

Document Appendix A, pp. 3-3 and 3-8 amended January 2017.

EXECUTIVE SUMMARY

Millions of dollars are spent each year on disaster response and recovery. By undertaking hazard mitigation – activities which will reduce the impact of future disasters – state and local governments and tribal organizations can reduce these costs and minimize the impacts of potentially disastrous events. Hazard mitigation can also be considered disaster prevention and encourages the development of disaster resilient communities. Wisconsin Emergency Management (WEM) is the lead agency for the hazard mitigation program in Wisconsin, a key component of which is the State of Wisconsin Hazard Mitigation Plan. The purpose of the original Plan was to identify Wisconsin's major hazards, assess the risk and vulnerability of the state to those hazards, and recommend actions to reduce vulnerability using the technical and programmatic resources of Wisconsin state agencies. Ultimately, the Plan strives to help protect the health, safety, property, environment, and economy of Wisconsin from the effects of natural hazards. In this five-year Plan update, all sections of the Plan were reviewed and revised, and include updated data and demographics (where applicable), risk assessments, mitigation goals, strategies, action items, and other pertinent information.

In 2016, the WHMT became a chapter of the national US Army Corps of Engineers Disaster Risk Management program, the Silver Jackets. The name was changed to the Wisconsin Silver Jackets Hazard Mitigation Team (WSJHMT). The core signatory agencies are:

- US Army Corps of Engineers
- Federal Emergency Management Agency
- Wisconsin Emergency Management
- Wisconsin Department of Natural Resources
- US Geological Survey
- National Weather Service

The Charter also identifies the rest of the WSJHMT members as supporting agencies. The Charter does not change how the WHMT operates as a team, but formalizes what the team had been doing for the past fifteen or more years.

The following State Mitigation Goals were updated by the Wisconsin Silver Jackets Hazard Mitigation Team and serve as the foundation for updated state Mitigation Strategy:

- 1. Minimize human, economic, and environmental disruption and reduce the potential for injury and loss of life from natural, technological, and manmade hazards.
- 2. Enhance public education about disaster preparedness and resilience, and expand public awareness of natural, technological, and manmade hazards.
- 3. Encourage and promote continued comprehensive hazard mitigation planning and implementation of the plan.
- 4. Support coordination and collaboration among federal, state, and local authorities, and

- non-governmental organizations regarding hazard mitigation activities.
- 5. Improve the disaster resistance of buildings, structures, and infrastructure whether new construction, expansion, or renovation.

The State of Wisconsin Hazard Mitigation Plan is primarily a natural hazard mitigation plan, and the Plan has evolved over time. However, this update has now included technological and human-caused hazards into the risk assessment. This update builds upon the Risk Assessment and Mitigation Strategy that were developed in 2005 and updated in 2008 and 2011. In addition, other plan elements were updated as needed to incorporate new information about hazards that threaten Wisconsin as well as changes to agency programs that address hazards.

The State of Wisconsin Hazard Mitigation Plan is organized to closely follow the planning requirements found in 44 CFR Parts 201.4 and 201.5.

Section 1 serves as an introduction to the Plan. It includes the purpose and scope of the plan and identifies the regulations and assurances [201.4(c)(6) and 201.4(c)(7)]. It further acknowledges and thanks the members of the Wisconsin Silver Jackets Hazard Mitigation Team for their efforts in this ongoing process. Finally, included in the introduction is background information on the State of Wisconsin. Every effort has been made to use the best available data for the update.

Section 2 describes and details the planning process used in update of the Plan including how it was prepared, who was involved, and how other agencies participated in the process [201.4(c)(1)].

Section 3, the Mitigation Strategy, identifies the state's strategy for reducing the losses identified in the Wisconsin Risk Assessment [201.4(c)(3)]. The section identifies the state's mitigation goals to guide the selection of activities to mitigate and reduce losses. These goals were reviewed and revised during the 2016 Plan update process. Included is a State Capability Assessment that provides a summary of state policies, laws, regulations, programs, and capabilities that exist and support mitigation. The State Capability Assessment was updated by meeting with individual members of the Wisconsin Silver Jackets Hazard Mitigation Team. A major component of the Mitigation Strategy is the specific mitigation actions that state agencies will implement. The mitigation actions were reviewed by the WSJHMT and each action's status (i.e. deleted, completed, ongoing, etc.) is discussed. New actions were also included. This update lists them according to lead agency. The section ends with an updated discussion regarding hazard mitigation funding and information regarding potential funding sources for implementing mitigation measures at the state and local levels.

Section 4 describes the state's process for supporting, through funding and technical assistance, the development of local hazard mitigation plans [201.4(c)(4)]. It highlights the progress Wisconsin has made over the last five years in local mitigation planning. It also describes how the state coordinates with local jurisdictions to encourage and support all-hazards mitigation planning. In addition, the section highlights some of the recent trends in

Wisconsin for local mitigation planning. The section highlights local plans that have started to address changing future weather patterns.

Section 5 describes the Plan Maintenance Process and includes the method and schedule for monitoring, evaluating, and updating the plan. It identifies how the state monitors project implementation closeouts, and reviews progress on achieving the goals of the Plan as well as the activities and projects in the Mitigation Strategy [201.4(c)(5)].

Section 6 describes and details the State's Comprehensive Hazard Mitigation Program [201.5(b)]. It describes the coordination among the state, federal, and other agencies and how the plan will be integrated with other state and federal planning efforts [201.4(b)].

The conclusion of the Plan, Section 7, acknowledges the adequacy of state hazard mitigation programs, which were tested and matured during a succession of disasters since the 1990s. Mitigation programs have reduced the number of flood-damaged and repetitive loss properties. At the same time, many challenges remain. Basement and stormwater flooding remain common, and flood insurance is widely misunderstood and underutilized. A very important task will be to effectively promote local mitigation planning (and local plan updates) as disaster prevention. Community planning and development professionals should continue to evaluate local hazards in their plans and embrace the goal of making disaster resilience a Wisconsin way of life.

Appendix K contains the signature pages for agency concurrence with the Plan. Other Plan appendices contain documentation regarding the history of the state's federal disaster declarations, hazard mitigation projects completed in the state, the Wisconsin Repetitive Loss Report, the State Administrative Plan for the Hazard Mitigation Grant Program, state and federal authorities for the Plan, and other reference materials.

For this update, the plan was reorganized, and there were some significant changes made to the Risk Assessment. The plan contained information that was duplicated sometimes in two or three sections. As in the previous update, in this update duplication was reduced by combining several sections and deleting several appendices.

The most significant change is with previous Section 3, Risk Assessment. This section has been eliminated and has been combined with the State's Threat Hazard Identification and Risk Assessment (THIRA). The THIRA includes natural hazards as well as technological and human-caused hazards. The THIRA includes 13 hazards: Severe Weather encompasses high winds, tornados, hail, and lightning; Flooding includes dam failure and landslide/land subsidence; Wildfires; Drought and Extreme Heat; Winter Storms and Extreme Cold; Coastal Erosion; Radiological Release; Hazardous Materials; Disruption of Lifelines; Emerging Infectious Diseases Including Pandemic Flu; Food and Agriculture Emergency; Cyber Attack; and Terrorism including Active Shooter and Civil Disturbances. The State-Owned or -Operated Critical Facility Risk Assessment is an attachment to the THIRA. The THIRA includes the nature of the hazard; history; probability, impact and mitigation potential; catastrophic scenario; and a consequence analysis. The THIRA is Appendix A to the State Plan.

2016 State Plan Update Summary

Plan Section	Description of Update
Section 1: Introduction	Updated planning process participants and demographic data
Section 2: Planning Process	Updated planning process including information about the WSJHMT, facts, figures, and statistics; discussion of coordination among agencies and plan integration is now in Section 6
Section 3: Mitigation Strategy	Revised goals, state and local hazard mitigation goal alignment, and strategy; updated State Capability Assessment and the Mitigation Action Plan
Section 4: Coordination of Local Mitigation Planning	Updated programs, local mitigation plan progress, planning costs, planning guidance, and planning maps; highlighted local plans that have included changing future weather patterns
Section 5: Plan Maintenance Process	Updated plan maintenance process and future plan update schedule
Section 6: Comprehensive State Hazard Mitigation Program	Updated comprehensive mitigation programs, regional and other planning initiatives, assessment of mitigation actions, and integration with FEMA mitigation programs and initiatives
Section 7: Conclusion	Updated data, statistics, and programs
Appendix A: Threat Hazard Identification and Risk Assessment (THIRA)	Previous Section 3, Risk Assessment, has been incorporated into the state THIRA and includes 13 hazards that address natural, technological, and human-caused hazards
Appendix B: History of Federal Disaster Declarations	Updated to include declarations 4076, 4141, 4276, and 4288
Appendix C: Mitigation Projects	Updated to include grants funded since 2008
Appendix D: Repetitive Loss Report	Updated repetitive loss report with current data
Appendix E: Wisconsin Silver Jackets Hazard Mitigation Team	Updated to include current membership roster
Appendix F: HMGP Administrative Plan	Updated to October 2016 Administrative Plan
Appendix G: Loss Avoidance Study: Wisconsin Property Acquisition and Structure Demolition	September 2009 loss avoidance study for Jefferson, Kenosha, and Crawford counties
Appendix H: Evaluating Losses through Acquisition Projects	Loss avoidance study for Milwaukee County
Appendix I: Authorities	Updated
Appendix J: Acronyms	Updated
Appendix K: State Agency Concurrences	Updated with current state agency concurrences
Appendix L: Standard Plan Crosswalk	State Mitigation Plan Review Tool

TABLE OF CONTENTS

EXECUTIVE SUMMARY	i
TABLE OF CONTENTS	V
SECTION 1: INTRODUCTION	1-1
1.1 Purpose and Scope	1-1
1.2 Regulations	1-2
1.3 Assurances	1-3
1.4 Wisconsin Silver Jackets Hazard Mitigation Team	1-3
1.5 State of Wisconsin Background Information	1-4
SECTION 2: THE PLANNING PROCESS	2-12
2.1 Overview of the Planning Process	2-12
SECTION 3: MITIGATION STRATEGY	3-22
3.1 State Mitigation Goals	3-22
3.2 Capability Assessment	3-23
3.3 Mitigation Action Plan	3-26
3.4 Hazard Mitigation Funding	3-82
SECTION 4: LOCAL HAZARD MITIGATION PLANNING	4-151
4.1 Funding of Local Planning Efforts	4-151
4.2 Hazard Mitigation Planning Program Process	4-153
4.3 Technical Resources	4-155
4.4 State, Tribal, and Local Hazard Mitigation Planning	4-157
SECTION 5: PLAN MAINTENANCE PROCESS	5-162
5.1 Monitoring, Evaluating, and Updating the Plan	5-162
5.2 Monitoring Progress of Mitigation Actions	5-165
5.3 Project Monitoring and Closeouts	5-165
SECTION 6: COMPREHENSIVE STATE HAZARD MITIGATION PROGRAM	6-166
6.1 Integration with Other Planning Initiatives	6-166
6.2 Integration with FEMA Mitigation Programs and Initiatives	6-178
6.3 Project Implementation Capability	6-202
6.4 Program Management Capability	6-206
6.5 Measuring Success: Loss Avoidance	6-218
6.6 Mitigation Efforts of Other Agencies	6-228
6.7 Effective Use of Available Mitigation Funding	6-233
6.8 State Commitment to a Comprehensive Mitigation Program	6-235

State of Wisconsin Hazard Mitigation Plan

SECTION 7: CONCLUSION	.7-267
APPENDIX A: THREAT HAZARD IDENTIFICATION AND RISK ASSESSMENT	A-1
APPENDIX B: NATURAL DISASTER SUMMARY AND HISTORY OF WISCONSIN'S FEDERAL DISASTER DECLARATIONS	
APPENDIX C: STATE MITIGATION GRANTS	C-1
APPENDIX D: REPETITIVE LOSS REPORT	D-1
APPENDIX E: WISCONSIN HAZARD MITIGATION TEAM	E-1
APPENDIX F: STATE ADMINISTRATION PLAN FOR THE HAZARD MITIGATION GRANT PROGRAM	F-1
APPENDIX G: AUTHORITIES	G-1
APPENDIX H: ACRONYMS	H-1
APPENDIX I: AGENCY CONCURRENCES	I-1
APPENDIX J: FEMA APPROVAL AND STATE HAZARD MITIGATION PLAN REVIEW TOOL	J-1

SECTION 1: INTRODUCTION

Natural disasters threaten communities and citizens throughout the United States. Between 1980 and 2016, the US experienced 200 natural disasters where damages exceeded \$1 billion. The total cost for these events exceeds \$1.1 trillion (adjusted to 2016 dollars using the Consumer Price Index; NCEI, 2016). Flooding represents 13% of the number of events with 9.4% of the losses, while severe storms made up 41.5% of the number of events yet only 15.5% of total losses. Tropical cyclones represent the highest in damages with 47.6% of total losses and drought is responsible for 19.1% of damages (NCEI, 2016). Nationwide, an increase in the number of severe storms, droughts, and flood events, has occurred over the last 20 years, resulting in an increase in property damage, and more frequent interruptions of business and government services (NCEI, 2016). Natural disasters have a tremendous economic impact on governments, businesses, and individuals.

In the 1980s, Wisconsin was granted six Presidential Disaster Declarations. In the 1990s, it was twice that number, and in the 2000s, the state received ten Presidential Disaster Declarations. Between 2000 and 2016, the state received an additional fourteen Declarations. Since 1990, Wisconsin has incurred over \$2.75 billion in disaster-related damages.

To reduce vulnerability to natural hazards and decrease the staggering costs individuals, the government, and the insurance industry pay in their wake, the state must find ways to minimize disaster losses through the implementation of mitigation projects and activities. Hazard mitigation activities are sustained actions taken to eliminate or reduce the long-term risk to human life and property from natural and technological hazards. Along with preparedness, response, and recovery, hazard mitigation is one of the four phases of emergency management. Mitigation can occur during any phase of emergency management – before, during, or after a disaster. However, hazard mitigation is the only phase of emergency management that can break the cycle of damage and repair. A report released by the Multihazard Mitigation Council (Institute of Building Sciences) in 2005 indicated that for every dollar spent on mitigation, \$4 or more can be saved in future damage costs. For flooding, \$5 or more can be saved in future damages for every dollar spent in mitigation.

1.1 Purpose and Scope

The purpose of the State of Wisconsin Hazard Mitigation Plan is to identify the state's major hazards, assess the vulnerability to those hazards, and take steps to reduce that vulnerability using the technical and programmatic resources of State of Wisconsin agencies. The Plan

includes a mitigation strategy that identifies goals and recommended actions and initiatives that will reduce or prevent injury and damage from the identified hazards.

The Plan assesses hazard risk, reviews current state and local hazard mitigation capabilities, develops mitigation strategies, and identifies state agency actions to address mitigation needs. The Plan does not attempt to develop local mitigation projects. As a home rule state, the State of Wisconsin respects the rights of communities to implement specific mitigation actions that best serve them. The Plan identifies existing resources and develops tools to assist communities in their mitigation efforts. This is accomplished by establishing statewide mitigation policies, and providing technical resources, financial guidance, and training and education opportunities. To this end, the State of Wisconsin Hazard Mitigation Plan is the foundation for a viable statewide mitigation program.

1.2 Regulations

In 1988, the Disaster Relief Act of 1974, PL 93-288, was amended by PL 100-707, the Robert T. Stafford Disaster Relief and Emergency Assistance Act. Section 404 of the Stafford Act allows the President to contribute up to 75% of the cost of hazard mitigation measures not to exceed 15% of the estimated federal assistance provided as a result of a Presidential Disaster Declaration. Section 404 funds can be used anywhere in the state and are not limited to the counties in the declared area.

Section 322 of the Disaster Mitigation Act of 2000 requires the development of a State Hazard Mitigation Plan for a state to be eligible for federal mitigation funds and certain other disaster assistance. States must develop and submit for approval to the Federal Emergency Management Agency (FEMA) a Standard Hazard Mitigation Plan that includes details of the planning process, identification of the state's natural hazards, a risk assessment for the identified natural hazards, a mitigation strategy, and a plan maintenance process. Section 322 of the Act also allows the President to increase the mitigation contributions to 20% of the federal assistance provided for the Presidential Disaster Declaration if the approved State Hazard Mitigation Plan contains enhanced mitigation program management information.

This Plan meets the requirements for a Standard and Enhanced State Plan under Interim Final Rule 44 CFR 201.4 and 201.5, published by the Federal Emergency Management Agency on February 26, 2002. The completed State Mitigation Plan Review Tool can be found in Appendix J.

Meeting the planning requirements of these regulations maintains the State of Wisconsin's eligibility for obtaining the maximum federal disaster assistance available including the hazard mitigation grants available through the Stafford Act.

1.3 Assurances

The State of Wisconsin will comply with all applicable federal statutes and regulations in effect with respect to the periods in which it receives grant funding, including 44 CFR Part 13, and 2 CFR Parts 200 and 3002 for grant awards for declaration issued after December 26, 2014. The State of Wisconsin Hazard Mitigation Plan will be amended according to the process described in the Plan Maintenance Section whenever necessary to reflect changes in state and federal statutes. The Plan complies with state and federal regulations, as cited in the Authorities Appendix and other portions of the Plan.

1.4 Wisconsin Silver Jackets Hazard Mitigation Team

The Wisconsin Silver Jackets Hazard Mitigation Team (WSJHMT) is comprised of representatives from the following state and federal agencies:

Cooperative Network

Federal Emergency Management Agency

Milwaukee Metropolitan Sewage District

Mississippi River Regional Planning Commission

National Weather Service

Public Service Commission of Wisconsin*

University of Wisconsin-Extension*

US Army Corps of Engineers

US Department of Agriculture, Natural Resources Conservation Service

US Department of Agriculture, Rural Development

US Department of Housing and Urban Development

US Economic Development Administration

US Geological Survey

Voluntary Organizations Active in Disaster

Wisconsin Association of Floodplain, Stormwater, and Coastal Managers

Wisconsin Economic Development Corporation*

Wisconsin Department of Administration*

- Division of Housing
- Division of Intergovernmental Relations; Wisconsin Coastal Management Program,
 Comprehensive Planning, and the Wisconsin Land Information Program
- Division of State Facilities

Wisconsin Department of Agriculture, Trade, and Consumer Protection*

Wisconsin Department of Health Services*

Wisconsin Department of Natural Resources*

- Division of Enforcement and Science
- Division of Forestry
- Division of Water

Wisconsin Department of Safety and Professional Services,* Division of Industry Services

Wisconsin Department of Transportation*

Wisconsin Emergency Management*

Wisconsin Emergency Management Association

Wisconsin Historical Society*

Wisconsin Office of the Commissioner of Insurance*

The heads of the agencies listed above (indicated with an asterisk) have reviewed and concurred that the State of Wisconsin Hazard Mitigation Plan is a working document that will improve the state's ability to minimize the effects of natural hazards and resist disaster, thereby protecting the health, safety, and economy of its citizens (see Appendix I). They further agree to implement the mitigation actions identified in the Mitigation Strategy and to provide support for and participate in plan updates.

1.5 State of Wisconsin Background Information

Wisconsin is the 23rd largest state in the United States at 54,310 square miles (land only) and has the 20th greatest population (5,771,337 as estimated by the American Community Survey in 2015). Wisconsin's natural beauty has made the state a favorite playground of the nation. Vacationers enjoy the state's clean lakes, rolling hills, quiet valleys, and deep forests. The winters

are ideal for skating, skiing, snowmobiling, tobogganing, and ice fishing. Many communities stage curling matches during the winter and others hold snowmobile derbies.

1.5.1 State Government

The Wisconsin State Capitol, located in Madison, houses both branches of the Wisconsin Legislature, the State Supreme Court, and the Office of the Governor. The state is divided into 72 counties and many smaller jurisdictions: cities, villages, and towns. Cities and villages are incorporated urban areas. Towns are minor civil divisions of counties and are unincorporated.



Wisconsin State Capitol Source: Wisconsin Department of Administration, 2011.

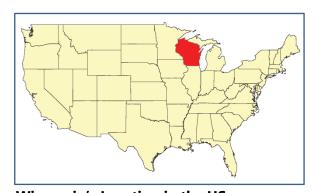
Wisconsin is bordered by Lake Superior and the Upper Peninsula of Michigan to the north, Lake Michigan to the east, Illinois to the south, and Iowa and Minnesota to the west. The state's

western boundary is defined by the Mississippi

Wisconsin is a "home-rule" state. This means that state authority in local affairs is limited except when the state enacts legislation that applies to all local jurisdictions uniformly. The state can also prohibit cities and villages from enacting ordinances in matters of statewide concern. Cities and villages have home-rule authority, but towns do not. Counties have only administrative home rule, which means they can organize their administrative departments as they see fit. When cities or villages request action by the county on their behalf, home rule can extend to the counties. A significant feature of home-rule for mitigation purposes is that home-rule communities have zoning authority.

1.5.2 Geography

and St. Croix Rivers.



Wisconsin's Location in the US Source: Wisconsin Emergency Management, 2011.

Geology

Thousands of years ago, most of Wisconsin was covered by glaciers which scraped the tops off tall hills, leaving rich earth deposits and beautiful lakes (over 15,000 of them) among rolling hills and ridges. As a result, the state can be divided into the five distinct geological land areas shown in Figure 1.5.2-1: the Lake Superior Lowland, the Eastern Ridges and Lowlands (Great Lakes Plains), the Northern Highland (also known as the Superior Upland), the Central Plain, and the Western Upland.



Figure 1.5.2-1: Wisconsin Geological Land Areas

Source: Wikipedia, public domain file, created March 16, 2010:

http://en.wikipedia.org/wiki/File:Wisconsin_geographic_provinces.svg.

Lake Superior Lowland: In northern Wisconsin, the Lake Superior Lowland slopes gradually upwards toward the south from the shores of Lake Superior. This small area of nearly flat plain extends about five to 20 miles inland.

Northern Highland: Most of northern Wisconsin is characterized by Northern Highland geography. This area, lying south of the Lake Superior Lowland, expands southward over about one third of the state. The Northern Highland reaches its highest elevations in the north, sloping downward to the south. The Northern Highland supports hundreds of small lakes and heavily forested hills. Timms Hill, the highest point in Wisconsin, is located in the Northern Highland.

Central Plain: South of the Northern Highland and curving across the central part of the state is the Central Plain. In the southern portion of the Central Plain, the Wisconsin River has carved the beautiful scenic gorge Wisconsin Dells. This is an area of buttes and mesas; an unexpected landscape for central Wisconsin.

Eastern Ridges and Lowlands: To the east of the Central Plain, the gently rolling hills of the Eastern Ridges and Lowlands area extend from Green Bay south to Illinois. This is the richest agricultural region of Wisconsin where ice-age glaciers deposited earth over limestone ridges.

Western Upland: To the west of the Central Plain, the Western Upland is characterized by limestone and sandstone bluffs along the Mississippi River. The Western Upland extends along the Mississippi River to the border of Illinois. The southwestern portion of the Western Upland, know and the Driftless Area, was not touched by glaciers and is an area that contains steeply sloped ravines and winding ridges.

Weather

Wisconsin lies between 42° 30' and 47° north latitude and is located centrally between the east and west coasts of the continent. As such, the state has four distinct seasons. The waters of Lake Superior and Lake Michigan create slightly more moderate climates along their shores. Wisconsin lies in the belt of prevailing westerly winds.

1.5.3 Water Resources and Recreation

Wisconsin values its water resources. With over 15,000 lakes, 33,000 miles of rivers and streams, and 5.3 million acres of wetlands to enjoy, Wisconsinites work hard to protect their lakes and restore their watersheds as shoreline use intensifies. Fishing and boating are major recreational activities in the state.

Aside from water, Wisconsin has numerous other outdoor recreational assets. According to the State of Wisconsin 2015-2016 Blue Book, there are nearly 6,000 state-owned campsites, and 6 million acres of hunting land. Wisconsin currently operates 49 state parks, 14 state forests, and 8 recreation areas. Visitors to Wisconsin's state parks, forests, trails, and recreation areas number over 14 million annually.

1.5.4 Infrastructure

Transportation

As of January 1, 2015, there were 115,212 miles of roads in Wisconsin. That includes 11,765 miles of state trunk highways, 19,867 miles of county trunk highways, and 81,828 miles of local roads. Over 79% of state roads (91,025 miles) are surfaced at bituminous grade or higher, with the remaining 21% being gravel- or soil-surfaced, graded and drained, or unimproved.

Wisconsin is also home to nine railroads with 3,489 miles of railroad, nine active lake harbors, and 662 airports of which 94 are publicly owned, 452 are privately owned, and 116 are specialized facilities.

Dams

There are currently about 3,900 dams in Wisconsin. About 100 dams have been removed since 1967. 60% of Wisconsin dams are privately owned, 9% are owned by the state, 17% are owned by a municipality, and the remaining 14% have other types of ownership. About 5% of the dams in Wisconsin produce hydroelectricity and therefore fall under federal jurisdiction. The Wisconsin Department of Natural Resources regulates the remaining 95% of dams.

Nuclear Power Plants

There are two nuclear power plants in Wisconsin: Kewaunee in Kewaunee County and Point Beach in Manitowoc County. Kewaunee Nuclear Power Plant is in the decommissioning process. They are both on the shore of Lake Michigan. The Prairie Island nuclear power plant in Minnesota is on the shore of the Mississippi River and thus also impacts Wisconsin. These power plants are regulated by the Nuclear Regulatory Commission (NRC).

1.5.5 Population

The population of Wisconsin as of 2015 is estimated to be 5,771,337 a 7.6% increase from the 2000 Census. Population growth was concentrated in the Fox River Valley, the far western part of the state near Minnesota's Twin Cities, Dane County, and southeastern Wisconsin.

With respect to population change in rural and urban areas, Wisconsin's demographic history largely parallels that of the rest of the country. Urban population is defined as persons living in and around cities with populations over 50,000, and those who reside in smaller cities and villages with populations of at least 2,500. The remainder of the population is considered rural.

The 2000 Census found that 68% of Wisconsin's population lives in urban areas. This contrasted with 79% nationally.

The five largest cities in Wisconsin are Milwaukee, Madison, Green Bay, Kenosha, and Racine.

In 2008, the Wisconsin Demographic Services Center completed a set of long-range projections for Wisconsin including the state's fifteen coastal counties. These projections from 2000-2035, help public officials and others anticipate and plan for future growth and decline.

As a group, Wisconsin's fifteen coastal counties are projected to increase by 9.2% in population through 2035. This change is less than the projected statewide growth of 24.1%. Numerically, the coastal counties population is projected to increase by 179,000 persons, from 1.94 million in 2000 to 2.12 million in 2035.

1.5.6 American Indians

American Indians have been a vital and significant population throughout Wisconsin's history and for hundreds of years prior to statehood. Geographically, American Indians have a strong presence not only in those counties that have reservations or tribal lands but also in a number of urban counties. In 2010, the largest populations were in Milwaukee County (6,794), Brown County (5,191) and Menominee County (3,981). When considered as a percentage of the total population, northern Wisconsin counties have the highest percentage of American Indian residents. Four counties have populations that are 10% or more American Indian: Menominee (87%), Sawyer (16%), Forest (11%), and Ashland (10%).

According to the "Tribes of Wisconsin" book prepared in July, 2011 by the Wisconsin Department of Administration, there are 11 federally-recognized Indian Tribes in Wisconsin:

Bad River Band of Lake Superior Tribe of Chippewa Indians

Forest County Potawatomi Community

Ho-Chunk Nation

Lac Courte Oreilles Chippewa Band of Lake Superior Indians

Lac du Flambeau Band of Lake Superior Chippewa Indians

Menominee Indian Tribe of Wisconsin

Stockbridge-Munsee Community of Mohican Indians

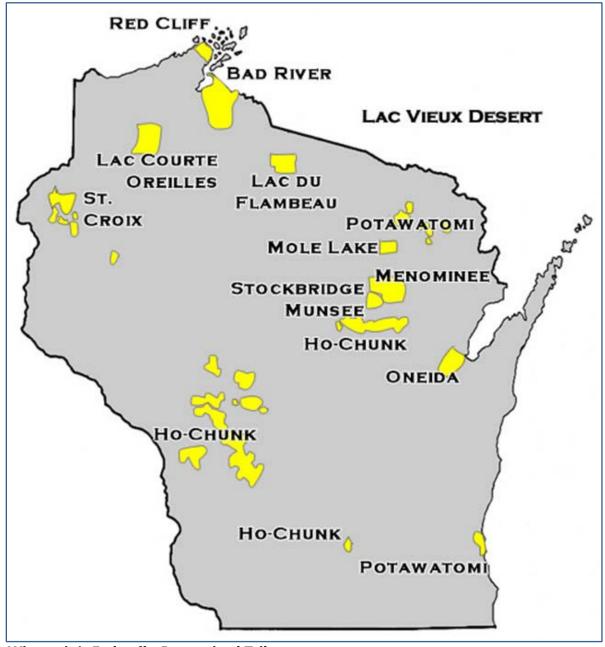
Oneida Nation

Red Cliff Band of Lake Superior Chippewa Indians

St. Croix Chippewa Indians of Wisconsin

Sokaogon Chippewa Community (Mole Lake Band of Lake Superior Chippewa Indians)

As sovereign nations, these tribes can apply directly to FEMA for mitigation grants or apply through the state as a subapplicant. They must meet the tribal mitigation planning requirements described in 44 CFR Part 201.7 to be awarded Hazard Mitigation Assistance funds.



Wisconsin's Federally-Recognized Tribes

Source: Great Lakes Inter-Tribal Council, 2016: http://www.glitc.org/.

1.5.7 Sources

The following agencies and document research assisted in providing background information.

- 1. NOAA National Centers for Environmental Information (NCEI). "U.S. Billion-Dollar Weather and Climate Disasters." 2016. https://www.ncdc.noaa.gov/billions/.
- 2. United States Census Bureau, American Community Survey Office. "ACS Data Tables on American FactFinder." http://www.census.gov/acs/www/data/data-tables-and-tools/american-factfinder/.

SECTION 2: THE PLANNING PROCESS

2.1 Overview of the Planning Process

Wisconsin Emergency Management (WEM) developed the State of Wisconsin Hazard Mitigation Plan over a period of several years. Subsequently, WEM has updated the plan over the last five years. The Plan is a multi-agency effort with WEM serving as the lead agency for the planning process. Mitigation staff from WEM led the development effort and conducted the bulk of the research and writing of plan drafts, worked with state and federal agencies, reviewed local plans for information to include in the State Plan, convened meetings of the Wisconsin Silver Jackets Hazard Mitigation Team (WSJHMT), managed the plan review process, and facilitated adoption by the state agency heads.

2.1.1 Initial Plan Development

In response to the 1993 Midwest Flood, WEM formed the Interagency Disaster Recovery Group (IDRG) that was an informal group with the responsibility to coordinate recovery and mitigation efforts and included both state and federal agencies. The purpose and goal of the IDRG was to assist the local governments during the disaster recovery phase by providing technical assistance when possible, preventing duplication of efforts and funding among the participating agencies, identifying and prioritizing mitigation projects, and identifying funding options for implementing long-term mitigation projects whether through the individual agencies or by "packaging" funding among the different programs. As a result of the success of the ad-hoc group, the IDRG continued to meet in response to subsequent major disasters in the state up until late 2003.

The successes of the IDRG made clear the need to formalize a group and designate a permanent State Hazard Mitigation Team which was an expansion of the IDRG with policy-making authority. To that end, The Adjutant General sent letters in March 2000 to ten state agencies requesting they attend a meeting to discuss the formation of the State Hazard Mitigation Team (SHMT) and development of the State Hazard Mitigation Plan and each agency's roles and responsibilities in these efforts. The original agencies invited to participate on the SHMT were those that were identified with responsibilities in the areas of natural resources, environmental regulation, planning and zoning, building codes, infrastructure regulation and construction, insurance, public information/education, economic development, and historic preservation.

An overview of Wisconsin's disaster history and hazard mitigation programs was provided along with an introduction to hazard mitigation planning at a meeting held on April 12, 2000. At the meeting agencies were requested to designate a representative from their agency as a member of the SHMT. The team member would act as a liaison between the SHMT and their respective agency and have access to technical expertise within the agency and be able to facilitate decision making and policy interpretation related to the agency in the areas of planning, regulations, programs, policies, and functions. Agency representatives were designated and the first official meeting of the SHMT was held on May 17, 2000. Several agencies that had multiple

facets that needed to be included in the plan had more than one representative on the SHMT. Many of the members of the IDRG were also members of the SHMT. Members of the team represented eleven state agencies.

The SHMT team met frequently during the development of the State Hazard Mitigation Plan. Meeting agendas, attendance sheets, meeting summaries, and handout materials are all on file at WEM. A summary was prepared after each meeting and distributed to SHMT members with any items that needed follow-up or action noted.

The Plan was finalized in July 2001, and was submitted to the state agency heads in August for agency concurrence. The head of each agency represented on the SHMT signed a State Agency Concurrence acknowledging that they had reviewed and concurred with the State Hazard Mitigation Plan. By signing the concurrence they agreed to continue to support and participate in the Plan updates, and implement the actions identified in the Plan. The Plan was placed on WEM's website. The State of Wisconsin Hazard Mitigation Plan was formally submitted to FEMA Region V on October 26, 2001. A letter dated January 21, 2002, from FEMA advised that the plan met Section 409 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act and the requirements of 44 CFR Part 206.405. The letter also included recommendations for the next update of the plan.

2.1.2 2004 Plan Update

On February 26, 2002, 44 CFR Part 201 established criteria for state and local hazard mitigation planning as authorized by Section 322 of the Stafford Act, as amended by Section 104 of the Disaster Mitigation Act of 2000. Beginning November 1, 2004, states were required to have an approved Standard State mitigation plan in order to be eligible to receive FEMA mitigation funds through the Hazard Mitigation Grant Program (HMGP) and the Pre-Disaster Mitigation (PDM) program as well as other disaster assistance. The regulations also included criteria for an Enhanced State mitigation plan. With the approval of an Enhanced Plan, the amount of assistance provided through the HMGP would increase from 7.5% (now 15%) to 20%. Failing to meet this requirement would have a significant financial impact on both the state and local governments following a disaster.

The regulations and planning requirements were discussed extensively at the next regularly scheduled SHMT quarterly meeting held on May 10, 2002. It was obvious that changes would be required to the State Plan in order to meet the new requirements, and that WEM would need the assistance of the SHMT members in meeting the requirements.

In July 2002 WEM requested FEMA Region V to review the State Hazard Mitigation Plan for compliance with the new planning requirements. FEMA provided specific comments in a letter dated November 4, 2002. Based on those comments, mitigation staff developed a strategy and timeline for completing the major components of the plan. The review comments were discussed with the SHMT.

In December 2003, the IDRG and the SHMT, which up to this point were functioning as two

separate groups with some members on both teams, merged to form the Wisconsin Hazard Mitigation Team (WHMT). Two additional members from state agencies were added to the team; the Department of Administration, Intergovernmental Relations, Comprehensive Planning Program; and the Department of Commerce, Division of Safety and Buildings. In addition, the Chairman of the Wisconsin Association of Floodplain, Stormwater, and Coastal Managers (WAFSCM) joined the WHMT. This member also worked for the Milwaukee Metropolitan Sewage District (MMSD), the largest district in the state. The MMSD has been implementing flood mitigation measures throughout the Milwaukee urban area. Earlier in the year the Executive Director from the Mississippi River Regional Planning Commission representing the Council of Regional Planning Organizations also joined the WHMT. In January of 2005, three additional members were added to team that included representatives from the Great Lakes Tribal Council, Wisconsin Emergency Management Association (WEMA), and the National Weather Service. Later that year, individuals representing the Department of Administration, Division of State Facilities; and Volunteer Organizations Active in Disasters (VOAD) joined the WHMT. Since 2005 a representative from the Cooperative Network joined the WHMT. This brought the total 41 members representing 11 state agencies and 7 federal agencies along with the WAFSCM, Council of Regional Planning Organizations, WEMA, and VOAD.

The 2004 Wisconsin Hazards Mitigation Plan was submitted to FEMA for review and on December 9, 2004, WEM received a letter advising that the state plan met the required criteria for a Standard State mitigation plan. The Plan would be approved upon formal adoption by the state. The head of each state agency represented on the WHMT signed a State Agency Concurrence acknowledging that they had reviewed and concurred with the State of Wisconsin Hazard Mitigation Plan. By signing the concurrence they agreed to continue to support and participate in the plan updates, and implement the actions identified in the Plan. The concurrences signed by each agency represented on the WHMT, including the WEM Administrator, represent formal adoption of the plan. The Enhanced Hazard Mitigation Plan was approved December 14, 2005.

2.1.3 2008 Plan Update

On February 16, 2006, the WHMT met and discussed the strategy for the three-year update. WEM reported that the Enhanced Hazard Mitigation Plan for Wisconsin was approved December 14, 2005. This increased the HMGP to 20% from 7.5% (now 15%) in future declarations.

For the 2008 Plan update, numerous meetings were held with the WHMT and documentation of the planning process includes meeting agendas, meeting summaries, handout packets, follow-up letters, and e-mails. Copies of the documentation are on file at WEM and can be provided upon request.

The State of Wisconsin Hazard Mitigation Plan 2008 update was developed by WEM with the assistance and use of information provided by other state and federal agencies. The 2008 Wisconsin Hazard Mitigation Plan was approved on December 9, 2008 with the Enhanced

Hazard Mitigation Plan approved on June 15, 2009.

2.1.4 2011 Plan Update

For the 2011 update of the State of Wisconsin Hazard Mitigation Plan a new approach was used that involved WEM Mitigation staff meeting with individual agencies to review past contributions and gather new information. The approach worked much better than the large-group-meeting and questionnaire formats that were used in the past. This approach led to better developed mitigation action items.

Individual meetings were held with the Departments of Transportation, Natural Resources (Forestry and Water Resources), Administration (Coastal Management Program, Intergovernmental Relations, and Division of Housing), and Safety and Professional Services; Office of the Commissioner of Insurance; National Weather Service; and US Geological Survey. Other agencies that were not met with individually, but contributed to the 2011 Plan update through written correspondence include the Department of Agriculture, Trade, and Consumer Protection; the Wisconsin Association for Floodplain, Stormwater, and Coastal Managers; and the Milwaukee Metropolitan Sewerage District. A few agencies that were contacted to update their past contributions to the plan did not respond, so their contributions were updated using information from other, related agencies and from their websites. There were two meetings with the entire team.

In the 2011 Plan update, the Risk Assessment underwent a complete overhaul. The methodologies were updated, new information was gathered on hazard events (including hail as a new hazard), and the first phase of the State Structure Inventory was included.

Additionally, the Plan was rearranged. The Plan contained information that was duplicated sometimes in two or three sections. In the update duplication was reduced by combining several sections and deleting several appendices. The Mitigation Strategy was reorganized such that the Action Items were organized by Lead Agency instead of by Goal. This was done for two reasons: first, it was easier for each agency to find their contribution; second, many of the Action Items meet more than one of the State Hazard Mitigation Goals, so organizing them by goal was somewhat misleading. Several appendices were added including a brand new Rural Electric Cooperative Annex and Loss Avoidance Studies.

2.1.5 2016 Plan Update

In 2015, the WHMT became a chapter of the national US Army Corps of Engineers Disaster Risk Management program, the Silver Jackets. The name was changed to the Wisconsin Silver Jackets Hazard Mitigation Team (WSJHMT).

For the 2016 State of Wisconsin Hazard Mitigation Plan update, WEM Mitigation staff used the same update process as utilized in 2011. Staff met with individual state agencies to review past contributions and gather new information. Mitigation actions and capabilities were reviewed and updated. Staff discussed with the agencies new mitigation actions. Again, this approach

worked much better than the large-group-meetings and questionnaire formats that had been used in the past. This approach leads to better developed mitigation action items as well as action items that agencies can collaborate together in achieving. The table in Figure 2.1.5-1 lists the meetings held between WEM and the state agencies.

Figure 2.1.5-1: Meetings with WSJHMT Member Agencies

Date	Time	Agency
4/12/16	10 am	Public Service Commission
4/13/16	9 am	Dept. of Administration/Division of Housing
4/13/16 1	10 am	Dept. of Administration/Intergovernmental Relations, Wisconsin Land
4/13/10	10 aiii	Information Program
4/13/16	11 am	Dept. of Agriculture, Trade and Consumer Protection
4/19/16	10 am	Dept. of Transportation
4/19/16	11 am	Dept. of Administration/Intergovernmental Relations, Wisconsin Coastal
4/13/10		Management Program
4/21/16	9 am	State Historical Society
4/21/16	11 am	Office of the Commissioner of Insurance
5/3/16	10 am	Dept. of Health Services
5/11/16	1 pm	Wisconsin Economic Development Corporation
5/11/16	2 pm	Dept. of Natural Resources/Division of Water
6/27/16	9 am	National Weather Service
6/29/16	12:30 pm	Dept. of Natural Resources/Division of Forestry
8/9/16	3 pm	University of Wisconsin-Extension
8/24/16	9 am	Dept. of Safety and Professional Services
10/7/16	9 am	Wisconsin Initiative Climate Change Impacts

The WSJHMT as a whole met five times during this plan update cycle. Meeting attendance, rosters, and minutes are on file with WEM and are distributed to all team members. Copies are available upon request.

<u>December 4, 2012</u>: 27 people representing 11 agencies attended the meeting. Presentations were made on the Great Lakes Coastal Flood Hazard Mapping Project; RiskMAP; Flood Inundation Mapping; THIRA; and the status of open disaster declarations 1719-DR, 1768-DR, 1933-DR, 1966-DR, and 4076-DR. The Mitigation Strategy in the State of Wisconsin Hazard Mitigation Plan was discussed. Each agency in attendance provided a report.

November 14, 2013: 22 people attended in person and via conference call representing 12 agencies. WEM provided a status update on open declarations (1933-DR, 1944-DR, 1966-DR, 4076-DR, and 1966-DR). Other topics discussed included the proposed Flood Inundation Mapping project for the Rock River in Jefferson, Dodge, and Rock Counties; USACE Non-Structural Floodproofing Workshop; Sandy Recovery Improvement Act; and the Biggert-Waters Act. In addition, the update of the State of Wisconsin Hazard Mitigation Plan was discussed. It was put forward that WEM wanted to include technological hazards and more information on climate change in the next plan update. WSJHMT members were also requested to review the five goals of the State Plan and provide input. Agency updates were provided by those in

attendance.

<u>February 17, 2015</u>: 25 people attended in person or via phone representing 11 agencies. WEM provided an update on open declarations as well as the Pre-Disaster Mitigation and Flood Mitigation Assistance programs. Other topics discussed included the Rock River Flood Inundation Mapping project; Columbia County Structure Inventory (Silver Jackets) project; the proposed charter for the Silver Jackets/Hazard Mitigation Team; Wisconsin Comprehensive Response System, the Short/Long Term Recovery Subgroup, and the Wisconsin Recovery Task Force (WEM); and Risk MAP. The update of the State of Wisconsin Hazard Mitigation Plan was discussed. An update schedule was distributed to team members. Agency updates were provided by those participating in the meeting.

December 7, 2015: 27 people attended in person or via phone representing 13 agencies. An update regarding the Silver Jackets charter was provided. The Charter was finalized and just waiting for several signatures. The WHMT will now be called the Wisconsin Silver Jackets Hazard Mitigation Team (WSJHMT). Presentations were provided on Climate and Health Impacts: Building Resilience Against Climate Effects (BRACE); Wisconsin Coastal Management Program (WCMP); Great Lakes Coastal Flood Study; and the Rock River Flood Inundation Map along with a live demonstration. The update of the State of Wisconsin Hazard Mitigation Plan was discussed. WEM advised that the state was going for EMAP (Emergency Management Accreditation Program) accreditation in the spring. There would be a self-assessment in June/July with the on-site assessment in August 2016. The hazards identified in the State of Wisconsin Hazard Mitigation Plan needed to be consistent with those identified in the THIRA (Threat Hazard Identification and Risk Assessment). This meant that the following hazards would need to be added to the State Plan: radiological release, hazardous materials, emerging infectious diseases including pandemic flu, food and agricultural emergencies, cyber-attack, and terrorism. Loss of life line services will also be discussed. Agency updates were provided by those in attendance.

November 16, 2016: 24 people attended in person or via phone representing 15 agencies. The main topic was update of the State Plan. The team reviewed and updated the five goals to include technological and human-caused hazards in goals 1 and 2. WEM Mitigation staff explained that technological and human-caused hazards have been added to the Risk Assessment, which is now incorporated into the THIRA and will be Appendix A to the State Plan. The Mitigation Strategy section of the plan was discussed. Agency concurrences were distributed to verify proper information. WEM provided a status update on the two most recent declarations, 4276-DR and 4288-DR, declared in August and October, respectively. Agency updates were provided. The meeting concluded with a tour of the new Emergency Operations Center.

One of the goals of the Short and Long-Term Recovery Committee of the Wisconsin Comprehensive Response Workgroup was to reconvene the Wisconsin Recovery Task Force (WRTF) as a standing task force as identified in the 2008 WRTF report. Based on the National Disaster Recovery Framework, the subcommittees of the original WRTF were realigned to more closely match those in the national Recovery Support Functions (RSF). The six RSF

Subcommittees are Economic, Health and Social Services, Housing, Infrastructure, Agriculture, and Mitigation. The SHMO chairs the RSF Mitigation Subcommittee with membership consisting of the WSJHMT. The RSF Subcommittee Chairs met in February 2015. The Chairs identified members for their Subcommittees and a WTRF meeting was held April 22, 2015. At the meeting the RSF Subcommittees broke into their respective groups. As a result of flooding in eight northern counties on July 11-12, 2016, the WRTF RSF Subcommittee Chairs met on July 19, 2016, to address several needs that were identified by the Governor and his cabinet as well as other recovery issues. A follow-up conference call was held August 5, 2016. Information and assignments from the meeting and subsequent call was shared by the RSF Subcommittee Chairs with the members of their subcommittee. The WRTF met on September 15, 2016, to discuss recovery actions for the northern flooding that resulted in declaration 4276-DR, as well as subsequent flooding that occurred in Buffalo and Trempealeau counties on August 10 and in Richland County on September 5. In addition, the WRTF discussed the ongoing erosion that is occurring in Racine and Kenosha counties along Lake Michigan. As stated above, the WSJHMT makes up the RSF Mitigation Subcommittee and is chaired by the SHMO.

As mentioned previously, in January 2016, the Wisconsin Silver Jackets Hazard Mitigation Team Charter was signed by core agencies of the Wisconsin Hazard Mitigation Team. The core agencies are:

- U. S. Army Corps of Engineers
- Federal Emergency Management Agency
- Wisconsin Emergency Management
- Wisconsin Department of Natural Resources
- US Geological Survey
- National Weather Service

The Charter also identifies the rest of the WSJHMT members as supporting agencies. The Charter does not change how the WHMT operates as a team, but formalizes what the team had been doing for the past fifteen or more years. As a result of the Charter, the state team changed its name to the Wisconsin Silver Jackets Hazard Mitigation Team (WSJHMT).

For this update, the plan was reorganized, and there were some significant changes made to the Risk Assessment. The plan contained information that was duplicated sometimes in two or three sections. As in the previous update, in this update duplication was reduced by combining several sections and deleting several appendices. Previous Appendix A (Natural Disaster Summary) and B (History of the State's Federal Disaster Declarations) were combined into Appendix B; previous Appendix G (Rural Electric Cooperative Annex) was eliminated and will be updated in the future as a stand-alone document; Appendix H (State-Owned Building Vulnerability Assessment Questionnaire) was also eliminated; Appendices I and J (loss avoidance studies) are now Appendices G and H; Appendices K (Authorities) and L (Acronyms) are now I and J; and finally Agency Concurrences will be Appendix K. Appendix L will be the State Mitigation Plan Review Tool.

The most significant change is with previous Section 3, Risk Assessment. This section has been eliminated and has been combined with the State's Threat Hazard Identification and Risk Assessment (THIRA). The THIRA includes natural hazards as well as technological and human-caused hazards. The THIRA includes 13 hazards. Severe Weather encompasses high winds, tornados, hail, and lightning; Flooding includes dam failure and landslide/land subsidence; Wildfires; Drought and Extreme Heat; Winter Storms and Extreme Cold; Coastal Erosion; Radiological Release; Hazardous Materials; Disruption of Life Lines; Emerging Infectious Diseases Including Pandemic Flu; Food and Agriculture Emergency; Cyber Attack; and Terrorism including Active Shooter and Civil Disturbances. The State-Owned or -Operated Critical Facility Risk Assessment is an attachment to the THIRA. The THIRA includes the nature of the hazard; history; probability, impact and mitigation potential; catastrophic scenario; and a consequence analysis. The THIRA is Appendix A to the State Plan.

As the lead agency in the development of the State of Wisconsin Hazard Mitigation Plan, WEM works with other state, federal, and local agencies to develop and implement the strategies outlined in this document and obtain interagency feedback on the success or failure of those strategies. That information is used in updating the Plan. The State of Wisconsin Hazard Mitigation Plan was developed and updated with the support and assistance of WSJHMT as described previously in this section.

Team members provide a variety of expertise and perspective to the planning process, including emergency management, natural hazards, land-use planning, agriculture, building codes, transportation, and infrastructure (see Appendix E for full membership). Agencies and their area of expertise are listed below:

Table 2.1.5-2 Wisconsin Silver Jackets Hazard Mitigation Team

Expertise	Organization
State Comprehensive Planning	Department of Administration, Intergovernmental Relations,
	Comprehensive Planning Program
	Association of Wisconsin Regional Planning Commissions
	Department of Administration, Intergovernmental Relations, Coastal
Coastal Management	Management Program
	Wisconsin Association for Floodplain, Stormwater, and Coastal Managers
State-Owned Buildings	Department of Administration, Division of State Facilities
Public Health	Department of Health Services
Historic Preservation	Wisconsin State Historical Society
Transportation Infrastructure	Department of Transportation, Division of Transportation Infrastructure
Transportation Infrastructure	Development, Bureau of Highway Operations
Building Codes	Department of Safety and Professional Services
	Wisconsin Emergency Management
Hazard Mitigation	Federal Emergency Management Agency
	Wisconsin Emergency Management Association
	Association of Wisconsin Regional Planning Commissions
	Wisconsin Emergency Management
Disaster Response	Federal Emergency Management Agency
	Wisconsin Emergency Management Association

Expertise	Organization
	Volunteer Organizations Active in Disasters
Community Development Block Grants/Housing and Public Facilities	Department of Administration, Division of Housing
Education/Planning/Local	University of Wisconsin-Extension
Government Resources	Association of Wisconsin Regional Planning Commissions
Insurance	Office of the Commissioner of Insurance
Lifelines	Public Service Commission, Division of Administrative Services Cooperative Network
Agriculture	Department of Agriculture, Trade and Consumer Protection, Division of Agricultural Resource Management, Bureau of Land & Water Resources, Conservation Management Section US Department of Agriculture, Natural Resources Conservation Service
Floodplain Management,	Department of Natural Resources Federal Emergency Management Agency
Stormwater, Dam Safety	US Army Corps of Engineers US Geological Survey
Dain Salety	Wisconsin Association for Floodplain, Stormwater, and Coastal Managers
Forestry	Department of Natural Resources
	Department of Administration
	US Department of Housing and Urban Development
Housing	US Department of Agriculture, Rural Development
	Department of Health Services
Conservation	US Department of Agriculture, Natural Resources Conservation Service Department of Natural Resources
	Department of Administration
	Wisconsin Economic Development Corporation
Business Recovery	Economic Development Administration
	Association of Wisconsin Regional Planning Commissions
Climate and Weather	National Weather Service
Volunteer Organizations: Red Cross, Salvation Army, etc.	Volunteer Organizations Active in Disasters

The purpose of the WSJHMT is to:

- Assist with the revision and update of the State of Wisconsin Hazard Mitigation Plan
 - o Review previous hazard mitigation planning and identify progress made on actions
 - o Review and update goals, objectives, and strategies for the update of the Plan
 - o Assist with development of plan maintenance process
- Provide ongoing monitoring of state hazard mitigation efforts after adoption and FEMA approval of the State Plan
- Assist in the review of the State Plan, and in revising the plan every five years

As hazard mitigation planning continuously involves multiple government agencies and other organizations, it is assumed the role of other entities will increase in the future. The Plan will be

adjusted accordingly during the five-year update cycle.

Implementation of the State of Wisconsin Hazard Mitigation Plan will be most effective if it is integrated with other planning efforts and initiatives. The state has made efforts at integration by identifying opportunities where mitigation can be integrated into existing plans, reports, programs, and/or initiatives. Integration and coordination with other agencies and organizations is described in more detail in Section 6, Comprehensive State Hazard Mitigation Program.

Section 6.8, State Commitment to a Comprehensive Mitigation Program, provides information and describes how WEM helps educate stakeholders about Wisconsin's hazards, assist stakeholders in developing plans, and obtain mitigation ideas and suggestions for the State Plan through a variety of activities and mechanisms. In this manner, WEM received input from different levels of government, local officials, business representatives, private organizations, and other interested parties including the public.

This educational process also has resulted in WEM's partners using mitigation in their programs and plans over time. These discussions and/or meetings have involved reviews of current programs and policies that promote or could potentially promote mitigation initiatives. Many of the mitigation successes since the 1993 floods have been as a direct result of these meetings and discussions. The lessons learned through these programs and activities have contributed to the development of the State Plan and have been integrated into their own plans, programs, and procedures. The State Capability Assessment in Section 3, Mitigation Strategy, includes a detailed description of where and how mitigation is integrated into specific agency plans, policies, programs, and initiatives.

Over the years, WEM has worked to identify partners interested in participating in the state's mitigation efforts. Integration of other federal, state, and local agencies; business and industry; and private non-profit organizations into the state mitigation program has been an ongoing process that also has helped to educate WEM's partners concerning the importance of mitigation.

SECTION 3: MITIGATION STRATEGY

The Wisconsin Hazard Mitigation Team (WHMT) prepared the goals, mitigation actions, and Mitigation Action Plan included in Wisconsin's State Hazard Mitigation Plan. The goals and mitigation actions were developed based on the experience of WHMT members, presentations and discussions about the natural hazards that impact the State, information from the State Risk Assessment, review and discussion of previous mitigation planning and activities, and review and discussion of the mitigation goals of the state's local mitigation plans. For the 2011 version of the Plan, Wisconsin Emergency Management (WEM) met one-on-one with representatives of the other WHMT agencies to review and update their contributions.

Through the WHMT's planning process, the mitigation goals below were developed for State Hazard Mitigation Plan. The goals guided the development of mitigation actions and the Mitigation Action Plan, and will foster a vision for hazard mitigation and disaster resistance throughout the state.

3.1 State Mitigation Goals

- 1. Minimize human, economic, and environmental disruption from natural, technological, and manmade hazards.
- 2. Enhance public education about disaster preparedness and resistance, and expand public awareness of natural, technological, and manmade hazards.
- 3. Encourage hazard mitigation planning.
- 4. Support intergovernmental coordination and cooperation among federal, state, and local authorities regarding hazard mitigation activities.
- 5. Improve the disaster resistance of buildings, structures, and infrastructure whether new construction, expansion, or renovation.

Goals were initially developed during the planning process for the original State Hazard Mitigation Plan completed in 2001. Through the planning processes for the 2008 and 2011 updates, the WHMT revised the goals to more accurately encompass the purpose of hazard mitigation in the state and the mission of the WHMT. In 2016, the WSJHMT further revised goals 1 and 2 to include technological and manmade hazards.

As of November 15, 2016, 72 counties, seven single jurisdictions, and ten tribal governments in Wisconsin have developed or are developing hazard mitigation plans. After reviewing these plans, WEM Mitigation staff determined that the goals of these local plans and the goals of the State Plan closely mirror each other. Section 4 discusses this in more detail. The plans and the areas they represent will provide ample information to ensure that the Mitigation Strategy of the State Hazard Mitigation Plan reflects the counties', tribal organizations', and single jurisdictions' goals and strategies.

3.2 Capability Assessment

3.2.1 State Capability Assessment

As part of the Mitigation Strategy, the State Hazard Mitigation Plan includes a discussion of the state's pre- and post-disaster hazard management capabilities, including an evaluation of state laws, regulations, policies, and programs related to hazard mitigation as well as to development in hazard-prone areas, and a discussion of state funding capabilities for hazard mitigation projects.

For development of the initial plan, a capability assessment survey was developed to collect information on policies, programs, regulations, authorities, agency initiatives, training, and technical assistance provided by state agencies that address hazard mitigation. Members of the WHMT coordinated with staff in their agencies to obtain information on all relevant activities. This inventory assisted the WHMT in identifying what capabilities existed, which were working well, and where there were unmet needs. For the three-year plan updates in 2008 and 2011, the members of the WHMT were asked to review and evaluate the state capability assessment. Revisions and additions were made. In both 2011 and 2016, WEM Mitigation staff met with each agency individually to obtain this information. This led to much more robust insights than using a survey or conducting a large-group meeting.

Completing a thorough capability assessment led to the identification and development of many specific mitigation recommendations and actions. By evaluating the effectiveness of the existing state capabilities with respect to capabilities of local governments, the state discovered the need for additional programs to assist communities in their mitigation efforts, and included those mitigation action items in the Mitigation Action Plan.

WEM has identified the following programs as having the greatest impact on mitigating damage from natural hazards:

- The Pre-Disaster Mitigation Competitive (PDM-C) program provides mitigation grants to state and local governments, and tribal organizations for comprehensive all-hazards mitigation planning and to implement cost-effective mitigation projects.
- The Hazard Mitigation Grant Program (HMGP) provides mitigation grants to state and local governments, eligible private non-profit organizations, and tribal organizations for comprehensive all-hazards mitigation planning and to implement cost-effective mitigation projects.
- Increased Cost of Compliance (ICC) coverage pays insurance claims for the cost of
 compliance with state or community floodplain management laws or ordinances after a
 direct physical loss by flood. When a building in the floodplain covered by a Standard
 Flood Insurance Policy under the NFIP sustains a flood loss and the state or community
 declares the building to be substantially or repetitively damaged, ICC will pay up to
 \$30,000 for the cost of elevation, floodproofing, demolition, or relocation that will bring
 the structure into compliance with the state or local floodplain ordinance.

- The Flood Mitigation Assistance (FMA) program provides annual funding for the
 development of comprehensive flood mitigation plans and implementation of costeffective mitigation measures on NFIP-insured properties. The former Repetitive Flood
 Claims and Severe Repetitive Loss programs have been rolled into the FMA program.
 Mitigation of repetitive loss and severe repetitive loss properties as defined by FEMA is
 the highest priority for the program.
- NR 116 Local and State Floodplain Standards prohibits construction in floodways and requires elevation and dry-land access in flood fringe areas. It limits improvements to non-conforming structures and requires compensatory storage in flood storage areas.
- Comprehensive planning legislation requires local governments to have comprehensive plans to guide them in making good land-use decisions. It complements mitigation planning and has added momentum to the mitigation planning movement by requiring the incorporation mitigation elements into comprehensive plans by 2010.
- The Home Safety Act requires the state's Uniform Dwelling Code (UDC) be enforced throughout the state. It includes the imperative to have all new construction inspected for compliance with the UDC. This law will improve the disaster resistance of homes by requiring implementation of safety standards at the time of construction. The effect will be a reduction in injury and property loss from all types of natural hazards.
- The Municipal Flood Control and Riparian Restoration Program provides grants for the mitigation of flood-prone property, the restoration of riparian areas, and the construction of flood control projects.
- The Firewise Communities program is intended to serve as a resource for agencies, tribes, organizations, fire departments, and communities across the US who are working toward a common goal: reduce loss of life, property, and resources to wildland fire by building and maintaining communities in a way that is compatible with our natural surroundings. Firewise Communities is part of the National Wildland/Urban Interface Fire Program.

Because of their length, Figures 3.2.1-1 and 3.2.1-2 are at the end of this section. The table in Figure 3.2.1-1 identifies and assesses state agency activities that support hazard mitigation. The table in Figure 3.2.1-2 identifies and lists potential funding sources for mitigation activities. The state relies heavily upon federal hazard mitigation programs available through FEMA to fund state and local hazard mitigation projects.

3.2.2 Local Capability Assessment

As part of the state's mitigation strategy, the State Hazard Mitigation Plan shall include a general description and analysis of the effectiveness of local mitigation policies, programs, and capabilities.

As of November 2016, all 72 counties and ten of the 11 federally-recognized tribes in Wisconsin have completed or are developing all-hazards mitigation plans. The local plans are discussed

further in Section 4 of the Plan.

There are several local regulations or programs that assist counties and communities in addition to several key statewide regulations or initiatives that provide for mitigation capabilities at the local level. They are identified in the table in Figure 3.2.2-1, Local Capability Assessment, at the end of this section.

In addition to the policies and/or regulations identified in the table, WEM Mitigation staff has been actively working with local governments to develop an awareness of mitigation opportunities and to further identify policies, programs and capabilities that exist that may advance mitigation efforts at the local level. This is done through the following activities:

- Provide information and guidance regarding the benefits of comprehensive hazard mitigation planning and the development of long-term or permanent mitigation measures. WEM with assistance of the Association of Wisconsin Regional Planning Commissions developed mitigation planning guidance, the Resource Guide to All Hazards Mitigation Planning in Wisconsin, which has been widely distributed.
- Develop and conduct All-Hazards Mitigation Planning Workshops for interested communities. In addition, hazard mitigation has been included in WEM's training curriculum in other courses such as the Disaster Response and Recovery Course, Local Damage Assessment, New Directors Series Workshop, and Municipal Planning Course. The G-393 Introduction to Mitigation for Emergency Managers course has also been added to WEM's curriculum. Hazard mitigation is included in the Local Officials Applicant Briefings held after each disaster declaration. WEM staff has teamed up with Wisconsin DNR staff in presenting at Substantial Damage Workshops.
- Develop and publish articles regarding all-hazards mitigation in various newsletters such as the WEM Digest; Department of Natural Resource's Floodplain and Shoreland Management Notes; Wisconsin Association for Floodplain, Stormwater, and Coastal Managers' (WAFSCM's) Water Matters; as well as others when requested.
- Make presentations on all-hazards mitigation whenever the opportunity presents itself.
 This includes at the Annual Governor's Conference on Homeland Security and
 Emergency Management; Wisconsin Emergency Management Association; WAFSCM's
 Annual Conference; Wisconsin Land Information Association; Association of Wisconsin
 Regional Planning Commissions; Wisconsin Utilities Association; Wisconsin State Bar
 Association; the UW-Madison; Great Lakes Tribal Organization; and Wetlands, Wildlife
 Habitat and Flood Hazards in the Rock River Basin; as well as others upon request.
- Utilize WEM's website to publish information and guidance on all-hazards mitigation.
 This includes information on the federal mitigation programs, state and local all-hazards
 mitigation planning, mitigation success stories, and other general information on
 mitigation. Documenting successful local mitigation stories demonstrates the long-term
 benefits of mitigation to other communities and the public as well as local policy- and
 decision-makers. Documenting success stories has generated an increase in awareness
 and interest in mitigation at the local level. Most of the presentation materials from the

- various workshops (Planning Workshop, Governor's Conference, and Buyout Workshop) are located on WEM's website.
- Effectively administer the federal mitigation grant programs (FMA, HMGP, and PDM) to fund cost-effective, environmentally-sound, long-term mitigation measures as well as comprehensive all-hazards mitigation planning.
- WEM has done numerous outreach activities for the public, emergency management professionals, and policy-makers since the last Plan update. They are detailed in Section 6.8.16.

3.3 Mitigation Action Plan

In developing the mitigation actions, the WSJHMT considered the following:

- The mission of WEM's Strategic Plan 2014-2016: WEM coordinates effective disaster response and recovery efforts in support of local governments. Through planning, training, and exercising, we prepare ourselves, our citizens, and response personnel to minimize loss of lives and property.
- Issues, concerns, and recommendations of the Post-Event Mitigation Strategies or Action Plans for major disaster declarations 1933, 1944, 1966, 4076, 4141, 4276, and 4288.
- The mitigation goals and objectives from local plans.
- Impacts of past disaster events.
- Recommendations from FEMA staff.
- The state's priority hazards: floods, tornadoes and high winds, wildfires, and coastal erosion. (See Appendix A, THIRA, for more information.)

For the 2016 Plan update, members of the WSJHMT met individually with WEM Mitigation staff to review and revise the Action Plan, specifically those items for which their agency is responsible. They also provided new action items as appropriate.

The Plan lists the Action Items by lead agency for two reasons: 1) it is easier for agencies to find their contributions, especially when updating the Plan; and 2) many of the Action Items satisfy more than one of the State Mitigation Goals, making it difficult to sort by goal. The order the Action Items are in under each agency does not reflect priority. Listed with each Action Item are background information; supporting agencies; the anticipated timeframe for implementation; and any changes since the previous update. New Action Items use italics for the Action Item number. Completed and deleted Action Items from the previous plan are listed in Section 3.3.15. The 2016 Update Status for each completed or deleted Action Item explains why it was removed from this update.

The Action Items are summarized in the table in Figure 3.3-1 for quick reference at the end of this section. The table includes a priority level (high, medium, or low) for each Action Item as specified by the lead agency. In addition, the table describes how each Action Item contributes

to the overall State Mitigation Strategy and which of the State Mitigation Goals it meets.

3.3.1 Lead Agency: Department of Administration (DOA)

Division of Energy, Housing, and Community Resources (DEHCR)

1.1 Action: Distribute hazard mitigation materials at housing workshops and training sessions.

Supporting Agency: WEM

Implementation: Continue to distribute hazard mitigation materials annually.

Background: WEM will provide hazard mitigation materials and the DEHCR will distribute

these materials at CDBG workshops and training sessions.

2011 Update Status: Unchanged. **2016 Update Status:** Unchanged.

1.2 Action: Include the Wisconsin Disaster Fund as a topic at workshops and trainings that also

discuss the Emergency Assistance Program.

Supporting Agency: WEM **Implementation:** Ongoing.

Background: WEM will present information about the Wisconsin Disaster Fund at Emergency Assistance Program and Bureau of Community Development workshops and trainings. WEM and the DEHCR will work together to provide mitigation information to recipients of housing rehabilitation and community development assistance.

2011 Update Status: Unchanged. **2016 Update Status:** Unchanged.

1.3 Action: Incorporate mitigation practices into the DEHCR's Emergency Assistance Program.

Supporting Agency: WEM

Implementation: The Division of Housing (now DEHCR) began incorporating mitigation practices into its housing rehabilitation programs in June 2001.

Background: The Eligible Activities List includes floodproofing, which is actually required for certain rehabilitation projects. Safe rooms where a need is identified, and retrofitting for greater wind resistance where property conditions require the replacement of roofing or siding, are also eligible activities

2011 Update Status: Delayed because CDBG funds are not usually used for the type of substantial rehabilitation necessary for the incorporation of mitigation practices. However, mitigation remains an eligible activity.

2016 Update Status: Unchanged.

1.4 Action: Do not approve grants or loans to communities to construct critical facilities in floodplains or other hazard-prone areas.

Supporting Agencies: WEM, DNR

Implementation: Ongoing.

Background: Community development programs within the DEHCR, such as the CDBG Public Facilities program, help disadvantaged communities finance the construction of community facilities and infrastructure. These are key components of the community and

need to be disaster resistant. The DEHCR will follow federal and state standards for flood risk mitigation and address other natural hazards as applicable when funding the construction of community facilities.

2011 Update Status: Action delayed because CDBG funds are not typically used for the type of substantial rehabilitation necessary for critical facility construction.

2016 Update Status: Unchanged.

1.5 Action: Administer and promote the Wisconsin Weatherization Assistance Program.

Implementation: Ongoing.

Background: Very low income households in Wisconsin can qualify for assistance in weatherizing their homes. This can not only keep heating and cooling costs down, but also protect structures from damages and save the lives of vulnerable individuals.

2016 Update Status: New action item.

1.6 Action: Chair the Housing Subcommittee on the Wisconsin Recovery Task Force (WRTF).

Supporting Agency: WEM

Implementation: Ongoing, as needed following disasters.

Background: Upon direction of Governor Doyle, WEM created the Wisconsin Recovery Task Force (WRTF) to assist individuals, businesses, and communities to recover quickly, safely, and with more resilience from future disasters. All WSJHMT members are on the Mitigation Subcommittee. Some WSJHMT members also chair the other subcommittees.

2016 Update Status: New action item; the WRTF was convened following two disasters in the state in 2016.

Division of Intergovernmental Relations: Wisconsin Land Information Program (WLIP)

1.7 Action: Coordinate and incorporate hazard mitigation planning concepts in future updates to the State Guide on Developing the Natural Resources Element of the Comprehensive Planning Guides.

Supporting Agencies: WEM, DNR, UW-Sea Grant Institute

Implementation: Ongoing.

Background: Wisconsin Comprehensive Planning legislation was created in 1999 to address the planning needs of Wisconsin communities. Many communities had outdated plans, inconsistent plans, or no plans at all. This legislation requires communities that want to enact or change zoning, subdivision regulations, or official mapping to have a comprehensive plan in place by January 1, 2010. Communities must address nine elements within the comprehensive plan. DOA drafted guides for each element. Hazard mitigation planning is mentioned briefly in the guide for the Natural Resources Element.

2011 Update Status: Mitigation planning information was provided to DOA by WEM. The Planning Guides are now only available online.

2016 Update Status: The Comprehensive Planning program no longer exists, but the Department of Administration continues to provide information on comprehensive planning.

1.8 Action: Promote hazard mitigation planning by maintaining a close relationship with the Comprehensive Planning program.

Supporting Agencies: WEM, Regional Planning Commissions

Implementation: Staff will provide an annual update on communities developing comprehensive plans so that, if possible, the information from the comprehensive plans can be used in the development or update of local hazard mitigation plans.

Background: Comprehensive plans for local communities contain information that is useful in hazard mitigation planning such as floodplain maps, future land use maps, contaminated site information, wetlands maps, stream corridors, etc.

2011 Update Status: WEM is preparing to update the Resource Guide to All Hazards Mitigation Planning in Wisconsin.

2016 Update Status: The Comprehensive Planning program no longer exists, but the Department of Administration continues to provide information on comprehensive planning.

1.9 Action: Work toward establishing a community for GIS and LiDAR data sharing.

Supporting Agencies: DNR, NWS, USGS, WEM, UW

Implementation: The WLIP is nearing completion of a statewide parcel data layer. LiDAR is also being pursued.

Background: GIS data layers can be very expensive when not available publicly. This project would allow users to access many types of GIS data for various purposes in the public interest including mitigation planning and mitigation project development.

2016 Update Status: New action item.

Division of Intergovernmental Relations: Wisconsin Coastal Mgmt. Program (WCMP)

1.10 Action: The WCMP will continue to raise awareness of coastal hazards through such activities as Coastal Awareness Month, and workshops and trainings that include concepts of disaster-resilient communities to promote hazard mitigation.

Supporting Agencies: WEM, DNR

Implementation: Ongoing.

Background: The WCMP seeks to prevent and minimize potential threats posed by coastal hazards through outreach efforts, grant programs, and agency partnerships.

2011 Update Status: Unchanged. WAFSCM, WEM, and WCMP will try to schedule a Coastal Hazards Workshop in fall 2011 or spring 2012.

2016 Update Status: Unchanged. WCMP worked with WEM staff and other members of the Coastal Hazards Work Group to organize and hold Great Lakes Coastal Processes and Best Management Practices workshops in 2011-2012.

1.11 Action: The WCMP will help communities develop and implement shoreline and bluff erosion policies.

Supporting Agencies: WEM, DNR, UW-Sea Grant Institute

Implementation: Current and ongoing. The WCMP will seek to increase the number and effectiveness of policies regulating coastal hazards in Wisconsin.

Background: The WCMP continues to work to update methodologies and technical information regarding coastal erosion in the Great Lakes. This information is intended to help devise mitigation activities, update current ordinances and other policies, and raise stakeholders' awareness of risks posed by coastal erosion.

2011 Update Status: Unchanged.

2016 Update Status: Changes to state rules regarding Shoreland Zoning, Wisconsin Admin. Code Ch. NR 115, may affect communities' shoreline policies. The WCMP will work with communities to assess and address the potential impacts.

1.12 Action: The Wisconsin Coastal Hazards Work Group (CHWG) will work with local governments in the state's 15 coastal counties to develop and revise policies relevant to coastal hazards.

Supporting Agencies: UW-Sea Grant Institute, DNR

Implementation: Ongoing.

Background: The most recent GIS effort that supports the work of the CHWG involves the visualization of coastal erosion processes. The UW-Sea Grant Institute collaborated on a project funded by NASA to apply remote sensing to local government problems. The Wisconsin State Cartographer approached the Sea Grant Institute and the UW-Madison Geography Department about the use of visualization software to communicate the risks of coastal erosion to development in Ozaukee County, WI. Their work has helped make sense of a large volume of scientific and spatial data while emphasizing the role that imagery and animation have in the public understanding of coastal erosion. The work has also helped identify the most suitable software tools for representing dynamic coastal processes.

2011 Update Status: The CHWG continues to develop tools and convey challenges of coastal erosion and flooding to coastal communities.

2016 Update Status: A CHWG member updated a document titled *Managing Coastal Hazard Risks on Wisconsin's Dynamic Great Lakes Shoreline* and provided supporting documents regarding Coastal Ordinance Provisions in Wisconsin communities and the Coastal Erosion Model Ordinance.

1.13 Action: The WCMP will coordinate the CHWG to expand hazard mitigation activities in those coastal areas vulnerable to destruction.

Supporting Agencies: WEM, UW-Sea Grant Institute, DNR

Implementation: The WCMP will continue to hold CHWG meetings as needed.

Background: The WCMP works with its partner agencies in the CHWG. The CHWG provides an opportunity for agencies to discuss current challenges and potential projects relevant to coastal hazards. They have developed various tools to convey the challenges of coastal erosion including an educational web site: http://www.geography.wisc.edu/coastal. Using 3-D animations of bluff erosion, coastal landowners can see the complex changes that happen as coastal bluffs erode. This successfully bridges the gap between scientific understanding and public perception of coastal hazards.

2011 Update Status: The CHWG continues to develop tools and convey to coastal communities the challenges of coastal erosion and flooding.

2016 Update Status: The CHWG has helped to develop a number of online resources to assist communities in understanding coastal processes. CHWG members continue to work with local communities in addressing their information needs. The WCMP and UW-Sea Grant Institute will host a Coastal Fellow who will review and begin revisions of the Coastal Processes Manual, a document that provides important information and recommendations

State of Wisconsin Hazard Mitigation Plan

for coastal engineering. Members of the CHWG are contributing to an "Integrated Assessment for Water Level Variability and Coastal Bluff Erosion in Northern Milwaukee County and Southern Ozaukee County," led by the UW-Sea Grant Institute.

3.3.2 Lead Agency: Department of Agriculture, Trade, and Consumer Protection (DATCP)

2.1 Action: Encourage communities to sign up for and participate in the Conservation Reserve Enhancement Program (CREP) to reduce crop losses.

Supporting Agencies: County Land Conservation Departments, USDA: Farm Services Agency and Natural Resources Conservation Service

Implementation: Ongoing; the program began in 2001. The sign-up period ended in October 2012.

Background: The CREP is a federal and state program that focuses on improving water quality. The program promotes reducing non-point pollutant runoff from agricultural lands; reducing sediment, nutrient, and pesticide loads; installing riparian buffers, filter strips, and grassed waterways; and restoring wetlands and prairie grasses. The program helps reduce runoff and peak flows in streams. The project goal was to set aside 100,000 acres. While primarily a water quality program, removing flood-prone cropland from production is a secondary benefit.

2011 Update Status: State funding was reduced from the \$40 million estimate to \$28 million in bonding authority in 2009 Wisconsin Act 28.

2016 Update Status: Of the \$28 million in bonding authority, about \$14 million has been spent. Almost 50,000 acres are currently enrolled under about 4,000 contracts. Half of the contracts will expire over the next three years; about 75% are expected to re-enroll.

2.2 Action: Chair the Agriculture Subcommittee on the Wisconsin Recovery Task Force (WRTF).

Supporting Agency: WEM

Implementation: Ongoing, as needed following disasters.

Background: Upon direction of Governor Doyle, WEM created the Wisconsin Recovery Task Force (WRTF) to assist individuals, businesses, and communities to recover quickly, safely, and with more resilience from future disasters. All WSJHMT members are on the Mitigation Subcommittee. Some WSJHMT members also chair the other subcommittees.

2016 Update Status: New action item; the WRTF was convened following two disasters in the state in 2016.

3.3.3 Lead Agency: Department of Natural Resources (DNR)

Division of Water

3.1 Action: Give extra points to communities applying for DNR Stewardship programs if their proposal includes mitigation elements.

Implementation: 2005; ongoing.

Background: DNR's Stewardship grant program allocates additional points for projects that acquire, enhance, or protect natural areas that provide water quality and water quality benefits. Many of these projects often also serve as flood mitigation measures. Adding specific mitigation actions, such as increasing floodwater storage capacity, to the project ranking criteria would help conserve natural resources while reducing flood losses.

2011 Update Status: Unchanged.2016 Update Status: Unchanged.

3.2 Action: Promote the No Adverse Impact (NAI) floodplain management approach statewide.

Supporting Agencies: WAFSCM, WEM

Implementation: 2005; ongoing.

Background: With over \$6 billion in flood damages annually, the drain on all levels of resources needs to be reduced. With intensifying development in watersheds and floodplains, the rationale is to manage that type of development more fervently. The NAI approach makes sense and will result in reduced damages. NAI increases support for watershed management by promoting multiple objectives through management strategies. This means it appeals to a wider range of interests and will broaden approval of flood management actions.

2011 Update Status: An NAI training session was held at the 2008 WAFSCM conference. The session promoted NAI activities including higher regulatory standards, to ensure that the actions of property owners are not allowed to adversely affect the rights of other property owners. It also discussed the adverse effects or impacts within communities such as increased flood peaks, increased flood stages, higher flood velocities, increased erosion and sedimentation, and other impacts communities consider important.

2016 Update Status: Unchanged.

3.3 Action: Promote substantial damage inspections.

Supporting Agency: WEM

Implementation: 2011; ongoing.

Background: To maintain membership in the NFIP, communities must have substantial damage inspection requirements in their floodplain zoning code. Substantial damage inspections following flood events help determine eligibility for state and federal disaster assistance, so it is crucial that communities enforce the inspection requirements in the zoning code and that they have qualified individuals performing the inspections. The DNR sends letters to communities affected by floods advising them on substantial damage determinations and proper outreach to potentially impacted residents. The DNR also discusses substantial damage inspection requirements at workshops and other public

speaking venues; stresses that the requirements are in the community's floodplain zoning code and are a minimum standard for NFIP compliance; discusses training opportunities and assistance available from state and federal sources after a flood event; promotes the use of the new Substantial Damage Estimator Tool; and encourages cooperation among neighboring communities.

2011 Update Status: New action item.

2016 Update Status: Substantial damage inspection has been a topic in floodplain workshops held in 2014, 2015, and 2016. Substantial damage workshops were held in northern Wisconsin in response to 2016 flood events. Substantial damage letters were sent in 2016 to all communities impacted by the summer and fall flooding.

3.4 Action: Promote more efficient methods of detecting non-compliant structures in the floodplain and reviewing local floodplain management procedures.

Supporting Agency: FEMA **Implementation:** Ongoing.

Background: Flood damages are increasing annually. Limiting non-compliant floodplain development will decrease potential damages. Developing more efficient methods of identifying non-compliant structures and reviewing local floodplain management procedures will facilitate the limiting of non-compliant development, thus reducing the number of structures and individuals at risk during flood events.

2011 Update Status: New action item. In 2008, a method of conducting aerial photo comparisons was developed and implemented. It resulted in an increase in the number of non-compliant structures identified and mitigated. The aerial photo process will be refined and other tools developed and implemented.

2016 Update Status: The aerial photo review comparison has been used to support the majority of Community Assistance Visits conducted since 2011. The comparisons identify more areas of potential concern than could typically be found with just a floodplain drive through. Most communities find that the resulting maps make it very easy to pull the information for the property and resolve the issue. Efforts are underway to refine the process and develop templates so that staff less familiar with GIS can help with the comparison exercise. The aerial photo review method may be used to assist WEM with open space compliance enforcement as well.

3.5 Action: Encourage restoration of natural wetland functions.

Supporting Agencies: NRCS, USFWS, local communities, property owners

Implementation: Ongoing.

Background: Wetlands provide natural flood storage areas. Restoring the natural function of these areas can reduce the flooding potential of other areas in the watershed. For many years, the DNR has been working with NRCS, USFWS, and other entities interested in wetland restoration to streamline the regulatory processes of these activities. Efficient spending of federal funds promotes access to future funding opportunities. The DNR has worked with partners on enabling legislation to develop a permitting process for certain classes of federally-funded and -designed wetland restoration projects; to develop a general permitting process; and to train staff from impacted agencies. Staff from NRCS, USFWS,

DNR, and WEM in cooperation with local governments, the UW-Extension, the Environmental Law Institute, the University of South Carolina-Chapel Hill, and the Rock River Coalition planned and conducted a Wetlands, Wildlife Habitat, and Flood Hazards in the Rock River Basin workshop in May 2011. The workshop was designed to facilitate greater collaboration between emergency managers and wetland and wildlife conservation managers to strengthen protection of vital wetlands and floodplains. It explored how agencies and organizations can work effectively together to meet multiple goals and identify the information needed and funding sources available for joint projects.

2011 Update Status: New action item. The DNR will continue to work with federal and other partners to improve the wetland restoration permitting process. The DNR will use lessons learned from the Wetlands, Wildlife Habitat, and Flood Hazards in the Rock River Basin workshop to identify and restore converted wetland areas.

2016 Update Status: Unchanged.

3.6 Action: Provide workshops and distribute informational materials to improve understanding and enforcement of floodplain, coastal, shoreline, and wetland regulations, including mitigation techniques.

Supporting Agencies: WCMP, UW-Sea Grant Institute, WEM

Implementation: Ongoing.

Background: Educating the public on flood hazards is one of the first duties and greatest challenges of any flood mitigation and prevention program. The DNR will coordinate with the WCMP to improve coastal hazards awareness; coastal hazards mitigation; and floodplain, shoreline, and wetland regulations. Staff will continue to have workshops on floodplain management regulations, substantial damage determinations, flood insurance, and compliance. They will conduct Community Assistance Visits to assess local floodplain management performance and compliance.

2011 Update Status: Will annually conduct ten floodplain management workshops and attend ten or more meetings of local government officials, realtors, insurance agents, and the general public to promote floodplain management.

2016 Update Status: The DNR sponsored the FEMA L-273 course, Managing Floodplain Development through the NFIP in 2014 in Eau Claire and co-sponsored the course with WAFSCM, WEM, and ASFPM in 2016 in Pewaukee. Shoreland Workshops are also held regularly.

3.7 Action: Provide sewer back-flow prevention information and other floodproofing measures to affected communities through public information programs.

Supporting Agency: WEM, OCI **Implementation:** Ongoing.

Background: Sewer back-flow has been identified as a major cause of damage during heavy rain events in Wisconsin's urbanized areas. Thus, it is important to provide information in these areas on how to prevent losses. Producing a pamphlet and/or web page about insurance and property protection options will assist in this.

2011 Update Status: Contacted MMSD staff to discuss enhanced distribution of informational materials. Plan to meet with appropriate staff before the end of FY2011.

2016 Update Status: Unchanged.

3.8 Action: Compile and distribute the Floodplain/Shoreland Notes newsletter.

Supporting Agencies: FEMA, WEM

Implementation: Ongoing.

Background: The newsletter is an effective method of providing local officials and others with information on all aspects of the NFIP, shoreland issues, dam safety, and hazard mitigation. The newsletter is stored online and past issues are used for reference by state and local officials and the public.

2011 Update Status: New action item. The newsletter is mailed three times per year to local officials and other interested individuals. The DNR currently uses electronic delivery. Past issues are maintained on the DNR website.

2016 Update Status: Unchanged. WEM regularly contributes articles regarding flood and all-hazards mitigation.

3.9 Action: Provide workshops and distribute informational materials to improve understanding and awareness of flood insurance.

Supporting Agency: FEMA **Implementation:** Ongoing.

Background: Workshops and visits will improve awareness of flood insurance and methods of reducing flood risks. Improving local awareness will increase the number of flood insurance policies. DNR held 11 flood insurance workshops and participated with other agencies in producing material for the 2010 Flood Awareness Week.

2011 Update Status: New action item. DNR will continue to hold at least three flood insurance workshops annually and continue participating in the annual Flood Awareness Week. DNR will work to update flood insurance information available on their website. **2016 Update Status:** Workshops specific to Flood Insurance were held in 2011 and

2016 Update Status: Workshops specific to Flood Insurance were held in 2011 and 2013. Workshops in 2012, 2014, 2015, and 2016 provided the most recent updates on National Flood Insurance Program changes. Websites have been updated to provide appropriate contact information for flood insurance assistance.

3.10 Action: Promote dam safety awareness through workshops, and the development of Emergency Action Plans (EAPs) and Inspection, Operations, and Maintenance (IOM) guidebooks, templates, and newsletters.

Supporting Agency: FEMA **Implementation:** Ongoing.

Background: The number and increasing age of dams escalates the need to ensure dam owners understand their responsibilities and the risk a dam can pose to surrounding properties and infrastructure. By increasing the number of EAPs, IOMs, and public awareness, the overall level of risk from dam failure can be reduced. The DNR has held five Dam Safety Workshops throughout the state for owners of large dams. An EAP Guidebook and Template were developed and posted on the Dam Safety website. A Dam Safety News newsletter was sent to the owners of large dams.

2011 Update Status: New action item. Dam safety workshops will be held on an annual

basis throughout the state on a rotating basis. A new IOM Guidebook and Template will be developed and posted on the DNR website. The Dam Safety News newsletter will be published twice a year.

2016 Update Status: Dam Safety workshops were held in 2011, 2012, 2013, 2014, and 2015. Two Dam Safety newsletters were published in each of those years. The IOM Template and Guidebook were completed in 2012 and are available on the website.

3.11 Action: Continue to provide technical assistance to non-National Flood Insurance Program (NFIP) communities that have had flood damage and encourage them to join the NFIP.

Supporting Agency: WEM **Implementation:** Ongoing.

Background: Although most communities that are not in the NFIP are not at high risk for flooding, many of these communities do have some flood risk and need to establish a community flood mitigation program to clearly identify and mitigate flood risk. The DNR has coordinated with several communities interested in joining the NFIP. Community Assistance Visits (CAVs) were conducted in these communities. In addition, the department is working with other newly incorporated communities.

2011 Update Status: Ongoing. 25 communities have joined the NFIP since 2006. Non-participating communities will continue to be contacted and encouraged to join the NFIP as part of the ongoing Risk MAP process.

2016 Update Status: 18 Communities have joined the NFIP since June 2011 and assistance has been provided to another 13 communities that are considering or in the process of joining. Outreach is complete for all non-participating communities located in Risk MAP watersheds. Assistance is provided to communities who inquire about joining the program.

3.12 Action: Work with local communities to encourage mapping of floodplains and coastal areas. DNR will help identify flood hazard and coastal erosion areas, especially in those communities where mapping of hazard areas is most needed.

Supporting Agencies: WEM, RPCs, WCMP

Implementation: Ongoing.

Background: Many developing areas of Wisconsin have flood and erosion risk but are poorly mapped for these risks or not mapped at all. Promoting hazard mapping will empower local communities and individuals to manage and reduce their risks. Each year DNR will try to help at least one priority community map its flood hazard areas. DNR will coordinate with WCMP to identify areas of coastal erosion. Staff conducted a pilot project to update coastal erosion information for Bayfield County on Lake Superior. A statewide process is underway to completely update Wisconsin's floodplain map base. The desired outcome is that all Wisconsin NFIP communities receive new flood maps.

2011 Update Status: Since 2008, 43 counties have received updated mapping through the Map Modernization process. DNR mapping staff produced many of the new countywide maps while floodplain management staff helps conduct outreach meetings and works with communities to adopt the maps into their floodplain zoning ordinances. DNR participated with FEMA to inventory all mapped floodplains in the state and determine if existing floodplain studies are valid or need updating. The results have been entered into FEMA's

Community Needs Management System (CNMS) and will be used to prioritize future mapping efforts. Funding through the Risk MAP initiative will result in the production of maps on a watershed basis. Risk MAP will also provide communities with additional products that will help better identify risks and opportunities for mitigation. New meetings have also been added to the process that will encourage participation in the mapping process by emergency managers and planning agencies. This will establish better links among the maps, mitigation opportunities, and sound land management. CNMS will be integrated into the DNR's Floodplain Analysis Database so that new mapping needs for developing areas can be tracked and considered in funding priorities.

2016 Update Status: Since 2011 all of the in-progress Map Modernization projects have been completed. A countywide mapping update has been completed for Rusk County along with Physical Map Revisions (PMR) for sections of the Chippewa River in Eau Claire and Chippewa County. A Risk MAP watershed mapping project has been completed for the nine counties and communities in the Upper and Lower Rock River Watershed. Discovery was completed and the Risk Map project is almost complete for the seven counties and communities in the Lower Wisconsin River Watershed, including countywide DFIRMs for three counties which had not been previously modernized. Discovery was completed and data development is in progress for the Upper Fox River Watershed (four counties and related communities) and the Milwaukee River Watershed (six counties and related communities). Discovery was also completed in the Wolf River Watershed. Four additional PMRs have been completed and four more are in progress. In 2016, the Kickapoo River Watershed was selected for Discovery. The CNMS is updated at critical points in each project. Into the future the DNR hopes to work with FEMA to continue the planned cycle of moving watershed projects through the phases of Discovery, Data Development, and Preliminary Maps & Post Preliminary Production. New Discovery will be prioritized on numerous factors including availability of high resolution topographic data, known unmapped flood risk, population, development pressure, and mitigation potential. FEMA approved funding to modernize floodplain maps in Iron and Lafayette counties now that they have LiDAR. Though they will not be regulatory maps, they will be more accurate than what is currently in place and will be good reference materials for local officials making policy and land use decisions. Additionally, FEMA is developing the Great Lakes Coastal Flood Study, which will update coastal flood zones on the Great Lakes to include V- and VEzones to show potential wave action.

3.13 Action: Promote mandatory disclosure of hazard-prone property to potential buyers. **Implementation:** Ongoing.

Background: The NFIP Community Rating System (CRS) already provides incentives via CRS points for communities that require full hazard disclosure in real estate listings because it promotes hazard awareness and helps individuals better manage their risk before making an investment in a home or other structure.

2011 Update Status: Ongoing outreach efforts to community officials; will include an article on this in the newsletter in the near future.

2016 Update Status: Information helping potential buyers understand flood risk information was provided in newsletters in 2012, 2013, and 2014.

3.14 Action: Encourage sewer utilities to provide backup power sources at lift stations to help prevent sewer back-flow flooding.

Implementation: Ongoing.

Background: Some sewer back-flow problems occur only because power outages prevent lift stations from operating to pump sewage out of low-lying areas and into the main lines. Providing backup power sources for these lift stations would help reduce or eliminate backflow problems in these areas.

2011 Update Status: Unchanged. **2016 Update Status:** Unchanged.

3.15 Action: Encourage sewer utilities to provide public information regarding sewer back-flow prevention to reduce basement flooding.

Supporting Agency: WEM **Implementation:** Ongoing.

Background: Since sewer back-flow has been identified as a problem in several urban areas of the state, promoting prevention at the local level would help reduce basement flooding.

2011 Update Status: Unchanged.2016 Update Status: Unchanged.

3.16 Action: Promote the NFIP Community Rating System (CRS) to local governments.

Supporting Agencies: WEM, FEMA, WAFSCM

Other Organizations: ASFPM Implementation: 2005; ongoing.

Background: A high CRS ranking will offer citizens of that locality reduced flood insurance premiums and other benefits. This action reduces flood risk by rewarding communities through lower premiums for their residents when they meet the three goals of the CRS: (1) reduce flood losses; (2) facilitate accurate insurance rating; and (3) promote awareness of flood insurance.

2011 Update Status: DNR sends out a CRS invitation letter to Wisconsin communities once a year. The City of Evansville joined the project in 2008.

2016 Update Status: Information on the CRS was routinely provided in the newsletter and at annual floodplain workshops. In addition, an annual letter is sent to all CRS communities thanking them for their participation and providing information relevant to their continued participation and improving their rating. Introduction to the CRS courses were held in three locations in the southern and eastern parts of the state. The purpose is to help communities in deployed Risk MAP watersheds understand the benefits of the CRS and help them join if they want to. A CRS workshop was also held at the 2016 WAFSCM Conference.

3.17 Action: Participate in the USACE Annual National Flood Risk Management (FRM)

Workshop

Supporting Agencies: WEM, USACE, FEMA

Implementation: Ongoing.

Background: The purpose of the FRM Workshop is to enable the federal, tribal, state, and

local governmental partners to learn from each other and collaborate on flood risk

management.

2016 Update Status: New action item. WEM or the DNR has sent a representative each year since 2010.

3.18 Action: Implement the Municipal Flood Control and Riparian Restoration (MFC) grant program.

Implementation: Ongoing.

Background: Grants are available biennially, typically in the spring of even years, for projects that reduce flood risk. Projects shall minimize harm to existing beneficial functions of water bodies and wetlands, maintain natural aquatic and riparian environments, use stormwater detention and retention structures and natural storage to the greatest extent possible, and provide opportunities for public access to water bodies and to the floodplain.

2016 Update Status: New action item. This program is 50% state funded with a 50% local match required. The DNR and WEM use MFC program and the FEMA HMA to match each other whenever possible.

3.19 Action: Co-chair the Infrastructure Subcommittee on the Wisconsin Recovery Task Force (WRTF).

Supporting Agency: WEM

Implementation: Ongoing, as needed following disasters.

Background: Upon direction of Governor Doyle, WEM created the Wisconsin Recovery Task Force (WRTF) to assist individuals, businesses, and communities to recover quickly, safely, and with more resilience from future disasters. All WSJHMT members are on the Mitigation Subcommittee. Some WSJHMT members also chair the other subcommittees.

2016 Update Status: New action item; the WRTF was convened following two disasters in the state in 2016.

3.20 Action: Work with the Cranberry agriculture community to develop a process for cranberry farms to be efficiently regulated under a county's floodplain ordinance.

Supporting Agency: FEMA

Other Organizations: Wisconsin Cranberry Growers Association, 29 counties with cranberry

production

Implementation: 2017

Background: Cranberry farming is a water-dependent activity that often occurs in the floodplain. Most growers and the Cranberry Growers Association have resisted getting floodplain permits for their activities in the mapped floodplain under the assumption that they were exempt from both the underlying state and federal regulations due to certain exemptions for cranberry operations in state statute and federal agriculture exemptions. DNR has been working with FEMA and the Growers Association over the past five years to gain a base acceptance of the need for cranberry operations to get appropriate floodplain development permits and the consequences to the local municipality for doing so. An agreement has been reached on an amendment to the model ordinance which provides time to process and register existing farms (present on the effective floodplain map) so they will be allowed to conduct identified maintenance activities on those farms without

permits. Development activities that will require a floodplain permit are also identified. A successful pilot project involving two farms was conducted in Wood County over the last year. A final draft of the addendum to the model ordinance is being finalized. It will go out for public comment in fall of 2016 and will hopefully be available for adoption by counties in early 2017. Outreach efforts will be conducted in the fall of 2016 and beyond to encourage counties to adopt the cranberry addendum and growers to register their farms.

2016 Update Status: New action item.

Division of Forestry

3.21 Action: Maintain a burning permit process through which people are issued an annual permit but are required to check burning restrictions (via phone or internet) each day prior to burning debris.

Implementation: 2008; ongoing.

Background: In the past, the Wisconsin DNR required people to obtain a burning permit each time they want to burn debris or perform broadcast burns. The permit would then be effective for three days, after which a new permit had to be obtained. The local conditions could easily change over the three days of the permit, leaving the debris burner unaware of new dangers. Under the new system, people will be issued burning permits annually, but they must check burning restrictions each day they want to burn debris. This decreases effort and expense in the permitting process and results in individuals being better informed of the fire risk.

2011 Update Status: New action item.2016 Update Status: Unchanged.

3.22 Action: Promote Wildfire Prevention Week and National Fire Prevention Week throughout the state using media blitzes, brochures, and events to increase public awareness about fire hazards, fire prevention, the Firewise Communities program, and the Ready, Set, Go! program. Coordinate efforts with the Ready Wisconsin campaign.

Supporting Agency: WEM **Implementation:** Ongoing.

Background: Wildfire Prevention Week is observed annually the third week in April among the Great Lakes states to promote wildfire prevention and education efforts during traditional spring fire season. National Fire Prevention Week is an annual observance sponsored by the National Fire Protection Association to inform the public about the importance of general fire prevention. It is celebrated the week in which October 9th falls. October 9th was proclaimed National Fire Prevention Day by President Woodrow Wilson in 1922 because it is the anniversary of not only the Great Chicago Fire, but also the Peshtigo Fire. The Peshtigo Fire occurred in northeastern Wisconsin and was the deadliest, most devastating fire in American history. This grim reminder demonstrates the vulnerability of our state to fire hazards and the need to educate the public about fire prevention.

2011 Update Status: New action item.

2016 Update Status: Unchanged, more effort will be made to coordinate with the Ready Wisconsin campaign including potentially linking to the current fire danger map from the

Ready Wisconsin website. Additionally, the Ready, Set, Go! program, which seeks to improve dialog between firefighters and residents, will be promoted in the state.

3.23 Action: Create and maintain an interactive county map on the state DNR website to show the current fire danger in each county, including the cooperative areas.

Supporting Agency: WEM **Implementation:** Ongoing.

Background: In the past, the public has had to call the DNR or their local officials to find out the local fire danger and burning restrictions. With the new interactive map, people can visit the DNR website and click on the county of interest to find the same information updated daily. The website is located at http://dnr.wi.gov/topic/ForestFire/restrictions.html?showfires.

2011 Update Status: New action item.2016 Update Status: Unchanged.

3.24 Action: Promote the concept of Firewise Communities USA statewide.

Supporting Agencies: WEM, FEMA, USDA, USDI, National Fire Protection Association, International Association of Fire Chiefs, National Association of State Foresters, National Emergency Management Association, US Fire Administration

Other Organizations: WEMA, State Fire Chiefs Association

Implementation: 2005; ongoing.

Background: The Firewise Communities USA recognition program enables communities to achieve a high level of protection against wildland/urban interface fires and maintain a sustainable ecosystem balance. The goal is to encourage and acknowledge action that minimizes home loss to wildfire. The program adapts well to small communities, developments, and residential associations. By promoting the concept and providing information to local governments, WEM hopes that more communities will join.

2011 Update Status: Four additional communities are now participating in the program bringing the total to 14 Firewise Communities in the state.

2016 Update Status: Unchanged; there are currently 12 Firewise Communities in the state. The decrease since 2011 is because of a change in the classification system.

3.25 Action: Promote the creation and implementation of Community Wildfire Prevention Plans (CWPPs), particularly in communities at high risk of fire hazard and those near the wildland/urban interface (WUI).

Supporting Agency: WEM

Other Organizations: FEMA, USDA, USDI, National Fire Protection Association, International Association of Fire Chiefs, National Association of State Foresters, National Emergency Managements Association, US Fire Administration, WEMA, State Fire Chiefs Association **Implementation:** Ongoing.

Background: Title I of the Healthy Forests Restoration Act, passed in 2003, authorizes and defines CWPPs. It provides an opportunity to address fire hazards along the WUI. CWPPs are developed locally and the format is flexible. They are required to include collaboration among levels of government and stakeholders, prioritized fuel reduction, and treatment of structural integrity. The adaptability of CWPPs to local conditions makes them excellent fire

hazard mitigation tools for a wide variety of communities.

2011 Update Status: New action item; there are 11 CWPPs in the in the state covering 21 Communities-at-Risk.

2016 Update Status: There are 20 CWPPs in the state covering 39 Communities-at-Risk.

3.26 Action: Identify permanent fire mitigation projects that can be supplemented by ongoing temporary mitigation projects.

Supporting Agency: WEM

Other Organizations: FEMA, USDA, USDI, National Fire Protection Association, International Association of Fire Chiefs, National Association of State Foresters, National Emergency Managements Association, US Fire Administration, WEMA, State Fire Chiefs Association **Implementation:** Ongoing.

Background: Between 2009 and 2011, DNR's Division of Forestry received grant funding for 29 educational projects, 28 fuel reduction projects, and 22 planning projects. Forest Fire Protection grants are only available in relatively small amounts. Working with the Division, WEM may be able to identify permanent fire mitigation projects that could qualify for the FEMA Hazard Mitigation Grant Program.

2011 Update Status: New action item.2016 Update Status: Unchanged.

3.27 Action: Update and distribute Communities-at-Risk and Communities-of-Concern maps.

Supporting Agency: WEM **Implementation:** 2018

Background: The DNR created maps showing wildfire risk in 2008.

2016 Update Status: New action item.

3.28 Action: Create a website template for storm response to assist private landowners with cleanup.

Supporting Agency: WEM **Implementation:** 2011; ongoing.

Background: \$250,000 was donated to set up a website for Burnett County following a severe storm blow-down which created copious amounts of debris. The debris took a great effort to clean up and was a serious fire risk.

2016 Update Status: New action item.

3.3.4 Lead Agency: Department of Health Services (DHS)

4.1 Action: Survey healthcare facilities to determine if they have NOAA weather alert radios and severe weather response plans. Provide information about NOAA weather radios and seek sources of funding to obtain NOAA radios for facilities lacking them.

Supporting Agency: WEM **Implementation:** Suspended.

Background: NOAA weather alert radios are a cost-effective way of alerting facilities of dangerous weather conditions. DHS, Division of Quality Assurance (DQA) will explore ways to provide NOAA radios in health care facilities that do not currently have them. DHS has surveyed the healthcare facilities that it regulates.

2011 Update Status: By December 31, 2011, DQA conducted a survey with regulated facilities and home health agencies about access to and use of NOAA weather radios. In 2012, DQA will work with WEM to acquire funding to support purchase of radios, installation, and training as needed.

2016 Update Status: Without access to match funds to purchase radios, DQA is unable to move this work forward, but it remains a priority.

4.2 Action: Conduct public health hazard risk assessments at all local and tribal health departments throughout the state.

Supporting Agencies: Centers for Disease Control and Prevention (CDC), WEM, Wisconsin Association of Local Health Departments and Boards, Emergency Medical Services (EMS), Hospital Preparedness Program, local and tribal health departments

Implementation: Completed.

Background: Local and tribal health departments will be required to complete a public health hazard risk assessment by mid-2012. They will work in conjunction with local hospitals, emergency management agencies, EMS, and trauma centers.

2011 Update Status: New action item. An inter-agency group has met several times to determine a methodology to recommend to local and tribal health departments for completing the hazard risk assessment.

2016 Update Status: In 2012, the Wisconsin Hazard Vulnerability Assessment Tool was created. The WI HVA tool used an all-hazards approach to address 15 national planning scenarios and 30 local planning scenarios. From the perspective of local public health jurisdictions and partners, the 2012 results show the top five scenarios that pose the greatest potential or relative threat were cyber-attacks (61%), power outages (56%), ice storms (54%), tornados (53%), and droughts (51%). In 2015, the WI HVA tool was used to develop a regional healthcare coalition (HCC) HVA in the 7 HCC areas in WI. Those results were compiled regionally and are being used to guide local and regional planning and exercise development.

4.3 Action: Chair the Health and Social Services Subcommittee on the Wisconsin Recovery Task Force (WRTF).

Supporting Agency: WEM

Implementation: Ongoing, as needed following disasters.

Background: Upon direction of Governor Doyle, WEM created the Wisconsin Recovery Task Force (WRTF) to assist individuals, businesses, and communities to recover quickly, safely, and with more resilience from future disasters. All WSJHMT members are on the Mitigation Subcommittee. Some WSJHMT members also chair the other subcommittees.

2016 Update Status: New action item; the WRTF was convened following two disasters in the state in 2016.

4.4 Action: Create extreme weather toolkits for local governments, local health departments, and citizens in Wisconsin about preparing for and responding to weather-related emergencies.

Supporting Agencies: CDC, WEM, local and tribal health departments **Implementation:** Toolkits were created in 2014 and 2015 with ongoing updates as needed. **Background:** Toolkits are available for nine topics: extreme heat, floods, winter weather, wildfires, chemical releases, harmful algal blooms, drought, thunderstorms and tornadoes,

and vectorborne diseases. The toolkits provide background information, practical guidance, strategies, media releases, talking points, definitions, and reference materials.

2016 Update Status: New action item.

4.5 Action: Develop heat vulnerability indexes (HVIs) to identify areas of greatest risk for negative health impacts due to extreme heat in each county in Wisconsin as well as the state as a whole.

Supporting Agencies: CDC, WEM, City of Milwaukee Health Department **Implementation:** The Wisconsin HVI was created in 2014. County and tribal HVI maps were created in 2015 and 2016.

Background: The statewide, county, and tribal HVI maps include four categories of data: population density, health factors, demographic and socioeconomic factors, and natural and built environment factors. The maps can help identify areas of high vulnerability to receive targeted messaging and resources during heat events.

2016 Update Status: New action item; HVIs are being included in state and local mitigation planning efforts.

4.6 Action: Develop flood vulnerability indexes (FVIs) to identify areas of greatest risk for negative health impacts due to flood events in floodplains in Wisconsin.

Supporting Agencies: CDC, WEM, local stakeholders (e.g. local emergency managers)

Implementation: The Wisconsin FVI is expected to be created in 2017.

Background: The FVI maps will include the following categories of data:

socioeconomic/demographic, health, and environmental. The maps will help identify areas of high vulnerability to receive targeted messaging and resources during flood events.

2016 Update Status: New action item; FVIs will be included in state and local mitigation planning efforts.

4.7 Action: Develop a checklist for local health departments to assess their community's vulnerability to negative health impacts due to flood events and provide them with tools to decrease vulnerability.

Supporting Agencies: CDC, WEM, local health departments, local stakeholders (e.g. local

emergency managers)

Implementation: The checklist will be developed in 2017.

Background: A checklist will allow local policy makers and land-use planners to ascertain and understand their flood risk. The accompanying tools will help them steer their communities toward increased flood resilience.

2016 Update Status: New action item.

4.8 Action: Fund local health department pilot projects to increase the capacity to understand climate-related health impacts and incorporate climate adaptation strategies into local plans.

Supporting Agencies: CDC, local health departments, local stakeholders (e.g., local emergency managers)

Implementation: The pilot projects were funded from 2014-2016.

Background: Each of the local health department pilot projects invited a set of stakeholders to a community engagement meeting. During the community engagement meetings stakeholders prioritized climate-related health concerns and identified action steps to address these concerns.

2016 Update Status: New action item.

3.3.5 Lead Agency: Department of Safety and Professional Services (DSPS)

5.1 Action: Work with the municipal fire departments to collect all fire incidents occurring within the state. Train fire departments to use of the National Fire Incident Reporting System program. Data collected can be uploaded to FEMA directly and is then used to develop new policies and laws for fire-safe construction.

Supporting Agency: State Fire Chiefs Association

Implementation: Ongoing.

Background: The need for fire data was recognized in 1974 when the Fire Prevention and Control Act authorized the US Fire Administration (USFA) to gather and analyze fire data relevant to the nation's fire problem. The National Fire Prevention and Control Administration (NFPCA, the predecessor to USFA), through a contract with the National Fire Protection Association (NFPA) in the mid 1970's, established the first National Fire Incident Reporting System (NFIRS), Version 1. The latest version, Version 5, published in 2000 is used today. NFIRS is the largest source of fire data in the world.

2011 Update Status: Unchanged. 2007 Wisconsin Act 75 requires fire departments in Wisconsin to report specific building fire incident information to DSPS within 60 days using NFIRS.

2016 Update Status: Unchanged.

5.2 Action: Require all fire departments within the state to inspect existing commercial buildings annually and provide them guidance in doing so. Routine inspections are performed to ensure the existing building still meets its design-specific building code requirements.

Supporting Agency: State Fire Chiefs Association

Implementation: Ongoing.

Background: The chief of every fire department will be responsible for having all public buildings and places of employment within their territory inspected annually. This inspection should ascertain whether any conditions liable to cause fire exist or whether there are any violations of laws or ordinances relating to fire hazards or prevention. If such conditions or violations are discovered, the fire chief is responsible for making sure they are corrected.

2011 Update Status: Unchanged. **2016 Update Status:** Unchanged.

5.3 Action: Provide for Administrative Code changes to adopt the most current edition of the National Fire Prevention Association's National Electrical Code (NEC). The rule will affect any building or structure within the state in which electric wiring will be installed.

Implementation: Ongoing.

Background: The state electrical code has adopted the NEC by reference since 1972. Currently, the 2011 edition of the NEC is adopted in the Wisconsin Administrative Code (WAC) SPS 316.014. This action item will support the continual update of the state code to the most current edition of the NEC. The alternative to not updating WAC SPS 316.014 would result in the state electrical code being out-of-date with current nationally-recognized

standards for the design, installation, and operation of electrical conductors and equipment in all buildings and structures.

2011 Update Status: The Division of Safety and Buildings is now adopting the 2011 NEC with an estimated effective date of April 1, 2012.

2016 Update Status: The 2011 NEC was adopted with an effective date of April 1, 2012.

5.4 Action: Adopt the 2009 editions of the national model codes from the International Code Council and the National Fire Protection Association.

Implementation: Adopted July 2011.

Background: The state adopted a model building code that became effective on July 1, 2011. This new code is actively enforced statewide.

2011 Update Status: Unchanged.

2016 Update Status: The state is still operating under the 2009 version of the model codes; they are in the review process for the 2015 version, but still enforcing the 2009 standards. The 2015 version incorporates language requiring safe rooms that meet FEMA 361 standards for certain buildings constructed in communities in the 250 mph wind zone (which includes the southern half of Wisconsin). The buildings requiring safe rooms are new schools, 911 call stations, emergency operations centers, and fire, rescue, ambulance, and police stations.

5.5 Action: Address the disaster resistance of manufactured homes by reviewing tie-down standards, installation standards, and inspection standards.

Implementation: Ongoing.

Background: Manufactured homes are particularly vulnerable to wind hazards. The state is committed to developing and enforcing tie-down standards to reduce the risk of property loss, injury, and death for people who live in manufactured homes.

2011 Update Status: Unchanged.

2016 Update Status: HUD 3285.402, the standards requiring tie-downs for manufactured homes, was first effective in 2007 and was updated in 2014. These are the most current standards.

5.6 Action: Enforce the requirement to inspect structures and buildings when permitting construction projects to ensure compliance with state building codes and promote disaster resistance and public safety. Municipalities can apply to become designated agents to enforce building codes.

Implementation: Ongoing.

Background: Without inspection of new construction for compliance with state building codes, there is no insurance that structures will be built to the properly. As of January 1, 2005, all municipalities are responsible for enforcement of the Uniform Dwelling Code. This includes submitting building plans and inspections for electrical, construction, plumbing, and HVAC. All post-1980 dwellings were covered by the code; however, in communities under 2,500, there was the option not to enforce the code (i.e., plan review and inspections).

2011 Update Status: Unchanged.2016 Update Status: Unchanged.

5.7 Action: Create and maintain a tracking system for all Privately Owned Wastewater

Treatment Systems (POWTS). **Implementation:** Ongoing.

Background: 2005 Wisconsin Act 347 requires the development and maintenance of a database for tracking POWTS systems. This ensures that information on all existing POWTS systems is collected and all future maintenance actions on these systems are tracked. This will aid in determining the status of POWTS following a flood event.

2011 Update Status: The state tracks all POWTS established since 2007. County governments are required to maintain a system for tracking all POWTS in their county. **2016 Update Status:** DSPS monitors compliance through audits of the county POWTS tracking systems. The statutory reference is Section 145.20(5) Wis. Stats. and WAC SPS 383.255.

5.8 Action: Require carbon monoxide detectors in all existing residential occupancies with fuel burning appliances, including single family housing units.

Implementation: Ongoing.

Background: 2007 Wisconsin Act 205 mandated the development of rules requiring carbon monoxide detectors in all existing residential occupancies to protect occupants from unseen leaks. This will be particularly important following a disaster when fuel burning appliances may have been disturbed or damaged.

2011 Update Status: The rules requiring carbon monoxide detectors went into effect on January 1, 2011 and are now being implemented and enforced.

2016 Update Status: Unchanged; 101.149 Wis. Stats. requires carbon monoxide detectors.

5.9 Action: Require the inspection of all electrical construction within commercial buildings through the statewide electrical inspection program.

Implementation: Ongoing.

Background: 2007 Wisconsin Act 63 requires electrical wiring is to be inspected in all construction involving public buildings, commercial properties, and farms. Municipalities may opt to be responsible for such inspections in their jurisdictions. The state will provide electrical inspections in municipalities that do not conduct such inspections. (Currently, Uniform Dwelling Code electrical inspections are required to obtain building permits for new construction or remodeling of one- and two-family dwellings.)

2011 Update Status: Unchanged.

2016 Update Status: Unchanged; this has not been completed.

5.10 Action: Develop and implement rules requiring statewide electrical inspection for all buildings.

Implementation: Ongoing.

Background: 2007 Wisconsin Act 63 mandates the development of rules requiring statewide inspection of all electrical wiring. Rules are also being developed to allow municipalities to assume authority on behalf of the state to perform all electrical inspections in their jurisdiction. The state will be responsible for inspections in areas where municipalities do not assume authority.

2011 Update Status: New action item.

2016 Update Status: Unchanged; this has not been completed.

5.11 Action: Consider the adoption of the International Residential Code written by the International Code Council.

Implementation: Ongoing.

Background: Over 40 states and hundreds of municipalities across the country use the International Residential Code as a standard for building one- and two-family homes. Currently the state drafts its own code for these types of occupancies. This change would align Wisconsin with the national standards and most recent initiatives used for the safety of homeowners.

2011 Update Status: Unchanged.

2016 Update Status: The state has not adopted the International Residential Code and continues to use the state Uniform Dwelling Code, which is current as of 2016.

3.3.6 Lead Agency: Office of the Commissioner of Insurance (OCI)

6.1 Action: Distribute hazard mitigation materials to insurance companies, agents, and consumers to support the Wisconsin Silver Jackets Hazard Mitigation Team (WSJHMT) in developing, establishing, and implementing permanent and viable statewide mitigation programs.

Implementation: Ongoing.

Background: As the regulatory agency for insurance and insurance carriers, OCI staff members serve as experts in the field of insurance. Staff cooperates with other agencies to encourage loss prevention and enhance consumer protection through the licensing and education of insurance agents and carriers. They inform businesses and individuals on insurance matters. OCI requires continuing education for agents. Credit can be obtained through flood insurance courses provided by the National Flood Insurance Program (NFIP).

2011 Update Status: Unchanged.2016 Update Status: Unchanged.

6.2 Action: Investigate the possibility of increasing the emphasis on flood insurance in trainings and exams for insurance agent licensing.

Supporting Agencies: WEM, DNR, FEMA

Implementation: Ongoing.

Background: Insurance agents are required to pass an exam to receive their license. There are few, if any, questions on the exam regarding flood insurance. With recent premium increases in the NFIP and following flood events, consumers may need more assistance regarding flood and homeowners insurance. Trainings offered to insurance agents before and after licensing would benefit from covering flood insurance topics.

2016 Update Status: New action item; examiners refer flood insurance questions back to FEMA, however with the NFIP rate increases, private insurance companies may look at providing flood insurance at actuarial rates.

6.3 Action: Maintain and update information regarding flood and other hazard insurance and the NFIP via the OCI website and press releases.

Supporting Agencies: WEM, DNR, FEMA

Implementation: Ongoing.

Background: OCI is the primary source of insurance information for many of the state's insurance providers. To increase the visibility of, emphasize the importance of, and provide general information about flood and other hazard insurance, OCI should maintain flood insurance, homeowners/renters insurance, and NFIP information on their website and issue press releases at appropriate times, like after disasters and when new legislation regarding the NFIP is enacted.

2016 Update Status: New action item; insurance agents look to OCI for information. OCI currently maintains information about flood and other hazard insurance and the NFIP on their website. They also issue press releases about at pertinent times..

6.4 Action: After flood events, distribute flood and homeowners insurance information in the

State of Wisconsin Hazard Mitigation Plan

affected areas and provide assistance with questions regarding filing claims, registering complaints, and what to expect. Be available to potentially staff a Disaster Recovery Center when the state qualifies for FEMA's Individual Assistance program.

Supporting Agencies: WEM, DNR, FEMA

Implementation: Ongoing.

Background: OCI provides information to insurance providers and customers. In post-disaster situation, insurance issues can be complicated. When community resources are already stretched thin, it is beneficial for them to receive any assistance possible, especially in highly technical matters, from the state.

2016 Update Status: New action item; OCI attended several open houses in Ashland and Sawyer counties following the July 2016 flooding to distribute information and field questions about insurance policies, claims, and complaint procedures.

6.5 Action: Develop and maintain post-disaster outreach procedures.

Supporting Agencies: WEM, DNR, FEMA

Implementation: Ongoing.

Background: OCI is a valuable resource for communities that have experienced disasters. Formalizing post-disaster procedures that include triggers for deployment, methods of information distribution and outreach, and guidelines for setting up disaster-specific websites will streamline OCI response and speed recovery for impacted communities. **2016 Update Status:** New action item; following the deployments for the July 2016 floods,

OCI decided to formalize their response procedures.

3.3.7 Lead Agency: Public Service Commission (PSC) of Wisconsin

7.1 Action: Encourage telecommunications utilities to obtain information about floodplains in advance of construction and to avoid construction in these areas. If construction in floodplains is unavoidable, the utilities will be encouraged to use alternative methods or technologies for plant additions. The utilities will be encouraged to know and use construction practices that avoid or minimize loss of service.

Implementation: Ongoing.

Background: The PSCW is an independent regulatory agency responsible for the regulation of Wisconsin public utilities. PSCW prior-approval of construction by telecommunications utilities is not required. However, the PSCW will work with the Wisconsin State Telecommunications Association to alert telecommunications utilities to the hazards of construction in the floodplain.

2011 Update Status: Unchanged.2016 Update Status: Unchanged.

7.2 Action: Perform hazard mitigation reviews for electric, natural gas, and water utility construction projects.

Implementation: Ongoing.

Background: All reviews and approvals of electric, natural gas, and water utility construction

projects must include a determination of floodplain impacts and mitigation.

2011 Update Status: Unchanged. **2016 Update Status:** Unchanged.

7.3 Action: Continue to educate the public about safety issues related to natural hazards at electric and natural gas utilities.

Implementation: Ongoing.

Background: The PSCW prepares a wide variety of public information brochures and makes them available to the public on its website at http://psc.wi.gov/theLibrary/publications.htm. These brochures are updated and others are produced on an as-needed basis.

2011 Update Status: Unchanged.2016 Update Status: Unchanged.

7.4 Action: Redundancy is built into the electric system so loss of any electric system element does not result in loss of load.

Implementation: Ongoing.

Background: Each line, substation, and plant has individual protections that automatically localize outages. To address potential problems in transmission, redundancy is built into the electric system. Redundancy is required to meet North American Electric Reliability Corporation (NERC) reliability standards.

2016 Update Status: New action item.

7.5 Action: PSC regulates wind energy development and looks at alternatives for each project. The priorities in order of preference are conservation and energy efficiency, non-

State of Wisconsin Hazard Mitigation Plan

combustible renewable resources, combustible renewable resources, and combustible non-renewable resources.

Implementation: Ongoing.

Background: Facilities with generating capacity of 100 MW or more require approval. Facilities less than 100 MW may also require approval if the cost exceeds certain thresholds.

2016 Update Status: New action item.

7.6 Action: State utilities must comply with a Renewable Portfolio Standard which requires them to obtain about 10% of energy sales from renewable resources. The PSC monitors this requirement.

Implementation: Ongoing.

Background: To address changing weather patterns, 196.378 Wis. Stats. requires Wisconsin electric providers to provide their customers with 10% of electricity from renewable resources.

2016 Update Status: New action item.

3.3.8 Lead Agency: Department of Transportation

8.1 Action: Present information about the Disaster Damage Aids, Public Assistance and Hazard Mitigation Assistance programs at the annual County Highway Association Commissioner training and other training opportunities.

Supporting Agency: WEM **Implementation:** Ongoing.

Background: Wisconsin County Highway Association holds an annual training session for Highway Commissioners which provides an opportunity to disseminate information about how the Public Assistance and Hazard Mitigation Assistance Programs work. This will not only keep the Highway Commissioners informed about the programs, but will also keep mitigation involved in discussions of future highway projects.

2011 Update Status: New action item.2016 Update Status: Unchanged.

8.2 Action: DOT will coordinate with WEM to sponsor annual workshops for DOT engineers, technicians, and other staff to review the components of post-disaster damage and mitigation programs.

Supporting Agency: WEM

Implementation: Ongoing; DOT will coordinate with WEM to plan a disaster damage mitigation workshop to review mitigation components of the Public Assistance, Emergency Relief, and Disaster Damage Aids programs. WEM and DOT will provide support to the workshop with presentations and materials.

Background: DOT provides engineers and technicians to assist local governments with post-disaster damage assessments of roads, bridges, and public works facilities. Their expertise is needed to implement the three highway emergency aid programs mentioned above, which all include mitigation components.

2011 Update Status: On hold due to higher work priorities. If time and resources become available this project may move forward.

2016 Update Status: New staff will look at implementing in the future.

8.3 Action: As a disaster is unfolding, send an email alert to DOT field staff to remind them to keep track of their time and costs for possible reimbursement from the Public Assistance program and to alert them to the possibility of assisting Wisconsin Emergency Management with a Preliminary Damage Assessment.

Supporting Agency: WEM **Implementation:** Ongoing.

Background: As a state agency, the DOT can apply to the Public Assistance program for reimbursement of expenses under a federal disaster declaration. To receive reimbursement, accurate records must be kept of staff time and related expenses to submit to WEM. In addition, DOT field staff often assists WEM with Preliminary Damage Assessments. An email alert will prepare staff for that possibility.

2011 Update Status: New action item.2016 Update Status: Unchanged.

8.4 Action: Present information about the Disaster Damage Aids program annually at WEM's Disaster Response and Recovery Operations (DRRO) workshop and at applicant briefings which occur in communities throughout the state when they are involved in a Presidential Disaster Declaration.

Supporting Agency: WEM **Implementation:** Ongoing.

Background: The workshop and applicant briefings provide opportunities to reach the

audience that the Disaster Damage Aids program is available to.

2016 Update Status: New action item; DOT has presented at the 2015 and 2016 DRRO workshop and at Applicant Briefings following the July and September 2016 flood events.

8.5 Action: Co-chair the Infrastructure Subcommittee on the Wisconsin Recovery Task Force (WRTF).

Supporting Agency: WEM

Implementation: Ongoing, as needed following disasters.

Background: Upon direction of Governor Doyle, WEM created the Wisconsin Recovery Task Force (WRTF) to assist individuals, businesses, and communities to recover quickly, safely, and with more resilience from future disasters. All WSJHMT members are on the Mitigation Subcommittee. Some WSJHMT members also chair the other subcommittees.

2016 Update Status: New action item; the WRTF was convened following two disasters in the state in 2016.

8.6 Action: Perform a statewide culvert inventory to evaluate and prioritize which culverts on state roads should be replaced and/or upsized.

Implementation: 2016; ongoing.

Background: In order to use resources wisely, the DOT is evaluating all culverts on state roads in Wisconsin. This evaluation will allow them to prioritize culverts most in need of replacement and identify mitigation opportunities.

2016 Update Status: New action item.

3.3.9 Lead Agency: University of Wisconsin-Extension (UW-Extension)

- **9.1 Action:** Perform education, outreach, and planning about how businesses could plan to continue their operations if they were affected by the following situations:
 - Loss of electrical power, gas, telephone and/or other utilities;
 - Inaccessible because of flooding, debris, road or bridge damage, chemical spills, transportation accidents, etc.;
 - Partially or completely destroyed by fire, flood, tornado, etc.; and
 - A major supplier (of materials, transportation, information, etc.) was put out of action by disaster.

Implementation: Ongoing.

Background: Businesses, organizations, and local governments can often continue to operate either at full capacity or a portion thereof, if they have planned for contingencies prior to the event(s).

2011 Update Status: Unchanged. **2016 Update Status:** Unchanged.

9.2 Action: Integrate hazard mitigation concepts into UW-Extension programs for community development, lake and watershed management, farm management, and housing.

Supporting Agencies: WEM, WCMP, DOA, and DNR

Implementation: Ongoing. Update the information as appropriate. County-based extension educators and emergency management directors are forming new partnerships to accomplish these efforts.

Background: UW-Extension develops and provides educational programming for community, agricultural, family, youth, business, and non-profit organizations, and local governments statewide. Important programming areas that can support hazard mitigation include community, natural resource and economic development; lake and watershed management; farm management; and housing. UW-Extension programs are delivered via face-to-face presentations, distance learning, printed material, and the media. When appropriate, UW-Extension educators integrate material on major state initiatives into educational programs. UW-Extension staff will prepare and adapt materials and update educational programs to include information on hazard mitigation.

2011 Update Status: Unchanged.2016 Update Status: Unchanged.

3.3.10 Lead Agency: Wisconsin Emergency Management (WEM)

10.1 Action: Administer the Hazard Mitigation Grant Program (HMGP), the Flood Mitigation Assistance (FMA) program, and the Pre-Disaster Mitigation (PDM) program by providing grants for planning and long-term, permanent, cost-effective mitigation measures.

Supporting Agencies: FEMA, Wisconsin Silver Jackets Hazard Mitigation Team (WSJHMT),

Regional Planning Commissions (RPCs)

Implementation: Ongoing.

Background: WEM has administered over \$40 million in HMGP, FMA, and PDM funds for projects that eliminate or reduce disaster damages and protect lives and property. WEM, together with the WSJHMT, will continue to encourage communities to apply for mitigation planning grants and fund cost-effective projects that reduce disaster costs. WEM will coordinate with other agencies through the WSJHMT to identify potential funding sources for projects and "package" funding to facilitate implementation of these projects.

2011 Update Status: WEM has now administered over \$86 million in HMGP, FMA, and PDM funds. The RFC and SRL programs have not yet been administered in the state, but remain in WEM's mitigation toolkit.

2016 Update Status: WEM has now administered over \$120 million in HMGP, FMA, and PDM funds. The RFC and SRL programs have been rolled into FMA and WEM has mitigated repetitive loss properties using FMA funds.

10.2 Action: Develop uniform guidance for providing replacement and supplemental housing assistance.

Supporting Agencies: DOA-Division of Housing, DNR

Implementation: Ongoing.

Background: After a disaster, individuals and communities may be eligible for replacement and/or supplemental housing assistance. The guidelines for administering assistance have not been clearly defined in the past. This can lead to delays and incorrect approvals or denials of claims. Developing uniform guidance will streamline the process and keep all agencies involved operating in a consistent manner. This will result in a faster recovery.

2011 Update Status: New action item.

2016 Update Status: WEM, DNR, and DOA-Division of Housing have met with the State Relocation Specialist to clarify state and federal regulations regarding replacement and supplemental housing assistance. When the State Relocation Specialist issues her formal opinion, WEM, DNR, and DOA-Division of Housing will draft guidance.

10.3 Action: Promote mitigation for the general public using the WEM website. Link to other agencies' websites as appropriate.

Supporting Agencies: DATCP, DNR, DOA, FEMA, OCI

Implementation: Ongoing.

Background: There is useful information appropriate for managing natural hazard risk currently available through various state agencies' websites. Advertising these links helps address many hazard awareness objectives. WEM's web page will be utilized to the fullest extent to educate all on the benefits of mitigation. The State Hazard Analysis, the State

Hazard Mitigation Plan, including mitigation activities, are included on the website. Staff will foster linkages between the following agencies and areas of expertise:

- DATCP Conservation Reserve Enhancement Program (CREP)
- DNR Municipal Flood Control and Riparian Restoration Program, Wisconsin Waters Initiative, Dam Safety, NFIP, Floodplain Mapping, Stewardship Programs, Forestry
- DOA Comprehensive Planning, CDBG-EAP
- FEMA Map Service Center, FIMA
- OCI Flood Insurance and Homeowners Insurance

2011 Update Status: Unchanged.2016 Update Status: Unchanged.

10.4 Action: Develop and document mitigation success stories. Publish reports and include on WEM's website and in WEM's Mitigation Display.

Supporting Agency: FEMA **Implementation:** Ongoing.

Background: By 2004, WEM had administered over \$40 million in mitigation planning and project grants. In some instances, those mitigation measures have been tested through recent events. It is important to document the damages that have been avoided through these mitigation measures by publishing these success stories. Documentation of the damages averted by these mitigation measures is provided to Congress to validate the continuation of mitigation programs. In addition, 44 CFR Part 201.5(b)(2)(iv) requires the state to have a system and strategy by which it will conduct an assessment of completed mitigation actions.

2011 Update Status: WEM has now administered over \$86 million in mitigation grants. Loss avoidance studies were conducted for mitigation projects in Kenosha, Jefferson, Crawford, and Milwaukee counties. Best practices articles and success stories continue to be developed and are published on the WEM and FEMA websites.

2016 Update Status: WEM has now administered over \$120 million in mitigation grants. Best practices articles and success stories continue to be developed and published. The technical expertise required to complete formal loss avoidance studies is beyond the capabilities of the state, so WEM will work with FEMA to complete them. Several communities where extensive mitigation was done were significantly impacted by the September 2016 flooding and would make good case studies.

10.5 Action: Work with the Office of the Commissioner of Insurance to promote public education about flood insurance during Flood Safety Awareness Week.

Supporting Agency: OCI

Implementation: Annually during the third week of March.

Background: The National Weather Service started Flood Safety Awareness Week in 2006. It is held the third week of March each year. Its purpose is to teach people about flood risks and how to save lives and protect property from flooding. WEM already promotes public education about flood safety during Flood Safety Awareness Week. Flood insurance participation is very low throughout the state. Incorporating education about flood insurance into Flood Safety Awareness Week will encourage more people to purchase flood

insurance and thus protect their assets from flood losses.

2011 Update Status: New action item.2016 Update Status: Unchanged.

10.6 Action: Create an online flood insurance education course for insurance agents.

Supporting Agency: OCI **Implementation:** Ongoing.

Background: Flood insurance participation in the state is very low. Insurance agents who provide flood insurance through the National Flood Insurance Program are required to take a continuing education course in flood insurance. The availability of an online course would facilitate agents meeting this requirement. The agents will then be able to encourage consumers to purchase flood insurance which will help them recover after a flood event.

2011 Update Status: New action item.

2016 Update Status: Unchanged; OCI offers flood insurance information on their website and issues press releases about flood insurance after disasters and when regulations change.

10.7 Action: Research the possibility of requiring all insurance agents to complete a course in flood insurance periodically.

Supporting Agency: OCI Implementation: Ongoing.

Background: Flood insurance participation in the state is low. Currently insurance agents who provide flood insurance through the National Flood Insurance Program are required to complete a one-time flood insurance course. Extending this requirement to all agents would increase the promotion of flood insurance to potential consumers. In addition, requiring that the course be taken periodically would keep agents informed of changes to the program and serve as a reminder of the importance of flood insurance.

2011 Update Status: New action item.2016 Update Status: Unchanged.

10.8 Action: Research and identify GIS resources that would assist WEM and local governments in developing their mitigation programs.

Supporting Agencies: RPCs **Implementation:** Ongoing.

Background: WEM recognizes that GIS can be a valuable tool for hazard mitigation planning, implementation of mitigation measures, and monitoring mitigation progress at both the state and local levels. To further this effort, WEM will continue to identify resources and provide for staff needs in the area of GIS development.

2011 Update Status: Unchanged.

2016 Update Status: Unchanged; the Wisconsin Land Information Program has developed a statewide parcel layer. Several counties have incomplete parcel mapping. WEM is trying to assist with funding to complete the parcel mapping in those counties. FEMA has released a nationwide floodplain layer online. As LiDAR in the state becomes more complete, any communities without DFIRMs will receive them and be added to the national floodplain layer. Additionally, WEM has hired two GIS staff.

10.9 Action: Update the State Hazard Mitigation Plan to include technological and man-made hazards.

Supporting Agency: WSJHMT **Implementation:** Ongoing.

Background: 44 CFR Part 201 requires that the State Hazard Mitigation Plan address natural hazards that impact the state. However, the state recognizes that technological and manmade hazards also pose a risk to citizens and facilities. Therefore, the State Hazard Mitigation Plan will begin to include technological and manmade hazards, based on available data, in future updates of the State Hazard Mitigation Plan.

2011 Update Status: Unchanged.

2016 Update Status: For the 2016 plan update, the Risk Assessment was merged with the state's Threat Hazard Identification and Risk Assessment (THIRA) because of the significant overlap in requirements. The THIRA includes technological and manmade hazards. For this update, few, if any, mitigation actions will be identified for the non-natural hazards, but they will be addressed in the risk assessment. For the next update, the plan will be expanded to the extent possible to include non-natural hazard mitigation actions. Incorporating technological and manmade hazards into the mitigation plan was also required for EMAP accreditation, which WEM received in 2016.

10.10 Action: Incorporate mitigation into WEM's Strategic Plan (short-term) and work with other state agencies (long-term) to incorporate mitigation into their strategic plans where appropriate.

Supporting Agency: WSJHMT **Implementation:** Ongoing.

Background: In 2004 WEM updated its Strategic Plan and included mitigation as a component. To further the state's mitigation efforts, mitigation should become part of the agency's day-to-day activities and considered in decision-making. Therefore, mitigation needs to become a component of all state agencies' strategic plans. This will be a long-term project for WEM to work with state agencies through the WSJHMT to further these efforts. **2011 Update Status:** Status unchanged. The Department of Military Affairs is working on updating their Strategic Plan.

2016 Update Status: The 2014-2016 Strategic Plan focused on internal capacity building and communication, so mitigation was not included. Work is underway on a 2017-2019 Strategic Plan.

10.11 Action: As local and tribal plans are completed, incorporate pertinent information into the State Hazard Mitigation Plan.

Supporting Agency: WSJHMT **Implementation:** Ongoing.

Background: 44 CFR Part 201 requires that the State Hazard Mitigation Plan and hazard mitigation actions coordinate with local hazard mitigation thus providing a complete assessment of state and local hazard mitigation priorities.

2011 Update Status: For this Plan update, additional jurisdictional plans were reviewed. A new portion in Section 5 highlights best practices in local mitigation plans from around the

state.

2016 Update Status: For this Plan update, additional jurisdictional plans were reviewed. Section 4 highlights plans that incorporate climate change.

10.12 Action: Develop a structure inventory of state-owned and -operated buildings, structures, and facilities and complete a risk assessment based on data collected specific to each building. Priority will be given to those structures considered a critical facility.

Supporting Agencies: DOA, other state agencies

Implementation: 2007; ongoing.

Background: 44 CFR § 201.4 requires that the State Hazard Mitigation Plan include an overview and analysis of potential losses to state-owned or -operated buildings, infrastructure, and critical facilities located in identified hazard areas. There are an estimated 6,500 state-owned buildings, structures, and facilities identified on the State Facility Database. WEM received a FFY05 PDM-C planning grant to begin conducting a structure inventory and risk assessment of state-owned buildings beginning with critical facilities. To date, the information to be collected has been determined and a database developed. This is a joint effort between WEM and DOA.

2011 Update Status: To date, only the Department of Corrections has provided WEM with information about their structures. This information is included in the State Structure Inventory in Section 3. WEM will continue to solicit information from other state agencies and update the Inventory as needed.

2016 Update Status: Using information on state-owned and –operated assets from DOA, WEM developed and followed a methodology consistent with the requirements of 44 CFR Part 201.4 for analyzing risk and potential losses. The methodology and results are described in the State Structure Inventory, an attachment to Appendix A, THIRA.

10.13 Action: Continue to lead the WSJHMT in establishing and implementing a long-term, permanent, and viable statewide mitigation program.

Supporting Agency: WSJHMT **Implementation:** Ongoing.

Background: The Wisconsin Interagency Disaster Recovery Group (IDRG) was organized in response to the 1993 Midwest Flood to coordinate relief and recovery efforts and to prevent duplication of efforts. The success of the group has been demonstrated by the various mitigation projects completed, often with multi-agency funding and technical assistance provided. The IDRG was a "reactive" group that was activated after a disaster. Staff recognized the need to formalize a group and thus designated the State Hazard Mitigation Team (SHMT) that would be a "pro-active" expansion of the IDRG with policy-making authority. The SHMT was responsible for the development of a statewide mitigation strategy as part of the State Hazard Mitigation Plan. Both groups played a vital role in furthering mitigation efforts in the state. In 2004, WEM consolidated these groups into the Wisconsin Hazard Mitigation Team (WHMT).

2011 Update Status: Status unchanged. WEM continues to lead the WHMT and schedules regular meetings to discuss and promote mitigation projects and opportunities and to update the State Hazard Mitigation Plan.

2016 Update Status: In 2015, the WHMT became a chapter of the USACE Silver Jackets Hazard Risk Management program and changed its name to the Wisconsin Silver Jackets Hazard Mitigation Team (WSJHMT). The role and mission of the team remains unchanged.

10.14 Action: Encourage Emergency Management Directors to work with Local Emergency Planning Committees (LEPCs) to participate in local hazard mitigation planning activities.

Supporting Agencies: RPCs **Implementation:** Ongoing.

Background: WEM is committed to promoting local all-hazards mitigation planning. Including the LEPCs in local mitigation planning will help address technological hazards and

improve coordination between response and planning emergency functions.

2011 Update Status: Unchanged. **2016 Update Status:** Unchanged.

10.15 Action: Promote use of FEMA's HAZUS hazard-analysis, GIS-based software as the modules become available. Continue staff training on HAZUS. The earthquake module became available in 2002, the flood module became available in 2004 and the hurricane module in 2006.

Supporting Agencies: FEMA, RPCs

Implementation: Ongoing.

Background: WEM has not used HAZUS to date because Wisconsin is not vulnerable to earthquakes. However, Wisconsin is vulnerable to flood and wind. Therefore WEM is exploring the use of HAZUS as a hazard-analysis tool for improving the State Risk Assessment. A WEM staff member attended HAZUS training at EMI in September 2004. **2011 Update Status:** The Flood Risk Analysis in the 2008 plan was performed using HAZUS software. WEM staff is continuously updating the Flood Risk Analysis that was developed for that plan. Updates include re-running counties that did not have an available DFIRM. Completed HAZUS runs will continually be sent to counties, along with updated analysis to be included in their county mitigation plan.

2016 Update Status: In 2015, WEM conducted a HAZUS analysis for Washington County in support of their hazard mitigation planning process. Due to funding and data limitations, WEM chose to conduct the statewide flood risk analysis using a simplified GIS procedure rather than creating a HAZUS analysis for each county.

10.16 Action: Work with FEMA and appropriate state agencies to identify pre-disaster mitigation techniques that can be funded through Section 406. This may include identifying and establishing new standards in codes.

Supporting Agencies: FEMA, SOT, DOA, DNR, PSC, others

Implementation: Ongoing.

Background: In major disaster declarations, cost effective mitigation measures can be implemented through Section 406 of FEMA's Public Assistance program for damaged public facilities. The program is often underutilized because mitigation opportunities are not properly identified on a timely basis. By working with FEMA and appropriate state agencies, this action will attempt to pre-identify those items that will be included in the Section 406

program. Further, costs to bring a damaged site to current codes and standards are eligible. This process may lead to the identification and establishment of new or additional codes and standards.

2011 Update Status: Status unchanged. WEM has met with DOT to discuss the possibility of training DOT field staff to identify Section 406 mitigation measures prior to and immediately following events, but before repairs are made.

2016 Update Status: In DR-4288, WEM developed several mitigation training opportunities at the Joint Field Office with FEMA. WEM Recovery staff created a sample script to help guide conversations about mitigation in recovery field operations and provided training to FEMA field staff. Additionally, WEM worked with the DNR to issue a policy memorandum outlining the difference between DNR code- and standard-related upgrades and hazard mitigation.

10.17 Action: Attend training and continue to build expertise in performing Benefit-Cost Analyses (BCAs), which is a major component of mitigation grant applications.

Supporting Agency: FEMA **Implementation:** Ongoing.

Background: The BCA component of the FEMA grant application process requires the use of FEMA's BCA software. The software calculates benefits based on critical project information that is entered by staff performing the analysis. FEMA uses this information when determining if a project will receive funding. It is important for staff to attend training and build expertise in this area to ensure that they understand the important elements of the software to calculate accurate BCAs for hazard mitigation projects.

2011 Update Status: WEM hosted BCA workshops conducted by FEMA in 2009 and 2011. The focus of the workshops were the Flood module and the Damage Frequency Assessment module of the BCA software. Both workshops were well-attended.

2016 Update Status: In collaboration with the state's Rural Electric Cooperatives, WEM hosted a BCA workshop led by FEMA in May 2015 and held a meeting in 2016 to work through BCAs for utilities without previous damages. WEM staff also participated in a BCA webinar sponsored by the Region in June 2012 and in two other webinars: BCA for Drought and Ecosystem Services in May 2015 and BCAs for the new Climate Resilient Mitigation Activities in June 2016.

10.18 Action: Provide training and technical assistance to local governments and tribal organizations on FEMA's eGrants system.

Supporting Agency: FEMA **Implementation:** Ongoing.

Background: FEMA requires electronic applications for its mitigation grant programs. WEM worked with local governments and tribal organizations to submit the 2003 Pre-Disaster Mitigation program applications. WEM will continue to train and work with subgrantees to successfully submit electronic applications as required by FEMA.

2011 Update Status: Unchanged; WEM provided technical assistance in the FFY 10, 11, and 12 funding cycles.

2016 Update Status: Unchanged; WEM provided technical assistance for the PDM and FMA

program application periods in FFY 13, 14, 15, and 16 funding cycles.

10.19 Action: Revise the Resource Guide to All-Hazards Mitigation Planning in Wisconsin and post the new version on the WEM and DOA websites to be available for both mitigation and comprehensive planning efforts.

Supporting Agencies: DOA, RPCs

Implementation: 2017

Background: The Resource Guide to All-Hazards Mitigation Planning in Wisconsin was published in 2003 to serve as a tool for mitigation and comprehensive planners. The Guide was not posted to the DOA website, which is a primary source of comprehensive planning information for communities around the state. Upon completion of the update, it will be reviewed by the DOA to be sure it conforms to state comprehensive planning requirements. Posting it to the DOA website will promote the inclusion of a mitigation element in communities' comprehensive plans.

2011 Update Status: New action item.

2016 Update Status: Unchanged; WEM plans to collaborate with the RPCs and apply for a FEMA grant in the FFY 17 funding cycle.

10.20 Action: Promote the purchase and use of NOAA weather radios (especially in critical facilities, daycare centers, schools, and hospitals) through the WEM website, public service announcements, etc.

Implementation: Ongoing.

Background: NOAA weather radios have been identified in the Plan as a valuable tool for warning people to take shelter during extreme weather events.

2011 Update Status: Unchanged. Mitigation presentations identify NOAA weather radios as a mitigation option. In addition, WEM has awarded seven HMGP grants with two more pending for the purchase and distribution of NOAA weather radios.

2016 Update Status: Unchanged; this remains a priority for the state. Since the previous update, three additional grants for the purchase and distribution of NOAA weather radios have been funded and three additional pre-applications have been submitted to WEM.

10.21 Action: Participate in conferences and give presentations to promote mitigation to local interest groups and associations. These groups could include but are not limited to the Association of Wisconsin Regional Planning Commissions, Wisconsin Land Information Associations, Wisconsin Chapter of the American Planning Association, the League of Wisconsin Municipalities, Wisconsin Counties Association (WCA), Wisconsin Emergency Management Association, and the Wisconsin Manufactured Housing Association.

Supporting Agencies: DNR, UW-Extension, DOA-WCMP, RPCs

Implementation: Ongoing.

Background: While the awareness of the importance of mitigation has improved in recent years, more can be done. Recognizing that mitigation activities occur at the local level, WEM staff will be able to reach local audiences by attending and participating in conferences sponsored by various organizations.

2011 Update Status: WEM continues to promote mitigation whenever possible. This has

included making presentations for the Southwest Building Inspectors Group, Wisconsin Claims Council, State Bar Association, University of Wisconsin Student Planning Association, GIS Day at the State Capitol, PRIMA (Risk Managers Association), LaFollette School of Public Affairs, Kickapoo River Seminar sponsored by the National Weather Service, Rural Electric Cooperatives Association, Wisconsin American Planning Association, and the Wetlands, Wildlife Habitat, and Flood Hazards in the Rock River Basin Workshop sponsored by the Environmental Law Institute.

2016 Update Status: Unchanged; Sections 6.8.15 Public-Private Partnerships and 6.8.16 Public Education and Outreach detail the presentations and workshops WEM Mitigation staff has been involved with since the last plan update. They are too numerous to list here.

10.22 Action: Include the Hazard Mitigation Planning Workshop and the G-393 Mitigation for Emergency Managers class into WEM's training curriculum and the CEM program, and hold at least one workshop annually.

Implementation: Annually or more often.

Background: Beginning November 1, 2004, communities are required to have an approved all-hazards mitigation plan that meets 44 CFR Part 201 in order to be eligible for funds through the FEMA mitigation programs. WEM Mitigation staff has developed a state-specific curriculum for an All-Hazards Mitigation Workshop. Since mitigation planning will be a requirement, it is important that this workshop become a part of the Emergency Managers certification program. Therefore, the course must be held at least once a year to provide an opportunity for all Emergency Managers to participate. Additionally, the G-393 Introduction to Mitigation for Emergency Managers class focuses heavily on mitigation planning.

2011 Update Status: The Hazard Mitigation Planning Workshop is part of the CEM program and is held annually, usually in April. The workshop is held more often if requested. One workshop was held in 2009, two in 2010, and one in 2011.

2016 Update Status: The G-393 Introduction to Mitigation for Emergency Managers class is now also part of the CEM program. The Planning Workshop was held once in 2012, 2013, 2014, and 2016, and twice in 2015. The G-393 class was held twice in 2013 and 2014 and once in 2015 and 2016.

10.23 Action: Identify and develop GIS applications to be used as a mitigation tool.

Supporting Agencies: FEMA, DNR, RPCs

Implementation: Ongoing.

Background: Once GIS resources have been identified and provided, WEM can begin to develop GIS applications. Possible GIS applications include mapping repetitive loss properties; grants management; public education and outreach activities; success stories; mitigation planning; and post-disaster project development and recovery.

2011 Update Status: Maps identifying repetitive loss properties as well as mitigation projects throughout the state were completed. The maps will need to be updated at least annually. Future projects can include mapping properties acquired with mitigation funds since GPS coordinates are available. In addition, WEM mitigation staff purchased a camera in 2011 with GPS capability. This camera can be utilized during damage assessment, project development, and final inspections among other activities.

2016 Update Status: WEM has hired two GIS specialists. The state now has a statewide parcel data layer and FEMA released a national floodplain layer. FEMA has assisted with mapping complete projects and open space parcels.

10.24 Action: Work with the University of Wisconsin system to develop Disaster Resistant University (DRU) plans.

Implementation: Ongoing.

Background: All University of Wisconsin facilities are owned by the state. By creating their own plans, the universities can target high-risk areas and structures for appropriate mitigation projects that WEM does not have the capacity to address. This will help meet 44 CFR Part 201 which requires an analysis of potential losses of state-owned and –operated facilities.

2011 Update Status: The University of Wisconsin-River Falls developed a hazard mitigation plan which was approved by FEMA. As a result, they applied for and were awarded a Pre-Disaster Mitigation grant to construct small storm shelters at two of their research farms. The University of Wisconsin-Superior has participated in the Douglas County Hazard Mitigation Plan. The University of Wisconsin-Madison, the largest UW campus, is presently developing a hazard mitigation plan and we expect a detailed structure inventory included in the plan. WEM will continue to work with other universities in the development of hazard mitigation plans.

2016 Update Status: The UW-River Falls updated their plan in 2014. The UW-Superior updated their plan in cooperation with the City of Superior in 2016. The UW-Madison completed their first plan in 2013.

10.25 Action: Maintain the Wisconsin Recovery Task Force (WRTF) as a standing task force for disaster recovery with defined expectations of duties for each subcommittee chair.

Supporting Agencies: WRTF **Implementation:** Ongoing.

Background: The WRTF was established after the 2008 flooding to coordinate the recovery activities. Six subcommittees were established with identified chairs. The subcommittee chairs met bi-weekly. It is recommended that the WRTF continue and develop pre-disaster policies, standard operating procedures for the task force and the subcommittees, and assessment protocols. It is also recommended that semi-annual meetings be held to ensure preparedness and facilitate effective operational readiness.

2011 Update Status: The Wisconsin Recovery Task Force has not met since 2008. However, it is WEM's intent to convene the group after large disasters to address short- and long-term recovery needs.

2016 Update Status: The WRTF was reconvened in February 2015. Subcommittee chairs were identified. Since then, the WRTF has met twice, once following each of the disasters in 2016. Collaboration has been excellent.

10.26 Action: Chair the Mitigation Subcommittee on the Wisconsin Recovery Task Force (WRTF).

Implementation: Ongoing, as needed following disasters.

Background: Upon direction of Governor Doyle, WEM created the Wisconsin Recovery Task Force (WRTF) to assist individuals, businesses, and communities to recover quickly, safely, and with more resilience from future disasters. All WSJHMT members are on the Mitigation Subcommittee. Some WSJHMT members also chair the other subcommittees.

2016 Update Status: New action item; the WRTF was convened following two disasters in the state in 2016.

10.27 Action: Develop, update, and implement a State Recovery Plan.

Supporting Agencies: WRTF **Implementation:** Ongoing.

Background: Developing a State Recovery Plan before disaster strikes will allow agencies and citizens to work together efficiently and without duplicating efforts following a disaster to ensure the fastest, most complete recovery possible for impacted communities.

2016 Update Status: New action item; WEM staff began developing a State Recovery Plan in June 2015 which was finalized in May 2016. The Plan is being implemented for the recovery from both presidential disaster declarations in 2016 as well as another, non-declared flood event.

10.28 Action: Develop and deploy Rapid Assessment Strike Teams (RASTs) to assist local governments in damage assessments following disaster events.

Supporting Agencies: Wisconsin Chapter of the American Institute of Architects (AIA) **Implementation:** Ongoing.

Background: Rapid, accurate damage assessments will expedite the disaster declaration process and allow recovery to begin as quickly as possible following a disaster. RASTs with appropriate training and the ability to deploy quickly

2016 Update Status: New action item; WEM and AIA drafted the Wisconsin Disaster Assessment Plan from 2014 to 2016. Two sessions of Disaster Assistance: Building Evaluator Training were held, one in 2014, one in 2016 in conjunction with the release of the Plan.

10.29 Action: Incorporate Climate Resilient Mitigation Activities (CRMAs) as defined by FEMA (including Aquifer Storage and Recovery; Floodplain and Stream Restoration; Flood Diversion and Storage; and Green Infrastructure) into WEM's scoring system for preapplications.

Implementation: 2016; ongoing.

Background: Climate resilience is a state and national priority. FEMA has identified several new project types (CRMAs) that are eligible for funding under the HMA grant programs. BCA guidance for these new project types has also been released. To show the importance of these types of projects, WEM will adjust the scoring for the pre-applications for the HMA grant programs to include points for CRMAs.

2016 Update Status: New action item; starting with DR-4276, declared in August 2016, WEM's Pre-Application Ranking Form includes points for CRMAs.

10.30 Action: Research ways to quantify resilience to changing future conditions and use those methods to give additional points to pre-applications submitted for projects that incorporate resilience.

Implementation: 2017; ongoing.

Background: To support the concept of resilient communities, WEM should include resilience to changing future conditions in the criteria for selecting mitigation projects. It is easy enough to add points for resilience to the Pre-Application Ranking Form, but it is difficult to define and quantify resilience in a way that can be scored. To incorporate resilience into the scoring, the state must first determine a standard definition.

2016 Update Status: New action item.

10.31 Action: Include information on planning for changing future conditions in the All-Hazards Mitigation Planning Workshop.

Implementation: 2014; ongoing.

Background: As communities throughout the state begin to incorporate changing future conditions into their hazard mitigation plans, the state should offer training, guidance, and best practices to assist them.

2016 Update Status: New action item; a map showing the potential percent change in floodplains throughout the US for the next 100 years is in the training materials. Over time, more information will be included.

10.32 Action: Include points for CRS participation in the Pre-Application Ranking Form.

Supporting Agencies: DNR, FEMA **Implementation:** 2017; ongoing.

Background: Participating in the CRS means that a community has higher floodplain management standards than legally mandated. Rewarding those communities with extra points on WEM's Pre-Application Ranking Form will further encourage participation in the CRS. The number of points received will be based on the CRS class the community has achieved.

2016 Update Status: New action item.

10.33 Action: Work with other state and federal agencies to prioritize watersheds around the state that are most appropriate for and would benefit the most from Flood Inundation Mapping.

Supporting Agencies: DNR, FEMA, NWS, USACE, USGS

Implementation: 2013; ongoing.

Background: Flood inundation maps are an extremely effective way to convey risk to responders, policy makers, and residents. Real-time river stages and the associated flood risk is communicated visually through these maps. Additionally, the maps are so detailed that specific addresses and intersections can be found. There are many watersheds in Wisconsin that have the necessary river gauges and topographic data to produce flood inundation maps. However, staff time and funding for these efforts is limited, so the suitable watersheds must be evaluated and prioritized.

2016 Update Status: New action item; the Rock River Flood Inundation Mapping project mapped five stretches of the Rock River in Dodge, Jefferson, and Rock counties that have a high flood risk and serious potential impacts. The final interactive maps were posted to the NWS website. DNR filmed a tutorial video DNR showing how to use the maps. Outreach was

done through press releases and in person at numerous events, conferences, and workshops. Currently the Upper Fox River in Kenosha and Racine counties is being mapped.

10.34 Action: Consider updating WEM's Local Mitigation Plan Review Tool to include criteria on the assessment of changing future conditions and on the analysis of projects that reduce or eliminate the future vulnerability to these conditions. These could start out as recommended criteria.

Supporting Agencies: FEMA

Implementation: 2017.

Background: Requiring communities to consider the risk of changing future conditions and actions they can take to reduce that risk will help communities be better prepared and more resilient when future conditions change.

2016 Update Status: New action item.

3.3.11 Lead Agency: Wisconsin Historical Society (WHS)

11.1 Action: WHS is using GIS to identify and map locations of known historical and archeological sites in floodplains.

Supporting Agencies: DNR, FEMA

Implementation: Ongoing; the WHS completed digitizing historical and archeological site

locations in 2001.

Background: Section 106 of the National Historic Preservation Act requires federal agencies and the programs that they fund avoid the alteration, damage to, or destruction of significant historical and archeological sites. Knowing that an area contains significant historical or archeological sites is considered when determining the appropriate treatment of these resources before, during, and after a disaster. This statewide GIS database contains the locations of significant historical and archeological sites making information on these resources more widely available. Mitigation planning can help protect these resources and critical historical facilities. The WHS site lists and maps all properties listed in the National Register of Historic Places as the data becomes available. Staff has developed agreements on data access and use.

2011 Update Status: Unchanged.

2016 Update Status: All WHS historic building sites, structures, and burial sites are geocoded. The national floodplain layer from FEMA can be overlaid to show where historic and archaeological sites are in floodplains. Knowing where burial sites are, in particular, can lead to appropriate installation of certain flood response measures like temporary levees.

11.2 Action: Provide ongoing support and coordination with the WSJHMT in developing, establishing, and implementing a permanent and viable statewide mitigation program while protecting historical and cultural resources.

Supporting Agencies: WEM, WSJHMT, FEMA

Implementation: Ongoing.

Background: Section 106 of the National Historic Preservation Act requires federal agency programs to avoid the alteration of, damage to, or destruction of significant historical and archeological sites. Coordination with WEM on hazard mitigation activities will help fulfill this mission.

2011 Update Status: Unchanged.

2016 Update Status: Unchanged; the WHS is looking at making the whole Section 106 process electronic to streamline historic preservation reviews.

11.3 Action: Identify historic properties and structures in the floodplain to target for mitigation (at-risk sites).

Supporting Agencies: WEM, DNR, FEMA

Implementation: Ongoing.

Background: All historic and archaeological sites are now geocoded. Overlaying a floodplain layer will show the properties and structures most at risk. Then WEM and WHS can work together to develop mitigation ideas and implement the most appropriate options.

2016 Update Status: New action item.

11.4 Action: Provide technical assistance with mitigation projects (historic preservation review) through annual training. In the future, the archaeological interests may have a separate workshop from others that go through 106 and other historic preservation review.

Supporting Agency: WEM, FEMA

Implementation: Ongoing.

Background: Mitigation projects are required to complete a thorough environmental and historic preservation review. Training to understand the subject matter more fully will enhance WEM's ability to perform historic preservation reviews in a timely manner.

2016 Update Status: New action item.

11.5 Action: Develop a Programmatic Agreement (PA) for historic preservation and archaeological reviews. Hold an annual meeting to review the agreement and ensure it's still applicable.

Supporting Agency: WEM, FEMA, Tribes

Implementation: Ongoing.

Background: Having a PA in place detailing the exact level of review required for each potential mitigation project will expedite the review process and eliminate additional staff time.

2016 Update Status: New action item; the PA is currently in draft form and under review by all interested parties. Upon adoption and approval, annual meetings will be held to ensure the PA remains current and applicable.

3.3.12 Lead Agency: National Weather Service (NWS)

12.1 Action: Achieve near 100% NOAA weather radio tower coverage in the state. WEM will work with the Educational Communications Board to pursue this goal.

Supporting Agency: WEM **Implementation:** Ongoing.

Background: NOAA weather radios have been identified in the plan as a valuable tool for warning people during extreme weather events. As near as possible to 100% coverage would help warn people in all areas of Wisconsin.

2011 Update Status: Status unchanged. There is 95% coverage statewide. New transmitters are currently being installed, but are not yet operational.

2016 Update Status: There is nearly 100% coverage. The bluff areas along the Mississippi River will never achieve full coverage because the steep topography prevents a signal reaching certain low points.

12.2 Action: Implement the Storm Spotter program and continue to recruit and educate new Storm Spotters.

Supporting Agency: WEM **Implementation:** Ongoing.

Background: Knowing what is happening on the ground is a vital part of the National Weather Service's severe weather operational process. For many years, storm spotters have helped the NWS by reporting what is happening on the ground during hazardous weather. These reports have triggered warnings which inform the public that severe weather has been occurring with the storms. Every year in early spring, the NWS provides training to spotters on the procedures for reporting severe weather and also tries to recruit new volunteers. Promoting these trainings and asking the public to participate in storm spotting helps to improve the severe weather operations in every NWS office in Wisconsin.

2016 Update Status: New action item; while the total number of storm spotters in the state is unknown, the NWS estimates that they train between 3,000 and 5,000 people statewide each year.

12.3 Action: Implement the StormReady program and continue to recruit and educate new participating agencies.

Supporting Agency: WEM **Implementation:** Ongoing.

Background: The National Weather Service's StormReady program recognizes communities and other organizations that have gone above and beyond to make sure that their location or organization is prepared for hazardous weather. The StormReady program encourages these communities to develop ways to receive weather alerts, monitor the weather, disseminate alerts, and engage in local preparedness activities. The more work that is done up front to ensure that people are ready for severe weather, the more prepared they will be when it occurs.

2016 Update Status: New action item; in Wisconsin there are currently 20 StormReady Sites, including Wisconsin Emergency Management, and 22 StormReady Supporters (less strict

quidelines).

12.4 Action: Implement the Weather Ready Nation Ambassador program and continue to recruit and educate new Ambassadors.

Supporting Agency: WEM **Implementation:** Ongoing.

Background: Since the devastating tornadoes in 2011 in Joplin, Missouri, and Alabama, the National Weather Service has been making an effort to develop a Weather Ready Nation to save more lives and livelihoods. By increasing the nation's weather-readiness, the country will be prepared to protect, mitigate, respond to, and recover from weather-related disasters. The Weather Ready Nation Ambassador initiative is an effort to formally recognize NOAA partners who are improving the nation's readiness, responsiveness, and overall resilience against extreme weather, water, and climate effects.

2016 Update Status: New action item; there are currently 126 Weather Ready Nation Ambassadors in Wisconsin including Wisconsin Emergency Management.

12.5 Action: Educate the public through a variety of weather and natural hazard awareness days and weeks each year.

Supporting Agency: WEM **Implementation:** Ongoing.

Background: The two main awareness weeks held in Wisconsin are Severe Weather Awareness Week and Winter Weather Awareness Week. During Severe Weather Awareness week, the National Weather Service and its partners share many safety tips regarding what people can do to stay safe when severe weather hits. It also features a pair of tornado drills on the Thursday of that week, one in the afternoon and another in the evening hours, where people can rehearse their tornado safety plans. Other awareness campaigns include Heat Awareness Day, Lightning Safety Day, and other seasonal campaigns.

2016 Update Status: New action item.

3.3.13 Lead Agency: Wisconsin Economic Development Corporation (WEDC)

13.1 Action: Develop and maintain an economic recovery framework to help businesses recover following a disaster.

Supporting Agencies: DOA-Division of Housing, WEM

Implementation: 2011; ongoing.

Background: A deeper understanding of the impact to a community of job loss and business failure following disaster is emerging. A business recovery toolkit will help leaders minimize job losses, thereby shortening recovery time. This not only provides disaster preparedness tools to communities and reduces the potential for business failure following a disaster, but it also integrates economic stability into long-term community recovery.

2011 Update Status: New action item.

2016 Update Status: Unchanged; in 2012 the Community Economic Recovery Guidebook received an Innovation Award from the National Association of Development Organizations.

13.2 Action: Target business-related mitigation materials to Wisconsin businesses, especially in vulnerable areas.

Implementation: Ongoing.

Background: Businesses are excellent and important partners to community mitigation efforts. To encourage business participation in disaster mitigation activities, it will be useful to concentrate efforts in areas with flood vulnerability to reduce future losses and build strong partnerships.

2011 Update Status: Unchanged.2016 Update Status: Unchanged.

13.3 Action: Chair the Business Subcommittee on the Wisconsin Recovery Task Force (WRTF).

Supporting Agency: WEM

Implementation: Ongoing, as needed following disasters.

Background: Upon direction of Governor Doyle, WEM created the Wisconsin Recovery Task Force (WRTF) to assist individuals, businesses, and communities to recover quickly, safely, and with more resilience from future disasters. All WSJHMT members are on the Mitigation Subcommittee. Some WSJHMT members also chair the other subcommittees.

2016 Update Status: New action item; the WRTF was convened following two disasters in the state in 2016.

13.4 Action: Develop a Memorandum of Understanding regarding the provision of technical assistance when dispensing disaster funds to businesses.

Supporting Agency: DOA **Implementation:** Ongoing.

Background: Having an agreement and procedures in place prior to a disaster will expedite the disbursement of disaster funds following an event and lower the instances of duplication of efforts and misunderstandings.

2016 Update Status: New action item.

3.3.14 All State Agencies

14.1 Action: Provide incentives such as awarding additional points for grant proposals competing for state funds when proposals address hazards with appropriate mitigation measures.

Implementation: Ongoing.

Background: Many projects funded by state agencies can fulfill multiple objectives. For example, a storm water project that addresses water quality issues can also address flood issues. A bike trail along a river can prevent more intense development in a flood-prone area and therefore prevent flood damage. Although state programs are funded as directed by the state legislature and with formulas that cannot be altered by agency staff, it would be beneficial to recognize those projects that accomplish mitigation objectives.

2011 Update Status: Unchanged.2016 Update Status: Unchanged.

14.2 Action: Seek out opportunities to sponsor low-cost hazard mitigation demonstration projects.

Implementation: Ongoing.

Background: Organizing low-cost mitigation demonstration projects at the state level helps

lead by example and epitomizes a disaster-resilient community approach.

2011 Update Status: Unchanged.2016 Update Status: Unchanged.

3.3.15 Completed and Deleted Action Items

1.7 Former Action: Invite WEM staff to participate in the State Agency Resource Working

Group (SARWG).

Supporting Agency: WEM

Implementation: 2004 and ongoing.

Background: The SARWG is a group of representatives from various agencies that promote

and cooperate on land use issues. SARWG is administered by DOA. Other agencies

represented include DNR, DATCP, DOT, PSC, WHS, DOA, and UW-LICGF.

2011 Update Status: Status unchanged.

2016 Update Status: DELETED – The SARWG has not been active for about ten years.

5.11 Former Action: Require statewide licensing of all electrical workers.

Implementation: April 1, 2013; ongoing.

Background: 2007 Wisconsin Act 63 mandates the creation of a new statewide licensing system for electrical workers. Previously, Wisconsin law did not require that a person be licensed or certified by either the state or a local government to work as an electrician or electrical contractor.

2011 Update Status: Unchanged.

2016 Update Status: COMPLETED – Licenses are required for electrical workers; DSPS will continue to license electrical workers.

5.12 Former Action: Participate at the national level on code development for the National Fire Alarm Code.

Implementation: Ongoing.

Background: The National Fire Protection Association is drafting a new chapter for the 2013 Fire Alarm Code to aid in emergency communications in disasters. The new chapter will establish minimum standards for the installation of mass notification systems. Mass notification is the capacity to provide real-time information to all building occupants or personnel in the immediate vicinity of a building during an emergency. To reduce the risk of mass casualties there must be a timely means to notify building occupants of threats and appropriate responses. Staff from Wisconsin were asked to participate on the national committee because of current state efforts to implement related technologies.

2011 Update Status: Unchanged.

2016 Update Status: DELETED – No DSPS staff are participating in this committee work.

10.8 Former Action: Create links from WEM's Recovery website to OCI's websites about flood insurance.

Supporting Agency: OCI **Implementation:** 2011.

Background: Flood insurance participation in the state is very low. OCI has websites explaining the National Flood Insurance Program and flood insurance benefits for homes and businesses. Creating a link from WEM's Recovery website to OCI's websites about flood insurance will allow easy access to the information and promote the purchase of flood

insurance.

2011 Update Status: New action item.

2016 Update Status: DELETED – This is covered in Action 10.3.

10.9 Former Action: Utilizing the Wisconsin Historical Society's GIS database on historical and archeological sites, develop a GIS layer identifying those that are located within the 100-year floodplain.

Supporting Agencies: WHS, DNR, FEMA

Implementation: Six year plan update - 2010 or before.

Revised: As time allows.

Background: Developing a GIS floodplain layer on state historical and archeological sites will assist in state and local risk assessments for flood hazards. It will help to identify the most vulnerable structures and focus efforts on developing appropriate mitigation actions for these structures and sites. In addition, it will expedite environmental reviews in the post-disaster recovery as well as in implementing mitigation measures.

2011 Update Status: Status unchanged. Due to staff time constraints, this action item has not yet been pursued, but may still be undertaken as staff time allows.

2016 Update Status: DELETED – This is covered in Action 11.1.

10.18 Former Action: Attend training on the HAZUS software and determine its feasibility for use in Wisconsin.

Supporting Agencies: FEMA, RPCs

Implementation: To be completed by three-year update (2007)

Background: HAZUS is a GIS-based multi-hazard risk assessment and loss estimation software developed by FEMA to help prepare and plan for safer and stronger communities. The software can help communities complete the Risk Assessment portion of local all-hazards mitigation plans by estimating potential losses for wind, flood, and earthquake hazards. WEM staff will need to obtain adequate training before they can determine appropriate use in Wisconsin at the State and local level.

2011 Update Status: WEM staff is continually attending HAZUS training when offered. Previous training completed by staff includes Application to HAZUS for Risk Planning in 2010. Staff also attended the HAZUS Conference in 2011.

2016 Update Status: COMPLETED – Ongoing training is merged into Action 10.15.

10.19 Former Action: After HAZUS software training, provide information to local governments as a tool in mitigation planning and provide training and technical assistance.

Supporting Agencies: WHMT, RPCs **Implementation:** 2004 and ongoing.

Background: HAZUS is a GIS-based multi-hazard risk assessment and loss estimation software developed by FEMA to help prepare and plan for safer and stronger communities. The software can help communities complete the Risk Assessment portion of local all-hazards mitigation plans by estimating potential losses for wind, flood, and earthquake hazards. Upon completion of adequate training on HAZUS, WEM staff will determine appropriate use in Wisconsin at the State and local level. Information will then be provided

to local governments so they can make a determination as to its use within their community. **2011 Update Status:** HAZUS training to locals is not provided regularly, but WEM staff is available to field questions as needed. HAZUS runs performed by WEM are sent to the counties.

2016 Update Status: DELETED – This is not something we do. HAZUS is highly technical and would be burdensome for local staff to attempt to use. Additionally, many local staff do not have the requisite GIS software for using HAZUS. WEM will continue to work with the RPCs, UW-Madison staff, and internal GIS staff to perform local HAZUS analyses. For the State Hazard Mitigation Plan, WEM is using a different flood risk analysis methodology.

10.24 Former Action: Continue to administer FEMA's Hazard Mitigation Assistance (HMA) grant programs to strengthen buildings against disaster by providing long-term, permanent and cost-effective mitigation measures.

Supporting Agencies: Agencies belonging to the WHMT

Implementation: Ongoing.

Background: WEM has administered over \$40 million in HMA funds for projects that eliminate or reduce disaster damages and protect lives and property. With the assistance of the WHMT, WEM will continue to encourage communities to apply for mitigation grant funds and fund cost-effective projects and projects that make the biggest impact in reducing disaster costs. In addition, WEM will coordinate with other agencies through the WHMT to identify potential funding sources for projects and "package" funding to ensure implementation of projects at the local level.

2011 Update Status: WEM has now administered over \$86 million in HMA funds.

2016 Update Status: DELETED – This is covered in Action 10.1.

10.27 Former Action: Continue to develop and use the WEM mitigation information display at training sessions, conferences, workshops, and other public awareness activities.

Supporting Agency: RPCs **Implementation:** Ongoing.

Background: Educating individuals about hazard mitigation will help promote hazard mitigation in their communities. A display that is portable and clearly conveys these concepts will help communicate these concepts.

2011 Update Status: Display is updated as needed and utilized at various conferences as well as mitigation training functions. This includes the Wisconsin Association for Floodplain, Stormwater, and Coastal Managers annual conference, the annual Governor's Conference on Emergency Management and Homeland Security, and the Wisconsin Emergency Management Association annual conference.

2016 Update Status: DELETED – The display is outdated and has not been used for several years.

10.29 Former Action: Continue to develop guidance and resource information that will assist with the development of local mitigation plans to meet the federal planning criteria for All-Hazards Mitigation Plans.

Supporting Agency: RPCs

Implementation: April 1, 2001 and ongoing.

Background: Beginning November 1, 2004, communities are required to have an approved all-hazards mitigation plan that meets the criteria in 44 CFR Part 201 in order to be eligible for funds through the FEMA mitigation programs. To assist the local governments in developing such plans, WEM worked with the Council of Regional Planning Organizations in the development of the Resource Guide to All-Hazards Mitigation Planning in Wisconsin. In addition, WEM developed a curriculum for an All-Hazards Mitigation Planning Workshop, provides guidance through its website, and mails guidance electronically to local governments. As information becomes available, WEM continues to develop and share guidance with the local governments.

2011 Update Status: Although the Resource Guide is useful and is included in the Hazard Mitigation Planning Workshops and posted on WEM's website, it needs to be updated. WEM will work to update the Resources Guide. As part of the annual Hazard Mitigation Planning Workshop, each attendee receives a binder with extensive resource materials as well as a CD containing the materials. The contents are also posted on WEM's website.

2016 Update Status: DELETED – This is covered in action 10.19.

10.32 Former Action: Annually update the Green Sheet to assist in environmental review process for hazard mitigation projects.

Supporting Agencies: WHMT/FEMA

Implementation: Ongoing.

Background: The Green Sheet is a resource guide for local governments that contains basic information on the environmental laws and policy requirements that must be considered when communities respond to and recover from disasters. The document also contains contact information for state and federal officials. The annual update will help ensure the document is current and will require less time to update when a disaster is declared.

2011 Update Status: The Green Sheet is updated after each disaster declaration. This included two declarations in 2009 and one in 2011.

2016 Update Status: DELETED – FEMA does this, not the state. There is no state or local contact information on the Green Sheet.

3.3.16 Prioritizing Mitigation Action Items

The Mitigation Action Plan consists of Action Items identified by the Wisconsin Silver Jackets Hazard Mitigation Team (WSJHMT) for state government to pursue over the next five years and beyond. The actions include developing and/or enhancing state programs, policies, regulations, planning, or other practices that will assist the local governments in furthering hazard mitigation goals. Each WSJHMT member prioritized the actions for their respective agency as high, medium, or low with the caveat that the priority may change based on circumstances such as: 1) availability of funds; 2) availability of resources; 3) legislative or programmatic changes; and 4) disaster events that may have occurred.

Wisconsin has a home-rule style of government. As a home-rule state, control of government services and actions is maintained at the most local level possible. The state recognizes that decisions for implementing local mitigation measures remain at the local level. Therefore, this plan does not identify and prioritize site-specific mitigation projects. It is left to the communities to identify and prioritize those mitigation measures that are best for their community. WEM encourages communities to develop comprehensive plans that include all potential mitigation measures instead of simply listing projects that are eligible for the federal hazard mitigation programs.

Since 1993, WEM and the WSJHMT (formerly WHMT) have given priority to acquisition, demolition, relocation, and/or floodproofing of floodprone properties, especially substantially damaged or repetitive loss properties, and have approved projects for these activities. The state's funding priorities are listed in Section 6.3 of this Plan.

When mitigation projects are proposed, WEM performs an initial review to ensure that the projects are eligible for FEMA's Hazard Mitigation Assistance grant programs. If the projects are eligible, WEM reviews, scores, and ranks them according to the criteria set forth in the State Administrative Plan for the Hazard Mitigation Grant Program (Appendix F). The criteria reflect state priorities, so non-structural projects such as acquisition, demolition, relocation, and/or floodproofing receive the highest ranking and the greatest consideration for funding. Based on the evaluation and funding availability, a list of recommended projects is submitted to the WEM Administrator. Some projects may be referred to other agencies for appropriate funding. In addition, WEM will work with WSJHMT members to "package" funding for projects where possible to maximize available funding. The state's criteria for evaluating proposed projects are listed in Section 6.3 of this Plan.

3.3.17 Addressing Cost-Effectiveness, Environmental Soundness, Technical Feasibility

In addition to the above priorities and considerations, the hazard mitigation programs administered by WEM require all mitigation projects proposed for funding (including state agency projects) to meet the following criteria:

1. Solve a repetitive problem.

- 2. Be cost-effective.
- 3. Be a permanent, long-term solution.
- 4. Be environmentally sound.
- 5. Be technically feasible.

In 2000, a Memorandum of Understanding (MOU) was signed by FEMA and WEM recognizing the state as a Hazard Mitigation Grant Program (HMGP) Managing State. The responsibilities this entailed are listed in Section 6.4 of this Plan update. Because FEMA failed to develop criteria under which the state was to manage the HMGP, six years later the MOU was terminated. Although the MOU is no longer in effect, the state continues to perform all of the activities identified in the MOU. The responsibilities of the state and FEMA for benefit-cost analyses (BCAs) are listed in Section 6.4.1 and for environmental reviews in Section 6.4.2. WEM's success in performing both BCAs and environmental review components is evidenced by the large number of projects funded and the low number of projects submitted that are not approved by FEMA.

3.4 Hazard Mitigation Funding

As stated previously in this section, the primary funding sources for state and local hazard mitigation projects have been federal hazard mitigation programs available through FEMA. Funds for the state match or state contribution toward the local match (12.5% for the Hazard Mitigation Grant Program) come from the state's general fund budget. Local governments have used a variety of other sources to fund hazard mitigation projects including local revenues, local in-kind goods and services, Community Development Block Grants, grants through the Department of Natural Resources Stewardship programs and the Municipal Flood Control and Riparian Restoration program, and others.

The State Capability Assessment, Section 3.2 and Tables 3.2.1-1 and 3.2.1-2, identifies a variety of sources that have been and will continue to be used to fund hazard mitigation projects, plans, and other initiatives by local and state governments. Additionally, other federal agencies and related organizations have been identified as potential funding sources to further hazard mitigation efforts in the state.

To help relieve the debt of some \$4 billion, the state government has cut back on programs and services. With a slow economic recovery, a limited long-term state GPR budget, and diminishing federal funding, it may be more difficult to fund mitigation efforts in the future.

A majority of state tax revenue is transferred to local governments. General purpose state taxes are combined with locally-collected revenues to fund local government in Wisconsin. In addition to the state's general purpose tax collection, local governments rely heavily on property taxes to fund their programs and services.

With fiscal challenges facing both the federal and state governments, not only will it be more

State of Wisconsin Hazard Mitigation Plan

difficult for local governments to secure funding for mitigation projects, but it will also be more difficult for them to raise matching funds. This short-term lack of money to fund mitigation projects may cause larger long-term losses if a disaster occurs, because mitigation projects that would have protected life and property were not implemented.

Figure 3.2-1: State Capability Assessment

Department of Administration (DOA)

DOA - Division of Energy, Housing, and Community Resources (DEHCR)

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
Community Development Block Grant (CDBG) – Housing Program	Makes loans to low- to moderate-income households to rehabilitate their homes. Hazard mitigation and building code compliance activities are eligible.	The CDBG Housing Program is designed to address housing needs as identified by the com- munity. Compliance with building codes can reduce wind damage vulnerability.	Funds are available annually to several entitlement communities over 50,000 in population and regionally on a competitive basis. Additionally, mitigation is not a priority in the minds of most homeowners.	All natural and manmade hazards
Home Investment Partnerships Program (HOME)	HOME provides loans to assist communities in establishing affordable housing for low-income people.	HOME can incorporate mitigation into new construction projects.	HOME cannot make awards based on an emergency.	All natural and some manmade hazards
CDBG – Emergency Assistance Program (EAP)	Following a disaster, EAP is a source of grants to low- to moderate-income households to restore their homes to pre- disaster condition. Hazard mitigation activities are promoted wherever appropriate.	EAP is awarded following a disaster. It is designed to help house- holds recover. Funded activities may include: 1) housing rehabilitation, 2) housing replacement, and 3) acquisition and demolition of properties in floodplain. Grants can also be used as the local match for HMGP grants.	EAP funds are awarded to local governments in response to a disaster and are restricted to low- to moderate-income households. EAP assistance can be provided only after official requests and often has no mitigation component.	All natural and manmade hazards

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
CDBG – Public Facilities (PF) Program	The PF program is a source of grant money for local governments to address deficiencies in municipal public facility infrastructure. The grants can help fund projects such as community tornado shelters, shelter retrofits, infrastructure upgrades, and other hazard mitigation projects.	The mitigation needs of small communities are often overlooked. They can be addressed by the PF program as part of the overall effort to improve public infrastructure.	Public Facility grants are awarded annually to local governments on a competitive basis and never represent 100% of the total project cost. Many small communities lack local support for projects or are unable to raise funds for the local cost share of the project.	All natural and manmade hazards
Environmental review assistance for CDBG-EAP projects	CDBG Technical Assistance funds can be used to pay DEHCR staff to conduct the environmental review record for EAP grants, thus decreasing community workload at a stressful time.	These funds help a community get needed housing assistance.	EAP assistance can only be provided when requested and some communities are still not aware of the program.	All natural and manmade hazards
CDBG-EAP and HOME program implementation training	Program implementation training sessions provide information on mitigation activities that are eligible for assistance.	These sessions raise awareness of consultants and local officials about mitigation efforts.	The sessions are held only annually and the audience is limited to those with funding.	All natural and manmade hazards

DOA – Division of Intergovernmental Relations: Comprehensive Planning and Wisconsin Land Information Program (WLIP)

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
Census and Population Information – Demographic Services Center	The Demographic Services Center's primary responsibility is to develop annual total population estimates for all Wisconsin towns, villages, and cities. It also develops population projections by age and sex for each county; population projections of total population for each municipality; and estimates of total housing units and households for each county.	Supplies federal, state, and local agencies with population and housing estimates and projections. This information can be used by planning and zoning agencies to mitigate hazards.	For cities, villages, and towns the population projections do not include age or gender.	All hazards

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
Comprehensive Planning Grant Program	This program financially assists local governments in the development and adoption of comprehensive plans. The program awards grants, maintains a library of comprehensive plans, and serves as a resource directory for local governments.	Comprehensive planning increases awareness of hazards and encourages authorities to plan future land uses and to mitigate hazards. Comprehensive plans include maps of floodplains, wetlands, and steep slopes.	This program is not tied to hazard mitigation. Grants have not been awarded since 2010.	All hazards
Comprehensive Planning Element Guides	Guides to assist local governments are available for the following comprehensive planning elements: Housing; Transportation; Agricultural, Natural and Cultural Resources; Economic Development; Intergovernmental Cooperation; Land Use; and Implementation.	These element guidebooks assist local governments in the development of their comprehensive plans. The Natural Resources guide discusses planning in floodplains.	The land use guide is not used enough in hazard mitigation planning.	All hazards
Comprehensive Planning Web-Based Resources	Collection of documents, guides, tools, and other useful information on topics including model ordinances, web mapping, comprehensive planning elements, and land use regulations.	This collects comprehensive planning information from various sources in one location.	Information is not complete, should be linked to more hazard mitigation planning resources.	All hazards
Land Subdivision Plat Review	Plat review regulates the creation of parcels on subdivision plats and the correction of faulty parcels on assessor plats. It also functions as a clearinghouse for the three state agencies and seventeen county planning agencies with statutory "objecting" authority.	Plat review uses statutes to insure plats follow zoning and planning.		All hazards

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed	
Municipal Boundary Review (MBR)	MBR regulates the transition of unincorporated areas to city or village status through municipal annexation, incorporation, consolidation, or through joint city-village-town activities involving cooperative boundary plans and agreements. Such agreements may change territorial boundaries and may provide for the sharing of municipal services.	MBR handles annexations and incorporations. If the land is contiguous to a municipality the MBR will review and give recommendations.	This is only an advisory opinion on annexation, but has full authority on incorporation, consolidation, and boundary agreements.	All hazards	
Wisconsin Land Information Program (WLIP)	WLIP is a voluntary, statewide program that provides financial support (from register of deeds fees) to local governments for land records modernization efforts. All seventy-two Wisconsin counties participate in the program.	WLIP is a data resource for local governments and consultants developing Comprehensive and All-Hazards Mitigation Plans.	WLIP does not actively promote hazard mitigation planning.	All hazards	
WLIP Statewide Parcel Map Layer	This is a current initiative, not yet fully implemented.	Parcel data is useful for land use planning, mitigation planning, and potential disaster loss estimates.	Some counties do not yet have complete parcel data.	All hazards	
Statewide LiDAR Data	This is a current initiative, not yet fully implemented.	LiDAR data will allow more accurate floodplain and flood inundation mapping.	This needs funding and support to be realized.	All hazards	

DOA – Division of Intergovernmental Relations: Wisconsin Coastal Management Program (WCMP)

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
WCMP Coastal Grant Program	Awards grants to communities for the protection of Wisconsin coastal resources.	The program is focused on a specific area of Wisconsin (15 coastal counties). Coastal erosion and flooding are the focuses of the program. Funding for land use planning aims at incorporating coastal hazards into planning.	Communities need financial and technical support in developing policies and guidance. The minimum setback standards of NR 115 are not adequate for many Great Lakes coastal areas. Changes to NR 115 may make some communities' existing policies unenforceable. Variable lake levels mean that local policies that may have been adequate for the past 15 years or so may not be adequate for future conditions.	Coastal storms and erosion
Interagency Coastal Hazards Work Group	Formulates strategies, goals, and policies for managing coastal hazards.	Members of the work group identify needs and opportunities for communities in the coastal counties. The work group is a forum to share information and opportunities regarding coastal hazards.	The work group continues to identify opportunities to help communities address their coastal hazards needs.	Coastal storms and erosion

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
WCMP Public Outreach	WCMP conducts public outreach activities related to coastal hazards and mitigation planning.	Public outreach is a component of the WCMP's coastal hazards strategy, with a goal of educating landowners and other stakeholder about the threats posed by coastal hazards. WCMP also supports efforts to train state and county staff, coastal engineers, and real estate interests on identifying and addressing such hazards.	WCMP's efforts are limited to the 15 coastal counties (and the communities within them) in the state.	Coastal storms and erosion

<u>Department of Agriculture, Trade, and Consumer Protection (DATCP)</u>

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
Conservation Reserve Enhancement Program (CREP)	This program removes exclusively sensitive riparian areas from crop or pasture production. Filter strips, grassed waterways, grass habitat, and restored wetlands are established. As an offshoot of the Farm Service Agency's Conservation Reserve Program (CRP), 87.5% of funding is federal and 12.5% state. While the CRP typically enrolls large tracts of land, the CREP program enrolls smaller areas to total 100,000 acres in the state. In drought years, haying may be allowed on CREP land to offset the overall loss of production on farmed lands.	This program helps reduce environmental damage from flooding. It provides cost-sharing and incentives for landowner participation.	A lack of funding for county staff to administer the program has resulted in counties being unable to fully utilize the program. CREP is only a tool; counties do not receive money for implementation.	Flooding, drought
Soil and Water Resources Management Program	This program provides state cost-share funds to counties for implementing their land and water resources management plan. The program also provides staffing grants to counties for performing necessary technical assistance. (Wisconsin Statutes Chapter 92)	This program helps reduce environmental damage from flooding. Measures can include stream-bank protection, barnyard and manure management, and others.	A lack of funding for county staff has resulted in the inability to fully implement the program in many counties. Cost-sharing for implementing conservation practices is not adequate in many counties.	Flooding, landslides, sinkholes
Drainage Districts	This program provides operation and maintenance of agricultural drains by local drainage districts. (Wisconsin Statutes Chapter 88; WAC Chapter ATCP 48)	This program provides technical assistance to drainage districts to help maintain drainage ditches.	There is a need for additional state and local staff.	Flooding
Engineering Support	DATCP engineers and engineering techs provide counties and landowners engineering and project design review.	DATCP engineers will design or help design conservation projects that protect water quality.	More engineering staff could better assist counties and landowners design and build structures and projects.	Flooding, Landslides, Sinkholes
GIS Capabilities	Several layers are available: registered poultry farms, CAFOs, beehives, CREPs, farmland preservation.	These layers can help planning efforts by focusing mitigation actions in appropriate locations.	. ,	All hazards

Department of Natural Resources (DNR)

DNR – Office of Business Support and External Services

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
NR 115 – Shoreland Protection	This regulation requires minimum setbacks from water bodies for new structures and requires permits for grading in shoreland areas.	New impervious surface standards and shoreland buffer restoration requirements will promote sustainable shoreland development, reduce runoff, promote infiltration of rainfall and protect natural shoreland functions. This regulation prevents construction in dangerous near-shore areas, thereby mitigating possible flood damages. Grading restrictions prevent increased runoff and resulting flood damages.	Greater setbacks and more restrictive grading restrictions would reduce flood damages even more, but present political climate makes this unlikely. Recent changes to NR 115 may make some communities' existing policies unenforceable. Variable lake levels mean that local policies that may have been adequate for the past 15 years will not be adequate in the future.	Flooding, sloughing
NR 116 – Floodplain Management	This regulation prohibits construction in floodways and requires elevation and dry-land access in flood fringe areas. It limits improvements to nonconforming structures and requires compensatory storage in flood storage areas.	This regulation prevents flood damages by controlling the placement and elevation of structures. It sets strict standards for the removal of lands from the floodplain and limits the granting of variances in floodplains. New floodplain maps more accurately delineate flood hazard areas and encourage achievable mitigation projects. Risk MAP products will incorporate mitigation data and provide support for mitigation planning efforts.	Prohibiting all development in floodplains would limit future flood damages, but such a change is unlikely.	Flooding
NR 117 – Shoreland- Wetland Protection Program	This regulation prohibits development in mapped wetland areas.	This regulation preserves wetland areas that retain and allow infiltration of flood water. It provides buffer areas for urbanizing watersheds.	Small, isolated wetlands and degraded wetlands can be developed in some cases, which can cause higher flood levels and increased damages.	Flooding

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
Municipal Flood Control and Riparian Restoration Program	This program provides grants for the mitigation of flood-prone property, the restoration of riparian areas, and the construction of flood control projects.	This program enables communities to acquire, relocate, and floodproof flood-prone structures. It allows restoration of flood-carrying and storage capacity of watersheds. It also funds new detention basins and flood walls.	Limited funding which typically can meet less than 1/4 of requested project dollars. Does require a match, which some communities are unable to provide. Counties are not eligible. More acquisition projects have been funded recently due to the 2007-08 disaster declarations and higher appropriations.	Flooding
Dam Safety Section	This group of DNR employees inspects dams, reviews dam repair plans, reviews dam transfer documents, and approves dam operation and maintenance plans.	This section of the DNR provides technical assistance to dam owners and consultants on the safe operation and maintenance of privately-owned dams. This prevents flooding by ensuring that dams are in good operating condition.	Limited staff cannot perform inspections on a timely basis; more dams are built each year, increasing the workload; staff encounter problems with ownership and the availability of financial resources for repairing dams.	Flooding
NR 335 – Municipal Dam	This program provides grants to repair and remove dams.	Old, unsafe dams which are a threat to downstream residents can be removed or repaired under this program.	Limited funding addresses only a very limited part of the total need for dam repairs and removal.	Flooding
NR 333 – Large Dam Standards and Emergency Action Plan (EAP)	This program ensures that large, high-hazard dams have a comprehensive, current EAP.	This program ensures that dam owners have the staff and systems in place to give adequate notice to downstream property owners in the event of a dam failure.	There is limited staff to provide technical assistance to dam owners and consultants.	Flooding
Executive Order 67: The State Must Follow State Wetland, Floodplain, Erosion, and Shoreland Standards	State agencies must comply with local zoning standards if feasible.	Compliance reduces the risks of flood damages and loss of flood storage areas. It also decreases erosion hazards.	None	Flooding

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
Executive Order 73: Flood Mitigation for State-Owned Facilities - 100 Year Floodplain Standard for State Buildings, and 500 Year Standard for Critical Facilities	State agencies must comply with local zoning standards if feasible.	Compliance reduces the risks of flood damages and loss of flood storage areas. It also reduces erosion hazards.	None	Flooding
Chapter 30	This regulation sets standards for placement of structures and material, diversion of water and other activities in navigable water of the state.	This regulation limits alterations to natural waterways in the state. It prevents flooding by strictly regulating in-water activities and preventing unauthorized diversions, discharges, and placement of structures.	Allows placement of rip-rap, piers, wharves, bulkheads, and other structures which could affect flood levels and velocities.	Flooding
Chapter 31 Regulation of Dams and Bridges (2011)	This provides a framework for the regulation of dams to protect life, health, and property and to protect the public's rights in the waterways of the state. The new inspection requirements were added to the statute in 2009 and are being implemented in the 2011 inspection season. The grant programs were funded in 2009 for the first time in 10 years and received additional funding in 2011.	This sets mandatory inspection frequency and requirements for large dams. It provides grant programs to repair, reconstruct, or remove municipally-owned dams and removal of any dam where the owner no longer wants to own and operate the dam.		Flooding

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
Storm Water	This regulation requires erosion control and storm water management practice implementation on construction sites of one acre or greater.	Adequate infiltration standards are required for new construction. If met, this volume control will have lasting effects on the overall hydrology of a drainage area and can improve the efficiency and flood mitigation of downstream projects. Projects at a minimum control the2-year, 24-hour storm, but most storm water ponds will control the 10, 25, or even 100- year event using the same practices.	Infiltration is not feasible in all areas and limited resources do not allow the review and inspection of all projects.	Flooding
Nonpoint Targeted Runoff Management (TRM) Program	Governmental units can be reimbursed up to 70 percent of eligible costs associated with installing Best Management Practices (BMP) to limit or end nonpoint source (run-off) water pollution.	Examples of eligible projects include, stream bank protection projects, wetland construction, detention ponds, barnyard and feedlot protection practices, livestock waste management practices, and design as part of construction.	Grant awards cannot exceed \$150,000. Grants are made for specific projects and have a 2-year implementation time frame.	Flooding
NR336 – Dam Removal Grant Program	This program provides grants to any dam owner to remove their dam(s).	Old, unsafe, or unwanted dams can be removed with this program. It decreases downstream risk for flooding during dam failure and in some cases lowers upstream flooding levels.	Current funding levels pay up to \$50,000 for removal costs for 10-15 dam removals each biennium. Demand for this program slightly outpaces available funding.	Flooding

DNR – Division of Forestry

Program, Policy, Regulation, Plan, or Practice		Needs Addressed	Unmet Needs	Hazards Addressed
Healthy Forest	Provides federal funds to thin	Reduces fire hazards near populated areas.		Fire
Initiative	forests around cities to mitigate			
	damage from forest fire.			

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
Forest Fire Protection Grant Program	Increases forest fire protection and suppression capabilities through cooperative efforts with local fire departments and county fire associations through a 50% cost share as per §917, 1997 Wisconsin Act 27.	Personal protective clothing, forest fire training, forest fire prevention projects, forest fire suppression equipment, dry hydrants, communications equipment, mapping equipment, maps, GPS units and off-road vehicles primarily used for fighting forest fires.	Funding is low; more grants are requested than can be funded. Fire departments that do not have a DNR-approved forest fire suppression agreement are not eligible to apply.	Fire
Single Engine Air Tanker Program	Provides aircraft that can drop 500 gallons of fire suppressing agent (foam, retardant, etc.) on initiating and wildland urban interface (WUI) fires.	Knocks down initiating fires to allow time for ground suppression equipment to create control lines around the fire. May also be used for structural protection tactics in the WUI.	After spring 2011, the aircraft will no longer be pre-positioned, but will be available on an as- needed basis.	Fire
Gypsy Moth Suppression Program	Spraying occurs in the springtime. Traps are set to track the spread of moths, locate the hot spots, and treat those areas. Quarantines are issued to control their spread.	Slows the progress of moths in the state, decreasing the rate of defoliation, and reducing the risk of fire from defoliated trees.	Not enough funding to stop the spread.	Fire
Fire Department Advisory Council (FDAC)	Member fire organizations include the Wisconsin State Firefighters Association and the State Fire Chiefs Association. Member fire departments represent broad geographical areas and different fire protection areas. The FDAC was formed as a partnership and forum for the discussion of issues that affect fire departments and the DNR on a statewide basis.	Wildland training programs, Forest Fire Protection Grants, and Federal Excess Property vehicle program.	Level of funding is low and more grants are requested than can be funded. Requested two FTEs but only .25 FTE assigned.	Fire
Le May Center Sales	Tools and training programs sold to fire departments at GSA costs.	Supports local fire departments with tools and training at government contract prices.		Fire

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
Wildland Urban Interface and Firewise Program	State programs encourage community members to work together to lower their collective wildfire risk.	Landowners are educated on how to make their properties safer from fire. Community leaders are encouraged to prepare Community Wildfire Protection Plans in communities at risk from wildfire. Homeowner associations in fire-prone areas are encouraged to become Firewise Communities. DNR staff and partners are encouraged to implement mitigation strategies to prepare for wildfire.	All initiatives related to the Wildland Urban Interface and Firewise Programs are funded through federal grants. National Fire Plan funds are declining over time and may not be available to sustain programs. Alternative funding is being sought. State funding is encouraged.	Fire
Urban Forestry Technical Assistance and Grants	The purpose of the grant is to fund projects that improve a community's capacity to manage its trees. The applicant may be a city, village, town, county, tribal government, or 501(c)(3) nonprofit organization. Joint applications are encouraged.	Strategic plans, management plans, and work plans including community tree inventories, vegetation ordinances, urban forestry, tree boards or tree action groups, urban forestry staff training, urban forestry public awareness programs and materials, urban forestry volunteer/neighborhood involvement programs, tree health care plans, hazard tree inventories, and contract specifications for urban tree planting, maintenance, and/or removal. Limited funds may be available for tree planting, maintenance, or removal.	Level of funding is low and more grants are requested than can be funded.	Fire , hail, high winds, ice storms
Managed Forest Law	Provides financial incentive to owners of private forests to manage their woodlands sustainably.	Encourages landowners to plan and manage sustainable forests.		Fire, hail, high winds, ice storms

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
Burning Regulations and Permits	In most areas of the state a written permit is needed from the DNR, local fire warden, or township official prior to outdoor debris burning. Intensive Areas – Heavily forested areas where DNR has primary fire responsibility. Agreements in place with local fire departments for fire suppression assistance. Burning permits required anytime the ground is not snow covered. Extensive Areas – Less forested areas where DNR has lighter fire suppression presence. Agreement with local fire departments in place for fire suppression assistance. Burning permits required from January 1 to May 31 when the ground is not snow covered. Cooperative Areas – Local fire departments have primary fire suppression responsibility. DNR can be used as Mutual Aid. Town chair must expend more than \$3,000 before DNR can take over responsibility of the forest fire. Burning permits are by town ordinance only.	The review of burning permits allows control of burns, prohibits burning in high fire risk times, and controls burning in low and moderate risk periods. Applicants are educated about burning. Burning permits are issued annually with the requirement that the holder check the burning restrictions for their county online or by phone the day of the burn. The permit process was assessed and web and phone hits are increasing. There is a mobile app or a permit can be issued over the phone at 1-888-WISBURN. Alternatively residents can visit the DNR website at dnr.wi.gov and enter the keyword "fire."	Not all of areas in Wisconsin are required to procure a permit. DNR has requested ten staff to help manage Cooperative Areas; however this request was not funded. The Wildland/Urban Interface is growing quickly and limited firefighting resources are asked to protect more and more infrastructure for higher value homes.	Fire

Department of Health Services (DHS)

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
People with Access and Functional Needs	This is the provision of technical assistance and/ or personnel to assist people with access or functional needs.	Personnel with expertise in human services and/or functional needs are available to assist if actual or potential problems are present, or have the potential of occurring, at the state or local level. Technical assistance can determine if an actual or potential human services and/or functional needs threat is present and if hazard mitigation is warranted or desirable.	None at this time with the State's coordination role. However, any decreases in funding may negatively affect the ability to provide technical assistance at the local level.	All hazards
Chemical Contamination of Groundwater, Surface Water, Soil, and Air	DHS provides technical assistance and/or personnel to assist with environmental health issues.	Personnel with expertise in environmental health issues are available to provide information specific to local concerns. Technical assistance can determine if an actual or potential public health threat is present and if hazard mitigation is warranted or desirable.	None at this time. However, any decreases in funding may negatively affect the ability of DHS/DPH Environmental Health Specialists to respond and assist local EH staff.	All hazards
Communicable or Infectious Disease	DHS provides technical information regarding communicable or infectious diseases.	Personnel with expertise in communicable/ infectious diseases are available to provide information specific to state or local concerns. Technical assistance can determine if an actual or potential public health threat is present and if hazard mitigation is warranted or desirable.	None at this time. However, any decreases in funding may negatively affect the DHS/DPH Communicable Disease Specialists who do surveillance, case investigation, and data/trends analysis.	Communicable or infectious diseases
Radiological/ Nuclear	DHS provides technical information regarding radiological/ nuclear issues and/or concerns.	Personnel with expertise in radiological/nuclear health issues are available to provide information specific to local concerns. Technical assistance can determine if an actual or potential radiological/nuclear public health threat is present and if hazard mitigation is warranted or desirable.	None at this time. However, any decreases in funding may negatively affect the ability of DHS/DPH Radiological Specialists to respond to radiological events.	Radiological and nuclear hazards
Emergency Preparedness	DHS is working to increase state infrastructure for planning and preparedness.	DHS/DPH is currently the recipient of federal grants to increase Wisconsin's public health, medical, and hospital capacity to respond to incidents of all hazards and other public health emergencies including disease outbreak. The Building Resilience Against Climate Effects (BRACE) Program in DPH has created a set of extreme weather toolkits to provide information to local governments, local health departments, and citizens about preparing for and responding to different weather emergencies.	None at this time. However, any decreases in funding may negatively affect the ability of DHS/DPH staff to respond to public health emergencies.	All hazards and other public health emergencies

Department of Safety and Professional Services (DSPS)

DSPS – Division of Industry Services

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
State Building Code Development	The Division of Industry Services protects the health, safety, and welfare of people in constructed environments in Wisconsin by developing the building code.	The Division develops, administers, and enforces state laws and rules relating to building construction safety and health.		All natural and some manmade hazards
State Building Code Enforcement	The Safety and Buildings Division reviews plans for public buildings, places of employment, and multi-family dwellings for compliance with the state statutes and building codes. The Division administers inspection certifications and evaluates building materials for conformance with standards.	Division plan reviewers and field inspectors provide consultation and education for designers, builders, and local officials. The Division also certifies municipalities to perform certain plan review and inspection services.	Statewide program execution is at a minimum. Further program enhancement is restricted due to lack of funding and difficulty in finding and retaining qualified people.	All natural and some manmade hazards
The Wisconsin Commercial Building Code (Wisconsin Statutes Chapter 101)	The Wisconsin Enrolled Commercial Building Code includes Chapters SPS 360 through 366 and the adopted provisions of the International Code Council 2009 codes: International Building Code, International Energy Conservation Code, International Mechanical Code, International Existing Building Code, and International Fuel Gas Code.	The purpose of the Commercial Building Code is to protect the health, safety, and welfare of the public and employees by establishing minimum standards for the design, construction, maintenance, and inspection of public buildings, including multi-family dwellings and places of employment. It is a provision under.	Ongoing code review and development is based on supportive funding. Wisconsin is still operating under the 2009 ICC codes, but is reviewing the 2015 updates.	All natural and some manmade hazards
Certifications, Licenses, and Registrations for Tradespeople and Inspectors	The Division of Industry Services administers the certifications, licenses, and registrations of approximately 44,000 individuals in 64 categories.	The division provides for quality assurance measures with the development and administration of certifications.		All natural and some manmade hazards

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
Home Safety Act	The Uniform Dwelling Code (UDC) is the statewide building code for one-and two-family dwellings built since June 1, 1980. Wisconsin law requires that the UDC be enforced in all municipalities. This includes having new construction inspected for compliance.	This ensures that one- and two-family homes meet uniform safety standards. Inspection agencies perform inspection services on behalf of the state where municipalities choose not to perform the services.	Providing for adequate inspection and consultation is limited due to lack of funding.	All natural and some manmade hazards
Building Code Training	This annual training consists of continuing education classes on codes used in building design, construction, or inspection and presentations at conferences.	This provides an opportunity for the public to learn about specific codes and construction topics.		All natural and some manmade hazards
Manufactured Housing Regulation	The Division of Industry Services regulates various aspects of manufactured housing. Division staff license manufacturers and review and approve plans for new manufactured home parks and additions. Staff also provides consultation, education, and complaint investigation services. The Division cooperates with agents to administer park licensing rules.	The Division works to provide safe living conditions and structures for manufactured housing consumers. Education and inspection are vital to the safety assurance program.		All natural hazards
Delegated Municipalities (Wisconsin Statutes section 101.12)	The Division of Industry Services may certify cities, villages, towns, and counties as delegated municipalities, which gives them the authority to review building plans and perform building inspections. The municipality or county must comply with specific administrative rules to ensure uniform application of the building code.	The Division provides opportunities for partnering with other governmental agencies to extend the effectiveness of Division programs and funds administration. The Division relies heavily on this option.		All natural and some manmade hazards
Statewide Electrical Inspection	2007 Act 60 mandates statewide inspection of all electrical wiring. The Division of Industry Services works with municipalities that choose to assume authority for electrical inspection. The Division is responsible for providing this service to municipalities that elect not to assume this authority.	This ensures safe and proper electrical wiring throughout the state. This will decrease fire risk and increase building safety in other disaster events.	The Division must identify and review municipal ordinances and work with municipalities who choose to assume authority for this service. The Division has yet to contract out this service for all other areas within the state.	All natural and some manmade hazards

Office of the Commissioner of Insurance (OCI)

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
Regulation of the insurance carriers and agents	Regulation ensures policyholders, claimants, and insurers are treated fairly and equitably; and encourages full cooperation of the office with other regulatory bodies. The Office of the Commissioner of Insurance (OCI) provides experts in the field of insurance and strives for loss prevention.	Regulation protects insured individuals and businesses, and requires insurance carriers and agents to comply with the policies customers purchase.	Regulatory priorities and budget restraints affect what can be delivered.	All; where significant insurance exclusions or limitations exist (such as flooding and earth-movement losses), OCI can facilitate communication about alternatives and policy language.
Public information on insurance issues	OCI provides insurance information for consumers to enable them to better manage their risks. Information is available from brochures, the OCI website, and OCI staff members.	This provides the public with resources for understanding insurance policies and regulations.	Regulatory priorities and budget restraints affect what can be delivered.	All; where significant insurance exclusions or limitations exist (such as flooding and earth-movement losses), OCI can facilitate communication about alternatives and policy language.
Pre-licensing education and continuing education for insurance agents	OCI provides instruction on insurance exclusions and coverage including flood insurance. The FEMA course on writing flood insurance satisfies a continuing education requirement for insurance agents.	This keeps insurance agents well-educated so they can provide the best and most fair service to customers.	Regulatory priorities and budget restraints affect what can be delivered.	All; where significant insurance exclusions or limitations exist (such as flooding and earth-movement losses), OCI can facilitate communication about alternatives and policy language.

Public Service Commission of Wisconsin (PSC)

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
Electric Utility Regulation	This provides for the regulation of construction, service, and operations of electric utilities and the administration of Wisconsin State Electric Code, Volume 1, and safe and adequate service and operations by Wisconsin electric utilities through Wis. Stat. Chapter 196 and Wis. Adm. Code Chapters PSC 111, 112, 113, and 114.	This provides regulatory oversight to the construction and operation of electric utility facilities, and the provision of safe and adequate electric services.	N/A	All hazards
Natural Gas Utility Regulation	This provides for the regulation of construction, service, and operations of natural gas utilities and the administration of the federal pipeline safety program through Wis. Stat. Chapter 196 and Wis. Adm. Code Chapters PSC 133, 134, and 135.	This provides regulatory oversight to the construction and operation of natural gas utility facilities, and the provision of safe and adequate natural gas services.	N/A	All hazards
Telecommunications Utility Regulation	This provides for the regulation of service and operations of telecommunications utilities and safe and adequate service and operations by telecommunications utilities through Wis. Stat. Chapter 196, Wisconsin Administrative Code Chapters PSC 165 and 114.	This provides regulatory oversight to telecommunications infrastructure, the operation of telecommunications facilities, and the provision of safe and adequate telecommunications services.	N/A	All hazards
Water Utility Regulation	This provides for safe and adequate service and operations by Wisconsin water utilities and the regulation of construction, service and operations of water utilities through Wis. Stat. Chapter 196 and Wis. Adm. Code Chapters PSC 184 and 185.	This provides regulatory oversight to the construction and operation of water utility facilities, and the provision of safe and adequate water services.	N/A	All hazards

Department of Transportation (WisDOT)

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
§ 86.34 Disaster Damage Aids Program	Covers restoration of disaster damages to any roadway or roadway structure that is not in the Official State Trunk Highway System. Also allows improvements to be made during repairs that will help mitigate the future occurrence of similar damages.	 (1) For claims > \$15,000, applicant receives 75% of replacement costs plus 50% of improvement costs. (2) For claims ≤ \$15,000, applicant receives payment equal to 75% of final costs for all repairs (replacement and improvement), which may include final costs if available. (3) For claims ≤ \$15,000 when applicant disagrees with WisDOT's estimate, applicant submits final costs payable as noted in (1). (4) If federal aid is granted for damage reimbursement, it shall be in lieu of aid otherwise available under DDA. 	Funding is only available after an event occurs. Local match is required.	All hazards
Statewide Traffic Operations Center (STOC), Bureau of Traffic Operations	Provides motorists with real- time information on traffic congestion and lane/highway closures. Information for ongoing highway incidents is posted on WisDOT website.	Prevents user delay of interstate/ freeway system and other state highways. STOC operates on a 24/7/365 basis. Coordinates with DOT highway representatives (WisHELP) when EOC is activated.	Lack of funding prevents addressing all DOT needs.	All hazards
Winter Maintenance Program	Prevention of snow and ice from state trunk highways.	Prevention of property damage and injuries/ death using planted vegetation and/or artificial snow fence along highways, and an anti-icing process to reduce ice on highways.	Contracting issues.	Snow, sleet, human error while driving
Highway Improvement Program	Hazard mitigation.	With highway or bridge improvement projects, DOT strives to eliminate, shield, or reduce potential damages from hazards.	Lack of funding prevents addressing all DOT needs.	Rain, flooding, human error while driving
Trans 213, Wisconsin Administrative Code § 84.18 – Local Bridge Improvement Assistance Program	Helps rehabilitate and replace, on a cost-share basis, the most seriously deficient existing bridges in local highway systems.	Counties, cities, villages, and towns are eligible for rehabilitation funding for bridges with sufficiency ratings < 80, and replacement funding on bridges with sufficiency ratings < 50.	Lack of funding prevents addressing all local needs.	Flooding, structural decay

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
Trans 213, Wisconsin Administrative Code § 85.026 – Transportation Enhancement Program	Funds projects that enhance communities and the environment.	Up to 80% of project costs paid with federal funds; provides for a wide variety of highway projects that can also mitigate flooding such as landscaping or mitigation of water pollution due to highway runoff.	Lack of funding prevents addressing all local needs.	Flooding
Transportation Security	Critical Infrastructure Vulnerability Assessment	Prevention of damage on critical state trunk highways and bridges through security enhancements.	Lack of funding may prevent DOT from implementing the results of the study.	Terrorism, other manmade incidents
Transportation Security	General Aviation Airport Vulnerability Assessment	Prevention of damage to Wisconsin's 135 general aviation airports through security enhancements.	Lack of funding may prevent DOT from implementing the results of the study.	Terrorism, other manmade incidents
Transportation Security	Rail Infrastructure Vulnerability Assessment	Prevention of damage to state-owned rail corridors through security enhancements.	Lack of funding may prevent DOT from implementing the results of the study.	Terrorism, other manmade incidents
Transportation Security	Maritime Infrastructure Vulnerability Assessment	Prevention of damage to Wisconsin's major waterways, ports, and harbors through security enhancements.	Lack of funding may prevent DOT and USCG from implementing the results of the study.	Terrorism, other manmade incidents
Transportation Security	Blast Design Training for Bridges/Structures	Training of bridge design engineers to mitigate the effects of explosions.	Lack of funding may prevent DOT from implementing the results of the study.	Terrorism, other manmade incidents
Transportation Security shared by DOT, DOA, DHFS, DNR, WEM	The WISCOM secure communications system for first responders will be selfmaintained and independent from the private sector.	Provides secure communication among specific Wisconsin agencies, and between those agencies and other local, state, and federal agencies. This would provide for interoperable communications during incident management, as well as day-to-day use by participating agencies.	WISCOM system is currently being implemented. System will be fully operational prior to January 1, 2013.	Terrorism, other manmade incidents
Winter weather tabletop exercises	DOT regions exercise response to winter weather.	Exercises the capabilities of the DOT regions to respond to severe winter weather events and helps identify gaps in capabilities.		Winter weather

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
WisHelper Group	Highway Emergency Liaison Personnel serve as a conduit for highway related information within the SEOC.	Assists SEOC-based agency representatives during an event by providing highway-related information.		All hazards

<u>University of Wisconsin – Cooperative Extension (UW-Extension)</u>

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
UW-Extension	Provides community education and public information programs promoting hazard awareness and mitigation concepts.	Offices in each county are linked to university and agency resources.	Local educational priorities and budgets affect the ability to deliver programs.	All hazards
Local Government Center	The UW-Extension runs a Local Government Center to provide guidance to UW System programs that support local government.	Many local government needs are addressed through this program including redevelopment, transportation, government procedures, land use, and land preservation. It provides an opportunity to advise those who work with local governments on best practices for development and land preservation.	Mitigation is not specifically included, but could be in the future because it is a component of healthy local communities.	All hazards

Department of Military Affairs (DMA)

DMA – Division of Emergency Management

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
State Disaster Fund 166.03(2)(b)9, Wis. Stats.	This fund provides for reimbursement to local units of government of eligible costs arising from a major catastrophe that are a direct result of response or recovery operations for the declared major catastrophe during the incident period if federal disaster assistance is not available.	Funding is for three types of eligible costs (debris clearance, protective measures, and roads and bridges). The state share of the damages and eligible costs incurred by local governmental units shall not be greater than 70% of the eligible disaster costs. The local share of damages and eligible costs incurred by local governmental units may not be less than 30%.	Costs which the WEM Administrator determines are not of such severity and magnitude that they are beyond the capabilities of the affected local governmental unit are not eligible.	All natural hazards
Hazard Mitigation Grant Program (HMGP), 44 CFR, Section 206, Subpart N	This program provides post-disaster mitigation grants to state, local, and tribal governments, and private non-profits. This is the primary source of funding at the state level to implement cost effective mitigation projects. The cost share is 75% federal, 12.5% state, 12.5% local.	Funding can be substantial for major disasters. Timing of funds after a disaster encourages some applicants to solve long-standing problems. State provides half of the 25% local match that is required.	Funding is only available after a disaster declaration. With the present economic situation, local governments are having difficulty funding the required local match. Many more applications are received than funds available. Demonstrating the costeffectiveness of projects is difficult. Communities must have approved allhazards mitigation plans.	All natural hazards

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
Flood Mitigation Assistance (FMA) Program, 44 CFR, Part 79	This program provides mitigation grants to state, local, and tribal governments to mitigate NFIP-insured structures. Planning grants are available for the development of comprehensive flood mitigation plans. Project grants are available for communities with an approved flood mitigation plan to implement mitigation measures identified in the plan. The cost share is 75% federal, 25% local.	This program provides an annual source of funds for flood mitigation. Repetitive loss and severe repetitive loss properties are the highest priority and receive higher federal cost shares (90% and 100%, respectively). Additional funds above the state allocation can be requested as part of a national competition.	Guidance is very restrictive that funds must be used to mitigate NFIP-insured properties. With the present economic situation, local governments are having difficulty funding the required local match. Communities must have an approved flood mitigation plan prior to receiving project grant funds. Demonstrating the costeffectiveness of projects is difficult. Planning grant funds can only be used towards flood mitigation plans and not all-hazards plans.	Flooding
Pre-Disaster Mitigation (PDM) Program, Section 203 of the Stafford Act, 42 USAC 5133	This program provides mitigation grants to state, local, and tribal governments for comprehensive all-hazards mitigation planning and to implement cost-effective mitigation projects.	This program involves an annual national competition. Comprehensive hazard mitigation plans will ensure a well thought out process for identifying viable and cost-effective mitigation measures. In addition, planning will shorten the recovery phase after a disaster. The state and subapplicants may also request management costs.	Applicants must have an approved all-hazards mitigation plan with identified mitigation measures in order to be eligible for project grant funds. Funds are available through a national competition. Demonstrating the cost-effectiveness of projects is difficult. Funding is unpredictable. With the present economic situation, local governments are having difficulty funding the required local match.	All natural hazards
Public Assistance (PA) Program, 44 CFR, Section 206, Subpart H	This program provides post-disaster grants to state, local, and tribal governments and private non-profits for disaster-related costs. Costeffective hazard mitigation measures may be included as eligible costs in the restoration of facilities. The cost share is 75% federal, 12.5% state, 12.5% local.	Timing of funds after a disaster encourages mitigation during the recovery phase in repairing public facilities. In many instances, mitigation is included on a site that has been repetitively damaged and received disaster assistance previously, thereby reducing or eliminating future costs.	Funding only available after a disaster declaration, and for a damaged facility. Demonstrating cost-effectiveness is difficult. Additional training is needed for local officials and inspectors on identifying eligible types of hazard mitigation measures. The mitigation measure has to be identified prior to repair in order to be eligible and considered for funding.	All natural hazards

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
Hazard Mitigation Planning, 44 CFR, Part 201 (201.4-7)	WEM develops the Wisconsin Hazard Mitigation Plan and coordinates with other federal and state agencies and organizations through the Wisconsin Hazard Mitigation Team. WEM provides technical planning assistance to local and tribal governments through development and distribution of guidance, training, and plan reviews.	Mitigation planning curriculum and guidance have been developed. A mail and e-mail list have been established for the continued distribution of information regarding mitigation planning. All local plans are reviewed and required and recommended revisions are identified.	A consistent funding source to ensure that mitigation planning continues is lacking. 72 of 72 counties and ten of 11 tribes are participating in the planning process. Without an approved all-hazards mitigation plan, counties and jurisdictions within are not eligible for funding to implement mitigation measures.	All natural hazards; the state and some local plans are including technological and manmade hazards
Technical Assistance	WEM provides technical assistance to local governments in project development and implementation.	WEM has developed expertise in performing benefit-cost analyses and environmental reviews for mitigation projects. WEM has also developed acquisition and floodproofing handbooks to assist applicants in administering such programs. WEM conducts onsite visits to assist communities in developing mitigation alternatives.	Local governments must contract out for engineering expertise for structural projects. There is a lack of knowledge and expertise in mitigating technological hazards.	All natural hazards
Agency Initiatives	Interagency cooperation among federal, state, local, tribal, and non-profit agencies to further the state's hazard mitigation goals.	This provides for agency cooperation. Examples: Association of State Floodplain Managers; Wisconsin Association for Floodplain, Stormwater, and Coastal Managers; Wisconsin Silver Jackets Hazard Mitigation Team; Coastal Hazards Work Group; Wisconsin Recovery Task Force.	The need to continue to work with other agencies and organizations.	All natural hazards

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
Public Information and Education Initiatives	WEM promotes hazard awareness with an annual Spring Flood Report, Tornado and Severe Weather Awareness Week, Fire Prevention Awareness Week, and Winter Weather Awareness Week. In addition, there is NOAA Weather Radio Day and Heat Awareness Day. WEM publishes a newsletter quarterly. Information on current hazard mitigation activities is included. Hazard information is included on the WEM website along with links to other information sources. The WEM Public Information Officer distributes press releases and coordinates relations with the media. Mitigation articles are provided for other publications such as Floodplain-Shoreland Management Notes (WNDR), and Water Matters (WAFSCM). Mitigation Success Stories are published and included on the agency website. Information on hazard mitigation is provided at agency training sessions such as the Disaster Response and Recovery Operations Workshop, All-Hazards Mitigation Planning Workshop, Damage Assessment Workshops, Local Officials Applicants Briefings as well as at local, state, and/or national conferences and workshops upon request.	Hazard mitigation information is provided on a timely basis to local emergency management, local officials, schools, and others. The WEM website provides good information to a wide variety of officials and the general public.	There is limited outreach to organizations outside of the emergency management arena such as private organizations, associations, and businesses that cold make an impact on mitigation and land use decisions within the state. Web access is not yet universal.	All natural hazards

Wisconsin Historical Society

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
Historical Preservation Assistance	The National Historic Preservation Act contains Section 106 implementing regulation 36CFR800 NEPA (National Environmental Policy Act) which requires agencies to consider the effects of their projects on all aspects of the environment, including the cultural environment.	Prior to approving an undertaking a federal agency head must take into account the effects on historic properties and give the ACHP a reasonable opportunity to comment. Digitized data sets in the Wisconsin Architecture and History Resources Database and shapefiles of various layers provide the foundation for performing the review and consultation process. It contains sets for historic structures, archeological sites, burial sites, modern cemeteries, and pre-settlement sites.	There is information only for sites reported to the WHS. Not all data is verified. The shapefiles should be updated every six months to maintain accuracy.	All hazards
WHS Data Sets	Data sets and shapefiles are kept of historic and burial sites.	This data can be used by responders when fire breaks are needed to avoid sensitive sites.		Fire

Milwaukee Metropolitan Sewerage District (MMSD)

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
Watercourse Policy	Provide recommendations and criteria for a strong regional funding role and system plans for assigning the construction and maintenance of major structural and non-structural measures for mitigating or eliminating existing flooding issues as defined by MMSD Watercourse Policy	Out-of-bank flooding, regional funding role, determination of MMSD responsibility.		Flooding
Watercourse Management Plans	Floodwater Management plans for individual watersheds for rivers under MMSD jurisdiction: Menomonee, Milwaukee, Kinnickinnic, Root, and Oak Creek. MMSD also developed individual plans for the following tributaries of the Milwaukee River: South Branch Creek, Indian Creek and Lincoln Creek.	Current and future out-of-bank flooding. The plans produce individual projects for each flood problem area. The projects will contain both design and construction. Projects may include acquisition of flooded or flood threatened structures, construction of flood management structures.		Flooding
Chapter 13	Provide a regionally-based minimum standard for storm water control	Future flooding problems and local		Flooding,
Stormwater Rule	for all new development with the MMSD service area.	drainage.		stormwater
Greenseams Program	This program identifies riparian properties in private hands (public lands may be considered under special circumstances) that would link existing public open space or provide other public benefit in the form of wetland protection, future flood protection, or erosion management.	Future flooding, stream channel protection.		Flooding
Conservation Plan	This program identifies existing open space in private hands that meet specific criteria for providing natural flood storage. Lands that are identified as having hydric soils, wetlands, or old wetlands are considered. The purchase of these properties provides public benefit in the form of wetland protection, water quality, and most important future flood protection, or erosion management.	Future flooding, stream channel protection.		Flooding
Floodplain Re- mapping Effort	MMSD contracted with SEWRPC to build off the existing HEC-RAS and HSPF Hydraulic and Hydrologic models used for the MMSD Watercourse Management Plans and update the existing regulatory FIS rate maps.	Future floodplain mapping and planning.		Flooding

Wisconsin Association of Floodplain, Stormwater, and Coastal Managers (WAFSCM)

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
Annual conference	Conference to inform a broad range of professionals and public officials on issues relating to reducing flood damages, managing floodplain resources, coastal issues, and stormwater. Concurrent sessions, workshops, and plenary sessions are held, as well as events to foster networking.	Flooding, stormwater, coastal issues.		Flooding, stormwater flooding, coastal hazards
Chapter Activities	The state chapter works with the National Organization and independently to educate local, state, and federal officials on flooding, stormwater, and coastal issues through office visits and written information.	Working for sound flood, coastal, and stormwater management.		Flooding, stormwater flooding, coastal hazards
Newsletter	WAFSCM sends out up to three newsletters a year to inform our membership on issues relating to reducing flood damages, managing floodplain resources, coastal issues, and stormwater.	Flooding, stormwater, coastal issues.	Difficulty with gathering articles. Compiled on a voluntary basis by several agencies.	Flooding, stormwater flooding, coastal hazards
Scholarships	WAFSCM provides scholarship opportunities for members to attend the national Association of State Floodplain Managers (ASFPM) annual conference, as well as the WAFSCM annual conference.	Provides individuals the opportunity to attend conferences they otherwise might not be able to. This provides the opportunity to further education as well as network with peers.		Flooding, stormwater flooding, coastal hazards
Awards	WAFSCM presents awards in several categories at annual conference to recognize individuals for their efforts. Awards include Chapter Service Award, Local Award for Excellence, and Excellence in Project Design or Implementation.	Recognition to those that go above and beyond expectations.		Flooding, stormwater flooding, coastal hazards
Stormwater Model	Watershed model with a stream and associated floodplain and upland areas. Different land uses can be applied to the model and the user has the ability to build levees along floodplains to demonstrate the impacts on the floodplain and downstream. The model is available for members use.	Public education and outreach.		Flooding, stormwater flooding

Regional Planning Commissions

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
Planning Services	RPCs offer services for preparing comprehensive plans and special purpose plans including all-hazards and flood mitigation plans.	These planning services play a major role in determining the location of future development and the direction of hazard mitigation actions.	State funding never covers the demand for comprehensive planning or hazard mitigation grant applications. Demand for other planning services also exceeds the availability of funds from federal, state, and local sources.	All hazards
Administration and Implementation Services	RPC offer services for writing zoning, subdivision, and other land use ordinances; for implementing projects through administering grants; for sharing costs in county administrative services and building and zoning code enforcement.	These administrative and implementation services address many community development needs including in some instances hazard mitigation.	More specific concepts should be developed to include hazard mitigation components in policies, programs, and projects.	All hazards
Technical Services	RPCs provide the following services: GIS mapping; zoning and subdivision ordinance preparation; environmental assessments and impact reviews; grant writing for park and recreation projects, business park development, housing development, hazard mitigation projects, and Brownfield projects; administration of business and housing rehabilitation revolving loan funds; business incubator services; civil and traffic engineering; forest resource and air and water quality management services; and in some cases watershed studies.	These technical services implement and inform local government plans and address key community development needs that in many instances also mitigate losses from hazards.	Limited budgets and funding levels do not allow Wisconsin's RPCs to meet the demand for the technical services requested of them. Hazard mitigation activities should be regularly considered when these services are provided.	All hazards

Program, Policy, Regulation, Plan, or Practice	Description	Needs Addressed	Unmet Needs	Hazards Addressed
Integration of Comprehensive Planning and Hazard Mitigation Planning	Comprehensive and hazard mitigation plans should build on and complement each other to direct new development to areas at low risk of disaster.	Much comprehensive planning data collection, analysis, projections, mapping, programs, policies, and projects complement hazard mitigation planning. Storm water, floodplain management, and sewer service area planning are addressed in comprehensive and other plans and complement flood hazard mitigation planning.	A more formal policy for integrating and coordinating comprehensive planning and all-hazards mitigation planning should be considered.	All hazards

Figure 3.2-2: Potential Funding and Technical Support Resources

Federal Agencies

Organization	Site Summary	Contact Information
	Federal Emergency Management Agency (http://www.fe	ma.gov/)
FEMA	General information on hazards, disaster assistance programs, current disasters, etc.	http://www.fema.gov/
FEMA National Floodplain Insurance program (NFIP)	Detailed information on the National Flood Insurance Program and other mitigation activities.	http://www.fema.gov/business/nfip/
FEMA US Fire Administration (USFA)	Information about reducing loss of life and economic loss due to fire and related emergencies, through leadership, advocacy, and coordination.	http://www.usfa.fema.gov/
	US Department of Agriculture (USDA) (http://www.usc	da.gov)
Natural Resources Conservation Service	Provides leadership in a partnership effort to help conserve, improve, and sustain our natural resources and environment.	http://www.nrcs.usda.gov/
Farm Service Agency (FSA)	Emergency Conservation Program shares the cost of rehabilitating eligible farmlands.	http://www.fsa.usda.gov/
Rural Development	Enhancing the ability of rural communities to develop, to grow and to improve their quality of life by targeting financial and technical resources in areas of greatest need through activities of greatest potential. Local offices deliver programs and offer assessments of emergencies and program help available.	http://www.rurdev.usda.gov/wi/
Rural Development Human Resources	USDA Rural Development in Wisconsin offers personnel to help staff a command site in case of natural or man-made disasters in Wisconsin. Cooperating with FSA, Rural Development Managers assess damage at the site of the disaster for the USDA Flash Report to the USDA National Office. Assessment of housing needs for displaced rural residents – temporary placement in Rural Development Multi Family Housing Projects near disaster struck area. Administrative staff is also available to assist in the areas of procurement, contracting, and IT.	Lori.Wells@wi.usda.gov

Organization	Site Summary	Contact Information
Rural Development Rural Business-Cooperative Service	Business and Community Programs offer a variety of assistance to rural business and communities. The programs revolve around financial partnerships with local economic organizations such as banks, lenders, economic development groups, cities, counties, tribes, and utility cooperatives.	https://www.rd.usda.gov/about-rd/agencies/rural-business-cooperative-service
Rural Development Rural Housing Service (RHS)	The Rural Housing Service delivers a variety of assistance to support the housing needs of rural people. Most involve direct assistance by the USDA, while others work through local partnerships. Programs offer assistance with purchasing or repairing Single Family homes, loans for Multi-Family Housing, Farm Labor Housing Loans and Grants, and Self-Help Technical Assistance Grants.	https://www.rd.usda.gov/about-rd/agencies/rural-housing-service
Rural Development Rural Utility Service	Offers emergency Community Water Assistance Grants that may be available to rural communities when disaster strikes. Congress may appropriate funds for the program after a disaster if the county or area has been designated eligible under a presidential emergency declaration.	https://www.rd.usda.gov/about-rd/agencies/rural- utilities-service
Rural Development Value Added Producer Grants	Helps independent producers and produce organizations enter into value-added activities.	https://www.rd.usda.gov/programs-services/value-added-producer-grants
Rural Development Multi-Family Housing Rental Assistance	Reduce the tenant contribution paid by low-income occupying eligible Rural Rental Housing projects financed by USDA, Rural Development, RHS through its Sections 515, 514, and 516 loans and grants. If available, can be used to aid disaster victims for temporary shelter in RHS properties.	https://www.rd.usda.gov/programs-services/multi-family-housing-rental-assistance
Rural Development Single-Family Housing Repair Loans and Grants	USDA Rural Development Section 504 Home Improvement Loans and Grants. Assists very-low income owner-occupants in repairing or replacing property damaged as a direct result of a natural disaster. Loans are made in counties eligible for federal assistance under an emergency declaration by the President. Grant recipients must be 62 years of age or older and unable to repay a loan.	https://www.rd.usda.gov/programs-services/single-family-housing-repair-loans-grants
Rural Development Emergency Community Water Assistance Grants	USDA, Rural Development, Rural Utility Service is authorized to help rural residents who have experienced a significant decline in quantity or quality of water to obtain adequate quantities of water that meet the standards of the Safe Drinking Water Act.	https://www.rd.usda.gov/programs- services/emergency-community-water-assistance- grants

Organization	Site Summary	Contact Information	
Rural Development Community Facilities Loans and Grants	USDA Rural Development Community Facilities (CF) Loans and Grants are available to rural communities for public projects such as fire and rescue services, utility extensions, clinics, child care facilities, industrial parks, and cultural centers. In April, 2004 the First Responders Initiative was introduced and offers CF funding for the improvement of first responder and emergency services in small communities and rural areas.	https://www.rd.usda.gov/programs-services/community-facilities-direct-loan-grant-program	
Rural Development Water and Waste Disposal Loans and Grants	USDA Rural Development Rural Utility Services loans and grants provide water and waste disposal facilities and services to low income rural communities whose residents face significant health risks.	https://www.rd.usda.gov/programs-services/water- waste-disposal-loan-grant-program	
	US Department of Commerce (DOC) (http://www.doc	gov)	
Economic Development Administration	Information about generating jobs, retaining existing jobs, and stimulating industrial and commercial growth in economically distressed areas of the US.	http://www.eda.gov/	
US Census Bureau	Profile of Wisconsin and each Wisconsin County.	http://www.census.gov/quickfacts/table/PST045215/55,00	
National Oceanic and Atmospheric Administration (NOAA)	Provides detailed information about coastal waters issues, including the Great Lakes.	http://www.noaa.gov/coasts.html	
NOAA, National Centers for Environmental Information	Current and historical archive of climatic data and information.	http://www.ncdc.noaa.gov/oa/ncdc.html	
NOAA, Climate Prediction Center	Drought and other hazard information.	http://www.cpc.ncep.noaa.gov/	
NOAA, National Severe Storms Laboratory	Comprehensive information on severe weather research.	http://www.nssl.noaa.gov	
NOAA, National Weather Service	Provides all available weather information including warning updates.	http://www.nws.noaa.gov	
NOAA and USDA	Weekly Weather and Crop Bulletin.	http://www.usda.gov/oce/weather/pubs/Weekly/Wwcb/	
US Department of Defense (http://www.defenselink.mil/)			
US Coast Guard, National Response Center	Contact for reporting all biological, chemical, radiological, etiological, and oil discharges into the environment.	http://nrc.uscg.mil/	
US Army Corps of Engineers	Provides information on assistance available for planning, engineering, and design of permanent flood control projects, and assistance to communities during flood emergencies.	http://www.usace.army.mil	

Organization	Site Summary	Contact Information		
U.S. Department of the Housing and Urban Development (http://www.hud.gov/)				
Public Housing Capital Fund	Provide funds to Public Housing Authorities to rehabilitate structures and include hazard mitigation projects for the low income public housing program in Wisconsin.	http://portal.hud.gov/hudportal/HUD?src=/recovery/ programs/capital stimulus		
HUD Disaster Recovery Assistance	Provide critical housing and community development resources to aid disaster recovery.	http://www.hud.gov/offices/cpd/communitydevelop ment/programs/dri/index.cfm		
Mortgage Insurance for Disaster Victims	HUD has a special mortgage insurance program under Section 203(h) of the National Housing Act to assist disaster victims.	http://portal.hud.gov/hudportal/HUD?src=/program offices/housing/sfh/ins/203h-dft		
Public and Indian Housing (PIH) Resources	For PHAs' disaster recovery costs not covered by insurance and essential assistance from FEMA, HUD will provide funding from the capital public housing reserve authorized by section 9(k) of the United States Housing Act of 1937, authority, as amended (42 U.S.C. 1437g(k)), or similar statutory authority, subject to the availability of appropriations.	http://portal.hud.gov/hudportal/HUD?src=/program offices/public indian housing		
Ginnie Mae	For a Presidentially declared disaster, Ginnie Mae issues an All Participant Memorandum, "Forbearance and a Buyout Authorization for Loans in Areas Declared a Disaster by President"	http://portal.hud.gov/hudportal/HUD?src=/hudprogr ams/Ginnie Mae I		
Community Planning and Development (CPD) Resources	HUD can waive regulatory and statutory program requirements to increase the flexibility of CDBG and HOME for disaster recovery.	http://portal.hud.gov/hudportal/HUD?src=/program offices/comm_planning		
Community Development Block Grant (CDBG)	Because the Federal government provides disaster relief, primarily through FEMA and SBA, to meet emergency, short-term recovery needs, the most appropriate use of CDBG funds is generally for longer term needs such as economic redevelopment of affected areas.	http://portal.hud.gov/hudportal/HUD?src=/program offices/comm planning/communitydevelopment/pro grams		
HOME Investment Partnerships Program	HOME provides grants to states and localities to build, buy, or rehabilitate affordable housing or to provide rental assistance to low-income people.	http://www.hud.gov/offices/cpd/affordablehousing/programs/home/index.cfm		
	US Department of the Interior (DOI) (http://www.doi.gov/)			
US Geological Survey	Excellent source of natural disaster information.	http://www.usgs.gov		
	US Department of Transportation (DOT) (http://www.d	ot.gov/)		
Federal Highway Administration	Responsible for improving the quality of the nation's highway systems and its intermodal connections.	http://www.fhwa.dot.gov/		

Organization	Site Summary	Contact Information		
	US Environmental Protection Agency (EPA) (http://www.epa.gov/)			
EPA, Office of Land and Emergency Management	Provides guidance and direction for solid waste and emergency response programs.	https://www.epa.gov/aboutepa/about-office-land-and-emergency-management		
US Small Business Administration (SBA) (http://www.sba.gov)				
Small Business Administration	Provides training and advocacy for small firms.	http://www.sba.gov		

Related Organizations

Organization	Site Summary	Contact Information
American Red Cross	Provides relief to victims of disasters and helps people prevent, prepare for, and respond to emergencies.	http://www.redcross.org
American Water Works Association	Provides information on water conservation and contains a comprehensive list of water-related sites.	http://www.awwa.org
Association of State Dam Safety Officials	General information about dams and dam safety in the US.	http://www.damsafety.org
Association of State Floodplain Managers	Information on floodplain management, flood hazard mitigation, the National Flood Insurance Program, and flood preparedness, warning, and recovery.	http://www.floods.org
National Association of Counties	The only nationwide organization representing county governments.	http://www.naco.org
National Drought Mitigation Center	Information on drought preparation and risk management.	http://drought.unl.edu/
National Emergency Management Association	The professional association of state, Pacific, and Caribbean insular state emergency management directors.	http://www.nemaweb.org
National Fire Protection Association	Provides scientifically based fire codes and standards, research, training, and education.	http://www.nfpa.org
National Lightning Safety Institute	Independent, non-profit consulting, education, and research organization focusing on lightning.	http://www.lightningsafety.com
Natural Hazards Center, University of Colorado	Clearinghouse for natural hazards information.	http://www.colorado.edu/hazards
Societal Aspects of Weather - Injury and Damage Statistics	Contains societal impact data for weather related disasters.	http://sciencepolicy.colorado.edu/soc asp/stats.html
The Disaster Center	Provides news and information on current disasters and emergency management. Links to each state included.	http://www.disastercenter.com
The Disaster Research Center, University of Delaware	Research center for the preparation and mitigation of natural disasters for groups, organizations, and communities.	http://www.udel.edu/DRC
Firewise Communities / USA Recognition Program	Site information available to help become a Firewise Community.	http://firewise.org
The Tornado Project	Offers tornado books, posters, videos, and links to other websites.	http://www.tornadoproject.com

Organization	Site Summary	Contact Information
United Nations International Strategy for Disaster Reduction	Increases public awareness of hazard and risk issues for the reduction of disasters in modern societies; motivates public administration policies and measures to reduce risks; and improves access of science and technology for risk reduction in local communities.	http://www.unisdr.org
Tornadoes in Wisconsin 1950 – 1995	Lists the date and location of all the tornadoes that occurred in Wisconsin from 1950 to 1995.	http://www.tornadoproject.com/alltorns/witorn.htm
Disaster Management Center, University of Wisconsin	Helps improve emergency management performance of non- governmental organizations, local and national governments, and international organizations through a comprehensive professional development program in disaster management.	http://epdweb.engr.wisc.edu/dmc

<u>Financial Assistance by Catalog of Federal Domestic Assistance Numbers</u>

The searchable Catalog can be found online at https://www.cfda.gov.

Code/Title	Description		
Hazards: All			
10.417 Very Low-Income Housing Repair Loans and Grants	To help very low-income owner-occupants in rural areas repair their properties.		
10.433 Rural Housing Preservation Grants	To assist very low- and low-income rural residents, individual homeowners, or rental property owners (single/multi-unit) by providing the consumer cooperative housing projects (co-ops) the necessary assistance to repair or rehabilitate their dwellings.		
14.119 Mortgage Insurance – Homes for Disaster Victims	To help victims of a major disaster undertake homeownership on a sound basis.		
14.218 Community Development Block Grants/Entitlement Grants	To develop viable urban communities, by providing decent housing and a suitable living environment, and by expanding economic opportunities, principally for persons of low and moderate income.		
14.228 Community Development Block Grants / States Program	The primary objective of this program is the development of viable urban communities by providing decent housing and a suitable living environment, and by expanding economic opportunities, principally for persons of low- and moderate-income. Each activity funded must meet one of the program's National Objectives by: Benefiting low- and moderate-income families; aiding in the prevention or elimination of slums or blight; or meeting other community development needs having a particular urgency because existing conditions pose a serious and immediate threat to the health or welfare of the community where other financial resources are not available.		
59.008 Disaster Assistance Loans	To provide loans to the victims of declared disasters for uninsured or otherwise uncompensated physical damage.		
97.024 Emergency Food and Shelter National Board Program	To supplement and expand ongoing efforts to provide shelter, food, and supportive services for needy families and individuals. To strengthen efforts to create more effective and innovative local programs by providing supplemental funding for them.		
97.025 National Urban Search and Rescue (US&R) Response System	Develop, maintain, deploy, coordinate, and support National Urban Search and Rescue resources on-scene to locate, provide initial medical treatment, and extricate victims of incidents requiring specialized search and rescue operations while simultaneously enhancing the US&R response capabilities of state and local governments.		
97.026 Emergency Management Institute – Training Assistance	To defray travel and per diem expenses of state, local, and tribal emergency management personnel who attend training courses conducted by the Emergency Management Institute.		
97.030 Community Disaster Loans	To provide loans subject to Congressional loan authority, to any local government that has suffered substantial loss of tax and other revenue in an area in which the President designates a major disaster exists.		
97.034 Disaster Unemployment Assistance	To provide federally-funded weekly benefits and re-employment assistance to workers and self-employed individuals who are unemployed as a direct result of a Presidentially-declared major disaster, and who are not eligible for any other state or federal regular unemployment insurance benefits.		

Code/Title	Description
97.036 Public Assistance Disaster Grants	To assist state and local governments in responding to and recovering from the devastating effects of disasters by providing assistance for debris removal, emergency protective measures and the repair, restoration, reconstruction or replacement of public facilities or infrastructure damaged or destroyed.
97.039 Hazard Mitigation Grant	To provide funding support to states, tribes, territories, communities, and other eligible applicants to implement mitigation planning and hazard mitigation measures that are cost effective and which substantially reduce the risk of future damage, hardship, loss or suffering in any area affected by a major disaster.
97.042 Emergency Management Performance Grants (EMPG)	To provide resources to assist state and local governments in sustaining and enhancing all-hazards emergency management capabilities. All-hazards approach to emergency response, including the development of a comprehensive program, planning, training, exercises, sets the stage for an effective and consistent response to any threatened or actual disaster or emergency, regardless of the cause. States have the opportunity to use EMPG funds to further strengthen their ability to support emergency management activities while simultaneously addressing issues of national concern as identified in the National Priorities of National Preparedness Guidelines.
97.047 Pre-Disaster Mitigation	To provide funding support to states, tribes, territories, communities, and public colleges and universities for pre- disaster mitigation planning and projects primarily addressing natural hazards. This program promotes implementation of activities designed to reduce injuries, loss of life, and damage and destruction to property from natural hazards.
97.048 Federal Disaster Assistance to Individuals and Households in Presidential Declared Disaster Areas	To provide financial assistance and, if necessary, direct assistance to individuals and households affected as a direct result of a Presidentially declared major disaster or emergency, who have uninsured or under-insured, necessary expenses and serious needs and are unable to meet such expenses or needs through other means.
97.049 Presidential Declared Disaster Assistance – Disaster Housing Operations for Individuals and Households	To address disaster-related housing needs of individuals and households suffering hardship within an area that, by Presidential declaration, has been designated as a disaster area.
97.050 Presidential Declared Disaster Assistance to Individuals and Households – Other Needs	To provide assistance to individuals and households affected by a disaster or emergency declared by the President, and enable them to address necessary expenses and serious needs, which cannot be met through other forms of disaster assistance or through other means such as insurance.
97.052 Emergency Operations Center (EOC)	The purpose of the EOC grant program is to improve emergency management and preparedness capabilities by supporting flexible, sustainable, secure, strategically located and fully interoperable EOCs with a focus on addressing identified deficiencies and needs. This program provides funding for construction or renovation of a state, local, or tribal government's principal EOC.
Hazards: Flooding and Coastal Erosion	
12.101 Beach Erosion Control Projects	To control beach and shore erosion to public shores through projects not specifically authorized by Congress.

Code/Title	Description
12.102 Emergency Rehabilitation of Flood Control Works or Federally Authorized Coastal Protection Works	To assist in the repair and restoration of flood control works damaged by flood, or federally authorized hurricane flood and shore protection works damaged by extraordinary wind, wave, or water action.
12.103 Emergency Operations Flood Response and Post-Flood Response	To provide emergency flood response and post-flood response assistance as required to supplement state and local efforts and capabilities in time of flood or coastal storm.
12.104 Flood Plain Management Services	To promote appropriate recognition of flood hazards in land and water use planning and development through the provision of flood and flood plain related data, technical services, and guidance.
12.105 Protection of Essential Highways, Highway Bridge Approaches, and Public Works	To provide bank protection of highways, highway bridges, essential public works, churches, hospitals, schools, and other non-profit public services endangered by flood-caused erosion.
12.106 Flood Control Projects	To reduce flood damages through projects not specifically authorized by Congress.
12.108 Snagging and Clearing for Flood Control	To reduce flood damages.
12.111 Emergency Advance Measures for Flood Prevention	To perform activities prior to flooding or flood fight that would assist in protecting against loss of life and damages to property due to flooding.
97.022 Flood Insurance	To enable persons to purchase insurance against physical damage to or loss of buildings and/or contents caused by floods, mudslide/mudflow, or flood related erosion.
97.023 Community Assistance Program State Support Services Element (CAP-SSSE)	CAP-SSSE funds are for providing technical assistance to National Flood Insurance Program (NFIP) communities, to evaluate NFIP management activities, and to build floodplain management expertise and capacity in order to ensure that NFIP goals are being met.
97.029 Flood Mitigation Assistance	To assist states, Indian tribal governments, and communities in reducing or eliminating the long-term risk of flood damage to structures insured under the National Flood Insurance Program.
97.045 Cooperating Technical Partners	To increase local involvement in and ownership of, the development and maintenance of flood hazard maps produced for the National Flood Insurance Program.
97.092 Repetitive Flood Claims	To assist states, tribes, and communities in reducing or eliminating the long-term risk of flood damage to structures insured under the National Flood Insurance Program that have had one or more claims for flood damages through mitigation activities that are in the best interest of the National Flood Insurance Fund.
97.110 Severe Repetitive Loss Program	To assist states and local governments in supporting actions that reduce or eliminate the long-term risk of flood damage to residential properties insured under the National Flood Insurance Program that meet the definition of severe repetitive loss property, and to reduce losses to the National Flood Insurance Fund (NFIF) by funding projects that result in the greatest savings to the NFIF in the shortest time period.
10.904 Watershed Protection and Flood Prevention	To provide technical and financial assistance in carrying out works of improvement to protect, develop, and utilize the land and water resources in watersheds.

Code/Title	Description
10.916 Watershed Rehabilitation Program	To provide technical and financial assistance to rehabilitate dams originally constructed with assistance of USDA Watershed Programs. Rehabilitation must extend the life of the dam and meet applicable safety and performance standards. Priority is given to dams that could result in loss of life if the dam should fail.
10.072 Wetlands Reserve Program	To assist landowners in restoring and protecting wetlands on eligible lands on which they agree to enter into a permanent or 30-year long-term easement (30-year contract for Indian tribes), or a restoration cost-share agreement with the Secretary. The goal is to maximize wetland functions, values, and wildlife benefits on every acre enrolled in the program.
10.763 Emergency Community Water Assistance Grants	The Rural Utilities Service is authorized to help rural residents who have experienced a significant decline in quantity or quality of water to obtain adequate quantities of water that meet the standards of the Safe Drinking Water Act.
10.902 Soil and Water Conservation	Provide conservation technical assistance to private landowners, conservation districts, tribes, and other organizations through a national network of locally-respected, technically-skilled, professional conservationists and assist them in conserving, improving and sustaining our natural resources and environment.
12.110 Planning Assistance to States	To cooperate with any state in the preparation of comprehensive plans for the development, utilization and conservation of water and related land resources of drainage basins located within the boundaries of such state.
15.065 Safety of Dams on Indian Lands	To improve the structural integrity of dams on Indian lands, including operations and maintenance of the dams.
15.037 Water Resources on Indian Lands	To support Indian tribes in the effective and efficient management, planning, and use of their water resources.
97.041 National Dam Safety Program	To support state governments and the Commonwealth of Puerto Rico in the development and maintenance of dam safety programs. To enable states and the Commonwealth of Puerto Rico to take precautions that ensure the safety of the dams, such as the development of regulatory authority for the design, construction, operation, and maintenance of dams, the undertaking of dam inspections, and development of Emergency Action Plans for dams.
Hazard: Fire	
15.031 Indian Community Fire Protection	To provide funds to perform fire protection services for Indian tribal governments that do not receive fire protection support from state or local government.
97.044 Assistance to Firefighters Grant	To provide funding directly to fire departments and emergency medical services organizations of a state for the purpose of enhancing departments' abilities to protect the health and safety of the public, as well as that of firefighting personnel, facing fire and fire-related hazards.
97.046 Fire Management Assistance Grant	To provide grants to states, Indian tribal governments, and local governments for the mitigation, management and control of any fire burning on publicly (nonfederal) or privately owned forest or grassland that threatens such destruction as would constitute a major disaster.
Hazard: Chemical / Hazardous Materials S	
20.218 National Motor Carrier Safety	To reduce the number and severity of accidents and hazardous materials incidents involving commercial motor vehicles (CMV). The goal is to reduce CMV-involved accidents, fatalities, and injuries through consistent, uniform, and effective CMV safety programs.

Code/Title	Description
66.812 Hazardous Waste Management Grant Program for Tribes	To provide financial assistance to tribal governments and tribal consortia for the development and implementation of hazardous waste programs; for building capacity to improve and maintain regulatory compliance; and for developing solutions to address hazardous waste impacting tribal lands.
Farmland and Crops	
10.054 Emergency Conservation Program	To enable farmers to perform emergency conservation measures to control wind erosion on farmlands, to rehabilitate farmlands damaged by wind erosion, floods, hurricanes, or other natural disasters and to carry out emergency water conservation or water enhancing measures during periods of severe drought.
10.404 Emergency Loans	To assist established (owner or tenant) family farmers, ranchers and aquaculture operators with loans to cover losses resulting from major and/or natural disasters, which can be used for annual farm operating expenses, and for other essential needs necessary to return disaster victims' farming operations to a financially sound basis in order that they will be able to return to private sources of credit as soon as possible.
10.450 Crop Insurance	To promote the national welfare by improving the economic stability of agriculture through a sound system of crop insurance and providing the means for the research and experience helpful in devising and establishing such insurance.
10.451 Noninsured Assistance	To provide crop loss assistance comparable to the catastrophic risk protection level of crop insurance to producers of commercial crops or other agricultural commodities for which the catastrophic risk protection level of crop insurance is not available.
10.069 Conservation Reserve Program	To protect the Nation's long-term capability to produce food and fiber; to reduce soil erosion and sedimentation, improve water quality, and create a better habitat for wildlife.

Figure 3.2-3: Local Capability Assessment

Policy, Program, or Initiative	Description	How it Supports Local Mitigation	Effectiveness in Local Mitigation
Wisconsin Commercial Building Code	The Wisconsin Enrolled Commercial Building Code is chapters Comm. 61 to 65 of the Wisconsin Administrative Code and the adopted provisions of the International Code Council codes: International Building Code, International Energy Conservation Code, International Mechanical Code, International Existing Building Code, and International Fuel Gas Code. The 2009 IBC was adopted with State of Wisconsin amendments in 2011. The 2015 IBC is in review now. The Department of Safety and Professional Services, Division of Industry Services reviews and approves plans for compliance with building codes and administers inspection certificates.	The code protects the health, safety, and welfare of the public and employees by establishing minimum standards for the design, construction, maintenance, and inspection of public buildings, including multi-family dwellings and places of employment. Notable requirements of the code: Windows, doors, parapets, awnings, exterior wall coverings, and rooftop equipment must be designed to resist wind loads up to 90 mph Wind loads are factored during design by a factor of safety as high as 1.6 (calculated wind load)	All structures built after the adoption of the state building code have increased resistance to hazards due to code enhancements. However, for existing structures, state building code requirements indicate that damaged building components only need to be replaced to the predamage condition as specified by the building code in effect at the time of original construction. If the structure is improved, the current code is to be used to regulate the redesign and reconstruction.
Wisconsin Uniform Dwelling Code	The Wisconsin Uniform Dwelling Code is the State's administrative code Comm. 20 and 21, provides construction and remodeling requirements for one- and two-family dwellings built after June 1, 1980. The code is administered by the Department of Safety and Professional Services, Division of Industry Services who is responsible for compliance with state building codes.	The code protects the health, safety, and welfare of the public by establishing minimum standards for the design, construction, maintenance, and inspection for one- and two-family dwellings. (Multi-family structures are covered under the commercial code.) Beginning January 1, 2005, all municipalities will have a code enforcement requirement which involves submitting building plans to obtain a building permit, and having electrical, construction, plumbing, and HVAC inspections during construction.	All structures built after adoption of state building code have increased resistance to hazards due to code enhancements.

Policy, Program, or Initiative	Description	How it Supports Local Mitigation	Effectiveness in Local Mitigation
NR 116 Floodplain Management	Administrative Code NR 116, Floodplain Management is administered by the Wisconsin Department of Natural Resources. It requires local governments (counties, cities, and villages) to adopt reasonable and effective zoning ordinances to regulate floodplains in their jurisdictions. Floodplain zoning prohibits new construction or reconstruction of substantially damaged structures in mapped floodways. In addition, it requires elevation (two feet above the base flood elevation) and dry-land access in flood fringe areas. It also limits improvements to non- conforming structures and requires compensatory	Floodplain management and zoning promote mitigation by restricting development in mapped floodplains. This prevents flood damages by controlling the placement and elevation of structures. It sets strict standards for the removal of lands from the floodplain and limits the granting of variances in floodplains. New floodplain maps more accurately delineate flood hazard areas and encourage achievable mitigation projects. Risk MAP products will incorporate mitigation data and provide support for mitigation planning efforts.	The state's floodplain management law exceeds NFIP requirements. The additional two feet of flood elevation help protect structures from severe floods. It limits construction in the floodplain with no new construction in the floodway. Local governments can set more restrictive standards than the state and federal government.
NR115 Shoreland Protection	storages in flood storage areas. Administrative Code NR115, Shoreland Protection Program, is administered by the Wisconsin Department of Natural Resources and establishes statewide minimum standards for shoreland development to control the intensity of development and create a buffer around water. It requires counties to adopt and administer shoreland zoning ordinances that meet or exceed the minimum standards. Standards include lot sizes, buffer strips, setbacks, and legal nonconformities.	Shoreland management and zoning promote mitigation by restricting development near water. This may prevent construction in dangerous near-shore areas, thereby mitigating possible flood damages. Grading restrictions prevent increased runoff and resulting erosion and flood damages.	Many counties have adopted ordinances that exceed the state minimum standards, however new regulations limit the power of municipalities to enforce any higher standards. New impervious surface standards and shoreland buffer restoration requirements will promote sustainable shoreland development, reduce runoff, promote infiltration of rainfall and protect natural shoreland functions.

Policy, Program, or Initiative	Description	How it Supports Local Mitigation	Effectiveness in Local Mitigation
NR 117 Shoreland- Wetland Protection Program	Administrative Code NR117, Shoreland-Wetland Protection Program, is administered by the Wisconsin Department of Natural Resources. It establishes statewide minimum standards for cities' and villages' shoreland-wetland zoning ordinances in order to accomplish shoreland protection objectives. Cities and villages are required to adopt and administer shoreland-wetland zoning ordinances within six months or receipt of final wetland inventory maps, which are prepared by the DNR. The ordinance creates a shoreland-wetland zoning district for all wetlands of five acres or more, and all portions of wetlands of five acres or more located in the jurisdiction.	This preserves wetland areas which retain and infiltrate flood waters. A jurisdiction may not rezone a wetland in a shoreland-wetland zoning district, or any portion thereof, if the proposed rezoning may result in a significant adverse impact to stormwater and floodwater storage capacity and shoreline protection against soil erosion.	Local governments can adopt ordinances that exceed the state minimum standards. In conjunction with NR 115 and 116, this can be a powerful tool in regulating development in or near floodplains and wetlands and near water in general. Small, isolated wetlands and degraded wetlands can be developed in some cases, which can cause higher flood levels and increased damages.
Risk MAP	DNR and other state agencies work with local communities to encourage mapping of floodplains and coastal areas. DNR will help identify flood hazard and coastal erosion areas, especially in those communities where mapping of the hazard is most needed.	Having current, accurate flood hazard and coastal erosion maps will allow communities to effectively focus mitigation activities on those high-risk areas. Additionally, the maps will assist local officials and decision makers in implementing effective risk management regulations including land use planning and zoning. Further, accessibility to certain grants and other types of funding can be increased by knowing where the hazard boundaries lie.	Flood hazard maps and for coastal communities, coastal erosion risk maps, are the cornerstone of flood and coastal erosion risk management policies and regulations. Appropriate land use planning and zoning, i.e. keeping people and structures out of hazard areas to begin with, are among the most effective types of local mitigation.

Policy, Program, or Initiative	Description	How it Supports Local Mitigation	Effectiveness in Local Mitigation
Comprehensive Planning	The State's Comprehensive Planning Law, commonly recognized as Wisconsin's "Smart Growth" legislation, requires any program or action of a town, village, city, county, or regional planning commission that affects land use after January 1, 2010 must be guided by, and consistent with, an adopted comprehensive plan. Planning efforts are no longer funded. Comprehensive plans must contain 9 elements: issues and opportunities; housing; transportation; utilities and community relations; land use; agricultural, natural, and cultural resources; economic development; intergovernmental cooperation; and implementation.	This provides the opportunity for communities to incorporate their comprehensive planning with their all-hazards mitigation planning efforts. It presents an opportunity to build community support for investing in long-term hazard reduction. Comprehensive plans will include activities such as land use planning, zoning ordinances, construction site erosion control ordinances, stormwater management zoning, and agricultural preservation plans all of which can contribute to hazard mitigation within a community.	There is not a specific element pertaining to hazard avoidance or hazard reduction. However, all-hazards mitigation plans can be integrated into a community's comprehensive plan through the various planning elements or as its own element. Comprehensive plans should also be consulted when developing hazard mitigation plans. A good comprehensive plan that addresses its hazards will lead to good land use decisions. Information and data collected for comprehensive planning is also useful and necessary in all-hazards mitigation planning.

Policy, Program, or Initiative	Description	How it Supports Local Mitigation	Effectiveness in Local Mitigation
Milwaukee	With a multi-objective mission to reduce sewer	MMSD has taxing authority in the most densely	According to engineering reports,
Metropolitan	inflows into Lake Michigan and reduce stormwater	populated area of the state and uses this	most residential structures within the
Sewerage District (MMSD)	flood damage to structures in Milwaukee's metro area, MMSD is executing a comprehensive stormwater and flood protection program.	authority to engineer controls for stormwater and flooding. It has used no emergency management funds for any of its buy-outs or other mitigation initiatives and projects. This	floodplains of some of the most notoriously flooding creeks have been acquired and demolished, or floodproofed above the 100-year
	MMSD has developed Floodwater Management	area of the state has been included in several	base flood elevation through a variety
	Plans with stakeholder input. Chapter 13,	flood declarations and has a high flood risk.	of methods including stormwater
	Stormwater Rule, provides a regionally based		storage, levees, and flow rate
	minimum standard for stormwater control. The	MMSD addresses current and future out-of-	reduction controls.
	Greenseams Program identifies riparian properties that would link existing public open spaces or	bank flooding. Plans present specific projects which contain both design and construction.	
	provide other public benefits in the form of	Projects include structural and non-structural	
	wetland protection, future flood protection, or	approaches.	
	erosion management. The Conservation Plan identifies existing open space in private hands that	The NANCO was supposed listed address factoring flood	
	meet specific criteria for providing natural flood	The MMSD programs listed address future flood and drainage problems and stream channel	
	storage. Lands that are identified as having hydric	protection.	
	soils, wetlands or old wetlands are considered. The	protection	
	purchase of these properties provides public		
	benefits in the form of wetland protection, water		
	quality, and most important future flood		
	protection or erosion management.		

Policy, Program, or Initiative	Description	How it Supports Local Mitigation	Effectiveness in Local Mitigation
Wisconsin Regional Planning Commissions	The Wisconsin Regional Planning Commissions (RPCs) provide planning and technical services to the counties and municipalities that participate in the Commission. RPCs provide technical services through GIS mapping, zoning, and subdivision ordinance preparation; environmental assessments and impact reviews; and engineering services; planning services for development of hazard mitigation plans, comprehensive plans, and special purpose plans; and develop zoning, subdivision and other land use ordinances for local governments. They implement projects through administration of grants. They also share costs in county administrative services and building and zoning code enforcement.	Services provided assist in land use planning and implementation of local government plans that address key community development needs. In many cases, the plans also mitigate losses from hazards. Data collection, analysis projections, mapping, programs, policies, and projects in comprehensive plans complement hazard mitigation planning. Stormwater, floodplain management, and sewer service area planning are a few of the areas addressed in comprehensive plans that have policies, programs, and projects that complement flood hazard mitigation.	RPCs are familiar with the local governments and the issues and politics that are involved at the local level. They provide a valuable service to local governments in the development of various planning efforts and in the provision of technical services. Hazard mitigation should be regularly considered when these services are provided. More specific concepts need to be developed to include hazard mitigation policies, programs, and projects when administering and implementing other plans and projects.
County Emergency Management	Emergency Management is a county office mandated by the State of Wisconsin. It is supported by county funds, which are reimbursed in part by federal funding. Emergency Management comprises organized analyses, planning, decision-making, and assignment of available resources to mitigate, prepare for, respond to, and recover from the effects of all hazards.	The County Emergency Management department cooperates with the County in preparing timely releases that inform the public on actions and precautions they can take to minimize disruptions and losses. County staff works to reduce or eliminate repetitive loss or substantially damaged structures by writing letters to owners to inform them of techniques and potential state and federal resources available to reduce further flood losses.	projector.

Figure 3.3-1: Mitigation Action Items

Action	Goal(s) Met	Priority	Supporting Agencies	Contribution to Mitigation Strategy	2016 Update Status
1.1 – Distribute hazard mitigation materials at housing workshops and training sessions.	1, 2	High	WEM	Expands and promotes public awareness.	Unchanged.
1.2 – Include the Wisconsin Disaster Fund as a topic at workshops and trainings that also discuss the Emergency Assistance Program.	1, 2, 4	High	WEM	Conferences, trainings, and workshops are effective venues for reaching multiple agencies and citizens with mitigation information.	Unchanged.
1.3 – Incorporate mitigation practices into the DEHCR's Emergency Assistance Program.	4, 5	Medium	WEM	Maintaining consistency within state and federal programs regarding planning, preparation and mitigation is evidence of cooperation and coordination.	Delayed because CDBG funds are not usually used for the type of substantial rehabilitation necessary for the incorporation of mitigation practices. However, mitigation remains an eligible activity.
1.4 – The DEHCR will not approve grants or loans to communities to construct critical facilities in floodplains or other hazard-prone areas.	5	Medium	DNR, WEM	Constantly looking at ways to improve and incorporate mitigation actions into state and local government legislation is a key to successful mitigation.	Action delayed because CDBG and HOME funds are not usually used for the type of substantial rehabilitation necessary for critical facility construction.
1.5 – Administer and promote the Wisconsin Weatherization Assistance Program.	1, 5	High		Weatherizing homes can protect structures from damage and save the lives of vulnerable individuals.	New action item.
1.6 – Chair the Housing Subcommittee on the Wisconsin Recovery Task Force (WRTF).	1, 4, 5	High	WEM, RPCs	The WRTF assists individuals, businesses, and communities in recovering quickly, safely, and with more resilience from future disasters.	New action item.
1.7 – Coordinate and incorporate hazard mitigation planning concepts in future updates to the State Guide on Developing the Natural Resources Element in the Comprehensive Planning Guides.	3, 4	Low	WEM, DNR, UW-Sea Grant Institute	Integrating hazard mitigation into comprehensive planning will strengthen communities' commitments to mitigation and allow collaboration on mutual goals instead of conflict.	The Comprehensive Planning program no longer exists, but the Department of Administration continues to provide information on comprehensive planning.

Action	Goal(s) Met	Priority	Supporting Agencies	Contribution to Mitigation Strategy	2016 Update Status
1.8 – Promote hazard mitigation planning by maintaining a close relationship with the Comprehensive Planning program.	3, 4	Medium	WEM, RPCs	Staff from the Department of Administration and WEM will work together to encourage communities that are updating comprehensive plans to include hazard mitigation.	The Comprehensive Planning program no longer exists, but the Department of Administration continues to provide information on comprehensive planning.
1.9 – Work toward establishing a community for GIS and LiDAR data sharing.	3, 4	Medium	DNR, NWS, USGS, WEM, UW	GIS data layers are helpful when mapping risk, but can be very expensive when not available publicly.	New action item.
1.10 – Promote hazard mitigation and raise awareness of coastal hazards.	1, 2	High	WEM, DNR	Education of mitigation and coastal hazards will lead to wise decision-making for local officials and property owners.	Unchanged. WCMP worked with WEM and other CHWG members to hold Great Lakes Coastal Processes and Best Management Practices workshops in 2011-2012.
1.11 – Help communities develop and implement shoreline and bluff erosion policies.	1, 3	High	WEM, DNR, UW-Sea Grant Institute	New ordinances and other policies will serve to establish revised setbacks and minimize future damages.	Changes to state rules regarding Shoreland Zoning, Wis. Admin. Code NR 115, may affect communities' shoreline policies. The WCMP will work with communities to assess and address potential impacts.
1.12 – The Coastal Hazards Work Group (CHWG) will work with local governments in the state's 15 coastal counties to develop and revise policies relevant to coastal hazards.	1, 3	High	UW-Sea Grant Institute, DNR	This increases local official and public awareness and will result in better managed shorelines throughout the state.	A CHWG member updated Managing Coastal Hazard Risks on Wisconsin's Dynamic Great Lakes Shoreline and provided supporting documents regarding Coastal Ordinance Provisions in Wisconsin communities and the Coastal Erosion Model Ordinance.

Action	Goal(s) Met	Priority	Supporting Agencies	Contribution to Mitigation Strategy	2016 Update Status
1.13 – Continue to coordinate Coastal Hazards Work Group (CHWG) to expand hazard mitigation activities in those coastal areas vulnerable to destruction.	1, 4	High	WEM, UW- Sea Grant Institute, DNR, RPCs	Expanding mitigation activities in coastal areas will reduce storm and erosion-related damage and protect lives and property.	The CHWG helped develop online resources and assists communities in understanding coastal processes. A Coastal Fellow will begin revisions of the Coastal Processes Manual. CHWG members are contributing to an Integrated Assessment for Water Level Variability and Coastal Bluff Erosion in Northern Milwaukee County and Southern Ozaukee County.
2.1 – Encourage communities to sign up for and participate in the Conservation Reserve Enhancement Program (CREP) to reduce crop losses.	1	High	CLCDs, USDA: FSA and NRCS	The CREP focuses on improving water quality by reducing runoff and peak flows in streams which prevents pollution. A secondary benefit is removing flood-prone cropland from production. It also can allow haying in drought years.	Of \$28 million in bonding authority, about half has been spent. Almost 50,000 acres enrolled under about 4,000 contracts. Half will expire in the next three years, about 75% of those expected to re-enroll.
2.2 – Chair the Agriculture Subcommittee on the Wisconsin Recovery Task Force (WRTF).	1, 4, 5	High	WEM, RPCs	The WRTF assists individuals, businesses, and communities in recovering quickly, safely, and with more resilience from future disasters.	New action item.
3.1 – Give extra points to communities applying for DNR Stewardship programs if their proposal includes mitigation elements.	1	Medium		Promoting flood mitigation values to acquisition criteria (i.e. flood water storage capacity removes floodplain from development) consideration can conserve natural resources while helping to reduce flood losses.	Unchanged.
3.2 – Promote the No-Adverse Impact (NAI) floodplain management approach statewide.	1	High	WAFSCM, WEM	The NAI approach makes sense and will result in reduced damages. By using NAI you have a tool to increase support for watershed management as it promotes multi-objective management strategies, which appeal to a wider range of interests. This increases support for any actions proposed or taken for flood management.	Unchanged.

Action	Goal(s) Met	Priority	Supporting Agencies	Contribution to Mitigation Strategy	2016 Update Status
3.3 – Promote substantial damage inspections.	1, 5	High	WEM	Substantial damage inspections are required to maintain membership in the NFIP. DNR will promote these to assist communities in remaining compliant.	Substantial damage inspection was a topic in floodplain workshops in 2014-2016; additional workshops were held in response to 2016 flood events; substantial damage letters were sent to all communities impacted by the 2016 events.
3.4 – Promote more efficient methods of detecting non-compliant structures in the floodplain and reviewing local floodplain management procedures.	1, 5	High	FEMA	Limiting non-compliant floodplain development will decrease potential damages.	Aerial photo review comparison has been used to support CAVs since 2011. This may also be used to assist WEM with open space monitoring in the future.
3.5 – Encourage restoration of natural wetland functions.	1	High	USDA: NRCS, UWFWS, local communities, property owners	Restoring the natural function of wetlands can reduce flooding potential of other areas in the watershed.	Unchanged.
3.6 – Provide workshops and distribute informational materials to improve understanding and enforcement of floodplain, shoreline, coastal, and wetland regulations.	1, 2	High	DOA: WCMP, UW-Sea Grant Institute, WEM	Assessing and improving local floodplain management and coastal hazard awareness is a key component of the outreach program efforts.	DNR sponsored FEMA L-273 course in 2014, 2016. Shoreland workshops also held regularly.
3.7 – Provide sewer back flow prevention information and other flood proofing measures to affected communities through public information programs.	1, 2	High	WEM, OCI	Using this mitigation technique decreases residential damage during major storm events.	Unchanged.
3.8 – Compile and distribute Floodplain/ Shoreland Notes newsletter.	2	High	FEMA, WEM	The newsletter provides local officials and others with information on the NFIP, shoreland issues, dam safety, and hazard mitigation.	Unchanged; distributed three times per year; WEM regularly contributes articles about mitigation.
3.9 – Provide workshops and distribute informational materials to improve understanding and awareness of flood insurance.	1, 2	High	FEMA	Distributing information on flood insurance will help reduce risks by increasing the number of flood insurance policies.	Workshops held in 2011-2016; websites updated to provide appropriate contact information for flood insurance assistance.

Action	Goal(s) Met	Priority	Supporting Agencies	Contribution to Mitigation Strategy	2016 Update Status
3.10 – Promote dam safety awareness through workshops, the development of EAPs and IOM guidebooks, templates, and newsletters.	1, 2	High	FEMA	Increasing the number of EAPs and IOM plans will reduce the overall risk of dam failure.	Dam safety workshops held in 2011-2015. Two Dam Safety newsletters published each year. IOM Template and Guidebook completed in 2012 and available on website.
3.11 – Continue to provide technical assistance to non-NFIP communities that have had flood damage and encourage them to join the NFIP.	1, 2, 4	High	WEM	To raise awareness of the NFIP to Wisconsin citizens and squelch misconceptions will only enhance the mitigation program.	18 communities have joined the NFIP since June 2011 and 13 more are considering joining. Outreach complete for all Risk Map watersheds.
3.12 – Work with communities to encourage mapping of floodplains and coastal areas.	1, 2, 4	High	WEM, RPCs, WCMP	Promoting hazard mapping will empower communities and individuals to manage and reduce their risks.	Since 2011, all in-progress Map Mod projects have been completed. Many communities are in various stages of Risk MAP.
3.13 – Promote mandatory disclosure of hazard-prone property to buyers.	1, 2, 4	Low	DNR	This allows homeowners to make informed decisions about mitigation.	Information on helping buyers understand flood risk was in newsletters in 2012-2014.
3.14 – Encourage sewer utilities to provide back-up power sources at lift stations to help prevent sewer backflow flooding.	1, 4	Low	DNR	Some sewer backflow problems occur because of power outages at lift stations. Back-up power sources would reduce this type of flood risk.	Unchanged.
3.15 – Encourage sewer utilities to provide public information regarding sewer back-flow prevention	1, 4	Low	DNR, WEM	Promoting sewer back-flow prevention at the local level will help reduce this type of flood risk.	Unchanged.
3.16 – Promote the NFIP CRS to local governments.	1, 2, 4	High	WEM, FEMA, WAFSCM, ASFPM	This reduces flood risk by rewarding communities for meeting CRS goals with lower insurance premiums.	Information routinely provided in the newsletter and at floodplain workshops. Intro to CRS courses were held in three locations and at the 2016 WAFSCM conference.
3.17 – Participate in the USACE Annual National Flood Risk Management (FRM) Workshop.	1, 4	Medium	WEM, USACOE, FEMA	The purpose of the workshop is to enable federal, tribal, state, and local government partners to learn from each other and collaborate on FRM.	New action item; WEM or DNR has sent a representative every year since 2010.

Action	Goal(s) Met	Priority	Supporting Agencies	Contribution to Mitigation Strategy	2016 Update Status
3.18 – Implement the Municipal Flood Control and Riparian Restoration grant program.	1, 5	High		Projects protect water resources and habitat. This includes flood mitigation and can be used to match federal grants.	New action item; the program is 50% state funded and 50% local match.
3.19 – Co-chair the Infrastructure Subcommittee on the Wisconsin Recovery Task Force (WRTF).	1, 4, 5	High	WEM, RPCs	The WRTF assists individuals, businesses, and communities in recovering quickly, safely, and with more resilience from future disasters.	New action item.
3.20 – Work with the cranberry agriculture community to develop a process for cranberry farms to be efficiently regulated under a county's floodplain ordinance.	1	Medium	FEMA	Many cranberry growers have not been getting permits for their activities in the mapped floodplain. Regulating their activities efficiently is beneficial to them and any potential impacts to the floodplain.	New action item.
3.21 – Maintain a burning permit process through which people are issued an annual permit but are required to check burning restrictions each day prior to burning debris.	1, 2	Medium		People will be required to check burning restrictions daily which will reduce the risk of fire.	Unchanged.
3.22 – Promote Wildfire and Fire Prevention Week throughout the state.	1, 2	Medium	WEM	Public education about fire prevention will help reduce the risk of fire.	Unchanged; more effort will be made to coordinate with Ready Wisconsin.
3.23 – Create and maintain an interactive county map on the DNR website showing the current fire danger.	1, 2	Medium	WEM	Public access to the most current fire danger information will help reduce the risk of fire.	Unchanged.
3.24 – Promote the concept of Firewise Communities USA statewide.	1, 2, 4	Low	WEM, FEMA, USDA, State Fire Chiefs' Association	This program encourages action that minimizes home loss to wildfire and protects lives.	There are 12 Firewise Communities in the state. The decrease from 2011 is because of a change in the classification system.
3.25 – Promote the creation of Community Wildfire Prevention Plans.	1, 3	Low	WEM	This provides an opportunity to address fire hazards along the wildland/urban interface.	There are 20 CWPPs in the state covering 39 Communities-at-Risk.
3.26 – Identify permanent fire mitigation projects that can be supplemented by ongoing temporary fire mitigation projects.	1, 4	Low	WEM	Permanent fire mitigation projects will help reduce the risk of fire.	Unchanged.
3.27 – Update and distribute Communities-at-Risk and Communities- of-Concern maps.	2, 3	Medium	WEM	The maps were first created in 2008 and show wildfire risk throughout the state. They are useful for planning and preparedness.	New action item.

Action	Goal(s) Met	Priority	Supporting Agencies	Contribution to Mitigation Strategy	2016 Update Status
3.28 – Create a website template for storm response to assist private landowners with cleanup.	1, 2	Medium	WEM	Blowdowns or other debris-creating events increase the wildfire risk. Expediting cleanup will reduce the risk.	New action item.
4.1 – Survey healthcare facilities for the use of NOAA weather radios and severe weather response plans to enable DHS and WEM to pursue funding for these activities.	1	High	WEM	This project further advances the goal of saving lives in severe weather events.	Without access to match funds to purchase radios, DHS is unable to move forward with this but it remains a priority.
4.2 – Conduct public health hazard risk assessments at all local and tribal health departments throughout the state.	1, 4	High	CDC, WEM, WAHLDAB, EMS, HPP, local and tribal health departments	This will identify risks to health departments, allowing them to take action to reduce the risks.	The Wisconsin Hazard Vulnerability Assessment Tool was created in 2012. 45 scenarios were evaluated and ranked by threat level. In 2015, the HVA tool was used to develop a regional tool. Results are being compiled and will be used to guide planning and exercises in the future.
4.3 – Chair the Health and Social Services Subcommittee of the Wisconsin Recovery Task Force (WRTF).	1, 4, 5	High	WEM, RPCs	The WRTF assists individuals, businesses, and communities in recovering quickly, safely, and with more resilience from future disasters.	New action item.
4.4 – Create extreme weather toolkits about preparing for and responding to emergencies in Wisconsin.	1, 2	High	CDC, WEM, local and tribal health departments	The toolkits educate local officials and the public about actions to take in a variety of extreme weather events. This knowledge will help people make good decisions and save lives and property.	New action item.
4.5 – Develop heat vulnerability indexes (HVIs) for each county in Wisconsin and the whole state.	1, 2, 3	High	CDC, WEM, City of Milwaukee	The HVIs show areas most at risk from heat so local officials and the public can target messaging and take appropriate protective measures, saving lives and property.	New action item.
4.6 – Develop flood vulnerability indexes (FVIs) to identify areas of greatest risk due to flood events in Wisconsin.	1, 2, 3	High	CDC, WEM, local and tribal health departments	The FVIs show areas most at risk during flood events so local officials and the public can target messaging and take appropriate protective measures, saving lives and property.	New action item.

Action	Goal(s) Met	Priority	Supporting Agencies	Contribution to Mitigation Strategy	2016 Update Status
4.7 – Develop a checklist for local health departments to assess their community's vulnerability to negative health impacts due to flood events and provide tools to decrease vulnerability.	1, 3	High	CDC, WEM, local and tribal health departments	A checklist will allow local policy-makers and land use planners to understand their flood risk, and make good decisions. The tools will help them steer their communities toward increased flood resilience.	New action item.
4.8 – Fund local health department pilot projects to increase the capacity to understand climate-related health impacts and incorporate climate adaptation strategies when planning.	1, 3	High	CDC, local health departments	Understanding the risk related to climate change will allow communities to plan appropriately for future conditions.	New action item.
5.1 – Train municipal fire departments on the use of the National Fire Incident Reporting System (NFIRS) and work to collect information on all fire incidents in the state. Data collected is directly uploaded to FEMA and then used to develop new policies and laws for firesafe construction.	1, 4, 5	High	State Fire Chiefs Association	Effective regulations for fire-safe construction will decrease fire hazards and losses.	Unchanged.
5.2 – Require all fire departments within the state to inspect existing commercial buildings annually and provide them guidance in doing so. Routine inspections are performed to ensure the existing building still meets its design-specific building code requirements.	1, 4, 5	High	State Fire Chiefs Association	Fire-safe buildings are at a lower risk of fire hazards and losses.	Unchanged.
5.3 – Provide for Administrative Code changes to adopt the 2011 edition of the National Electrical Code (NEC). The rule will affect any building or structure within the state in which electrical wiring will be installed.	1, 4, 5	High		Fire-safe installation of electric wiring decreases the risk of fire hazards and losses.	2011 NEC was adopted with effective date April 1, 2012.
5.4 – Adopt the 2009 editions of the national model codes from the International Code Council and the National Fire Protection Association.	1, 5	High		Constantly looking at ways to improve and incorporate mitigation actions into government legislation is a key to successful mitigation.	The state is still operating under the 2009 editions. The 2015 editions are in review.

Action	Goal(s) Met	Priority	Supporting Agencies	Contribution to Mitigation Strategy	2016 Update Status
5.5 – Address the disaster resistance of manufactured homes by reviewing tiedown standards, installation standards, and inspection standards.	1, 5	Medium		Constantly looking at ways to improve and incorporate mitigation actions into government legislation is a key to successful mitigation.	HUD 3285.402, the standards requiring tie-downs for manufactured homes was updated in 2014.
5.6 – Enforce the requirement to inspect structures and buildings when permitting construction projects to ensure compliance with state building codes. Municipalities can apply to become designated agents to enforce building codes.	1, 5	High		These safety inspections promote disaster resistance and ensure public safety.	Unchanged.
5.7 – Create and maintain a tracking system for all Privately Owned Wastewater Treatment Systems (POWTS).	1, 5	Medium		Having this information will aid in determining the status of POWTS systems following flood events.	DSPS monitors compliance through audits of the county POWTS tracking systems.
5.8 – Require carbon monoxide detectors in all existing residential occupancies with fuel burning appliances.	1, 5	Medium		This will protect occupants of residential occupancies against possible carbon monoxide leaks during the recovery period after a disaster.	Unchanged.
5.9 – Require the inspection of all electrical construction within commercial buildings through the statewide electrical inspection program.	1, 5	Medium		Ensuring all electrical wiring within commercial structures meets the minimum national code requirements will enhance building survivability and life safety in the event of a disaster.	Unchanged; not yet completed.
5.10 – Develop and implement rules requiring statewide electrical inspection for all buildings.	1, 5	Medium		This will ensure that wiring meets appropriate codes, reducing the risk of damages in a disaster.	Unchanged; not yet completed.
5.11 – Consider the adoption of the International Residential Code written by the International Code Council.	1, 5	Medium		Use of the International Residential Code would improve the level of construction of all one- and two-family homes within Wisconsin. This standard is proven to enhance the survivability of structures and the safety of occupants.	The state has not adopted the International Residential Code and continues to use the state Uniform Dwelling Code, which is current as of 2016.

Action	Goal(s) Met	Priority	Supporting Agencies	Contribution to Mitigation Strategy	2016 Update Status
6.1 – Distribute hazard mitigation materials to insurance companies, agents, and consumers to support the Wisconsin Hazard Mitigation Team in developing, establishing and implementing permanent and viable statewide mitigation programs.	1, 2, 4	Low		This will expand mitigation education in Wisconsin.	Unchanged.
6.2 – Investigate the possibility of increasing the emphasis on flood insurance in trainings and exams for insurance agent licensing.	1	Medium	WEM, DNR, FEMA	Having better knowledge of flood insurance will help insurance agents give customers the best information so customers will make the best insurance decisions, protecting their investments adequately.	New action item.
6.3 – Maintain and update flood and other hazard insurance information via the OCI website and press releases.	1, 2	High	WEM, DNR, FEMA	The OCI website is where many people get information from after a disaster. Having thorough, accurate, and up-to-date information is crucial for helping individuals obtain the appropriate insurance and file claims and complaints.	New action item.
6.4 – After flood events distribute flood and homeowners insurance information in the affected areas. Be available at DRCs if FEMA Individual Assistance is granted.	1, 2, 4	High	WEM, DNR, FEMA	In post-disaster situations, insurance issues can be complicated. It will be beneficial to have OCI information and representatives available to help expedite the recovery.	New action item; OCI staff attended several open houses following the July 2016 flooding.
6.5 – Develop and maintain post- disaster outreach procedures.	1, 2	Medium	WEM, DNR, FEMA	Procedures will help OCI respond quickly and efficiently after a disaster to provide insurance information to residents and insurance agents in impacted communities.	New action item; following the 2016 deployments, OCI decided to formalize a procedure.
7.1 – Encourage telecommunication utilities to obtain information about floodplains in advance of construction and avoid construction in these areas.	1, 5	Medium		Continuing oversight will help to keep telecommunications utilities focused on mitigation and will minimize service disruptions.	Unchanged.
7.2 – Perform hazard mitigation reviews for electric, natural gas, and water utility construction projects.	1, 5	High		Continuing oversight will help to keep utilities focused on mitigation and will minimize service disruptions.	Unchanged.

Action	Goal(s) Met	Priority	Supporting Agencies	Contribution to Mitigation Strategy	2016 Update Status
7.3 – Continue to educate the public about safety issues related to natural hazards at electric and natural gas utilities.	1, 2	High		Public education and outreach will be improved by this activity.	Unchanged.
7.4 – Redundancy is built into the electric system so loss of any electric system element does not result in loss of load.	1	High		Having this redundancy will help prevent power loss which, depending on weather conditions, can have a moderate to severe impact on lives and property.	New action item.
7.5 – PSC regulates wind energy development and looks at alternatives for each project.	1	Medium		The top priorities are conservation and energy efficiency, and non-combustible, renewable resources. This addresses changing weather patterns.	New action item.
7.6 – State utilities must comply with a Renewable Portfolio Standard which requires about 10% of energy sales to come from renewable resources.	1	Medium		To address changing weather patterns, the state requires energy providers to meet the Renewable Portfolio Standard.	New action item.
8.1 – Present information about the DDA, PA, and HMA programs at the annual County Highway Association Commissioner training.	1, 2, 4	Medium	WEM	This will keep Highway Commissioners informed about the programs and keep mitigation involved in discussions of future highway projects.	Unchanged.
8.2 – DOT will coordinate with WEM to sponsor a workshop for DOT engineers, technicians, and other staff to review the components of post-disaster damage and mitigation programs.	1, 2, 4	Low	WEM, FEMA	Conferences, workshops, and trainings are ways to reach multiple agencies and citizens to advance mitigation knowledge.	Was on hold. New staff will look at implementing in the future.
8.3 – As a disaster unfolds, send an email alert to DOT field staff reminding them to keep track of costs for possible reimbursement from the PA program and to keep in mind the possibility of assisting with Preliminary Damage Assessments.	1, 4	Medium	WEM	This will allow DOT to claim as much reimbursement as possible and prepare them for assisting with Preliminary Damage Assessments.	Unchanged.

Action	Goal(s) Met	Priority	Supporting Agencies	Contribution to Mitigation Strategy	2016 Update Status
8.4 – Present information about the Disaster Damage Aids program at WEM's annual DRRO workshop and at Applicant Briefings following a disaster.	1, 2, 4	High	WEM	The workshop and Applicant Briefings allow people who work in emergency management and/or whose communities were impacted by a disaster to learn about the programs available to help them recover and mitigate.	New action item; DOT has presented at the 2015 and 2016 DRRO workshops and at Applicant Briefings in July and September 2016.
8.5 – Co-chair the Infrastructure Subcommittee on the Wisconsin Recovery Task Force (WRTF).	1, 4, 5	High	WEM, RPCs	The WRTF assists individuals, businesses, and communities in recovering quickly, safely, and with more resilience from future disasters.	New action item.
8.6 – Perform a statewide culvert inventory to evaluate and prioritize which culverts on state roads should be replaced and/or upsized.	1, 5	High		Prioritizing culverts for replacement or upsizing means funds will be spent responsibly and areas in need of mitigation will be identified prior to construction.	New action item.
9.1 – Perform education, outreach, and planning for businesses for a variety of scenarios that could be caused by disasters.	1, 2	Medium		Making businesses aware of planned contingencies and options during major operational disruption can minimize human and economic loss.	Unchanged.
9.2 – Integrate hazard mitigation concepts into local extension programs for community development, lake and watershed management, farm management, and housing development.	1, 3	Medium	WEM, WCMP, DOA, DNR	The more efforts made to expand mitigation awareness and proper land management, the more damage prevention and preparation will occur within the state.	Unchanged.
10.1 – Administer the HMGP, FMA, and PDM programs.	1, 3, 5	High	WHMT, RPCs	WEM will continue to solicit applications for these funds in order to reduce property losses and save lives in Wisconsin caused by disasters.	WEM has administered over \$120 million in funds from the HMGP, FMA, and PDM programs.
10.2 – Develop uniform guidance for providing replacement and supplemental housing assistance.	1, 4	Medium	DOA-DH, DNR	This will streamline the process of receiving replacement and/or supplemental housing assistance, making recovery quicker.	Unchanged; WEM and other agencies met with the State Relocation Specialist. When she issues her formal opinion, work on the guidance will move forward.
10.3 – Promote mitigation for the public using the WEM website.	1, 2, 3	High	DNR, DOA, WCMP, OCI, DHS, DATCP, RPCs	Public education and outreach will be improved by this activity.	Unchanged.

Action	Goal(s) Met	Priority	Supporting Agencies	Contribution to Mitigation Strategy	2016 Update Status
10.4 – Develop and document mitigation success stories. Publish them on the WEM website.	2, 4	High	FEMA	The goal in sharing success stories is to motivate communities to come up with solutions to better withstand the next disaster and prevent future damage.	Loss avoidance studies and best practices stories have been written for many of WEM's mitigation projects. More will be pursued in light of the 2016 flooding.
10.5 – Work with the OCI to promote public education about flood insurance during Flood Safety Awareness Week	1, 2, 4	High	OCI	Promoting flood insurance education will increase the number of policies which will in turn decrease losses from flood events.	Unchanged.
10.6 – Create an online flood insurance education course for insurance agents.	1, 2	High	OCI	Agents will be able to encourage consumers to purchase flood insurance which will decrease losses from flood events.	Unchanged.
10.7 – Research the possibility of requiring all insurance agents to complete a course in flood insurance periodically.	1, 2	High	OCI	This will increase the promotion of flood insurance to consumers which will increase flood insurance participation, thereby decreasing losses from flood events.	Unchanged.
10.8 – Research and identify GIS resources that would assist WEM and local governments in developing their mitigation programs.	1, 3	High	RPCs	Ongoing mitigation efforts lessen the impact that disasters have on people's lives and property through damage prevention.	Unchanged; the WLIP developed a statewide parcel layer. FEMA has released a national floodplain layer. LiDAR remains a priority for the state.
10.9 – Update the State Hazard Mitigation Plan to include technological and man-made hazards.	1, 3	High	WHMT	Identifying and subsequently mitigating man- made and technological disasters will be of benefit to the citizens of Wisconsin and reduce risk to property and life.	Included in the risk assessment for the 2016 update. More will be developed for the next update including mitigation actions.
10.10 – Incorporate mitigation into WEM's Strategic Plan and work with other agencies to do the same.	1, 3, 4	Medium	WHMT	Cooperation and communication between agencies and sharing of goals and priorities is one way to accomplish the strategy set forth in this document.	The 2014-2016 Strategic Plan focused on internal capacity building, so mitigation was not included. Work on the 2017-2019 version is underway.
10.11 – As local and tribal plans are completed, incorporate pertinent information into the State Hazard Mitigation Plan.	1, 3	High	WHMT	Providing an assessment of state and local hazard mitigation priorities ensures that efforts complement each other, and don't duplicate or conflict.	Additional jurisdictional plans were incorporated into this update focusing on climate change.
10.12 – Develop a structure inventory and risk assessment for state-owned and -operated buildings.	1, 3, 5	High	DOA	A state structure inventory will inform hazard preparation for state-owned and -operated buildings.	Completed for this update, State Structure Inventory in Appendix A, THIRA.

Action	Goal(s) Met	Priority	Supporting Agencies	Contribution to Mitigation Strategy	2016 Update Status
10.13 – Continue to lead the WHMT in establishing and implementing a statewide mitigation program.	1, 4	High		Interagency cooperation in expanding mitigation education in Wisconsin accomplishes several goals in the Mitigation Strategy.	In 2015, the WHMT became a chapter of the USACE Silver Jackets Hazard Risk Management program and changed the name to WSJHMT.
10.14 – Encourage EM directors to work with LEPCs to participate in local hazard mitigation planning activities.	1, 3	Medium	RPCs	Mitigation planning at the local level is required by statute.	Unchanged.
10.15 – Promote use of FEMA's HAZUS hazard-analysis, GIS-based software.	1, 3	Medium	RPCs	With the addition of the flood and wind module, HAZUS-MH may provide Wisconsin with a hazard-specific analysis tool for estimating potential losses.	In 2015, a HAZUS run was conducted for Washington County. For this state plan update, due to the limitations of HAZUS, WEM conducted a statewide flood risk analysis using a simplified GIS procedure instead.
10.16 – Identify pre-disaster mitigation techniques that can be funded through Section 406.	1, 4	Medium	FEMA, DOT, DOA, DNR, PSCW	Identifying techniques prior to a disaster will allow field staff to be properly trained to recognize opportunities for mitigation through Section 406.	In DR-4288, WEM developed several mitigation training opportunities at the Joint Field Office with FEMA. Additionally, WEM worked with DNR to issue a policy memorandum defining the difference between DNR coderelated upgrades and mitigation.
10.17 – Attend training and continue to build expertise in Benefit-Cost Analyses.	1, 4	High	FEMA	BCA is a required element of applying for mitigation funds.	WEM hosted a FEMA BCA workshop for Rural Electric Cooperatives in 2015. Staff also participated in several other BCA training opportunities.
10.18 – Provide training and technical assistance to local governments and tribal organizations on FEMA's e-grants system.	1, 4	Medium	FEMA	The e-grant process will be a required element for applying for FEMA's mitigation funds.	Unchanged; WEM provided technical assistance for the FFY 13, 14, 15, and 16 PDM and FMA funding cycles.
10.19 – Revise the Resource Guide to All-Hazards Mitigation Planning in Wisconsin and post it on the WEM and DOA websites.	1, 3, 4	High	DOA	The guide functions to assist local communities in mitigation and comprehensive planning efforts. It is outdated. An update will make it more useful and posting it on the websites will make it more accessible.	Unchanged; WEM plans to collaborate with the RPCs and apply for a FEMA grant in the FFY 17 funding cycle.

Action	Goal(s) Met	Priority	Supporting Agencies	Contribution to Mitigation Strategy	2016 Update Status
10.20 – Promote the purchase and use of NOAA weather radios.	1, 2	High		Reducing the threat to lives will be realized by the use of radios in private residences and in schools, critical facilities, and daycare centers.	Status unchanged. WEM continues to administer grants to purchase NOAA weather radios.
10.21 – Participate in conferences and give presentations to promote mitigation to local interest groups and associations.	1, 2, 3, 5	Medium	DNR, UW- Extension, WCMP, RPCs	WEM staff can reach local audiences and reinforce that mitigation planning and activities occur at the local level. More education can always be accomplished.	Unchanged; Sections 6.8.15 and 6.8.16 list many of the presentations and workshops WEM Mitigation staff were involved in since 2011.
10.22 – Include the Hazard Mitigation Planning Workshop and the G-393 course in WEM's training curriculum and the EM certification program.	1, 3, 4	High	RPCs	This action enables mitigation measures through planning efforts.	The workshop and course are part of the EM certification program and is held at least once a year, often twice.
10.23 – Identify and develop GIS applications to be used as a mitigation tool.	1, 3, 4, 5	High	DNR, RPCs	This will help minimize damages.	WEM has hired two GIS specialists. The state now has a statewide parcel data layer and FEMA released a national floodplain layer.
10.24 – Work with Wisconsin universities to develop Disaster Resistant University Plans.	1, 3, 4	Medium		These plans will guide mitigation actions which help save lives and property.	UW-River Falls updated their plan in 2014; UW-Superior updated their plan in cooperation with the City of Superior in 2016; UW-Madison completed their first plan in 2013.
10.25 – Maintain the Wisconsin Recovery Task Force as a standing task force.	1, 4, 5	High	WRTF	It is recommended that semi-annual meetings be held to ensure preparedness and facilitate effective operational readiness of the task force following a disaster declaration.	The WRTF was reconvened in February 2015. Subcommittee chairs were identified. Since then the WRTF has met following two disasters.
10.26 – Chair the Mitigation Subcommittee on the Wisconsin Recovery Task Force (WRTF).	1, 4, 5	High		The WRTF assists individuals, businesses, and communities in recovering quickly, safely, and with more resilience from future disasters.	New action item.
10.27 – Develop, update, and implement a State Recovery Plan.	1, 4, 5	High	WRTF	Developing the plan before disaster strikes will allow impacted communities to recover more quickly.	New action item; State Recovery Plan finalized in May 2016.
10.28 – Develop and deploy Rapid Assessment Strike Teams after disaster events.	1, 4, 5	High		Rapid, accurate damage assessments will expedite the disaster declaration process and allow recovery to begin as quickly as possible.	New action item; WEM and the American Institute of Architects are working together.

Action	Goal(s) Met	Priority	Supporting Agencies	Contribution to Mitigation Strategy	2016 Update Status
10.29 – Incorporate Climate Resilient Mitigation Activities (CRMAs) into WEM's scoring system for pre- applications.	1, 5	High		Giving extra points for CRMAs will encourage development of that type of activity. It is a priority for FEMA.	New action item; starting with DR-4276, WEM has incorporated CRMAs into the scoring system for pre-applications.
10.30 – Research ways to quantify resilience to changing future conditions to allow extra points for preapplications that incorporate resilience.	1, 5	Medium		Giving extra points for activities that incorporate resilience will encourage development of that type of activity, but that is difficult to quantify, so figuring that out should come first.	New action item.
10.31 – Include information on planning for changing future conditions in the All-Hazards Mitigation Planning Workshop	3, 5	High		Providing information and resources about planning for changing future conditions will make it easier for communities to include that in their planning efforts.	New action item; a mention of this has been part of the curriculum for the workshop, but it should be expanded.
10.32 – Include points for CRS participation in the Pre-Application Ranking Form.	1, 5	High		Including points for CRS participation will encourage communities to participate. The CRS credits flood risk management activities.	New action item.
10.33 – Work with other agencies to prioritize watersheds for Flood Inundation Mapping efforts.	1, 2, 3	High		Flood inundation mapping is a very effective way to communicate risk. Prioritizing communities allows those with the highest flood risk to be completed first.	New action item; flood inundation mapping has been done on the Rock River and is being pursued on the Upper Fox currently.
10.34 – Consider updating WEM's Local Plan Review Tool to include criteria on assessing changing future conditions and on the analysis of projects that reduce vulnerability to these conditions.	1, 2, 3	Medium		Including recommended criteria for changing future conditions may encourage communities to put it in their plan.	New action item.
11.1 – WHS is using GIS to identify and map locations of known historical and archaeological sites in floodplains.	1, 5	Medium	DOA, DNR	By decreasing the impact to these historical sites in the disaster recovery phase, preservation of Wisconsin's historical and archeological areas will be secured.	All WHS sites are now geocoded. The national floodplain layer can be overlaid.
11.2 – Provide ongoing support and coordination with the WSJHMT in developing, establishing, and implementing a permanent and viable statewide mitigation program while protecting historical and cultural resources.	1, 4, 5	High	WEM, WSJHMT	Interagency cooperation in expanding mitigation education in Wisconsin accomplishes several goals in the Mitigation Strategy.	Unchanged; the WHS is looking at making the whole section 106 process electronic to streamline historic preservation reviews.

Action	Goal(s) Met	Priority	Supporting Agencies	Contribution to Mitigation Strategy	2016 Update Status
11.3 – Identify historic properties and structures in the floodplain to target for mitigation.	1, 5	Medium	WEM, DNR, FEMA	To preserve the historic nature of certain sites, creative mitigation should be pursued.	New action item.
11.4 – Provide technical assistance with mitigation projects through annual training.	1, 2, 4, 5	Medium	WEM, FEMA	All HMA projects must go through the environmental review process. Providing technical assistance and training will expedite this.	New action item.
11.5 – Develop a Programmatic Agreement for historic preservation and archaeological reviews.	1, 4	High	WEM, FEMA, tribes	A Programmatic Agreement will allow for expedited reviews and quicker project approval and completion.	New action item; the PA is currently in draft form and will be reviewed over the next several months.
12.1 – Achieve near 100% NOAA weather radio tower coverage in the state.	1, 2	High	WEM	This action will help protect people during severe weather events.	Status unchanged.
12.2 – Implement the Storm Spotter program and continue to recruit and educate new Storm Spotters.	1, 2	High	WEM	Storm Spotters allow the NWS to know what's going on on the ground so they can issue the proper alerts and warnings.	New action item; approximately 3,000 to 5,000 new Storm Spotters are trained each year in the state.
12.3 – Implement the StormReady program and continue to recruit and educate new agencies.	1, 2, 4	High	WEM	The StormReady program encourages communities and organizations to be prepared for hazardous weather.	New action item; there are 20 StormReady Sites in Wisconsin (including WEM) and 22 StormReady Supporters.
12.4 – Implement the Weather Ready Nation Ambassador program and continue to recruit and educate new Ambassadors.	1, 2, 4	High	WEM	Weather Ready Nation Ambassadors improve the nation's readiness, responsiveness, and resilience to extreme weather.	New action item; there are 126 Weather Ready Nation Ambassadors in Wisconsin (including WEM).
12.5 – Educate the public through a variety of weather and natural hazard awareness days and weeks each year.	2	High	WEM	Educating the public about severe weather and natural hazards better prepares them for when events occur.	New action item.
13.1 – Develop and maintain an economic recovery framework to help businesses recover following a disaster.	1, 2, 4	Medium	DOA-DH, WEM	This will hasten business recovery, thereby minimizing losses.	Unchanged; in 2012 the Guidebook received an Innovation Award from the National Association of Development Organizations.
13.2 – Target business-related mitigation materials to Wisconsin businesses, especially in vulnerable areas.	1, 2	Medium		This action is further advancing the goal of saving lives and reducing damage in severe weather events.	Unchanged.

Action	Goal(s) Met	Priority	Supporting Agencies	Contribution to Mitigation Strategy	2016 Update Status
13.3 – Chair the Business Subcommittee on the Wisconsin Recovery Task Force (WRTF).	1, 4, 5	High		The WRTF assists individuals, businesses, and communities in recovering quickly, safely, and with more resilience from future disasters.	New action item.
13.4 – Develop a Memorandum of Understanding regarding the provision of technical assistance when dispensing disaster funds to businesses.	1	Medium	DOA	Having an agreement in place prior to a disaster will expedite the disbursement of funds and overall recovery.	New action item.
14.1 – Provide incentives when grant proposals address hazards with appropriate mitigation measures.	1, 4, 5	High		State funded mitigation grant proposals can only benefit the residents of Wisconsin and further the goals in the State Mitigation Plan.	Unchanged.
14.2 – Seek out opportunities to sponsor low-cost hazard mitigation demonstration projects.	1, 2, 4, 5	Medium		Implementing mitigation demonstration projects sets an example to all communities that mitigation clearly reduces damage.	Unchanged.

SECTION 4: LOCAL HAZARD MITIGATION PLANNING

The Mitigation staff at Wisconsin Emergency Management (WEM) works with counties and local jurisdictions to encourage and support all-hazards mitigation planning since publication of the hazard mitigation planning regulations (44 CFR Parts 201 and 206) in the Federal Register dated February 26, 2002. On July 1, 2008, the Final Rule was published to include local mitigation plan update requirements and the Tribal Multi-Hazard Mitigation Planning Guidance (44 CFR 201.7). The updated local and tribal guidance was designed for three major objectives:

- 1. To help local jurisdictions develop and adopt new mitigation plans or revise existing mitigation plans to meet the requirements of 44 CFR Part 201;
- 2. To help federal and state reviewers evaluate mitigation plans from different jurisdictions in a fair and consistent manner; and
- 3. To help local jurisdictions conduct comprehensive reviews and prepare updates to their plans to meet the requirements of 44 CFR Part 201.

On October 31, 2007, FEMA published amendments to the 44 CFR Part 201 and 72 Federal Register 61720 to incorporate mitigation planning requirements for the Flood Mitigation Assistance (FMA) program. The amendments impacted 44 CFR §201.6, Local Mitigation Plans, as follows:

- 1. Combined the Local Mitigation Plan requirement for all Hazard Mitigation Assistance programs under 44 CFR §201.6 to include the FMA program as well as the HMGP and PDM programs, thus eliminating duplicative mitigation plan regulations;
- 2. Incorporated the requirement for communities with National Flood Insurance Program (NFIP) insured properties that have been repetitively damaged from floods to address such properties in their risk assessment and mitigation strategy; and,
- 3. Incorporated the requirement for communities that participate in the NFIP to include a strategy for continued compliance with the NFIP.

As of October 1, 2008, these three amendments must be included in the DMA2K plans to be FEMA approved.

4.1 Funding of Local Planning Efforts

The State of Wisconsin has been very successful in securing hazard mitigation planning funds, especially through the PDM program and the HMGP. With 11 federally-recognized tribes and 72 counties updating plans on a five-year cycle, approximately 16 tribal and countywide plans must be updated annually. That number does not include municipal, or university plans, which have also been funded through the state in the past.

In Wisconsin there are 1,850 municipalities (585 cities and villages, and 1,265 towns). Due to the large number of municipalities, limited funds available for planning, and personnel limitations, WEM has determined that tribal and countywide mitigation plans should be encouraged and

will receive priority in funding decisions. The countywide plan refers to the hazard mitigation plan for the county and includes all the incorporated and unincorporated areas of the county, unless otherwise stated. It may also include other public agencies or non-profits, like school districts or rural electric cooperatives. Any municipality within a county may prepare a mitigation plan specific to that municipality, separate from the countywide mitigation plan. Municipal plans may be funded in extraordinary circumstances depending on the availability of funds.

Funding for the PDM program has been unstable in recent years. Because of a decrease in available funds, in 2013 each state was allowed to submit only five subapplications. In 2014 and 2015, each state could submit ten, and in 2016, it was increased to 18. This presents challenges in funding all countywide plan updates in the state. Tribes can apply directly to FEMA for PDM planning funds without the applications counting toward the state limit. WEM encourages tribes to do this, remaining committed to offering the same level of technical assistance to direct applicants as to subapplicants who apply to the program through the state.

With PDM planning grants were awarded in 2011-2016 as follows:

- 2011 PDM cycle funded seven planning grants
- 2012 PDM cycle was not used because there was a large disaster declaration, so the HMGP was used to fund all planning grants with impending expiration dates
- 2013 PDM cycle funded five planning grants
- 2014 PDM cycle funded ten planning grants
- 2015 PDM cycle funded nine planning grants (and one project to round out the ten allowable subapplications)
- 2016 PDM cycle had 11 planning grants applied for; to date all 11 have been selected for further review and requests for information completed (two projects were also submitted and selected for further review)

DMA2K also authorized 7% of HMGP funds to be used for developing and updating mitigation plans. Depending on the size of a disaster, that can mean funding for dozens of plans or only a few. Because of the unpredictable nature of disasters, HMGP funding for local plans cannot be relied on, but will be fully utilized when available. Based on the amount of funding available, since the previous State Plan update in 2011, WEM has utilized 7% HMGP planning funds under federal declarations 1933-DR, 1944-DR, 1966-DR, 4076-DR, and 4141-DR to fund another 29 local and tribal plans. WEM has also received eight planning subapplications for 4276-DR, declared in August 2016 and will be soliciting for additional planning subapplications under 4288-DR, declared in October 2016.

All 72 counties in Wisconsin have completed or are developing all-hazards mitigation plans as of November 2016. Additionally, ten of the 11 tribal governments in the state, seven municipalities, and two universities have current mitigation plans or are developing them.

The FMA program can also be used to fund flood-only mitigation plans. A number of plans were funded under this program between 1996 and 2006, but currently the state only funds all-

hazards local and tribal mitigation plans, so FMA planning funds are no longer utilized.

Appendix C lists the FMA, PDM, and HMGP subawards funded in the state, separated into plans and projects. The tables list the funding source, subrecipient, and dollar amount of the subawards.

Figure 4.1-1 shows the planning status of all counties in Wisconsin as of November 2016. Tribal, municipal, and university plans are listed at the bottom.

4.2 Hazard Mitigation Planning Program Process

In 2016, almost all counties and tribes in the State of Wisconsin have completed initial plan development. In addition, all counties and tribes with expired plans and many with approved plans are in the five-year plan update process.

WEM gives funding priority to those communities that have yet to develop a plan and/or are in a county included in the most recent federal disaster declaration. Additional priority is given to counties with plans expiring in the next two years. The ranking and prioritization of grant applications is based on the following criteria:

- Budget and local share secured
- Reasonable work schedule
- Description of the planning process
- Geographic and political areas to be covered in the plan
- Reference maps attached
- Population to be covered by the planning area
- Is the community small and impoverished?
- Description of the hazards to be included
- Description of the problems
- Other community planning initiatives
- Expected benefits of the planning process
- Is the county in a disaster declared area?
- Does not have a plan
- Plan expiration date

The above criteria apply to PDM and HMGP planning grant applications.

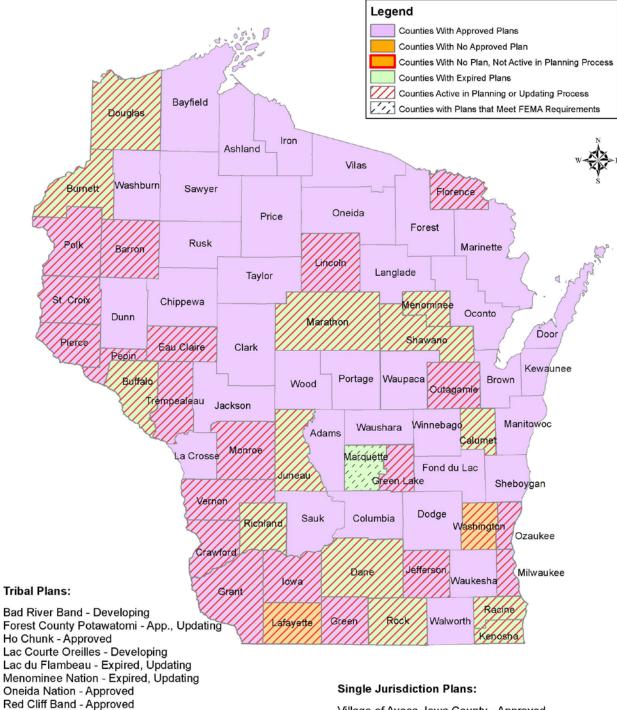


Figure 4.1-1: Local Mitigation Plan Status, November 2016

University Plans:

University of Wisconsin-Madison - Approved University of Wisconsin-River Falls - Approved

Stockbridge-Munsee Band Mohican - Approved

Sokaogon Community - Approved

Village of Avoca, Iowa County - Approved
City of Crandon, Forest County - Approved
City of Darlington, Lafayette County - Approved
City of Eau Claire, Eau Claire County - Approved
City of Milwaukee, Milwaukee County - App., Updating
City of Sheboygan, Sheboygan County - Approved
City of Superior, Douglas County - Approved

The mitigation plan can be a separate, stand-alone plan or part of a comprehensive plan. In addition, plan participation can be tribal, municipal, countywide, or other multi-jurisdictional such as by region or watershed. Some counties may develop their hazard mitigation plan as an annex to their Emergency Operations Plan.

WEM works closely with the local governments to provide technical assistance in plan development. Draft mitigation plans and completed Plan Review Tools are submitted to WEM Mitigation staff for review and comment. Based on the criteria and guidance, review comments are provided to the community. The review ensures that each plan meets the requirements of 44 CFR Part 201, complies with existing federal and state policies and regulations, and complements the State of Wisconsin Hazard Mitigation Plan and state mitigation priorities.

Plans are reviewed on a first-come, first-served basis with every effort to complete the review within 45 days of submission. Once the plan meets all of the required planning criteria, Mitigation staff notifies the community that the plan will be sent to FEMA for review. State Mitigation staff completes a final Plan Review Tool and submits that with the final plan in electronic format. FEMA then reviews the plan and either requests additional revisions or issues a conditional approval letter. Once FEMA issues the conditional approval letter, the county and participating jurisdictions can formally adopt the plan.

Future mitigation projects and initiatives are based on those identified in the local hazard mitigation plans. Jurisdictions are allowed the flexibility to add and remove established mitigation projects as priorities, funding, and situations change. The ongoing mitigation strategy review process is vital for the state and local governments.

4.3 Technical Resources

WEM Mitigation staff provides ongoing support through technical assistance and guidance to tribes, counties, and communities developing or updating all-hazards mitigation plans. Assistance provided includes, but is not limited to:

- Meeting with communities to review mitigation planning requirements.
- Conducting annual All-Hazards Mitigation Planning Workshops for communities and consultants developing or updating hazard mitigation plans. Since the 2004 plan, workshops have been held at least annually for a total of 19 general workshops and one tribal workshop. Class attendees receive all class and supplemental information in a binder and on a CD. In addition, the information is posted to WEM's Hazard Mitigation website
- Conducting FEMA's G-393 Introduction to Mitigation for Emergency Managers course at least annually. It has been held seven times since 2011. It is a three-day course that looks at the mitigation planning process in great detail.
- Providing written and oral guidance. All communities developing or updating mitigation plans are provided a copy of the Resource Guide to All Hazards Mitigation Planning; the FEMA State and Local Hazard Mitigation Planning How-to-Guides; FEMA's Local

Mitigation Planning Handbook, Plan Review Guide, and Plan Review Tool; and FEMA's Tribal Multi-Hazard Mitigation Planning Guidance as well as other planning documents.

- Delivering technical assistance through reviewing sections of plans under development and providing feedback.
- Relaying relevant information obtained from FEMA.
- Identifying information sources available through state and federal agencies, locally and nationally.
- Interpreting state and federal guidelines.
- Distributing planning best practices examples and making approved plans available.
- Providing information via WEM's website. The website provides:
 - o Local Hazard Mitigation link:
 - Resource guides and tools for developing local all-hazards mitigation plans
 - Approved local hazard mitigation plans
 - Guidance and crosswalk
 - o State Risks and Hazard Mitigation link:
 - Information on the hazards that impact the state
 - Repetitive loss information
 - State Hazard Mitigation Plan
- Writing and distributing via email planning updates to provide local governments with the latest information, guidance, and suggestions related to hazard mitigation planning.
- Providing information on repetitive loss properties and NFIP claim information as well as disaster payments for the community.
- Promoting all-hazards mitigation planning at various WEM trainings such as:
 - New Directors Series
 - o Introduction to Emergency Management
 - o Disaster Response and Recovery Operations Workshop
 - o Pre-conference training session at the Governor's Conference
 - Local damage assessment classes
- Informing Wisconsin Association of Floodplain, Stormwater, and Coastal Managers membership on all-hazards mitigation programs and planning through the newsletter and annual conference.
- Writing hazard mitigation planning articles in various newsletters like the DNR Floodplain quarterly newsletter.

Publications

To assist communities in developing flood mitigation plans, in 1995 the Department of Natural Resources developed the Wisconsin Community Flood Mitigation Planning Guidebook. In addition to the guidebook, WEM developed additional planning guidance to meet FMA

planning requirements.

In 2002 FEMA provided a grant to the states to assist in preparing for and developing processes and procedures for implementing the newly-created Pre-Disaster Mitigation (PDM) program. The state contracted with the Council of Regional Planning Commissions (now the Association of Wisconsin Regional Planning Commissions) to develop local mitigation planning guidance. The *Resource Guide to All Hazards Mitigation Planning in Wisconsin* was completed and has been widely distributed at planning workshops and upon request.

One of the mitigation action items of Wisconsin Emergency Management listed in the 2011 and 2016 State of Wisconsin Hazard Mitigation Plan is to update the 2003 *Resource Guide to All Hazards Mitigation Planning in Wisconsin* to include new planning regulations, guidance, and data sources.

4.4 State, Tribal, and Local Hazard Mitigation Planning

4.4.3 Process for State, Tribal, and Local Planning Coordination

As tribal and local plans are developed or updated and submitted to the state for review, WEM Mitigation staff read through the tribal/local mitigation goals and ensure that they align with state mitigation priorities. While it is not required that tribal/local goals exactly match the state's mitigation priorities, it is important for consistent mitigation program delivery and maximizing funding opportunities that they do not conflict. If a conflict was discovered, WEM Mitigation staff would work directly with the community in question to learn what influenced the community to select the conflicting goal or goals and whether the state's mitigation priorities should be re-evaluated based on new information.

Tribal and local mitigation actions are also reviewed to ensure compliance with the National Flood Insurance Program, if applicable, and to confirm they target the areas and hazards identified as having the highest potential losses in the tribal/local risk assessment. Each time a Hazard Mitigation Assistance grant application period opens (annually for the PDM and FMA programs, following a disaster for the HMGP) and for each update of the state HMGP Administrative Plan and Hazard Mitigation Plan, the state's priorities are re-evaluated by WEM Mitigation staff and the Wisconsin Silver Jackets Hazard Mitigation Team. This is done to ensure that the priorities of the state match with tribal and local priorities and the projects they feel are important to implement.

In the annual All-Hazards Mitigation Planning Workshop and other courses and materials, the state's mitigation goals and priorities are shared with tribes and local communities. This allows them to ensure their goals and strategies complement the state's and to discuss any questions or concerns they have about the state's mitigation program. Additionally, the statewide risk assessment (Appendix A), is promoted as a tool for the tribes and local communities to use when completing their risk assessments. Because the tribal and local risk assessments target relatively small areas of the state, most of the information is not appropriate for inclusion in the

statewide risk assessment. However, certain areas of the state have higher populations, higher risks, or unique conditions that may warrant more in-depth coverage in the statewide risk assessment. For those areas, specific information may be extracted from local risk assessments for inclusion in the state plan.

Additionally, as plans are reviewed, WEM Mitigation staff look for best practices and trends. The best practices are distributed in the annual All-Hazards Mitigation Planning Workshop and upon request. The trends are monitored and noted for potential discussion in upcoming workshops and inclusion in the State Plan. In the five years since the previous plan update, it was noted that climate change was seen in tribal and local plans more and more often. That along with FEMA's new requirement to include climate change in state plans, prompted WEM Mitigation staff to look more closely at climate change both in tribal and local plans and for inclusion the state plan (see Appendix A, Threat Hazard Identification and Risk Assessment).

4.4.2 Climate Change in the State Plan

While there remains some debate about the cause of climate change, there has been a documented change in weather patterns over time in Wisconsin. In the past 50 years, average statewide temperatures have increased by about 1.1°F. It is also likely that the state will see more extreme weather events.¹ Section 3 of Appendix A, Thread Hazard Impacts and Risk Assessment (THIRA), further discusses national and statewide climate change projections and mitigation potential. Because a change in climate has the propensity to affect the severity and extent of the natural hazards addressed in the THIRA, the potential impacts of climate change are addressed in each natural hazard section.

As a state-level agency, WEM does not do bricks-and-mortar mitigation projects; that is a local responsibility. However, WEM has the opportunity to influence and encourage local mitigation efforts through training, technical assistance, and resource allocation. To reflect this, WEM has included several new action items in the Mitigation Strategy in Section 3 of the Plan. They encompass a variety of approaches including, but not limited to, the following:

- Incorporating information on planning for future conditions into trainings
- Incorporating Climate Resilient Mitigation Activities into the scoring system for project applications
- Updating WEM's local mitigation plan review document to include criteria on the assessment of changing future conditions, including weather patterns

4.4.3 Climate Change in Local Plans

WEM Mitigation staff looked at all approved local and tribal plans from 2011 through 2016 and all plans in process for which a draft has been submitted. Only one plan was evaluated for each county, tribe, municipality, or university, so for plans in process, the current draft was evaluated

¹ Wisconsin Initiative on Climate Change Impacts report, http://www.wicci.wisc.edu/report/2011 WICCI-Report.pdf, 2011.

and the previous plan was not. Of the 86 total plans evaluated, 70 were countywide plans, seven were tribal plans, seven were municipal plans, and two were university plans.

The tables in Figures 4.4.3-1 and 4.4.3-2 show the breakdown of plans by year and type, respectively, in relation to whether they included climate change. There are three categories: plans with no mention of climate change; plans that mentioned climate change only in passing, possibly in relation to how it may affect one hazard in the future; and plans that fully addressed climate change. The Percent Including Climate Change was calculated as those plans that mention climate change and those that fully discuss climate change divided by the total plans in that category. The decision was made to do this because communities that mention climate change are at least thinking about it and have the opportunity to address it more fully in future plan updates, when perhaps the political will is leaning more in favor of it or better localized research is available.

Figure 4.4.3-1: Inclusion of Climate Change in Local Plans by Year of Approval

	2011	2012	2013	2014	2015	2016	In Process
No Climate Change	3	12	7	7	12	5	7
Mentions Climate Change	0	1	2	1	0	1	0
Fully Addresses Climate Change	0	2	7	3	3	4	9
TOTAL	3	15	16	11	15	10	16
Percent Including Climate Change	0.0%	20.0%	56.3%	36.4%	20.0%	50.0%	56.3%

Figure 4.4.3-2: Inclusion of Climate Change in Local Plans by Type of Jurisdiction

	Counties	Tribes	Municipalities	Universities	TOTAL
No Climate Change	45	4	4	0	53
Mentions Climate Change	4	1	0	0	5
Fully Addresses Climate Change	21	2	3	2	28
TOTAL	70	7	7	2	86
Percent Including Climate Change	35.7%	42.9%	42.9%	100.0%	38.4%

Because of the relatively small sample size, it's difficult to draw meaningful conclusions, but overall it seems that generally over time more plans are starting to include climate change. Additionally, it appears as though countywide plans are the least likely type to include climate change even though quite a few of them do. As more plans in the state are developed and updated, more data will be available to use to paint a more accurate picture.

Further analysis was performed on the plans that included climate change. Of the plans that just mentioned it, three countywide plans stated climate change could impact lake levels in the future and therefore the rates of coastal erosion. One countywide plan stated generally that climate change will impact future conditions in unknown ways, and one tribal plan mentioned that climate change can have impacts on rainfall patterns, which in turn affect tree growth, forest composition, and wildfire risk.

Common themes among the plans that fully addressed climate change were discussions of

probability, impacts to the community, and impacts to other hazards. Three counties and one tribe suggested climate change adaptations that focus on areas of potential impacts, like water resources and the built environment. Five counties and one tribe included mitigation actions that address climate change and the University of Wisconsin-River Falls included climate change in one of their three mitigation goals.

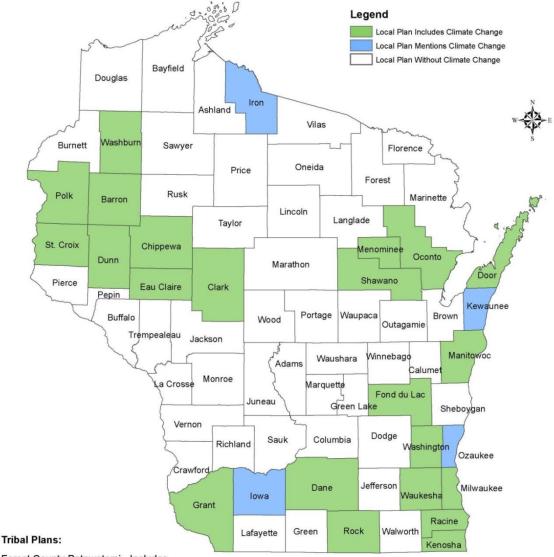


Figure 4.4.3-3: Local Plans and Climate Change, November 2016

Forest County Potawatomi - Includes
Ho Chunk - Does not include
Menominee Nation - Does not include
Oneida Nation - Includes
Red Cliff Band - Does not include
Sokaogon Community - Does not include
Stockbridge-Munsee Band Mohican - Mentions

University Plans:

University of Wisconsin-Madison - Includes University of Wisconsin-River Falls - Includes

Single Jurisdiction Plans:

Village of Avoca, Iowa County - Does not include
City of Crandon, Forest County - Does not include
City of Darlington, Lafayette County - Includes
City of Eau Claire, Eau Claire County - Includes
City of Milwaukee, Milwaukee County - Includes
City of Sheboygan, Sheboygan County - Does not include
City of Superior, Douglas County - Does not include

Figure 4.4.3-3 shows which communities have fully included, mentioned, and not included climate change in their local mitigation plans. Many communities along the Lake Michigan coast have included it. Notably, three counties that did not include a discussion of climate change mentioned it in relation to the impact to lake levels and coastal erosion. The state mitigation plan also describes the impacts climate change could have on coastal hazards.

With the exception of the Fox River Valley in Brown County and the surrounding area, the major population centers and areas of the state experiencing the most growth (Madison/Dane County, southeast counties, St. Croix County, Eau Claire County) are covered by mitigation plans that include climate change.

Many communities around the state are engaging in other planning and activities in preparation for climate change:

- The Milwaukee Metropolitan Sewerage District, the leader in mitigation in the Milwaukee area, commissioned a Climate Change Vulnerability Analysis in 2014. The study looked at likely climate-related impacts through 2050.
- The Wisconsin Department of Natural Resources, Bureau of Science Services compiled the La Crosse Area Climate Adaptation Study in 2013. The Study involved community engagement and suggested future steps. One of the suggestions was to incorporate adaptation into local mitigation planning.
- The City of Madison and Dane County are both engaged in climate change planning.
 Madison developed a Climate Protection Plan that describes climate change and looks at
 current and potential future impacts the City's practices have on the environment. The
 Dane County Climate Change and Emergency Preparedness report, prepared by the
 Climate Change Action Council, discusses climate risks and identifies adaptation
 opportunities and strategies to increase resilience. The Action Council is led by Dane
 County Emergency Management.

The trend toward including climate change in local plans parallels the direction of the state plan. WEM Mitigation staff will continue to look for ways to inform and support local communities in their planning efforts and will work with communities to understand their concerns and challenges in planning for and implementing long-term, cost-effective mitigation measures.

SECTION 5: PLAN MAINTENANCE PROCESS

Hazard mitigation planning is a continuous process. The policies and procedures established in the State of Wisconsin Hazard Mitigation Plan reflect the current emergency management and hazard mitigation philosophy at both the state and federal levels. Federal regulations [44 CFR 201.4 (d)] require the State Plan to be reviewed, revised, and submitted for approval to the Region V Director of FEMA every five years. The regulations also require a plan maintenance process that includes an established method and schedule for monitoring, evaluating, and updating the plan; a system for monitoring implementation of mitigation measures and project closeouts; and a system for reviewing progress on achieving goals as well as activities and projects identified in the Mitigation Strategy.

5.1 Monitoring, Evaluating, and Updating the Plan

Wisconsin Emergency Management is responsible for developing, reviewing, evaluating, and updating the State Hazard Mitigation Plan and submitting to FEMA for approval every five years. The State Hazard Mitigation Officer (SHMO), with the support of the Wisconsin Silver Jackets Hazard Mitigation Team (WSJHMT) will coordinate the implementation and update of the State Plan.

The State Plan, approved in 2005, 2008, and 2011, stated that a review will take place in three ways:

- Annually for progress made on mitigation actions and projects identified in the Mitigation Strategy of the State Plan.
- After each major disaster in the state that receives a Presidential Disaster Declaration to address areas where the State Plan should be amended to reflect the impact of the disaster.
- Every five years before submission to FEMA for approval.

The SHMO will convene regular WSJHMT meetings to monitor and evaluate progress on achieving hazard mitigation program goals and actions as identified in the Mitigation Strategy. In addition, the WSJHMT will continue to discuss, research, and develop mitigation recommendations in support of the Plan's goals. These recommendations will then be added to the Plan during the five-year Plan update.

In the event of a major disaster declaration, the SHMO and the WSJHMT will review the existing State Hazard Mitigation Plan to determine if existing policies, priorities, programs, and/or capabilities are adequate to address the issues generated by the disaster. The SHMO and Federal Hazard Mitigation Officer, Region V National Flood Insurance Program (NFIP) Specialist and the state Department of Natural Resources Floodplain Management staff will develop the post-event Mitigation Strategy at the Joint Field Office. This strategy will identify mitigation opportunities and issues that need to be addressed based on the event and identify the specific activities that each agency will accomplish in administering mitigation programs for the

declaration. This report will become an integral part of the annual report as well as the five-year Plan update.

During this five-year update cycle, there were four federal disaster declarations, FEMA-4076-DR declared August 2, 2012, FEMA-4141-DR declared August 8, 2013, FEMA-4276-DR declared August 9, 2016, and FEMA-4288-DR declared October 20, 2016. The WSJHMT met to discuss the impacts of the disasters and it was felt that the goals and mitigation actions of the State Plan as well as the Mitigation Strategies for those events were current and adequate. This method of analysis has worked well during the update process. WEM Mitigation staff and WSJHMT members are presently involved in recovery efforts for the two most recent events declared in August and October, 2016, which will be ongoing for the foreseeable future. In addition, the Wisconsin Recovery Task Force (WRTF) was convened for 4276-DR and 4288-DR. The WSJHMT is the Mitigation RSF Subcommittee on the WRTF, which is led by the SHMO.

This update of the plan looked at the following. Subsequent updates will continue addressing the items identified below:

- Review and revise the State Risk Assessment. The State Risk Assessment has been
 incorporated into the THIRA (Threat Hazard Identification and Risk Assessment) and is
 included in Attachment A to the State Plan. This will include a review and update of
 hazard profiles and data on vulnerable state facilities as new information becomes
 available. With this update, technological and human caused hazards have been included
 in the THIRA as well as the impacts from changing future conditions.
- Include information from local and countywide all-hazards mitigation plans completed during the five-year update cycle especially those sections related to the Risk Assessment and Mitigation Strategy.
- Examine progress on and determine effectiveness of mitigation actions in the Mitigation Strategy and determine how the performance of those actions should influence the State Plan's Mitigation Strategy.
- Examine implementation of the State Plan, identify problems (technical, political, legal, and financial), and develop recommendations to overcome them.
- Examine the effectiveness of state-funded, local mitigation projects, and determine how the performance of those projects should influence the Mitigation Strategy.
- Recommend ways to increase involvement by state agencies and local jurisdictions in hazard mitigation.
- Recommend revisions to the Mitigation Strategy's goals, recommendations, projects, and action plan to reflect changes in policies, priorities, programs, and funding; as appropriate, recommendations will include findings of any hazard mitigation reports following disaster events.
- Following review and revision of the State Plan, the WSJHMT will analyze the plan maintenance process, and make changes to improve the process and method used to review the plan.

In addition, the State Plan update will be coordinated with other state plans, as appropriate, such as the Wisconsin Emergency Response Plan, Wisconsin State Recovery Plan, and THIRA.

The WSJHMT will review and concur with the Plan update before submission to FEMA. WEM will request signed state agency concurrence from those state agencies represented on the WSJHMT when FEMA advises that the update meets requirements. Agency concurrence will be incorporated into the Plan update as adoption of the update and included in Appendix K. The table in Figure 5.1-1, shows the schedule of activities for the next five-year Plan update cycle.

Figure 5.1-1: Plan Update Schedule of Activities

Activity	Target Date
Hold a WSJHMT meeting to discuss development of the update and the agencies' roles and the responsibilities as members of the Team. (WEM)	11/1/20
Review the Mitigation Strategies for any declared disasters since the last update to identify new issues generated by those disasters. (WEM, Team)	11/1/20
Review and update the State Risk Assessment [201.4(c)(2)] incorporating information from local all-hazards mitigation plans. (Risk Assessment is in the THIRA.) (WEM)	2/1/21
Review and update the Mitigation Strategy [201.4(c)(3)] incorporating information from local all-hazards mitigation plans. (WEM, Team) • Update the State Capability Assessment • Update the Local Capability Assessment • Review existing Mitigation Actions and report progress • Identify new Mitigation Actions based on recent disasters, information from local plans, and changes in programs, regulations, policies, and funding. • Identify any new potential funding sources or programs	4/1/21
Review and update the mitigation and disaster history portions of the plan including status of mitigation projects completed and those currently in progress from the last update of the Plan. (WEM)	6/1/21
Review and update the coordination of local mitigation planning and assistance [201.4(c)(4)] portions of the plan. (WEM)	6/1/21
Review and update the Plan Maintenance [201.4(c)(5)] section of the plan. (WEM)	6/1/21
Review and Update the Enhanced [201.5(b)] portion of the plan. (WEM)	6/1/21
Assemble draft of the Wisconsin Hazard Mitigation Plan update. (WEM)	7/1/21
Copy and distribute the draft Wisconsin Hazard Mitigation Plan and request agency review and comments. (WEM, All)	8/1/21
Incorporate changes into final draft of the Wisconsin Hazard Mitigation Plan update. (WEM)	9/1/21
Distribute Wisconsin Hazard Mitigation Plan update for final review and concurrence. (WEM, All)	9/15/21
Submit Wisconsin Hazard Mitigation Plan update to the Federal Emergency Management Agency for review and approval. (WEM)	10/1/21
Distribute approved State Hazard Mitigation Plan update to state and federal agencies, as appropriate; place on WEM's website. (WEM)	12/1/21

The SHMO will distribute copies of the approved Plan to federal, state, local, and tribal agencies

as appropriate. In addition, the Plan can be viewed and downloaded at WEM's website, http://emergencymangement.wi.gov.

5.2 Monitoring Progress of Mitigation Actions

The previous version of the State Plan stated that the Plan will be reviewed and evaluated annually to ensure that program implementation is on schedule. Team members will complete an annual progress reports and submit the report to the SHMO. This process has not worked well for the WEM and the rest of the Team. Therefore, the process will be changed as described below.

The previous process was to have WEM Mitigation staff track progress of actions identified in the State Plan and prepare an annual report by December 31. The annual report would include progress on recommendations and whether that progress is meeting the goals as stated in the Mitigation Strategy. The report would also contain a review of the effectiveness of current programs and recommend additional mitigation activities for the future. The information contained in the annual reports would be incorporated into the five-year Plan update. During this update, one annual report was completed for 2012. The remaining annual reports were not completed during the update cycle as planned due to staffing and other work priorities. Although reports were not completed, WEM was aware of agency activities through day-to-day contact and Team and WRTF meetings following disaster declarations in 2012, 2013, and two in 2016.

In 2014 the three-year update requirement was changed to five years. During the update cycle, it was found to be time consuming to try and capture all of the activities from the past five years. For the next update cycle, WEM will track activities annually by gathering the information throughout the year, and complete an analysis at the end of the year. This information will be gathered through normal correspondence and contact with Team members, as well as regularly-scheduled and as-needed WSJHMT and WRTF meetings. Minutes are produced after each meeting which will also serve as documentation for the year end analysis. In addition, information is provided in quarterly progress reports submitted to the Region.

5.3 Project Monitoring and Closeouts

State agencies and local governments with projects funded by the Hazard Mitigation Grant Program, Pre-Disaster Mitigation program, and Flood Mitigation Assistance program are required to submit quarterly reports to WEM. Additionally, agencies and local governments receiving hazard mitigation grants are required to submit a closeout report at the conclusion of any project. More information on the process used to monitor progress of mitigation actions funded by FEMA's Hazard Mitigation Assistance programs can be found in Sections 6.4.3 and 6.4.4, Comprehensive State Hazard Mitigation Program, and the Hazard Mitigation Grant Program Administrative Plan, Appendix F.

SECTION 6: COMPREHENSIVE STATE HAZARD MITIGATION PROGRAM

This section of the Plan will serve as the State's Enhanced Hazard Mitigation Plan and will demonstrate that the State of Wisconsin has developed a comprehensive, effective, and integrated hazard mitigation program. This section will describe how the Plan has been integrated with other State planning initiatives as well as the FEMA mitigation programs. Further, it will provide documentation and describe how the State effectively utilizes available mitigation funding and is capable of managing increased mitigation funding that will become available upon approval.

The State of Wisconsin Hazard Mitigation Plan was updated and approved as a Standard and Enhanced State Mitigation Plan by the Federal Emergency Management Agency (FEMA) in a letter from the Regional Administrator dated December 6, 2011.

6.1 Integration with Other Planning Initiatives

The Mitigation staff in the Wisconsin Division of Emergency Management (WEM) is responsible for integrating, to the extent practicable, hazard mitigation planning and programs with other state and local planning initiatives and programs. This section includes a discussion of the state agencies that the Mitigation staff cooperates with as partners in the effort to meet the State mitigation goals as identified in Section 3. Throughout the planning process, mitigation staff coordinated with and utilized information provided by the other state agencies. Section 2 provides a thorough discussion of the state planning process and initiatives while Section 3 identifies the state's pre and post-disaster hazard management policies, programs, and capabilities to mitigate the state's hazards. As planning efforts continue and mature, interaction among the various agencies will expand. The state agencies, as part of the Wisconsin Silver Jackets Hazard Mitigation Team, were integral in the creation of the state's mitigation goals and action plan found in Section 4.

Section 2 and the State Capability Assessment found in Section 3.2 discuss the related mitigation programs and projects that make up the state's overall mitigation capacity and contribute to the state's mitigation program. The table in Figure 6.1-1 summarizes the integration of hazard mitigation planning with other state planning initiatives. They are discussed in more detail in Section 2.

Figure 6.1-1: State Planning Initiatives

Initiative	Description
Comprehensive	The state's comprehensive law required communities to develop a comprehensive
Planning – State	plan by January 1, 2010, if they wish to make decisions to change and manage land
Agency Resource	use in their jurisdiction. The State Agency Resource Working Group (SARWG) was a
Working Group	statutorily funded group of the Wisconsin Land Council administered through the
	Department of Administration, Division of Intergovernmental Relations which is
	responsible for administering the Comprehensive Planning Grant Program for the
	State. Representatives came from various state agencies and participated in
	promoting and cooperating on land use issues. The State Hazard Mitigation Officer

Initiative	Description
	participated on the group to promote mitigation planning as part of the comprehensive planning process. The DOA-Comprehensive Planning Grants Program representative on the SARWG also participates on the WSJHMT. With the sunset of the Wisconsin Land Council, the group is no longer statutorily funded or required, however, members continue to communicate and share information via e-mail to promote comprehensive and mitigation planning. The nine comprehensive planning elements and ideas for how to integrate mitigation planning are included in local hazard mitigation guidance, <i>Resource Guide to All-hazards mitigation Planning in Wisconsin</i> . The nine planning elements include: Issues and Opportunities; Housing; Transportation; Utilities and Community Facilities; Agriculture, Natural and Cultural Resources; Economic Development; Intergovernmental Cooperation; Land Use; and Implementation.
Wisconsin Coastal Management Program (WCMP)	The WCMP provides technical assistance and coordinates state resources to support the management of Wisconsin's Great Lakes coasts. The WCMP administers the Coastal Grant Program, which provides grants to communities for coastal resource protection and organizes the Wisconsin Coastal Hazards Work Group (CHWG), which includes representatives from the DNR, University of Wisconsin, UW Sea Grant, and WEM. In turn, there is a WCMP representative on the
	 WSJHMT. Program objectives, as described in the Wisconsin 2016-2020 Needs Assessment and Strategy, include: Developing and enhancing government hazard policies through targeted outreach and technical assistance, with a focus on shoreline and bluff erosion policies Developing new local regulations, reviewing local plans, maps, and ordinances, and generating documents for policy makers and homeowners Working with partner agencies and local governments through the CHWG Educating landowners and other stakeholders about coastal hazards, and supporting efforts to train government staff, coastal engineers, and real estate interests Providing technical assistance in the form of reports, outreach documents, visualization tools and mapping to communicate conditions of the coastline in support of local decision making and policy development
Wisconsin Emergency Response Plan	The State Hazard Mitigation Plan is an appendix to the 2015 Wisconsin Emergency Response Plan. Each ESF includes mitigation activities in support of the function. ESF-14 addresses Long Term Community Recovery and Mitigation and identifies priorities for short and long-term recovery; and roles and responsibilities for supporting agencies. It includes the Wisconsin Recovery Task Force (WRTF) and the
Wisconsin Recovery Plan	WSJHMT. The WSJHMT is the Mitigation RSF Subcommittee of the WRTF. The Plan was completed in May 2016 and provides a framework to support local and tribal government in recovering from declared and non-declared events. It outlines the state's recovery structure including the Wisconsin Recovery Task Force, and identifies programs that are available in declared and non-declared events.
Threat Hazard Identification and	The THIRA is a process to identify risk, assess impacts, and define targets for measuring capability gaps and improvements. The THIRA sets capability baselines

Initiative	Description
Initiative Risk Analysis (THIRA) Wisconsin Recovery Task Force (WRTF)	for the State Preparedness Report (SPR). The SPR is a self-assessment of the state's current level of preparedness relative to the capability targets identified in the THIRA. For this plan update, the state risk assessment is being rolled into the THIRA, see Appendix A. The THIRA identifies thirteen hazards (6 considered natural hazards, and 7 technological/human caused.) The THIRA describes the hazard and past history; probability, vulnerability, impact and potential losses; mitigation potential; catastrophic scenario; summary risk analysis; and sources. A key element of ESF-14 and the State Recovery Plan is the WRTF which is comprised of state and federal agencies and NGOs with recovery responsibilities. The WRTF is chaired by the WEM Administrator and consists of six Recovery Support Function (RSF) Subcommittees: agriculture, economic, housing, health and social services, infrastructure, and mitigation. The State Hazard Mitigation Officer serves as the Chair of the RSF Mitigation Subcommittee. The members of the WSJHMT make up the RSF Mitigation Subcommittee. The WRTF serves as the state-level organization responsible for pre-disaster recovery planning, coordination of state and federal recovery efforts, and maintaining readiness and capability to align state RSF subcommittees with the National Disaster Recovery Framework. The WRTF can be activated in declared and non-declared disasters to assist county, local, and tribal jurisdictions in recovering from a disaster.
Homeland Security Council – Interagency Working Group	The Interagency Working Group is chaired by Wisconsin Emergency Management and comprised of representatives of the Departments of Administration; Agriculture, Trade and Consumer Protection; Health Services; Children and Family Services; Corrections; Justice; Natural Resources; and Transportation; as well as the Office of Energy Independence; the National Guard; and UW Police. The Group was formed in the late 90's with its original focus on terrorism preparedness. Since that time, its mission has evolved to cover all hazards and all phases of emergency management. The Group meets the second Thursday of the month or more often if dictated by current events and acts as a support group to the Governor's Homeland Security Council.
Wisconsin Comprehensive Response Group (WCRG)	The WCRG was formed in November 2013 by the WEM Administrator with a mission to address response in the first 72 hours of an event. The workgroup works to enable response, address survivor needs, and look at restoration needs. There are 11 committees. The Mitigation Section Supervisor chairs the Short and Long Term Recovery Committee. The workgroup meets quarterly.
Building Resilience Against Climate Change (BRACE)	The BRACE Workgroup was formed in 2013 and is located in the Wisconsin Department of Health Services, Bureau of Environmental and Occupational Health. The Wisconsin BRACE program seeks to develop climate adaptation strategies based on best practices and scientific knowledge to address health risks related to potential severe weather and climate-driven events. The Climate and Health Program explores the ability to predict the public health burden for the following climate-related risk factors: extreme heat, changing precipitation patterns and flooding, drought, impacts on ground water aquifers and surface waters, vector-borne diseases, and winter weather events. The BRACE program seeks to expand partnerships, provide expertise, foster collaboration and develop strategies that will address health risk factors related to severe weather event indicators. The State Hazard Mitigation Officer participates on the BRACE Workgroup and provided

Initiative	Description
	input into the BRACE Strategic Adaptation Plan.
Wisconsin Initiative on Climate Change Impacts (WICCI)	The mission of WICCI is to generate and share information that can limit vulnerability to climate change in Wisconsin and the upper Midwest. WICCI is a network of many groups and individuals who work together through communication and collaboration. There are working groups who focus on specific climate problems; a Working Group Council that brings working groups together and gives them guidance and support; a Science Advisory Board on climate science and on-the-ground implementation issues, and a Coordination Team to assist with day-to-day operations and outreach. WEM is not part of WICCI, however, they are resource to the WSJHMT and provides information and data to support mitigation activities. Agencies and some members of the WSJHMT serve various WICCI working groups.
Wisconsin Voluntary Organizations Active in Disasters (WIVOAD)	WI VOAD is a humanitarian association of independent voluntary organizations who may be active in all phases of disaster. Its mission is to foster efficient, streamlined service delivery to people affected by disaster, while eliminating unnecessary duplication of effort, through cooperation in the four phases of disaster. Staff from WEM provides coordination and assistance to WIVOAD members. WIVOAD has taken a lead role in long-term recovery and sponsors Long Term Recovery Committees. These committees, using WIVOAD's 501(c)(3) tax exempt status, focus on fundraising, reaching out to individuals and families with unmet disaster needs, and providing services to them through a uniform case management process. The WIVOAD chair also sits on the WSJHMT and the WRTF.
Risk Assessment of State-Owned and Operated Buildings, Critical Facilities, and Infrastructure	There are 6,579 state facilities per the Department of Administration's database. The structures range from small storage sheds to large multi-story office buildings. WEM has identified 1,086 critical facilities including agency, location, and replacement cost. The total replacement cost is \$5.56 billion. The plan identifies the vulnerability from the hazards in the THIRA.

As stated above, the state agencies on the Wisconsin Silver Jackets Hazard Mitigation Team were integral in the creation of the State Plan through the development of the mitigation goals, capability assessment, and action plan found in Section 3. The table in Figure 6.1-2 lists the agencies that were active in the planning process and summarizes their contributions to the process and the state's overall mitigation program.

Figure 6.1-2: Contributing Agencies

Agency	Contribution to Process
Department of Administration (DOA)	 Demographic Services Center supplies state and local agencies with population and housing estimates and projections. Information used in hazard mitigation planning. Comprehensive Planning provides guidance and assistance to local governments in the development of comprehensive plans. Planning elements are included in hazard mitigation planning guidance. Hazard mitigation is identified in several planning elements. The Wisconsin Land Information Program provides a data resource for state and local governments in the development of both comprehensive and hazard mitigation plans.

Agency	Contribution to Process
Dept. of Agriculture, Trade and Consumer	 Wisconsin Coastal Management Program provides guidance and assistance to the 15 coastal counties on incorporating coastal hazards into comprehensive and hazard mitigation planning. The Division of State Facilities provides WEM with a list of state-owned and -operated assets for assessing risks, vulnerability and potential damages from the hazards identified in the THIRA. Manages and administers the state's Community Development Block Grants for both housing and public facilities. Mitigation activities are encouraged and costs are eligible within the programs. Coordinates closely with WEM to further mitigation and disaster recovery after an event and in many instances provides local match to FEMA mitigation grant programs. Manages and administers several programs that reduce environmental damages from flooding.
Protection (DATCP) Wisconsin Emergency Management (WEM)	 Chairs the WRTF Agriculture Subcommittee. Responsible for the development, maintenance and implementation of the State Hazard Mitigation Plan. Responsible for administration of HMGP, FMA, and PDM programs. Provides guidance and assistance in the development and updates of local hazard mitigation plans. This includes plan review and providing comments. As plans are approved, local goals/objectives, capabilities, and mitigation actions are incorporated into updates of the State Plan. Promotes hazard awareness and mitigation through awareness campaigns, newsletter, agency website, and workshops. The State Hazard Mitigation Officer is chair of the RSF Mitigation Subgroup on the WRTF and also leads the WSJHMT. Provides technical assistance to local and tribal jurisdictions by developing
	 tools such as worksheets, and providing training through conducting workshops and webinars. Provides support to the Wisconsin Association for Floodplain, Stormwater and Coastal Management.
Department of Health Services (DHS)	 Provides technical assistance and/or personnel to address special needs populations, environmental health issues, communicable or infectious disease, radiological/nuclear issues, and bio-terrorism preparedness. Administers FEMA crisis counseling grants and case management for declared disasters. Works closely with the Long Term Recovery Committees, Individual Assistance and Mitigation staff. Chairs the WRTF RSF Health and Social Services Subcommittee. The Bureau of Environmental and Occupational Health coordinates the BRACE (Building Resilience Against Climate Change) program that looks at health impacts as a result of climate change.
Wisconsin Historical Society (WHS)	Provides historic preservation assistance. Reviews proposed mitigation projects to meet Section 106 requirements. Maintains inventory of historic structures. Provides technical assistance in projects involving historic and archaeological sites and structures.
Office of the Commissioner of Insurance (OCI)	Responsible for the regulation of insurance carriers and agents. Provides public information on insurance issues. Provides CEU instruction to insurance industry.

Agency	Contribution to Process
Department of Natural	DNR staff has provided text, review, and comment on this State Plan,
Resources (DNR)	previous plans, and Mitigation Strategies after each disaster event.
	Floodplain management staff assists WEM Mitigation staff in reviewing
	proposed mitigation projects for engineering feasibility and provides
	information from Flood Insurance Studies for conducting Benefit-Cost
	Analyses.
	Environmental staff provides review and input in the environmental review
	process on proposed mitigation projects.
	Administers the state's Shoreland Protection Program, Local Floodplain
	Management Standards, and State Wetland Standards.
	Administers the Municipal Flood Control and Riparian Restoration program
	that provides grants to local governments for flood mitigation. Coordinates
	closely with WEM and in some cases provides local match to federal
	mitigation grants.
	Administers the NFIP and provides information on flood insurance,
	floodplain management and flood hazard mapping.
	Administers the Dam Safety Program which inspects dams and reviews
	repair plans and operation and maintenance plans. Provides grants to repair
	and remove dams. Ensures that high-hazard dams have the required
	emergency action plans.
	Administers Chapter 30 which sets standards for placement of structures
	and material, diversion of water, and other activities in navigable waters.
	Stormwater management requires erosion controls and stormwater
	management practices on construction sites.
	Administers Non-point Targeted Runoff Management Program.
	Manages and administers the provisions of the Managed Forest Law, and
	provides technical assistance to private forests statewide.
	Administers Forest Fire Protection Grant Program, Healthy Forests Initiative,
	Single Engine Air Tanker Program, and the Wildland Urban Interface and
	Fire Wise Communities programs.
	DNR representative co-chairs with WisDOT the WRTF RSF Infrastructure
	Subcommittee.
	Provides support to the Wisconsin Association for Floodplain, Stormwater,
	and Coastal Management.
Department of Safety	Administers the State's Building Codes. This includes training, inspection
and Professional	licensing, plan reviews, and enforcement. Coordinating with WEM and DNR
Services (DSPS)	on the development of response teams that would assist local governments
	after a disaster in inspection of damaged structures.
Public Service	Regulates construction, service, and operations of electric, natural gas,
Commission (PSC)	telecommunications, and water utilities.
Department of	Administers the Disaster Damage Aids Program that provides grants to local
Transportation	governments for flood-damaged roads. Allows improvements to prevent
(WisDOT)	future damages.
	In highway and bridge improvement projects, strives to eliminate or reduce
	potential damages from hazards.
	Identifies mitigation opportunities as part of project developments.
	Transportation Security identifies measures to reduce damages to critical

Agency	Contribution to Process			
	 infrastructure, airports, rail, and maritime assets. DOT representative co-chairs with DNR the WRTF RSF Infrastructure Subcommittee. 			
University of Wisconsin Extension (UWEX)	 Provides community education and public information programs promoting hazard awareness and mitigation concepts. 			
Wisconsin Economic Development Corporation (WEDC)	 Coordinates with the business community to address impacts from disasters and develop an economic recovery framework incorporating mitigation. Chairs the WRTF RSF Economic Subcommittee. 			

6.1.1 Comprehensive Planning

Wisconsin's Comprehensive Planning Law was enacted in 1999 and is often referred to the "smart growth law." It requires all local governments to develop and adopt a comprehensive plan. Beginning January 1, 2010, if a town, village, city, or county enacts or amends an official mapping, subdivision regulation, or zoning ordinance, the enactment or amendment ordinance must be consistent with the community's comprehensive plan. The law was amended in 2010 to delay the requirements until January 1, 2012, for those local governments that have applied for but have not received a comprehensive planning grant; and to allow the Department of Administration (DOA) to grant local governments that have received a planning grant a time extension to adopt the plan by January 1, 2012. There are nine planning elements:

- Issues and Opportunities
- Housing
- Transportation
- Utilities and Community Facilities
- Agricultural, Natural, and Cultural Resources
- Economic Development
- Intergovernmental Cooperation
- Land Use
- Implementation

At the same time the legislation was passed in 1999, a Comprehensive Planning Grant Program was created in the DOA to help local governments develop their comprehensive plans. Grant funds were available through the DOA for completing comprehensive plans. As of September 2010, \$21 million in grants had been awarded to 1,171 communities. As of September 27, 2016, 66 county plans, 1,455 municipal plans, four tribal plans, and seven Regional Planning Commission plans had been submitted. Due to budget cuts, no grants have been awarded since 2010 and no grants are planned for the future.

Based on a 2011 report, it is estimated that 100 county and municipal governments exercise

local land use regulations subject to the Comprehensive Planning Law's consistency requirement, but have not adopted a comprehensive plan and are not completing one.

Figures 6.1.1-1 and 6.1.1-2 show the comprehensive planning status statewide.

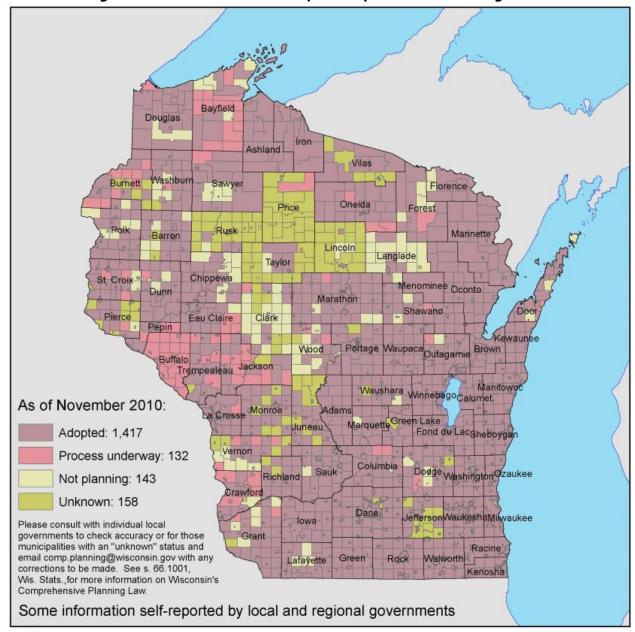


Figure 6.1.1-1 Statewide Municipal Comprehensive Planning Status



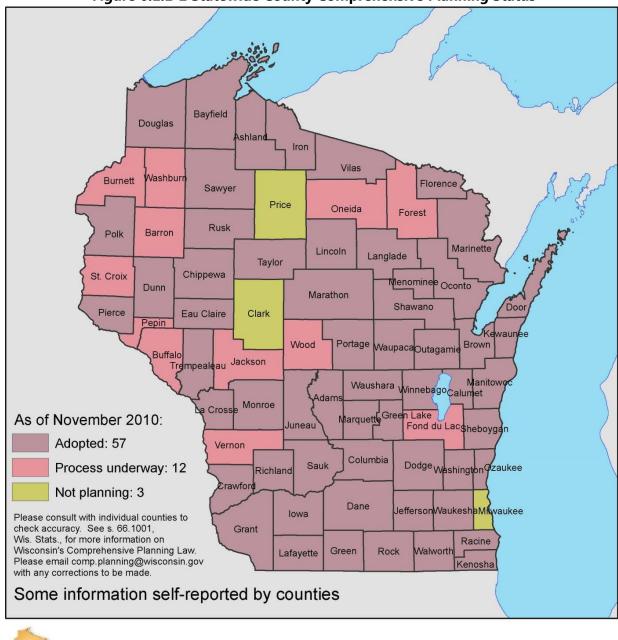


Figure 6.1.1-2 Statewide County Comprehensive Planning Status

Division of Intergovernmental Relations www.doa.state.wi.us/compplanning

November 30, 2010

There is a DOA Comprehensive Planning representative on the Wisconsin Silver Jackets Hazard Mitigation Team. The State Hazard Mitigation Officer (SHMO) was also a member of and participated on the State Agency Resource Working Group.

WISCONSIN DEPARTMENT OF ADMINISTRATION

Although there is no required element for hazard mitigation, the importance of comprehensive planning is discussed and stressed at the annual Hazard Mitigation Planning Workshops held by Wisconsin Emergency Management. It is imperative future development plans identify and locate hazards to assist policymakers in making the best and safest decisions for their residents.

In turn, hazard mitigation planning needs to be cognizant of future development plans. A list of the nine comprehensive planning elements and some ideas on how to integrate all-hazards mitigation planning concepts into them are included in the *Resource Guide to All Hazards Mitigation Planning in Wisconsin*. In addition, where to integrate the comprehensive planning elements into the all-hazards mitigation plan are also described in the Guide. The DOA's website includes a link to the Guide. Local all-hazards mitigation plans can be integrated into the comprehensive plan as long as all of the required elements are included, and vice versa. Hazard Mitigation Assistance planning grants could be provided to communities desiring to develop one plan that meets both mitigation and comprehensive planning requirements, however, only those portions directly related to the mitigation requirements would be eligible for funding.

6.1.2 Regional Planning

The Association of Wisconsin Regional Planning Commissions (AWRPC) represents the nine Regional Planning Commissions (RPCs) in Wisconsin. Figure 6.1.2-1 shows a statewide map with the service areas for each RPC. For most communities in Wisconsin, RPCs serve as the only affordable local planning body available and are a source of planning expertise in the development of comprehensive plans and special purpose plans including all-hazards and flood mitigation plans. The RPCs provide the mechanism by which multiple jurisdictions within a region may coordinate their plans. Most of Wisconsin's RPCs assist communities in developing their comprehensive plans as required by state law. Recognizing the close relationship the RPCs have with local governments, the resources they can provide, and the link between comprehensive and hazard mitigation planning, WEM utilized its 2002 FEMA Pre-Disaster Mitigation \$50,000 (one-time) grant to contract with the Council of Regional Planning Organizations (now the AWRPC) to develop local mitigation planning guidance. The *Resource Guide to All-Hazards Mitigation Planning in Wisconsin* is provided to local and tribal governments to assist them in the development of hazard mitigation plans. The Guide is utilized at planning workshops and distributed upon request.

Since there is a close relationship between the RPCs and the local governments, and between comprehensive and hazard mitigation planning, a representative from the AWRPC (formerly Council of Regional Planning Organizations) joined the Wisconsin Hazard Mitigation Team (now the Wisconsin Silver Jackets Hazard Mitigation Team – WSJHMT) in 2003. This member serves as a conduit between the RPCs and the WSJHMT. Having an AWRPC member participate on the WSJHMT helps the state share resources, combine planning requirements, avoid duplication, and provide additional local and regional assistance to communities that choose to plan. This individual is also a member of the WRTF RSF Mitigation Subcommittee.

As a result of the 2008 flood disaster, the Economic Development Administration (EDA) provided grants to the RPCs in the disaster area for the development of Flood Recovery Strategies. To accomplish the tasks assigned, the Department of Commerce took the lead and coordinated the effort that was referred to as the EDA Disaster Recovery Collaboration. The group met monthly through August 2011. WEM Mitigation staff participated in the collaboration by attending the meetings and providing input. Potential projects were brought forward and discussed to

maximize funding opportunities. In addition, a collaboration website was established where members shared information. One of the outcomes of the group, again with the Department of Commerce as the lead, was the development of a Community Economic Recovery Guidebook to assist economic development organizations, businesses, and community leaders in preparation of economic recovery from a disaster. A link to the updated guidebook was placed on WEM's website and can be downloaded at https://sites.google.com/a/schoolfactory.org/recovery/.

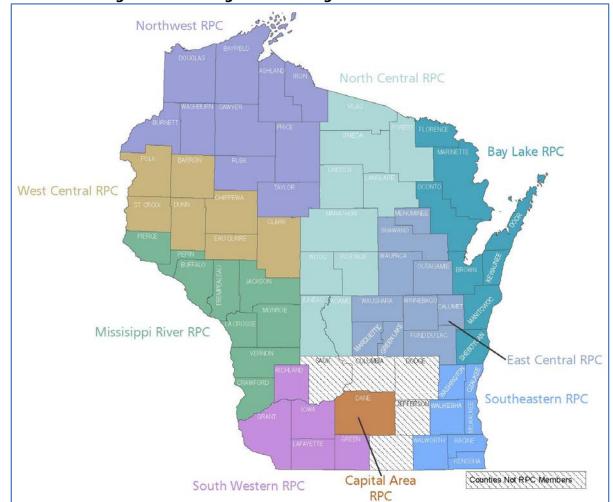


Figure 6.1.2-1: Regional Planning Commission Service Areas

Source: Association of Wisconsin Regional Planning Commissions, www.awrpc.org, accessed 10/31/2016.

The RPCs are one of WEM's strongest partners in mitigation planning. They have provided planning services to many of the counties in the development and update of all-hazards mitigation plans. In addition, the RPCs prepare grant applications for local governments to obtain federal and state assistance for many types of activities including mitigation grant subapplications for both plans and projects. After the 2008 floods, RPCs located in the southern part of the state worked with their respective local jurisdictions to assist in the completion of additional grant applications for recovery assistance. With the involvement of the RPCs in the state and local planning process, they are knowledgeable on both state and local mitigation

priorities and program requirements. Therefore, they are able to develop comprehensive grant applications.

6.1.3 Rural Electric Cooperatives

Rural Electric Cooperatives (RECs) are integral to the State of Wisconsin and its communities. The first REC in Wisconsin energized its system in the spring of 1937 and the last REC energized its system in 1945. Today, there are 25 RECs in Wisconsin that generate, transmit and distribute electric power. Wisconsin's RECs collectively serve more than 257,000 consumers (approximately 625,000 people); and maintain 50,807 miles of power lines. Nationally, investor-owned and municipal power companies have 34 and 48 services per mile of line, respectively. Service densities directly relate to the amount of revenue per mile of line and to the impact of service outages from natural hazard events.

Initial discussions of development of a REC Annex to the State of Wisconsin Hazard Mitigation Plan began in late 2007. Several RECs in the State had been recipients of hazard mitigation funding. WEM approached the Cooperative Network (at that time Wisconsin Federation of Cooperatives) to gauge the interest of the state's RECs in developing a REC Annex to the State of Wisconsin Hazard Mitigation Plan.

Thirteen of the state's RECs entered into a Memorandum of Understanding with Wisconsin Emergency Management that included the following:

- Joint development of a REC annex for inclusion in the State of Wisconsin's Hazard Mitigation Plan
- Identification of natural hazards that have the potential of affecting a REC's infrastructure
- Conducting an assessment of vulnerabilities of the infrastructure to these hazards and mitigation measures to reduce these vulnerabilities
- Active participation in the periodic review, evaluation, and update of the REC Annex.

In previous versions of the Hazard Mitigation Assistance (HMA) Unified Guidance, private nonprofits were required to have participated in a FEMA-approved hazard mitigation plan to be an eligible subapplicant for the Hazard Mitigation Grant Program. In the 2015 HMA Guidance, however, that requirement was removed (as long as the entity meets the Public Assistance definition of a private, non-profit organization.) Because the state strongly believes in predisaster mitigation planning, whether required or not, we will continue to work with the electric cooperatives to update the REC Annex, although it may be completed at a later date than the main body of the State of Wisconsin Hazard Mitigation Plan. This delay is in part because of the two flooding disasters the state experienced this year, both in regions served primarily by RECs and whose cooperatives were impacted.

In working with the RECs throughout the state, WEM Mitigation staff learned that the RECs felt the biggest barrier to implementing mitigation projects through the HMA programs was passing

the benefit-cost analysis (BCA). Many miles of power lines are vulnerable to hazards, but without having past damage events, it is difficult for a project to pass the BCA. Some RECs were hesitant to participate in the REC Annex planning process because they did not see the point if their projects could not pass the BCA and become eligible for funding. To address this issue, in 2015, WEM and FEMA staff jointly held a REC BCA Workshop in Black River Falls, a location central to many of the RECs. Additionally, in early 2016, WEM staff, a Wisconsin Electric Cooperative Association representative, and a REC representative held a call with a FEMA BCA expert and worked through the BCA for a potential project using future damage probability instead of recorded past damages. This work will facilitate the implementation of REC mitigation projects.

6.2 Integration with FEMA Mitigation Programs and Initiatives

There are several federal programs that the state utilizes, which include regulations that provide local communities with guidance for state and regional agencies. Section 3, Figure 3.2.1-2 provides information on federal capabilities.

6.2.1 Public Assistance Program

Mitigation measures can be implemented through FEMA's Public Assistance (PA) program after a disaster declaration (under Section 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5172). PA funds allow an existing damaged facility to incorporate mitigation measures during repairs if the measures are cost-effective or are required by code.

This provision in the regulations, however, has been very much underutilized. Initially, PA provided funds to repair facilities to pre-disaster condition without considering mitigation opportunities. Beginning in 1996 with disaster declaration FEMA-1131-DR-WI, a greater effort was made to fund Section 406 mitigation through the PA program. Federal mitigation staff was assigned to liaise with state PA staff and to provide technical assistance. To further emphasize mitigation opportunities, a Memorandum of Understanding (MOU) for disaster declaration FEMA-1180-DR-WI was developed between state and federal representatives to promote the implementation of Section 406 mitigation measures.

In disaster FEMA-1332-DR declared in July 2000, the Federal Coordinating Officer's goal was to incorporate Section 406 mitigation into 20% of all PA projects. Mitigation was actually incorporated into 40% of projects, significantly exceeding the goal.

State PA staff strongly supports mitigation. The Mitigation and PA staffs coordinate closely to ensure that Section 406 mitigation opportunities are included wherever possible. Mitigation staff can provide support to PA subapplicants in completing benefit-cost analyses to support Section 406 projects. Following the declarations in 2012, 2013 and 2016, WEM developed strategic objectives to coordinate with PA to better identify 406 mitigation projects in the state to highlight success stories. WEM mitigation staff consults with State PA staff on any Hazard Mitigation Grant Program pre-applications that have potential for Section 406 funding.

6.2.2 National Flood Insurance Program (NFIP)

The three components of the program are: flood insurance, floodplain management, and flood hazard mapping. By participating in the NFIP, communities agree to adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in Special Flood Hazard Areas (SFHAs). In turn, federally backed flood insurance is made available within the community as financial protection against flood losses. Flood insurance and floodplain management are the first line of flood mitigation. Flood insurance is an alternative to disaster assistance, which is not available in every flood event. Gaining participation in the NFIP and encouraging property owners to purchase flood insurance significantly reduces disaster costs. Flood insurance and floodplain management reduce flood exposure to people and property.

Flood insurance policies within communities participating in the regular NFIP program include benefits for Increased Cost of Compliance (ICC). For structures with a substantial damage determination, up to \$30,000 is made available to bring the structure to current NFIP standards, which will mitigate the structure from future flood events. This can include elevation, relocation, or demolition. State Mitigation staff provides ICC information and guidance to communities after a flood disaster. The ICC can provide for demolition costs in an HMA acquisition/demolition project and count towards the required local match. ICC benefits are also available for severe repetitive loss properties mitigated with FMA funds regardless of whether recent flood damage has occurred.

From 2006 through 2015, total flood insurance claims nationwide averaged more than \$1.9 billion per year. In 2015 the NFIP was over \$23 billion in debt to the US Treasury with little chance that the program could ever repay that debt. Congress looked at why the program was in debt and what could be changed to improve it. The 2012 Flood Insurance Reform Act, otherwise known as Biggert-Waters 2012 (BW-12) included provisions for the phase-out of subsidies and discounts on flood insurance premiums which would equate to 25% increase in premium rates each year until the premiums reflected full risk rates. The Act also included other measures to improve the financial soundness of the NFIP. When the first rate increases hit, homeowners in affected areas responded with anger. This led to Congress to pass the Homeowner Flood Insurance Affordability Act of 2014 (HFIAA) that repealed and modified certain provisions of the BW-12 and made additional program changes to other aspects of the program not covered by the original Act. HFIAA lowered the recent rate increases on some policies, prevented some future rate increases, and implemented a surcharge on all policyholders. It also repealed certain rate increases that had already gone into effect and provided for refunds to those policyholders. The law required FEMA to designate a Flood Insurance Advocate to advocate for the fair treatment of NFIP policy holders. HFIAA also authorized additional resources to complete an affordability study. HFIAA will impact over 5.5 million flood insurance policies of which 16,262 are in Wisconsin.

Knowing the importance of flood insurance, WEM, the Office of the Commissioner of Insurance (OCI), and the Department of Natural Resources participated in an effort that promoted flood insurance in Wisconsin during Flood Insurance Awareness Week (March 16-20, 2009). Several

press releases were distributed to media outlets encouraging citizens to purchase flood insurance. On March 17, 2009, the WEM Administrator, the Insurance Commissioner, the DNR Secretary, and the Region V Mitigation Division Director toured three Wisconsin cities promoting the need for and importance of flood insurance. The three agencies again coordinated efforts to promote subsequent Flood Awareness Weeks March 15-19, 2010 and March 14-18, 2011. Efforts included mailing media packets to the county emergency management offices and media outlets promoting flood safety awareness and encouraging residents to assess their risks and purchase flood insurance. The information was posted to the WEM and Ready Wisconsin websites. Following the flooding in northern Wisconsin that resulted in the federal declaration 4276-DR, the Commissioner of Insurance attended meetings along with several other Department Secretaries in Sawyer and Ashland Counties providing information and answering questions regarding insurance. The Office of Commissioner of Insurance's website provide information regarding flood insurance (https://oci.wi.gov/Pages/Consumers/FloodInsurance.aspx) as well as provides information after flooding events, answers questions, and respond to complaints.

The NFIP's Community Rating System (CRS) was implemented in 1990 to recognize and encourage community floodplain management activities that exceed the minimum NFIP standards. The National Flood Insurance Reform Act of 1994 codified the CRS in the NFIP. Policy holders in communities that participate in the Community Rating System (CRS) are entitled to a discount on their policy. Under the CRS, flood insurance premium rates are adjusted to reflect the reduced flood risk resulting from community activities that meet the three goals of the CRS: (1) reduce flood losses; (2) facilitate accurate insurance rating; and (3) promote the awareness of flood insurance.

There are 10 CRS classes (categories): class 1 requires the most credit points and results in the largest premium reduction; class 10 receives no premium reduction. Only one community in the nation has achieved a class 1 rating: Roseville, California. The CRS recognizes 18 creditable activities, in four categories: Public Information, Mapping and Regulations, Flood Damage Reduction, and Flood Preparedness. The table in Figure 6.2.2-1 shows the credit points earned, classification awarded, and premium reductions given for Wisconsin communities in the CRS.

Figure 6.2.2-1: Wisconsin Communities in the CRS

Community Number	Community Name	CRS Entry Date	Current Effective Date	Current Class	Credit for SFHA	Credit for Non- SFHA
550001	Adams County	10/1/1991	5/1/2012	7	15	5
550612	Allouez, Village	10/1/1992	5/1/2012	6	20	10
550128	Eau Claire, City	10/1/1991	10/1/2008	7	15	5
550578	Elm Grove, Village	5/1/2001	5/1/2012	5	25	10
550366	Evansville, City	5/1/2010	5/1/2010	7	15	5
550136	Fond du Lac, City	5/1/2013	5/1/2013	7	15	5
550022	Green Bay, City	10/1/1991	10/1/2001	7	15	5
550523	Kenosha County	5/1/2013	5/1/2013	5	25	10
555562	La Crosse, City	10/1/1991	10/1/2002	8	10	5

Community Number	Community Name	CRS Entry Date	Current Effective Date	Current Class	Credit for SFHA	Credit for Non- SFHA
550001	Adams County	10/1/1991	5/1/2012	7	15	5
550612	Allouez, Village	10/1/1992	5/1/2012	6	20	10
550128	Eau Claire, City	10/1/1991	10/1/2008	7	15	5
550578	Elm Grove, Village	5/1/2001	5/1/2012	5	25	10
550366	Evansville, City	5/1/2010	5/1/2010	7	15	5
550136	Fond du Lac, City	5/1/2013	5/1/2013	7	15	5
550022	Green Bay, City	10/1/1991	10/1/2001	7	15	5
550523	Kenosha County	5/1/2013	5/1/2013	5	25	10
555562	La Crosse, City	10/1/1991	10/1/2002	8	10	5
550085	Mazomanie, Village	10/1/1991	5/1/2012	8	10	5
550487	New Berlin, City	10/1/2005	5/1/2010	7	15	5
550310	Ozaukee County	10/1/1991	10/1/2007	8	10	5
550402	Reedsburg, City	5/1/2013	5/1/2013	6	20	10
550660	Suamico, Village	5/1/2008	5/1/2013	7	15	5
550107	Watertown, City	10/1/1991	10/1/2007	7	15	5
550108	Waupun, City	10/1/1991	10/1/2001	8	10	5
550537	Winnebago County	10/1/1991	10/1/2001	8	10	5

Source: FEMA, 2016.

Three communities, the cities of Fond du Lac and Reedsburg and Kenosha County, joined the CRS since the last Plan update. All three communities have completed acquisition and demolition activities. In addition, ratings for five communities went down (remember: a lower score is better, like in golf), resulting in additional savings in flood insurance premiums for their constituents (Adams County, and the villages of Allouez, Elm Grove, Mazomanie, and Suamico).

In addition to providing flood insurance and reducing flood damages through floodplain management regulations, the NFIP identifies and maps the nation's floodplains. Mapping flood hazards creates the broad-based awareness of the flood hazards and provides the data needed for floodplain management programs to actuarially rate new construction for flood insurance.

Floodplain maps and Flood Insurance Studies (FIS) provide critical flood hazard information needed to develop effective planning focusing on the areas with the greatest flood risk. In addition, WEM utilizes this flood hazard information in evaluating proposed hazard mitigation projects and conducting benefit-cost analyses.

Figure 6.2.2-2 shows NFIP participation statistics for Wisconsin as of October 1, 2016. There are serious consequences for communities that elect not to participate in the NFIP: flood insurance is not available to individuals or businesses (lending institutions cannot approve mortgages for properties located in a SFHA without the purchase of flood insurance); certain disaster assistance (HGMP, FMA, and PDM programs) and other federal grants are not available to individuals, businesses, or local governments.

Figure 6.2.2-2: NFIP Statistics for Wisconsin

<u> </u>	
Participating communities - regular program	544
Participating communities - emergency program	3
Total participating communities	547
Participating communities with no SFHA identified	18
Non-participating communities with SFHAs identified	65
Total communities with SFHAs identified	594*
Suspended communities	16
Withdrawn communities	2

^{*} This number includes all 72 counties. Source: FEMA, 2016.

As part of the mitigation strategy after a disaster declaration, DNR contacts the non-participating and suspended communities to provide them with information and technical assistance and to encourage them to join the program.

The NFIP is administered by the Wisconsin DNR Floodplain Management Program (FMP). WEM works closely with the DNR on NFIP issues, since community eligibility for pre- and post-disaster mitigation programs relies on NFIP participation. The FMP plays an important role in state mitigation efforts. The responsibilities of FMP staff members include, but are not limited to, the following:

- Help communities administer local floodplain management programs
- Provide technical assistance to local floodplain managers in making substantial damage determinations after a flood
- Ensure that communities are in compliance with local ordinances
- Assist non-participating communities in enrolling in the NFIP
- Assist NFIP-participating communities in enrolling in the CRS
- Represent the FMP on the Wisconsin Silver Jackets Hazard Mitigation Team
- Represent the FMP on the Wisconsin Recovery Task Force RSF Mitigation Subcommittee
- Work with WEM Mitigation staff to administer mitigation programs and develop a repetitive loss strategy for the state
- Provide training to local government and emergency management officials on floodplain management and mitigation

In 1995 the DNR developed the "Wisconsin Community Flood Mitigation Planning Guidebook." WEM then developed additional flood mitigation planning guidance to assist local governments in meeting Flood Mitigation Assistance program planning requirements. WEM and the DNR sponsored and conducted flood mitigation planning workshops using both of these documents as training tools.

As complement to the guidebook, the DNR, with financial assistance from FEMA/WEM, developed the video "Mitigation Revitalizes a Flood Community: The Darlington Story." The video showed how the City investigated mitigation measures following recurrent flooding events. The City followed a mitigation planning process similar to the one described in the guidebook to produce a plan that included strategies to decrease future flood damages and attack the underlying economic problems. The video explained how the City brought civic leaders, business owners, and citizens together. The efforts of the City have been recognized in videos produced by FEMA and the Association of State Floodplain Managers.

The DNR has produced a brochure, "Living in the Floodplain: What You Need to Know – Who You Need to Know", which has been widely distributed since 2007. The brochures are handed out at Public Officials Applicants Briefings, training workshops, public meetings, mitigation courses and workshops, and at Disaster Recovery Centers.

After flooding events, local officials are responsible for inspecting flood damaged structures in the special flood hazard area (SFHA) to determine if they are substantially damaged (50% or more damaged). If so, the property owner is required to bring a non-conforming structure into compliance with the local floodplain ordinance. After the 2004, 2007, 2008, and 2010 federal disaster declarations the DNR and WEM Mitigation staff conducted Substantial Damage Determination Workshops to provide information to local officials on their responsibilities under their local floodplain ordinance and advise them of their mitigation options. In addition, the DNR sponsored the FEMA L-273 course, Managing Floodplain Development through the NFIP in 2007 in La Crosse, 2008 in Kenosha County, and 2014 in Eau Claire. The DNR also co-sponsored the course with the Wisconsin Association for Floodplain, Stormwater, and Coastal Management (WAFSCM) and the Association of State Floodplain Managers (ASFPM) in 2016 in Pewaukee. Local officials from around the state attended the class. To further support floodplain management in the state, the DNR conducted 19 floodplain development and permitting workshops in 2008 and 2009, 15 flood insurance workshops in 2010 and 2011, 10 LOMC workshops in 2012, 15 Floodplain Workshops in 2013, 10 Floodplain Workshops in 2014, 11 Floodplain Workshops in 2015, and 12 Floodplain Workshops in 2016; developed and distributed the Floodplain and Shoreland Notes newsletter three times a year to over 1,000 subscribers; and provided support to the WAFSCM. DNR staff also did outreach to the following organizations: Wisconsin County Code Administrators, Wisconsin Building Inspectors Association, Wisconsin Realtors Association, Wisconsin Lakes Association, Wisconsin League of Municipalities, Wisconsin Counties Association, American Society of Civil Engineers, Wisconsin Bar Association, Wisconsin Surveyors Association and Wisconsin Counties Highways Association as well as to the tribal governments of the Ho-Chunk Nation, the Forest County Potawatomi Community, and the Sokaogon Chippewa Community.

6.2.3 Risk MAP

Flood Hazard Maps produced by the NFIP are basic and essential tools for flood insurance, floodplain management, and flood hazard mitigation. Flood Map Modernization (Map Mod) was a multi-year Presidential initiative funded by Congress from fiscal year FY 2003 to FY 2008, which

improved and updated flood maps and provided 92% of the nation's population with digital Flood Insurance Rate Maps.

Risk MAP (Risk Mapping, Assessment, and Planning) is the successor to FEMA's Map Modernization and expands the focus to include risk assessment, mitigation planning and traditional hazard identification (flood mapping) activities. Risk MAP is meant to better inform communities as they make decisions related to reducing flood risk by implementing mitigation actions. Risk MAP will build on the strong foundation of Map Modernization that is in place. This integrated flood risk management approach will weave county-level flood hazard data developed in support of the NFIP into watershed-based risk assessments that serve as the foundation for local hazard mitigation plans and targeted risk communication activities.

The vision for Risk MAP is to deliver quality data that increases public awareness and leads to action that reduces risk to life and property. The Risk MAP goals are:

- 1. Address gaps in flood hazard data
- 2. Measurably increase public's awareness and understanding
- 3. Lead effective engagement in mitigation planning
- 4. Provide an enhanced digital platform
- 5. Align risk analysis programs and develop synergies

The outcomes and benefits are: engaged communities making informed decisions; increases in accuracy and reliability of products; effective risk assessments and mitigation plans; and communities that can more effectively communicate risk. Risk MAP products may include: flood risk database, flood risk report, and/or flood risk map.

The creation of maps under Risk MAP is a multi-step process:

- **Step 1.** Discovery Meeting: Meet with representatives from the communities chosen for remapping to gather information on local priorities and any available engineering and topographic data
- **Step 2.** Data Development: Information and data gathered at the scoping meeting is reviewed for compliance with FEMA's mapping standards. New engineering studies are done if funding is available.
- **Step 3.** Preliminary FIRMs: Preliminary FIRMs are created using the gathered data. The preliminary maps are made available to local officials and the public for review during an open house.
- **Step 4.** Expanded Appeal Process: A 90-day appeal period is set by the NFIP during which the public can submit comments and appeals to the preliminary FIRMs. The community collects all comments and/or appeals and then forwards those on to the DNR for final evaluation. Changes are then made to the preliminary FIRMs to incorporate any valid comments and appeals.

- **Step 5.** Final Map Creation: Once all changes are made to the preliminary FIRMs, the engineering data and maps are sent to FEMA for final map production. FEMA's Map Service Center is responsible for providing the final maps and the Flood Insurance Study to the affected communities.
- **Step 6.** Letter of Final Determination and Ordinance Adoption: FEMA is responsible for notifying the communities of the effective date of the FIRMs. Each community that will have new FIRM panels is sent a Letter of Final Determination (LFD). The LFD notifies the community that it has six months to amend the current floodplain ordinance.

DNR started working with FEMA as a Cooperating Technical Partner (CTP) in 2001. DNR's priorities for watershed selection were based on flood risk, recent flood events, and availability of digital floodplain and high quality elevation data. The scope of Risk MAP activities in Wisconsin continues to broaden. Risk MAP activities include efforts to update and digitize flood maps; to conduct "discovery meetings" focusing on riverine mapping needs; "discovery meetings" focusing on potential local mitigation actions, and discovery meetings focused on coastal mapping needs. Community officials will have the opportunity to share their local knowledge and concerns on which streams warranted new floodplain map engineering and other related topics. State Mitigation staff attended the discovery meetings, open houses, and resiliency and community outreach meetings. Staff discussed the status of the communities' hazard mitigation plans and how Risk MAP products might assist in making the plans more comprehensive; previous mitigation projects in the area; and hazard mitigation funding opportunities. Mitigation staff will continue to support NFIP efforts in the state.

In the last several years, Risk MAP efforts have focused on the following:

- 1. The update of maps in Ashland County, Wisconsin.
- 2. Great Lakes pilot meetings in Brown County and others.
- 3. New maps for Dodgeville, Wisconsin and Iowa County.
- 4. Wolf River Discovery meetings
- 5. Upper Fox Watershed (Wisconsin) on May 18, 2016

Figure 6.2.3-1: Risk MAP Activities

Watershed	Discovery	Flood Risk Review	Open Houses	Resilience	Community Outreach
Chippewa/Eau Claire/Rusk Counties	January 2011		January, February 2013		
Upper and Lower Rock River	February 2011		March, April, June, July, October, November 2013	January 2014	May 2014, April 2015, August 2016
Lower Wisconsin River	November 2011		May, June, August 2014	March 2014	July, August, September 2014; August 2016
Upper (Illinois) Fox River	November 2012, February 2014	May 2016		May 2016	
Wolf River	February 2015				May 2015

Watershed	Discovery	Flood Risk Review	Open Houses	Resilience	Community Outreach
Milwaukee River	May 2013				
Great Lakes	March 2014	September 2014			February 2015, August 2016
Ashland, Bayfield, Douglas Counties (inland scoping)	July 2014				

As of October 2016, five counties are in the preliminary map production phase, one county is in the final map production phase, and 58 counties have DFIRMS available. Eight counties will not be mapped due to limited funding.

6.2.4 Severe Repetitive Loss and Repetitive Loss Properties

The NFIP paid over \$9 billion in 2012 in flood insurance claims. Historically, over 30% of claims go to property owners who hold only 1% of the policies issued. To address this issue, Congress passed the Flood Insurance Reform Act on June 30, 2004. It included measures to address those properties that result in a disproportionate amount of claims on the NFIP. The Act created the Repetitive Flood Claims and Severe Repetitive Loss programs described below.

In 2006, Congress appropriated \$10 million for the Repetitive Flood Claims (RFC) program to provide funding to reduce or eliminate the long-term risk of flood damage to structures insured through the NFIP. RFC funds were made available to mitigate residential or commercial properties that had received one or more NFIP insurance payments within a state or community that could not meet the requirements of the FMA program for either cost share or capacity to manage the activities. RFC grants were eligible for up to 100% federal funding. Like in the other programs, the state was required to have an approved Hazard Mitigation Plan; however, a local mitigation plan was not required. WEM solicited applications for RFC through the annual HMA application period. The state did not receive any eligible RFC applications from local governments. In 2009, the state worked with a community in Waukesha County where they did not have an approved all-hazards mitigation plan on the potential acquisition and demolition of a property that was substantially damaged in the June 2008 floods. However, the project did not have a positive BCR, therefore, was determined not to be cost-effective.

The Act also created a pilot program for mitigation of severe repetitive loss (SRL) properties, and increased funding in the FMA program would be from \$20 million to \$40 million for five years. Severe repetitive loss properties were defined as NFIP-insured residential properties that meet one of two triggers:

1) Four or more claims over \$5,000 (including building and contents) each, the cumulative amount of such claims payments exceeding \$20,000

2) At least two claims with a cumulative amount exceeding the value of the building.

For both, at least two of the claims must have occurred within any rolling ten-year period since 1978 and must be greater than ten days apart.

The SRL Pilot Program was announced in 2008 with \$80 million available to mitigate properties that met the SRL definition. The purpose of the program was to reduce or eliminate the long-term risk of flood damage to SRL residential properties and the associated drain on the NFIP from such properties. Eligible activities included acquisition, demolition, or relocation; elevation; dry-floodproofing of historic structures; minor physical localized flood control projects; and mitigation reconstruction (demolition and rebuilding of structures). Both the state and community were required to have an approved hazard mitigation plan. Funding was 75% federal with a 25% local match. The match could be reduced to 10% for states with an approved state mitigation plan that included a strategy for reducing the number of repetitive loss properties.

There were 17 states designated at "target states" meaning they had over 51 identified SRL properties. Illinois was the only state in FEMA Region V that met the criteria. Target states received allocations based on the number of SRL properties in the state. 10% was set aside for non-target states.

The Repetitive Loss Report, Appendix D, is used as a resource to prioritize mitigation projects for mitigation grants. The Report provides the state with a resource to identify the properties with the most repetitive losses and to prioritize specific mitigation recommendations for those properties. The state utilizes the Repetitive Loss Report statistics from past and current mitigation projects to provide guidance for future mitigation projects and to reduce future flood losses. Repetitive loss information is a criteria in selecting mitigation projects for funding. RLP information is also provided to local governments to address and include in development and update of their all-hazards mitigation plans.

A summary of repetitive loss (RL) properties in Wisconsin can be found in Appendix D, Wisconsin's Repetitive Loss Report. As of July 2016, there were 659 statewide RL properties that meet the **NFIP** definition (those properties that have had two or more flood insurance claims of at least \$1,000 each within a rolling ten-year period since 1978). Of that number, 103 (15.6%) have been mitigated through acquisition/demolition or elevation. The NFIP database lists 13 (2.0%) as mitigated due to a lack of recent, accurate data. The report identifies 114 communities with RL properties (including mitigated properties). Over 97% of Wisconsin communities with RL properties have five or fewer, as displayed in Table 2 of the report.

The City of Milwaukee, which has 230 repetitive loss properties, is the only community with more than 50 such properties. The City of Milwaukee and the Milwaukee Metropolitan Sewage District (MMSD) actively undertake mitigation projects. In most cases, they are not funded with federal mitigation grants; therefore, WEM is not aware of all of the activities undertaken. As such, it can be difficult to track the status of those repetitive loss properties. The same is true for other communities around the state that engage in locally-funded mitigation activities.

FEMA Region V provides an annual report for SRL and RL properties that meet the **FMA** definition (see Section 6.2.5.) It is important to note that the FMA definition of RLP and SRL is different than the NFIP definition. The reports provide the state with a resource to identify the properties with the most repetitive losses and to prioritize specific mitigation recommendations for those properties. The state utilizes the reports to reach out to the communities and provide guidance for future mitigation of the properties to reduce future flood losses. Since 2010, the state through the HMA programs has mitigated seven SRL and seven RL properties. The tables in Figures 7.2.6-1 and 7.2.6-2 identify those communities with SRL and RL properties remaining.

Figure 6.2.4-1: 2016 Severe Repetitive Loss Communities

Community SRL Properties		Comment	
Berlin, City of	1	Insured	
Crawford County	1	Cannot be located due to insufficient data, uninsured	
Durand, City of	2	1 insured part of a pending FFY16 FMA grant; 1 uninsured	
Janesville, City of	1	Insured	
Jefferson County	2	1 insured and part of a FFY 14 FMA grant; 1 uninsured	
Milwaukee, City of	3	All uninsured	
Pierce County	1	Insured	
Prescott, City of	2	1 uninsured	
Steuben, Village of	1	Insured	
Washington County	2	Insured	
Waukesha County	1	Uninsured	
Total	17		

Figure 6.2.4-2: 2016 Repetitive Loss Communities

Community	Repetitive Loss Properties	Comment
Dane County	1	Insured
Gays Mills, Village of	1	Acquired/demolished
Jefferson County	5	1 acquired/demolished; 1 insured; 3 uninsured
Kenosha County	1	Insured
Marquette County	1	Uninsured
Milwaukee, City of	6	All uninsured
Pierce County	4	1 acquired/demolished; 2 uninsured
Richland County	1	Insured
Rock County	1	Uninsured
Village of Steuben	1	Acquired/demolished
Trempealeau County	1	Uninsured
Total	23	

Repetitive loss information is a consideration in the funding criteria for mitigation projects. When a community submits an application for mitigation funding, the state refers to the SRL and RLP reports as well as the State's Repetitive Loss Report to determine if there are any repetitive loss properties identified in the application. If they are not identified and the

properties fit within the original scope of the project, the state recommends that the repetitive loss properties become part of the project. SRL and RLP information is also provided to local governments to address and include in development or update of local all-hazards mitigation plans.

One of the challenges in addressing SRL and RL properties is that as flood claims are processed, data constantly changes. As the state works to mitigate repetitive loss properties, additional properties are identified in subsequent flooding events. In addition, some of the repetitive loss properties are impossible to identify due to poor location information.

As stated previously, mitigating SRL and RL properties is high state priority. WEM strongly encourages local governments to mitigate such properties; however it cannot force local governments or property owners to do so.

The State of Wisconsin supports, through funding and technical assistance, the development of local mitigation plans in counties with SRL and RL properties. In addition, WEM will work with the county to assist in the plan, and with the community to assist in the project application for such properties. All of the communities with an identified SRL or RL property either have an approved all-hazards mitigation plan or are in the process of updating the plan with one exception. Washington County contains two SRL properties. The County is presently developing their first all-hazards mitigation plan.

WEM reaches out to those communities with identified SRL and RL properties annually as part of the HMA non-disaster grant application period as well as after disasters when HMGP funds are available.

6.2.5 Flood Mitigation Assistance Program

On June 30, 1994, the National Flood Insurance Reform Act (NFIRA) was signed into law. The purpose of the NFIRA was to improve the financial condition of the National Flood Insurance Program (NFIP) and reduce the federal expenditures for federal disaster assistance to flood damaged properties. One of the things that the NFIRA did was create a pre-disaster mitigation grant program called the Flood Mitigation Assistance (FMA) program. The Biggert-Waters Flood Insurance Reform Act of 2012 consolidated the Repetitive Flood Claims and Severe Repetitive Loss grant programs under the Flood Mitigation Assistance program. Although the DNR administers the NFIP, WEM administers the FMA program. It is a cost-share program (minimum 75% federal with a 25% local match) through which states and communities can receive grants for flood mitigation planning and projects and management costs.

The overall goal of the FMA is to reduce or eliminate claims under the NFIP. This is done by funding cost-effective mitigation measures to buildings, manufactured homes and other NFIP-insured structures. Program priority is given to reducing the number of severe repetitive loss (SRL) and repetitive loss properties (RLP) and their associated claims under the NFIP. Other goals of the program are to encourage long-term, comprehensive mitigation planning; respond to the needs of communities participating in the NFIP; and complement other federal and state

mitigation programs with similar goals. The program is subject to the availability of appropriation funding as well as any directive or restriction made with respect to the funds.

Prior to 2011, the state received an allocation based on the number of flood insurance policies in force and the number of repetitive loss structures in the state. At that time repetitive loss structures were defined as those structures that have had two or more flood insurance claims of at least \$1,000 each in the last ten years. The minimum amount any state received was \$10,000 for flood mitigation planning grants and \$100,000 for project grants to implement mitigation activities identified in approved mitigation plans. States could submit applications above the allocation to be considered through a national competition. In addition, up to 10% of the project funds are allowed to be used for state management costs.

Due to program restrictions at the time, the state was not always able to spend the available allocation. In 2004, funds were required to be used for RLPs. The state solicited applications, but there were no projects submitted that met the requirement. Although the state solicited FMA applications in 2008, no applications were received, therefore, the state did not apply for FMA funds. The state solicited FFY 11 FMA applications during the annual HMA (Hazard Mitigation Assistance) program application period. The state reviewed applications to determine if any of the projects fit the FMA program criteria. None were received. The State submitted an application in FFY12 for elevation of a RLP; acquisition and demolition of a SRL property in FFY13, and the acquisition and demolition of two SRL properties in FFY14. The state submitted an application in FFY15 to acquire and demolish an SRL property. The property was found eligible and met program requirement, but was not selected for funding by FEMA. The application was resubmitted in FFY 2016 and has been selected for further review.

Appendix C contains detailed tables describing the FMA projects and plans that have been funded in Wisconsin. Below are the FMA funds (federal share) by year the state has received and implemented:

Figure 6.2.5-1: Flood Mitigation Assistance Funding

FFY	Planning	Project	State Mgmt.	Total
1996/1997	\$11,800	\$117,100		\$128,900
1998*	\$30,754	\$401,500		\$432,254
1999	\$11,250	\$125,100		\$136,350
2000	\$13,307	\$148,110		\$161,417
2001	\$14,257	\$145,250		\$159,507
2002	\$13,800	\$114,125		\$127,925
2003	\$0	\$89,349	\$3,811	\$93,160
2004	\$0	\$0	\$0	\$0
2005	\$13,399	\$107,512	\$8,183	\$129,094
2006	\$10,364	\$0	\$0	\$10,364
2007	\$0	\$180,441	\$5,360	\$185,801
2009	\$0	\$153,000	\$0	\$153,000
2010	\$0	\$83,250	\$2,155	\$85,405

FFY	Planning	Project	State Mgmt.	Total
2011	\$0	\$0	\$0	\$0
2012	\$0	\$84,644	\$8,040	\$92,684
2013	\$0	\$187,637	\$10,473	\$198,110
2014	\$0	\$473,592	\$33,042	\$506,634
2015	\$0	\$0	\$0	\$0
Total	\$118,931	\$2,410,610	\$71,064	\$2,600,605

^{*} Due to unspent funds in other states, Wisconsin was able to receive additional funds. Source: WEM, 2016.

To receive FMA grant funds, the community must be participating and in good standing with the NFIP. Eligible projects and criteria are basically the same as for the Hazard Mitigation Grant Program. The biggest difference is that this program focuses only on flood hazards, not all hazards, and aims to reduce claims submitted under the NFIP, so the projects must reduce the risk of flood damage to structures insured under the NFIP.

Emphasis and priority is given to insured SRL and RL properties. WEM makes every attempt to utilize FMA funds to mitigate losses to these properties. A summary of Wisconsin's Repetitive Loss Report dated October 2016 is presented in Appendix D. The state makes every attempt to mitigate SRL and RL properties through all of the HMA programs.

With the notice of funding availability for the FMA program, WEM Mitigation staff solicits subapplications from those communities that have properties identified as SRL or RLP, and advises of the potential for increased funding. In order to receive increased funding, properties must meet the FMA SRL or RLP definition.

SRL: A structure that is

- a) covered under a current flood insurance policy, and
- b) has incurred flood damage
 - i) for which 4 or more separate claims payment (including building and contents) have been made under flood insurance coverage with the amount of each such claim exceeding \$5,000 and with the cumulative amount of such claims payment exceeding \$20,000,

Or

ii) for which at least two separate claims payment (includes only building) have been made under such coverage, with the cumulative amount of such claims exceeding the market value of the insured structure.

RLP: A structure with a current flood insurance policy that

a) has incurred flood-related damage on two occasions in which the cost of the repair, on the average, equaled or exceeded 25% of the market value of the structure at the time of each such flood event.

and

b) at the time of the second incidence of flood-related damage, the contract for flood insurance contains increased cost of compliance coverage.

SRL properties can be eligible for 100% federal funding and RLP for 90% federal funds with a 10% local match. Properties with a current flood insurance policy, but that do not meet the SRL or RLP definition are eligible for funding of 75% federal funds with a 25% local match.

FEMA and the state have identified the highest priority for funding is SRL properties followed by RLPs.

The previous plan update identified challenges with the FMA program. Some of those challenges have been addressed, but one still remains, which is that planning grant funds can only be used to address flood hazards, not all hazards in a community. They can be used to complete flood mitigation components of local all-hazards mitigation plans. This restriction makes it difficult to award planning grant funds through the FMA program. Communities are not interested in applying for two different planning grants to complete one all-hazards mitigation plan.

Previously the state received several projects that included SRL properties, but failed the benefit-cost analysis. With the change in allowing states to utilize pre-calculated benefits for acquisition and demolition projects, this challenge has been greatly reduced and has opened up more opportunities to mitigate SRL and RL properties.

6.2.6 Hazard Mitigation Grant Program

The Section 404-Hazard Mitigation Grant Program (HMGP) is a critical component of the state's mitigation efforts. The program was created in November 1988 as a result of the Robert T. Stafford Disaster Relief and Emergency Assistance Act that amended PL 93-288, the Federal Disaster Relief Act of 1974. The HMGP is administered by WEM and makes grants available to state and local governments as well as eligible private, non-profit organizations and Indian tribes to implement long-term mitigation measures following a major disaster declaration. Eligible projects must be environmentally sound, cost-effective, solve a problem, and prevent future disaster damages. The grants are cost-shared with 75% provided in federal funds through FEMA with a 25% local match. Wisconsin provides half of the local match; thereby reducing the required local match to 12.5%. In order to receive HMGP funds, a community must be participating and in good standing with the National Flood Insurance Program (NFIP). Further, beginning November 1, 2004, communities must have a FEMA-approved all-hazards mitigation plan to be eligible for funds for project implementation.

President Bill Clinton signed the Hazard Mitigation and Relocation Assistance Act that amended Section 404 of the Stafford Act on December 3, 1993. This amendment significantly increased the amount of funding available in the HMGP in two ways. First, it increased the federal share of grant funds from 50% to 75%. Second, the proportion of federal funds allotted to the HMGP was

increased to 15% of the federal funds spent on the Individual and Public Assistance programs for each disaster, whereas before it was based on 10% of the federal funds spent in the Public Assistance program only. The change of the funding formula raised the amount of HMGP funds available in the state for the 1993 Midwest Flood from \$2 million to \$14 million. Unfortunately, in 2003 the amount of federal funds allocated to each federal declaration was reduced from 15% to 7.5%. States including Wisconsin supported restoring the federal share back to 15% of the Individual and Public Assistance funds for each federal declaration.

On October 30, 2000, the Disaster Mitigation Act of 2000 (DMA2K) was enacted and amended the Stafford Act. The purpose of the Act was to establish a national program for pre-disaster mitigation, streamline administration of disaster relief, and control federal costs of disaster assistance. Section 322 of the act had a great impact on the HMGP. States are required to have a FEMA-approved Standard Hazard Mitigation Plan to be eligible for certain disaster assistance programs including the HMGP. This section also increased HMGP funding from 15% (previously 7.5%) to 20% for those states that have an approved State Enhanced Hazard Mitigation Plan. In addition, it established a requirement for local and tribal mitigation plans and authorized 7% of the HMGP funds to be available to states for use in developing such plans. The Interim Final Rule, 44 CFR Part 201, Hazard Mitigation Planning, published February 26, 2002, and Final Rule, published October 31, 2007, established criteria for state and local hazard mitigation planning authorized by Section 322 of the Stafford Act, as amended by Section 104 of the DMA2K, and contained the rules for hazard mitigation planning and the Hazard Mitigation Grant Program. The rules addressed state and local mitigation planning requirements.

WEM Mitigation staff solicits, reviews, evaluates, and ranks HMGP subapplications before presenting to the Wisconsin Silver Jackets Hazard Mitigation Team for discussion. Based on those discussions, funding recommendations are made to the Division Administrator for a final decision on which applications are forwarded to FEMA for approval. As of October 1, 2016, \$92,093,801 in HMGP project funds and \$1,998,689 in HMGP planning funds have been used in or allocated to the state for 143 mitigation projects and 47 local plans or plan updates. Four federal declarations were declared since the last plan update (4076-DR in 2012, 4141-DR in 2013, and most recently 4276-DR and 4288-DR in 2016). Projects consist of acquisition and demolition, elevation, safe room construction, wind retrofits, stormwater management, utility protection, education and outreach, NOAA weather radio purchase and distribution, river gauge installation, and mitigation planning. The table in Figure 6.8.17-1 identifies approved funding by declaration. In addition, Appendix B provides a detailed history of the disaster declarations and the HMGP. Appendix C identifies mitigation projects implemented statewide. The HMGP is the primary funding component for implementing mitigation actions identified in state and local hazard mitigation plans.

WEM Mitigation staff makes every attempt to fully utilize all available funding. Applications are submitted in the amount of or exceeding all available funding for the declaration within the required timeframe (i.e. 12 months from the declaration, 18 months with approved time extensions). In addition, eligible projects over above the allocation are submitted in the event funds become available. As projects are completed, any unspent funds in projects are

reobligated to projects that have cost overruns. The goal is to spend as much funds as possible and returning as little as possible at the end of the performance period.

The program does have some challenges which are not unique to HMGP, but impact all of the FEMA mitigation programs. The requirement for the project to be cost-effective, meaning that the benefits must outweigh the costs, is the largest challenge that faces projects submitted for funding. In some cases, viable mitigation projects are not funded as they cannot meet FEMA's strict BCA requirements. In most situations the required documentation cannot be obtained. This is particularly frustrating when repetitive loss or severe repetitive loss properties are involved. The planning requirements can be another challenge. In order for a community to be eligible for funding, they must have a FEMA-approved all-hazards mitigation plan. This requirement in limited instances may delay funding of mitigation projects because either the community does not have an approved all-hazards mitigation plan or the plan has expired. In most instances the plan is in the update process, but not yet completed. WEM diligently works with counties to ensure that the plans remain current and do not expire. WEM annually notifies those with plans expiring within two years to start their update process and provides information on available grant funding. If there is a county that doesn't have a plan or if it is expired, they would be a high priority to receive HMGP planning grant funds.

Under the HMGP program, the BCA requirement is waived for properties located in the special flood hazard area (SFHA) that are determined by the authorized local official to be substantially damaged under the local floodplain ordinance. This greatly expedites project approval for acquiring flood-damaged properties. However, a challenge is getting the community to complete the substantial damage determinations. After a declaration, DNR contacts all impacted communities to remind them of their responsibility to complete substantial damage determinations. WEM will work with those communities that have substantially damaged structures to apply for HMGP funding to mitigate those structures. In addition, DNR and WEM conduct substantial damage workshops for local officials. DNR also provides technical assistance to communities if requested.

In August 2013 FEMA issued a memo on pre-calculated benefits for acquisition and elevation projects located in the SFHA. FEMA determined that acquisition and demolition of properties located in the SFHA for which costs are equal to or less than \$276,000 is cost-effective. Further, FEMA determined that elevation of structures located in the SFHA for which costs are equal to or less than \$175,000 is cost-effective. For projects that include multiple properties, the average cost of all structures in the project must meet the stated criterion. This has greatly expedited and increased the number of acquisition and elevation projects including SRL and RL properties.

Further, FEMA has identified and quantified environmental benefits that can be incorporated into the overall benefits for acquisition-related activities. FEMA developed economic values for green open space and riparian areas into the BCA toolkit for acquisition projects. The benefit cost ratio (BCR) must be at least 0.75 before incorporating the environmental benefit. This will assist those projects where the acquisition cost exceeds the pre-calculated benefit and the traditional BCA is required. In addition, FEMA has developed Fact Sheets and Benefit Cost Analysis guidance for Climate Resilient Mitigation Activities (CRMAs). The Fact Sheets provide

high-level technical information and requirements for HMA programs. The Benefit Cost Analysis tools have been developed to calculate benefits for drought mitigation and/or ecosystem services for mitigation projects.

In October 2000, Wisconsin was recognized has a Managing State for the HMGP. This means that FEMA recognized the state is capable of performing benefit-cost analyses and environmental reviews for proposed projects. Based on a Memorandum of Understanding signed by FEMA and WEM, the state prepared a project summary sheet for all HMGP applications submitted to FEMA. Then, instead of reviewing the entire application package, FEMA reviewed the project summary sheet and approved the project and environmental documents. This significantly streamlined the approval process. In a letter dated February 15, 2006, the MOU was terminated. The reason was that with the passage of the DMA2K, Interim Final Rule, published on February 26, 2002, 44 CFR 201, stated: "Management State means a State to which FEMA has delegated the authority to administer and manage the HMGP under the criteria established by FEMA" To date, such criteria has never been developed. Therefore, there are no "managing states."

The Sandy Recovery Improvement Act (SRIA) provided FEMA with the authority to implement provisions of Program Administration by States (PAS). States that wish to participate may be delegated additional defined responsibilities by FEMA based on their staffing plan, grants management and hazard mitigation experience, and demonstrated past performance. In return, the state will have increased control and oversight to implement the HMGP. FEMA approved PAS for the state in administering declaration 4141-DR. Under the PAS agreement, WEM received an expedited application approval process by FEMA, delegated authority to approve extensions for performance periods, approved post-award scope of work changes with no change in activity and no need for additional funds such as extensions for demolition, and approved post-award budget revisions using available funds as a result of cost underruns.

6.2.7 Pre-Disaster Mitigation Program

The Disaster Mitigation Act of 2000 (DMA2K), Public Law 106-390, was signed into law on October 30, 2000, and established a national program for pre-disaster hazard mitigation. The purpose of the law was to reduce disaster losses through pre-disaster mitigation planning; streamline recovery processes through planned, pre-identified, cost-effective mitigation; and link pre- and post-disaster mitigation planning and initiatives.

Section 203 of the Stafford Act, as amended by Section 102 of the DMA2K, created the Pre-Disaster Mitigation (PDM) program. The PDM makes funding available to state, local, and tribal governments to implement cost-effective hazard mitigation activities that complement a comprehensive mitigation program. Funding may be awarded for the development and update of all-hazards mitigation plans or for cost-effective hazard mitigation projects. Subapplicants must be participating in the NFIP for projects located in a Special Flood Hazard Area.

Interim Final Rule, 44 CFR Part 201, Hazard Mitigation Planning, published February 26, 2002, and Final Rule published October 31, 2007, established criteria for state, local, and tribal hazard

mitigation planning authorized by Section 322 of the Stafford Act, as amended by Section 104 of the DMA2K. After November 1, 2004, local and tribal governments applying for PDM funds through states have to have an approved local mitigation plan prior to the approval of local mitigation project grants. States are also required to have an approved Standard Mitigation Plan in order to receive PDM funds for state or local mitigation projects. A major change in the final rule was that all plans approved after October 1, 2008, must address participation in the NFIP and continued compliance with NFIP requirements as well as NFIP insured properties that have been repetitively damaged by floods. The development and subsequent updates of the State of Wisconsin Hazard Mitigation Plan will meet that requirement. Therefore, the development of state, local, and tribal hazard mitigation plans is the key to maintaining eligibility for PDM funding. Another major change to 44 CFR Part 201 was made on April 25, 2014, which changed state plan submissions from three years to five years.

Successful grants receive 75% federal funding of total project costs. The subapplicant is responsible for 25%. Small, impoverished communities may receive federal funding of 90%.

In 2002 FEMA provided a one-time grant in the amount of \$50,000 to the states for developing a statewide strategy for PDM program implementation. Wisconsin used the funds to contract with the Council of Regional Planning Organizations to develop local mitigation planning guidance. Members of the Council were representatives from the Regional Planning Commissions throughout the state. The *Resource Guide to All-Hazards Mitigation Planning in Wisconsin* was completed and has been used to provide guidance to local and tribal governments developing mitigation plans. The Guide is utilized at planning workshops and distributed upon request. In addition, the state received \$476,883 in federal funds for local hazard mitigation planning. The funds were used to award planning grants to thirteen counties and five jurisdictions for the development of all-hazards mitigation plans. In addition, FEMA provided planning grants directly to three of the state's tribal governments.

The 2003 PDM budget provided \$248,375 in federal funds to each state. The state used the funds to award planning grants to another seven counties for the development of mitigation plans.

The remaining PDM appropriation of approximately \$130 million was made available to initiate a national PDM competitive grant program for pre-disaster mitigation activities. The intent of the PDM-C is to provide a consistent source of funding to state, local, and tribal governments for pre-disaster mitigation planning and projects. The state submitted five planning grant applications (three counties and two tribal governments), six project grant applications, and a State Management Costs (SMC) application for a total of \$4,166,387 (\$3,142,442 federal share). One planning and one project subgrant were determined to be small and impoverished; therefore, eligible for 90% federal funding. The PDM-C applications were determined to be eligible by a National Evaluation Panel in accordance with PDM-C Grant Guidance and Notice of Funds Availability, and subsequently were approved for funding. In addition, one tribal organization applied as a direct grantee to FEMA and received a planning grant.

PDM-C funds for 2004 and 2005 were combined and announced in FFY 2005. The state's

application included 19 planning and five project subgrants in addition to SMC in the amount of \$3,549,249. The state was awarded \$1,556,063 for 17 planning grants, and two projects along with SMC.

PDM-C funding in 2006 was reduced to \$50 million nationwide. This limited the state to five subapplications plus SMC. The state submitted three planning, two project subgrants, and state management costs totaling \$947,011. The planning grants and one project were funded in the amount of \$243,553. The second project application for a storm shelter was determined to be eligible, but was not funded due to the lack of funds. The subapplication was resubmitted and funded in 2007.

The state submitted a PDM-C application in 2007 for \$1,831,102. The application included a request for 11 planning subgrants and two projects as well as SMC. Nine of the 11 planning grants and one project grant were approved along with SMC for a total of \$1,758,611.

The 2008 PDM-C application included seven planning subgrants and one project along with SMC for a total of \$2,167,758. The planning subgrants and SMC were approved in the amount of \$262,914. As a result of a Congressional Directive, the state submitted an LPDM (Legislative Pre-Disaster Mitigation) subgrant in the amount of \$630,000. The initial subapplication was denied as it was determined not to be cost-effective. The community resubmitted a subapplication that was approved in the amount of \$238,344.

The 2009 PDM-C application included eight planning and one project subgrant along with SMC totaling \$5,155,319. All of the planning subgrants and SMC were approved for a total of \$379,217. Again in 2009, the state was designated with an LDPM subgrant in the amount of \$300,000 (federal share). Two LPDM subgrants were approved for a generator and sirens in the amount of \$136,500 and \$229,883 for a total of \$366,383. Along with SMC the total grant was \$383,409.

The 2010 PDM-C application included 11 planning and two project subgrants along with SMC in the amount of \$1,104,398. Nine of the planning subgrants and one project along with SMC were approved for \$734,825.

The 2011 PDM-C application included eight planning and three project subgrants along with SMC in the amount of \$4,228,135. The state was initially notified that all of the planning subgrants and two of the projects were selected for further review. However, due to funding cuts, one of the planning and one of the project subgrants were removed from consideration. The state resubmitted these two subapplications, along with one of the other unfunded projects, for funding through the HMGP under declaration 1933-DR. The one remaining project was withdrawn from the competition and was funded under declaration 1933-DR. The planning subgrants along with SMC were approved in the amount of \$302,661.

Figure 6.2.7-1: Pre-Disaster Mitigation Funding

	FFY	Planning	Project	State Mgmt.	Total
	2002	\$476,883	\$0	\$50,000*	\$ 526,883

FFY	Planning	Project	State Mgmt.	Total
2003	\$230,990	\$3,758,585	\$176,812	\$4,166,387
2004-05	\$1,064,142	\$341,600	\$150,321	\$1,556,063
2006	\$156,412	\$65,000	\$22,141	\$243,553
2007	\$1,037,919	\$650,500	\$70,092	\$1,758,611
2008	\$239,017	\$0	\$23,897	\$262,914
2008-LPDM	\$0	\$238,344	\$18,906	\$257,250
2009	\$353,639	\$0	\$25,579	\$379,218
2009-LPDM	\$0	\$366,383	\$17,026	\$383,409
2010	\$593,373	\$93,593	\$47,859	\$734,825
2011	\$275,924	\$0	\$26,737	\$302,661
2012**	\$0	\$0	\$0	\$0
2013	\$166,001	\$0	\$16,536	\$182,537
2014	\$440,672	\$0	\$43,709	\$484,380
2015	\$362,528	\$349,782	\$0	\$712,310
2016***	\$680,622	\$1,078,314	\$175,893	\$1,934,829
Total	\$6,078,122	\$6,942,101	\$815,508	\$13,835,731

^{*}One-time grant. **Did not submit an application. ***Pending approval. Source: WEM, 2016.

The state received four project subapplications for the 2012 PDM cycle. Due to sufficient funding in HMGP that year, the subgrants that met the BCA requirements were submitted through the HMGP instead. Therefore, the state did not submit a 2012 PDM application.

The 2013 PDM application included five planning subapplications as well as SMC in the amount of \$182,537. All subapplications as well as SMC were approved.

The 2014 PDM application included ten planning subapplications along with SMC in the amount of \$484,380. The subapplications and SMC were all approved.

The 2015 PDM application included nine planning and one project subapplication in the amount of \$712,310. The subapplications were all approved.

The 2016 PDM application included 11 planning and two project subapplications along with SMC in the amount of \$1,934,829. The state was advised that all of the subapplications were selected for further review and are presently under review at the Regional Office.

On January 22, 2009, the State of Wisconsin had its first Disaster Resistant University (DRU) plan approved for the University of Wisconsin-River Falls. As a result of the plan, the University received a project subgrant for the construction of small storm shelters located at two research farms. The University of Wisconsin-Madison, the state's largest campus, was awarded a 2011 PDM subgrant for the development of a hazard mitigation plan. The University of Wisconsin-Superior also participated in the City of Superior's plan update in 2016. The DRU plans follow the same methodology as the local mitigation plans.

WEM applied for and received a 2007 PDM-C subgrant for updating the State Hazard Mitigation

Plan. A larger portion of the grant was for the development of a statewide Hazus flood risk assessment. With support from the University of Indiana Purdue-POLIS Center, the University of Wisconsin-Land Information and Computer Graphics Facility (LICGF) completed a statewide Hazus flood risk assessment. The statewide Hazus flood risk assessment was included in the 2008 update of the State of Wisconsin Hazard Mitigation Plan. In addition, the individual county Hazus flood risk assessments were distributed to all counties and to each respective Regional Planning Commission. FEMA highlighted Wisconsin's Statewide Flood Risk Assessment efforts in a Best Practices story. With the 2011 update of the State Plan, a Hazus risk assessment was completed for the counties that had digitized FIRM maps completed since the 2008 update. This included new assessments for 13 counties. The statewide summary was updated to reflect these changes. The project was also highlighted at GIS Day held at the State Capitol in February 2009 for State Legislators.

There are several challenges in administering and implementing the PDM program. As in the FMA and HMGP programs, meeting FEMA's BCA requirements for projects other than acquisition and elevation remain a challenge, although FEMA has developed several tools to assist in the BCA process. Another major challenge is that the annual funding for the program is uncertain from year to year. States solicit and process applications without knowing what the funding availability is. In the past funding has been cut resulting in a limited number of subapplications allowed. In addition, the guidance changes from year to year, although it has been more consistent in recent years. Another challenge is the short application period of 90 days. It is almost impossible to develop complete subapplications in this short timeframe other than acquisition projects and sometimes safe rooms. In this time period the state has to review the guidance, solicit applications, and review and process those applications including completing the benefit-cost analysis and the preliminary consultation for the environmental review. The state does not get any management costs up-front to complete this effort. State Management Costs are only awarded based on subgrant awards. So if funding is drastically reduced or subgrants are not awarded, the state may have put a considerable amount of effort and resources into the program without being awarded adequate management costs. Finally, all applications have to be submitted through FEMA's eGrants system. Subapplicants are not familiar with utilizing this system and some have great difficulty in completing the required subapplication. Another issue is the subapplication utilized in eGrants does not request the required information needed for the BCA. This requires state staff to provide additional technical assistance and guidance outside of the eGrants system to obtain the documentation necessary to complete the subapplication.

WEM Mitigation staff work with local jurisdictions and Regional Planning Commissions to develop projects. When there were National Evaluations, state Mitigation staff participated on the panels every year. WEM will continue to work directly with FEMA Region V to submit projects for future PDM funding. As included in the previous plan update, the SHMO participated on the National Review Panel for the Maryland, Washington, and Florida State Enhanced Plan reviews. Another mitigation staff person sat on the panel that reviewed the second update of the State of Washington's Enhanced Plan.

Appendix C contains detailed tables describing the PDM projects and plans that have been funded in Wisconsin.

6.2.8 Hazus

Hazus was developed by the FEMA under contract with the National Institute of Building Sciences (NIBS). NIBS maintains committees of wind, flood, earthquake, hurricane, and software experts to provide technical oversight and guidance to Hazus development. Loss estimates produced by Hazus are based on current scientific and engineering knowledge of the effects of hurricane winds, floods, and earthquakes. Estimating losses is essential to decision-making at all levels of government, providing a basis for developing mitigation plans and policies, emergency preparedness, and response and recovery planning. Hazus provides estimates of hazard-related damage before a disaster occurs and takes into account various impacts of a hazard event. The impacts include the following:

- Physical damage to residential and commercial buildings, schools, critical facilities, and infrastructure.
- Economic loss, including lost jobs, business interruptions, and repair and reconstruction costs.
- Social impacts, including impacts to people, and requirements for shelters and medical aid.

Hazus uses state-of-the-art GIS software to map and display hazard data, the results of damage, and economic loss estimates for buildings and infrastructure. It also allows users to estimate the impacts of hurricane winds, floods, and earthquakes on populations. Hazus provides three levels of analysis:

- A Level 1 analysis yields a rough estimate based on the nationwide database and is a way to begin the risk assessment process and prioritize high-risk communities.
- A Level 2 analysis requires the input of additional or refined data and hazard maps that will produce more accurate risk and loss estimates. Assistance from local emergency management personnel, city planners, GIS professionals, and others may be necessary for this level of analysis.
- A Level 3 analysis yields the most accurate estimates of loss and typically requires the
 involvement of technical experts such as structural and geotechnical engineers who can
 modify loss parameters based on the specific conditions of a community. This level of
 analysis will allow users to supply their own techniques to study special conditions such
 as dam failures and tsunamis. Engineering and other expertise is needed at this level.

The risk assessment and vulnerability analysis is one of the most difficult tasks for local governments to complete in developing a hazard mitigation plan. Hazus can significantly assist in this effort. In addition, Hazus may assist local governments in developing mitigation policies, developing and improving emergency operations plans, generating scenarios for exercises and training purposes, and quickly estimating losses after a disaster and what resources will be

required for response and recovery. The GIS capability of local governments will determine how successful they are in utilizing Hazus.

A previous WEM mitigation staff member completed Hazus training at the Emergency Management Institute, and interfaced with software developers to gain access to updated versions of the programs and to solve problems encountered with the software. WEM hosted a four-day Hazus class in 2006 conducted by FEMA contractors. The four-day class included both an introduction to GIS and an advanced Hazus Flood class. 32 people attended the training including state staff, RPC staff, and local government staff. FEMA highlighted Wisconsin's Statewide Hazus Flood Risk Assessment efforts in a Best Practices story.

In 2008, WEM partnered with the University of Wisconsin Land Information and Computer Graphics Facility, and the Polis Center at Indiana-Purdue University at Indianapolis on a joint effort to create at statewide Hazus flood risk assessment for all 72 Wisconsin counties. This statewide Hazus flood risk assessment was included in the 2011 State Plan. In addition, the individual county Hazus flood risk assessments were distributed to all counties and each respective Regional Planning Commission. Since DFIRMs (Digital Flood Insurance Rate Maps) provide better results in Hazus, as additional FIRMs were digitized, WEM reran the Hazus for those counties for the 2011 update of the State Plan. This included 13 additional counties. The statewide summary was then updated to include the data. WEM's website includes an interactive map where the county Hazus risk assessment can be viewed and downloaded. WEM staff also participates in the Central Hazus Users Group.

Mitigation staff made a presentation for State Legislators on the statewide Hazus flood risk assessment at GIS Day at the State Capitol in February 2009. In addition, a presentation was made to the Wisconsin Land Information Association in June 2010.

One of the Disaster Response and Recovery Planners on WEM's Mitigation Section staff has attended the Basic Hazus (December 2014) and the Hazus for Flood (July 2015) at the Emergency Management Institute. One of the WEM Recovery Section staff has attended Hazus for Risk Management, Hazus for Disaster Operations, and Hazus for Comprehensive Data Management.

In 2015 WEM Mitigation staff conducted two Level 1+ Hazus analyses for Washington County in support of the County's first hazard mitigation planning process. The first analysis followed the program's Enhanced Quick Look (EQL) method, using the most recent DFIRM for the county and a USGS 30 meter Digital Elevation Model (DEM) to generate flood depth grids. The second used flood depth grids generated by Wisconsin DNR staff. Loss estimates for both analyses were generated using default inventory data contained within the Hazus software. WEM provided Washington County with maps, tabular outputs, and other data as requested by the Southeastern Wisconsin Regional Planning Commission (SEWRPC).

In this plan update, a different approach was utilized in identifying the flood risk statewide. To identify properties at risk to flood damage, WEM staff used ArcGIS to overlay the Special Flood Hazard Area with the Statewide Parcel Inventory layer. Wisconsin's Statewide Parcel Inventory

was first released in 2015, with the most recent update occurring in August 2016. Attributes contained in the statewide parcel layer include assessed value of land and improvements, estimated fair market value, acreage information, and more. Although this analysis does not provide the same wealth of data generated by Hazus, the locally-provided information contained in the parcel layer is thought to be a more accurate representation of actual property values than the national estimates contained in Hazus. Additionally, WEM lacked the staff, funding, and assistance from outside agencies that made the statewide Hazus analysis possible in 2008. Given the time and funding constraints, the SFHA-parcel layer overlay presented a simpler and more tractable alternative to conducting Hazus runs for all 72 counties.

6.3 Project Implementation Capability

WEM is responsible for the management and administration of the federal hazard mitigation assistance programs. The responsibility for program coordination, implementation, and administration is delegated to the State Hazard Mitigation Officer who complies with federal requirements and involves appropriate state, local, and tribal governments in pre- and post-disaster hazard mitigation programs. Close coordination is maintained with the agencies on the Wisconsin Silver Jackets Hazard Mitigation Team (WSJHMT) as well as the Wisconsin Recovery Task Force (WRTF) RSF Mitigation Subcommittee who provide financial and technical assistance during disaster recovery as well as implementing the mitigation strategy of the State Hazard Mitigation Plan.

Since 1993, WEM and the WHMT (now WSJHMT) have established the top priority of acquisition, demolition, relocation, and/or elevation of flood-prone properties, and have approved projects for these activities. In administering the hazard mitigation programs, WEM has established the following priorities based on funding availability and provided the projects meet all of the program criteria:

- Acquisition and demolition of properties substantially damaged (properties in the floodplain where losses are greater than 50% of equalized assessed value);
- Acquisition and demolition or relocation of severe repetitive loss (SRL) properties and repetitive loss properties (RLPs);
- Acquisition and demolition or relocation of damaged properties in the floodplain;
- Acquisition and demolition or relocation of floodplain properties;
- Acquisition or relocation of flood damaged properties not in the floodplain;
- Elevation or retrofitting flood damaged structures in the floodplain;
- Elevation, floodproofing, or retrofitting flood damaged structures not in the floodplain;
- Other hazard reduction projects (such as detention ponds, storm sewer improvements, protection of utilities, drainage, and safe rooms, etc.); and
- Promotion of the National Flood Insurance Program.

Education or public awareness, purchase and distribution of NOAA weather radios, and river gauge projects are funded under the 5% Initiative in the Hazard Mitigation Grant Program (HMGP) when it is felt there will be a positive outcome from the project. In addition, the state has utilized 7% of the HMGP funds available since 2001 to award planning subgrants to communities for the development and update of all-hazards mitigation plans. The above priorities can also be found in this Plan in Section 3 as well as the State Administrative Plan for the HMGP, Appendix F.

To be eligible for the federal hazard mitigation programs, a project must meet the federal minimum project criteria listed below.

- 1. Be in conformance with the State Hazard Mitigation Plan.
- 2. Have a beneficial impact upon the project area.
- 3. Be in conformance with 44 CFR Part 9, Floodplain Management and Protection of Wetlands and 44 CFR Part 10, Environmental Considerations.
- 4. Solve a problem independently or constitute a functional portion of a solution where there is assurance that the project as a whole will be completed. (Projects that merely identify or analyze hazards or problems without a funded, scheduled implementation program are not eligible.)
- 5. Be both feasible and effective at mitigating the risks of the hazard for which the project is designed. A project's feasibility is demonstrated through conformance with accepted engineering practices, established codes, standards, modeling techniques, or best practices. Engineering designs area accepted if a registered professional engineer (or other design professional) certifies that the design meets the appropriate code or industry design.
- 6. Be cost-effective. Both costs and benefits will be computed on a net present value basis (i.e. obtaining expected damage estimates as a function of hazard intensity).
 - a. Address a problem that has been repetitive, or a problem that poses a significant risk if left unsolved (i.e. evaluating the hazard in terms of the frequency and intensity of expected occurrences).
 - b. Cost no more than the anticipated value of the reduction in both direct damages (property) and subsequent negative impacts (loss of function, death, injuries) to the area if future disasters were to occur.
- 7. Be the most practical, effective, and environmentally sound alternative after consideration of a range of options, including the "no action" alternative.
- 8. Contribute, to the extent practicable, to a long-term solution to the problem it is intended to address.
- 9. Consider long-term changes to the areas and entities it protects, and have manageable future maintenance and modification requirements.
- 10. Have an approved hazard mitigation plan. If not (for HMGP), must have the capability

and desire to complete within twelve months.

In addition, WEM also considers the following criteria in evaluating proposed mitigation projects:

- 1. Conformance with the goals and priorities of the State Hazard Mitigation Plan.
- 2. Mitigation activities that fit within an overall plan for development in the community, disaster area, or state.
- 3. Mitigation activities that if not taken will have a severe detrimental impact on the community such as the loss of life, loss of essential services, damage to critical facilities, or economic hardship.
- 4. Mitigation activities that have the greatest potential for reducing future disaster losses.
- 5. Mitigation activities that are designed to accomplish multiple objectives, including damage reduction, environmental enhancement, historical preservation, tourism/recreation, economic recovery/development, and building community resilience to climate change.
- 6. The community's level of interest and demonstrated degree of commitment to mitigation programs and activities.
- 7. Community's participation in and compliance with the National Flood Insurance Program. WEM coordinates closely with the Wisconsin Department of Natural Resources in determining a community's compliance with the NFIP.
- 8. The proposed project does not encourage development in the Special Flood Hazard Area.
- 9. The proposed project is in conformance with the community's comprehensive land use plan, hazard mitigation plan, and capital improvements program where such plans and programs exist.

WEM reviews all proposed mitigation measures to ensure that the proposed projects are eligible and meet minimum criteria as outlined above. In evaluating proposed projects, WEM reviews, scores, and ranks proposed projects based on certain criteria (see Appendix F, State Administrative Plan for the Hazard Mitigation Grant Program-September 2016, Attachment C). Based on the evaluation and funding availability, a list of recommended projects will be submitted to the WEM Administrator for further consideration. Based on state priorities, non-structural projects such as acquisition, demolition, relocation, and elevation receive the highest ranking and the greatest consideration for funding. Some projects may be referred to other agencies through the WSJHMT for appropriate funding. In addition, WEM will work with the WSJHMT, and where applicable, the WRTF, to "package" funding for projects, where possible, to maximize the funding that is available. Proposed projects are evaluated based on project type, site vulnerability, project benefits, and other considerations.

Items considered in evaluating proposed projects:

- 1. Type of project (structural versus non-structural)
- 2. Site vulnerability
 - o Frequency of event
 - o Does the project involve removing structures from the hazard area?
 - o Does the project address SRL or RL properties?
 - o Does the project address multiple hazards?
- 3. Project Benefits
 - o Alleviate or reduce the need for emergency services during disasters
 - Alleviate or reduce damages to improved structures
 - o Beneficial impact on more than one community (multi-jurisdictional)
 - Solve a problem independently or as part of another solution with assurance that the project will be completed
 - o Long-term solution to a repetitive problem or imminently dangerous situation
 - o Directly prevents death and injury by reducing a person's vulnerability to the hazard
 - Substantially reduces future disaster costs
 - o Reduces the cost of repairing repetitive damages
 - o Restores floodplains and/or wetlands
 - o Multiple objectives such as damage reduction, environmental enhancement, and economic recovery
 - o Promotes economic growth and community development
 - o Promotes development of recreational areas/historic areas
 - o Provides flood protection beyond the 100-year flood event
 - Alleviate or reduce the negative impacts of changing future conditions and natural hazard risks, as identified in the Risk Assessment component of the State Hazard Mitigation Plan.

The following additional criteria is considered on projects that meet state priorities, particularly when there is insufficient funding and there is a need to prioritize projects among multiple jurisdictions (state priorities are listed on p. 6-38):

- In a declared disaster area
- Status of mitigation plan
- Involves use of innovative approaches to mitigation
- Project submitted previously
- Other agencies willing to provide funds towards the proposed project
- Community willing to put funds towards the project over and above the required local match
- Funds available to fund the entire project
- Future maintenance requirements for the project
- Community has successfully implemented previous mitigation grants

Community participates in the Community Rating System

For the Flood Mitigation Assistance program, the proposed project must address mitigating an NFIP-insured property with repetitive loss or severe repetitive loss properties receiving priority.

As stated in the above criteria, projects must be cost-effective. Only projects with a benefit-cost ratio of at least 1:1 will be forwarded to FEMA for approval. WEM Mitigation staff have been performing and completing benefit-cost analyses since 1997 for the federal hazard mitigation grant programs. The staff has developed expertise in performing this function by attending benefit-cost analysis training when it is offered by FEMA, as well as utilizing the FEMA Mitigation BCA Toolkit and Guidance.

Although the state mitigation staff completes the benefit-cost analysis, they depend on information in the subapplication provided by the community. To help communities develop mitigation projects that are as cost-effective as possible, and that have a benefit of at least one dollar for each dollar of cost, the mitigation staff developed Checklists and Property Data Worksheets for both acquisition/demolition and elevation projects. In addition, application Tips and Checklists have been developed for safe rooms and localized flood control projects as well as a Checklist for generator projects. The use of the Checklists has resulted in more complete and accurate applications. The information requested on the worksheets provides staff with the data necessary for an accurate and complete benefit-cost analysis. (The worksheets can be found in Appendix D, Administrative Plan for the HMGP, Attachment D.) WEM also has hosted BCA Workshops in October 2007, June 2009, and June 2011 for local officials to understand the software and the type of data required. The State Hazard Mitigation Officers from Wisconsin and Minnesota presented a short BCA training session at the Minnesota Association of Floodplain Managers and the Wisconsin Association for Floodplain, Stormwater, and Coastal Management Combined Annual Conference in October 2009. WEM has worked with the Cooperative Network discussing mitigation activities related to the Rural Electric Cooperatives. As a result of the collaboration, WEM hosted a BCA Workshop for the Rural Electric Cooperatives in May 2015. The workshops were all very well attended. The training provided a clear understanding to the attendees of the required documentation for the BCA and why the information was needed.

WEM Mitigation staff uses the FEMA-approved benefit-cost modules in performing benefit-cost analyses for proposed mitigation projects, which are based on criteria established in OMB Circular A-94, Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs. (See the following section for more information regarding benefit-cost analyses.)

Although the results of the benefit-cost analysis are a factor in determining project eligibility, it is not the only factor considered. Again, the project needs to meet federal and state priorities and criteria. Funding availability is also a consideration.

6.4 Program Management Capability

October 2000 through February 2006, a Memorandum of Understanding existed between FEMA and WEM recognizing the state as a Hazard Mitigation Grant Program Managing State. The

MOU was developed to build a FEMA-State collaborative partnership for the implementation of the HMGP. The agreement defined the roles and responsibilities of each agency. Under the arrangement, responsibility for eligibility reviews for each project application was shifted to WEM with FEMA reviewing the project summaries provided by WEM for compliance with program requirements. In addition, FEMA would conclude the environmental review. The changes in the roles and responsibilities resulted in a faster approval of projects, in most cases less than 30 days after submittal from the state to FEMA. Per the MOU WEM agreed to

- Perform eligibility reviews for full project applications;
- Apply streamlined procedures for certain project types as identified in the MOU;
- Determine cost-effectiveness for all projects using standard benefit-cost methodology and provide documentation;
- Undertake environmental review tasks and complete the Record of Environmental Review (RER) for FEMA's signature; and
- Provide complete project applications to FEMA within 18 months (now one year) for each project that WEM selects for funding and submit through NEMIS.

The MOU was terminated in a letter from FEMA, Region V, dated February 15, 2006, as 44 CFR 201 states; "Management State means a State to which FEMA has delegated the authority to administer and manage the HMGP under the criteria established by FEMA...." Since FEMA had not yet developed the "managing state" criteria, the MOU was terminated by the Region. However, WEM continued to perform the state's roles and responsibilities identified in the MOU.

As a result of the Sandy Recovery Improvement Act of 2013, Program Administration by States (PAS) was established to create a more streamlined subgrant approval process allowing communities to get the hazard mitigation funds they need faster. States may participate in the PAS initiative and be delegated additional defined responsibilities by FEMA based on an analysis of state staffing plan, award management and hazard mitigation experience, and demonstrated past performance. In return for assuming additional responsibilities, the state will have increased control and oversight in implementing the HMGP. If the Region determines the state meets the criteria, they will work with the state on drafting an operational agreement. The operational agreement outlines the agreed-upon delegations.

As a result of declaration 4141-DR declared August 8, 2013, the state entered into a PAS Operational Agreement for the HMGP to implement the pilot program. Under the agreement WEM was delegated the following activities:

1. Review and approve HMGP subapplicant application requests submitted prior to expiration of the application period, by using expedited application approval process and project summaries for FEMA's use in obligating funds. (The expedited application approval process would be the submission of a completed eligibility and completeness checklist with an attached project summary. Once FEMA receives these completed items, FEMA would award and obligate funds.)

- a. Project Applications and Amendments limited to Acquisitions, Elevations, and Safe Room Projects
- b. Planning Applications
- 2. Approve Period of Performance extensions for subgrants with no impact to the grant Period of Performance. The state would submit an updated Eligibility and Completeness Checklist and Project Summary. The changes would be documented in the quarterly report.
- 3. Approve post-award scope of work modifications with no change to the project activity and no resulting need for additional federal funds.
 - Without prior approval from FEMA, approve demolition time limit extension requests with no impact to the grant Period of Performance. The changes would be documented in the quarterly report.
- 4. Without prior approval from FEMA, approve post-award budget revisions using funds available as a result of cost underruns from other approved subgrants. These funds can be moved to approve subgrants with cost overruns. Funds will only be used within the same HMGP grant.

Updated operational agreements will be developed for each declared disaster after which the state requests delegation of some elements of HMGP administration. In addition, the state will update the HMGP Administrative Plan to including an addendum outlining the components the state will administer for each disaster.

The Mitigation staff's ability to manage hazard mitigation programs effectively is demonstrated by their success in the nationally competitive Pre-Disaster Mitigation program. Since the inception of the program in 2002 through 2015, the state has submitted 144 applications with 129 of the grants approved and funded. That is a 90% success rate.

However, the state Mitigation staff's greatest test (in the ability to manage the program) was the administration of HMGP from the 2008 June floods. The state's HMGP allocation was nearly \$30.8 million for FEMA-1768-DR-WI declared on June 14, 2008. DR-1768 is by far the largest disaster Wisconsin has faced. The HMGP was the largest in state history; double the previous amount from the 1993 Midwest Floods. With the state's priority of acquisition and demolition of substantially damaged properties, 195 properties were acquired and demolished.

Many of the communities that acquired properties after the 2008 floods were impacted again by substantial flooding most recently on September 21-22 with a federal declaration issued October 20, 2016. With this flooding, the success of the past efforts is demonstrated. The reduction in damages in several communities is obvious as officials and staff toured the flooded areas. Success stories will be developed and completed for several communities.

One of the requirements for acquisition projects is three-year open space monitoring to ensure that the properties are being maintained as open space. The state has taken this requirement seriously and completed its fourth three-year certification. The FEMA records did not match the

state's records for a variety of reasons. State Mitigation staff worked with FEMA Region V in 2016 on a project to correct the data so that FEMA's databases matched the state's. The project was successful and one of the state Mitigation Planners presented the state's process at the FEMA Region V Fall Conference in October 2015. In addition, the Section Supervisor presented on the topic at the national Annual Hazard Mitigation Stakeholders Workshop in July 2016.

The State Administrative Plan for the Hazard Mitigation Grant Program (Appendix F) details how state Mitigation staff administers the HMGP. Although there is not a specific administrative plan for the Flood Mitigation Assistance and Pre-Disaster Mitigation programs, the same basic procedures are used for these programs as for the HMGP. How the Mitigation staff handles the notification of hazard mitigation grant funding availability and the application process are summarized below from the administrative plan:

- As soon as possible following the notice from FEMA on the availability of mitigation funds, the state solicits applications statewide. Included is information on funding availability, eligibility criteria, state priorities, application deadlines, and other pertinent information. At a minimum, application notices are distributed to all the County Emergency Management offices statewide, the Regional Planning Commissions, tribal government organizations, and, if post-disaster, to all of the Public Assistance applicants in the declared area, communities with ongoing mitigation funding needs, as well as the Wisconsin Silver Jackets Hazard Mitigation Team and the state's Rural Electric Cooperatives. The Mitigation staff maintains an ongoing list of communities interested in applying for mitigation funds as they come available. Contacts on this list are also sent information on the application process and information is posted to WEM's website. In the post-disaster situation, applications are also mailed to potential applicants outside of the disaster area.
- Other potential applicants are identified through information gathered in the Preliminary Damage Assessment, community site visits, through communication with the WSJHMT, and information provided by the Public Assistance Officer through contacts in that program.
- In the post-disaster situation, a detailed overview of the HMGP is presented at the Applicants Briefings for the Public Assistance program.
- In the post-disaster situation, an overview of the mitigation programs and planning requirements is also presented at Substantial Damage Determination Workshops, if held.
- Pre-applications are solicited for the HMGP. Each pre-application is reviewed, scored, and ranked. Based on the ranking, state priorities, and funding availability, full application packets are sent to selected communities. The full application can be found in Appendix F, Attachment D.
- For all three federal Hazard Mitigation Assistance programs, subapplicants are required to provide extensive information on proposed projects:
 - o Name of the subapplicant and its assigned FIPS code and DUNS number
 - o Primary and secondary contact persons for the project
 - o Detailed project cost estimate with supporting documentation

- o Identification of source for local match requirements
- o Project title and description
- Project location (including maps)
- o Detailed scope of work for the project
- o Pictures of the project site
- Work schedule with key milestones including time needed to meet any EHP conditions
- Considered alternatives (at least two besides the proposed project)
- Information on direct and indirect damages and other impacts. This information supports the benefit-cost analysis (see section below for more details on preparing and submitting accurate BCAs).
- o Required future maintenance for the project
- o Environmental considerations (see section below for more details on preparing and submitting accurate environmental reviews)
- o Local or tribal mitigation plan compliance
- NFIP status
- Assurances for construction and non-construction projects
- Additional requirements for acquisition projects:
 - Statement of Assurances for Property Acquisition projects with attached warranty deed restrictions
 - Signed Notice of Voluntary Interest Form
 - Property Data Worksheet(s)
 - o Signed FEMA Form 009-0-3, Declaration and Release, if needed
 - Consultation with the Department of Transportation and the US Army Corps of Engineers
 - Signed Acknowledgement of Conditions of Projects in a Special Flood Hazard Area, if applicable
- State Mitigation staff provides technical assistance and guidance to subapplicants in completing subapplications. In addition, staff will conduct workshops for communities interested in the acquisition/demolition of flood-damaged structures, developing a good subapplication, benefit-cost analysis, and safe room projects.
- Once received, Mitigation staff reviews each application for completeness and ensures that adequate information has been provided and that the project meets minimum eligibility requirements. Staff will contact the applicant to obtain additional information as necessary and involve appropriate members of the WSJHMT in the review process.
- If the application is complete and the project meets eligibility requirements, mitigation staff will perform a BCA for the proposed project.
- Mitigation staff will complete the required environmental review process on eligible projects with a positive BCA.
- For the HMGP, based on funding availability the SHMO will make a recommendation to the WEM Administrator who will make the final decision regarding the selection of

- projects to forward to FEMA for final approval. Applications will be submitted to FEMA as soon as possible after the disaster but no later than 12 months after the declaration (or 18 months with approved extensions).
- For the HMA program, complete applications that meet the minimum program
 requirements will be prioritized and forwarded to FEMA for funding consideration.
 Complete applications that exceed available funding are submitted as backup
 applications in the event additional funds do become available. WEM will submit the
 application and subapplications within the allotted timeframe established by FEMA.

6.4.1 Preparing and Submitting Accurate Benefit-Cost Analyses

As previously stated projects must be cost-effective. Only projects with a benefit-cost ratio of at least 1:1 are forwarded to FEMA for approval. WEM Mitigation staff has been performing and completing benefit-cost analyses since 1997 for the federal Hazard Mitigation Assistance programs, and have developed expertise in performing this function.

To help communities develop mitigation projects that are as cost-effective as possible, and that have a benefit of at least one dollar for each dollar of cost, the Mitigation staff developed Checklists and Property Data Worksheets for both acquisition/demolition and elevation projects. In addition, application Tips and Checklists have been developed for safe rooms and localized flood control projects as well as a Checklist for generator projects. The use of the Checklists has resulted in more complete and accurate applications. The information requested on the worksheets provides staff with the data necessary for an accurate and complete benefit-cost analysis. (The worksheets can be found in Appendix D, Administrative Plan for the HMGP, Attachment D.)

Mitigation staff uses the FEMA-approved benefit-cost module (Version 5.2.1) in performing benefit-cost analyses for proposed mitigation projects, which are based on criteria established in OMB Circular A-94, Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs. In addition, the FEMA Mitigation BCA Toolkit and additional guidance is extensively utilized in documenting eligible costs for completing an accurate BCA. The type of project and information provided in the application, will determine which benefit-cost analysis module will be used to determine the project's cost-effectiveness.

WEM hosted Benefit-Cost Analysis Workshops in October 2007, June 2009, and June 2011 for local officials to understand the software and the type of data required. WEM hopes to host future classes. The State Hazard Mitigation Officers from Wisconsin and Minnesota presented a short BCA training session at the Minnesota Association of Floodplain Managers and the Wisconsin Association for Floodplain, Stormwater, and Coastal Management Combined Annual Conference in October 2009. WEM has worked with the Cooperative Network discussing mitigation activities related to the Rural Electric Cooperatives. As a result of the collaboration, WEM hosted a BCA workshop for the Rural Electric Cooperatives in May 2015. The training provided a clear understanding to the attendees of the required documentation for the BCA and why the information was needed.

State Mitigation staff attends training on BCA including attending FEMA's Emergency Management Institute. Staff participated in a BCA webinar sponsored by the Region in June 2012, and BCA for Drought and Ecosystem Services in May 2015. They also sat in on a webinar about completing BCAs for the new Climate Resilient Mitigation Activities in June 2016.

Although the results of the benefit-cost analysis are a factor in determining project eligibility, it is not the only factor considered. Again, the project needs to meet federal and state priorities and criteria as previously identified in this plan. Funding availability is also a major consideration.

Benefit-cost analysis is used for all projects to determine cost-effectiveness. The BCA determines whether the cost of investing in a project today, will result in sufficiently reduced damages in the future to justify spending the money on the project. If the benefit is greater than the cost, then the project is cost-effective. The BCA for each project is basically the same, the difference is the type of data used in the calculations.

- 1. Cost-effectiveness is determined by comparing the project cost to the value of damages prevented after the mitigation measure.
- 2. If the dollar value of the benefits exceeds the cost of funding the project, the project is cost-effective. To arrive at a ratio, the benefits are divided by the costs, resulting in a benefit-cost ratio (BCR). The BCR simply states whether the benefits exceed the project costs, and by how much.
- 3. To arrive at a BCR, divide the benefits by the cost. If the result is 1.0 or greater, then the project is cost-effective. If it is less than 1.0, it is not cost-effective.
- 4. The acquisition of structures that are declared substantially damaged (from any origin) and located in a riverine SFHA on a preliminary or effective FIRM is considered cost-effective.
- 5. The acquisition of structures located in an SFHA on the FIRM where the total project cost averages \$276,000 or less per structure is considered cost-effective.
- 6. The elevation of structures located in an SFHA on the FIRM where the total project cost averages \$175,000 or less per structure is considered cost-effective.
- 7. Acquisition projects with a BCR of 0.75 are allowed to incorporate environmental benefits. FEMA has developed and incorporated economic values for green open space and riparian areas into the BCA toolkit for acquisition projects.
- 8. 5% Initiative projects, with a narrative that indicates there is a reasonable expectation that future damage or loss of life or injury will be reduced or prevented by the activity, are considered cost effective.

FEMA is encouraging communities to incorporate methods to mitigate the impacts of climate change into eligible HMA activities and in 2016 provided guidance on Climate Resilient Mitigation Activities (CRMAs) including green infrastructure methods, expanded ecosystem service benefits, and three flood reduction and drought mitigation activities: Aquifer Storage and Recovery (ASR), Floodplain and Stream Restoration (FSR) and Flood Diversion and Storage

(FDS). Guidance has included Fact Sheets and Job Aids with checklists for complete application along with information on how to utilize the FEMA BCA modules in calculating benefits of such projects. WEM will encourage and work with communities interested in pursuing CRMA projects.

WEM:

- 1. Determines cost-effectiveness of projects using standard benefit-cost methodology. (Version 5.2.1 of FEMA's BCA software is recommended, however, WEM may use any standard methodology including narrative mutually agreed to by FEMA and WEM.) WEM has the option of six FEMA computer BCA modules based on the type of project and availability of appropriate and accurate data:
 - o Flood
 - Hurricane Wind
 - o Tornado Safe Room
 - o Earthquake
 - Wildfire
 - o Damage Frequency Assessment
- 2. Documents the BCA fully, including explanations of assumptions, data derivations, and analytical techniques.
- 3. Attaches the BCA report along with supporting documentation and Data Documentation Templates to project application packages for FEMA review.
- Utilizes a technical contractor if the need arises.

FEMA:

- 1. Provides BCA module software, accompanying technical manuals, and training.
- 2. Reviews benefit-cost analysis and data documentation before approving projects.
- 3. If the BCA is determined to be unacceptable, provides a written explanation of the problems and (where possible) proposes solutions to those problems.

A narrative analysis is used when the benefits of a project cannot be easily quantified into specific categories and do not conform to any of the modules or formats. This analysis allows for a subjective, broad-based approach to quantify the benefits of a project so that all benefits of the project can be recorded and the project objectively assessed. This type of analysis is normally used in the state's HMGP 5% Initiative projects.

The results of the BCA will determine if the project is cost-effective. If the project is cost-effective, it is still under consideration by WEM for further funding. At this step in the review process, WEM would start the environmental review process for the project. If the project was not cost-effective, mitigation staff would attempt to obtain additional information from the applicant to arrive at a positive BCR. If there is no additional credible data available or all available data has been utilized, and the project is still not cost-effective, the project is rejected.

6.4.2 Preparing and Submitting Accurate Environmental Reviews

WEM:

- Coordinates with the FEMA Regional Environmental Officer (REO), Project Officer and other state and federal agencies during the project development process to address environmental issues.
- 2. Completes formal consultation required specifically of federal agencies under federal environmental laws and NEPA (National Environmental Protection Act).
- 3. Undertakes environmental review tasks (including tasks related to the National Historic Preservation Act); gathers necessary environmental data through the applicant, past studies, and informal consultation with state and other federal agencies; recommends level of review under the NEPA.
- 4. Completes and submits the Record of Environmental Consideration (REC) and all supporting documentation with submission of the project application.
- 5. Ensures that the required public notices are completed.

FEMA:

- 1. Provides WEM with the current REC.
- 2. Reviews WEM's REC, supporting documentation and recommendation for level of review and makes a final decision on level of NEPA review.
- 3. Coordinates with WEM to complete the preparation of an Environmental Assessment (EA) or Environmental Impact Statement (EIS) for projects that do not clearly fall under the categorical exclusion (CATEX) category.
- 4. Prepares and/or reviews appropriate NEPA and other environmental documents. Approve or request additional information with 30 business days of receipt of a project summary from WEM.
- 5. Coordinates with WEM if there is a need to utilize a technical contractor.

Below is a list of regulations that WEM reviews to ensure compliance with applicable historic and environmental protections laws and regulations:

- Historic and Archaeological Resources (PL 96-515, Section 106)
- Floodplain Management Presidential Executive Order 11988 (44 CFR Part 9)
- Protection of Wetlands Executive Order 11990 (44 CFR Part 9)
- Environmental Justice Presidential Executive Order 12898 (59 Fed.Reg. 7629-7633)
- Endangered Species Act (16 USC Section 1531)
- Fish and Wildlife Coordination Act (16 USC Section 661)
- Wild and Scenic Rivers Act (16 USC Section 271)

- Rivers and Harbors Act (Section 10)
- Wilderness Act (16 USC)
- Farmlands Protection Policy Act (16 USC)
- Coastal Zone Management Act (16 USC, Section 1451)
- Coastal Barrier Resources Act (16 USC)
- Clean Air Act (16 USC)
- Clean Water Act (Section 404) (16 USC)
- Hazardous Material and Hazardous Waste (determine if project site involved is a Superfund site, has above or underground storage tanks, or other potential contaminants)

Appendix F, Administrative Plan for the HMGP, page 11 and Attachment E, includes the procedures for preparing and completing accurate environmental reviews. The same procedures apply for the other HMA programs.

State Mitigation staff attends EHP training when it is offered. In addition, state Mitigation staff attends the annual State Archeological Consultants Workshop sponsored by the State Historical Society.

WEM is participating with FEMA Region V and other stakeholders in the development of a Programmatic Agreement Governing Section 106 Review. The first conference call was held on March 31, 2016. As of October 1, 2016, the agreement is approximately half completed. Once the agreement is completed, it will define responsibilities in the review process and streamline the review of certain activities with little potential to affect historic properties.

6.4.3 Submitting Complete and Accurate Quarterly Progress and Financial Reports

WEM Mitigation staff has an excellent record of submitting timely, complete, accurate, and comprehensive quarterly progress and financial reports for the HMA programs. The following summarizes the process that the Mitigation staff follows in meeting quarterly reporting requirements. This information can also be found in the HMGP Administrative Plan, Appendix F. (WEM does not have a separate administrative plan for the non-disaster HMA programs, though the same procedures as for the HMGP are adhered to.)

Upon project approval, a State/Local Hazard Mitigation Assistance Agreement is signed by both WEM and the subrecipient. The agreement requires the subrecipient to submit quarterly status reports within 15 days of the end of the quarter. Due dates are January 15, April 15, July 15, and October 15. Quarterly reports contain information such as project identification information and project number, subrecipient, project type, significant activities and developments since the previous report including a comparison of accomplishments against the work schedule; percent

completion and whether the project is on schedule; a discussion of any problems, delays, or adverse conditions that impair the ability to meet the scheduled completion date; status of costs and amount disbursed; whether an extension to the performance period is anticipated; incremental funding amounts (SFM), if any; and for acquisition projects the number of properties acquired that quarter, demolished that quarter, and the number of anticipated acquisitions and demolitions to be completed the following quarter. (See Appendix F, Attachments J and K.) Approximately two weeks before the end of the quarter, WEM sends out a reminder to all subrecipients that the quarterly report is due on the 15th of the following month. Second and third reminders are sent prior to the due date. If no report is submitted a notice is sent advising the subrecipient that the quarterly report is overdue, that per the Agreement they are required to submit a quarterly report, and that their funding may be jeopardized if they fail to submit a report.

Using the subrecipient quarterly reports, WEM Mitigation staff prepares its quarterly report for the mitigation programs. The quarterly report consists of a letter with narrative information regarding each open disaster declaration, open non-disaster grants, as well as information on other activities that the Mitigation staff has been involved with for the quarter. In addition, a spreadsheet is completed for each program and each grant (see Appendix F, Attachment K). Information included on the spreadsheet includes the following:

- Project number and subrecipient name
- Type of project
- Grant approval date
- Grant performance period and any approved extensions
- Significant activities and developments since last report
- Percent of work completed
- Whether the project is on schedule
- Discussion of any problems, delays, or adverse conditions
- Federal, state, and local shares
- Grant amount including management costs dispersed to date and amount remaining
- General comments
- For acquisition projects, the number of acquisitions and demolitions completed overall and completed that quarter

For the HMGP grants, FEMA requires states to enter quarterly report information into NEMIS. Because WEM Mitigation staff cannot access the necessary functionality (verified by FEMA Region V staff), instead WEM Mitigation staff complete additional spreadsheets for each disaster with a line for each subaward. FEMA Region V staff then uploads the spreadsheets into NEMIS. After upload, FEMA Headquarters scores the spreadsheet looking at factors like change in percent of work complete since the last quarter and how long it's been since a payment was

made. Unfortunately, the narrative portion of the quarterly reports, which may explain any apparent discrepancies, is not taken into account in the scoring.

The WEM Financial Management Officer (FMO) prepares and submits timely, accurate financial reports. Both the financial and progress reports are submitted within 30 days of the end of the quarter (January 30, April 30, July 30, October 30). On rare occasions, an extension may be requested in submitting the reports due to extensive workload and/or disaster operations, and the reports are always submitted within two weeks of the due date. WEM Mitigation staff has been praised by FEMA Region V for their comprehensive quarterly reports.

6.4.4 Completing Projects

WEM Mitigation staff has a very good record of closing out hazard mitigation grants and HMGP programs within required timeframes. The following summarizes the process that the Mitigation staff follows in monitoring approved grants, and completing project and declaration closeouts within established performance periods including financial reconciliation. This information can also be found in the HMGP Administrative Plan, Appendix F. (WEM does not have a separate administrative plan for the non-disaster HMA programs though the same procedures as for the HMGP are adhered to.)

The State/Local Hazard Mitigation Assistance Agreement that is signed by both WEM and the subrecipient and requires the subrecipient to begin the project within 90 days of subaward approval and complete the project per the schedule submitted with the subapplication (not to exceed three years from project obligation date). In addition, they are required to submit a final report covering all aspects of the project within 30 days after project completion. If the subrecipient cannot complete the project within the identified performance period per the grant agreement, a request for a time extension must be submitted to WEM 60 days prior to the end of the performance period. Requests for time extensions needs to explain why the completion date cannot be met, how much of the project work remains, and a revised work schedule. If an extension request for any project means that the activity period will go beyond the state's performance period (or close date for disasters), the SHMO will request up to a one-year time performance extension. This request will be submitted to the Region 60 days prior to the end of the performance period.

Upon completion of all work on a project, the SHMO will certify to FEMA that costs incurred in the performance of eligible work are allowable, that the approved work was completed, and that the mitigation measure is in compliance with the Federal-State Agreement (for the HMGP) and the State/Local Assistance Agreement. WEM Mitigation staff will prepare a project closeout worksheet providing a complete assessment of the project, which is submitted to FEMA Region V along with a request to close the grant (see Appendix F, Attachment L). The Environmental Closeout Declaration (Appendix F, Attachment E, page E-14) is included with the project closeout worksheet.

When all projects are completed within the disaster declaration, the SHMO will prepare the Declaration Closeout Letter and Worksheet for the HMGP and forward to FEMA along with the

request to close the declaration (see Appendix F, Attachment M). The FMO will close out the HMGP financially by submitting a final SF-425, certifying project completion. All valid expenditures for the declaration will be liquidated within 90 days of the end of the performance period. There are cases where unspent funds from one project will need to be deobligated so they can be reobligated to another project with a cost overrun. In some cases this causes the declaration closeout to go beyond the 90 days. However, state staff works closely with FEMA Region V staff to close the declarations as soon as possible. The SHMO also prepares a final report for completed projects for the FMA and PDM program and submits to FEMA along with a request to close the project. Again, the FMO is responsible for submitting the final financial reports. All expenditures are liquidated within 90 days of the end of the performance periods for each program. Appendix C includes a listing of completed mitigation projects.

The subrecipient and recipient closeout reports are valuable for not only historical purposes and in monitoring projects for adherence to certain grant agreements such as open space deed restrictions, but they are also valuable in documenting loss avoidance and developing success stories. The closeout reports including any properties that have been acquired are shared with the Department of Natural Resources Floodplain Management staff. This information is useful for floodplain management staff during community assistance contacts and visits. In addition, during these visits floodplain management staff can monitor the acquired sites to ensure that the subgrants have adhered to the required deed restrictions.

As of September 1, 2016, the State has closed the HMGP for 21 of 27 disasters since 1990 for which it received grant funding. Two declarations, 1933-DR and 1966-DR, are under a time extension until March 21, 2017, and March 18, 2017, respectively. The remaining four open declarations (4076-DR, 4141-DR, 4276-DR, and 4288-DR) are still within their original performance periods. The FMA programs have all been closed except for federal fiscal years 2014 and 2015 which are still within the original performance periods. For the PDM, fiscal years 2002, 2003, 2004-05, 2006, 2007, 2008, 2008-LPDM, 2009, 2009-LPDM, 2010, and 2011 are all closed. Fiscal years 2013 and 2014 have one-year time extensions and 2015 and 2016 are under the original performance periods. Closeouts on subawards are done upon project completion.

6.5 Measuring Success: Loss Avoidance

An important component of mitigation is to celebrate our successes. IN 2005, the Institute of Building Sciences calculated that for every \$1 spent on mitigation, \$4 is saved in future disaster losses (\$5 for flood disaster losses). Over time, the return on investment for long-term mitigation measures will continue to increase. To demonstrate this, WEM Mitigation staff document the success and economic benefits of the mitigation measures implemented through the mitigation programs.

Since 1990, \$94 million in HMGP funds have been or are currently being administered in Wisconsin. In addition to the HMGP, FMA funds of \$2.6 million and PDM funds of \$13.8 million have been or are currently being administered. That totals more than \$110 million in mitigation funds awarded to the state for mitigation activities. The funding for each grant program is

broken down by project in Appendix C.

As stated previously, the priority for mitigation is acquisition and demolition, relocation and elevation of hazard-prone structures. Through the HMGP, FMA, and PDM programs 633 structures have been acquired and demolished. (See Appendix C for project descriptions by grant program and community.)

Loss avoidance studies are one type of activity that WEM and FEMA undertake to document their successes and quantify the economic benefits of mitigation measures implemented through the mitigation programs. These studies use a methodology developed by FEMA to quantitatively evaluate the effectiveness of mitigation projects using actual post-mitigation hazard events in the calculation. The loss avoidance studies can be found on the WEM website at http://emergencymanagement.wi.gov/mitigation/stories.asp.

Kenosha, Jefferson, and Crawford Counties

In 2009 the Loss Avoidance Study: Wisconsin Property Acquisition and Structure Demolition was completed for three frequently flooded rivers in Wisconsin: the Fox River in Kenosha County, the Rock River in Jefferson County, and the Kickapoo River in Crawford County. Each county had acquired flood-prone structures after previous significant flood events. To calculate losses avoided through mitigation actions, a formula was used based on actual flood events that occurred after the acquisitions and previous flood damages including physical losses, losses of function, and emergency management costs. The return on investment (ROI) was calculated using the losses avoided and the project costs. The results were encouraging.

The Fox River floods at least once a year and sometimes two or three times in a year. Between 1993 and 2003, five local emergency declarations were issued for the Fox River floodplain. With the emergency declaration of May 2004, when the Fox River again overflowed its banks, many fewer homes and residents were at risk because over that ten year period, 56 property owners had participated in the Fox River Flood Mitigation Program, administered by the Kenosha County Housing Authority, with staff support provided by the Southeastern Wisconsin Regional Planning Commission. Damages were averted where mitigation measures had been undertaken. By 2008, 75 flood-prone properties had been acquired along the Fox River using HMGP, FMA, PDM, and CDBG funds. Between 1996 and 2009, the ROI for the acquisitions was 102%.

Blackhawk Island, at the mouth of the Rock River, in Jefferson County is another area that is plagued with annual flooding. The Island is a peninsula surrounded on either side by Lake Koshkonong and Mud Lake. When the lakes swell, the two bodies of water merge into one, covering the low-lying areas of the peninsula. The road on the Island becomes submerged, and as the water rises it flows into homes. After the Great Flood of 1993, the County applied for and received HMGP funds to implement their Flood Mitigation Buyout Program. Along with HMGP, the County has utilized FMA funds, CDBG funds, and grant funds from the Department of Natural Resources to continue to acquire structures on and near Blackhawk Island. By 2008, 35 properties had been acquired and demolished. Between 1993 and 2009, the ROI for Jefferson County's program was 107%. Since the area experiences flooding annually, the ROI has certainly increased since 2008 and will continue to do so in the future.

Crawford County has also been active in flood mitigation. The Kickapoo River floods regularly and has caused damage to numerous buildings in several Crawford County villages. Of particular concern to County officials was the Crawford County Highway Shop. Whenever the Shop flooded, the staff could not access equipment. This was a significant problem because the staff performs many duties during flood events including the following: floodwater rescues, closing roads, building temporary dikes, and constructing safety devices. In 2002, Crawford County utilized HMGP funds to relocate the facility to higher ground. Although it was an expensive project, the ROI was calculated to be 592% after only two flood events (2007 and 2008). This mitigation project can certainly be considered a success.

Milwaukee County

In 2010, a loss avoidance study of acquisition projects in Milwaukee County was compiled titled Evaluating Losses Avoided through Acquisition Projects. WEM requested a report with a methodology that could easily be replicated. The study included properties mitigated in Wauwatosa, Milwaukee, Brown Deer, and Oak Creek. FEMA used their Hazus and BCA² software programs to determine losses avoided due to mitigation actions.

In 1998 and 1999, the City of Wauwatosa, using HMGP and CDBG funds, acquired and demolished 23 floodway structures in the Valley Park area along the Menomonee River. Calculated for individual properties, the ROIs ranged from 35% to 143% with an average of 77%. This may seem low, but the computations were done for only one potential flood event. The Menomonee River at Wauwatosa has experienced five historic crests since August 1998. Clearly, considerable losses have been avoided as a result of this project.

The Lincoln Creek area in the City of Milwaukee experienced over 4,000 flood events between 1960 and 1997. It was targeted for mitigation activity prior to the June 1997 flood. Using HMGP funds from the 1997 flood, WEM and the City of Milwaukee worked together to acquire and demolish 21 properties. The Milwaukee Metropolitan Sewerage District (MMSD) also completed a flood mitigation project in the area involving two detention basins and channel modifications. The area was remapped after the MMSD project, so only six of the mitigated properties remained in the floodplain. The ROIs for these six properties ranged from 28.7% to 35.0% with an average of 31.7%. These figures were again calculated for only one potential flood event.

After Root River flooding in May and July 2000, a repetitive loss property in the City of Oak Creek was determined to be uninhabitable. Without mitigation, the property would continue to incur damages and have flood insurance claims paid. WEM and the City used HMGP funds to purchase and demolish the structure. The ROI calculated by FEMA for one potential flood event was 61%.

After devastating floods in 1997 and 1998, the Village of Brown Deer initiated an acquisition and demolition project for nine repetitive loss properties along South Branch Creek using HMGP and CDBG funds. The ROIs for the properties ranged from 42.0% to 52.4% with an average of 45.8%. Again, the ROIs were calculated for only one flood event and would be much greater if several events occurred. After the project was completed, MMSD used the acquired properties to create a detention basin along the South Branch Creek which has helped mitigate flood damage in much of the County. The benefits from the detention basin are not included in the loss avoidance calculation.

Evaluation of the benefits of a mitigation project really cannot be documented until the area of the project is impacted by another similar disaster. The following method will be used after an event has occurred:

² Hazus is a GIS-based program developed by FEMA for estimating losses from natural hazards; BCA stands for Benefit-Cost Analysis.

- Identify whether a previous mitigation project has been implemented in the affected
 area. This could include mitigation measures such as acquisition and demolition,
 elevation, floodproofing, reinforcement of structures, safe room construction, protection
 of utilities, retention and detention ponds, stormwater projects, or other structural
 measures to protect property and infrastructure.
- If so, contact local officials to solicit information about the effectiveness of the mitigation measures and the impact of the event in the project area.
- Identify what data is available to support a loss avoidance study or best practices story. This could include pictures, newspaper articles, flood levels, damages to mitigated and unmitigated structures, etc.
- Using the above documentation as well as information on mitigated properties such as
 past damages and benefit-cost analysis inputs, begin to identify if there is sufficient data
 to complete a loss avoidance study.

For acquisition projects the following is one method that can be utilized to document loss avoidance if there is adequate data available:

Phase 1: Data Collection

- Evaluate available data for inclusion in the study.
 - Address
 - o Structure and content values
 - Project costs
 - o FIS reports specific event data
 - Acquisition date
 - Stream gauge data depth and/or stream flow
 - o Insurance payout data

Phase 2: Analysis

- Establish the values of structure and contents potentially at risk during an event.
- Establish which event(s) occurring after the completion of an acquisition project would have affected the acquisition properties.
- Establish the level of damages associated with the event(s) above.
- HAZUS analysis: Used in the event of incomplete or inadequate data for either the events or property. Using the current state provided flood boundary, a HAZUS model can be run for a typical 100-year flood event. This process will produce an estimated damage projection for each property.

Phase 3: Reporting

• The reporting phase involves taking the damage curves established in the analysis phase and applying them to the potential loss values established.

- The results would then be applied to the cost of the acquisition to determine a return on investment.
- Additional reporting on the presence of location maps for properties and stream gauges if available offers background to support conclusions.

If there is not sufficient data to support a loss avoidance study, best practices or success stories could be developed that would encourage communities and individuals to develop hazard mitigation strategies and implement mitigation measures to reduce or eliminate future disaster losses.

6.5.1 Other Mitigation Successes

Many mitigation projects in Wisconsin have been profiled by FEMA as "best practices." Below are descriptions of recent best practices projects that represent a variety of mitigation action types. Following the descriptions in Figure 6.5.2-1 is a table of other mitigation best practices projects in Wisconsin. The full-length best practices articles can be found on WEM's website at http://emergencymanagement.wi.gov/mitigation/stories.asp or on FEMA's website at https://www.fema.gov/best-practices-stories. Success stories will continue to be developed for future events to demonstrate the success and economic benefits of effective mitigation measures.

Town of Lakeside

A couple purchased a home in 1991 next to a small stream. In 2000 there was a tremendous amount of snow and the in-laws mentioned the potential for spring flooding. The couple purchased flood insurance which included an ICC (Increase of Compliance) clause that could provide up to \$30,000 to bring structures into compliance with local floodplain regulations in the event the structure was substantially damaged from a flood. Only months later the Amnicon River did exceed its banks backing up the small stream where they lived causing substantial damage to the structure. Since the damage exceeded 50% of the equalized assessed value, the home was considered substantially damaged and the ICC clause went into effect. Since the structure was located in the floodway, the only option was to demolish the structure. Douglas County applied to WEM for a grant through the Hazard Mitigation Grant Program to acquire and demolish the structure. ICC provided the cost for demolition, reducing the County's local share for the grant. If the property owners had not participated in the buyout program, their former home would have been flooded again in 2012 when three severe floods occurred in the area between May and June.

Village of Oliver

In August 2002 several homes in the Village of Oliver was experiencing earth mass-movement referred to as a "slump", which is common in the area, put several structures in imminent danger. The ground failure was due in part of an underlay of red clay, which contains significant amount of mineral, smectite. Smectite absorbs water and expands to many ties it original

volume, shrinking back again when it dries. This contributes to the instability of the red clay especially when saturated. The spring and summer of 2012 the area received a lot of rain which added to the weight. The water also acted as a lubricant which facilitated down-slope movement. Through WEM, the Village received funds through the Hazard Mitigation Grant Program to acquire and demolish three structures that were in imminent danger from ground failure. In June 2012 a severe storm occurred in Oliver which caused extensive flooding throughout the rea and led to a federal disaster declaration. The same three properties purchased by mitigation funds experienced further slumping. By previously acquiring the three properties, additional losses were avoided.

City of Superior

In 1999, a 100-year storm inundated the city with more than five inches of rain in two hours and caused extensive damages. The City received a Hazard Mitigation Program grant to construct a stormwater detention basin and a 7,000 foot storm water interceptor sewer to connect to the existing storm sewer system. HMGP funded the storm sewer interceptor sewer. The project was determined a success after significant flooding occurred in October 2005. Officials estimated that 284 structures, both residential and commercial benefited from the project with an estimated \$1.42 million in damages avoided. In 2009 the City constructed a 3,000 foot storm water inceptor sewer t connect to the previous project with funds provided by the American Recovery and Reinvestment Act. The mitigation efforts were again tested in June 2012 when a severe thunderstorm dropped 8 to 10 inches of rain over the Superior area resulting in flash flooding. Public Works officials estimated that prior to the completion of the project, a storm of that magnitude would have yielded about 150 calls, but they only received 15 reports of flooded basements.

Town of Clover

The Town of Clover is located near Lake Superior in Northern Wisconsin, and experiences periods of seasonal flooding each year, particularly on Nicoletti Road, a town roadway located on an unnamed perennial tributary to Lake Superior, locally referred to as "Horseshoe Creek." Clay soil near Lake Superior limits infiltration, resulting in large volumes of stormwater runoff during heavy rain events. This runoff, as well as snow melt in the spring, regularly flooded the wetlands and waterways near Nicoletti Road, rendering it and other area roads impassable during any rain event of 2 inches or greater (approximately a 1-year storm). The section of the roadway near the Horseshoe Creek culvert was particularly prone to washing out, requiring repeated annual repairs. Because the culvert was not large enough to allow the flow from a 1year storm to pass through, the wetland area upstream would overfill and inundate nearby Bark Bay Road as well. Flooded roads routinely presented public safety threats by endangering drivers and creating obstacles to EMS and fire response in the area. Washouts also carried gravel and sediment from the roadways to the wetlands, estuary, and lake within the Bark Bay Slough Natural Area. In 2013, the Town of Clover applied for funding under FEMA's Hazard Mitigation Grant Program (HMGP) to install a large culvert in Horseshoe Creek at Nicoletti Road. The grant was awarded in 2014, and the project was completed in October 2015. During the July 11-12, 2016, storms, three to four inches of rain fell on the Town of Clover in a 24-hour period

(approximately a 5- or 10-year storm). Many roads and culverts in the area washed out, including part of Nicoletti Road to the east of the culvert mitigation project. At this point of the road, 11 streams from the hills to the south drain into a ditch on the south side of the roadway. During the storms, this ditch filled beyond its capacity and overtopped Nicoletti Road, resulting in a quarter mile of roadbed erosion and subsequent closure of the road. However, the road damage stopped short of the culvert mitigation project; the upsized culvert was able to handle the runoff from this event, and Nicoletti Road at Horseshoe Creek held.

Bayfield County

Bayfield County, Wisconsin is located on the shores of Lake Superior in Northwestern Wisconsin. A 65-person staff provides services to the County's 15,000 residents from the Bayfield County Courthouse in the City of Washburn. In the past, the courthouse experienced power outages at least five times each year, ranging in duration from a few minutes to several hours on average. Originally, the sole back-up power source was the Uninterruptible Power Supply (UPS), which only provided short-term back-up power to individual electronics. This left the HVAC system and power to the county offices, county telephone system, county vehicle fueling station, and cooling system for phone and computer equipment unprotected in the event of an outage. In 2013, Bayfield County submitted an application for funding for a 200 kW generator under the Hazard Mitigation Grant Program. The grant was awarded in August 2013, and the generator installation was completed in October 2014. On July 11-12, 2016 northwestern Wisconsin was ravaged by multiple rounds of severe thunderstorms, including heavy rains, high winds, and extensive flooding. While County and local first responders worked to cope with damage to roads, harbors, homes, and businesses, another round of storms on July 21 caused thousands of power outages across Bayfield County and the surrounding area, including the County courthouse and jail. The outages also coincided with one of the hottest days of the year, with temperatures reaching over 90°F. Although the courthouse lost power, the generator provided back-up power until electricity was restored on the 22nd. This allowed County staff to continue providing essential emergency response services during the outage, including using the courthouse as a cooling and equipment charging center for Bayfield County residents without power.

Figure 6.5.1-1: Wisconsin Mitigation Best Practices Articles

Year	Project Type	Municipality	County	Title
1978-1983	Flood control; Floodproofing; Relocation	Soldiers Grove, Village	Crawford	Village Locals Reflect: Moving Was Best Flood Protection
1978-1983	Flood Control; Floodproofing; Relocation	Soldiers Grove, Village	Crawford	Small Wisconsin Village Leads the Nation: Rebuilds Above Floodwaters
1993-ongoing	Acquisition/Buyouts; Flood Control; Retrofitting, Structural	Darlington, City	Lafayette	Multiple Mitigation Measures Give Darlington and Elevating Experience

Year	Project Type	Municipality	County	Title
1994-97	Acquisition/Buyouts; Elevation, Structural; Flood Control	Black River Falls, City	Jackson	Freeboard Saves Town from Additional Flood Losses
1993-ongoing	Floodproofing	Darlington, City of	Lafayette	Mitigation Leads to Preservation and Economic Recovery for One Community
1994-98	Acquisition/Buyouts	Eau Claire, City	Eau Claire	City of Eau Claire: Acquisition
1994-ongoing	Acquisition/Buyouts; Building Codes	Kenosha County	Kenosha	Moving People Out of Harm's Way
1994-ongoing	Acquisition/Buyouts	Kenosha County	Kenosha	Fighting Floods, Saving Property and Protecting Lives in Kenosha
1994-ongoing	Acquisition/Buyouts	Jefferson County	Jefferson	Program Cooperation Alleviates Repetitive Flooding Burden
1994-1997	Acquisition/Buyouts	Trenton Island	Pierce	Mitigation Success, Trenton Island
1996-97	Acquisition/Buyouts	Trenton Island	Pierce	Floodways and Wetlands of the Mighty Mississippi: Trenton Island, Wisconsin
1996-97	Education/Outreach/ Public Awareness; Land Use/Planning	Wisconsin State	All	Wisconsin Mitigation Video: An Education and Training Tool
1996-98	Acquisition/Buyouts	Oakfield, Village	Fond du Lac	New School Building Hardened Against the Wind
1997-ongoing	Education/Outreach/ Public Awareness	Milwaukee County	Milwaukee	The Dry Facts: Protecting Homes From Damage
1997-ongoing	Acquisition/Buyouts; Floodproofing; Land Use/Planning	Darlington, City	Lafayette	City of Darlington Honored: Acquisition and Floodproofing
1998-2001	Acquisition/Buyouts; Flood Control	Brown Deer, Village	Milwaukee	Detention Ponds, Not Homes, Played Host to Recent Flood Event
1998-2001	Acquisition/Buyouts	Wauwatosa, City	Milwaukee	Acquisition Project Proves Beneficial as Safety Measure and Recreational Avenue
1999-2006	Acquisition/Buyouts; Elevation, Structural; Flood Control	Elm Grove, Village	Waukesha	Small Village Executes Large Mitigation Project
2001	Education/Outreach/ Public Awareness	Milwaukee County	Milwaukee	Community Outreach: Milwaukee County at the Wisconsin State Fair
2001-03	Flood Control; Floodproofing; Relocation	Crawford County	Crawford	Moving Highway Shop Improves Disaster Response

Year	Project Type	Municipality	County	Title
2003	Warning Systems	Portage County	Portage	Enabling Residents to Hear and Heed Severe Weather Warnings
2004	Storm Shelters	Juneau County	Juneau	Providing Shelter from the Storm
2005	Flood Control	Cambria, Village	Columbia	Mitigation Project Reunites a Town Divided
2005-ongoing	Flood Control	Monroe, City	Green	Pulling the Plug on Monroe's Water Problems
2005-ongoing	HAZUS	Wisconsin State	All	Wisconsin Emergency Management-HAZUS Used to Evaluate Flood Risk and Losses
2006-10	Flood Control	Thiensville, Village	Ozaukee	Village of Thiensville Channelization Project
2007-08	Elevation, Structural	Gays Mills, Village	Crawford	Higher and Drier in Wisconsin
2008-10	Mitigation Planning	Clark County	Clark	Teamwork Gives Rise to a Comprehensive All-hazards mitigation Plan
2012	Acquisition/Buyouts	Lakeside	Douglas	When a Homeowner's Dream Becomes a Flooding Nightmare Flood Insurance Comes to the Rescue
2012	Acquisition/Buyouts	Oliver	Douglas	Slump Forces Owners out of Home
2012	Flood Control	Superior	Douglas	Improved Sewer System Prevents Damages
2012-2016	Generator	Bayfield County	Bayfield	Generator Keeps the Lights on at the Bayfield County Courthouse
2012-2016	Culvert	Clover	Bayfield	Mitigation Prevents Road Damage in the Town of Clover

At the time this plan was updated, there was significant flooding that occurred September 21-22 in the southwest and west central portions of the state. The Governor's request for a federal declaration was issued on October 20, 2016. Several of the communities impacted by the most recent flooding have implemented mitigation projects through acquisition, demolition, and elevation. This provides an opportunity for WEM to potentially complete additional loss avoidance studies and success stories. The effectiveness of the completed mitigation measures was obvious during the Preliminary Damage Assessment and fly-overs of the flooded areas.

In a large event or an event where there could be many potential success stories, based on present staffing, WEM may request the assistance of FEMA in documenting and completing success stories.

6.6 Mitigation Efforts of Other Agencies

The totals in the table above do not reflect the mitigation efforts undertaken by other agencies and local governments. The Department of Commerce (now the Department of Administration) through Community Development Block Grant (CDBG) funds has provided mitigation assistance to many communities by acquiring and demolishing numerous floodplain properties (see Appendix C). Notable mitigation successes using this funding strategy include Kenosha and Jefferson counties, the villages of Gays Mills and Rock Springs, and the Town of Spring Green.

Kenosha County has purchased or is in the process of purchasing 108 properties along the Fox River in the towns of Salem and Wheatland and in the Village of Silver Lake. These acquisitions were made using CDBG funds as well as HMGP, FMA, and PDM funds. The County's mitigation goal is to acquire and demolish up to 160 flood-prone properties, as funds become available.

Another example of successful flood mitigation is the Rock River/Lake Koshkonong area in Jefferson County. In addition to CDBG, HMGP, and FMA funds, the county received Urban Rivers Grant Program funds through the Department of Natural Resources. These funds combined have enabled the county to purchase 115 properties, many of which were in the floodway. Both counties continue to apply for funding to reach their mitigation goals.

There are also mitigation projects occurring in Wisconsin through local initiatives using mostly local funding. The Milwaukee Metropolitan Sewerage District (MMSD) has been implementing a floodplain and stormwater management strategy for over fifteen years. Their strategy involves engineered flood management structures and acquisition to protect structures that are vulnerable to a 1% probability flood according to flood hazard models. Through their Flood Management Program they have completed several projects including the County Grounds (\$90 million,) Hart Park (\$48 million,) Kinnickinnic River, Valley Park (\$12 million) and Lincoln Creek (\$120 million) with two more projects underway; Menomonee Concrete Removal (\$5.4 million) and Western Milwaukee (http://www.mmsd.com/floodmanagement/). The projects have reduced flood damages to thousands of homes and to public infrastructure as well as provided environmental and recreational benefits. MMSD's Greenseams program helps prevent future flooding and water pollution. Greenseams is an innovative flood management program that permanently protects key lands contains water-absorbing soils. The program makes voluntary purchases of undeveloped privately-owned properties in areas expected to have major growth in the next 20 years and open space along streams, shorelines, and wetlands. All land acquired will remain undeveloped. Wetland maintenance and restoration at these sites will provide further water storage. Another benefit of the program is that it also preserves wildlife habitat and creates recreational opportunities for the people living in the area.

One of the more well-known mitigation projects was the relocation of Soldiers Grove. The Village experienced flooding in 1907, 1912, 1917, 1935, 1951, the "big one" in 1978, and lesser floods after that. The August 2007 and June 2008 floods were some of the biggest floods to hit the Village. The Village began to debate about what to do about the flooding in the mid-60's when the construction of a dam was considered. In 1975 a relocation coordinator was hired, and

in 1976 the Village passed a resolution that supported relocation to avoid future flood damages. After the 1978 flood Village officials convinced state and federal officials that moving the town was the best floodproofing. By 1983 the project costing \$6 million in public funds was completed. The Soldiers Grove central riverside municipal park and campgrounds stand where the downtown once stood. The park received little damage in 2007, however, was substantially damaged in the 2008 event. It is not hard to imagine the devastation that would have occurred if the downtown had not relocated. The Solar Village uphill was unscathed. At the time of the Soldiers Grove relocation, there were no FEMA mitigation programs available. The relocation was completed through various funding sources and from several state and federal agencies all working together in a partnership over a period of years. As a result of the 2007 disaster, the Village received HMGP funds to elevate four structures and acquire another.

The Village of Gays Mills is the next town downstream of Soldiers Grove. Like Soldiers Grove it has experienced the same flooding over the years. However, unlike Soldiers Grove the Village had not relocated to higher ground. The Village was struck by back-to-back floods in August 2007 and June 2008, both greater than 500-year flood events which resulted in substantial losses within the Village. As a result of the federal declaration in 2008, the Long-Term Community Recovery (LTCR) was activated, which integrated assistance from state and federal partners to address recovery needs for the Village. Through many community meetings a Long Term Recovery Plan was completed. The Village considered several alternatives and partial relocation was selected.

The Village developed two sites north of downtown as relocation sites. The site known as North Mills contains both commercial and residential uses. The Village constructed a mercantile center for business relocation as well as a new Community Commerce Center that houses the village hall, library and community center with a commercial community kitchen. Single and multiple family housing were also constructed at the site as well as other commercial properties. A second site north of North Mills was developed and the EMS and Public Works Department relocated to that site. The Village would like to build a new fire department at the location and hopes to attract additional businesses.

The Wisconsin Hazard Mitigation Team through the Wisconsin Recovery Task Force worked together to assist the Village in reaching its goals. Multiple agencies and funding sources were utilized in the Village's recovery efforts. Funding was provided through the HMGP for acquisition/demolition and elevation. The Economic Development Administration provided funding for the infrastructure in the commercial area. Community Development Block Grant (CDBG) funding was provided by the state Department of Commerce (now provided by the Department of Administration) for the local match to the HMGP and for the Community Commerce Center. The state Department of Transportation provided funding for highway improvements at the relocation site. Coulee CAP (Community Action Program) provided financing and sponsorship of the multi-family housing units, and USDA Rural Development assisted low-income and elderly population with housing needs. The state Department of Health Services provided Social Service Block Grant (SSBG) to assist homeowners whose income exceeded the LMI requirements of the CDBG program, and funded a Flood Recovery

Coordinator. In addition, there were private investments. The Kickapoo River in the Village once again exceeded its bank from rains that occurred on September 21-22, 2016. Flood damages were significantly reduced by the mitigation actions implemented after 2008.

The Community Development Block Grant-Emergency Assistance Program (CDBG-EAP) is administered by the Wisconsin Department of Administration. CDBG-EAP funds are used to assist local units of government in addressing emergency housing, public facility, infrastructure, and business assistance needs that occur as a result of natural or manmade disasters. Such assistance may include, but is not limited to, housing rehabilitation, acquisition/demolition, housing replacement, road repairs, stormwater drainage, and public facilities. A local unit of government interested in applying for CDBG-EAP funds must do so within 90 days of the disaster event.

CDBG-EAP funds may be used to address damage caused by the disaster, including repair of disaster-related damage to the dwelling unit, including repair or replacement of plumbing, heating, and electrical systems; acquisition and demolition of dwellings unable to be repaired; down payment and closing cost assistance for the purchase of replacement dwellings (assistance is limited to 50% of the pre-disaster equalized assessed value); publicly-owned utility system repairs; streets and sidewalks; and community centers.

The DOA is a major partner to WEM after disaster events. The CDBG-EAP programs can assist in mitigating damages after a disaster, and staff works closely with WEM through the WSJHMT as well as the WRTF. The funds can be used to acquire and demolish or elevate structures damaged by floods. CDBG has provided the local match on many HMA projects. Without those funds, communities would not have been able to implement their mitigation projects. After the 2008 floods, CDBG-EAP funds provided the local match on all of the HMGP grants, and provided additional funds to assist communities in their recovery efforts. They are especially instrumental in non-declared events, as they may be the only source of funding for recovery activities after an event. WEM coordinated with DOA in developing proposals for the HUD National Disaster Resiliency Competition. Appendix C identifies projects completed with CDBG-EAP funding.

As a part of the state hazard mitigation effort, WEM maintains close coordination with the Department of Natural Resources (DNR). The DNR, as the state's lead floodplain management agency, plays a key role in providing technical assistance for mitigation programs and in developing the hazard mitigation action plan in flood disasters. The DNR administers the Municipal Flood Control program as defined by Ch. NR 199, Wisconsin Administrative Code. The program helps local governments minimize flooding and flood-related damages through various types of projects. Projects shall minimize harm to existing beneficial functions of water bodies and wetlands, maintain natural aquatic and riparian environments, use stormwater detention and retention structures and natural storage to the greatest extent possible, and provide opportunities for public access to water bodies and to the floodplain. The program provides grants to cities, villages, towns, tribes, and metropolitan sewerage districts for projects such as property acquisition and removal of structures for permanent open space or flood water storage; acquisition of vacant land or flood water flowage easement to facilitate more efficient flood flows to the water body; floodproofing and flood elevation of public and private

structures; flood water control detention ponds; riparian restoration project on a watercourse; and flood mapping. The grants are offered every other year with the application date usually in the spring of even years. The state share may not be greater than 50% of the eligible project cost and no single recipient can receive more than 20% of the funding available. Since the goals of the program are very similar to the HMA programs, DNR and WEM work closely in funding mitigation projects particularly acquisition and demolition of floodplain properties. Since the program is state funds, it can be used as local match to the HMA programs, and vice versa. The two agencies coordinate together to stretch the limited available dollars to fund as many eligible projects as possible. Appendix C identifies projects funded and completed through the DNR Municipal Flood Control program.

The Disaster Damage Aids (DDA) program provides financial assistance to local governments to repair any highway under its jurisdiction which is not part of the State Trunk Highway system and that has had significant damage caused by a disaster event. The program is governed by §86.34, Wisconsin Statutes. Funds may be used to repair a highway to match its pre-disaster condition (replacement) and to make changes to a highway, its drainage facilities, etc., to prevent similar damage from occurring in the future (improvements). The applicant pays a share of these replacement and improvement costs. DDA is a biennial program with annual appropriation levels. It is categorized as a sum sufficient appropriation which means if further funding is needed it can be allocated in the amounts necessary. The DDA becomes the primary source of funding for road repairs and improvements (mitigation) after a disaster when there is no federal declaration.

In a federal declaration, the FEMA Public Assistance program provides financial assistance to state, tribal, and local governments, and certain private non-profit organizations (PNPs). Through the PA program, FEMA provides supplemental federal disaster grant assistance for debris removal, emergency protective measures, and the repair, replacement, or restoration of disaster-damaged, publicly-owned facilities and the facilities of certain PNPs. The PA program also encourages protection of these damaged facilities from future events by providing assistance for hazard mitigation measures during the recovery process (Section 406). The WEM Mitigation staff works closely with the state PA staff and State Coordinating Officer in identifying and pursuing mitigation opportunities through Section 406 of the PA Program. The federal share of assistance is not less than 75% of the eligible cost for emergency measures and permanent restoration. The state through WEM will provide up to 12.5% of the local match.

At a WHMT meeting on December 4, 2012, USGS made a presentation on Flood Inundation Mapping. The USGS gauges and NWS flood warning locations in AHPS play a critical role in development of the product. Inundation maps translate flood data (flood gauge information) into operational data (inundation maps) that can communicate risk and consequences of forecasted flooding. Utilizing stream gauge information, hydraulic modeling is conducted which is then intersected with LiDAR elevation information to create the map library. You can then combine the map library with the USGS streamflow data and NWS flood forecast information to create a flood inundation map. The product does not show the FEMA floodplain map as that is a regulatory product and USGS is a non-regulatory agency. It can be a great tool for not only

emergency preparedness and response, but also communicating risk to the public. WEM looked at funding this type of project through the HMGP after the 2008 floods, but was advised that it was not an eligible activity. Identifying funding was an issue.

After that WHMT meeting, WEM, DNR, and USGS met to discuss the possibility of trying to fund a pilot study in Wisconsin. Due to flood risk, LiDAR, flood modeling and past mitigation activities, the group selected the Rock River for a potential pilot project. In February 2013, the USACE put a call out for proposals for the Flood Risk Management program with the proposals due in April. A proposal developed by WEM, DNR, USGS, USACE, and NWS for flood inundation mapping for five stretches consisting of 38 miles on the Rock River was submitted. The proposal was shared with all of the stakeholders at a meeting in April 2013. Stakeholders consisted of officials from Dodge, Jefferson, and Rock counties; Department of Transportation; Department of Administration; Wisconsin Economic Development Corporation; US Army Corps of Engineers; National Weather Service; Association of State Floodplain Managers; FEMA; USGS; DNR; and WEM. The state was notified in April 2014 that the project was selected.

The majority of the work was completed by the DNR and USACE. The maps were completed and went live on the NWS website in August 2015. The final product was presented to the stakeholders. In addition, a press release was issued and the DNR developed a tutorial video. The counties put a link to the maps on their webpages. In addition, the product was presented at several forums including the Wetlands, Wildlife Habitat and Flood Hazards in the Rock River Basin webinar series; Wisconsin Association for Floodplain, Stormwater and Coastal Management annual conference; WEM's annual All-Hands Meeting with all of the county and tribal emergency management directors in the state; and the Annual Governor's Conference on Emergency Management and Homeland Security. The promotion of the maps has generated a great deal of interest.

As a result of the effort, the DNR is presently developing flood inundation maps for the Upper Fox River in Racine and Kenosha Counties. WEM and the DNR will be developing a strategy for developing additional flood inundation maps throughout the state.

With the success of obtaining funding through the USACE Flood Risk Management program, WEM, DNR, USACE, and Columbia County developed and submitted a proposal in April 2014 to develop a floodplain structure inventory on the Wisconsin River in Columbia County. The state was notified in December 2014 that the project had been selected. A meeting was held with WEM, DNR, USACE, and Columbia County in February 2015 to discuss the scope of the project. That meeting was followed by a meeting with the local stakeholders in March. A Fact Sheet and Press Release were developed for the project. The USACE completed the field work over the summer and presented a draft report in December 2015. The USACE provided a presentation and the final report at a meeting in August 2016. Due to funds remaining in the project, the group has requested additional work on the project, in addition to completing a flood inundation map for the river gauge in the City of Portage.

6.7 Effective Use of Available Mitigation Funding

The State of Wisconsin continues to effectively implement mitigation programs towards achieving its goals as identified in this plan:

- 1. Minimize human, economic, and environmental disruption from natural, technological, and manmade hazards.
- 2. Enhance public education about disaster preparedness and resistance, and expand public awareness of natural, technological, and manmade hazards.
- 3. Encourage hazard mitigation planning.
- 4. Support intergovernmental coordination and cooperation among federal, state, and local authorities regarding hazard mitigation activities.
- 5. Improve the disaster resistance of buildings, structures, and infrastructure whether new construction, expansion, or renovation.

The mitigation programs utilized in implementing mitigation measures throughout the state are primarily federally funded, however, are state administered. These include the HMA programs (HMGP, FMA, and PDM). The projects that have been approved and funded through these programs support the state's hazard mitigation goals as well as meet the priorities and criteria as outlined in Section 7.3. This section describes the history of the State's mitigation programs and demonstrates the state's ability to effectively use and administer all available mitigation funding through both federal and state mitigation programs. Appendix B provides information on the history of the state's federal declarations including the HMGP. Appendix C identifies mitigation projects funded and completed to date throughout the state.

In addition to the three HMA programs, there are several programs at the state level that support the goals and are utilized in advancing mitigation statewide:

- NR 116 Local and State Floodplain Standards prohibits construction in floodways and requires elevation and dry-land access in flood fringe areas. Limits improvements to non-conforming structures and requires compensatory storage in flood storage areas.
- Comprehensive Planning requires local governments to have a comprehensive plan for making good land use decisions. It is a synergetic companion to mitigation planning and has added momentum to the mitigation movement by incorporating mitigation into the comprehensive plans.
- The Home Safety Act requires the state's Uniform Dwelling Code (UDC) be enforced
 throughout the state. This includes the necessity to have all new construction inspected
 for compliance with the UDC. The law will improve the construction of homes, by
 requiring implementation of safety standards. The effect is a reduction in loss of property
 and injury from all types of natural hazards.

- NR 199 the Municipal Flood Control and Riparian Restoration program provides grants for the mitigation of flood-prone property, restoration of riparian areas, and the construction of flood control projects.
- Community Development Block Grant, Housing and Public Facilities programs can provide grants to communities for implementing mitigation activities such as acquisition, demolition, relocation, and elevation.
- The Disaster Damage Aids (DDA) program provides financial assistance to local governments to repair any highway under its jurisdiction which is not part of the State Trunk Highway system and that has had significant damage caused by a disaster event including making changes to prevent similar damage from occurring in the future.

These programs as well as others are described and evaluated in Section 3.2 and Figure 3.2.1-1.

Since 1990, \$94 million in HMGP funds has been administered in the state. Based on the Preliminary Damage Assessments, the estimate for FEMA-4276-DR-WI is \$5 million and \$2.2 million for FEMA-4288-DR. This will bring the total for HMGP funds to \$101.2 million in the state for the history of the program. FMA funds in the amount of \$2.6 million have been administered, and PDM funds in the amount of \$13.8 million. Between the three programs over \$110 million in funds has been provided to communities for mitigation planning and project implementation. To date the number of structures that have been mitigated through the HMGP, and FMA and PDM programs by acquisition/demolition is 633 with more in process. Additionally, WEM has provided support to local governments in the development of all-hazards mitigation plans through the issuance of guidance, education through planning workshops, and planning grants.

As stated in Section 6.4, a Memorandum of Understanding had existed between FEMA and WEM recognizing the state as a Hazard Mitigation Grant Program Managing State, but since has been rescinded. Although the MOU was no longer in place, WEM continued with the roles and responsibilities identified in the MOU.

The state's allocation for declaration 1768-DR declared June 14, 2008, was \$30,875,884 (\$23,156,913 federal share) and is by far the worst disaster Wisconsin has experienced. The HMGP was and is the largest in state history. The state's priority was acquisition and demolition of substantially damaged properties. Seventeen communities received project grant funds for acquisition/demolition with another ten receiving planning grants totally obligating the allocation. Due to deductions for duplication of benefits (the total of which was unknown at the time of approval) the actual amount spent on all of the grants was \$23,350,412.26 (\$17,512,809.24 federal share) resulting in a deobligation of \$7,525,471.74 (\$5,644,103.81 in federal funds.) Duplication of benefits included funds received through flood insurance claims, FEMA Individual Assistance, as well as other assistance. Through the HMGP, 195 properties were acquired and demolished with nearly all of them identified as substantially damaged.

State Mitigation staff makes every attempt to fully utilize all available funding in the mitigation programs. For HMGP, unspent funds in projects are reobligated to projects that have cost overruns. In addition, eligible projects above the allocation are submitted in the event funds

become available. The goal is to spend as much of the available funds as possible and return as little as possible at the end of the performance period. Unfortunately it is not always possible to utilize all of the available funding.

The state was allocated \$21,338,532 (\$16,003,899 federal share) in HMGP after declaration 1933-DR declared August 11, 2011. The state received applications totaling over \$34 million, however, there was great difficulty for some of the projects to pass the benefit-cost analysis. The state submitted 40 applications (18 planning and 22 project grants) for a total of \$13,366,830.69 (\$10,025,123.02 federal share.) One project was determined ineligible and two withdrew as there were issues with the benefit-cost analysis. The state solicited applications a second time in an attempt to utilize all of the available funding. This was the first time that the state was unable to submit enough eligible projects for the total allocated funds for the declaration.

In July 2015 FEMA announced the HMGP Pilot Closeout for Uncommitted Open Disasters from 2010 through 2013. This provided states with uncommitted funds a chance to fund additional projects. The requirements were the declaration had to be open and uncommitted funds could only be used to amend applications submitted within the original application period. It allowed for expanded scopes of works. The only Wisconsin declaration with uncommitted funds was 1933-DR. All funds in the other four open declarations were obligated. The state reached out to the original subapplicants and submitted amendments to three grants to acquire and demolish an additional eight properties. Additional funds were obligated in the amount of \$1,381,492 (\$1,036,113 federal share).

The mitigation staff has successfully administered over 270 hazard mitigation grants, identified in Appendix C, and effectively managed the HMGP for over 26 years. These activities as well as those described above and throughout the plan demonstrate that Wisconsin effectively uses existing mitigation programs to achieve its mitigation goals.

6.8 State Commitment to a Comprehensive Mitigation Program

WEM is the lead agency for the development of and promotion of a statewide comprehensive mitigation program. In doing so, WEM works with other state, federal, and local agencies and other organizations in implementing the goals and mitigation strategy of the State of Wisconsin Hazard Mitigation Plan. The Wisconsin Silver Jackets Hazard Mitigation Team (WSJHMT) led by WEM is made up of representatives from state and federal agencies, as well as several other interested groups. Key elements of the state's comprehensive mitigation program include the development of the State of Wisconsin Hazard Mitigation Plan, financial and technical assistance to local governments as they develop their hazard mitigation plans, implementation of mitigation measures, and conducting trainings and workshops for state and local officials. The following provides examples of the state's ongoing commitment to a comprehensive mitigation program.

6.8.1 Local Mitigation Planning Support

Both FEMA and the state agree that in order to be truly effective in mitigation at the local level, there needs to be a local mitigation planning process. The previous challenge for the state was convincing communities at risk from natural hazards to complete the mitigation planning process. The challenge now is convincing the communities the need for maintaining those plans. Before 2002, the only federal mitigation planning grant funds available were for flood mitigation planning through the FMA program. The all-hazards mitigation planning requirements proved difficult for local governments to meet, particularly small communities with limited or no staff. Most of the communities that developed mitigation plans contracted with their local Regional Planning Commission or hired a private consultant.

As a result of the HMGP and PDM programs 48 all-hazards mitigation plans are currently approved and not yet in the update phase (35 counties, six municipalities, five tribes, and two universities), 22 plans are currently approved and updating (20 counties, one tribe, and the City of Milwaukee), and 17 plans have expired and are being updated (15 counties and two tribes). Four communities are developing their first plan (two counties, and two tribes). No countywide plans have expired that are not being updated. All 72 counties and ten of the 11 federally-recognized tribes in the state have current plans or are developing or updating plans. The federal, state, local, and tribal investment in this planning effort is over \$7.3 million. Several countywide, local, and tribal plans have been developed or updated without HMA funding. WEM still provides the same level of technical assistance. Local plans are required to be updated every five years. For more information about local hazard mitigation planning efforts in Wisconsin, see Section 4.

Local hazard mitigation plans are required to be updated and reapproved by FEMA every five years in order for the community to remain eligible for FEMA mitigation funds. If a community's plan lapses, they are no longer eligible for mitigation funds until the plan is updated and approved by FEMA. This presents another challenge for state Mitigation staff. The majority of approved plans statewide are countywide, multi-jurisdictional plans. To ensure that plans do not expire, state Mitigation staff have closely monitored expiration dates of local mitigation plans and notify the counties with plans due to expire within two years of the requirement to update the plan and inform them of the availability of planning grant funds.

The WEM Mitigation staff has worked with counties and local jurisdictions to encourage and support hazard mitigation planning prior to and since publication of the federal planning regulations. (Section 4 describes in more detail the coordination of local mitigation planning.) Some of the activities that support mitigation planning are summarized below.

- Prior to federal planning requirements, WEM required subgrantees of HMGP to develop a mitigation plan and encouraged development of Flood Mitigations Plans.
- In 1995, the DNR developed the Wisconsin Community Flood Mitigation Planning Guidebook. WEM developed additional planning guidance to meet FMA planning

- requirements. WEM and DNR conducted several flood mitigation planning workshops throughout the state.
- WEM contracted with the Council of Regional Planning Organizations (now the Association of Wisconsin Regional Planning Commissions) to develop planning guidance for meeting the requirements of 44 CFR Part 201. The result was the Resource Guide to All Hazards Mitigation Planning in Wisconsin.
- Wisconsin's Comprehensive Planning and Smart Growth legislation require all local governments to develop and adopt a comprehensive land-use plan by 2010. A list of the nine planning elements and some ideas on how to integrate all-hazards mitigation planning concepts into them are included in the *Resource Guide to All Hazards Mitigation Planning in Wisconsin*. In addition, where to integrate the comprehensive planning elements into all-hazards mitigation plans are described in the guidance.
- To date WEM Mitigation staff has conducted twenty All-Hazards Mitigation Planning Workshops to communities and consultants developing hazard mitigation plans as well as for those interested in finding out more regarding the overall planning process. A workshop was held in the fall of 2004 for the Great Lakes Inter-Tribal Council which consists of representation from the eleven recognized tribal governments in the state. Five workshops were presented during this plan update including a workshop for the Northeast Regional Emergency Management Directors. At a minimum, one planning workshop is held annually in the spring. Information presented and distributed at the workshops is put on a CD and is provided to each individual attending the training. The Resource Guide to All Hazards Mitigation Planning; FEMA's Local Mitigation Plan Review Guide and Tool dated October 2011; FEMA's Local Mitigation Planning Handbook dated March 2013; and FEMA's Tribal Mitigation Plan Review Crosswalk and Tribal Multi-Hazard Mitigation Planning Guidance dated March 2010 are included on the CD as well as other materials.
- Conducts the G393-Introduction to Hazard Mitigation for Emergency Managers twice a year. The G-393 was held in 2011; twice in 2013, 2014, and 2015; and once in 2016. The three-day class is well-attended and well-received.
- Provide technical assistance through reviewing sections of plans under development and providing feedback.
- Identifying information sources with web links available through state and federal agencies, locally and nationally.
- Providing information via WEM's website. The website provides a "Local Hazard Mitigation Planning" link where local governments can find the resource guides and tools for developing local all-hazards mitigation plans. In addition there is a link to the State Hazard Mitigation Plan
- WEM hosted a four-day HAZUS class in 2006 conducted by FEMA contractors.
- As part of the 2008 update to the State Plan, WEM completed a statewide HAZUS flood risk assessment with support from the University of Indiana Purdue-POLIS Center, the

- University of Wisconsin-Land Information and Computer Graphics Facility (LICGF). The County Assessments were provided to the counties to assist them in development or update of their county all-hazards mitigation plans.
- One of the Disaster Response and Recovery Planners in the WEM Mitigation Section taken the HAZUS and HAZUS for Flood courses at the Emergency Management Institute and provides support to counties and other agencies interested in utilizing HAZUS. She will run reports for counties if requested.
- Provides information on SRL and RL properties and NFIP claim information as well as other disaster payments to those developing and/or updating their local plans.
- Developed a Household Natural Hazards Preparedness Questionnaire that local governments could utilize and/or modify to fit their needs. The survey was utilized in two updates of the plan (2005 and 2008).
- Reviews draft plans utilizing the FEMA Local Mitigation Plan Review Tool/FEMA Tribal Mitigation Plan Review Crosswalk, and provides comments on required and recommended revisions. Submits final plans to FEMA for review and approval.
- Information on all-hazards mitigation planning is provided at other WEM training such as the Introduction to Emergency Management (twice a year), Disaster Response and Recovery Operations Workshop (annually), Public Assistance Applicant Briefings, Substantial Damage Workshops, and other workshops when the opportunity presents itself.
- Information on the all-hazards mitigation program and planning is provided to the Wisconsin Association of Floodplain, Stormwater, and Coastal Management through their newsletter and annual conference.
- The All-Hazards Mitigation Planning Workshop and the G-393-Introduction to Hazard Mitigation for Emergency Managers are part of WEM's Certified Emergency Manager (CEM) Program.

6.8.2 State Legislation Supporting Mitigation

A statewide hazard mitigation program is under development, which will include legislative initiatives, formation of new and continuation of existing partnerships, and other executive actions that promote hazard mitigation.

Wisconsin has numerous legislative rules, administrative codes, and executive orders that support the mitigation process statewide. Below is a list of key legislation which is covered in more detail in Section 4, Mitigation Strategy.

Chapter 323, Emergency Management

Wisconsin Uniform Commercial Building Code, 2013 Wisconsin Act 270, SPS 361-366

Wisconsin Uniform Dwelling Code, SPS 320 - 360

2007 Wisconsin Act 63, Regulation of Electricians, Electrical Contractors, and Electrical Inspectors

and Electrical Wiring

2007 Wisconsin Act 205, Installation of Carbon Monoxide Detectors

Administrative Code NR 116, Floodplain Management

Administrative Code NR 115, Shoreland Protection Program

Administrative Code NR 117, Shoreland-Wetland Protection

Administrative Code NR 199, Municipal Flood Control and Riparian Restoration Program

Administrative Code NR 335, Dam Safety

Administrative Code NR 333, Large Dam Standards and Emergency Action Plans

Executive Order 67, State must follow wetland, floodplain, erosion and shoreland standards.

Executive Order 73, Flood mitigation for state-owned facilities

Chapter 30, Standards for Navigable Waters

Chapter 917, 1997 Wisconsin Act 27, Fire Protection Grant Program

Wisconsin Acts 16, 33, 233, 307, Wisconsin Comprehensive Planning Law

Chapter 92, ATCP 50, Soil and Water Resources Management

Chapter 88, ATCP 48, Operation and Maintenance of Drainage Districts

Chapter 86.34, Disaster Damage Aids Program

Chapter 84.18, Trans 213 Local Bridge Improvement Assistance Program

Chapter 85.026, Transportation Enhancement Program

6.8.3 Wisconsin Silver Jackets Hazard Mitigation Team

A significant development for the state following the record-breaking 1993 floods was the creation of Wisconsin's Interagency Disaster Recovery Group (IDRG). The mission of the IDRG was "to develop a cooperative federal and state disaster recovery effort that can assist communities and regional agencies in utilizing all available funding sources to recover from and mitigate the future effects associated with the damages from natural hazards."

The success of the IDRG during the recovery from the Great Flood of 1993 demonstrated the value of the group to communities around the state. Therefore, the IDRG remained in place to coordinate long-term recovery efforts following every disaster declaration. In 2003, the IDRG merged with the State Hazard Mitigation Team to form the Wisconsin Hazard Mitigation Team.

Agencies with responsibilities in the areas of natural resources, environmental regulation, planning and zoning, building codes, infrastructure regulation and construction, insurance, public information/education, economic development, and historic preservation were included on the State Hazard Mitigation Team (SHMT). Several agencies that had multiple facets that needed to be included in the plan had more than one representative on the Team. Many of the

members of the IDRG were also members of the SHMT.

In December 2003, the IDRG and the SHMT merged to form the Wisconsin Hazard Mitigation Team (WHMT). Additional members from state agencies were added to the team. The WHMT played an integral role in establishing the Wisconsin Recovery Task Force after the devastating floods of 2008. Appendix E includes the members of the team. The team consists of 52 members representing 12 state agencies and 8 federal agencies along with WAFSCM, Association of Wisconsin Regional Planning Commissions, WEMA, Cooperative Network, and VOAD.

In January 2016, the Wisconsin Silver Jackets Hazard Mitigation Team Charter was signed by core agencies of the Wisconsin Hazard Mitigation Team. The core agencies are:

- U. S. Army Corps of Engineers
- Federal Emergency Management Agency
- Wisconsin Emergency Management
- Wisconsin Department of Natural Resources
- US Geological Survey
- National Weather Service

The Charter also identifies the rest of the Team members as supporting agencies. The Charter does not change how the WHMT operates as a team, but formalizes what the team had been doing for the past fifteen plus years. As a result of the Charter, the state team changed its name to the Wisconsin Silver Jackets Hazard Mitigation Team (WSJHMT).

The WHMT is active in updating the State Plan, but also assists in disaster recovery activities.

The WHMT has established a set of five State Hazard Mitigation Goals which were revised in 2016 for this plan update:

- 1. Minimize human, economic, and environmental disruption and reduce the potential for injury and loss of life from natural, technological, and manmade hazards.
- 2. Enhance public education about disaster preparedness and resilience, and expand public awareness of natural, technological, and manmade hazards.
- 3. Encourage and promote continued comprehensive hazard mitigation planning and implementation of the plan.
- 4. Support coordination and collaboration among federal, state, and local authorities, and non-governmental organizations regarding hazard mitigation activities.
- 5. Improve the disaster resistance of buildings, structures, and infrastructure whether new construction, expansion, or renovation.

6.8.4 Wisconsin Recovery Task Force

It was obvious early in the administration of the 2008 flood declaration that additional outside resources would be required to assist the state and its communities in the recovery. Upon direction of Governor Doyle, WEM created the Wisconsin Recovery Task Force (WRTF) to assist individuals, businesses, and communities to recover quickly, safely, and with more resilience from future disasters. Six subcommittees were formed with a focus on mitigation, agriculture, business, housing, human needs, and infrastructure. The WRTF was comprised of many state and federal agencies. The primary goal of the WRTF was to identify the unmet needs of the communities and citizens of Wisconsin. The WRTF met bi-weekly. One of the outcomes from the report submitted to the Governor was that the WRTF be a standing task force and meet semi-annually to ensure preparedness and facilitate effective operational readiness following a disaster.

The Wisconsin Hazard Mitigation Team (WHMT) played an integral part in identifying the key players that comprise the WRTF. Many of the WHMT members actively participated in and led WRTF subgroups. Without the WHMT, it is very likely that the WRTF would not have been created and activated as quickly as it was.

The State Hazard Mitigation Officer was assigned to chair the Mitigation Subcommittee. The Subcommittee consisted of 11 state agencies (all which were members of the WHMT); seven federal agencies (five of which were members of the WHMT); and five other organizations (four of which were members of the WHMT). The mission of the committee was to "[a]ssist communities during the recovery process to make their communities more disaster resistant." The goals of the committee were based on the goals of the State of Wisconsin Hazard Mitigation Plan and were identified as:

- 1. Minimize human, economic, and environmental disruption from natural hazards.
- 2. Improve the disaster resistance of buildings, structures, and infrastructure, whether new construction, expansion, or renovation.
- 3. Support and assist the intergovernmental coordination and cooperation among the federal, state, and local agencies regarding hazard mitigation activities.

The Subcommittee identified challenges, issues, and roadblocks that the State and communities faced during the recovery process. They included:

- 1. Communities lack capability (resources and staff) to develop and implement long-term mitigation solutions to reduce future flooding.
- 2. NFIP sanctioned and non-participating communities are not eligible for FEMA mitigation funding.
- 3. Lack of funding to complete identified mitigation and recovery needs, particularly the lack of funds for local match required for various grants.

- 4. Lack of resources to develop good, well-thought out project applications to obtain federal and state funding to implement viable and necessary mitigation and recovery projects.
- 5. Potential contamination of project sites could delay the actual implementation and funding of projects.

In addition, FEMA activated Emergency Support Function (ESF) 14 for the declaration. ESF 14 provided support for to the state for long-term recovery by assisting the WRTF, and in developing a Long Term Recovery Plan for the Village of Gays Mills. In addition, they worked with the Village of Rock Springs and developed the Rock Springs Flood Recovery Report to address recovery issues in that community. The information gathered from these planning efforts also assisted with the recovery in other impacted communities.

Two additional reports were completed (Hydrogeological and NFIP Interpretations of Terrace Flooding Northwest of Spring Green, Wisconsin and Possible Mitigation; and Flooding Conditions at Clark Creek and Possible Mitigation) were completed to address flooding in the towns of Spring Green and Greenfield in Sauk County.

The US Geological Survey developed flood-peak inundation maps and water-surface profiles for nine communities along the Baraboo, Kickapoo, Crawfish, and Rock Rivers in GIS by combining flood high-water marks with available 1-10-meter resolution digital elevation model data. The high-water marks were those surveyed during the flood by communities, counties, and federal agencies and hundreds of additional marks surveyed by the USGS. The flood maps and profiles outline the extent and depth of flooding through the communities and are being used in recovery efforts. The information also provides documentation for future loss avoidance studies in Gays Mills and Jefferson County.

The Subcommittee worked together to identify needs and match the needs with the appropriate agency and funding source(s). In addition, members worked together to try and package funding where possible. As a result of this Subcommittee and the Wisconsin Hazard Mitigation Team, the Department of Commerce committed Community Development Block Grant funds to cover the 12.5% local match to the Hazard Mitigation Grant Program subgrants. This provided 100% funding to those communities implementing buyout and elevation projects.

One of the goals of the Short- and Long-Term Recovery Committee of the Comprehensive Response Work Group was to reconvene the WRTF as a standing task force as identified in the 2008 WRTF report. Based on the National Disaster Recovery Framework, the subcommittees of the original WRTF were realigned to more closely match those in the national Recovery Support Functions (RSF). The six RSF Subcommittees are identified as: Economic, Health and Social Services, Housing, Infrastructure, Agriculture, and Mitigation. Due to the unique recovery issues associated with a radiological incident at the nuclear power plants, a Radiological Emergency Preparedness (REP) Recovery Ad Hoc Working Group was established under the Agriculture RSF Subcommittee. Chairs were identified for the RSF Subcommittees and a meeting was held in February 2015. The Chairs identified members for their subcommittees and a WTRF meeting was

held in April 2015. The SHMO chairs the RSF Mitigation Subcommittee with membership consisting of the WSJHMT. Two of the several tasks identified for the WRTF were 1) to develop a State Recovery Plan; and 2) to develop Rapid Assessment Strike Teams (RASTs). The individual RSF Subcommittees met throughout the past year and are still identifying mission, goals and objectives.

Staff from the WEM Mitigation and Recovery Sections began to develop a State Recovery Plan in June 2015, which was finalized in May 2016.

WEM has been working with the Wisconsin Chapter of the American Institute of Architects (AIA) since 2014 in development of rapid damage assessment teams that would assist local governments during a disaster to assess the damages to structures during a disaster. WEM staff attended Disaster Assistance: Building Evaluator Training sponsored by AIA in July 2014 and 2015. The training provided is based on the California Safety Assessment Program (SAP). The program utilizes volunteers and mutual aid resources to provide professional engineers, architects, and certified building inspectors to assist local governments in safety evaluation of their built environment in the aftermath of a disaster. The workshop taught participants on how to conduct rapid damage assessments of structures, and discussed the appropriate protocol for coordination with emergency managers. The Wisconsin AIA Chapter's goal is to develop teams for each of the six regions in the state. In turn the RASTs would be a resource to the state in times of disaster. A second training was held in July 2016 where the draft Wisconsin Disaster Assessment Plan developed by WEM and AIA was presented. The Plan discusses the process and procedures for deploying the RASTs. An MOU between WEM and AIA Wisconsin was signed in April 2016. WEM and AIA continue to work together to finalize procedures, develop regional teams of volunteers, and credential team members. WEM is also working with the Code Officials Alliance in developing a Building Inspectors Mutual Assistance Agreement. Once an agreement is worked out, local building inspectors would provide mutual aid and assist other communities in the inspection of buildings damaged in a disaster. The same training and procedures used for AIA would be utilized with the municipal building inspectors.

WEM convened the RSF Subcommittee Chairs in July and August 2016 in response to flooding in northwest part of the state that resulted in a federal declaration for eight counties. Priorities for short- and long-term recovery were identified for the RSF Subcommittees. The entire WRTF met in September to address recovery needs not only for the counties included in the declaration, but also subsequent flooding that occurred in Buffalo and Trempealeau counties in August, and the ongoing bluff erosion in Racine and Kenosha counties. The WRTF will continue to meet to address recovery needs in declared and non-declared events in the state and ongoing recovery planning.

6.8.5 State Hazard Mitigation Staff

In addition to forming the IDRG, WEM realized that they would benefit from hiring a full-time State Hazard Mitigation Officer (SHMO). The SHMO was hired in August 1994. An Assistant SHMO was added in 1998, and a Disaster Response and Recovery Planner in 2003. In 2007, a

second Disaster Response and Recovery Planner was added, increasing the WEM hazard mitigation staff to four full-time employees. The Mitigation Section was created in 2012 and consists of the Section Supervisor, SHMO, and the two planners. Additional temporary staff is utilized when the need dictates. The SHMO is a Certified Floodplain Manager (CFM).

To maintain program proficiency and improve the program, mitigation staff avail themselves of training opportunities. This includes in-person training as well as webinars offered by FEMA at the national and regional level and other agencies in the area of environmental and historic preservation, benefit-cost analysis, grants management, HAZUS, mitigation planning, eGrants, climate change, and other topics. Staff participated in every national evaluation for the PDM program until it was suspended and have attended the annual hazard mitigation summits when held. Since June 2011 mitigation staff has participated in over 32 training offerings including attending classes at the FEMA Emergency Management Institute. This training increases the state's capability to develop and implement a comprehensive mitigation program.

Due to the efforts that the Mitigation staff has undertaken in the three-year open space monitoring requirement for acquired properties, one of the Disaster Response and Recovery Planners presented the state's process at the FEMA Region V Fall Conference in October 2015. The Section Supervisor presented on the topic at the Annual Hazard Mitigation Stakeholders Workshop in July 2016 at the Emergency Management Institute.

Through an EMAC request, in June 2014 the Section Supervisor assisted the State of Colorado in developing a methodology for reviewing, ranking, and selecting proposed HMGP projects.

The Supervisor and SHMO attended Emergency Management Accreditation Program (EMAP) training in October 2015, and participated in the subsequent assessment in August 2016. The WEM Administrator announced on October 14, 2016, that the state achieved accreditation.

6.8.6 Municipal Flood Control Program

The DNR administers the Municipal Flood Control program as defined by Ch. NR 199, Wisconsin Administrative Code. The program helps local governments minimize flooding and flood-related damages through various types of projects. Projects shall minimize harm to existing beneficial functions of water bodies and wetlands, maintain natural aquatic and riparian environments, use stormwater detention and retention structures and natural storage to the greatest extent possible, and provide opportunities for public access to water bodies and to the floodplain. The program provides grants to cities, villages, towns, tribes and metropolitan sewerage districts for projects such as property acquisition and removal of structures for permanent open space or flood water storage; acquisition of vacant land or flood water flowage easements to facilitate more efficient flood flows to the water body; floodproofing and elevation of public and private structures; flood water control detention ponds; riparian restoration projects on a watercourse; and flood mapping. The grants are offered every other year with the application date usually in the spring of even years. The state share may not be greater than 50% of the eligible project cost and no single recipient can receive more than 20% of the funding available.

The program priorities are:

- 1. Acquisition and removal of structures which, due to zoning restrictions, cannot be rebuilt or repaired.
- 2. Acquisition and removal of structures in the 100-year floodplain.
- 3. Acquisition and removal of repetitive loss or substantially damaged structures.
- 4. Acquisition and removal of other flood damaged structures.
- 5. Floodproofing and elevation of structures.
- Riparian restoration projects, including removal of dams and artificial obstructions, restoration of fish and native plan habitat, erosion control and stream bank restoration projects.
- 7. Acquisition of vacant land, or perpetual conservation or flowage easements to provide additional flood storage or to facilitate natural or more efficient flood flows.
- 8. Construction of structures for the collection, detention, retention, storage and transmission of stormwater and groundwater for flood control and riparian restoration projects.
- 9. Preparation of flood insurance studies and other flood mapping projects.

Similar to the HMA acquisition/demolition requirements, the Municipal Flood Control grant program requires the removal of a structure on the property to be acquired for the development of permanent open space for flood storage or flood water flowage to a watercourse. Since the goals of the program are very similar to the HMA programs, DNR and WEM work closely together in funding mitigation projects, particularly acquisition and demolition of floodplain properties. Since the program is state funds, it can be used as local match to the HMA programs, and vice versa. The two agencies coordinate together to stretch the limited available dollars to fund as many eligible projects as possible.

6.8.7 Community Development Block Grant-Emergency Assistance Program

The Community Development Block Grant-Emergency Assistance Program (CDBG-EAP) is administered by the Wisconsin Department of Administration. CDBG-EAP funds are used to assist local units of government in addressing emergency housing, public facility, infrastructure, and business assistance needs that occur as a result of natural or manmade disasters. Such assistance may include, but is not limited to, housing rehabilitation, acquisition/demolition, housing replacement, road repairs, stormwater drainage, and public facilities. A local unit of government interested in applying for CDBG-EAP funds must do so within 90 days of the disaster event.

CDBG-EAP funds may be used to address damage caused by the disaster, including repair of disaster-related damage to the dwelling unit, including repair or replacement of plumbing,

heating, and electrical systems; acquisition and demolition of dwellings unable to be repaired; down payment and closing cost assistance for the purchase of replacement dwellings (assistance is limited to 50% of the pre-disaster equalized assessed value); publicly-owned utility system repairs; streets and sidewalks; and community centers.

The CDBG-EAP programs can assist in mitigating damages after a disaster, and work closely with WEM through the WSJHMT and the WRTF. The funds can be used to acquire and demolish damaged structures as well as elevate those that have been damaged by floods. CDBG has provided the local match on many HMA projects. Without those funds, communities would not have been able to implement their mitigation projects. After the 2008 floods, CDBG-EAP funds provided the local match on all of the HMGP grants, and provided additional funds to assist communities in their recovery efforts. They are especially instrumental in non-declared events, as they may be the only source of funding for recovery activities after an event.

6.8.8 Disaster Damage Aids Program

The Department of Transportation's Disaster Damage Aids (DDA) program provides financial assistance to local governments to repair any highway under its jurisdiction which is not part of the State Trunk Highway system and that has had significant damage caused by a disaster event. The program is governed by §86.34, Wisconsin Statutes. Funds may be used to repair a highway to match its pre-disaster condition (replacement) and to make changes to a highway, its drainage facilities, etc., to prevent similar damage from occurring in the future (improvements). The applicant pays a share of these replacement and improvement costs. DDA is a biennial program with annual appropriation levels. It is categorized as a sum-sufficient appropriation which means if further funding is needed it can be allocated in the amounts necessary. The DDA becomes the primary source of funding for road repair improvements (mitigation) after a disaster when there is no federal declaration.

6.8.9 EDA Disaster Recovery Collaboration

As discussed in 6.1.2, as a result of the 2008 flood disaster, the Economic Development Administration (EDA) provided grants to the Regional Planning Commissions in the disaster area for the development of Flood Recovery Strategies. To accomplish the tasks assigned, the Department of Commerce took the lead to coordinate the effort that was referred to as the EDA Disaster Recovery Collaboration. This group met monthly up through August 2011. WEM Mitigation staff participated in the collaboration by attending meetings and providing input. One of the outcomes of the group, again with the Department of Commerce as the lead, was the development of a Community Economic Recovery Guidebook to assist economic development organizations, businesses, and community leaders in preparation of economic recovery from a disaster. EDA is a member of the WSJHMT as well as the WRTF RSF Mitigation Subcommittee.

6.8.10 Wisconsin Coastal Management Program

Housed within the Department of Administration, the Wisconsin Coastal Management Program (WCMP) provides technical assistance and coordinates state resources to support the management of Wisconsin's Great Lakes coasts. The WCMP's duties include administering the Coastal Grant Program, which provides grants to communities for coastal resource protection, and overseeing initiatives on beach management, marina pollution reduction, and coastal natural hazards.

Three of the WCMP's main objectives are to provide technical assistance, support education and public outreach, and foster coordination between local governments and state agencies with respect to coastal issues. The Coastal Hazards Strategy, part of the WCMP's larger Wisconsin 2016-2020 Needs Assessment and Strategy, focuses on developing and/or enhancing government hazard policies through targeted outreach and technical assistance. Implementing this strategy includes reviewing and revising regulations and guidance relevant to coastal hazards at the state, regional, and local level, including state statutes, zoning ordinances, comprehensive plans, and informational documents. The WCMP also helps with the development and expansion of technical tools, including mapping and other visualization tools, to further support decision making and policy development.

WEM participates on the Coastal Hazards Work Group (CHWG) chaired by the WCMP. This group was formed to provide a forum for sharing information and opportunities related to coastal hazards. Members of the group work to formulate goals, strategies, and policies for managing coastal hazards, in addition to furthering the WCMP's goals of providing technical expertise, education and outreach, and planning support to Wisconsin's coastal communities. The CHWG meets bimonthly or as needed. The group also meets with representatives of the three coastal regional planning commissions and representatives of local governments as needed.

Examples of technical projects completed by CHWG members:

- The CHWG has helped to develop a number of online resources to help communities understand coastal processes. For example, CHWG partners used WCMP funds to collect oblique photographs of the Great Lakes shoreline in 1976 and 2007, which were then assembled into the Wisconsin Shoreline Inventory and Oblique Photo Viewer, an interactive web-based map.
- The WCMP funded a 2016 study on changes in bluff profiles conducted by UW-Madison researchers. The study compared 2012 LiDAR data to manual measurements taken in the 1970s in order to characterize changes over time.
- Beginning in 2016, the WCMP and the UW Sea Grant Institute are hosting a Coastal Fellow who will review and revise the Coastal Processes Manual, a document that provides important information and recommendations for coastal engineering.

Examples of education and outreach provided by CHWG members:

- The WCMP and ASFPM published three reports in 2016 featuring contributions from CHWG members: Managing Coastal Hazard Risks on Wisconsin's Dynamic Great Lakes Shoreline, Coastal Ordinance Provisions in Wisconsin Communities, and Modern Studies of Coastal Erosion in Wisconsin.
- The WCMP worked with WEM staff and other members of the Coastal Hazards Work Group to organize and hold Great Lakes Coastal Processes and Best Management Practices workshops in 2011-2012.
- CHWG members provided input to the Wisconsin Initiative on Climate Change Impacts (WICCI) Coastal Communities Working Group, leading to the development of the 2010 report Climate Change and Wisconsin's Great Lakes Coastal Communities.

Examples of CHWG coordination with municipalities and governmental agencies:

- CHWG members are currently supporting the local response to severe Lake Michigan bluff erosion in the Village of Mount Pleasant (Racine County) by providing technical advice, program coordination, information on funding opportunities, and outreach to coastal property owners.
- Members of the CHWG are contributing to the University of Michigan-funded Integrated
 Assessment for Water Level Variability and Coastal Bluff Erosion in Northern Milwaukee
 County and Southern Ozaukee County, led by the UW Sea Grant Institute. The study area
 ranges from the Shorewood/Milwaukee area (Milwaukee County) to Port Washington
 (Ozaukee County), including Whitefish Bay, Bayside, Mequon, and Grafton. Results of this
 interdisciplinary project will be combined with those of other teams working on the same
 issues in different areas (Michigan, Canada, etc.), with final deliverables anticipated in
 April 2017.
- CHWG members have been working to develop guidance for coastal communities impacted by recent changes to statewide shoreland zoning regulations. As part of this effort, a CHWG member recently updated a document titled *Managing Coastal Hazard Risks on Wisconsin's Dynamic Great Lakes Shoreline*, as well as supporting documents such as *Coastal Ordinance Provisions in Wisconsin Communities* and the *Coastal Erosion Model Ordinance*.

Agencies represented on the group include UW-Madison, UW Sea Grant Institute, the DNR, the WCMP, and WEM. The WCMP representative also serves on the Wisconsin Silver Jackets Hazard Mitigation Team. A link to the WEM Hazard Mitigation website is provided on the Wisconsin Coastal Management Program website.

6.8.11 State Agency Resource Working Group

The State Agency Resource Working Group (SARWG) was a statutory funded group of the Wisconsin Land Council administered through the Department of Administration, Division of Intergovernmental Relations. The Division is responsible for administering the Comprehensive Planning Grant Program for the state. Representatives from various state agencies participated

in promoting and cooperating on land use issues. As a mitigation action, WEM participated on the group to promote mitigation planning as part of the comprehensive planning process. The DOA representative on the SARWG also participates on the WSJHMT. With the sunset of the Wisconsin Land Council there is no statutory requirement or funding for the group. However, members continue to communicate and share information via email to promote comprehensive and mitigation planning.

6.8.12 Building Resilience Against Climate Effects (BRACE)

The BRACE Workgroup was formed in 2012 and is located in the Wisconsin Department of Health Services, Bureau of Environmental and Occupational Health (BEOH). The Wisconsin BRACE program studies and prepares for anticipated climatic effects on the public's health. The BRACE program seeks to expand partnerships, provide expertise, foster collaboration, and develop strategies that will address health risk factors related to severe weather event indicators. The BRACE program aims to develop climate adaptation strategies based on best practices and scientific knowledge to address health risks related to potential severe weather and climate-driven events.

The SHMO participates on the BRACE Workgroup and provided input into the BRACE Strategic Adaptation Plan. Staff from the BRACE project presented at the WHMT meeting December 2015 and discussed the Strategic Adaptation Plan. Climate and Health Toolkits were developed for Severe Thunderstorms and Tornados, Flood, Winter Weather, Extreme Heat, Drought, Wildfire, Harmful Algal Blooms, and Chemical Release and are posted on the DHS and the Ready Wisconsin websites.

The BRACE program conducted also a geo-spatial analysis of heat-related morbidity and mortality of the state and the greater Milwaukee urban area. This analysis resulted in a heat vulnerability index (HVI) based on existing population and census data, GIS environmental data layers, climate and weather data, and disease prevalence rates to identify areas of greatest risk for negative health impacts due to extreme heat. The countywide and tribal HVIs were shared with the counties and tribes to include in their preparedness and mitigation planning efforts.

In partnership with the UW Solid Waste and Hazardous Waste Education Center, and the Space Science and Engineering Center, BRACE developed a report on reducing risk of environmental impact from releases of hazardous materials from manufacturing facilities during extreme floods. They utilized several databases to identify manufacturing facilities located in 100-year floodplains; identified facilities likely to have hazardous materials or waste onsite; and provided targeted technical assistance to those companies at risk from spills or discharge from extreme flood events. They also developed guidance for manufacturing facilities, "Managing the Risk of Chemical Spills from Flooding: A Guide for Wisconsin Manufacturers." This information was shared with county and tribal emergency managers to include in their preparedness and mitigation planning efforts. The Wisconsin Climate and Health Profile Report (PDF, 1.4 MB) summarizes the Wisconsin Building Resilience Against Climate Effects (BRACE) CDC grant project, Wisconsin's climate and associated health impacts, and identifies which populations in

Wisconsin are most vulnerable to extreme weather events and climate impact.

6.8.13 Homeland Security Council

In March 2003, the Wisconsin Homeland Security Council was created by executive order to address the state's ability to prepare for and respond to threats to Wisconsin's homeland security. Every non-statutory committee or council created by executive order of the governor expires at the end of each gubernatorial term of office unless the new governor, by executive order, provides for its continued existence. Thus, the Wisconsin Homeland Security Council was re-created by Governor Scott Walker's Executive Order #6 in January 2011. New members were appointed to fill vacancies; however, the structure – consisting of 13 members and chaired by the Wisconsin Homeland Security Adviser – remains the same. In May 2013, Governor Walker expanded the membership of the Wisconsin Homeland Security Council to 16 members with Executive Order #101 to better protect the citizens and critical infrastructure of the state.

Major General Donald Dunbar, Adjutant General of the Wisconsin National Guard, is the Governor's Homeland Security Adviser. The Adviser and sixteen-member council is responsible for advising the Governor, coordinating state and local prevention and response efforts and producing periodic reports on the state of homeland security in Wisconsin. The Council works with local, state, federal, and tribal agencies; non-governmental organizations; and private industry to improve citizen and community preparedness. Other agencies on the Council are WEM; Department of Justice, Division of Criminal Investigation; Department of Health Services, Division of Public Health; Department of Administration, Divisions of Enterprise Technology and Capitol Police; Wisconsin Chiefs of Police Association; Badger State Sheriffs Association; DNR; Department of Agriculture, Trade and Consumer Protection; Department of Corrections; Public Service Commission of Wisconsin; City of Milwaukee Police Department; Wisconsin State Fire Chiefs Association; Department of Transportation, Wisconsin State Patrol; and the Wisconsin Chapter of the American Public Works Association. There are nine working groups.

The Interagency Working Group is chaired by WEM and comprised of representatives of the Departments of Administration; Agriculture, Trade and Consumer Protection; Corrections; Health Services; Children and Families; Justice; Natural Resources; and Transportation; the National Guard; and the UW Police. The Group was formed in the late 90's with its original focus on terrorism preparedness. Since that time, its mission has evolved to cover all hazards and all phases of emergency management. The Group meets monthly or more often if dictated by current events and acts as a support group to the Governor's Homeland Security Council.

6.8.14 Wisconsin Voluntary Organizations Active in Disasters

Wisconsin Voluntary Organizations Active in Disasters (WIVOAD) is a humanitarian association of independent voluntary organizations who may be active in all phases of disaster. Its mission is to foster efficient, streamlined service delivery to people affected by disaster, while eliminating unnecessary duplication of effort, through cooperation in the four phases of disaster: preparation, response, recovery, and mitigation. Staff from WEM provides coordination and

assistance to WIVOAD members. WIVOAD has taken a lead role in long-term recovery and sponsors Long-Term Recovery Committees. These committees, using WIVOAD's 501(c)(3) tax exempt status, focus on fundraising, reaching out to individuals and families with unmet disaster needs, and providing services to them through a uniform case management process.

As a result of the floods of 2008, 11 Long Term Recovery Committees were created to assist in the flood recovery efforts addressing unmet needs of flood victims. WIVOAD has worked tirelessly to assist flood victims in their complex recovery issues. WEM Mitigation staff has also worked with the Long Term Recovery Committees in meeting unmet needs of those impacted by disasters particularly in those communities where HMGP buyout programs were implemented. Figure 6.1.4-1 shows the 11 Long-Term Recovery Committees from the 2008 Floods. The committees have continued to provide recovery assistance in events that have occurred since 2008.

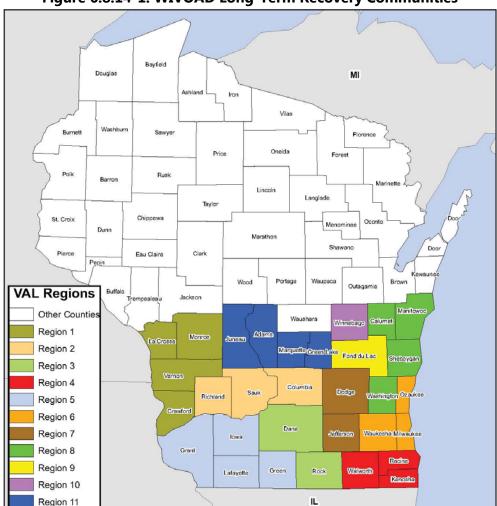


Figure 6.8.14-1: WIVOAD Long-Term Recovery Communities

Source: Wisconsin Recovery Task Force, June 2008 Severe Storms, Tornadoes and Flooding, FEMA-1768-DR-WI, November 2008 Report to the Governor.

6.8.15 Public-Private Partnerships

In addition to working with the agencies on the WSJHMT, for the past several years WEM staff provided information on hazard mitigation programs and the planning process to groups and individuals through a variety of means. The previous plan update dated 2011 identified that WEM staff made presentations to the following groups: Wisconsin Emergency Management Association, Wisconsin Manufactured Housing Association, Wisconsin Land Information Association, American Planning Association, Wisconsin Utilities Association, the State Bar of Wisconsin, Association of Wisconsin Regional Planning Commissions, Great Lakes Inter-Tribal Council, Wisconsin Claims Council, University of Wisconsin-Madison Student Planning Association, Wisconsin Chapter of the Public Risk Managers Association, Wisconsin Association for Floodplain, Stormwater, and Coastal Managers, the LaFollette School of Public Affairs, and Southwest Building Inspectors Group. In addition, information was provided to communities receiving Community Development Block Grants on how they can incorporate mitigation into rehabilitation of housing stock. Presentations on hazard mitigation planning and its link to comprehensive planning and smart growth were made to the State Agency Resource Working Group of the Wisconsin Land Council, at a workshop for local officials on Complying with Comprehensive Planning and State Agency Resources.

WEM Mitigation staff continues its efforts to partner with and educate a variety of organizations.

WEM has been working with the Wisconsin Chapter of the American Institute of Architects (AIA) since 2014 in development of rapid damage assessment teams that would assist local governments assess the damages to structures during a disaster. WEM Mitigation and Recovery have participated in training sponsored by AIA in July 2014 and 2015. The training provided is based on the California Safety Assessment Program (SAP). The program utilizes volunteers and mutual aid resources to provide professional engineers, architects, and certified building inspectors to assist local governments in safety evaluation of their built environment in the aftermath of a disaster. The Wisconsin AIA Chapter is working with WEM to develop teams for each of the six regions in the state. In turn the Rapid Assessment Strike Teams (RASTs) would be a resource to the state in times of disaster. The Wisconsin AIA Chapter and WEM developed the draft Wisconsin Disaster Assessment Plan that discusses the process and procedures for deploying the RASTs. An MOU between WEM and AIA Wisconsin was signed in April 2016. WEM and AIA continue to work together to finalize procedures, develop regional teams of volunteers, and credential team members. WEM is also working with the Code Officials Alliance in developing a Building Inspectors Mutual Assistance Agreement. Once an agreement is worked out, local building inspectors would provide mutual aid and assist other communities in the inspection of buildings damaged in a disaster. The same training and procedures used for AIA would be utilized with the municipal building inspectors.

WEM is also a member of the national Association of State Floodplain Managers (ASFPM). The Mitigation staff participates in the quarterly mitigation calls and attends the annual conference where staff has presented on numerous occasions. In addition, they provide input on positons papers when requested. Staff has participated in several efforts since the last plan update. In

2014 staff participated in a study that ASFPM and the McKnight Foundation were developing looking at environmental benefits in the Rock River Watershed. Information and data were provided on cost-effective projects as well as those that were deemed not cost-effective in the watershed looking at how incorporating additional environmental benefits could have benefited the unfunded projects. The SHMO participates in the Planning Information Exchange regarding mitigation planning that ASFPM and the American Planning Association (APA) sponsors.

Mitigation staff has provided support to the Wisconsin Association for Floodplain, Stormwater, and Coastal Management (WAFSCM) since its inception in 2000. The SHMO in partner with a representative from the Milwaukee Metropolitan Sewage District were instrumental in the formation of the WAFSCM. In 2004, WAFSCM became a Chapter of ASFPM. The 2005 ASFPM annual conference was held in Madison where WAFSCM was the state sponsor. Mitigation staff was heavily involved in the national conference including the planning and preparedness activities. In addition, WEM coordinated a field trip to the City of Darlington to highlight the mitigation efforts of that community. Mitigation staff supports the association by participating in board calls and on several committees. In the past the SHMO has served in positions as Treasurer, Secretary, and Chair of the Membership Committee, as well as coordinated and published the newsletter. Presently the Section Supervisor chairs the Scholarship Committee, and several other staff members participate on the Conference Committee. Staff attends the annual conference providing support and equipment, and making presentations. WAFSCM sponsors training throughout the year. Most recently WAFSCM, in partner with ASFPM, sponsored E-273 Managing Floodplain Development through the NFIP, a four-day class. The Section Supervisor has received two awards for her efforts in supporting the organization including Chapter Service Award and Lifetime Achievement Award. In 2009 the SHMO nominated Donna Haugom, Jefferson County Emergency Management Director, and she received the Local Award for Excellence for her efforts in implementing mitigation in her county. In addition, Meg Galloway and Bill Sturtevant along with the DNR Dam Safety and Floodplain Management Section received the Excellence in Project Design and Implementation for their efforts in reconstructing Highway A in Wisconsin Dells after it failed in the 2008 flood. WEM nominated the City of Oshkosh received a 2016 award for Excellence in Project Design and Implementation. The project was construction of a detention pond that was funded through the HMGP. WAFSCM promotes the common interests in floodplain, stormwater, and coastal management to enhance cooperation between the various related private, local, regional, state, and federal agencies; and encourages and ensures effective, new, and innovate approaches to managing the state's floodplain, stormwater, and coastal systems.

The Regional Planning Commissions are one of WEM's strongest partners in mitigation planning. The RPCs have provided planning services to many of the counties in the development and update of all-hazards mitigation plans. In addition, the RPCs prepare grant applications for local governments to obtain federal and state assistance for many types of activities including mitigation grant applications for both planning and projects. After the 2008 floods, RPCs located in the southern part of the state worked with their respective local jurisdictions to assist in the completion of additional grant applications for recovery assistance. With the involvement of the RPCs in the state and local planning process, they are knowledgeable on both state and local

mitigation priorities and program requirements. Therefore, they are able to develop comprehensive project grant applications. Since there is a close relationship between the RPCs and the local governments, and a link between comprehensive and hazard mitigation planning, a representative from the Association of Wisconsin Regional Planning Commissions (AWRPC; formerly Council of Regional Planning Organizations) joined the Wisconsin Silver Jackets Hazard Mitigation Team (WSJHMT; formerly Wisconsin Hazard Mitigation Team) in 2003. This member serves as a conduit between the RPCs and the WHMT. Having an AWRPC member participate on the WSJHMT helps the state share resources, combine planning requirements, avoid duplication, and provide additional local and regional assistance to communities that choose to plan. This individual is also a member of the WRTF RSF Mitigation Subcommittee. The SHMO attended and presented information on mitigation planning at two AWRPC meetings, one in May 2012 and one in September 2015.

The Natural Resources Defense Council (NRDC) reached out to WEM Mitigation staff in the summer of 2015 to provide assistance in addressing changing future conditions in the 2016 update of the State Hazard Mitigation Plan. Throughout the past year, the council has worked with staff and provided guidance and assistance. After reviewing the existing State Plan and consulting with state staff, they provided two documents. The first provided ideas on how to incorporate projections of changing future conditions into hazard mitigation actions, regulations, and policies. The second contained recommendations for incorporating long-term costs and benefits of projects that build resilience to changing future conditions into FEMA BCA. Both documents will assist the state staff and the WSJHMT as they move forward in developing future mitigation strategies and form projects to reduce the impacts from changing future conditions. Several recommendations were considered and have been incorporated into the plan update.

WEM and DNR staff were contacted in early 2011 by the Environmental Law Institute (ELI) and the University of North Carolina (UNC) at Chapel Hill regarding collaborating together on a workshop on Wetlands, Wildlife Habitat, and Flood Hazards in the Rock River Basin. The workshop was held May 13, 2011, and was designed to facilitate a greater collaboration between emergency managers and wetland and wildlife conservation managers to strengthen protection of vital wetlands and floodplains. Wisconsin Wetlands Association was a sponsor in addition to the ELI and UNC. The workshop explored how different agencies and organizations can work together to meet multiple goals and identify the information needed and funding sources available for joint projects. Both WEM and the DNR made presentations at the workshop. Based on the workshop results the ELI and UNC developed a guidebook, Improving Community Resilience to Flooding in the Upper Midwest through Inter-Agency Collaboration, in 2014. Since the workshop held 2011, WEM Mitigation staff has continued to partner with the ELI, UNC, and the Wisconsin Wetlands Association by participating in their annual Wetlands, Wildlife Habitat, and Flood Hazards in the Rock River Basin webinar series. Staff participated in the webinar series and presented information in webinars on the hazard mitigation programs in October and November 2012; hazard mitigation assistance in buyout programs in August 2013; hazard mitigation programs in November 2014; and Rock River Flood Inundation Mapping Project in September 2015.

WEM Mitigation Section Supervisor participated on the Natural Hazards, Community Resilience, and Habitat Connectivity Advisory Committee in July 2015 and worked on a project to help communities leverage the potential value of properties acquired under federal hazard mitigation and other grant programs to achieve habitat benefits, connect fragmented habitats, and improve community resilience while engaging local residents and underserved communities. The project included the development of in-depth case studies of potential habitat and flood mitigation benefits of acquired properties in communities in four states including Wisconsin. As part of the committee, the Mitigation Section Supervisor identified communities for the case study, helped identify data to be used in the analysis, and will review the case studies, articles, and action guide and assist with outreach and dissemination of the final products.

Rural Electric Cooperatives (RECs) are integral to the State of Wisconsin and its communities. The first REC in Wisconsin energized its system in the spring of 1937 and the last REC energized its system in 1945. Today, there are 25 RECs in Wisconsin that generate, transmit and distribute electric power. Initial discussions of development of a REC Annex to the State of Wisconsin Hazard Mitigation Plan began in late 2007. Several RECs in the state had been recipients of hazard mitigation funding. WEM approached the Cooperative Network (at that time Wisconsin Federation of Cooperatives) to gauge the interest of the state's RECs in developing a REC Annex to the State of Wisconsin Hazard Mitigation Plan. The 2011 Plan included a REC Annex. In the 2015 HMA Guidance the requirement that RECs must participate in a mitigation plan to be eligible for project grants was removed. Because the state strongly believes in pre-disaster mitigation planning, whether required or not, we will continue to work with the electric cooperatives to update the REC Annex, although it may be completed at a later date than the main body of the State of Wisconsin Hazard Mitigation Plan.

In working with the RECs throughout the state, WEM staff learned that the RECs felt the biggest barrier to implementing mitigation projects through the HMA programs was passing the benefit-cost analysis (BCA). To address this issue, in 2015, WEM and FEMA staff jointly held a REC BCA Workshop in Black River Falls. Additionally, in early 2016, WEM staff, a Wisconsin Electric Cooperative Association representative, and a REC representative held a call with a FEMA BCA expert and worked through the BCA for a potential project using future damage probability instead of recorded past damages. This work will facilitate the implementation of REC mitigation projects. A representative of the Cooperative Network is a member of the WSJHMT as well as the RSF Mitigation and Infrastructure Subcommittees of the WRTF.

6.8.16 Public Education and Outreach

One of the challenges that WEM has faced has been keeping citizens, local officials, and emergency management staff informed about the importance of and need for hazard mitigation. Educating the public and local governments on topics like household preparedness, flood insurance, and federal assistance opportunities is an ongoing process. Since the Midwest Flood of 1993 and the 2008 floods, officials in the state have become much more alert to the probability of disaster striking and the need for mitigation to reduce future loss of life and economic damages.

WEM uses numerous strategies to disseminate mitigation information:

- Incorporating mitigation information in annual winter weather, tornado and severe weather, and flood awareness campaigns
- Publishing mitigation information on the WEM website
- Including mitigation articles in the DNR and WAFSCM newsletters
- Integrating mitigation elements in all county-level Damage Assessment Workshops as well as the Introduction to Emergency Management, and the Disaster Response and Recovery Operations Workshop. The last two are part of Wisconsin's Certified Emergency Manager program.
- Conducting an All-Hazards Mitigation Planning Workshop annually to educate local
 officials, emergency management staff, planners, consultants, and others about the
 mitigation planning process and plan components. The workshop again is part of
 Wisconsin's Certified Emergency Manager program.
- Conducting G-393, Introduction to Mitigation for Emergency Managers, twice a year to educate local officials, emergency management staff, planners, consultants, and others about developing mitigation programs at the local level. The workshop again is part of Wisconsin's Certified Emergency Manager program.
- Sponsoring training such as Benefit-Cost Analysis, HAZUS, Buyout Workshops, and Safe Room Workshops
- Creating timely workshops, such as Project Application Development, Buyout Workshops, BCA for Rural Electric Cooperatives, and Safe Room Workshops, and others for communities in need of training following a disaster event
- Participating in Risk MAP discovery, open houses, community outreach, and resilience meetings

In addition, when a disaster strikes, WEM educates local governments and the public about their options and what help is being offered by different agencies, including FEMA. Mitigation staff attends the Public Assistance Applicant Briefings and presents information regarding mitigation opportunities and funding. WEM participates in Substantial Damage Workshops conducted by FEMA and DNR providing information on the mitigation programs and how they can provide assistance to property owners whose properties are determined substantially damaged. Both WEM and DNR staff attend community meetings throughout the declared area. Their focus is to discuss the National Floodplain Insurance Program (NFIP), the Hazard Mitigation Grant Program (HMGP) and other recovery issues.

State Mitigation staff takes every opportunity given to spread the word about mitigation and disaster resilience. This is demonstrated by some of the numerous outreach activities identified below for this five-year plan update.

• April 2011: FEMA Region V webinar - Village of Gays Mills Recovery and Mitigation

- May 2011: Wetlands, Wildlife Habitat, and Flood Hazards in the Rock River Basin Workshop
- October 2011: Yahara Lakes Watershed Advisory Group
- March 2012: County Code Administrators Conference
- May 2012: Climate Change Workshop at the State Capitol
- May 2012: Regional Planning Commission Council
- June 2012: Coastal Hazards Process and Best Management Practices Milwaukee
- August 2012: Coastal Hazards Process and Best Management Practices Ashland
- October and November 2012: Wetlands, Wildlife Habitat, and Flood Hazards in the Rock River Basin webinar series
- April 2013: Completed an interview for the WEM website
- April 2013: Brief the Homeland Security Council on BW-12
- July 2013: Wisconsin Public Radio interview on flooding and mitigation in the southwest part of the state
- September 2013: Upper Mississippi River Conference, Davenport, Iowa
- August 2013: Wetlands, Wildlife Habitat, and Flood Hazards in the Rock River Basin webinar series
- October 2013: Annual WAFSCM Conference presentation on the disaster declaration process
- November 2013: Interview for video with Wisconsin Geological and Natural History Survey on groundwater monitoring and the Spring Green mitigation project
- March 2014: Governor's Conference on Emergency Management presentation on BW-12, GW Act, and the SRIA; and Damage Assessment
- October 2014: Annual WAFSCM Conference on a mitigation panel with Jefferson County and the DNR
- March 2015: Safe Room Workshop (presented twice in Dodgeville)
- May 2015: Safe Room Workshop in the West Central Region
- May 2015: BCA for Rural Electric Cooperatives, Black River Falls
- July 2015: University of Wisconsin-Green Bay, Master Academy for Civic and Public Affairs, City of Darlington's Recovery and Mitigation: Experiences and Successes
- July 2015: Planning for Integrated Assessment of Water Level Variability and Coastal Bluff in Northern Milwaukee County and Southern Ozaukee County
- September 2015: Safe Room Workshop in the Southwest Region
- September 2015: Association of Regional Planning Commissions

- September 2015: Wetlands, Wildlife Habitat, and Flood Hazards in the Rock River Basin webinar series on the Rock River Flood Inundation Mapping Project
- October 2015: WEM All-Hands Meeting presentation on the Rock River Flood Inundation Mapping Project
- November 2015: WAFSCM Annual Conference presentation on the Rock River Flood Inundation Mapping Project
- March 2016: Annual Governor's Conference presentation on the Rock River Flood Inundation Mapping Project
- April 2016: University of Wisconsin-Madison presentation on natural hazard resilience and planning
- September 2016: E-273 Managing Floodplain Development in the NFIP, Waukesha

In the development of the first State of Wisconsin Hazard Mitigation Plan and the subsequent three-year update, Mitigation staff utilized a Household Natural Hazards Preparedness Questionnaire. The questionnaire was developed from a survey developed by the Oregon Natural Hazards Workgroup at the University of Oregon's Community Service Center. The questionnaire included the State Plan's mitigation goals and asked the individual completing the questionnaire to provide their opinion of the importance of the goals. The questionnaire had general questions designed to help gauge household preparedness and the individual's knowledge of mitigation tools that may be available. The questionnaire was interactive and could be completed on WEM's website. In addition, the survey was distributed at various WEM training sessions, speaking engagements that Mitigation staff attended, and the Annual Governor's Conference on Emergency Management.

6.8.17 Non-Federal Match for HMGP

The FEMA mitigation programs require a 75/25 cost-share with a few of exceptions. Since 1990 the state has provided half of the non-federal match for the HMGP grants. The federal, state, and local mitigation dollars listed below show the commitment to the HMGP. Through the coordination with the WSJHMT, other state agencies funded the local match requirements for many projects, particularly when they involved acquisition and demolition, or funded projects in their entirety. After the 2008 floods, the Department of Commerce, Division of Housing (now in the Department of Administration) committed Community Development Block Grants to fund the entire local match for the HMGP grants that involved acquisition and demolition and/or elevation.

Figure 6.8.17-1: Hazard Mitigation Grant Program Funding History 1991-2016

Disaster	Federal Share	State Share	Local Share	Total
*912-DR-WI	\$54,342	\$27,171	\$27,171	\$108,684
*959-DR-WI	\$19,434	\$9,717	\$9,717	\$38,868
*963-DR-WI	\$188,187	\$94,093	\$94,093	\$376,373

Disaster	Federal Share	State Share	Local Share	Total
*964-DR-WI	\$195,537	\$97,768	\$97,768	\$391,073
994-DR-WI	\$10,503,364	\$1,750,559	\$1,750,559	\$14,004,482
1131-DR-WI	\$258,395	\$43,066	\$43,066	\$344,527
1180-DR-WI	\$4,516,254	\$752,709	\$752,709	\$6,021,672
1236-DR-WI	\$1,325,761	\$220,960	\$220,960	\$1,767,681
1238-DR-WI	\$3,294,156	\$549,025	\$549,025	\$4,392,206
1284-DR-WI	\$604,500	\$100,750	\$100,750	\$806,000
1332-DR-WI	\$3,034,202	\$505,698	\$505,698	\$4,045,598
1369-DR-WI	\$2,994,056	\$499,009	\$499,009	\$3,992,074
1429-DR-WI	\$455,707	\$75,951	\$75,951	\$607,609
1432-DR-WI	\$568,297	\$94,714	\$94,714	\$757,725
**1526-DR-WI	\$1,224,548	\$204,087	\$204,087	\$1,632,722
1719-DR-WI	\$3,033,568	\$505,595	\$505,595	\$4,044,758
1768-DR-WI	\$17,512,811	\$2,918,800	\$2,918,800	\$23,350,411
1933-DR-WI	\$10,944,078	\$1,824,012	\$1,824,012	\$14,592,102
1944-DR-W	\$611,926	\$101,988	\$101,988	\$815,901
1966-DR-WI	\$1,626,806	\$271,134	\$271,134	\$2,169,074
4076-DR-WI	\$1,570,599	\$261,767	\$261,767	\$2,094,133
4141-DR-WI	\$994,261	\$165,710	\$165,710	\$1,325,681
***4276-DR-WI	\$3,750,000	\$625,000	\$625,000	\$5,000,000
***4288-DR-WI	\$1,650,000	\$275,000	\$275,000	\$2,200,000
Total	\$70,930,789.00	\$11,974,283	\$11,974,283	\$94,879,354
Average	\$2,955,450	\$498,928	\$498,928	\$3,953,306

(Does not include Administrative or State Management Costs)

6.8.18 Construction Standards

Wisconsin has adopted commercial building codes. The Wisconsin Commercial Building Code includes SPS 361-366 and the adopted provisions of the 2009 International Code Council codes: International Building Code, International Energy Conservation Code, International Mechanical Code, International Fuel Gas Code, and International Existing Building Code. The Commercial Code protects the health, safety, and welfare of the public and employees by establishing

^{*} Cost share was 50% federal/25% state/25% local. HMGP was 10% of Public Assistance permanent repairs only.

^{**} HMPG was based on 7.5% of Individual and Public Assistance programs.

^{***} Based on Preliminary Damage Assessment.

minimum standards for the design, construction, maintenance, and inspection of public buildings, including multi-family dwellings and places of employment.

In addition to the Commercial Codes, Wisconsin has adopted the Uniform Dwelling Code (UDC) for one- and two-family dwellings SPS 320-360. The UDC provides construction and remodeling requirements for work done after June 1, 1980. Beginning January 1, 2005, all municipalities are required to enforce the Code. Enforcement involves submitting building plans to obtain a building permit, and having electrical, construction, plumbing, and HVAC inspections during construction.

The state Department of Safety and Professional Services (DSPS) reviews plans prior to construction for compliance with state statutes and building codes. The DSPS administers and issues certification licenses and registrations for approximately 44,000 individuals in 64 categories for specific trades. Annual continuing education classes are conducted for building codes used for design, construction, and inspection.

6.8.19 State Facilities, Infrastructure, and Critical Facilities

A key component of this Plan is the identification of those state-owned or -operated critical facilities that are vulnerable to various types of hazards. This information can be used to guide the development and implementation of cost-effective mitigation measures. These measures will help to reduce or eliminate identified vulnerabilities to the most critical assets of state government. Ideally this will help ensure that these state assets remain operational in times of disaster or emergency to provide for the continuation of emergency operations, continuity of government, critical public safety, health care, transportation, and educational functions, and the provision of other essential services to the public.

The Wisconsin Department of Administration (DOA) is the best available source of information on state-owned and -operated assets. DOA provided WEM an inventory including assets ranging from small storage sheds to large multi-story office buildings. The inventory totals 6,579 critical and non-critical state-owned and -operated buildings, infrastructure, and facilities. WEM reviewed all 6,579 records. During the review, assets were categorized as critical or non-critical.

Critical facilities were defined as state-owned or -operated facilities deemed essential due to their function, size, service area, uniqueness, delivery of vital services, and for the protection of the health and safety of citizens including buildings and infrastructure that meet characteristics such as the following:

- Communications facilities;
- Correctional facilities and other custodial facilities, including facility utility services;
- Utility services, including: electrical power generation, heating, wastewater treatment, water treatment, etc.;

- Hospitals and other medical facilities, including: group homes, shelters, mental health facilities, etc.;
- Major state government facilities that house key state operations;
- · Critical military facilities; and
- Emergency response facilities, including: law enforcement, security, fire, etc.

Approximately 16.5%, or 1086, of the total assets are designated as critical facilities. The largest percentage 35.9%, or 390, of the critical facilities are identified with the Department of Corrections. The total replacement cost of critical facilities is approximately \$5.56 billion dollars. Over 90% of this amount is comprised of assets from four agencies: Department of Corrections at 31.1%, or \$1.7 billion; University of Wisconsin System at 25.2%, or \$1.4 billion; Department of Administration at 21.2%, or \$1.2 billion; and Department of Health Services at 13.4%, or \$745 million.

The THIRA (see Appendix A) includes an analysis of vulnerability and loss estimation to state-owned and -operated critical facilities. The analysis included reviewing the state inventory and, where possible, correcting incorrect or adding missing information. If a critical asset could be reasonably identified on aerials photographs, the latitude and longitude was added. Information was included on the number of critical facilities, replacement cost, and average replacement cost by county. Critical facilities located in a FEMA Special Flood Hazard Area were identified.

To get a more accurate risk assessment there needs to be site-specific information. The information in the State Facility Database is a good start, but additional information is required to determine hazard vulnerability for each building and to further develop a strategy to mitigate the losses from identified hazards.

6.8.20 Post-Disaster Recovery Operations

Hazard mitigation is an integral part of Wisconsin's post-disaster recovery operations. WEM Mitigation staff participates in the Preliminary Damage Assessment process to identify potential mitigation opportunities. In addition, staff assists in the preparation of documentation for the Governor's request letter for a federal disaster declaration. State Mitigation staff coordinates with the state and federal agencies on the Wisconsin Silver Jackets Hazard Mitigation Team and the Wisconsin Recovery Task Force that may have technical or funding assistance available to communities during the recovery process. State Mitigation staff co-locates with federal Mitigation and NFIP staff at the Joint Field Office as soon as it opens. State and federal Mitigation and NFIP staff work cooperatively to develop a post-event Mitigation Strategy. The Strategy identifies mitigation activities such as community mitigation education and outreach, coordination with other disaster assistance programs, mitigation project development, and National Flood Insurance Program mitigation opportunities and promotion. State Mitigation staff attends and participates in the Public Assistance Applicants Briefings and provides information regarding hazard mitigation programs including hazard mitigation opportunities through the Public Assistance program (Section 406). State Mitigation staff also attends and

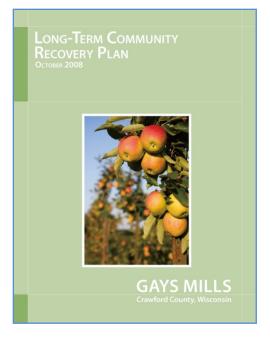
participates in any Substantial Damage Determination training workshops for zoning and local officials and provides information regarding mitigation opportunities for properties determined to be substantially damaged. State Mitigation staff works closely with Public Assistance staff to ensure that all possible 406 hazard mitigation opportunities are pursued and funded. State Mitigation staff provides technical assistance to all respective grant applicants on project development techniques and proper documentation for environmental and cost effectiveness reviews. (See Section 7.4.1 and 7.4.2, and Appendix F, State Administrative Plan for HMGP.)

The State Hazard Mitigation Officer chairs the RSF Mitigation Subcommittee on the Wisconsin Recovery Task Force. The RSF Mitigation Subcommittee is made up of members of the WSJHMT. The Subcommittee works closely with the other five RSF Subcommittees to assist local governments during the recovery phase in declared and non-declared disasters.

6.8.21 Gays Mills Recovery Efforts

In August 2007 and June 2008, the Village of Gays Mills was struck with two back-to-back floods. Both events were greater than the 500-year flood event and caused substantial damage to the Village's residential and business districts. The Village of Gays Mills resides in a valley surrounded by steep bluffs and hills. The Village is located within the unglaciated region of southwest Wisconsin and the Kickapoo River winds through the valley.

After the first flood hit in 2007, WEM worked with the community to help them in the recovery process. 1719-DR was declared. The Village was unsure if it should consider relocation of the town at that time. The Village did decide to proceed with the acquisition and demolition of those structures closest to the river and most severely damaged, and elevation of other substantially damaged structures. The State Hazard Mitigation Officer attended many community meetings to discuss the HMGP and other grant funding opportunities.



The Village did not have time to catch its breath before the next flood came in June 2008, less than 10 months from the previous flood. The HMGP projects of acquisition/demolition and elevation had not commenced and the structures were again flooded. In addition to those homes and business that were flooded in 2007, additional structures were affected in 2008. Many homeowners that were considering elevations decided they did not want to go through another flood in their present location and instead switched to acquisition/demolition, which required the 1719-DR HMGP application to be amended.

The Village also had several other hard choices to make after the 2008 flood. The 2008 flood forced village officials and citizens to seriously consider relocation of their town. The state requested FEMA assistance through

ESF-14: Long Term Community Recovery. The Long Term Community Recovery team developed a Long Term Flood Recovery Plan for the Village.



Gays Mills Conceptual Design

The Recovery Plan process involved a series of meetings and workshops for the community. It was incredibly important for state and federal partners to attend the recovery events because ultimately, it is the responsibility of the state, with the help of the federal and other agencies, to assist in the implementation of the plan. Two planning charrettes were held on August 20 and 21, 2008 and WEM Mitigation staff along with representatives from USDA-Rural Development and the Mississippi River Regional Planning

Commission attended the two-day session. On September 18 and 19, 2008 a community meeting and design charrette were held, respectively. The State Hazard Mitigation Officer attended the meeting and the charrette along with representatives from USDA-Rural Development and FEMA. On October 20, 2008, the ESF-14 team made a presentation of the draft plan to the community. At that meeting, priorities were discussed and representatives from WEM, the Mississippi River Regional Planning Commission, USDA-Rural Development were present. The final plan was presented to the community on October 31, 2008.

However, the interagency cooperation and effort did not end when the ESF-14 Team left. WEM coordinated two strategy meetings on November 19, 2008, and December 2, 2008, with several members of the WHMT/WRTF. The Department of Commerce, USDA-Rural Development, the Mississippi River Regional Planning Commission, FEMA, EDA, HUD, WHEDA, Coulee CAP, and WEM attended the meeting and reviewed all of the projects identified in the Flood Recovery Plan. Through discussion, the agencies identified which projects were possibly fundable by their programs and which were not. Ultimately, the task of the group was to package funding to assist in as many projects as possible.

On December 15, 2008, all of the agencies met with the Gays Mills Long Range Planning Committee and other interested citizens to discuss the funding options available. The State Hazard Mitigation Officer led the meeting and discussed which agencies could potentially fund which projects. It was a very productive meeting which provided direction and hope for the community.

Two relocation sites just north of the existing downtown were purchased by the Village. The site known as North Mills was for mixed use of residential housing and businesses. Originally two five-unit townhouses were constructed. They were so successful that two more multi-family housing units were constructed. In additional, property owners who participated in the buyout program rebuilt in the site.



Gays Mills Mercantile Center

The Village completed construction of a mercantile center to house relocated businesses, and the Community Commerce Center that houses the new Village Hall, library, and a community center with a community kitchen. Sustainability was one of the Village's goals. With that in mind the new Community Commerce Center includes energy efficient systems including geo-thermal heating and cooling. In addition, the grocery store, gas station, and

funeral home have all relocated to the new site. The EMS building which was substantially damaged in 2007 relocated to the second site known as Dudgeon north of the Community Commerce Center along with a new public works building. In the future the Village would like to see a small health clinic and assisted living facility along with additional businesses at the second site. The Village also wants to construct a new Fire Station. Through the HMGP, 29 residential and three commercial properties were acquired and demolished and an additional five properties were elevated at a cost of \$1,573,482.

Approximately \$18 million was provided to assist the Village in its recovery from the devastating floods of 2007 and 2008. FEMA, WEM, EDA, USDA-Rural Development, Wisconsin Department of Commerce, Department of Natural Resources, Wisconsin Department of Transportation, Department of Health Services, as well as private investors have all provided funding.

Gays Mills is an excellent example of the State of Wisconsin's commitment to a comprehensive mitigation program but not the only community that the state is working to assist in flood recovery. Throughout the recovery process, the state and federal agencies have coordinated and integrated mitigation into operations.

As this Plan is being updated, the Kickapoo River in the Village rose above flood stage from rains that occurred on September 21-22, 2016. A federal declaration was granted on October 20 for ten



Gays Mills September 2016 Flooding: Elevated Structures Near Previous Buyouts

counties including Crawford. Most of the Village was under water, but losses were significantly reduced due to past mitigation. Houses elevated remained dry while neighboring properties where past buyouts occurred were inundated with floodwaters. A success story will be produced featuring this mitigation effort.

6.8.22 National Efforts

State Mitigation staff provides input and participates on panels, workgroups, and committees as requested by FEMA Regional or Headquarters Offices. Staff participated on FEMA's HMA National Evaluation every year until it was suspended. Mitigation staff also attends and participates in the FEMA Region V Spring and Fall Workshops as well as any annual HMA summits and workshops held. Staff participated in the following FEMA-sponsored activities:

- PPD-8 Mitigation Stakeholder Engagement webinar, December 2011, January 2012, and March 2012
- FEMA Think Tank Conference in Milwaukee, January 2012
- FEMA Region V RISC Meeting, September 2014
- FEMA Grants Modernization Workshop, January 2016

Due to the efforts that the Mitigation staff has undertaken to meet the three-year open space monitoring requirement for acquired properties, one of the Disaster Response and Recovery Planners presented the state's process at the FEMA Region V Fall Conference in October 2015. The Section Supervisor presented on the topic at the Annual Hazard Mitigation Stakeholders Workshop in July 2016 at the Emergency Management Institute.

The SHMO participated on the Enhanced Plan Review Procedures Work Group and the External Stakeholder Work Group for Mitigation Plan Review Process from 2011 to 2013. In addition, the Mitigation Section Supervisor participated on the Recovery Pre-Disaster Planning Guidance for States, Tribes, and Territories Workgroup in December 2013 and January 2014.

The SHMO participated on the National Review Panel for the State of Maryland, Washington, and Florida to review their first enhanced plans. In addition, another Mitigation staff member sat on the panel that reviewed the second update of the State of Washington's enhanced plan.

Staff participates in National HAZUS calls as well as the Central HAZUS Users Group (CHUG).

Staff participated in the HUD National Disaster Resiliency program call and webinar in November 2015. In addition, staff participated in a Co-Mentoring across Resilient Communities through HHMA Resilient Neighbors Network webinar in February 2013; and a Whole Community Sheltering Planning Conference in January 2014.

Staff also participates in webinars and workshops sponsored by the US Army Corps of Engineers. This includes:

• Flood Risk Management Team Webinar, November 2011

State of Wisconsin Hazard Mitigation Plan

- Silver Jackets Webinar Week, August 2013
- Regional Flood Risk Management Flood Preparedness Workshop, February 2014
- Flood Risk Management Workshop in Massachusetts, August 2014 and December 2015

Through an EMAC request, in June 2014 the Section Supervisor assisted the State of Colorado in developing a methodology for reviewing, ranking, and selecting proposed HMGP projects.

Wisconsin is committed to working with FEMA in the future to improve and streamline programs, policies, and procedures.

SECTION 7: CONCLUSION

Hazard mitigation reduces the vulnerability of the citizens of the State of Wisconsin to natural hazards. The state has made a commitment to hazard mitigation, with floods as its top priority. Floods are the most costly natural hazard in the state. Acquisition of flood-prone structures is an effective way to prevent flood damage and to minimize human suffering associated with flood damage. Since 1990, Wisconsin has acquired and removed approximately 633 residential and commercial structures from flood-prone areas, elevated 32 structures, and floodproofed another 43 using FEMA's Hazard Mitigation Assistance programs. There have been a variety of other flood mitigation projects in the last 25 years as well including the construction of 13 safe rooms to protect the population from severe weather including tornadoes. The majority of the safe rooms were constructed during this plan update cycle. Communities, using state, federal, and local hazard mitigation program funds, have also conducted flood awareness programs, repaired dams and levees, and constructed storm sewers and detention ponds to reduce the likelihood of future damage.

Wisconsin is subject to other hazards besides floods. Tornadoes, high winds, hail, thunderstorms, wildfires, and extreme temperatures are natural hazards that have caused significant loss of life and property. While not as many Wisconsin agency programs are focused on these hazards as floods, the resources are significant. For many of these other hazards, prevention is the biggest part of mitigation. Through strong building codes, inspection and code enforcement, severe damage and loss of life as a result of building failure is minimized. Likewise, weather warning systems, hazard awareness programs, insurance, and public health advisories can reduce loss of life and property by giving the public access to information that can help them take protective measures. Finally, careful consideration of potential hazards when building facilities for utilities, health care, and public use ensures that government and public facilities are truly long-term investments. Together with the many flood mitigation programs, these are Wisconsin's core strengths for reducing the public's vulnerability to natural hazards.

State agency programs that address hazards through mitigation have matured under the trying circumstances of the Great Midwest Flood of 1993 and the subsequent major flooding of 2008. No doubt the mitigation efforts of the last 25 years have saved millions of dollars in damages from the Wisconsin floods of 2007, 2008, and most recently 2016. Many challenges have been met, yet many challenges remain including how we address changing future weather patterns. With respect to flooding, many people in Wisconsin are subject to basement flooding and sewer backups. Too few people have flood insurance or understand it. Stormwater flooding is common and becoming more common as development increases. With respect to tornadoes and windstorms, many communities would benefit from performing a shelter assessment, especially for schools and health care facilities, to evaluate their capability to shelter people sufficiently during high wind events.

Although the top priority for mitigation will remain the acquisition and demolition of flood-vulnerable structures, with a focus on repetitive loss and severe repetitive loss properties, other

State of Wisconsin Hazard Mitigation Plan

mitigation and hazard awareness issues need to be addressed. The long-term challenge for public planning, development, public safety, and emergency management professionals at every level of government is making disaster resilience in Wisconsin a way of life and getting individuals to recognize their true risk.

This Plan update demonstrates that state agencies are willing to take a leadership role to promote hazard mitigation, and disaster resilient communities. However, ultimately all mitigation is local. Participation in state and federal mitigation programs is at the discretion of each community and its citizens. Therefore, the state will continue to encourage local mitigation planning so local problems will have local solutions.

Wisconsin Emergency Management and our state agency partners have updated this State of Wisconsin Hazard Mitigation Plan, as a state disaster-prevention planning tool, to help the state and all its citizens understand and combat the effects of natural disasters. This Plan update is also designed to fulfill the requirements of 44 CFR Parts 201.4 and 201.5. Ultimately, the Plan shows a solid history of hazard mitigation in Wisconsin, an appraisal of concerns, and the commitment of state agencies to adopt policies and take actions that will address these concerns.

APPENDIX A: THREAT HAZARD IDENTIFICATION AND RISK ASSESSMENT





Document pp. 3-3 and 3-8 amended January 2017.

Table of Contents

Table of Contents	i
1.0 Introduction	1-1
1.1 Purpose	1-1
1.2 Confidentiality Statement	1-1
2.0 Methodology	2-1
2.1 THIRA	
2.2 Critical Facilities Risk Assessment	2-3
3.0 Threats and Hazards	3-1
3.1 Changing Future Conditions	
3.2 Severe Weather (Including Tornadoes and High Winds, Hail, and Lightning)	
3.2.1 Nature of the Hazard	
3.2.2 History	
3.2.3 Probability, Impacts, and Mitigation Potential	3-29
3.2.4 Catastrophic Scenario	
3.2.5 Summary Risk Analysis	3-63
3.2.6 Sources – Agency Input and Research	3-65
3.3 Flooding (Including Dam Failure, Landslide, and Land Subsidence)	3-69
3.3.1 Nature of the Hazard	3-69
3.3.2 History	3-63
3.3.3 Probability, Impact, and Mitigation Potential	3-82
3.3.4 Catastrophic Scenario	3-111
3.3.5 Summary Risk Analysis	3-111
3.3.6 Sources – Agency Input and Research	3-113
3.4 Wildfire	3-117
3.4.1 Nature of the Hazard	3-117
3.4.2 History	3-121
3.4.3 Probability, Impacts, and Mitigation Potential	3-124
3.4.4 Catastrophic Scenario	3-133
3.4.5 Summary Risk Analysis	3-133
3.4.6 Sources – Agency Input and Research	3-135
3.5 Drought and Extreme Heat	3-137
3.5.1 Nature of the Hazard	3-137
3.5.2 History	3-140

i

3.5.3 Probability, Impact, and Mitigation Potential	3-146
3.5.4 Catastrophic Scenario	3-154
3.5.5 Summary Risk Analysis	3-156
3.5.6 Sources – Agency Input and Research	3-159
3.6 Winter Storms and Extreme Cold	3-162
3.6.1 Nature of the Hazard	3-162
3.6.2 History	3-164
3.6.3 Probability, Impacts, and Mitigation Potential	3-171
3.6.4 Catastrophic Scenario	3-184
3.6.5 Summary Risk Analysis	3-184
3.6.6 Sources – Agency Input and Research	3-186
3.7 Coastal Erosion and Bluff Failure	3-188
3.7.1 Nature of the Hazard	3-188
3.7.2 History	3-193
3.7.3 Probability, Impact, and Mitigation Potential	3-197
3.7.4 Catastrophic Scenario	3-204
3.7.5 Summary Risk Analysis	3-205
3.7.6 Sources – Agency Input and Research	3-207
3.8 Radiological Release	3-209
3.8.1 Nature of the Hazard	3-209
3.8.2 History	3-210
3.8.3 Probability, Impact, and Mitigation Potential	3-212
3.8.4 Catastrophic Scenario	3-218
3.8.5 Summary Risk Analysis	3-218
3.8.6 Sources – Agency Input and Research	3-219
3.9 Hazardous Materials Incident (Including Fixed Facilities and Transportation)	3-220
3.9.1 Nature of the Hazard	3-220
3.9.2 History	3-220
3.9.3 Probability, Impact, and Mitigation Potential	3-224
3.9.4 Catastrophic Scenario	3-226
3.9.5 Summary Risk Analysis	3-227
3.9.6 Sources – Agency Input and Research	3-228
3.10 Disruption of Life Lines – electric, fuel, water, wastewater	
3.10.1 Nature of the Hazard	3-229
3.10.2 History	3-235

3.10.3 Probability, Impact, and Mitigation Potential	3-236
3.10.4 Catastrophic Scenario	3-237
3.10.5 Summary Risk Analysis	3-238
3.10.6 Sources – Agency Input and Research	3-239
3.11 Emerging Infectious Diseases (Including Pandemic Influenza)	3-240
3.11.1 Nature of the Hazard	3-240
3.11.2 History	3-241
3.11.3 Probability, Impact, and Mitigation Potential	3-243
3.11.4 Catastrophic Scenario	3-244
3.11.5 Summary Risk Analysis	3-247
3.11.6 Sources – Agency Input and Research	3-248
3.12 Food and Agriculture Emergency	3-249
3.12.1 Nature of the Hazard	3-249
3.12.2 History	3-249
3.12.3 Probability, Impact, and Mitigation Potential	3-250
3.12.4 Catastrophic Scenario	3-252
3.12.5 Summary Risk Analysis	3-252
3.12.6 Sources – Agency Input and Research	3-254
3.13 Cyber Incident	3-255
3.13.1 Nature of the Hazard	3-255
3.13.2 History	3-255
3.13.3 Probability, Impact, and Mitigation Potential	3-261
3.13.4 Catastrophic Scenario	3-261
3.13.5 Summary Risk Analysis	3-262
3.13.6 Sources – Agency Input and Research	3-264
3.14 Domestic Terrorism (Including Active Shooter Incidents and Civil Disturbances)	3-265
3.14.1 Nature of the Hazard	3-265
3.14.2 History	3-266
3.14.3 Probability, Impact, and Mitigation Potential	3-267
3.14.4 Catastrophic Scenario	3-269
3.14.5 Summary Risk Analysis	3-270
3.14.6 Sources – Agency Input and Research	3-271
4.0 Critical Facilities	4-1
4.1 History	4-1
4.2 Requirements	4-2

4.2.1 Methodology	4-2
4.3 Summary of Assets	4-4
4.3.1 State Highway System	4-10
4.4 Vulnerability and Potential Losses	4-11
4.5 Mitigation Potential	4-17
5.0 THIRA Maintenance	5-1
Appendix A. Core Capabilities	A-1
A.1 Descriptions	A-1
A.2 Mission Areas	A_5
Appendix B. Core Capability Targets	B-1
Appendix C. Estimated Required Resources	C-1
C.1 Resource Typing	C-1
C.1.1 National NIMS Resource Types	C-1
C.1.2 Other Standardized Resources	C-1
Appendix D. State Preparedness Report	D-1
D.1 Assessment Methodology	D-1
D.2 Core Capabilities Ratings	D-3
D.2.1 Average Ratings	D-6
D.3 Rating Assessment	D-6
Appendix E. Probability Ranking Criteria	E-1
Appendix F. Mitigation Potential Ranking Criteria	F-1
Appendix G. Impacts of Catastrophic Scenario Ranking Criteria	
Appendix H. Vulnerability Ranking Criteria	H-1

1.0 Introduction

This is the 2016 State of Wisconsin Threat and Hazard Identification and Risk Assessment (THIRA) developed, promulgated, and maintained by the Wisconsin Department of Military Affairs (DMA), Division of Emergency Management (WEM). This 2016 THIRA is an update to the threats and hazards described in the state's 2015 THIRA.

1.1 Purpose

This THIRA serves as the foundation of the State's planning and preparedness efforts. Specific uses include, but are not limited to, the following:

1.1.1 Unified Reporting Tool

In 2016 the Federal Emergency Management Agency (FEMA) transitioned to an online Unified Reporting Tool (URT) for submittal of the THIRA. The submittal of this THIRA along with the State Preparedness Report (SPR) represents the State's contribution to the national endeavor to base preparedness efforts on data-driven decision making. This THIRA and SPR data, along with data from all other states and jurisdictions, is collected and reviewed by FEMA. This data is used by FEMA and other federal agencies to inform the development of strategic plans, goals, and priorities; develop technical assistance and support; better understand expectations related to federal support; identify areas in need of improvement; and, measure progress made in making the nation more resilient.

1.1.2 Preparedness Grant Programs

This THIRA is a requirement for the Homeland Security Grant Program (HSGP) and the Emergency Management Performance Grant Program (EMPG).

1.1.3 Wisconsin Hazard Mitigation Plan

This THIRA serves as the required natural hazard risk assessment section of the 2016 update of the Wisconsin Hazard Mitigation Plan (WHMP). The WHMP establishes the state's mitigation strategy and identifies the goals, recommended actions, and initiatives that will reduce or prevent injury and damage from natural hazards. A FEMA approved hazard mitigation plan is required for the state to be eligible for federal mitigation funds and certain other disaster assistance.

1.2 Confidentiality Statement

This THIRA and SPR data include jurisdiction-specific preparedness data that is FOR OFFICIAL USE ONLY (FOUO). The THIRA and SPR data shared with the Federal Government cannot be distributed outside the Federal Government and is intended for recipients with a clear

Section 1 Introduction 1-1 2016 THIRA/SPR

disaster/emergency preparedness mission and a valid need to know. Receipt of THIRA and SPR data will be accompanied by this confidentiality statement and an interpretation guide.

Section 1 Introduction 1-2 2016 THIRA/SPR

2.0 Methodology

This 2016 Threat and Hazard Identification and Risk Assessment (THIRA) is an update to the natural hazard identification and risk assessment in the 2011 Wisconsin Hazard Mitigation Plan (WHMP) and the threats and hazards described in the 2015 THIRA. This update focused on:

- Alignment with the recommendations from the Emergency Management Accreditation Process (EMAP) undertaken by Wisconsin Emergency Management in 2015.
- Development of the required natural hazard identification and risk assessment element for the 2016 update of the Wisconsin Hazard Mitigation Plan (WHMP).
- Development of the required risk assessment of state owned or operated critical facilities element for the 2016 update of the WHMP.
- Consultations with subject matter experts to review, revise, and update applicable content.

This THIRA update followed the process prescribed by the Department of Homeland Security (DHS) *Threat and Hazard Identification and Risk Assessment Guide, Comprehensive Preparedness Guide (CPG) 201, Second Edition, August 2013.*

2.1 THIRA

The THIRA is structured around the CPG 201's four step process depicted in Figure 2.1-1.



Figure 2.1-1: THIRA Process

Source: CPG 201, Second Edition, August 2013.

2.1.1 Identification of Threats and Hazards of Concern

The THIRA/SHMP document prepared for the 2015 EMAP identified 13 threats and hazards of concerns. These threats and hazards were drawn from 2011 WHMP and the 2015 THIRA. In Step 1 the state reviewed these 13 threats and hazards with careful consideration of two key factors:

Section 2 Methodology 2-1 2016 THIRA/SPR

- The likelihood of the state experiencing a specific threat or hazard.
- The significance of a threat or hazard effect on the state.

This review and consideration resulted in no significant revisions or updates to the 13 previously identified threats and hazards of concern.

2.1.2 Context Description for Threats and Hazards

In Step 2 the state reviewed the applicable context descriptions in the THIRA/SHMP document and the 2015 THIRA for the threats and hazards identified in step 1. The context descriptions outline the conditions, including time and location, under which a threat or hazard might occur.

In the 2015 THIRA and accompanying State Preparedness Report (SPR) eight threat and hazard scenarios were developed and submitted to FEMA. This included at least one natural, one technological, and one human-caused hazard. An additional five general threat assessment were developed for use by the state but not submitted to FEMA.

This review resulted in revisions and updates to the eight threat and hazard scenarios and the five general threat assessments.

2.1.3 Establish Capability Targets

In Step 3 the state reviewed the capability targets in the THIRA/SHMP document and the 2015 THIRA for the context descriptions developed in step 2. The capability targets in the 2015 THIRA were originally developed in 2012. In 2015 a comprehensive review of the capability targets was conducted and only minor updates were needed. This year's review included careful consideration of the following three tasks:

- Development of impacts for each scenario for each core capability.
- Development of desired outcomes for each core capability.
- Development of capability targets for each core capability.

Each core capability must have at least one estimated impact, one desired outcome, and one capability target. The core capabilities are described in the National Preparedness Goal and listed in Appendix A.

In task 1 of step 3 the state reviewed the impacts developed for each scenario for each core capability. These impacts should describe how the threat or hazard might affect a core capability. Consistent with CPG 201 guidance the impacts were developed to be as specific and include quantitative descriptions as much as possible to better gain an understanding of what is needed to manage risk (e.g., rescue 500 people; provide; provide long-term housing for 200 displaced families; screen 80,000 event attendees for weapons; receive situation reports from four partner agencies).

Section 2 Methodology 2-2 2016 THIRA/SPR

In task 2 of step 3 the state reviewed the desired outcomes developed for each core capability. The desired outcomes were developed to describe the timeframe or level of effort needed to successfully deliver core capabilities. The desired outcomes do not need to be tied to a specific scenario. The desired outcomes are intended to reflect the state's priorities and goals for a particular core capability (e.g., complete search and rescue operations within 72 hours; ensure 100% verification of identity to authorize, grant, or deny physical and cyber access to specific locations).

In task 3 of step 3 the state reviewed the capability targets developed for each core capability. The capability targets were developed to define success and describe what the state wants to achieve for each core capability. The capability targets are intended to combine quantitative details from impacts and desired outcomes to develop capability targets (e.g., recover and identify 50 fatalities within 72 hours; evacuate 20,000 people over a 3 square mile area within 3 hours prior to an incident; assess, repair, and reopen 150 miles of major highways within 12 hours following an incident).

This review resulted in minor revisions and updates to the capability targets. The core capabilities targets are listed in Appendix B.

2.1.4 Application of Results

In Step 4 the state reviewed the required resources in the 2015 THIRA for the capability targets developed in step 3. The resource requirements are in the form of a list of resources needed to successfully manage the threats and hazards.

The estimation of required resources was a new THIRA requirement in 2013. At that time the assessment was required for 13 of the 32 core capabilities. In 2015 the requirement increased to 19 core capabilities.

This review resulted in minor revisions and updates to the required resources. The estimated required resources are listed in Appendix C.

2.2 Critical Facilities Risk Assessment

This update also includes a risk assessment of state owned or operated critical facilities. The risk assessment methodology is based on the requirements found in 44 CFR §§201.4(c)(2)(ii) and 201.4(c)(2)(iii) and further described in the 2015 State Mitigation Plan Review Guide shown in Figure 2.2-1.

Figure 2.2-1: Risk Assessment for State Assets

Does the risk assessment address the vulnerability of state assets located in hazard areas and estimate the potential dollar losses to these assets?

Intent

To understand vulnerability of assets critical for state resilience as a basis for identifying and prioritizing mitigation actions.

a. The risk assessment must include an analysis of the potential impacts of hazard events to state assets and a summary of the assets most vulnerable to the identified hazards. These assets may be located in the identified hazard areas or affected by the probability of future hazard events.

b. The risk assessment must estimate potential dollar losses to state assets located in identified hazard areas.

Vulnerability and potential losses are not a list or inventory of state facilities but the summary of the potential impacts to those assets from the identified hazards. Factors affecting vulnerability may include asset use and function as well as construction type, age, or intended use.

State assets may include state-owned or operated buildings, infrastructure, and critical facilities.

<u>Critical facilities</u> means structures that the state determines must continue to operate before, during, and after an emergency and/or hazard event and/or are vital to health and safety. Examples of critical facilities may include, but are not limited to:

- Emergency operations centers, police and fire stations, and storage facilities (including data storage).
- Structures that house occupants with restricted mobility or access and/or functional needs, such as hospitals, institutions, and shelters.
- Utility generating, transmission, and storage facilities and related infrastructure, such as power and/or water treatment plants.
- Transportation facilities, such as ports, airports, roads, railroads, bridges, and/or tunnels.

Source: FEMA, State Mitigation Plan Review Guide, 2015.

Consistent with this guidance the following methodology was used to identify state owned or operated critical facilities and infrastructure for the purpose of developing a state critical facilities risk assessment.

2.2.1 Inventory of Assets

Wisconsin Emergency Management (WEM) identified the Wisconsin Department of Administration (DOA) as the best available source of information on state owned and operated assets. The DOA provided WEM with an all agencies inventory of assets in an Excel format spreadsheet. This inventory included assets ranging from small storage sheds to large multistory office buildings. The inventory totaled 6,579 critical and non-critical state owned and operated buildings, infrastructure, and facilities. Each asset included data such as agency name, institution name, building (asset) name, location, and replacement cost. Not all data fields were complete.

2.2.2 Identification of Critical Facilities

WEM reviewed all 6,579 records. During this initial review preliminary data scrub and validation was begun and assets were categorized as critical or non-critical. If the asset was identified as a critical facility, the facility type was added to the record.

The identification of critical facilities was based on the 2011 WHMP definition amended to be consistent with the State Mitigation Plan Review Guide 2015. Specifically:

Critical Facilities

State-owned [or -operated] facilities deemed essential due to their function, size, service area, uniqueness, delivery of vital services, and for the protection of the health and safety of citizens including buildings and infrastructure that meet characteristics such as:

- Communications facilities;
- Correctional facilities and other custodial facilities, including facility utility services;
- Utility services, including: electrical power generation, heating, wastewater treatment, water treatment, etc.;
- Hospitals and other medical facilities, including: group homes, shelters, mental health facilities, etc.;
- Major State government facilities that house key state operations;
- Critical military facilities; and
- Emergency response facilities, including: law enforcement, security, fire, etc.
- [Transportation facilities such as ports, airports, roads, railroads, bridges, and/or tunnels.] (FEMA, State Mitigation Plan Review Guide, 2015.)

2.2.3 Addition of Location Information

WEM again reviewed all 6,579 records. Following this second review location information was added for those assets identified as critical. This included reviewing address information and, where possible, correction or addition of missing information. Further, if critical assets could be reasonably identified on aerials photographs the latitude/longitude information was added. Location information was sourced from agency information, web sources, and Google™ Maps.

2.2.4. Critical Facilities and Special Flood Hazard Area

The inventory of assets information was manipulated using the ESRI Geographic Information System (GIS) to identify critical facilities located in a FEMA-designated special flood hazard area (SFHA). Specifically, the GIS analysis sought to identify the number and value of critical facilities located in a special flood hazard area.

Section 2 Methodology 2-5 2016 THIRA/SPR

2.2.5. Assessment

WEM used the combination of tables, charts, and GIS maps in order to analyze location and potential threats to the identified critical facilities. The summary and risk assessment of state owned or operated critical facilities is described in Section 4.

Section 2 Methodology 2-6 2016 THIRA/SPR

3.0 Threats and Hazards

The State of Wisconsin faces a variety of natural, technological, and human-caused threats and hazards. The three types of threats and hazards can be defined as follows:

- **Natural hazards**: A potential incident resulting from acts of nature (e.g. hurricane, earthquake, tornado, animal disease outbreak, pandemic, or epidemic).
- **Technological hazards**: A potential incident resulting from accidents or failures of systems or structures (e.g. hazardous materials spill, dam failure).
- **Human-caused hazards**: A potential incident resulting from the intentional actions of an adversary (e.g. threatened or actual chemical attack, biological attack, cyber-attack incident).

The Threat and Hazard Identification and Risk Assessment (THIRA) process identified 13 threats and hazards that could plausibly occur in the state and would have a significant effect on the state. This included seven primarily natural hazards, two primarily technological hazards, three primarily human-caused hazards, and one hazard (disruption of lifelines) that crosses all three hazard types.

Each of the identified threats and hazards was further reviewed and ranked based on a qualitative consideration of the probability, vulnerability, mitigation potential, and aggregate impact of the threat or hazard. The probability ranking criteria is listed in Appendix D, the vulnerability ranking criteria is listed in Appendix E, the mitigation potential ranking criteria is listed in Appendix F, and the aggregate impacts of catastrophic scenario ranking criteria is listed in Appendix G. The table in Figure 3.0-1 presents a summary of the threats and hazards, type, and rank.

In the following sections the state has prepared more in-depth analyses for each of the identified threats and hazards.

Table 3.0-1: Summary of Threats and Hazards

Threat or Hazard	Hazard Type	Probability	Vulnerability	Mitigation Potential	Aggregate Impact
Severe Weather Including Tornadoes and High Winds, Hail, and Lightning	Natural	High	High	Medium	High
Flooding Including Dam Failure, Landslide, and Land Subsidence	Natural Dam Failure: Technological	High	High	Medium	High
Wildfire	Natural	Medium	High	Medium	Medium
Drought and Extreme Heat	Natural	Medium	High	Low	Medium
Winter Storms and Extreme Cold	Natural	High	High	Low	Low
Coastal Erosion and Bluff Failure	Natural	Medium	High	High	Low
Radiological Release	Technological Radiological attack: Human- caused	Low	Low	Low	High
Hazardous Materials Incident Including Fixed Facilities and Transportation	Technological	Medium	Medium	Medium	Medium
Disruption of Lifelines Electric, Fuel, Water, Wastewater	Natural, Technological, and Human- caused	Medium	Low	Medium	High
Emerging Infectious Disease Including Pandemic Influenza	Natural	Medium	Medium	Medium	High
Food and Agriculture Emergency	Human-caused	Medium	Low	Medium	Medium
Cyber-attack	Human-caused	High	Medium	Medium	Medium
Terrorism Including Active Shooter Incidents and Civil Disturbances	Human-caused	Low	Medium	Low	High

Source: Wisconsin Emergency Management, 2016.

3.1 Changing Future Conditions

Weather is the short-term condition of the atmosphere. Climate is the long-term behavior of the atmosphere. The term "climate change" refers to a significant, long-term change in weather patterns (NASA, 2011).

Researchers first began documenting an overall global-scale warming trend in the early 1970s. Over the past 100 years, the average surface temperature of the earth has risen by about 1.5°F, and is expected to rise another 0.5 to 8.6°F over the next century (EPA, 2016).

Although it is widely accepted by the scientific community that the observed changes in global temperatures are the result of human actions (IPCC, 2014), there is considerable uncertainty about the impacts these changes will ultimately have. Some models predict extreme degradation of the Earth's ecosystems and catastrophic damage to human settlements, while others predict minor impacts that humans and natural systems will adapt to without much effort. Changing climate patterns are likely to have different impacts on different systems in different areas, making it difficult to generalize. In any event, emergency managers will be responsible for preparing for and responding to natural disasters.

The Precautionary Principle

"Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."

- UN Conference on the Environment, 1992

Even in the face of uncertainty, it is important to incorporate the best available climate data into hazard mitigation planning. Most risk assessments rely on past occurrences of a given hazard to make predictions about future occurrences; if future conditions are significantly different than past conditions, this strategy will be inadequate. Considering potential changes in future conditions when developing mitigation strategies will result in projects that are resilient to increasingly severe future hazards, adaptable to variable conditions, energy efficient, and in harmony with natural systems. No matter what Wisconsin's future climate looks like, all present and future residents will benefit from a healthy environment, increased efficiency, and better protection from natural hazards.

According to the U.S. Global Change Research Program, "climate change will tend to amplify existing risks climate poses to people, ecosystems, and infrastructure" (NCA, 2014). Rather than giving climate change its own section, it makes more sense to discuss forecasted changes in previously identified hazards. The 2016 Plan therefore organizes the best available climate change data by hazard as a starting point for addressing the potentially large and complex changes in Wisconsin's weather patterns.

Research Initiatives

The Wisconsin Initiative on Climate Change Impacts (WICCI) has been researching climate change effects specific to Wisconsin. WICCI is a partnership between the University of Wisconsin, Wisconsin Department of Natural Resources (DNR), and other state agencies and institutions. The group was formed in 2007 as a response to a bi-partisan State legislative committee wanting to better understand potential effects of changing weather patterns in the state. WEM's Mitigation Section has both used the data from WICCI's first 2011 report and participated in the ongoing discussion of changing weather patterns in Wisconsin.

WICCI has found that Wisconsin's climate has changed in a pattern consistent with the well-documented historical global trend. The WICCI analysis was completed after examining daily weather data gathered from 176 weather stations from throughout the state from 1950 through 2006. Specifically, WICCI worked with the National Weather Service (NWS) to measure daily maximum and minimum temperatures, and used linear regression to configure the "best fit lines" for the entire time series (WICCI, 20011. For more about the methodology used by WICCI, please visit: http://www.wicci.wisc.edu/climate-modeling-methods.php.

General Trends

WICCI research provides a basis for understanding potential future trends in statewide climate. Figure 3.1-1 shows the annual average temperature change throughout the state. Data collected from 1950 through 2006 demonstrates a statewide increase in annual average temperature of 1.1°F, with the peak warming occurring in northwest Wisconsin.

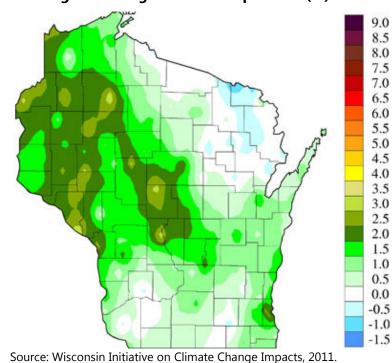


Figure 3.1-1: Change in Average Annual Temperature (°F) from 1950-2006

The other significant weather change observed over the last 50 years is an increase in yearly precipitation. According to WICCI, the annual average precipitation rose by about 3.1 inches between 1950 and 2006 (Figure 3.1-2), representing a 10 percent increase.

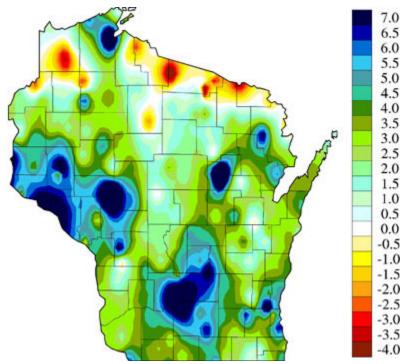


Figure 3.1-2: Change in Average Annual Precipitation (inches) from 1950-2006

Source: Wisconsin Initiative on Climate Change Impacts, 2011.

Over the next 50 years, the observed trend toward higher temperatures and precipitation amounts is expected to continue. WICCI projects that the average annual temperature will warm by an additional four to seven degrees Fahrenheit by the middle of the 21st century (Figure 3.1-3). The magnitude of temperature increases is expected to vary seasonally, with the greatest relative warming occurring during winter and spring, and by time of day, with greater increases projected for nighttime temperatures.

With respect to precipitation, the projections are less certain, but WICCI researchers indicate that there is about a 75 percent probability that Wisconsin will experience an increase in annual average precipitation. Seasonal differences in precipitation changes show most of that increase occurring in autumn. Researchers also predict an additional two to three extreme rainfall events (events generating two inches or more of precipitation) will occur each year (Figure 3.1-4).

As seen in Figures 3.1-1-4, the predicted future changes may manifest very differently in different parts of the state. While statewide averages convey a general upward trend for precipitation and temperature, some regions may experience changes that are more, less, or completely different than the state averages. Unfortunately, the best available projections are not precise or certain enough to provide specific information at the regional or county level. In the absence of specific information, county, regional, and local emergency managers are advised

to anticipate variability and prepare for extremes. Future conditions are likely to be markedly different than past conditions; not knowing the exact magnitude or direction of that difference makes it important to build flexibility into hazard mitigation plans and procedures, pay attention to trends as they emerge, and prepare to adapt accordingly. Adaptive measures that can be taken in the meantime include developing strategies that are applicable in a variety of future scenarios, increasing building standards and protection levels, improving efficiency and redundancy in critical systems, and adopting a holistic view of weather, hazards, and human development.

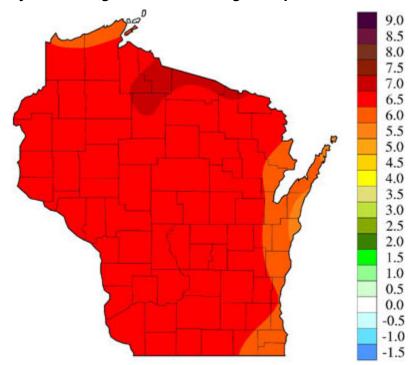


Figure 3.1-3: Projected Change in Annual Average Temperature (°F) from 1980-2055

 $Source: Wisconsin\ Initiative\ on\ Climate\ Change\ Impacts,\ 2011.$

WICCI predicts that one result of warmer temperatures will be changes to the habitats and migratory patterns of Wisconsin plants and wildlife, causing changes in their ranges and distributions. For example, southern hardwood species will replace species like white birch and jack pine in Wisconsin forests. Some impacts of warmer temperatures may be positive, such as a longer growing season, but warmer conditions are also likely to beget drought, extreme weather events, heat stress, and pests that would offset these positives. A result of increased precipitation is greater rainfall that will likely increase the frequency of storms and rain events.

In addition to coordinating with WICCI researchers, WEM Mitigation staff received recommendations from the National Resources Defense Council (NRDC) for incorporating mitigation strategies, action items, and other updates related to resiliency to changing future conditions into the State Hazard Mitigation Plan update. NRDC recommendations that align with WEM's goals and capabilities have been included in the 2016 update, including adding

Climate Resilient Mitigation Activities and consideration of long-term resilience benefits to WEM's Priority/Ranking System for mitigation projects (Appendix F).

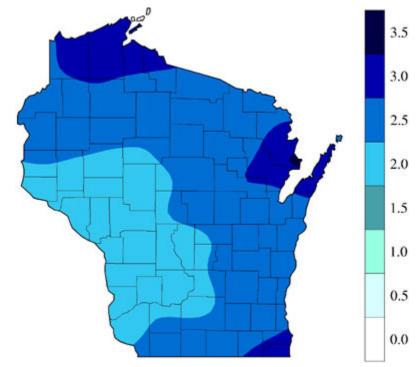


Figure 3.1-4: Projected Change in Frequency of 2" from 1980-2055

Source: Wisconsin Initiative on Climate Change Impacts, 2011.

Mitigation Potential and Opportunities for Future Improvement

It is human nature to think about weather in the short term and focus on extreme events only when they are imminent or occurring. However, because changes in climate patterns occur over the course of decades, mitigation plans must take a long-term approach. Clark County, Wisconsin's all-hazards mitigation plan points out that current best practices and existing infrastructure are based on past conditions rather than current or future trends. This may mean that they are already outdated for today's conditions, not to mention future conditions that are different than the past or present. Mitigation planners are left with the responsibility of planning for uncertain conditions, despite natural human hesitance to break from the norm.

Even before the importance of tracking and planning for climatic changes was fully recognized, there was still a need for building Wisconsin's capacity to cope with historically typical weather events. It therefore remains important to build resiliency no matter what the current trends or future projections are, rather than to choose inaction in the absence of concrete data. Resiliency in this context can best be described as "bouncing forward" – building additional capacity and redundancy into existing systems so that when natural hazards do occur, these systems are stronger than they were before.

Effectively planning for changing future conditions will therefore require experimenting with new approaches, integrating existing systems, building flexibility into plans and strategies, and revising them regularly as new information becomes available. As we wait for more research and data to inform mitigation decisions, we can support climate change mitigation planning and projects in Wisconsin communities. We can also prioritize utilities and infrastructure projects, especially those that integrate systems and/or incorporate energy efficient components. During disaster recovery, we can take advantage of disaster damages as an opportunity to 'bounce forward,' advocating for 406 mitigation projects where possible. According to the 2014 National Climate Assessment, the Midwest's highly energy-intensive economy generates per capita greenhouse gas emissions that are more than 20% higher than the national average; we can therefore take advantage of the large potential to reduce emissions in our region.

In relation to climate change, the future is uncertain, with varying models predicting a range of outcomes. It is difficult to predict how much and at what speed the climate will change. Despite this uncertainty, WEM's Mitigation staff will work proactively using the information that is currently available, focusing on low-cost, low-risk projects that will benefit Wisconsin's communities even if no long-term changes occur.

3.1.1 Changing Future Conditions Sources

The following agencies and document research assisted in providing subject matter expertise.

- 1. Intergovernmental Panel on Climate Change. http://www.ipcc.ch/
- 2. NOAA Climate Services. http://www.wicci.wisc.edu/resources.php
- 3. United States Environmental Protection Agency Climate Change Site. http://www.epa.gov/climatechange/
- 4. NASA Global Climate Change Site. http://climate.nasa.gov/
- 5. IPCC, 2014: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Barros, V.R., C.B. Field, D.J. Dokken, M.D Mastrandrea, K.J. Mach, T.E. Bilir, M.. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 688.
- 6. WICCI Homepage. http://www.wicci.wisc.edu/
- 7. WICCI Climate Change Overview. http://www.wicci.wisc.edu/climate-change.php
- 8. WICCI Climate Change Modeling Methodology. http://www.wicci.wisc.edu/climate-modeling-methods.php
- 9. WICCI Resources. http://www.wicci.wisc.edu/resources.php
- 10. University of Wisconsin Nelson Institute for Environmental Studies. http://www.nelson.wisc.edu/
- 11. University of Wisconsin Sea Grant Institute Climate Change Site. http://www.seagrant.wisc.edu/home/Topics/ClimateChange.aspx
- 12. FEMA Climate Change. www.fema.gov/climate-change

Section 3

- 13. Climate Wisconsin. www.climatewisconsin.org
- 14. U.S. Global Change Research Program. <u>www.globalchange.gov</u>
- 15. 2014 National Climate Assessment (USGCRP). http://nca2014.globalchange.gov/
- 16. WICCI Interactive Mapping Tool. http://www.wicci.wisc.edu/climate-map.php
- 17. U.S. Climate Resilience Toolkit. http://toolkit.climate.gov/

3.2 Severe Weather

(including tornadoes and high winds, hail, and lightning)

3.2.1 Nature of the Hazard

Thunderstorm events are generated by an upward motion of unstable air (convection) that contains a high amount of moisture. They are characterized by heavy rain; high winds, downbursts, and tornadoes; hail; and lightning. Occasionally, thunderstorms occur in winter during heavy snow events. Typically, Wisconsin thunderstorms are approximately 15 miles across and last for about 30 minutes, but events of longer duration or with high rates of precipitation can lead to flooding.

The National Weather Service (NWS) classifies a thunderstorm as severe if one or more of the following conditions are met:

- 1. Winds reach or exceed 58 mph
- 2. The storm produces a tornado
- 3. The storm produces hail at least one inch in diameter
- 4. Flash flooding occurs

In thunderstorms, **straight-line winds** are winds without any rotation. This classification differentiates them from tornadic winds. In severe thunderstorms, **downbursts** are created by falling rain and associated sinking air, resulting in winds that can reach speeds of 125 mph. **Microbursts**, concentrated versions of downbursts, can have wind speeds up to 168 mph. Defined as a 240-mile-wide wind storm with gusts of at least 58 mph, a **derecho** consists of multiple downbursts and microbursts. Substantial damage can result from downbursts, microbursts, and derechos.

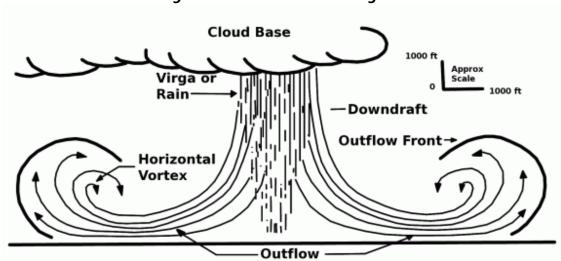


Figure 3.2.1-1: Downburst Diagram

Source: NOAA, NWS, Norman, OK, http://www.srh.noaa.gov/oun/?n=events-20110614, accessed 6/3/2016.

A **tornado** is a violently rotating column of air (vortex) extending from the base of a convective cloud (usually cumulonimbus) to the ground. Tornadoes form in many parts of the world under many types of conditions; however, the most common conditions in Wisconsin are intense squall lines and supercell thunderstorms. Tornadoes can be classified as **supercell** or **non-supercell**. Supercell tornadoes are derived from supercell thunderstorms of which a key component is a rotating updraft. These tornadoes can be devastating. Non-supercell tornadoes are formed by a spinning column of air near the ground and tend to be short-lived and weaker than supercell tornadoes. Non-supercell tornadoes include gustnadoes, land spouts, and water spouts.

Most tornadoes in the US last less than ten minutes, but can exist for more than an hour. (NOAA, Storm Prediction Center) The path of a tornado can range from a few hundred feet to miles and tornado widths may range from tens of yards to a mile or two.

In 1971, researchers Tetsuya Fujita and Allen Pearson developed the **Fujita-Pearson Scale (F-Scale)** for measuring tornado intensity. In 2007, the US National Weather Service created the refined **Enhanced Fujita Tornado Scale (EF-Scale)** based on empirical data. Both scales indicate damage only – associated wind speeds are only estimations.

Figure 3.2.1-2: Enhanced Fujita Tornado Scale (EF-Scale)

Category	F-Scale Wind Speed (mph)	EF-Scale Wind Speed (mph)
EF0 (weak)	40-72	65-85
EF1 (weak)	73-112	86-110
EF2 (strong)	113-157	111-135
EF3 (strong)	158-206	136-165
EF4 (violent)	207-260	166-200
EF5 (violent)	261-318	>200

Source: NOAA, NWS, 2011.

The new EF-Scale keeps the previous numerical values of zero to five from the old F-Scale and maintains the same degree of damage associated with each rating value. However, the estimated wind speed values associated with the higher numerical ratings were lowered in the EF-Scale based on engineering studies and meteorological research. Consequently, the damage inflicted by an F-4 tornado will be comparable to that of an EF-4 tornado, even though the estimated wind speed of the EF-4 tornado is lower. Tornadoes occurring prior to 2007 were assigned F-Scale values while those after February 1, 2007 have been assigned EF-Scale values. A detailed description of the EF-Scale can be found online at the NWS Storm Prediction Center website.

Hail can also develop in thunderstorms when strong currents of rising air, known as updrafts, carry water droplets high within the storm, exposing these droplets to cold air and freezing them. As the frozen droplets begin to fall toward the ground, rising currents within the storm lift them again. The hailstones gain an ice layer and grow increasingly larger with each ascent.

Eventually the hailstones become too heavy for the updraft to support, and they fall to the ground.

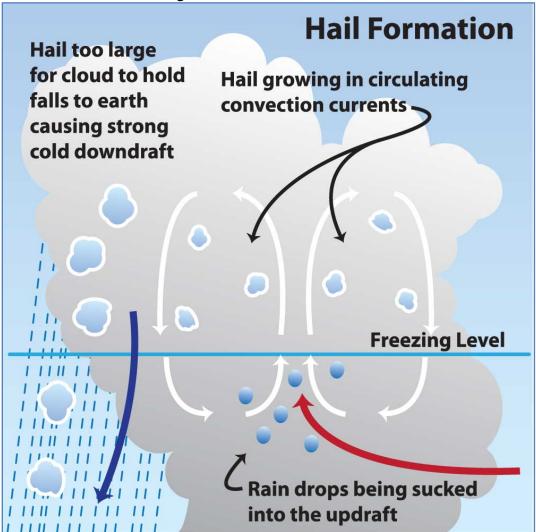


Figure 3.2.1-3: Hail Formation

Source: NASA's SciJinks, http://scijinks.ipl.nasa.gov/rain/, accessed 6/28/2016.

Though hail typically accompanies severe thunderstorms, all strong thunderstorms have the potential to produce hailstones of small diameter (less than one inch). The size of hailstones varies and is a direct consequence of the severity and size of the thunderstorm; greater instability in the atmosphere causes stronger updrafts. Stronger updrafts can keep hailstones suspended for longer periods of time, resulting in larger hailstones at ground level. Hailstones vary widely in size, as shown in Figure 3.2.1-3. Trained volunteer storm spotters and the National Weather Service (NWS) officially report severe hail, which are hailstones considered one inch in diameter or greater.¹

¹ Prior to 2010, hail greater than 0.75 inches was considered severe. Unless otherwise noted, all statistics prior to 2010 reflect the 0.75 inch threshold and all statistics from 2010 to the present reflect the one inch threshold.

Figure 3.2.1-4: Estimating Hail Size

Size of Reference	Diameter (inches)
Pea	0.25
Small Marble	0.50
Penny	0.75
Quarter	1.00
Ping-Pong Ball	1.50
Golf Ball	1.75
Tennis Ball	2.50
Baseball	2.75
Tea cup	3.00
Softball	4.00
Grapefruit	4.50

Source: NOAA, NWS, Milwaukee/Sullivan, 2011.

Another byproduct of a thunderstorm is lightning. The action of rising and descending air in a thunderstorm separates positive and negative charges, with lightning the result of the buildup and discharge of energy between positive and negative charge areas. Water and ice particles may also affect the distribution of the electrical charge. In only a few millionths of a second, the air in a lightning strike is heated to 50,000°F, a temperature five times hotter than the surface of the sun. The heated air expands so rapidly that it causes a shock wave which can be heard as thunder.

Lightning can travel between clouds (**cloud-to-cloud**), from one point to another within one cloud (**intra-cloud**), from a cloud to the air surrounding the storm (**cloud-to-air**), from a cloud to the ground (**cloud-to-ground**), or from the ground to a cloud (**ground-to-cloud**). The first four types are considered **natural lightning** because they occur naturally in the environment. Ground-to-cloud lightning is considered **artificially-initiated** or **triggered lightning** because it strikes human-made objects like airplanes, rockets, very tall structures, and structures on mountains.

According to the NWS, on average, about 25 million cloud-to-ground strikes are detected in the continental US annually, with about half of all flashes contacting more than one ground point. In addition, there are roughly five to ten times as many cloud-to-cloud flashes as there are cloud-to-ground flashes.

Over 95% of cloud-to-ground lightning is **negative lightning**, which means the lightning transfers a negative charge from the lower portion of a cloud to the ground. However, **positive lighting** can occur too, transferring a net positive charge from the upper portion of a cloud to the ground. Although much less common, positive lightning can be more dangerous. Because it must travel a longer distance to reach the ground, the electrical field is stronger which means the strike can have a longer duration with a charge ten times that of a negative lightning strike.

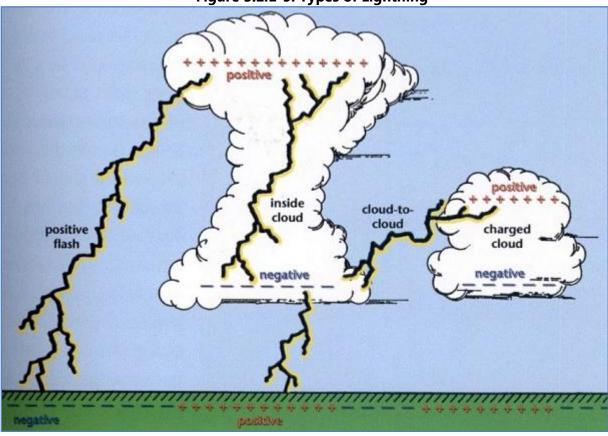


Figure 3.2.1-5: Types of Lightning

Source: Crondall Weather, http://www.crondallweather.co.uk/lightning.html, accessed 6/28/2016.

The hazard posed by lightning is significantly underrated. After floods, lightning kills the most people on average each year. High winds, rainfall, and a darkening cloud cover are warning signs for possible cloud-to-ground lightning strikes. While many lightning casualties happen at the onset of a storm, more than half of lightning deaths occur after a thunderstorm has passed. The lightning threat diminishes after the last sound of thunder, but may persist for more than 30 minutes. When thunderstorms are in the area, but not overhead, the lightning threat can exist when skies are clear. Lightning has been known to strike ten miles or more from the storm in an area with clear sky above. Large outdoor gatherings are particularly vulnerable to lightning strikes that could result in injuries and deaths. This vulnerability underscores the importance of developing site-specific emergency procedures for these types of events with particular emphasis on adequate early warning.

3.2.2 History

Severe storms occur regularly in Wisconsin, especially in the warmer months. Figure 3.2.2-1 shows some of the statewide record-breaking impacts of these storms.

Figure 3.2.2-1: Wisconsin Record-Breaking Storm Facts

Record	Location(s)	County/-ies	Date	Magnitude
Deadliest Tornado	New Richmond	St. Croix	June 12, 1899	117 killed
Longest-Track Tornado	River Falls to Van Buskirk	Pierce to Iron	April 5, 1929	187 miles
Most Tornadoes in One Day	Central Wisconsin	Dane, Jefferson, others	August 18, 2005	27 tornadoes
Costliest Tornado	Barneveld	Iowa	June 8, 1984	\$40.4 m (\$82.1 m adjusted)
Largest Hailstone	Wausau	Marathon	May 22, 1921	5.7 inch diameter
Costliest Hailstorm	Southern Wisconsin	Iowa to Milwaukee	April 13, 2006	\$420 m

Source: WEM, 2016.

What follows is a list of significant storms in Wisconsin's recorded history. Most of them caused deaths, injuries, or serious damages. Some had other unique aspects that make them noteworthy.

June 12, 1899

On June 12, 1899, a strong storm with heavy rain and hail hit the City of New Richmond in St. Croix County. Hundreds of visitors were in town that day for the circus which ended around 4:30 pm, just when the storm began. A powerful tornado struck close to 6 pm. Passing through the very center of town, the tornado leveled buildings and sent debris flying. Half of the city was destroyed and 117 people were killed. This tornado originated on Lake St. Croix, about five miles south of Hudson. The tornado moved to the northeast, east of Hudson, in the direction of New Richmond, leveling farms near Burkhardt and Boardman. Over 300 buildings were damaged or destroyed. The damage was estimated at \$300,000. The great visibility of the tornado may have prevented an even higher death total. While not a massive tornado, the combination of time and position was unfortunate. Figure 3.1.2-2 shows some of the damage caused by the 1899 tornado.

May 22, 1921

A storm in Wausau (Marathon County) on the evening of May 22, 1921, came up quickly from the southwest producing large hail, lightning, and thunder. Although most of the hailstones reached a maximum of four inches, one was recorded at 5.7 inches in diameter and is considered Wisconsin's largest. Several people were injured by the large hailstones and damage was extensive, estimated at \$150,000. Many west-facing windows were broken and trees were severely damaged. Cars that were caught in the storm suffered broken windshields and holes through their tops. (Simes)



Figure 3.2.2-2: New Richmond Tornado Damage, 1899

Source: Library of Congress Prints and Photographs Online Catalog, Reproduction Number LC-USZ62-96084.

April 5, 1929

The longest tornado recorded in Wisconsin occurred in the late afternoon of April 5, 1929 in a large belt of storms about 250 miles wide. (Stewart) The tornado touched down near River Falls in Pierce County and traveled 187 miles at 68 miles per hour to Van Buskirk in Iron County. 12 people were killed and 100 were injured.

April 3, 1956

Two people in Bancroft and seven in Berlin were left dead following two separate tornado events. A strong cold front came up behind an outbreak of violent thunderstorms over Wisconsin and Illinois on April 3, 1956. Figure 3.1.2-3 shows the US Weather Bureau's Daily Weather Map for that day. The Berlin tornado levelled the city, missing the high school, where over 400 students were in class, by only a few yards. Witnesses saw cars and buildings lifted and carried through the air. Along with the fatalities, there were 50 people injured and over \$1 million in property damage.

June 4, 1958

Severe thunderstorms which began the afternoon of June 4, 1958, in Minnesota quickly moved into the West Central portion of Wisconsin. The storms spawned several tornadoes which killed 28 people in the state, 12 of whom were in Colfax in Dunn County, where an F5 tornado struck around 7 pm. Damage in Colfax was estimated at \$2 million with statewide damage estimates topping \$10 million. Many homes, farms, and other buildings were damaged or destroyed.

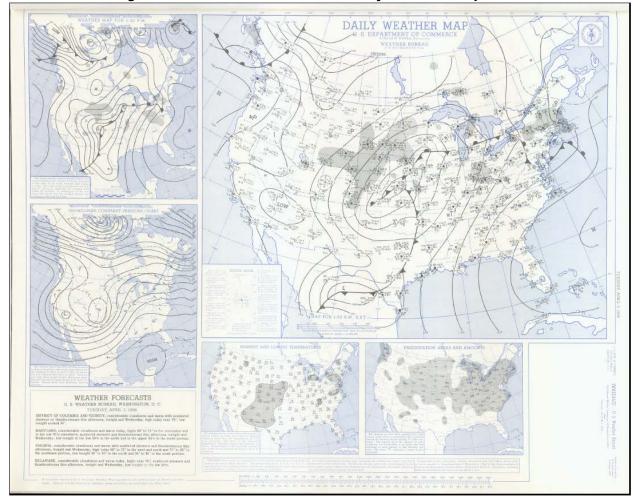


Figure 3.2.2-3: Tornado Outbreak Daily Weather Map, 1956

Source: NOAA, NWS, 1956 Tornado Outbreak Overview, Daily Weather Map for Tuesday, April 3, 1956, http://www.weather.gov/images/grr/1956Tornado/04031956map.png, accessed 10/4/2016.

April 21, 1974

A tornado, estimated to be F4 intensity, hit the City of Oshkosh in Winnebago County on April 21, 1974. Despite a lack of advance warning no one was killed, although seventeen people were reported injured. Eleven commercial structures were damaged and property damage reached \$4 million. About the time the tornado began ripping through Oshkosh, a series of tornadoes spun up in the Lomira/Brownsville area in Dodge County. The tornadoes left a trail of broken homes and barns in their wake and destroyed a large lumberyard. Two deaths and numerous injuries were attributed to the storms.

July 4, 1977

On July 4, 1977, a long-lived line of severe thunderstorms produced significant wind damage across a large part of northern Wisconsin. This derecho developed over west central Minnesota during the morning and moved southeast, increasing in intensity as it approached Wisconsin. A series of intense downburst winds caused major forest blown-downs, widespread severe

damage to property, one casualty, and 35 injuries. This band of extreme damage, which was 10 to 20 miles wide and over 160 miles long, extended from eastern Burnett County through Washburn, Sawyer, Price, and Oneida counties. Approximately 850,000 acres of trees were either destroyed or badly damaged. Damage estimates including buildings and vehicles totaled about \$24 million. Wind gusts may have reached 135 mph at times.

July 15, 1980

Another derecho occurred in western Wisconsin on July 15, 1980, following a major heat wave. A low pressure system combined with the heat and moisture led to severe storms with winds in excess of 110 mph. Approximately 4,800 square miles in the western counties of Chippewa, Clark, Dunn, Eau Claire, Pierce, and St. Croix was devastated. Damages were estimated at \$240 million.

June 8, 1984

A storm system of supercell thunderstorms moved across the state in just after midnight June 8, 1984. These storms spawned at least seven tornadoes including a powerful F5 tornado which struck the Village of Barneveld in Iowa County and proceeded to move northeast through Dane County. Nine people in Barneveld were killed and 200 were injured. About 90% of the village was destroyed including 93 homes and 17 of the 18 businesses and public facilities. Another 64

Figure 3.2.2-4: Barneveld Tornado Damage, 1984



Source: University of Wisconsin Digital Collections, http://uwdc.library.wisc.edu, Digital Identifier WI.barnv0029.bib, accessed 10/4/2016.

homes were damaged. Damage was estimated at \$40 million, which adjusted for inflation, makes this the costliest tornado in Wisconsin history. Figure 3.2.2-4 shows the damage.

July 18, 1996

In the late afternoon of July 18, 1996, a line of thunderstorms caused the NWS to issue a tornado watch for the eastern two-thirds of Wisconsin. As the line moved east, the storms became more severe in Marathon and Portage counties. The storms were very dangerous by the time they reached Fond du Lac County. Warning sirens sounded in the Village of Oakfield at shortly after 7 pm. At 7:15 pm a tornado intensifying from an F3 to F4 rating tore through the community. This violent tornado further intensified to an F5 rating just east of Oakfield. The path of destruction was 13.3 miles long and up to a quarter mile wide. Only 17 people were injured,

but over 150 homes and businesses were damaged or destroyed. The warning sirens certainly saved lives that day.

May 31, 1998

During the early morning hours of Sunday, May 31, 1998, south-central and southeast Wisconsin experienced another derecho. Incredibly powerful, hurricane-force high winds, with peak gusts of 100 to 128 mph tore through 12 counties, while another eight counties had peak gusts of 30 to 80 mph. Although all 20 counties in south-central and southeast Wisconsin reported scattered to widespread wind damage, there were five main corridors or swaths of concentrated damage: 1) from central Sauk County through northern Dane County, northern Jefferson County, southern Dodge County, and Waukesha County into Milwaukee County; 2) from east-central Columbia County across northern Dodge County and through southeast Fond du Lac County and southern Sheboygan County; 3) from central Washington County to east-central Ozaukee County; 4) from southeast Iowa County into northwest Green County; and 5) from the northwest to the central part of Lafayette County.

Utility companies and Emergency Managers stated that the May 31, 1998 event was the most damaging, widespread, straight-line thunderstorm wind event to affect southern Wisconsin in the past 100 years. Estimated monetary damage for all twenty counties was \$55.85 million for homes, businesses, utility and agriculture buildings, signs, street lights, billboards, campers, and boats. An additional \$1.48 million in damages occurred in crop and livestock losses. As a sign of the wind power, many concrete silos had their tops blown off and many barns were flattened. Roofs peeled off homes and other structures. Thousands of large trees were either uprooted or twisted and broken by the winds. Hundreds of power poles were snapped or pushed over by the winds or falling trees and branches. At one point, approximately 60,000 customers in south-central Wisconsin and 170,000 in southeast Wisconsin were without electricity. Some residences and businesses were without power for as long as five or six days due to the deluge of needed utility repairs and a shortage of replacement power poles.

July, 1999

Throughout July 1999, the northwestern portion of Wisconsin received an unusual amount of thunderstorm activity. The cumulative damage from these events led to a Presidential Disaster Declaration for ten counties. Most of the wind damage occurred in forested areas of Douglas and Bayfield counties. The US Forest Service stated that downbursts and wind affected an estimated 92,000 acres of forest during this month-long period.

Approximately 12,000 acres of trees were nearly 100% down in the affected area and another 30,000 acres were moderately affected with up to 40% of trees destroyed. The downed trees created an immediate debris problem on area roads as well as a severe long-term fire hazard. Other long-term effects include the possible spread of tree diseases, which could affect the value of timber as an economic resource; lost tourism and tourism revenue; increased spending for debris clearance; and increased spending for firefighting activities.





Source: NOAA, NWS, Milwaukee County Tornado – March 8, 2000, https://www.weather.gov/mkx/030800 mke-county-tornado, accessed 10/4/2016.

March 8, 2000

A tornado classified as an F1 by the NWS spun up at General Mitchell International Airport in Milwaukee on March 8, 2000. Tornadoes of this category were considered weak, with 73-112 mph winds (on the old Fujita Scale). However, because the area it hit was highly developed and densely populated, in just a few minutes the tornado managed to cause \$381,000 in damages to about 75 homes and \$3.8 million in damage to commercial real estate. Figure 3.2.2-5 shows the path of the tornado.

May 12, 2000

On May 12, 2000, a major super-cell storm developed in west-central Wisconsin. It proceeded to move across the central part of the state from south of La Crosse through the Lake Winnebago area to Manitowoc and finally to Lake Michigan. Ten counties were pounded with hailstones one to three inches in diameter during the morning hours. Damage to property and crops was estimated at \$122 million, making this Wisconsin's first-ever \$100 million hailstorm. Chilton and St. Nazianz in Manitowoc County were particularly hard-hit by hail and wet microbursts that produced winds over 100 mph and a brief EF0 to EF1 tornado.

June 11, 2001

A line of thunderstorms with many of the same characteristics as a tropical storm ripped through east-central and west-central Wisconsin on June 11, 2001. The thunderstorm complex produced hurricane-strength wind gusts and hail, resulting in thousands of downed trees and damage to structures. Nearly \$20 million in damage was reported in central and east-central Wisconsin. Much of the wind damage was concentrated in Wood, Portage, Waushara, Waupaca, Winnebago, Outagamie, and Calumet counties and the cities of Appleton and Oshkosh. Overall, this event affected 30 counties, which were included in Presidential Disaster Declaration 1369.

June 18, 2001

A strong F3 tornado hit Burnett and Washburn counties on June 18, 2001. This tornado touched down near Grantsburg and continued traveling east for over 25 miles to an area just outside of Spooner. Witnesses said the tornado split into three tornadoes in some areas. There was

extensive damage and destruction along the tornado's path. Damage was most concentrated in a six-block wide area of the Village of Siren in Burnett County, where numerous homes and businesses were completely leveled and three people were killed and sixteen injured.

September 2, 2002

On Labor Day, 2002, a strong cold front came in behind a squall line of supercell storms. An F3 tornado developed and struck the Village of Ladysmith in Rusk County, with estimated winds of 158 to 206 mph. The damage the tornado caused to a 16-by-4-block area, which included most of the downtown business district, was estimated at \$20 million. The tornado damaged more than 130 structures in this community of 3,900. There were 24 injuries, none of them serious, primarily because the downtown business district was unusually empty due to the holiday.

August 3, 2004

Clusters of severe thunderstorms moved southeast through south-central and southeast Wisconsin on August 3, 2004, resulting in damaging high winds that toppled large trees, very large damaging hail, and heavy rains that led to flash flooding. Columbia County suffered the most damage thanks to hurricane-force thunderstorm winds coupled with hail stones one to three inches in diameter. The wind-driven hail damaged at least 100 homes and several businesses and churches in Fall River. The wind-driven hail also mowed down some corn and soybean fields between Rio and Columbus. Some of the hail stones were still frozen the next morning. Flash flooding resulted in gravel shoulder washouts and flooded buildings and basements in the Wisconsin Dells to Wyocena area of Columbia County. Rainfall amounts of 2.50 inches were measured in one to two hours in the Portage area Columbia County. This storm caused over \$3 million in damages.

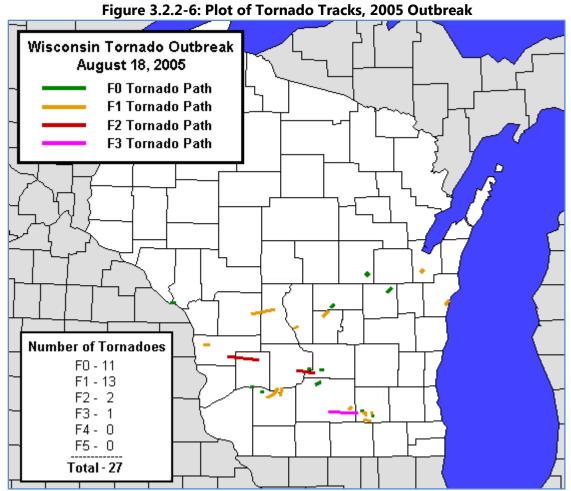
August 18, 2005

A memorable day in Wisconsin, August 18, 2005, saw 27 tornadoes spin up in Wisconsin. It was a new single-day state record. Figure 3.1.2-6 shows a plot of the tornado tracks. The strongest tornado, an EF3, which raked the Stoughton area in Dane County, traveled for 20 miles, resulting in one fatality, 23 injuries, and \$35 million in reported damages.

April 13, 2006

Three supercell thunderstorms moved across the southern part of the state on April 13, 2006. These storms produced hail up to 4.25 inches in diameter in a large swath from Mineral Point in Iowa County to north of Milwaukee. Based on insurance claims information, these hailstorms resulted in total damage of about \$420 million, making it the most costly hailstorm day in Wisconsin weather history. Over 50,000 vehicle claims, 40,000 residential claims, and about 5,400 business/farm claims were filed with various insurance companies. The first of the three hailstorms was the single costliest thunderstorm in Wisconsin weather history, with damage estimated at \$300 million.

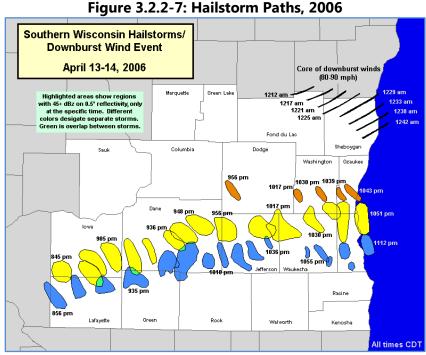
The paths of the three hailstorms are shown in Figure 3.2.2-7. The storm shaded in yellow was the strongest of the three, and produced hailstones two to 4.25 inches in diameter near Lake Mills in Jefferson County.



Source: NOAA, NWS, Milwaukee/Sullivan, https://www.weather.gov/iimages/mkx/doc-events/tornado/ 081805/081805 witortracks.gif, accessed 10/4/2016.

July 30, 2006

On July 30, 2006, downburst winds hit the Bayfield waterfront where an art fair was in progress at Memorial Park. Most of the ninety fair tents were demolished and art pieces were tossed into Lake Superior. A woman broke her hand and a man received a large gash on his hand. Numerous large trees were blown down in Bayfield and across northern Douglas County. The local Catholic church lost a portion of its roof, resulting in damage estimated at \$300,000. There was an unverified report from a private weather system clocking the wind at 99 mph before it became inoperable. At the Apostle Island Marina numerous boats were damaged. Damages were over \$1.5 million.



Source: NOAA, NWS, Milwaukee/Sullivan, 2008.

August 24, 2006

Many storms were reported between August 23 and 25, 2006 in the central and southern parts of the state. Tornadoes and large hail were present with these supercells. Notably, there was significant lightning in Kenosha causing structural fires and power outages. \$14 million in lightning damages were reported making this the costliest lightning event in Wisconsin weather history.

June 7, 2007

Damaging winds, hail, and tornadoes triggered by supercell thunderstorms tore through central and northeast Wisconsin on June 7, 2007. A tornado in northeast Wisconsin, one of five that touched down that day, traveled over 40 miles through Shawano, Menominee, Langlade, and Oconto counties. It was the longest-track tornado in 2007 in the entire US and resulted in over \$15 million in damages.

Also of note was the hail produced by the storms. Hailstones up to 5.5 inches in diameter were measured in Port Edwards in Wood County, shown in Figure 3.2.2-8. The storm resulted in \$45 million in hail damage.

Figure 3.2.2-8: 5.5-Inch Diameter



Source: NOAA, NWS, Green Bay, https://www.weather.gov/grb/060707 tornadoes, accessed 10/4/2016.

August 13, 2007

A large, severe thunderstorm on August 13, 2007, produced winds damaging an area from just west of New Richmond to Glenwood City in St. Croix County. This damage occurred within an approximately two to four mile swath between the cities. Some damage reports included the following information: 109 homes and 48 barns damaged or severely damaged; two homes and two barns destroyed; power lines and trees down; widespread power outages for 12 hours. Total estimates were \$35 million in property damages and \$10 million in crop damage.

January 7, 2008

With temperatures in the 60s, a rare weather event developed in southeastern Wisconsin on January 7, 2008. Thunderstorms formed ahead of a stationary front producing hail, damaging winds, and a few tornadoes. The first tornado spun up in southeast Walworth County and tracked through the Wheatland and Brighton areas of Kenosha County. The second tornado occurred in the Town of Somers in Kenosha County and on the north side of the City of Kenosha. The paths are shown in Figure 3.1.2-9.

In Walworth County five structures sustained damage – three minor and two moderate. In Kenosha County, 105 homes sustained damage: 46 minor, 32 major, and 27 destroyed. Thanks to early warnings issued by the NWS, these tornadoes resulted in only fifteen minor injuries and about \$13.8 million in damage. This was the first instance of an EF3 tornado in Kenosha County since the rating system began in 1982 and was also the first instance of a tornado in Wisconsin in January since 1967.



Figure 3.2.2-9: Kenosha County Tornado Paths, 2008

Source: NOAA, NWS, Milwaukee/Sullivan, 2008.

Early June, 2008

Several severe storms passed over the southern half of the state in early June, 2008. These storms produced massive amounts of rain which led to flash and riverine flooding. The precipitation also exacerbated already wet conditions resulting in groundwater flooding in some areas that did not abate for months. This is discussed in more detail in the flood portion of the Risk Assessment. The storms also gave rise to high winds, tornadoes, and hail, including a hailstorm with the third-largest recorded hailstone in the state in Waukesha County on June 12.

April-June 2010

Scattered severe storms with large hail struck parts of central and southern Wisconsin on April 3, April 10, May 22, and June 8, 2010. There were reports of hailstones ranging from two to 4.25 inches in diameter. On April 3 alone, at least 575 insurance claims were filed with Madison-based American Family Insurance Company in Dane and Dodge counties. Collectively, the reported and unreported damages for the four days of hail probably totaled several million dollars.

Later that same summer, on June 21, 2010, another storm struck, spawning an EF2 tornado about two miles west-southwest of the Village of Eagle in Waukesha County and moved east through the southern part of the Village, dissipating on the northwest side of Mukwonago Park. Fifteen people were injured. Eight homes were destroyed and another 67 had major damage. The tornado uprooted or damaged thousands of trees and totaled at least three dozen vehicles. At Old World Wisconsin, an outdoor museum operated by the Wisconsin Historical Society near Eagle, about 2,500 trees were damaged.

April 10, 2011

A series of severe thunderstorms impacted much of Wisconsin on April 10, 2011. Although that day is largely remembered for the 15 tornadoes that occurred throughout the state, the storms also produced copious amounts of hail. The hailstones that day were not particularly large, with only three reports of hailstones greater than two inches and none greater than 2.5 inches in diameter. However, these hail storms did result in a tremendous amount of crop and property damage, estimated at over \$31 million.

July 1, 2011

On July 1, 2011, a line of severe thunderstorms moved from Pine County, Minnesota, to northwest Wisconsin. The storms produced extremely strong straight-line winds and downbursts. Large swaths of forested land in and around Burnett County were blown down. Figure 3.1.2-10 shows aerial and ground photos of the damage, respectively. Around 130,000 acres were impacted statewide, with 81,000 in Burnett County. Damage to improved property was minimal, but the impact to the timber industry was significant. Approximately 2 million cords of wood, up to \$160 million worth, was lost. Additionally, the downed woody debris required costly cleanup and increased the fire hazard for the area.

Figures 3.2.2-10: Burnett County Blowdown Aerial and Ground Photos, 2011





Source: NOAA, NWS, Duluth, MN, http://www.weather.gov/dlh/1jul2011 winddamge, accessed 10/21/2016.

August 6 and 7, 2013

In the late night and early morning hours of August 6 and 7, 2013, a line of severe thunderstorms moved across central Wisconsin. The line primarily produced damaging winds across western and central Wisconsin. However, as the line neared the Fox Valley, the storms began to produce tornadoes. In total, there were six tornadoes across east-central Wisconsin, including five EF-1 tornadoes and one EF-2 tornado. Hundreds of homes, businesses, and farm buildings were damaged. Thousands of trees and power lines were downed, leaving tens of thousands without power. Between the high winds and tornadoes, total property damage amounted to nearly \$20 million. Fortunately only two injuries and no deaths were reported due to these storms.

June 16 and 17, 2014

A line of severe thunderstorms moved across southern Wisconsin June 16 and 17, 2014 in the late night and early morning hours. In addition to damaging winds, these storms spawned 12 tornadoes. Most of the tornadoes were EF-0s and EF-1s, but there were two EF-2s and one EF-3 that struck the City of Verona, a suburb of Madison, in Dane County. Before hitting Verona, one of the EF-2s struck the City of Platteville in Grant County, where five people were injured. Fortunately those were the only injuries sustained. However, these tornadoes did cause over \$42 million in property damage, with \$20 million of that in Platteville and \$14 million in Verona.

August 2, 2015

On August 2, 2015, a cluster of thunderstorms developed inland from Lake Michigan in northern Wisconsin. That cluster of storms then moved directly south and congealed into a squall line that produced severe hail across much of eastern Wisconsin. There were multiple reports of hailstones over two inches in diameter, with the largest reported at 3.75 inches. Surprisingly, very little was reported in terms of property or crop damage associated with these storms.

Significant Tornado Events

Because tornadoes are so violent and tornado events can be extremely devastating, in terms of both damages and loss of life, it's worth taking note of significant tornado events experienced in the state, and the impacts they have had. The table in Figure 3.2.2-11 lists the event dates, EFratings, locations, reported damages (property and crops), and deaths. The number of deaths has dropped off dramatically since the 19th century and the early part of the 20th century, likely because of the prevalence of improved construction materials and practices, more accurate forecasting models, and more effective warning systems.

Figure 3.2.2-11: Significant Tornado Events in Wisconsin, 1865-2015

Date	EF-Rating	Location (County/-ies)	Reported Damage	Number of Deaths
June 29, 1865		Vernon	Not Available	24
May 23, 1878	EF4 (est.)	Dane, Iowa, Jefferson, Milwaukee, Waukesha (may have been three tornadoes)	Not Available	19
May 18, 1898	EF5 (est.)	Clark, Eau Claire, Langlade, Lincoln, Marathon	Not Available	17
June 12, 1899		St. Croix	Not Available	117
September 21, 1924		Eau Claire to Oneida	Not Available	26
September 21, 1924		Barron to Ashland	Not Available	10
April 5, 1929	EF4 (est.)	Barron, Pierce, St. Croix	\$4,000,000	7
April 3, 1956	EF4 (est.)	Green Lake, Waushara, Winnebago	\$1,000,000	7
June 4, 1958		Chippewa, Clark, Dunn (three tornadoes)	\$27,750,000	27
April 11, 1965	EF2 (est.)	Dodge, Jefferson	\$2,500,000	3
April 21, 1974	EF4 (est.)	Winnebago	\$4,000,000	0
April 21, 1974	EF3 (est.)	Dodge, Fond du Lac	\$5,000,000	2
July 15, 1980		Chippewa, Dunn, Eau Claire (nine tornadoes)	\$150,000,000	0
April 27, 1984	EF3	Oneida, Vilas	\$52,500,000	1
April 27, 1984	EF3	Menominee, Shawano, Waupaca	\$2,624,000	0
April 27, 1984	EF4	Outagamie, Winnebago	\$3,600,000	1
April 27, 1984	EF4	Waukesha	\$1,300,000	1
June 8, 1984	EF5	Columbia, Dane, Iowa	\$40,000,000	9
August 29, 1992	EF3	Waushara	\$10,100,000	1
July 5, 1994	EF4	Manitowoc	\$2,100,000	0
August 27, 1994	EF3	Adams	\$4,600,000	2
July 18, 1996	EF5	Fond du Lac	\$40,400,000	0
August 23, 1998	EF3	Door	\$7,000,000	0
March 8, 2000	EF1	Milwaukee	\$4,181,000	0
June 18, 2001	EF3	Burnett, Washburn	\$10,000,000	3
September 2, 2002	EF3	Rusk	\$25,000,000	0
June 23, 2004	EF3	Dodge, Fond du Lac, Green (two tornadoes merged)	\$20,000,000	1
August 18, 2005	EF3	Dane, Jefferson	\$35,052,000	1

Date	EF-Rating	Location (County/-ies)	Reported Damage	Number of Deaths
August 18, 2005	EF2	Richland, Vernon	\$3,570,000	0
June 7, 2006	EF3	Langlade, Menominee, Oconto, Shawano	\$15,400,000	0
January 7, 2008	EF3	Kenosha, Walworth	\$13,810,000	0
June 21, 2010	EF2	Waukesha	\$206,000,000	0
June 16, 2014	EF2	Grant	\$20,500,000	0
June 16, 2014	EF3	Dane	\$14,000,000	0

Source: NOAA, NWS, Milwaukee/Sullivan, 2016.

3.2.3 Probability, Impacts, and Mitigation Potential

Thunderstorms and the associated severe weather can occur throughout Wisconsin during any month of the year, but the highest frequency is from May through September. June has the highest frequency of tornadoes, followed by July, May, and August. February is the only month with no documented tornadoes in Wisconsin. Hail also materializes more often during the warmer months with 85% occurring between May and September. Thunderstorms occur most often between noon and 10 pm with 75% of tornadoes occurring between 3 and 10 pm. The peak hour for severe thunderstorms and tornadoes is 6 to 7 pm.

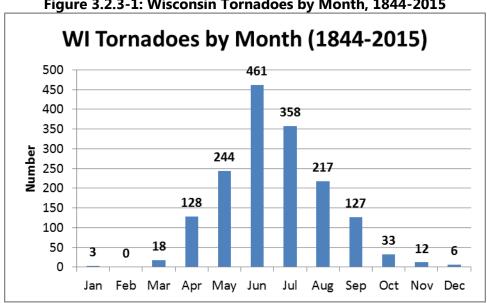


Figure 3.2.3-1: Wisconsin Tornadoes by Month, 1844-2015

Source: NWS, Milwaukee/Sullivan, 2016.

Figures 3.2.3-2 and 3.2.3-3 show the average number of thunderstorm days and the average number of severe weather days across the US, respectively. Severe weather days are days with storms producing tornadoes, high winds, and/or hail. The highest concentration for both figures is found in the southeast. In Wisconsin, the average is between 30 and 50 thunderstorm days and 10 and 30 severe weather days with more of each toward the southern portion of the state and fewer in the north. The number of thunderstorm and severe weather days will fluctuate from year to year.

Between 1982 and 2010, when thunderstorms in Wisconsin became severe, short-fuse weather materialized in the form of damaging high winds 61% of the time, large hail 32% of the time, and tornadoes 7% of the time.

The probability, impacts, and mitigation potential of high winds and tornadoes, hail, and lightning will be discussed individually below. Overall impacts of severe storms can also include flooding, which is discussed at length in a separate section.

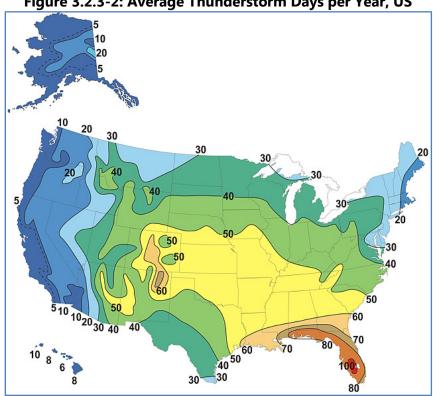


Figure 3.2.3-2: Average Thunderstorm Days per Year, US

Source: NWS, Southern Region Headquarters, 2016.

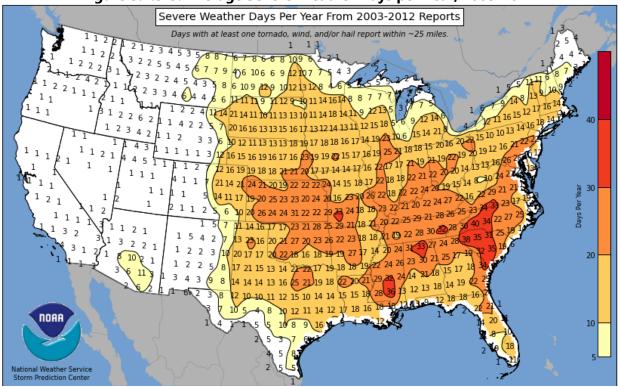


Figure 3.2.3-3: Average Severe Weather Days per Year, 2003-2012

Source: NWS, Storm Prediction Center, 2016.

3.2.3.1 Tornadoes and High Winds

Hazard Ranking

Evaluation Criteria	Description	Ranking
Probability	 The hazard has impacted the state numerous times on an annual basis The hazard is widespread, generally affecting regions or multiple counties in each event There is a reliable methodology for identifying events and locations 	High
Mitigation Potential	 Methods for reducing risk from the hazard are technically reliable The state or counties have experience in implementing mitigation measures Mitigation measures are eligible under federal grant programs There are multiple possible mitigation measures for the hazard The mitigation measures are known to be cost-effective 	High

Background

Figure 3.2.3.1-1 depicts the annual number of days with severe thunderstorm winds that can be expected throughout the US. The highest concentration of annual thunderstorm wind days is in the southeastern part of the country. Parts of North and South Carolina, Tennessee, and Virginia experience upwards of 20 severe thunderstorm wind events per year on average. Portions of Wisconsin range from an average of three to 13 events per year.

Severe Thunderstorm Wind Days Per Year From 2003-2012 Reports

Figure 3.2.3.1-1: US Average Severe Thunderstorm Wind Days, 2003-2012

Source: NOAA, NWS, Storm Prediction Center, http://www.spc.noaa.gov/wcm/, accessed 10/24/2016.

With even higher wind speeds, tornadoes also occur regularly in Wisconsin. The state lies along the northern edge of the nation's maximum frequency belt for tornadoes, called "Tornado Alley" by some. Tracks of the tornadoes that occurred nationwide between 1950 and 2015 are shown in Figure 3.2.3.1-2.

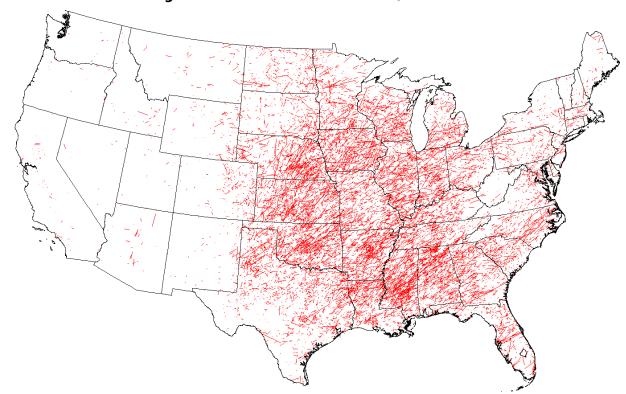


Figure 3.2.3.1-2: US Tornado Tracks, 1950-2015

Source: NOAA, NWS, Storm Prediction Center, http://www.spc.noaa.gov/gis/svrgis/, accessed 2016.10.18.

Frequency and Probability

According to the NWS, between 1970 and 2015, Wisconsin has experienced 740 hurricane-force wind events (74 mph or higher). Figure 3.1.3.1-3 shows the number of these events by county. Note the concentration of events in southeastern Wisconsin. Rock, Dane, and Waukesha counties have had 35, 32, and 23 hurricane-force wind events, respectively, since 1970. This concentration around areas with higher population densities poses the threat of damages where land is most developed.

In the same time period, winds at or above 100 mph have been documented during 64 events, meaning that winds similar to a Category 2 hurricane are experienced about 1.4 times every year in Wisconsin. Figure 3.1.3.1-4 indicates the number of severe thunderstorm wind events with wind gusts of 100 mph or more by county. Since these extreme wind events are uncommon, the data shown does not lend itself to meaningful conclusions. Generally, however, the central part of the state has experienced very few Category 2 hurricane wind gusts as a result of severe thunderstorm events.

Figure 3.2.3.1-3: Wisconsin Hurricane Force Wind Events by County, 1982-2015



Wisconsin Hurricane Force Wind Events



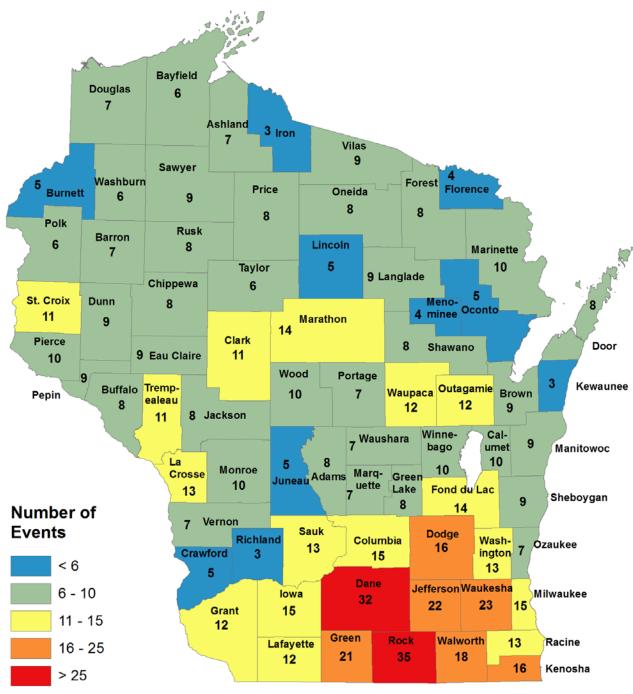


Figure 3.2.3.1-4: Wisconsin 100+ mph Wind Events by County, 1982-2015



Wisconsin > 100 MPH Wind Events



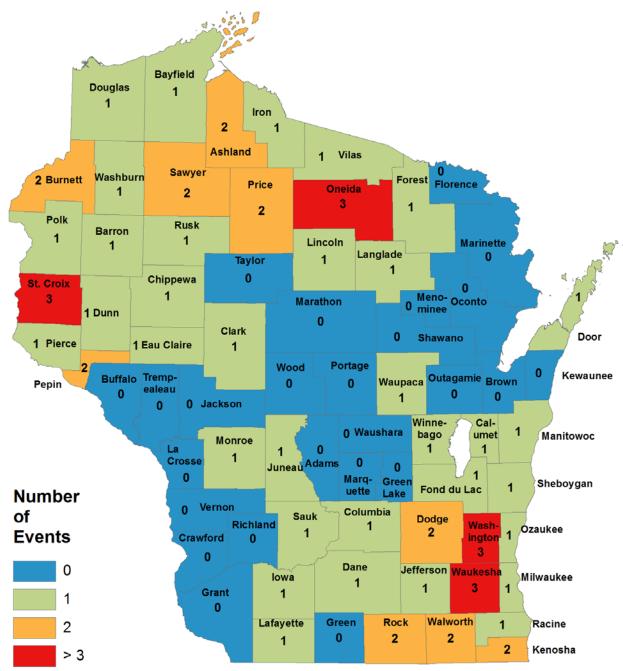


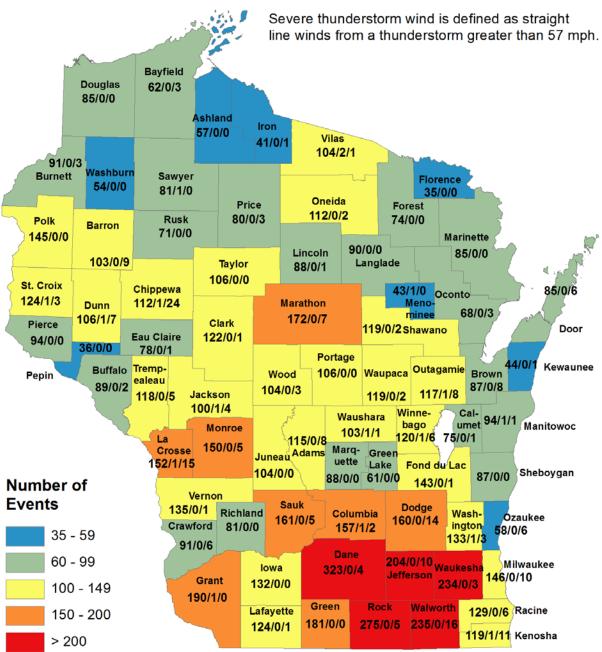
Figure 3.2.3.1-5: Wisconsin Severe Thunderstorm Wind Events, Deaths, and Injuries by County, 1844-2015



Wisconsin Severe Thunderstorm Wind Events



1844 - 2015 # Events / # Deaths / # Injuries



The frequency of high wind events is important to be aware of because these events can result in damages, injuries, and deaths. Figure 3.2.3.1-5 shows the distribution of severe thunderstorm wind events between 1844 and 2015 by county. Five counties (Dane, Jefferson, Rock, Walworth, and Waukesha) in the south-central to southeast part of the state each experienced over 200 events in that time, with Dane County recording over 300. This is alarming due in part to the recent development of land in these counties and the projected population growth. Only five counties experienced fewer than 50 severe thunderstorm wind events in that time. As shown, 17 fatalities and dozens of injuries in Wisconsin were attributed to severe thunderstorm winds between 1982 and 2015. Although severe thunderstorm winds pose a serious threat, the potential for damage and loss of life can be even greater in tornado events.

Figure 3.2.3.1-6 shows how Wisconsin ranked among other states in terms of number of tornadoes, fatalities, injuries, and nominal reported damaged (not adjusted for inflation). The number of tornadoes per year varies due to fluctuations in the jet stream pattern, which influences thunderstorm movement. Wisconsin ranked fourth nationally in number of tornadoes in 1980 when 43 tornadoes spun up, which was more than the normal leading state, Texas, had that year. During 1999, there were only eleven confirmed tornadoes in Wisconsin, which is only half of the average. In 2005, Wisconsin had 62 tornadoes, which was the seventh highest state total for the year.

Figure 3.2.3.1-6: State Tornado Rankings by Number of Tornadoes, Fatalities, Injuries, and Damages (1950-2010)

Rank	State	Tornadoes	Rank	State	Fatalities	Rank	State	Injuries	Rank	State	Damages (Millions)
1	TX	7,904	1	TX	537	1	TX	8,200	1	TX	\$11,756
2	KS	3,667	2	MS	418	2	MS	6,072	2	ОК	\$7,795
3	OK	3,290	3	AL	376	3	AL	5,815	3	FL	\$7,326
4	FL	3,052	4	AR	367	4	AR	5,014	4	IA	\$6,063
5	NE	2,542	5	TN	304	5	ОН	4,441	5	KS	\$5,482
6	IA	2,212	6	OK	282	6	OK	4,404	6	MS	\$5,202
7	IL	2,102	7	IN	252	7	IN	4,230	7	MO	\$4,890
8	MO	1,942	8	MI	243	8	IL	4,124	8	GA	\$4,560
9	CO	1,890	9	KS	232	9	TN	3,884	9	NE	\$4,452
10	MS	1,791	10	MO	230	10	GA	3,735	10	AL	\$4,203
11	AL	1,695	11	IL	203	11	MI	3,364	11	IL	\$4,119
12	LA	1,689	12	ОН	191	12	FL	3,292	12	LA	\$4,013
13	SD	1,658	13	GA	178	13	MO	3,147	13	AR	\$3,893
14	AR	1,587	14	FL	161	14	KY	2,792	14	IN	\$3,471
15	MN	1,580	15	LA	155	15	KS	2,679	15	WI	\$3,327
16	GA	1,380	16	KY	125	16	LA	2,650	16	ОН	\$3,269
17	ND	1,356	17	MA	102	17	NC	2,208	17	TN	\$3,165
18	IN	1,236	18	NC	100	18	IA	2,190	18	MN	\$2,783
19	WI	1,224	19	WI	99	19	MN	1,932	19	MI	\$2,760
20	NC	1,116	20	MN	98	20	WI	1,634	20	NC	\$2,550

The "average" Wisconsin tornado between 1982 and 2007 had a lifespan of 7.1 minutes, a path length of 3.7 miles, a path width of 118 yards, and an EF rating of 0.7 (between EF0 and EF1). Despite the averages, strong year-to-year variations occur. In the same time period, there was a low of only seven tornadoes in 1995 and a high of 62 in 2005. Figure 3.1.3.1-7 shows all reported tornado ratings in Wisconsin from 1982 to 2015. The table indicates that about 85.4% of Wisconsin's tornadoes were rated as "weak" (EF0-EF1), 13.8% were "strong" (EF2-EF3), and 0.8% were "violent" (EF4-EF5).

Figure 3.2.3.1-7: Wisconsin Tornado Ratings, 1982-2015

				Ulliauo			
Year	EF0	EF1	EF2	EF3	EF4	EF5	Total
1982	1	9	6	0	0	0	16
1983	20	5	3	1	1	0	30
1984	10	8	10	3	2	1	34
1985	3	7	6	0	0	0	16
1986	4	4	5	1	0	0	14
1987	8	8	0	0	0	0	16
1988	8	19	7	1	0	0	35
1989	9	7	1	0	0	0	17
1990	0	6	3	0	0	0	9
1991	5	3	2	0	0	0	10
1992	7	15	2	2	0	0	26
1993	27	9	1	0	0	0	37
1994	8	18	6	2	1	0	35
1995	5	2	0	0	0	0	7
1996	11	7	2	0	0	1	21
1997	6	6	2	0	0	0	14
1998	16	3	3	2	0	0	24
1999	10	1	0	0	0	0	11
2000	11	6	1	0	0	0	18
2001	7	4	0	1	0	0	12
2002	18	5	2	1	0	0	26
2003	10	4	0	0	0	0	14
2004	22	10	2	2	0	0	36
2005	40	19	2	1	0	0	62
2006	11	2	0	0	0	0	13
2007	13	3	1	1	0	0	18
2008	23	13	1	1	0	0	38
2009	11	5	0	0	0	0	16
2010	17	24	5	0	0	0	46
2011	14	18	6	1	0	0	39
2012	3	0	1	0	0	0	4
2013	8	6	1	0	0	0	15
2014	5	11	4	1	0	0	21

Year	EF0	EF1	EF2	EF3	EF4	EF5	Total
2015	12	5	0	0	0	0	17
Total	383	272	85	21	4	2	767

Source: NOAA, NWS, Milwaukee/Sullivan, 2016.

While all Wisconsin counties have recorded at least three tornadoes between 1844 and 2015, six counties (Barron, Dane, Dodge, Fond du Lac, Grant, and Marathon) have each recorded over 40 tornadoes as shown in Figure 3.1.3.1-8. Dane, Dodge, Grant, and Marathon counties have had the most with 74, 60, 59, and 54, respectively. Counties in the southern part of the state have had more recorded tornadoes than the rest of the state, with a concentration of 30 or more per county in the south-central area. Please note that in the 1800s and early 1900s, tornadoes that did not occur in populated areas during the day were rarely reported or documented.

Figure 3.2.3.1-9 is a plot of Wisconsin's short- and long-track tornadoes for the period 1950 through 2015. This map indicates that most long-track tornadoes in the state travel southwest to northeast; however, a number of the tornadoes moved west to east as well as northwest to southeast. Data accompanying the map indicated that northwest-to-southeast moving tornadoes tended to occur in the latter part of the warm season.

The number of tornadoes per township in each county was determined in order to find the number of tornadoes per square mile. This data was then projected onto 100-meter square grids to create Figure 3.2.3.1-10. This technique allows for tornado count data to be applied on a regional level, showing trends of tornado occurrence (FEMA, 2009). Using this technique allows the untrained eye to clearly identify local "hot spots" across the state at the township level for the 61 years of data provided. Speculation suggests that the concentration of tornadoes between Madison and Lake Winnebago may be related to the fact that the terrain in that area is flatter than in the southwestern counties. Additionally, an interaction between a lake breeze front generated by Lake Winnebago and outflow boundaries (gust fronts) generated by individual thunderstorms may enhance the spin-up of tornado rotation below the cloud base.

Figure 3.2.3.1-8: Wisconsin Tornado Events, Deaths, and Injuries by County, 1844-2015



Wisconsin Tornado Events



1844 - 2015 # Events / # Deaths / # Injuries

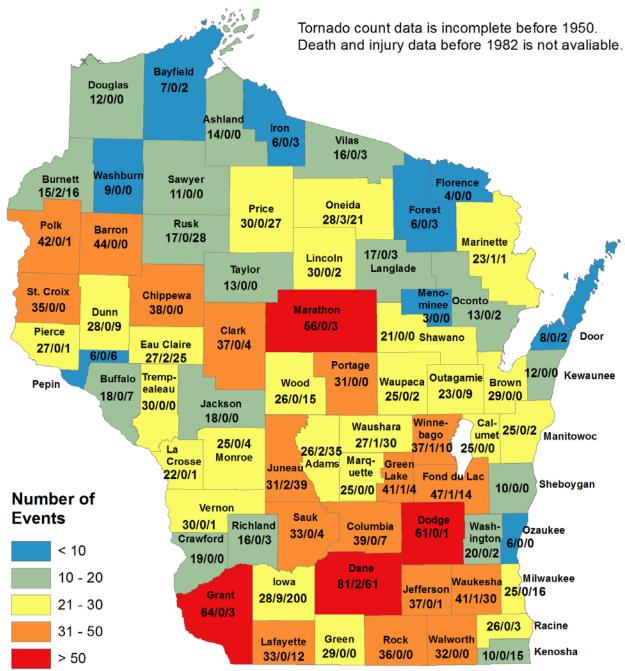
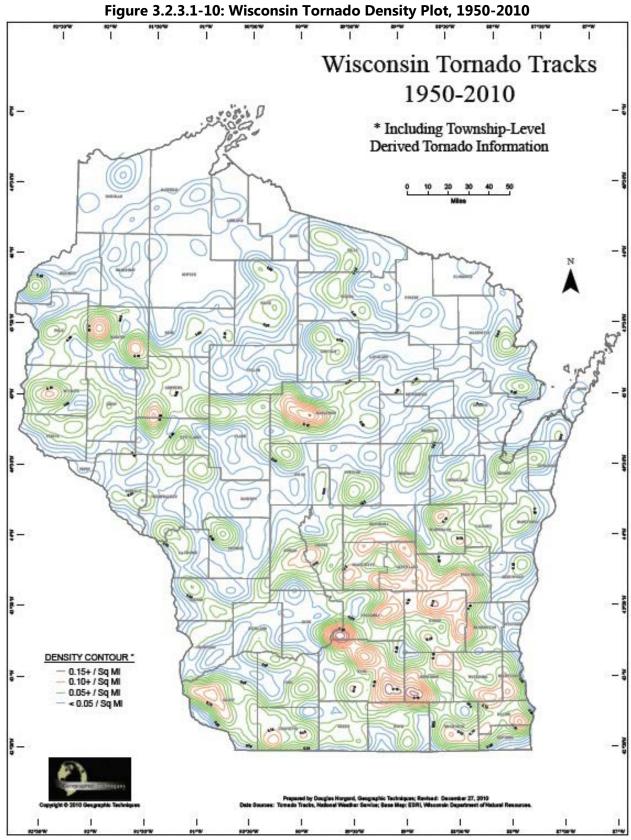


Figure 3.2.3.1-9: Wisconsin Tornado Tracks, 1950-2015



Source: Norgord, Douglas, Geographic Techniques, 2010.

Impacts and Potential Losses

Both thunderstorm winds and tornadoes can lead to loss of life, injury, and damage to property, infrastructure, crops, and forested areas. Wind and tornadoes often create excessive amounts of debris that then needs to be cleaned up and managed properly. Securing the workforce to clean up after a large event can be problematic and costly. Additionally, disposing of the debris properly requires knowledge of local disposal requirements and permitting, which may also be costly.

Because severe windstorms are less common and generally produce far fewer damages than tornadoes, loss estimates were only performed for tornadoes.

The four tables shown in Figures 3.2.3.1-11 through 3.2.3.1-14 were compiled using historic data from the NWS, Milwaukee/Sullivan, and NOAA's National Centers for Environmental Information Storm Event Database.

Information on tornadoes from January 1, 1950, through December 31, 2015, for each county in the state was entered into a spreadsheet that includes calculations to obtain the following information: average damage amounts per tornado, annual probability, and estimated future annual losses. The following are definitions of the terms used in the tables in Figures 3.2.3.1-11 through 3.2.3.1-14:

- **Total Damages** = Cumulative sum of all reported damages associated with all tornadoes occurring in the 66 year period from January 1, 1950, to December 31, 2015 (reported damages obtained from the Storm Events Database)²
- Average Damage per Tornado = Total damages divided by the number of tornadoes
- **Estimated Annual Tornadoes** = Number of tornadoes divided by the number of reporting years (66)
- **Estimated Future Annual Losses** = Average Damage per Tornado x Estimated Annual Tornadoes

Note that all reported damages were recorded in nominal values by the NWS. All values were adjusted for inflation and reported in 2015 dollars. Using the BLS CPI Inflation Calculator, 2011, 2012, 2013, and 2014 dollar amounts were adjusted to 2015 dollars using multipliers of 1.05, 1.03, 1.02, and 1.00, respectively.

Damage calculations include all reported property and crop damage as well as injuries and deaths sustained as a result of the tornadic event. Injury and death values were calculated as follows:

1. Injury was assigned a value based on the December 2011 FEMA Benefit-Cost Analysis Re-engineering (BCAR) Development of Standard Economic Values report, which incorporates research completed on behalf of the Department of Homeland Security in

_

² Damages include all property and crop damages recorded by the NWS. If damages were not reported, they were not included in these calculations. For multi-county tornadoes, each county's respective damage total was provided by the NWS.

2008. The values can be thought of as the "willingness-to-pay" (WTP) to avoid an injury. The report recommends using 1997 values and adjusting for inflation using the US Bureau of Labor Statistics (BLS) Consumer Price Index (CPI) Inflation Calculator. These are the adjusted 2015 values:

Minor	\$14,000
Moderate	\$107,000
Serious	\$399,000
Severe	\$1,300,000
Critical	\$5,300,000

2. Since the NWS does not differentiate between injury categories in their data, a combined injury value was calculated. Less than 1% of tornadoes in the state are EF-4 to EF-5 (violent). About 14% are EF-2 to EF-3 (strong), and 85% are EF-0 to EF-1 (weak). That means that the types of injuries suffered will overwhelmingly be those most likely in weak tornadoes.

According to FEMA's BCAR Tornado Safe Room Methodology Report (2009), on average, 5% of those injured will be hospitalized (injury categories Serious through Critical) in an EF-1 tornado and 10% in an EF-2. Therefore, the Serious through Critical injury WTP values were averaged and weighted as 10% of the total. The Minor and Moderate injury (non-hospitalization categories) WTP values were averaged and weighted as 90% of the total. The total was then rounded to the nearest thousand.

$$\{[(\$14,000 + \$107,000)/2] \times .9\} + \{[(\$399,000 + \$1,303,000 + \$5,302,000)/3] \times .1\} = \$288,000$$

3. The CPI 2015 adjusted value of a statistical life is \$6.9 million.

These calculations were done for each county to arrive at the future annual probability of a tornado and estimated annual losses from tornado events. Figure 3.1.3.1-11 lists the counties in alphabetical order and highlights the top five counties in each category. The top county is in black, the next four in grey.

Figure 3.2.3.1-11: Tornado Property/Crop Loss Estimates by County (1950-2015)

County Name	Number of Tornadoes	Total Damages	Avg. Damage per Tornado	Estimated Annual Tornadoes	Estimated Future Annual Losses
Adams	17	\$7,498,300	\$441,076	0.26	\$113,611
Ashland	10	\$330,000	\$33,000	0.15	\$5,000
Barron	36	\$9,945,550	\$276,265	0.55	\$150,690
Bayfield	5	\$852,500	\$170,500	0.08	\$12,917
Brown	27	\$7,122,050	\$263,780	0.41	\$107,910
Buffalo	14	\$9,466,512	\$676,179	0.21	\$143,432
Burnett	13	\$13,815,890	\$1,062,761	0.20	\$209,332

County Name	Number of Tornadoes	Total Damages	Avg. Damage per Tornado	Estimated Annual Tornadoes	Estimated Future Annual Losses
Calumet	22	\$4,596,500	\$208,932	0.33	\$69,644
Chippewa	28	\$40,607,800	\$1,450,279	0.42	\$615,270
Clark	23	\$10,137,425	\$440,758	0.35	\$153,597
Columbia	36	\$13,837,989	\$384,389	0.55	\$209,667
Crawford	13	\$704,745	\$54,211	0.20	\$10,678
Dane	63	\$96,137,672	\$1,525,995	0.95	\$1,456,631
Dodge	58	\$31,215,800	\$538,203	0.88	\$472,967
Door	8	\$8,819,800	\$1,102,475	0.12	\$133,633
Douglas	10	\$941,600	\$94,160	0.15	\$14,267
Dunn	19	\$65,338,700	\$3,438,879	0.29	\$989,980
Eau Claire	17	\$17,873,300	\$1,051,371	0.26	\$270,808
Florence	3	\$98,250	\$32,750	0.05	\$1,489
Fond du Lac	43	\$66,287,050	\$1,541,559	0.65	\$1,004,349
Forest	6	\$6,092,500	\$1,015,417	0.09	\$92,311
Grant	49	\$27,743,920	\$566,202	0.74	\$420,362
Green	23	\$4,463,800	\$194,078	0.35	\$67,633
Green Lake	31	\$14,106,835	\$455,059	0.47	\$213,740
Iowa	27	\$6,340,800	\$234,844	0.41	\$96,073
Iron	4	\$619,157	\$154,789	0.06	\$9,381
Jackson	13	\$4,295,500	\$330,423	0.20	\$65,083
Jefferson	33	\$11,827,090	\$358,397	0.50	\$179,198
Juneau	23	\$10,115,200	\$439,791	0.35	\$153,261
Kenosha	9	\$24,228,578	\$2,692,064	0.14	\$367,100
Kewaunee	8	\$656,000	\$82,000	0.12	\$9,939
La Crosse	16	\$19,521,550	\$1,220,097	0.24	\$295,781
Lafayette	28	\$9,873,335	\$352,619	0.42	\$149,596
Langlade	8	\$6,500,500	\$812,563	0.12	\$98,492
Lincoln	23	\$13,452,500	\$584,891	0.35	\$203,826
Manitowoc	20	\$9,397,000	\$469,850	0.30	\$142,379
Marathon	49	\$18,381,300	\$375,129	0.74	\$278,505
Marinette	20 19	\$4,443,500	\$222,175 \$107,047	0.30 0.29	\$67,326
Marquette Menominee	2	\$2,033,900 \$5,720,000	\$2,860,000	0.29	\$30,817 \$86,667
Milwaukee	17	\$8,528,300	\$501,665	0.03	\$129,217
Monroe	20	\$5,803,850	\$301,003	0.20	\$87,937
Oconto	12	\$12,519,900	\$1,043,325	0.30	\$189,695
Oneida	20	\$56,299,100	\$2,814,955	0.30	\$853,017
Outagamie	21	\$39,538,600	\$1,882,790	0.32	\$599,070
Ozaukee	4	\$39,338,000	\$1,882,790	0.32	\$46,682
Pepin	5	\$660,000	\$132,000	0.08	\$10,000
Pierce	20	\$4,188,800	\$132,000	0.30	\$63,467
Polk	27	\$9,655,239	\$357,601	0.41	\$146,292
Portage	23	\$4,186,800	\$182,035	0.41	\$63,436
Price	23	\$29,031,800	\$1,262,252	0.35	\$439,876

County Name	Number of Tornadoes	Total Damages	Avg. Damage per Tornado	Estimated Annual Tornadoes	Estimated Future Annual Losses
Racine	21	\$10,304,392	\$490,685	0.32	\$156,127
Richland	13	\$3,840,500	\$295,423	0.20	\$58,189
Rock	24	\$8,617,189	\$359,050	0.36	\$130,563
Rusk	13	\$28,435,000	\$2,187,308	0.20	\$430,833
Sauk	23	\$7,198,400	\$312,974	0.35	\$109,067
Sawyer	8	\$305,800	\$38,225	0.12	\$4,633
Shawano	15	\$6,451,600	\$430,107	0.23	\$97,752
Sheboygan	8	\$3,997,345	\$499,668	0.12	\$60,566
St. Croix	31	\$41,640,500	\$1,343,242	0.47	\$630,917
Taylor	8	\$4,626,600	\$578,325	0.12	\$70,100
Trempealeau	17	\$6,489,340	\$381,726	0.26	\$98,323
Vernon	19	\$5,151,300	\$271,121	0.29	\$78,050
Vilas	13	\$29,095,000	\$2,238,077	0.20	\$440,833
Walworth	25	\$6,253,000	\$250,120	0.38	\$94,742
Washburn	8	\$3,058,000	\$382,250	0.12	\$46,333
Washington	18	\$33,308,000	\$1,850,444	0.27	\$504,667
Waukesha	30	\$39,833,497	\$1,327,783	0.45	\$603,538
Waupaca	18	\$5,838,100	\$324,339	0.27	\$88,456
Waushara	19	\$32,001,750	\$1,684,303	0.29	\$484,875
Winnebago	27	\$10,666,015	\$395,038	0.41	\$161,606
Wood	19	\$30,232,000	\$1,591,158	0.29	\$458,061
STATE	1445	\$1,096,277,115	\$758,669.28	1.00	\$758,669.28

Source: NOAA, NWS and WEM, 2016. All dollar amounts have been adjusted to 2015 dollars.

There are 16 counties in Wisconsin (out of 72) that have experienced over \$25 million in tornado damages, as reported to the NWS. They are listed in Figure 3.2.3.1-12. Dane County has had the second highest number of events (56) since 1950 and is also relatively densely populated, which helps explain the high amount of reported damages.

Figure 3.2.3.1-12: Counties with the Highest Average Reported Tornado Damages (1950-2015)

County Name	Number of Tornado Events	Total Damages
Dane	63	\$96,137,672
Fond du Lac	43	\$66,287,050
Dunn	19	\$65,338,700
Oneida	20	\$56,299,100
St. Croix	31	\$41,640,500
Chippewa	28	\$40,607,800
Waukesha	30	\$39,833,497
Outagamie	21	\$39,538,600

County Name	Number of Tornado Events	Total Damages	
	TOTTIAGO EVEITES	Dailiages	
Washington	18	\$33,308,000	
Waushara	19	\$32,001,750	
Dodge	58	\$31,215,800	
Wood	19	\$30,232,000	
Vilas	13	\$29,095,000	
Price	23	\$29,031,800	
Rusk	13	\$28,435,000	
Grant	49	\$27,743,920	

Source: NOAA, NWS and WEM, 2016. All dollar amounts have been adjusted to 2015 dollars.

There exists a large disparity of the numbers of tornado events occurring throughout the state. Figure 3.2.3.1-13 lists the counties in Wisconsin that experience the costliest tornado events. 22 counties experience average reported damages of over \$1 million per tornado, some of which also have a high number of tornado events. Although Menominee and Forest counties have had only two and six tornadoes, respectively, since 1950, they have experienced serious damages. The other counties with the costliest average damages have had between eight and 63 tornado events in the 66 year period from 1950 to 2015.

Figure 3.2.3.1-13: Average Loss per Tornado by County (1950-2015)

rigare 3.2.3.1 13. Average 1033						
County Name	Number of Tornadoes	Avg. Damage per Tornado				
Dunn	19	\$3,438,879				
Menominee	2	\$2,860,000				
Oneida	20	\$2,814,955				
Kenosha	9	\$2,692,064				
Vilas	13	\$2,238,077				
Rusk	13	\$2,187,308				
Outagamie	21	\$1,882,790				
Washington	18	\$1,850,444				
Waushara	19	\$1,684,303				
Wood	19	\$1,591,158				
Fond du Lac	43	\$1,541,559				

County Name	Number of Tornadoes	Avg. Damage per Tornado
Dane	63	\$1,525,995
Chippewa	28	\$1,450,279
St. Croix	31	\$1,343,242
Waukesha	30	\$1,327,783
Price	23	\$1,262,252
La Crosse	16	\$1,220,097
Door	8	\$1,102,475
Burnett	13	\$1,062,761
Eau Claire	17	\$1,051,371
Oconto	12	\$1,043,325
Forest	6	\$1,015,417

Source: NOAA, NWS and WEM, 2016. All dollar amounts have been adjusted to 2015 dollars.

The data from the National Weather Service was used to project the annual probability of death and injury at the county level. Figure 3.2.3.1-14 lists the counties in alphabetical order for estimated future death and injury losses from tornado events with dollar amounts calculated using the methodology described earlier in this section.

Figure 3.2.3.1-14: Tornado Death/Injury Loss Estimates by County (1950-2015)

County Name	Total # of Deaths	Estimated Annual Deaths	Estimated Annual Loss Due to Death	Total # of Injuries	Estimated Annual Injuries	Estimated Annual Loss Due to Injury
Adams	0	0.000	\$0	18	0.273	\$78,545
Ashland	0	0.000	\$0	0	0.000	\$0
Barron	0	0.000	\$0	16	0.242	\$69,818
Bayfield	0	0.000	\$0	4	0.061	\$17,455
Brown	0	0.000	\$0	7	0.106	\$30,545
Buffalo	0	0.000	\$0	7	0.106	\$30,545
Burnett	3	0.045	\$313,636	25	0.379	\$109,091
Calumet	1	0.015	\$104,545	7	0.106	\$30,545
Chippewa	5	0.076	\$522,727	90	1.364	\$392,727
Clark	1	0.015	\$104,545	9	0.136	\$39,273
Columbia	1	0.015	\$104,545	55	0.833	\$240,000
Crawford	0	0.000	\$0	9	0.136	\$39,273

County Name	Total # of Deaths	Estimated Annual Deaths	Estimated Annual Loss Due to Death	Total # of Injuries	Estimated Annual Injuries	Estimated Annual Loss Due to Injury
Dane	4	0.061	\$418,182	66	1.000	\$288,000
Dodge	0	0.000	\$0	36	0.545	\$157,091
Door	0	0.000	\$0	4	0.061	\$17,455
Douglas	0	0.000	\$0	0	0.000	\$0
Dunn	21	0.318	\$2,195,455	77	1.167	\$336,000
Eau Claire	6	0.091	\$627,273	20	0.303	\$87,273
Florence	0	0.000	\$0	0	0.000	\$0
Fond du Lac	2	0.030	\$209,091	24	0.364	\$104,727
Forest	0	0.000	\$0	3	0.045	\$13,091
Grant	0	0.000	\$0	12	0.182	\$52,364
Green	0	0.000	\$0	45	0.682	\$196,364
Green Lake	8	0.121	\$836,364	54	0.818	\$235,636
Iowa	9	0.136	\$940,909	206	3.121	\$898,909
Iron	0	0.000	\$0	3	0.045	\$13,091
Jackson	0	0.000	\$0	5	0.076	\$21,818
Jefferson	3	0.045	\$313,636	36	0.545	\$157,091
Juneau	3	0.045	\$313,636	38	0.576	\$165,818
Kenosha	0	0.000	\$0	15	0.227	\$65,455
Kewaunee	0	0.000	\$0	1	0.015	\$4,364
La Crosse	0	0.000	\$0	3	0.045	\$13,091
Lafayette	0	0.000	\$0	12	0.182	\$52,364
Langlade	0	0.000	\$0	3	0.045	\$13,091
Lincoln	0	0.000	\$0	4	0.061	\$17,455
Manitowoc	0	0.000	\$0	2	0.030	\$8,727
Marathon	0	0.000	\$0	19	0.288	\$82,909
Marinette	3	0.045	\$313,636	8	0.121	\$34,909
Marquette	0	0.000	\$0	0	0.000	\$0
Menominee	0	0.000	\$0	0	0.000	\$0
Milwaukee	0	0.000	\$0	176	2.667	\$768,000
Monroe	0	0.000	\$0	4	0.061	\$17,455
Oconto	0	0.000	\$0	6	0.091	\$26,182
Oneida	5	0.076	\$522,727	36	0.545	\$157,091
Outagamie	0	0.000	\$0	10	0.152	\$43,636
Ozaukee	0	0.000	\$0	30	0.455	\$130,909
Pepin	0	0.000	\$0	6	0.091	\$26,182
Pierce	0	0.000	\$0	6	0.091	\$26,182
Polk	4	0.061	\$418,182	18	0.273	\$78,545
Portage	2	0.030	\$209,091	4	0.061	\$17,455
Price	0	0.000	\$0	26	0.394	\$113,455
Racine	0	0.000	\$0	10	0.152	\$43,636
Richland	0	0.000	\$0	9	0.136	\$39,273
Rock	0	0.000	\$0	2	0.030	\$8,727
Rusk	0	0.000	\$0	34	0.515	\$148,364
Sauk	0	0.000	\$0	13	0.197	\$56,727

County Name	Total # of Deaths	Estimated Annual Deaths	Estimated Annual Loss Due to Death	Total # of Injuries	Estimated Annual Injuries	Estimated Annual Loss Due to Injury
Sawyer	0	0.000	\$0	0	0.000	\$0
Shawano	0	0.000	\$0	1	0.015	\$4,364
Sheboygan	1	0.015	\$104,545	8	0.121	\$34,909
St. Croix	2	0.030	\$209,091	35	0.530	\$152,727
Taylor	0	0.000	\$0	3	0.045	\$13,091
Trempealeau	0	0.000	\$0	3	0.045	\$13,091
Vernon	0	0.000	\$0	2	0.030	\$8,727
Vilas	0	0.000	\$0	4	0.061	\$17,455
Walworth	0	0.000	\$0	3	0.045	\$13,091
Washburn	0	0.000	\$0	0	0.000	\$0
Washington	3	0.045	\$313,636	57	0.864	\$248,727
Waukesha	1	0.015	\$104,545	32	0.485	\$139,636
Waupaca	6	0.091	\$627,273	10	0.152	\$43,636
Waushara	1	0.015	\$104,545	34	0.515	\$148,364
Winnebago	1	0.015	\$104,545	52	0.788	\$226,909
Wood	0	0.000	\$0	31	0.470	\$135,273
STATE	96	1.455	\$10,036,364	1608	24.364	\$7,016,727

Source: NOAA, NWS and WEM, 2016. All dollar amounts have been adjusted to 2015 dollars.

3.2.3.2 Hail

Hazard Ranking

Evaluation Criteria	Description	Ranking
Probability	 The hazard has impacted the state numerous times on an annual basis The hazard is widespread, generally affecting regions or multiple counties in each event There is a reliable methodology for identifying events and locations 	High
Mitigation Potential	 Methods for reducing risk from the hazard are not well-established, are not proven reliable, or are experimental The state or counties have little or no experience in implementing mitigation measures, and/or no technical knowledge of them Mitigation measures are ineligible under federal grant programs There is a very limited range of mitigation measures for the hazard, usually only one feasible alternative The mitigation measures have not been proven cost-effective and are likely to be very expensive compared to the magnitude of the hazard The long-term effectiveness of the measure is not known, or is known to be relatively poor 	Low

Background

Hailstorms are relatively frequent across the US. Since 1986, nearly 3,000 individual hail events have been reported annually across the country. Figure 3.2.3.2-1 depicts the annual number of days with severe hail (one inch in diameter or larger) reports per 100 square miles in the US. Although they can occur in any state in the mainland US, the states with the highest average number of annual hail days are in the Great Plains with Kansas, Oklahoma, Nebraska, South Dakota, and Texas leading. Southwestern Kansas sees the most severe hail days per year, over 12, while other Great Plains areas average only six or seven.

Compared to the Great Plains, during this nine-year period Wisconsin experienced significantly fewer severe hail days per year, on average. In fact, most of Wisconsin's counties experienced an average of only two to five severe hail events annually from 2003 to 2012, with a higher average concentration of up to eight events in southeastern Wisconsin.

Though hail-related fatalities are rare, hail can cause tremendous amounts of crop and property damage. On average, hail causes \$1 billion in damage to crops and property each year in the US. The costliest hailstorms in the US occurred in Dallas/Fort Worth, Texas, on May 5, 1995, and in St. Louis, Missouri, on April 10, 2001. Both storms had reported damages of over \$2 billion. The largest hailstone ever recorded fell in Vivian, South Dakota, on July 23, 2010, with a diameter of eight inches and weighing almost two pounds.

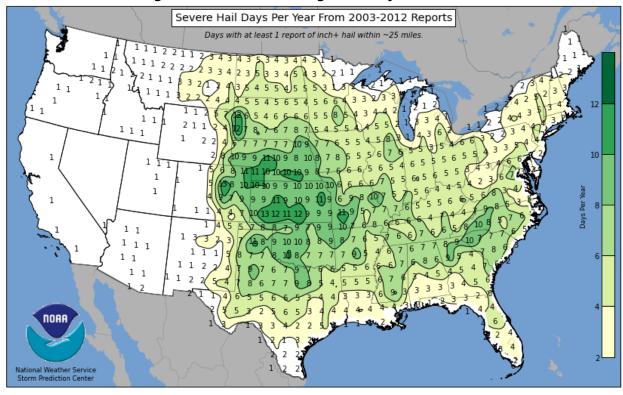


Figure 3.2.3.2-1 US Average Hail Days, 2003-2012

Source: NOAA, NWS, Storm Prediction Center, http://www.spc.noaa.gov/wcm/, accessed 10/24/2016.

Frequency and Probability

Figure 3.2.3.2-2 highlights the severe hailstorm events³ that occurred in each Wisconsin county between 1982 and 2015, including the numbers of deaths and injuries attributed to those events. Only two counties have experienced fewer than 20 hail severe hail events during the 34 year period shown. There are 19 counties with over 100 severe hail events and an additional 21 counties with between 80 and 99 severe hail events.

In Wisconsin there was an annual average of 173 hail events producing stones one inch in diameter or larger between 2007 and 2015. In that same time period, there were 1,390 total severe hailstorm events in the state.

According to local experts at the NOAA National Weather Service Office in Sullivan, Wisconsin, the average land area affected by an individual hail event is about 225 square miles. In other words, on average, an area within an 8.5 mile radius of the center of the storm is affected in a hail event. Hail risk at a single point or over an area is a function of the target at risk (crop or property) and the hail frequency and intensity. The qualitative annual probability of hail

Section 3.2 Severe Weather Threats and Hazards

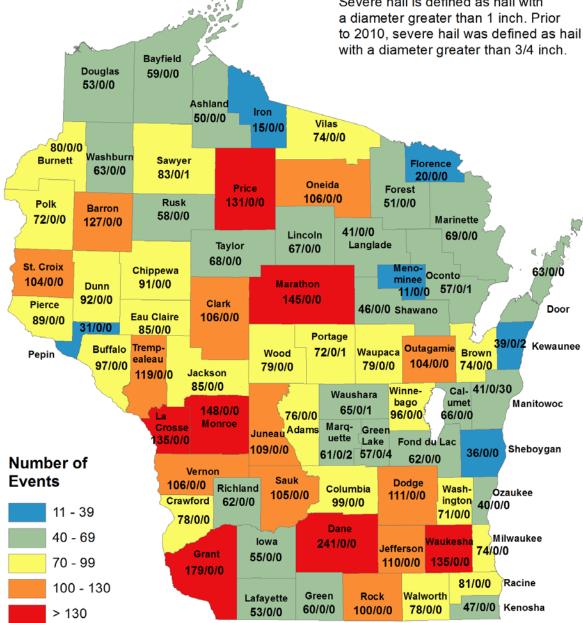
³ Severe hailstorm events were described as hailstorms with hailstones at least 0.75 inches in diameter prior to 2010. Starting in 2010, severe hailstorm events were redefined as hailstorms with hailstones at least one inch in diameter.

⁴ This estimate was provided by a meteorologist at the NOAA, NWS Milwaukee/Sullivan Office specializing in storm statistics in 2011.

occurring somewhere in the state is quite high. However, the site-specific incidence of hail is lower due to the localized nature of the hazard.

Figure 3.2.3.2-2: Wisconsin Hail Events, Deaths, and Injuries by County, 1982-2015





Source: NOAA, NWS, Milwaukee/Sullivan, 2016.

NOAA

Impacts and Potential Losses

Both agricultural and urban land uses are susceptible to costly hail damage. Many Wisconsin counties, such as Dane and Grant, have large proportions of their land area devoted to agricultural uses. Accounting for 85% of Wisconsin's hailstorms, May through September are the months of maximum hailstorm frequency in Wisconsin. Unfortunately, those months also correspond to the growing and harvesting season for most of the state's crops. Crop damage from hail can devastate an agricultural region's economy.

Counties like Milwaukee, Waukesha, Dane, and St. Croix, have high concentrations of development and dense population centers. Property damage to structures, vehicles, and occasionally infrastructure, from hail is relatively common.

Surprisingly, very few injuries resulting from hail have occurred in the more densely populated areas of the state. Manitowoc County has seen the highest number of reported injuries from hail, 30, all of which stemmed from a single severe hailstorm event on May 12, 2000, described in more detail in the Severe Weather History section of this document. Between 1994 and 2015, there were a total of 41 injuries reported in the state as a result of hail. There have been no fatalities in Wisconsin due to hail, but there have been a few nationwide.

The tables in Figures 3.2.3.2-3 through 3.2.3.2-7 were compiled using historic data from NOAA's NCEI Storm Events Database. Information on hailstorm events (hailstones greater than 0.75 inches in diameter) from January 1, 1994, through December 31, 2015, for each county in the state was used. The Database does not have complete historic records for severe hail events prior to 1994. All damages were reported in nominal dollar amounts and were adjusted for inflation to reflect 2015 values.

Damage calculations included all reported property and crop damages as well as injuries sustained from hailstorm events. No deaths from hail have been reported in Wisconsin.

1. Injury was assigned a value based on the December 2011 FEMA Benefit-Cost Analysis Reengineering (BCAR) Development of Standard Economic Values report, which incorporates research completed on behalf of the Department of Homeland Security in 2008. The values can be thought of as the "willingness-to-pay" (WTP) to avoid an injury. The report recommends using 1997 values and adjusting for inflation using the US Bureau of Labor Statistics (BLS) Consumer Price Index (CPI) Inflation Calculator. These are the adjusted 2015 values:

Minor	\$14,000
Moderate	\$107,000
Serious	\$399,000
Severe	\$1,300,000
Critical	\$5,300,000

2. Since the NWS does not differentiate between injury categories in their data, a combined injury value was calculated. Because of the rarity of injuries and absence of any recorded

deaths due to hailstorm events in Wisconsin, it was determined that the threat of Serious to Critical injury is negligible. Therefore, the combined injury value averaged only the Minor and Moderate injury categories:

$$($14,000 + $107,000)/2 = $60,500$$

These calculations were completed for each county to arrive at the future annual probability of a hailstorm and estimated annual losses from hailstorm events. The following are definitions of the terms used in the tables in Figures 3.2.3.2-3 through 3.2.3.2-7:

- **Estimated Losses from Injuries** = Cumulative sum of all damages associated with injuries from a severe hail event (1994-2015), as reported to the NWS
- Reported Property Damages = Cumulative sum of all reported property damages associated with hail events occurring in the 22 year period from January 1, 1994, to December 31, 2015 (reported damages obtained from the Storm Events Database)⁵
- **Reported Crop Damages** = Cumulative sum of all reported crop damages associated with hail events occurring in the 22 year period from January 1, 1994, to December 31, 2015 (reported damages obtained from the Storm Events Database)⁶
- Average Damage per Hail Event = Total damages divided by the number of hail events
- **Estimated Annual Hail Events** = Number of hail events divided by the number of reporting years (22)
- **Estimated Future Annual Damages** = Average Damage per Hail Event x Estimated Annual Hail Events

The tables in Figures 3.2.3.2-3 and 3.2.3.2-4 show the counties that have received the most property damage and crop damage, respectively, from hail events. 13 counties have had over \$10 million in total reported property damages, with Dane County leading the way. As one of the most populous counties in the state, it's not surprising that Dane County has experienced high property damages. 11 counties have suffered over \$1 million in crop damages. Because crop damage generally happens in more rural areas and property damage in more urban areas, little overlap would be expected between the two tables. In fact, only two counties are on both the list for high property damages and the list for high crop damages: Manitowoc and Pierce. Manitowoc is on both lists because of one unusually severe hail storm on May 12, 2000, which also caused 30 of the 41 hail injuries in the state in the past 22 years. The storm is discussed in more detail in the Severe Weather History section of this document.

.

⁵ Damages include all property damages recorded by the NWS. If damages were not reported, they were not included in these calculations. For multi-county hailstorms, each county's respective damage total was provided by the NWS. ⁶ Damages include all crop damages recorded by the NWS. If damages were not reported, they were not included in these calculations. For multi-county hailstorms, each county's respective damage total was provided by the NWS.

Figure 3.2.3.2-3: Hail Property Damage

County	Number of Hail Events	Reported Property Damages	Average Property Damages per Event	
Dane	225	\$82,755,290	\$367,801	
Manitowoc	39	\$72,090,000	\$1,848,462	
Calumet	69	\$51,695,800	\$749,214	
Wood	75	\$51,350,000	\$684,667	
Barron	130	\$36,385,100	\$279,885	
Waushara	50	\$35,885,250	\$717,705	
La Crosse	114	\$28,582,723	\$250,726	
Waukesha	131	\$28,017,900	\$213,877	
Iowa	52	\$26,900,800	\$517,323	
Pierce	84	\$26,800,000	\$319,048	
Winnebago	99	\$25,073,750	\$253,270	
Jefferson	109	\$16,037,750	\$147,135	
Washington	74	\$11,562,060	\$156,244	

Figure 3.2.3.2-4: Hail Crop Damage

County	Number of Hail Events	Reported Crop Damages	Average Crop Damages per Event
Grant	188	\$17,728,980	\$94,303
Lafayette	44	\$14,191,000	\$322,523
Manitowoc	39	\$6,912,400	\$177,241
Pierce	84	\$6,210,000	\$73,929
Monroe	139	\$5,304,330	\$38,161
Door	58	\$3,500,000	\$60,345
Columbia	93	\$3,374,000	\$36,280
Rock	91	\$3,194,950	\$35,109
Pepin	33	\$1,770,000	\$53,636
Crawford	75	\$1,685,650	\$22,475
Jackson	79	\$1,235,390	\$15,638

Source: NOAA, NCEI, Storm Events Database, 2016.

Source: NOAA, NCEI, Storm Events Database, 2016.

Only seven counties reported injuries due to hail events between 1994 and 2015, as seen in Figure 3.2.3.2-5. As discussed previously, all of Manitowoc County's injuries were reported in one hail event, profiled in the Severe Weather History section of this document.

Figure 3.2.3.2-5: Hail Injuries

County	Number of Hail Events	Reported Injuries	Estimated Losses from Injuries
Manitowoc	39	30	\$1,815,000
Green Lake	48	4	\$242,000
Kewaunee	35	2	\$121,000
Marquette	51	2	\$121,000
Oconto	51	1	\$60,500
Portage	71	1	\$60,500
Waushara	50	1	\$60,500

Source: NOAA, NCEI, Storm Events Database, 2016.

The table in Figure 3.2.3.2-6 lists 11 Wisconsin counties with an estimated average future annual loss of over \$1 million due to hail events. Dane County leads again, largely because of the high number of reported severe hail events and the large concentration of population reporting damages. Manitowoc is in second place, again due in part to the May 12, 2000 event.

Figure 3.2.3.2-6: Future Hail Losses

County	Number of Hail Events	Total Reported Damages	Average Damage per Hail Event	Estimated Annual Hail Events	Estimated Future Annual Losses
Davis					
Dane	225	\$82,912,110	\$368,498	10.23	\$3,768,732
Manitowoc	39	\$80,817,400	\$2,072,241	1.77	\$3,673,518
Calumet	69	\$51,720,200	\$749,568	3.14	\$2,350,918
Wood	75	\$51,350,000	\$684,667	3.41	\$2,334,091
Barron	130	\$36,390,200	\$279,925	5.91	\$1,654,100
Waushara	50	\$35,945,750	\$718,915	2.27	\$1,633,898
Pierce	84	\$33,010,000	\$392,976	3.82	\$1,500,455
La Crosse	114	\$28,669,853	\$251,490	5.18	\$1,303,175
Waukesha	131	\$28,050,150	\$214,123	5.95	\$1,275,007
Iowa	52	\$27,341,250	\$525,793	2.36	\$1,242,784
Winnebago	99	\$25,073,750	\$253,270	4.50	\$1,139,716

Source: NOAA, NCEI, Storm Events Database, 2016.

Figure 3.2.3.2-7, lists the counties in alphabetical order and highlights the top five counties in each category. The top county is in black, the next four in grey.

Figure 3.2.3.2-7: Hail Event Damage by County

	Figure 5.2.5.2-7: Hall Event Damage by County									
County	Number of Hail Events	Reported Injuries	Estimated Losses from Injuries	Reported Property Damages	Reported Crop Damages	Total Reported Damages	Average Damages per Hail Event	Estimated Annual Hail Events	Estimated Future Annual Damages	
Adams	67	0	\$0	\$466,749	\$118,820	\$585,569	\$8,740	3.05	\$26,617	
Ashland	45	0	\$0	\$1,575	\$0	\$1,575	\$35	2.05	\$72	
Barron	130	0	\$0	\$36,385,100	\$5,100	\$36,390,200	\$279,925	5.91	\$1,654,100	
Bayfield	64	0	\$0	\$23,080	\$0	\$23,080	\$361	2.91	\$1,049	
Brown	65	0	\$0	\$25,956	\$0	\$25,956	\$399	2.95	\$1,180	
Buffalo	86	0	\$0	\$142,973	\$190,830	\$333,803	\$3,881	3.91	\$15,173	
Burnett	91	0	\$0	\$0	\$0	\$0	\$0	4.14	\$0	
Calumet	69	0	\$0	\$51,695,800	\$24,400	\$51,720,200	\$749,568	3.14	\$2,350,918	
Chippewa	82	0	\$0	\$27,500	\$0	\$27,500	\$335	3.73	\$1,250	
Clark	105	0	\$0	\$232,540	\$310,910	\$543,450	\$5,176	4.77	\$24,702	
Columbia	92	0	\$0	\$7,513,430	\$1,368,000	\$8,881,430	\$96,537	4.18	\$403,701	
Crawford	75	0	\$0	\$623,523	\$1,685,650	\$2,309,173	\$30,789	3.41	\$104,962	
Dane	225	0	\$0	\$82,755,290	\$156,820	\$82,912,110	\$368,498	10.23	\$3,768,732	
Dodge	116	0	\$0	\$4,329,870	\$3,960	\$4,333,830	\$37,361	5.27	\$196,992	
Door	58	0	\$0	\$0	\$3,500,000	\$3,500,000	\$60,345	2.64	\$159,091	
Douglas	59	0	\$0	\$15,600	\$0	\$15,600	\$264	2.68	\$709	
Dunn	95	0	\$0	\$134,000	\$51,500	\$185,500	\$1,953	4.32	\$8,432	
Eau Claire	82	0	\$0	\$25,000	\$0	\$25,000	\$305	3.73	\$1,136	
Florence	19	0	\$0	\$0	\$0	\$0	\$0	0.86	\$0	
Fond du Lac	59	0	\$0	\$64,800	\$0	\$64,800	\$1,098	2.68	\$2,945	
Forest	49	0	\$0	\$121,800	\$0	\$121,800	\$2,486	2.23	\$5,536	
Grant	188	0	\$0	\$3,964,230	\$17,728,980	\$21,693,210	\$115,389	8.55	\$986,055	
Green	39	0	\$0	\$20,655	\$725	\$21,380	\$548	1.77	\$972	
Green Lake	48	4	\$242,000	\$2,072,500	\$434,300	\$2,748,800	\$57,267	2.18	\$124,945	
Iowa	52	0	\$0	\$26,900,800	\$440,450	\$27,341,250	\$525,793	2.36	\$1,242,784	
Iron	18	0	\$0	\$0	\$0	\$0	\$0	0.82	\$0	
Jackson	79	0	\$0	\$547,090	\$1,235,390	\$1,782,480	\$22,563	3.59	\$81,022	
Jefferson	109	0	\$0	\$16,037,750	\$276,000	\$16,313,750	\$149,667	4.95	\$741,534	

County	Number of Hail Events	Reported Injuries	Estimated Losses from Injuries	Reported Property Damages	Reported Crop Damages	Total Reported Damages	Average Damages per Hail Event	Estimated Annual Hail Events	Estimated Future Annual Damages
Juneau	88	0	\$0	\$770,966	\$645,800	\$1,416,766	\$16,100	4.00	\$64,398
Kenosha	47	0	\$0	\$244,020	\$0	\$244,020	\$5,192	2.14	\$11,092
Kewaunee	35	2	\$121,000	\$1,210	\$0	\$122,210	\$3,492	1.59	\$5,555
La Crosse	114	0	\$0	\$28,582,723	\$87,130	\$28,669,853	\$251,490	5.18	\$1,303,175
Lafayette	44	0	\$0	\$6,791,360	\$14,191,000	\$20,982,360	\$476,872	2.00	\$953,744
Langlade	44	0	\$0	\$1,510	\$0	\$1,510	\$34	2.00	\$69
Lincoln	65	0	\$0	\$2,960	\$0	\$2,960	\$46	2.95	\$135
Manitowoc	39	30	\$1,815,000	\$72,090,000	\$6,912,400	\$80,817,400	\$2,072,241	1.77	\$3,673,518
Marathon	133	0	\$0	\$13,905	\$0	\$13,905	\$105	6.05	\$632
Marinette	76	0	\$0	\$88,000	\$0	\$88,000	\$1,158	3.45	\$4,000
Marquette	51	2	\$121,000	\$1,382,500	\$0	\$1,503,500	\$29,480	2.32	\$68,341
Menominee	10	0	\$0	\$0	\$0	\$0	\$0	0.45	\$0
Milwaukee	101	0	\$0	\$9,468,800	\$0	\$9,468,800	\$93,750	4.59	\$430,400
Monroe	139	0	\$0	\$8,463,084	\$5,304,330	\$13,767,414	\$99,046	6.32	\$625,792
Oconto	51	1	\$60,500	\$2,660,000	\$885,000	\$3,605,500	\$70,696	2.32	\$163,886
Oneida	96	0	\$0	\$556,090	\$0	\$556,090	\$5,793	4.36	\$25,277
Outagamie	101	0	\$0	\$6,758,000	\$0	\$6,758,000	\$66,911	4.59	\$307,182
Ozaukee	35	0	\$0	\$7,557,500	\$19,350	\$7,576,850	\$216,481	1.59	\$344,402
Pepin	33	0	\$0	\$268,000	\$1,770,000	\$2,038,000	\$61,758	1.50	\$92,636
Pierce	84	0	\$0	\$26,800,000	\$6,210,000	\$33,010,000	\$392,976	3.82	\$1,500,455
Polk	72	0	\$0	\$176,290	\$0	\$176,290	\$2,448	3.27	\$8,013
Portage	71	1	\$60,500	\$312	\$0	\$60,812	\$857	3.23	\$2,764
Price	121	0	\$0	\$936,000	\$0	\$936,000	\$7,736	5.50	\$42,545
Racine	79	0	\$0	\$237,190	\$0	\$237,190	\$3,002	3.59	\$10,781
Richland	57	0	\$0	\$64,693	\$248,523	\$313,216	\$5,495	2.59	\$14,237
Rock	91	0	\$0	\$5,215,480	\$3,194,950	\$8,410,430	\$92,422	4.14	\$382,292
Rusk	55	0	\$0	\$0	\$0	\$0	\$0	2.50	\$0
Sauk	99	0	\$0	\$1,182,040	\$626,940	\$1,808,980	\$18,273	4.50	\$82,226
Sawyer	89	0	\$0	\$800	\$0	\$800	\$9	4.05	\$36

County	Number of Hail Events	Reported Injuries	Estimated Losses from Injuries	Reported Property Damages	Reported Crop Damages	Total Reported Damages	Average Damages per Hail Event	Estimated Annual Hail Events	Estimated Future Annual Damages
Shawano	40	0	\$0	\$0	\$0	\$0	\$0	1.82	\$0
Sheboygan	34	0	\$0	\$0	\$1,320	\$1,320	\$39	1.55	\$60
St. Croix	95	0	\$0	\$4,020,000	\$0	\$4,020,000	\$42,316	4.32	\$182,727
Taylor	72	0	\$0	\$265,209	\$417,835	\$683,044	\$9,487	3.27	\$31,047
Trempealeau	119	0	\$0	\$91,213	\$142,965	\$234,178	\$1,968	5.41	\$10,644
Vernon	97	0	\$0	\$499,788	\$529,686	\$1,029,474	\$10,613	4.41	\$46,794
Vilas	69	0	\$0	\$985,000	\$0	\$985,000	\$14,275	3.14	\$44,773
Walworth	71	0	\$0	\$0	\$2,200	\$2,200	\$31	3.23	\$100
Washburn	65	0	\$0	\$19,380	\$0	\$19,380	\$298	2.95	\$881
Washington	74	0	\$0	\$11,562,060	\$0	\$11,562,060	\$156,244	3.36	\$525,548
Waukesha	131	0	\$0	\$28,017,900	\$32,250	\$28,050,150	\$214,123	5.95	\$1,275,007
Waupaca	80	0	\$0	\$0	\$0	\$0	\$0	3.64	\$0
Waushara	50	1	\$60,500	\$35,885,250	\$0	\$35,945,750	\$718,915	2.27	\$1,633,898
Winnebago	99	0	\$0	\$25,073,750	\$0	\$25,073,750	\$253,270	4.50	\$1,139,716
Wood	75	0	\$0	\$51,350,000	\$0	\$51,350,000	\$684,667	3.41	\$2,334,091
STATE	5,557	41	\$2,480,500	\$572,210,592	\$68,753,514	\$643,444,605	\$115,790	252.59	\$29,247,482

All dollar amounts have been adjusted for inflation to 2015 dollars.

Source: NOAA, National Centers for Environmental Information, Storm Events Database, 2016.

3.2.3.3 Lightning

Hazard Ranking

Evaluation Criteria	Description	Ranking
Probability	 The hazard has impacted the state numerous times on an annual basis The hazard is widespread, generally affecting regions or multiple counties in each event There is a reliable methodology for identifying events and locations 	High
Mitigation Potential	 Methods for reducing risk from the hazard are not well-established, are not proven reliable, or are experimental The state or counties have little or no experience in implementing mitigation measures, and/or no technical knowledge of them Mitigation measures are ineligible under federal grant programs There is a very limited range of mitigation measures for the hazard, usually only one feasible alternative The mitigation measures have not been proven cost-effective and are likely to be very expensive compared to the magnitude of the hazard The long-term effectiveness of the measure is not known, or is known to be relatively poor 	Low

Background

According to the National Weather Service (NWS), on average, about 25 million cloud-to-ground lightning strikes are detected in the continental United States annually, with about half of all flashes contacting more than one ground point. In addition, there are roughly five to ten times as many cloud-to-cloud flashes as there are cloud-to-ground flashes (NWS).

Large outdoor gatherings (sporting events, concerts, campgrounds, etc.) are particularly vulnerable to lightning strikes that could result in injuries and deaths. This vulnerability underscores the importance of developing site-specific emergency procedures for these types of events, with particular emphasis on adequate early warning. Early warning of lightning hazards, combined with prudent protective actions, can significantly reduce the likelihood of lightning-related injuries and deaths.

In the 76-year period between 1940 and 2015, there were 9,311 fatalities in the US attributed to lightning strikes. That averages about 123 per year. However, in the 30-year period from 1986 to 2015, the average was 48 lightning fatalities per year and in the 10-year period from 2006 through 2015, the average was only 31 deaths per year. Since 2010, there have never been more than 30 lightning deaths in one year. The pattern indicates the number of deaths from lightning in the US is declining over time. This could be caused by better education and information about the risks of lightning and improved forecasting and warning systems.

In a 1998 study, the Center for Disease Control (CDC) states, "approximately 30% of persons struck by lightning die and 74% of lightning strike survivors have permanent disabilities." The

study also notes that 63% of lightning-associated deaths occur within one hour of injury, 92% occur between May and September, and 73% occur during the afternoon and early evening. The National Weather Service has identified patterns in lightning fatality cases. Between 2006 and 2013, 81% of lightning fatalities were male, 19% female. Additionally, the majority, 64%, occurred during leisure activities, while 17% occurred during daily routines, and 15% during work-related activities. 4% of activities were unknown.

Frequency and Probability

Lightning occurs with most severe thunderstorms, but does not always produce damages. The probability of lightning occurring in the state is quite high due to the high number of severe thunderstorms in the state; however, the site-specific incidence of lightning is considered low because of the extremely localized nature of the hazard.

In Wisconsin, there were 872 reported lightning events between 1982 and 2015. During this period, 26 deaths and 210 injuries from lightning were reported in the state. These numbers are likely underestimated because few people report suspected lightning deaths, injuries, and damages.

Wisconsin also has a high frequency of property loss due to lightning. During the 16-year period from 2000 to 2015, there was nearly \$55 million in property and crop damages from lightning reported in Wisconsin (NWS, 2016). One of the most damaging lightning events occurred during a storm in Kenosha on August 24, 2006. Lightning was responsible for at least \$14 million in damages. This storm is profiled in more detail in the Severe Weather History section.

In Wisconsin, from 2007 to 2015, there were six reported fatalities and 11 injuries directly caused by lightning (NWS, 2016). Figure 3.2.3.3-1 shows the damaging lightning events by county from 1982 to 2015. The number of reported deaths and injuries are also presented on the map. Note the high concentration of damaging lightning events in the southeastern part of the state. Waukesha County leads Wisconsin in the number of lightning events with 81 occurring since 1982. Walworth and Rock counties have experienced the most reported injuries with 18 and 15, respectively. The high number of lightning-related injuries in southeastern Wisconsin is likely related to the higher concentration of population.

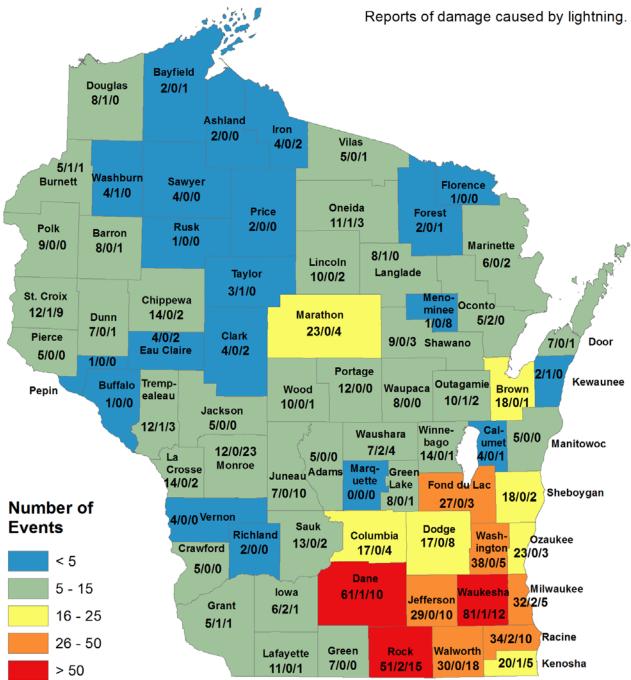
Figure 3.2.3.3-1: Wisconsin Lightning Events, Deaths, and Injuries by County, 1982-2015



Wisconsin Lightning Events



Events / # Deaths / # Injuries



3.2.3.4 Changing Future Conditions

Wisconsin communities are no stranger to severe weather, including tornados, high winds, lightning, and hail. The predicted increases in temperature will likely result in stronger and more frequent rainstorms. Current models predict increased frequency and intensity of extreme weather statewide, including more frequent, more intense precipitation events. These changes will likely lead to increased incidences and severity of flooding, erosion, and landslides/land subsidence.

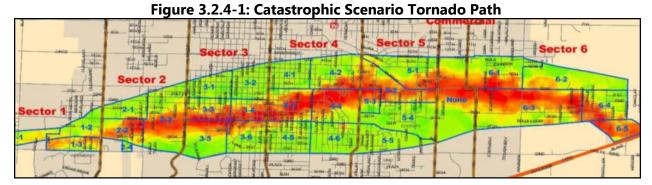
Possible impacts include an increased risk to life and property in both the public and private sectors. Public utilities and manufactured housing developments will be especially prone to damages. Jurisdictions already affected should be prepared for more of these events, and should thus prioritize mitigation actions such as construction safe rooms for vulnerable populations, retrofitting and/or hardening existing structures, improving warning systems and public education, and reinforcing utilities and other critical infrastructure.

FOR OFFICIAL USE ONLY

3.2.4 Catastrophic Scenario

During a mid-afternoon in May, 26 tornadoes touchdown throughout the southwest and east-central regions of Wisconsin. In total tornadoes impact 29 communities in 14 counties.

The largest of the 26 tornadoes, an EF4, rips through a heavily-populated urban area from west to east along a major traffic corridor. The tornado's path totals 15.6 miles with a width of .52 miles. Total population in the affected area is 47,000. The map is Figure 3.2.4-1 depicts the tornado's path.



Overall, there are 43 fatalities, 675 injuries, and 18,000 residents displaced – predominantly in the metropolitan area. The tornadoes cause a total of \$1 billion in property damage, including 3,400 homes destroyed, 1,800 homes with major damage, and 600 businesses damaged.

3.2.5 Summary Risk Analysis

The table in Figure 3.2.5-1 provides a summary risk analysis for the severe weather hazard.

Figure 3.2.5-1: Severe Weather Summary Risk Analysis

Evaluation Criteria	Description	Ranking
	Risk to People, Property, Environment, and Operations	
Probability/potential threat of occurrence	 The hazard has impacted the state annually, or more frequently The hazard is widespread, generally affecting regions or multiple counties in each event There is a reliable methodology for identifying events and locations 	High
Vulnerability	 Minimal countermeasures are in place to prevent or protect against this hazard. Countermeasures may have potential, but limited demonstrated history in reducing the threat potential. The nature of the hazard may limit the availability of countermeasures. 	High

Mitigation Potential	 Mitigation methods are established The State or counties have limited experience with the kinds of measures that may be appropriate to mitigate the hazard Some mitigation measures are eligible for federal grants There is a limited range of effective mitigation measures for the hazard Mitigation measures are cost-effective only in limited circumstances Mitigation measures are effective for a reasonably long period of time 	Medium
	Impacts of Catastrophic Scenario	
Public	 Local and regional medical services are unable to manage the volume of injuries and fatalities. Mass evacuation, sheltering and care of displaced residents, medical patients, and vulnerable populations may be required. 	High
Responders	 Significant federal and/or mutual aid from other states would be needed to meet the needs of the incident. Federal disaster declaration. 	High
COOP, including delivery of services	State or local government mission essential functions impacted for less than 24 hours.	Low
Property, Facilities & Infrastructure	 Widespread destruction of critical infrastructure, public and private property. More than 50% of buildings and infrastructure in affected area damaged or destroyed, and/or loss of lifeline services for more than 7 days. Public and Private property loss far exceeds federal minimums. 	High
Environment	 Environmental damage limited to a single community or small geographic area. Damage requires short-term remediation efforts by local and state government. 	Low
Economy	 Medium-term effects to large portion of the jurisdiction's economy, possibly extending to the region. Damage to multiple economic sectors possibly requiring state or federal government assistance. 	Medium
Public Confidence	 Some transitory acute effects on behavior health including elevated stress, anxiety, depression, and behavior for individuals in impacted communities. Minor civil disturbances possible. 	Low
	Aggregate Impact	High

Source: Wisconsin Emergency Management, 2016.

FOR OFFICIAL USE ONLY

3.2.6 Sources – Agency Input and Research

The following agencies and document research assisted in providing subject matter expertise to this scenario's core capabilities.

- 1. National Weather Service. "Norman, OK." US Department of Commerce, NOAA, National Weather Service. Accessed June 2016. http://www.weather.gov/oun/.
- 2. National Weather Service. "Severe Weather 101." NOAA National Severe Storms Laboratory. Accessed June 03, 2016. http://www.nssl.noaa.gov/education/svrwx101/.
- 3. Service, National Weather. "Severe Weather Awareness Severe Thunderstorms." US Department of Commerce, NOAA, National Weather Service. Accessed June 03, 2016. http://www.weather.gov/mkx/taw-severe thunderstorms.
- 4. National Weather Service. "Enhanced Fujita Tornado Damage Scale." Enhanced Fujita Tornado Damage Scale. Accessed June 27, 2016. http://www.spc.noaa.gov/faq/tornado/ef-scale.htm.
- 5. National Weather Service. "Hail Basics." NOAA National Severe Storms Laboratory. Accessed June 27, 2016. http://www.nssl.noaa.gov/education/svrwx101/hail/.
- 6. Storm Prediction Center. "Hail Size as Related to Objects (Storm Prediction Center)." Hail Size as Related to Objects (Storm Prediction Center). Accessed June 28, 2016. http://www.spc.noaa.gov/misc/tables/hailsize.htm.
- 7. National Weather Service. "Understanding Lightning: Thunder." NWS Lightning Safety: Understanding Lighting: Thunder. Accessed June 28, 2016. http://www.lightningsafety.noaa.gov/science/science_thunder.htm.
- 8. National Severe Storms Laboratory. "Lightning Basics." NOAA National Severe Storms Laboratory. Accessed June 28, 2016. http://www.nssl.noaa.gov/education/svrwx101/lightning/.
- 9. National Severe Storms Laboratory. "Lightning Types." NOAA National Severe Storms Laboratory. Accessed June 28, 2016. http://www.nssl.noaa.gov/education/svrwx101/lightning/types/.
- 10. National Weather Service. "Lightning Safety." NWS JetStream Lightning Safety. Accessed June 28, 2016. http://www.srh.noaa.gov/srh/jetstream/lightning/lightning safety.html.
- 11. National Weather Service. "The Positive and Negative Side of Lightning." NWS JetStream The Positive and Negative Side of Lightning. Accessed June 28, 2016. http://www.srh.noaa.gov/srh/jetstream/lightning/positive.html.
- 12. Wisconsin Initiative on Climate Change Impacts. "Wisconsin Initiative on Climate Change Impacts WICCI: Adaptation Science." Wisconsin Initiative on Climate Change Impacts WICCI: Adaptation Science. Accessed June 28, 2016. http://www.wicci.wisc.edu/publications.php.
- 13. National Weather Service, Milwaukee-Sullivan. "Severe Weather Awareness Severe Thunderstorms." US Department of Commerce, NOAA, National Weather Service. Accessed June 29, 2016. http://www.weather.gov/mkx/taw-severe_thunderstorms.

14. National Weather Service, Green Bay. "Wisconsin Tornado and Severe Weather Statistics." US Department of Commerce, NOAA, National Weather Service. Accessed June 30, 2016. http://www.weather.gov/qrb/WI tornado stats.

- 15. Storm Prediction Center. "NOAA's NWS Storm Prediction Center Forecast Tools." Storm Prediction Center. Accessed June 30, 2016. http://www.spc.noaa.gov/climo/online/monthly/newm.html.
- 16. National Centers for Environmental Information. "Storm Events Database." Storm Events Database | National Centers for Environmental Information. Accessed June 30, 2016. https://www.ncdc.noaa.gov/stormevents/.
- 17. "1958 Colfax, Wisconsin Tornado Outbreak." Wikipedia. Accessed October 04, 2016. https://en.wikipedia.org/wiki/1958 Colfax, Wisconsin tornado outbreak.
- 18. "Western Wisconsin Derecho." Wikipedia. Accessed October 03, 2016. https://en.wikipedia.org/wiki/Western_Wisconsin_Derecho.
- 19. National Weather Service. "Introduction to Thunderstorms." NWS JetStream Thunderstorms. Accessed October 13, 2016. http://www.srh.noaa.gov/jetstream/tstorms/tstorms_intro.html.
- 20. Centers for Disease Control and Prevention. "Lightening Associated Deaths in the United States, 1980-1995." Centers for Disease Control and Prevention. May 22, 1998. Accessed October, 2016. https://wonder.cdc.gov/wonder/PrevGuid/m0052833/m0052833.asp.
- 21. National Weather Service. "NWS Lightning Safety Home Page." NWS Lightning Safety Home Page. Accessed October 2016. http://www.lightningsafety.noaa.gov/fatalities.shtml.
- 22. National Weather Service. "Lightning Safety Awareness Week." US Department of Commerce, NOAA, National Weather Service. Accessed October 2016. http://www.weather.gov/iln/lightningsafetyweek.
- 23. Federal Emergency Management Agency. "FEMA's Multi-Hazard Identification and Risk Assessment, "Part 1: Atmospheric Hazards: Thunderstorms'." Federal Emergency Management Agency. Accessed October 2016. https://www.fema.gov/media-library/assets/documents/7251?id-2214.
- 24. "Thunderstorms & Lightning." Thunderstorms & Lightning | Ready.gov. Accessed June 2016. https://www.ready.gov/thunderstorms-lightning.
- 25. "Severe Weather Data." Severe Weather Data | National Centers for Environmental Information (NCEI) Formerly Known as National Climatic Data Center (NCDC). Accessed June 2016. https://www.ncdc.noaa.gov/data-access/severe-weather.
- 26. National Centers for Environmental Information. "Storm Events Database." Storm Events Database | National Centers for Environmental Information. Accessed October 2016. https://www.ncdc.noaa.gov/stormevents/.
- 27. "NOAA/NWS Storm Prediction Center." NOAA/NWS Storm Prediction Center. Accessed November 2016. http://www.spc.noaa.gov/.
- 28. "Natural Hazards Center Homepage." Natural Hazards Center. Accessed November 2016. https://hazards.colorado.edu/.
- 29. National Weather Service. "NWS Forecast Office, Milwaukee/Sullivan, WI." US Department of Commerce, NOAA, National Weather Service. Accessed November 2016. http://www.weather.gov/mkx/.

30. National Weather Service. "NWS Forecast Office, Green Bay, WI." US Department of Commerce, NOAA, National Weather Service. Accessed November 2016. http://www.weather.gov/grb/.

- 31. Service, National Weather. "NWS Forecast Office, La Crosse, WI." US Department of Commerce, NOAA, National Weather Service. Accessed November 2016. http://www.weather.gov/arx/.
- 32. United States of America. Oconto County. Oconto County Emergency Management.

 Oconto County, Wisconsin Hazard Mitigation Plan. By Oconto County Hazard Mitigation
 Plan Steering Committee and Bay-Lake Regional Planning Commission. Oconto, WI:
 Oconto County, 2015.
- 33. Changing Climate Resilient Communities: Climate Science for Natural Hazard Mitigation Planning, presentation by David S. Liebl, Dane County Emergency Management, 22 July 2015.
- 34. Wisconsin Initiative on Climate Change Impacts. "Impacts Presentation." Wisconsin Initiative on Climate Change Impacts. Accessed November 2016. http://www.wicci.wisc.edu/impacts.php#2.
- 35. Norgord, Douglas. *Wisconsin Tornado Atlas, 1950-2008*. Mount Horeb, WI: Geographic Techniques, 2009.
- 36. Taschler, Joe. "Loggers Face Massive Cleanup Job from Wisconsin Storm." *Milwaukee Journal Sentinel*, September 04, 2011. Accessed October 21, 2016. http://archive.jsonline.com/business/129241353.html.
- 37. Simes, E. F. "Hailstorm at Wausau, Wis., May 22, 1921." *Monthly Weather Review*, June 1921, 334-35. Accessed October 21, 2016. Norgord, Douglas. Wisconsin Tornado Atlas, 1950-2008. Mount Horeb, WI: Geographic Techniques, 2009.
- 38. Panorama View of New Richmond, Wis. after Cyclone, June 12, 1899. 1899. Prints and Photographs Online Catalog, Library of Congress, Washington, D.C. WI, 1899. Accessed October 04, 2016. http://www.loc.gov/pictures/resource/pan.6a13048/.
- 39. Stewart, W. P. "Tornadoes in Wisconsin, April, 1929." *Monthly Weather Review*, April 1929, 157. Accessed October 04, 2016. http://docs.lib.noaa.gov/rescue/mwr/057/mwr-057-04-0157b.pdf.
- 40. National Weather Service. "1956 Tornado Outbreak." Map. In 1956 Tornado Outbreak, US Weather Bureau Daily Weather Map, Tuesday, April 3, 1956. 1956. Accessed October 04, 2016. http://www.weather.gov/images/grr/1956Tornado/04031956map.png.
- 41. Federal Emergency Management Agency. *Understanding Your Risks: Identifying Hazards and Estimating Losses*. Washington, D.C.: Federal Emergency Management Agency, 2001. August 2001. Accessed October 2016. https://www.fema.gov/media-library-data/20130726-1521-20490-4917/howto2.pdf.
- 42. "NOAA National Severe Storms Laboratory." NOAA National Severe Storms Laboratory. Accessed November 29, 2016. http://www.nssl.noaa.gov/.
- 43. National Weather Service. "Natural Hazard Statistics." NWS Analyze, Forecast and Support Office. April 6, 2016. Accessed November 2016. http://www.nws.noaa.gov/om/hazstats.shtml.

44. Storm Prediction Center. "Map, Killer Tornadoes by Year (1991-2016)." Annual Fatal Tornado Summary - NOAA/NWS Storm Prediction Center. November 29, 2016. Accessed November 29, 2016. http://www.spc.noaa.gov/climo/torn/fatalmap.php.

- 45. Storm Prediction Center. "The Enhanced Fujita Scale (EF Scale)." Storm Prediction Center. Accessed October 2016. http://www.spc.noaa.gov/efscale/.
- 46. Norgord, Douglas G. *Geographic Techniques*. Mt. Horeb, WI: Geographic Techniques, 2003.

3.3 Flooding

(including dam failure, landslide, and land subsidence)

3.3.1 Nature of the Hazard

Flooding

Flooding, as defined by the National Flood Insurance Program (NFIP), is "a general and temporary condition where two or more acres of normally dry land, or two or more properties, are inundated by water or mudflow" (NFIP, 2016). Floods are natural events that provide many environmental benefits, such as enriching soils and recharging aquifers. Floods are only considered hazards when development occurs in the floodplain, exposing people and/or property to the risk of flood damages. Nationwide, hundreds of flood hazard events occur each year, making it one of the most common hazards in all 50 states and U.S. territories (FEMA, 2011).

Floods specifically affect **floodplains**, lowland areas adjacent to lakes or rivers that are periodically covered with water. In Wisconsin, riverine floodplains range from narrow, confined channels in the steep valleys of hilly regions, to wide, flat areas in plains and coastal regions. The amount of water that inundates a floodplain is a function of the size and topography of the contributing watershed, the regional and local climate, geological characteristics, and land use attributes.

The U.S. experiences a number of different types of floods, the most common of which is riverine flooding, also known as overbank flooding. Wisconsin is also prone to experiencing flash floods, ice jam floods, local drainage floods, and high groundwater floods. Flash floods in particular are notable for their rapid escalation, which typically occurs with little or no warning and tends to be accompanied by other problems.

By definition, **flash floods** occur within six hours of a causative event such as heavy rains, rain combined with snowmelt, ice jams, or dam failures. They usually involve a rapid rise in water level, high velocity discharge, and large amounts of debris. Flash floods can cause significant damage, including the toppling of trees, undermining of buildings and bridges, scouring of channels, and creation of sink holes. The intensity of flash flooding is a function of the intensity and duration of rainfall, steepness of the watershed, stream gradients, watershed vegetation, natural and artificial flood storage areas, and configuration of the streambed and floodplain. Urban areas are increasingly subject to flash flooding due to the removal of vegetation, installation of impermeable surfaces, and construction of manmade drainage systems.

Much of the flooding on Wisconsin's larger rivers occurs more than six hours after a causative event. This kind of flooding can ultimately affect not only larger rivers, but also small streams and low-lying areas outside of the floodplains of larger rivers. In Wisconsin, it is not uncommon for flash flooding on larger rivers to transition into general river flooding that persists for days.

Prolonged periods of rainfall from weather systems covering large areas represent the most common cause of flooding in Wisconsin's large rivers. These systems may saturate the ground and overload the rivers and/or reservoirs in numerous smaller basins that drain into larger rivers. Localized weather systems, such as thunderstorms, may cause intense rainfall over smaller areas, leading to flooding in smaller rivers and streams. These events may also lead to flooding in larger waterways, as smaller rivers and streams feed into larger systems. Annual spring floods caused by the melting of snowpack may affect both large and small rivers and areas.

Floodplain Regulation and Mapping

Humans have settled on the edges of lakes, rivers, and other waterbodies since the earliest civilizations. This innate attraction to water has unfortunately resulted in widespread, costly, and repetitive flood damages where development encroaches upon the natural floodplain. Regulatory measures have thus been enacted to reduce flood risk, prevent loss of life and damage to property, and maintain the natural value of undeveloped floodplains. The successful regulation of development in floodplains relies on collaboration between multiple levels of government.

At the Federal level, floodplain regulation primarily falls to FEMA and the National Flood Insurance Program (NFIP). The NFIP, established in 1968, administers the nationwide flood insurance program and sets standards for floodplain management as part of the requirements for participating in the program. NFIP requirements are outlined in 44 Code of Federal Regulations 59-72. Communities that elect to participate in the NFIP ensure the availability of federally-backed flood insurance policies for the homeowners, renters, and businesses in their jurisdiction. As of August 2016, 547 Wisconsin communities participate in the NFIP; 65 additional communities have mapped floodplains but are not currently in good standing with the program (NFIP, 2016).

FEMA produces **Flood Insurance Rate Maps (FIRMs)**, which show areas at risk of flooding and provide a basis for regulatory decisions and insurance requirements. FIRMs are generated using data from Flood Insurance Studies (**FISs**), engineering studies that examine records of river flow, rainfall, hydrologic and hydraulic analyses, topographic surveys, and community information. FIRMs were first distributed as printed paper maps, but in recent years FEMA has switched to Digital Flood Insurance Rate Maps (**DFIRMs**).

FIRMs show the **Special Flood Hazard Area (SFHA)**, defined as the area that is inundated during the **base flood**, also known as the 1-percent-annual-chance or "100-year" flood. In Wisconsin, the base flood is also referred to as the **regional flood**. In areas where the **Base Flood Elevation (BFE)** has been calculated through engineering studies, it serves as the regulatory benchmark for structure elevation or floodproofing. Flood insurance premiums are determined by a structure's elevation in relation to the BFE. State statutes refer to the BFE as the **regional flood elevation**; in Wisconsin, the **flood protection elevation** is two feet above the regional flood elevation.

Floodplain regulation activities in Wisconsin are administered by the Wisconsin Department of Natural Resources (DNR) Floodplain Management Section. The State of Wisconsin has required communities to regulate floodplains since 1968 through Chapter NR 116 of the Wisconsin Administrative Code. The standards established in ch. NR 116 exceed the minimum standards set by the NFIP in order to provide a higher level of protection to Wisconsin residents. Some of the higher standards set by Wisconsin include the prohibition of structures in the floodway, the requirement that elevated structures be at least two feet above the regional flood elevation, and the requirement that structures have dryland access even during flooding.

State floodplain managers also support FEMA's flood mapping efforts. DNR engineers often conduct the engineering studies and hydraulic analyses used to create FISs and DFIRMs under FEMA's Risk MAP program. DNR staff reviews and approves these studies to ensure compliance with ch. NR 116.

Local governments are responsible for regulating new construction in mapped flood hazard areas, and are typically the first point of contact for community members regarding floodplain management issues. Communities manage floodplain development through their local floodplain ordinances. Wisconsin state statutes require communities to adopt a reasonable and effective floodplain ordinance if adequate hydraulic and engineering data is available in their area. Local ordinances are required to comply with both ch. NR 116 and 44 CFR 59-72 if the community wishes to participate in the NFIP. The DNR provides two model ordinances that communities can use to achieve compliance.

Communities must enforce Federal, state, and local floodplain ordinances and make FIRMs and FISs available to the public in order to remain in good standing with the NFIP. FEMA can penalize communities that fail to meet these requirements through probation or suspension from the NFIP. The DNR can take enforcement action if communities violate the minimum requirements of NR 116.

Flood Mitigation

Attempts to reduce flood risk usually take one of two approaches: those that focus on controlling the flood through structural means, and those that aim to reduce vulnerabilities through smaller-scale projects such as elevations and acquisitions. Large structural projects may provide significant short-term benefits, but tend to be costly and often have unpredictable secondary effects. In contrast, smaller projects tend to be more cost effective, work with rather than against the system's natural tendency to flood, and often provide additional flood storage capacity.

Many historically flood-prone urban areas have been removed from the regulatory floodplain through the application of two structural flood mitigation measures: 1) flood control dams, which reduce peak discharges; and, 2) levees, which redirect floods away from areas that would otherwise be inundated. As Wisconsin develops, however, urbanization decreases the abilities of natural systems to absorb rainfall due to the increased amount of impervious surfaces and subsequent increase in runoff. Structural flood mitigation projects may not be able to provide

protection during increasingly severe flood events if they are designed based on preurbanization conditions.

Although flooding resulting from inadequate man-made or "gray" infrastructure presents serious issues that communities must address, this type of flooding has not typically been mapped by the NFIP. Because the NFIP only requires local governments to impose land use regulations in a mapped floodplain, there is little regulatory incentive for communities to take action. The NFIP standard flood insurance policy, however, often pays claims for flood losses in areas with inadequate infrastructure.

Dam Failure

A **dam** is a barrier, typically constructed of earth, rock, concrete, or mine tailings, used to store, control, or divert water. The water impounded behind a dam is referred to as the **reservoir** and its volume is measured in acre-feet, with one acre-foot being the volume of water that covers one acre of land to a depth of one foot. Due to topography, even a small dam may have a reservoir containing many acre-feet of water. The water (or other liquid) stored behind a dam can have catastrophic downstream impacts if released suddenly due to dam failure or misoperation.

Wisconsin's approximately 3,900 dams serve many purposes. Approximately 900 of the dams constructed since the late 19th century have since washed out or been removed. Many of these dams were originally used for logging and milling operations, though they are not typically used for this purpose anymore. Today, Wisconsin's dams are used for recreation, agricultural production and land management, electrical power generation, and erosion, water level, and flood control (DNR, 2015). Of the existing dams, 60% are owned by a company or private

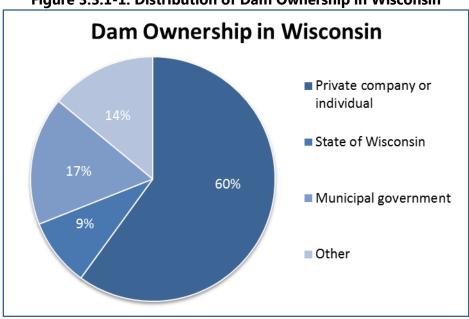


Figure 3.3.1-1: Distribution of Dam Ownership in Wisconsin

Source: Wisconsin Department of Natural Resources, 2015

individual, 9% are owned by the State of Wisconsin, 17% are owned by municipal governments, and 14% are owned by other groups (Figure 3.3.1-1).

A **dam failure** is the collapse, breach, or other failure of a dam that causes downstream flooding (FEMA, 1997). Dam failures usually occur when the spillway capacity is inadequate and water overtops the dam or when internal erosion through the dam foundation occurs (also known as piping). During a dam failure, a high-velocity, debris-laden wall of water can be released and rush downstream, damaging or destroying whatever is in its path. Dam failures may result from one or more the following:

- Prolonged periods of rainfall and flooding (the cause of most failures)
- Inadequate spillway capacity which causes overtopping flows
- Landslides into reservoirs
- High winds
- Internal erosion

- Flood debris blocking gates
- Erosion due to embankment or foundation leakage or piping
- Improper design or maintenance
- Negligent operation
- Failure of upstream dams
- Earthquake

For emergency planning purposes, dam failures are categorized as either rainy day or sunny day failures. **Rainy day failures** involve periods of excessive precipitation leading to unusually high runoff. This high runoff increases the reservoir level, and if not controlled, the overtopping of the dam or excessive water pressure can lead to dam failure. Normal storm events can also lead to rainy day failures if water outlets are plugged with debris or otherwise made inoperable. **Sunny day failures** occur due to poor dam maintenance, damage/obstruction of outlet systems, or vandalism. This is the worst type of failure and can be catastrophic because the breach is unexpected and there may be insufficient time to properly warn downstream residents.

Among the 3,900 dams in Wisconsin, there is a wide variance in the potential to cause damage in the event of failure. Very few dams in Wisconsin were built primarily to protect people and property from floods. Most of the dams that provide a flood-control benefit are associated with large hydroelectric operations on major rivers where flood control is a secondary benefit, or they are PL-566 dams, which are dams built through the Watershed Protection and Flood Prevention Act of 1954. Wisconsin has 83 PL-566 dams, located mainly in the western part of the state. The PL-566 dams often hold little or no water in their reservoirs under normal conditions. Since these dams only hold significant amounts of water during floods, they present a special hazard as everyday water-related problems such as seepage cannot be readily seen and corrected. Almost all of Wisconsin's PL-566 dams are between 30 and 50 years old, and are approaching the end of their useful life. Safety studies, maintenance, repairs, and/or rehabilitation are required in order to alleviate health and safety concerns for downstream developments (NRCS, 2016).

Wisconsin Dams by Size Lake Michigan Legend **Wisconsin Dams** Small Dam 25 50 100 Large Dam Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors, Sources: Esri, GEBCO, NOAA, National Geographic, DeLorme, HERE, Geonames.org, and

Figure 3.3.1-2: Location of Large and Small Dams in Wisconsin

Source: Wisconsin Department of Natural Resources, 2016.

Dam regulation

Dams in Wisconsin are regulated by one of two levels of government. About 150 large hydroelectric dams are federally regulated, while most of the remaining 3,700 dams are regulated at the state level by the Wisconsin Department of Natural Resources (DNR). The state does not regulate dams that are not on a watercourse, that impound a liquid other than water, or that are associated with a cranberry operation.

State-regulated dams are classified by the DNR as either large or small. **Large dams** either have a structural height of over six feet and impound more than 50 acre-feet of water, or have a structural height of over 25 feet and impound more than 15 acre-feet. There are approximately 1,160 large dams in the state (DNR, 2015). Large dams are subject to mandatory inspection and design requirements due to their greater potential for impacting downstream areas in the event of a failure. The remaining dams are classified as small dams, and tend to be subject to less stringent regulation. Figure 3.2.1-2 displays the location of large and small State-regulated dams in Wisconsin. Notice the large concentration of small dams along the western part of the state.

Landslides and Land Subsidence

Stormwater runoff, soil saturation, and river erosion often associated with flooding can also lead to **landslides**, or the downward and outward movement of slopes. The term landslides can be used to refer to a variety of events, including mudflows, mudslides, debris flows, rock falls, rockslides, debris avalanches, debris slides, and earth flows. Landslides may include any combination of natural rock, soil, or artificial fill, and are classified by the type of movement and the type of material.

The types of movement include:

- Slides are downward displacements along one or more failure surfaces of soil or rock.
 The material may be a single intact mass or a number of pieces. The sliding may be rotational (turning about a point) or translational (movement roughly parallel to the failure surface). The most common type of slide is called a slump. A slump is a rotational slide occurring when a portion of a hillside moves downslope under the influence of gravity.
- **Flows** are rapid mass movements of loose soils, rocks, and organic matter that combine with air and water to form a downhill-flowing slurry mixture. Flows are distinguished from slides by high water content and velocities that resemble those of viscous liquids.
- **Lateral spreads** are large movements of rock, fine-grained soils (i.e., quick clays), or granular soils, distributed laterally. Liquefaction may occur spontaneously in loose, granular soils due to earthquake vibrations or changes in pore-water pressure.
- **Falls** and **topples** are masses of rock or other material that detach from a steep slope or cliff and free-fall, roll, or bounce downward. Falls and topples are typically rapid or

extremely rapid. Earthquakes commonly trigger rock falls.

A combination of two or more landslide movements is referred to as a **complex movement**.

Almost any steep or rugged terrain can be susceptible to landslides under the right conditions. The most hazardous areas are steep slopes on ridges, hill, and mountains, incised stream channels, and slopes excavated for building and road construction. Slide potentials are enhanced where slopes are destabilized by construction or river erosion. Road cuts and other altered or excavated areas are particularly susceptible to landslides and debris flows. Rainfall and seismic shaking by earthquakes or blasting can trigger landslides. Trains can also generate ground vibrations equivalent to a 3.0 to 4.9 earthquake, causing ground disturbance and collapse.

Debris flows (also referred to as mudslides) generally occur during intense rainfall on saturated soil. They usually start on steep hillsides as soil slumps or slides that liquefy and accelerate to speeds as great as 35 miles per hour. Multiple debris flows may merge, gain volume, and travel long distances from their source, making areas downslope particularly hazardous. Surface runoff channels along roadways and below culverts are common sites of debris flows and other types of landslide.

In Wisconsin, the hilly terrain adjacent to the Mississippi River is especially prone to landslides. The bluffs of this so-called "driftless" region are formed of limestone bedrock covered by an ancient mix of clay and river silt. Under most conditions, this provides a solid base for home building, though most counties restrict building to a slope of 20-30%. Homes that are built on "benches" may have much steeper areas above or below them. As water particles fill the space between silt particles, the silt and clay first become "plastic" and then "viscous." When plastic, the soil will move when pressure (such as the weight of a home) is applied to it. When viscous, it begins to slow under its own weight like a glacier, only much more quickly.

Landslides often occur together with other major natural disasters, thereby exacerbating relief and reconstruction efforts. Floods and landslides are closely related and both involve precipitation, runoff, and ground saturation that may be the result of severe thunderstorms. Earthquakes, though rare in Wisconsin, may cause landslides ranging from rock falls and topples, to massive slides and flows. Landslides into a reservoir may indirectly compromise dam safety or a landslide may even affect the dam itself. Wildfires may remove vegetation from hillsides, significantly increasing runoff and landslide potential.

Landslides are a widespread geologic hazard, occurring in every U.S. state and territory. The US Geologic Survey estimates that landslides cause 25 to 50 deaths and over \$1 billion in damages each year in the United States. The costs of landslides are increasing rapidly as lands susceptible to failure are developed for highways, housing, industry, and recreation. Landslides pose serious threats to highways and structures that support fisheries, tourism, timber harvesting, mining, and energy production, as well as general transportation.

Land subsidence occurs when subsurface supports (i.e. bedrock or soils) fail, causing a loss of surface elevation. This hazard is primarily caused by human activities in relation to mining and drainage of soils, but can also be caused by natural geologic conditions. Annually in the US, land subsidence and sinkholes account for an average of \$125 million in damages (FEMA, 1997).

In certain parts of the state, sinkholes are more likely to be caused by human activity. Some parts of southern and western Wisconsin have experienced sinkholes from collapsed, abandoned underground mines. In urban flooding and storm events, the Milwaukee area has had sinkholes occur in the middle of busy streets above storm sewers.

In other instances, sinkholes causing land subsidence are caused from geologic properties of bedrock, called karst formations. **Karst formations** are prevalent in areas where carbonate bedrock, such as limestone or dolomite, is present. As the limestone rock under the soil dissolves over time from rainfall or flowing groundwater, a hollow area may form underground into which surface soil can sink.

Karst features also provide direct conduits to groundwater. Areas with karst conditions can be subject to groundwater contaminants from pollutants entering a sinkhole, fissure, or other karst features. Karst features should be identified and considered in a community, especially for land use planning, stormwater management, and hazardous materials planning, to avoid possible damage to structures or contamination of groundwater.

3.3.2 History

Flooding

Wisconsin has experienced a significant flooding event at least once every decade since 1880.

Flooding has been a principle cause of damage in 32 of 46 Presidential Disaster Declarations and one of six Presidential Emergency Declarations in Wisconsin from 1971 through June 2016. Flood events tend to cause the most widespread damages of all Wisconsin's natural hazards.

Low-lying areas of the counties that border Wisconsin's largest rivers, the Mississippi and the Wisconsin, are particularly prone to flooding of both the main channels and smaller tributaries. Smaller rivers, such as the Chippewa, Menomonee, Kickapoo, Pecatonica, Bad, Wolf, and Milwaukee Rivers, are also regularly experience periodic flooding.

Understanding flood risk in Wisconsin is important, especially as many communities develop lands previously dedicated to agricultural or preservation uses. Throughout recent years, flooding in Wisconsin has changed in scale and scope. This is due largely to the increasing demand for housing along Wisconsin's waterfronts, land use changes that reduce natural flood storage capacity, and recent trends toward increasing precipitation amounts.

The table in Figure 3.3.2-1, below, lists the major flood events in Wisconsin since 1973. Flood events in recent decades tend to affect a greater number of counties and result in increasingly costly damages. The majority of the most widespread and damaging floods on record occurred between 1990 and 2010.

Figure 3.3.2-1: Major Flood Events in Wisconsin, 1973-2016

Date of Flood Event	Disaster Number	Area Affected (County/ies)	Damages	Fatalities
1973	376	Adams, Brown, Buffalo, Chippewa, Clark, Crawford, Door, Dunn, Eau Claire, Green Lake, Jefferson, Kenosha, Kewaunee, La Crosse, Langlade, Lincoln, Manitowoc, Marathon, Marinette, Marquette, Milwaukee, Oconto, Outagamie, Ozaukee, Pepin, Portage, Racine, Rock, Rusk, Sheboygan, Walworth, Waukesha, Waupaca, Waushara, Wood	\$24,000,000	0
1975	482	Buffalo, Pepin, Pierce, Trempealeau	\$5,200,000	0
1978	559	16 counties in southern and southwestern Wisconsin; the Kickapoo River Valley was the most severely affected area	\$51,000,000	0
June & Sept. 1980	626	6 northwestern and west-central counties including Chippewa, Dunn, Eau Claire, and Pierce	\$6,000,000	0
July 1984	3091	Vernon	\$1,000,000	0
Sept. 1985	1	Ashland, Bayfield, Douglas	\$3,000,000	0
Aug. 1986	770	Milwaukee, Waukesha	\$20,000,000	2
Sept. 1986	775	Dodge, Fond du Lac, Kenosha, Milwaukee, Ozaukee, Sheboygan, Washington, Waukesha	\$6,000,000	0

Date of Flood Event	Disaster Number	Area Affected (County/ies)	Damages	Fatalities
June 1990	874	East-central and southwestern counties, including Brown (including City of Green Bay), Kewaunee, Calumet, Manitowoc, Outagamie, Winnebago, Dane, Green, Rock, Grant, Iowa, Lafayette (including City of Darlington), Crawford, Richland, Sauk, Juneau, and Vernon	\$21,000,000	0
Aug. 1990	877	City of Tomah and surrounding areas of Monroe County	\$6,200,000	2
Sept. 1992	964	Brown, Calumet, Crawford, Dane, Grant, Green, Iowa, Juneau, Kewaunee, Lafayette, Manitowoc, Monroe, Outagamie, Richland, Rock, Sauk, Vernon, Winnebago	\$17,000,000	0
June - Aug. 1993	994	Adams, Brown, Buffalo, Calumet, Chippewa, Clark, Columbia, Crawford, Dane, Dodge, Dunn, Eau Claire, Fond du Lac, Grant, Greene, Green Lake, Iowa, Jackson, Jefferson, Juneau, Kenosha, La Crosse, Lafayette, Lincoln, Marathon, Marquette, Menominee, Milwaukee, Monroe, Outagamie, Pepin, Pierce, Portage, Price, Racine, Richland, Rock, Rusk, Sauk, Shawano, St. Croix, Trempealeau, Vernon, Waupaca, Waushara, Winnebago, Wood	\$740,000,000	2
July 1996	1131	Fond du Lac, Green (including City of Monroe and the Village of Monticello)	\$6,000,000	2
June 1997	1180	Milwaukee, Ozaukee, Washington, Waukesha	\$87,700,000	0
Aug. 1998	1238	Milwaukee, Waukesha, Sheboygan, Racine, Rock	\$55,000,000	2
July 1999	1284	Ashland, Bayfield, Douglas, Florence, Iron, Oneida, Price, Rusk, Sawyer, Vilas	\$31,000,000	0
May–July 2000	1332	Columbia, Crawford, Dane, Grant, Iowa, Juneau, Kenosha, Lafayette, Milwaukee, Richland, Sauk, Vernon, Walworth, Adams, Ashland, Barron, Burnett, Forest, Green, Iron, Jackson, Monroe, Oneida, Polk, Rusk, Sawyer, Washburn, Dodge, Racine, Waukesha	\$74,000,000	0
April 2001	1369	Adams, Ashland, Barron, Bayfield, Buffalo, Burnett, Calumet, Chippewa, Clark, Crawford, Douglas, Dunn, Grant, Iron, Jackson, Juneau, La Crosse, Outagamie, Pepin, Pierce, Polk, Portage, Rusk, St. Croix, Taylor, Trempealeau, Vernon, Washburn, Waupaca, Waushara, Winnebago, Wood	\$84,200,000	0
June 2002	1429	Adams, Clark, Dunn, Marathon, Marinette, Portage, Waushara, Wood	\$14,300,000	0
Sept. 2002	1432	Polk	\$3,000,000	0
May-June, 2004	1526	Clark, Columbia, Crawford, Dodge, Fond du Lac, Grant, Green Lake, Jefferson, Kenosha, Ozaukee, Vernon, Winnebago	\$268,425,000	1
July 2006	-	Waukesha County and City of Madison	\$13,000,000	0
Aug. 2007	1719	Columbia, Crawford, Dane, Grant, Green, Iowa, Jefferson, Kenosha, La Crosse, Racine, Richland, Rock, Sauk, Vernon	\$116,400,000	1

Date of Flood Event	Disaster Number	Area Affected (County/ies)	Damages	Fatalities
June 2008	1768	Adams, Calumet, Crawford, Columbia, Dane, Dodge, Fond du Lac, Grant, Green, Green Lake, Iowa, Jefferson, Juneau, Kenosha, La Crosse, Lafayette, Marquette, Manitowoc, Milwaukee, Monroe, Ozaukee, Racine, Richland, Rock,, Sauk, Sheboygan, Vernon, Walworth, Washington, Waukesha, Winnebago	\$763,618,860	1
July 2010	1933	Calumet, Grant, Milwaukee	\$45,000,000	
Sept. 2010	1944	Buffalo, Clark, Jackson, Juneau, Marathon, Portage, Taylor, Trempealeau, Wood	\$4,600,000	0
June 2012	4076	Ashland, Bayfield, Douglas	\$8,620,700	0
June 2013	4141	Ashland, Bayfield, Crawford, Grant, Iowa, Richland, St. Croix, Vernon	\$9,290,000	0
July 2016	4276	Ashland, Bayfield, Burnett, Douglas, Florence, Iron, Sawyer, and Washburn	\$26,000,000	4
Sept. 2016	4288	Adams, Chippewa, Clark, Crawford, Jackson, Juneau, La Crosse, Monroe, Richland, Vernon	\$11,340,000 (Ongoing)	2

Sources: Wisconsin Emergency Management; NOAA National Weather Service, Milwaukee/Sullivan, WI, 2016.

June – August 1993

Major flooding impacted nine Midwestern states during the summer of 1993. Generating more than \$15 billion in damages and resulting in 50 fatalities across the region, the 1993 flood remains one of the most severe and damaging floods in US history. The severe damages experienced during the 1993 floods, including the failure of hundreds of levees across the region, challenged traditional approaches to flood control first developed in the 1940s. The resulting shift in national policy focus toward non-structural mitigation strategies, such as reducing flood risk through acquisition and demolition of flood-prone properties and increasing natural flood storage capacity, continues today.

In Wisconsin, extremely heavy rainfall resulted in a Presidential Disaster Declaration for 47 counties with total associated damage exceeding \$740 million (\$1.23 billion in 2016 dollars). Forty of the counties received both Public and Individual Assistance declarations, while the other seven were declared for Individual Assistance only. Though Wisconsin was not affected as severely as other states in the Midwest, the 1993 floods were one of the state's most significant disasters in terms of both damages and funds received through disaster relief programs. The total amount of disaster relief funds Wisconsin received from all declarations prior to 1993 was \$352 million. Approximately \$300 million (\$480 million in 2012 dollars) in disaster relief was received for the 1993 Presidential Disaster Declaration alone.

June 1997

Since 1993, several flooding events have been especially noteworthy; the first of which occurred on June 20 and 21, 1997. During this event, a rainstorm dumped more than seven inches of rain in a 30-hour period in Milwaukee and surrounding counties. The intense rainfall overwhelmed

creeks and rivers, as well as storm and sanitary sewers. Hundreds of local roads and highways were filled with water, as deep as 23 feet in some areas. Thousands of homes were damaged, many of which had six to seven feet of water in their basement. The flood also damaged hundreds of businesses, many of which were forced to close temporarily or permanently. Some of the damaged businesses that provide critical services included Bayshore Clinical Labs, St. Michael's Hospital Health Center, St. Luke's South Shore Hospital, and the dialysis center in the City of Brown Deer.

The initial damage losses from the 1997 floods amounted to almost \$55 million for the public and private sectors, with most of the \$44 million in private sector losses being uninsured. The severity of the storm and significance of the uninsured losses prompted a request for a Presidential Disaster Declaration for four Wisconsin counties. The declaration was granted for both Public and Individual Assistance. A fifth county was added later for Public Assistance only.

April 2001

In 2001, flooding was the principal reason Wisconsin initially received Presidential Disaster Declaration DR-1369 although tornadoes and severe storms were also major factors as the disaster progressed. Heavy winter snowfall combined with spring rain led to spring flooding. In mid-April, rain and rapid snowmelt caused the Mississippi River and many of its tributaries to flood. Floodwaters along the Mississippi River from Alma (Buffalo County) to Prairie du Chien (Crawford County) rose to their highest levels since 1965. In addition, severe storms also struck northern Wisconsin in late April. Heavy rains mixed with freezing rain, snow, and strong winds caused widespread flooding and wind dam- age. The initial flooding affected 17 counties; eventually, 32 counties were declared for DR-1369 for a variety of storm-related damage, including tornadoes.

June 2002

Late in June 2002, a series of severe thunderstorms swept across central and northeast- ern Wisconsin. The storms produced up to 15 inches of rain in 24 hours in some locations with flooding on the Peshtigo, Wisconsin, and Yellow Rivers, flash flooding on smaller streams, and extensive ponding throughout many of the affected areas. There were re- ports of one to two feet of water in the streets of Marinette (Marinette County) and one foot of water in the streets of Wautoma (Waushara County). The high-velocity flood- waters destroyed or caused extensive damage to bridges, bridge approaches, culverts and road surfaces, leaving impassable gaps on county and township roads throughout the disaster area. Erosion and scouring around culverts and bridges reached depths of up to eight feet. Marathon, Adams, Portage, and Marinette Counties were particularly hard hit. Nearly \$4 million in damage was identified in these four counties, primarily to roads, bridges, drainage ditches, culverts, and sewer lines.

May – June 2004

In the months of May and June, 2004, a series of weather systems moved east across the central and southern parts of Wisconsin and generated thunderstorms that dumped heavy rains. This

resulted in widespread river, urban, and agricultural flood damage that totaled a staggering \$268,425,000, with one flood-related death. Rainfall amounts in May 2004, ranged from seven inches to a maximum of 14.72 inches at Lynxville (Crawford County), or two to three times the monthly average. In May alone, the water level in Lake Michigan rose 11 inches due to rain and runoff. In June 2004, rainfall totals ranged from five to 12.72 inches at Readstown (Vernon County). Some of the larger rivers rose two to four feet above flood stage which constituted moderate to major flooding.

August 2007

In August, 2007, a series of thunderstorm clusters moved east-southeast through the southern third of Wisconsin, dumping record-setting rains. Many locations set new all- time daily and monthly August rainfall records. Much of the rain fell during August 19-20, when six to 12 inches were measured (150% to 300% of the August monthly average). One person perished in a flash flood event in southern Richland County. Alongside unofficial reports of 22 to 25 inches of water, Viroqua (Vernon County) picked up 21.74 inches of rain for the month, a new all-time monthly record for Wisconsin. Total flood damages were about \$116.4 million. A record flood crest was reported at the Root River Canal near Raymond (Racine County), and major flood levels were observed at New Munster on the Fox River (Kenosha County) and at Newville on the Rock River (Rock County). Some locations along the Kickapoo River came within one to two inches of establishing a new all-time record crest.

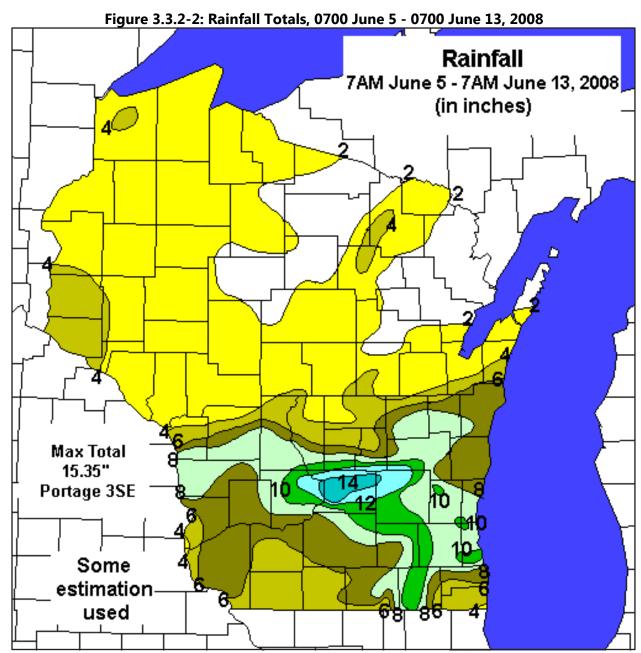
June 2008

In June 2008, yet another widespread, severe flooding/flash flooding event, consisting of two rounds of heavy rains, ravaged an already saturated part of the state south of a line from La Crosse (La Crosse County) to Manitowoc (Manitowoc County). The first round of heavy rains occurred June 5 through 8, 2008, followed by a second round during the overnight hours of June 12 through 13, 2008. Collectively, amounts ranged from six to over 15 inches. In many locations, 24-hour and monthly rainfall records were established. Milwaukee would eventually measure 12.27 inches, which was a new record monthly rainfall. Rainfall totals for June 5 through 13 are illustrated in Figure 3.3.2-2.

The heavy rains combined with the already-saturated soils intensified flooding conditions. At least 38 river gauge sites set new all-time record-high crests; in some cases exceeding flood stage by six to over 11 feet. The Baraboo River in Baraboo (Sauk County) crested at 27.48 feet, where normal flood stage is 16.0 feet.

The intense and extensive flooding necessitated rescues, evacuations, road closures, and sandbagging. Thousands of homes sustained damages, and many people were left homeless. Hundreds of small businesses were damaged and temporarily closed. Damage to public facilities was estimated to be in the tens of millions of dollars. Both the agriculture and tourism industries, the heart of state and local economies, suffered significantly. Many of the communities were still recovering from the flooding that occurred ten months earlier, which also resulted in a Federal disaster declaration.

In some cases, rivers remained in flood stage into late July 2008, and some low spots in farm fields still had standing water into September 2008 due to a high water table. Most of the flooding was of the "100-year" magnitude, and some was probably of the "200- or 300-year"



Source: NOAA National Weather Service, Milwaukee/Sullivan, WI, 2011.

type. Numerous roads were closed, damaged, or washed-out in river valleys and other low spots, and some bridges were significantly damaged. The worst river flooding occurred on the Baraboo, Kickapoo, Rock, Northern and Southeastern Fox, and Crawfish Rivers. A number of farm fields were never replanted by the time they dried out in late July or early August 2008. In some areas, the June 2008 flooding in Wisconsin was worse than the 1993 flooding. On June

14th, President Bush declared Disaster Declaration 1768 in the state. Eventually the declaration included 31 counties with estimated damages totaling roughly \$763 million (FEMA, 2011).

July 2010

Parts of south-central and southeast Wisconsin experienced several rounds of record-setting torrential rains during the afternoon and evening hours of July 22, 2010 that led to flash flooding. During the afternoon, a persistent band of strong to severe thunder- storms developed and moved very slowly over the region throughout the evening hours. The individual storms were moving quite fast, at about 40 to 50 mph, but the slow southward movement of the boundary of these storms resulted in storms repeatedly moving over the same area. Widespread three to four inch rainfall amounts were reported along and on either side of the I-94 corridor, with locally higher amounts of five to eight inches. The greatest rain amounts fell in Milwaukee County, where the most damage occurred. Mitchell Field recorded 5.61 inches for the day, setting a new record for the date. The previous record was 1.26 inches set in 1948.

Massive flooding shut down streets and the freeway system in parts of Milwaukee County at rush hour with up to four feet of rushing water. There was one fatality in Milwaukee. The Milwaukee Fire Department logged 50 rescues from homes and streets. The Milwaukee Metropolitan Sewerage District reported that the storm resulted in a combined sewer overflow of around two billion gallons. All Lake Michigan beaches in Milwaukee were closed through the following weekend of July 24 and 25, 2010, due to sewer contamination. The City of Milwaukee received at least 2,000 calls for sewer backups into basements of homes, with the northern half of the City hit hardest. Flooding rains created a massive 20 foot deep sink hole in the City of Milwaukee, swallowing a sport utility vehicle and a street light. The driver of the SUV was injured and treated at a hospital. Electrical power cables and other cable lines were also damaged.

General Mitchell International Airport (Milwaukee County) was closed late Thursday night, July 22, through 2 p.m. Friday, July 23, 2010 due to flooded runways. Over 4,400 homes reported water-filled basements in the City of Milwaukee alone. 11,764 homes received some sort of impact from the flooding, with six homes destroyed; 57 homes receiving major damage; 1,859 home receiving minor damage; and 9,842 homes minimally affected by the flood waters. 68 businesses were affected, with nine having major damage and 59 having minor damage. About 32,000 WE Energy utility customers lost electricity through- out southeast Wisconsin due to the flooding and lightning.

September 2010

An excessive rainfall event, with amounts of three to six inches, occurred across parts of central and northeast Wisconsin starting on the evening of September 22 and lasting through the morning hours of September 23, 2010. The heaviest rain fell over the central part of the state where many locations received more than five inches. This led to flash flooding, as well as moderate to record river flooding across parts of central Wisconsin. A new record stage of 18.41 feet was established on the Yellow River at Babcock (Wood County). This is 6.41 feet above flood

stage. The Wisconsin River at Portage (Columbia County) set a new record crest of 20.66 feet on September 28, 2010, or 3.66 feet over flood stage.

June 2012

From June 17 to 20, the Arrowhead of Minnesota and northwest Wisconsin were inundated with 8-10 inches of rain. In Duluth, 7.24" of rain fell the 19th & 20th, the wettest two-day period on record. Massive flooding swept through the region. The official rainfall in Duluth on the 19th was 4.14 inches and on the 20th it was 3.10". Superior received 8.15 inches of rain.

June 2013

During the period of June 21-28, 2013, parts of Wisconsin experienced historic 24-hr, 48-hr, 72-hr, and 7-day rainfall amounts. This resulted in river flooding, mud-slides, damaged buildings and closed roads. Some river gauge sites experienced major flooding levels and record crests. Four regions of the state experienced record-setting rain totals in June 2013: Douglas County to Ashland County, Crawford County to northwestern Iowa County, the Dane-Green-Rock-western Walworth County area and the northeast Marathon-Northern Shawano-Menominee County area. Unfortunately, the urbanization and drainage situation in the southern part of Madison amplified the effects of flooding. A number of counties had some road or public infrastructure damage. The hardest-hit counties were Ashland, Crawford, Dane, Grant, Iowa, Richland, Sauk, St. Croix, and Vernon.

July 2016

On July 11, 2016, multiple rounds of strong to severe thunderstorms impacted much of northwest Wisconsin. Rainfall amounts totaled 4 to 10 inches in a 24-hour period, with the majority of rain falling within just eight hours. The worst of the heavy rain and concomitant flash flooding occurred in the evening. Much of the region experienced significant flooding, leading to road closures, washouts, damage to harbors and marinas, and tragically, four fatalities. High winds and downbursts produced by a bow echo type storm contributed to the widespread damage.

The storms and flooding came during the area's peak tourist season. Damages to tourist attractions such as Saxon Harbor and the region's many trails and campgrounds resulted in millions of dollars of lost revenue. The DNR reported that 10 major state and county trails were closed due to the event, while the U.S. Forest Service reported damage to over 1,000 miles of service roads and more than 80 percent of bridges and culverts in the storm area.

Over 350 homes were impacted by the July storms and flooding. The initial damages were compounded by a secondary severe thunderstorm event on July 21, which caused tens of thousands of power outages across the northern part of the state. The stress on residents and local emergency response efforts was further intensified by high heat index levels that occurred from July 20-22, particularly in areas without power.



Figure 3.3.2-3: Damages at Saxon Harbor (Iron County) during July 2016 Floods

Source: Iron County Sherriff's Department, 2016.

September 2016

Beginning on September 21 and extending through September 22, 2016, multiple rounds of severe thunderstorms impacted much of west central and southwestern Wisconsin. The area received over 10 inches of precipitation during this two day period, resulting in flash flooding in the areas with the heaviest rainfall. Saturated soils and vegetative conditions due to high rainfalls over the preceding month caused stream, riverine, and urban flooding to develop faster than normal, resulting in mudslides, washouts, and flooding on roadways. Numerous road closures were enacted, including a multiple-day closure of State Highway 35, a major transportation corridor along the Mississippi River. With travel severely limited, many communities experienced economic impacts due to reduced tourism and cancellation of annual events.

Over 485 homes were impacted in addition to the extensive road damage and large amounts of debris generated by this event. In Crawford County alone, more than 60 households reported over \$1,475,000 in damages. Sadly, the dangerous conditions caused by the flooding resulted in the loss of two lives.

Figure 3.3.2-4: Aerial View of Gays Mills (Crawford County) Flooding, September 2016

Source: Richland County Emergency Management, 2016.

Figure 3.3.2-5, on the following page, shows the county-by-county distribution of flood events across Wisconsin for the period of 1982-2015. The map shows the number of flood events, the number of directly-related fatalities, and the number of directly-related injuries. Notice that the southern part of the state has most of the flood events. Hilly terrain in the southwestern counties and the built-up urban areas in the southeast are factors that increase the chances of flooding. Noteworthy is the fact that Dane and Vernon Counties have the most flooding events during the time period, with 77 and 71, respectively. Very few injuries and deaths are recorded during the 28 year period, with the highest number of injuries sustained in any one county equal to three (Rock and Jackson counties).

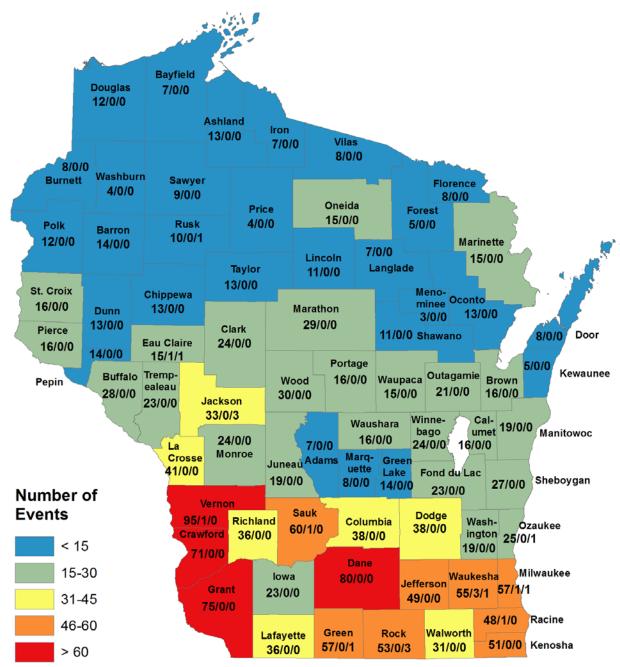
Figure 3.3.2-5 Flood Events by County, 1982-2015



Wisconsin Flood Events



1982 - 2015 # Events / # Deaths / # Injuries



Source: NOAA National Weather Service, Milwaukee/Sullivan, WI, 2016.

Dam Failure

Although sunny day failures do happen, many of Wisconsin's dam failure incidents have occurred during flood events. Minor damage, overtopping, and embankment erosion are common during period of minor and major flooding. Examples of significant dam failure events from the Wisconsin DNR's dam incident database are presented in the table in Figure 3.3.2-6 (note: dam failures stemming from the 1993 floods are summarized in a separate table).

On the night of September 1, 1985, a flooding event nearly overtopped the 66-foot tall Orienta Falls power-generating dam on the Iron River (Bayfield County). Heavy waters overwhelmed the earth embankment and bulldozed away the dam's powerhouse walls. The dam, operated by Northern States Power, was severely damaged. Additionally, three bridges were destroyed, telephone service was cut, many roads and culverts were washed away, and although no one died, two families downstream were evacuated for fear the whole dam would collapse. The flood brought down the Orienta Dam, but changing times prevented its expensive \$500,000 repair. The river was returned to its natural state (Katherine Esposito, Wisconsin Natural Resources Magazine, April 1999).

Between 1990 and 1995, more than 75 Wisconsin dams failed. Many of these dam failures were associated with the Great Midwest Flood of 1993. Though none of these failures resulted in any loss of life, injuries and extensive property damage occurred during several events.

Excessive precipitation (nine inches of rain in four hours) in August 1990 stressed the 50-year old Lake Tomah Dam (Monroe County), imperiling the lives of approximately 2,000 residents of the City of Tomah (Monroe County) who had to be evacuated from their homes. Municipal workers, volunteers, and Wisconsin National Guard personnel averted a breach by using more than 20,000 sand bags to reinforce the structure. A large crane was used to open the floodgates and the level of the lake dropped eight inches in one hour. The excess water emptied into the Lemonweir River, which overtopped its banks and rose approximately two inches per minute until it stabilized.

In March 1993, the Briggsville Dam (Marquette County) failed and washed out the embankment. Fortunately, severe property damage was averted, but a recreational lake was completely drained. This failure was just one of many that occurred in 1993, a record year for precipitation and flooding.

One of the more publicized 1993 incidents involved the Hatfield Dam (Jackson County). A power canal dike at the dam failed due to flooding. Initial reports from the area indicated that the main dam had failed, but this proved to be incorrect. A summary of dam washouts, overtopping, or damages associated with the 1993 floods is provided in the table in Figure 3.3.2-7.

In September 1994, heavy rainfall in Price County caused concern over the potential failure of the Musser, Jobe, and Weimer Dams. Price County Emergency Management, WEM, and DNR Dam Safety staff monitored a command post above the Musser dam, while the Wisconsin

Figure 3.3.2-6: Summary of Significant Dam Incidents in Wisconsin, 1980 to 2016

Year	County	Dam	Event description
rear	County	Daili	
1980	Jackson	Hatfield	Gate failure washed two fisherman downstream, resulting in injury.
1981	Juneau	Necedah	Major damage due to undermining of foundation/piping through embankment.
1984	Eau Claire	Vogler Flour Mill	Deteriorated concrete caused failure, drawdown, and damage to principal spillway.
1984	Juneau	Emery	High flows and failure of automated gate opener caused overtopping, washout, and embankment failure.
1984	Burnett	Fish Lake Wla Grettum	Heavy rains caused minor flooding, leading to overtopping of a low spot in the embankment, and damage to downstream bridge and road.
1985	Bayfield	Port Wing	Gate mechanism failure combined with high flows and debris during minor flooding led to embankment failure, major damage, and destruction of downstream powerhouse.
1986	Marquette	Lawrence Lake	Failure caused by piping through embankment led to major damage and downstream evacuation.
1986	Chippewa	Stanley Mill	Major flooding overtopped embankment and inundated CTH O downstream.
1988	Forest	Bog Brook	Beavers plugged spillway, causing overtopping, major damage, and washing out of road downstream.
1988	Kenosha	Hawke	Piping through embankment caused failure and washout at normal flows.
1988	Waukesha	Bischel	Deteriorated concrete wall and foundation caused piping, damage to downstream road.
1989	St. Croix	Little Falls	Cables rusted and failed during flood, causing abutment overtopping and major damage totaling \$275,000.
1989	Fond du Lac	Fairwater	Failure to operate gates during major flooding caused release of water upstream; emergency action plan activated.
1990	Sauk	Leland	Major flooding washed out dam.
1990	Monroe	Tomah Lake	Failure to operate gates during major flooding resulted in overtopping, major damage.
1994	Burnett	Gomulake and Profitt	Major flooding caused a full breach of the emergency spillway, washing out Highway 35 downstream.
1994	Sauk	Steinhorst and Coughlin	Piping along cutoff wall at embankment/fractured bedrock interface led to development of a 9-foot sinkhole.
1995	Waushara	Pine River	Minor flooding caused extensive overtopping of dam and downstream road and powerhouse.

Year	County	Dam	Event description
1995	Juneau / Monroe	Potters Flowage/Lower Reservoir	Embankment failure during minor flooding led to overtopping and washing out of Highway 21 and damage to railroad crossing downstream.
1995	Waushara	Mount Morris	Minor flooding during construction on dam and abutting bridge led to embankment erosion. Damage to a crane, air compressor, road embankment, and downstream bridge. Upstream, high velocity flows washed out five large trees and undermined a house foundation, leading to evacuation of the house.
1995	Iron	Hazel Lake	Dam failure led to release of water upstream and piping through embankment; emergency action plan activated.
1996	Price	Vander Veen	Emergency spillway eroded during minor flood event, causing major damage and washing approximately 6,500 cubic yards of material downstream.
1996	Iron	Lake of the Falls	High flows from major flooding due to snow melt caused damage to upstream property and led to highway closure.
1996	Waukesha	Vernon Marsh-Ref. Flowage	Piping through embankment caused sunny day failure, washed out 50-60 cubic yards of embankment material.
2001	Juneau	Robert, Arthur	Major flooding combined with rusted culvert washed out 60 feet of embankment.
2002	Polk	Upper Osceola	Flood and debris blockage caused overtopping during major flooding event, leading to embankment failure and flooding of homes.
2004	Columbia	Udeys	Embankments overtopped during major flood event; evacuation of homes downstream.
2004	Columbia	Cambria	Major damage caused by embankment overtopping during major flood event. Breach partially covered Highway 146.
2007	Vernon	Bad Axe 2	Emergency spillway damaged during major flooding; evacuation downstream.
2007	Vernon	Bad Axe 12	Major flooding led to flowage and erosion in auxiliary spillway; evacuation downstream.
2007	Vernon	Bad Axe 11	Evacuation downstream during major flooding.
2007	Vernon	West Fork Kickapoo 4	Damage to auxiliary spillway during major flooding, evacuation downstream.
2007	Vernon	West Fork Kickapoo 17	Seepage through abutment during major flood caused erosion and danger of failure. Downstream Highway 56 was detoured, evacuation downstream.

Year	County	Dam	Event description
2007	Vernon	West Fork Kickapoo 5	Major flooding led to seepage and soil saturation in auxiliary spillway. Closure of County Highway Y and evacuation downstream; eventual blow out downstream.
2007	Adams	Upper Camelot	Development of significant boil on downstream toe; emergency action plans activated, road closed, Lake Camelot and Lake Sherwood drawn down.
2008	Dodge	Lowell	More than 20,000 sandbags were put in place to prevent overtopping of embankments during major flooding.
2008	Columbia	Pardeeville	Partial breach during major flooding; evacuation downstream.
2015	Clark	Humbird	Major flood event caused riprap to settle behind abutment walls, leading to overtopping and scouring downstream.
2015	Trempealeau	Eleva Roller Mill	Major flood event led to overtopping and development of scour area on embankment.

Source: Wisconsin Department of Natural Resources, 2016.

Conservation Corps coordinated local sandbagging efforts. Evacuation of low-lying areas below the Musser Dam was ordered as construction crews attempted to open the inoperable floodgates. The floodgates were opened, allowing maximum release of water behind the dam and averting a near-catastrophic situation at the Musser Dam. Nearby, the Ladysmith Dam (Rusk County) overtopped during this event and partially failed.

The Radigan Dam (Douglas County) sustained major damage from flooding associated with Disaster Declaration 1369 in May 2001. Fortunately, the dam did not completely fail, but the amount of damages exceeded \$300,000.

On September 2, 2002, heavy rains occurred in the far western counties of Wisconsin. In the Village of Osceola (Polk County), heavy rain caused an old milldam to breach, crashing floodwaters through a mobile home park. The torrent continued downstream, overtopping a second dam and causing extensive road damage.

In August of 2007, heavy rains severely affected southwest Wisconsin. Many dams were stressed and overtopped. In Vernon County, many dams were overwhelmed with debris (in the form of large, round hay bales) and water. As a result, the dams either failed, seeped water, or were under significant stress. Major repairs needed to be made to at least 22 dams in Vernon County.

With the severe flooding in June 2008, many dams in southern Wisconsin were stressed and overtopped. In Sauk County, a glacial deposit, which formed part of the shoreline of Lake Delton overtopped and the lake overflowed, washing five homes and part of County Highway A into the Wisconsin River. The Dell Creek Dam that had formed Lake Delton was left high and dry after the event, and the lake was reduced to a narrow stream.

Throughout the 2008 storm event, Wisconsin DNR Dam Safety staff monitored over 200 stressed dams. Ultimately, 25 dams sustained damage that required repair or reconstruction, including four that were breached. In the years since 2008, the state has experienced several dam failure incidents every year. Generally, these incidents have only had small, localized impacts.

After several years without funding, Wisconsin's dam owners can apply for funding through the Dam Grant Programs. Municipalities can now apply for dam maintenance, repair, reconstruction, or removal funds through the Municipal Dam Grant Program administered by the Wisconsin DNR. This competitive cost-share program provides up to \$400,000 to cover engineering and construction costs on dams owned by municipalities, counties, tribes, and public lake districts. The cost-share percentages vary from 33 to 100 percent according to project type and total cost. Privately-owned and federally-regulated dams are not eligible for assistance under this program.

A second grant program, the Removal Grant, provides any willing dam owner up to \$50,000 to remove dams they no longer wish to maintain. Any entity with legal access can also apply for funding to remove dams that have been abandoned by their owner. The removal grants reimburse 100% of eligible costs up to the grant maximum. Funding for eligible projects is awarded on a first-come, first-served basis. The 2015-17 Biennial Budget allocated \$4 million to the Dam Grant Programs; of this allocation, approximately \$3.5 million will be distributed to Municipal Dam Grant recipients, with the remainder going toward Dam Removal Grants. While other state and federal programs have funded past dam projects, they were all limited-time programs and are no longer available to state dam owners.

Table 3.3.2-7: Summary of 1993 Dam Failures/Damages

Season	County	Dam	Event
Winter	Juneau	Partridge Lake Dam	Dam was washed out
	Dodge	Lake Emily Dam	Dam was washed out/damaged
	Dodge	Lowell Dam	Dam was washed out/damaged
	Iowa	Cox Hollow Dam	Dam was washed out/damaged
	Iowa	Wright Dam	Dam was washed out/damaged
Spring	Jefferson	Hebron Dam	Dam was overtopped
	Jefferson	Upper Watertown Dam	Dam was overtopped
	Marquette	Briggsville Dam	Dam was washed out/damaged
	Racine	Waterford Dam	Dam was washed out/damaged
	Sheboygan	Gooseville Dam	Dam was washed out/damaged
	Clark	Humbird Dam	Embankments washed out
	Columbia	Jordan Dam	Emergency repairs made to prevent embankment failure
Summer	Columbia	Cambria Dam	Dam was washed out
	Dodge	Fox Lake Dam	Embankment problems caused seepage
	Eau Claire	Dells Dam	Damage to waterwheel
	Eau Claire	Fairchild Dam	Dike overtopped, road washed out

Table 3.3.2-7: Summary of 1993 Dam Failures/Damages

Season	County	Dam	Event
	Eau Claire	Lake Dam	Dam was washed out
	Eau Claire	Lake Eau Claire Dam	Gate broken in attempt to open it
	Eau Claire	Rock Dam	Dam was washed out
	Jackson	ASP Cranberry Dikes	Two dikes were washed out
	Jackson	Hatfield Dam	Dam was washed out
	Jackson	Roberts Cranberry Dikes	Four dikes were washed out
	Marquette	Packers Bay Dam	Embankment overtopped
	Oconto	Reservoir/Dummy Dams	Lake bypassed through low area, road damage
	Outagamie	Upper Appleton Dam	high head caused grout patch failure, seepage through wall
	Rock	Shopier Dam	Emergency repairs made to fill embankment breach
	Waupaca	Auld & Rohrer Dam	Contractor breached embankment to prevent spillway construction from failing
	Waupaca	Bass Lake Dam	Dam was washed out
	Trempealeau	Blair Dam	Slow gate operation caused downstream road embankment erosion

Source: Wisconsin Department of Natural Resources, 1993.

Landslides and Land Subsidence

Like dam failures, may of Wisconsin's notable landslides and land subsidence incidents have occurred during major flood events. The steep slopes and bluffs in the southwestern part of the state are particularly prone to mudslides, debris flows, and slumps. In 2000, during Presidential Disaster Declaration DR-1332-WI, a home in Grant County was damaged when its foundation partially collapsed as the hillside slumped from heavy rainfall. In 2001, a home in the City of Superior (Douglas County) was endangered as the entire yard started slipping downhill toward the Nemadji River. Although the house was 100 yards from the river and not in the floodplain, stream bank erosion from spring flooding had caused the ground within 15 feet of the house to slide downhill. The City of Superior applied for and received funding through the Hazard Mitigation Grant Program (HMGP) under Disaster Declaration 1369 to purchase and demolished the threatened structure from the landowner.

Falling rock is also a common problem along the bluffs of the Mississippi River. In 1995, a 55-ton boulder crashed into a Fountain City (Buffalo County) home, causing serious damage but fortunately no injuries. Seven years later, a 400,000-pound boulder rolled down a bluff in Fountain City (Buffalo County), leveling trees but causing little additional damage.

In 2002, seven properties along the St. Louis River in the Village of Oliver (Douglas County) experienced severe land subsidence. A combination of steep slopes, red clay soils, and ground vibrations from a nearby railroad line led to a massive slump in a residential area. Three of the seven properties affected were in imminent danger, including one home whose garage broke off

and dropped approximately 12 feet below the main slab, jeopardizing the structure's integrity and stability. A slip rate ranging from 1.5 to 4.5 inches per day quickly widened the distance between the main and displaced slabs. Figure 3.3.2-8 shows the 18-foot scarp that eventually developed as a result of the slump. The Village received HMGP grants through Disaster Declarations 1429 and 1432 to purchase and demolish this property and the other two properties deemed to be in imminent danger.

Main Slump Scarp

Displaced Garage Slab

Figure 3.3.2-8: Land Subsidence in the Village of Oliver (Douglas County)

Source: Wisconsin Emergency Management, 2002.

The area along the Upper Mississippi River was once again hard hit by severe storms on August 18-19, 2007. Over two days, 11-15" of rainfall deluged the "coulee country" from Winona, MN to Genoa and Viroqua (Vernon County). Bridges were awash as creeks that were 20 feet wide under normal conditions expanded to widths of 100 feet, or in some cases, flooded entire valleys. Waterfalls gushing over the rocky bluff faces turned normally stable soils into gelatinous flows down 600-foot-high bluffs. Mudslides, a few carrying homes with them, covered major and minor roads. Highway 35 from Goose Island to Stoddard (Vernon County) was covered in mud and debris. Two homes slid onto Highway 35 south of La Crosse (La Crosse County). A third home near Chaseburg (Vernon County) was destroyed by a mudslide. One yard in the Goose Island area (La Crosse County) had 25 dump trucks of mud removed.

Southwestern Wisconsin was again inundated with torrential rains during the week of June 21-27, 2013. The City of Boscobel (Grant County) received over 13 inches of rain that week, with 24-hour extremes reaching 7.79 inches. Flash flooding, damage to private and public property, power outages, and extensive road closures ensued. Many of the road closures were due to mudslides and washouts; in many areas, the mud was so thick that cleanup crews used snowplows to clear roadways. In addition to mudslides and washouts on county and local roads, Wisconsin Highway 35 was closed from Lynxville to Prairie du Chien due to mudslides and debris. A massive, 200-foot-long landslide buried Highway 61 with 25 feet of mud, rock, and debris in Crawford County near Boscobel. Luckily, no one was injured during the slide.

Heavy rains and flooding overnight on September 21-22, 2016 led to landslides in southwestern Wisconsin, where upwards of 7 inches of rain were received in some western Wisconsin locations. In Victory (Vernon County), mud created by the rain event pushed a home off of its

footings and down a bluff onto Highway 35 along the Mississippi River at approximately 4:30am.

Figure 3.3.2-9: Landslide Damage in La Crosse County, August 2007





Source: Wisconsin Emergency Management, 2007.

Figure 3.3.2-10: Mudslide Damage in Victory (Vernon County), September 2016





Source: Peter Thomson, La Crosse Tribune, 2016.

Tragically, the homeowner was inside the structure when the bluff failed and was killed during the collapse.

Land subsidence has played a role in several dam incidents. The abutments of the Steinhorst and Coughlin dam in Sauk County, for example, have become weakened by the gradual development of sinkholes over the years. In 1994, piping at the meeting point of the dam embankment and underlying fractured bedrock led to the development of a nine foot sinkhole. In 2005, a second sinkhole formed in the embankment over the course of a year, this time seven feet in diameter. Upon inspection, several other small sinkholes were also observed on other parts of the embankment.

3.3.3 Probability, Impact, and Mitigation Potential

3.3.3.1 Flooding

Hazard Ranking

Evaluation Criteria	Description	
Probability	 The hazard has impacted the state numerous times on an annual basis The hazard is widespread, generally affecting regions or multiple counties in each event There is a reliable methodology for identifying events and locations 	High
Mitigation Potential	 Methods for reducing risk from the hazard are technically reliable The state or counties have experience in implementing mitigation measures Mitigation measures are eligible under federal grant programs There are multiple possible mitigation measures for the hazard The mitigation measures are known to be cost-effective 	High

Frequency and Probability

Floods are described in terms of their extent and the related probability of occurrence. Flood studies use historical records to determine the probability of occurrence for different extents of flooding. From these records, a probability of occurrence is determined and expressed in a percentage. The percentage describes the chance that the level of flood water exceeds a certain height, on average in any given year.

The most widely adopted design and regulatory standard for floods in the US is the **one-percent annual chance flood (base flood)**, which has been formally adopted by FEMA. The base flood, or "100-year flood," has a one-percent chance of occurring in any particular year. This measure is a simple and general way to express the statistical likelihood of a flood; actual recurrence periods vary from place to place. The area that is inundated during the base flood is called the **Special Flood Hazard Area (SFHA)**.

Smaller floods occur more often than larger, deeper, and more widespread floods. Thus, a "10-year" flood has a greater likelihood of occurring than a "100-year" flood. The table in Figure 3.3.3.1-1 shows a range of flood recurrence intervals and their probabilities of occurrence.

It is important to note that the risk of a flood event occurring changes over time. Since natural hazards do not affect a particular location every single year, the focus is on the overall probability of the event occurring over a selected time horizon. Assuming that most hazard events are independent outcomes, the probability of a 100-year flood occurring at any given time is 1/100 or 0.01 (one-percent annual chance). However, the probability of a 100-year flood occurring at least once over the next 100 years is 1-(0.99)^100=0.63 (63-percent chance).

Figure 3.3.3.1-1 Flood Probability Terms

Flood Recurrence Intervals	Annual Percent Chance of Occurrence
10-year	10.0%
25-year	4.0%
50-year	2.0%
100-year	1.0%
500-year	0.2%

Source: FEMA, 2016.

This plan considers hazards over the entire State of Wisconsin; however, flood probability and magnitude are highly location-specific, so it is not possible to characterize these generally across the state in a meaningful way. The State Plan includes flood risk assessments that implicitly include probability and magnitude determinations on a state and county basis. However, truly accurate determinations of flood probability and magnitude require site-specific engineering studies and data-gathering that is beyond the scope of this hazard profile.

Impacts and Mitigation Potential

Flooding is Wisconsin's most costly natural disaster, generating direct costs such as rescue and relief efforts, clean-up operations, and rebuilding public and private structures, as well as indirect costs, such as business interruptions, loss of wages, tax base declines in flood blighted areas, and subsidies for flood insurance. The statewide flood risk assessment is an initial step in identifying and quantifying vulnerability to flood damage throughout Wisconsin. This assessment estimates the potential direct costs of damage to structures located in or near the 100-year/one-percent annual chance floodplain. The results of this analysis can serve as a starting point for highlighting areas at risk to flood damage.

To complete this risk assessment, WEM used the newly-developed statewide parcel inventory to determine the value of improved structures located on parcels that fall within the one-percent annual chance floodplain. **Wisconsin's Statewide Parcel Dataset** was created through a joint effort by the Department of Administration, the State Cartographer's Office, and local governments. The statewide dataset contains aggregated information from existing county and municipal parcel datasets and is available to the public through both a web application and file geodatabase download. The GIS parcel layer contains attributes such as assessed value and property class for 3.46 million parcels across the state.

The **National Flood Hazard Layer (NFHL)** shapefile provided SFHA boundaries for the majority of counties. The NFHL is a digital database produced by FEMA that contains flood hazard mapping data from FIRMs and Letters of Map Revision (LOMRs) maintained through the NFIP. The NFHL dataset represents the current effective flood risk data for areas where maps have been modernized. For counties where maps have not been modernized and NFHL data is not

available, it was necessary to approximate the floodplain boundary through other means.

For the flood risk assessment included the *2011 State of Wisconsin Hazard Mitigation Plan*, alternative floodplain datasets were used to generate flood depth grids. **Digital Q3 Flood Data** containing base flood boundaries was available for three counties in 2011. Q3 data was the first GIS product FEMA created as part of its map modernization program before it was replaced by the now-standard DFIRM products. Q3 data shows the location of the SFHA, but does not include BFE values.

For counties lacking both DFIRM and Q3 data, previous researchers used **Hazus-MH** to generate 100-year flood boundaries. Hazus is a software tool developed by FEMA that uses GIS software to map and display hazard data and estimate damage and economic loss buildings and infrastructure for flood, hurricane, and earthquake events. The software's functionality also includes generating floodplain boundaries and flood depth grids. This analysis used Hazus-generated floodplain boundaries created in 2011 based on hydrologic and hydraulic (H&H) analyses performed at square mile intervals on all stream reaches identified from USGS 30-meter digital elevation models (DEMs). The table in Figure 3.3.3.1-2 breaks down the proportions of counties with DFIRM-, Q3-, or H&H-based floodplain boundaries; this information is displayed graphically in Figure 3.3.3.1-3.

Figure 3.3.3.1-2: Flood Risk Data Sources

Sources	Counties (n)
DFIRM	61*
Q3	1
H&H + FIS Discharge Values	11*
Total	72*

^{*}In Lafayette County, DFIRM data was available for the City of Darlington and surrounding areas only. H&H/FIS-based floodplain boundaries were combined with the DFIRM data to create a floodplain layer for the entire county.

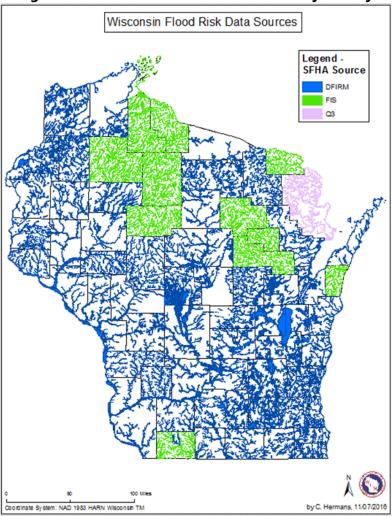


Figure 3.3.3.1-3: Flood Risk Data Sources by County

The statewide parcel layer and floodplain data layers were analyzed in ArcMap 10.4.1. To prepare for the analysis, the parcel layer records were narrowed down to include only parcels that contain improved structures. Floodplain boundary data from the NFHL was selected to include only Zones A (one-percent annual chance of flood, no elevation data) and AE (one-percent annual chance of flood, elevation data available). The amended parcel and floodplain layers were then intersected to identify areas of overlap. The end product was a shapefile comprised of improved parcels located at least partially in the one-percent annual chance/100-year floodplain. This methodology was repeated for those 12 counties without DFIRM data. Instead, the HAZUS-generated floodplains (Q3 and H&H + FIS) were intersected with the parcels with improved structures, resulting in a similar analysis. The model used to conduct this analysis is outlined in Figure 3.3.3.1-4.

Figure 3.3.3.1-4: Flood Risk Assessment Methodology

Source: Wisconsin Emergency Management, 2016.

The analysis was conducted for the entire state. Results were then exported into Microsoft Excel and subtotaled by county. The table in Figure 3.3.3.1-5 displays some of the results from this analysis, as well as each county's population according to the 2010 Decennial Census. The total number of improved parcels and number of improved parcels located in the Special Flood Hazard Area was calculated for each county. The value of improvements was used to approximate the replacement cost of structures located on each parcel; values for all improved parcels as well as improved parcels in the SFHA are provided below.

Figure 3.3.3.1-5: Results of SFHA/Parcel Layer Overlay

County	Population	Improved Parcels (n)	Improved Parcels in SFHA (n)	Total Value of Improvements (\$)	Value of Improvements SFHA Parcels (\$)
Adams	20,875	19,870	2,707	\$1,522,709,334	\$250,913,700
Ashland	16,157	8,563	1,528	\$760,455,290	\$173,513,570
Barron	45,870	22,868	5,486	\$2,715,975,600	\$744,847,200
Bayfield	15,014	12,849	2,403	\$1,245,829,300	\$323,440,700
Brown	248,007	82,593	9,355	\$13,739,669,900	\$2,061,740,900
Buffalo	13,587	4,765	492	\$447,283,900	\$47,931,500
Burnett	15,457	14,658	6,624	\$1,373,818,100	\$724,190,100
Calumet	48,971	18,593	1,585	\$2,919,526,400	\$266,146,000
Chippewa	62,415	26,409	3,304	\$3,410,363,300	\$477,442,700
Clark	34,690	15,398	1,754	\$1,386,685,000	\$170,014,600
Columbia	56,833	24,051	4,054	\$3,372,457,428	\$538,214,200
Crawford	16,644	2,509	317	\$177,769,300	\$20,901,300
Dane	488,073	162,105	7,974	\$36,257,251,291	\$1,920,635,197
Dodge	88,759	31,845	4,668	\$4,444,474,704	\$739,497,551
Door	27,785	24,976	5,361	\$4,213,314,000	\$1,112,666,000
Douglas	44,159	20,204	3,454	\$2,224,653,900	\$421,656,300
Dunn	43,857	15,765	1,912	\$2,093,340,300	\$231,748,100
Eau Claire	98,736	34,095	2,707	\$5,346,320,500	\$486,363,500
Florence	4,423	4,933	732	\$336,326,400	\$51,127,400
Fond Du Lac	101,633	37,487	6,100	\$5,373,928,430	\$913,860,300
Forest	9,304	8,555	2,137	\$589,181,460	\$168,835,640

County	Population	Improved Parcels (n)	Improved Parcels in SFHA (n)	Total Value of Improvements (\$)	Value of Improvements SFHA Parcels (\$)	
Grant	51,208	20,939	1,319	\$2,126,568,330	\$108,763,270	
Green	36,842	15,110	1,399	\$2,049,796,250	\$216,916,700	
Green Lake	19,051	10,622	2,230	\$1,282,934,920	\$362,595,600	
Iowa	23,687	10,991	939	\$1,373,621,500	\$110,534,200	
Iron	5,916	5,973	1,069	\$484,329,600	\$107,134,700	
Jackson	20,449	10,056	1,137	\$970,155,700	\$128,873,500	
Jefferson	83,686	30,259	4,359	\$4,716,349,353	\$708,410,473	
Juneau	26,664	14,498	2,112	\$1,349,762,100	\$188,198,200	
Kenosha	166,426	53,281	3,602	\$8,300,438,500	\$1,226,684,100	
Kewaunee	20,574	9,305	1,374	\$1,385,046,875	\$577,700	
La Crosse	114,638	37,969	3,419	\$6,115,549,300	\$719,122,400	
Lafayette	16,836	8,077	1,133	\$788,845,800	\$108,549,700	
Langlade	19,977	11,545	1,691	\$1,012,947,910	\$151,797,840	
Lincoln	28,743	15,774	2,680	\$1,531,906,900	\$298,585,900	
Manitowoc	81,442	33,211	2,376	\$4,006,212,200	\$363,902,500	
Marathon	134,063	52,027	4,662	\$7,289,697,334	\$719,705,800	
Marinette	41,749	29,807	5,463	\$2,486,257,810	\$597,858,820	
Marquette	15,404	7,328	1,630	\$721,319,537	\$161,145,907	
Menominee	4,232	1,504	331	\$166,323,800	\$40,179,800	
Milwaukee	947,735	270,147	7,249	\$34,413,186,291	\$1,842,736,182	
Monroe	44,673	18,178	2,061	\$2,215,353,300	\$290,311,400	
Oconto	37,660	24,716	5,831	\$2,407,673,968	\$568,920,468	
Oneida	35,998	31,970	8,819	\$5,563,847,700	\$1,573,408,400	
Outagamie	176,695	63,474	3,633	\$10,538,719,900	\$831,695,200	
Ozaukee	86,395	34,267	4,593	\$7,882,477,700	\$1,164,950,700	
Pepin	7,469	5,028	566	\$554,133,000	\$58,557,700	
Pierce	41,019	14,670	1,448	\$2,196,933,600	\$220,161,100	
Polk	44,205	21,772	3,834	\$2,565,026,000	\$516,817,600	
Portage	70,019	25,893	1,704	\$3,512,066,000	\$256,026,400	
Price	14,159	10,843	2,647	\$828,720,200	\$225,878,600	
Racine	195,408	69,451	5,533	\$10,033,843,210	\$1,081,114,800	
Richland	18,021	8,540	1,564	\$755,749,700	\$138,199,900	
Rock	160,331	59,066	3,726	\$7,424,038,822	\$599,541,550	
Rusk	14,755	9,832	2,408	\$710,228,100	\$187,406,500	
Sauk	84,345	28,080	3,405	\$4,744,555,300	\$544,862,800	
Sawyer	61,976	14,941	2,801	\$1,571,546,900	\$297,119,200	
Shawano	16,557	20,313	2,946	\$2,026,192,133	\$311,789,564	
Sheboygan	41,949	43,096	3,036	\$6,464,610,000	\$651,846,800	
St Croix	115,507	32,320	3,038	\$5,565,642,300	\$480,546,000	
Taylor	20,689	9,790	1,400	\$879,532,800	\$125,381,700	
Trempealeau	28,816	13,301	2,188	\$1,476,936,673	\$234,280,000	
Vernon	29,773	8,322	837	\$830,455,400	\$67,647,000	

County	Population	Improved Parcels (n)	Improved Parcels in SFHA (n)	Total Value of Improvements (\$)	Value of Improvements SFHA Parcels (\$)	
Vilas	21,430	23,677	3,666	\$3,200,625,900	\$600,992,900	
Walworth	102,228	43,988	3,591	\$9,571,298,311	\$1,172,724,600	
Washburn	15,911	13,044	4,995	\$1,318,562,900	\$599,159,700	
Washington	131,887	49,130	6,203	\$9,341,066,900	\$1,200,627,500	
Waukesha	389,891	138,200	11,093	\$32,512,664,457	\$3,098,127,530	
Waupaca	52,410	24,009	5,085	\$2,732,147,622	\$617,430,895	
Waushara	24,496	16,204	3,912	\$1,554,145,445	\$420,917,130	
Winnebago	166,994	59,857	7,102	\$8,993,160,500	\$1,273,019,350	
Wood	74,749	30,556	2,863	\$3,679,798,900	\$411,755,600	
TOTAL	5,686,986	2,208,042	241,356	\$330,174,337,488	\$39,829,178,337	

Sources: Wisconsin Land Information Program, 2016; FEMA Map Service Center, 2016; U.S. Census Bureau, 2010; Wisconsin Emergency Management, 2016.

The same method was used to assess the flood risk of Wisconsin's critical infrastructure and key resources (CI/KR). A list of 544 geocoded CI/KR facilities is maintained by WEM's CI/KR Program and was last updated in 2013. The GIS data layer for CI/KR facilities was intersected with the floodplain data layers described above to identify essential facilities located in the SFHA.

Statewide, the results of the 2016 flood risk assessment indicate that approximately 11% of the Wisconsin's improved parcels are located at least partially in the "100-year" floodplain. The value of the improvements on these parcels amounts to over \$39.8 billion.

The number of improved SFHA parcels in each county is displayed in Figure 3.3.3.1-7. Waukesha, Brown, Oneida, Dane, and Milwaukee Counties represent the areas with both the greatest number and greatest value of improved parcels in the SFHA. Waukesha County leads the state in both total number of parcels in the floodplain (11,093) and value of potentially-vulnerable improvements (over \$3 billion).

Looking exclusively at the raw numbers, counties with a high number of parcels in the SFHA appear to be concentrated in the southern and southeastern parts of the state. When viewed as a proportion of total improved parcels, however, the concentration shifts to the north/northwest (Figure 3.3.3.1-8). The counties with the greatest proportion of improved parcels in the SFHA relative to the total number of improved parcels are Burnett (45% of improved parcels located in the SFHA), Washburn (38%), Oneida (28%), Forest (25%), and Rusk (24%).

When viewed as a proportion of the total number of improved parcels countywide, the counties with the highest raw number and value of SFHA parcels rank toward the bottom of the list. Milwaukee and Dane Counties rank last with 3% and 5% of their improved parcels located in the SFHA, respectively; Waukesha ranks 60th with 8%, while Brown County ranks 47th with 11% of its improved parcels in the SFHA.

The counties with the greatest proportion of their total improvement value located on SFHA parcels are Burnett (53%), Washburn (45%), Forest (29%), Oneida (28%), and Green Lake (28%). Despite their high total value of improvements on SFHA parcels compared to other counties, the proportions of these values in Milwaukee (5%), Dane (5%), Waukesha (9%), and Brown Counties (15%) are small relative to the high total value of improvements in these counties.

The table in Figure 3.3.3.1-6 displays the number and type of essential facilities located in the SFHA by county. Statewide, nine essential facilities in five counties are at risk of inundation during a one-percent annual chance flood event. Relocation of large and complex facilities, such as water treatment and energy plants, is unlikely to be a practical mitigation strategy. Mitigation efforts at such facilities tend to focus on protection and system redundancy to prevent damage and loss of service.

Figure 3.3.3.1-6: Essential Facilities Located in the SFHA

County	WTP	Energy	Chemical / Hazardous Material	Ag/Food	Cultural	Manufacturing	TOTAL
Brown	1	1					2
*Marinette			2			1	3
Milwaukee				1	1		2
Rock	1						1
Wood			1				1
TOTAL	2	1	3	1	1	1	9

^{*}Marinette County's floodplains are HAZUS-generated and not part of the NFIP.

Source: FEMA Map Service Center, 2016, Wisconsin Emergency Management, 2013.

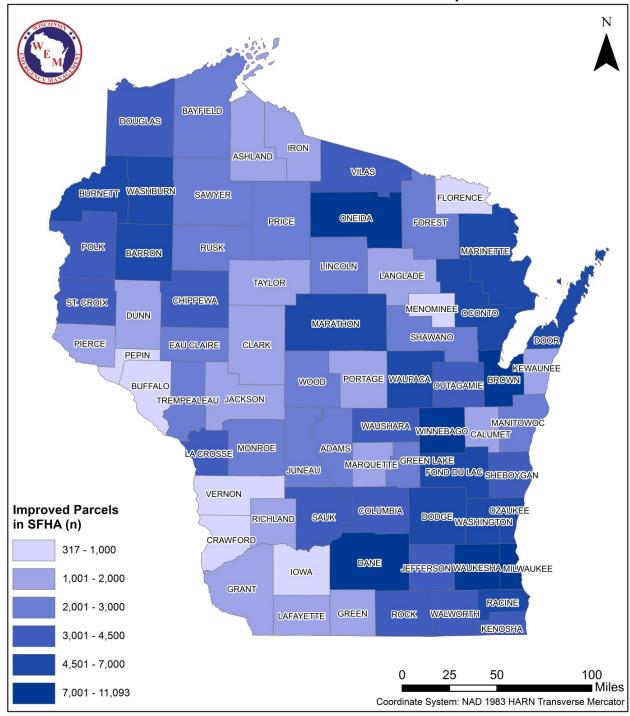


Figure 3.3.3.1-7: Number of Improved Parcels in the 100-Year/One-Percent-Annual-Chance Floodplain

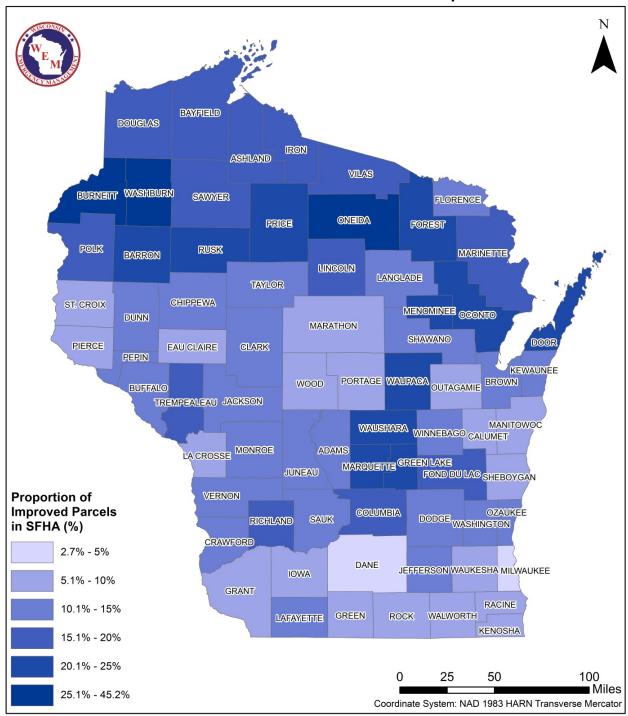


Figure 3.3.3.1-8: Percent of Improved Parcels in the 100-Year/One-Percent-Annual-Chance Floodplain

BAYFIELD DOUGLAS IRON ASHLAND **VILAS** BURNETT WASHBURN SAWYER **FLORENCE ONEIDA** PRICE FOREST **POLK** RUSK MARINETTE LINCOLN LANGLADE TAYLOR **CHIPPEWA** ST. CROIX MENOMINEE OCONTO DUNN SHAWANO DOOR PIERCE **EAU CLAIRE** CLARK PEPIN KEWAUNEE PORTAGE WAUPACA OUTAGAMIE **BROWN** TREMPEALEAU JACKSON WAUSHARA WINNEBAGO CALUMET MANITOWOC MONROE LACROSSE MARQUETTE GREEN LAKE JUNEAU FOND DU LAC SHEBOYGAN VERNON **OZAUKEE** SAUK DODGEWASHINGTON RICHLAND CRAWFORD DANE JEFFERSON WAUKESHA MILWAUKEE IOWA GRANT RACINE ROCK WALWORTH LAFAYETTE **GREEN** KENOSHA Value of Improvements on \$325 million - \$550 million SFHA Parcels (USD) \$550 million - \$1 billion \$577,700 - \$125 million \$1 billion - \$2 billion \$125 million - \$200 million 50 100 \$2 billion - \$3.1 billion \$200 million - \$325 million Coordinate System: NAD 1983 HARN Transverse Mercator

Figure 3.3.3.1-9: Value of Improvements for Improved Parcels in the 100-Year/One-Percent-Annual-Chance Floodplain

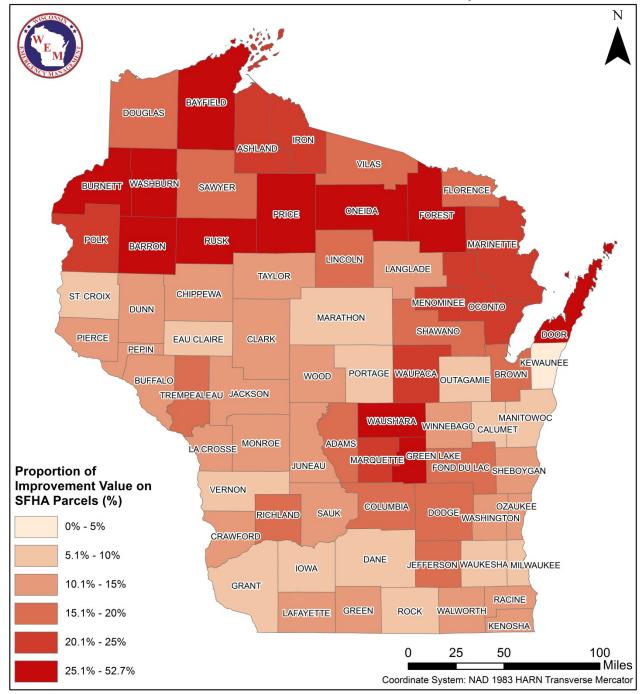


Figure 3.3.3.1-10: Percent of Total Improvement Value in the 100-Year/One-Percent-Annual-Chance Floodplain

Wisconsin's statewide parcel inventory is the most detailed, accurate, and up-to-date source of information on development patterns in the state. However, it does not include locational information for structures within each parcel, making it an imperfect representation of a given parcel's true flood risk. Although a parcel may fall within the SFHA boundary, this does not necessarily indicate that the improved structure on that parcel will be affected by floodwaters. Results may be particularly skewed in areas with large parcel sizes, such as north/northwestern counties where development is less much less dense than in south/southeastern counties. The results of the flood risk assessment are thus an interesting starting point for discussions of mitigation potential, but they are not necessarily conclusive. In order to make informed mitigation decisions, it is necessary to review multiple types of information from a wide array of sources.

There are many different approaches to characterizing flood risk and mitigation potential. Developing a comprehensive, holistic view of flooding in the state requires looking at different time scales – documenting past history and modeling potential future scenarios – and data levels – reviewing data for the state, counties, communities, and individual properties. When assessing mitigation potential, WEM considers a variety of other factors for each county, such as number of repetitive and severe repetitive loss properties, flood insurance claims, and involvement in past disaster declarations.

Every county in the state has been included in at least one flood-related Presidential Disaster Declaration (Figure 3.3.3.1-11). Crawford (11), Vernon (11), Grant (10), Green (9), and Milwaukee (9) have been involved in the most declarations since 1973. Communities within Waukesha, Kenosha, Milwaukee, Crawford, Jefferson, Lafayette, and Dane Counties (including the counties themselves) have received the greatest number of Hazard Mitigation Assistance grants (HMGP, PDM, and FMA) for completing flood-related projects.

Additional reports that describe different aspects of flood risk and mitigation potential are included as attachments to this plan. The *State of Wisconsin Repetitive Loss Report* provided in Appendix E analyzes data on properties repeatedly damaged by flooding and the communities where such properties are located. As a part of FEMA's Flood Risk Program, the Wisconsin DNR conducted several Level 2 HAZUS analyses for the Upper and Lower Rock (2013), Upper Fox (2016), and Lower Wisconsin (2014) watersheds; detailed results of these analyses can be found on the DNR's website.

Wisconsin communities may use the results of this analysis to identify mitigation actions that protect structures on parcels that fall partially or completely within the SFHA. Different mitigation actions will work best in different places. The most effective way to eliminate flood risk is to prevent new development in the floodplain and remove existing structures where possible. Development can still connect residents to the waterfront through public parks, boat landings, and other uses that can withstand periodic inundation. For properties of historic or cultural significance, or in areas where it is not practical to diminish the tax base, flood damages may be avoided by elevating and/or floodproofing existing floodplain structures. Alternatively, communities may look to increase flood storage capacity in other parts of their watershed through open space preservation or the installation of detention basins, etc. Large structural

projects may prove to be cost prohibitive for many communities, and may not be feasible to install in areas that are already highly developed; levees, dams, berms and other large projects should be considered only when absolutely necessary.

Figure 3.3.3.1-11: Number of Flood-Related Disaster Declarations and HMA Grants by County

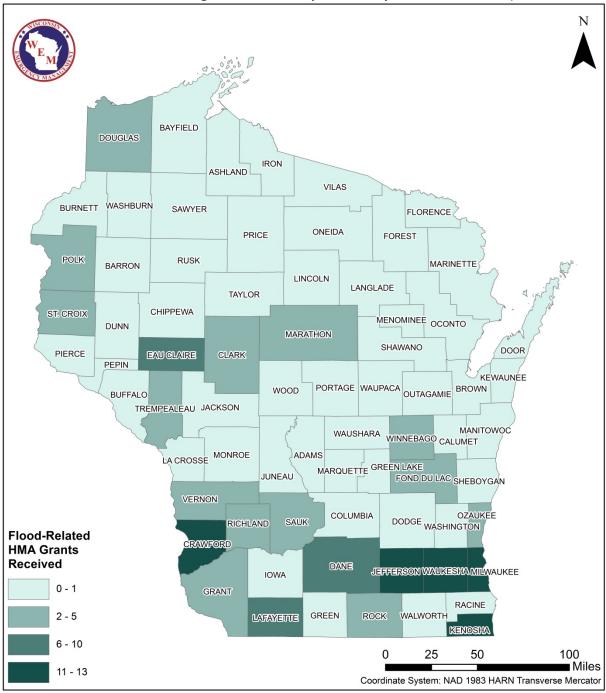
County	Flood-Related Disaster Declarations	Flood- Related HMA Grants
Adams	7	0
Ashland	6	0
Barron	2	1
Bayfield	5	0
Brown	4	0
Buffalo	5	0
Burnett	3	0
Calumet	6	0
Chippewa	5	0
Clark	7	3
Columbia	5	1
Crawford	11	11
Dane	6	9
Dodge	5	0
Door	1	0
Douglas	4	5
Dunn	5	0
Eau Claire	3	6
Florence	2	0
Fond Du Lac	5	4
Forest	1	1
Grant	10	4
Green	9	1
Green Lake	4	0
Iowa	7	0
Iron	4	0
Jackson	5	1
Jefferson	5	11
Juneau	8	1
Kenosha	7	13
Kewaunee	3	0
La Crosse	6	1
Lafayette	5	10
Langlade	1	0
Lincoln	2	0
Manitowoc	4	0

	Flood-Related	Flood-
County	Disaster	Related
	Declarations	HMA Grants
Marathon	4	2
Marinette	2	0
Marquette	3	0
Menominee	1	0
Milwaukee	9	12
Monroe	7	0
Oconto	1	0
Oneida	2	0
Outagamie	5	0
Ozaukee	5	5
Pepin	4	0
Pierce	4	1
Polk	3	2
Portage	5	0
Price	2	0
Racine	6	1
Richland	8	4
Rock	7	2
Rusk	5	0
Sauk	6	4
Sawyer	3	0
Shawano	1	0
Sheboygan	4	1
St Croix	3	2
Taylor	2	0
Trempealeau	4	3
Vernon	11	5
Vilas	1	0
Walworth	3	1
Washburn	3	1
Washington	3	0
Waukesha	7	13
Waupaca	3	0
Waushara	4	1
Winnebago	6	2
Wood	5	0

BAYFIELD DOUGLAS IRON ASHLAND VILAS BURNETT WASHBURN SAWYER FLORENCE ONEIDA PRICE FOREST **POLK** RUSK MARINETTE BARRON LINCOLN LANGLADE **TAYLOR** CHIPPEWA ST. CROIX MENOMINEE OCONTO DUNN MARATHON SHAWANO DOOR PIERCE CLARK EAU CLAIRE PEPIN KEWAUNEE PORTAGE WAUPACA OUTAGAMIE BROWN **BUFFALO** TREMPEALEAU JACKSON WAUSHARA WINNEBAGO CALUMET MANITOWOC LACROSSE MONROE **ADAMS** MARQUETTE GREEN LAKE JUNEAU FOND DU LAC SHEBOYGAN VERNON COLUMBIA OZAUKEE DODGE WASHINGTON RICHLAND SAUK Flood-Related CRAWFORD Disaster Declarations (n) DANE JEFFERSON WAUKESHA MILWAUKEE **IOWA GRANT** RACINE 2 - 5 **GREEN** ROCK WALWORTH LAFAYETTE 6 - 10 0 100 25 50 Coordinate System: NAD 1983 HARN Transverse Mercator

Figure 3.3.3.1-12: Number Flood-Related Presidential Disaster Declarations by County

Figure 3.3.3.1-13: Number of HMA Grants Awarded for Flood-Related Mitigation Projects (HMPG, PDM, and FMA grants received by the county itself or its municipalities)



3.3.3.2 Dam Failure

Hazard Ranking

Evaluation Criteria	Description	
Probability	 The hazard has impacted the state annually or more frequently The hazard is widespread, generally affecting regions or multiple counties in each event There is a reliable methodology for identifying events and locations 	High
Mitigation Potential	 Mitigation measures are established The state or counties have limited experience with the kinds of measures that may be appropriate to mitigate the hazard Some mitigation measures are eligible for federal grants There is a limited range of effective mitigation measures for the hazard Mitigation measures are cost-effective only in limited circumstances Mitigation measures are effective for a reasonable period of time 	Medium

Frequency and Probability

Since 1917, the DNR has administered the Dam Safety program under Chapter 31 in the Wisconsin State Statutes, which regulates all dams and bridges affecting navigable waters in the State (Wisconsin Code § 31). Chapter NR 333 was recreated in 1985, changing the way that dam safety is enforced for large dams that are State-regulated in order "to minimize the danger to life, health, and property" (Wisconsin Code § NR 333.01). NR 333 mandates that all State-regulated large dams have an Emergency Action Plan (EAP) and an Inspection, Operation, and Maintenance (IOM) Plan which are approved in accordance with NR 333.

Under NR 333, the DNR assigns hazard ratings to large dams in the state. When assigning hazard ratings, DNR Dam Safety staff considers both the existing land use and land use controls (zoning) downstream of the dam. Dams are classified in one of three categories that identify their potential hazard to life and property:

- 1. **High hazard** failure of dam would probably result in the loss of life
- 2. **Significant hazard** failure of dam could result in appreciable property damage
- 3. **Low hazard** failure would result in only minimal property damage and loss of life is unlikely

Figure 3.3.3.2-1 shows the locations of dams in Wisconsin with high or significant hazard ratings. The map only includes dams for which the DNR has approved a dam failure analysis and rated the dam as high or significant hazard. There are several dams without dam failure analyses throughout the state. The majority of these are estimated to be low hazard potential. Of the dams shown on the map, very few high- or significant-hazard dams are near high population centers such as the Madison, Milwaukee, or Fox River Valley areas.

Figure 3.3.3.2-2 displays large, state-regulated dams that have not had a hazard analysis approved. A vast majority of these dams are estimated to have low hazard potential. The DNR Dam Safety program is working to get all analyses reviewed and approved over the next 10 years, giving the highest priority to dams estimated to be significant or high hazard.

Impacts and Mitigation Potential

The economic impact of a dam or levee failure includes, but is not limited to, the cost to repair the structure, the flood damage resulting from the failure, and loss of income due to displaced businesses or workers. Though there have been very few dam failures in Wisconsin resulting injuries or loss of life, many existing dams require frequent repairs, and preventing potential failures due to maintenance issues is always a top concern.

Dam IOM plans and EAPs must also be approved in accordance with NR 333 for all large, state-regulated dams. IOMs and EAPs are evaluated for compliance in the following situations:

- When a new dam is being designed and constructed
- Within ten years of performing a hazard analysis on an existing dam
- When an existing dam is reconstructed
- After a dam failure analysis is approved by the DNR
- When a dam is adopted in a floodplain zoning ordinance
- When the DNR issues a department directive ordering a dam safety inspection

Figure 3.3.3.2-3 shows the approval status of IOM Plans for large, state-regulated dams. IOMs identify who is responsible for operating, inspecting, and maintaining a given dam. IOM plans describe the dam's structure and history, its operation during different flow rates, and its inspection and maintenance schedules. Many of Wisconsin's past dam incidents have involved failures due to deteriorated or nonfunctioning components. IOM planning represents an important mitigation action designed to help dam owners organize information, ensure proper maintenance, prevent dam failure, and ultimately protect life and property downstream. There are about 460 dams without approved IOM Plans as of June 2016. The state does not typically keep IOM Plans for federally regulated dams on file, so these dams are not represented in Figure 3.3.3.2-3.

Figure 3.3.3.2-4 shows the EAP approval status for large, state-regulated dams. An EAP is a formal document unique to each dam which identifies potential emergency conditions and lays out specific procedures to mitigate problems, notify local emergency managers, and protect the affected population. Plans must be tailored to site-specific conditions as well as the requirements of the individual, agency, or organization that operates the dam. Both the EAP and IOM are important documents in the state and dam owner's efforts to eliminate the loss of life and reduce the risk of property damage in downstream areas which may result from a dam failure. The state is working towards 100% compliance for all state-regulated, large dams with a focus on high and significant hazards dams over the next several years.

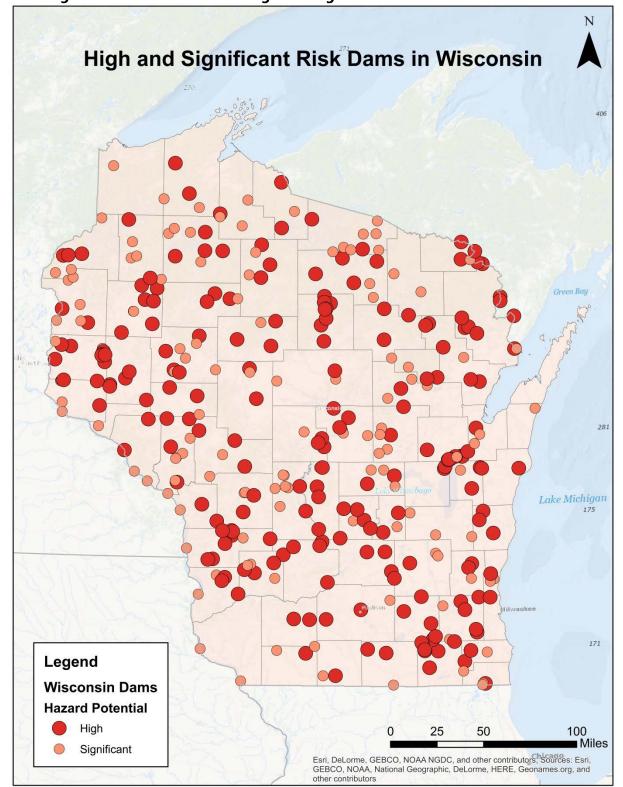


Figure 3.3.3.2-1: Location of High and Significant Hazard Dams in Wisconsin.

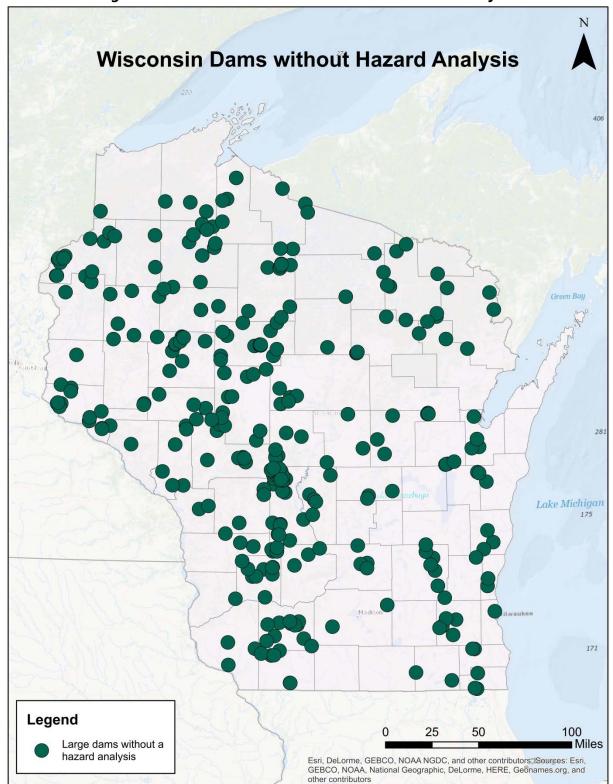


Figure 3.3.3.2-2: Wisconsin Dams Without a Hazard Analysis.

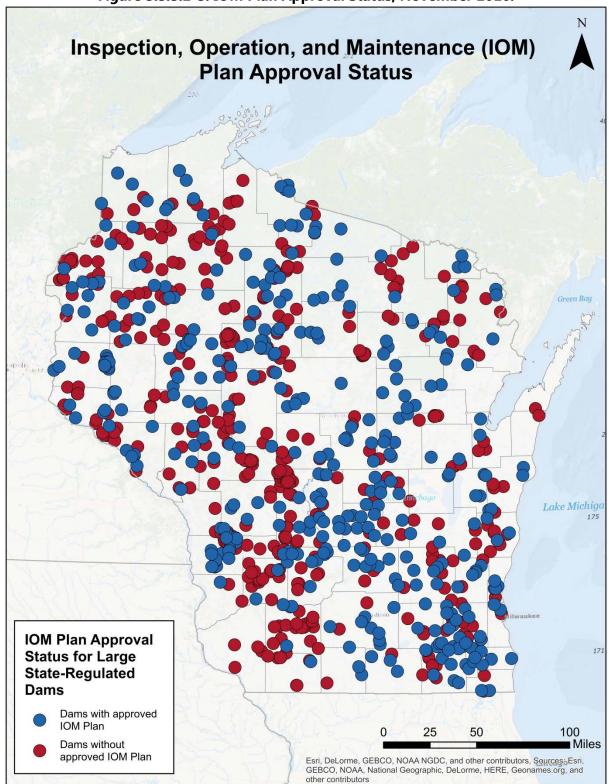


Figure 3.3.3.2-3: IOM Plan Approval Status, November 2016.

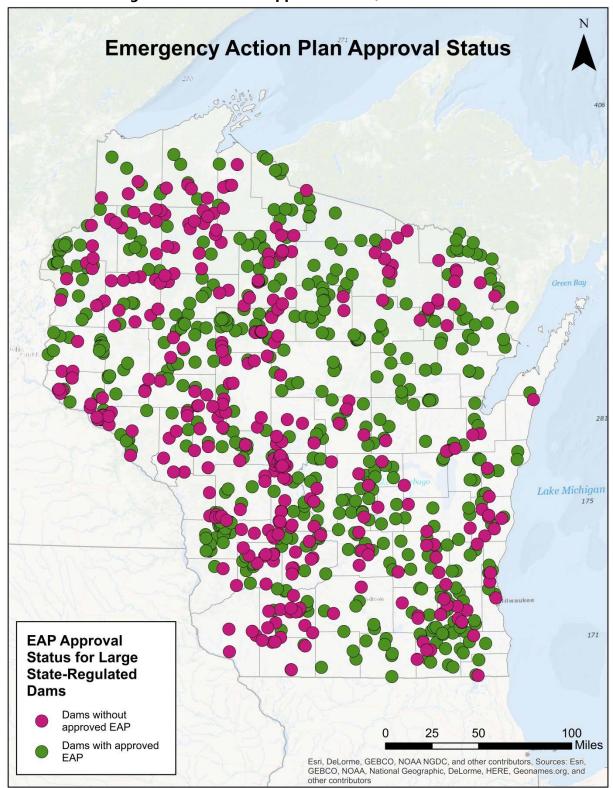


Figure 3.3.3.2-4: EAP Approval Status, November 2016.

3.3.3.3 Landslides and Land Subsidence

Hazard Ranking

Evaluation Criteria	Description	Ranking
Probability	 The hazard impacts the state occasionally, but not annually The hazard is somewhat localized, affecting only relatively small or isolated areas when it occurs The methodology for identifying events is not well-established, or is not applied across the entire state 	Medium
Mitigation Potential	 Methods for reducing risk from the hazard are not well-established, are not proven to be reliable, or are experimental The state or counties have little or no experience in implementing mitigation measures, and/or no technical knowledge of them There is a very limited range of mitigation measures for the hazard, and usually only one feasible alternative The mitigation measures have not been proven cost-effective and are likely to be very expensive compared to the magnitude of the hazard The long-term effectiveness of the measure is not known or is known to be relatively poor 	Low

Frequency and Probability

Landslide probability is highly site-specific, and cannot be accurately characterized on a statewide basis, except in the most general sense. Statewide analyses for potential have been performed by the US Geological Survey (USGS) and the Wisconsin Geological and Natural History Survey (WGNHS).

Figure 3.3.3.3-1 displays the karst potential in the state. Most areas at greatest risk of shallow karst potential (less than 50 feet below surface) can be found in the far western and southwestern portions of the state in Buffalo, Crawford, Grant, Green, Iowa, La Crosse, Lafayette, Monroe, Pepin, Richland, Trempealeau, and Vernon counties. One main outlying area, Door County, is also at risk for shallow karst potential. Deeper karst potential (more than 50 feet below ground surface) is found largely in the eastern portion of the state along the Fox River, and into southeastern Wisconsin.

Figure 3.3.3.3-2, on the following page shows the areas of high landslide incidence and susceptibility in the state. The dark green areas indicate the portions of the state with high susceptibility and moderate incidence of landslides. This area coincides with the shallow karst potential along the western part of the state in Buffalo, Crawford, Grant, La Crosse, Pepin, Pierce, Trempealeau, and Vernon counties.

The area with the highest incidence, in red, is limited to Douglas County along the St. Louis River, near the City of Superior. Another area to highlight is the shoreline along Lake Michigan.

Racine and Kenosha counties are highly susceptible, due to coastal erosion, but experience low incidence. The rest of the Lake Michigan coastal counties (Door, Kewaunee, Manitowoc, Milwaukee, Ozaukee, and Sheboygan) experience moderate incidence of landslides. Last, the Fox River valley, along with other areas in the state vulnerable to deeper karst potential, experiences moderate susceptibility, but low incidence of landslide.

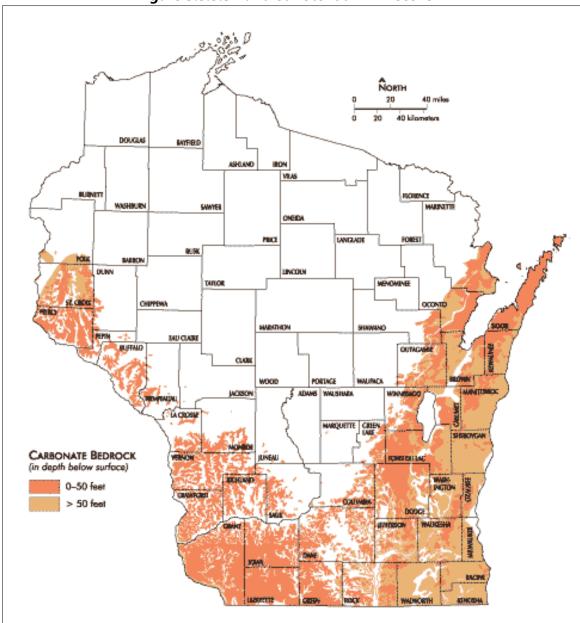


Figure 3.3.3.3-1: Karst Potential in Wisconsin

Source: Wisconsin Geological & Natural History Survey, 2013.



Figure 3.3.3.3-2: Landslide Incidence and Susceptibility in Wisconsin

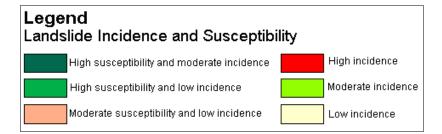


Figure 3.3.3.3-3: Landslide on Highway 61 in Crawford County near Boscobel, June 2013

Source: Wisconsin Emergency Management, 2013.

Impacts and Mitigation Potential

Landslides, particularly in the southwestern part of the state, have impacted many of Wisconsin's structures and infrastructure. The most common impact of landslides is damage to or closure of roadways. In a few instances, landslides have led to the sudden and sometimes deadly destruction of homes constructed on steep slopes. Often times, slumps or slides will occur in stages, allowing property owners some time to take action before their home is completely destroyed. Landslides in Wisconsin tend to be relatively small in extent and magnitude compared to the massive events that occur nationwide in the Appalachian Mountains, Rocky Mountains, Pacific Coastal Range, and Alaska and Hawaii.

Sinkholes in Wisconsin also tend to be smaller – usually less than 10 feet across - than those that occur in other states prone to karst topography such as Georgia and Florida. Though sinkholes have formed underneath the streets of Milwaukee, much of the state's carbonate bedrock lies under less urbanized areas. Because sinkhole formation occurs gradually below the surface, it is difficult to predict or detect subsidence incidents before they happen.

Few mitigation actions can guarantee stability in areas prone to slides or subsidence, as these phenomena are caused by features such as bedrock and soil substrate that are difficult if not impossible to change. Acquisition is often the best option for the most at-risk properties; in areas where the risk is less severe, slope stabilization projects may be effective. Owners of properties with steep slopes may wish to install low-growing ground cover plantings and utilize flexible underground pipe fittings to prevent leaks that could lead to instability. In several areas where railroad tracks run between a river and bluffs, fences have been erected with sensors to detect rock falls that could otherwise damage or derail trains.

Wellhead protection actions should be taken in karst areas to prevent groundwater contamination, especially in the parts of the state where the bedrock is less than 50 feet from the ground surface. Small sinkholes (less than 20 feet across) can be filled with different sizes of rock and cement if necessary. The WGNHS recommends fencing off large sinkholes and permanently preventing construction nearby; a small earthen berm can be constructed around the sinkhole to prevent unfiltered surface runoff from entering the groundwater supply through the sinkhole.

3.3.3.4 Changing Future Conditions

Wisconsin experienced a 10% increase in average annual precipitation over the 56-year period from 1950 to 2006. This is an annual average of about three more inches of precipitation than in the 1950s (WICCI, 2009). Eight of the ten wettest years on record have occurred since 1978. This trend toward heavier precipitation has had costly impacts to the state; in the 2008 floods, floodwaters covered 810 square miles of land in the affected area, leading to problems such as well contamination and generating an estimated \$34 million in damage claims (Dane County Emergency Management).

Figure 3.3.3-1 shows the statewide distribution of changes in annual average precipitation. Noteworthy is the additional variability in annual precipitation, as much as seven inches, in areas with high population density, such as near Madison (Dane County), Milwaukee (Milwaukee County), Eau Claire (Eau Claire County), and Hudson (Saint Croix County).

WICCI's most recent predictions indicate that annual average precipitation may continue to increase through 2050, including a higher incidence of more "extreme" rainfall events

Resilience

"The ultimate goal is to have a resilient system — that is, a floodplain, river, and watershed that can tolerate changes like floods. A resilient system will recover to its approximate original state once the disturbance is over or removed." - Floodplain Management: A New Approach for a New Era, 2009

(those that generate more than six inches of precipitation in a 24-hour period). The expected increases in rainfall frequency and intensity are likely to put additional stress on natural hydrological systems and community stormwater systems. Floodplain developments and low-income communities in urban areas are among the areas most vulnerable to increased flooding.

Heavier snowfalls in the winter will lead to intensified spring flooding, and groundwater levels will remain high even in non-floodplain areas. Such changes in climate patterns can lead to the development of compounding events that interact to create extreme conditions. This confluence of events was observed in 2008, when saturated spring soils and a record summer rainfall combined to create the most damaging flood in state history. Some areas that are not in mapped floodplains may experience unexpected groundwater flooding, as observed during past flood events in Brodhead, Spring Green, and Calumet County. Flooding caused by high groundwater levels typically recedes more slowly than riverine flooding, slowing the response and recovery process. Groundwater-fed rivers and streams are also likely to experience heightened flooding when groundwater levels are high.

Jurisdictions updating or installing stormwater management systems should consider potentially larger future discharge amounts when sizing culverts and drainage ways; storage capacity can also be increased by building retention basins to hold excess stormwater. Communities already prone to flooding should be prepared for a potential increase in facility closures and/or damages, as well as an increase in public demand for flood response and

assistance. Natural features that experience repeated flooding may manifest changes in the form of stream bank instability and changing shoreline, floodplain, and wetland boundaries. Communities may also wish to plan for the potential loss of cropland and damage to both private property and public infrastructure such as bridges.

The environmental impacts of flooding include erosion, surface and groundwater contamination, and reduced water quality. The threat of more frequent flood events may thus be a concern particularly for communities who depend on lakes, rivers, or trout streams for tourism. Rural communities may experience increases in well contamination and road washouts, while urban areas may be particularly vulnerable to flash flooding as heavy rain events quickly overwhelm the ability of a more impermeable environment to absorb excess stormwater.

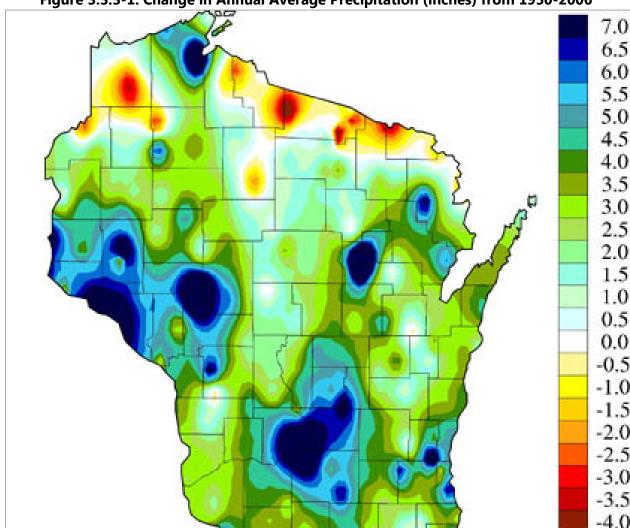


Figure 3.3.3-1: Change in Annual Average Precipitation (inches) from 1950-2006

Source: Wisconsin Initiative on Climate Change Impacts, "How is Wisconsin's Climate Changing?" 2009.

3.3.4 Catastrophic Scenario

In early June, two rounds of heavy rains cause widespread flooding in the southern part of the state. Thousands of homes, businesses, and farms are damaged or destroyed by the flood waters. In some cases, rivers remain in flood stage into late July, and some low spots in farm fields still have standing water into September due to a high water table. Most of the flooding is of the "100-year" magnitude, and some of the "200- or 300-year" type. Wisconsin receives a Presidential Disaster Declaration that includes 31 counties with estimated damages totaling roughly \$820 million.

3.3.5 Summary Risk Analysis

The table in Figure 3.3.5-1 provides a summary risk analysis for the flooding hazard.

Figure 3.3.5-1: Flooding Summary Risk Analysis

Evaluation Criteria	Description	Ranking
	Risk to People, Property, Environment, and Operations	
Probability/potential threat of occurrence	 The hazard has impacted the state annually, or more frequently The hazard is widespread, generally affecting regions or multiple counties in each event There is a reliable methodology for identifying events and locations 	High
Vulnerability	 Minimal countermeasures are in place to prevent or protect against this hazard. Countermeasures may have potential, but limited demonstrated history in reducing the threat potential. The nature of the hazard may limit the availability of countermeasures. 	High
Mitigation Potential	 Methods for reducing risk from the hazard are technically reliable The State or counties have experience in implementing mitigation measures Mitigation measures are eligible under federal grant programs There are multiple possible mitigation measures for the hazard The mitigation measures are known to be cost-effective The mitigation measures protect lives and property for a long period of time, or are permanent risk reduction solutions 	High
Impacts of Catastrophic Scenario		
Public	 Local medical services are unable to manage the volume of injuries and fatalities. Patients require transportation to regional medical facilities outside of the affected areas. Local area evacuations, sheltering, and care of displaced residents, medical patients, and vulnerable populations may be required. 	Medium

	Significant federal and/or mutual aid from other states would be		
Responders	needed to meet the needs of the incident.	High	
'	Federal disaster declaration.	3	
	State or local government mission essential functions impacted		
COOP, including delivery of services	for 1-7 days, temporary relocation of business operations may be	Medium	
	necessary.		
	Widespread destruction of critical infrastructure, public and		
	private property.		
Property, Facilities &	More than 50% of buildings and infrastructure in affected area	111.4	
Infrastructure	damaged or destroyed, and/or loss of lifeline services for more	High	
	than 7 days.		
	Public and Private property loss far exceeds federal minimums.		
	Widespread environmental damage over a large geographic area		
	affecting several communities across a region.		
Environment	Significant damage to an ecologically sensitive area such as	High	
Environment	wetlands, rivers, lakes, or public water supply.		
	Damage requires massive long-term remediation efforts of state		
	and federal government.		
	Tremendous adverse impact affecting the livelihood of the region		
Economy	and possibly extending to statewide.	High	
Leonomy	Long-term, cascading damage across multiple economic sectors	riigii	
	requiring federal government assistance.		
Public Confidence	Some transitory acute effects on behavior health including		
	elevated stress, anxiety, depression, and behavior for individuals	Low	
	in impacted communities.	LOW	
	Minor civil disturbances possible.		
	Aggregate Impact	High	

3.3.6 Sources - Agency Input and Research

The following agencies and document research assisted in providing subject matter expertise to this scenario's core capabilities.

- 1. Changing Climate Resilient Communities: Climate Science for Natural Hazard Mitigation Planning, presentation by David S. Liebl, Dane County Emergency Management, 22 July 2015.
- United States of America. Oconto County. Oconto County Emergency Management.
 Oconto County, Wisconsin Hazard Mitigation Plan. By Oconto County Hazard Mitigation Plan Steering Committee and Bay-Lake Regional Planning Commission. Oconto, WI: Oconto County, 2015.
- 3. "National Climate Assessment." National Climate Assessment. Accessed October 2016. http://nca2014.globalchange.gov/.
- 4. Federal Emergency Management Agency. "FEMA's Multi-Hazard Identification and Risk Assessment, 'Subpart C: Hydrologic Hazards' ". Federal Emergency Management Agency. Accessed October 2016. https://www.fema.gov/media-library/assets/documents/7251?id=2214.
- 5. National Weather Service. "NWS Flood Safety Home Page." NWS Flood Safety Home Page. Accessed October 2016. http://www.floodsafety.noaa.gov/.
- 6. National Centers for Environmental Information. "Storm Events Database." Storm Events Database | National Centers for Environmental Information. Accessed October 2016. https://www.ncdc.noaa.gov/stormevents/.
- 7. "NOAA National Severe Storms Laboratory." NOAA National Severe Storms Laboratory. Accessed November 29, 2016. http://www.nssl.noaa.gov/.
- 8. "NOAA/NWS Storm Prediction Center." NOAA/NWS Storm Prediction Center. Accessed November 2016. http://www.spc.noaa.gov/.
- 9. "Natural Hazards Center Homepage." Natural Hazards Center. Accessed November 2016. https://hazards.colorado.edu/.
- 10. National Weather Service. "NWS Forecast Office, Milwaukee/Sullivan, WI." US Department of Commerce, NOAA, National Weather Service. Accessed November 2016. http://www.weather.gov/mkx/.
- 11. National Weather Service. "NWS Forecast Office, Green Bay, WI." US Department of Commerce, NOAA, National Weather Service. Accessed November 2016. http://www.weather.gov/grb/.
- 12. Service, National Weather. "NWS Forecast Office, La Crosse, WI." US Department of Commerce, NOAA, National Weather Service. Accessed November 2016. http://www.weather.gov/arx/.
- 13. National Weather Service. "NWS Analyze, Forecast and Support Office." NWS Analyze, Forecast and Support Office Service. Accessed November 2016. http://www.nws.noaa.gov/om/.
- 14. National Weather Service. "Natural Hazard Statistics." NWS Analyze, Forecast and Support Office. April 6, 2016. Accessed November 2016. http://www.nws.noaa.gov/om/hazstats.shtml.

15. "Official NFIP Site - Flood Risk & Insurance | FEMA - FloodSmart.gov." Official NFIP Site - Flood Risk & Insurance | FEMA - FloodSmart.gov. Accessed October 2016. https://www.floodsmart.gov/floodsmart/.

- 16. "FEMA Flood Map Service Center." FEMA Flood Map Service Center | Welcome! Accessed October 2016. https://msc.fema.gov/portal/.
- 17. Freitag, Bob, Susan Bolton, Frank Westerlund, and J. L.S Clark. *Floodplain Management: A New Approach for a New Era*. Washington, D.C.: Island Press, 2009.
- 18. Wisconsin Department of Natural Resources. "Floodplain Management." Floodplain Management Wisconsin DNR. Accessed October 2016. http://dnr.wi.gov/topic/Floodplains/.
- 19. Federal Emergency Management Agency. "The National Flood Insurance Program Community Status Book." The National Flood Insurance Program Community Status Book | FEMA.gov. Accessed October 2016. https://www.fema.gov/national-flood-insurance-program-community-status-book.
- 20. State of Wisconsin Cartographer's Office, and Wisconsin Land Information Program.

 "Statewide Parcel Map Initiative, Statewide Data." Statewide Parcel Map Initiative Data.

 Accessed October 2016. http://www.sco.wisc.edu/images/stories/publications/V2/data/.
- 21. Wisconsin Department of Natural Resources. "Risk MAP." Floodplain Risk Mapping, Assessment and Planning Wisconsin DNR. Accessed October 2016. http://dnr.wi.gov/topic/floodplains/riskmap.html.
- 22. Wisconsin Initiative on Climate Change Impacts. "Impacts Presentation." Wisconsin Initiative on Climate Change Impacts. Accessed November 2016. http://www.wicci.wisc.edu/impacts.php#2.
- 23. *Wisconsin 2050: Scenarios of a State of Change*. August 20, 2016. Accessed October 2016. http://www.wicci.wisc.edu/resources/ClimateWI2050-Communites August 2016.pdf.
- 24. Federal Emergency Management Agency. "FEMA's Multi-Hazard Identification and Risk Assessment, 'Subpart B: Geologic Hazards' ". Federal Emergency Management Agency. Accessed October 2016. https://www.fema.gov/media-library/assets/documents/7251?id=2214.
- 25. READY Campaign. "Landslides & Debris Flow." Landslides & Debris Flow | Ready.gov. Accessed November 29, 2016. https://www.ready.gov/landslides-debris-flow.
- 26. U.S. Geological Survey. "Landslide Hazards Program." Landslide Hazards Program. Accessed November 29, 2016. http://landslides.usgs.gov/.
- 27. U.S. Geological Survey. "Landslide Hazards Program." Landslide Hazards Program. Accessed November 2016. http://landslides.usgs.gov/.
- 28. U.S. Geological Survey. "Landslide Monitoring." Landslide Monitoring. Accessed November 2016. http://landslides.usgs.gov/monitoring/.
- 29. U.S. Department of the Interior. U.S. Geological Survey. *National Landslide Hazards Mitigation Strategy: A Framework for Loss Reduction*. By Elliot C. Spiker and Paula L. Gori. Reston, VA: U.S. Geological Survey, 2000. http://pubs.usgs.gov/of/2000/ofr-00-0450/ofr-00-0450.html.
- 30. "Association of Environmental & Engineering Geologists." Association of Environmental & Engineering Geologists. Accessed November 2016. http://www.aegweb.org/.

31. University of Wisconsin, Extension. "Wisconsin Geological & Natural History Survey." Wisconsin Geological Natural History Survey. Accessed November 2016. http://wgnhs.uwex.edu/.

- 32. Wisconsin Geological Natural History Survey. "Karst and Sinkholes." Wisconsin Geological Natural History Survey. Accessed November 2016. http://wgnhs.uwex.edu/water-environment/karst-sinkholes/.
- 33. Wisconsin Department of Natural Resources. "Wisconsin Groundwater Coordinating Council Report to the Legislature." Groundwater Coordinating Council. Accessed November 2016. http://dnr.wi.gov/topic/Groundwater/GCC/index.html.
- 34. Federal Emergency Management Agency. "FEMA's Multi-Hazard Identification and Risk Assessment, 'Part 2: Technological Hazards". Federal Emergency Management Agency. Accessed October 2016. https://www.fema.gov/media-library/assets/documents/7251?id=2214.
- 35. Federal Emergency Management Agency. "Dam Safety." Dam Safety FEMA.gov. July 2016. Accessed November 2016. https://www.fema.gov/dam-safety.
- 36. Federal Emergency Management Agency. "Dam Safety Publications & Resources." Dam Safety Publications & Resources | FEMA.gov. July 2016. Accessed November 29, 2016. https://www.fema.gov/dam-safety-publications-resources.
- 37. Bureau of Reclamation: Security, Safety, and Law Enforcement. "Security, Safety and Law Enforcement Office Dam Safety." Dam Safety Office | Security, Safety and Law Enforcement Office | Bureau of Reclamation. Accessed November 2016. http://www.usbr.gov/ssle/damsafety/.
- 38. Wisconsin Department of Natural Resources. "Dam Safety Program." Dam Safety Wisconsin DNR. Accessed November 2016. http://dnr.wi.gov/topic/dams/.
- 39. Wisconsin Department of Natural Resources. "Dam Inspection Database Search." Dam Search Wisconsin DNR. Accessed November 2016. http://dnr.wi.gov/topic/dams/damSearch.html.
- 40. "Association of State Dam Safety Officials." Association of State Dam Safety Officials. Accessed November 2016. http://www.damsafety.org/.
- 41. "U.S. Society on Dams." Accessed November 2016. http://www.ussdams.org/.
- 42. American Society of Civil Engineers. "Dams Report Card." 2013 Report Card for America's Infrastructure. 2015. Accessed November 2016. http://www.infrastructurereportcard.org/dams/.
- 43. American Society of Civil Engineers. "Levees." 2013 Report Card for America's Infrastructure. 2015. Accessed November 2016. http://www.infrastructurereportcard.org/levees/.
- 44. American Society of Civil Engineers. "Wisconsin Infrastructure Report Card." 2013 Report Card for America's Infrastructure. 2016. Accessed November 2016. http://www.infrastructurereportcard.org/wisconsin/wisconsin-overview/.
- 45. Esposito, Katherine. "Dammed If You Do and Damned If You Don't." *Wisconsin Natural Resources Magazine*, April 1999. Accessed November 2016. http://dnr.wi.gov/wnrmag/html/stories/1999/apr99/dams.htm.
- 46. Natural Resources Conservation Service Wisconsin. "Watershed Protection and Flood Prevention Program." Watershed Protection and Flood Prevention Program | NRCS

Wisconsin. Accessed November 2016.

https://www.nrcs.usda.gov/wps/portal/nrcs/main/wi/programs/planning/wpfp/.

47. Natural Resources Conservation Service Wisconsin. "Watershed Rehabilitation." Watershed Rehabilitation | NRCS Wisconsin. Accessed November 2016. https://www.nrcs.usda.gov/wps/portal/nrcs/main/wi/programs/planning/wr/.

3.4 Wildfire

3.4.1 Nature of the Hazard

Chapter 26.01(2) of the Wisconsin State Statutes defines **forest fires** as "uncontrolled, wild, or running fires occurring on forest, marsh, field, cutover, or other lands involving farm, city, or village property and improvements incidental to the uncontrolled, wild, or running fires occurring on forest, marsh, field, cutover, or other lands." They often begin unnoticed, can spread quickly, and are usually signaled by dense smoke that can fill the air for miles around. Wildfires in Wisconsin are primarily human-caused by burning yard debris, arson, or campfires, for example. They can also be caused by natural events like lightning.

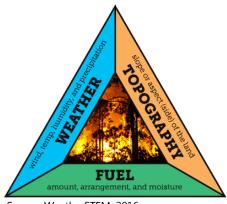
Types of Wildfires in Wisconsin

- **Interface or intermix fires** (also known as wildland-urban interface or WUI fires) occur in areas where both vegetation and structures provide fuel.
- **Firestorms** occur during extreme weather (i.e. high temperatures, low humidity, and high winds) with such intensity that fire suppression opportunities are limited. These events typically burn until the weather or fuel conditions change to reduce the fire spreading behavior.
- Prescribed fires occur with the intentional application of fire to wildland natural fuels, under specific environmental conditions, to accomplish planned land management objectives. They are a part of a fuel management strategy and one of the most complicated and complex operations to implement.

Factors Influencing Fire Behavior

Fuels

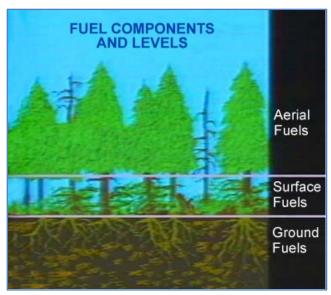
- Fuel is required for any fire to burn. In regard to wildfire, fuels may consist of the following:
 - o Living vegetation: grass, shrubs, and trees
 - Dead plant material: dead trees; dried grass; and fallen branches, pine needles, and leaves
 - Urban fuels: houses, vehicles, and other manmade objects



Source: WeatherSTEM, 2016.

- Fuels are arranged horizontally and vertically
 - o **Horizontal** arrangement refers to the distribution of fuels over the landscape (FEMA)
 - o **Vertical** arrangement consists of the following:
 - Aerial fuels are green and dead materials in the upper forest canopy including tree
 tops and branches, snags, and tall shrubs. Crown fires burn these aerial fuels and
 typically occur in conifer stands; this type of fire tends to be very intense and difficult
 to control.

- **Surface fuels** are materials lying on or immediately above the ground including pine needles, leaves, grass, downed logs, stumps, tree limbs, and low shrubs.
- Ground fuels are combustible materials lying beneath the ground, including deep duff, roots, buried logs, and other organic matter. Fires in ground fuels are usually called peat fires.



Source: Utah State University, 2016.

Weather

- **Temperature:** Higher temperatures preheat fuels by driving off moisture, which allows fuels to burn faster.
- **Relative humidity:** Lower relative humidity and a lack of precipitation lower fuel moisture; dry fuels burn more easily than fuels with higher moisture content.
- **Wind speed:** Wind is the most important weather factor in wildfire risk because it both dries fuel and increases the supply of oxygen. Wind has the greatest influence on the rate and direction of fire spread. In Wisconsin, wind direction almost always changes in a clockwise rotation and winds tend to be strongest in the mid-afternoon.

Topography

- **Slope:** Steep slopes spread fire rapidly. Fire travels faster uphill and afternoon winds travel upslope as hot air rises, pushing fire even faster.
- **Aspect:** Aspect is the direction a slope faces. In Wisconsin, north-facing slopes tend to be more shaded with more moisture and heavier fuels, such as deciduous trees. South-facing slopes tend to be sunnier and drier, with more light fuels like grasses.

Interaction with Other Hazards

Some natural hazards cause wildfires, others intensify them, and still other hazards are intensified by wildfires. In Wisconsin, the following hazards may interact with wildfires, altering the conditions in the fire:

- **Severe thunderstorm wind events:** Higher wind speeds increase the rate at which a wildfire spreads. The rate of spread varies directly with wind velocity. Additionally, high winds and downbursts can cause blowdowns, leaving downed trees and branches as fuel for wildfires. (See Section 3.2 for more information about severe weather including thunderstorms, high wind, tornado, hail, and lightning.)
- **Lightning:** A cloud-to-ground lightning strike may cause a wildfire. (See Section 3.2 for more information about severe weather including thunderstorms, high wind, tornado, hail, and lightning.)
- **Flooding:** Wildfires clear vegetation from the landscape, decreasing the soil's ability to absorb moisture and removing obstructions that could slow floodwaters. This increases the likelihood of flooding in fire-ravaged areas. (See Section 3.3 for more information about flooding, dam failure, landslides, and land subsidence.)
- Landslides: Because wildfires remove vegetation and damage soils, flash runoff erosion is more likely and can contribute to landslides. (See Section 3.3 for more information about flooding, dam failure, landslides, and land subsidence.)

Wildfire Management

Figure 3.4.1-1 shows the percent of Wisconsin wildfires attributed to each cause. Debris burning and equipment fires make up over half of the wildfire causes. The vast majority overall are caused by human error. When fires get out of control, wildfire management must be employed.

Wildfire management involves the control, containment, and suppression of a wild or uncontrolled fire. If not promptly controlled, a wildfire may grow into an emergency or disaster. Even small fires can threaten lives, resources, and improved property. The indirect effects of wildfires can also be detrimental. In addition to charring vegetation and destroying forest resources, large, intense fires can harm the soil, waterways, and the land itself.

Figure 3.4.1-1: Percent of Wisconsin Wildfires by Cause, 2011-2015

Campfires	4.2%
Debris Burning	29.4%
Equipment	21.1%
Fireworks	3.6%
Improper Ash Disposal	5.2%
Incendiary	6.2%
Lightning	1.9%
Railroad	4.2%
Smoking	1.4%
Power Line	8.9%
Miscellaneous	13.9%



Firewise Communities Program

The Firewise Communities Program is a multi-agency effort among agencies, tribes, organizations, fire departments, and communities across the US to reduce the loss of life, property, and resources to wildland fire by building and

maintaining communities in a way that is compatible with natural surroundings. This goal is accomplished by actively involving homeowners, community leaders, planners, developers, and others in the effort to decrease the fire risk before a fire starts. The Firewise Communities approach emphasizes community responsibility for planning and designing a safe community, effective emergency response, and individual responsibility for safer home design, construction, landscaping, and maintenance.

There are three main Firewise concerns in fire-prone areas:

- 1. **Buildings:** Emphasis is on flammability of residential buildings/areas and outbuildings.
- 2. **Surrounding vegetation:** Does the current vegetation help spread fire or promote fire suppression?
- 3. **Access:** Can emergency vehicles and workers service the area if/when a fire is burning?

The Firewise Communities Program recommendations are primarily focused on the "Home Ignition Zone (HIZ)," an area extending 100 to 200 feet beyond each side of all buildings on a property. In a well-designed site, the HIZ should provide enough distance between buildings and a wildfire, and should modify vegetation around the structure so it acts as a fire break instead of a spreading aid. Creating such defensible space increases the chance of buildings surviving wildfire without outside help (DNR, 2011).

There are currently 11 Wisconsin communities in the Firewise program, mainly in the central part of the state.

3.4.2 History

While most of the wildfire starts in Wisconsin are quickly contained and kept to less than ten acres in size, Wisconsin has experienced catastrophic fires throughout its history. In the period between the 1850s and 1910, intensive logging was practiced. The slash left from logging fueled large fires throughout this time.

In 1905, 249 town fire wardens were appointed around the state, the first measure implemented toward forest fire control. Although they could hire firefighters, the wardens had no equipment to fight fires. Beginning in 1911, ranger stations and lookout towers were constructed, spreading organized fire protection across the state.

In 1915, the first forest fire detection flight in history was flown by Logan Archbold "Jack" Vilas. It occurred in a small town in none other than Vilas County (Jack was a cousin of senator William Freeman Vilas, for whom the County was named). By 1916, fire detection flights were being flown across the US and in 1917, the US Forest Service implemented a fire detection flight plan dubbed "the Wisconsin Plan." Since that time, advances in firefighting in the state include the construction of standard lookout towers, fire lanes, and bridges; the use of chartered aircraft to detect new fires and perform reconnaissance; the use of radios by aircraft, ground firefighters, and lookout towers; and the use of single engine air tankers to fight fires.



Jack Vilas, 1891-1976 Source: Wikipedia, 2016.

The first burning permit law was passed in 1925 which required people to obtain a written permit prior to burning in a protection district on ground without snow cover.

The DNR highlights the wildfire events described below as noteworthy wildfires in the state's history.



Source: www.exploringoffthebeatenpath.com, 2016.

1871

The most disastrous fire in Wisconsin's history was the Peshtigo Fire, when more than 1.5 million acres of forest burned in northeastern Wisconsin, mainly in Oconto, Marinette, Shawano, Brown, Kewaunee, Door, and Manitowoc counties. The fire was estimated to have displaced 3,000 people, killed 1,152 people, and left another 350 missing. This event was the greatest single loss of human life by fire in American history; however, the Great Chicago Fire occurred at the same time and received much more publicity.

1894

On July 27, the Phillips Fire burned over 100,000 acres in Price County, destroying 400 homes and much of the downtown area in the City of Phillips. 13 people died trying to escape by swimming across Long, Duroy, and Elk Lakes.

1930-34

In the dust bowl era, severe droughts ravaged the state. During this four-year period, about 2,950 fires burned 336,000 acres annually in Wisconsin.

1959

On May 1, a running crown fire in Burnett County burned 17,560 acres, causing \$201,889 in reported damages.

<u>1977</u>

The entire state suffered two years of severe drought. Nearly 49,000 acres burned in 1977 alone. Over 170 structures were destroyed or damaged. Jackson, Washburn, Douglas, and Wood Counties were the worst hit. The Saratoga Fire in Wisconsin Rapids (Wood County) burned 6,159 acres and destroyed 90 buildings; the Brockway Fire in the Black River Falls area (Jackson County) burned 17,590 acres; and the Five-Mile Fire in Washburn and Douglas Counties burned 13,375 acres and destroyed 83 buildings.

1980

Over two days in April, the Ekdall Church Fire in Burnett County and the Oak Lake Fire in Washburn County together burned over 16,000 acres and destroyed more than 200 buildings.

2003

The Crystal Lake Fire in Marquette and Waushara Counties burned 572 acres. Nearly 200 buildings were threatened and several were destroyed.

2005

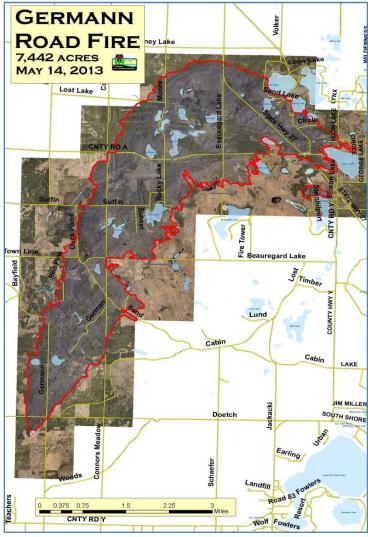
On May 5, the Cottonville Fire burned a swath 1.5 miles wide and seven miles long through the Towns of Big Flats, Preston, and Colburn (Adams County). It took nearly 200 personnel to suppress the wildfire in about 11 hours. Over 100 people were evacuated for several days while crews extinguished smaller fires. There were nine year-round residences, 21 seasonal homes, and at least 60 outbuildings destroyed in the 3,410 acre fire. 300 buildings were saved due to firefighting efforts.

2013

In the afternoon of May 14, a logging crew accidentally started a fire when harvesting timber in the Town of Gordon in Douglas County. Over the next 30 hours, the Germann Road Fire spread to the towns of Highland and Barnes in Douglas and Bayfield counties, respectively, ultimately clearing a swath almost ten miles long and a mile and a half wide. Although 104 structures were destroyed (23 residential), fire control efforts saved an estimated 350 structures. Burning nearly 7,500 acres in 30 hours, this was the largest wildfire to impact Wisconsin in 33 years.



Germann Road Fire Aerial Photograph Source: DNR, 2016.



Source: DNR, 2016.

3.4.3 Probability, Impacts, and Mitigation Potential

Hazard Ranking

Evaluation Criteria	Description	Ranking
Probability	 The hazard impacts the state occasionally, but not annually The hazard is somewhat localized, affecting only relatively small or isolated areas when it occurs The methodology for identifying events is not well-established, or is not applied across the entire state 	Medium
Mitigation Potential	 Mitigation methods are established The state or counties have limited experience with the kinds of measures that may be appropriate to mitigate the hazard Some mitigation measures are eligible for federal grants There is a limited range of effective mitigation measures for the hazard Mitigation measures are cost-effective only in limited circumstances Mitigation measures are effective for a reasonable period of time 	Medium

Background

Nationally, wildfire risk is highest in the western states where the largest, deadliest, and costliest wildfires occur. Figure 3.4.3-1 shows the US wildfire risk. Although Wisconsin doesn't have as high a wildfire risk as some other parts of the country, there are wildfires in the state every year, which, if not handled quickly and appropriately, can turn devastating. See Section 3.4.2 for a discussion of wildfire history in the state.



Figure 3.4.3-1: US Wildfire Risk, 2014

Source: US Forest Service, 2016.

Most Wisconsin wildfires occur in spring between March and June, with the highest incidence in April. Figure 3.4.3-2 shows the number of wildfires that have happened in each month for the last five years. It's clear that the wildfire risk is much higher in the spring than any other time, but the risk does persist through the summer and fall, diminishing, but not disappearing entirely, in winter.

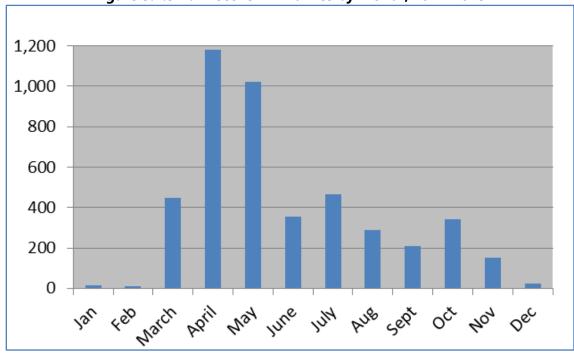


Figure 3.4.3-2: Wisconsin Wildfires by Month, 2011-2015

Source: Wisconsin Department of Natural Resources, 2011 and 2016.

The season length and peak months vary from year to year. Land use, vegetation, amount of combustible materials present, and weather conditions, such as high wind, low humidity, and lack of precipitation, are the chief factors in determining the number of fires and acreage burned. Generally fires are more likely when vegetation is dry from a winter with little snow and/or a spring and summer with sparse rainfall.

Wildland-Urban Interface (WUI) Fires

Throughout the twentieth century, housing was concentrated mainly in larger metropolitan statistical areas. People began moving to the outer fringe of cities and suburbs in the latter part of the 1900s. As development into rural and wildland areas continues, the dynamics of fire suppression and control have changed drastically (DNR, 2011).

Wildfire danger grows as more and more homes and other manmade objects are situated in forests, grasslands, and other areas with highly flammable vegetation, creating what is known as the wildland-urban interface (WUI). According to the DNR, "the WUI can be a lone house in the middle of a forest, a subdivision on the edge of a pine plantation, or homes surrounded by grassland" (DNR, 2011). Locating manmade structures in areas that have burned naturally in the

past both interrupts the natural recurrent cycle of wildfires and adds fuel to wildfires. Figure 3.4.3-3 shows Wisconsin's wildland-urban interface as of 2010.

Until residents adapt to the dangers around them, fire officials continue their efforts to promote and protect the safety of people and property in WUI areas with highly flammable vegetation. There is particular concern with locating homes in remote areas where access roads and driveways are too narrow or sandy to allow emergency vehicles to properly service the homes. Furthermore, the addition of homes increases danger through use of power lines, liquid propane tanks, hazardous materials, and increased vehicular traffic (DNR, 2011).

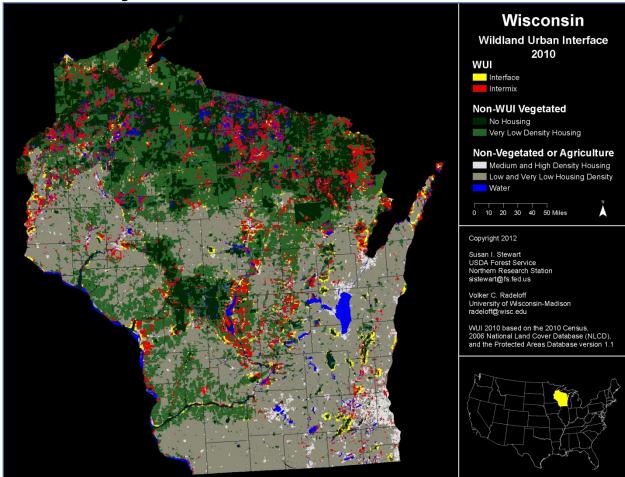


Figure 3.4.3-3: Wildland Urban Interface in Wisconsin, 2010

Source: SILVIS Lab, University of Wisconsin, 2012.

Another factor raising concern for the WUI areas is that the increase in the number of available, skilled firefighters and equipment is not keeping pace with the increase in rural development. In these fire-prone WUI areas, firefighters often work as volunteers, and may be unaware of the additional challenges posed by WUI fires in their communities, such as the need for evacuation plans or the simultaneous confrontation of structure fires and wildfires. That type of demand requires a high level of training which may not be available.

Frequency and Probability

There is a 100% probability that there will be at least one wildfire in Wisconsin each year. Wildfire managers prioritize the protection of lives, property, and resources, in that order. The challenge is to minimize the damage done by wildfire, while at the same time ensuring the safety of citizens and firefighters. Preventing damages relies heavily on educating residents of and visitors to WUI areas to avoid starting wildfires (see Section 3.4.1 for most common causes of Wisconsin wildfires) and to keep people and property safe when wildfires do occur.

Wildfires are an ongoing threat to both rural areas and WUI communities. The number of acres burned has dropped notably from 9,740 acres in 1988 to 767 acres in 2011, which was a 25-year low, however the total can vary significantly from year to year. The potential for wildfire persists due to the standing, constantly renewing fuel load.

On average, over 1,100 wildfire events occur annually in Wisconsin causing thousands of dollars of damages to property and destroying natural resources (DNR, 2011, 2016). In the past five years, 2013 saw the most property burned, with 9,110 acres; the majority of the acreage burned was from a single wildfire in Douglas and Bayfield counties, the Germann Road Fire, profiled in Section 3.4.2. As shown in Figures 3.4.3-4 and 3.4.3-5, thousands of acres burn annually in the state.

Figure 3.4.3-4: Wisconsin Wildfires, 2005-2015

Year	Number of Wildfires	Number of Acres Burned	Number of Structures Saved	Number of Structures Burned
2005	1,520	6,196	832	157
2006	1,597	2,124	497	66
2007	1,486	4,713	595	62
2008	821	998	219	31
2009	1,519	3,361	682	85
2010	1,220	2,093	440	41
2011	727	767	198	16
2012	1,498	2,824	527	40
2013	685	9,110	660	136
2014	597	2,743	314	25
2015	1,004	2,787	509	38
TOTAL	12,674	37,716	5,473	697

Source: Wisconsin Department of Natural Resources, 2011 and 2016.

10,000
8,000
4,000
2,000

2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

Number of Wildfires

Acres Burned

Figure 3.4.3-5: Number of Wildfires Compared to Acreage Burned, 2005-2015

Source: Wisconsin Department of Natural Resources, 2011 and 2016.

Though dozens of structures in Wisconsin are destroyed by wildfire each year, hundreds more are saved through sound fire management techniques as depicted in Figure 3.4.3-6.

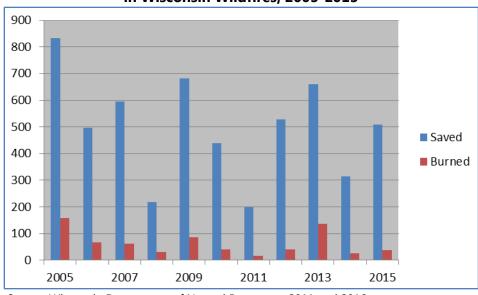


Figure 3.4.3-6: Structures Burned and Saved in Wisconsin Wildfires, 2005-2015

Source: Wisconsin Department of Natural Resources, 2011 and 2016.

Communities-at-Risk

In 2003, the National Association of State Foresters produced the Field Guidance for Identifying and Prioritizing Communities-at-Risk (CARs). The purpose of the Guidance was to provide states with a nationally-consistent approach for assessing and displaying the risks to communities

from wildfire. The Wisconsin DNR, in cooperation with its federal and tribal partners, began working on a statewide assessment of CARs in 2004 which was finished in March 2011.

CAR is a model used to identify broad areas of the state that are at relatively high risk of resource damage from wildfire. Results of the model can then be used by local governments developing Community Wildfire Protection Plans (CWPPs), and by the DNR to reduce local risks of wildland fire by prioritizing hazard mitigation and fire prevention efforts.

The approach used in this risk assessment model is based on the Methodology section of the Guidance document which recommends assessing and mapping four factors: 1) historic fire occurrence; 2) hazard; 3) values protected; and 4) protection capabilities. Modifications to this methodology were made to fit the data layers available for Wisconsin.

The DNR uses three factors to assess communities at risk from wildfire:

- 1. **Hazard:** The relative likelihood that an ignited wildfire will achieve sufficient intensity to threaten life or property based on land cover type and historic fire regime.
- 2. **WUI (Values at Risk):** The relative vulnerability of each 2000 census block to wildfire damage based on housing density and spatial relationships with undeveloped vegetation in the WUI. Wisconsin's WUI was layered with a weighted vegetation layer to accentuation proximity to flammable vegetation.
- 3. **Ignition Risk:** The relative likelihood of a wildfire ignition within a given 150m pixel based on historic fire occurrence, population density, and proximity to a potential ignition source.

Models were developed in GIS to create statewide grids representing each of the three input factors. Finally, a statewide composite grid was created using a weighted overlay of hazard (40%), WUI (30%), and ignition risk (30%). This composite grid represents CARs on a zero to nine scale of threat, with zero representing little to no threat (i.e. low or high density urban development) and nine representing a very high threat (i.e. a jack pine or red pine forest).

Statistical risk could then be calculated by municipal civil division (MCD). MCD was chosen since city or village boundaries change as land is annexed for planned development. This measure provided consistency in reporting and this is the level used in development of CWPPs (DNR, 2011).

Each of Wisconsin's 1,864 towns, villages, and cities was defined as a "community." Using a combination of natural breaks and field verification, quantitative markers were assigned for five threat levels: very low, low, moderate, high, and very high. Ultimately, those communities with a high or very high threat of wildfire, totaling 337 in the state, were designated CARs.

Communities in Wisconsin vary considerably in size, particularly when comparing norther, more rural communities, to southern, more urban, communities. Because of this variation in size, the potential for missing areas of high risk was great for larger towns. For this reason, the DNR incorporated a Community-of-Concern (COC) category, identifying those towns with portions of

their land at high risk of wildfire, but which were not otherwise included as CARs. A COC was defined as a community that contained at least two contiguous square miles at high or very high risk of wildfire. 237 communities were designated COCs.

The breakdown of communities is shown in the table in Figure 3.4.3-7 and in the maps in Figures 3.4.3-8 and 3.4.3-9 on the following pages.

Figure 3.4.3-7: Wildfire Risk Levels of Wisconsin Communities

Risk Level	Number	% of Wisconsin Communities	Cities	Villages	Towns	% of Wisconsin Land Area
Very High (CAR)	93	5%	2	12	79	6%
High (CAR)	244	13%	10	47	187	16%
Concern (COC)	237	13%	8	6	223	20%
TOTAL	574	31%	20	65	489	42%

Source: Department of Natural Resources, 2011.

Impacts

Wildfires are capable of causing significant injury, death, and damage to property. A recent inventory of Wisconsin land cover showed that 16 million acres, or 46%, is forested. The potential for property damage from wildfires increases each year as additional properties are developed in woodland areas and higher numbers of people use these areas recreationally. Fires can extensively impact the economy of an affected area, especially the logging, recreation, and tourism industries. Major direct costs associated with forest fires or wildfires are the expense of suppression; property loss; salvage and removal of downed timber and debris; and restoration of the burned area.

3.4.3.1 Changing Future Conditions

Although precipitation totals are expected to increase overall, researchers predict that it will fall during fewer, more intense events. The periods in between intense rain or snowfalls may therefore be marked by a greater number of dry days. This coupled with longer summers, higher average temperatures, and concomitant increased evapotranspiration, may result in droughts, which in turn raise the likelihood of wildfires. Communities that currently experience wildfires may wish to strengthen their prevention efforts and response capacity accordingly.

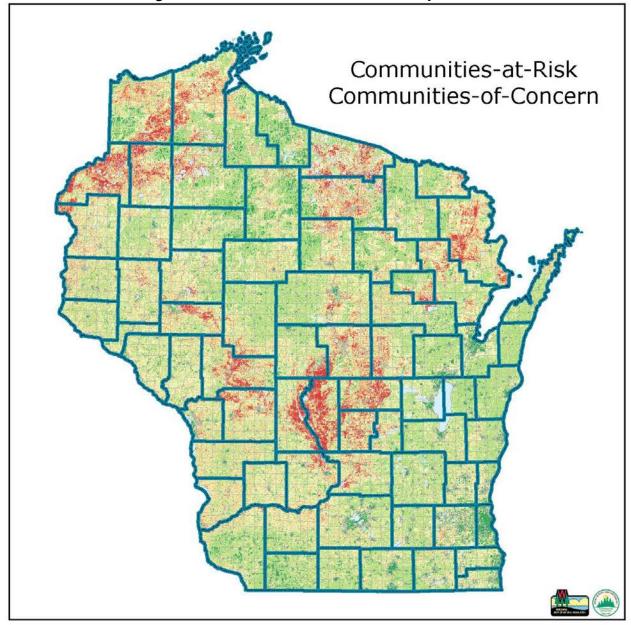
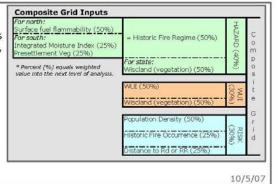


Figure 3.4.3-8: Communities-at-Risk Composite Grid

Introduction to the CAR Composite Grid

The composite grid is a model generated with Wisconsin datasets compiled from three input grids: Hazard (40%), WUI (30%), Risk (30%) (see table). Each 150-m pixel is attributed a value from 0 to 9, with 9 representing the highest risk of exposure to wildfire damage. These values are represented in the map as Very High to Very Low.

The composite grid is used to determine Communities-at-Risk. To identify a Community-at-Risk, the mean of all values within a Municipal Civil Division (MCD) must fall above CAR thresholds. Thresholds were determined using statistical methods and field verification.



Source: Department of Natural Resources, 2011.

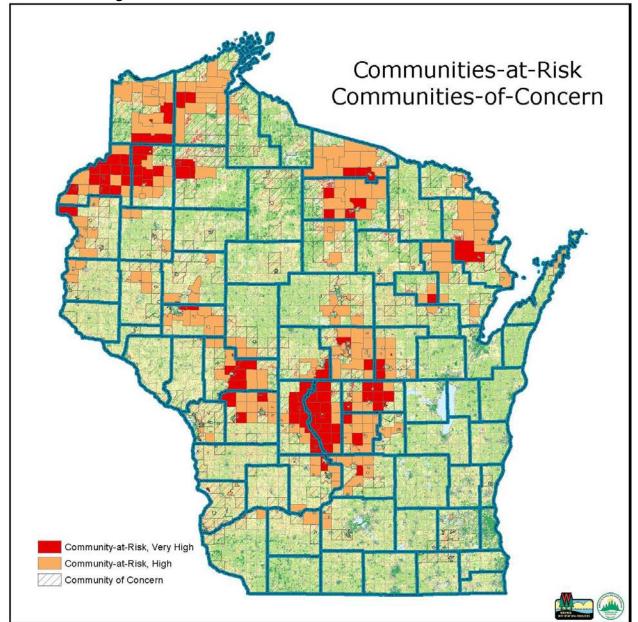


Figure 3.4.3-9: Communities-at-Risk, Communities-of-Concern

Introduction to Communities-at-Risk

The purpose of this model is to identify broad areas of the state that are at relatively high exposure to resource damage due to wildfire.

As mandated by the NASF, Wisconsin's Communities-At-Risk are divided into three categories:

- 1) Very High
- 2) High
- 3) Community of Concern*



For Wisconsin, Communities-at-Risk are reported at the MCD (municipal civil division) level*. MCD was chosen due to its identifiable legal boundaries, ease in reporting, and usage in the development of Community Wildfire Protection Plans.

* Menominee County is an exception due to its lack of MCD's (civil townships). Therefore, Menominee county is reported by legal township.

* A Community of Concern is a Wisconsin DNR concept whereby it is demonstrated that a significant portion of the community (more than 2 adjoining square miles) are at high or very high risk, but where the community as a whole falls below the Community-at-Risk threshold.

Source: Department of Natural Resources, 2011.

3.4.4 Catastrophic Scenario

A wildfire burns over 104,000 acres in Burnett and Washburn Counties – a high-risk wildland-urban interface (WUI) area. The fire quickly burns a 30-mile long, 7-mile wide path through an area sparsely populated with year-round residents yet peppered with hundreds of seasonal recreational homes and cabins associated with the area's lakes and forests. The fire burns uncontrolled for 36 hours before it is partially contained near Webb Lake in eastern Burnett County. Shifting winds then push the fire out of containment to the north and west where it continues to burn for another 12 hours into Washburn County on a 10-mile long, 3-mile wide path before it is fully contained. Extinguishing of hot spots continues for another week. The fire destroys over 80,000 acres of standing timber and 20% of the homes and businesses in the area, resulting in \$11 million in property damage and the evacuation of 25,000 residents.

3.4.5 Summary Risk Analysis

The table in Figure 3.4.5-1 provides a summary risk analysis for the wildfire hazard.

Figure 3.4.5-1: Wildfire Summary Risk Analysis

Evaluation Criteria	Description	Ranking
	Risk to People, Property, Environment, and Operations	
Probability/potential threat of occurrence	 The hazard impacts the state occasionally, but not annually The hazard is somewhat localized, affecting only relatively small or isolated areas when it occurs The methodology for identifying events is not well-established, or is not applied across the entire state 	Medium
Vulnerability	 Minimal countermeasures are in place to prevent or protect against this hazard. Countermeasures may have potential, but limited demonstrated history in reducing the threat potential. The nature of the hazard may limit the availability of countermeasures. 	High
Mitigation Potential	 Mitigation methods are established The State or counties have limited experience with the kinds of measures that may be appropriate to mitigate the hazard Some mitigation measures are eligible for federal grants There is a limited range of effective mitigation measures for the hazard Mitigation measures are cost-effective only in limited circumstances Mitigation measures are effective for a reasonably long period of time 	Medium

Impacts of Catastrophic Scenario			
Public	 Local medical services are unable to manage the volume of injuries and fatalities. Patients require transportation to regional medical facilities outside of the affected areas. Local area evacuations, sheltering, and care of displaced residents, medical patients, and vulnerable populations may be required. 	Medium	
Responders	 Local and mutual aid resources would be fully committed and significant state assistance would be needed in order meet the needs of the incident. State disaster declaration. 	Medium	
COOP, including delivery of services	State or local government mission essential functions impacted for less than 24 hours.	Low	
Property, Facilities & Infrastructure	 Significant damage to critical infrastructure, public and private property over a large area. 10-50% of buildings and infrastructure in affected area damaged or destroyed in affected area, and/or loss of lifeline services for up to 1-7 days. 	Medium	
Environment	 Widespread environmental damage over a large geographic area affecting several communities across a region. Significant damage to an ecologically sensitive area such as wetlands, rivers, lakes, or public water supply. Damage requires massive long-term remediation efforts of state and federal government. 	High	
Economy	 Medium-term effects to large portion of the jurisdiction's economy, possibly extending to the region. Damage to multiple economic sectors possibly requiring state or federal government assistance. 	Medium	
Public Confidence	 Some transitory acute effects on behavior health including elevated stress, anxiety, depression, and behavior for individuals in impacted communities. Minor civil disturbances possible. 	Low	
	Aggregate Impact	Medium	

Source: Wisconsin Emergency Management

FOR OFFICIAL USE ONLY

3.4.6 Sources – Agency Input and Research

The following agencies and document research assisted in providing subject matter expertise.

- 1. WeatherSTEM. "Fire Weather." WeatherSTEM. Accessed November 2016. https://learn.weatherstem.com/modules/learn/lessons/121/index.html.
- 2. Utah State University. "Wildland Fire Management and Planning Unit 2: Fuels Classification." Wildland Fire Management and Planning. Accessed November 2016. http://ocw.usu.edu/Forest Range and Wildlife Sciences/Wildland Fire Management and Planning/Unit 2 Fuels Classification 2.html.
- 3. Firewise, and National Fire Protection Association. "Firewise Communities List." Firewise Communities. Accessed November 2016. http://www.firewise.org/usa-recognition-program/firewise-communities-list.aspx?sso=0.
- 4. Spatial Analysis for Conservation and Sustainability. "2010 Wildland Urban Interface Maps." SILVIS Lab | Spatial Analysis for Conservation and Sustainability. Accessed November 2016. http://silvis.forest.wisc.edu/maps/wui/2010/download.
- 5. U.S. Forest Service. "Wildlife Hazard Potential." ArcGIS. Accessed November 2016. http://www.arcgis.com/home/item.html?id=fc0ccb504be142b59eb16a7ef44669a3#.
- 6. United States of America. Oconto County. Oconto County Emergency Management.

 Oconto County, Wisconsin Hazard Mitigation Plan. By Oconto County Hazard Mitigation
 Plan Steering Committee and Bay-Lake Regional Planning Commission. Oconto, WI:
 Oconto County, 2015.
- 7. Wisconsin 2050: Scenarios of a State of Change. August 20, 2016. Accessed October 2016. http://www.wicci.wisc.edu/resources/ClimateWI2050-Communites August 2016.pdf.
- 8. Cardille, Jeffrey A., Stephen J. Ventura, and Monica G. Turner. "Environmental and Social Factors Influencing Wildfires in the Upper Midwest." *United States. Ecological Applications.* 11, no. 1, 111-27.
- 9. Cleland, David T., Thomas R. Crow, Sari C. Saunders, Donald I. Dickmann, Ann L. Mclean, James K. Jordan, Richard L. Watson, Alyssa M. Sloan, and Kimberly D. Brosofske. "Characterizing Historical and Modern Fire Regimes in Michigan (USA): A Landscape Ecosystem Approach." *Landscape Ecology.* 19 (2004): 311-25.
- 10. Finley, Robert W., and Nina Janicki. "Finley's Presettlement Vegetation." *Ecological Landscapes of Wisconsin.*, 1999.
- 11. Haight, Robert G., David T. Cleland, Roger B. Hammer, Volker C. Radeloff, and T. Scott Rupp. "Assessing Fire Risk in the Wildland-Urban Interface." *Journal of Forestry* Oct-Nov (2004): 41-48.
- 12. Radeloff, V. C., R. B. Hammer, S. I. Stewart, J. S. Fried, S. S. Holcomb, and J. F. McKee-Fry. "The Wildland Urban Interface in the United States." *Ecological Applications* 15, no. 3 (2005): 799-805.
- 13. Stewart, Susan I., Volkder C. Radeloff, Roger B. Hammer, and Todd J. Hawbaker. "Defining the Wildland-Urban Interface." *Journal of Forestry*, 2007, 201-07.
- 14. Sturtevent, Brian R., Patrick R. Zollner, Eric J. Gustafson, and David T. Cleland. "Human Influence on the Abundance and Connectivity of High-risk Fuels in Mixed Forests of Northern Wisconsin, USA." *Landscape Ecology.* 19 (2004): 235-53.

15. U.S. Department of the Interior, and U.S. Department of Agriculture. "Urban Wildland Interface Communities within Vicinity of Federal Lands That Are at High Risk from Wildfire." *Federal Register* 66, no. 3 (2001): 66-3.

- 16. Federal Emergency Management Agency. "FEMA's Multi-Hazard Identification and Risk Assessment, 'Subpart E: Other Natural Hazards' ". Federal Emergency Management Agency. Accessed October 2016. https://www.fema.gov/media-library/assets/documents/7251?id=2214.
- 17. READY Campaign. "Wildfires." Wildfires | Ready.gov. Accessed November 29, 2016. https://www.ready.gov/wildfires.
- 18. National Interagency Fire Center. "National Interagency Fire Center Home." National Interagency Fire Center. Accessed November 2016. https://www.nifc.gov/.
- 19. Storm Prediction Center. "Fire Weather Outlooks." Storm Prediction Center. Accessed November 2016. http://www.spc.noaa.gov/fire/.
- 20. National Weather Service. "NWS Wildland Fire Safety Home Page." NWS Wildland Fire Safety Home Page. Accessed November 2016. http://www.nws.noaa.gov/om/fire/.
- 21. "Natural Hazards Center Homepage." Natural Hazards Center. Accessed November 2016. https://hazards.colorado.edu/.
- 22. Wisconsin Department of Natural Resources. "Wisconsin Department of Natural Resources-Division of Forestry." Wisconsin DNR. Accessed November 2016. http://dnr.wi.gov/forestry.
- 23. Wisconsin Department of Natural Resources. "Wisconsin Department of Natural Resources-Burning Restrictions and Fire Activity." Burning Restrictions and Fire Activity. Accessed November 2016. http://dnr.wi.gov/topic/forestfire/restrictions.html.
- 24. Wisconsin Department of Natural Resources. "Forest Fire Protection." Forest Fire Protection DNR. Accessed November 2016. http://dnr.wi.gov/topic/ForestFire/index.asp.
- 25. Wisconsin Department of Natural Resources. "Wisconsin Forest Management Guidelines." Wisconsin Forest Management. Accessed November 2016. http://dnr.wi.gov/topic/ForestManagement/guidelines.html.
- 26. Wisconsin Department of Natural Resources. "Major Events in Wisconsin Fire History." Major Fire Events in Wisconsin History Wisconsin DNR. Accessed November 2016. http://dnr.wi.gov/topic/ForestFire/WisconsinFires.html.
- 27. National Centers for Environmental Information. "Storm Events Database." Storm Events Database | National Centers for Environmental Information. Accessed June 30, 2016. https://www.ncdc.noaa.gov/stormevents/.

3.5 Drought and Extreme Heat

3.5.1 Nature of the Hazard

While drought and extreme heat are two separate hazards, when they occur simultaneously, the impacts of both can be significantly exacerbated, so they are addressed together in this section of the plan.

Drought

Drought is the result of a natural decline in expected precipitation over an extended period of time and occurs in virtually every climate on the planet, including areas of high and low precipitation. The severity of drought can be aggravated by other climatic factors such as prolonged high winds, low relative humidity, and extreme heat (FEMA). The following four definitions are commonly used to describe different types of drought and demonstrate the complexity of the hazard:



Sunburst Dairy, Belleville, WI, 2012. Source: Reuters, 2016, www.reuters.com.

- 1. **Meteorological drought:** Degree of dryness, expressed as a departure of the actual precipitation from the expected average or normal precipitation amount, based on monthly, seasonal, or annual time scales.
- 2. **Hydrological drought:** Effects of precipitation shortfalls on streamflows, and reservoir, lake, and groundwater levels.
- 3. **Agricultural drought:** Soil moisture deficiencies relative to water demands of crops.
- 4. **Socioeconomic drought (or water management drought):** Shortage of water due to the demand for water exceeding the supply.

The severity of a drought depends on several factors:

- Duration
- Intensity
- Geographic extent
- Water supply demands for both human use and vegetation

Drought is difficult to define in exact terms, due in part to the ways it differs from other hazards:

- The onset and end of a drought are difficult to determine because of the slow buildup of effects and the lingering impacts after its apparent end.
- There is no exact and universally-accepted definition, adding to the confusion of existence and severity.

• The impact of drought is less obvious and may be spread over a larger geographic area.

These characteristics have hindered the preparation of drought contingency or mitigation plans and can make it difficult to perform an accurate risk analysis.

The magnitude of a drought is measured using the **Palmer Drought Severity Index**. Factors like temperature, soil moisture, and precipitation are entered into an algorithm that returns results between -4 (extreme drought) and 4 (extremely moist) with zero being normal conditions. The index is effective at determining drought over a period of months, but less effective over shorter timeframes. Droughts are rated by the US Drought Monitor into the following categories based on five indicators including the Palmer Index and streamflow data:

• D0: Abnormally Dry

- Going into drought:
 - Short-term dryness slowing planting and growth of crops or pastures
- o Coming out of drought:
 - Some lingering water deficits
 - Pastures or crops not fully recovered

• D1: Moderate Drought

- Some damage to crops and pastures
- o Streams, reservoirs, or wells low, some water shortages developing or imminent
- Voluntary water-use restrictions requested

• D2: Severe Drought

- Crop or pasture losses likely
- o Water shortages common
- Water restrictions imposed

• D3: Extreme Drought

- Major crop and pasture losses
- Widespread water shortages or restrictions

• D4: Exceptional Drought

- Exceptional and widespread crop and pasture losses
- o Shortages of water in reservoirs, streams, and wells creating water emergencies

The **Crop Moisture Index** was developed to measure soil moisture over shorter periods, up to four weeks, and has values between -3 (severely dry) and 3 (excessively wet), again with zero as normal conditions. The National Weather Service's Climate Prediction Center publishes both Palmer Drought Severity and Crop Moisture indices for the country weekly.

Extreme Heat

Extreme summer heat is the combination of very high temperatures and exceptionally humid conditions. This heat is measured by the **heat index**, a scale that quantifies how hot it actually feels. At a heat index of 105°F or higher, the heat is extreme enough to cause disorders associated with exposure to heat and/or physical activity. If such conditions persist for an

extended period of time, it is called a **heat wave**. When extreme heat conditions are forecast, the National Weather Service (NWS) warns people and agencies to take precautions:

- **Excessive Heat Outlook:** Issued when conditions for an excessive heat event may occur in the next three to seven days; provides information for those who need to plan for heat (emergency management, public health officials, utility companies, etc.).
- **Excessive Heat Watch:** Issued when conditions for an excessive heat event will occur in the next 12 to 48 hours.
- **Excessive Heat Advisory:** Issued when the daytime heat index is expected to exceed 100°F in the next 36 hours; or if the heat index is expected to exceed 95°F for four consecutive days.
- **Excessive Heat Warning:** Issued when the heat index is expected to exceed 105°F during the day and 75°F throughout the night in the next 36 hours; or if the heat index is expected to exceed 100°F for four consecutive days.

Figure 3.5.1-1 shows the National Oceanic and Atmospheric Administration (NOAA) NWS heat index values. As indicated, the heat index is a function of the actual temperature and the relative humidity. The categories in light orange, dark orange, and red indicate when the heat index values are of concern and precautions should be taken limiting sun exposure and physical activity.

Temperature (°F) 104 109 Relative Humidity (%) 112 117 100 105 110 103 108 114 105 112 119 109 116 126 135 105 113 108 117 112 121 Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity Caution Extreme Caution Danger Extreme Danger

Figure 3.5.1-1: NOAA's National Weather Service Heat Index

Source: NOAA, NWS Milwaukee/Sullivan, 2016.

3.5.2 History

During the 20th century, eight notable droughts and several heat waves of record have occurred in the state. It's important to note that it was not until 1979 that the National Weather Service (NWS) adopted the Heat Index Scale, forever changing the way heat waves were documented. Prior to that high temperatures were recorded but the overall impact of extended heat combined with high humidity was not.

1929-1934

The drought of 1929-1934 was probably the most significant in Wisconsin history, considering its duration and severity. This drought had a 75-year recurrence interval in most of the state and a greater than 100-year recurrence interval in certain areas. As shown in Figure 3.5.2-1, much of the country experienced drought conditions through this time. The austere economic impacts of the Great Depression compounded its effects. The drought continued with somewhat decreased effect until the early 1940s in some parts of the state.

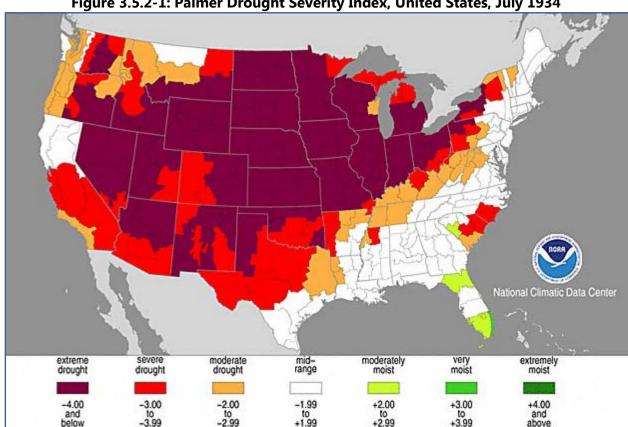


Figure 3.5.2-1: Palmer Drought Severity Index, United States, July 1934

Source: NOAA, National Centers for Environmental Information, 2016.

In addition to the severe drought of the Dust Bowl years, extreme heat both exacerbated the drought conditions and created additional hardship for the poverty-stricken during the Great Depression. The summer of 1936 saw some of the hottest temperatures on record for Wisconsin and the nation. Over 5,000 deaths were attributed to heat that year.

Most of Wisconsin's all-time highest daily temperatures were recorded during the Dust Bowl. On July 13, 1936, the highest temperature ever recorded in Wisconsin, 114°F, occurred in Wisconsin Dells in the central part of the state. The table in Figure 3.5.2-2 lists some Wisconsin cities that recorded their highest temperatures during the Dust Bowl.

Figure 3.5.2-2: Wisconsin Record High Temperatures Set During the Dust Bowl

Municipality	Temperature	Date
Wisconsin Dells	114°F	July 13, 1936
Mondovi	110°F	July 14, 1936
Richland Center	110°F	July 14, 1936
Hatfield	108°F	July 14, 1936
La Crosse	108°F	July 14, 1936
Lancaster	108°F	July 14, 1936
Viroqua	108°F	July 13, 1936

Municipality	Temperature	Date
Appleton	107°F	July 14, 1936
Madison	107°F	July 14, 1936
Oshkosh	107°F	July 13, 1936
Mather	106°F	July 14, 1936
Milwaukee	105°F	July 24, 1934
Green Bay	104°F	July 13, 1936
Medford	104°F	July 13, 1936

Source: NWS, Milwaukee/Sullivan, 2016.

1948-1950

The 1948-1950 drought was most significant in the northern part of the state. In the most severely affected areas, the drought had a recurrence interval of greater than 70 years.

1955-1959

The 1955-1959 drought had a recurrence interval of 30 to 70 years in all but the northwestern corner of the state.

1976-1977

Estimates suggest that the 1976-1977 drought in the Great Plains, Upper Midwest, and far western states caused direct losses of \$10 to \$15 billion (FEMA). The drought was most severe in a wide band stretching from north to south across the state. Stream flow measuring stations recorded recurrence intervals from 10 to 30 years. State agricultural losses reached \$624 million. 64 counties were declared Federal Drought Areas and deemed eligible for assistance under the Disaster Relief Act. Additionally, numerous private and municipal wells ran dry. Federal assistance was used to help communities drill new wells and obtain new water supplies.

1987-1989

Some people believe the North American Drought of 1988 to be the most severe ever experienced in Wisconsin and much of the Midwest. It was characterized not only by below normal precipitation, but also by persistent dry air and above normal temperatures. Heatwaves killed an estimated 5,000 people nationwide and contributed to high livestock loss (NOAA, NCEI). Stream flow measuring stations indicated a drought recurrence interval of 75 to 100

years. The effects were most severe in north-central and northeastern Wisconsin. The drought occurred early in the growing season and resulted in a 30-60% crop loss with state agricultural losses estimated at \$1.3 billion. 52% of the state's 81,000 farms were estimated to have had crop losses of 50% or more, with 14% of farms suffering estimated losses of 70% or more (FEMA). State and federal drought assistance programs helped Wisconsin farmers recover a portion of their losses. All Wisconsin counties were designated eligible for this drought assistance. In total, the drought in the central and eastern states between 1987 and 1989 caused an estimated \$39 billion in damages (FEMA). Figure 3.5.2-3 shows the Palmer Drought Severity Index for July 1988.

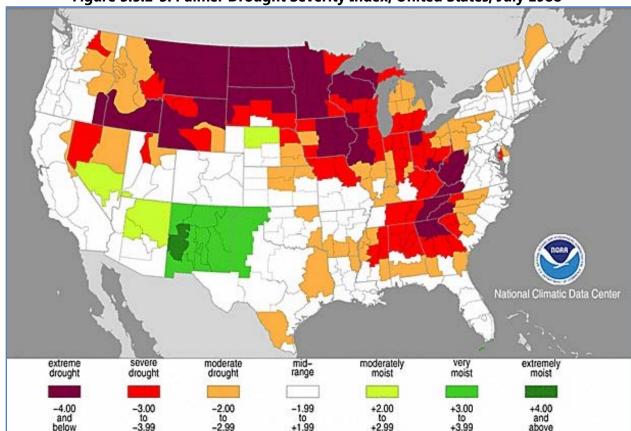


Figure 3.5.2-3: Palmer Drought Severity Index, United States, July 1988

Source: NOAA, National Centers for Environmental Information, 2016.

The impact of this drought on private and municipal water supplies was not as severe; there were only a few reports of individual wells running dry. Several municipal water utilities experienced maximum use of their water delivery systems. Many water utilities imposed some type of water-use reduction rules or restrictions, usually involving the limitation of lawn and yard watering.

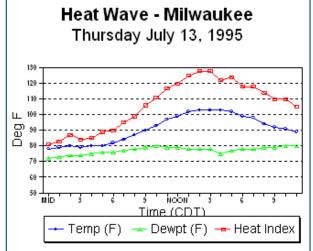
1995

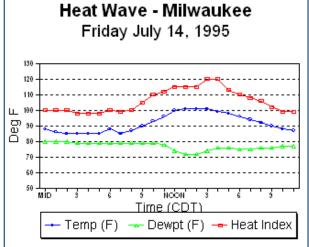
Two major heat waves occurred in Wisconsin in 1995, one in June, one in July. Nationwide, the two heatwaves claimed 1,021 lives. During the first heat wave, June 17-27, temperatures rose into the upper 90s with heat index values of 98 to 104°F. Nine people in Wisconsin died directly

from the heat. During the second heat wave, July 12-15, Wisconsin witnessed the greatest number of weather-related deaths in state history when 141 people died directly or indirectly from the heat. 85 of the deaths were in Milwaukee (NWS). High temperatures ranged from 100 to 108°F with heat index values between 120 and 130°F.

The relative humidity during the July heat wave produced heat index values which are rarely reached. The heat index values were the main contributing factor in the large number of fatalities. In urban areas, like Milwaukee County, heat index values were higher due to the concentration of buildings, concrete, and asphalt. This phenomenon is known as the **urban heat island effect**. The urban heat island effect intensified the effects of the already very high temperatures. Figure 3.5.2-4 shows the temperature, dew point, and heat index trend-lines for Milwaukee General Mitchell Field for July 13 and 14, 1995. Note that the heat index values barely fell below 100°F overnight on July 13.

Figure 3.5.2-4: Temperature, Dew Point, and Heat Index, Milwaukee, July 13 and 14, 1995





Source: NWS, Milwaukee/Sullivan, 2008.

1999

Another heat wave struck Wisconsin during the last two weeks of July in 1999, peaking July 28-31. During those four days, high humidity and temperatures in the 90s and 100s produced heat index values of 110 to 125°F. The heat wave resulted in twelve direct and eight indirect deaths (NWS). There was a record peak demand for electric power in the Milwaukee area during this time, mirroring the record set during the same period for the whole Midwest.

2001

Several heat waves from mid-July to early August 2001 claimed 15 lives (ten direct fatalities, five indirect) across Wisconsin. At least 300 people were treated at hospitals for heat exhaustion as temperatures topped out in the mid- to upper 90s. However, on August 7, the temperature rose to 102°F at Mount Mary College in Milwaukee County and 101°F in Buffalo and Trempealeau counties.

2003

In August of 2003, drought conditions returned to parts of south-central and southeast Wisconsin. The jet stream and associated low pressure systems stayed north of Wisconsin, resulting in few cold-front passages. Conditions worsened from abnormally dry (D0) to a moderate (D1) drought as the month progressed. This drought continued into September 2003 and ultimately reached the severe (D2) category. Crop and fruit tree farms without irrigation capability were particularly impacted. The hottest day of the summer in Milwaukee occurred on August 21 when 96°F was recorded. Madison topped out at 94°F on August 26. Milwaukee experienced six days in August with temperatures climbing to 90°F or higher. The summer was the driest in three decades in West Bend in Washington County where only 5.11 inches of rain fell (7.82 inches below normal). Similar conditions occurred throughout southern Wisconsin.

2007

Between January and July 2007, drought gradually crept back into most of Wisconsin, spreading from north to south. The jet stream pattern kept low pressure systems and associated thunderstorms northwest of Wisconsin while summer temperatures averaged one to three degrees above normal. Eventually moderate (D1) to extreme (D3) drought covered 85% of the state. Only the southern tier of counties had normal to abnormally dry (D0) conditions. Crop yields were reduced. In August, moderate to heavy rains across central and southern Wisconsin broke the drought in those areas, but the drought only gradually departed the northern part of the state, lingering until December.

2011

In 2011, Wisconsin experienced its most widespread and probably most oppressive heat wave since 1995. Between July 17 and 21, maximum heat indices peaked in the 105 to 115°F range over much of the state. Air temperatures reached 95 to 100°F while overnight minimum temperatures remained mostly in the 72 to 82°F range. Three heat-related fatalities occurred during this heat wave.

2012

Wisconsin experienced a major heat wave during the first seven days of July 2012, peaking July 4-6. There were several heat-related fatalities during this event and most likely several hundred people needed medical treatment. The July 2012 heat wave was roughly as hot as the killer July 1995 heat wave, but less humid and longer in duration. Maximum air temperatures ranged from the upper 90s to 106°F. However, it was cooler near Lake Michigan and Lake Superior and across the northern third of the state. Maximum heat indices peaked in the 100 to 115°F range thanks to dew points reaching the mid-60s to mid-70s.

Along with, and probably exacerbated by, the heat wave of 2012, a cruel drought affected nearly all of Wisconsin during the 2012 summer and fall seasons, resulting in reduced crop yields and forced sell-off of some dairy and cattle herds. Alfalfa hay crops also suffered. The reduced

quantity and increased cost of feed were factors in the livestock sales. There were many reports of wells running dry and some well depths had to be increased in order to find water. The drought was generated by a large, warm blocking high pressure in the upper levels of the atmosphere which was centered over the middle of the nation in May and June. Part of this high pressure expanded north into the western Great Lakes region in July, forcing storms to stay mostly north of Wisconsin as the summer



Heat- and Drought-Affected Crops, Wisconsin, 2012. Source: New York Times, 2015.

progressed. The drought started across the southern third of counties in June and steadily expanded north during July and August. Eventually, the southern two-thirds of the state was in severe (D2) to extreme (D3) drought status. The drought continued into December thanks to a very dry November.

Deadly Extreme Heat Events

The table in Figure 3.5.2-5 summarizes heat-related deaths in the state from 1982 to 2015. Years with no heat-related deaths are not included in the table. Most of the fatalities in Wisconsin occurred during the two major heat wave events in June and July 1995. A death is considered **direct** if the medical examiner ruled that heat was the primary cause of death. If heat was a contributing factor (not the main cause), the examiner ruled that death **indirect**.

Figure 3.5.2-5: Heat-Related Deaths in Wisconsin, 1982-2015

Year	Direct	Indirect
1986	1	0
1988	1	0
1993	2	0
1995	82	72
1997	1	0
1999	13	8
2001	10	5

Year	Direct	Indirect
2002	3	5
2003	0	4
2006	3	1
2011	5	0
2012	14	7
2013	2	0
TOTAL	137	102

Source: NWS, Milwaukee/Sullivan, 2016.

3.5.3 Probability, Impact, and Mitigation Potential

Hazard Ranking

Evaluation Criteria	Description	Ranking
Probability: Drought	 The hazard impacts the state occasionally, but not annually The hazard is somewhat localized, affecting only relatively small or isolated areas when it occurs The methodology for identifying events is not well-established, or is not applied across the entire state 	Medium
Probability: Extreme Heat	 The hazard has impacted the state annually, or more frequently The hazard is widespread, generally affecting regions or multiple counties in each event There is a reliable methodology for identifying events and locations 	High
Mitigation Potential: Drought and Extreme Heat	 Methods for reducing risk from the hazard are not well-established, are not proven reliable, or are experimental The state or counties have little or no experience in implementing mitigation measures, and/or no technical knowledge of them Mitigation measures are ineligible under federal grant programs There is a very limited range of mitigation measures for the hazard, usually only one feasible alternative The mitigation measures have not been proven cost-effective and are likely to be very expensive compared to the magnitude of the hazard The long-term effectiveness of the measure is not known, or is known to be relatively poor 	Low

Frequency and Probability

Drought

The future incidence of drought is highly unpredictable, and may also be localized, making it difficult to determine probability with any accuracy; however, the National Weather Service (NWS) and National Integrated Drought Information System (NIDIS) are improving methodologies for accurately forecasting drought conditions. Both organizations use a combination of current and historic precipitation, streamflow, groundwater levels, and crop data to perform short- and long-term forecasts.

The Palmer Drought Severity Index determines long-term drought forecasts, profiling several months at a time; however, it does not provide accurate short-term forecasts (several weeks). It uses a rating of zero as normal with drought shown in negative numbers and excessive moisture in positive numbers. The scale and conditions from November 2016 are pictured in Figure 3.5.3-1. The green shading over Wisconsin indicates that the state was experiencing very moist conditions. The NWS updates the Palmer Index weekly. Current Palmer Drought Severity Index information can be found online at the NWS Climate Prediction Center's Drought Monitoring website at http://www.cpc.ncep.noaa.gov/products/monitoring and data/drought.shtml.

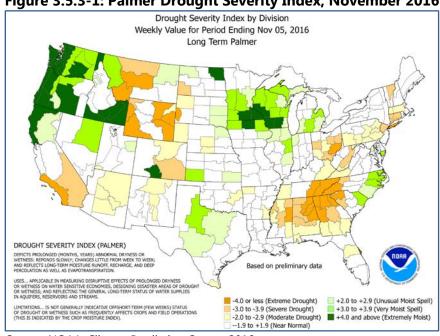


Figure 3.5.3-1: Palmer Drought Severity Index, November 2016

Source: NOAA, Climate Prediction Center, 2016.

The US Drought Monitor indicates which parts of the country are experiencing short-term drought conditions. The US drought Monitor can be accessed at the NIDIS website at http://www.drought.gov. Figure 3.5.3-2 shows the short-term drought conditions for the beginning of November 2016. The overall lack of any color shading over Wisconsin indicates that there were no short-term drought conditions in Wisconsin. This contrasts markedly with the D4 (exceptional drought) conditions in California and the southeast.

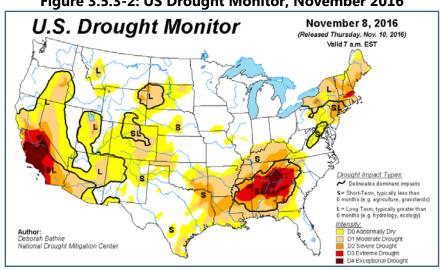


Figure 3.5.3-2: US Drought Monitor, November 2016

Source: US Drought Monitor, 2016.

Extreme Heat

The probability of exceeding 89°F in any given year is high, but temperatures are not the only determinant of the impacts of heat. Other factors include humidity, duration, and timing of the extreme heat event.

Extreme heat is the deadliest type of severe weather in Wisconsin. Statewide there were 137 direct heat-related deaths between 198 and 2015 and an additional 102 indirect heat-related deaths (see Section 3.5.2 for a breakdown of heat-related deaths by year and narratives of the significant heat waves in Wisconsin's history). This averages to 4.2 direct and 3.1 indirect heat-related deaths per year (NWS). Figure 3.5.3-3 shows the direct heat-related deaths by county.

Wisconsin Heat DOAR **Wave Deaths** 1982 - 2015 Bayfield Douglas 0 Iron **Total Heat Related** 0 Deaths: 137 Vilas Ashland 0 Burnett Washburn Price 0 0 Oneida 0 0 Rusk Barron Lincoln Marinette Langlade Taylor Chippewa 0 St. Croix 0 Dunn Meno-Marathon 0 minee 0 Pierce Eau Claire Clark Shawano Portage Kewaunee Buffalo Tremp-Outagamie 0 Wood Brown 0 Pepin 1 Jackson 0 Waushara Winne-8 bago Manitowoc 3 1 Monroe Marg-Green Fond du Lac Sheboygan 0 0 Vernon Columbia Sauk Number of Richland Crawford **Events** Dane Jefferson V 0 lowa Grant 0 1 - 5 Green Walworth Rock Lafayette 6 - 10 Kenosha > 10

Figure 3.5.3-3: Total Heat Wave Days per Wisconsin County, 1982-2015

Source: NWS, Milwaukee/Sullivan, 2016.

The Building Resilience Against Climate Effects (BRACE) program in the Wisconsin Department of Health Services has compiled heat vulnerability index maps for the state and each county. A combination of risk factors (population density, health factors, demographic and socioeconomic factors, and the natural and built environment) was used to create the maps. Figures 3.5.3-4 and 3.5.3-5 show the maps for the state and Milwaukee County. With its high population density, high poverty rate, and urban heat island effect, it is no surprise that Milwaukee County has a high vulnerability to extreme heat events and has experienced many heat-related fatalities.

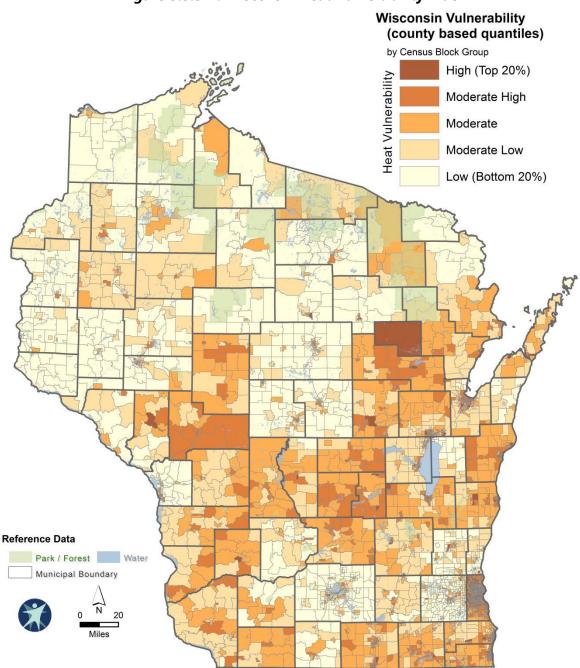


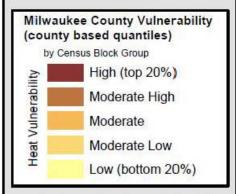
Figure 3.5.3-4: Wisconsin Heat Vulnerability Index

Source: Department of Health Services, BRACE, 2016.

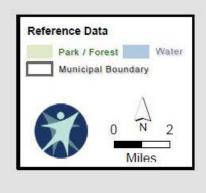
Figure 3.5.3-5: Milwaukee County Heat Vulnerability Index

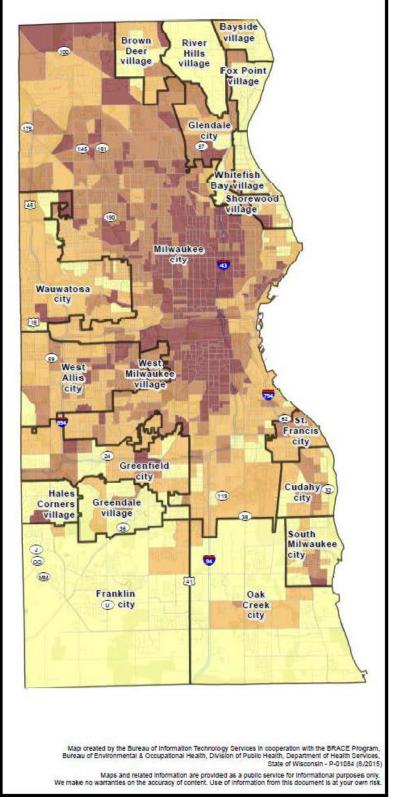
Milwaukee County Heat Vulnerability Index

The MilwaukeeCounty Heat Vulnerability* analysis was created by the Building Resillence Against Climate Effects program within the Wisconsin Department of Health Services. The data displayed in the map is meant to serve as an informational tool to better understand the spatial distribution of human populations most vulnerable to extreme heat related events.



- * The Milwaukee County Heat Vulnerability Index is based on the Wisconsin Heat Vulnerability Index** with slight alterations to account for risk factors specific to Milwaukee County. Additional data sets were made available for the Milwaukee study area and incorporated into the analysis. It is representative of the heat vulnerability in Milwaukee County, and is not representative of the vulnerability compared to the other counties in Wisconsin.
- "The Wisconsin Heat Vulnerability Index is based on multiple indicators associated with risk for heat-related illness and mortality. The index analysis was created as a measure of vulnerability by U.S. Census block groups during an extreme heat event. The measure includes: health factors, demographic and household characteristics, natural and built environment factors (e.g., air quality, temperature, land cover) and population density.





Source: Department of Health Services, BRACE, 2016.

Figures 3.5.3-6 and 3.5.3-7 highlight heat wave events in Wisconsin from 1982 to 2015. Figure 3.5.3-6 shows the heat wave days per county, indicating the number of calendar days in that time on which a heat advisory or excessive heat warning was issued. Southeastern Wisconsin has a higher likelihood of heat wave days, most counties experiencing at least 70 days total with a 2.1 day annual average.

Figure 3.5.3-6: Total Heat Wave Days per Wisconsin County, 1982-2015

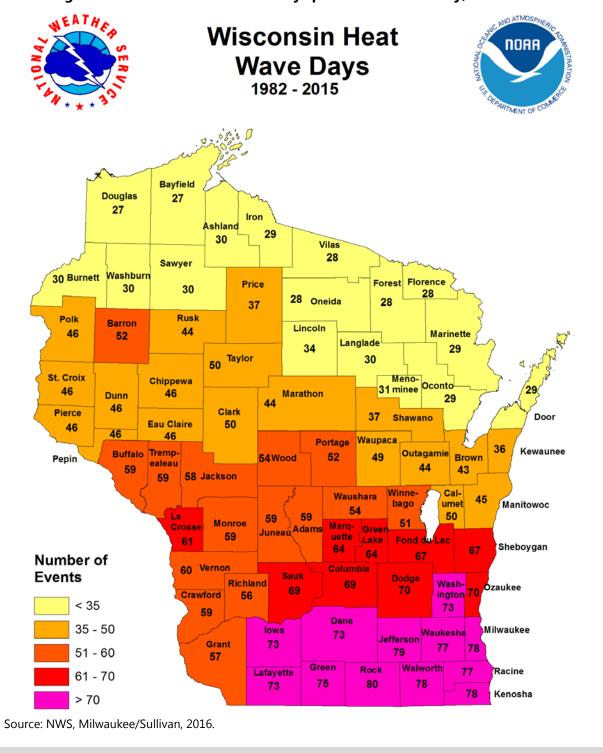
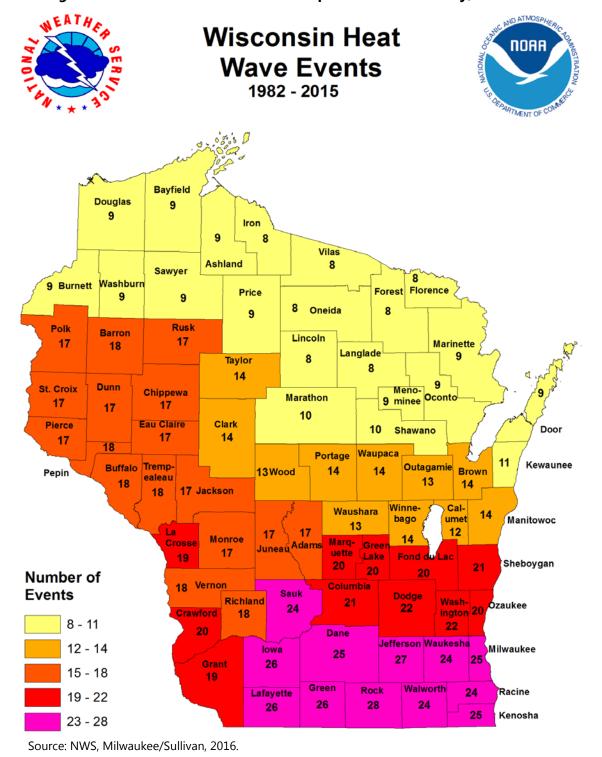


Figure 3.5.3-7 displays the number of heat wave events per county. This map, along with Figure 3.5.3-6, indicates that individual heat wave events have a tendency to last for multiple days. In southeastern Wisconsin, where there are the most heat wave days and heat wave events, an event will last between 3.5 and 3.8 days, on average.

Figure 3.5.3-7: Total Heat Wave Events per Wisconsin County, 1982-2015



Impacts

Drought

The impacts of drought are varied and far-reaching. Droughts may cause a shortage of water for human and industrial consumption, hydroelectric power, recreation, and navigation. Water quality may decline and the number and severity of wildfires may increase. As land is cleared by wildfire, loss of vegetation can result in flooding, even from average rainfall following drought conditions. Severe droughts may result in the loss of agricultural crops and forest products, undernourished wildlife and livestock, and lower land values.

Wisconsin is most vulnerable to agricultural drought. The state has approximately 15.2 million acres of farmland on 78,000 farms and was ranked ninth in the country in overall farm receipts in 2015 (USDA, Economic Research Service). Even small droughts of limited duration can significantly reduce crop growth and yields, adversely affecting farm incomes and local economies.

Extreme Heat

Extreme heat is of great concern since exposure causes serious life-threatening conditions. The risk to humans is grave, as more people die from heat than any other extreme weather event. From 2006-2015, an average of 113 people died annually from heat-related events (NWS). The danger categories and heat disorders associated with the heat index values described in Section 3.5.1 are listed in the table in Figure 3.5.3-8. Note that caution should be taken when the heat index approaches 90°F.

Figure 3.5.3-8: Heat Index and Associated Heat Disorders

Danger Category		Heat Disorder	Heat Index Value (How Hot It Feels)
IV	Extreme Danger	Heatstroke or sunstroke highly likely with continued exposure.	>130°F
III	Danger	Sunstroke, heat cramps, or heat exhaustion likely; heat stroke possible with prolonged exposure and/or physical activity.	105-130°F
II	Extreme Caution	Sunstroke, heat cramps, and heat exhaustion possible with prolonged exposure and/or physical activity.	90-105°F
I	Caution	Fatigue possible with prolonged exposure and/or physical activity.	80-90°F

Source: NWS, Green Bay, 2016.

There are different stages of heat disorders associated with exposure to heat:

 Heatstroke: An often fatal medical emergency occurring when the body's responses to heat stress are insufficient to prevent a substantial rise in the body's core temperature, typically exceeding 105°F. Even with rapid cooling and treatment, the average fatality rate is 15%.

• **Heat Exhaustion:** A less serious medical condition characterized by dizziness, weakness, or fatigue. Body temperatures may be normal or slightly to moderately elevated. With fluid treatment, the prognosis is typically good.

- **Heat Syncope:** A sudden loss of consciousness typically associated with people exercising who are not acclimated to warm temperatures. It causes little or no harm to the individual.
- Heat Cramps: A condition that may occur in people unaccustomed to exercising in the heat.

In addition to affecting people, severe heat places significant stress on plant and animal life. Severe heat may reduce the yields of crops or contribute to crop loss. Similarly, livestock may become overheated leading to reduced milk production and other health problems (Garcia).

3.5.3.1 Changing Future Conditions

As average temperatures rise statewide, Wisconsin communities can expect to see longer summers and shorter winters. Northern Wisconsin will likely experience the greatest warming, but most of the state will grow warmer over the course of the next century, especially in the summer months. One 2003 report predicted that Wisconsin summers may become more like Illinois summers by the year 2030; by 2100, summer in Wisconsin will feel more like summer in present-day Arkansas.⁷

Heat waves are expected to become longer and more intense over time, with a 5-6°F rise in average summertime temperatures statewide, and a greater number of days over 90°F each year, as many as twenty additional days over 90°F by 2050. Peak temperatures are likely to reach 110-112°F. The hottest day during the period from 2046 to 2065 is likely to be hotter than the historic hottest day on record from 1960 to 1999.

The impacts of extreme heat events are experienced most accurately by the elderly and other vulnerable populations. High temperatures are exacerbated in urban environments, a phenomenon known as the urban heat island effect, which in turn tend to have higher concentrations of vulnerable populations. Higher demand for electricity as people try to keep cool amplifies stress on power systems and may lead to an increase in the number of power outages. Atmospheric concentrations of ozone occur at higher air temperatures, resulting in poorer air quality, while harmful algal blooms flourish in warmer water temperatures, resulting in poorer water quality.

Mitigation against the impacts of future temperature increase may include increasing education on heat stress prevention, organizing cooling centers, allocating additional funding to repair and maintain roads damaged by buckling and potholes, and reducing nutrient runoff that contributes to algal blooms. Local governments should also prepare for increased demand on

-

⁷ Confronting Climate Change in the Great Lakes Region, Union of Concerned Scientists and the Ecological Society of America, 2003.

public recreational facilities, utility systems, and healthcare centers. Improving energy efficiency in public buildings will also present an increasingly valuable savings potential.

The number of heavy rainfall events is predicted to increase, yet researchers currently expect little change in total rainfall amounts, indicating that the periods between heavy rainfalls will be marked by an increasing number of dry days. Higher temperatures and increased evapotranspiration increase the likelihood of drought.

Agricultural operations are particularly vulnerable to drought. A trend of increasing use of groundwater irrigation by agriculture has been taking place in areas of the state that traditionally relied on rainfall as a source of water for crops. Competition for groundwater between municipal and private wells and other users may arise in areas of the state that rely on groundwater for irrigation during dry periods.

3.5.4 Catastrophic Scenario

Precipitation across Wisconsin is 15 inches below normal since January 1st, and the state ushers in the first day of summer after 39 consecutive days without rainfall. Unusually high temperatures and humidity cause the National Weather Service (NWS) to issue several Excessive Heat Warnings for the southern two-thirds of Wisconsin, with local coroners and medical examiners reporting 6 heat-related deaths. A Heat dome is stationary across the upper Midwest, with little or no precipitation in the forecast, and the NWS anticipates issuing an Excessive Heat Watch for 5 days for much of Wisconsin. As a result of the high use of residential and commercial air conditioning Wisconsin utilities are experiencing record electric usage that is creating a burden on the electrical infrastructure.

Fish kills are being reported due to low surface water levels and unusually high water temperatures. Higher than normal bacteria counts are also causing stress on wildlife and water quality. The extended drought is impacting aquifers. A number of rural drinking water and agricultural supply wells are experiencing difficulty fully meeting water needs. Some wells have gone completely dry. Half of the state's corn and hay crops are lost. 40,000 dairy cattle must be slaughtered due of lack of feed. The cull of dairy cattle decreases the milk supply and contributes to a milk shortage. Heat stress impacts weight gain, milk production, and reproductive efficiency for farm animals as well as wildlife. Even with burning restrictions issued throughout the state there is an increase in large wildfires due to dry vegetation. Wildlife viability is taxed due to lack of vegetation for foraging. Burning bans are in place. It is anticipated that food prices will increase by 12 % in the next year.

3.5.5 Summary Risk Analysis

The table in Figure 3.5.5-1 provides a summary risk analysis for the drought and extreme heat hazard.

Figure 3.5.5-1: Drought and Extreme Heat Summary Risk Analysis

Evaluation Criteria	Description	Ranking
	Risk to People, Property, Environment, and Operations	
Probability/potential threat of occurrence	 The hazard impacts the state occasionally, but not annually The hazard is somewhat localized, affecting only relatively small or isolated areas when it occurs The methodology for identifying events is not well-established, or is not applied across the entire state 	Medium
Vulnerability	 Minimal countermeasures are in place to prevent or protect against this hazard. Countermeasures may have potential, but limited demonstrated history in reducing the threat potential. The nature of the hazard may limit the availability of countermeasures. 	High

Mitigation Potential	 Methods for reducing risk from the hazard are not well-established, are not proven reliable, or are experimental The State or counties have little or no experience in implementing mitigation measures, and/or no technical knowledge of them Mitigation measures are ineligible under federal grant programs There is a very limited range of mitigation measures for the hazard, usually only one feasible alternative The mitigation measures have not been proven cost-effective and are likely to be expensive compared to the magnitude of the damages caused by the hazard The long-term effectiveness of the measure is not known, or is known to be relatively poor 	Low
	Impacts of Catastrophic Scenario	
Public	 Local medical services are unable to manage the volume of injuries and fatalities. Patients require transportation to regional medical facilities outside of the affected areas. Local area evacuations, sheltering, and care of displaced residents, medical patients, and vulnerable populations may be required. 	Medium
Responders	 Emergency response capabilities largely exist locally or through mutual aid to meet the needs of the incident, with minimal state assistance needed for some specialized resources. Local disaster declaration probable. 	Low
COOP, including delivery of services	State or local government mission essential functions impacted for less than 24 hours.	Low
Property, Facilities & Infrastructure	 Significant damage to critical infrastructure, public and private property over a localized area. Up to 10% of buildings and infrastructure in affected area damaged, and/or loss of lifeline services for up to 24 hrs. 	Low
Environment	 Widespread environmental damage over a large geographic area affecting several communities across a region. Significant damage to an ecologically sensitive area such as wetlands, rivers, lakes, or public water supply. Damage requires massive long-term remediation efforts of state and federal government. 	High
Economy	 Tremendous adverse impact affecting the livelihood of the region and possibly extending to statewide. Long-term, cascading damage across multiple economic sectors requiring federal government assistance. 	High

Public Confidence	•	Medium and long-term effects including elevated stress, depression and behavioral health impacts for individuals in and out of impacted communities. Short- to medium term reduction of confidence in government in society. Civil disturbances in impacted communities may require law enforcement response.	Medium
		Aggregate Impact	Medium

Source: Wisconsin Emergency Management

FOR OFFICIAL USE ONLY

3.5.6 Sources – Agency Input and Research

The following agencies and document research assisted in providing subject matter expertise to this scenario's core capabilities.

- 1. Gillam, Carey. "Rains Help Shrink Drought but High Plains Still Parched." Reuters. October 25, 2012. Accessed November 2016. http://in.reuters.com/article/us-usa-drought-idINBRE89017X20121025.
- 2. National Centers for Environmental Information. "Historical Palmer Drought Indices." Historical Palmer Drought Indices | Temperature, Precipitation, and Drought | National Centers for Environmental Information (NCEI). Accessed November 2016. https://www.ncdc.noaa.gov/temp-and-precip/drought/historical-palmers/.
- 3. National Centers for Environmental Information. "Billion-Dollar Weather and Climate Disasters: Table of Events." Billion-Dollar Weather and Climate Disasters: Table of Events | National Centers for Environmental Information (NCEI). Accessed November 2016. https://www.ncdc.noaa.gov/billions/events.
- 4. U.S. Drought Monitor. "U.S. Drought Monitor Classification Scheme." United States Drought Monitor. Accessed November 2016. http://droughtmonitor.unl.edu/aboutus/classificationscheme.aspx.
- 5. Gillis, Justin. "New Study Links Weather Extremes to Global Warming." *New York Times*, April 27, 2015. Accessed November 2016. http://www.nytimes.com/2015/04/28/science/new-study-links-weather-extremes-to-global-warming.html? r=2.
- 6. Wisconsin Department of Health Services. "Wisconsin Heat Vulnerability Index (HVI)." Wisconsin Department of Health Services. February 23, 2016. Accessed November 2016. https://www.dhs.wisconsin.gov/climate/wihvi.htm.
- 7. U.S. Department of Agriculture, Economic Research Service. "Farm Income and Wealth Statistics." Accessed November 2016. https://data.ers.usda.gov/reports.aspx?ID=49642.
- 8. Confronting Climate Change in the Great Lakes Region, Union of Concerned Scientists and the Ecological Society of America, 2003.
- 9. "National Climate Assessment." National Climate Assessment. Accessed October 2016. http://nca2014.globalchange.gov/.
- 10. Wisconsin Initiative on Climate Change Impacts. "Impacts Presentation." Wisconsin Initiative on Climate Change Impacts. Accessed November 2016. http://www.wicci.wisc.edu/impacts.php#2.
- 11. Changing Climate Resilient Communities: Climate Science for Natural Hazard Mitigation Planning, presentation by David S. Liebl, Dane County Emergency Management, 22 July 2015.
- 12. Clark County. *Multi-Hazard Mitigation Plan*. By Clark County Emergency Management. Neillsville, WI, 2016.
- 13. United States of America. Oconto County. Oconto County Emergency Management.

 Oconto County, Wisconsin Hazard Mitigation Plan. By Oconto County Hazard Mitigation
 Plan Steering Committee and Bay-Lake Regional Planning Commission. Oconto, WI:
 Oconto County, 2015.

14. *Wisconsin 2050: Scenarios of a State of Change*. August 20, 2016. Accessed October 2016. http://www.wicci.wisc.edu/resources/ClimateWI2050-Communites August 2016.pdf.

- 15. Federal Emergency Management Agency. "FEMA's Multi-Hazard Identification and Risk Assessment, 'Subpart E: Other Natural Hazards' ". Federal Emergency Management Agency. Accessed October 2016. https://www.fema.gov/media-library/assets/documents/7251?id=2214.
- 16. National Centers for Environmental Information. "North American Drought Monitor."

 North American Drought Monitor | Temperature, Precipitation, and Drought | National Centers for Environmental Information (NCEI). Accessed November 2016.

 https://www.ncdc.noaa.gov/temp-and-precip/drought/nadm/maps.
- 17. National Centers for Environmental Information. "Climate Prediction Center United States Drought Information." Climate Prediction Center United States Drought Information. Accessed November 2016. http://www.cpc.ncep.noaa.gov/products/Drought/.
- 18. "Natural Hazards Center Homepage." Natural Hazards Center. Accessed November 2016. https://hazards.colorado.edu/.
- 19. United States Drought Monitor. "United States Drought Monitor Home." United States Drought Monitor. Accessed November 2016. http://droughtmonitor.unl.edu/.
- 20. National Integrated Drought Information System. "National Integrated Drought Information System." Accessed November 2016. https://www.drought.gov/drought/.
- 21. National Weather Service. "NOAA Drought Information Center." NOAA Drought Information Center. Accessed November 2016. http://www.noaanews.noaa.gov/drought/.
- 22. Wisconsin Department of Natural Resources. "Wisconsin Department of Natural Resources-Water Division." Water Division. Accessed November 2016. http://dnr.wi.gov/about/divisions/water/.
- 23. Wisconsin Department of Natural Resources. "Wisconsin Department of Natural Resources-Water Resources." Water Topics Wisconsin DNR. Accessed November 2016. http://dnr.wi.gov/topic/water.html.
- 24. National Centers for Environmental Information. "Storm Events Database." Storm Events Database | National Centers for Environmental Information. Accessed October 2016. https://www.ncdc.noaa.gov/stormevents/.
- 25. Federal Emergency Management Agency. "FEMA's Multi-Hazard Identification and Risk Assessment, 'Part 1: Atmospheric Hazards' ". Federal Emergency Management Agency. Accessed October 2016. https://www.fema.gov/media-library/assets/documents/7251?id=2214.
- 26. U.S. Department of Labor Occupational Safety and Health Administration. "Campaign to Prevent Heat Illness in Outdoor Workers." OSHA's Campaign to Prevent Heat Illness in Outdoor Workers | Occupational Safety and Health Administration. Accessed November 2016. https://www.osha.gov/SLTC/heatillness/index.html.
- 27. U.S. Environmental Protection Agency. "Heat Island Effect." EPA. Accessed October 2016. https://www.epa.gov/heat-islands.
- 28. National Weather Service. "NWS Heat Safety Home Page." NWS Heat Safety Home Page. Accessed November 2016. http://www.nws.noaa.gov/om/heat/index.shtml.

29. National Weather Service. "NWS Heat Safety Watches and Warnings Home Page." NWS Heat Safety Watches and Warnings Home Page. Accessed November 2016. http://www.nws.noaa.gov/om/heat/www.shtml.

- 30. National Weather Service. "NWS Forecast Office, Milwaukee/Sullivan, WI." US Department of Commerce, NOAA, National Weather Service. Accessed November 2016. http://www.weather.gov/mkx/.
- 31. National Weather Service. "NWS Forecast Office, Green Bay, WI." US Department of Commerce, NOAA, National Weather Service. Accessed November 2016. http://www.weather.gov/grb/.
- 32. Service, National Weather. "NWS Forecast Office, La Crosse, WI." US Department of Commerce, NOAA, National Weather Service. Accessed November 2016. http://www.weather.gov/arx/.
- 33. National Weather Service. "Natural Hazard Statistics." NWS Analyze, Forecast and Support Office. April 6, 2016. Accessed November 2016. http://www.nws.noaa.gov/om/hazstats.shtml.

3.6 Winter Storms and Extreme Cold

3.6.1 Nature of the Hazard

Winter storms vary in size and strength and include heavy snowstorms, blizzards, freezing rain, sleet, ice storms, and considerable blowing and drifting snow conditions that can close roads. Additionally, the combination of extremely cold temperatures and strong winds can result in dangerous wind chills that cause bodily injury like frostbite or even death due to exposure (hypothermia). Severe winter storms can cause unusually heavy rain or snowfall, high winds, extreme cold, and ice storms throughout the continental US.

Winter storms can be very disruptive to transportation and commerce. Trees, cars, roads, and other surfaces can develop a glaze of ice making conditions extremely hazardous to motorists and pedestrians. The most prevalent impacts of heavy accumulations of ice and snow are slippery roads and walkways leading to vehicle and pedestrian accidents; collapsed roofs from fallen trees and limbs and heavy ice and snow loads; and felled trees, telephone poles and lines, electrical wires, and communications towers. As a result of severe winter storms, power and telecommunications can be disrupted for days. Such storms can also cause high rainfall which, combined with snow melt, can cause flooding. See Section 3.3 for a discussion of flooding.

A variety of weather phenomena and conditions can occur during winter storms. The following are National Weather Service (NWS) approved descriptions of winter storm elements:

- Heavy snowfall: accumulation of four or more inches of snow in a 12-hour period or six or more inches in a 24-hour period.
- **Blizzard:** sustained wind or frequent wind gusts of at least 35 mph accompanied by considerable falling and/or blowing snow.
- **Ice storm:** freezing rain produces significant or damaging accumulations of ice, usually ¼" or thicker.
- **Freezing drizzle/freezing rain:** drizzle or rain that falls as a liquid but freezes into glaze upon contact with the ground or objects with a temperature of 32°F or below.
- Sleet: pellets of ice composed of frozen or mostly frozen raindrops or refrozen partiallymelted snowflakes.
- **Wind chill:** measure of accelerated heat loss from exposed skin due to increased wind speeds.

If the temperature is 0°F with a 15 mph wind, the wind chill is -19°F. At this wind chill, exposed skin can freeze in 30 minutes as shown in Figure 3.6.1-1. In general, the NWS regional offices will issue **Wind Chill Advisories** when wind chill values are expected to drop to -20 to -34°F with winds at least 10 mph. Similarly **Wind Chill Warnings** are issued in Wisconsin for wind chill values of -35°F or lower with winds at least 10 mph.

Wind chill is calculated using the following formula, where T is the air temperature in degrees Fahrenheit and V is the wind speed in miles per hour:

Wind Chill (°F) = $35.74 + 0.6215(T) - 35.75(V^{0.16}) + 0.4275(T)(V^{0.16})$

Figure 3.6.1-1: NWS Wind Chill Chart

Temperature (°F)									(°F)										
	Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
	5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
	10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
	15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
	20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
J.	25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
Wind (mph)	30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
þ	35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
W	40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
	45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
	50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
	55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
	60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98
Frostbite Times						30) minu	tes	10	minut	es	5 m	inutes						

Source: NOAA, NWS, http://www.nws.noaa.gov/om/winter/windchill.shtml, 2016.

3.6.2 History

There have been many noteworthy winter storms in Wisconsin. The table in Figure 3.6.2-1 shows some of the record-breaking events in the state's history.

Figure 3.6.2-1: Wisconsin Record-Breaking Winter Event Facts

Record	Location	County	Date	Magnitude
24-hour snow accumulation	Neillsville	Clark	December 27-28, 1904	26 inches
Seasonal snow accumulation	Hurley	Iron	Winter 1996-97	301.8 inches/ 25.2 feet
Snowless streak	Milwaukee	Milwaukee	March 4-December 18, 2012	288 days
Coldest temperature	Couderay	Sawyer	February 4, 1996	-55°F

1881

True to form, March 1881 came in like a lion with a blizzard raging from the 2nd to the 4th in the southern and central portions of Wisconsin. Resulting in two to four feet of snow accumulation and drifts of over 20 feet, this was one of the worst in history for the Milwaukee area. Between February 24 and March 20, Milwaukee received 63.7 inches of snow.

1922

With widespread ice accumulations of one to two inches and reports of close to four, the ice storm on February 21-23, 1922, was one of the worst in the state's history. The southwest and south central parts of the state were primarily impacted. The ice toppled an estimated 15,000 to 20,000 utility poles. Power, telegraph, and phone service were disrupted from two to 15 days. Trees used for timber and fruit production were damaged or killed. Estimated damages were \$10 million, which was an incredible amount at the time (equivalent to \$144 million in 2016⁸).

1924

On February 4 and 5, 1924, a blizzard walloped the southern part of the state with high snow accumulations and drifts up to ten feet. Milwaukee's heaviest 24-hour snowfall occurred in this storm: 20.3 inches.

1976

In March 1976, an ice storm of disastrous proportions occurred in southern Wisconsin. Accumulations of up to five inches of ice were recorded. Utility poles and trees were downed throughout the southern part of the state causing widespread blackouts. Some areas were without power for ten days. This storm was of such magnitude and caused such significant

⁸ Calculation performed using the US Bureau of Labor Statistics, Consumer Price Index Inflation Calculator: http://www.bls.gov/data/inflation_calculator.htm.

damage that a Presidential Disaster Declaration was granted. The storm affected 22 counties, resulted in extensive power outages, and caused more than \$50 million in damage.

1979

Near blizzard conditions occurred in January 1979 when record snowfalls were recorded in many areas of Wisconsin and winds gusted to over 30 mph. Many people were isolated from assistance and services as roads drifted shut and highway crews were unable to keep them open. Conditions were extremely hazardous in the City of Milwaukee and Racine County where a Presidential Emergency Declaration was obtained to assist in snow removal operations.

1981-82

Blizzard-like conditions occurred again during winter 1981-82 when extremely cold temperatures were accompanied by wind speeds gusting to 50 mph. Wind chill factors reached -100°F and severely affected the health and safety of those who ventured outdoors.

1990

Late in spring, a snowstorm hit the eastern side of Wisconsin depositing over six inches in some areas. By the date of the storm, May 10, most trees and other plants had started leafing out, so there was significant damage to the flora of the area.

Later that year, December 2 through 4, a statewide blizzard occurred, depositing over ten inches of snow across the central and southern portions of Wisconsin. Snowfalls of 22 inches were recorded in Juneau and Adams counties, 20 inches in Marquette County, 19 inches in Dodge and Washington counties, and 17-18 inches in Columbia and Dane counties. At 17.3 inches, Dane County's highest 24-hour snowfall record was set during this storm. This excessive snowfall throughout such a large area severely taxed the state's capability to clear and remove snow.

1991

An early storm lasting from October 31 to November 2, 1991, left large amounts of snow in northwest Wisconsin, with 35 inches in areas of Douglas County and more than 30 inches in Bayfield, Burnett, Polk, St. Croix, and Pierce counties. In late November 1991, another storm struck northwestern Wisconsin and left snow accumulations of 18 to 20 inches in Sawyer County and over 10 inches in Bayfield, Douglas, Burnett, Polk, St. Croix, Barron, Washburn, Ashland, and Iron counties.

2000

December 2000, was one of the ten coldest Decembers on record throughout most of the state. In addition to low temperatures, record or near-record snow depths of 15 to 34 inches occurred in much of the southern part of Wisconsin during December. Fourteen counties (Columbia, Dane, Door, Green, Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Rock, Sheboygan, Walworth, and Waukesha) received a Presidential Emergency Declaration (EM-3163)

as a result of the snowfalls. In total, these counties received over \$5.4 million in federal funds to cover costs associated with snow removal and emergency response efforts.

2004-05

A major winter storm with lake-effect enhancement during the period of December 11-13, 2004, buried Iron County with up to 26 inches of snow. Yet another major winter storm on March 18-19, 2005, plastered west-central Wisconsin with fourteen to sixteen inches and 18 to 23 inches in parts of Buffalo and Jackson counties.

2007-08

The 2007-08 winter season was "one for the ages." Numerous winter storms, including two blizzards and four ice storms, pounded the southern half of the state. Winter snowfall totals of 70 to 122 inches across the southern counties established new all-time winter snowfall records at many locations. These totals were roughly 200 to 240% of normal, and many communities simply ran out of salt, or were unable to purchase additional supplies due to increased demand.

The worst storm of the winter occurred on February 5-6, 2008, southeast of a line from Dubuque, Iowa to Madison (Dane County) to Sheboygan (Sheboygan County). 12 to 21 inches of snow combined with northeast winds of 20 to 30 mph and some gusts up to 50 mph to create near-blizzard conditions. Major vehicle backups occurred in both southbound and northbound lanes on Interstate 39/90 in Dane and Rock Counties after several trucks could not make it up hills during intense snowfall rates of one to two inches per hour at the height of the storm. Over 1,500 vehicles and trucks were stranded for ten to twenty hours thanks to snowfalls of up to 21 inches in that area. As a result of this storm, eleven counties (Dane, Dodge, Green, Jefferson, Kenosha, Milwaukee, Racine, Rock, Walworth, and Waukesha) received federal funds to help with costs of maintaining safe roads and providing emergency response in Presidential Emergency Declaration EM-3285.

The 2007-08 winter season snowfall totals through the end of March, 2008, across southern Wisconsin are shown in Figure 3.6.2-2. Though additional snowfalls of up to 1.5 inches occurred in April 2008 in some locations, the map captures practically the entire total snowfall for the entire Winter 2007-2008 season By the end of May, 2008, the total 2007-08 winter season snowfall reached 122.1 inches in West Allis (Milwaukee County), which was the highest value in southeastern Wisconsin, and a new all-time winter season record for West Allis. Likewise, the 101.4 inches measured at Truax Field in Madison smashed the old winter season record of 76.1 inches set during the winter of 1978-79. The winter snowfall at Milwaukee Mitchell Field of 99.1 inches was the second highest winter total on record for that location.

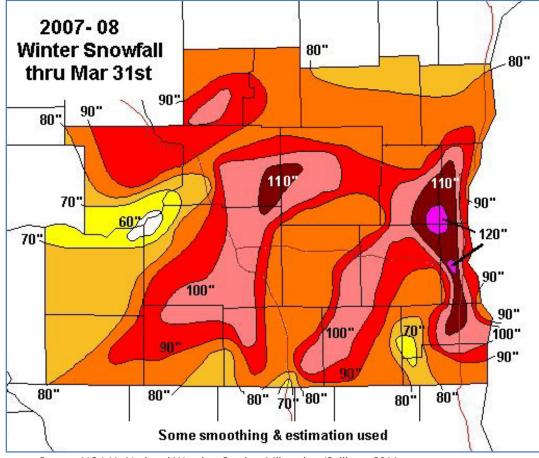


Figure 3.6.2-2: Southern Wisconsin Winter Snowfall Totals, 2007-2008

Source: NOAA's National Weather Service, Milwaukee/Sullivan, 2011.

2011

On February 1-2, 2011, southern Wisconsin was hit with the Groundhog Day Blizzard when a powerful low pressure center passed south of the state. Figure 3.6.2-3 displays the total snowfall

for the event. In Milwaukee, 19.8 inches snow fell from mid-afternoon Tuesday through Wednesday morning, the fourth highest amount for any 24-hour period. Other areas, such as West Bend (Washington County), saw over 22 inches of snow. Adding to the dangerous conditions were the blizzard-condition sustained wind of between 40 and 50 mph in many areas, with peak gusts of up to 55 mph in some locations. These winds caused snow drifts of three to eight feet in most areas, with report of drifts reaching twelve to fifteen feet in many rural areas throughout southern Wisconsin. Wisconsin Emergency Management issued a Civil Danger Warning, urging motorists to stay off roads to avoid



Groundhog Day Blizzard, 2011.Source: NOAA's National Weather Service,
Milwaukee/Sullivan, 2011.

dangerous driving conditions. I-43 was closed from Beloit (Rock County) to Mukwonago (Waukesha County), along with portions of I-90. 100 National Guardsmen were mobilized throughout the state to rescue motorists stranded along roadways and to run emergency shelters. The severe winter storm caused the declaration of a Federal Major Disaster (DR-1966), allowing eleven counties (Dane, Dodge, Grant, Green, Iowa, Kenosha, Lafayette, Milwaukee, Racine, Walworth, and Washington) to use Public Assistance funds for emergency work and the repair or replacement of disaster-damaged facilities.

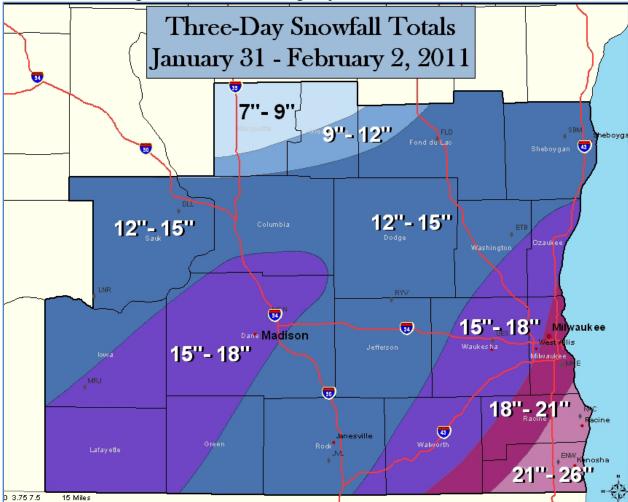


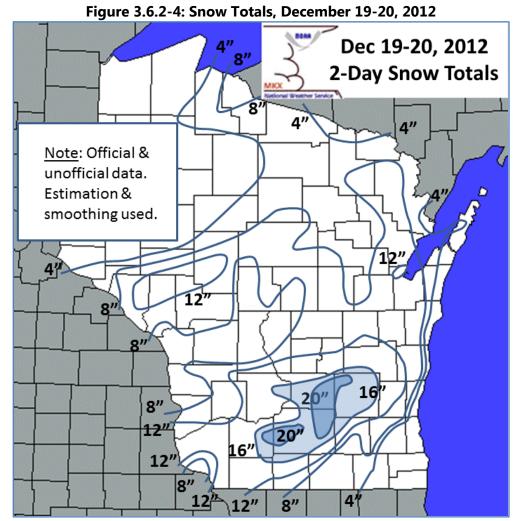
Figure 3.6.2-3: Groundhog Day Blizzard Snowfall Totals

Source: NOAA's National Weather Service, Milwaukee/Sullivan, 2011.

2012

From the evening of December 19 to the night of December 20, 2012, a major winter storm descended on the south central portion of the state resulting in snow accumulations from 12 to 22 inches. Another round of snow fell farther north between Trempealeau and Langlade counties with accumulations of eight to 15 inches. Gusts of 35 to 50 mph combined with the snowy conditions resulted in low visibility and drifts of three to five feet. Many accidents were reported. Relatively warm temperatures of 29 to 33°F meant the snow was wet and heavy.

Broken limbs and the sheer weight of the snow brought down many utility lines. Around 35,000 customers lost power during the storm.



Source: NOAA's National Weather Service, Milwaukee/Sullivan: http://www.weather.gov/mkx/020211 groundhog-blizzard, 2016.

2014

In winter 2014, Wisconsin experienced a polar vortex. That happens when, as shown in Figure 3.5.2-5, the cold air cell that is usually centralized in the Arctic splits into smaller cells and those cells travel farther south, cooling the northern hemisphere continents more than normal and warming the Arctic. Both Green Bay (Brown County) and La Crosse (La Crosse County) saw the second and third coldest, respectively, January and February on record. Statewide, it was the fifth coldest December (2013) through February stretch on record. 14 locations in the state set new record low average temperatures.

Unfortunately the record cold temperatures also coincided with a propane shortage throughout the Midwest. Many residences in the rural parts of the state rely on propane for heat. When the

shortage hit, many people had to move to shelters or stay with friends or relatives. Staying in other places was an option for some, but when home temperatures drop, permanent damage can occur like when water pipes freeze and burst. Because of the shortage, propane prices soared and those without standing contracts spent a lot more than they had planned on.

Other impacts of the extended cold temperatures included the following:

- Water utility intakes on the Great Lakes became blocked with ice preventing the intake of water into the plants.
- Lake Superior froze enough to allow over-ice access to the ice caves in the Apostle Islands, resulting in an economic boost from tourism.
- There was record ice cover on Lake Michigan of 93.29%. The previous record was 93.1% set in 1977.
- The Great Lakes froze so early and stayed frozen so late that shipping commerce was negatively impacted.

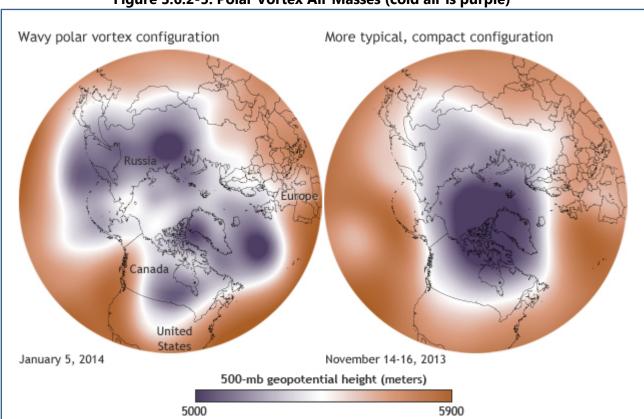


Figure 3.6.2-5: Polar Vortex Air Masses (cold air is purple)

Source: NOAA, Climate.gov: https://www.climate.gov/news-features/event-tracker/wobbly-polar-vortex-triggers-extreme-cold-air-outbreak, 2014.

3.6.3 Probability, Impacts, and Mitigation Potential

Hazard Ranking

Evaluation Criteria	Description	Ranking
Probability	 The hazard has impacted the state annually, or more frequently The hazard is widespread, generally affecting regions or multiple counties in each event There is a reliable methodology for identifying events and locations 	High
Mitigation Potential	 Methods for reducing risk from the hazard are not well-established, are not proven reliable, or are experimental The state or counties have little or no experience in implementing mitigation measures, and/or no technical knowledge of them Mitigation measures are ineligible under federal grant programs There is a very limited range of mitigation measures for the hazard, usually only one feasible alternative The mitigation measures have not been proven cost-effective and are likely to be very expensive compared to the magnitude of the hazard The long-term effectiveness of the measures is not known, or is known to be relatively poor 	Low

Frequency and Probability

The winter storm season in Wisconsin generally runs from October through March. Severe winter weather has occurred, however as early as September and as late as the latter half of April and into May in some locations.

Much of the snowfall in Wisconsin occurs in small amounts of one to three inches per event. Heavy snowfalls that produce at least six inches of accumulation in one county happen on average about ten to 12 times per winter statewide. The northwestern and north central parts of the state can experience early and late season storms, while any part of Wisconsin can receive heavy mid-winter snows.

Seasonal snowfall in Wisconsin varies between the seasonal average of approximately 30 inches in the extreme south central area of the state to over 100 inches in the Lake Superior snowbelt in Ashland and Iron counties. Average values in some areas of the Lake Superior snowbelt are actually much higher than 100 inches (up to 160 inches), but are very localized and too fine to be shown in the analysis below. Average annual snowfall across Wisconsin is shown in Figure 3.6.3-1. This data is for the 115 year period starting the winter of 1900-01 through the winter of 2015-16.

In Figure 3.6.3-2, the total number of Wisconsin blizzard events by county is shown for the winters from 1982-83 through 2015-16. Though the northern part of the state receives higher precipitation, more high-wind accumulations and drifting events occur in the southern half of the state, on average. Grant County has seen the most blizzards, with nine, while Manitowoc, Dodge, and Rock counties are just behind that with eight each.

Figure 3.6.3-1: Average Annual Snowfall in Wisconsin, 1900-01 to 2015-16

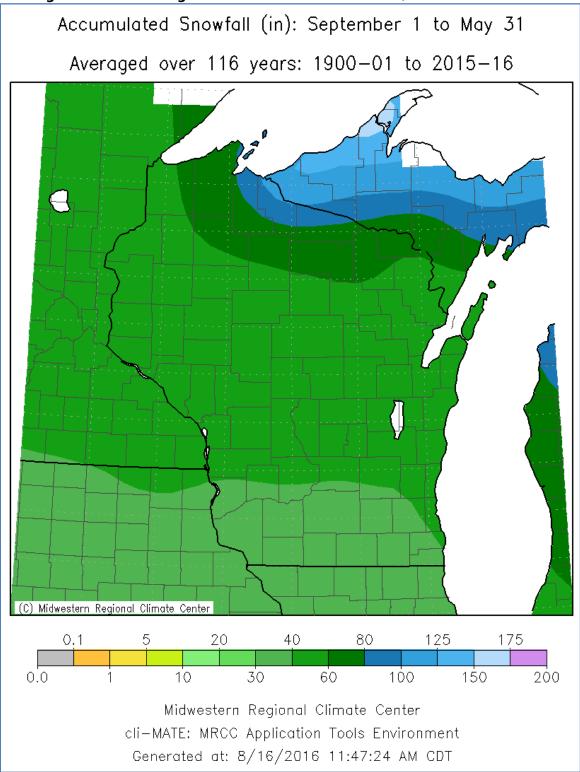


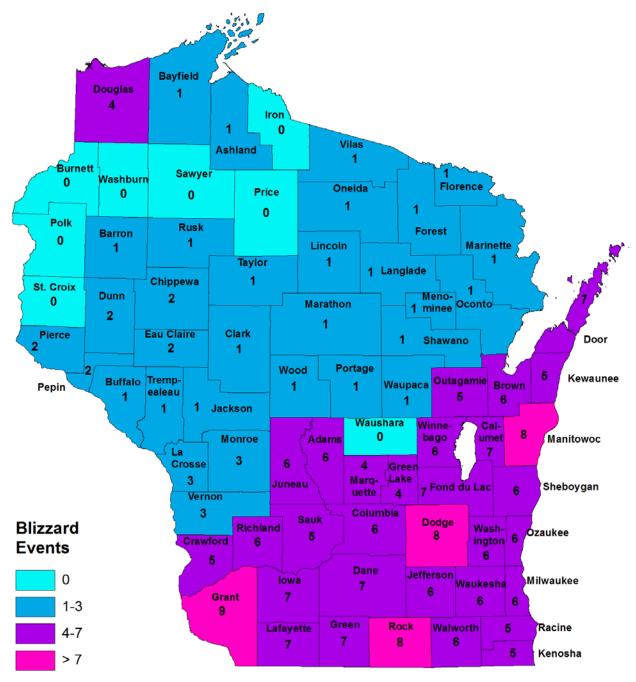
Figure 3.6.3-2: Wisconsin Blizzard Events by County, 1982-83 to 2015-16



Wisconsin Blizzard Events

Winter 1982-83 - Winter 2015-16





Ice and sleet storms can occur anytime throughout the winter season from October through April. Early and late season ice and sleet storms are generally restricted to northern Wisconsin. Otherwise, the majority of these storms occur from west central through northeast Wisconsin. On average, a major ice storm occurs with a frequency of about once every other year. In addition, between three and five instances of glazing (less than ¼" of ice accumulation) occur throughout Wisconsin during a normal winter. A county distribution of ice storms for the winters 1982-83 through 2015-16 is shown in Figure 3.6.3-3.

Combining winter storms, blizzards, and ice storms together at the county level leads to the final distribution shown in Figure 3.6.3-4. This map reveals which counties have been affected by severe winter weather events for the winters 1982-83 through 2015-16. The northern counties are most likely to experience major winter systems. Iron County has experienced the most winter weather events in this time period with 205 total, followed by Ashland with 192. Pepin County is the only county with fewer than 85 winter weather events. There exists a fairly obvious stratification of the likelihood of winter weather events, with like colors clustered together.

Figure 3.6.3-5 indicates a yearly average of severe winter weather events for each county. This was calculated by dividing the total number of events by the number of winter seasons included. This map helps reveal the pattern of winter weather event probability, showing the highest likelihood in the northern counties of Douglas, Bayfield, Ashland, Iron, and Vilas.

Figures 3.6.3-6, 3.6.3-7, and 3.6.3-8 show the winter (December through February) average temperatures, average number of days with below zero temperatures, and the average minimum lowest winter temperatures, respectively, statewide from 1971 through 2000 (best available data). These figures show that the northwestern and north central parts of the state, except the part along Lake Superior, experience the coldest temperatures and the southeastern and eastern parts of the state along Lake Michigan experience the least cold temperatures.

For winter weather overall, heavy snowfalls are likely to occur in northern Wisconsin in counties along Lake Superior. Although, based on snowfall totals across southern Wisconsin during the 2007-08 winter season, it is possible for seasonal totals of 150 inches or more to occur in southern and central Wisconsin; however, it is rare.

There is no clear pattern of the occurrence of ice storms throughout the state.

The lake effect from Lake Michigan and Lake Superior provide slightly warmer temperatures for those areas than those further inland, but also increases the likelihood of blizzards in the east and high snowfall in the north.

Impacts

Heavy snow and ice storms can cause dangerous driving and walking conditions; traffic backups; damage to buildings, trees, utility poles and lines, and other structures; and power outages. High winds combined with extreme cold create unsafe conditions for people to be outside and can lead to frostbite, hypothermia, and death.

Figure 3.6.3-3: Wisconsin Ice Storms by County, 1982-83 to 2015-16



Wisconsin Ice Storm Events

Winter 1982-83 - Winter 2015-16



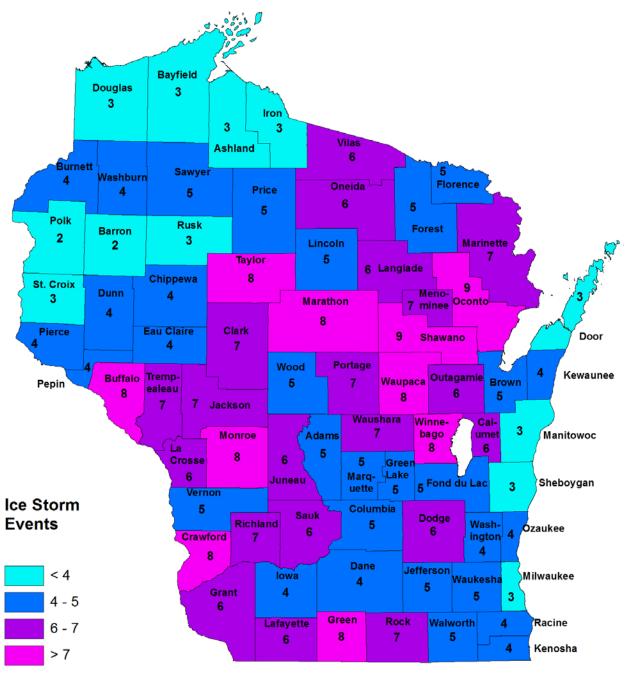
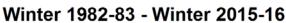


Figure 3.6.3-4: Wisconsin Total Winter Weather Events by County, 1982-83 to 2015-16



Wisconsin Total Winter Events





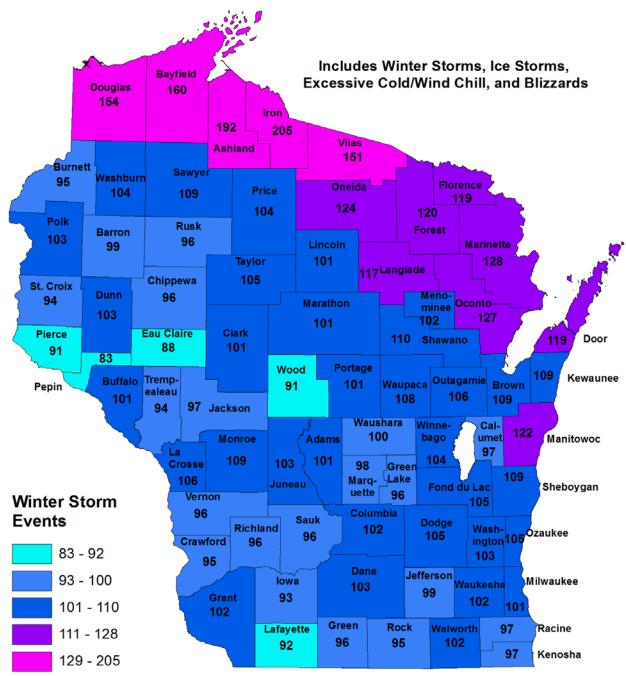


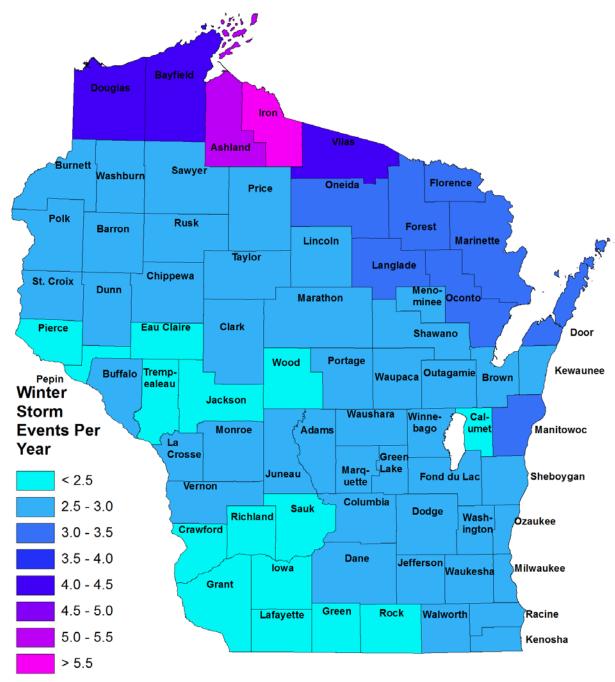
Figure 3.6.3-5: Wisconsin Average Annual Winter Weather Events by County, 1982-83 to 2015-16



Yearly Average Winter Storms Per WI County



Winter 1982-83 - Winter 2015-16



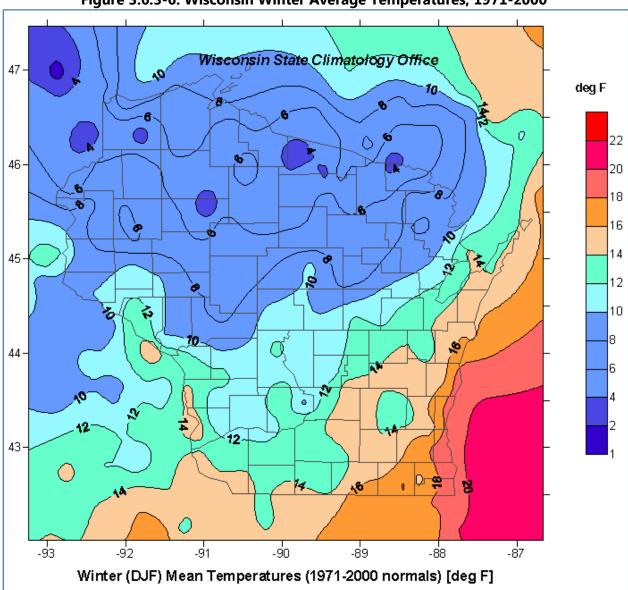


Figure 3.6.3-6: Wisconsin Winter Average Temperatures, 1971-2000

Source: Wisconsin State Climatology Office, http://www.aos.wisc.edu/~sco/seasons/winter.html#Temperature, 2016.

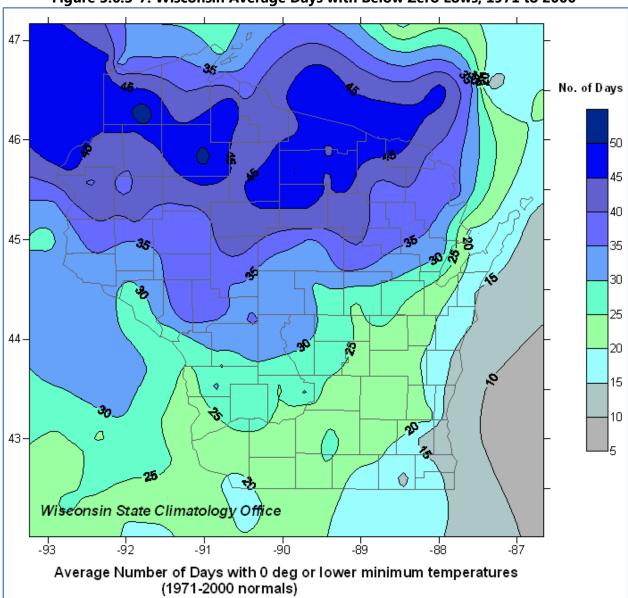


Figure 3.6.3-7: Wisconsin Average Days with Below Zero Lows, 1971 to 2000

Source: Wisconsin State Climatology Office, http://www.aos.wisc.edu/~sco/seasons/winter.html#Temperature, 2016.

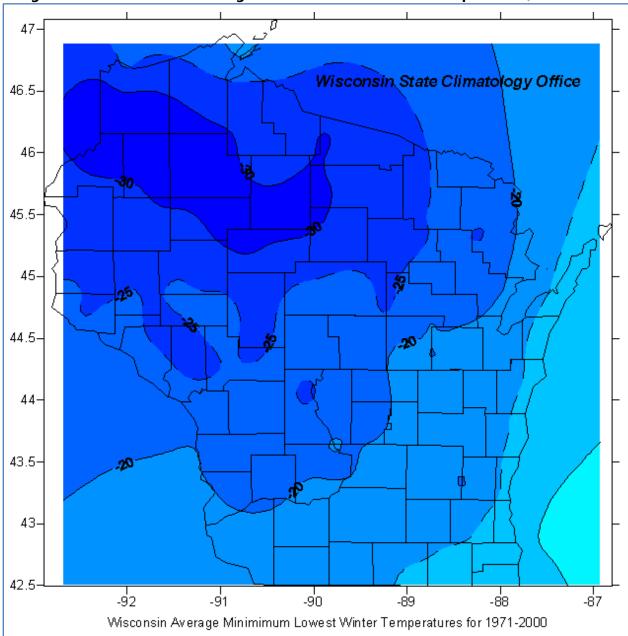


Figure 3.6.3-8: Wisconsin Average Lowest Minimum Winter Temperatures, 1971-2000

Source: Wisconsin State Climatology Office, http://www.aos.wisc.edu/~sco/seasons/winter.html#Temperature, 2016.

3.6.3.1 Changing Future Conditions

The observed average temperature increase in the state has been highest for winter. Statewide, the temperatures have increased 2.5°F since 1950, with 3.5°F to 4.5°F increases in the northwest portion of the state, as seen in Figure 3.6.3.1-1. Wisconsin's average growing season now lasts 12 days longer than it did in the 1950s (WICCI, 2011). In other words, the "spring thaw" comes sooner, and the "fall freeze" comes later.

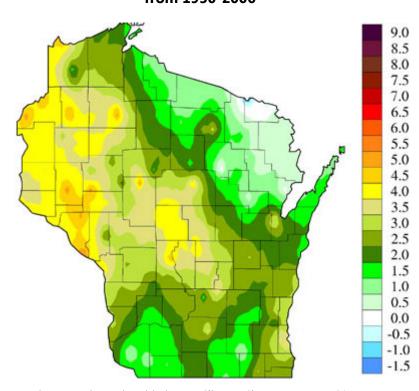


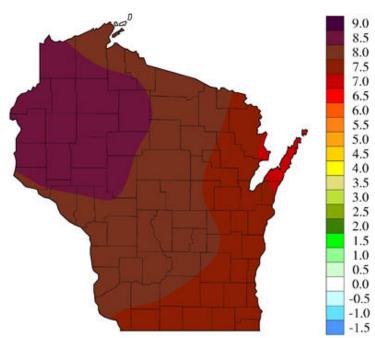
Figure 3.6.3.1-1: Change in Winter Average Temperature (°F) from 1950-2006

Source: Wisconsin Initiative on Climate Change Impacts, 2011.

Wisconsin presently experiences fewer nights below 0°F than in 1950. Specifically, most of the state sees between two and six fewer below-zero nights, while the extreme northwestern portion of the state experiences between 18 and 24 fewer nights below 0°F (WICCI, 2011).

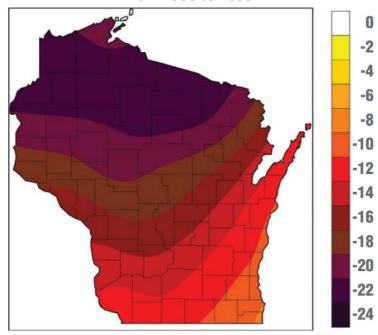
Looking toward the future, current models predict this winter warming trend to continue. In its most recent report, WICCI predicts that Wisconsin's average winter temperature will increase five to eleven degrees Fahrenheit by 2055 (Figure 3.6.3.1-2) and that in the same time period the average number of nights each year with temperatures reaching below zero will decrease by between eight and 22 nights (Figure 3.6.3.1-3).

Figure 3.6.3.1-2: Projected Change in Winter Average Temperature (°F) from 1980 to 2055



Source: Wisconsin Initiative on Climate Change Impacts, 2011.

Figure 3.6.3.1-3: Projected Change in Number of Days with Below Zero Lows from 1980 to 2055



Source: Wisconsin Initiative on Climate Change Impacts, 2011.

WICCI also predicts increases in wintertime precipitation, which could occur in the form of snow, rain, or freezing rain (Figure 3.6.3.1-4). The average projection among climate models

considered by WICCI researchers indicates an increase of approximately 20% across northern Wisconsin.

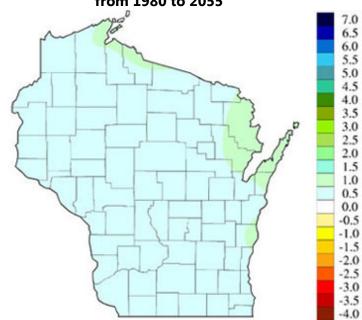


Figure 3.6.3.1-4: Projected Change in Winter Average Precipitation (inches) from 1980 to 2055

Source: Wisconsin Initiative on Climate Change Impacts, 2011.

A shorter overall winter season and fewer days of extreme cold may have both positive and negative indirect impacts. Warmer winter temperatures may result in changing distributions of native plant and animal species and/or an increase in pests and non-native species. Maple syrup production may also be affected by changes in winter weather patterns, which could have significant economic impacts as Wisconsin is the number four maple syrup producing state in the U.S. (Climate Wisconsin, 2016).

Warmer winter temperatures will result in a reduction of lake ice cover. In addition to impacting human activities such as ice fishing, reduced lake ice cover impacts aquatic ecosystems by raising water temperatures. Water temperature is linked to dissolved oxygen levels and many other environmental parameters that affect fish, plant, and other animal populations. A lack of ice cover also leaves lakes exposed to wind and evaporation during a time of year when they are normally protected. On the Great Lakes, declining ice cover could lead to a benefit in the form of a longer commercial navigation season.

As both temperature and precipitation increase during the winter months, freezing rain will be more likely. Additional wintertime precipitation in any form will contribute to saturation and increase the risk and/or severity of spring flooding. A greater proportion of wintertime precipitation may fall as rain rather than snow; reduced snowpack may impact areas where winter tourism centered on cross-country skiing, snowmobiling, or other snow sports is part of the local economy.

3.6.4 Catastrophic Scenario

A severe ice storm affects large portions of the state, followed by a period of bitter cold. Ice accumulations in the southwest and southeast regions range up to five inches in diameter on wires and limbs of trees. The excessive ice accumulations are in part caused by thunderstorms that rapidly built up the ice. High winds gusting to 60 mph make the situation even worse. Up to 600,000 residences are directly affected by the ice storm and up to 100,000 people are without power during the height of the storm. Some rural areas are without power for over 10 days. There are major traffic back-ups on the major interstates that last up to 12-18 hours.

3.6.5 Summary Risk Analysis

The table in Figure 3.6.5-1 provides a summary risk analysis for the winter storms and extreme cold hazard.

Figure 3.6.5-1: Winter Storms and Extreme Cold Summary Risk Analysis

Evaluation Criteria	Description	Ranking
	Risk to People, Property, Environment, and Operations	
Probability/potential threat of occurrence	 The hazard has impacted the state annually, or more frequently The hazard is widespread, generally affecting regions or multiple counties in each event There is a reliable methodology for identifying events and locations 	High
Vulnerability	 Minimal countermeasures are in place to prevent or protect against this hazard. Countermeasures may have potential, but limited demonstrated history in reducing the threat potential. The nature of the hazard may limit the availability of countermeasures. 	High
Mitigation Potential	 Methods for reducing risk from the hazard are not well-established, are not proven reliable, or are experimental The State or counties have little or no experience in implementing mitigation measures, and/or no technical knowledge of them Mitigation measures are ineligible under federal grant programs There is a very limited range of mitigation measures for the hazard, usually only one feasible alternative The mitigation measures have not been proven cost-effective and are likely to be expensive compared to the magnitude of the damages caused by the hazard The long-term effectiveness of the measure is not known, or is known to be relatively poor 	Low

Impacts of Catastrophic Scenario								
Public	 Local medical services are able to manage volume of injuries and fatalities but are near the limits of their capabilities. Only critically injured patients are diverted to facilities outside of the affected areas. Limited evacuations and sheltering may be required. 	Low						
Responders	 Local and mutual aid resources would be fully committed and significant state assistance would be needed in order meet the needs of the incident. State disaster declaration. 	Medium						
COOP, including delivery of services	State or local government mission essential functions impacted for 1-7 days, temporary relocation of business operations may be necessary.	Medium						
Property, Facilities & Infrastructure	 Significant damage to critical infrastructure, public and private property over a large area. 10-50% of buildings and infrastructure in affected area damaged or destroyed in affected area, and/or loss of lifeline services for up to 1-7 days. 	Medium						
Environment	 Environmental damage limited to a single community or small geographic area. Damage requires short-term remediation efforts by local and state government. 	Low						
Economy	 Slight negative impact to local economic activity in the short-term. Direct effects limited to the local community or small portion of the region. 	Low						
Public Confidence	 Some transitory acute effects on behavior health including elevated stress, anxiety, depression, and behavior for individuals in impacted communities. Minor civil disturbances possible. 	Low						
	Aggregate Impact	Low						

Source: Wisconsin Emergency Management

FOR OFFICIAL USE ONLY

3.6.6 Sources - Agency Input and Research

The following agencies and document research assisted in providing subject matter expertise to this scenario's core capabilities.

- National Weather Service. "NWS Winter Storm Windchill Home Page." NWS Winter Windchill Home Page. Accessed November 2016. http://www.nws.noaa.gov/om/winter/windchill.shtml.
- 2. National Weather Service. "Wind Chill Chart." Chart. November 01, 2001. Accessed November 2016. http://www.nws.noaa.gov/om/winter/windchill-images/windchillchart3.pdf.
- 3. National Weather Service. "Worst Snowstorms in the State of Wisconsin from 1881 to Present." National Weather Service Forecast Office Milwaukee/Sullivan, WI. Accessed November 2016. http://www.crh.noaa.gov/Image/mkx/pdf/snowstorms-wisconsin.pdf.
- 4. National Weather Service. "Ice Storm of February 21-23, 1922." National Weather Service Forecast Office La Crosse, WI. Accessed December 01, 2016. https://www.weather.gov/arx/feb2222.
- 5. National Weather Service. "2012 Wisconsin Yearly Weather Summary." 2013. Accessed November 2016. http://www.crh.noaa.gov/Image/mkx/climate/2012/2012 WI Yrly Wx Summary.pdf.
- 6. National Weather Service, Milwaukee/Sullivan WI Forecast Office. "Major Winter Storm For The Great Lakes December 20, 2012." US Department of Commerce, NOAA, National Weather Service. Accessed October 2016. http://www.weather.gov/mkx/122012-winterstorm.
- 7. National Weather Service, Milwaukee/Sullivan WI Forecast Office. "2012 Milwaukee Record Snowless Streak." US Department of Commerce, NOAA, National Weather Service. Accessed November 2016. http://www.weather.gov/mkx/121812 Record Snowless Streak Ends.
- 8. "U.S. State Temperature Extremes." Wikipedia. Accessed October 2016. https://en.wikipedia.org/wiki/U.S. state temperature extremes.
- 9. Erdman, Jon. "NOAA: Winter 2013-2014 Among Coldest on Record in Midwest; Driest, Warmest in Southwest." The Weather Channel. March 23, 2016. Accessed October 2016. https://weather.com/news/news/winter-ncdc-state-climate-report-2013-2014-20140313.
- 10. "Confirmed: 14 Wisconsin Cities Observe Coldest Winter on Record." Home WAOW Newsline 9, Wausau News, Weather, Sports. February 01, 2014. Accessed November 2016. http://www.waow.com/story/24861505/2014/03/Saturday/confirmed-14-wisconsin-cities-observe-coldest-winter-on-record.
- 11. Ortiz, Erik. "Prolonged Cold Blast Worsens Propane Shortage across Midwest." NBC News. January 26, 2014. Accessed November 2016. http://usnews.nbcnews.com/news/2014/01/26/22455731-prolonged-cold-blast-worsens-propane-shortage-across-midwest?lite.
- 12. Kennedy, Caitlyn. "Wobbly Polar Vortex Triggers Extreme Cold Air Outbreak | NOAA Climate.gov." Wobbly Polar Vortex Triggers Extreme Cold Air Outbreak | NOAA Climate.gov. January 08, 2014. Accessed October 2016. https://www.climate.gov/news-

- features/event-tracker/wobbly-polar-vortex-triggers-extreme-cold-air-outbreak.
- 13. National Oceanic and Atmospheric Administration, and Environment Canada. "Great Lakes Significant Events for December 2013-February 2014." *Great Lakes Region Quarterly Climate Impacts and Outlook*, March 2014. March 2014. Accessed November 2016. http://mrcc.isws.illinois.edu/pubs/docs/GL-201403Winter_FINAL.pdf.
- 14. National Weather Service. "March 8, 2014 Record Ice Coverage on Lake Michgan." US Department of Commerce, NOAA, National Weather Service. Accessed November 2016. http://www.weather.gov/mkx/030814 Record Ice Coverage on Lake Michigan.
- 15. Young, John. "Wisconsin Winter Climate: Temperature." Wisconsin State Climatology Office. Accessed November 2016. http://www.aos.wisc.edu/~sco/seasons/winter.html#Temperature.
- United States of America. Oconto County. Oconto County Emergency Management. Oconto County, Wisconsin Hazard Mitigation Plan. By Oconto County Hazard Mitigation Plan Steering Committee and Bay-Lake Regional Planning Commission. Oconto, WI: Oconto County, 2015. http://www.baylakerpc.org/media/46490/oconto co haz plan 2015.pdf
- 17. Wisconsin Initiative on Climate Change Impacts. "Impacts Presentation." Wisconsin Initiative on Climate Change Impacts. Accessed November 2016. http://www.wicci.wisc.edu/impacts.php#2.
- 18. Climate Wisconsin, and Wisconsin Educational Communications Board. "Home | Climate Wisconsin." Climate Wisconsin. Accessed October 2016. http://climatewisconsin.org/.

3.7 Coastal Erosion and Bluff Failure

3.7.1 Nature of the Hazard

According to the Great Lakes Information Network, the Great Lakes represent one fifth of the world's fresh water supply and 95% of the U.S. supply. The natural resources and aesthetics offered by the Great Lakes have attracted shoreland development throughout Wisconsin's history. The 15 counties that make up Wisconsin's Great Lake coast (Figure 3.7.1-1) represent 19% of the state's land area and hold 36% of its 2010 population. The people and structures occupying the shores of Lakes Michigan and Superior face a number of natural hazards unique to these areas, including erosion of bluffs, banks, beaches, and near-shore lake beds, flooding due to stormwater runoff, high lake levels, or storm surges, and damage to shoreline structures from wave action.

Coastal Erosion

Coastal erosion is defined as the wearing away of land or a lakebed. Erosion leads to the loss or displacement of material along coastlines, beaches, or dunes over a period of time, and can be influenced by both natural coastal processes and human activities.

Natural processes:

- Lake level changes
- Currents and tides
- Waves and storm surges
- Wind
- Flooding
- Orientation of shoreline
- Sediment influx
- Littoral processes
- Ice floes
- Overwash
- Freeze/thaw cycle

Human activities:

- Dredging
- Jetty and groin construction
- Seawalls and shoreline hardening
- Revetments
- Beach nourishment
- Boat wakes
- Construction of harbors
- Construction of sedimenttrapping dams in river tributaries

The rate at which coastal erosion occurs is dependent on a complex web of factors. Cyclical changes in lake levels, disruption of beach-building material transport, and storms all influence the rate of erosion. Annual variability in wave climate and lake levels causes the rates of bluff and dune erosion along the shores of the Great Lakes to vary from near zero to tens of feet per year (National Research Council, 1990). Erosion rates can increase as a result of elevated groundwater levels, increased loads on bluff tops, loss of vegetation on slopes, or overland runoff. Lake ice running up onto the shore due to thawing or wave action can also exacerbate coastal erosion by damaging shore structures, removing vegetation, transporting sand, rock, and other debris, and eroding the base of steep banks, rendering them unstable and subject to landslides.

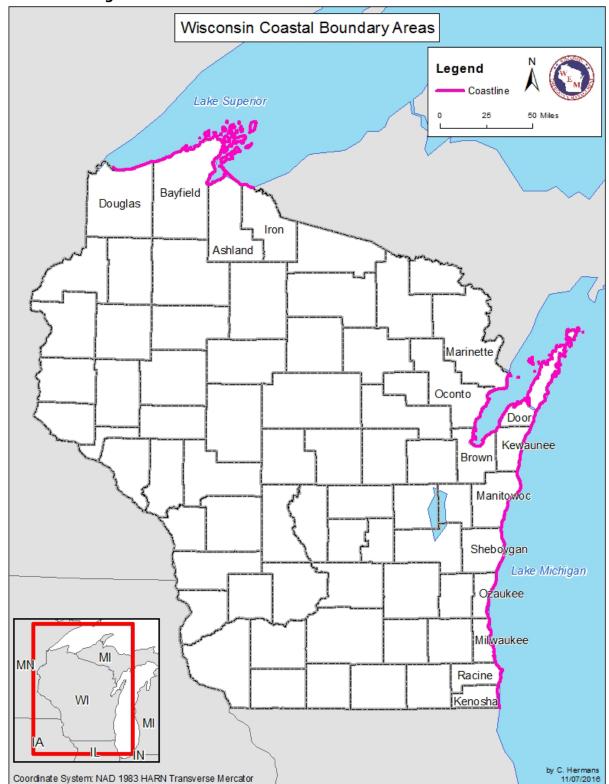


Figure 3.7.1-1: Great Lakes Coastal Erosion Areas in Wisconsin

Source: Wisconsin Emergency Management, 2016.

Human activities that affect beach-building sediments also contribute to shoreline erosion. Navigational improvements, shoreline structures, and certain dredge material disposal practices deplete both tributary and shoreland sources of sediment. Removing these sediments from the shore system contributes to erosion.

Coastal erosion tends to be a gradual process. However, sudden slumps or bluff failures prompting emergency action do occur. These events, often precipitated by strong storms with high winds and/or heavy wave action, are rare.

With nearly 80% of Wisconsin's shoreline affected by coastal erosion and bluff recession, recurring erosion presents a significant risk in almost every coastal county. Erosion rates tend to be highest along sand plains and high bluffs comprised of glacial till. On Lake Michigan, vulnerability to erosion is highest along the 185-mile stretch from the Illinois border to the Sturgeon Bay Canal in Door County, and in the bays and clay banks along the Door Peninsula. Erosion of the Lake Superior shoreline tends to be more localized. The highest risk of erosion exists along the high clay bluffs extending from Bark Point (Bayfield County) to Wisconsin Point (Douglas County), and from Iron County to the White River in Ashland County.

Coastal Flooding

Coastal flooding occurs when excess water from precipitation, snowmelt, or storm surges overflows onto the shore. **Storm surges** cause a temporary rise in water level due to storm winds blowing across open water. The duration of the surge depends on how long the storm lasts; some surges can persist for an entire day. A **seiche** is an oscillation of the water in a lake that continues after the originating force has dissipated. In the Great Lakes, this phenomenon is typically caused by strong winds and changes in atmospheric pressure that push the water from one side of the lake to the other. After atmospheric conditions return to normal, the water rebounds to the other side and continues to oscillate back and forth until it loses momentum. Seiches produce effects similar to those of a storm surge, but occur periodically and usually for a shorter duration.

Wisconsin's low-lying areas along the Lake Michigan shoreline are particularly susceptible to coastal flooding, as observed in southern Kenosha County and along the western shore of Green Bay. Communities positioned on low terraces, such as those in Milwaukee, Ozaukee, and Brown Counties, are at a medium risk of flooding. High bluff areas are the least flood-prone.

Coastal Regulations

Development in Great Lakes coastal areas is impacted by local, state, and federal regulations. Recent and impending changes at the state and federal levels will influence development patterns moving forward. Both coastal communities and communities with inland lakes are working to adapt to changes in the statewide shoreland zoning standards (Chapter NR 115 of the Wisconsin Administrative Code). Act 55 passed in the summer of 2015 prohibits county and local zoning ordinances from establishing shoreland setbacks greater than the state minimum standard of 75 feet. Many local governments had previously enacted stricter setbacks to protect

water resources from overdevelopment and pollution. Wisconsin Department of Natural Resources (DNR) and Administration (DOA) staff are currently working with communities to amend their ordinances as required while still providing protection for shoreland structures and natural resources.

At the federal level, collaboration between FEMA and the US Army Corps of Engineers (USACE) on the Great Lakes Coastal Flood Study will soon bring coastal V Zones to the Great Lakes. Zones V and VE represent the area along the coast that is subject to inundation by the one-percent-annual-chance flood event with additional hazards associated with storm-induced waves. Base flood elevations (BFEs) have been determined through hydraulic analysis in VE Zones, while this data does not exist for V Zones.

Flood insurance is required for V and VE Zone structures, and floodplain management standards must be enacted in these areas. FEMA also requires V Zone structures to be elevated on pilings. It is not yet known how this requirement will be fulfilled in Wisconsin, where state law prohibits elevating structures on anything except fill, and where ice has the potential to cause severe damage during winter coastal storms.

Work maps for Wisconsin should be available for Lake Michigan in summer 2017 and Lake Superior in 2018; final maps will likely not be ready for at least one year following the release of the work maps.

Lake Level Fluctuations

High water levels and increased wave action exacerbate both coastal erosion and coastal flooding issues. As lake levels rise, bluff recession rates also increase. Major storm events also lead to erosion because of increased wave action on the shoreline. The effects of wave-induced erosion are usually even greater during periods of high water. Lake level is therefore a significant factor in determining the rate of erosion along Wisconsin's coasts.

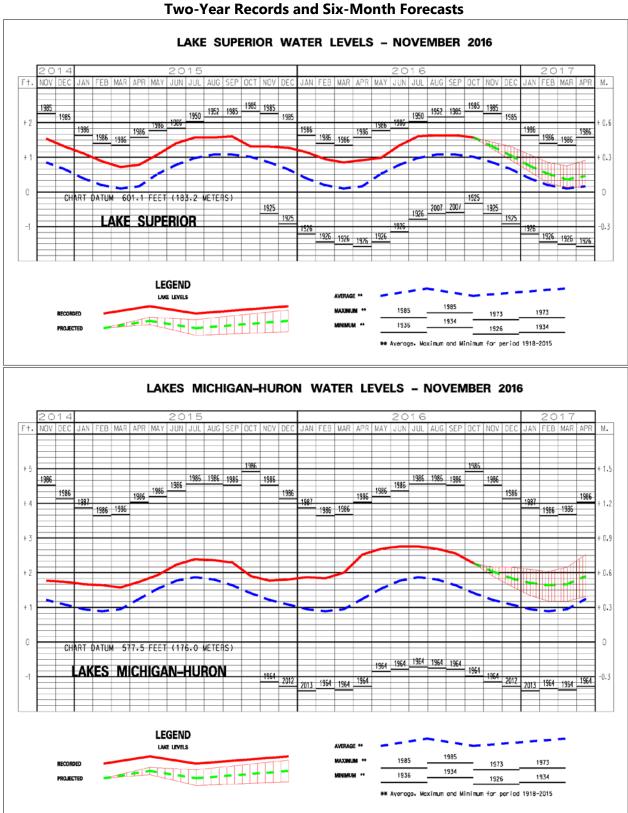
Water levels in the Great Lakes fluctuate on both a seasonal and long-term basis. Seasonally, the lakes are at their lowest levels during the winter, when much of the precipitation is held on land in the form of snow and ice, and evaporation occurs over the open water. The highest seasonal levels are during the summer when snowmelt from the spring thaw and summer rains contributes to the water supply.

Though low lake levels increase bluff stability, they pose problems for facilities that are dependent on constant access to water, such as marinas and nearshore water intakes. High lake levels heighten the existing risk in places vulnerable to coastal flooding, erosion, and/or ice jambs, while at the same time improving transport conditions for the shipping industry.

Figures 3.7.1-2 illustrates recent lake level trends and near-future projections for Lake Superior and Lakes Michigan-Huron.

Figure 3.7.1-2: Lake Superior and Lakes Michigan-Huron Water Levels:

Two-Year Records and Six-Month Forecasts



Source: US Army Corps of Engineers, 2016.

3.7.2 History

All 15 coastal counties in Wisconsin experience erosion, coastal flooding, fluctuating water levels, and damage to shoreline structures along Lake Superior and Lake Michigan.

Bluff Erosion

According to the Wisconsin Coastal Management Program's (WCMP) *Needs Assessment and Strategy, 2011-2015*, coastal erosion along Lake Michigan occurs along the 185 miles of shoreline from southern-most Kenosha County to the Sturgeon Bay Canal (northern tip of Door County), and in the northeastern part of Brown County. Along the remainder of the Lake Michigan shore (from Sturgeon Bay Canal in Door County to Green Bay), bluff erosion is limited to smaller segments of bays and clay banks.

The Needs Assessment and Strategy, 2011-2015 also describes Lake Superior's entire Wisconsin shoreline as vulnerable to coastal erosion, with the exception of rocky portions of the Bayfield Peninsula, low marshlands in Chequamegon Bay, and the mouth of the Bad River. Vulnerability is highest along the high clay bluffs running from Bark Point in Bayfield County to Wisconsin Point in Douglas County, and from Iron County to the White River in Ashland County.

Bluff erosion has been the focus of several major projects in recent years. In 2007, Concordia University in the City of Mequon (Ozaukee County) completed implementation of a \$12 million project to de-water the bluff, regrade its slope, and install shoreline revetments. The university, situated on a 130-foot high bluff overlooking Lake Michigan, had previously experienced 20 years of erosion at a rate of one foot per year. Although the project was initially celebrated for the protection, aesthetics, and connection to the lake it provided, it soon became apparent that the revetment structure prevented the natural transport of sediment parallel to the shore. As a result, the beaches of neighboring properties became starved for sediment and rapidly disappeared. Without beaches to absorb the impacts of wave action, the bluffs on these properties became increasingly unstable. In 2011, neighbors to the south of Concordia filed lawsuits against the university and began constructing their own revetments, ultimately extending the problems further and further south. This example demonstrates the complex nature of coastal erosion processes and underscores the critical need for cooperative efforts.

In February of 2011, the owners of a lakefront property in Sheboygan County noticed that their bluff was beginning to fail; by May, it had already receded several feet. To prevent damage to their home, the owners opted to relocate the house from its original location 165 feet from the bluff to property they owned across the highway. The relocation was completed in September of the same year, at a total cost of \$90,000 (\$10,000 to move the structure, \$80,000 for the foundation, required permits, utilities, and septic installation). Bluff instability on this property is likely caused by high groundwater conditions and poor stormwater management nearby.

Most recently, severe bluff instability in Mount Pleasant has garnered the attention of local, county, state, and Federal agencies. The Village of Mount Pleasant (Racine County) first began reaching out in the spring of 2016 when instability on a 40-foot tall Lake Michigan bluff

threatened approximately 12 private homes as well as public utilities. High Lake Michigan water levels following decades of low water eroded the area's loose, unconsolidated soil and caused instability, mirroring similar issues that occurred in this location when water levels were high in the 1970s. In the last decade, a handful of homes have been removed from the same area due to the threat of bluff failure. Currently, the top of the bluff is within 20 to 50 feet of the homes; several of the homes closest to the lake are in danger of imminent collapse (Figure 3.7.2-1).



Figure 3.7.2-1: Bluff failure in Mount Pleasant, 2016.

Source: Wisconsin Department of Natural Resources, 2016.

To date, multiple agencies and levels of government have collaborated to pool resources and determine locally appropriate solutions. USACE, DNR, WEM, and DOA staff, along with members of the Coastal Hazards Work Group, have combined efforts in the search for ways to protect life and property in Mount Pleasant. The issues and efforts are on-going as of fall 2016. This scenario has emphasized the need for collective solutions, rather than disjointed individual action. Additionally, it has served as a reminder that bluff recession, though gradual, is a natural and ultimately unavoidable process; in many cases, the best mitigation action is managed retreat from high-risk areas.

Coastal Flooding

All 15 coastal counties in Wisconsin experience some coastal flooding; however, it tends to be most serious in the low-lying areas of southern Kenosha County, and from the City of Green Bay to the state line of Upper Peninsula Michigan. Although the risk of coastal flooding is reduced when lake levels are low, lake levels are only one factor contributing to coastal flooding. Other factors include **wind set-up**, or the tendency for water levels to increase on downwind lakeshores, and decrease on upwind lakeshores, and **wave run-up**, the maximum vertical extent of the rush of water from a breaking wave onto a beach. Wave run-up is caused by wind but is also dependent on the shore profile. Waves form more readily where there is a shallow beach profile. Strong winds can cause or exacerbate coastal flooding in these areas.

One notable coastal flooding event occurred on April 9, 1973. During a period of high lake levels, a "Nor-easter" storm blew through Green Bay, producing a storm surge that inundated the City of Green Bay's downtown area with four feet of water. In addition to flood damages, erosion occurred on the open coast. This so-called 500-year flood event generated millions of dollars in damages (GLCR, 2013).

Storm surges can also cause severe flooding during periods of low lake levels. In fact, the largest recorded water level on Lake Michigan was observed at the southern tip of Green Bay during a storm in December 1990, when lake levels were only a couple feet above the all-time low. The second highest level recorded at the gage occurred during similar conditions in December 2009 (GLCR, 2013).

Lake Level Fluctuations

Long-term variation in lake levels depends on precipitation and evaporation trends in the Great Lakes watershed as a whole. Lake levels rise when net water supply exceeds outflow, and above-average lake levels can persist for extended periods even after the conditions that caused them have ended. The water volume of the Great Lakes is large, and outflow from natural outlets is limited. Flow regulation structures exist in Lakes Ontario, Michigan, and Superior, but their influence is limited by their size. Controlled releases strive to simulate long-term averages in an effort to serve multiple interests. The source of about 40% of Lake Superior's annual water supply is from the snowpack around its shores. Lakes Michigan and Huron get up to 30% of their yearly supply from Superior's snowmelt when it flows into the lower lakes (Detroit Free Press, 2000). The table in Figure 3.7.2-2 shows the mean, maximum, and minimum lake levels for Lake Superior and Lake Michigan-Huron.

Coastal property owners are acutely aware of hazards during periods of high-water levels, especially right after a damaging storm or bluff failure, but this awareness can fade over time if low lake levels slow the erosion rate. Lake levels were above long-term averages from 1996 to 1998. The last period of significantly higher lake levels was in 1985 to 1986, resulting in \$16 million of documented damage to public facilities alone (WCMP, 1992). Record snowfall in northern Wisconsin in 1996 was followed by near record high-water levels in 1997. However,

unusually mild weather and light snowfall in the winters of 1998-1999 and 1999-2000 began to drop the lake levels once again to below long-term averages.

Figure 3.7.2-2: Summary of Lake Superior and Lake Michigan-Huron Water Levels, 1918-2015 (in feet)

Lake Superior

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015	602.2	601.9	601.8	601.8	602.1	602.5	602.6	602.6	602.7	602.4	602.3	602.3
Mean	601.4	601.2	601.1	601.2	601.6	601.8	602.1	602.1	602.1	602.1	601.9	601.7
Maximum	602.7	602.5	602.4	602.6	602.8	602.9	603.1	603.2	603.2	603.4	603.3	603.1
Max Year	1986	1986	1986	1986	1986	1986	1950	1952	1985	1985	1985	1985
Minimum	599.8	599.6	599.5	599.5	599.6	599.9	600.3	600.4	600.5	600.7	600.4	600.1
Min Year	1926	1926	1926	1926	1926	1926	1926	2007	2007	1925	1925	1925

Lake Michigan-Huron

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015	579.1	579.0	579	579.1	579.3 6	579.6 6	579.8 2	579.7 9	579.7	579.3 3	579.2	579.2
		/		/	U	Ü		9		3		3
Mean	578.4	578.3	578.4	578.7	579.0	579.2	579.3	579.2	579.1	578.8	578.7	578.5
Maximum	581.3	581.1	581.1	581.5	581.6	581.8	582.0	582.0	582.0	582.4	582.0	581.6
Max Year	1987	1986	1986	1986	1986	1986	1986	1986	1986	1986	1986	1986
Minimum	576.0	576.1	576.1	576.2	576.6	576.6	576.7	576.7	576.6	576.4	576.3	576.2
Min Year	2013	1964	1964	1964	1964	1964	1964	1964	1964	1964	1964	2012

Source: U.S. Army Corps of Engineers, 2016.

These trends continued throughout the 2000-2007 period where record low Lake Superior water levels were set for the months of August and September in 2007. Lake Michigan water levels also approached record lows for the months of November through February during the winter of 2007-2008. During 2008, the entire Great Lakes basin received above average precipitation. As a result, both Lake Superior and Lake Michigan water levels have risen from record or near record low levels to levels within 0.5 to 1.0 feet of their long term averages. Lake Michigan water levels again reached historic lows in 2013 before beginning another rapid increase from 2014 to present.

3.7.3 Probability, Impact, and Mitigation Potential

Hazard Ranking

Evaluation Criteria	Description	Ranking
Probability	 The hazard has impacted the state annually, or more frequently The hazard is widespread, generally affecting regions or multiple counties in each event There is a reliable methodology for identifying events and locations 	High
Mitigation Potential	 Methods for reducing risk from the hazard are technically reliable The state or counties have experience implementing mitigation measures Mitigation measures are eligible under federal grant programs There are multiple possible mitigation measures for the hazard The available mitigation measures are known to be cost-effective The mitigation measures protect lives and property for a long period of time or are permanent risk reductions solutions 	High

Wisconsin's coastal counties range from very sparsely populated (e.g. Iron County) to highly urban (e.g. Milwaukee County). The Great Lakes coast in Wisconsin can be divided into three sections based on population density characteristics:

• Southeastern Coastal Counties

This area includes the four southern-most coastal counties: Kenosha, Racine, Milwaukee, and Ozaukee. According to the 2010 Census, the southeastern coastal counties have a population density of 1,293 persons per square mile. Much of the southeast Wisconsin coast is part of the urban corridor that stretches between Milwaukee and Chicago. The southern counties include the coastal cities of Milwaukee Cudahy, Oak Creek, and St. Francis in Milwaukee County, Mequon and Port Washington in Ozaukee County, Kenosha (Kenosha County), and Racine (Racine County).

The southeastern coastal counties experienced an overall population gain of 2.6%, with all counties experiencing growth ranging from 0.8% in Milwaukee County to 11.3% in Kenosha County. The 11.3% increase in Kenosha County is particularly concerning, since it is one of the lowest-lying areas of the state. The City of Kenosha, which experienced almost 6% growth from 2000 to 2006, may need to examine ways to mitigate this increased population exposure to coastal hazards.

Northern Lake Michigan Coastal Counties

This area contains seven counties: Brown, Door, Kewaunee, Manitowoc, Marinette, Oconto, and Sheboygan. The northern Lake Michigan coastal Counties have a moderate population density of 118 people per square mile. This section includes the coastal cities of Algoma (Kewaunee County), Green Bay (Brown County), Kewaunee (Kewaunee County), Manitowoc (Manitowoc County), Marinette (Marinette County), Oconto (Oconto County), Sheboygan

(Sheboygan County), Sturgeon Bay (Door County), and Two Rivers (Manitowoc County). Much of the shoreline borders Green Bay. Door County possesses the most extensive Great Lakes shoreline in Wisconsin at 240 miles.

Northern Lake Michigan coastal counties experienced a collective population increase of 4.2%. Though Door, Manitowoc, and Marinette Counties lost 0.6%, 1.8%, and 3.8%, respectively, the rest of the counties saw significant increases of over 1%.

Brown County witnessed a 9.4% population increase during the ten year period. This increase comes from outside the Green Bay area, which is the county's fastest growing area. From 2000 to 2006, Green Bay experienced a 2.4% decrease in population. This population loss may decrease the number of people affected by coastal flooding, as Green Bay is among the lowest-lying areas in the state. According to the Bay-Lake Regional Planning Commission, the northwestern portion of Brown County is one of the areas at greatest risk for coastal flooding.

Northwestern Coastal Counties

This area borders Lake Superior and includes the counties of Ashland, Bayfield, Douglas, and Iron. This section has a low population density of approximately 17.8 people per square mile. Northwestern counties include cities of Ashland (Ashland County), Bayfield (Bayfield County), Superior (Douglas County), and Washburn (Bayfield County).

The northwestern coastal counties along Lake Superior experienced an overall loss of 781 persons or about 1% of its total population.

Coastal Erosion

Frequency and Probability

All of Wisconsin's coastal counties experience coastal erosion. The coastal erosion county-level risk assessment provides additional information on the risk of coastal erosion. It should be noted that coastal erosion is a function of rainfall and local conditions, making it difficult to accurately calculate general statewide probabilities.

Impacts and Mitigation Potential

Because coastal erosion is fairly site-specific, the effects of increased development and population growth are more easily measured in terms of risk and vulnerability. GIS analysis of the Wisconsin Statewide Parcel Database to identify improved parcels in the high and low risk coastal erosion zones provided the basis for estimating potential losses from this hazard. The parcel database includes information such as total parcel value, improvement value, and property class for each digitized parcel in the state. The erosion risk zones were established based on the distance in miles from the coastal area boundary:

• **High Risk Erosion Zone** – the area within 1/4 mile of the coastal area boundary

Low Risk Erosion Zone – the area within 1/2 mile of the coastal area boundary

Records from the GIS parcel layer were narrowed down to include only parcels containing improved structures. A buffer analysis was completed in ArcMap 10.4.1 to identify parcels within one quarter and one half mile of the Lakes Superior and Michigan coasts. The results of this analysis were then sorted and summarized using Microsoft Excel.

Property type (residential, commercial, or manufacturing) was determined using the Property Class field included in the Statewide Parcel Layer. The statewide database divides properties among eight statutory classifications: Residential, Commercial, Manufacturing, Agricultural, Undeveloped, Agricultural Forest, Productive Forest Land, and Other. In some cases, one parcel falls into multiple classes; for these parcels, the Statewide Parcel Layer lists all of the applicable classes in the Property Class field. To avoid double-counting, this analysis only placed parcels with one class into the Residential, Commercial, or Manufacturing categories listed in the tables in Figures 3.7.3-2 and 3.7.3-3. The total number of parcels in each county listed in the table in Figure 3.7.3-1 includes all classes of parcels, including those with multiple classes.

Figure 3.7.3-1: Summary of Improved Structures in Coastal Erosion Zones by County

	High-Risk Erosion Zone Low-Risk Erosion Zone (0.25 miles from CAB) (0.50 miles from CAB)			
County	Improved Parcels (n)	Value of Improvements (USD)	Improved Parcels (n)	Value of Improvements (USD)
Ashland	1,114	\$188,995,690	2,157	\$459,245,790
Bayfield	1,456	\$186,098,300	2,400	\$439,059,850
Brown	1,354	\$197,503,000	1,953	\$486,343,050
Door	7,836	\$1,617,963,800	11,267	\$3,894,553,600
Douglas	36	\$3,535,900	53	\$6,607,300
Iron	8	\$558,700	11	\$859,700
Kenosha	1,508	\$259,564,900	3,686	\$734,606,300
Kewaunee	1,301	\$392,644,100	2,132	\$533,206,700
Manitowoc	2,023	\$235,107,900	4,770	\$636,536,400
Marinette	735	\$75,619,700	1,140	\$162,347,000
Milwaukee	4,882	\$1,657,938,200	16,307	\$7,693,945,050
Oconto	466	\$40,684,000	554	\$77,829,600
Ozaukee	1,411	\$368,077,900	2,787	\$1,096,627,200
Racine	3,247	\$529,086,600	7,731	\$1,281,416,500
Sheboygan	2,715	\$350,952,500	5,510	\$929,125,700
TOTAL	30,092	\$6,104,331,190	62,458	\$18,432,309,740

Sources: Wisconsin Land Information Program, 2016; Wisconsin Emergency Management, 2016.

With 7,836 improved parcels, Door County has the greatest number of vulnerable properties of all classes in the high risk area, followed by Milwaukee (4,882) and Racine (3,247). Overall, Milwaukee County has the highest loss potential with over \$1.65 billion in improvement value

within ¼ mile of the Lake Michigan shoreline, followed by Door (\$1.61 billion) and Racine (\$529 million) counties.

The county with the greatest number of vulnerable improved parcels (all classes) in the low-risk area is Milwaukee (16,307), followed by Door County (11,267) and Racine County (7,731). Milwaukee County has the highest total loss potential in the low-risk erosion zone at \$7.69 billion, followed by Door (\$3.89 billion) and Racine (\$1.28 billion) counties.

The table in Figure 3.7.3-2 displays the loss estimation by property class for the high-risk erosion zone. Within areas subjected to high risk erosion, Door County has the largest number of improved residential parcels (7,184), followed by Milwaukee (4,725), Racine (3,116), and Sheboygan (2,585). Counties with the highest number of improved commercial parcels are Door, Bayfield, and Kewaunee, with 527, 210, and 177 parcels, respectively. Bayfield, Manitowoc, and Racine Counties each have four improved parcels classified as manufacturing within a quarter mile of the coast.

Figure 3.7.3-2: High Risk Erosion Zone Risk Assessment

_	Improved Parcels (n) Value of improvements (USD)				(USD)	
County	Residential	Commercial	Manufacturing	Residential	Commercial	Manufacturing
Ashland	971	124	3	\$128,013,190	\$55,326,900	\$3,802,900
Bayfield	1,132	210	4	\$136,262,100	\$38,831,200	\$796,800
Brown	1,303	25	0	\$179,937,400	\$14,880,300	\$0
Door	7,184	527	3	\$1,464,810,600	\$128,352,200	\$5,734,300
Douglas	11	0	0	\$530,300	\$0	\$0
Iron	5	1	0	\$230,600	\$70,200	\$0
Kenosha	1,203	38	1	\$167,283,400	\$49,400,500	\$543,900
Kewaunee	1,054	177	0	\$115,888,500	\$268,999,100	\$0
Manitowoc	1,106	76	4	\$127,432,600	\$23,364,400	\$1,497,200
Marinette	703	14	1	\$65,940,900	\$6,811,300	\$445,300
Milwaukee	4,725	85	2	\$960,262,900	\$150,285,250	\$2,072,000
Oconto	421	7	0	\$37,531,300	\$655,000	\$0
Ozaukee	1,276	92	3	\$331,067,500	\$28,625,300	\$980,200
Racine	3,116	120	4	\$446,268,900	\$76,555,400	\$5,662,900
Sheboygan	2,585	88	0	\$302,902,600	\$35,294,400	\$0
TOTAL	26,795	1,584	25	\$4,464,362,790	\$877,451,450	\$21,535,500

Sources: Wisconsin Land Information Program, 2016; Wisconsin Emergency Management, 2016.

The table in Figure 3.7.3-3 shows loss potential in low-risk erosion areas by property class. Milwaukee County has the largest number of residential (15,288) and second largest number of

commercial properties (658) in the low-risk erosion zone. Door County has the second largest number of both residential properties (10,033) and largest number of commercial parcels (969). Ashland, Ozaukee, and Racine counties each have 13 parcels classified as manufacturing in the low-risk erosion zone.

Figure 3.7.3-3: Low Risk Erosion Zone Risk Assessment

	Improved Parcels (n)			Value of Improvements (USD)			
County	Residential	Commercial	Manufacturing	Residential	Commercial	Manufacturing	
Ashland	1,783	336	13	\$185,648,990	\$95,313,900	\$9,424,600	
Bayfield	1,902	302	4	\$201,890,300	\$50,606,900	\$796,800	
Brown	1,855	47	0	\$273,815,500	\$61,247,600	\$0	
Door	10,033	969	9	\$1,918,664,800	\$200,601,000	\$9,072,300	
Douglas	16	0	0	\$814,700	\$0	\$0	
Iron	6	1	0	\$268,700	\$70,200	\$0	
Kenosha	2,878	355	9	\$311,233,200	\$156,598,800	\$3,170,500	
Kewaunee	1,763	257	0	\$165,449,100	\$282,522,900	\$0	
Manitowoc	2,682	335	11	\$265,130,100	\$69,785,800	\$16,241,000	
Marinette	1,044	49	2	\$92,588,100	\$20,196,500	\$6,325,400	
Milwaukee	15,288	658	12	\$2,656,652,599	\$904,272,050	\$5,026,700	
Oconto	483	7	0	\$42,751,900	\$655,000	\$0	
Ozaukee	2,556	154	13	\$561,999,600	\$85,203,700	\$11,789,700	
Racine	7,176	527	13	\$816,307,800	\$191,516,200	\$9,623,700	
Sheboygan	5,097	341	0	\$524,292,500	\$103,890,300	\$0	
TOTAL	54,562	4,338	86	\$8,017,507,889	\$2,222,480,850	\$71,470,700	

Sources: Wisconsin Land Information Program, 2016; Wisconsin Emergency Management, 2016.

Mitigation actions that can be taken to prevent coastal erosion include installing bluff toe and top protection structures, implementing stormwater best management practices on the bluff top, and cutting slopes back to a stable angle. In the most vulnerable areas, homes and infrastructure may need to be removed or relocated. No matter what action is selected in a given location, it is important to integrate projects at the community or regional level to maximize effectiveness and prevent unintended effects.

Coastal Flooding

The coastal one-percent-annual-chance floodplain has been mapped for all but four of Wisconsin's coastal counties. This information is included in the National Flood Hazard Layer (NFHL) that was used to conduct the GIS analysis for the flood risk assessment located in Section 3.2.3. The floodplains generated from Flood Insurance Study and Q3 data for the remaining coastal counties (Ashland, Iron, Kewaunee, and Marinette) also accounted for flooding in coastal

areas. The flood risk assessment thus includes a quantitative description of coastal flooding vulnerability. Because of the difficulty of separating coastal flooding from riverine flooding in coastal areas, a holistic analysis of this interconnected system was chosen for the 2016 plan update, rather than attempting to profile coastal flooding individually by drawing artificial boundaries.

No current NFHL data in Wisconsin reflects the recent effort to map V Zones for the Great Lakes.

Future plan updates can incorporate this data as it becomes available over the next few years.

According to the Bay Lake Regional Planning Commission's *Guide to Hazard Mitigation Planning for Wisconsin Coastal Communities*, the Wisconsin counties at greatest risk for annual coastal flooding are Kenosha, Marinette, Oconto, Brown, Douglas (City of Superior), Bayfield County (Bark Bay and Chequamegon Bay), and Ashland County (Chequamegon Bay). Careful and strict enforcement of shoreland and floodplain ordinances will be the key to preventing losses in these areas. A medium risk for coastal flooding exists on the low terraces of Racine, Milwaukee, Ozaukee, Sheboygan, Manitowoc, Brown, Door, and Kewaunee Counties. There is a low risk for coastal flooding on high bluffs, which are found in Ozaukee, Sheboygan, Manitowoc, Brown, Door, and Kewaunee Counties.

Surges and seiches raise and lower water levels on a short-term basis; some historical surge and seiche events have been strong enough to cause ships to run aground. Vulnerability to flooding caused by surges and seiches is greatest at beaches that are open to the lake or that are located near bay entrances or shores of coastal rivers. The most intense surges happen in shallow bays exposed to long distances of open water; areas that have this topography and contain critical and/or vulnerable facilities and populations are at the greatest risk.

Lake Level Fluctuations

The water levels of Lakes Superior and Michigan fluctuate seasonally each year. There is also a high probability of fluctuation occurring from year to year as lake levels are influenced by other variable factors such as precipitation, temperature, evaporation, and ice cover.

Changes in lake levels influence the rate of coastal erosion and occurrence of coastal flooding. The impacts of changing lake levels range from property damage to economic hardships, especially for the shipping industry.

3.7.3.1 Changing Future Conditions

Increases in temperature and precipitation predicted by climate scientists will affect Great Lakes water levels. The interactions between these variables are complex, and there is considerable uncertainty as to what the overall impact to lake levels will be. On the one hand, higher winter temperatures will reduce the amount of ice cover that forms over the Great Lakes in winter, which would lead to lower water levels. However, increases in extreme precipitation are also predicted, which would generate a greater amount of runoff, leading in turn to higher water levels. Ultimately, it is not yet possible to predict with any certainty how the interaction of these opposing factors will influence lake levels overall; they may cancel each other out, or they may exacerbate the highs and lows that we currently experience. The US Army Corps of Engineers (USACE) recommends anticipating future lake levels beyond historical ranges.

Though 2016 lake levels have been higher than normal in recent years, the Oconto County All-Hazards Mitigation Plan predicts an overall decline of 0.8 - 1.4 feet in Lake Michigan by the end of the century, with wide annual variation. If this prediction proves to be accurate, awareness of coastal hazards may fade as low lake levels slow the erosion rate and reduce incidences of storm damage. Lower average lake levels may encourage coastal development, potentially leading to problems during years when water levels are high.

When water levels are high, coastal erosion increases, especially when paired with stronger and more frequent storms. Changes in the freeze-thaw cycle and increasingly severe spring floods are also likely to contribute to increased flooding, erosion, and bluff instability. Given the recent problems with coastal erosion and bluff instability brought on during the current period of high lake levels, coastal communities will need to be more vigilant and proactive about protecting shoreline properties and infrastructure moving forward.

Although six of Wisconsin's fifteen coastal counties (Ashland, Door, Iron, Manitowoc, and Marinette Counties) experienced population losses from 2000 to 2010, coastal counties as a whole experienced an overall population gain. Should this trend continue, increased growth and development can in turn increase the risk and vulnerability of counties as property values increase and areas that were once undeveloped undergo urbanization.

3.7.4 Catastrophic Scenario

Based on the Great Lakes Storm of November 1913

Following one of the hottest summers on record, Lake Michigan water levels and temperatures are higher than average. High lake levels coupled with a few fall storms have caused severe erosion and bluff instability along the low-lying, highly-developed shoreline stretching from the Wisconsin/Illinois border to northern Milwaukee County. Private property and public roads and utilities in several coastal municipalities are at risk of being damaged by further erosion.

As work progresses on bluff stabilization plans, an extratropical cyclone or "November gale" strikes in early November. A cold, dry front moving south/southeast from Canada collides with warm, wet air moving north/northeast out of the Gulf of Mexico, creating a fearsome blizzard with cyclonic rotation and hurricane-force winds that feeds on the Lake's unusually warm waters. During the storm, wind speeds average 70 mph, with gusts up to 90 mph. Waves crest at over 50 feet. Milwaukee, Racine, and Kenosha Counties are blanketed in 20-30 inches of snow, with the high winds causing whiteout conditions and 4-5 foot drifts in some areas. Though several lulls in the storm lead residents to believe the worst is behind them, the storm hovers over the area for 3 days in total as it gathers power from the warm lake water.

Storm impacts on the lake include dozens of damaged and capsized ships; 25 are completely destroyed, with an additional 23 stranded for several days in open water. Financial losses incurred by the shipping industry exceed \$180 million, and the region mourns over 300 boating-related fatalities.

On-shore impacts of the storm include widespread power outages and transportation shutdowns. The hurricane-strength winds and resulting wave action cause severe coastal erosion and flooding, as well as several catastrophic bluff failures. Several lakefront properties that experienced elevated erosion risk during the summer and early fall now completely succumb to bluff collapse, causing damage to both private homes and public infrastructure, and resulting in 8 additional fatalities. Several breakwaters in Milwaukee and other locations are damaged or obliterated, leaving previously protected shorelines completely vulnerable to uninhibited wave impacts.

Many of the facilities with damaged breakwaters are power and water utilities. Jones Island in Milwaukee and the South Shore Water Reclamation Facility in Oak Creek both sustain major damage, crippling municipal water systems and releasing hundreds of millions of gallons of effluent into Lake Michigan and other waterways. Severe erosion at the Linnwood Water Treatment Plant, We Energies/Oak Creek Power Plant, and Kenosha Wastewater Treatment necessitates emergency repairs to prevent total loss of service; however, initial response and recovery actions are greatly impaired by the heavy snowfall and blizzard conditions. I-794 in Milwaukee is severely undermined by erosive forces, causing a partial collapse and rendering the road impassible. Bluff erosion also encroaches on the FBI Office in St. Francis, Carthage College, and Everbrite Electronics Manufacturing properties.

The table in Figure 3.7.4-1 lists examples of vulnerable lakefront assets in Milwaukee, Racine, and Kenosha Counties.

Figure 3.7.4-1: Examples of Vulnerable Lakefront Assets

	of vullerable takerrollt Assets
McKinley N	
	re Yacht Club
	vaukee Yacht Club
Boating Facilities • Reef Point	Marina (Racine)
Southport	Marina
Prairie Har	bor Yacht Club
Note: Most boa	ts would be put in storage by October.
• Lakefront p	
Discovery \(World
Henry W. N	Лaier
Recreational Facilities • Festival Pa	rk
 Milwaukee 	Art Museum
Racine Civi	c Center
Kenosha P	ublic Museum
UW Schoo	of Freshwater Sciences
Education Centers • Carthage C	College
The Prairie	School
• Jones Islan	d Water Reclamation Plant
South Short	e Water Reclamation Plant
• Linnwood	Water Treatment Plant
Utilities • South Milv	vaukee Wastewater Treatment Facility
We Energie	es/Oak Creek Power Plant
Racine Wa	stewater Treatment
Kenosha W	astewater Treatment Facility
Kinnickinni	c, Menomonee, and Milwaukee Rivers
• I-794	
Other • Lakeshore	Drive
• Milwaukee	FBI Office in St. Francis
Everbrite, I	LC

3.7.5 Summary Risk Analysis

The table in Figure 3.7.5-2 provides a summary risk analysis for the winter storms and extreme cold hazard.

Figure 3.7.5-1: Coastal Hazards Summary Risk Analysis

Evaluation Criteria	Description	Ranking
	Risk to People, Property, Environment, and Operations	
Probability/potential threat of occurrence	 The hazard impacts the state occasionally, but not annually The hazard is somewhat localized, affecting only relatively small or isolated areas when it occurs The methodology for identifying events is not well-established, or is not applied across the entire state 	Medium

	Minimal countermeasures are in place to prevent or protect against this hazard.	
Vulnerability	Countermeasures may have potential, but limited demonstrated	
	history in reducing the threat potential.	High
	The nature of the hazard may limit the availability of	
	countermeasures.	
	Methods for reducing risk from the hazard are technically reliable	
	The State or counties have experience in implementing	
	mitigation measures	
	Mitigation measures are eligible under federal grant programs	
Mitigation Potential	There are multiple possible mitigation measures for the hazard	High
	The mitigation measures are known to be cost-effective	
	The mitigation measures protect lives and property for a long	
	period of time, or are permanent risk reduction solutions	
	Impacts of Catastrophic Scenario	
	Local medical services are able to manage volume of injuries and	
	fatalities but are near the limits of their capabilities.	
Public	Only critically injured patients are diverted to facilities outside of	Low
	the affected areas.	-
	Limited evacuations and sheltering may be required.	
	Emergency response capabilities largely exist locally or through	
	mutual aid to meet the needs of the incident, with minimal state	
Responders	assistance needed for some specialized resources.	Low
	Local disaster declaration probable.	
	State or local government mission essential functions impacted	
COOP, including	for 1-7 days, temporary relocation of business operations may be	Low
delivery of services	necessary.	
	Significant damage to critical infrastructure, public and private	
B	property over a large area.	
Property, Facilities & Infrastructure	10-50% of buildings and infrastructure in affected area damaged	Medium
Imastructure	or destroyed in affected area, and/or loss of lifeline services for	
	up to 1-7 days.	
	Environmental damage limited to a single community or small	
Environment	geographic area.	Low
Liviloililleilt	Damage requires short-term remediation efforts by local and	LOW
	state government.	
	Slight negative impact to local economic activity in the short-	
Economy	term.	Low
Leonomy	Direct effects limited to the local community or small portion of	LOW
	the region.	
Public Confidence	Some transitory acute effects on behavior health including	
	elevated stress, anxiety, depression, and behavior for individuals	Low
	in impacted communities.	2000
	Minor civil disturbances possible.	
	Aggregate Impact	Low

Source: Wisconsin Emergency Management, 2016.

FOR OFFICIAL USE ONLY

3.7.6 Sources – Agency Input and Research

The following agencies and document research assisted in providing subject matter expertise to this scenario's core capabilities.

- 1. FEMA's Multi-Hazard Identification and Risk Assessment, http://www.fema.gov/library/viewRecord.do?id=2214
- 2. Federal Emergency Management Agency. "FEMA's Multi-Hazard Identification and Risk Assessment, 'Subpart C: Hydrologic Hazards"". Federal Emergency Management Agency. Accessed October 2016. https://www.fema.gov/media-library/assets/documents/7251?id=2214. Federal Emergency Management Agency.
- 3. Federal Emergency Management Agency. "FEMA's Multi-Hazard Identification and Risk Assessment," Federal Emergency Management Agency. Accessed October 2016. https://www.fema.gov/media-library/assets/documents/7251?id=2214.
- 4. Office for Coastal Management. "NOAA'S Office of Coastal Management." NOAA Office for Coastal Management. Accessed October 2016. https://coast.noaa.gov/.
- 5. U.S. Army Corps of Engineers, Detroit District. "Great Lakes Information." Great Lakes Information. Accessed November 2016. http://www.lre.usace.army.mil/Missions/Great-Lakes-Information/.
- 6. Strum, Marie T. "The Lake Michigan Potential Damages Study." *Solutions to Coastal Disasters*, 2002. 2002. Accessed November 2016. doi:10.1061/40605(258)55.
- 7. Wisconsin Coastal Management Group. "Wisconsin Coastal Management Group." Wisconsin Coastal Management. Accessed November 2016. http://www.doa.state.wi.us/section.asp?linkid=65&locid=9.
- 8. Wisconsin Department of Administration, Wisconsin Coastal Management Program. Wisconsin Coastal Management Program Needs Assessment and Strategy: 2011-2016.

 November 01, 2010. Accessed November 2016.

 https://coast.noaa.gov/czm/enhancement/media/wi3092011.pdf.
- 9. Springman, Robert, and Stephen M. Born. *Wisconsin's Shore Erosion Plan: An Appraisal of Options and Strategies*. 1979. Accessed November 2016. https://www.gpo.gov/fdsys/pkg/CZIC-tc224-w6-s6-1979/html/CZIC-tc224-w6-s6-1979/html.
- 10. Wisconsin Department of Natural Resources. "Wisconsin Department of Natural Resources Shoreland Management Program." Wisconsin's Shoreland Management Program. Accessed November 2016. http://dnr.wi.gov/topic/ShorelandZoning/Programs/program-management.html.
- 11. Bay-Lake Regional Planning Commission, and Angela M. Pierce. *Guide to Hazard Mitigation Planning for Wisconsin Coastal Communities*. Green Bay, WI, 2007. June 2007. Accessed November 2016. http://www.baylakerpc.org/media/46893/coastal hazards planning guide june 2007.pdf.
- 12. University of Wisconsin Sea Grant. "UW Sea Grant." UW Sea Grant. Accessed November 2016. http://www.seagrant.wisc.edu/home/Default.aspx?tabid=39.
- 13. Committee on Coastal Erosion Zone Management, Water Science and Technology Board, Marine Board, Commission on Engineering and Technical Systems, and National

- Research Council. *Managing Coastal Erosion*. Washington, D.C.: National Academy Press, 1990. Electronic, https://www.nap.edu/read/1446/chapter/1#ii. ISBN 0-309-04143-0
- 14. U.S. Army Corps of Engineers, Detroit District. "FINAL 2015 And Long-Term (1918-2015) Mean, Max, & Min Monthly Mean Water Levels (based of Gage Networks)." Chart. U.S. Army Corps of Engineers, Detroit District. May 11, 2016. Accessed September 2016. http://www.lre.usace.army.mil/Portals/69/docs/GreatLakesInfo/docs/WaterLevels/LTA-GLWL-English 2015.pdf.
- 15. Wisconsin Coastal Management Program. "Wisconsin Shoreline Inventory and Oblique Photo Viewer." Wisconsin Shoreline Inventory and Oblique Photo Viewer. Accessed November 2016. http://floodatlas.org/wcmp/obliqueviewer/.
- 16. U.S. Army Corps of Engineers. "Great Lakes Oblique Imagery." Great Lakes Oblique Imagery. Accessed November 2016. http://greatlakes.erdc.dren.mil/.
- 17. U.S. Army Corps of Engineers, Detroit District. "Great Lakes Water Levels." Great Lakes Water Levels. Accessed October 2016. http://www.lre.usace.army.mil/Missions/Great-Lakes-Water-Levels/.
- 18. Great Lakes Coastal Resilience Planning Guide. "Great Lakes Coastal Resilience Planning Guide." Great Lakes Coastal Resilience Planning Guide. Accessed November 2016. http://greatlakesresilience.org/.
- United States of America. Oconto County. Oconto County Emergency Management. *Oconto County, Wisconsin Hazard Mitigation Plan*. By Oconto County Hazard Mitigation Plan Steering Committee and Bay-Lake Regional Planning Commission. Oconto, WI: Oconto County, 2015. http://www.baylakerpc.org/media/46490/oconto_co_haz_plan_2015.pdf
- 20. Wisconsin Initiative on Climate Change Impacts. "Impacts Presentation." Wisconsin Initiative on Climate Change Impacts. Accessed November 2016. http://www.wicci.wisc.edu/impacts.php#2.
- 21. "National Climate Assessment." National Climate Assessment. Accessed October 2016. http://nca2014.globalchange.gov/.
- 22. Great Lakes Information Network. "Great Lakes Information Network." Great Lakes Information Network. Accessed October 2016. http://www.great-lakes.net/.

3.8 Radiological Release

The radiological release hazard can be described as the accidental or intentional release of radioactive material in sufficient quantity to constitute a threat to public health and safety. A radiological release could involve airborne radioactive material and/or radioactive contamination of the environment. The degree and area of a radiological release could vary greatly depending on the type and amount of the release as well as current and future weather conditions. Response to radiological release requires specialized personnel who have been properly trained and equipped.

3.8.1 Nature of the Hazard

The radiological release hazard includes:

- The accidental or intentional release from a nuclear power plant.
- The intentional release from a radiological dispersal device (RDD) or an improvised nuclear device (IND).

There are three active nuclear power plants that are located in or near the state. They are the Point Beach Nuclear Plant located adjacent to Lake Michigan and north of Two Rivers, Wisconsin; the Prairie Island Nuclear Generating Plant located along the Mississippi River in Red Wing, Minnesota; and the Byron Nuclear Generating Station located in Ogle County, Illinois.

In addition, there are three closed nuclear power plants with stored spent nuclear fuel rods that are located in or near the state. They are the Dairyland Power Cooperative located in Genoa, Wisconsin; the Zion Nuclear Generating Plant located adjacent to Lake Michigan in Zion, Illinois; and the Kewaunee Power Station in Carlton, Wisconsin.

The construction and operation of nuclear power plants is closely monitored and regulated by the Nuclear Regulatory Commission (NRC). Based on the redundant safeguards and robust secondary containment many analysts believe an incident that would result in the release of a large amount of radioactive material would most likely be caused by a deliberate act.

An RDD is a device or mechanism that is intended to spread radioactive material from the detonation of conventional explosives or other means⁹. Another definition is a device that poses a threat to public health and safety through the malicious spread of radioactive material by some means of dispersion. The mode of dispersal typically conceived as an RDD is an explosive device coupled with radioactive material¹⁰.

An IND is a crude, yield-producing nuclear weapon fabricated from diverted fissile material¹¹. Another definition is an illicit nuclear weapon bought, stolen, or otherwise originating from a

_

⁹ Protective Action Guides and Planning Guidance for Radiological Incidents. EPA. March 2013

¹⁰ Planning Guidance for Protection and Recovery Following Radiological Dispersal Device (RDD) and Improvised Nuclear Device (IND) Incidents. FEMA. Federal Register 73, no. 149 (August 1, 2008).

¹¹ Protective Action Guides and Planning Guidance for Radiological Incidents. EPA. March 2013

nuclear state, or a weapon fabricated by a terrorist group from illegally obtained fissile nuclear weapons material that produces a nuclear explosion¹².

A radiological release would likely result in massive social and economic disruptions in the affected areas. Access to and from an affected areas would need to appropriately managed. Those individuals that received a high dose of radiation would require transportation, hospitalization, and lengthy supportive care. The number of fatalities would likely be low. However, special arrangements would be needed to handle and transport contaminated bodies. A decontamination of the affected area would be required. The cascading effects associated with a radiological release could cause major disruptions in transportation and other services nationwide.

These disruptions would be more widespread if the radiological release was located in a densely populated area or if radioactive material is carried downwind and/or downstream to a densely populated area. A radiological release affecting a densely populated area would quickly exceed local, state, and regional response capabilities. The rapid deployment of national assets such as Hazardous Material Teams, Emergency Medical Teams, and National Guard Weapons of Mass Destruction (WMD) Civil Support Team (CST) would be critical to response.

3.8.2 History

A release of radiological materials from a nuclear power plant has never occurred in Wisconsin or the region. Known events have occurred at Three Mile Island, Chernobyl, and Fukushima. In addition to these nuclear plant events there have been a number of radiological and nuclear related incidents around the world.

March 28, 1979, Three Mile Island Nuclear Generating Station

The Three Mile Island accident refers to a loss-of-coolant and partial nuclear meltdown that occurred on March 28, 1979 at the Three Mile Island Nuclear Generating Station, Unit 2, in Dauphin County, Pennsylvania. The accident was determined to be a result of human factors and mechanical failure. The partial meltdown resulted in the release of radioactive gases and iodine. Epidemiological studies have determined no link between the accident and the rate of cancer. Following the accident Unit 2 was too badly damaged and contaminated to resume operations. The reactor was gradually deactivated and permanently closed. Cleanup started in August 1979 and ended December 1993. Cleanup cost totaled approximately 1 billion dollars (unadjusted).

April 26, 1986, Chernobyl Nuclear Power Plant

The Chernobyl disaster refers to a nuclear accident that occurred on April 26, 1986 at the Chernobyl Nuclear Power Plant located near the city of Pripyat, Ukraine (at the time the Ukrainian Soviet Socialist Republic of the Soviet Union). The accident released radioactive

3-210

Section 3.2 Severe Weather Threats and Hazards

¹² Planning Guidance for Protection and Recovery Following Radiological Dispersal Device (RDD) and Improvised Nuclear Device (IND) Incidents. FEMA. Federal Register 73, no. 149 (August 1, 2008)

particles into the atmosphere spreading over a large area of the western Soviet Union and Europe. It has been estimated that the Soviet Union spent the equivalent of \$18 billion dollars (unadjusted) on containment and decontamination. Thirty-one workers and emergency responders were killed in the accident and initial response. Long-term the number of deaths from radiation exposure may reach many thousand.

Currently the area around the Chernobyl site is one of the most radioactively contaminated areas in the world. The Chernobyl Exclusion Zone covers an area of approximately 1,000 sq. mi. where radioactive contamination from fallout is highest and public access and inhabitation are restricted.

September 1987, Goiania, Brazil

An old nuclear source was scavenged from an abandoned hospital. It was subsequently handled by many residents of Goiania, Brazil. Approximately 8% of the population presented with psychosomatic symptoms (rash on the neck and upper body, vomiting, diarrhea), 50 people ingested cesium, 28 sustained radiation skin burns, and 2 men, 1 woman, and 1 child died from acute gamma radiation exposure. The contamination was tracked over 40 city blocks and 85 homes, 41 of which were evacuated and 7 demolished. Cleanup generated 3,500 m³ of radioactive waste, and cost \$20 million. Neighboring provinces boycotted products for a month. Tourism collapsed and economic losses totaled in the hundreds of millions of dollars.

1995, Moscow, Russia

Terrorists, believed to be Chechen rebels, created an RDD from dynamite and Cesuim-137 that had been removed from cancer treatment equipment. The device was buried in a park in Moscow. It was located and defused before it could be detonated.

2006, London, England

A former Soviet KGB agent who had defected to London, was poisoned by Polonium-210 in 2006. He was admitted to a London hospital feeling very ill, his health steadily declined and he died several weeks later. A subsequent investigation identified additional people and locations in London contaminated by Polonium. Thousands contacted the National Health Services out of concern.

November, 2007 Pelindaba Nuclear Facility

Four armed men broke into the Pelindaba Nuclear Facility is South Africa. The facility stored enough weapons-grade uranium to make 25 bombs. The men spent 45 minutes inside the facility before they were discovered, and all four escaped. At the same time, a separate group unsuccessfully attempted to break into the facility. A week later, three suspects were arrested. Six Pelindaba security personnel were suspended, and an internal investigation was launched.

March 11, 2011, Fukushima I Nuclear Power Plant

The Fukushima Daiichi nuclear disaster refers to a nuclear accident at the Fukushima I Nuclear Power Plant located in Fukushima, Japan. The accident was a cascading event triggered by the Tohoke earthquake and tsunami on March 11, 2011. The tsunami destroyed emergency generators powering cooling systems leading to three nuclear meltdowns, release of radioactive material, and contamination of ground and sea water. To date, it has been estimated that Japan has spent the equivalent of \$15 billion dollars on regional clean up and decontamination. However, the cleanup is on-going effort and total costs will not be known until decommissioning. There were no deaths directly attributed to accident. Long-term the number of cancer deaths from radiation exposure may reach many hundred.

June 2011, Moldova

Moldovan police seized stolen highly enriched uranium (HEU) from a gang by posing as a North African buyer. The gang's members had sought to sell the uranium that they reported was enriched to an unspecified refinement of the isotope uranium-235 for between \$29 million and \$144 million per kilogram. Six people active in the former Soviet Union were arrested.

July 2012, Knoxville, Tennessee

Three anti-nuclear protesters broke into Y-12, a nuclear storage facility that contains the United States' primary supply of weapons-grade uranium. The protesters tripped the perimeter intrusion detection system and were confronted by heavily armed guards. The National Nuclear Security Administration (NNSA) will use lessons from this event to "further refine and improve [the] security posture at Y-12."

December 2013, Mexico

A truck containing a Category 1 cobalt-60 tele-therapy source was stolen in Mexico. Presumably the thieves were unaware of the truck's cargo. The source was located in a field two days later, where it had been stripped of its protective shielding but otherwise undamaged. One person showed signs of overexposure to the source. At least 60-70 additional people presented themselves for testing.

3.8.3 Probability, Impact, and Mitigation Potential

Despite the lack of historical occurrences locally it is incumbent on the state to remain vigilant. Serious nuclear and radiological related incidents internationally have demonstrated the need to maintain active and viable plans to handle such incidents.

Federal, state, and local governments and utility personnel take extensive precautions to ensure that, should a radiological release occur, its impact on the safety and well-being of the general public and the environment will be minimal. These precautions include the development and continual testing of emergency plans, training of response personnel, coordination of response

actions, and development and dissemination of emergency public information. A regular series of large, interagency drills and exercises takes place for each nuclear plant.

The Nuclear Regulatory Commission (NRC) has defined four sets of plant conditions, or emergency classifications that indicate the level of risk a nuclear event may pose to the public. Nuclear power plants, as well as research or test reactors, use the following emergency classifications to respond to incidents, in order of increasing severity:

Emergency Classifications for Nuclear Power Plants

- 1. **Notification of Unusual Event:** Events are in progress or have occurred that indicate potential degradation in the safety level of the plant. No release of radioactive material requiring offsite response or monitoring is expected unless further degradation occurs.
- 2. **Alert:** Events are in progress or have occurred that involve an actual or potential substantial degradation in the safety level of the plant. Any radioactive material releases from the plant are expected to be limited to a small fraction of amounts described in the Environmental Protection Agency (EPA) Protection Action Guides (PAGs).
- 3. **Site Area Emergency:** Events are in progress or have occurred that caused actual or likely major failures of plant functions needed to protect the public. Any radioactive material releases are not expected to exceed EPA PAGs except near the site boundary.
- 4. **General Emergency:** Actual or imminent substantial core damage or melting of reactor fuel with the potential for loss of containment integrity has occurred. Radioactive releases during a general emergency can be expected to exceed EPA PAGs for more than the immediate site area. It is important to note that the vast majority of events reported to the NRC are routine in nature and do not require incident response.

To help in developing a preplanned strategy for protective actions during an emergency, there are two emergency planning zones (EPZs) around each nuclear power plant. The size and shape of each zone is determined through planning that considers specific site conditions, unique geographical features, and area demographic information. Preplanned strategies for these EPZs helps to support activity beyond the zones in the unlikely event it would be needed. The NRC defines the EPZs as follows:

Emergency Planning Zones

- 1. **Plume Exposure Pathway:** This zone has a radius of about 10 miles from the reactor site. Predetermined protective action plans for this zone are designed to avoid or reduce dose from potential exposure of radioactive materials. These action plans include sheltering, evacuation, and the use of potassium iodide (KI) where appropriate.
- Ingestion Exposure Pathway: This zone has a radius of about 50 miles from the reactor site. Predetermined protective action plans for this zone are designed to avoid or reduce dose from potential ingestion of radioactive materials. These action plans include a ban on contaminated food and water.

Following the 1979 Three Mile Island accident, NRC regulations changed to require each nuclear power plant operator to submit the radiological emergency response plans of state and local governments within the 10-mile plume exposure pathway, as well as plans of state governments within the 50-mile ingestion pathway.

Federal, State, and Local Responsibilities

- 1. Federal: The Federal Emergency Management Agency (FEMA) and the NRC jointly share federal oversight responsibilities for nuclear power plants, as follows:
 - a. The NRC evaluates emergency plans of the plants themselves, including adequacy and sufficiency of the plans, as well as the resources and equipment needed during an emergency. The NRC also issues nuclear power plant operating licenses, and takes enforcement actions such as levying violations, fines, or ordering the shutdown of operating reactors.
 - b. FEMA develops the coordinated response of federal agencies to a nuclear power plant radiological emergency. It interfaces with state and local governments with regard to emergency preparedness. FEMA evaluates state and local emergency plans to ensure sufficiency and adequacy. The emergency preparedness training of state and local officials is a FEMA responsibility.
- 2. State and Local: State and local government officials are responsible for deciding and implementing appropriate protective actions for the public during a nuclear plant emergency. Protective actions include evacuation, sheltering-in-place, and/or taking KI pills. State and local officials should base their decisions on recommendations made by the nuclear plant operator and their respective state or local radiological or health organizations.

In Wisconsin, the Department of Health Services (WI DHS), Radiation Protection Section carries primary responsibility for the safety and health of the populace during radiological incidents. Wisconsin DHS is augmented by specially trained local responders, as well as regional hazardous material (Hazmat) teams and military assets when available. Of concern at the state and local level is the range of protective and detection equipment available to first responders. This has led to questions regarding equipment standardization and state and local preparedness.

The Wisconsin National Guard (WI NG) WMD CST, when deployed, addresses the consequences of the release involving chemical, biological, radiological, nuclear, or high-yield explosive (CBRNE) devices. The National Guard leverages its war-fighting capability to support the civil authorities by providing a disciplined, well-trained, and well-equipped organization to supplement local, state, and federal efforts to manage the potentially catastrophic effects of a CBRNE event. CSTs can provide special technical support to augment specific needs of the incident commander. CSTs are designed and trained to provide initial assessment of CBRNE events and advice and assistance.

The table in Figure 3.8.3-1 lists other key federal radiological and nuclear resources.

Figure 3.8.3-1: Key Federal Radiological and Nuclear Resources

Agency	Description of Roles
Department of Homeland Security (DHS)	Assumes domestic incident management responsibilities for deliberate attacks.
DHS/Customs and Border Patrol (CBP)	 Coordinates the federal response for incidents involving the inadvertent import of radioactive materials Maintains radiation detection equipment and nonintrusive inspection technology at ports of entry and Border Patrol checkpoints to detect the presence of radiological substances transported by persons, cargo, mail, or conveyance arriving from foreign countries Through its National Targeting Center, provides extensive analytical and targeting capabilities to identify and interdict suspected nuclear/ radiological materials.
DHS Domestic Nuclear Detection Office (DNDO)	 Provides R/N Program Assistance, including the deployment of Mobile Detection Deployment Units (MDDUs) and preparation of R/N Detection Supplemental Grant Guidance Coordinates the technical adjudication of a radiation detection alarm and recommends technical federal asset responses as required The DNDO Joint Analysis Center (JAC) may respond to a request for assistance in identifying unknown nuclear/radiological materials Supports the deployment of an enhanced global nuclear detection system to detect and report on attempts to import, possess, store, transport, develop, or use an unauthorized nuclear explosive device, fissile material, or radiological material in the United States.
DHS/U.S. Coast Guard (USCG)	 Coordinating agency for the federal response to incidents involving the release of nuclear/radioactive materials that occur in certain areas of the coastal zone, including incidents involving foreign or unknown sources of radioactive material Coordinates agency response for these incidents during the prevention and emergency response phase, and transfers responsibility for later response phases to the appropriate agency.
DHS/Transportation Security Administration (TSA)	 Develops policies to protect the nation's transportation systems Through the Office of Law Enforcement/Federal Air Marshal Service, runs the Visible Intermodal Prevention and Response Team (VIPR or VIPER), which supports law enforcement in the screening, search, and detection of various modes and routes of transportation (railways, airports, bus stations, ferries, tunnels, ports, subways, truck weigh stations, rest areas) and special events (National Special Security Events (NSSE), major sporting events, conventions, etc.) Deploys at the request of and collaboration with federal, state, and local transportation stakeholders to prevent and deter acts of terrorism against transportation systems Tools can include nuclear and radiological detection equipment, mobile drive-through x-ray detection machines, and transportation systems (air, land, sea)

Environmental Protection Agency (EPA)	 Coordinating agency for the federal environmental response to incidents that occur at facilities not licensed, owned, or operated by a federal agency or an NRC agreement state, or currently or formerly licensed facilities for which the owner/operator is not financially viable or is otherwise unable to respond Coordinating agency for the federal environmental response to incidents involving the release of nuclear/radioactive materials that occur in the inland zone and in areas of the coastal zone not addressed by DHS/USCG Maintains Protective Action Guidelines for radiological incidents, upon which many protective action decisions are made Conducts laboratory analysis for environmental sampling May provide support for radioactive waste storage and disposal, as well as removal of contaminated debris May support environmental remediation.
Nuclear Regulatory Commission (NRC)	Coordinating agency for incidents at or caused by a facility or an activity that is licensed by the NRC or an NRC agreement state
Federal Radiological Monitoring and Assessment Center (FRMAC)	 Responsible for coordinating all environmental radiological monitoring, sampling, and assessment activities for the response DOE leads the FRMAC for the initial response, then transitions FRMAC leadership to EPA for site cleanup Established at or near the incident location, the FRMAC usually includes representatives from DOE, EPA, the Department of Commerce, the DHS National Communications System, the U.S. Army Corps of Engineers (USACE), and other federal agencies as needed Supports decontamination of federal, State, and local emergency responders and equipment integrating into the FRMAC.
Interagency Modeling and Atmospheric Assessment Center (IMAAC)	 Is an interagency center responsible for production, coordination, and dissemination of the federal consequence predictions for an airborne hazardous material release Provides the single federal atmospheric prediction of hazardous material concentration through a partnership with Departments of Energy, Defense, and Commerce (through the National Oceanic and Atmospheric Administration, or NOAA), EPA, NASA, and NRC Is an off-site resource that supports the incident response remotely.
Department of Health and Human Services (HHS)	 Coordinates federal support for external monitoring of people for radiation exposure Assists local and state health departments in establishing a registry of potentially exposed individuals, performing dose reconstruction, and conducting long-term monitoring of this population for potential long-term health effects If requested, coordinates federal support for population decontamination, performing monitoring for internal contamination, administering available pharmaceuticals for internal decontamination, and managing fatalities Provides available medical countermeasures through deployment of the Strategic National Stockpile.
HHS/Food and Drug Administration (FDA)	Conducts food and agriculture laboratory analysis.
HHS/Center for Disease Control (CDC)	Conducts laboratory analysis for bioassays.

Department of Agriculture (USDA)	 Provides support for assessment, control, and decontamination of contaminated animals Provides support for stabilization and disposition of contaminated animal carcasses Provides support for the assessment, stabilization, and disposal of contaminated animal products and plant materials.
Department of Defense (DOD)	 Provides Defense Support of Civil Authorities (DSCA) in response to requests for assistance May provide Weapons of Mass Destruction Civil Support Teams (WMD CSTs) and CBRN (chemical, biological, radiological, and nuclear) Enhanced Response Force Packages (CERFP) from the National Guard, CBRNE (chemical, biological, radiological, nuclear, and high-yield explosive) Consequence Management Response Forces (CCMRF), and/or DOD Advisory Teams.
DOD/U.S. Army Corps of Engineers (USACE)	 May provide support for radioactive waste storage and disposal May support radiological survey functions, gross decontamination, site characterization, contaminated water and debris management, and environmental and site remediation
Department of Justice (DOJ)/Federal Bureau of Investigation (FBI)	 Has lead responsibility for criminal investigations of terrorist acts or terrorist threats by individuals or groups inside the United States, or directed at U.S. citizens or institutions abroad Manages, leads, and coordinates all law enforcement and investigative activities in response to terrorist acts or threats

Other agencies that may play key roles include: DOE, Department of Commerce, FEMA, Department of the Interior, Department of Labor, Department of State, Department of Transportation, Department of Veterans Affairs, and National Aeronautics and Space Administration (NASA).

3.8.4 Catastrophic Scenario

A large urban area is preparing for an annual music festival scheduled for 11 days. Festival planners anticipate approximately 100,000 attendees each day on the festival grounds and an additional 300,000 in the vicinity of the festival. It is scheduled for the end of June through the beginning of July when the wind is forecast for 7 mph out of the southeast. Intelligence sources indicate slightly elevated threat levels for RDD attacks across the county, and warn that state and local jurisdictions should implement all prevention and detection capabilities available at high-priority and high-risk sites.

3.8.5 Summary Risk Analysis

The table in Figure 3.8.5-1 provides a summary risk analysis for the radiological release hazard.

Figure 3.8.5-1: Radiological Release Summary Risk Analysis

Evaluation Criteria	Description	Ranking
	Risk to People, Property, Environment, and Operations	
Probability/potential threat of occurrence	 The hazard occurs only very infrequently, generally less than every five years on a large scale, although localized events may be more frequent The hazard is generally very localized and on a small scale (i.e. sub-county level) A methodology for identifying event occurrences and/or severities is poorly established in the state, or is available only on a local basis 	Low
Vulnerability	 Multiple, reliable, well-coordinated, countermeasures are in place to prevent or protect against this hazard. Countermeasures have an extensive demonstrated history of testing and success in significantly reducing the threat potential. 	Low
Mitigation Potential	 Methods for reducing risk from the hazard are not well-established, are not proven reliable, or are experimental The State or counties have little or no experience in implementing mitigation measures, and/or no technical knowledge of them Mitigation measures are ineligible under federal grant programs There is a very limited range of mitigation measures for the hazard, usually only one feasible alternative The mitigation measures have not been proven cost-effective and are likely to be expensive compared to the magnitude of the damages caused by the hazard The long-term effectiveness of the measure is not known, or is known to be relatively poor 	Low
	Impacts of Catastrophic Scenario	
Public	 Local and regional medical services are unable to manage the volume of injuries and fatalities. Mass evacuation, sheltering and care of displaced residents, medical patients, and vulnerable populations may be required. 	High

Responders	 Local and mutual aid resources would be fully committed and significant state and federal assistance would be needed in order meet the needs of the incident. State and federal disaster declaration. 	High
COOP, including delivery of services	Minimal impact on government essential functions.	Low
Property, Facilities & Infrastructure	 Damage to property, facilities and infrastructure anticipated in impacted area. Some structures could be could be impacted for up to a year. Infrastructure damages would likely take longer than one week to repair. 	High
Environment	 Widespread environmental damage over a large geographic area affecting several communities across a region. Significant damage to an ecologically sensitive area such as wetlands, rivers, lakes, or public water supply. Damage requires massive long-term remediation efforts of state and federal government. 	High
Economy	 Tremendous adverse impact affecting the livelihood of the region and possibly extending to statewide. Long-term, cascading damage across multiple economic sectors requiring federal government assistance. 	High
Public Confidence	 Long-term loss of confidence in government and society. Mass panic and major civil disturbances are possible. 	High
	Aggregate Impact	High

3.8.6 Sources - Agency Input and Research

The following agencies and document research assisted in providing subject matter expertise to this scenario's core capabilities.

- 1. Department of Homeland Security, Domestic Nuclear Detection Office
- 2. FEMA Region V Threat and Hazard Identification and Rick Assessment (THIRA)
- 3. Wisconsin Department of Health Services (WI DHS), Radiation Protection Section
- 4. Wisconsin Emergency Response Plan, Radiological Incident Annex

3.9 Hazardous Materials Incident

(including fixed facilities and transportation)

A hazardous materials incident can be described as the uncontrolled release of hazardous materials capable of posing a risk to life, health, safety, property, or the environment. A hazardous materials incident is most often a result of accidents at fixed facilities or during transportation.

3.9.1 Nature of the Hazard

Hazardous materials are any solid, liquid, or gas that can pose a threat to human health and/or the environment due to being radioactive, flammable, explosive, toxic, corrosive, a biohazard, an oxidizer, an asphyxiant, or capable of causing severe allergic reactions. The release of hazardous materials can lead to property damage, short and long term health effects, serious injuries, and even death. Emergency response to incidents involving the release of hazardous materials may require fire, law enforcement, search and rescue, and hazardous materials units.

3.9.2 History

The vast majority of reported hazardous materials incidents result from the loading, unloading, and transportation of hazardous materials. The map in figure 3.9.2-1 indicates that Wisconsin over the past 10 years ranks toward the bottom third of states in total hazardous materials incidents.

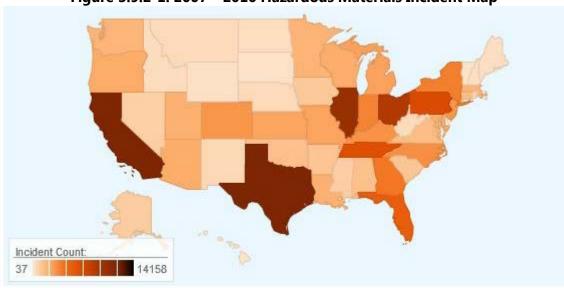


Figure 3.9.2-1: 2007 – 2016 Hazardous Materials Incident Map

Source: Hazmat Intelligence Portal, U.S. Department of Transportation, Data as of 10/21/2016

Since 1971 Wisconsin has had a total of 10,958 reported hazardous materials transportation incidents¹³. This total is comprised of 10,498 highway incidents (95.8%), 266 rail incidents (2.4%), 188 air incidents (1.7%), 2 other incidents (>0.1%), and 0 water incidents (0.0%). The total cost for all reported incidents is approximately \$57 million dollars. Approximately half of the amount (\$26.6 million) is from the 1996 Weyauwega Train Derailment.

These incidents included 175 involving a crash or derailment, 68 causing or contributing to personal injury, 59 causing or contributing to an evacuation, 38 closing a major transportation artery or facility, and 7 causing or contributing to a fatality. The following describe a selection of notable incidents.

July 5, 2009 Patrick Cudahy Meat Packing Plant Fire

On July 5, 2009, in Cudahy, WI, the Patrick Cudahy meat packing plant was accidently set ablaze by two brothers celebrating Independence Day using a military parachute flare obtained through one of the brothers' recent U.S. Marine Corps service. The fire burned for several days and involved over 130 firefighters from 27 different departments in the near-suburban area of Milwaukee's south side. The historic plant was almost completely destroyed.

Acrid, thick black smoke changed to white smoke and back again as the fire burned through various parts of the factory. An ammonia explosion was successfully averted as ammonia gas used from refrigeration at the plant, extremely toxic and fatal if inhaled was contained in an area away from the fire.



Figure 3.9.2-2: East Side View of Cudahy Plant Fire

The smoke and threat of ammonia forced evacuation of over 18,000 local residents, of which 387 evacuees including 77 individuals with access and functional needs required sheltering by the American Red Cross (ARC). The city's water system was drained, as over 33 million gallons of water were sprayed on the fire that engulfed the sprawling 1.4 million square foot complex.

_

¹³ Hazmat Intelligence Portal, U.S. Department of Transportation. Data as of 9/25/2016.

Later in the day, after no ammonia was detected in the air and the fire was brought under control, the evacuation order was lifted. Fortunately, few of the plant's 2,000 employees were present due to the Independence Day holiday.

April 2, 2001 Green Bay Tanker Truck Collision

On April 2, 2001 in Green Bay, WI, a northbound gasoline tanker truck operated by Condon Transport, Inc. was making a left turn (west bound) in heavy fog. Simultaneously, a passenger vehicle with four occupants heading east bound failed to stop at a stop sign and struck the tanker in its center as the tanker was negotiating the left-hand turn. The passenger vehicle sheared off the tankers wet lines and possibly punctured the tank itself (the tank appeared to have a fracture once lifted from the wreckage). Gasoline spilled into the passenger vehicle and caused an immediate fire, killing all four occupants.

March 4, 1996 Weyauwega Trail Derailment

On March 4, 1996, at about 5:50 a.m., a Wisconsin Central Limited (WC) train consisting of two locomotive units, 68 loaded freight cars, and 13 empty freight cars, derailed the 17th through 50th head cars at Weyauwega, Wisconsin. Sixteen of the derailed cars contained hazardous materials: two loaded with sodium hydroxide, seven loaded with liquefied petroleum gas (LPG), and seven loaded with propane.



Figure 3.9.2-3: Overhead View of the Train Derailment

Source: National Transportation Safety Board Report, CHI 96 FR 010, Derailment/Hazardous Material Release, Wisconsin Central, LTD, Weyauwega, Wisconsin, August 16, 1997.

The derailment resulted in a release of hazardous material that caught fire and consumed seven of the cars loaded with LPG and propane and threatened to ignite the remaining hazardous material cars. The fire also burned a local feed mill building. High tension electric lines were

knocked down, and city water and natural gas services were disrupted. About 3,155 residents of the town were immediately evacuated from their homes, with over half remaining evacuated for the entire 16-day incident period. Major highway arteries – US Highways 10 and 110 – were closed, as well as all county roads leading into the area. There were no injuries directly attributable to the derailment, but three individuals suffered minor injuries during the evacuation. The costs associated with the accident exceeded \$26 million.

Pieces of broken rail from the "heel" area of a switch point rail were recovered in the wreckage. The broken rail displayed failure characteristics which indicated that the fractures originated from a bolt hole crack. National Transportation Safety Board (NTSB) examination and analysis of the broken rails indicated that the bolt hole crack had been present for some time. The examination also revealed that the rails and joint bars displayed many characteristics that were indicative of problems in the joint and bolt hole area. These characteristics were telltale signs of a problem that should have been observed and acted upon by well-trained, vigilant track inspectors and their supervisors.

The WC Supervisor of Maintenance and the WC Manager of Maintenance were responsible for the inspection of the track at Weyauwega to insure compliance with Federal Railroad Administration (FRA) regulations on track safety standards. WC records indicated both were considered to be qualified track inspectors for FRA track safety standards. However, a review of their training records indicated that neither person had been recently trained in track safety standard compliance on the WC, nor had they recently received any FRA track safety standard competency testing. The National Transportation Safety Board investigation concluded that the cause of this accident was that the switch point rail broke due to an undetected bolt hole crack that progressed from improper maintenance because Wisconsin Central management did not ensure that the two employees responsible for inspecting the track structure were properly trained.

June 30, 1992 Nemadji Train Derailment

At 2:55 a.m. on June 30, 1992, 14 cars, 3 carrying hazardous materials, derailed and fell approximately 70 feet from the railroad bridge at Highway 35 into the Nemadji River, south of Superior, Wisconsin. The location of the incident was about 4.5 miles upriver from Lake Superior (46.42N, 092.02W). Three of the cars contained hazardous materials. Two of these cars were in the water; one remained on the bridge and at risk. One car containing 35,000 gallons of Benzene-dicyclo-pentadiene (or aromatic concentrates) ruptured and lost an estimated 15,000 gallons of product into the river. The second car in the river contained LPG (Liquefied Petroleum Gas) and remained intact. A car on the bridge containing Butadiene also remained intact. There was a light fog at the time of the incident, and initially, the local fire department ordered the evacuation of the lower areas of both Duluth and Superior. Immediate evacuation of approximately 50,000 residents of Superior, Wisconsin and Duluth, Minnesota was begun by local authorities because of the odorous and visible plume caused by the spill. Most of those evacuated were allowed to return to their homes on July 1. The weather was clear at time of the

incident but rained on and off for 3 days, temperatures varied between 57-82°F, with winds out of the northwest at 10 knots. The evacuation zone of 1 mile radius was maintained until July 4.

3.9.3 Probability, Impact and Mitigation

Hazardous materials are present in most communities. These materials may be manufactured, transported, stored, used, and disposed of by a variety of users including business, industry, agriculture, universities, hospitals, utilities, and other facilities. In an effort to reduce the risk to the public and the environment these hazardous materials are highly regulated by state and federal agencies.

However, despite regulations and precautions accidental releases do occur. Most releases are the result of human error. Occasionally a release may be the result of natural causes. Regardless of the cause a release can cause severe harm to people or the environment and may require immediate response. Many programs and initiatives have been designed to mitigate, prepare for, respond to, and recover from hazardous material incidents including, but not limited to, the following.

Emergency Planning and Community Right-to-Know Act (EPCRA)

Wisconsin Emergency Management (WEM) / State Emergency Response Commission (SERC) is responsible for implementing the federal Emergency Planning and Community Right-to-Know Act (EPCRA), also known as the Superfund Amendments and Reauthorization Act (SARA) of 1986, at the state and local levels. WEM/SERC is also responsible for administering the Emergency Planning Grant that provides funding on a formula basis to county LEPCs for local planning and program administration and the Equipment Grant which provides matching funding for computer equipment and hazardous materials response equipment. Under 1991 WI Act 104 the WEM/SERC is also responsible for contracting with regional hazardous materials response teams as well as providing hazardous materials response equipment funding, on a matching basis, to the designated county hazardous materials response teams.

EPCRA Compliance and Enforcement Program

The Compliance Program staff offers technical assistance regarding the EPCRA requirements and compliance to facility owners/operators, LEPCs, County Emergency Management Directors, and other state and local agency staff. Assistance is provided to county LEPCs for outreach programs. Also educational materials and presentations are available for business and industry, highlighting program requirements. Compliance staff also conducts compliance reviews to identify potentially noncompliant facilities and conduct investigations.

WEM offers three grants administered by the EPCRA program:

Planning Grant

- The Planning Grant and the Emergency Management Performance Grant (EPMG) share the same plan of work.
- Local Emergency Planning Committees (LEPCs) must complete plan-of-work components to be reimbursed.
- Award is based on the annual Planning Grant Formula.
- Funded by EPCRA program revenue (fees).

Computer & Hazmat Equipment

- Maximum total award for counties with an eligible hazardous materials team is \$10,000.
- Counties without a county level team are eligible for the computer portion only.
- The grant has an 80/20 match. The match can be in-kind or cash.
- Award criteria is based on an approved equipment list and funding available.
- Funding comes from state general program revenue (GPR).

Hazardous Materials Emergency Preparedness (HMEP) Sub-Grant

- Training and Planning grant funded by US DOT (EPCRA administers the planning portion).
- Purpose is to improve the delivery of EPCRA and enhance planning efforts with a focus on transportation.
- Training grants are to be used by HMEP subgrantees for the funding of training activities that enhance the capabilities of states, territories, and tribal governments.
- Training should be developed and delivered in accordance with requirements for emergency responders under National Fire Protection Association (NFPA) standard 472.
- Training grants are to be used by HMEP subgrantees for training public sector employees to respond safely and efficiently to accidents and incidents involving the transportation of hazardous materials.

Local Emergency Planning Committee (LEPC)

Each Wisconsin county is designated as an emergency planning district and has a Local Emergency Planning Committee (LEPC) to administer the local program. LEPC membership includes local elected officials, members of emergency response agencies (emergency management, fire, law enforcement, EMS, health, etc.), and representatives for transportation, public works, the media, community groups, environmental groups, and owners/operators of facilities. LEPCs are responsible for receiving and maintaining filings of facility submissions. They also maintain a county-wide emergency response plan, develop and maintain facilities' off-site emergency response plans and the county's hazard analysis for both fixed facilities and transportation. LEPCs assess the county hazmat response resources and equipment, respond to public requests for information under "community right-to-know" law, and conduct hazmat training and exercises. Wisconsin has annual exercise requirements and the LEPC attempts to involve facilities, response agencies, and other local officials in the exercises.

The county-wide emergency response plan includes: the county hazard analysis summary, a list of facilities storing hazardous materials, identification of transportation routes for extremely hazardous substances (EHS), procedures for notification or releases, response to releases, procedures for sheltering and evacuation, and a schedule for training and exercising. Individual facility off-site plans include: facility name and location, name of facility emergency planning coordinator with 24 hr. contact phone number, list of primary emergency responders, list of resources available from/at facility, list of outside resources available, hazard analysis of the facility with a vulnerability zone for release of EHS stored at facility, identification of special facilities (i.e., schools, hospitals, nursing homes, day care centers, etc.) within the zone, population protection procedures (sheltering and evacuation) and attachments. These plans are developed and maintained by the LEPC.

Hazardous Materials Response Teams

WEM contract and manages 22 Regional Hazardous Materials Response Teams. These teams provide a high level of hazardous materials response capabilities to local communities. The teams are divided into Task Forces: Northeast Task Force, Northwest Task Force, Southeast Task Force, and the Southwest Task Force. These Task Forces are then divided into Type I, Type II, and Type III teams, all with complimentary capabilities and training requirements.

The Wisconsin Hazardous Materials Response System may be activated for an incident involving a hazardous materials spill, leak, explosion, injury or the potential of immediate threat to life, the environment, or property. The Wisconsin Hazardous Materials Response system responds to the most serious of spills and releases requiring the highest level of skin and respiratory protective gear. This includes all chemical, biological, or radiological emergencies.

Local (County) Hazardous Materials Response Teams respond to chemical incidents which require a lower level of protective gear but still exceed the capabilities of standard fire departments. Forty counties currently have level 4 Hazardous Materials Response Teams. Those teams may provide assistance to surrounding counties and are approved by the Local Emergency Planning Committees.

3.9.4 Catastrophic Scenario

During a weekday at approximately 9:00 a.m., a delivery truck driver is filling a 49,000 lb. tank with a hazardous chemical at a major chemical company facility when he receives an important family emergency phone call. The driver rushes back into the truck and drives off, forgetting that the truck is still connected to the pump.

As the truck drives off, the emergency stop valve on the delivery truck is damaged due to the nozzle still being engaged in the tank. The truck driver quickly realizes that the damage is causing a major chemical release, and runs to the back of the truck to try to stop the leak; he is overcome by fumes and falls to the ground.

The chemical company employee assisting with the transfer is splashed by the chemical (especially on his gloved hands). He has no skin contact with the acid, but does inhale some fumes. The contaminated employee runs in and grabs the manager on his bare arm to have him call the E-Team. The manager then runs outside and finds the truck driver lying on the ground. The manager attempts to rescue the driver, but realizes that there are too many fumes and retreats back into the facility.

There is a release of 9,000 lbs. of the chemical over a 2-hour period, in addition to 4,500 lbs. of gas released into the ambient air. The winds are out of ESE at 3 miles per hour. The temperature is 72 degrees, with 80% cloud cover.

The facility sits adjacent to a major freeway running through a large metropolitan area. Directly across from the freeway is a university, which is in session. There are various public and private facilities within the projected plume area, where serious health problems could occur.

Approximately 20,000 individuals will need to be evacuated with sheltering space required for 30% of the evacuees. There is a possibility that another 60,000 individuals may need to be evacuated in the event the hazardous material cannot be contained due to changing atmospheric conditions.

3.9.5 Summary Risk Analysis

The table in Figure 3.9.5-1 provides a summary risk analysis for the hazardous materials incident hazard.

Figure 3.9.5-1: Hazardous Materials Incident Summary Risk Analysis

Evaluation Criteria	Description	Ranking
	Risk to People, Property, Environment, and Operations	
Probability/potential threat of occurrence	 The hazard impacts the state occasionally, but not annually The hazard is somewhat localized, affecting only relatively small or isolated areas when it occurs The methodology for identifying events is not well-established, or is not applied across the entire state 	Medium
Vulnerability	 Multiple, reliable, well-coordinated, countermeasures are in place to prevent or protect against this hazard. Countermeasures have an extensive demonstrated history of testing and success in significantly reducing the threat potential. 	Low
Mitigation Potential	 Methods for reducing risk from the hazard are technically reliable The State or counties have experience in implementing mitigation measures Mitigation measures are eligible under federal grant programs There are multiple possible mitigation measures for the hazard The mitigation measures are known to be cost-effective The mitigation measures protect lives and property for a long period of time, or are permanent risk reduction solutions 	High

Impacts of Catastrophic Scenario					
Public	 Local and regional medical services are unable to manage the volume of injuries and fatalities. Mass evacuation, sheltering and care of displaced residents, medical patients, and vulnerable populations may be required. 	High			
Responders	 Local and mutual aid resources would be fully committed and significant state assistance would be needed in order meet the needs of the incident. State disaster declaration. 	Medium			
COOP, including delivery of services	State or local government mission essential functions impacted for less than 24 hours.	Low			
Property, Facilities & Infrastructure	 Significant damage to critical infrastructure, public and private property over a localized area. Up to 10% of buildings and infrastructure in affected area damaged, and/or loss of lifeline services for up to 24 hrs. 	Low			
Environment	 Environmental damage affecting one or more communities within a county. Moderate damage to an ecologically sensitive area such as wetlands, rivers, lakes, or public water supply. Damage requires short- to medium-term remediation efforts of state and federal government. 	Medium			
Economy	 Medium-term effects to large portion of the jurisdiction's economy, possibly extending to the region. Damage to multiple economic sectors possibly requiring state or federal government assistance. 	Medium			
Public Confidence	 Medium and long-term effects including elevated stress, depression and behavioral health impacts for individuals in and out of impacted communities. Short- to medium term reduction of confidence in government in society. Civil disturbances in impacted communities may require law enforcement response. 	Medium			
	Aggregate Impact	Medium			

3.9.6 Sources - Agency Input and Research

The following agencies assisted in providing their expertise on the subject matter related to the core capabilities in this scenario.

- 1. Milwaukee County Emergency Management
- 2. Milwaukee Fire Department
- 3. Milwaukee Police Department
- 4. MABAS Wisconsin, Patrick Cudahy Fire IMAS Report July, 2009
- 5. U.S. Department of Transportation (DOT), Pipeline and Hazardous Materials Safety Administration (PHMSA)

3.10 Disruption of Life Lines

(including electric, fuel, water, wastewater)

A disruption of life lines can be described as the failure of a critical public or private utility infrastructure that results in a loss of essential functions and/or services.

3.10.1 Nature of the Hazard

The vast majority of the public is dependent on public and private utility infrastructure to provide life-supporting services such as electricity, fuel, water, and wastewater. The disruption of one or more of these life line systems could have devastating consequences on the public. A disruption of life lines may be a secondary hazard resulting from the impacts of a natural, technological, or human-caused hazard.

A disruption of any life line can lead to a threat to the public health and safety if immediate actions are not taken. If the disruption were to involve more than one life line system or is large enough in scope and magnitude, whole communities or regions could be severely impacted. A disruption will often disproportionally impact the most vulnerable members of society such as the very young, the very old, those in poor health, and the poor or impoverished. Examples of disruptions include, but are not limited to such events as an electricity outage rendering fans and air conditioning inoperable during a period of extreme heat; shortage of fuel rendering furnaces inoperable during a period of extreme cold; damaged or malfunctioning water or wastewater treatment system exposing the public to a sanitation concerns; and, inadequate storm water system failing to protect an area from dangerous and damaging flooding.

Electric

Investor owned utilities supply the vast majority of power to Wisconsin electricity customers. Other suppliers include municipal utilities and power cooperatives. The relative amounts of power supplied by the three types of utilities have changed very little over the past 20 years. The table in Figure 3.10.1-1 lists kilowatt hour (kWh) and percentage of electricity supply by type of utility.

Figure 3.10.1-1: Electricity Supply by Utility Type

		9		, ,, ,			
Year	Private Utilities		Municipal Utilities		Power Cooperatives		TOTAL
	kWh	%	kWh	%	kWh	%	TOTAL
1970	21,515	87.1	2,160	8.7	1,040	4.2	24,715
1980	32,335	85.7	3,547	9.4	1,864	4.9	37,746
1990	41,653	84.7	5,263	10.7	2,282	4.6	49,198
2000	54,404	84.1	7,375	11.4	2,910	4.5	64,689
2010	57,183	83.2	7,759	11.3	3,810	5.5	68,752
2012	57,128	83.0	7,856	11.4	3,836	506	68,820
kWh in listed in millions							

Source: 2013 Wisconsin Energy Statistics, State Energy Office.

The demand for electricity changes daily and seasonally. During peak times, the largest amount of electricity known as "peak load" is needed, but a "base load" of electricity is needed year-round. The industrial, residential, and commercial sectors all use a similar percentage of total electricity sales. The industrial sector accounts for 34.2%, commercial 33.0%, residential 30.5%, and agricultural 2.2%.

Because electricity cannot be stored easily, utilities must anticipate demand. Utilities meet this demand with in-state power plants and by purchasing electricity from power plants in other states. The balancing of supply and demand is required in order to maintain a reliable electric system. Maintaining reliable and economical electrical generation for the state depends on sufficient quantities of the right types of power plants operating together in a cost-effective manner. A diversity of energy resources also helps achieve stability of generation and prevents dependence on a specific fuel. The table in Figure 3.10.1-2 lists percentage of electricity supply by type of plant.

Figure 3.10.1-2: Wisconsin Electric Generation by Type of Plant

						_ , , .		
Year	Coal	Nuclear	Hydro	Petroleum	Natural Gas	Renewables	Unknown Fuel	Total
1990	61.1	14.0	4.9	3.6	12.0	1.4	2.9	100
2000	50.3	11.5	4.1	3.5	26.2	1.8	2.5	100
2010	43.0	9.1	2.7	3.9	36.3	5.1	0.0	100
2012	43.9	8.7	2.7	3.9	35.4	5.4	0.0	100
	Totals might not add due to rounding							

Source: 2013 Wisconsin Energy Statistics, State Energy Office

Since 1990 the data indicates the percentage of total electric production derived from coal has decreased from 61% to 44%. During this same time production from natural gas has increased from 12% to 35%. The kWh production from nuclear and hydro has generally stayed consistent from 1990 to 2012 but the increase in total kWh results in a percentage of total decrease. In addition, electric production from renewable sources has increased from just 1.4% to account for over 5% of total electric production. The renewables category includes biomass, methane from landfills and digesters, solar, and wind resources.

The transmission system must accommodate changing electricity supply and demand conditions, unexpected outages, planned shutdowns of generator or transmission equipment for maintenance, weather extremes, fuel shortages, and other challenges. Electricity flows from power plants, through transformers and transmission lines, to substations, distribution lines, and then finally to the electricity consumer. The diagram in Figure 3.10.1-3 depicts a simplified electric system.

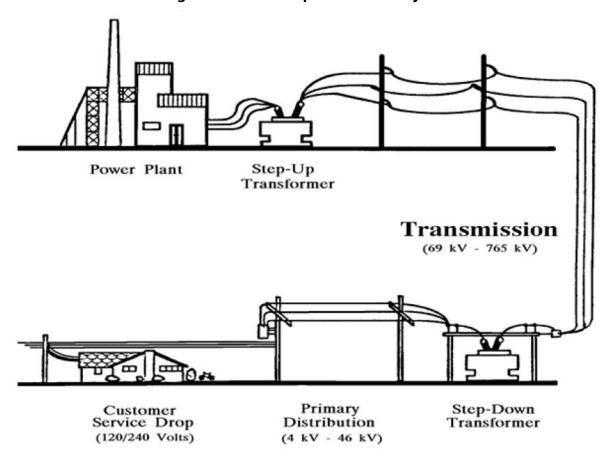


Figure 3.10.1-3: Simplified Electric System

Source: Public Service Commission of Wisconsin, Electric09 (10/13).

The transmission grid includes not only transmission lines that run from power plants to where electricity is used, but also from transmission line to transmission line, providing a redundant system that helps assure the smooth flow of power. If a transmission line is taken out of service in one part of the power grid, the power reroutes itself through other power lines to continue delivering power. If adjacent transmission lines cannot handle the extra power flow, safety devices may switch them off to prevent damage. Severe overloads can lead to cascading outages and system-wide failure (i.e. a blackout). This is one of the disadvantages of the interconnectedness of the transmission grid.

The map in Figure 3.10.1-4 depicts the state's electric generating facilities over 100 Megawatts and electric transmission lines.

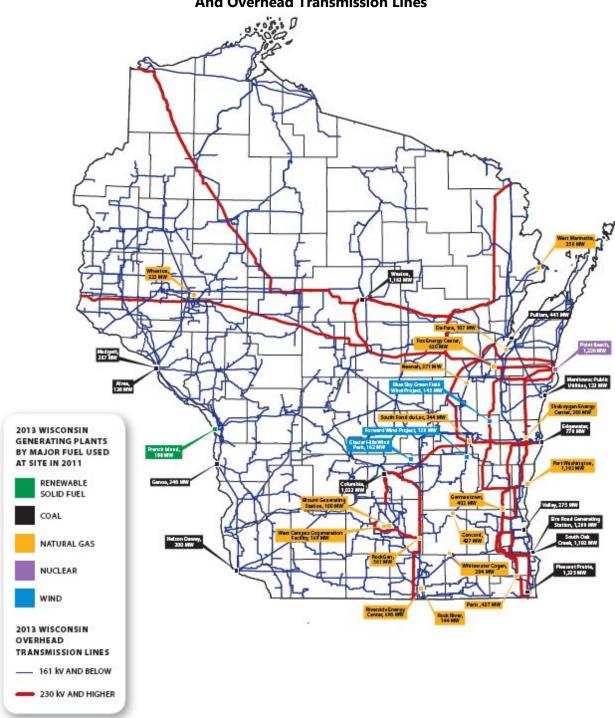


Figure 3.10.1-4: 2013 Wisconsin Generating Plants
And Overhead Transmission Lines

Source: 2013 Wisconsin Energy Statistics, State Energy Office.

There are approximately 12,000 miles of transmission lines in Wisconsin. The Wisconsin transmission system has a general electric flow from northwest to southeast through the state. The western part of Wisconsin is connected by high-voltage lines primarily from Minnesota. The southeastern part of Wisconsin is connected to northern Illinois by high-voltage lines. Imported electric is further addressed in the following fuel section.

Fuel

The state's fuel needs are primarily supplied by petroleum, coal, natural gas, imported electricity, nuclear energy, and renewables. The category of renewables includes hydroelectric generation, solar, biomass, biogas, and wind. The table in Figure 3.10.1-5 lists these fuels by percentage of total energy consumption.

Figure 3.10.1-5: 2012 Wisconsin Energy Consumption by Fuel Type

	7 71
Fuel	Percentage
Petroleum	28.5
Coal	26.3
Natural Gas	26.0
Imported electricity	6.8
Nuclear Energy	6.7
Renewables	5.7
Total	100

Source: 2013 Wisconsin Energy Statistics, State Energy Office

The petroleum category includes gasoline, jet fuel, light distillate (such as kerosene), middle distillate (such as heating fuel and diesel fuel), residual fuel oil, and liquid propane gas (LPG). The primary use of petroleum fuel is transportation. Just over 88% of all petroleum is used for transportation.

The coal category includes both bituminous coal and sub-bituminous coal. Generally, the industrial and commercial sectors use bituminous coal with a high energy content. The utility sector uses sub-bituminous coal with a lower energy and sulfur content. Utilities mainly use low-sulfur coal to conform to regulations addressing sulfur emissions. The primary use of coal fuel is by electric utilities. Just over 91% of all coal is used by electric utilities.

The natural gas category includes natural gas, compressed natural gas (CNG), and liquefied natural gas (LNG). Natural gas is an important fuel source to many sectors. Natural gas is used by utilities for electric generation; by residential users for heating and other gas appliances (e.g. stove, dryer, water heater); and commercial and industrial user for heating and other uses. The largest user of natural gas is industry at 31.0%, followed by residential at 28.1%, electric utility at 21.7%, and commercial at 18.8%.

In Wisconsin the natural gas industry includes natural gas utilities, interstate pipelines, producers, and marketers. The natural gas utilities are the local distribution companies (LDCs). Interstate pipeline companies move the gas from the production area to the local utility. The natural gas producers and marketers produce or sell the gas to buyers such as the local utility.

The ANR Pipeline Company supplies 59.7% of the state's natural gas. The majority of this natural gas originates in Oklahoma and Louisiana. The Northern Natural Gas Company supplies 19.8% of the state's natural gas. The majority of this natural gas originates in Texas, Oklahoma, Kansas, and Alberta, Canada.

The imported electricity category represents the estimated resource energy used in other states or Canada to produce the electricity imported into Wisconsin. Historically, the state has imported, rather than exported, a small percentage of electricity. The table in Figure 3.10.1-6 lists percentage of imported electricity by year.

Figure 3.10.1-6 Wisconsin Electric Imports

	9
Year	Electric Imports
1970	-2.5%
1975	-1.7%
1980	-0.5%
1985	-0.1%
1990	6.2%
1995	7.7%
1996	5.0%
1997	8.0%
1998	6.7%
1999	6.0%
2000	5.8%
2001	7.2%

Year	Electric Imports
2002	5.9%
2003	5.1%
2004	5.5%
2005	7.3%
2006	3.5%
2007	5.2%
2008	4.2%
2009	4.2%
2010	3.0%
2011	4.1%
2012	6.8%

Source: 2013 Wisconsin Energy Statistics, State Energy Office.

Water

There are 582 public water utilities in Wisconsin. Of that number 78 are Class AB utilities serving 4,000 or more customers, 140 are Class C utilities serving from 1,000 to 4,000 customers, and 364 are Class D utilities serving fewer than 1,000 customers. Most are municipally owned, but five are private or investor-owned systems.

The majority of water utilities are sourced by groundwater (530) compared to surface water (52) as their primary water source. The amount of water pumped is more evenly split between groundwater (51%) compared to surface water (49%).¹⁴

¹⁴ 2015 Wisconsin Water Fact Sheet, Public Service Commission of Wisconsin.

Wastewater

Wisconsin has approximately 950 permitted sanitary sewage collection systems ¹⁵. Discharges of untreated or inadequately treated sewage from any place in sewage collection systems are commonly referred to as sanitary sewer overflows (SSOs). Discharges of untreated sewage are a potential hazard to human health and can have significant impacts on water quality. Typically, SSOs occur as a result of either the entry of an excessive amount of precipitation and groundwater, known as infiltration/inflow (I/I), into the sewers or there is a mechanical, electrical, or structural failure in a component of the collection system. When a sewage collection system has insufficient capacity to transport the sewage from the I/I entering it, the system will relieve itself by overflowing from the sewer system at some point or backing up through a building sewer into a basement.

3.10.2 History

The following describe a selection of notable local, regional, and national incidents.

March 4-5, 1976 Ice Storm

On March 4-5, 1976 southern and eastern Wisconsin is impacted by a devastating ice storm. Ice accumulations ranged up to five inches on wires and tree limbs. High winds gusting to 60 mph worsened the situation. The storm brought down hundreds of utility poles, thousands of power and telephone lines, and a large number of trees. Up to 600,000 residences were directly affected and up to 100,000 were without power during the height of the storm. Some rural areas were without power for over 10 days. Twenty-one counties were included in a federal disaster declaration.

August 14, 2003 Northeast Blackout

The Northeast blackout of 2003 was a widespread power outage in the northeastern and Midwestern, United States and Ontario, Canada beginning just after 4:10 p.m. EDT. The primary cause was a software bug in the alarm system at a control room of the FirstEnergy Corporation, located in Ohio. Due to the lack of alarm operators were unaware of the need to re-distribute power after overloaded transmission lines hit unpruned foliage. This local failure cascaded into a widespread failure of the grid. According to the official analysis of the blackout by the U.S. and Canadian governments more than 508 generating units at 265 power plants shut down during the outage. Some power was restored by 11 p.m. Power was not restored for many others until 2 days later.

2014 Winter

The harsh winter in 2014 led to a higher incidence of main breaks, and many utilities advised their customers to run their water to prevent further breaks and protect distribution systems

¹⁵ Wisconsin Department of Natural Resources, Programs for Sanitary Sewer Collection System, CMOM webpage accessed on 10/25/2016.

"Non-revenue water" is water that is produced but does not generate sales to recover production costs. In 2014 non-revenue water accounted for about 24% of the water produced by water utilities in Wisconsin. This amount constitutes a 31% increase from 2013.

2014 Winter Propane Shortage

On January 25, 2014 Governor Walker signs Executive Order 130 declaring a State of Emergency in Response to Severe Winter Weather and a Propane Shortage. The shortage is believed to be the result of several factors including: high demand for propane in November to dry a large, late harvest of corn; disruption of pipeline delivery of propane to the Midwest; and record cold and snowstorms in upper Midwest increasing use of propane and interfering with truck and rail delivery. DHS reports three probable cold weather related deaths occurred in Ashland, Marquette, and Milwaukee Counties on Friday, January 3.

3.10.3 Probability, Impact and Mitigation Potential

The disruption of life lines has and likely will again occur as a secondary hazard resulting from the impacts of a natural, technological, or human-caused hazard.

Electric

The Wisconsin transmission system can become congested under normal power flow conditions. In addition, there are many transmission lines in Wisconsin that are more than 60 years old, requiring upgrades or replacement. Multiple failures in one location can quickly affect the entire system, producing a large scale blackout. Fortunately, this does not happen very often.

Due to the 2003 blackout in the Northeast, the Federal Energy Regulatory Commission (FERC) passed mandatory reliability rules in 2005 which resulted in a series of new mandates including requirements for redundancy, reliability, and rigorous right-of-way maintenance.

Fuel

Wisconsin's natural gas utilities, or local distribution companies (LDCs) are regulated by the Public Service Commission (PSC). The rates and services of interstate pipeline companies, as well as the construction of new pipelines, is regulated by the Federal Energy Regulatory Commission (FERC)

Water

In general the state benefits from plentiful surface and ground water resources. However, these water resources are not always available in the quantity or quality that is needed for human uses. Many communities are facing serious water supply challenges based on increased demand, declining groundwater supplies, and aging infrastructure. The number of communities facing water challenges is expected to grow in the future. The Public Service Commission (PSC)

of Wisconsin works with Wisconsin water utilities to incorporate water conservation and efficiency measures into water supply planning.

Wastewater

Sewers deteriorate over time and develop cracks, breaks, and blockages if not properly maintained. Aging, out-of-sight, out-of-mind sewer systems can be neglected and thus not be inspected or maintained on a regular basis.

The Wisconsin Department of Natural Resources (DNR) regulates municipal and industrial operations discharging wastewater to surface water or groundwater through the Wisconsin Pollutant Discharge Elimination System (WPDES) permit program. Plans for wastewater treatment facilities must be reviewed and approved by the DNR. All SSOs must be reported to the DNR within 24 hours followed by a written report within 5 days.

Wisconsin Administrative Code requires that all owners of collection systems develop and implement a Capacity, Management, Operation, and Maintenance (CMOM) Program. A CMOM Program is to assure that a sewage system is properly managed, operated, and maintained at all times; has adequate capacity to convey peak flows; and all feasible steps are taken to eliminate excessive infiltration and inflow from the system. A CMOM Program must mitigate the impact of overflows on waters of the state, the environment, and public health.

3.10.3.1 Changing Future Conditions

Deteriorating infrastructure is a current nationwide problem that is likely to be exacerbated by changing future conditions. Higher future temperatures, for example, would increase the demand for cooling homes, businesses, and public buildings, placing greater stress on power systems. Existing stormwater systems were designed based on past conditions that are now changing; many systems may quickly become inadequate if storms continue to become more frequent and/or intense.

Wisconsin communities should prepare for even greater stress on infrastructure systems that may already be outdated. Although declining infrastructure is a serious problem, it also presents an opportunity to improve and integrate existing systems so that they serve communities better and more efficiently.

3.10.4 Catastrophic Scenario

In early January, a cyber-attack against a key natural gas compressor station causes a shutdown of two pipelines in eastern Wisconsin, damaging pipeline infrastructure and forcing a rapid shutdown of natural gas power plants throughout the southwest, southeast, and east central regions. Coordinated physical attacks at substations in two urban areas trigger a power outage to approximately 80% of customers throughout five counties. The physical damage caused by the attacks is expected to take up to several weeks to completely repair. A total of 832,303 are without power and 1,164,000 without natural gas for over one week. Many critical infrastructure

facilities have back-up generators, but roughly one-quarter of these operate on natural gas, and the remainder require fuel after 48-72 hours.

3.10.5 Summary Risk Analysis

The table in Figure 3.10.5-1 provides a summary risk analysis for the disruption of life lines hazard.

Figure 3.10.5-1: Disruption of Life Lines Summary Risk Analysis

Evaluation Criteria	Description	Ranking			
	Risk to People, Property, Environment, and Operations				
Probability/potential threat of occurrence	 The hazard impacts the state occasionally, but not annually The hazard is somewhat localized, affecting only relatively small or isolated areas when it occurs The methodology for identifying events is not well-established, or is not applied across the entire state 	Medium			
Vulnerability	 Multiple, reliable, well-coordinated, countermeasures are in place to prevent or protect against this hazard. Countermeasures have an extensive demonstrated history of testing and success in significantly reducing the threat potential. 	Low			
Mitigation Potential	 Mitigation methods are established The State or counties have limited experience with the kinds of measures that may be appropriate to mitigate the hazard Some mitigation measures are eligible for federal grants There is a limited range of effective mitigation measures for the hazard Mitigation measures are cost-effective only in limited circumstances Mitigation measures are effective for a reasonable period of time 	Medium			
	Impacts of Catastrophic Scenario				
Public	Minimal injuries and fatalities would be expected, but significant state and federal resources for mass care and shelter may be needed for populations without water, heat, or electricity.	Medium			
Responders	 Local and mutual aid resources would be fully committed and significant state assistance would be needed in order meet the needs of the incident. State disaster declaration. 	Medium			
COOP, including delivery of services	State and local government unable to deliver mission essential functions for longer than 7 days, major long-term relocation of staff and business operations necessary.	High			
Property, Facilities & Infrastructure	Loss of lifeline services for more than 7 days.	High			
Environment	Minimal impact on the environment is anticipated.	Low			
Economy	 Tremendous adverse impact affecting the livelihood of the region and possibly extending to statewide. Long-term, cascading damage across multiple economic sectors requiring federal government assistance. 	High			

Public Confidence	 Long-term loss of confidence in government and society. Mass panic and major civil disturbances requiring massive, sustained law enforcement response, curfews, and other security measures. 	High
	Aggregate Impact	High

3.10.6 Sources - Agency Input and Research

The following agencies and document research assisted in providing subject matter expertise to this scenario's core capabilities.

- 1. Public Service Commission of Wisconsin
- 2. Wisconsin Department of Natural Resources
- 3. Wisconsin State Energy Office
- 4. Wisconsin Initiative on Climate Change Impacts. "Impacts Presentation." Wisconsin Initiative on Climate Change Impacts. Accessed November 2016. http://www.wicci.wisc.edu/impacts.php#2.
- 5. *Wisconsin 2050: Scenarios of a State of Change*. August 20, 2016. Accessed October 2016. http://www.wicci.wisc.edu/resources/ClimateWI2050-Communites August 2016.pdf.
- 6. *Building Community Adaptation Strategies in Duluth,* presentation by Jodi Slick, Ecolibrium3, 28 January 2016.

3.11 Emerging Infectious Diseases

(including pandemic influenza)

Emerging infectious diseases, including pandemic influenza (flu), represent an irregular hazard with the potential to rapidly overwhelm a health care system. This hazard includes infectious diseases that may be transmitted among humans or between animals and humans; the reappearance of those infectious diseases once thought eradicated; new strains of known infectious diseases; and, previously unknown or unidentified infectious diseases. Despite extraordinary advances in development of countermeasures (diagnostics, therapeutics, and vaccines), the ease of world travel and increased global interdependence have added layers of complexity to containing these infectious diseases that affect not only the health but the economic stability of societies. Human immunodeficiency virus (HIV) infection and acquired immune deficiency syndrome (AIDS), severe acute respiratory syndrome (SARS), and the 2009 pandemic H1N1 influenza are only a few of many examples of emerging infectious diseases in the modern world.

3.11.1 Nature of the Hazard

Emerging infectious diseases pose a particular risk to urban and suburban communities due to the close environment in which people interact. An infectious disease may be transmitted by a variety of mechanisms, including airborne inhalation, food, liquids, bodily fluids, contaminated objects, ingestion, or vector-borne spread.

Some infectious diseases, such as flu, present seasonal threats to the public and require continual monitoring. A pandemic flu is an epidemic of an influenza virus that spreads on a worldwide scale and infects a large proportion of the world population. This is in contrast to the regular seasonal epidemics of flu.

A flu pandemic can occur when a new strain of the influenza virus is transmitted to humans from another animal species. ¹⁶Historically, these new human-susceptible strains have arisen most commonly in pigs, chickens, and ducks. These animals form the cornerstone of livestock raised throughout the world for human consumption.

The most current and active threat comes from influenza type A strains that originate in birds and become readily transferable into other organisms. These viruses can be transmitted from wild birds to other bird species, causing outbreaks in domestic poultry. These viruses can also mutate into highly virulent strains that can infect humans, with the potential to cause human influenza pandemics. This should especially concern people who live in close proximity to livestock. The movement of influenza viruses throughout the world is thought to be caused in

1

¹⁶ "Avian Influenza: Molecular Mechanisms of Pathogenesis and Host Range," Animal Viruses: Molecular Biology. Caister Academic Press.

part by bird migrations. However, commercial shipments of live birds, as well as human transnational travel transport a large number of pathogenic influenza strains.¹⁷

Influenza strains with the most rapid spread between birds and humans, posing a severe risk for a pandemic, are influenza A (H5N1) viruses. Of considerable concern is highly pathogenic avian influenza A H5N1 (HPAI A [H5N1]), commonly known as avian influenza or "bird flu." Viruses designated as highly pathogenic result in high mortality (up to 100 percent) within 48 hours. HPAI A (H5N1) is capable of killing tens of millions of birds as a direct result of infection, while hundreds of millions more must be destroyed by authorities to control the pathogen's spread.

The World Health Organization (WHO) currently considers HPAI A (H5N1) endemic in many bird populations globally, particularly in Southeast Asia and the Middle East. Since 2004 the virus has caused millions of poultry deaths and severely impacted livelihoods, local economies, and international trade.

Fortunately, human-to-human spread of HPAI A (H5N1) has been rare. Most humans who become infected with the virus had close contact with H5N1-infected poultry or contaminated surfaces. By October 2011 the WHO had attributed more than 566 human cases and 300 deaths to HPAI A (H5N1). The HPAI A (H5N1) is thought to pose the world's largest and gravest pandemic threat because of its ability to mutate rapidly in poultry, spread to humans, and high lethality. Description of the surface of the surface

3.11.2 History

The United States and Wisconsin share a lengthy history shaped, in part, by the impacts of emerging infectious disease. Perhaps the most deadly disease epidemic in the United States and Wisconsin resulted in the devastation of the American Indian populations. These epidemics introduced and spread European diseases such as measles or smallpox to American Indian populations. Many archaeologists have speculated that these epidemics swept through the American Indians communities in Wisconsin long before European explorers reached the area.

Smallpox and Measles

Smallpox and measles were introduced to American Indian population by European explorers to the new world. In Wisconsin smallpox epidemics continued to affect many American Indian communities into the 1830s. Smallpox epidemics were not limited to American Indian populations. In August 1895 smallpox swept through the population on the south side of Milwaukee.

_

¹⁷ Li, KS et al. (2004). Genesis of a highly pathogenic and potentially pandemic H5N1 influenza virus in eastern Asia, Nature 430 (6996): 209–13.

¹⁸ http://www.who.int/mediacentre/factsheets/avian_influenza/en/index.html

¹⁹ http://www.who.int/influenza/human_animal_interface/EN_GIP_LatestCumulativeNumberH5N1cases.pdf

²⁰ http://www.who.int/mediacentre/factsheets/avian_influenza/en/

Malaria

Malaria was common among French, British, and later American troops on the Wisconsin frontier. In the summer months malaria would often reach epidemic proportions. At Fort Crawford, 154 of the 199 men stationed there in the summer of 1830 had malaria.

Cholera

Cholera epidemics swept the United States and Wisconsin from 1832 to 1834, and again from 1849 to 1854. The worst of the cholera epidemics were centered in Milwaukee.

1918 flu pandemic

The 1918 flu pandemic, also known as the Spanish flu, was caused by the H1N1 influenza virus. To maintain morale World War I censors minimized reports of illness and mortality in Germany, Britain, France, and the United States. In neutral Spain the papers were free to report on the pandemic creating the false impression that the country was especially hard hit. The pandemic is believed to have infected 500 million people across the world and resulted in the deaths of 50 to 100 million. In Wisconsin the Spanish flu infected more than 100,000 and claimed more than 8,400 lives.

1956-1958 Asian flu

The 1956 to 1958 flu pandemic, also known as Asian flu, was caused by an H2N2 strain of the influenza A virus. The virus was first identified in Guizhou, China in early 1956 and lasted worldwide until 1958. The U.S. death toll is estimated at 69,800. Estimates of worldwide deaths vary widely depending on source. The World Health Organization has settled on approximately two million.

1968-1969 Hong Kong flu

The 1968 flu pandemic, also known as Hong Kong flu, was caused by an H3N2 strain of the influenza A virus. The first recorded outbreak was in Hong Kong. It is estimated to have killed one million people worldwide.

2009 flu pandemic

The most recent influenza pandemic was the 2009 H1N1 pandemic, which first entered the United States from Mexico. ²¹ The 2009 flu pandemic, also known as swine flu, involved the H1N1 influenza virus. The virus appeared to be a new strain of H1N1 combined with a Eurasian pig flu virus. Confirmed worldwide deaths totaled 14,286.

3-242

²¹ CDC MMWR, April 30, 2009 / 58(Dispatch); 1-3 (http://www.cdc.gov/mmwR/preview/mmwrhtml/mm58d0430a2.htm).

FOR OFFICIAL USE ONLY

3.11.3 Probability, Impact, and Mitigation Potential

The probability of emerging infectious diseases epidemics is unknown. An emerging infectious disease may be unaffected by existing immunities in a population and can therefore spread rapidly, infect large numbers of people in a short period of time, and cause high levels of mortality.

The real or perceived threat of an emerging infectious disease has the potential to disrupt normal public interactions. The impact of emerging infectious diseases can be mitigated by immunization; reporting, investigation, and surveillance; and response.

Immunizations, also called vaccinations, are one of the greatest achievements in public health. Vaccines prevent disease in people who receive them. If enough people in the community are vaccinated there is little opportunity for an outbreak to occur, protecting the entire community. Before vaccines, many children died from diseases like measles, pertussis (whooping cough), and Haemophilus influenza. Through the introduction of routine vaccinations, these and other vaccine-preventable diseases occur much less often in the United States.

The Wisconsin Department of Health Services (DHS) Wisconsin Electronic Disease Surveillance System (WEDSS) is a web-based system designed to facilitate reporting, investigation, and surveillance of communicable diseases in Wisconsin. State statute requires that a number of diseases and conditions considered to have significant public health impact must be promptly reported to the local health officer. Specifically, any health care provider who knows, or has reason to believe, a person treated or visited by him or her has a communicable disease is required to promptly report.

The Centers for Disease Control and Prevention (CDC) Health Alert Network (HAN) is the CDC's primary method of sharing cleared information about urgent public health incidents with public information officers; federal, state, territorial, and local public health practitioners; clinicians; and public health laboratories. Jurisdictional HAN programs connect all 50 states and the District of Columbia, 8 territories, and the Cities of Chicago, Los Angeles, and New York.

Specific plans and procedures have been developed to assist with the response including the Public Health Emergency Plan, Wisconsin Hospital Emergency Plan, Wisconsin Pandemic Influenza Operational Plan, Fatality Incident Response Plan, and the Regional Hospital Bioterrorism Preparedness Interim Stockpile Plan, and the Strategic National Stockpile Plan (SNS).

3.11.3.1 Changing Future Conditions

Higher temperatures and wetter conditions tend to increase mosquito and tick activity, leading to an increased risk of zoonotic diseases. Mosquitos are known to carry diseases such as West Nile virus (WNV), La Crosse/California encephalitis, Jamestown Canyon virus, St. Louis encephalitis, and Eastern equine encephalitis. The two major concerns associated with warmer and wetter conditions are that the mosquito species already found in Wisconsin and the

diseases that they carry will become more prevalent, and that new species carrying unfamiliar diseases will start to appear for the first time.

Warmer winters with fewer hard freezes in areas that already see WNV-carrying mosquitos are likely to observe both a higher incidence of WNV and a longer WNV season, ultimately leading to an increase in human cases. Non-native mosquito species may move into Wisconsin if the climate becomes more suitable for them, bringing with them diseases such as Jamestown Canyon virus, Chikungunya, and Dengue Fever.

Ticks are also well-known disease vectors in Wisconsin, carrying pathogens such as Lyme disease, anaplasmosis, Ehrlichiosis, Powassan virus, and Babesiosis. Recent studies show that existing northwestern Wisconsin deer tick populations are expanding further south and east. Human cases of Lyme disease and other tickborne diseases have been detected in recent years, and an increase in reported cases of Ehrlichiosis around Eau Claire has been observed since 2008. The lone star tick is also poised to establish a larger population in Wisconsin and expand its range from the southeast part of the state into the central and northern regions.

Warmer, wetter weather can lead to an increase in algal blooms and declining beach health. An increase in flood events may also be associated with an increased incidence of mold problems in homes and businesses, as well as contamination of wells and surface waters due to sewer overflows and private septic system failures.

If these predictions come true, communities will have to contend with the human health impacts related to the increased prevalence of infectious diseases, heat waves, and changes in air and water quality. Public health officials will need to focus on spreading information and enacting pest and disease reduction. Floodprone communities will need to focus on continuously improving flood controls and mitigation strategies, including restricting building and chemical storage in floodplains, upgrading well and septic requirements, and providing water testing kits to residents.

3.11.4 Catastrophic Scenario

In October, a concerned citizen contacts the Wisconsin Department of Natural Resources (DNR) regarding "an unusual number" of dead ducks at a state park in northwestern Wisconsin. Tests on 28 recovered migratory ducks confirm that the ducks died from a viral infection identified as influenza A (H5N1) (a.k.a. Avian Influenza or Bird Flu). Subsequently, the U.S. Department of Health and Human Services announces finding the influenza A (H5N1) virus in migratory birds in Wisconsin, Washington, California and Minnesota.

Within a week of initial virus identification in birds, Wisconsin diagnoses the first cases of Avian Influenza in humans. The influenza A (H5N1) virus specimens were collected from a 35-year-old woman and her infant daughter at an area hospital.

The Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP) and U.S. Department of Agriculture (USDA) notify and visit farms within a 10-mile radius, identifying

three poultry farms where increased poultry mortality has been noted. A state and local survey of the farms' employees identifies several persons with current influenza-like symptoms and others that had been ill within the previous weeks. The map in Figure 3.11.4-1 depicts the location and surrounding area of recovered H5N1 confirmed migratory bird deaths overlaid with a 10-mile radius.

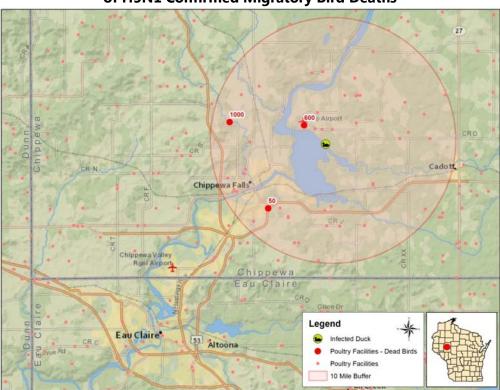


Figure 3.11.4-1: Location and 10-mile Radius of H5N1 Confirmed Migratory Bird Deaths

By mid-November, three hospitals in the area (total populations 99,879 and 62,778, respectively) report increased incidences of respiratory illness. At least four patients require the use of ventilators to survive. An investigation determines that the ill mother and daughter did not have direct contact with infected birds from the lake or farms, but did have contact with workers from the infected farms, leading to the conclusion that human-to-human transfer of the virus occurred.

By late December, influenza A (H5N1) illness is evident across the state and country. Hospitals locally and regionally are overwhelmed with ill patients seeking treatment. Ventilators are becoming scarce and worried-well are not showing up for work.

By the end of February, approximately 15% of the citizenry in 34 west-central Wisconsin counties have fallen ill with a fatality rate of approximately 4% for those that become infected. Hospitals and outpatient clinics in these counties exceed capacity while other counties statewide are at or near capacity from treating local cases and absorbing overflow from the west. The map in Figure 3.11.4-2 depicts the 34 H5N1 affected counties.

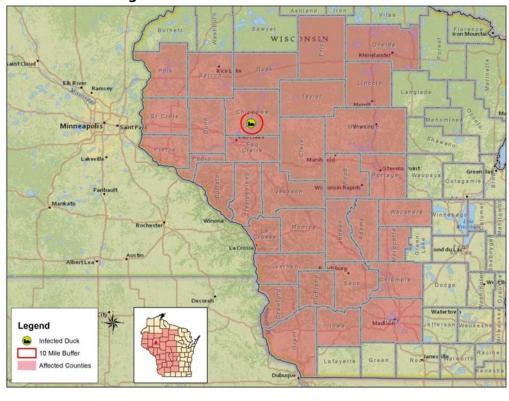


Figure 3.11.4-2: H5N1 Affected Counties

Statewide analysis indicates over 80,000 confirmed cases of influenza A (H5N1) (1.4% overall confirmed infection rate of Wisconsin's 5.7 million people) with countless others going unconfirmed due to lack of official diagnoses. Of those infected (confirmed and unconfirmed), approximately 4,000 die.

Human remains internment facilities in severely affected counties are overwhelmed; however, the state directs that remains must be handled locally to prevent contamination during transfer from the affected area. Counties must consider effecting mass burial or cremation of human remains to prevent further contamination of the non-infected population.

Medical staff shortages statewide are reported at 35% with rates of over 50% locally. Although essential infrastructure (water, power, gas/heat) remains functional, consistency in operation is severely degraded due to staff affected by the pandemic. Health care facilities and public health staff are exhausted and generally unable to respond effectively. Reports of chronic fatigue and burnout are widely reported with little or no relief available. Local pharmacies, health care providers and hospitals statewide report shortages of anti-viral medications as well as ventilators, gloves, masks, lab supplies, and other medical essentials.

The pandemic disrupts supply chains thus impacting availability of necessities. Looting and rioting is sporadic and concentrated in the severely impacted counties as people scramble to acquire needed supplies, such as food and water. Local law enforcement resources, already degraded due to illness, are consumed with matters such as unattended deaths and are unable to maintain social order and contain civil unrest in the hardest hit areas. Outside assistance is

needed to address law enforcement shortfalls as well as to maintain on-scene protection and relief site security.

3.11.5 Summary Risk Analysis

The table in Figure 3.11.5-1 provides a summary risk analysis for the emerging infectious disease hazard.

Figure 3.10.5-1: Emerging Infectious Diseases Summary Risk Analysis

Evaluation Criteria	Description	Ranking
	Risk to People, Property, Environment, and Operations	
Probability/potential threat of occurrence	 The hazard impacts the state occasionally, but not annually The hazard is somewhat localized, affecting only relatively small or isolated areas when it occurs The methodology for identifying events is not well-established, or is not applied across the entire state 	Medium
Vulnerability	Multiple measures are in place to prevent or protect against this hazard. Countermeasures have been tested and have demonstrated success in reducing the threat potential.	Medium
Mitigation Potential	 Mitigation methods are established The State or counties have limited experience with the kinds of measures that may be appropriate to mitigate the hazard Some mitigation measures are eligible for federal grants There is a limited range of effective mitigation measures for the hazard Mitigation measures are cost-effective only in limited circumstances Mitigation measures are effective for a reasonable period of time 	Medium
	Impacts of Catastrophic Scenario	
Public	 Large numbers of illnesses statewide are possible. Local and regional medical services are unable to manage the volume of patients needing treatment and hospitalization. 	High
Responders	 Local medical services are unable to manage the volume of patients. Patients require transportation to regional medical facilities outside of the affected areas. Significant federal response would be mobilized, including Strategic National Stockpile assets. 	High
COOP, including delivery of services	 State or local government mission essential functions may be impacted over the course of the outbreak due to employee absenteeism. Services would be degraded, but not would not completely stop. 	Medium
Property, Facilities & Infrastructure	Minimal impact on property and infrastructure.	Low
Environment	Minimal impact on the environment.	Low
Economy	Medium-term effects to a large portion of the state's economy across multiple sectors due to widespread illness and social distancing.	Medium

Public Confidence	•	Long-term loss of confidence in government and society. Curfews and other security measures may be required.	High
		Aggregate Impact	High

3.11.6 Sources – Agency Input and Research

The following agencies and document research assisted in providing subject matter expertise to this scenario's core capabilities.

- 1. FEMA Region V Threat and Hazard Identification and Risk Assessment (THIRA)
- 2. Wisconsin Department of Agriculture, Trade, and Consumer Protection
- 3. Wisconsin Department of Health Services
- 4. Wisconsin Pandemic Influenza Operational Plan
- 5. Wisconsin Emergency Response Plan
- 6. Wisconsin Initiative on Climate Change Impacts. "Impacts Presentation." Wisconsin Initiative on Climate Change Impacts. Accessed November 2016. http://www.wicci.wisc.edu/impacts.php#2.
- 7. Wisconsin 2050: Scenarios of a State of Change. August 20, 2016. Accessed October 2016. http://www.wicci.wisc.edu/resources/ClimateWI2050-Communites August 2016.pdf.
- 8. https://www.dhs.wisconsin.gov/climate/diseases.htm

3.12 Food and Agriculture Emergency

A food and agriculture emergency hazard can be described as any intentional or accidental threat to the state's food and agricultural products. This includes actions that represent both real and perceived threats to the state's food and agricultural products.

3.12.1 Nature of the Hazard

Wisconsin's history, identity, and economy are intimately connected to food and agricultural production. Wisconsin is known as "America's Dairyland" and is home to more than one million dairy cows. However, more than dairy is produced and processed in the state. Wisconsin ranks first in the nation for snap beans for processing, cheese, cranberries, ginseng, mink pelts, dry whey for humans, milk goats, and corn for silage. Agriculture contributes an estimated \$88.3 billion annually to the state's economy and provides 11.9% of the state's employment. A food and agricultural emergency has the potential to have a number of long-lasting negative effects on the state's economy, employment, and confidence in the food and agricultural sectors.

The food and agricultural emergency hazard includes intentional or accidental actions that threaten or disrupt the means of production or the quantity, quality, or safety of the state's food and agricultural products. This includes the introduction and spread of plant and animal pests and diseases. Specifically, diseases that have the potential to spread to humans (zoonotic diseases) such as brucellosis and rabies; that may spread from farm to farm such as foot-and-mouth disease (FMD) or pseudorabies; and diseases that cause other states and nations to close trade doors to our livestock and agricultural products such as avian influenza or tuberculosis.

3.12.2 History

The following describe a selection of notable local and international food and agriculture emergencies.

<u>December 1996 – May 1997, Berlin, Wisconsin</u>

The police chief of Berlin, Wisconsin, received an anonymous letter in late December 1996, claiming that feed products at National By-Products Incorporated had been tainted with a pesticide and that the police should expect "large scale animal mortality." National By-Products is a supplier for the Purina Mills animal feed plant in Fond du Lac, WI. On January 2, 1997 the Purina feed was tested and found to contain low levels of contamination (one or two parts per million). The following day, Purina stopped a shipment of 300 tons of feed bound for Wisconsin, Illinois, Iowa, and Michigan. Officials from the Wisconsin Department of Agriculture, Trade, and Consumer Protection announced that tallow stored at National By-Products Inc. had been deliberately contaminated with chlordane, an extremely toxic and persistent insecticide that was widely used in the U.S. between 1947 and the late 1980s. On September 14, 1999, Brian "Skip"

_

²² Wisconsin Department of Agriculture, Trade and Consumer Protection website, Wisconsin Agricultural Statistics, Updated July 15, 2016.

Lea was indicted for product tampering after a police investigation found that he had twice contaminated the tallow. Lea owned a rival animal food processing facility, as well as dead livestock removal company.

1998 Chilean Grape Scare

The Chilean grape scare of 1989 resulted from the alleged contamination of Chilean grapes. On March 2 an individual telephoned the U.S. embassy in Santiago and claimed that some Chilean grapes contained cyanide. Following the threat it is alleged that 2 grapes were found to have been injected with cyanide. As a result the United States Food and Drug Administration banned imports of Chilean fruit and warned people not to eat grapes or Chilean fruit. The Chilean fruit export sector was thrown into panic and thousands of farm workers lost their jobs. The Chilean government was forced to provide temporary subsidies to offset more than \$400 million in losses. Investigators found no traces of cyanide in any other fruit shipped from Chile. No individual or group has claimed responsibility.

July 4, 1998, Middleton, WI

On July 4, 1998 individual(s) conducted a daylight raid on the United Vaccines Laboratory located in Middleton, Wisconsin. The raid resulted in the release of animals and destruction of property. The individual(s) cut holes in the fence and released 310 ferrets and mink were released. In addition, equipment and windows were also destroyed. The slogan "Independence Day for Fur Farm Prisoners" was painted at the United Vaccines Laboratory. Joint Animal Liberation Front (ALF)/Earth Liberation Front (ELF) claimed responsibility.

2001 United Kingdom Foot-and-Mouth Outbreak

The outbreak of foot-and-mouth disease in the United Kingdom in 2001 caused a crisis in British agriculture and tourism. With the intention of controlling the spread of the disease public rights-of-way were closed. Over 10 million cows and sheep were killed in an eventually successful attempt to halt the disease. By the time that the disease was halted in October 2001 the crisis was estimated to have the United Kingdom \$16 billion dollars (US).

3.12.3 Probability, Impact, and Mitigation Potential

Outbreaks of foreign animal diseases not previously occurring in the United States, such as avian influenza H5N1; or that have been previously eradicated, such as FMD; or that the United States is attempting to eradicate, such as pseudorabies and bovine tuberculosis, are very rare in Wisconsin. The state is, however, currently engaged in efforts to address a number of other well-known threats such as avian influenza (poultry), chronic wasting disease (deer and elk), and the destructive invasive species emerald ash borer, gypsy moth, and zebra mussel. The on-going local, state, and federal management efforts seek to control and minimize these and other threats.

Perhaps the greatest food and agricultural threat is the intentional (criminal or terrorism) spread of an animal disease such as FMD. The disease was eradicated in the United States 1929. In the unlikely event that Wisconsin experienced a criminal or terror related FMD outbreak it would have devastating financial, physiological, and economic impacts. FMD is a worldwide concern and many countries are dealing with the disease in their livestock populations. It is a severe, highly contagious viral disease. The FMD virus causes illness in cows, pigs, sheep, goats, deer, and other animals with divided hooves. Animal health, Incident Management Teams, dairy, swine, and goat industries, as well as law enforcement would likely be taxed beyond existing capabilities. Fortunately FMD is not a public health or food safety threat. However, due to misinformation and panic the psychological implications would be very impactful on dairy and meat consumers.

Most food and agriculture producers employ a variety of biosecurity measures, including but not limited to tracking access to production facilities in order to mitigate threats. This coupled with entities like the Wisconsin Statewide Information Center (WSIC) being vigilant about monitoring for possible criminal or terror attacks help to insure the low likelihood of such an event. Additional mitigating factors include, but are not limited to, the following.

Animal Disease Reporting

Veterinarians are legally required to report suspected cases of certain diseases to the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) or the U.S. Department of Agriculture. When veterinarians report these diseases, a state or federal veterinarian will investigate and, if necessary, submit samples to either the U.S. Veterinary Laboratory in Ames, Iowa, or to Plum Island Research Center in New York (for suspected foreign animal diseases). Until test results are available, the premises are likely to be quarantined.

Plant Pests and Diseases

The Bureau of Plant Industry, DATCP, monitors for plant pests and diseases in the state. The Bureau uses scientific surveys and routine inspections of licensed businesses to monitor for pests and diseases. It also enforces regulations to control and prevent introduction and spread of pests and diseases. Growers in Wisconsin can subscribe to the weekly Pest Bulletin to stay informed.

Invasive Species

In 2001 the Wisconsin Legislature directed the Department of Natural Resources (DNR) to establish a statewide program to control invasive species. The program and regulations are aimed at preventing new invasive species from getting to Wisconsin, and enabling quick action to control or eradicate those here but not yet established.

3.12.4 Catastrophic Scenario

Two members of a religious based terror group illegally entered the United States. Their goal is to introduce the Foot and Mouth Disease (FMD) virus obtained from infected animals in South America into U.S. beef and dairy herds. They hope to destroy worldwide confidence in the safety of U.S. beef and dairy exports providing the opportunity for beef and dairy producers from their region to fill the void created.

On September 3 a local veterinarian arrives at a livestock market in western Wisconsin to issue a Certificate of Veterinary Inspection (CVI) for a load of calves headed for Illinois. While there, a market employee asks him to look at a cull cow with sores in her mouth. The cow was dropped off the previous evening with two other cows. This morning the employee noticed that she would not eat and is drooling. The employee held her back, but the rest of that pen is ready to go through the ring in an hour. A total of 300 animals are scheduled to go through the ring today.

The District Veterinarian relays her findings to the Wisconsin State Veterinarian and the USDA Area Veterinarian in Charge (AVIC), who decide to send the samples Priority A for testing. Preliminary positive results for Foot and Mouth Disease (FMD) are relayed to the State Veterinarian. Based on the preliminary findings, and the compatible clinical signs, the State Veterinarian implements the state foreign animal disease response plan, and activates the joint USDA/DATCP Incident Management Team.

Animals that had already been sold and transported off the market grounds that day are traced to approximately 20 other farms in WI, and also several farms in MN, IA and IL. The livestock market has been quarantined, and a disease testing (surveillance) zone has been set up 6.2 miles surrounding the market.

3.12.5 Summary Risk Analysis

The table in Figure 3.12.5-1 provides a summary risk analysis for the food and agriculture emergency hazard.

Figure 3.12.5-1: Food and Agricultural Emergency Summary Risk Analysis

Evaluation Criteria	Description	Ranking
	Risk to People, Property, Environment, and Operations	
Probability/potential threat of occurrence	 The hazard impacts the state occasionally, but not annually The hazard is somewhat localized, affecting only relatively small or isolated areas when it occurs The methodology for identifying events is not well-established, or is not applied across the entire state 	Low
Vulnerability	 Multiple measures are in place to prevent or protect against this hazard. Countermeasures have been tested and have demonstrated success in reducing the threat potential. 	Medium

Mitigation Potential	 The State or counties have little or no experience in implementing mitigation measures, and/or no technical knowledge of them Mitigation measures are ineligible under federal grant programs There is a very limited range of mitigation measures for the hazard, usually only one feasible alternative The mitigation measures have not been proven cost-effective and are likely to be expensive compared to the magnitude of the damages caused by the hazard The long-term effectiveness of the measure is not known, or is known to be relatively poor 	Low
	Impacts of Catastrophic Scenario	
Public	 Local medical services are able to manage volume of injuries and fatalities but are near the limits of their capabilities. Only critically injured patients are diverted to facilities outside of the affected areas. Limited evacuations and sheltering may be required. 	Low
Responders	 Significant federal and/or mutual aid from other states would be needed to meet the needs of the incident. Federal disaster declaration. 	High
COOP, including delivery of services	 State or local government mission essential functions impacted for less than 24 hours. 	Low
Property, Facilities & Infrastructure	 Significant damage to critical infrastructure, public and private property over a localized area. Up to 10% of buildings and infrastructure in affected area damaged, and/or loss of lifeline services for up to 24 hrs. 	Low
Environment	 Environmental damage affecting one or more communities within a county. Moderate damage to an ecologically sensitive area such as wetlands, rivers, lakes, or public water supply. Damage requires short- to medium-term remediation efforts of state and federal government. 	Medium
Economy	 Tremendous adverse impact affecting the livelihood of the region and possibly extending to statewide. Long-term, cascading damage across multiple economic sectors requiring federal government assistance. 	High
Public Confidence	 Medium and long-term effects including elevated stress, depression and behavioral health impacts for individuals in and out of impacted communities. Short- to medium term reduction of confidence in government in society. Civil disturbances in impacted communities may require law enforcement response. 	Medium
<u> </u>	Aggregate Impact	Medium

FOR OFFICIAL USE ONLY

3.12.6 Sources – Agency Input and Research

The following agencies assisted in providing their expertise on the subject matter related to the core capabilities in this scenario.

- 1. Department of Agriculture, Trade and Consumer Protection (DATCP)
- 2. Department of Natural Resources (DNR)
- 3. Department of Health Services (DHS)

3.13 Cyber Incident

A cyber incident can be described as the hostile use of information technology by individuals or groups for the purpose of financial gain or as an action to further a social or political agenda. This includes the use of information technology to threaten, exchange information, and/or organize and execute attacks against networks, computer systems, and infrastructure. Familiar cyber incidents include, but are not limited to, unauthorized access to networks, infection of vulnerable systems by computer virus, web site defacing, and denial-of-service attacks.

3.13.1 Nature of the Hazard

A cyber incident is a human caused hazard which can affect demographically and geographically diverse populations. In most cases a cyber incident can be characterized as either being carried out for financial gain, directly or as a hired actor, or to further a social or political agenda.

An attack for financial gain may directly target financial institutions such as banks or credit unions. An attack may also be directed at business, research, or industrial targets for purposes of industrial espionage (theft of proprietary information or technology). In either case the perpetrators may ransom information back to the source to prevent dissemination to competitors or the public.

An attack to further a social or political agenda typically operates with the intent to gain access to sensitive or classified material. This information may be disseminated to the public with the intent to discredit or embarrassing the target. This is commonly referred to as "hacktivism".

Since 2009 there has been an increase in cyber incidents directed at power generation and oil companies. These attacks have used a variety of techniques such as spear-phishing, social engineering, Windows operating system bugs, and remote administration tools (RATs). None of these approaches are very advanced or hard to develop and manage. Although evidence suggests the growing trend in these attacks appears to target individual entities, instead of primary infrastructure, a mass coordinated attack cannot be discounted.

3.13.2 History

The cyber incident hazard is rapidly evolving and any attempt to describe recent historical occurrences will be limited. The following describe a selection of notable local and international incidents.

March 9, 2015 City of Madison

On March 9, 2015 the city of Madison and Dane County experienced a cyber-attack following an officer-involved shooting. The cyber-attack was a denial-of-service attack which blocked or disrupted official communications, including email, and some police and fire dispatch services. Both a U.S. citizen calling himself "Bitcoin Baron" and the hacker activist group Anonymous claimed credit for the attack.

December 23, 2015 Ukraine Power Companies

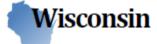
On December 23, 2015, Ukrainian power companies experienced unscheduled power outages impacting approximately 225,000 customers. Reports indicate that the power outages were caused by remote cyber intrusions at three regional electrical power distribution companies. In addition, three other organizations, some from other critical infrastructure sectors, were intruded upon but did not experience operational impacts.

The cyber-attack was reportedly synchronized and coordinated, probably following extensive reconnaissance of the victim networks. During the cyber-attacks malicious remote operation of the breakers was conducted by multiple external humans using either existing RATs at the operating system level or remote industrial control system (ICS) client software via virtual private network (VPN) connections.

All three companies indicated that the actors wiped some systems by executing the KillDisk malware at the conclusion of the cyber-attack. The KillDisk malware erases selected files on target systems and corrupts the master boot record rendering systems inoperable. It is believed that this was done in an attempt to interfere with expected restoration efforts.

The tables in Figures 3.13.2-1, 2, 3, and 4 present the statistics for Wisconsin from pages 218-221 in the "2015 Internet Crime Report" produced by the Federal Bureau of Investigation (FBI), Internet Crime Complain Center (IC3).

Figure 3.13.2-1: 2015 Wisconsin Internet Crime Report, Victims

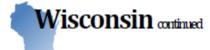


	Victim Demographics					
Age Range	Age Range Male Count Male Loss Female Count Female Lass Total Count Total Lass					
Under 20	68	\$ 41,707	51	\$ 24,822	119	\$ 66,529
20 - 29	327	\$ 365,248	287	\$ 136,117	614	\$ 501,365
30 - 39	329	\$ 446,409	317	\$ 289,959	646	\$ 736,368
40 - 49	319	\$ 734,987	335	\$ 2,825,270	654	\$ 3,560,257
50 - 59	357	\$ 1,528,629	376	\$ 835,323	733	\$ 2,363,952
Above 60	392	\$ 1,823,153	269	\$ 1,050,375	661	\$ 2,873,528
Totals	1,792	\$ 4,940,132	1,635	\$ 5,161,867	3,427	\$ 10,101,998

419/Overpayment 401 Malvi Identity Theft 374 Rans Personal Data Breach 275 Corp Extortion 244 IPR/Coredit Card Fraud 216 Deni Harassment/Threats of Violence 212 Civil Other 209 Crim Advanced Fee 185 Inverse Phishing/Vishing/Smishing/Pharming 179 Virus Auction 177 Re-si Employment 172 Char Confidence Fraud/Romance 156 Gam Real Estate/Rental 140 Heal Government Impersonation 112 Terror	
419/Overpayment 401 Mala Identity Theft 374 Rans Personal Data Breach 275 Corp Extortion 244 IPR/C Credit Card Fraud 216 Deni Harassment/Threats of Violence 212 Civil Other 209 Crim Advanced Fee 185 Inversor Phishing/Vishing/Smishing/Pharming 179 Virus Auction 177 Re-si Employment 172 Char Confidence Fraud/Romance 156 Gam Real Estate/Rental 140 Heal Government Impersonation 112 Term	Crime Type Victim Count
Identity Theft 374 Rans Personal Data Breach 275 Corp Extortion 244 IPR/ Credit Card Fraud 216 Deni Harassment/Threats of Violence 212 Civil Other 209 Crim Advanced Fee 185 Inver Phishing/Vishing/Smishing/Pharming 179 Virus Auction 177 Re-si Employment 172 Char Confidence Fraud/Romance 156 Gam Real Estate/Rental 140 Heal Government Impersonation 112 Terro	epresentation 46
Personal Data Breach 275 Corp Extortion 244 IPR/C Credit Card Fraud 216 Deni Harassment/Threats of Violence 212 Civil Other 209 Crim Advanced Fee 185 Inver Phishing/Vishing/Smishing/Pharming 179 Virus Auction 177 Re-si Employment 172 Char Confidence Fraud/Romance 156 Gam Real Estate/Rental 140 Heal Government Impersonation 112 Terro	vare/Scareware 45
Extortion 244 IPR/Credit Card Fraud 216 Deni Harassment/Threats of Violence 212 Civil Other 209 Crim Advanced Fee 185 Inverse Phishing/Vishing/Smishing/Pharming 179 Virus Auction 177 Re-si Employment 172 Char Confidence Fraud/Romance 156 Gam Real Estate/Rental 140 Heal Government Impersonation 112 Terror	omware 45
Credit Card Fraud 216 Deni Harassment/Threats of Violence 212 Civil Other 209 Crim Advanced Fee 185 Inver Phishing/Vishing/Smishing/Pharming 179 Virus Auction 177 Re-si Employment 172 Char Confidence Fraud/Romance 156 Gam Real Estate/Rental 140 Heal Government Impersonation 112 Terre	orate Data Breach 40
Harassment/Threats of Violence 212 Civil Other 209 Crim Advanced Fee 185 Inversion Phishing/Vishing/Smishing/Pharming 179 Virus Auction 177 Re-si Employment 172 Char Confidence Fraud/Romance 156 Gam Real Estate/Rental 140 Heal Government Impersonation 112 Terro	Copyright and Counterfeit 25
Other 209 Crim Advanced Fee 185 Inverse Phishing/Vishing/Smishing/Pharming 179 Virus Auction 177 Re-si Employment 172 Char Confidence Fraud/Romance 156 Gam Real Estate/Rental 140 Heal Government Impersonation 112 Terrental	al of Service 17
Advanced Fee 185 Inverse Phishing/Vishing/Smishing/Pharming 179 Virus Auction 177 Re-si Employment 172 Char Confidence Fraud/Romance 156 Gam Real Estate/Rental 140 Heal Government Impersonation 112 Terror	Matter 15
Phishing/Vishing/Smishing/Pharming 179 Virus Auction 177 Re-si Employment 172 Char Confidence Fraud/Romance 156 Gam Real Estate/Rental 140 Heal Government Impersonation 112 Terro	es Against Children 15
Auction 177 Re-si Employment 172 Char Confidence Fraud/Romance 156 Gam Real Estate/Rental 140 Heal Government Impersonation 112 Terrental	stment 15
Employment 172 Char Confidence Fraud/Romance 156 Gam Real Estate/Rental 140 Heal Government Impersonation 112 Terror	13
Confidence Fraud/Romance 156 Gam Real Estate/Rental 140 Heal Government Impersonation 112 Terro	hipping 11
Real Estate/Rental 140 Heal Government Impersonation 112 Terror	ity 5
Government Impersonation 112 Terro	bling 2
	th Care Related 2
Business Email Compromise 101 Crim	orism 2
	inal Forums 1
No Lead Value 86 Hack	ctivist 1
Lottery/Sweepstakes 61	

Descriptors*		
Social Media	257	*These descriptors are used by the IC3 for tracking purposes
Virtual Currency	24	only and are only available after another crime type has been selected.

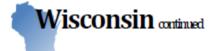
Figure 3.13.2-2: 2015 Wisconsin Internet Crime Report, Crime by Loss



Confidence Fraud/Romance \$ 3,180,380 Misrepresentation \$ 69,69,69,69,69,69,69,69,69,69,69,69,69,6		Crime Type by Loss	(Victim Location)	
Business Email Compromise \$ 1,996,541 IPR/Copyright and Counterfeit \$ 66,4 Non-Payment/Non-Delivery \$ 1,338,590 Extortion \$ 56,4 Personal Data Breach \$ 811,795 Malware/Scareware \$ 32,4 Real Estate/Rental \$ 591,640 Phishing/Vishing/Smishing/Pharming \$ 26,8 Advanced Fee \$ 537,098 Re-shipping \$ 13,4 Investment \$ 496,421 Ransomware \$ 9,2 Identity Theft \$ 461,186 Denial of Service \$ 6,4 419/Overpayment \$ 295,178 Charity \$ 6,6 Employment \$ 290,220 Crimes Against Children \$ 3,6 Credit Card Fraud \$ 266,238 Gambling \$ 2,2 Auction \$ 218,158 Virus \$ 3 Harassment/Threats of Violence \$ 208,795 Criminal Forums Government Impersonation \$ 187,625 Hacktivist Civil Matter \$ 148,536 No Lead Value	Crime Type	Loss Amount	Crime Type	Loss Amount
Non-Payment/Non-Delivery \$ 1,338,590 Extortion \$ 56,6 Personal Data Breach \$ 811,795 Malware/Scareware \$ 32,6 Real Estate/Rental \$ 591,640 Phishing/Vishing/Smishing/Pharming \$ 26,8 Advanced Fee \$ 537,098 Re-shipping \$ 13,8 Investment \$ 496,421 Ransomware \$ 9,1 Identity Theft \$ 461,186 Denial of Service \$ 6,8 419/Overpayment \$ 295,178 Charity \$ 6,6 Employment \$ 290,220 Crimes Against Children \$ 3,6 Credit Card Fraud \$ 266,238 Gambling \$ 2,5 Auction \$ 218,158 Virus \$ 3 Harassment/Threats of Violence \$ 208,795 Criminal Forums Government Impersonation \$ 187,625 Hacktivist Civil Matter \$ 158,829 Health Care Related Other \$ 148,536 No Lead Value	Confidence Fraud/Romance	\$ 3,180,380	Misrepresentation	\$ 69,461
Personal Data Breach \$ 811,795 Malware/Scareware \$ 32,6 Real Estate/Rental \$ 591,640 Phishing/Vishing/Smishing/Pharming \$ 26,9 Advanced Fee \$ 537,098 Re-shipping \$ 13,8 Investment \$ 496,421 Ransomware \$ 9,1 Identity Theft \$ 461,186 Denial of Service \$ 6,8 419/Overpayment \$ 295,178 Charity \$ 6,8 Employment \$ 290,220 Crimes Against Children \$ 3,6 Credit Card Fraud \$ 266,238 Gambling \$ 2,2 Auction \$ 218,158 Virus \$ 3 Harassment/Threats of Violence \$ 208,795 Criminal Forums Government Impersonation \$ 187,625 Hacktivist Civil Matter \$ 148,536 No Lead Value	Business Email Compromise	\$ 1,996,541	IPR/Copyright and Counterfeit	\$ 66,444
Real Estate/Rental \$ 591,640 Phishing/Vishing/Smishing/Pharming \$ 26,9 Advanced Fee \$ 537,098 Re-shipping \$ 13,8 Investment \$ 496,421 Ransomware \$ 9,3 Identity Theft \$ 461,186 Denial of Service \$ 6,8 419/Overpayment \$ 295,178 Charity \$ 6,8 Employment \$ 290,220 Crimes Against Children \$ 3,0 Credit Card Fraud \$ 266,238 Gambling \$ 2,2 Auction \$ 218,158 Virus \$ 3 Harassment/Threats of Violence \$ 208,795 Criminal Forums Government Impersonation \$ 187,625 Hacktivist Civil Matter \$ 158,829 Health Care Related Other \$ 148,536 No Lead Value	Non-Payment/Non-Delivery	\$ 1,338,590	Extortion	\$ 56,279
Advanced Fee \$ 537,098 Re-shipping \$ 13,8 Investment \$ 496,421 Ransomware \$ 9,3 Identity Theft \$ 461,186 Denial of Service \$ 6,8 419/Overpayment \$ 295,178 Charity \$ 6,8 Employment \$ 290,220 Crimes Against Children \$ 3,0 Credit Card Fraud \$ 266,238 Gambling \$ 2,2 Auction \$ 218,158 Virus \$ 3 Harassment/Threats of Violence \$ 208,795 Criminal Forums Government Impersonation \$ 187,625 Hacktivist Civil Matter \$ 158,829 Health Care Related Other \$ 148,536 No Lead Value	Personal Data Breach	\$ 811,795	Malware/Scareware	\$ 32,624
Investment	Real Estate/Rental	\$ 591,640	Phishing/Vishing/Smishing/Pharming	\$ 26,911
Identity Theft \$ 461,186 Denial of Service \$ 6,3 419/Overpayment \$ 295,178 Charity \$ 6,3 Employment \$ 290,220 Crimes Against Children \$ 3,6 Credit Card Fraud \$ 266,238 Gambling \$ 2,2 Auction \$ 218,158 Virus \$ 3 Harassment/Threats of Violence \$ 208,795 Criminal Forums Government Impersonation \$ 187,625 Hacktivist Civil Matter \$ 158,829 Health Care Related Other \$ 148,536 No Lead Value	Advanced Fee	\$ 537,098	Re-shipping	\$ 13,899
419/Overpayment \$ 295,178 Charity \$ 6,3 Employment \$ 290,220 Crimes Against Children \$ 3,0 Credit Card Fraud \$ 266,238 Gambling \$ 2,3 Auction \$ 218,158 Virus \$ 3 Harassment/Threats of Violence \$ 208,795 Criminal Forums Government Impersonation \$ 187,625 Hacktivist Civil Matter \$ 158,829 Health Care Related Other \$ 148,536 No Lead Value	Investment	\$ 496,421	Ransomware	\$ 9,102
Employment \$ 290,220 Crimes Against Children \$ 3,0 Credit Card Fraud \$ 266,238 Gambling \$ 2,5 Auction \$ 218,158 Virus \$ 3 Harassment/Threats of Violence \$ 208,795 Criminal Forums Government Impersonation \$ 187,625 Hacktivist Civil Matter \$ 158,829 Health Care Related Other \$ 148,536 No Lead Value	Identity Theft	\$ 461,186	Denial of Service	\$ 6,800
Credit Card Fraud \$ 266,238 Gambling \$ 2,5 Auction \$ 218,158 Virus \$ 3 Harassment/Threats of Violence \$ 208,795 Criminal Forums Government Impersonation \$ 187,625 Hacktivist Civil Matter \$ 158,829 Health Care Related Other \$ 148,536 No Lead Value	419/Overpayment	\$ 295,178	Charity	\$ 6,344
Auction \$ 218,158 Virus \$ 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Employment	\$ 290,220	Crimes Against Children	\$ 3,040
Harassment/Threats of Violence \$ 208,795 Criminal Forums Government Impersonation \$ 187,625 Hacktivist Civil Matter \$ 158,829 Health Care Related Other \$ 148,536 No Lead Value	Credit Card Fraud	\$ 266,238	Gambling	\$ 2,540
Government Impersonation \$ 187,625 Hacktivist Civil Matter \$ 158,829 Health Care Related Other \$ 148,536 No Lead Value	Auction	\$ 218,158	Virus	\$ 100
Civil Matter \$ 158,829 Health Care Related Other \$ 148,536 No Lead Value	Harassment/Threats of Violence	\$ 208,795	Criminal Forums	\$ -
Other \$ 148,536 No Lead Value	Government Impersonation	\$ 187,625	Hacktivist	\$ -
	Civil Matter	\$ 158,829	Health Care Related	\$ -
	Other	\$ 148,536	No Lead Value	\$ -
Corporate Data Breach \$ 146,427 Terrorism	Corporate Data Breach	\$ 146,427	Terrorism	\$ -
Lottery/Sweepstakes \$ 90,128	Lottery/Sweepstakes	\$ 90,128		

Descriptors*		
Social Media	\$ 2,638,270	*These descriptors are used by the IC3 for tracking purposes
Virtual Currency	\$ 48,302	only and are only available after another crime type has been selected.

Figure 3.13.2-3: 2015 Wisconsin Internet Crime Report, Crime by Type



Crime Type by Subject Count				
Crime Type	Subject Count	Crime Type	Subject Count	
Non-Payment/Non-Delivery	248	Civil Matter	11	
Identity Theft	108	IPR/Copyright and Counterfeit	9	
Harassment/Threats of Violence	87	Government Impersonation	7	
Auction	85	Lottery/Sweepstakes	6	
Personal Data Breach	71	Crimes Against Children	4	
Credit Card Fraud	69	Denial of Service	4	
419/Overpayment	59	Investment	4	
Confidence Fraud/Romance	47	Malware/Scareware	4	
Other	46	Charity	3	
Advanced Fee	45	Health Care Related	2	
Real Estate/Rental	43	Virus	2	
No Lead Value	42	Criminal Forums	1	
Misrepresentation	34	Re-shipping	1	
Employment	30	Gambling	0	
Extortion	21	Hacktivist	0	
Phishing/Vishing/Smishing/Pharming	19	Ransomware	0	
Corporate Data Breach	18	Terrorism	0	
Business Email Compromise	17			

Descriptors*		
Social Media	83	*These descriptors are used by the IC3 for tracking purposes
Virtual Currency	1	only and are only available after another crime type has been selected.

Figure 3.13.2-4: 2015 Wisconsin Internet Crime Report, Crime by Loss



	Crime Type by Loss	(Subject Location)		
Crime Type	Loss Amount	Crime Type	Loss Amount	
Misrepresentation	\$ 759,480	Charity	\$ 11,640	
Civil Matter	\$ 751,029	Employment	\$ 11,546	
Credit Card Fraud	\$ 522,924	Malware/Scareware	\$ 10,100	
Confidence Fraud/Romance	\$ 522,245	Denial of Service	\$ 10,000	
Non-Payment/Non-Delivery	\$ 512,857	Extortion	\$ 8,896	
Personal Data Breach	\$ 426,158	Virus	\$ 7,220	
Identity Theft	\$ 401,628	Crimes Against Children	\$ 3,000	
Business Email Compromise	\$ 216,445	Lottery/Sweepstakes	\$ 1,325	
Real Estate/Rental	\$ 187,245	IPR/Copyright and Counterfeit	\$ 968	
Harassment/Threats of Violence	\$ 115,762	Criminal Forums	\$ -	
Advanced Fee	\$ 104,155	Health Care Related	\$ -	
Investment	\$ 89,850	No Lead Value	\$ -	
Government Impersonation	\$ 82,093	Phishing/Vishing/Smishing/Pharming	\$ -	
Auction	\$ 72,968	Gambling	\$ -	
Other	\$ 63,862	Hacktivist	\$ -	
419/Overpayment	\$ 51,318	Ransomware	\$ -	
Re-shipping	\$ 43,883	Terrorism	\$ -	
Corporate Data Breach	\$ 38,833			
Descriptors*				
Social Media	\$ 382,270	*These descriptors are used by the IC3 for tracking purpose only and are only available after another crime type has		

Descriptors*		
Social Media	\$ 382,270	*These descriptors are used by the IC3 for tracking purposes only and are only available after another crime type has
Virtual Currency	\$ 30,000	been selected.

FOR OFFICIAL USE ONLY

3.13.3 Probability, Impact, and Mitigation Potential

Efforts to determine probability and impact for this hazard are limited by inadequate historical precedence, an evolving variety of attack mediums, and an increasingly large number of potential targets. However, the pervasive presence of information technology likely assures a high probability of occurrence. The hazard impact will vary greatly depending on the intended purpose of the attack, type of attack, and target or targets of attack. The state has undertaken a number of efforts to mitigate the potential impacts of future attacks.

The Wisconsin Department of Justice (DOJ)/Wisconsin Statewide Information Center (WSIC) serves as the state's primary fusion center. The WSIC gathers information from numerous sources and produces intelligence products for federal, state, and local government agencies, the private sector, and the public.

The Wisconsin Department of Administration (DOA), Division of Enterprise Technology Enterprise Service Desk (DET ESD) monitors the state cyber-domain on a 24-hour basis for threats or disruptions using a variety of automated systems. DET ESD notifies the state chief information security officer of any detected or suspected threat or attack against state information technology assets. In addition, DOA, DET has started to train cyber-response teams specifically to support local units of government in Wisconsin. These State, Local, Tribal, and Territorial (SLTT) teams will develop deep technical skills available to assist local units of government. Through grant funding provided by the U.S. Department of Homeland Security the program is working to initially stand up three teams. The future goal is the formation of one team to be located in each of WEM's six regions.

The Wisconsin National Guard (WI NG) plays a key role in the state's overall cyber strategy. The WI NG maintains a Computer Network Defense Team which collaborates with other cyber security professionals across industries. The WI NG has also partnered with the Illinois National Guard to stand up a cyber protection team.

3.13.4 Catastrophic Scenario

On December 1 the DOJ/WSIC begins to see information posted on social media indicating an unspecified cyber threat to power companies operating within the state. The December 1 threat initiates a wide ranging, and often confused, exchange on social media. Over the next four weeks supporters and detractors engage in a heated debate on the subject of power generation, transmission, and use in the state and the nation.

On the evening of December 31 an unknown actor(s) begin a cyber-attack on the Badger State Power Company. The Badger State Power Company serves approximately 250,000 customers in central Wisconsin. Social media posts indicate that the targeting of Badger State Power Company and timing of the attack were meant as a statement with Badger State Power Company representing the state and the New Year as a resolution to reduce use of fossil fuels. Unintentionally, the attack also occurs during a period of extreme cold temperatures. High temperatures are expected to remain in the single digits for several days.

On the morning of January 1 a small number of Badger State Power Company customers lose electricity. The affected customers begin calling the company to report the power outage. The company begins investigating the unexplained outage and working to restore service. As the day progresses the situation worsens. By the end of the day approximately 100,000 customers have lost power. Thousands of calls, texts, and emails overwhelm the company's telephone and email systems. The extreme cold temperatures displace those residents that primarily rely on electricity for heating, cooking, and hot water.

The disruption of electrical service disables traffic signals in the affected area. The lack of traffic control in urbanized areas significantly increases travel times and accidents. Calls for service quickly overwhelm local emergency medical, fire, and law enforcement.

Many government agencies and hospitals are able to continue providing critical services on emergency generator back-up systems. However, these emergency generator back-up systems are limited by available fuel supply typically limited to 24-, 48- or 72-hours. Few businesses in the affected areas are similarly equipped and are forced to close. This immediately degrades local access to food, fuel, supplies, and other necessities.

Badger State Power Company, other state power companies, state, and federal entities work tirelessly to restore electrical service to affected customers. During this time unexplained encrypted network traffic on the industrial control system (ICS) is discovered. A review of available information suggests that vulnerability on the ICS was exploited to manipulate other system components. It is speculated that the yet unknown manipulation of one or more of these system components is responsible for the outages.

After five days the source of the fault has yet to be determined and many of the 100,000 remain without power. Public information and communication has become extremely challenging. Television, radio, mobile telephone, and internet are all severely limited by the widespread power outage and continuing demand on backup power sources such as batteries and generators.

3.13.5 Summary Risk Analysis

The table in Figure 3.13.5-5 provides a summary risk analysis for the cyber incident hazard.

Figure 3.13.5-1: Cyber Incident Summary Risk Analysis

Evaluation Criteria	Description	Ranking
	Risk to People, Property, Environment, and Operations	
Probability/potential threat of occurrence	 The hazard has impacted the state numerous times on an annual basis The hazard is widespread, generally affecting regions or multiple counties in each event There is a reliable methodology for identifying events and locations 	High

Vulnerability	 Multiple measures are in place to prevent or protect against this hazard. Countermeasures have been tested and have demonstrated success in reducing the threat potential. 	Medium
Mitigation Potential	 Mitigation methods are established The State or counties have limited experience with the kinds of measures that may be appropriate to mitigate the hazard Some mitigation measures are eligible for federal grants There is a limited range of effective mitigation measures for the hazard Mitigation measures are cost-effective only in limited circumstances Mitigation measures are effective for a reasonable period of time 	Medium
	Impacts of Catastrophic Scenario	
Public	 Local medical services are able to manage volume of injuries and fatalities but are near the limits of their capabilities. Only critically injured patients are diverted to facilities outside of the affected areas. Limited evacuations and sheltering may be required. 	Low
Responders	 Local and mutual aid resources would be fully committed and significant state assistance would be needed in order meet the needs of the incident. State disaster declaration. 	Medium
COOP, including delivery of services	• State or local government mission essential functions impacted for 1-7 days, temporary relocation of business operations may be necessary.	Medium
Property, Facilities & Infrastructure	 Significant damage to critical infrastructure, public and private property over a large area. 10-50% of buildings and infrastructure in affected area damaged or destroyed in affected area, and/or loss of lifeline services for up to 1-7 days. 	Medium
Environment	 Environmental damage limited to a single community or small geographic area. Damage requires short-term remediation efforts by local and state government. 	Low
Economy	 Medium-term effects to large portion of the jurisdiction's economy, possibly extending to the region. Damage to multiple economic sectors possibly requiring state or federal government assistance. 	Medium
Public Confidence	 Medium and long-term effects including elevated stress, depression and behavioral health impacts for individuals in and out of impacted communities. Short- to medium term reduction of confidence in government in society. Civil disturbances in impacted communities may require law enforcement response. 	Medium
	Aggregate Impact	Medium

FOR OFFICIAL USE ONLY

3.13.6 Sources – Agency Input and Research

The following agencies and document research assisted in providing subject matter expertise.

- 1. American Transmission Company
- 2. Dane County Emergency Management
- 3. FEMA Region V Threat and Hazard Identification and Risk Assessment (THIRA)
- 4. National Level Exercise 2012 After Action Report
- 5. Wisconsin Department of Administration, Division of Enterprise Technology
- 6. Wisconsin Emergency Response Plan, Cyber Incident Annex

3.14 Domestic Terrorism

(including active-shooter incidents and civil disturbances)

Terrorism can be described as the threat or use of violence, by individuals or groups, to create fear for the purpose of furthering or achieving a political goal. This section considers the hazard of terrorism as well as those criminal activities that may appear as terrorism such as an active shooter incident, civil disturbance, or sabotage.

3.14.1 Nature of the Hazard

Terrorism is a human made hazard that can involve the threat or use of various forms of violence. Those engaged in terrorism generally seek maximum public exposure, rather than maximum damage, to create and spread fear. Terrorism can affect a much larger population than those who are directly attacked by taking advantage of media and social media opportunities.

Terrorism is a crime, but not all criminals are terrorists. A political goal specifically distinguishes terrorism from other criminal activity. However, the fear, public exposure, and required emergency response of some types of criminal activity may sufficiently resemble terrorism as to be similarly addressed.

For the purpose of this section the hazard of terrorism, active shooter, and civil disturbances are defined as follows:

Domestic Terrorism

The United States Code defines domestic terrorism as "activities that involve acts dangerous to human life that are a violation of the criminal laws of the United States or of any State; and appear: to be intended to intimidate or coerce a civilian population; to influence the policy of a government by intimidation or coercion; or to affect the conduct of a government by mass destruction, assassination, or kidnapping; and occur primarily within the territorial jurisdiction of the United States."

Active Shooter

The Department of Military Affairs (DMA), Joint Forces Headquarter (JFHQ) Physical Security Plan, Annex L, defines an active shooter as "an individual or group actively engaged in killing or attempting to kill people in a confined and populated area."

Civil Disturbances

The United States Code defines civil disorder as "any public disturbance involving acts of violence by assemblages of three or more persons, which causes an

immediate danger of or results in damage or injury to the property or person of any other individual.

Terrorism, and criminal activities that may appear as terrorism, is a hazard that must be considered for all large events. Wisconsin is known for its many large events, which occur mostly in the summer months. The state also has very popular professional and college sports teams. These events attract large numbers of people in compacted areas. Some sporting events and festivals held in the state draw crowds as large as 300,000 people at one time.

3.14.2 History

The following describe a selection of incidents illustrating both the "lone wolf" and domestic terrorist threat to Wisconsin.

August 14, 1970, University of Wisconsin - Madison



Source: UW-Madison Archives, 9/1, 7778-M #27, August 24, 1970.

The Sterling Hall Bombing was committed by four young people as a protest against the University's research connections with the US military during the Vietnam War. It resulted in the death of a university physics researcher and injuries to three others.²³

July 20, 2000, Rhinelander, Wisconsin

Five individuals associated with the Earth Liberation Front (ELF) damage or destroy 500 trees that were part of a research experiment and defaced U.S. Forest Service vehicles with references to ELF. The individuals targeted the Forest Service facility because it was the location of genetic research experiment designed to make trees more disease resistant. Researchers indicated that the trees were naturally bred (not bioengineered) to grow faster and resist diseases. Court determined damages exceeded \$400,000.

²³ http://en.wikipedia.org/wiki/Sterling_Hall_bombing

March 12, 2005, Brookfield, Wisconsin

A member of the Living Church of God fired into the congregation, killing 7 before taking his own life at a Sheraton Hotel in Brookfield, Wisconsin. Four other were wounded, one critically. No motive was determined by police. Authorities examined possible religious connections to the shooting, but other motive including job loss and mental health issues are likely.

August 5, 2012, Oak Creek, Wisconsin

A local subject thought to be a white supremacist shot 9 people, killing 6 before taking his own life at a Sikh Temple on a Sunday morning. The incident was classified as an act of domestic terrorism by federal officials.

October 21, 2012, Brookfield, Wisconsin

A mass shooting at the Azana Spa located in Brookfield, Wisconsin. The shooter was the estranged husband of a spa employee. He shot 7 people, killing 3 including his wife, before taking his own life.

3.14.3 Probability, Impact, and Mitigation Potential

On an annual basis the US Department of Homeland Security (DHS) Office of Intelligence and Analysis (I&A) releases a Risk Assessment for each of the Metropolitan Statistical Areas (MSAs). In Fiscal Year (FY) 2016 the DHS/I&A used a threat methodology model to assign MSAs into one of four categories. The DHS/I&A Risk Assessments for State, the Milwaukee MSA, and the Madison MSA are useful tools for determining the probability, impact, and mitigation of terrorism and civil disturbances incidents as viewed from the Federal level. Specifically, the Risk Assessment threat corresponds to probability; consequence corresponds to impact; and vulnerability relates to the mitigation measures that State has applied through the years.

Threat Level 1 represented the highest threat level and Threat 4 represented the lowest threat level. An MSA with a Threat Level 1 has consistent range of past plots and identified by international and domestic terrorists as a threat. The DHS/I&A also assigned states and territories into one or three categories. Threat Level 1 represented the highest threat level and Threat Level 3 represented the lowest threat level.

The Milwaukee – Waukesha –West Allis (MWWA) MSA has been categorized as a Threat Level 3. DHS has assessed that international and domestic terrorists, as well as Homegrown Violent Extremists (HVEs), may have the intent to attack MWWA. Their judgment is based upon limited past threat reporting or non-specific past threat reporting. They do not rule out a future attack, there just isn't a clear desire to attack MWWA based upon previous reporting. The table in Figure 3.14.3-1 presents information for the MWWA MSA.

Figure 3.14.3-1: MWWA Threat Ranking

Relative Risk Score	This UASI	Rank FY15	Rank FY16
Total	1.09	42	41
Threat (30% of Relative Risk Score)	This UASI	Level FY15	Level FY16
Total	3	3	3
Vulnerability Index (20% of Relative Risk Score)	This UASI	Rank FY15	Rank FY16
Targeted Infrastructure Index (10%)	2.30	37	38
Border Index (10%)	0.09	54	56
Total	60.68	57	58
Consequence Index (50% of Relative Risk Score)	This UASI	Rank FY15	Rank FY16
Population Index (30%)	0.95	35	35
Economic Index (13%)	8.72	37	37
National Infrastructure Index (5%)	6.77	43	39
National Security Index (2%)	1.98	79	80
Total	3.69	42	41

Source: FY2016 Risk Assessment, US Department of Homeland Security (DHS) Office of Intelligence and Analysis (I&A)

The Madison MSA has been assigned as a Threat Level 4 MSA. DHS has assessed that international and domestic terrorists, and HVE's, are unlikely to attack Madison. It is stated that they do not discount the possibility of an attack; there simply is an absence of specific, credible threat information regarding Madison. The table in Figure 3.14.3-2 presents information for the Madison MSA.

Figure 3.14.3-2: Madison MSA Threat Ranking

Relative Risk Score	This UASI	Rank FY15	Rank FY16
Total	0.44	79	78
Threat (30% of Relative Risk Score)	This UASI	Level FY15	Level FY16
Total	4	4	4
Vulnerability Index (20% of Relative Risk Score)	This UASI	Rank FY15	Rank FY16
Targeted Infrastructure Index (10%)	2.30	37	38
Border Index (10%)	0.00	90	91
Total	60.66	67	69
Consequence Index (50% of Relative Risk Score)	This UASI	Rank FY15	Rank FY16
Population Index (30%)	0.38	61	60
Economic Index (13%)	3.95	63	63
National Infrastructure Index (5%)	4.51	64	56
National Security Index (2%)	2.02	81	79
Total	1.83	74	73

Source: FY2016 Risk Assessment, US Department of Homeland Security (DHS) Office of Intelligence and Analysis (I&A)

A state with a Threat Level 1 is assessed that terrorists and HVEs have intent to attack these states to cause economic damage and mass causalities from highly credible reporting. Wisconsin, as a whole, is considered a Threat Level 3. DHS assesses that while terrorists and HVEs may have interest in attacking Wisconsin, threat reporting and activity is limited in credibility and specificity. The table in Figure 3.14.3.-3 presents information for the State of Wisconsin.

Figure 3.14.3-3: State of Wisconsin Threat Ranking

Relative Risk Score	This State	Rank FY15	Rank FY16
Total	1.84	23	23
Threat (30% of Relative Risk Score)	This State	Level FY15	Level FY16
Total	3	3	3
Vulnerability Index (20% of Relative Risk Score)	This State	Rank FY15	Rank FY16
Targeted Infrastructure Index (10%)	6.59	27	26
Border Index (10%)	20.05	33	33
Total	66.52	25	24
Consequence Index (50% of Relative Risk Score)	This State	Rank FY15	Rank FY16
Population Index (30%)	1.85	23	23
Economic Index (13%)	12.67	20	20
National Infrastructure Index (5%)	13.51	24	24
National Security Index (2%)	6.35	34	34
Total	6.92	24	24

Source: FY2016 Risk Assessment, US Department of Homeland Security (DHS) Office of Intelligence and Analysis (I&A).

3.14.4 Catastrophic Scenario

A large urban area holds an annual multiple day music festival during the summer. On the second to last day of the festival the weather is seasonable and pleasant encouraging a large turnout. By evening approximately 100,000 are in attendance on the festival grounds and an additional 300,000 in the vicinity of the festival.

Just before the start of a fireworks show a single actor ("lone wolf" or homegrown violent extremist) attacks a densely crowded area of the festival grounds. The attacker is armed with a handgun and multiple magazines as well as a body-borne improvised explosive device (BBIED) (e.g., suicide vest) fabricated with homemade explosives.

The attacker begins by firing at those people in the crowd nearest and most convenient. The first shots produce a very limited reaction from the crowd. Many in the crowd are unfamiliar with the sound of a handgun and confuse the noise with the beginning of the fireworks show. As the shooting continues the realization that something is wrong spreads through the crowd creating confusion and fear. After running out of ammunition the attacker rushes towards an exit

congested with those fleeing and detonates the suicide vest. First responders are immediately overwhelmed as they work to secure the area and treat the survivors.

Almost immediately after the start of the attack numerous people in the crowd begin reporting on the attack using social media. The explosion and immediate aftermath are recorded on cell phone video and uploaded to social media. The video is quickly reported on by national and international news. Event organizers and state and local officials are immediately overwhelmed with requests for information.

The investigation following the attack identifies the attacker as a local male in his twenties. It is believed that he became radicalized by extremist web sites. The investigation indicates that he planned the attack in the weeks leading up to the event and made several pre-operational planning or surveillance visits to the festival area in the days prior to the attack. He was also able to use the internet to acquire the weapons, materials, and knowledge used in the attack. The pre-operational financing, planning, and surveillance would be difficult or impossible to detect.

The attack resulted in numerous direct and indirect injuries to festival goers and widespread panic in the crowd including 40 fatalities, 358 major casualties, and 620 minor casualties. An additional 4,500 individuals suffer from psychological effects for experiencing the incident.

3.14.5 Summary Risk Analysis

The table in Figure 3.14.5-1 provides a summary risk analysis for the terrorism hazard.

Figure 3.14.5-1: Terrorism Summary Risk Analysis

Evaluation Criteria	Description	Ranking
	Risk to People, Property, Environment, and Operations	
Probability/potential threat of occurrence	 The hazard occurs only very infrequently, generally less than every five years on a large scale, although localized events may be more frequent The hazard is generally very localized and on a small scale (i.e. sub-county level) A methodology for identifying event occurrences and/or severities is poorly established in the state, or is available only on a local basis 	Low
Vulnerability	 Multiple, reliable, well-coordinated, countermeasures are in place to prevent or protect against this hazard. Countermeasures have an extensive demonstrated history of testing and success in significantly reducing the threat potential. 	Medium
Mitigation Potential	 Methods for reducing risk from the hazard are not well-established, are not proven reliable, or are experimental The State or counties have little or no experience in implementing mitigation measures, and/or no technical knowledge of them Mitigation measures are ineligible under federal grant programs There is a very limited range of mitigation measures for the hazard, usually only one feasible alternative 	Low

	 The mitigation measures have not been proven cost-effective and are likely to be expensive compared to the magnitude of the damages caused by the hazard The long-term effectiveness of the measure is not known, or is known to be relatively poor 	
	Impacts of Catastrophic Scenario	
Public	 Local medical services are unable to manage the volume of injuries and fatalities. Patients require transportation to regional medical facilities outside of the affected areas. 	High
Responders	 Significant federal and/or mutual aid from other states would be needed to meet the needs of the incident. A federal disaster declaration would be expected. 	High
COOP, including delivery of services	Impact on COOP would be low unless government facilities receive a direct attack.	Low
Property, Facilities & Infrastructure	Some damage to property and facilities in the localized area of the attack.	Low
Environment	Minimal impact on the environment.	Low
Economy	Negative impact to local economic activity in the short-term. Direct effects limited to the local community.	Medium
Public Confidence	Major loss of confidence in government and society. Possible panic and major civil disturbances requiring sustained law enforcement response and other security measures.	High
	Aggregate Impact	High

3.14.6 Sources – Agency Input and Research

The following agencies assisted in providing their expertise on the subject matter related to the core capabilities in this scenario.

- 1. City of Milwaukee Fire Department
- 2. City of Milwaukee Police Department
- 3. Department of Homeland Security, Office of Intelligence and Analysis
- 4. Federal Bureau of Investigation, Joint Terrorism Task Force
- 5. Milwaukee County Emergency Management
- 6. Milwaukee County Medical Examiner
- 7. Southeastern Wisconsin Threat Analysis Center
- 8. Wisconsin Department of Health Services
- 9. Wisconsin Statewide Intelligence Center

4.0 Critical Facilities

The State's most valuable and critical assets are the employees working with or in a state owned or operated building, infrastructure, or facility. In an effort to minimize the risk to personnel and disruption to agency mission essential functions many State agencies have developed emergency plans. However, an emergency plan cannot fully mitigate the negative impacts to state services that can result from the interruption or degradation of access or service associated with a building, infrastructure, or facility.

4.1 History

The 2011 State of Wisconsin Hazard Mitigation Plan (WHMP) included a strategy to address the vulnerability of state assets. The strategy proposed gathering detailed information on all state owned or operated facilities for the purpose of developing a database of asset information. The asset database would be used to identify critical facilities and conduct a risk assessment based on those critical facilities. The strategy proposed an ambitious program including data collection, site visits, development of a secure database, and additional staffing.

The data collection portion of the strategy was piloted with the Department of Corrections (DOC). The pilot project involved the development, distribution, collection, and processing of a questionnaire that required very specific information regarding each structure. The DOC collected information on 471 buildings within 25 different institutions, centers, and schools. The buildings included critical and non-critical buildings. The DOC pilot project successfully collected detailed information on department assets. The results of the risk scores:

- 18 buildings were rated "low"
- 166 buildings were rated "medium to low"
- 257 buildings were rated "medium"
- 30 buildings were rated "medium high"
- 0 buildings were rated "high"

Of the 30 buildings rated "medium high" risk when looking at the buildings' vulnerability to floods. Half of the buildings were non-critical such as storage sheds, cellars, and garages. The other buildings were considered critical infrastructure because of the service they provide such as residence hall, barrack, and power plants.

The post-pilot review indicated that full implementation of the proposed strategy for all stateowned or operated facilities across all state agencies would be time and resource intensive and result in excess information collection.

4.2 Requirements

A state owned or operated critical facilities risk assessment is a required element for the 2016 update of the Wisconsin Hazard Mitigation Plan (WHMP). A simplified methodology based on the requirements described in 44 CFR §§201.4(c)(2)(ii) and 201.4(c)(2)(iii) was used for this critical facilities risk assessment. The table in Figure 4.2-1 captures FEMA's guidance for meeting these requirements.

Figure 4.2-1: Federal Guidance Critical Facilities Risk Assessment

Element	Requirements
S5. Does the risk assessment address the vulnerability of state assets located in hazard areas and estimate the potential dollar losses to these assets? [44CFR §§201.4(c)(2)(ii) and 201.4(c)(2)(iii)]	 a. The risk assessment must include an analysis of the potential impacts of hazard events to state assets and a summary of the assets most vulnerable to the identified hazards. These assets may be located in the identified hazard areas or affected by the probability of future hazard events. b. The risk assessment must estimate potential dollar losses to state assets located in identified hazard areas. Vulnerability and potential losses are not a list or inventory of state facilities but the summary of the potential impacts to those assets from the identified hazards. Factors affecting vulnerability may include asset use and function as well as construction type, age, or intended use.
Intent: To understand vulnerability of assets critical for state resilience as a basis for identifying and prioritizing mitigation actions.	 State assets may include state-owned or operated buildings, infrastructure, and critical facilities. Critical facilities means structures that the state determines must continue to operate before, during, and after an emergency and/or hazard event and/or are vital to health and safety. Examples of critical facilities may include, but are not limited to: Emergency operations centers, police and fire stations, and storage facilities (including data storage). Structures that house occupants with restricted mobility or access and/or functional needs, such as hospitals, institutions, and shelters. Utility generating, transmission, and storage facilities and related infrastructure, such as power and/or water treatment plants. Transportation facilities, such as ports, airports, roads, railroads, bridges, and/or tunnels.

Source: State Mitigation Plan Review Guide, FEMA, effective March 2016.

4.2.1 Methodology

Consistent with this guidance the following methodology was used to identify state owned or operated critical facilities and infrastructure for the purpose of developing a state critical facilities risk assessment.

1. Inventory of Assets

Wisconsin Emergency Management (WEM) identified the Wisconsin Department of Administration (DOA) as the best available source of information on state owned and operated

assets. The DOA provided WEM with an all agencies inventory of assets in an Excel format spreadsheet. This inventory included assets ranging from small storage sheds to large multistory office buildings. The inventory totaled 6,579 critical and non-critical state owned and operated buildings, infrastructure, and facilities. Each asset included data such as agency name, institution name, building (asset) name, location, and replacement cost.

The provided inventory of assets does have two notable limitations. First, not all relevant data fields were complete. Second, the inventory did not include the state owned and operated roads and bridges that comprise the state highway system.

2. Identification of Critical Facilities and Data Scrub

WEM reviewed all 6,579 records. During this initial review preliminary data scrub and validation was begun and assets were categorized as critical or non-critical. If the asset was identified as a critical facility, the facility type was added to the record.

The identification of critical facilities was based on the 2011 WHMP definition amended consistent with the State Mitigation Plan Review Guide 2015. The resulting definition of critical facilities is as follows:

Critical Facilities

State-owned [or operated]²⁴ facilities deemed essential due to their function, size, service area, uniqueness, delivery of vital services, and for the protection of the health and safety of citizens including buildings and infrastructure that meet characteristics such as:

- Communications facilities;
- Correctional facilities and other custodial facilities, including facility utility services:
- Utility services, including: electrical power generation, heating, wastewater treatment, water treatment, etc.;
- Hospitals and other medical facilities, including: group homes, shelters, mental health facilities, etc.;
- Major State government facilities that house key state operations;
- Critical military facilities; and
- Emergency response facilities, including: law enforcement, security, fire, etc.
- [Transportation facilities such as ports, airports, roads, railroads, bridges, and/or tunnels.]²⁵

3. Addition of Location Information

²⁴ From State Mitigation Plan Review Guide, FEMA, Effective March 2016

²⁵ From State Mitigation Plan Review Guide, FEMA, Effective March 2016

WEM again reviewed all 6,579 records. Following this second review location information was added for those assets identified as critical. This included reviewing address information and, where possible, correction or addition of missing information. Further, if critical assets could be reasonably identified on aerials photographs the latitude and longitude information was added. Location information was sourced from agency information, web sources, and Google™ Maps.

4. Critical Facilities and Special Flood Hazard Areas

The inventory of assets information was manipulated using the ESRI Geographic Information System (GIS) to identify critical facilities located in a FEMA-designated special flood hazard area (SFHA). The GIS analysis sought to identify the number and value of critical facilities located in the SFHA.

5. Assessment

WEM used the combination of tables, charts, and GIS maps in order to analyze location and potential threats to the identified critical facilities.

4.3 Summary of Assets

The following is a summary of state owned and operated assets based on the inventory of assets developed using the methodology described in the previous section. The summary is not intended to be a list or inventory of all state owned and operated assets.

The table in Figure 4.3-1 lists the total number of assets, critical assets, replacement cost, and average replacement cost by agency. More than half of all assets are identified as Department of Natural Resources assets, with 2852 assets, or University of Wisconsin assets, with 1720 assets. Approximately 16.5%, or 1086, of the total assets are designated as critical facilities. The largest percentage 35.9%, or 390, of the critical facilities are identified with the Department of Corrections.

The total replacement cost of critical facilities is approximately \$5.56 billion dollars. Over 90% of this amount is comprised of assets from 4 agencies: Department of Corrections at 31.1%, or \$1.7 billion; University of Wisconsin System at 25.2%, or \$1.4 billion; Department of Administration at 21.2%, or \$1.2 billion; and Department of Health Services at 13.4%, or \$745 million.

Figure 4.3-1: Assets by Agency

Figure 4.3-1: Assets by Agency								
Agency	Total Number of Assets	% of all assets	Assets Identified as Critical Facilities	% of all assets	% of Critical Facilities	Replacement Cost of Critical Facilities	% of Replacement Cost Total	Average Replacement Cost Per Critical Facility
Department of Administration	48	0.7%	34	0.5%	3.1%	\$1,176,442,945.69	21.2%	\$34,601,263.11
Department of Agriculture, Trade and Consumer Protection	5	0.1%	0	0.0%	0.0%	\$	0.0%	\$
Board of Commissioners of Public Lands	2	0.0%	0	0.0%	0.0%	\$	0.0%	\$
Department of Corrections	693	10.5%	390	5.9%	35.9%	\$1,729,738,990.46	31.1%	\$4,435,228.18
Educational Communications Board	58	0.9%	58	0.9%	5.3%	\$34,113,093.46	0.6%	\$588,156.78
Department of Health Services	186	2.8%	101	1.5%	9.3%	\$745,796,543.45	13.4%	\$7,384,124.19
Historical Society	222	3.4%	0	0.0%	0.0%	\$	0.0%	\$
Department of Military Affairs	307	4.7%	132	2.0%	12.2%	\$241,410,647.39	4.3%	\$1,828,868.54
Department of Natural Resources	2852	43.4%	109	1.7%	10.0%	\$36,466,031.36	0.7%	\$334,550.75
Department of Public Instruction	30	0.5%	29	0.4%	2.7%	\$91,616,656.87	1.6%	\$3,159,195.06
State Fair Park	47	0.7%	0	0.0%	0.0%	\$	0.0%	\$
Department of Transportation	306	4.7%	107	1.6%	9.9%	\$71,167,497.49	1.3%	\$665,116.80
University of Wisconsin System	1720	26.1%	119	1.8%	11.0%	\$1,401,321,120.88	25.2%	\$11,775,807.74
Department of Veterans Affairs	102	1.6%	7	0.1%	0.6%	\$32,257,255.87	0.6%	\$4,608,179.41
TOTAL	6578	100.0%	1086	16.5%	100.0%	\$5,560,330,782.93	100.0%	\$5,120,009.93

 $Source: Wisconsin\ Emergency\ Management;\ Department\ of\ Administration,\ 2016.$

The Department of Corrections manages risk through the Office of Special Operations, Preparedness and Emergency Response Section (PERS). This section provides a systemic structure for Department-wide emergency preparedness, education, training, response, and management. This includes:

- Continuity of Operations Planning (COOP)
- Emergency Operations Plans
- Emergency Operations Center
- Preparedness and Operations
- National Incident Management System (NIMS) compliance
- Incident Management Team (IMT) operations
- Comprehensive exercise program and training
- Security and operational audits
- Vulnerability assessments
- Work stoppage and disturbance planning
- Resources allocation and policy development

The University of Wisconsin System is one of the largest systems of public higher education in the country, serving approximately 180,000 students each year and employing more than 40,000 faculty and staff statewide. The system is made up of 13 four-year universities, 13 freshman-sophomore college campuses, and the statewide UW-Extension. In general the universities and college campuses plan and prepare to manage the local risks. In 2003 the UW-Madison Police Department established an Emergency Management Unit for mitigation, planning, response, and recovery. The unit is responsible for the UW-Madison campus and several other UW System campuses.

The Department of Health Services manages risk through the Division of Enterprise Services, Office of Facilities, Safety and Risk Management. This office provides space planning; and coordinates staff moves, fleet management, parking, and Continuity of Operations planning and implementation.

The table in Figure 4.3-2 lists the number, replacement cost, and average replacement cost of critical facilities by facility type. A total of 1086 assets are designated as critical facilities with a replacement cost of approximately \$5.6 billion dollars. The largest number by facility type is the 390 identified as Correction Facility. However, the largest replacement cost by facility type is the \$1.71 billion identified as Major State Government. The majority (26 of 33) of assets identified as Major State Government facilities are identified as Department of Administration assets. The remaining seven assets identified as Major State Government facilities are identified as Department of Transportation assets.

Figure 4.3-2: Critical Facilities by Facility Type

Facility Type	Count	%	Replacement Cost	%	Average Replacement Cost
Communications Facility	180	16.5%	\$165,261,674.76	3.0%	\$918,120.42
Correction Facility	390	35.9%	\$1,729,738,990.46	31.1%	\$4,435,228.18
Utility Services	81	7.5%	\$631,180,116.84	11.4%	\$7,792,347.12
Hospital and other Medical Facility	126	11.6%	\$1,478,823,781.18	26.6%	\$11,736,696.68
Major State Government	33	3.0%	\$1,135,774,784.44	20.4%	\$34,417,417.71
Critical Military Facility	131	12.1%	\$240,814,261.56	4.3%	\$1,838,276.81
Emergency Response Facility	112	10.3%	\$84,019,905.51	1.5%	\$750,177.73
Transportation Facility	2	0.2%	\$2,454,117.66	0.0%	\$1,227,058.83
Other Essential Facilities	31	2.9%	\$92,263,150.53	1.7%	\$2,976,230.66
TOTAL	1086	100.0%	\$5,595,776,383.09	100.0%	\$5,143,176.82

Source: Wisconsin Emergency Management; Department of Administration, 2016.

The table in Figure 4.3-3 lists the total number of assets, critical assets, replacement cost, and average replacement cost by County. Note, asset totals differ based on 4 communication assets located in Minnesota and 1 DOT District 7 asset does not include county identification information.

As may be expected the highest concentration of all state assets are located near to the seat of state government located in Dane County. Specifically, 13.6% or 895 of all state assets are located in Dane County; 4.1% or 267 of all assets are located in Waukesha County; 3.6% or 237 of all assets are located in Door County; 3.5% or 227 of all assets are located in Columbia County; and 3.3% or 214 of all assets are located in Dodge County.

Similarly the highest concentrations of critical facility assets are located in or near Dane County. Specifically, 16.1% or 174 critical facilities are located in Dane County; 10.9% or 118 critical facilities are located in Juneau County; and 10.1% or 109 critical facilities are located in Dodge County.

The replacement cost by County also illustrates the concentration of critical facility assets located in or near Dane County. Just less than half of the total replacement cost of critical facility assets attributed to Dane County. Specifically, 48.9% or \$2.7 billion dollars replacement cost for critical facility assets has been identified for Dane County. The next highest amount is 6.9% or \$382 million dollars identified for Winnebago County.

Figure 4.3-3 Assets by County

	Figure 4.3-3 Assets by County								
County	Total Number of Assets	% of all Assets	Assets Identified as Critical Facilities	% of all Assets	% of Critical Facilities	Replacement Cost of Critical Facilities	% of Replacement Cost Total	Average Replacement Cost	
Adams	33	0.5%	10	0.15%	0.9%	\$1,973,325	0.0%	\$197,333	
Ashland	65	1.0%	4	0.06%	0.4%	\$285,473	0.0%	\$71,368	
Barron	17	0.3%	0	0.00%	0.0%	\$	0.0%	\$	
Bayfield	60	0.9%	9	0.14%	0.8%	\$2,086,514	0.0%	\$231,835	
Brown	138	2.1%	28	0.43%	2.6%	\$141,981,943	2.6%	\$5,070,784	
Buffalo	22	0.3%	2	0.03%	0.2%	\$89,517	0.0%	\$44,759	
Burnett	48	0.7%	13	0.20%	1.2%	\$3,504,467	0.1%	\$269,574	
Calumet	69	1.1%	5	0.08%	0.5%	\$657,769	0.0%	\$131,554	
Chippewa	123	1.9%	40	0.61%	3.7%	\$231,330,821	4.2%	\$5,783,271	
Clark	9	0.1%	2	0.03%	0.2%	\$76,234	0.0%	\$38,117	
Columbia	227	3.5%	4	0.06%	0.4%	\$67,772,205	1.2%	\$16,943,051	
Crawford	49	0.7%	21	0.32%	1.9%	\$38,692,133	0.7%	\$1,842,483	
Dane	895	13.6%	174	2.65%	16.1%	\$2,721,404,693	48.9%	\$15,640,257	
Dodge	214	3.3%	109	1.66%	10.1%	\$343,055,242	6.2%	\$3,147,296	
Door	237	3.6%	8	0.12%	0.7%	\$1,030,664	0.0%	\$128,833	
Douglas	155	2.4%	19	0.29%	1.8%	\$23,610,216	0.4%	\$1,242,643	
Dunn	94	1.4%	10	0.15%	0.9%	\$15,842,963	0.3%	\$1,584,296	
Eau Claire	93	1.4%	15	0.23%	1.4%	\$32,057,881	0.6%	\$2,137,192	
Florence	11	0.2%	3	0.05%	0.3%	\$611,102	0.0%	\$203,701	
Fond du Lac	130	2.0%	24	0.37%	2.2%	\$80,189,605	1.4%	\$3,341,234	
Forest	6	0.1%	4	0.06%	0.4%	\$751,967	0.0%	\$187,992	
Grant	211	3.2%	10	0.15%	0.9%	\$72,993,998	1.3%	\$7,299,400	
Green	27	0.4%	0	0.00%	0.0%	\$	0.0%	\$	
Green Lake	9	0.1%	2	0.03%	0.2%	\$176,148	0.0%	\$88,074	
Iowa	98	1.5%	5	0.08%	0.5%	\$1,033,896	0.0%	\$206,779	
Iron	22	0.3%	6	0.09%	0.6%	\$1,230,101	0.0%	\$205,017	
Jackson	79	1.2%	20	0.30%	1.9%	\$63,101,843	1.1%	\$3,155,092	
Jefferson	68	1.0%	4	0.06%	0.4%	\$19,677,324	0.4%	\$4,919,331	
Juneau	199	3.0%	118	1.80%	10.9%	\$238,544,528	4.3%	\$2,021,564	
Kenosha	85	1.3%	7	0.11%	0.6%	\$28,304,876	0.5%	\$4,043,554	
Kewaunee	10	0.2%	0	0.00%	0.0%	\$	0.0%	\$	
La Crosse	71	1.1%	5	0.08%	0.5%	\$12,608,834	0.2%	\$2,521,767	
Lafayette	82	1.2%	1	0.02%	0.1%	\$20,689	0.0%	\$20,689	
Langlade	19	0.3%	3	0.05%	0.3%	\$2,252,682	0.0%	\$750,894	
Lincoln	78	1.2%	29	0.44%	2.7%	\$38,863,518	0.7%	\$1,340,121	
Manitowoc	46	0.7%	1	0.02%	0.1%	\$412,826	0.0%	\$412,826	
Marathon	62	0.9%	10	0.15%	0.9%	\$18,976,541	0.3%	\$1,897,654	
Marinette	62	0.9%	9	0.14%	0.8%	\$2,436,749	0.0%	\$270,750	
Marquette	35	0.5%	5	0.08%	0.5%	\$850,054	0.0%	\$170,011	

County	Total Number of Assets	% of all Assets	Assets Identified as Critical Facilities	% of all Assets	% of Critical Facilities	Replacement Cost of Critical Facilities	% of Replacement Cost Total	Average Replacement Cost
Menominee	0	0.0%	0	0.00%	0.0%	\$	0.0%	\$
Milwaukee	151	2.3%	15	0.23%	1.4%	\$234,078,513	4.2%	\$15,605,234
Monroe	49	0.7%	12	0.18%	1.1%	\$50,348,933	0.9%	\$4,195,744
Oconto	19	0.3%	2	0.03%	0.2%	\$297,866	0.0%	\$148,933
Oneida	155	2.4%	13	0.20%	1.2%	\$7,496,489	0.1%	\$576,653
Outagamie	38	0.6%	3	0.05%	0.3%	\$6,532,153	0.1%	\$2,177,384
Ozaukee	36	0.5%	0	0.00%	0.0%	\$	0.0%	\$
Pepin	4	0.1%	0	0.00%	0.0%	\$	0.0%	\$
Pierce	99	1.5%	2	0.03%	0.2%	\$9,545,034	0.2%	\$4,772,517
Polk	61	0.9%	1	0.02%	0.1%	\$5,955	0.0%	\$5,955
Portage	110	1.7%	9	0.14%	0.8%	\$23,040,998	0.4%	\$2,560,111
Price	29	0.4%	10	0.15%	0.9%	\$6,394,669	0.1%	\$639,467
Racine	123	1.9%	47	0.72%	4.3%	\$284,509,395	5.1%	\$6,053,391
Richland	12	0.2%	3	0.05%	0.3%	\$486,410	0.0%	\$162,137
Rock	34	0.5%	18	0.27%	1.7%	\$38,932,765	0.7%	\$2,162,931
Rusk	11	0.2%	3	0.05%	0.3%	\$303,756	0.0%	\$101,252
Sauk	173	2.6%	1	0.02%	0.1%	\$111,971	0.0%	\$111,971
Sawyer	98	1.5%	8	0.12%	0.7%	\$4,911,809	0.1%	\$613,976
Shawano	12	0.2%	7	0.11%	0.6%	\$912,035	0.0%	\$130,291
Sheboygan	170	2.6%	59	0.90%	5.5%	\$82,936,137	1.5%	\$1,405,697
St. Croix	62	0.9%	8	0.12%	0.7%	\$5,327,121	0.1%	\$665,890
Taylor	13	0.2%	1	0.02%	0.1%	\$286,361	0.0%	\$286,361
Trempealeau	26	0.4%	0	0.00%	0.0%	\$	0.0%	\$
Vernon	49	0.7%	0	0.00%	0.0%	\$	0.0%	\$
Vilas	158	2.4%	2	0.03%	0.2%	\$540,327	0.0%	\$270,164
Walworth	128	1.9%	17	0.26%	1.6%	\$58,998,976	1.1%	\$3,470,528
Washburn	83	1.3%	10	0.15%	0.9%	\$4,655,484	0.1%	\$465,548
Washington	34	0.5%	7	0.11%	0.6%	\$22,049,572	0.4%	\$3,149,939
Waukesha	267	4.1%	13	0.20%	1.2%	\$38,001,142	0.7%	\$2,923,165
Waupaca	93	1.4%	7	0.11%	0.6%	\$13,229,339	0.2%	\$1,889,906
Waushara	86	1.3%	8	0.12%	0.7%	\$59,831,269	1.1%	\$7,478,909
Winnebago	143	2.2%	48	0.73%	4.4%	\$382,592,009	6.9%	\$7,970,667
Wood	86	1.3%	8	0.12%	0.7%	\$14,783,446	0.3%	\$1,847,931
TOTAL	6570	100.0%	1081	16.45%	100.0%	\$5,559,629,275	100.0%	\$5,143,043

Source: Wisconsin Emergency Management; Department of Administration, 2016.

4.3.1 State Highway System

The summary tables presented in Figure 4.3-1, 4.3-2, and 4.3-3 do not include information on the state owned or operated assets that comprise the state highway system. This system includes the following:

- 1,588 miles of multi-lane highways (backbone)
- 10,167 miles of highways (non-backbone)
- 5,267 state-owned or maintained bridges

The map in Figure 4.3.1-1 depicts the state highway system.



Figure 4.3.1-1: State Highway System

Source: Keep Wisconsin Moving, Report of the Wisconsin Transportation Finance and Policy Commission, January 2013.

The state highway system is a small (approximately 10%) but important portion of the larger state highway network. The state highway network is comprised of approximately 115,145 miles of state and local public roads. The vast majority of this network (approximately 90%) is owned and maintained by the local jurisdiction (county, city, village, or town) in which they are located.

4.4 Vulnerability and Potential Losses

A key component of this plan is the identification of those state owned or operated critical facilities that are vulnerable to various types of hazards. An indicator of vulnerability and potential loss of the critical facilities is past federal Public Assistance (PA) data. The table in Figure 4.4-1 lists the total amount of federal PA funding to state and tribal recipients by threat or hazard for the period from August 1999 to August 2016. This table contains raw, unedited and summarized information derived from FEMA's Public Assistance (PA) program systems—not from FEMA's official financial systems—and is subject to human error. This information is believed to be current as of the date the data was downloaded from Open FEMA, however, due to differences in reporting periods and status obligations, this information may differ from official publications on other public websites. This data is not intended to be used for any official federal financial reporting.

Figure 4.4-1: Federal Public Assistance to State and Tribal Recipients

Threat or Hazard	Public Assistance (PA)
Severe Weather	¢9.220.712
Including Tornadoes and High Winds, Hail, and Lightning	\$8,239,712
Flooding	¢050.536
Including Dam Failure, Landslide, and Land Subsidence	\$850,526
Wildfire	\$
Drought and Extreme Heat	\$
Winter Storms and Extreme Cold	\$4,231,435
Coastal Erosion and Bluff Failure	\$
Radiological Release	\$
Hazardous Materials Incidents	¢
Including Fixed Facilities and Transportation	•
Disruption of Life Lines	¢
Electric, Fuel, Water, Wastewater	•
Emerging Infectious Diseases	¢
Including Pandemic Influenza	Į.
Food and Agricultural Emergency	\$
Cyber-attack	\$
Terrorism	¢
Including Active Shooter Incidents and Civil Disturbances	\$

Source: Federal Emergency Management Agency (FEMA) Public Assistance (PA) data for the period from August 1999 to August 2016, accessed November 17, 2016.

Consideration of this information can be used to guide the development and implementation of cost effective mitigation measures. These measures will help to reduce or eliminate identified vulnerabilities to the most critical assets of state government. Ideally this will help ensure that these state assets remain operational in times of disaster or emergency to provide for the continuation of emergency operations, continuity of government, critical public safety, health

care, transportation and educational functions, and the provision of other essential services to the public.

Severe Weather

At the county level National Weather Service data has identified Dane, Grant, Dodge, and Marathon County with the highest number of tornado events from 1844 to 2015; identified Dane, Rock, Walworth, Waukesha, and Jefferson with the highest number of severe thunderstorm wind events; identified Dane, Grant, Monroe, Marathon, La Crosse, Waukesha, and Price with the highest number of severe hail events; and identified Waukesha, Dane, and Rock County with the highest number of lighting events. The table in Figure 4.4-2 lists the counties with the highest number of assets, critical facilities, and replacement cost of critical facilities potentially at risk from severe weather.

Figure 4.4-2: Assets at Risk from Severe Weather

County	Total # of Assets	# of Critical Facilities	Replacement Cost of Critical Facilities
Dane	895	174	\$2,721,404,693
Dodge	214	109	\$343,055,242
Grant	211	10	\$72,993,998
Jefferson	68	4	\$19,677,324
La Crosse	71	5	12,608,834
Marathon	62	10	\$18,976,541
Monroe	49	12	\$50,348,933
Price	29	10	\$6,394,669
Rock	34	18	\$38,932,765
Walworth	128	17	\$58,998,976
Waukesha	267	13	\$38,001,142

Source: Wisconsin Emergency Management; Department of Administration, 2016.

The table in Figure 4.4-3 lists the total amount of federal PA funding to state and tribal recipients for severe weather including tornadoes and high winds, hail, and lightning for the period from August 1999 to August 2016. Categories A and B are typically referred to as temporary work and Categories C, D, E, F, and G are typically referred to as permanent work.

Figure 4.4-3: Public Assistance for Severe Weather

Damage Category	Count	Federal Share Obligated
Category A – Debris Removal	49	\$1,060,800.68
Category B – Emergency Protective Measures	48	\$2,345,943.65
Category C – Roads and Bridges	27	\$842,460.54
Category D – Water Control Facilities	28	\$225,626.84
Category E – Buildings and Equipment	18	\$106,657.05
Category F – Utilities	5	\$52,047.34
Category G – Parks, Recreational Areas, and Other Facilities	109	\$1,605,111.69
Category Z – State Management	51	\$2,001,064.67
TOTAL	335	\$8,239,712.46

Source: Federal Emergency Management Agency (FEMA) Public Assistance (PA) data for the period from August 1999 to August 2016, accessed November 17, 2016.

Flooding

Flooding has been identified as the principal cause of damage in 32 of 46 of Presidential Disaster Declarations and one of six Presidential Emergency Declarations in Wisconsin from 1971 through August 2016. At the county level National Weather Service data has identified Crawford, Dane, Grant, and Vernon with the highest number of flood events from 1982 to 2015. The table in Figure 4.4-4 lists the counties with the highest number of assets, critical facilities, and replacement cost of critical facilities potentially at risk from flooding.

Figure 4.4-4: Assets at Risk from Flooding

County	Total # of Assets	# of Critical Facilities	Replacement Cost of Critical Facilities
Crawford	49	21	\$38,692,133
Dane	895	174	\$2,721,404,693
Grant	211	10	\$72,993,998
Vernon	49	0	\$0

Source: Wisconsin Emergency Management; Department of Administration, 2016.

The table in Figure 4.4-5 lists the total amount of federal PA funding to state and tribal recipients for flooding for the period from August 1999 to August 2016. Categories A and B are typically referred to as temporary work and Categories C, D, E, F, and G are typically referred to as permanent work.

Figure 4.4-5: Public Assistance for Flooding

Damage Category	Count	Federal Share Obligated
Category A – Debris Removal	24	\$349,902
Category B – Emergency Protective Measures	27	\$294,838
Category C – Roads and Bridges	10	\$63,512
Category D – Water Control Facilities	3	\$31,551
Category E – Buildings and Equipment	2	\$2,782
Category F – Utilities	0	\$0
Category G – Parks, Recreational Areas, and Other Facilities	24	\$101,721
Category Z – State Management	13	\$6,220
TOTAL	103	\$850,526

Source: Federal Emergency Management Agency (FEMA) Public Assistance (PA) data for the period from August 1999 to August 2016, accessed November 17, 2016.

The threat of flooding is typically not considered a county-wide or community-wide threat. Flooding is most commonly associated with floodplains or lowlands adjacent to water bodies. FEMA partners with Tribal nations, States, and communities through the Risk Mapping, Assessment, and Planning (Risk MAP) program to identify flood hazards, assess flood risks, and provide accurate data. This data is incorporated into Flood Insurance Rate Maps (FIRMs).

WEM used ESRI GIS to better understand where the critical facilities intersected with mapped floodplains. Approximately 96% (1043 of 1086) of the identified critical facilities included latitude and longitude information. The map in Figure 4.4-6 depicts the critical facilities with latitude and longitude and digital FIRMs.

State Structure Inventory: Buildings in the Floodplain Legend Building in the Floodplain All Buildings with Lat/Long Floodplain, Zones A or AE 40 80 Miles by: C. Hermans, 10/03/2016

Figure 4.4-6: Assets in the Floodplain

Source: Wisconsin Emergency Management; Department of Administration, 2016.

The GIS analysis identified three critical facilities in two locations that intersect with the special flood hazard area. Note, not all counties have digital FIRM information available. The table in Figure 4.4-7 identifies the three identified assets.

Figure 4.4-7: Critical Facilities Located in the Floodplain

County	Asset	Replacement Value
Waukesha	Lee S. Dreyfus State Office Building (addition)	\$15,853,925
Wood	Wisconsin Rapids State Office Building	\$10,381,503
Wood	Wisconsin Rapids State Office Building (addition)	\$3,485,356

Source: Wisconsin Emergency Management; Department of Administration, 2016.

A further review of the Waukesha County Land Information website indicates that the Lee S. Dreyfus Office Building is mapped out of the special flood hazard area. A further review of the Wood County Land Information website indicates that the Wisconsin Rapids State Office Building and addition are located in a special flood hazard area.

Wildfires

Wildfires have been identified as an ongoing threat to both rural areas and wildland urban interface (WUI) communities. At the county level the Wisconsin Department of Natural Resources (DNR) has identified the counties of Adams, Burnett, Jackson, Juneau, Washburn, and Waushara with the greatest number of communities at very high risk of wildfire. The table in Figure 4.4-8 lists the counties with the highest number of assets, critical facilities, and replacement cost of critical facilities potentially at risk from wildfires.

Figure 4.4-8: Assets at Risk from Wildfires

County	Total # of Assets	# of Critical Facilities	Replacement Cost of Critical Facilities
Adams	33	10	\$1,973,325
Burnett	48	13	\$3,504,467
Jackson	79	20	\$63,101,843
Juneau	199	118	\$238,544,528
Washburn	83	10	\$4,655,484
Waushara	86	8	\$59,831,269

Source: Wisconsin Emergency Management; Department of Administration, 2016.

Drought and Extreme Heat

Drought and extreme heat are a serious threat to people, animals, and plants. Drought and extreme heat can stress life lines (electric, fuel, water, and wastewater) and indirectly affect state critical facilities. However, the hazard generally does not represent a direct threat to state critical facilities.

Winter Storms and Extreme Cold

Winter Storms and extreme cold are a serious threat to people, animals, and plants. Winter storms and extreme cold can disrupt transportation, stress lifelines (electric, fuel, water, and

wastewater) and negatively affect state critical facilities. In instances of excessive snow or sustained periods of extreme cold this could include damage from snow loads or frozen plumbing.

The table in Figure 4.4-9 lists the total amount of federal PA funding to state and tribal recipients for winter storms for the period from August 1999 to August 2016. Categories A and B are typically referred to as temporary work and Categories C, D, E, F, and G are typically referred to as permanent work.

Figure 4.4-9: Public Assistance for Winter Storms

Damage Category	Count	Federal Share Obligated
Category A – Debris Removal	0	\$0
Category B – Emergency Protective Measures	24	\$4,072,919
Category C – Roads and Bridges	0	\$0
Category D – Water Control Facilities	0	\$0
Category E – Buildings and Equipment	0	\$0
Category F – Utilities	0	\$0
Category G – Parks, Recreational Areas, and Other Facilities	0	\$0
Category Z – State Management	8	\$158,517
TOTAL	32	\$4,231,436

Source: Federal Emergency Management Agency (FEMA) Public Assistance (PA) data for the period from August 1999 to August 2016, accessed November 17, 2016.

Coastal Erosion

Coastal erosion affects all 15 coastal counties. Coastal erosion is usually a gradual process. However, sudden incidents prompting emergency action do occur. The hazard does not currently pose a threat to state critical facilities. Future development of specific coastal erosion location information may better define potential threats to state critical facilities.

Radiological Release

The radiological release hazard is most closely associated with the nuclear power plants located in or near the state. The counties of Kewaunee, Pierce, and Manitowoc are located within a 10 mile radius of a nuclear power plant. The table in Figure 4.4-10 lists the counties with the highest number of assets, critical facilities, and replacement cost of critical facilities potentially at risk from radiological release.

Figure 4.4-10 Assets at Risk from Radiological Release

County	Total # of Assets	# of Critical Facilities	Replacement Cost of Critical Facilities
Kewaunee	10	0	\$0
Manitowoc	46	1	\$412,826
Pierce	99	2	\$9,545,034

Source: Wisconsin Emergency Management; Department of Administration, 2016.

Hazardous Materials Incident

Hazardous materials are present in most communities and not geographically specific. The extensive use and transportation of these hazardous materials presents a state-wide threat. Future development of more detailed hazardous material incident location information may better define potential threats to state critical facilities.

Disruption of Life Lines

The disruption of life lines (electric, fuel, water, and wastewater) could potentially threaten the use and operation of state critical assets. However, the disruption of life lines is often a secondary hazard resulting from the impacts of a natural, technological, or human-cause hazard.

Emerging Infectious Diseases

Emerging infectious diseases are a serious threat to people and animals. In addition, emerging infectious diseases can stress the health care system and indirectly affect state critical facilities. However, the hazard generally does not represent a direct threat to state critical facilities, except for those health care related facilities.

Food and Agriculture Emergency

A food and agriculture emergency is a serious threat to people, animals, and the environment. In addition, a food and agriculture emergency could indirectly affect state critical facilities. However, the hazard generally does not represent a direct threat to state critical facilities.

Cyber Incident

All state owned or operated critical facilities are potentially threatened by cyber-attack.

Terrorism

All state owned or operated critical facilities are potentially threatened by terrorism.

4.5 Mitigation Potential

It is the intention of WEM to use the data collected in this update to promote the continued assessment of the state structure inventory in an effort to better understand the vulnerability of these assets to all threats and hazards. Further, the following steps have been developed to assess the mitigation potential for at-risk critical facilities.

1. Review and Revise State Structure Inventory

WEM will continue to work with the Department of Administration and other state agencies to review and revise the state structure inventory. This may include the review and revision of asset information such as:

- Use
- Location
- Replacement value

2. Assessment of Critical Facilities

WEM will continue to review and assess the state structure inventory in an effort to validate facilities identified as critical based on use information. Additional attention will be directed at those critical facilities with an identified replacement value of over \$1,000,000. The threshold value of \$1,000,000 is intended to identify those critical assets that may be the most difficult and costly for the State of Wisconsin to replace.

3. Refine Risk and Vulnerability

WEM will continue to work with other state agencies through the Wisconsin Silver Jackets Hazard Mitigation Team and the Governor's Homeland Security Council's Interagency Working Group to further refine risk and vulnerability to critical facilities. Non-critical facilities will be designated as a low priority for further analysis and data collection. Critical facilities with a replacement value over \$1,000,000 will be designated as a higher priority for further analysis and data collection.

4. Prioritize

WEM will evaluate the vulnerability to specific hazards (high, medium, low). WEM will also evaluate if the above criteria are sufficient for evaluating risk to State-owned and operated critical facilities. This continued assessment is intended to maintain and improve the understanding of the vulnerability of assets critical for state resilience. This information will be used as a basis for identifying and prioritizing mitigation actions.

5.0 THIRA Maintenance

All Federal Emergency Management Agency (FEMA) regions, states, and Urban Areas Security Initiative (UASI) regions are required to complete a Threat and Hazard Identification and Risk Assessment (THIRA) to receive federal emergency preparedness funding. It is anticipated that this requirement will continue into the foreseeable future and be subject to occasional guidance revisions.

The maintenance of the State of Wisconsin THIRA is the responsibility of the Planning Section, Bureau of Planning and Preparedness, Wisconsin Emergency Management. The Planning Section will maintain awareness of current applicable THIRA guidance and requirements. The THIRA/SPR will be reviewed, revised, and updated as necessary but at least annually. Further, it is anticipated that the THIRA will be used as the risk assessment component of future Hazard Mitigation plans. Currently, FEMA requires update of state hazard mitigation plans on a 5 year cycle.

The table in Figure 5.0-1 describes the anticipated review, revision, and update schedule for the THIRA.

Figure 5.0-1: THIRA Maintenance Schedule

Activity	Tasks	Frequency
Review, revise, and update	 Review for accuracy Revise consistent with applicable guidance Update reflect current information/conditions Incorporate lessons learned and changes in policy and philosophy 	Annually
Hazard Mitigation Plan Update	Review, revise, and update consistent with risk assessment requirements for state hazard mitigation plan	5 years

Appendix A. Core Capabilities

The National Preparedness Goal defines what it means for the whole community to be prepared for all types of disasters and emergencies. The text in Figure A-1 quotes the National Preparedness Goal.

Figure A-1: National Preparedness Goal

"A secure and resilient nation with the capabilities required across the whole community to prevent, protect against, mitigate, respond to, and recover from the threats and hazards that pose the greatest risk."

Source: National Preparedness Goal

The National Preparedness Goal describes 32 core capabilities that address the greatest risks to the nation.

A.1 Descriptions

These core capabilities are described in the National Preparedness Goal as follows:

Planning

Conduct a systematic process engaging the whole community as appropriate in the development of executable strategic, operational, and/or tactical-level approaches to meet defined objectives.

Public Information and Warning

Deliver coordinated, prompt, reliable, and actionable information to the whole community through the use of clear, consistent, accessible, and culturally and linguistically appropriate methods to effectively relay information regarding any threat or hazard, as well as the actions being taken and the assistance being made available, as appropriate.

Operational Coordination

Establish and maintain a unified and coordinated operational structure and process that appropriately integrates all critical stakeholders and supports the execution of core capabilities.

Intelligence and Information Sharing

Provide timely, accurate, and actionable information resulting from the planning, direction, collection, exploitation, processing, analysis, production, dissemination, evaluation, and feedback of available information concerning physical and cyber threats to the United States, its people, property, or interests; the development, proliferation, or use of WMDs; or any other matter bearing on U.S. national or homeland security by local, state, tribal, territorial, Federal, and other

stakeholders. Information sharing is the ability to exchange intelligence, information, data, or knowledge among government or private sector entities, as appropriate.

Interdiction and Disruption

Delay, divert, intercept, halt, apprehend, or secure threats and/or hazards.

Screening, Search and Detection

Identify, discover, or locate threats and/or hazards through active and passive surveillance and search procedures. This may include the use of systematic examinations and assessments, biosurveillance, sensor technologies, or physical investigation and intelligence.

Forensics and Attribution

Conduct forensic analysis and attribute terrorist acts (including the means and methods of terrorism) to their source, to include forensic analysis as well as attribution for an attack and for the preparation for an attack in an effort to prevent initial or follow-on acts and/or swiftly develop counter-options.

Access Control and Identity Verification

Apply and support necessary physical, technological, and cyber measures to control admittance to critical locations and systems.

Cybersecurity

Protect (and if needed, restore) electronic communications systems, information, and services from damage, unauthorized use, and exploitation.

Physical Protective Measures

Implement and maintain risk-informed countermeasures, and policies protecting people, borders, structures, materials, products, and systems associated with key operational activities and critical infrastructure sectors.

Risk Management for Protection Programs and Activities

Identify, assess, and prioritize risks to inform Protection activities, countermeasures, and investments.

Supply Chain Integrity and Security

Strengthen the security and resilience of the supply chain.

Community Resilience

Enable the recognition, understanding, communication of, and planning for risk and empower individuals and communities to make informed risk management decisions necessary to adapt to, withstand, and quickly recover from future incidents.

Long-term Vulnerability Reduction

Build and sustain resilient systems, communities, and critical infrastructure and key resources lifelines so as to reduce their vulnerability to natural, technological, and human-caused threats and hazards by lessening the likelihood, severity, and duration of the adverse consequences.

Risk and Disaster Resilience Assessment

Assess risk and disaster resilience so that decision makers, responders, and community members can take informed action to reduce their entity's risk and increase their resilience.

Threats and Hazard Identification

Identify the threats and hazards that occur in the geographic area; determine the frequency and magnitude; and incorporate this into analysis and planning processes so as to clearly understand the needs of a community or entity.

Infrastructure Systems

Stabilize critical infrastructure functions, minimize health and safety threats, and efficiently restore and revitalize systems and services to support a viable, resilient community.

Critical Transportation

Provide transportation (including infrastructure access and accessible transportation services) for response priority objectives, including the evacuation of people and animals, and the delivery of vital response personnel, equipment, and services into the affected areas.

Environmental Response/Health and Safety

Conduct appropriate measures to ensure the protection of the health and safety of the public and workers, as well as the environment, from all-hazards in support of responder operations and the affected communities.

Fatality Management Services

Provide fatality management services, including decedent remains recovery and victim identification, working with local, state, tribal, territorial, insular area, and Federal authorities to provide mortuary processes, temporary storage or permanent internment solutions, sharing

information with mass care services for the purpose of reunifying family members and caregivers with missing persons/remains, and providing counseling to the bereaved.

Fire Management and Suppression

Provide structural, wildland, and specialized firefighting capabilities to manage and suppress fires of all types, kinds, and complexities while protecting the lives, property, and the environment in the affected area.

Logistics and Supply Chain Management

Deliver essential commodities, equipment, and services in support of impacted communities and survivors, to include emergency power and fuel support, as well as the coordination of access to community staples. Synchronize logistics capabilities and enable the restoration of impacted supply chains.

Mass Care Services

Provide life-sustaining and human services to the affected population, to include hydration, feeding, sheltering, temporary housing, evacuee support, reunification, and distribution of emergency supplies.

Mass Search and Rescue Operations

Deliver traditional and atypical search and rescue capabilities, including personnel, services, animals, and assets to survivors in need, with the goal of saving the greatest number of endangered lives in the shortest time possible.

On-scene Security, Protection, and Law Enforcement

Ensure a safe and secure environment through law enforcement and related security and protection operations for people and communities located within affected areas and also for response personnel engaged in lifesaving and life-sustaining operations.

Operational Communications

Ensure the capacity for timely communications in support of security, situational awareness, and operations by any and all means available, among and between affected communities in the impact area and all response forces.

Public Health, Healthcare, and Emergency Medical Services

Provide lifesaving medical treatment via Emergency Medical Services and related operations and avoid additional disease and injury by providing targeted public health, medical, and behavioral health support, and products to all affected populations.

Situational Assessment

Provide all decision makers with decision-relevant information regarding the nature and extent of the hazard, any cascading effects, and the status of the response.

Economic Recovery

Return economic and business activities (including food and agriculture) to a healthy state and develop new business and employment opportunities that result in an economically viable community.

Health and Social Services

Restore and improve health and social services capabilities and networks to promote the resilience, independence, health (including behavioral health), and well-being of the whole community.

Housing

Implement housing solutions that effectively support the needs of the whole community and contribute to its sustainability and resilience.

Natural and Cultural Resources

Protect natural and cultural resources and historic properties through appropriate planning, mitigation, response, and recovery actions to preserve, conserve, rehabilitate, and restore them consistent with post-disaster community priorities and best practices and in compliance with applicable environmental and historic preservation laws and executive orders.

A.2 Mission Areas

The National Preparedness Goal organizes the core capabilities into five mission areas:

- Prevention: Prevent, avoid, or stop an imminent, threatened, or actual act of terrorism.
- **Protection**: Protect our citizens, residents, visitors, and assets against the greatest threats and hazards in a manner that allows our interests, aspirations, and way of life to thrive.
- **Mitigation**: Reduce the loss of life and property by lessening the impact of future disasters.
- **Response**: Respond quickly to save lives; protect property and the environment; and meet basic human needs in the aftermath of catastrophic incident.
- Recovery: Recover through a focus on the timely restoration, strengthening, and
 revitalization of infrastructure, housing, and a sustainable economy, as well as the health,
 social, cultural, historic, and environmental fabric of communities affected by a
 catastrophic incident.

Some core capabilities fall into one mission area and others apply to several mission areas. The table in Figure A.2-1 lists the core capabilities by mission area.

Table A.2-1: Core Capabilities by Mission Area

Prevention	Protection	Mitigation	Response	Recovery
		Planning		
	Pub	lic Information and Wa	rning	
	(Operational Coordination	on	
Intelligence and	d Information Sharing	Community	Infrastruct	ure System
Interdictio	n and disruption	Resilience	Critical	Economic Recovery
Screening, Se	earch and Detection	lang tarm	Transportation	
Forensics and Attribution	Access Control and Identity Verification	Long-term Vulnerability Reduction	Environmental Response/Health	Health and Social Services
	Cybersecurity	Risk and Disaster	and Safety	Housing
	Physical Protective Measures	Resilience Assessment	Fatality Management Services	Natural and Cultural Resources
	Risk Management for Protection Programs	Threats and Hazard Identification	Fire Management and Suppression	
	and Activities Supply Chain		Logistics and Supply Chain Management	
	Integrity and Security		Mass Care Services	
			Mass Search and Rescue Operations	
			On-scene Security, Protection, and Law Enforcement	
			Operational Communications	
			Public Health, Healthcare, and Emergency Medical Services	
			Situational Assessment	

Source: CPG 201, Second Edition, August 2013.

Appendix B. Core Capability Targets

The capability targets have been written to be broadly applicable statewide where possible, while recognizing that emergency response is incident specific. Whether a capability can be deployed or whether a particular target can be achieved in any given incident depends on conditions. In some incidents, it may not be possible or appropriate to deploy a particular capability. The table in Figure B-1 lists the state's core capability targets.

Figure B-1: Wisconsin Core Capability Targets

Figure B-1: Wisconsin Core Capability Targets		
Core Capability	Desired Capability Target	
Planning	 Update the Wisconsin Emergency Response Plan (WERP) with all appropriate emergency support functions (ESFs) and annexes every two years, meeting the Comprehensive Preparedness Guide (CPG) 101 standards. Review the Wisconsin Recovery Plan annually to ensure all sections of the plan comply with state law and are consistent with current federal guidance. Update county and tribal plans every two years to meet standards defined in the FEMA's Plan Review Guide. Implement an SEOC incident action plan that identifies state specific tasks to assist all impacted local jurisdictions with response operations within 2 hours of SEOC elevation. 	
Public Information and Warning	 Deliver reliable and actionable information to the public, including individuals with disabilities, those with access and functional needs, and those who are members of English as a Second Language (ESL) population. Issue emergency alerts, assured by monthly testing of the state emergency notification system, to communicate with residents. Review and update pre-scripted warning messages. Activate state and local Joint Information Centers (JICs) as needed. 	
Operational Coordination	 Elevate the state emergency operations center (SEOC) (to Level 2) and establish unified command structures to coordinate with all relevant local law enforcement and all relevant state and federal agencies within two hours of a credible threat or incident. Audit training quarterly to ensure all assigned emergency operation center personnel have completed or are scheduled to complete incident command system (or equivalent) and position specific training. Collaborate with all eligible recipients to successfully obligate 100% of federal funding provided for mitigation plans or projects each year. Coordinate with local incident command post(s) and local emergency operations centers (EOCs) within one hour of an incident and maintain operations for one week. Establish a minimum of 3 interoperable fire, EMS, and law enforcement frequencies for interoperable voice and data communications across 2 or more counties within 1 hour of an incident using established state and national channels. Establish an incident management structure to support a FEMA Type 2 incident or two simultaneous FEMA Type 3 incidents within four hours and maintain for one week. 	

Core Capability	Desired Capability Target
Intelligence and Information Sharing	 Maintain an overall score above the national network average on the annual National Fusion Center Assessment. Train state law enforcement officers (LEOs) in nationwide suspicious activity reports (SARs). Monitor web and social media activity before and during an incident. Develop and maintain a statewide training program that increases annual SAR reporting by the public by ten percent each year. Maintain trained threat liaison officers (TLOs) in all Wisconsin counties.
Interdiction and Disruption	 Deploy at least one specialized tactical alert team or bomb detection unit within 1 hour of a notification of a credible threat or incident. Deploy at least one explosive ordinance disposal (EOD) unit within 2 hours of a notification of a credible threat or incident. Support monitoring operations for approximately 95% of the area at predetermined state-identified special events for the duration of the event.
Screening, Search, and Detection	 Initiate maximum screening operations of cargo, conveyances, mail, baggage, and people associated with a credible terrorist attack at all ports of entry within 60 minutes of receiving actionable intelligence. Continuously conduct screening, search, and detection operations, including CBRNE detection operations, at 2 land and maritime ports of entry within 2 hours of notification of a credible threat. For state-identified special events, randomly search a predetermined percentage of event attendees, not less than 25%.
Forensics and Attribution	 Support physical, biometric, and cyber evidence collection across a 1 square-mile area within 24 hours of an incident. Support CBRNE evidence collection across a 1 square mile area within one hour of the conclusion of an incident. Test 50% of samples received from an incident site at the Wisconsin State Laboratory of Hygiene within eight hours of delivery. This number is dependent on sample type(s) and number(s).
Access Control and Identity Verification	 Establish access control for a five-mile evacuation zone within six hours of an incident. Appropriate protocols and resources are in place to credential responders over a five-mile area within 12 hours of an incident.
Cybersecurity	 Facilitate engagement between cybersecurity stakeholders on a monthly basis to share threat information and best practices. Isolate all network vulnerabilities within 24 hours of a malicious or inadvertent compromise. Within 12 hours of a request, provide all asset owner(s) access to supplemental security monitoring and event analysis team(s). Within 12 hours of a request, provide all asset owner(s) access to supplemental forensic teams for root cause analysis and, if appropriate, coordination with ongoing Law Enforcement forensic requirements.
Physical Protective Measures	 Provide security staff equivalent to a minimum of two officers per 1,000 attendees at state-identified special events. Conduct pre-event training of 100% of public safety related staff working state-identified special events, and provide daily briefings during the event.

Core Capability	Desired Capability Target
Risk Management for Protection Programs and Activities	 Facilitate engagement between emergency management stakeholders and public/private critical infrastructure partners on an annual basis to share best practices and better understand interdependencies. Identify, assess, and prioritize critical infrastructure and maintain a state list for situational awareness. Maintain a target rate of 100% compliance on the State and Federal EPCRA planning and reporting requirements, on an annual basis. Recommend site security assessments by the Department of Homeland Security (DHS) Office of Infrastructure Protection or similar security experts of events over 10,000 in attendance.
Supply Chain Integrity and Security	 Identify and prioritize supply chain critical infrastructure in the impacted areas with highest priority to water, energy, fuel, transportation, and medical services within in the first 12 hours of an incident. Protocols are in place to increase security and local law enforcement support at major supply chain nodes, Logistics Staging Areas (LSAs), and Points of Distribution (PODs) across 2 or more counties within 12 hours after the supply chain critical infrastructure has been identified and prioritized.
Community Resilience	 Provide outreach and support to assist and motivate 100 % of affected communities to complete comprehensive all-hazards mitigation plans with a focus on structural and non-structural mitigation measures. Support, assist, and motivate 100 % affected communities in identifying their resiliency priorities and with developing the ability to systematically anticipate and adjust to trends that could endanger the future of their community. Annually plan for and implement risk mitigation actions and programs in conjunction with whole community representatives. Using various communication means, incorporate the message that "physical/virtual security is a shared responsibility" between sectors and also between governments and citizens that results in preparing 100 % of people for self-reliance during events using instruction on sustainable protective measures that could be implemented. Ensure 100 % individuals in the affected area are educated regarding measures to be taken to safeguard their homes and businesses. Ensure that 100 % counties, cities, villages, and townships within the impacted area adopt, in accordance with applicable guidance, a risk-informed all-hazard mitigation plan developed through partnerships across the entire community.
Long-Term Vulnerability Reduction	 Complete all hazard mitigation assistance (HMA) funded projects within three years of FEMA approval. Convene the Wisconsin Hazard Mitigation Silver Jackets Team at least once a year to promote national standards, model building codes, and best practices that reduce vulnerabilities.

Core Capability	Desired Capability Target
Risk and Disaster Resilience Assessment	 Complete the Threat and Hazard Identification and Risk Assessment (THIRA) and State Preparedness Report (SPR) to analyze vulnerabilities, resilience capabilities, and estimated impacts of threats and hazards across the state, for all residents, every year, in accordance with federal, state, and local requirements Update the Wisconsin Hazard Mitigation Plan and county plans every five years. State and counties review plans annually to insure internal requirements remain valid and applicable. Achieve 95% county compliance on mitigation plan completion. Coordinate biannual assessments of the energy systems with the Wisconsin State Energy Office and the Public Service Commission for resilience and recovery in a power outage lasting up to one week, specifically assessing critical infrastructure systems.
Threats and Hazard Identification	 In collaboration with whole community partners, annually identify and determine the frequency and magnitude of threats and hazards likely to occur across the state, in accordance with federal requirements. Conduct monthly threat assessment briefings for key state Homeland Security officials regarding applicable national, regional, and state threat assessments.
Infrastructure Systems	 Establish critical infrastructure situation map using GIS within two hours of an incident and continuously provide real-time status updates. Identify key locations for generator back-up systems to restore power immediately within the National Fire Protection Association (NFPA) and the National Electrical Code (NEC) standards to all critical infrastructure and key resources (CIKR). Restore power infrastructure for 100% of the affected customers within five days.
Critical Transportation	 Evacuate 60,000 residents, including 12,000 individuals with access and functional needs, within six hours of an incident based upon approximately 20,000 vehicles moving at 1,500 vehicles per traffic lane per hour. Establish routes for emergency service traffic within two hours of an incident. Complete emergency repairs on main thoroughfares within two weeks of an incident. Repair 100% of damaged transportation infrastructure within 18 months of an incident.
Environmental Response/Health and Safety	 Decontaminate 20% of population within the affected area within 12 hours of an incident. Verify that counties with a nuclear power plant maintain a three-day supply of KI, as well as monitor the expiration dates, for their trained emergency workers. Test wells and city water for safety and identify number of well kits needed within 24 hours of an incident. Maintain capacity to provide facemasks for 10,000 volunteers. Maintain capacity to provide tetanus shots for 28,000 (18,000 residents and 10,000 volunteers). Identify temporary debris storage and reduction sites within 72 hours of an incident.
Fatality Management Services	 Conduct operations to recover, identify, and properly handle the remains of 20 fatalities within 96 hours of an incident. Order the proper handling, through burial or cremation, of any human remains of an individual who has died of a communicable disease, within 24 hours after the individual's death and consider, to the extent feasible, the religious, cultural, or individual beliefs of the deceased individual or his/her family.

Core Capability	Desired Capability Target
Fire Management and Suppression	Within 6 hours of a request for assistance, provide structural, wildland, and specialized firefighting capabilities to manage and suppress fires of all types, kinds, and complexities while protecting the lives, property, and the environment in the affected area.
Logistics and Supply Chain Management	 Establish an integration plan for the donation of goods and services from private sector organizations. Provide food, water, and supplies for 10,000 volunteers daily for two weeks with assistance from various non-governmental organizations (NGOs).
Mass Care Services	 Mobilize resources within 24 hours of an incident to provide temporary shelter and basic human need services for 8,000 residents, including 3,200 individuals with access and functional needs, and 5,000 pets for 2 weeks. Establish a system that provides for the reunification of families within 24 hours of the incident.
Mass Search and Rescue Operations	 Conduct search operations on 5,000 homes and 600 businesses within 24 hours. Deploy the state Urban Search & Rescue Team within two hours and operate within federal standards with two Type I 70-person platoons for seven days.
On-scene Security, Protection, and Law Enforcement	 Provide security and law enforcement services to protect 10,000 responders and volunteers operating across 2 or more counties within 48 hours of an incident. Provide security and law enforcement services to protect ten shelters, two reception centers, and four pharmaceutical distribution centers staffed by one law enforcement officer for each 500 participants, within 48 hours of an incident
Operational Communications	 Establish a minimum of 3 frequencies to provide response-level interoperable communication among all involved state, local, tribal, and federal agencies across 2 or more counties within one hour for routine incidents, and within three hours for a significant incident. Provide access to a non-IP based back-up communication system connecting 1 or more county emergency operation center with the state emergency operation center within three hours of an incident. Provide high frequency (HF) radio connection between the SEOC and FEMA Region 5 immediately following an incident. Every month test SEOC satellite communication equipment to verify operational status.
Public Health, Healthcare, and Emergency Medical Services	 Annually update plan for epidemiological surveillance and investigation. Conduct a biannual medical countermeasures Operation Readiness Review (ORR) of medical supplies management and distribution. Analyze situation and make requests to CDC or other federal organizations within 6 hours of an incident. Track bed availability for up to 1,200 casualties within 2 hours and up to 80,000 patients over the course of 4 months. Provide personal protective equipment (PPE) for 75% of the licensed professionals. Within 6 hours, complete triage and basic emergency medical care for 1,200 injured. Provide definitive care within 12 to 72 hours for all casualties, transporting necessary patients to hospitals outside the affected area. Require all hospitals in Wisconsin to use the WITrac system. Maintain, at a minimum, 50% of hospitals per region participating in the pathogen screening and communication process. Train hospital personnel with pathogen screening and communication procedures.

Core Capability	Desired Capability Target
Situational Assessment	 Gather and analyze information to inform decision makers of potential follow-on or continuing threats or hazards that may impact a WEM region. During an elevation of the SEOC, maintain 24 hour contact with the National Weather Service (NWS), the Wisconsin Joint Operations Center (WI-JOC), and any activated county EOCs for the duration of an incident. Maintain situational awareness with all affected counties and the private sector CIKR during an incident. Leaders provide daily updates and compile into weekly assessments during an incident.
Economic Recovery	 Establish and maintain industry wide contacts with major businesses and organizations. Within 18 months of an incident, both long- and short-term economic recovery plans have been developed - in conjunction with the Small Business Administration and other relevant agencies - and fully implemented to restore all affected sites to an operational status so that the postulated economic impact is mitigated to the extent possible and the state and national economies are put on track to return to their pre-incident normalcy.
Health and Social Services	 Initiate crisis counseling to affected residents within 24-hours of the onset of an incident Establish statewide MOAs to arrange for the deployment of up to 50 counselors, verifying the list of available counselors semi-annually.
Housing	Provide long-term/permanent housing for 6,000 of displaced residents for one year or 12,000 of affected residents for two months.
Natural and Cultural Resources	Identify and report natural and culturally significant properties impacted within the affected area during the preliminary damage assessment (PDA) process within three weeks of the event.

Appendix C. Estimated Required Resources

In Step 4 the state applies the results of the Threat and Hazard Identification and Risk Assessment (THIRA) process by estimating the resources required to meet capability targets. This is presented as a list of resources needed to successfully manage the threats and hazards.

C.1 Resource Typing

Resource typing is categorizing, by capability, the resources requested, deployed, and used in incidents. Resource typing helps communities request and deploy needed resources through the use of common terminology. To the extent possible the state has developed resource requirements expressed as a list of National Incident Management System (NIMS) typed resources or other standardized resources.

C.1.1 National NIMS Resource Types

National NIMS resource types support a common language for the mobilization of resources prior to, during, and after major incidents. Resource users at all levels use these definitions as a consistent basis when identifying and inventorying their resources for capability estimation, planning, and for mobilization during mutual aid efforts. National NIMS resource types represent the minimum criteria for the associated component and capability. The Resource Typing Library Tool (RTLT) is an online catalogue of national NIMS resource typing definitions and job titles/position qualifications.

Step 4 of the THIRA process enables entities to estimate how many resources – including national NIMS resource types – are needed to achieve capability targets. As FEMA and the emergency management community continue to define additional national NIMS resource types, the THIRA process will provide a more accurate and complete picture of community-level resource needs.

C.1.2 Other Standardized Resources

FEMA guidance also recommends consideration of other standardized resources when developing resource requirements. For example, state, tribal, and local governments sometimes establish standardized definitions of deployable resources. Mission Ready Packages (MRPs) available through the Emergency Management Assistance Compact (EMAC) describe other types of standardized resources, including credentialed personnel. EMAC MRPs describe resources available for deployment for intrastate and interstate mutual aid.

The table in Figure C.1.2-1 lists the NIMS-typed or other standardized resources needed to meet each of the core capability targets.

Figure C.1.2-1: Estimated Required Resources

Resource																		Cor	e Capa	bilitie	s												٦
Category	Name	Planning	Public Information and Warning	Operational Coordination	Intelligence and Information Sharing	Interdiction and disruption	Screening, Search and Detection	Forensic and Attribution	Access Control and Identity Verification	Cybersecurity	Physical Protective Measures	Risk Management for Protection Programs and Activities	Supply Chain Integrity and Security	Community Resilience	Long-term Vulnerability Reduction	Risk and Disaster Resilience Assessment	Threats and Hazard Identification	Infrastructure System	Critical Transportation	Environmental Response/Health and Safety	Fatality Management Services	Fire Management and Suppression	Logistics and Supply Chain Management	Mass Care Services	Mass Search and Rescue Operations	On-scene Security, Protections, and Law Enforcement	Operational Communication	Public Health, Healthcare, and Emergency Medical Services	Situational Assessment	Economic Recovery	Health and Social Services	Housing	Natural and Cultural Resources
Animal Emergency Response	Small Animal Transport Team I																		4					4									٦
	Small Animal Sheltering Team I																							2									
	Incident Management Team Animal Protection I																							1									
Emergency Medical Services	Ambulance Strike Team IV																											8					
	Emergency Medical Task Force I																			4	1							4					
	Mass Casualty Support Vehicle II																				2												
	Multi-patient Medical Transport Vehicle I																		6														
Fire/Hazardous Materials	Fire Truck – Aerial (Ladder or Platform) II																								5								
	Hand Crew IV																					10											
	Strike Team, Engine (Fire) I																								10								
	Communications Support Team (CAP) I																									1	2						

	Resource														,	ı		Cor	e Capa	bilitie	es								1			
Category	Name	Planning	Public Information and Warning	Operational Coordination	Intelligence and Information Sharing	Interdiction and disruption	Screening, Search and Detection	Forensic and Attribution	Access Control and Identity Verification	Cybersecurity	Physical Protective Measures	Risk Management for Protection Programs and Activities	Supply Chain Integrity and Security	Community Resilience	Long-term Vulnerability Reduction	Risk and Disaster Resilience Assessment	Threats and Hazard Identification	Infrastructure System	Critical Transportation	Environmental Response/Health and Safety	Fatality Management Services	Fire Management and Suppression	Logistics and Supply Chain Management	Mass Care Services	Mass Search and Rescue Operations	On-scene Security, Protections, and Law Enforcement	Operational Communication	Public Health, Healthcare, and Emergency Medical Services	Situational Assessment	Economic Recovery	Health and Social Services	Housing Natural and Cultural Decourage
	Communications Support Team (CAP) II																												31			
	Critical Incident Stress Management Team I																											4		1		
	Critical Incident Stress Management Team III																													40		
	Donations Coordinator II								-														1									
	Donations Management																															
ŧ	Personnel/Team II																						1									
mer	EOC Management Support Team I																						1									Ш
age	Evacuation Liaison Team (ELT) I																		1													
Man	Mobile Communications Center (Mobile EOC) I																										1					
Incident Management	Mobile Communications Center (Mobile EOC) II																									1	2					
Ē	Mobile Communications Center (Mobile EOC) III																												3			
	Mobile Feeding Kitchen (Mobile Field Kitchen) I																							1								
	Public Information Officer III		2		2																											
	Rapid Needs Assessment Team I																						1									
	Incident Management Team II	1		1																												
	Individual Assistance Disaster Assessment Team I																															1
	Bomb Squad/Explosives Team I					1																										
	Bomb Squad/Explosives Team II					1																										

	Resource																	Cor	e Capa	bilitie	es												
Category	Name	Planning	Public Information and Warning	Operational Coordination	Intelligence and Information Sharing	Interdiction and disruption	Screening, Search and Detection	Forensic and Attribution	Access Control and Identity Verification	Cybersecurity	Physical Protective Measures	Risk Management for Protection Programs and Activities	Supply Chain Integrity and Security	Community Resilience	Long-term Vulnerability Reduction	Risk and Disaster Resilience Assessment	Threats and Hazard Identification	Infrastructure System	Critical Transportation	Environmental Response/Health and Safety	Fatality Management Services	Fire Management and Suppression	Logistics and Supply Chain Management	Mass Care Services	Mass Search and Rescue Operations	On-scene Security, Protections, and Law Enforcement	Operational Communication	Public Health, Healthcare, and Emergency Medical Services	Situational Assessment	Economic Recovery	Health and Social Services	Housing	Natural and Cultural Resources
Law Enforcement Operations	Computer Network Defense Team No description in RTLT Cyber Response Team No description in RTLT Law Enforcement Patrol Team (Strike Team) I Law Enforcement Patrol Team (Strike Team) III Law Enforcement Preventive Radiological/Nuclear Detection (PRND) Team No description in RTLT Multi-disciplinary Preventive Radiological/Nuclear Detection (PRND) Team No description in RTLT Maritime Multi-disciplinary Preventive Radiological/Nuclear Detection (PRND) Team No description in RTLT Maritime Multi-disciplinary Preventive Radiological/Nuclear Detection (PRND) Team No description in RTLT						1	1	4	1 3	4	1	4													1 4							
Mass Care Services	Field Kitchen Unit IV																							2									

	Resource																	Cor	e Capa	bilitie	s											
Category	Name	Planning	Public Information and Warning	Operational Coordination	Intelligence and Information Sharing	Interdiction and disruption	Screening, Search and Detection	Forensic and Attribution	Access Control and Identity Verification	Cybersecurity	Physical Protective Measures	Risk Management for Protection Programs and Activities	Supply Chain Integrity and Security	Community Resilience	Long-term Vulnerability Reduction	Risk and Disaster Resilience Assessment	Threats and Hazard Identification	Infrastructure System	Critical Transportation	Environmental Response/Health and Safety	Fatality Management Services	Fire Management and Suppression	Logistics and Supply Chain Management	Mass Care Services	Mass Search and Rescue Operations	On-scene Security, Protections, and Law Enforcement	Operational Communication	Public Health, Healthcare, and Emergency Medical Services	Situational Assessment	Economic Recovery	Health and Social Services	Housing
	Shelter Management Team I																							3								
	Mobile Field Medical Team II	Н																										16				
	Public Health and Medical Team																							3								6
	in a Shelter I																							3								
	Environmental Health I Epidemiology (Surveillance and																											4				
alth	Investigation) I																			1	1							4				
He	Epidemiology (Surveillance and																				3											
ublic	Investigation) II			_																												\sqcup
ld Pı	Isolation and Quarantine I Isolation and Quarantine II			-																	3							4				\vdash
Medical and Public Health	Mass Dispensing Consultant Team																				٥											
dica	I																			2								4				
Me	Mass Dispensing Consultant Team II																			3 4								28				
	Receiving, Staging, and Storing																			8								4				
	(RSS) Task Force																			0								+				
	Social Worker			_																											50	H
Mitigation	Hazard Mitigation Outreach Specialist II													1																		
	Buses I																		50													

	Resource																	Cor	e Capa	bilitie	S	_											
Category	Name	Planning	Public Information and Warning	Operational Coordination	Intelligence and Information Sharing	Interdiction and disruption	Screening, Search and Detection	Forensic and Attribution	Access Control and Identity Verification	Cybersecurity	Physical Protective Measures	Risk Management for Protection Programs and Activities	Supply Chain Integrity and Security	Community Resilience	Long-term Vulnerability Reduction	Risk and Disaster Resilience Assessment	Threats and Hazard Identification	Infrastructure System	Critical Transportation	Environmental Response/Health and Safety	Fatality Management Services	Fire Management and Suppression	Logistics and Supply Chain Management	Mass Care Services	Mass Search and Rescue Operations	On-scene Security, Protections, and Law Enforcement	Operational Communication	Public Health, Healthcare, and Emergency Medical Services	Situational Assessment	Economic Recovery	Health and Social Services	Housing	Natural and Cultural Resources
	Buses IV																		12														
	Electronic Boards, Variable																		10														\neg
	Message Signs (VMS)						_		_	_	_								10														_
	Floodlights						4											100															4
	Generators I Generators II																	5															
	Generators II Generators III										-							30															
	Generators IV																	20															\neg
orks	Maintenance and Repair Team –						1			+	+																						
×	Light Equipment Public Works I																	4															
Public Works	Emergency Management Support																	2															П
Pι	Team – Water/Wastewater																	_															
	Repair and Restoration Team – SCADA																	4															
	No description in RTLT																	4															
	Repair Restoration Team –																																
	Communications No description																	4															
	in RTLT																																
	Wood Chipper I					_	_	_		-	-	_							12													\vdash	_
scue	Canine SAR Team – Disaster Response																								4								
Search and Rescue	Canine SAR Team – Land Cadaver Air Scent II																								4								
h aı	Structural Collapse Rescue Team I																								2								
Searc	Structural Collapse Rescue Team III																								4								

Resource	Core Capabilities
Category Name	Planning Public Information and Warning Public Information and Warning Operational Coordination Interdiction and disruption Screening, Search and Detection Forensic and Attribution Access Control and Identity Verification Access Control and Identity Verification Access Control and Identity Verification Cybersecurity Physical Protective Measures Risk Management for Protection Programs and Activities Supply Chain Integrity and Security Community Resilience Long-term Vulnerability Reduction Risk and Disaster Resilience Assessment Threats and Hazard Identification Infrastructure System Critical Transportation Environmental Response/Health and Safety Fatality Management Services Fire Management Services Mass Search and Rescue Operations On-scene Security, Protections, and Law Enforcement Operational Communication Public Health, Healthcare, and Emergency Medical Services Situational Assessment Economic Recovery Health and Social Services Housing Natural and Cultural Resources
US&R Incident Support Team	
US&R Task Force	

Appendix D. State Preparedness Report

The State Preparedness Report (SPR) is a self-assessment of the state's current capability levels against the capability targets identified in the Threat and Hazard Identification and Risk Assessment (THIRA). The SPR supports the National Preparedness System by helping to identify capability gaps. The state can use this information to help make programmatic decisions to build and sustain capabilities, plan to deliver capabilities, and validate capabilities. The state is required to submit a SPR annually to receive Federal preparedness assistance administered by the Department of Homeland Security.

D.1 Assessment Methodology

The 2016 SPR follows FEMA's assessment methodology. This assessment methodology has been used consistently since 2012 and is comprised of the following:

- 1. Set capability targets identified in the THIRA.
- 2. Assess current preparedness levels for achieving those targets according to the 32 core capabilities defined in the National Preparedness Goal.
- 3. Assess preparedness levels for each core capability using a five-point scale where one (1) indicates little-to-no capability, and five (5) indicates that they have all, or nearly all, of the capability required to meet their targets in each of the following solution areas:
 - Planning
 - Organization
 - Equipment
 - Training
 - Exercise

The table in Figure D.1-1 lists the ratings for the planning solution area, Figure D.1-2 lists the ratings for the organization solution area, Figure D.1-3 lists the ratings for the equipment solution area, Figure D.1-4 lists the ratings for the training solution area, and Figure D.1-5 lists the ratings for the exercise solution area.

Figure D.1-1: Planning Solution Area Ratings

Score	Description
1	No plans/annexes exist.
2	Some plans exist, but lack some annexes or other required elements
3	Plans/annexes are complete and up-to-date.
4	Plans/annexes are complete, up-to-date, and have been validated by exercises or real-world operations within the last two years.
5	Plans/annexes are complete, up-to-date, and have been validated by exercises or real-world operations within the last two years; plans include coordination with higher levels of government and resource needs for catastrophic incidents.
Α	Planning is not required for this capability.
В	This jurisdiction is not responsible for providing planning for this capability.

Figure D.1-2: Organization Solution Area Ratings

Rating	Description
1	Very little (0-20%) of the required
1	organizational structure exists.
2	Little (21-40%) of the required
2	organizational structure exists.
3	Much (41-60%) of the required
3	organizational structure exists.
4	Most (61-80%) of the required
4	organizational structure exists.
5	All or nearly all (81-100%) of the required
5	organizational structure exists.
_	Organization is not relevant for this
Α	capability.
В	Organization for this capability is provided
D	entirely by other jurisdictions

Figure D.1-3: Equipment Solution Area Ratings

Score	Description
1	Very little (0-20%) of the required
1	equipment exists.
2	Little (21-40%) of the required equipment
2	exists.
3	Much (41-60%) of the required equipment
3	exists.
4	Most (61-80%) of the required equipment
4	exists.
5	All or nearly all (81-100%) of the required
5	equipment exists; sustainment needs only.
۸	Equipment is not relevant for this
Α	capability.
D	Equipment for this capability is provided
В	entirely by other jurisdictions.

Figure D.1-4 Training Solution Area Ratings

Rating	Description
1	Very few (0-20%) relevant persons have
1	completed all relevant courses.
2	Few (21-40%) relevant persons have
2	completed all relevant courses.
3	Many (41-60%) relevant persons have
3	completed all relevant courses.
4	Most (61-80%) relevant persons have
4	completed all relevant courses.
5	All or nearly all (81-100%) relevant persons
)	have completed all relevant courses.
Α	Training is not required for this capability.
В	Training for this capability is provided
В	entirely by other jurisdictions.

Figure D.1-5 Exercise Solution Area Ratings

	Solution Area Ratings
Rating	Description
1	No exercises or real-world operations have been conducted within the last two years.
2	Limited exercises or real-world operations have been conducted within the last two years; little documentation exists.
3	Exercises or real-world operations have been conducted within the last two years; AAR/IP documented.
4	Exercises or real-world operations have been conducted within the last two years; AAR/IP documented; most corrective actions have been implemented.
5	Exercises or real-world operations have been conducted within the last two years, including coordination with higher levels of government; AAR/IP documented; all corrective actions have been implemented.
Α	Exercises are not relevant for this capability.
В	Exercises for this capability are provided entirely by other jurisdictions.

4. Assignment of a low, medium, or high relative priority level to each core capability based on its impact on preparedness, and the degree to which state plans to build and/or sustain the capability in the near-term. The table in Figure D.1-6 lists the priority levels.

D.1-6: Core Capability Priority Definitions

Priority Level	Definition
Low	The capability impacts actions and requirements of a more long-term nature.
Medium	The capability impacts emergency care and effective response after immediate protection of lives
iviedium	and establishment of a safe and secure environment have been accomplished.
Himb	The capability impacts the immediate protection of lives and establishment of a safe and secure
High	environment.

D.2 Core Capabilities Ratings

The table in Figure D.2-1 lists each of the 32 core capabilities and their ratings for 2016 and the priority level of each core capability. The priority levels have remained unchanged since 2012 and are based on FEMA guidance. The table also lists the ratings averages for 2016 and each year going back to 2012.

FFOR OFFICIAL USE ONLY State of Wisconsin

D.2-1: Core Capabilities Ratings

	D.L 1. CO		1		,					1	
Core Capability	Priority	Planning	Organization	Equipment	Training	Exercise	2016 Average	2015 Average	2014 Average	2013 Average	2012 Average
Planning	High	4	5	5	4	4	4.4	4.4	4.2	4.2	4.2
Public Information and Warning	High	3	4	5	5	4	4.2	4.0	4.0	4.0	3.8
Operational Coordination	High	4	4	3	4	4	3.8	3.8	3.4	3.2	2.6
Intelligence and Information Sharing	High	3	5	5	4	4	4.2	4.2	4.0	4.0	3.8
Interdiction and disruption	High	3	4	3	3	3	3.2	3.2	3.0	3.0	2.8
Screening, Search and Detection	Medium	4	4	3	4	4	3.8	3.8	3.6	3.6	3.4
Forensics and Attribution	Medium	3	2	3	2	3	2.6	2.6	2.6	2.4	2.4
Access Control and Identity Verification	High	4	4	3	4	4	3.8	3.4	3.2	3.0	3.0
Cybersecurity	High	4	3	3	5	2	3.4	3.4	2.8	2.6	2.2
Physical Protective Measures	Medium	4	4	4	4	4	4	4.0	4.0	4.0	4.0
Risk Management for Protection Programs and Activities	Medium	4	4	5	4	Α	4.25	4.3	4.25	4.25	4.3
Supply Chain Integrity and Security	High	4	3	3	3	4	3.4	3.4	3.4	3.2	2.0
Community Resilience	Medium	4	4	Α	4	4	4.0	3.6	3.4	3.0	2.6
Long-term Vulnerability Reduction	Medium	4	4	5	5	Α	4.5	4.5	4.5	4.25	4.0
Risk and Disaster Resilience Assessment	Low	5	5	Α	4	Α	4.7	4.3	4.0	4.0	3.7
Threats and Hazard Identification	Medium	5	5	Α	5	5	5.0	5.0	5.0	5.0	5.0
Infrastructure System	Medium	4	4	4	3	2	3.4	3.4	3.4	2.6	2.4
Critical Transportation	High	3	5	5	2	2	3.4	3.4	3.4	3.4	3.4
Environmental Response/Health and Safety	Medium	4	4	5	3	3	3.8	3.8	3.8	3.8	3.8
Fatality Management Services	Medium	4	3	3	3	3	3.2	3.2	2.8	2.8	2.0
Fire Management and Suppression ²⁶	High	4	5	5	5	4	4.6	n/a	n/a	n/a	n/a
Logistics and Supply Chain Management ²⁷	High	3	4	4	4	4	3.8	3.8	3.6	3.0	2.2
Mass Care Services	Medium	3	3	3	3	3	3.0	3.0	2.6	2.6	2.0
Mass Search and Rescue Operations	High	4	4	5	4	5	4.4	4.4	4.4	5.0	4.0
On-scene Security, Protection, and Law Enforcement	Medium	3	4	3	3	4	3.4	3.4	3.4	3.2	3.0
Operational Communications	High	4	4	5	4	4	4.2	4.2	4.2	4.0	3.8
Public Health, Healthcare, and Emergency Medical Services	High	3	4	4	4	4	3.8	3.8	3.8	3.6	2.8

Fire Management and Suppression is a new core capability for 2016.
 Logistics and Supply Chain Management formerly designated as Public and Private Services and Resources.

Core Capability	Priority	Planning	Organization	Equipment	Training	Exercise	2016 Average	2015 Average	2014 Average	2013 Average	2012 Average
Situational Assessment	High	5	4	5	5	4	4.6	4.6	4.4	4.2	3.6
Economic Recovery	Medium	4	4	Α	4	3	3.75	4.0	4.0	3.8	3.8
Health and Social Services	Medium	4	3	3	4	3	3.4	3.4	2.4	2.0	1.5
Housing	Low	3	3	Α	1	1	2.0	2.0	2.0	2.0	1.5
Natural and Cultural Resources	Low	5	5	Α	5	5	5.0	5.0	5.0	5.0	5.0

D-5

Source: Wisconsin Emergency Management

Color Key				
POETE	Average Rating			
Capability Rating Improvement	1.0 – 1.9			
Over Previous Year	2.0 – 2.9			
	3.0 – 3.9			
	4.0 – 4.9			
	5.0			

The table indicates that the state has made consistent progress building and sustaining capabilities across all core capabilities.

D.2.1 Average Ratings

This use of a consistent assessment methodology since 2012 has provided the opportunity for informative comparisons year-to-year. The table in Figure D.2.1-1 summarizes the average core capability ratings from 2012 to 2016. Please note, a rating of "3" generally represents the minimum capacity necessary to effectively accomplish a core capability.

Figure D.2.1-1: Summary Average Core Capability Ratings

Rating	2012	2013	2014	2015	2016
1.0 - 1.9	2	0	0	0	0
2.0 – 2.9	11	7	6	2	2
3.0 – 3.9	11	12	12	16	16
4.0 – 4.9	5	9	11	11	12
5.0	2	3	2	2	2

Source: Wisconsin Emergency Management

The SPR process indicates that Wisconsin is generally well prepared for threats and hazards of various types that occur somewhat frequently such as tornadoes and floods. However, it also identified areas for improvement in preparedness for events that occur infrequently or of such a catastrophic nature that their occurrence would significantly overwhelm the capabilities of local authorities.

D.3 Rating Assessment

The core capability ratings in each of the solution areas are based on the state's current capability levels compared to the capability targets identified in the THIRA. A brief summary of completed and on-going preparedness activities is provided as context for the rating. The summary may also include the state's perceived Federal government roles for filling capability gaps in the future.

The table in Figure D.3-1 summarizes the 2016 ratings for the planning core capability.

Figure D.3-1: 2016 Planning Ratings

Solution Area	2016 Rating	Context for Rating
Planning	4	The Wisconsin Emergency Response Plan (WERP), Second generation approved in 2015. WERP currently under annual review for minor annual update; comprehensive review and update scheduled for 2017. Wisconsin Recovery Plan completed May 2016. Wisconsin Hazard Mitigation Plan update approved by FEMA December 2016.
Organization	5	WEM continues to maintain and use organizational structures for engaging the whole community as appropriate including Emergency Support Functions (ESFs), Recovery Support Functions (RSFs), the Wisconsin Homeland Security Council, the Comprehensive Response Group, the Wisconsin Hazard Mitigation Silver Jackets Team, the Wisconsin Voluntary Organizations Active in Disasters (WI VOAD), and the Public-Private Partnership.

Solution Area	2016 Rating	Context for Rating
Equipment	5	New SEOC completed and equipped. SEOC manual and position specific task books completed.
Training	4	SEOC position specific, WEM 101, and ESF training materials developed and trainings executed.
Exercise	4	SEOC exercises conducted including Miles Paratus (large scale) and REP drills. Real world SEOC elevations including July for severe storms and flooding and September for severe storms, flooding, and mudslides.
Average	4.4	

Source: Wisconsin Emergency Management

The table in Figure D.3-2 summarizes the 2016 ratings for the public information and warning core capability.

Figure D.3-2: 2016 Public Information and Warning Ratings

Solution Area	2016 Rating	Context for Rating
Planning	3	Complete and up-to-date Communications and Warning Emergency Support Function (ESF), External Affairs ESF, and Joint Information Center (JIC) plan.
Organization	4	Established contracts with three vendors to provide 24-hour written and telephone translation services in the SEOC if needed. Wisconsin Agro Security Resource Network (WARN) provides a well-developed industry contacts for the agriculture sector.
Equipment	5	New SEOC completed with dedicated space and equipment for Communications and Warning, Geographic Information Systems, Wisconsin National Guard (WI NG) Joint Operations Center (JOC), Network Operations, Public Information Office, and Wisconsin Disaster Information Assistance Line (WI-DIAL).
Training	5	SEOC position specific, WEM 101, and ESF training materials developed and trainings executed. Social Media assistance provided by Madison College. Social media breakout sessions to be held at the 2017 Governor's Conference on Emergency Management.
Exercise	4	SEOC exercises conducted including Miles Paratus (large scale) and REP drills. Real world SEOC elevations including July for severe storms and flooding and September for severe storms, flooding, and mudslides.
Average	4.2	

Source: Wisconsin Emergency Management

The table in Figure D.3-3 summarizes the 2016 ratings for the public operational coordination core capability.

Figure D.3-3 Operational Coordination Ratings

Solution Area	2016 Rating	Context for Rating
Planning	4	The Wisconsin Emergency Response Plan (WERP), Second generation approved in 2015. WERP currently under annual review for minor annual update; comprehensive review and update scheduled for 2017.
Organization	4	WEM continues use the Incident Command System (ICS) structure as appropriate. WEM also continues to maintain and support the Emergency Support Functions (ESFs) and Recovery Support Functions (RSFs) structure.

Solution Area	2016 Rating	Context for Rating
Equipment	3	New SEOC completed and equipped.
Training	4	SEOC position specific, WEM 101, and ESF training materials developed and trainings executed. WEST procedures developed and training begun. IMT members attending position specific courses.
Exercise	4	SEOC exercises conducted including Miles Paratus (large scale) and REP drills. Real world SEOC elevations including July for severe storms and flooding and September for severe storms, flooding, and mudslides. WEST exercised.
Average	3.8	

Source: Wisconsin Emergency Management

The table in Figure D.3-4 summarizes the 2016 ratings for the intelligence and information sharing core capability.

Figure D.3-4 Intelligence and Information Rating

Solution Area	2016 Rating	Context for Rating
Planning	3	The WERP includes an approved Cyber Annex. The Cyber Annex is currently being updated. A Wisconsin Cyber Disruption Response Strategy has been developed. Currently working with a public and private team representing the CI/KR sector.
Organization	5	WEM continues use the Incident Command System (ICS) structure as appropriate. WEM also continues to maintain and support the Emergency Support Functions (ESFs) and Recovery Support Functions (RSFs) structure. The Wisconsin Department of Justice (DOJ)/Wisconsin Statewide Intelligence Center (WSIC) serves as the state's primary fusion center gathering information from numerous sources and procedures and produces intelligence products.
Equipment	5	New SEOC completed and equipped. WSIC complete, equipped, and operational.
Training	4	Threat Liaison Officers (TLOs) are trained in 72 of 72 Wisconsin counties, 60% of all law enforcement officers are trained in NSI and suspicious activity reporting (SAR), and implementation of "See Something, Say Something" program statewide.
Exercise	4	SEOC exercises conducted including Miles Paratus (large scale) and REP drills. Real world SEOC elevations including July for severe storms and flooding and September for severe storms, flooding, and mudslides. On-going participation of analyst in exercises.
Average	4.2	

Source: Wisconsin Emergency Management

The table in Figure D.3-5 summarizes the 2016 ratings for the interdiction and disruption core capability.

Figure D.3-5 Interdiction and Disruption Rating

Solution Area	2016 Rating	Context for Rating
Planning	3	Current Emergency Police Services (EPS) Standard Operating Procedures (SOPs). The WERP includes an approved Public Safety and Security Emergency Support Function (ESF). The Public Safety and Security ESF is currently being reviewed.
Organization	4	Eight SWAT teams and five police bomb squads are incorporated into the Aligned Law Enforcement Response Teams (ALERT) system have regional responsibilities.
Equipment	3	WSIC complete, equipped, and operational.

Solution Area	2016 Rating	Context for Rating
Training	3	Threat Liaison Officers (TLOs) are trained in of 72 Wisconsin counties, % of all law enforcement agencies are trained in NSI and suspicious activity reporting (SAR), and implementation of "See Something, Say Something" program statewide.
Exercise	3	Real world operation locally and across the country has generated actual deployments, equipment fielding, and training.
Average	3.2	

Source: Wisconsin Emergency Management

The table in Figure D.3-6 summarizes the 2016 ratings for the screening, search, and detection core capability.

Figure D.3-6 Screening, Search, and Detection Rating

Solution Area	2016 Rating	Context for Rating
Planning	4	State and local plans for BioWatch and Biosense response are in place. Wisconsin State Laboratory of Hygiene (WSLH) has an alerting, response and surge plan. The State has an unknown substance protocol for first responders. Planning continues to standardize equipment among all regional HAZMAT teams to monitor air quality at hazardous materials incidents using remote instrumentation. DATCP has plans in place to respond to incidents involving animal health. Additionally planning efforts have been strengthened in response to the 2015 avian influenza incident.
Organization	4	WSLH coordinates the Wisconsin Laboratory Response Network (LRN) with over 130 participating labs statewide. WI DHS maintains a network of influenza sentinel clinicians. WSLH and WI DHS have 24/7 on-call staff in place. Coordination between DHS and DATCP has increased in response to real world events involving avian influenza.
Equipment	3	WSLH, DATCP maintain lab equipment for testing for biological, chemical and animal specimens. National Guard Civil Support Team has a mobile lab.
Training	4	On-Demand training is available of the unknown substance protocol and specimen collection and packaging. WSLH and WI DHS provide annual seminars on current issues. WSLH and WI DHS publish guidance during outbreaks.
Exercise	4	WSLH participates in CDC bioterrorism and chemical surge testing exercises annually. DATCP continues to conduct secure milk supply exercises throughout the state.
Average	3.8	

Source: Wisconsin Emergency Management

The table in Figure D.3-7 summarizes the 2016 ratings for the forensics and attribution core capability.

Figure D.3-7 Forensics and Attribution Rating

		<u> </u>
Solution Area	2016 Rating	Context for Rating
Planning	3	Current Emergency Police Services (EPS) Standard Operating Procedures (SOPs). The WERP includes an approved Public Safety and Security Emergency Support Function (ESF). The Public Safety and Security ESF is currently being reviewed.
Organization	2	The Wisconsin Department of Justice (DOJ)/Wisconsin Statewide Intelligence Center (WSIC) serves as the state's primary fusion center gathering information from

		numerous sources and procedures and produces intelligence products.
Equipment	3	WSIC complete, equipped, and operational.
Training	2	A wide variety of relevant training opportunities are available for local and state law enforcement. WEM in conjunction with law enforcement has developed established statewide law enforcement qualifications.
Exercise	3	Real world operation locally and across the country has generated actual deployments, equipment fielding, and training.
Average	2.6	

Source: Wisconsin Emergency Management

The table in Figure D.3-8 summarizes the 2016 ratings for the access control and identity verification core capability.

Figure D.3-8 Access Control and Identity Verification Rating

Solution Area	2016 Rating	Context for Rating
Planning	4	The policies and procedures for a statewide credentialing system have been established.
Organization	4	A statewide credentialing system has been developed and implemented. Statewide law enforcement qualifications have been completed. Additional qualifications are being developed.
Equipment	3	The majority of state credentialing equipment is in place. Many local agencies have also purchased printers and scanners and other jurisdictions have established partnerships with adjacent jurisdictions. An increasing number of agencies are issuing credentials to their employees.
Training	4	WEM continues to present briefings on the statewide credentialing system.
Exercise	4	SEOC exercises conducted including Miles Paratus (large scale) and REP drills. Real world SEOC elevations including July for severe storms and flooding and September for severe storms, flooding, and mudslides. Specific training continues at the state level.
Average	3.8	

Source: Wisconsin Emergency Management

The table in Figure D.3-9 summarizes the 2016 ratings for the cybersecurity core capability.

Figure D.3-9 Cybersecurity Rating

Solution Area	2016 Rating	Context for Rating
Planning	4	Wisconsin Emergency Response Plan's Cyber Annex is current. The Wisconsin Cyber Disruption Response Strategy has been developed working with a public and private team representing the 16 Critical Infrastructure Key Resource sectors. The next steps will be to establish governance and utilize the strategy to develop the plan.
Organization	3	Governor Walker continues to host the annual Wisconsin Cyber Summit with State, Local and Federal Partners. The summits have led to the formation of working groups to consider cyber in multiple domains. The Division of Enterprise Technology (DET), Bureau of Security's vacancies have been filled adding additional security operations and security audit/compliance resources. The DET, in conjunction with Wisconsin Emergency Management has created three SLTT cyber response teams to grow cyber capabilities. The initial goal is to have three teams of 10. Currently 19 members have been recruited from multiple Wisconsin communities.

Equipment	3	The Bureau of Security in the Division of Enterprise Technology (DET) has employed open source solutions for security monitoring and incident response. These have proved effective; however, staff intensive. To augment this solution, DET has contracted for managed security services. This service includes Security Operations Center coverage 24 hours a day as well as vendor managed equipment for security incident monitoring and alerting.
Training	5	Partnered with Merit Networks, a non-profit organization in Michigan to provide training for SLTT response team members.
Exercise	2	In 2015 DOA DET participated in 2 exercises with the SLTT teams and the National Guard cyber team utilizing Merit Networks' Cyber Range.
Average	3.4	

Source: Wisconsin Emergency Management

The table in Figure D.3-10 summarizes the 2016 ratings for the physical protective measures core capability.

Figure D.3-10 Physical Protective Measures Rating

Solution Area	2016 Rating	Context for Rating
Planning	4	Planning is a part of most all of the large-scale events held in the state such as professional sporting events, large indoor/outdoor concerts, and other events. The EPS Coordinator has been integrated into the planning and coordination of these large scale events, working closely in support of local law enforcement agencies.
Organization	4	County Sheriffs and Police Chiefs have formalized their mutual aid procedures through MOU's with their regional agencies.
Equipment	4	This capability is generally strong in larger jurisdictions where large-scale events are commonplace, but limited for smaller law enforcement agencies that infrequently handle large special events; Additionally, larger agencies are resourced to maintain necessary equipment and training while smaller agencies lack such capability.
Training	4	This capability is generally strong in larger jurisdictions where large-scale events are commonplace, but limited for smaller law enforcement agencies that infrequently handle large special events; Additionally, larger agencies are resourced to maintain necessary equipment and training while smaller agencies lack such capability.
Exercise	4	Several communities have planned and exercised "active Shooter" scenarios with their school districts. In 2015, EPS has participated in multi-level exercises to include Hostile action Based (HAB) events and one civil unrest scenario.
Average	4	

Source: Wisconsin Emergency Management

The table in Figure D.3-11 summarizes the 2016 ratings for the physical protective measures core capability.

Figure D.3-11 Risk Management for Protection Programs and Activities Rating

Solution Area	2016 Rating	Context for Rating
Planning	4	The Wisconsin Emergency Response Plan (WERP), Second generation approved in 2015. The WERP Critical Infrastructure and Key Resources (CI/KR) annex is current. WERP currently under annual review for minor annual update; comprehensive review and update scheduled for 2017. State Critical Facilities addressed in the updated Wisconsin Hazard Mitigation Plan.

Organization	4	A state critical infrastructure workgroup exists under the Homeland Security Council to coordinate activities. Public-Private utility partnership has increased situational awareness and planning for power outage scenarios. EPCRA inspector training and certification program is in place. Both WEM and DOJ have staff assigned with partial responsibility for CI/KR.
Equipment	5	State critical infrastructure list has 400+ high-risk sites identified. State Critical Facilities list revised for updated Wisconsin Hazard Mitigation Plan.
Training	4	This capability is generally strong in larger jurisdictions where protection programs and activities are more commonplace, but limited for smaller law enforcement agencies that infrequently handle large special events; Additionally, larger agencies are resourced to maintain necessary equipment and training while smaller agencies lack such capability.
Exercise	Α	Exercises are not relevant for this capability.
Average	4.25	

Source: Wisconsin Emergency Management

The table in Figure D.3-12 summarizes the 2016 ratings for the supply chain integrity and security core capability.

Figure D.3-12 Supply Chain Integrity and Security Rating

Solution Area	2016 Rating	Context for Rating
Planning	4	State energy assurance plan completed. WI DHS has a medical countermeasure distribution plan with private sector partners for warehousing and transportation.
Organization	3	Key partners with Rx Respond and major medical suppliers to monitor the medical and pharmaceutical supply chain.
Equipment	3	Key partners maintain a medical surge, PPE, antibiotic and antiviral stockpiles.
Training	3	WI DHS provides training for public health and is developing training for hospitals.
Exercise	4	WI DHS has completed hospital PPE distribution and regional coordination exercises.
Average	3.4	

Source: Wisconsin Emergency Management

The table in Figure D.3-13 summarizes the 2016 ratings for the community resilience capability.

Figure D.3-13 Community Resilience Rating

Solution Area	2016 Rating	Context for Rating
Planning	4	The state prepares an annual Threat and Hazard Identification and Risk Assessment (THIRA) and State Preparedness Report (SPR). Wisconsin has a newly adopted (December 2016) enhanced hazard mitigation plan. Currently 69 counties have approved hazard mitigation plans and three counties are in the process of developing plans. Student Tools for Emergency Preparedness (STEP) program implementation and the implementation of WARN – Wisconsin Agro-security Resource Network has greatly increased public preparedness and local/regional collaboration.
Organization	4	WEM continues to maintain and use organizational structures for engaging the whole community as appropriate including Emergency Support Functions (ESFs), Recovery Support Functions (RSFs), the Wisconsin Homeland Security Council, the

		Comprehensive Response Group, the Wisconsin Hazard Mitigation Silver Jackets Team, the Wisconsin Voluntary Organizations Active in Disasters (WI VOAD), and the Public-Private Partnership. Public-private partnerships are active in SE, EC, WC, and SW regions.
Equipment	Α	Equipment is not relevant for this capability.
Training	4	Planning workshops are held annually to assist local jurisdictions; most county emergency managers have attended but some still need this training. In addition G-393 – Introduction to Hazard Mitigation for Emergency Managers, is offered twice a year. Preparedness staff has held Public-Private Partnership Workshops and Business Emergency Operations Center training. In 2015 DATCP conducted in each WEM region the following workshops: Agriculture Movement Permitting; National Veterinary Stockpile Animal Disease; and Animal Disease Handling.
Exercise	4	WEM elevated the SEOC for the national GridEx exercise as an opportunity to enhance exercise play and coordination with the electrical energy sector.
Average	4.0	

Source: Wisconsin Emergency Management

The table in Figure D.3-14 summarizes the 2016 ratings for the long-term vulnerability reduction capability.

Figure D.3-14 Long-Term Vulnerability Reduction Rating

Solution Area	2016 Rating	Context for Rating
Planning	4	The state prepares an annual Threat and Hazard Identification and Risk Assessment (THIRA) and State Preparedness Report (SPR). Wisconsin has a newly adopted (December 2016) enhanced hazard mitigation plan. Currently 69 counties have approved hazard mitigation plans and three counties are in the process of developing plans. Student Tools for Emergency Preparedness (STEP) program implementation and the implementation of WARN – Wisconsin Agro-security Resource Network has greatly increased public preparedness and local/regional collaboration.
Organization	4	WEM continues to maintain and use organizational structures for engaging the whole community as appropriate including Emergency Support Functions (ESFs), Recovery Support Functions (RSFs), the Wisconsin Homeland Security Council, the Comprehensive Response Group, the Wisconsin Hazard Mitigation Silver Jackets Team, the Wisconsin Voluntary Organizations Active in Disasters (WI VOAD), and the Public-Private Partnership. Public-private partnerships are active in SE, EC, WC, and SW regions. Ready Wisconsin campaign and new winter awareness campaign initiatives improve public awareness of mitigation strategies.
Equipment	5	Advances in the use of social media and automated warning systems are progressing. WEM partners with the National Guard and UW Madison to enhance our social media presence.
Training	5	Planning workshops are held annually to assist local jurisdictions; most county emergency managers have attended but some still need this training. In addition G-393 – Introduction to Hazard Mitigation for Emergency Managers, is offered twice a year. Preparedness staff has held Public-Private Partnership Workshops and Business Emergency Operations Center training. In 2015 DATCP conducted in each WEM region the following workshops: Agriculture Movement Permitting; National Veterinary Stockpile Animal Disease; and Animal Disease Handling.
Exercise	А	Exercises are not relevant for this capability.
Average	4.5	

Source: Wisconsin Emergency Management

The table in Figure D.3-15 summarizes the 2016 ratings for the risk and disaster resilience assessment capability.

Figure D.3-15 Risk and Disaster Resilience Assessment Rating

Solution Area	2016 Rating	Context for Rating
Planning	5	The state prepares an annual Threat and Hazard Identification and Risk Assessment (THIRA) and State Preparedness Report (SPR). Wisconsin has a newly adopted (December 2016) enhanced hazard mitigation plan. Currently 69 counties have approved hazard mitigation plans and three counties are in the process of developing plans. Student Tools for Emergency Preparedness (STEP) program implementation and the implementation of WARN – Wisconsin Agro-security Resource Network has greatly increased public preparedness and local/regional collaboration.
Organization	5	WEM continues to maintain and use organizational structures for engaging the whole community as appropriate including Emergency Support Functions (ESFs), Recovery Support Functions (RSFs), the Wisconsin Homeland Security Council, the Comprehensive Response Group, the Wisconsin Hazard Mitigation Silver Jackets Team, the Wisconsin Voluntary Organizations Active in Disasters (WI VOAD), and the Public-Private Partnership. Public-private partnerships are active in SE, EC, WC, and SW regions.
Equipment	Α	Equipment is not relevant for this capability.
Training	4	Planning workshops are held annually to assist local jurisdictions; most county emergency managers have attended but some still need this training. In addition G-393 – Introduction to Hazard Mitigation for Emergency Managers, is offered twice a year. Preparedness staff has held Public-Private Partnership Workshops and Business Emergency Operations Center training. In 2015 DATCP conducted in each WEM region the following workshops: Agriculture Movement Permitting; National Veterinary Stockpile Animal Disease; and Animal Disease Handling.
Exercise	А	Exercises are not relevant for this capability.
Average	4.7	

Source: Wisconsin Emergency Management

The table in Figure D.3-16 summarizes the 2016 ratings for the threats and hazards identification assessment capability.

Figure D.3-16 Threats and Hazards Identification Rating

Solution Area	2016 Rating	Context for Rating	
Planning	5	The state prepares an annual Threat and Hazard Identification and Risk Assessm (THIRA) and State Preparedness Report (SPR). Wisconsin has a newly adopted (December 2016) enhanced hazard mitigation plan. Currently 69 counties have approved hazard mitigation plans and three counties are in the process of developing plans.	
Organization	5	WEM continues to maintain and use organizational structures for engaging the whole community as appropriate including Emergency Support Functions (ESFs), Recovery Support Functions (RSFs), the Wisconsin Homeland Security Council, the Comprehensive Response Group, the Wisconsin Hazard Mitigation Silver Jackets Team, the Wisconsin Voluntary Organizations Active in Disasters (WI VOAD), and the Public-Private Partnership. Public-private partnerships are active in SE, EC, WC, and SW regions. The state will continue to assist local jurisdictions in this area by	

		providing comprehensive analysis support, targeted resources where urgently
		needed, and by fostering cooperation and collaboration, as necessary.
Equipment	Α	Equipment is not relevant for this capability.
Training	5	Planning workshops are held annually to assist local jurisdictions; most county emergency managers have attended but some still need this training. In addition G-393 – Introduction to Hazard Mitigation for Emergency Managers, is offered twice a year. Preparedness staff has held Public-Private Partnership Workshops and Business Emergency Operations Center training. In 2015 DATCP conducted in each WEM region the following workshops: Agriculture Movement Permitting; National
		Veterinary Stockpile Animal Disease; and Animal Disease Handling.
Exercise	5	This has been validated through extensive exercises with various high-risk facilities.
Average	5.0	

Source: Wisconsin Emergency Management

The table in Figure D.3-17 summarizes the 2016 ratings for the Infrastructure Systems capability.

Figure D.3-17 Infrastructure Systems Rating

Solution Area	2016 Rating	Context for Rating
Planning	The Wisconsin Emergency Response Plan (WERP), Second generation appr 2015. The WERP Critical Infrastructure and Key Resources (CI/KR) annex is WERP currently under annual review for minor annual update; comprehen- and update scheduled for 2017. State Critical Facilities addressed in the up Wisconsin Hazard Mitigation Plan. Comprehensive Response System (CRS) plan and Phased Synchronization Matrix are under development. Some ite addressed in these documents are Public Works, Building and Bridge Inspe Mutual Aid (This would also include items such as cemeteries, water and so distribution). Also underway is refueling planning.	
Organization	4	WEM manages the Comprehensive Response Group (CRG) a multi-agency and private partner working group to create and maintain the plans, to address response needs, primarily in the first 72 hours of a THIRA centric event.
Equipment	4	Grant applications have been received by Public Service Commission for generation wiring at refueling locations, the grant process is underway.
Training	3	This capability is generally strong in larger jurisdictions but limited for smaller jurisdictions. Additionally, larger jurisdictions generally have greater resources to maintain necessary equipment and training while smaller agencies lack such capacity.
Exercise	2	SEOC exercises conducted including Miles Paratus (large scale) and REP drills. Real world SEOC elevations including July for severe storms and flooding and September for severe storms, flooding, and mudslides. Wisconsin participated in National Grid Ex exercise.
Average	3.4	

Source: Wisconsin Emergency Management

The table in Figure D.3-18 summarizes the 2016 ratings for the critical transportation capability.

Figure D.3-18 Critical Transportation Rating

Solution Area	2016 Rating	Context for Rating
Planning	3	Localized planning and exercising has occurred regarding this capability, with detailed traffic evacuation route guidance plans for the 12 largest regions in the

		state. Limited work has been done regionally or statewide to establish critical route priorities for clearing, repair, and securing the needed resources for traffic evacuation. County guidance for debris management has been developed.
		A statewide network of bridge inspectors, who have been assigned regional
Organization	5	responsibility, has been established. A statewide Public Works mutual aid agreement is being developed.
		The majority of equipment for this capability is provided by other jurisdictions.
Equipment	5	Additional equipment available from other state agencies, National Guard, and the private sector.
Training	2	Additional training for relevant personnel needed for this capability.
Exercise	2	Localized exercising has occurred regarding this capability. The capability has not been exercised in the 12 largest regions in any catastrophic event scenario. Limited discussions have occurred at some tabletop exercises.
Average	3.4	

Source: Wisconsin Emergency Management

The table in Figure D.3-19 summarizes the 2016 ratings for the environmental response/health and safety capability.

Figure D.3-19 Environmental Response/Health and Safety Rating

Solution Area	2016 Rating	Context for Rating
Planning	4	Planning and compliance requirements are under revision. Relevant agencies continue to focus efforts on specific areas such as integrating Toxic Release Inventory (TRI) into ongoing preparedness and response plans, developing plans for large-scale animal disposal, and encouraging routine well testing for contamination.
Organization	4	SE Wisconsin's BIOWATCH air emissions and daily monitoring system implemented. Signed MOUs with the State of Minnesota for HazMat Team assistance.
Equipment	5	The Department of Health Services; Department of Natural Resources; Department of Agricultural, Trade and Consumer Protection, and other state and federal agencies maintain all, or nearly all, required equipment for this capability. WEM continues to collaborate and coordinate with federal, state, and local entities to understand and address potential equipment needs.
Training	3	On-going training of eight regional and 40 county HazMat teams. Wisconsin's two Type I HazMat teams are trained to respond to CBRN incidents. The six Type II and 12 Type III teams are also trained with some CBRN capacity.
Exercise	3	An annual full-scale exercise is held for nuclear power plant incidents. There is a need to adequately replicate scenarios so that exercises generate useful lessons learned, such as whether local entities have adequate chlorine bleach and other disinfectants on hand. There also is a need for additional partnered activity during exercises to foster cooperation and collaboration.
Average		

Source: Wisconsin Emergency Management

The table in Figure D.3-20 summarizes the 2016 ratings for the fatality management services capability.

Figure D.3-20 Fatality Management Services Rating

				<u> </u>
Solution	2016	Context for Rating		
Area	Rating		Cont	lext for Rating

Planning	4	4 Wisconsin DHS has developed a Fatality Management Plan.	
Organization	3	Wisconsin DHS serves as lead agency for this capability.	
Fauinment	3	The Dane County Fatality Incident Response Support Team maintains two storage	
Equipment		trailers available for deployment statewide.	
Training	3	Wisconsin DHS provides Fatality Management 101 and 201 Training. They have also	
Training		provided train-the-trainer training for Family Assistance Centers.	
Exercise	2	Regional joint public health and hospital exercises will contain fatality management	
Exercise	3	as an objective.	
Average			

Source: Wisconsin Emergency Management

The table in Figure D.3-21 summarizes the 2016 ratings for the fire management and suppression capability.

Figure D.3-21 Fire Management and Suppression Rating

Solution	2016	Context for Rating
Area	Rating	Context for Ruting
Dlanning	4	Wisconsin Emergency Management in conjunction with the Wisconsin State Fire
Planning	4	Chiefs Association maintains a Wisconsin Fire Service Emergency Response Plan.
Organization	F	The Mutual Aid Box Alarm System-Wisconsin (MABAS-WI) serves as the operational
Organization	5	agency and provides a framework for Wisconsin fire services resource deployment.
		The majority of equipment for this capability is provided by local jurisdictions.
Equipment	5	Additional equipment available from the Wisconsin Department of Natural
		Resources (WDNR) and other agencies.
Training	F	The WDNR, Division of Forestry offers free wildland fire training to fire departments
Training	3	in cooperative fire protection areas of Wisconsin.
Exercise	4	This has been validated through numerous real world operations.
Average	4.6	

Source: Wisconsin Emergency Management

The table in Figure D.3-22 summarizes the 2016 ratings for the logistics and supply chain management capability.

Figure D.3-22 Logistics and Supply Chain Management Rating

Solution Area	2016 Rating	Context for Rating	
Planning	3	The WEM Community Preparedness Coordinator continues work on a public/private partnership program and build-out of a business emergency operations center.	
Organization	4	WEM continues to maintain and use organizational structures for engaging the whole community as appropriate including Emergency Support Functions (ESFs), Recovery Support Functions (RSFs), the Wisconsin Voluntary Organizations Active in Disasters (WI VOAD), and the Public-Private Partnership. WEM has developed and trained staff to serve in the Logistic section in the SEOC. Public-Private Partnership. Public-private partnerships are active in SE, EC, WC, and SW regions.	
Equipment	4	The majority of equipment for this capability is provided by other jurisdictions. Additional equipment available from other state agencies, National Guard, and the private sector. New SEOC completed and equipped.	

Training	4	Preparedness staff has held Public-Private Partnership Workshops and Business
Training		Emergency Operations Center training.
Exercise	4	SEOC exercises conducted including Miles Paratus (large scale) and REP drills. Real world SEOC elevations including July for severe storms and flooding and September for severe storms, flooding, and mudslides. Wisconsin participated in National Grid Ex exercise.
Average	4.5	

Source: Wisconsin Emergency Management

The table in Figure D.3-23 summarizes the 2016 ratings for the mass care services capability.

Figure D.3-23 Mass Care Services Rating

Solution Area	2016 Rating	Context for Rating
Planning	3	The Wisconsin Emergency Response Plan (WERP), Second generation approved in 2015. The WERP Mass Care, Emergency Assistance, Housing & Human Services Emergency Support Function (ESF) is current.
Organization	3	The Wisconsin Department of Health Services (WI DHS) and Wisconsin Department of Children & Families (DCF) are the lead coordinating agencies for this capability.
Equipment	3	National Mass Evacuation Tracking System (NMETS) kits obtained for Dane, Milwaukee, Kenosha, and Racine counties. Several Counties have shelter resources as does the American Red Cross and Salvation Army. The State Hospital Preparedness Program has cots. FNSS trailer and supplies acquired; FNSS and sheltering supplies strategically placed throughout the state.
Training	3	WI DHS has completed train the trainer for family assistance centers. Functional Assessment Service Teams (FAST) training is being conducted statewide. Basic and manager level shelter training available online, partners can access; annual Red Cross statewide training held for over 200 volunteers and staff.
Exercise	3	Statewide public health exercises were conducted and included mass care objectives.
Average	3.0	

Source: Wisconsin Emergency Management

The table in Figure D.3-24 summarizes the 2016 ratings for the mass search and rescue operations capability.

Figure D.3-24 Mass Search and Rescue Operation Rating

Solution Area	2016 Rating	Context for Rating
Planning	4	The Wisconsin Emergency Response Plan (WERP), Second generation approved in 2015. The WERP Search and Rescue Emergency Support Function (ESF) is current.
Organization	4	Wisconsin Task Force 1 (WI-TF1) can be currently considered as a Type 1 collapse search and rescue team. The team has addressed liability and malpractice coverage issues through episodic coverage and is moving forward with rostering physicians. Mutual Assistance Agreement in place with the State of Minnesota
Equipment	5	WI-TF1's equipment cache meets NIMS Type I US&R Task Force requirements. Transportation for WI-TF1 is acquired and mission capable.
Training	4	WI-TF1 members are attending FEMA structural specialist school. WI-TF1 continues to train quarterly and also completed a wide area search class.

Exercise	5	WI–TF1 participated in several exercises throughout the year, fostering cooperation and collaboration with military domestic operations partners. WI-TF1 has participated in operational readiness exercises and has proven self-sufficient for minimum 72-hour duration.
Average		

Source: Wisconsin Emergency Management

The table in Figure D.3-25 summarizes the 2016 ratings for the on-scene security, protection, and law enforcement capability.

Figure D.3-25 On-scene Security, Protection, and Law Enforcement Rating

Solution Area	2016 Rating	Context for Rating
Planning	3	The Wisconsin Emergency Response Plan (WERP), Second generation approved in 2015. The WERP Public Safety and Security Emergency Support Function (ESF) is current. Law Enforcement staff has been integrated into local, county and state Incident Management Teams (IMT) and are partners in Incident Action Plan (IAP) development.
Organization	4	WEM Emergency Police Services has reinforced its regional response structure with regional coordinators and alternates as well as substantial education of the coordinating staff on protocols necessary for an EPS response. The ALERT Program was moved from OJA to the EPS Program. This move has enhanced the coordination of stakeholders and has streamlined the coordination and notification process.
Equipment	3	The addition of new EOD robots and MRAP tactical vehicles into the state has greatly enhanced law enforcements ability to respond and mitigate complex situations while providing increased protections to first responder personnel.
Training	3	A wide variety of relevant training opportunities are available for local and state law enforcement. WEM in conjunction with law enforcement has developed established statewide law enforcement qualifications.
Exercise	4	There have been numerous real-world operations with AARs completed.
Average	3.4	

Source: Wisconsin Emergency Management

The table in Figure D.3-26 summarizes the 2016 ratings for the operational communications capability.

Figure D.3-26 Operational Communications Rating

Solution Area	2016 Rating	Context for Rating
Planning	4	On-going communication systems technology and procedural up-dates.
Organization	4	Over 90% of counties have demonstrated interoperability within 1 hour for routine incidents.
Equipment	5	Over 90% of emergency responder radios have access to a minimum of 10 mutual aid channels, and 66/72 counties have WISCOM connections in dispatch. Recent conversion to Smartphones and digital trunking radios along with new dispatch console with patching capabilities.
Training	4	Three additional WEM staff have been cross trained in SEOC communications equipment use and incidental procedures. Conducted annual review of WEM communications systems and associated training. WEM Duty Officers have been trained on sending IPAWS messages utilizing the DEMO site within the IPAW

		messaging tool.
Exercise	4	SEOC exercises conducted including Miles Paratus (large scale) and REP drills. Real world SEOC elevations including July for severe storms and flooding and September for severe storms, flooding, and mudslides.
Average	4.2	

Source: Wisconsin Emergency Management

The table in Figure D.3-27 summarizes the 2016 ratings for the public health, healthcare, and emergency medical services capability.

Figure D.3-27 Public Health, Healthcare, and Emergency Medical Services Rating

Solution Area	2016 Rating	Context for Rating
Planning	3	The Wisconsin Emergency Response Plan (WERP), Second generation approved in 2015. The WERP Health and Medical Services Emergency Support Function (ESF) is current. WI DHS has a surge expert panel currently working on this area.
Organization	4	The Wisconsin Department of Health Services serves as the lead coordinating agency. Regional healthcare coalitions have been established.
Equipment	4	Regional communication and some coordination are being integrated into response. WISCOM Radios are installed in all hospitals and installed in aeromedical equipment. WI DHS is piloting a patient tracking system with select EMS agencies across the state.
Training	4	WI DHS has completed train the trainer for family assistance centers. Functional Assessment Service Teams (FAST) training is being conducted statewide. Basic and manager level shelter training available online, partners can access; annual Red Cross statewide training held for over 200 volunteers and staff.
Exercise	4	They are also developing a medical countermeasure distribution and dispensing full-scale exercise in 2016.
Average	-	

Source: Wisconsin Emergency Management

The table in Figure D.3-28 summarizes the 2016 ratings for the situational assessment capability.

Figure D.3-28 Situational Assessment Rating

Solution Area	2016 Rating	Context for Rating
Planning	5	SEOC manual has been completed and was exercised. Position specific, ESF and liaison training has been developed and delivered.
Organization	4	WEM continues to work with the energy sector to establish procedures for providing situational assessment.
Equipment	5	WEM has created a HSIN site to be utilized as an additional tool to provide situational awareness. A standard SEOC Situation Report template has been finalized to provide easily digestible information to the command group and stakeholders.
Training	5	Continuing EOC and response software training being made available to private partners.
Exercise	4	SEOC exercises conducted including Miles Paratus (large scale) and REP drills. Real world SEOC elevations including July for severe storms and flooding and September for severe storms, flooding, and mudslides.
Average	4.6	

Source: Wisconsin Emergency Management

The table in Figure D.3-29 summarizes the 2016 ratings for the economic recovery capability.

Figure D.3-29 Economic Recovery Rating

Solution Area	2016 Rating	Context for Rating
Planning	4	The Wisconsin Recovery Plan completed in 2016. Wisconsin. The WEM Community Preparedness Coordinator continues work on a public/private partnership program and build-out of a business emergency operations center. Economic Development Corporation (WEDC) published a handbook on business recovery. DATCP has developed plans in cooperation with producers to minimize the economic impact to the Agricultural sector in an Agricultural related disaster.
Organization	4	WEM continues to maintain and use organizational structures for engaging the whole community as appropriate including Emergency Support Functions (ESFs), Recovery Support Functions (RSFs), the Wisconsin Voluntary Organizations Active in Disasters (WI VOAD), and the Public-Private Partnership. WEM has developed and trained staff to serve in the Logistic section in the SEOC. Public-Private Partnership. Public-private partnerships are active in SE, EC, WC, and SW regions. WEDC will Chair the Economic Subcommittee on the Wisconsin Recovery Task Force and the Economic Recovery Support Function (RSF).
Equipment	А	Equipment is not relevant for this capability.
Training	4	Preparedness staff has held Public-Private Partnership Workshops and Business Emergency Operations Center training.
Exercise	3	SEOC exercises conducted including Miles Paratus (large scale) and REP drills. Real world SEOC elevations including July for severe storms and flooding and September for severe storms, flooding, and mudslides.
Average		

Source: Wisconsin Emergency Management

The table in Figure D.3-30 summarizes the 2016 ratings for the health and social services capability.

Figure D.3-30 Health and Social Services Rating

Solution Area	2016 Rating	Context for Rating
Planning	4	The Wisconsin Emergency Response Plan (WERP), Second generation approved in 2015. The WERP Health and Medical Services Emergency Support Function (ESF) is current. WI DHS has a surge expert panel currently working on this area. Mass Care and Emergency Human Services Preparedness Guide has been completed.
Organization	3	The Wisconsin Department of Health Services serves as the lead coordinating agency. Establishing a Regional shelter strategy work group. Now able to deploy Functional Assessment Service Teams (FAST). Established and maintaining the Wisconsin Emergency Assistance Volunteer Registry (WEAVR) electronic registration system for health professionals.
Equipment	3	Regional communication and some coordination are being integrated into response. WISCOM Radios are installed in all hospitals and installed in aeromedical equipment. WI DHS is piloting a patient tracking system with select EMS agencies across the state.

Training	4	WI DHS conducted Disaster Behavioral Health training statewide. WI DHS has completed train the trainer for family assistance centers. Functional Assessment Service Teams (FAST) training is being conducted statewide. Basic and manager level shelter training available online, partners can access; annual Red Cross statewide training held for over 200 volunteers and staff.
Exercise	3	SEOC exercises conducted including Miles Paratus (large scale) and REP drills. Statewide public health exercises were conducted and included mass care objectives. Real world SEOC elevations including July for severe storms and flooding and September for severe storms, flooding, and mudslides.
Average	3.4	

Source: Wisconsin Emergency Management

The table in Figure D.3-31 summarizes the 2016 ratings for the housing capability.

Figure D.3-31 Housing Rating

Solution Area	2016 Rating	Context for Rating
Planning	3	The Wisconsin Recovery Plan completed in 2016. Wisconsin. Wisconsin Housing Strategy Plan completed along with new Mass Care Plan. Revisions of ESFs 6 and 14 complete.
Organization	3	The Wisconsin Recovery Task force has a subcommittee to specifically address housing.
Equipment	Α	Equipment is not relevant for this capability.
Training	1	There is a need to deliver applicable training to relevant persons.
Exercise	1	There is a need to provide applicable exercise opportunities to relevant persons.
Average		

Source: Wisconsin Emergency Management

The table in Figure D.3-32 summarizes the 2016 ratings for the natural and cultural resources capability.

Figure D.3-30 Natural and Cultural Resources Rating

Solution Area	2016 Rating	Context for Rating
Planning	5	Natural and cultural sites are well integrated in existing plans and programs. The Wisconsin Recovery Plan completed in 2016. The Wisconsin Emergency Response Plan (WERP), Second generation approved in 2015. The WERP Agricultural and Natural Resources Emergency Support Function (ESF) is current.
Organization	5	Well established relationships with the Department of Agriculture, Trade and Consumer Protection (DATCP), Department of Natural Resources (DNR), Wisconsin Historical Society, and other relevant entities.
Equipment	Α	Equipment is not relevant for this capability.
Training	5	A wide variety of training opportunities available to local and state responders, WEM program staff, and SEOC staff.
Exercise	5	SEOC exercises conducted including Miles Paratus (large scale) and REP drills. Real world SEOC elevations including July for severe storms and flooding and September for severe storms, flooding, and mudslides.
Average	5.0	

Source: Wisconsin Emergency Management

Appendix E. Probability Ranking Criteria

The table in Figure E-1 describes the criteria for a threat or hazard probability rank.

Figure E-1: Probability Ranking Criteria

Rank	Criteria
High	 The hazard has impacted the state annually, or more frequently The hazard is widespread, generally affecting regions or multiple counties in each event There is a reliable methodology for identifying events and locations
Medium	 The hazard impacts the state occasionally, but not annually The hazard is somewhat localized, affecting only relatively small or isolated areas when it occurs The methodology for identifying events is not well-established, or is not applied across the entire state
Low	 The hazard impacts the state occasionally, but not annually The hazard is somewhat localized, affecting only relatively small or isolated areas when it occurs The methodology for identifying events is not well-established, or is not applied across the entire state

Appendix F. Mitigation Potential Ranking Criteria

The table in Figure F-1 describes the criteria for a threat or hazard mitigation potential rank.

Figure F-1: Mitigation Potential Ranking Criteria

Rank	Rank Criteria	
Kalik		
	Methods for reducing risk from the hazard are technically reliable	
	The state or counties have experience in implementing mitigation measures	
	Mitigation measures are eligible under federal grant programs	
High	There are multiple possible mitigation measures for the hazard	
	The mitigation measures are known to be cost-effective	
	The mitigation measures protect lives and property for a long period of time, or are	
	permanent risk reduction solutions	
	Mitigation methods are established	
	The state or counties have limited experience with the kinds of measures that may	
	be appropriate to mitigate the hazard	
Medium	Some mitigation measures are eligible for federal grants	
	There is a limited range of effective mitigation measures for the hazard	
	Mitigation measures are cost-effective only in limited circumstances	
	Mitigation measures are effective for a reasonably long period of time	
	 Methods for reducing risk from the hazard are not well-established, are not proven reliable, or are experimental 	
	The state or counties have little or no experience in implementing mitigation	
	measures, and/or no technical knowledge of them	
	Mitigation measures are ineligible under federal grant programs	
Low	There is a very limited range of mitigation measures for the hazard, usually only one	
	feasible alternative	
	The mitigation measures have not been proven cost-effective and are likely to be	
	expensive compared to the magnitude of the damages caused by the hazard	
	The long-term effectiveness of the measure is not known, or is known to be relatively poor	

Appendix G. Impacts of Catastrophic Scenario Ranking Criteria

The table in Figure G-1 describes the ranking criteria for the impacts of the threat or hazard catastrophic scenario.

Figure G.1: Impacts of Catastrophic Scenario Ranking Criteria

Rank	Criteria
	Public
High	 Local and regional medical services are unable to manage the volume of injuries and fatalities. Mass evacuation, sheltering and care of displaced residents, medical patients, and vulnerable populations may be required.
Medium	 Local medical services are unable to manage the volume of injuries and fatalities. Patients require transportation to regional medical facilities outside of the affected areas. Local area evacuations, sheltering, and care of displaced residents, medical patients, and vulnerable populations may be required.
Low	 Local medical services are able to manage volume of injuries and fatalities but are near the limits of their capabilities. Only critically injured patients are diverted to facilities outside of the affected areas. Limited evacuations and sheltering may be required.
	Responders
High	 Significant federal and/or mutual aid from other states would be needed to meet the needs of the incident. Federal disaster declaration.
Medium	 Local and mutual aid resources would be fully committed and significant state assistance would be needed in order meet the needs of the incident. State disaster declaration.
Low	 Emergency response capabilities largely exist locally or through mutual aid to meet the needs of the incident, with minimal state assistance needed for some specialized resources. Local disaster declaration probable.
	COOP, including delivery of services
High	 State and local government unable to deliver mission essential functions for longer than 7 days, major long-term relocation of staff and business operations necessary.
Medium	 State or local government mission essential functions impacted for 1-7 days, temporary relocation of business operations may be necessary.
Low	State or local government mission essential functions impacted for less than 24 hours.
	Property, Facilities, and Infrastructure
High	 Widespread destruction of critical infrastructure, public and private property. More than 50% of buildings and infrastructure in affected area damaged or destroyed, and/or loss of lifeline services for more than 7 days. Public and Private property loss far exceeds federal minimums.
Medium	 Significant damage to critical infrastructure, public and private property over a large area. 10-50% of buildings and infrastructure in affected area damaged or destroyed in affected area, and/or loss of lifeline services for up to 1-7 days.

Low	 Significant damage to critical infrastructure, public and private property over a localized area. Up to 10% of buildings and infrastructure in affected area damaged, and/or loss of lifeline services for up to 24 hrs. 				
	Environment				
High	 Widespread environmental damage over a large geographic area affecting several communities across a region. Significant damage to an ecologically sensitive area such as wetlands, rivers, lakes, or public water supply. Damage requires massive long-term remediation efforts of state and federal government. 				
Medium	 Environmental damage affecting one or more communities within a county. Moderate damage to an ecologically sensitive area such as wetlands, rivers, lakes, or public water supply. Damage requires short- to medium-term remediation efforts of state and federal government. 				
Low	 Environmental damage limited to a single community or small geographic area. Damage requires short-term remediation efforts by local and state government. 				
	Economy				
High	 Tremendous adverse impact affecting the livelihood of the region and possibly extending to statewide. Long-term, cascading damage across multiple economic sectors requiring federal government assistance. 				
Medium	 Medium-term effects to large portion of the jurisdiction's economy, possibly extending to the region. Damage to multiple economic sectors possibly requiring state or federal government assistance. 				
Low	 Slight negative impact to local economic activity in the short-term. Direct effects limited to the local community or small portion of the region. 				
	Public Confidence				
High	 Long-term loss of confidence in government and society. Mass panic and major civil disturbances requiring massive, sustained law enforcement response, curfews, and other security measures. 				
Medium	 Medium and long-term effects including elevated stress, depression and behavioral health impacts for individuals in and out of impacted communities. Short- to medium term reduction of confidence in government in society. Civil disturbances in impacted communities may require law enforcement response. 				
Low	 Some transitory acute effects on behavior health including elevated stress, anxiety, depression, and behavior for individuals in impacted communities. Minor civil disturbances possible. 				

Appendix H. Vulnerability Ranking Criteria

The table in Figure H-1 describes the criteria for a threat of hazard vulnerability rank.

Figure H-1: Vulnerability Ranking Criteria

Rank	Criteria
High	 Minimal countermeasures are in place to prevent or protect against this hazard. Countermeasures may have potential, but limited demonstrated history in reducing the threat potential. The nature of the hazard may limit the availability of countermeasures.
Medium	 Multiple measures are in place to prevent or protect against this hazard. Countermeasures have been tested and have demonstrated success in reducing the threat potential.
Low	 Multiple, reliable, well-coordinated, countermeasures are in place to prevent or protect against this hazard. Countermeasures have an extensive demonstrated history of testing and success in significantly reducing the threat potential.

APPENDIX B: NATURAL DISASTER SUMMARY AND HISTORY OF WISCONSIN'S FEDERAL DISASTER DECLARATIONS

APPENDIX B: HISTORY OF THE STATE'S FEDERAL DISASTER DECLARATIONS

This appendix will present a discussion of how Wisconsin's Hazard Mitigation Grant Program evolved in the course of the state's declared disaster history from 1991 to 2016.

FEMA-912-DR-WI

On August 6, 1991, the President declared a major disaster for the counties of Dane, Jefferson, Ozaukee, Washington and Waukesha as a result of high winds and severe storms that occurred July 7, 1991.

Severe storms in south central and southeastern Wisconsin on July 7 ranged from 60 to 80 miles per hour and hail as large as one inch in diameter fell in northeastern Dane County. Wind and hail caused crop damage and damage to farm buildings. In urban areas, trees were split and uprooted, damaging property and blocking streets as well as causing significant damages to private and public utility power lines. High winds also caused damage to 400 homes. A state owned hanger at the Dane County Regional Airport was completely destroyed damaging two state airplanes.

Total estimated damages for the disaster were \$26.7 million. The costs incurred by government were estimated to be \$3.7 million with individual property and agricultural losses at \$23 million. The declaration was granted for Public Assistance only as the majority of the private sector damages were covered by insurance. The Public Assistance Program provided \$3,283,562 to 79 community and county applicants. The Farmers Home Administration Emergency Loan Program also was made available to farmers who were affected by the storm.

The Hazard Mitigation Team Report prepared for FEMA-912-DR-WI identified mitigation opportunities in the following areas: 1) Use of local forestry program standards in the removal of damaged and hazardous trees and branches; 2) Identification and utilization of wind resistant building construction and repair standards, and the incorporation of mitigation provisions in local inspectors' training and certification programs; and 3) Provision of warning sirens. The issues raised remain concerns today and are being addressed by the State Hazard Mitigation Team through the planning process. Some require additional research and will require legislative action. Others will have opposition to implementation from various parties.

As a result of the declaration, the five counties were also eligible for the Section 404-Hazard Mitigation Grant Program (HMGP). HMGP funds available totaled \$108,684 with the federal share representing 50% or \$54,342, state share 25% or \$27,171 with a local match of 25% or \$27,171. Due to the small amount of funds available, the state had a difficult time in identifying an eligible project that would meet all of FEMA's program criteria and the funds remained unobligated for some time.

After the Midwest Flood in 1993, the state received a HMGP application from Jefferson County for acquisition and demolition of structures in the floodway on Blackhawk Island located in the

Towns of Sumner and Koshkonong. Major floods occurred on the island in 1929, 1959, 1979 and 1993 with 1929 the worst recorded flood. Lesser flooding occurs almost annually, affecting many of the island's low to moderate-income level families and secondary residences. In 1993, the water came up to less than 10 inches from the all-time high and nearly every resident was evacuated for more than seven weeks. The repeated flooding caused structures on the island to show signs of disrepair. Septic systems and holding tanks were poor to substandard quality and presented an environment threat. In addition to the damages that occurred to the structures, there were continued expenses for the towns and county in emergency response and road repairs on the island.

As a result of the flooding in 1993, the county received grants from the Department of Administration (Community Development Block Grant in the amount of \$500,000) and the Department of Natural Resources (Urban Rivers Grant Program in the amount of \$611,000) for acquisition and demolition. To further the county's efforts, the state requested and FEMA approved a HMGP grant under 912-DR in the amount of \$108,684 for Jefferson County. The funds were applied to the acquisition and demolition of three properties located on Blackhawk Island. The county received additional HMGP funds under declaration FEMA-994-DR-WI as well as the Flood Mitigation Assistance Program (FMA) to further their efforts of acquisition and demolition on Blackhawk Island. To date the county has acquired and demolished 30 structures utilizing the various funding sources. In addition, the county received a FMA Planning Grant to develop a comprehensive flood mitigation plan. There are about 60 structures remaining on the island. The acquisition and demolition of structures on Blackhawk Island remains a high priority with the county.

FEMA-959-DR-WI

On September 2, 1992, the President declared a major disaster for Waushara County for severe storms and tornadoes that occurred on August 29. During the evening of August 29, two tornadoes occurred. The first, an F1, occurred in Adams County and was on the ground for 4.5 miles. No injuries were reported and there was only minor damage. The second tornado ripped through Waushara County killing two individuals (one from a heart attack) and injuring 30 others. The tornado, rated F3 (158-206 mph) was on the ground for approximately 30 miles. The City of Wautoma sustained the heaviest damage with debris being a major concern.

The storms destroyed mobile homes, severely damaged a migrant worker camp and decimated thousands of trees. Forty-eight homes were destroyed, 95 received major damage, 289 received minor damage and 100 were affected to a lesser degree. Twenty-eight businesses were also damaged as well as many farm buildings. Two private, non-profit organizations were destroyed: One employed handicapped individuals and the other was a senior citizen center. On alternate weekends the senior citizen center hosted a Bingo Night. Fortunately, it was empty the night of the tornado or there could have been up to 200 people in the center at the time the tornado struck. The number of deaths and injuries could have been much higher.

Debris was widespread in both urban and rural areas. There were massive tracts of downed timber posing a serious problem on both public and private lands. About 953 acres of

commercial and state forested lands were critically affected. Waushara County is known as the Christmas tree capitol of the world. Christmas tree farms were severely impacted by this event. Metal debris from destroyed mobile homes was also a problem and was scattered throughout forests and agricultural fields.

The costs incurred by government were estimated to be \$1.8 million with individual property and agricultural losses at \$8.3 million. The estimated damages totaled \$10.1 million. Disaster assistance through the Public Assistance Program was provided to 18 applicants and totaled \$807,648. Assistance through the Individual and Family Grant program and through Crisis Counseling totaled \$391,881. In addition, Disaster Housing Grants, Small Business Administration low-interest loans and unemployment assistance were provided. Waushara County and the contiguous counties of Adams, Green Lake, Marquette, Portage, Waupaca and Winnebago were eligible for physical and production loss loans through the Farmers Home Administration.

The Hazard Mitigation Team Report prepared for FEMA-959-DR-WI identified 12 mitigation recommendations in the following areas: Alert and Warning (3), Severe Weather Protection Shelters (1), Training and Education (3), Building Codes and Standards (4) and Economic Development (1). Several of the recommendations remain concerns today and are being addressed by the State Hazard Mitigation Team through the planning process for this document. Some require additional research and will require legislative action.

As a result of the declaration, the communities within the county were eligible for Section 404-Hazard Mitigation Grant Program funds. HMGP funds available totaled \$38,868 with the federal share representing 50% or \$19,434, a state share of 25% or \$9,717 with a local match of 25% or \$9,717. Waushara County applied for an HMGP grant for a weather information system that would create a forecasting system for all hazards that would greatly enhance the ability of local responders to preplan their responses based on past, current and predictable future weather conditions. This application was related to mitigation recommendation 3 of the Hazard Mitigation Team Report.

FEMA denied the application stating that the proposal was considered an enhancement to the county's preparedness capability and was not mitigation. They further referred to FEMA's policy dated February 7, 1992, regarding the funding of warning systems and other similar equipment. The policy states that HMGP cannot fund the purchase of warning systems, enhanced computer hardware and similar equipment. However, 44 CFR Section 206.434, states that "development or improvement of warning systems" are eligible under HMGP. The state submitted a formal appeal to the decision on behalf of the county and was denied. Working with FEMA and this office, the county submitted another application for the development and implementation of a geographic information system (GIS) application that received approval. The project consisted of verifying digitized floodplain maps, using a global positioning system (GPS) to identify the location of structures in the 100-year floodplain of the Pine River, determine the lowest adjacent and first floor elevations and incorporate the information into the county's GIS system. The information would be used in emergency situations and for mitigation planning efforts. The

project covered 12.7 miles of the Pine River and involved investigation of 124 structures. In addition to the HMGP awarded to the county, a basement was constructed in the rebuilding of the senior center to be used as a community shelter utilizing Section 406 funds.

FEMA-963-DR-WI

On September 18, 1992, the President declared a major disaster for Dane County as a result of severe storms and tornadoes that occurred on June 17. The Governor had requested a disaster declaration for Dane County on June 22, but was denied on the basis that the majority of damage occurred to insured structures. An appeal submitted on July 27 cited the tremendous burden already placed on the state by the numerous natural disasters that had already taken place during the year. Subsequently the President granted a disaster declaration for Public Assistance and Hazard Mitigation.

On June 17, 1992, a tornado touched down in southern Dane County just ten miles south of Madison. The F3 tornado touched down in the City of Fitchburg at the State of Wisconsin Oakhill Correctional Institute causing heavy to total destruction of the various buildings and equipment. More than 12 buildings at the prison farm were totally destroyed and two others sustained a 50% loss. Total damages, including inventory, livestock and machinery/equipment were set at more than \$5.2 million. The tornado continued to travel northeast, destroying businesses and residences in its path. The storm damaged almost 200 homes, including 48 that were totally destroyed. The majority of homes destroyed and damaged were located in the Waubesa Heights subdivision within the Town of Dunn. Other private sector damages included damages to barns, outbuildings and sheds. Debris removal was also a concern.

Between 20 and 30 persons were injured, but fortunately there were no deaths. Contemplating the magnitude of the storm, it is significant that there were few injuries and no deaths. This was attributed to the fact that the storm occurred during the day and that there was adequate warning.

The costs incurred by government were estimated at \$5.4 million with damages to individual property and agricultural losses at \$9 million for total estimated damages of \$14.4 million. Disaster assistance through the Public Assistance Program was provided to 12 applicants and totaled \$2,600,142.

The Hazard Mitigation Survey Team Report prepared for FEMA-963-DR-WI identified 4 recommendations. Again, one of the recommendations dealt with building codes and standards similar to those identified in the previous report for FEMA-959-DR-WI. Several of the recommendations remain concerns today and are being addressed by the State Hazard Mitigation Team through the planning process for this document. Some require additional research and will require legislative action. Others have opposition from various parties to implementation.

As a result of the declaration, the communities within the county were eligible for Section 404-Hazard Mitigation Grant Program funds. HMGP funds available totaled \$376,374 with the

federal share representing 50% or \$188,187, a state share of 25% or \$94,093.50 with a local match of 25% or \$94,093.50. The state received 12 pre-applications from six communities totaling \$836,405. Grants were awarded to the City of Sun Prairie and the Villages of Cross Plains and Deforest. The City of Sun Prairie received HMGP funds in the amount of \$137,340. Fifty percent or \$68,670 represented the federal share with the state providing 25% or \$34,335. The city provided the remaining 25% plus additional funds in the amount of \$91,021. The City of Sun Prairie received an initial grant for the development of a stormwater management plan. A subsequent award was then granted to implement one of the recommendations identified in the stormwater management plan. The Village of Cross Plains received a grant in the amount of \$37,000 (\$18,500 federal share, \$9,250 state and local shares) for a clearwater infiltration abatement project. Finally, the Village of Deforest received a grant in the amount of \$202,034 (\$101,017 federal share, \$50,508.50 state and local shares) for the development of a detention basin. In addition to HMGP, funds for construction of the basin were provided through a Community Development Block Grant in the amount of \$200,049. Both the City of Sun Prairie and the Village of Deforest reported that these projects reduced damages during the flooding that occurred in May-June 2000. It is also worth mentioning that the City of Sun Prairie completed an all-hazards mitigation plan subsequent to receiving mitigation funds.

FEMA-964-DR-WI

On September 30, 1992, the President declared a major disaster for severe storms and flooding that occurred between September 14-24. This was the third federal disaster declaration granted for the state in less than two months. The declaration made Buffalo, Crawford, Jackson, Juneau, Pepin, Pierce, Richland, Sauk, Trempealeau and Vernon Counties eligible for Public and Individual Assistance as well as the Hazard Mitigation Grant Program.

The majority of the rain fell between September 14 and 18 with the heaviest rainfall occurring on the 16th. Precipitation reports showed a wide area across the central portion of the state received rainfall greater than 4 inches. Two areas recorded rainfall greater than 7 inches, one located in upper Buffalo and Trempealeau Counties and the other near Hillsboro just east of the Kickapoo Valley. Within these areas, there were isolated reports of 9 to 13 inches. A few farmers in the LaValle-Hillsboro region reported three-day amounts of 14-17 inches. Four rivers, the Pine River in Richland County, the Trempealeau River in Trempealeau County, the Baraboo River in Sauk County and the Kickapoo River in Crawford and Vernon Counties rose quickly. Many of the rivers crested at record levels, and some equaled or exceeded the 100-year flood elevation. Arcadia, Richland Center, Rock Springs, Viola and Gays Mills were evacuated as flood waters inundated or surrounded residences. The flooding forced early closure of Farm Progress Days, which was a serious blow to the economy of the region.

Dozens of state, county and local roads were closed when swollen rivers and run-off flooded them. Numerous bridges were damaged or destroyed. A levee in Arcadia was greatly stressed and in danger of breaching. The Wisconsin National Guard assisted emergency officials and volunteers with sandbagging efforts. There was considerable damage in the City of Richland Center. Approximately 120 buildings were flooded. Due to previous mitigation, 50 to 70

residences were protected and suffered no damage. Damage assessment indicated that 19 homes received major damage, 174 minor and 132 were affected to a lesser degree.

The damages to and costs incurred by government were estimated at \$1.9 million with damages to individual property and agricultural losses at almost \$16 million for total estimated damages of \$17.9 million. Disaster assistance through the Public Assistance Program was provided to 145 applicants in the amount of \$2,821,355. Individual assistance was provided through the Individual and Family Grant Program in the amount of \$126,402. In addition, Disaster Housing Grants and Small Business Administration low-interest loans provided assistance.

The Interagency Hazard Mitigation Team Report for FEMA-964-DR-WI identified 9 mitigation recommendations in the following areas: Flood Planning (2), Stream Maintenance (1) and Alert and Warning (6) as well as 19 site specific recommendations.

As a result of the declaration, the communities within the ten counties were eligible for Section 404-Hazard Mitigation Grant Program funds. HMGP funds available totaled \$391,074 with the federal share representing 50% or \$195,537, state share 25% or \$97,768 with a local match of 25% or \$97,768. The state received 25 pre-applications totaling \$1,732,163. Based on a review of the submitted pre-applications, 8 applicants were asked to participate in the formal application process. Grants were awarded to the Cities of Blair (Trempealeau County) and Black River Falls (Jackson County). The City of Blair was approved for a HMGP grant in the amount of \$109,144 for a dam improvement project on Lake Henry. Fifty percent or \$54,572 represented the federal share, with the state and city providing 25% each in the amount of \$27,286. In addition, the city received a Community Development Block Grant in the amount of \$109,173, and a grant from the Department of Natural Resources in the amount of \$43,460 for this project. The City of Black River Falls was awarded a grant in the amount of \$281,930 for constructing storm sewers to alleviate flooding problems. The federal share represented 50% or \$140,965 with the state and local shares of 25% or \$70,482 each. In addition, the city also received a Community Development Block Grant in the amount of \$43,971 to complete this project.

FEMA-994-DR-WI

Wisconsin experienced above normal precipitation across much of Wisconsin during April and May of 1993. Initially this began with prolonged periods of rain and heavy late season snowfalls, then as showers and thunderstorms. In early June, a weather pattern developed that was characterized by a strong low-pressure system over the western United States and a large high-pressure system in the southeast. The jetstream dipped south in the western states and flowed northeasterly across the upper Midwest. The southeastern high blocked the eastward movement of storms, thus creating a convergence zone between the warm, moist flow from the Gulf of Mexico and the much cooler and drier air from Canada, which resulted in thunderstorms. As a result, the upper Midwest within this zone was deluged with rain through most of June and July. The persistence of this weather pattern caused unusually large amounts of rain to fall over the upper Midwest. These large accumulations and the wetter-than-usual spring produced flooding throughout the upper Mississippi River basin. Cumulative totals of 20-40 inches for the first seven months of the year were typical; putting totals 150-200% above normal.

This event would become known as the Great Midwest Flood, with nine states including Wisconsin declared a federal disaster area. The magnitude of the Great Midwest Flood to people, property, business, agriculture, tourism, and the environment, was unmatched by any other flood in the history of the country. Damages exceeded \$12 billion with \$747 million in Wisconsin. The Mississippi and Missouri Rivers would be closed to shipping and millions of acres of farmland were severely impacted.

The state incurred \$800 million in agricultural-related damages. Cool, wet weather in 1992 combined with over \$125 million in winterkill losses and a very wet spring made this one of the most disastrous periods in the state agricultural history. It was estimated that 804,800 acres of farmland suffered severe erosion due to the flooding. It would cost \$11 million to implement all the land treatment practices needed to correct erosion damage. At least 4,700 homes were damaged and 2,500 people evacuated. Private business losses exceeded \$31 million, most of it related to business shutdowns and damages to goods and supplies. Public damages reached \$43.6 million. The state lost millions in tourism revenue and incurred costs for additional staff for public health services, unemployment claims for displaced workers and extensive use of National Guard and Conservation Corps services.

In Wisconsin, the disaster started with one of its wettest and most stormy months of June in memory. The first bout of severe weather occurred on June 7 and 8 when heavy rains and severe thunderstorms developed in the southern two-thirds of the state. The most damaging weather occurred in east central Wisconsin where tornadoes ripped through Green Lake and surrounding communities. Statewide the rains continued and were followed by an outbreak of tornadoes that occurred on June 17. That storm affected a band of counties extending from Grant County northeastward to central and east central counties. In addition to the damages caused by the high winds and tornadoes, rainfall of two to seven inches throughout the southern and western part of the state caused even greater problems on rivers and streams that were bank-full and soils that were still saturated from spring snowmelt and record precipitation during the month of May. Flooding occurred along the following rivers and tributaries: Black, Buffalo, Chippewa, Eau Claire, Fox, Kickapoo, Trempealeau, Wolf, Wisconsin and Mississippi. The National Weather Service issued flood watches and warnings almost continuously. Several dams and levees failed, hundreds were evacuated and hundreds of millions of dollars in damages resulted.

Evacuations occurred in Jackson, Columbia, Trempealeau, Adams and several other counties as rivers made islands of residential and business areas. Both individual and municipal water supplies were contaminated along with collapsed mound and/or septic systems.

Significant structural damage to residences occurred in the Grove subdivision in the City of Black River Falls when the levee along the Black River failed. Approximately 90 structures were substantially damaged. The municipal sewer and water systems were also severely damaged. The city with a population of 3,500 received \$45 million in damages. Damages to utilities were estimated at \$6.5 million.

Over 250 members of the Wisconsin National Guard were on duty in the City of Black River Falls beginning on June 20. They assisted with flood fighting efforts, security and evacuation. On June 28 another 25 Guard members were activated to assist in sandbagging operations in the City of Prairie du Chien in Crawford County. Guard members and/or equipment such as water buffaloes and tankers were also used in numerous other communities. Guard helicopters assisted with overflights in assessing the severity of the situation throughout the area. Hundreds of volunteers also assisted in sandbagging efforts in the most critical areas around the state.

Literally hundreds of state, county and town roads were closed when swollen rivers and runoff flooded them. Local police, fire, public works and emergency management officials worked around the clock for more than a week monitoring dams and levees and taking emergency protective actions.

The preliminary damage assessment identified almost 1,600 homes that were affected by the flooding. In addition, emergency protective measures and damage to roads and bridges were confirmed at nearly \$5 million.

On June 29 the Governor requested federal disaster assistance for 30 counties. Initial damage assessment figures compiled by the county emergency management offices indicated that disaster-related costs were \$30 million in private damage, \$20 million in public damages and \$124 million in agricultural losses for a total in excess of \$174 million.

On July 2, 1993, the President declared a major disaster for 17 of the 30 counties as a result of flash flooding, heavy rains, severe storms and tornadoes that began on June 7. The counties included in the declaration included Calumet, Clark, Eau Claire, Green Lake, Jackson, Marquette and Trempealeau for both Public and Individual Assistance, and the Counties of Columbia, Dunn, Fond du Lac, Outagamie, Portage, Sauk, Waupaca, Waushara, Winnebago and Wood for Individual Assistance only.

Subsequent rainfalls in late June and July again caused serious damages this time in the basins of the Pecatonica and Yahara Rivers. An extreme example of localized flooding occurred on July 17-18 as a flash flood at the Baraboo River and Devils Lake. Over 12 inches of rain fell in a three-hour time period and exceeded the 100-year precipitation event by 3.6 inches. The flash flood washed away cars, roads, bridges and buildings, and resulted in the death of a twelve-year old when the car he was riding in was overturned and he was carried downstream. The Baraboo River rose ten feet in five hours, 6.75 feet above flood stage. Three of the City of Baraboo's wells were disabled, numerous highways closed and more than 2,300 campers evacuated. There was three to five feet of standing water throughout Baraboo. Damage to a major industry in the city was estimated at \$1.5 million. Devils Lake State Park incurred significant damages and was closed for the first time in its history.

Working together, the Wisconsin National Guard, Wisconsin Conservation Corps and the Department of Corrections provided over 1,110 personnel for 4,340 man-days along with 125 vehicles and heavy equipment for over 10,770 hours in assisting on 62 projects in 14 counties.

By August, the stalled weather pattern began to revert to more normal conditions. Finally, floodwaters receded around the state with the exception of the lower Rock River (Some of the above information was provided from the report on "The Floods of 1993: The Wisconsin Experience," prepared by the Wisconsin Department of Natural Resources).

On July 30, the Governor requested that FEMA waive the 25% state and local match for the Public Assistance Program, the 50% state and local match for the Hazard Mitigation Grant Program and the 25% state match for the Individual and Family Grant Program because of the duration, magnitude and severity of the 1993 flood disaster. Damages had been estimated at \$175 million in total disaster-related costs in the Governor's initial request for disaster assistance June 29. Disaster losses were now estimated at \$47 million in public and \$700 million in private losses for a total of \$747 million, with that amount increasing with each passing day. It would

Disaster Declaration FEMA DR 994 Individual & Public Assistance

Adams, Buffalo, Calumet, Clark, Columbia, Crawford, Dane, Dodge, Dunn, Eau Claire, Fond du Lac, Grant, Green, Green Lake, Iowa, Jackson, Jefferson, Juneau, Kenosha, La Crosse, Lafayette, Marquette, Menominee, Milwaukee, Outagamie, Pepin, Pierce, Portage, Price, Racine, Rock, Rusk, Sauk, Shawano,

Individual Assistance Only
Brown, Chippewa, Lincoln, Marathon,
Monroe, Richland, and Winnebago.

St. Croix, Trempealeau, Vernon,

Waupaca, Waushara, and Wood.

take the state years to recover. This disaster was unlike any the state had ever experienced. The request to waive the match requirements for the HMGP and IFGP were denied as the cost sharing requirements for both programs are set by law, therefore, they could not be adjusted. However, eventually FEMA increased the federal cost share for the Public Assistance Program for the nine states impacted by the Midwest Floods to 90% requiring only a 10% state and local match. This not only increased the amount of federal funding for eligible applicants of the Public Assistance Program, but also increased the amount of HMGP funds that would be available since the funding allocation was based on 10% of the amount of federal funds approved in the Public Assistance Program.

By the end of summer, 47 counties would be included in the declaration and made eligible for federal disaster assistance. Forty counties were declared for both Public and Individual Assistance, while another seven were eligible for Individual Assistance only. All 47 counties were eligible for the Hazard Mitigation Grant Program. The incident period extended from June 7 to August 25.

The Interagency Hazard Mitigation Team Report for FEMA-994-DR-WI dated July 23, 1993, identified 36

mitigation recommendations for 42 of the 47 counties in the following categories: Alerts and Warning (3), Education (7), Flood Planning (2), River/Stream Maintenance (1), site specific recommendations (21) and Technical Assistance (2).

Due to the magnitude of the Great Midwest Flood, on August 6, Congress approved HR 2667, a bill to provide \$5.3 billion in supplemental disaster appropriations to federal agencies to assist state and local governments respond and recover from the widespread flooding. Eleven federal agencies would receive supplemental funds from this bill. FEMA received \$2 billion. In addition, \$200 million was awarded to the Department of Housing and Urban Development for Community Development Block Grants and \$200 million to the Economic Development Administration for economic recovery and public works grants. These programs in particular would play an important role in the state's recovery from the devastating floods.

To ensure that the flood recovery would be rapid and well coordinated among the various agencies responsible for implementing recovery programs, a meeting was held with federal and state agencies on August 18 in conjunction with the Annual Governor's Conference on Emergency Management. Eighteen federal and state agencies were represented at the meeting. State agencies were required to provide weekly updates to WEM regarding status of the various recovery activities. Reports were consolidated and forwarded to the Governor's Office. WEM was the primary coordinating agency with FEMA.

On August 26 and 27, the Midwest Flood Disaster Workshop was held in Des Moines, Iowa to provide a forum for federal, state and local officials to discuss the short and long term needs and to begin to develop flood recovery plans. Representatives from WEM and the Department of Administration attended this workshop. The goals of the session were to:

- Devise a relief system to deliver the highest level of assistance and service to the maximum number of victims:
- Provide a quick response to the questions and technical needs of the providers of housing relief services; and
- Assess federal programs in light of the current situation.

To coordinate recovery efforts at the state level, FEMA and WEM conducted a meeting with various federal and state agencies and Regional Planning Commissions on September 19 to discuss a strategy for dealing with mitigation and long-term recovery. At the meeting it was determined that a core group of agencies would meet on a weekly basis to act as a clearinghouse for communities proposing long-term recovery projects. Other agencies were brought into the process as needed. The core group consisted of FEMA, WEM, the Economic Development Administration, the Department of Natural Resources, the Department of Administration, the Department (Commerce) and the State Historical Society. The Farmers Home Administration, Natural Resources Conservation Service and the State Departments of Transportation and Industry, Labor and Human Relations (Workforce Development) would later join the group. The group would become known as the Wisconsin

Interagency Disaster Recovery Group (IDRG) which continues to meet today in response to disaster declarations. The IDRG identified as its mission: "To develop a cooperative federal and state disaster recovery effort that can assist communities and regional agencies in utilizing all available funding sources to recovery from and mitigate the future effects associated with the damages from natural hazards." The objectives of the IDRG to achieve the mission were to:

- Serve as a clearinghouse for tracking and status reporting of disaster recovery project applications;
- Encourage and assist funding submissions from communities for recovery and hazard mitigation projects;
- Assure full utilization of all available and applicable funding sources for recovery and mitigation projects;
- Encourage the enhancement of recovery projects with hazard mitigation measures; and
- Assist in the avoidance of funding duplication for recovery and mitigation efforts.

Significant to the state's recovery was FEMA's establishment of the Wisconsin Interagency Hazard Mitigation Recovery Office (WIHRO). This office was set up in WEM headquarters and was staffed with a full-time FEMA staff person who worked closely with WEM staff and supported the efforts of the core group. Projects submitted to the core group were entered into a database developed and maintained by the WIHRO. The database acted as a central source of information and provided the status on all projects submitted to the agencies. The WIHRO staff grew to two and continued to be staffed until 1996. It played a vital role in implementing mitigation projects within the state.

The Regional Planning Commissions (RPCs) in Wisconsin played an integral part in the recovery process. The Economic Development Administration funded Flood Recovery Coordinators in the RPCs to assist communities in developing grant applications for the various funding sources available, and to prepare Regional Flood Recovery Plans. In addition, FEMA provided technical assistance funds to supplement EDA's efforts with the RPCs. The RPCs worked with communities and agencies to clarify and/or obtain additional information on specific projects.

FEMA's priority was to fund projects that reduced future disaster losses through acquisition or relocation of properties most prone to flood damages. Although many other types of projects were funded through the various agencies on the IDRG, the group's priority also became acquisition, demolition, relocation and floodproofing of flood damaged property.

The Great Midwest Flood was a turning point for mitigation and in particular the Hazard Mitigation Grant Program. On December 3, 1993, the President signed the Hazard Mitigation and Relocation Assistance Act. This significantly increased funding in the HMGP in two ways. First, it increased the amount of funding for grants from 50% federal share to 75%. Second, allocation funding was increased from 10% of the federal share of the funds spent in the Public Assistance Program to 15% of the total estimated federal grant assistance provided under the

Stafford Act (i.e., Individual and Public Assistance Programs). This would raise the amount of HMGP funds available in this declaration from an estimate of \$2 million to over \$14 million.

The database developed by WIHRO included 136 projects totaling \$70 million that were reviewed by the IDRG. WEM received over 90 pre-applications for HMGP totaling \$30 million. To assist the communities in their recovery efforts, the IDRG packaged several funding sources so that the community did not have to fund the required local match. The required local match was provided with CDBG funds through the Departments of Development (Commerce) and Administration. Following the priorities of the IDRG, HMGP grants were awarded to the following communities:

B.1 HMGP APPLICANTS FOR FEMA 994-DR		
Applicant	County	Amount
Darlington, City of	Lafayette	\$4,175,790
Eau Claire, City of	Eau Claire	\$2,152,831
Eau Claire County	Eau Claire	\$1,217,227
Jefferson County	Jefferson	\$ 458,635
Pierce County	Pierce	\$6,000,000
TOTAL		\$14,004,483

This was the first declaration that acquisition/demolition and floodproofing projects were implemented utilizing HMGP funds, and it was not an easy task. The WEM had no prior experience with these types of projects, therefore, policies and procedures had to be established. In addition, several of the projects particularly in the City of Darlington had significant issues that had to be resolved prior to funding and implementation. This included issues involving relocation assistance per state law, environmental contamination, floodplain management compliance, historical and ADA (Americans with Disabilities Act) requirements. With the persistence, patience and coordination of the agencies involved and the applicants, these "roadblocks" were eventually overcome and the projects proceeded. As a result, 179 properties were mitigated; 156 properties (12 commercial) acquired and demolished and another 23 properties (21 commercial most of which were historic) floodproofed. Additional properties were mitigated utilizing CDBG funds provided through the Department of Administration. Through the Department of Commerce, CDBG funds were provided to many communities to implement mitigation measures to repair and reconstruct public facilities.

As stated previously, on June 20 an earthen levee that protected a portion of the City of Black River Falls referred to as the Grove subdivision failed. Floodwaters reached the ceiling of the first floor of many structures causing significant damage. As a result of the levee failure, the city received funds to reconstruct the levee to current standards for adequate protection in future events. Funds in the amount of \$2,014,625 were provided in Section 406 mitigation funding through the Public Assistance Program to reconstruct the levee south of Highway 54 in the residential area referred to as the Grove. Additional funds from the Economic Development

Administration and the State Department of Commerce (CDBG) provided for the construction of the levee north of Highway 54 protecting the downtown business area. The excellent cooperation and coordination among the state and federal agencies made this project possible.

The City of Darlington's mitigation program is a prime example of what can be achieved by long-term planning and cooperation of city officials, local business owners and concerned citizens as well as federal and state agencies. In the last 50 years, four major flood events occurred on the Pecatonica River causing substantial damage to homes and businesses, most recently in 1990 and 1993. After the 1990 flood, attention focused on alternatives to prevent future damage such as relocation, floodproofing and elevating structures. The city had developed a Master Plan in 1984. After the 1990 flood, the city updated the Master Plan to include flood mitigation strategies. The city completed a comprehensive flood mitigation plan with a grant provided by FEMA through WEM. Goals of both plans were to implement an extensive flood mitigation effort that would include historic preservation, economic development, downtown revitalization, recreation and tourism. The revised Darlington Master Plan was barely a year old and the Darlington Flood Mitigation Plan was in draft when the 1993 flood hit the city. The flood provided the impetus and a sense of urgency to finalize the flood mitigation plan.

Repeated flooding over time led to deterioration of many of the downtown buildings. City officials, citizens and business owners determined that they could no longer sit by and let nature decide the future of their community. The city finalized the Flood Mitigation Plan that included not only floodproofing residential properties and acquisition and demolition of commercial floodplain properties (some with contamination), but also a downtown rehabilitation and mitigation project. Instead of moving the downtown businesses, the project included in-place floodproofing and rehabilitation of buildings. The city was the first community in the state to have a FEMA-approved mitigation plan.

The first step was to inventory and collect survey data for structures in the floodplain. The Corps of Engineers, Natural Resources Conservation Service and WDNR all worked together to provide the flood data needed to estimate flood damages for the economic analysis. Next, the State Historical Society nominated Darlington's historic Main Street Central Business District to the National Register of Historic Places. The District includes 51 buildings within a six-block area. Next, a study was completed to identify flood mitigation measures for 41 buildings.

The approach taken in Darlington is characterized as innovative and unique. The approach in Darlington was to find a way for the government agencies, building and business owners and the city to arrive at a consensus on how to accomplish four major objectives: 1) preserve the historic downtown business district; 2) restore the downtown economic base; 3) develop an urban river open space park and recreation area; and 4) eliminate or substantially reduce flood damage in the future. With the assistance of many federal and state agencies the following mitigation measures were implemented:

- 12 commercial buildings were acquired and demolished adjacent to the river and the land used for riverfront park and recreation area. A 33-acre parcel on higher ground was developed as a business park for the relocated businesses;
- 52 residential structures were mitigated with some structures elevated and others had floodwalls constructed where raising the structure was not possible;
- 6 downtown businesses that could not be floodproofed or elevated were afforded as much flood protection as possible by raising or floodproofing building mechanics, electrical and plumbing;
- 13 historic downtown buildings were refurbished and floodproofed while maintaining their historic character; and
- A new wastewater treatment plant was constructed outside of the floodplain.

Benefits resulting from implementation of the mitigation recommendations are the significant reduction of future flood damages, quicker recovery following floods, capital improvements, economic development and revitalization of the downtown business community.

The city worked continuously and aggressively to implement their mitigation program. The city applied for and received over \$10 million in various state and federal grants and loans to accomplish their goals. As a result of their efforts, the city has reduced the number of repetitive loss properties in the city from 11 to 2 (one rejected a mitigation offer). The city was honored with a State Historical Society of Wisconsin Historic Preservation Achievement Award on May 9, 1998, and the architectural and engineering firm hired for the downtown floodproofing project received a state award for special categories through the Association of Building Contractors. The city continues to pursue funding to further their mitigation efforts. They have received additional grants and acquired and demolished a repetitive loss property as well as relocated the fire department outside of the floodplain. The City of Darlington is an example of what a small community can do with long-term planning and determination.

Another significant result of the declaration was that mitigation would take a more important role in emergency management. WEM created a position and hired a full-time hazard mitigation officer in August of 1994.

As a result of the declaration, almost \$300 million in disaster relief was provided through the various state and federal programs. More than 4,500 individuals received disaster assistance through the FEMA programs making it the largest Individual Assistance Program in the state up to that point in time. More than 600 state and local governments and non-profits received disaster assistance through the Public Assistance Program. To date, this disaster generated the most funding for the state's Public Assistance and Hazard Mitigation Grant Programs.

B.2 SOURCES OF FEDERAL ASSISTANCE FOR FEMA 994-DR		
Program	Amount	
Agricultural Programs	\$230,742,262	
SBA Disaster Loan Program (individuals and businesses)	\$ 10,394,929	
Disaster Housing Grants	\$ 3,944,158	
Individual and Family Grant	\$ 1,492,267	
Public Assistance Program	\$ 22,297,456	
Hazard Mitigation Grant Program	\$ 14,427,340	
Community Development Block Grants	\$ 5,008,911	
Community Services Grants	\$ 1,525,000	
Federal Highway Administration	\$ 1,019,309	
TOTAL	\$290,851,632.00	

FEMA-1131-DR-WI

On August 2, 1996, the President declared a major disaster for Fond du Lac and Green Counties as a result of tornadoes and flooding that occurred on July 17 and 18. The Governor requested both Public and Individual Assistance. However, the declaration was granted for Public Assistance only, as the majority of private sector damages were covered by insurance. Hazard Mitigation was also granted as part of the declaration. The Governor appealed the decision for Individual Assistance that again was denied. However, Green County was declared eligible for low-interest loans from the Small Business Administration.

In 1996 following a wet spring, a weather front stalled over southern Wisconsin and northern Illinois. This front produced torrential record rains along the state border on the evening of July 17 with Green County receiving eleven inches of rain in five hours. The heavy rain caused riverine flooding, flash flooding and sewer backup. Dozens of roads were damaged with many bridges destroyed.

The stalled weather system also generated a line of severe thunderstorms that moved through east central Wisconsin during the late afternoon and evening on July 18. Shortly after 7 p.m., a tornado touched down in the Village of Oakfield and the Towns of Oakfield and Byron in Fond du Lac County. The twister was classified as an F5 storm and left a path of destruction about one quarter mile wide and 15 miles long. There were nineteen injuries and more than 360 homes and businesses damaged or destroyed. Destroyed were two churches, a private school, a middle school and a major business. Thousands of trees were uprooted as well.

The costs and losses incurred by government were estimated to be \$11.4 million with damages to individual property and agricultural losses at \$49.7 million for total estimated damages of \$61.1 million. Disaster assistance through the Public Assistance Program was provided to 33 communities and totaled \$2,140,156.

The Hazard Mitigation Early Implementation Strategy Report dated August 14, 1996 outlined a four-phase approach for identifying and implementing appropriate mitigation strategies. The first phase was to reconvene the Wisconsin Interagency Disaster Recovery Group (IDRG) to assist the local governments during the recovery phase. This was done to provide technical assistance when possible; prevent duplication of efforts and funding; identify and prioritize mitigation measures and projects; and identify funding options for implementing mitigation measures whether through the individual agencies or by "packaging" various funding programs. Phase II included conducting briefings/meetings with local officials. This was done to discuss mitigation and various options available, introduce local officials to mitigation planning, and make them aware of potential funding programs. Phase III was to solicit pre-applications for the Hazard Mitigation Grant Program. Phase IV entailed a thorough review of the pre-applications submitted and selecting those projects for the HMGP formal application process.

In administering the declaration, greater effort was made to fund Section 406 mitigation opportunities through the Public Assistance Program. To further this effort, a federal mitigation staff person was assigned to be a liaison with Public Assistance (Infrastructure) staff and provide technical support. This liaison reviewed Damage Survey Reports (DSRs) for mitigation opportunities and provided the required benefit-cost analysis for the 406 mitigation projects.

A Recovery Information Center opened for one day in the Village of Oakfield and two Construction Information Workshops were held designed to inform local homeowners and building professionals of wind resistant construction practices. A document, Building to Resist Strong Winds, was developed by the mitigation staff and distributed at the workshops. In addition, a display demonstrating connectors along with catalogs and installation guides were provided. It was estimated that 35 to 40 homeowners and 10 building professionals attended the workshops.

As a result of the declaration, the communities within Fond du Lac and Green Counties were eligible for the Section 404-Hazard Mitigation Grant Program funds. HMGP funds available totaled \$344,527 with the federal share representing 75% or \$258,395, a state share of 12.5% or \$43,066 with a local match of the same amount. The state received eight pre-applications (three from Fond du Lac County and five from Green County) totaling \$1,070,729. Grants were awarded to the City of Monroe and the Village of Oakfield. The City of Monroe received HMGP funds in the amount of \$142,311 (\$106,733 federal, \$17,789 state and local shares) for the construction of a detention pond. Another grant was awarded to the Oakfield School District in the amount of \$202,216 (\$151,662 federal and \$25,277 state share).

The Oakfield Middle School was destroyed in the tornado that struck the community on July 18. If school had been in session at the time of the tornado, there may have been many injuries and possibly deaths. The School District had the foresight to apply for HMGP funds to harden the new facility by strengthening and reinforcing the walls. Funds were provided to construct the interior and exterior bearing walls with reinforced masonry; construct the roof system with precast flat slabs on the low room areas; upper roof over the gymnasium/stage area was precast double trees; with the complete roof system tied into the masonry bearing walls with reinforcing

steel and welded plate inserts. The hardened facility will not only reduce future damages, but will also provide protection to the students, faculty and others in the community during severe weather. The increased cost of construction over the original design was \$233,000. The cost for the added protection was relatively small compared to the benefits that cannot be measured. This was the first time the state funded this type of project with HMGP funds.

FEMA-1180-DR-WI

On July 7, 1997, the President declared a Major Disaster for Milwaukee, Ozaukee, Washington and Waukesha Counties as a result of flooding that occurred on June 21-23. The declaration was granted for Public and Individual Assistance as well as Hazard Mitigation.

During the night of June 20 and the morning of June 21, 1997, a storm system passed through the southeastern portion of Wisconsin in the area of Ozaukee, Milwaukee, Washington and Waukesha Counties. This storm system generated torrential rains throughout this four-county area with rainfall ranging from five to nearly ten inches in a thirty-hour period beginning at 6:00 AM on Friday, June 20 and ending on June 21 at noon. Information from the "Rainfall Frequency Atlas of the Midwest" indicated that this was greater than a 100-year rainfall for this area. The most intense rainfall was centered in northern Milwaukee County and covered a 13 mile-wide, 18 mile-long band which included the extreme southern portion of Ozaukee County, southeastern Washington County and northeastern Waukesha County.

Between 3:00 and 11:00 AM on June 21, Flash Flood and Flood Warnings were issued for portions of the four counties. The Milwaukee County EOC set up a flood information hotline which received over 900 calls between Saturday morning and the following Monday (June 23).

The flooding was made worse by existing high-moisture conditions. Prior to the flooding rains, moderate rainfall amounts of from 1.5 to 2.0 inches were reported across the region in a 24-hour period on June 15-16. This earlier rain saturated the area soils. When the intense rainfalls of June 20-21 occurred, the ability of the soil to absorb rainfall was reduced and the amount of runoff was increased.

The torrential rain coupled with heavy urban runoff caused the drainage ditches, sewer systems, creeks and rivers to rise rapidly. Most of the larger rivers in the area reached and surpassed flood stage by midmorning on June 21. The Milwaukee, Menomonee, Fox and Sheboygan Rivers and Lincoln and Oak Creeks reported flooding levels during the morning. With the storm sewer system overloaded, sanitary sewers began to back up into residences throughout the area. Areas with significant damage included Mequon and Thiensville in Ozaukee County, Germantown in Washington County, New Berlin, Brookfield, Menomonee Falls and Sussex in Waukesha County and Brown Deer, Glendale and Wauwatosa in Milwaukee County. The Piggsville and Lincoln Creek areas in the City of Milwaukee were among the hardest hit. Milwaukee County received extensive damages to its parks and golf courses.

Thousands of homes were damaged due to overland flooding, stormwater drainage problems and sanitary sewer backups. Water was filling basements and in some cases reaching the first

floor of the house. Hundreds of businesses along waterways and drainage creeks sustained damages and had to close for some time. Several roads were closed and electricity was lost as the storms passed through the area.

Initial damage assessments reported \$71 million in damage to private property and \$17 million to public property for a total of \$87 million. As a result of the declaration, \$6,164,209 was provided through the Public Assistance Program to 57 communities, state agencies and eligible private non-profit organizations. More than 14,000 individuals applied for Individual Assistance totaling over \$37 million. This represents the largest Individual Assistance Program ever administered in the state. In addition, the declared counties received a special HUD (Housing and Urban Development) CDBG award in the amount of \$4.1 million for unmet needs.

As in the previous disaster, greater effort was made to fund eligible mitigation measures through the Individual and Public Assistance Programs. For the first time, a Memorandum of Understanding (MOU) was developed for the declaration for implementing Section 406 mitigation opportunities. The MOU outlined the process and procedures that would be implemented in the declaration to ensure that all eligible mitigation opportunities were explored and funded through the program. The MOU was signed by Federal and State Hazard Mitigation and Public Assistance Officers as well as the State and Federal Coordinating Officers and the Deputy FCO for Mitigation.

For the first time, Hazard Mitigation Grant Program funds were eligible statewide. Available HMGP funds for the declaration totaled \$6,265,003 with the federal share representing 75% or \$4,698,752, a state share of 12.5% or \$783,125 with a local match of the same amount. The state received over 60 pre-applications totaling \$60 million. After discussion with the Wisconsin IDRG, the decision was made that projects consisting of acquisition and floodproofing would receive the highest priority for further funding consideration. Each pre-application was reviewed, scored and ranked based on the state's priorities. Nine communities were requested to participate in the formal application process, along with Milwaukee County for an educational project. After review of the formal applications, benefit-cost analyses and environmental review, the following applications were submitted to FEMA for approval:

B.3 HMGP APPLICANTS FOR FEMA 1180-DR		
Applicant	County	Amount
Brookfield, City of	Waukesha	\$222,075
Menomonee Falls, Village of	Waukesha	\$1,886,927
Milwaukee, City of	Milwaukee	\$1,613,000
Milwaukee County	Milwaukee	\$40,000
Wauwatosa, City of	Milwaukee	\$2,388,661
West Allis, City of	Milwaukee	\$114,340

TOTAL \$6,2

All of the projects involved acquisition of flood damaged properties with the following exceptions. The City of Milwaukee's grant included some floodproofing in the Menomonee Valley area, and Milwaukee County's project was for the production of a mitigation video and brochure targeted at homeowners.

In August 1998, the applications were at FEMA Region V awaiting approval and obligation of funds when Milwaukee and Waukesha Counties again incurred significant damages from flooding. Many of the same structures damaged in the previous flood were flooded again, making some of them uninhabitable and substantially damaged. Subsequent to this second flood the above applicants received grant approval.

As projects were completed, unspent funds were reallocated to other projects. The City of West Allis' project involved the acquisition and demolition of one property. The property owner declined an offer, therefore, grant funds were withdrawn. Unspent funds from the Cities of West Allis and Wauwatosa were reobligated to Eau Claire County for the acquisition and demolition of a property that was substantially damaged as a result of flooding that occurred in September of 2000. Unspent funds from the Cities of Milwaukee and West Allis were reobligated to Milwaukee County to further their educational efforts. The County purchased a portable display booth that was used at the Wisconsin State Fair and Bay Shore Safety Days. In addition, unspent funds from the Cities of Wauwatosa and West Allis were reobligated to the City of Oak Creek for the acquisition and demolition of one repetitive loss property that was substantially damaged as result of flooding that occurred in June 2000. The allocation for the declaration and funds approved totaled \$6,265,003 with actual expenditures of \$6,148,173. Appendix C identifies the projects and actual amounts awarded for the declaration.

FEMA-1236-DR-WI

On July 24, 1998, the President declared a major disaster for Buffalo, Clark, Crawford, Dunn, Grant, Jackson, LaCrosse, Monroe, Pepin, Pierce, Richland, St. Croix, Trempealeau and Vernon Counties as a result of high winds and severe storms that occurred on June 18-30. The Governor's request added Chippewa, Eau Claire and Rock Counties and included both Public and Individual Assistance. However, the declaration was granted only for Public Assistance for the above fourteen counties (initially Richland County was denied, but after appeal was included). Individual Assistance was denied on the basis that most of the private sector losses were covered by insurance. The Governor appealed the decision that denied Public Assistance for Chippewa, Eau Claire, Richland and Rock Counties, and Individual Assistance for all seventeen counties. The Governor also requested that Juneau, Sauk and Wood Counties be added for Public Assistance. The only request that was successful was the addition of Richland County for Public Assistance. All other requests were denied.

The disaster was the result of an extraordinary siege of severe weather during the period of June 18 through 30. Warmer than normal temperatures and high humidity levels, combined with a

strong, relatively stationary jet stream, resulted in downburst winds, tornadoes, heavy rain and flash flooding. The Severe Storms Prediction Center issued 17 severe weather watches (12 for thunderstorms and 5 for tornadoes) during this time period. The average number of watches issued annually in the state is 38. In addition, the Wisconsin National Weather Service offices issued an equally significant number of severe thunderstorm and tornado warnings and flash flood watches and warnings, with that number equaling 60% of those issued annually in the state. The state was still reeling from the damages suffered in storms that occurred May 31. Thus, the severity of these later weather events amplified the difficulty of the situation and slowed recovery even more.

Hundreds of homes and farm structures sustained damage. Thousands of acres of trees on both public and private lands were blown down, creating a serious problem with debris. Power outages were as widespread as those experienced subsequent to the 1976 ice storm, with some areas without power for four to five days. Local utility crews from other states helped to restore service. Particularly hard hit were the numerous private non-profit rural electric cooperatives that serve the west central area of the state. They sustained millions of dollars of damage and needed many months to fully restore service to its pre-disaster status.

Heavy rainfall caused many streams and rivers to reach or exceed flood stage and forced the closure of numerous roads. A few rivers even exceeded the levels they rose to in the record 1993 floods. Many farm fields were flooded and some crops, such as corn and soybeans were damaged in crucial stages of development. The basements of dozens of homes were flooded resulting in damage to furnaces and water heaters, and in some cases structural damage.

Initial damage assessments estimated there were \$37 million in private and agricultural losses and \$11 million to public property for a total of \$48 million in damages. Public Assistance grants totaling \$8,360,750 were awarded to 214 communities and private non-profit organizations.

The Mitigation Strategy Report, dated August 7, 1998, focused on coordination with other disaster assistance programs, mitigation project development and promotion of the NFIP's mitigation opportunities.

HMGP funds available for this declaration were \$1,962,465 with the 75% federal share of \$1,471,849, a state share of 12.5% or \$245,308 with the local match the same. The state received 24 pre-applications totaling \$1.4 million. Each pre-application was reviewed, scored and ranked based on the state's priorities. The state convened the IDRG to discuss the pre-applications and establish priorities for HMGP funding.

As federal and state staff were administering the disaster assistance programs out of the Disaster Field Office located in La Crosse, significant flooding was occurring in the east central and southeast part of the state. As a result of those events, the state received a second Major Disaster Declaration in August for Milwaukee, Racine, Rock, Sheboygan and Waukesha Counties. A decision was made to pool the HMGP funds available from both declarations to be used to

fund projects submitted under either declaration that met the state's priority (i.e., acquisition of flood damaged properties with those determined to be substantially damaged receiving the highest priority). None of the pre-applications submitted under declaration 1236-DR met the criteria. Therefore, pre-applications submitted under the second declaration that met these criteria received further consideration. Ten communities were asked to participate in the formal application process with eight of the ten returning applications. After review of the formal applications, benefit-cost analyses and environmental review, the following applications were submitted to FEMA and subsequently approved:

B.4 HMGP APPLICANTS FOR FEMA 1236-DR		
Applicant	County	Amount
Brookfield, City of	Waukesha	\$ 180,725
Elm Grove, Village of	Waukesha	\$ 869,048
Menomonee Falls, Village of	Waukesha	\$ 502,782
Milwaukee, City of	Milwaukee	\$ 170,000
New Berlin, City of	Waukesha	\$ 136,325
State Management Costs	WEM	\$ 103,585
TOTAL		\$1,962,465

All of the projects involved the acquisition of substantially damaged properties except for the Village of Menomonee Falls. The village identified sixteen properties for acquisition and had received an approved HMGP grant as a result of the previous year's declaration, however, there were not enough funds awarded to purchase all the properties. Therefore, the funds awarded under declaration 1236-DR were to supplement the previous grant award.

As projects were completed, unspent funds were reallocated to other projects. Unspent funds from the Cities of New Berlin and Milwaukee were used to fund construction of a retention pond in the Village of Thiensville. Funds allocated for the declaration and approved totaled \$1,962,465 with actual expenditures of \$1,767,681. Appendix C identifies the projects and actual amounts awarded for the declaration.

FEMA-1238-DR-WI

On August 12, 1998, the President declared a Major Disaster for Milwaukee, Rock, Sheboygan and Waukesha Counties for both Public and Individual Assistance as a result of severe storms and flooding that occurred August 5-7. Racine County was later added for Individual Assistance but was denied Public Assistance. In addition, the Hazard Mitigation Grant Program was made eligible statewide.

The disaster was the result of an extremely active severe weather pattern during the period of August 4 through 7 in the southern part of the state. The storms caused flash flooding and urban/small stream flooding, the majority of which occurred on August 5 and 6. A series of slow-moving thunderstorms affected the area over several days and dumped from five to ten

inches of rain in a three to five hour period. The most severely impacted areas were the Cities of Sheboygan and Kohler in Sheboygan County, the eastern portion of Waukesha County, the northwest half of Milwaukee County, much of Rock County and the Town of Waterford in Racine County. Observed rainfall amounts in the City of Sheboygan were at least 10.7 inches, anywhere from 6 to 10 inches in Waukesha and Milwaukee Counties and 6 to 9 inches in Rock County.

The state was still in the recovery phase as a result of damages suffered in a May 31 severe weather (request for federal disaster assistance denied) and the June 18-30 storms. The severity of this event just amplified the situation making the recovery even slower.

The rain came so rapidly and intensely that sandbagging and pumping were ineffective. Creeks and rivers rose rapidly. Storm and sanitary sewers were overwhelmed by the intense rainfall. Tragically, two boys lost their lives in the Village of Elm Grove in Waukesha County as they were swept into a culvert and drowned in the drainage system. Another youngster in Rock County was pulled from a river and was in critical condition. Dozens of others were injured in the clean-up effort. Emergency response personnel were busy rescuing persons from stranded vehicles and evacuating homes and institutions.

Thousands of homes were damaged to one extent or another, hundreds of which had water above the first floor. Many of those sustained structural damage with basement walls bowing or collapsing. In the City of Sheboygan, which was particularly hard hit, an apartment complex was structurally damaged causing the long-term displacement of more than 100 residents. The flooding also affected hundreds of businesses, many of which sustained major damage and several of which permanently went out of business. Some of the same areas that had been hard hit the previous summer were again damaged in this event, making many structures substantially damaged.

Initial damage assessment figures reported \$44 million in private losses and \$11 million in public damages for a total of \$55 million in disaster damages. \$3,357,975 was awarded to 54 applicants for Public Assistance. A total of \$26,518,526 was made available as Individual Assistance from the following sources: Loans from the Small Business Administration (\$12,479,500); Disaster Housing Grants (\$8,824,255); Individual and Family Grants (\$5,147,127); the Disaster Unemployment Assistance Program (\$3,253); and the Crisis Counseling Program (\$64,121). The declared counties also received a Community Development Block Grant for \$3,462,000 to address serious unmet needs.

The Mitigation Strategy Report dated August 21, 1998, identified activities to be implemented in the following areas: Community mitigation education and outreach; Coordination with other disaster assistance programs; Mitigation project development; and NFIP mitigation opportunities and promotion.

Hazard mitigation (HMGP) funds available for the declaration amounted to \$4,450,421 with \$3,337,816 representing the 75% federal share with the state and local match of \$556,302 each. Recognizing that some of the hardest hit areas within Waukesha and Milwaukee Counties were

the same areas affected by flooding the previous summer, mitigation staff knew there would be structures that would meet the criteria of substantially damaged under local floodplain zoning. Therefore, federal and state staff including DNR worked with local officials to make substantial damage determinations. This included having FEMA provide a training session for local officials, state WEM and DNR staff meeting with communities and DNR sending letters to each of communities requesting them to identify the substantially damaged structures. This information became the basis for project development for the HMGP.

The state received 45 pre-applications totaling over \$50 million. Each pre-application was reviewed, scored and ranked. The IDRG reconvened and discussed the pre-applications and established HMGP funding priorities. FEMA and WEM staff was now faced with administering two declarations at the same time. The IDRG sought to fund those projects that included acquisition of flood damaged properties, with acquisitions of property determined to be substantially damaged under local floodplain zoning given the highest priority. In addition, the decision was made to pool the HMGP funds available from both declarations (1236 and 1238) to be used to fund projects that met the state's priority. None of the pre-applications submitted under 1236-DR met the criteria. Of the pre-applications submitted under 1238-DR, 16 were for acquisition and totaled \$35 million. Ten communities were asked to participate in the formal applications, benefit-cost analyses and environmental review, the following applications were submitted to FEMA and subsequently approved.

B.5 HMGP APPLICANTS FOR FEMA 1238-DR		
Applicant	County	Amount
Brown Deer, Village of	Milwaukee	\$1,304,650
Darlington, City of	Lafayette	\$ 196,841
Kenosha County	Kenosha	\$ 885,000
Menomonee Falls, Village of	Waukesha	\$ 117,705
Sheboygan, City of	Sheboygan	\$1,850,000
State Management Costs	WEM	\$ 117,705
TOTAL		\$4,450,421

The grants in the Village of Brown Deer and the City of Sheboygan involved the acquisition of substantially damaged properties. Again, the grant for the Village of Menomonee Falls was awarded to supplement previous grants to enable the Village to complete the acquisition of sixteen properties. The City of Darlington's grant was also awarded to supplement a previous grant so that they could complete the extensive mitigation project underway in that community since 1993. Since the 1993 flood, Kenosha County has aggressively pursued funding for mitigation efforts along the Fox River. As a result, the county was awarded a grant for

acquisition and demolition of structures along the Fox River that have repeatedly received flood damages.

As the projects were completed, any unspent funds were obligated to other projects incurring funding shortfalls, as well as to new projects identified in subsequent events.

As a result, a grant was awarded to the Village of North Fond du Lac for the acquisition and demolition of two properties one which was a repetitive loss site. In addition, additional funds were awarded to the Village of Thiensville for the construction of a retention pond. Funds allocated for the declaration and approved totaled \$4,450,421 with actual expenditures of \$4,392,207. Appendix C identifies the projects and actual amounts awarded to date for the declaration.

FEMA-1284-DR-WI

On August 16, 1999, the President declared a major disaster for Ashland, Bayfield, Douglas, Florence, Iron, Oneida, Price, Rusk, Sawyer and Vilas Counties as a result of severe storms, straight-line winds and flooding that occurred July 4-31 for Public Assistance. The Hazard Mitigation Grant Program was made eligible statewide.

On July 4 and 5 a strong thunderstorm accompanied by high winds dumped torrential rains and caused flash flooding in Bayfield County. More than four inches of rain fell in a very short time in various parts of the county, seriously impairing road systems. Another incident occurred on July 8 when strong thunderstorms dumped more than two inches of rain in Rusk County. The next major episode affected Florence County. Several parts of the county received over seven inches of rain over a six-hour period on July 15 and an additional two inches on July 16. The combined rains and resulting flash flooding had a devastating impact on the affected townships and residents.

On July 23, Rusk and Sawyer Counties were struck by strong early morning thunderstorms. Significant rainfall occurred and straight-line winds caused power outages. A combination of weather systems on July 25 led to continually redeveloping storms for several hours, which affected an even larger area of the state. Heavy rains and high winds occurred once again in Rusk, Sawyer and Bayfield Counties, but with an even more severe effect on Douglas County. Reports of four and five inches of rain were common and the resulting flash floods washed out roads, bridges and culverts. Several small communities such as Solon Springs in Douglas County waited nervously for the storms and rain to subside as homes and businesses were put at risk by the sudden downpour.

The final episode was on July 30. Thunderstorms produced strong wind gusts of more than 75 miles per hour and rainfall averaging one to two inches over a widespread area. Many of the areas hit were the same counties that were ravaged by the previous episodes of severe weather. In Rusk, Douglas and Sawyer Counties downed trees and power lines and washed out roads were once again very common. The storms' intensity persisted as they traveled eastward and wrecked further havoc in Oneida, Vilas and Florence Counties. Tragically, this storm killed three people and inflicted dozens of injuries as trees fell on people and homes.

The collective impact of the series of storms was tremendous especially to the infrastructure of the very sparsely populated, poor, rural communities in these counties. Roads were severely damaged with washouts, scouring, culverts washed away and bridges destroyed. Getting the main roads passable was a tremendous burden on towns that often had a one or two person road crew. Because of the multiple storms, some roads or sections of road were repeatedly damaged, with crews just completing repairs only to have them washed out again several days later. Many persons were forced to take alternate routes of travel driving literally hundreds of miles out of their way to get to their destinations.

High winds and tornadoes also blocked roads with debris. In Oneida and Vilas Counties especially, debris was just shoved to the side of the major roads so as to provide emergency access. It was many weeks before the debris along the right of way was totally removed. Even after cleanup of the roads and right of ways, there remained hundreds of acres of downed timber on private land and local, county, state and national forests. This downed timber created a danger for forest fires that continued into 2000. In light of the fact that it was prime camping season, the state was very fortunate that more campers and park users were not killed or injured. The high winds also took their toll on rural electric cooperatives. There were many downed power lines and utility lines.

Dozens of homes were also affected by the severe weather. In some counties such as Douglas and Florence many residents reported basement flooding. Others experienced water in living areas. In Solon Springs in Douglas County, the St. Croix Lake was so high that homes were surrounded by water. Another problem was contamination of water supply wells due to flooding. Falling trees and high winds damaged dozens of homes and farm buildings. Thousands of residents and businesses were affected by the widespread power outages. Initial damage assessment figures reported \$1.5 million in losses to private property and \$6.5 million on public damages for a total of \$8 million. A total of \$5,158,534 in Public Assistance grants were awarded to 167 applicants.

The Mitigation Strategy Report dated August 24 identified activities to be implemented in the following areas: Community mitigation education and outreach; Coordination with other disaster assistance programs; Mitigation project development; and NFIP mitigation opportunities and promotion.

HMGP funds available for the declaration amounted to \$812,059 with \$609,044 representing the 75% federal share and a state and local match of \$101,529 each. The state received twenty preapplications totaling \$4,438,999. Each pre-application was reviewed, scored and ranked. The IDRG reconvened and discussed the pre-applications and established HMGP funding priorities. After discussion with the IDRG, a decision was made to ask eight applicants (thirteen applications) to participate in the formal application process. Two applicants withdrew. After review of the applications and benefit-cost analyses, the recommendation was made to fund projects as follows:

B.6 HMGP APPLICANTS FOR FEMA 1284-DR		
Applicant	County	Amount
Florence, Town of	Florence	\$250,240
Head of the Lakes Electric Coop.	Douglas	\$235,760
Superior, City of	Douglas	\$320,000
State Management Costs	WEM	\$ 6,059
TOTAL		\$812,059

Based on the funding available and project costs, the applicants are providing greater than the required 12.5% local match. The Town of Florence received a grant for the purpose of a constructing a new municipal well; the Head of Lakes Electric Cooperative replaced 6.3 miles of existing overhead power lines to underground; and the City of Superior for costs of construction of a 700-foot storm water interceptor sewer to connect to the existing storm sewer. In addition, two of the applications (Village of North Fond du Lac in Fond du Lac County and Village of Thiensville in Ozaukee County) were funded under declarations 1236 and 1238 with unspent funds from other projects. Funds allocated for the declaration and approved totaled \$812,059 with actual expenditures of \$806,041. Appendix C identifies the projects and actual amounts awarded to date for the declaration.

FEMA-1332-DR-WI

On June 23, 2000, the President declared a major disaster for 12 counties as a result of severe storms, straight-line winds and flooding that began on May 26. By the end of the incident period (July 19), thirty counties had been included in the declaration: Thirteen counties for both Public and Individual Assistance (Columbia, Crawford, Dane, Grant, Iowa, Juneau, Kenosha, Lafayette, Milwaukee, Richland, Sauk, Vernon and Walworth); Fourteen for Public Assistance only (Adams, Ashland, Barron, Burnett, Forest, Green, Iron, Jackson, Monroe, Oneida, Polk, Rusk, Sawyer and Washburn); and another three (Dodge, Racine and Waukesha) for Individual Assistance. The Hazard Mitigation Grant Program was made eligible statewide.

The disaster started after a very wet month of May. The National Weather Service indicated that it was the wettest month ever for most locations in southern Wisconsin going back through the weather books to 1870. Generally, 8 to 11 inches were measured, with some locations in eastern Iowa and Dane Counties unofficially receiving between 16 and 18 inches. The wet, rainy weather culminated in a series of severe thunderstorms and heavy rains that began May 26 and continued into early June.

The storms produced record rainfalls, tornadoes and hurricane force winds. From 9:00 p.m. on May 29 through 8:00 p.m. on June 2, between 8 and 10 inches of rain fell along a line from southern Vernon County through northern Richland County to central Sauk County, over northwest Iowa County into northwest Dane County and over northern Lafayette County. Because soils were already saturated, the heavy rains pushed most mainstream rivers over flood stage and caused severe and widespread flooding.

Three tornadoes were documented on June 1, in Dodge, Juneau and Monroe Counties. The one in Dodge County, an F2, occurred just after 6:00 p.m. and was on the ground for more than 16 miles. The tornado destroyed or did major damage to several dozen homes in Iron Ridge, a small community of 800 in Dodge County. Elsewhere, there were notable downbursts or wind gusts in the 75 to 100 mph range, accompanied by hail as large as golf balls. Rains reappeared on June 3-4 and added another one to two inches to already saturated soils.

The collective impact of these series of storms was tremendous, especially to the infrastructure of the counties. For many of the communities, roads were severely damaged with washouts, scouring, culverts washed away and bridges destroyed. Just getting the main roads passable was a tremendous burden on the towns, which sometime have a one or two person road crew. Because of multiple storms, some roads or sections of road were damaged repeatedly, with crews just effecting repairs, only to have them washed out again several days later.

High winds and tornadoes also blocked roads with debris and downed power and utility lines. In Juneau and Monroe Counties especially, debris was just shoved to the side of the major roads so as to provide access for emergency vehicles and power crews. It was weeks before debris along the right-of-way was totally removed. This was of great concern to local officials and residents, as many of the roads were nothing more than narrow fire lanes, and the debris made the roadways even narrower. Even after the cleanup, there remained acres of downed timber and debris on private land and in local, county and state forests.

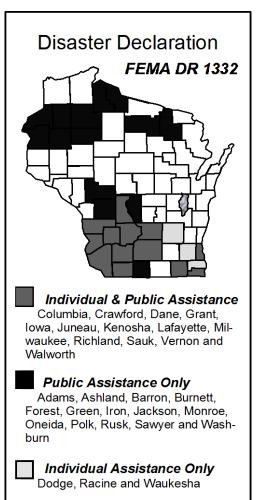
The high winds and flooding also impaired electrical service and took their toll on the rural electric cooperatives. Power crews did a commendable job of restoring service, considering the multiple events, the widespread area of impact and the condition of the roadways. Phone service was also affected, mostly by the rain, and it took at least 2 weeks to have all service fully restored.

Dozens of homes were also affected by the flooding and severe winds. In the majority of the counties, basement flooding was common, jeopardizing furnaces and water heaters. Grant County reported a dozen or more homes that had major damage or were destroyed. Several communities reported sewer back up in residences. Still others had access problems, as roads were either blocked with debris, inundated with water or had bridges washed away. Private well contamination and septic tank problems were reported. Thousands of residences and businesses were affected by the widespread power outages and even those citizens whose structures sustained no physical damage, had to deal with spoiled food or commodities. Shelters were opened, as necessary, in the affected areas to accommodate those displaced from their homes or to serve as relief stations for those involved with the cleanup.

Initial damages assessment figures reported \$11.4 million in private property and \$17.3 million in public damages for a total of \$28.7 million. A preliminary damage assessment was completed for sixteen counties. On June 13, the state requested that Public Assistance be made available to sixteen counties and Individual Assistance for ten of the counties plus contiguous counties.

Another major storm system moved across southeastern corner of the state on June 12 and 13. Kenosha and Walworth Counties received 3 to 5 inches of rain on already heavily saturated soils. Since the Governor's original request, rains continued to fall across southern Wisconsin. In Kenosha, damages were countywide and the County Executive declared a State of Emergency. At one point, more than 100 roads were closed due to high water with 41 county roads remaining closed for several days. Property owners reported losses due to basement flooding, sewer backup and backed up wells. A boating unit assisted with evacuations of a mobile home park in Pleasant Prairie and homes in the Town of Somers. Several communities in Walworth County were also impacted. One village evacuated 100 residences bordering a rapidly rising retention pond. The request included Public Assistance for all three counties, and Individual Assistance for Kenosha and Walworth. The Governor amended his request on June 14 to include the Counties of Jackson, Kenosha, and Walworth.

On June 23, the President declared twelve counties from the Governor's original request eligible for Public Assistance only. On June 28, FEMA advised that Individual Assistance was not granted, as it was determined that the impacts to individuals were not beyond state and local capabilities.



The Governor appealed the above decision on June 30, as additional damages were uncovered in several counties, including Dane, Grant, and Kenosha. The appeal requested that FEMA re-evaluate the information and make Individual Assistance available to the twelve counties and all contiguous counties.

On June 30, the disaster declaration was amended to add Columbia, Kenosha, Jackson, and Walworth Counties for Public Assistance only. Subsequent to the Governor's appeal, on July 11 Crawford, Dane, Grant, Kenosha, Milwaukee, Vernon and Walworth Counties were all declared eligible for Individual Assistance.

On July 2, storms roared through southeastern Wisconsin. Strong winds and heavy rains (4 to 6.5 inches) with the subsequent loss of power caused water and sewage to backup in nearly 7,000 homes. That storm also spawned a F1 tornado that affected the City of Oak Creek and portions of northern Racine County. On July 10, the WEM Division Administrator on behalf of the Governor asked that both Public and Individual Assistance be extended to Milwaukee County, and Public Assistance in Racine County. In addition, he requested that the incident period be extended to July

5. Ironically, the incident period was closed effective July 5. However, on July 8 and 9 the state once again experienced another 4 to 10 inches of rain that resulted in flash flooding in many of the same areas already included in the declaration. In Sauk, Vernon and Crawford Counties, roads affected in the earlier storms were once again damaged, in some cases more severely. With soils saturated and rivers and lakes at or near flood stage, most of the southern half of the state remained at risk with damages occurring with each storm event. More damages were reported in Barron, Burnett, Forest, Oneida, Polk, Rusk, Sawyer and Washburn. On July 12 the Governor requested that the incident period be reopened.

On July 13, Public Assistance was extended to Milwaukee County. This would be the third presidential disaster declaration in four years for the county. On July 13, the WEM Division Administrator requested that in addition to Public Assistance, that Individual Assistance also be granted to Racine County. Effective July 18, Racine County was made eligible for Individual Assistance, but denied Public Assistance. In addition, the Counties of Richland and Sauk were also made eligible for Individual Assistance as a result of the Division Administrator's request the day before.

As a result of the storms that occurred over the weekend of the 10th, ten sparsely populated counties in the northern half of the state were seriously impacted, sustaining almost \$2 million in Public Assistance costs with almost \$1 million in road damages. Therefore, on July 17, the Division Administrator requested that Ashland, Barron, Burnett, Forest, Iron, Oneida, Polk, Rusk, Sawyer and Washburn Counties be included in the declaration for Public Assistance. On July 18 the request was granted and the incident period was closed effective July 19.

Based on calls received on the FEMA teleregistration number, on July 21 the State Coordinating Officer requested that Individual Assistance be granted to Columbia, Iowa, Juneau and Waukesha Counties, and on August 8 for Juneau County. The requests were granted on July 26 and August 9. As a result of the severe weather extending from May 26 through July 19, the final count was 30 counties included in the federal declaration. Thirteen counties were declared for both Public and Individual Assistance, fourteen for Public Assistance only, and three counties for Individual Assistance only.

Under the Disaster Housing Program, 4,139 individuals were eligible for assistance with more than \$6 million disbursed. In the Individual and Family Grant Program, 4,033 applications have been approved for the program with over \$4.5 million issued to disaster victims making it the second largest IFG program in terms of dollars for the state. The Public Assistance Program received 447 applications for disaster assistance totaling to date \$13,857,393.

The Mitigation Strategy Report dated July 17, 2000, identified activities to be implemented in the following areas: Community mitigation education and outreach, coordination with other disaster assistance programs, mitigation project development and National Flood Insurance Program mitigation opportunities and promotion.

Hazard Mitigation (HMGP) funds available for the declaration are \$4,424,019 with \$3,318,014 representing the 75% federal share with the state and local match of \$553,002.50 each. Preapplications for the program were mailed to potential applicants on September 5 with a due date of October 9. The state received 89 pre-applications totaling \$29.8 million. The preapplications were categorized as follows:

B.7 HMGP PRE-APPLICATIONS FOR FEMA 1332-DR BY TYPE		
Number	Туре	Amount
13	Acquisition	\$14,225,523
17	Detention	\$ 8,327,638
7	Sewer	\$ 1,658,966
7	Drainage	\$ 2,310,000
32	Road Related	\$ 1,244,790
12	Miscellaneous	\$ 2,014,120
1	Ineligible	\$ 1,800
89	TOTAL	\$29,782,837

Each pre-application was reviewed, scored and ranked. Based on the funding priorities previously established by the Interagency Disaster Recovery Group, those communities that applied for acquisition were requested to participate in the formal application process. Formal applications have been forwarded to 9 additional communities with proposed projects that were feasible and addressed state mitigation priorities. A total of 16 completed formal applications were returned. After review of the applications and benefit-cost analyses, the recommendation was made to fund the projects as follows.

B.8 HMGP APPLICANTS FOR FEMA 1332-DR		
Applicant	County	Amount
Baraboo, City of	Sauk	\$ 150,000
Crandon, City of	Forest	\$ 110,000
Cumberland, City Municipal	Barron	\$ 380,520
Dane Co. Emergency Mgmt.	Dane	\$ 33,000
Eau Claire, City of	Eau Claire	\$1,488,562
Elm Grove, Village of	Waukesha	\$ 943,638
Jefferson County	Jefferson	\$ 555,743
Kenosha County	Kenosha	\$ 643,997
Shell Lake, City of	Washburn	\$ 50,000
Sun Prairie, City of	Dane	\$ 30,000
State Management Costs	WEM	\$ 38,559

TOTAL \$4,424,019

Four applications involved acquisition and demolition, one demolition only, one relocation/floodproofing, three retrofit projects, one structural and one planning grant. The Jefferson and Kenosha Counties and the Village of Elm Grove used the grant funds to further their ongoing acquisition programs. The City of Eau Claire incurred significant damages from storms and flooding that occurred in September 2000. The State requested and was denied a federal disaster declaration. However, the State was able to award HMGP funds to the City for the acquisition of ten homes that suffered major damages. Other projects involved burying overhead power lines, construction of a storm sewer, relocating a picnic shelter, installing back flow valves and installing surge protectors on warning sirens. Funds allocated for the declaration and approved totaled \$4,424,019 with actual expenditures of \$4,045,602. Appendix C identifies the projects and actual amounts awarded to date for the declaration.

FEMA-3163-EM-WI

On January 24, 2001, the President declared a state of emergency in the State of Wisconsin. The declaration was based on emergency measures performed to save lives and protect public health and safety resulting from record/near record snow on December 11-31, 2000. Dane, Door, Green, Kenosha, Kewaunee, Manitowoc, Milwaukee, Racine, Rock, Sheboygan and Walworth Counties for emergency protective measures (Category B) under the Public Assistance program for a period of 48 hours. Later Columbia, Ozaukee and Waukesha counties were added to the emergency.

FEMA-1369-DR-WI

On May 11, 2001, the President declared a major disaster for 17 counties as a result of flooding and severe storms that began on April 10th. By the time the incident period would close on July 6th an additional 15 counties would be added to the declaration for a total of 32 counties. Eighteen Counties would be declared for both Individual and Public Assistance, and another 14 for Public Assistance only.

Heavy December snowfalls contributed to spring flooding. In mid-April, rain and snowmelt caused the Mississippi River and many of its tributaries to flood. Floodwaters along the Mississippi River from Alma to Prairie du Chien rose to the highest levels since 1965. Spring snowmelt flood outlooks issued by the National Weather Service in March indicated that minor to moderate flooding could be expected along the Mississippi River, assuming normal precipitation and temperatures. However, a cooler than normal spring was not conducive to a gradual snowmelt in the northern reaches of the river basin. Warmer weather in early April resulted in a sudden melt and combined with persistent rainfalls, the Mississippi River began to swell. Early in the week of April 8th, the NWS issued statements indicating the gravity of the situation and communities all along the River began an intense flood-fighting effort.

The River crested at near record stages in most Wisconsin locations during the week of April 15th and then slowly began to recede. The recession was short-lived, however, when additional

heavy rains and snowfall in the northern reaches of the river basin caused the River to rise gain. It crested for the second time in most locations during the last week in April, and remained above flood stage for weeks.

In northern Wisconsin, snowmelt flooding saturated the sandy soils and water tables rose. Persistent showers during the first weeks in April kept those levels high and then heavy rains, from 3 to 5 inches, snow and ice the weekend of April 21 and 22 brought the situation to disastrous proportions. Rivers and creeks quickly exceeded flood stage and lakes overflowed.

The prolonged flood fighting efforts took their toll, not only financially, but also emotionally on the affected communities and individuals. Millions of dollars were spent on emergency protective measures to protect property and save lives. Damage to infrastructure was significant as was the damages to municipal, county, and state parks, forests and recreational areas. Two of the State's historical properties, Villa Louis in Prairie du Chien and Stonefield in Cassville, sustained damage.

More than 2,000 residences were damaged with varying levels of water in them. More than 200 businesses were impacted, including 100 that closed due to the flooding. Even those businesses that did not sustain physical damage suffered economic loss with the closure of the Mississippi River to all traffic. The same was true of the affected communities, most of which thrive on the commerce provided by the River and the tourism industry.

The scope of the disaster expanded when severe storms hit the west-central and east-central areas of the State on June 11 with hurricane-force winds, several tornados, golf and baseball size hail and heavy rains. More than 30 counties reported damage totaling more than \$11 million. One week later on June 18th, a F3 tornado hit Burnett and Washburn Counties. This tornado touched down near Grantsburg and continued traveling east for over 25 miles to an area just outside of Spooner. There was extensive damage and destruction along the tornado's path. The tornado destroyed much of the small community of Siren with a population of 874. Damage was concentrated in a six-block wide where numerous homes and businesses were completely leveled, 3 people killed and 16 people injured.

Under the Housing Program over \$1.6 million was distributed to almost 1,100 households. A total of \$707,028 was distributed to 250 applicants under the Individual and Family Grant Program. WEM received 518 applications from local governments for Public Assistance and distributed \$25,854,670 through the program making it the largest Public Assistance Program to date. The Small Business Administration provided more than \$20 million in low-interest home repair loans, business damage loans and business economic recovery injury loans.

The Mitigation Strategy dated June 2, 2001, identified activities that included identifying and cataloging mitigation opportunities in the impacted communities; implementing acquisition, relocation, demolition, and/or floodproofing mitigation measures; maximizing financial resources for mitigation opportunities; and ensuring long-term mitigation through comprehensive floodplain management and local building practices.

For the first time, there was an opportunity to document the benefits of past mitigation efforts. Pierce County received a HMGP grant after the 1993 flood to acquire fifty-nine properties located on Trenton Island, which is located in the middle of the Mississippi River. Another 7 properties sold to the Red Wing Area Fund, a local conservation group. A flood that occurred in 1997 as well as the flooding in 2001 illustrated the benefits of the buyout program. The extensive losses caused in 1993 would have been multiplied in the 1997 and 2001 floods and in future floods if the homes and businesses participating in the buyout program had remained on the island. To demonstrate the benefits of the program, a success story was developed on the Trenton Island project. The story, as well as other success stories, can be found on WEM's website at http://emergencymanagement.wi.gov and FEMA Region V's website at www.fema.gov/mitigationbp/sstoryfind.do.

Hazard Mitigation (HMGP) funds available for the declaration were \$4,390,075 with \$3,292,556 representing the 75% federal share with the state and local match of \$548,759.50 each. WEM received 74 pre-applications for project grant funds totaling over \$25 million. The pre-applications were categorized as follows:

B.9 HMGP PRE-APPLICATIONS FOR FEMA 1369-DR BY TYPE		
Number	Туре	Amount
12	Acquisition	\$ 6,730,357
6	Floodproofing-Elevation	\$ 457,417
11	Drainage/Detention	\$ 5,476,171
9	Sewer	\$ 6,116,196
9	Miscellaneous	\$ 646,668
20	Road Related	\$ 2,221,770
7	5% Special Projects	\$ 3,467,370
74	TOTAL	\$25,115,949

After reviewing, scoring and ranking the applications, 19 communities were requested to participate in the formal application process. Upon review of the applications and completion of the benefit-cost analyses the following applications were submitted to FEMA and approved for funding.

B.10 HMGP PROJECT GRANT APPLICANTS FOR FEMA 1369-DR		
Applicant	County	Amount
Burnett County	Burnett	\$ 29,425
Crawford County	Crawford	\$ 713,548
Dairyland Electric Power Coop.	Vernon	\$ 12,000
Douglas County	Douglas	\$ 93,600

Grant County	Grant	\$ 471,850
Grant County	Grant	\$ 20,770
Jefferson County	Jefferson	\$ 336,845
Juneau County	Juneau	\$ 169,436
Kenosha County	Kenosha	\$ 414,500
Dept. of Natural Resources	State	\$ 96,450
Shell Lake, City of	Washburn	\$ 250,000
Superior, City of	Douglas	\$ 86,317
Trempealeau County	Trempealeau	\$1,059,000
State Management Costs	WEM	\$ 333,811
TOTAL		\$4,087,552

This was the first declaration that communities were eligible to apply for funds for the development of an all hazards mitigation plan. Based on 7% of the HMGP funds planning grants were awarded as follows:

B.11 HMGP PLANNING GRANT APPLICANTS FOR FEMA 1369-DR				
Applicant	County	Amount		
Burnett County	Burnett	\$ 60,000		
Dane County	Dane	\$ 40,000		
Douglas County	Douglas	\$ 53,333		
Grant County	Grant	\$ 50,000		
Juneau County	Juneau	\$ 20,000		
Shell Lake, City of	Washburn	\$ 19,000		
Superior, City of	Douglas	\$ 55,000		
Sun Prairie, City of	Dane	\$ 5,190		
TOTAL		\$302,523		

Funds allocated for the declaration and approved totaled \$4,390,075 with actual expenditures of \$4,009,852. Appendix C identifies the projects and actual amounts awarded to date for the declaration.

FEMA-1429-DR-WI

On July 19, 2002, the President declared a major disaster for Adams, Clark, Dunn, Marathon, Marinette, Portage, Waushara, and Wood Counties for Public Assistance as a result of heavy rains, flooding and severe storms that took place June 21-25.

Severe weather began on June 21 with tremendous rainfall in central Wisconsin caused by a nearly stationary warm front. Heavy and persistent rains continued into June 22, with totals

being reported anywhere from 5 to 15 inches. Intermittent rainfalls occurred over the next several days further saturating soils and keeping river levels and water tables high. The National Weather Service issued numerous flash flood watches and warnings throughout the period. On June 23, a cold front associated with the weather pattern triggered another bout of severe weather, including heavy rains and a tornado. Marinette County was hardest hit by this event, with flash flooding doing substantial damage to the infrastructure in the City of Marinette and the Village of Crivitz. Homes and businesses also sustained various degrees of damage. On June 25, another storm occurred with high winds and heavy rains. In Clark County, the City of Abbotsford was particularly impacted, with several businesses and homes sustaining tornado damage. Numerous trees were downed and two minor injuries were reported. Dunn County was also affected with numerous trees down and the Rural Electric Cooperative sustaining damage.

The impact of the storms was tremendous to the public, private and agricultural sectors. More than 350 residences incurred minor damage with basement flooding and sewer backup. A number of individuals were evacuated from their homes during the height of the flooding, oftentimes because access was totally cut-off. Detours caused others to drive many miles out of their way to get to their homes or places of business. Local emergency crews and volunteers helped sandbag around residences and businesses in an attempt to minimize damages. Private well contamination and septic tank problems were also reported.

The agricultural sector in the impacted counties reported damage to cranberries, potatoes, sweet corn, peas, snap beans, corn, soybeans, oats, barley, ginseng and alfalfa. In some cases it was too late to replant. The storms took their greatest toll on the public sector. Roads were severely damaged with washouts, scouring, culverts washed away and bridges. In Clark and Dunn counties high winds and tornadoes blocked roads with debris and downed power and utility lines. In the City of Marinette storm sewers were damaged or collapsed with damages to infrastructure at more than \$500,000. Similar situations were experienced in numerous other communities in the eight affected counties.

WEM received 104 applications from local governments for Public Assistance and distributed \$4,495,653 million through the program. The Farm Service Agency made emergency loans available to farmers in 30 counties (the original 8 plus 22 contiguous counties).

Hazard Mitigation (HMGP) funds available for the declaration were \$662,603 with \$496,952 representing the 75% federal share with the state and local match of \$82,825.50 each. WEM received 38 pre-applications totaling \$7.5 million. The pre-applications included 8 for acquisitions, 13 structural, 6 road and culverts, 2 educational, 4 power related, and 4 other.

Disaster declaration 1429-DR was followed by 1432-DR declared September 10th. The amount of HMGP funds available combined from both disasters was less than \$2 million. Since the declarations were so close together and the amount of funds was limited, the decision was made to pool the HMGP funds available from both declarations and use to fund projects that

met the state's priority. Upon review of the formal applications and completion of the benefit-cost analyses the following applications were submitted to FEMA and approved for funding.

B.12 HMGP APPLICANTS FOR FEMA 1429-DR				
Applicant	County	Amount		
Crandon, City of	Forest	\$ 21,000		
Curtis, Village of	Clark	\$ 60,000		
Elm Grove, Village of	Waukesha	\$208,401		
Oliver, Village of	Douglas	\$255,100		
Portage County	Portage	\$ 40,849		
State Management Costs	WEM	\$ 77,253		
TOTAL		\$662,603		

Three applications included acquisition with the other two for the development of all hazard mitigation plans. Funds allocated for the declaration and approved totaled \$662,603 with actual expenditures of \$607,609. Appendix C identifies the projects and actual amounts awarded to date for the declaration.

FEMA 1432-DRI-WI

On September 10, 2002, the President declared a major disaster for Polk, Rusk and Taylor Counties for Individual and Public Assistance along with 16 contiguous counties for Individual Assistance as a result of severe storms, tornadoes and flooding that occurred September 2-6, 2002.

Severe weather began early in the morning on September 2, 2002. Heavy rains occurred in the far western counties of the State. In Polk County Village of Osceola the rains caused an old mill dam to breach and floodwaters crashed through a mobile home park. The torrent continued downstream, overtopping a second dam and causing extensive road damage. Other townships in the county were also affected by almost 5 inches of rain. The storms continued to intensify as the day progressed, prompting the National Weather Service to issue Severe Thunderstorm or Tornado Watches for much of the northern half of the State. The National Weather Service confirmed a total of six tornadoes, two each in Marathon and Fond du Lac Counties and one each in the Taylor and Rusk Counties.

The initial thunderstorms that developed in Burnett and Polk Counties intensified into supercells as they entered into Rusk and Sawyer Counties around 4:30 p.m. and produced a F3 tornado that destroyed homes and businesses in Ladysmith in Rusk County. Forty minutes later another supercell thunderstorm moved across southwest Taylor County and spawned a tornado that moved through the Town of Gilman where it blew the roof off the high school. The same storm system moved east into Marathon County and produced a F0 tornado near Athens and a F1 tornado in the northern suburbs of Wausau.

The tornado in Taylor and Rusk Counties was the most devastating, particularly in Rusk County. It touched down at approximately 4:20 p.m. about one and one-half miles west-southwest of downtown Ladysmith and remained on the ground for approximately 30 minutes. It traveled at about 30 mph. It left a path of destruction 15 miles long and one-quarter mile wide. For part of its track in downtown Ladysmith it was rated an F3 on the Fujita scale, the rest of the track was F2 intensity. Once outside Ladysmith the tornado dissipated to an F1 level. The tornado in Taylor County, F2 intensity, touched down at 5:11 p.m. near Gilman and lifted at 5:50 p.m. west of Medford.

The impact of the tornadoes and storms was tremendous to the public and private sectors. More than 200 residences incurred various degrees of damage. In Ladysmith, population just under 4,000, more than 32 homes were destroyed, 71 incurred major damage and 110 minor damage. Twenty-four businesses were destroyed and 11 incurred major damage. Those businesses employed about 160 individuals either full or part time. The economic impact of the event in Ladysmith was estimated at \$29.5 million.

Under the Housing Program over \$125,000 was distributed to 95 households. A total of \$250,635 was distributed to 66 applicants under the Individual and Family Grant Program. WEM received 52 applications from local governments for Public Assistance and distributed over \$2,743,600 through the program.

Utilizing FEMA HMTAP (Hazard Mitigation Technical Assistance Program) funds, the report *Bracing for the Future: Construction Techniques to Protect against Future Wind Damage in Ladysmith* was developed in partnership with FEMA, WEM and the City of Ladysmith. The report identified the different types of damages sustained to both residential and commercial structures as well as the Gilman High School along with explanation as to the cause. The report further outlined wind-damage reduction techniques along with relative costs. The mitigation strategies in the report focused on construction enhancements that would allow a building or structure to resist winds above the current building code. The report can be found on WEM's website at http://emergencymanagement.wi.gov.

Hazard Mitigation (HMGP) funds available for the declaration were \$1,089,584 with \$817,188 representing the 75% federal share with the state and local match of \$136,198 each. WEM received 25 pre-applications totaling \$7.5 million. Several of the pre-applications were also submitted under 1429-DR. The pre-applications included 7 for acquisitions and 11 structural measures.

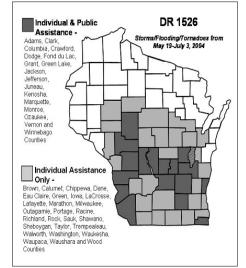
As stated previously, since declarations 1429-DR and 1432-DR were so close together and the amount of funds was limited, the decision was made to pool the HMGP funds available from both declarations and use to fund projects that met the state's priority. Upon review of formal applications and completion of the benefit-cost analyses the following applications were submitted to FEMA and approved for funding.

B.13 HMGP APPLICANTS FOR FEMA 1432-DR				
Applicant	County	Amount		
Ferryville, Village of	Crawford	\$ 74,500		
Oliver, Village of	Douglas	\$ 150,600		
Osceola, Village of	Polk	\$ 543,140		
Polk County	Polk	\$ 60,000		
Portage County	Portage	\$ 6,800		
Rusk County	Rusk	\$ 29,250		
Rusk County	Rusk	\$ 29,856		
St. Croix Falls, City of	Polk	\$ 84,950		
State Management Costs	WEM	\$ 110,488		
TOTAL		\$1,089,584		

The applications included 4 acquisitions, 2 purchase and distribution of weather alert radios, and 2 for the development of all hazard mitigation plans. Funds allocated for the declaration and approved totaled \$1,089,584 with actual expenditures of \$755,243. Appendix C identifies the projects and actual amounts awarded to date for the declaration.

FEMA 1526-DR-WI

On June 18, 2004, the President declared a major disaster as a result of severe storms and flooding that began on May 19th. The following counties were declared for the Public Assistance Program: Clark, Columbia, Crawford, Dodge, Fond du Lac, Grant, Green Lake, Kenosha,



Ozaukee, Vernon, and Winnebago Counties. Individual Assistance was declared for Columbia, Dodge, Fond du Lac, Jefferson, Kenosha, Ozaukee, and Winnebago. On July 2, 2004, 6 more counties were added for Public Assistance and 37 for Individual Assistance bringing the total number of counties to 44 (17 for Public Assistance and 44 for Individual Assistance.) This would be the greatest number of declared counties in one summer since 1993 when 47 counties received federal aid. The declaration initially covered damages that occurred between May 19 and July 3, 2004. On October 8th, based on a request by the Governor submitted on July 8th, the incident period was reopened to cover damages that occurred beginning May 7 through July 3, 2004.

Rainfall during early May left soils saturated and rivers and stream banks near full. This set the stage for the overland and riverine flooding that occurred in the latter half of the month when a second period of record precipitation occurred. According to the National Weather Service, at

some official observation sites in southern Wisconsin, new all-time May precipitation records were set. In some cases, new all-time monthly records were broken. Repeated rains persisted over the southern half of Wisconsin during most of May and through June. Repeated rounds of thunderstorms with heavy rains caused record or near record flooding along the Fox, Rock, Crawfish, Kickapoo and Fond du Lac Rivers, among many others. In the latter part of June, subsequent to the original declaration, severe storms, flooding and tornadoes occurred in additional counties.

Columbia and Dodge Counties reported damages to roads, homes and businesses as a result of heavy rains that occurred over a 24-hour period on June 9-10 when up to 9 inches of rain fell. Especially hard hit was the small community of Randolph. Over 250 homes and 15 businesses reported basement or first floor flooding. Heavy rains caused damage to the Cambria Dam, washing out a major state highway. The City of Fond du Lac and the Village of North Fond du Lac also incurred significant damages in addition to evacuating approximately 300 homes.

Damage to private residences and businesses was tremendous. The Preliminary Damage Assessment (PDA) reports indicated that more than 5,000 primary residences were damaged to varying degrees. Some had water in them for weeks. Many had collapsed, cracked or bulging basement walls and foundations. The PDA indicated that about 62% of those affected are low to moderate income and that almost all of the structures sustaining damage were uninsured. Tourism was also significantly impacted. Many parks and trails were damaged and/or destroyed. Several dams were threatened and incurred damages.

The agricultural sector also sustained considerable damage. This is very significant in that most of the affected counties have economies dependent on agriculture. Many early plantings of crops were washed out by the torrential rains.

Then on the evening of June 23rd severe thunderstorms swept across the State spawning 16 confirmed tornados, killing one person and causing millions in damages. The date ranks fourth in the number of tornadoes striking Wisconsin on a single day. The storm created a path three miles wide by nine miles long in Adams County causing significant damages in the Towns of Easton and New Chester. A tornado touched down in a campground in Warrens in Monroe County injuring 6 people. An F3 tornado in Markesan, Green Lake County, caused extensive tree and building damage. One person was killed when the tornado destroyed his home. Tornados touched down in Dane, Green Lake, Dodge, Fond du Lac, Marquette, Outagamie, and Portage counties. The tornadoes ranged in strength from F0 to F3.

Over 8,000 people applied for federal assistance with close to 2,978 households approved for \$5,100,075 under the Housing Assistance Program. Over 1,975 were approved for \$1,468,795 million in Other Needs Assistance. Over 2,000 people have applied for Disaster Unemployment Assistance, with 224 claims approved in the amount of \$156,041. The Small Business Administration received over 1,300 applications for low-interest loans with 349 approved for \$9.9 million. 386 communities have applied to the Public Assistance Program with grants approved in the amount of \$14,245,186.

During the Disaster Field Operations, a data collection effort was conducted in Jefferson (Blackhawk Island area) and Kenosha Counties (Fox River area.) Damaged structures were inventoried and information collected for potential mitigation opportunities. Both Counties have been implementing buyout programs since the 1993 floods and indicated their intent to apply for additional HMGP funds. The structure inventory will assist the counties in determining which properties should be considered for mitigation as well as assist in completing the HMGP application. In addition, success stories were documented and completed for both counties on past mitigation efforts. The stories, as well as other success stories, can be found on WEM's website at http://emergencymanagement.wi.gov and FEMA's website at http://emergencymanagement.wi.gov and FEMA's website at http://emergencymanagement.wi.gov and FEMA's website at http://emergencymanagement.wi.gov and FEMA's

The potential for substantially damaged structures in the floodplain was high. Therefore, FEMA, WDNR and WEM staff conducted Substantial Damage Training Workshops in Madison, Oshkosh, Waukesha, and Portage. The training will assist those officials responsible for determining structures that may be substantially damaged in accordance with their local floodplain ordinance. FEMA and WDNR staff provided additional technical assistance to several communities.

This was the first declaration where the program received 7.5% of the Individual and Public Assistance Programs, versus 15%. WEM received 73 pre-applications totaling \$15.6 million. Pre-applications were reviewed, scored and ranked. Projects that met State priorities and made the biggest impact on reducing future disaster costs were considered for funding.

B.14 HMGP PRE-APPLICATIONS FOR FEMA 1526-DR BY TYPE		
Number	Туре	Amount
9	Acquisition	\$ 4,978,500
1	Floodproofing	\$ 24,950
4	Studies	\$ 791,000
4	Warning systems	\$ 197,790
9	Hazard Mitigation Plans	\$ 328,000
10	Roadwork	\$ 739,919
5	Sewer	\$ 2,218,000
22	Structural	\$ 2,194,150
9	Miscellaneous	\$ 4,168,563
73	TOTAL	\$15,640,872

The HMGP allocation for the disaster was \$1,847,086. Three planning grants under the 7% allocation were funded; 3 projects under the 5% allocation for the purchase and distribution of NOAA weather radios; and 4 projects for acquisition and demolition of floodprone properties. The following projects were funded.

B.15 HMGP APPLICANTS FOR FEMA 1526-DR		
Applicant	County	Amount
Columbia County	Columbia	\$ 45,000
Dodge County	Dodge	\$ 50,000
Eau Claire County	Eau Claire	\$ 30,000
Oshkosh, City of	Winnebago	\$ 411,050
Oneida County	Oneida	\$ 25,000
Kenosha County	Kenosha	\$ 798,470
Jackson County	Jackson	\$ 6,080
Grant County	Grant	\$ 286,470
Ferryville, Village	Crawford	\$ 45,811
Dodge County	Dodge	\$ 34,508
State Management Costs	All	\$ 114,697
TOTAL		\$1,847,086

Funds allocated for the declaration and approved totaled \$1,847,086 with actual expenditures of \$1,648,364. Appendix C identifies the projects and actual amounts awarded to date for the declaration.

FEMA-3249-EM-WI

In response to Hurricane Katrina, the State Emergency Operations Centers (EOC) was activated from September 6-20, 2005. Through the EOC WEM processed requests from the Gulf States for assistance through the Emergency Management Assistance Compact (EMAC). Over 50 individuals traveled to the Gulf States through the EMAC. On September 8, 2005, Governor Doyle requested the President declare an emergency declaration for the State of Wisconsin as a result of Hurricane Katrina that occurred on August 29, 2005. The emergency declaration was requested to cover 100% of the costs associated with providing emergency shelter and mass care for the evacuees that were arriving in the State from the Gulf States. The emergency declaration was granted on September 13th. WEM was responsible for administering the emergency declaration. In addition to the evacuees arriving from Hurricane Katrina, costs associated with evacuees from Hurricane Rita were also later included.

On September 6th, the Governor advised FEMA that Wisconsin was prepared to provide shelter for up to 1,150 evacuees at the Tommy G. Thompson Youth Center (950) at Wisconsin State Fair Park and the South Milwaukee Community Center (250.) The Tommy G. Thompson Youth Center was designated as the shelter to receive evacuees from Hurricanes Katrina and Rita. The shelter was managed by the American Red Cross and the Salvation Army. On September 8th, 170 evacuees, along with 26 animals, arrived via two FEMA-charted flights. The shelter which closed November 1, 2005, housed 365 evacuees, including some who self-evacuated. Most

evacuees were placed in housing with some going to hotels. The American Red Cross served 827 cases. The highest number of households registered with FEMA identifying that they were in Wisconsin was 1,994 on October 26, 2005.

Under the emergency declaration issued by the President eligible costs would be reimbursed 100% through the Public Assistance Program. This included costs incurred by State agencies and local governments in response to Hurricanes Katrina and Rita. Those costs included shelter and transitional housing costs for evacuees. Cost incurred in the emergency declaration totaled \$1,120,372.

FEMA 1719-DR-WI

On August 26, 2007, President Bush declared a major disaster as a result of severe storms and flooding that began on August 18th. The following counties were declared eligible for the Individual Assistance Program (IA): Crawford, La Crosse, Richland, Sauk and Vernon. The Hazard Mitigation Grant Program was declared eligible statewide. On August 31, the Governor requested that the following counties be declared for IA: Columbia, Dane, Grant, Green, Iowa, Jefferson, Kenosha, Racine and Rock. The Governor also requested a Public Assistance (PA) request for Crawford, Dane, La Crosse, Richland, Sauk, and Vernon counties. Amendment 2 to the disaster declaration included 9 additional counties for IA (Columbia, Dane, Grant, Green, Iowa, Jefferson, Kenosha, Racine and Rock) and 5 counties (Crawford, La Crosse, Richland, Sauk and Vernon) for PA.

Heavy rainfall began on August 18 and continued through the week. Soils became saturated and rivers and streams overflowed their banks. At some official observation sites in southern Wisconsin, new all-time August 24-hour precipitation records were set, Gays Mills (7.41 inches), Prairie du Chien (6.52 inches) and Viroqua (9.23 inches), and in La Crosse County and a new all-time monthly records were set for any month of the year with 17.00 inches of rainfall, according to the National Weather Service. The cause of the storms and record precipitation was an unusually stagnant weather pattern that persisted over the southwestern half of Wisconsin from August 18 to 31. Repeated rounds of thunderstorms with heavy rains caused record or near record flooding along the Kickapoo (crested 6 feet above flood stage), Pine, Fox, Rock and Crawfish Rivers, among many others.

Damage to private residences and businesses was tremendous. Some residences had water in them for days. Many residences had cracked or bulging basement walls and foundations. Many affected residents were low to moderate income and almost all of them sustaining damage were uninsured. Many businesses were also affected.

The agricultural sector sustained considerable damage. This is very significant in that most of the declared counties have economies dependent on agriculture. The Wisconsin Farm Services Office had requested an Administrator's Designation for physical loans.

Over 4,000 people applied for federal assistance with 2,902 households approved for \$7,495,433 under the Housing Assistance Program. Another 651 were approved for \$499,236 in Other

Needs Assistance. The Small Business Administration approved 234 low-interest loans for over \$6 million. The Public Assistance Program approved 144 grants to state and local governments, and eligible private non-profit organizations for a total of \$12,828,586.

B.16 HMGP PRE-APPLICATIONS FOR FEMA 1719-DR BY TYPE		
Number	Туре	Amount
8	Acquisition	\$12,534,493
2	Floodproofing	\$ 255,250
7	Warning systems	\$ 395,121
13	Hazard Mitigation Plans	\$ 405,927
5	Roadwork	\$ 131,088
4	Sewer	\$ 588,475
6	Structural	\$ 316,096
1	Miscellaneous	\$ 5,664
46	TOTAL	\$14,632,114

Pre-applications were reviewed, scored and ranked. Projects that met the State priorities and make the biggest impact on reducing future disaster costs were considered for funding. Wisconsin has an approved "enhanced" state mitigation plan, therefore, eligible for 20% of the Public and Individual Assistance Programs. This declaration would be the first for the State to receive the additional HMGP funding. The HMGP allocation for the disaster would be \$5,552,079. Three planning grants (2 for plan updates to meet the 5-year plan requirement) under the 7% allocation were funded; 2 projects for elevation; and 5 projects for acquisition and demolition of floodprone properties. Funding was approved for a project under the 5% allocation for an automated, high water warning system for dams in Vernon County. The following projects were approved:

B.17 HMGP APPLICANTS FOR FEMA 1719-DR		
Applicant	County	Amount
Chaseburg, Village of	Crawford	\$1,806,675
Crawford County	Crawford	\$ 40,000
Gays Mills, Village of	Crawford	\$1,429,866
Kenosha County	Kenosha	\$1,392,414
Mount Pleasant, Village of	Racine	\$ 263,400
Oregon, Village	Dane	\$ 105,920
Richland County	Richland	\$ 36,000
Soldiers Grove, Village of	Crawford	\$ 152,781
Vernon County	Vernon	\$ 40,000

Vernon County	Vernon	\$ 114,000
State Management	All	\$ 171,023
TOTAL		\$5,552,079

Projects are complete, with a HMGP closeout date of April 10, 2014. Funds allocated for the declaration and approved totaled \$5,552,079. As projects are completed, any unspent funds are reallocated to those with a cost overrun. As of October 10, 2016, expenditures on the approved grants totaled \$4,162,230.83, with federal expenditures totaling \$3,247,233.93.

FEMA-3285-EM-WI

A major snowfall began on February 5 and continued through February 7, 2008. The event included heavy snowfall, strong gusty winds out of the north and even thunder. The heavy snow fell at the rate of one to three inches per hour in some of the hardest hit areas. Several locations in Rock, Walworth, Jefferson and Ozaukee counties reported the highest amounts of 20 to 21 inches. Numerous locations in the 13 counties (Dane, Dodge, Green, Jefferson, Kenosha, Lafayette, Milwaukee, Ozaukee, Racine, Rock, Walworth, Washington and Waukesha) included in this request reported amounts between 12 and 19 inches. Wind speeds between 15 to 25 mph, with gusts up to 35 mph and isolated gusts reported at 60 mph, created near blizzard or white out conditions especially in rural areas. Visibilities of less than ¼ mile were common and drifts of 2 to 4 feet made travel extremely dangerous.

It is important to note that the February 5-7 event is just one of many snowfalls that occurred in southern Wisconsin since December 1, 2007. In fact, Madison received more than 100 inches of snow this season, making it the snowiest winter on record (previous record was 76.1 inches). The Madison area received measurable snowfall on more than 50 days since December 1, 2007.

The repeated snowfalls, and particularly the February 5-7 storm, inflicted hardships on many Wisconsin communities and totally depleted snow removal budgets. Schools across much of southern Wisconsin have been closed on more than one occasion. The storms also forced the cancellation of numerous air flights from the Milwaukee and Dane County airports. The snow also curtailed shopping activity at retail establishments and malls have been closed due to treacherous travel conditions.

Snow depths in many areas were at record levels. These snow depths made it increasingly difficult to find places to put the snow. It was piled high at street intersections and around fire hydrants, increasing the risk to public safety from traffic accidents and residential fires. The unusual depths also made it difficult for homeowners and businesses to keep sidewalks cleared, increased the hazards for pedestrian traffic, especially school children and the disabled.

On March 19, 2008, the President declared a snow emergency in the State of Wisconsin. This declaration was based on emergency measures performed to save lives and protect public health and safety resulting from record snow and near record snow during the period of February 5-6, 2008. The counties declared were Dane, Dodge, Green, Jefferson, Milwaukee,

Rock, Walworth and Washington counties for emergency protective measures (Category B) under the Public Assistance program for any continuous 48-hour period during or proximate to the incident period. On April 18, 2008, the FEMA-State Agreement was amended to included Kenosha, Racine and Waukesha counties to the snow emergency. Funding was provided to 475 eligible applicants totaling \$11,291,568.

FEMA 1768-DR-WI

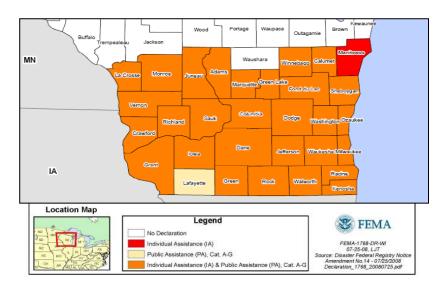
Severe weather began on June 5, 2008 with dozens of thunderstorms and tornado watches and warnings issued. Heavy rainfall, hail, damaging winds and several tornadoes were reported. Next, a warm weather front tracked from west to east across Wisconsin on Saturday, June 7. This event coincided with a moist and unstable air mass moving northward triggering an outbreak of severe weather and heavy rains throughout the afternoon and continuing into the Numerous super cell thunderstorms developed over the state spawning tornadoes, funnel clouds, rotating wall clouds and flash flooding over all of southern Wisconsin. On Sunday, June 8, the warm, moist air lingered in the state when a cold front tracked east out of the northern plains. A line of thunderstorms tracked across the state ahead of the front producing severe thunderstorms and heavy rains. The rains combined with the already saturated soils worsened the flooding conditions necessitating rescues, evacuations, road closures and sandbagging. The continuing weather pattern persisted on Monday, Tuesday, and Wednesday (June 9-11.) On Thursday, June 12, a slow moving cold front combined with warm moist air again passed through the state producing tornadoes, severe thunderstorms, and heavy rainfall. Collectively amounts ranged from 6 to over 15 inches. The greatest amount was 15.35 inches south of Portage in Columbia County. Depending on location, 24-hour and monthly rainfall records were established. All of this rain fell on top of a ground that was saturated due to all-time record winter snowfalls of 70 to 122 inches across southern Wisconsin which were roughly double normal amounts. At least 38 river gauge sites set new all-time record- high crests; in some cases exceeding flood stage by 6 to over 11 feet. The Baraboo River in Baraboo crested at 11.48 feet over flood stage. In some cases, rivers remained in flood stage into late July, and many low spots in farm fields still had standing water into September. From June 7 to 13, there were 20 tornadoes reported where the average number in a year for Wisconsin is 21.

The State EOC was activated 24/7 from June 7-24. Interstates and hundreds of roads were closed making travel very difficult. WEM provided over 700,000 sandbags to communities in the impacted area. Thirty-five shelters were open and served 2,623 people. Over 77,000 meals were served. Over 160 waste water treatment plans diverted 90 million gallons of sewage. There were three confirmed deaths. Damages were in excess of \$926 million.

Small rural and urban communities alike were devastated by the repeated flooding and storms. Tens of thousands of homes, businesses and farms were damaged or destroyed. Damage to public facilities is in the tens of millions of dollars. Both the agriculture and tourism industries, representing the heart of state and local economies, will suffer significantly. The worst flooding occurred on the Baraboo, Kickapoo, Rock, Fox (northern and southeastern) and Crawfish Rivers. Many of the communities are still recovering from flooding that occurred ten months ago

resulting in federal disaster declaration 1719-DR-WI. In some cases, the June 2008 flooding was worse than the 1993 flooding.

On June 9, Governor Jim Doyle declared a State of Emergency for 30 counties. On June 13, the Governor requested a presidential declaration for 6 counties. On June 14, President Bush declared the following counties eligible for the Individual Assistance (IA) Program: Columbia, Crawford, Milwaukee, Sauk and Vernon. Subsequently, the following 26 counties were added to the declaration: Adams, Calumet, Dane, Dodge, Fond du Lac, Grant, Green, Green Lake, Iowa, Jefferson, Juneau, Kenosha, La Crosse, LaFayette, Marquette, Manitowoc, Monroe, Ozaukee, Racine, Richland, Rock, Sheboygan, Walworth, Washington, Waukesha, and Winnebago. Twenty-nine communities were declared for both Public and Individual Assistance. Manitowoc County was declared for Individual Assistance only and Lafayette County for Public Assistance bringing the total to 31 counties. The incident period was June 5 through July 25, 2008.



Over 40,000 people applied for Individual Assistance with nearly 24,000 households receiving housing assistance totaling over \$50 million with over 9,000 households approved for Other Needs Assistance totaling \$6.5 million. The Small Business Administration approved nearly 2,000 low-interest loans for individuals and businesses totaling over \$46 million; nearly 1,400 flood insurance claims were paid totaling over \$12 million; and 10,000 people visited a Disaster Recovery Center. A total of 847 communities were eligible for funding through the Public Assistance Program. Over 3,000 project worksheets with over \$62 million approved in the Public Assistance Program. This disaster was the largest ever in the State.

Due to the extensive damages, Governor Doyle created the Wisconsin Recovery Task Force (WRTF). This Task Force was instructed to focus on mitigation, agriculture, business, housing, human needs, and infrastructure concerns. The Task Force was comprised of many state and federal agencies. Ultimately, the mission of the WRTF was to assist individuals, businesses, and communities to recover quickly, safely, and with more resistance to future disasters. The primary goal of the WRTF was to identify the unmet needs of the communities and citizens of Wisconsin

and assist them during the recovery. A WRTF report was presented to the Governor in November 2008 and can be downloaded at http://www.emergencymanagement.wi.gov/recovery/docs/Wisconsin Recovery TaskForce 2008.
pdf. The WRTF continued to meet to implement the recommendations of the report and to support long term recovery efforts in hardest impacted communities.

The Wisconsin Hazard Mitigation Team (WHMT) played an integral part in identifying the key players that comprise the Wisconsin Recovery Task Force. Members of the WHMT are members of the Mitigation Subcommittee. Without the Wisconsin Hazard Mitigation Team, it is very likely that the Wisconsin Recovery Task Force would not have been created as quickly as it was.

This disaster was considered an "incident of national significance." As a result FEMA activated ESF-14, Long Term Recovery, for the first time in the state. ESF-14 provided 5 FEMA employees and 8 contractors for long-term recovery. The Village of Gays Mills was flooded in the 2007 disaster and again flooded in June 2008. Both events were greater than the 500 year flood and caused substantial damage to the Village's residential and business district. The Village received HMGP assistance as a result of the 2007 flood when it was hit with the second flood. The Village was unsure if it should consider relocation of the town. The Team worked with the community of Gays Mills in developing a long term recovery plan that identified potential relocation sites and potential funding sources. In addition, they worked with Rock Springs to address recovery issues. Information gathered from these planning efforts assisted with recovery in other impacted communities.

The Recovery Plan process for Gays Mills involved a series of meeting and workshops for the community. On October 20, 2008, the ESF-14 team made a presentation of the draft plan to the community. At that meeting, priorities were discussed and representatives from WEM, the Mississippi River Regional Planning Commission, USDA-Rural Development were present. The final plan was presented to the community on October 31, 2008.

However, the interagency cooperation and effort did not end when the ESF-14 Team left. WEM coordinated two strategy meetings on November 19, 2008 and December 2, 2008 with several member of the WHMT/WRTF. The Department of Commerce, USDA-Rural Development, the Mississippi River Regional Planning Commission, FEMA, EDA, HUD WHEDA, Coulee CAP and WEM attended the meeting and reviewed all of the projects identified in the Flood Recovery Plan. Through discussion, the agencies identified which projects were possibly fundable by their programs and which were not. Ultimately, the task of the group was to package funding to assist in as many projects as possible.

On December 15, 2008, all of the agencies met with the Gays Mills Long Range Planning Committee and other interested citizens to discuss the funding options available. The State Hazard Mitigation Officer led the meeting and discussed which agencies could potentially fund which projects. It was a very productive meeting which provided direction and hope for the community.

Two relocation sites just north of the existing downtown were purchased by the Village. The site known as North Mills will be used for mixed use of residential housing and businesses. Four multi-family townhouses and residential housing were constructed at the new site. Construction of a mercantile center for businesses and a Community Commerce Center that houses the Village Hall, library, community center and a community kitchen were completed. In addition, the grocery store, gas station, and funeral home relocated to the new site. A second site north of North Mills includes a new EMS facility and Public Works building as well as additional businesses. The Village would to see a small health clinic and assisted living facility at this site in the future. FEMA, WEM, EDA, USDA-Rural Development, State Department of Commerce, State Department of Transportation, State Department of Health Services as well as private investors have all been sources of funding.



Mercantile Center

Community Commerce Center

In addition to activating ESF-14, FEMA deployed the Mitigation Assessment Team (MAT) to conduct engineering analyses to determine causes of failures and successes of structures within the declared area. A report was completed that contained recommendations that the state, communities, and organizations/agencies could take to reduce future damages and protect lives and property.

All counties in the State of Wisconsin are eligible to apply for assistance under the Hazard Mitigation Grant Program (HMGP). WEM received 118 pre-applications totaling \$40 million. Based on the number of destroyed homes, the priority of acquisition and demolition of substantially damaged structures was established early after the disaster. The State received 18 buyout applications for over 230 properties totaling nearly \$35 million.

Since Wisconsin has an approved "enhanced" state hazard mitigation plan, it was eligible for 20% of the Public and Individual Assistance Programs. The HMGP allocation for the disaster was \$30,875,884. Ten planning grants (7 for plan updates to meet the five-year plan requirement) were funded. The remaining funding was awarded to 17 communities for acquisition and demolition of flood damaged structures with majority substantially damaged and uninhabitable. The following communities received approved project grants:

B.18 HMGP PROJECT GRANT APPLICANTS FOR FEMA 1768-DR		
Applicant	County	Amount
Elroy, City of	Juneau	\$ 572,000
Excelsior, Town of	Sauk	\$ 121,800
Fond du Lac, City of	Fond du Lac	\$1,642,410
Gays Mills, Village of	Crawford	\$1,098,006
Grant County	Grant	\$ 467,300
Janesville, City of	Rock	\$1,244,750
Jefferson County	Jefferson	\$8,087,673
Jefferson, City of	Jefferson	\$ 499,830
Kenosha County	Kenosha	\$2,488,118
LaFarge, Village of	Vernon	\$1,195,674
Paddock Lake, Village of	Kenosha	\$ 688,610
Reedsburg, City of	Sauk	\$2,602,770
Richland Center, City of	Richland	\$ 113,500
Rock County	Rock	\$1,172,709
Rock Springs, Village of	Sauk	\$2,512,786
Spring Green, Town of	Sauk	\$5,377,624
Sugar Creek, Town of	Walworth	\$ 722,513
TOTAL		\$30,608,073

In addition the following received planning grants:

B.19 HMGP PLANNING GRANT APPLICANTS FOR FEMA 1768-DR		
Applicant	County	Amount
Avoca, Village of	Iowa	\$ 28,560
Burnett County	Burnett	\$ 30,000
Green County	Green	\$ 9,270
Green Lake County	Green Lake	\$ 36,000
Iowa County	Iowa	\$ 48,360
Juneau County	Juneau	\$ 14,857
Kenosha County	Kenosha	\$ 40,000
Milwaukee County	Milwaukee	\$ 11,510
Rock County	Rock	\$ 30,000
Sauk County	Sauk	\$ 19,245
TOTAL		\$267,802

The declaration was closed on June 7, 2016. Federal funds allocated for the declaration and approved totaled \$30,875,884. Actual expenditures totaled \$24,363,352 including management costs. Due to deductions for duplication of benefits (which was unknown at the time of approval) the actual amount spent on all of the projects was less than the amount approved and obligated resulting in excess funds being returned. Duplication of benefits included funds received through flood insurance claims, FEMA Individual Assistance and any other assistance provided. Through the declaration 195 properties were acquired and demolished with nearly all of them identified as substantially damaged. It is worth noting that the State Department of Commerce provided funding through Community Development Block Grants (supplemental funds) to the subrecipients to cover the 12.5% local match.

FEMA-1933-DR-WI

During the afternoon and into the evening hours on July 22, 2010, a persistent band of strong to severe thunderstorms developed and moved through the south central and southeastern portions of the state. Individual storms within the system moved quite fast, however the line containing these storms did not, resulting in the storms repeatedly training or moving over the same area. Reports of 3 to 4 inches of rain were widespread along and on either side of the I-94 corridor, with locally higher amounts of 5 to 8 inches. The heaviest rainfall occurred in Milwaukee County, where hourly rainfall amounts of 2 to 4 inches were reported. One local television station on the northeast side of the City of Milwaukee measured 7 inches of rain in approximately 2.5 hours. Mitchell Field recorded 5.61 inches of rain for the day, which is a record for that date. This also is the second highest daily rainfall total on record for Milwaukee.

It was this same frontal boundary that affected Grant County in southwestern Wisconsin from July 22 through 24. During the morning of July 22 widespread rainfall totals of 1 to 2 inches occurred. The next system moved into the southwest part of the state in the afternoon and early evening hours of the 22nd and dumped between 8 and 10 inches of rain in the southern third of Grant County. The final round of heavy rain occurred from the evening hours of the July 23 through the morning hours of July 24 and produced another 2 to 4 inches of rain on areas already saturated. The resulting flash flooding was devastating for Grant County, which is a sparsely populated rural area.

On July 23, Governor Jim Doyle declared a State of Emergency for Milwaukee County. On July 31, the Governor requested a presidential declaration for Grant, Milwaukee and Waukesha Counties. On August 11, the President declared Grant and Milwaukee Counties eligible for the Public Assistance (PA) program. On September 7, 2010, Calumet County, which was also heavily impacted by the storm system, was added on to the Public Assistance declaration. September 18, 2010, the counties of Milwaukee and Grant were declared eligible for FEMA's Individual Assistance (IA) programs.

Over 33,000 people applied for Individual Assistance with over 16,000 households receiving housing assistance totaling over \$45 million and nearly 15,000 households approved for Other

Needs Assistance totaling \$13 million. A total of 92 communities are eligible for funding through the Public Assistance Program with over \$20 million approved in the Public Assistance Program.

All counties in the State of Wisconsin are eligible to apply for assistance under the Hazard Mitigation Grant Program (HMGP). After review, scoring and ranking the pre-applications formal applications were sent to 52 communities totaling \$29,348,299.

Since Wisconsin has an approved "enhanced" state hazard mitigation plan, it was eligible for 20% of the Public and Individual Assistance Programs. The HMGP allocation for the disaster was \$21,338,532. The State received \$34 million in project applications, however, benefits on several projects did not exceed the cost of the project, therefore, not cost-effective and ineligible.

The State submitted 22 project and 18 planning applications totaling \$13,366,821. Two projects were withdrawn, and one was determined ineligible. This was much less than the amount of funds available. The State solicited applications a second time in an attempt to utilize all of the available funding. In addition, several applications originally submitted for funding through the Pre-Disaster Mitigation Program were withdrawn and submitted for funding through the declaration. This was the first time that the State was unable to submit enough eligible projects for the total allocated funds.

In July 2015 FEMA announced the HMGP Pilot Closeout for Uncommitted Open Disasters from 2010 through 2013. This provided states with uncommitted funds a chance to fund additional projects. The requirements were the declaration had to be open and uncommitted funds could only be used to amend applications submitted within the original application period. It allowed for expanded scopes of works. The state reached out to the original applicants and submitted amendments to three grants to acquire and demolish an additional eight properties. Additional funds were obligated in the amount of \$1,381,492 (\$1,036,113 federal share).

The following project grants were approved:

B.20 HMGP PROJECT GRANT APPLICANTS FOR FEMA 1933-DR		
Applicant	County	Amount
Brookfield, City of	Waukesha	\$23,000
Clark Electric Cooperative	Clark	\$15,425
Clark County	Clark	\$141,533
Clark County	Clark	\$33,000
Glendale, City of*	Milwaukee	\$1,594,393
Green County	Green	\$68,100
Jefferson County*	Jefferson	\$2,073,360
Lisbon, Town*	Waukesha	\$558,245
Loyal, City of	Clark	\$198,476

TOTAL		\$14,014,263
Whitefish Bay, Village of*	Milwaukee	\$5,294,408
Vienna, Town of	Dane	\$274,901
Trempealeau County	Trempealeau	\$182,206
Prairie du Chien	Crawford	\$241,850
Portage County	Portage	\$85,301
Pine Valley, Town of	Clark	\$146,146
Oshkosh, City of	Winnebago	\$2,064,738
Neillsville, City of	Clark	\$162,629
Marquette County	Marquette	\$4,552
Lyons, Town of	Walworth	\$852,000

^{*}Received additional funds under the Uncommitted Funds Pilot

The following planning grants were approved:

B.21 HMGP PLANNING GRANT APPLICANTS FOR FEMA 1933-DR		
Applicant	County	Amount
Bayfield County	Bayfield	\$ 40,000
Calumet County	Calumet	\$ 47,322
Columbia County	Columbia	\$ 18,152
Grant County	Grant	\$ 51,972
Ho-Chunk Nation	N/A	\$ 31,600
Iron County	Iron	\$ 27,340
Jackson County	Jackson	\$ 40,001
Jefferson County	Jefferson	\$ 19,429
La Crosse County	La Crosse	\$ 50,000
Langlade County	Langlade	\$ 40,000
Lincoln County	Lincoln	\$ 35,000
Marinette County	Marinette	\$ 33,623
Marquette County	Marquette	\$ 18,686
Ozaukee County	Ozaukee	\$ 32,800
Portage County	Portage	\$ 42,027
D 1.C .	Price, Rusk,	\$ 159,910
Rusk County	Sawyer, Taylor	э 139,910
Sheboygan County	Sheboygan	\$ 35,446
Waupaca County	Waupaca	\$46,880

TOTAL	\$770,188

The declaration closeout date is March 21, 2017. To date 13 project and 16 planning grants are closed. Total funds expended to date including management costs is \$11,932,369.

FEMA-1944-DR-WI

A potent, early-fall storm system brought waves of very heavy rain to western into central Wisconsin starting late on Wednesday, September 23, 2010 and continued into early Friday, September 24, 2010. This was due to an unusually moist air mass over the Central Plains and a stationary front that aligned just south of Interstate 90. This rain strengthened the stationary front over the area, locking in the trigger for prolonged rain and thunderstorms Wednesday night. By morning on September 24, a band of 4 to 8 inches of rain had fallen with many reports of flooding. Rain continued, but lightened throughout the day on Thursday, September 23. The National Weather Service stated the precipitation that fell during this period was 300-700% above the normal that typically falls in late September.

The rains caused river levels to rise rapidly, with record or near record crests on the Black and Trempealeau Rivers. The Yellow River at Babcock, in Wood County, crested at the highest level ever recorded at the site, reaching 6.4 feet above flood stage. The larger or main rivers, including the Chippewa, Black, Trempealeau, Wisconsin, Mississippi and Kickapoo were all impacted. The situation was exacerbated by the fact that Wisconsin experienced an abnormally wet summer, soils were already saturated and many rivers were at relatively high levels prior to the onset of the storms.

On September 23, Governor Jim Doyle declared a State of Emergency for Trempealeau, Jackson and Clark Counties. It was subsequently amended to include Buffalo, Columbia, Marathon, Portage and Wood Counties. On October 14, the Governor requested a presidential declaration as a result of flooding and severe storms beginning on September 22 and continued through October 9 for Buffalo, Clark, Jackson, Juneau, LaCrosse, Marathon, Portage, Taylor, Trempealeau and Wood Counties for the Public Assistance (PA) program.

A federal declaration for Public Assistance was granted on October 21 for the requested counties with the exception of LaCrosse County. All counties in the State of Wisconsin are eligible to apply for assistance under the Hazard Mitigation Grant Program (HMGP).

A total of 196 communities were eligible for funding with over \$5.4 million approved in the Public Assistance Program.

All counties in the State of Wisconsin are eligible to apply for assistance under the Hazard Mitigation Grant Program (HMGP). WEM received 32 pre-applications totaling \$3.8 million. Through the formal application process, WEM received ten applications totaling \$1,597,375.

Since Wisconsin has an approved "enhanced" state hazard mitigation plan, it was eligible for 20% of the Public Assistance Programs. The HMGP allocation for the disaster was \$1,058,284.

The following grants were approved:

B.22 HMGP PLANNING GRANT APPLICANTS FOR FEMA 1944-DR		
Applicant	County	Amount
Walworth County	Walworth	\$ 19,429
TOTAL		\$19,429

B.23 HMGP PRO	JECT GRANT APPLICANTS FOR	R FEMA 1944-DR
Applicant	County	Amount
Columbia County	Colombia	\$ 19,350
Marathon County	Marathon	\$ 882,825
Marathon City, Village	Marathon	\$ 95,000
Oneida County	Oneida	\$ 25,000
TOTAL		\$1,022,175

Project applications included river gauges, NOAA weather radios and two for acquisition and demolition of 8 properties. Projects are complete and the declaration was closed on September 16, 2015. Actual expenditures totaled \$852,521.

FEMA-1966-DR-WI

During the overnight hours of February 1-2, 2011, a powerful low pressure center passing south of Wisconsin produced blizzard conditions across much of southern Wisconsin. Snow associated with the system began in the mid-afternoon hours in far southern Wisconsin and pushed northward into the state through the evening. The snowstorm was accompanied by winds of 40 to 50 miles per hour with localized gusts of up to 60 miles per hour. This excessive wind caused blizzard conditions from early on the evening of February 1, 2011, through the early morning hours of February 2, 2011. In addition to the blizzard, several inches of snow fell on January 31, 2011, with light lake effect snow in the eastern half of the area throughout the day on February 1, 2011.

Snowfall totals in Milwaukee broke the one-day record on February 2, 2011, with 9.1 inches falling and an accumulation of 19.6 inches in 48 hours. Madison similarly experienced snowfall totals breaking the one-day record at 8.1 inches and a three-day accumulation of 18.7 inches. Twelve to 16 inches of snow fell along Highway 29 between Green Bay and Wausau.

As a result of this storm, many county and local roads were deemed impassible, as well as portions of Interstates 94 and 43. The Wisconsin National Guard and Department of Natural Resources were activated to look for any stranded motorists. The blizzard conditions also caused the closure of Milwaukee's Mitchell Field Airport.

On April 5, 2011, a Major Presidential Disaster Declaration was granted, resulting in federal assistance to eligible applicants in 10 counties designated for FEMA Public Assistance for winter storm and snowstorm damage that occurred between January 31 and February 3, 2011, and hazard mitigation throughout the state. The declared Counties included: Dane, Dodge, Grant, Iowa, Kenosha, Lafayette, Milwaukee, Racine, Walworth, and Washington.

A total of 470 communities were eligible for funding in the amount of \$10,869,140 through the Public Assistance Program.

All counties in the State of Wisconsin are eligible to apply for assistance under the Hazard Mitigation Grant Program (HMGP). Since Wisconsin has an approved "enhanced" state hazard mitigation plan, it was eligible for 20% of the Public Assistance Programs. The HMGP allocation was \$2,169,413. The state submitted five project and seven planning grants totaling \$3,946,131. Three of the planning grants were submitted with \$0 request as well as two project grants. One project was for two safe rooms with funding provided for one.

The following grants were approved:

B.24 HMGP PLAN	NING GRANT APPLICANTS FO	R FEMA 1966-DR								
Applicant	Applicant County									
Darlington, City of	Lafayette	\$ 16,000								
Forest County	Forest	\$ 40,000								
Manitowoc County	Manitowoc	\$ 50,888								
Richland County	Richland	\$ 21,057								
UW-River Falls	Pierce, St. Croix	\$ 19,812								
TOTAL		\$147,757								

B.25 HMGP PRO	DJECT GRANT APPLICANTS FOR	R FEMA 1966-DR
Applicant	County	Amount
Bagley, Village of	Grant	\$ 401,545
Madison, City of	Dane	\$ 1,568,210

WEM Webinars	Dane	\$ 51,900
TOTAL		\$2,021,655

The projected closeout is March 18, 2017. Five the grants are closed with expenditures to date total \$2,176,467.

FEMA-4076-DR-WI

During the period of June 19-20, 2012, heavy rains caused rising waters and flash flooding in parts of Northern Wisconsin. During the height of the flooding many roads were inundated and had to be closed. Culverts were washed out as normally calm streams and tributaries turned into rushing torrents. The overall impact of this storm was magnified in that it was the fifth time in a year and the second time in three weeks that the counties of Ashland, Bayfield, and Douglas, in addition to the Red Cliff Band of Lake Superior Chippewa were hit with devastating weather.

The most significant impact of these storms was the economic toll created locally. The initial estimates for the June-20 were \$2,300,000 for the counties of Ashland, Bayfield, and Douglas. Most municipalities had just replaced culverts, gravel, and pavement from the 2012 Memorial Day storms when the June 19-20 storms struck. 677 homes reported water and/or sewage in their basements with 19 reported as major. These homes represent 4% of the occupied homes in Douglas County. The other serious disruption was the function and services of the University of Wisconsin-Superior (UW-S), potentially delaying school opening. Initial estimates to the flooded power plant, power distribution tunnels, and 14 buildings with water damage were from \$8,700,000 to \$11,000,000. The power plant had over 35 feet of water inside, with more than a foot on the ground floor, and filled to the top in the basement and sub-basement. The library had in excess of 175,000 books removed for possible restoration. All three affected counties are very rural in nature, with economies based primarily on agriculture and tourism, which were affected heavily by the storms.

On August 2, 2012, President Obama declared a Major Presidential Disaster, resulting in federal assistance to eligible applicants in 3 counties and 1 tribal nation designated for FEMA Public Assistance for high water and flooding damage that occurred between June 19-20, and hazard mitigation throughout the state. The declared counties were Ashland, Bayfield, and Douglas, and the declared nation was the Red Cliff band of Lake Superior Chippewa.

A total of 50 communities were eligible for funding in the amount of \$12,254,454 through the Public Assistance program.

All counties in the State of Wisconsin are eligible to apply for assistance under the Hazard Mitigation Grant Program (HMGP). Since Wisconsin has an approved "enhanced" state hazard mitigation plan, it was eligible for 20% of the Public Assistance Programs. The HMGP allocation was \$2,105,069 for the declaration. Three planning grants originally submitted under declaration 1966-DR were resubmitted under this declaration and approved for funding. Ten projects were submitted with eight approved. A second safe room for the Village of Bagley that

was originally submitted under declaration 1966-DR was submitted in this declaration and was approved.

The following grants were approved:

B.26 HMGP PLAN	NNING GRANT APPLICANTS FO	DR FEMA 4076-DR
Applicant	County	Amount
Adams County	Adams	\$ 40,000
Oconto County	Oconto	\$ 50,888
Washburn County	Washburn	\$ 23,314
TOTAL		\$114,202

B.27 HMGP PRO	JECT GRANT APPLICANTS FOR	R FEMA 4076-DR
Applicant	County	Amount
Bagley, Village of	Grant	\$ 403,250
Bayfield County Gen.	Bayfield	\$ 91,000
Bayfield County SR	Bayfield	\$ 317,483
Clover, Town of	Bayfield	\$ 66,220
Crawford County	Crawford	\$ 215,375
Dunn County	Dunn	\$ 198,390
River Falls, City of	Pierce, St. Croix	\$ 666,471
Richland Center, City	Richland	\$ 32,678
TOTAL		\$1,990,867

The projected closeout is June 18, 2017. Five grants are closed with expenditures to date total \$2,028,363.

FEMA-4141-DR-WI

During the period of June 20-28, 2013, parts of Wisconsin experienced historic 24-hour, 48-hour, 72-hour, and 7-day rainfall amounts. The basic weather set-up for the June 2013 heavy rains and flooding was very similar to the June 2008 situation. There were several rounds of thunderstorm activity persisting for 3 to 9 hours that occurred mostly at night over a stretch of a week. Each round resulted in 3 to 6 inches of rain affecting parts of northwestern through southwestern and south-central Wisconsin within a 24- hour period. Total rainfall amounts for the June 20-28 period in the worst-hit area ranged from 8 to over 13 inches, which was greater than 600% above normal for the week. Although the heaviest rains and flooding in the June 20-28 period were not as widespread as the record June 2008 flooding in southern Wisconsin, on a local basis, the impact was just as profound.

Governor Scott Walker declared a State of Emergency in Ashland, Crawford, Grant, Iowa, Richland, St. Croix, and Vernon Counties on June 26, 2013. The Order was later amended to add Bayfield, Dane, Rock, and Sauk Counties, and the Red Cliff Band of Lake Superior Chippewa and to correct the event date. This Order directed all state agencies to assist those counties as appropriate in the response and recovery efforts, and authorized the call to state active duty such elements of the Wisconsin National Guard as the Adjutant General deemed necessary to assist civil authorities.

On August 8, 2013 a Major Presidential Disaster was declared, resulting in federal assistance to eligible applicants in 8 counties and 1 Native American nation for flooding damage that occurred between June 20-13, 2013, and hazard mitigation throughout the state. The declared Counties included: Ashland, Bayfield, Crawford, Iowa, Richland, St. Croix, and Vernon, and the affected nation was the Red Cliff Band of the Lake Superior Chippewa in Bayfield County.

A total of 134 communities are eligible for funding through the Public Assistance program with \$7,857,258 approved. Since Wisconsin has an approved "enhanced" state hazard mitigation plan, it was eligible for 20% of the Public Assistance Programs. The HMGP allocation was \$1,524,748. The state received 44 pre-applications totaling over \$27 million. The State submitted two planning and five project grants to FEMA that were approved. Four of the five projects were for acquisition and demolition of floodplain properties. To date one grant is closed and funds disbursed in the amount of \$661,697. The projected closeout for the declaration is February 6, 2018.

The following grants were approved:

B.28 HMGP PLAN	NNING GRANT APPLICANTS FO	R FEMA 4141-DR
Applicant	County	Amount
Dane County	Dane	\$ 33,777.00
Door County	Door	\$ 33,000.00
TOTAL		\$66,777.00

B.29 HMGP PRO	JECT GRANT APPLICANTS FOR	R FEMA 4141-DR
Applicant	County	Amount
Gays Mills, Village	Crawford	\$ 143,800
Glendale, City	Milwaukee	\$ 499,990
Ozaukee County	Ozaukee	\$ 200,975
Richmond, Town of	Walworth	\$ 6,794
Vernon County	Vernon	\$ 606,410
TOTAL		\$1,457,969

FEMA-4276-DR-WI

Beginning on Monday, July 11 and extending through Tuesday, July 12, 2016, multiple rounds of severe thunderstorms impacted much of east central to northeast Minnesota and northwest Wisconsin. During a 24-hour period the area received eight to 12 inches of precipitation with the worst of the heavy rain and resulting flash flooding occurring in the evening hours. As an example, according to the National Weather Service, the area one mile west-south-west of the Town of Saxon recorded 9.80 inches of rain in a 24-hour period ending on July 12, 2016. In the area extending from Danbury in Burnett County to Hurley in Iron County the majority of the total precipitation fell within just eight hours. In addition, a bow echo type storm moved across northern Iron County and caused tremendous amounts of damage at Saxon Harbor. The harbor was devastated by the flooding and debris carried by the many creeks, rivers, and streams that converge in the immediate area.

These storms resulted in widespread flash flooding across the region causing numerous road closures including the multiple-day closure of U.S. Highway 2, a major transportation corridor across northern Wisconsin. The flooding and damage to roadways was so severe in northwestern Wisconsin that residents and visitors were advised not to travel within much of the area due to washouts and inundated roadways. The timing of these storms also came during the peak tourist season in these areas of the state.

Tragically, this event resulted in the loss of four lives and caused numerous injuries and medical emergency calls to local first responders. Immediately following the storm many volunteer organizations and private sector partners provided assistance to residents impacted by the rainstorm and flooding.

This event and the resulting damage have had a significant negative impact on the residents and communities of the area. Many of the area's state highways, county highways, and local roads were inundated with water and debris and had to be closed. Culverts and bridges were washed out, resulting in long detour routes for residents and the trucking industry. Highway crews were busy implementing road closures, making temporary road repairs, and cleaning up debris. Multiple harbors and marinas on Lake Superior received significant damage. In particular, Saxon Harbor in Iron County, was housing 70 boats at the time of the July 12 storm. Of these, at least 12 were destroyed, 19 beached, and 6 sunk and later recovered. Two boats remain unaccounted for, while two vehicles and three camper trailers were also lost. Thirty-three floating docks were swept out into the lake and destroyed. The fish hatchery and wild rice operations of the Bad River Tribe also sustained major damage.

This event has impacted over 350 homes and left behind tens of millions of dollars in public sector damage. Both the initial storm and a secondary severe thunderstorm event on July 21, 2016 caused tens of thousands of power outages across the northern part of the state and

generated large amounts of debris. The stress on citizens and local emergency response efforts was further intensified by high heat index levels that occurred statewide from July 20-22.

On August 9, 2016, a Major Presidential Disaster Declaration was granted, resulting in federal assistance to eligible applicants in 8 counties and 1 Native American nation for flooding damage that occurred between July 11-12, 2016, and hazard mitigation throughout the state. The declared Counties included: Ashland, Bayfield, Burnett, Douglas, Florence, Iron, Sawyer, and Washburn, and the affected nation was the Bad River Band of the Lake Superior Chippewa.

A total of 102 communities have applied for funding through the Public Assistance Program. The disaster is so recent total amounts applied for in the Public Assistance Program are pending. The Preliminary Damage Assessment resulted in estimated eligible damages of \$25,687,005. Since Wisconsin has an approved "enhanced" state hazard mitigation plan, it was eligible for 20% of the Public Assistance Programs. Based on the PDA, the estimate for HMGP for the declaration is \$5 million.

FEMA-4288-DR-WI

Beginning on Wednesday, September 21 and extending through Thursday, September 22, 2016, multiple rounds of severe thunderstorms impacted much of west central through southwestern Wisconsin. During this two day period, the area received over ten inches of precipitation; the heaviest rains resulted in flash flooding throughout the evening hours. Since the area experienced saturated soils and vegetative conditions due to high rainfalls over the preceding month, stream, riverine, and urban flooding developed faster than normal, resulting in mudslides, washouts, and flooding on roadways.

The result was widespread flash flooding across the region, causing numerous road closures, including the multiple-day closure of State Highway 35, a major transportation corridor along the Mississippi River in western Wisconsin. Closing main roads at this time was especially troubling, since these storms and resulting road closures coincided with a peak tourism weekend in western and central Wisconsin.

Tragically, this event included the loss of two lives in Vernon County. On September 22, 2016, a man died after a mudslide swept down a hill and destroyed his home while he was inside. A second man died on September 23, 2016, while pulling a horse trailer with his pickup truck; he drowned after swiftly moving water on top of a road surface swept his vehicle downstream.

This event impacted over 485 homes and left behind tens of millions of dollars in public sector damage. Both the initial storm and the flooded rivers through September 29, 2016 caused excessive road damage and generated large amounts of debris. For many of these counties, this was the fourth major storm and flood event since June 2016, resulting in intensified stresses for citizens and local emergency response efforts.

On October 20, 2016, a Major Presidential Disaster Declaration was granted, resulting in federal assistance to eligible applicants in 10 counties for flooding damage that occurred between September 21-22, 2016, and hazard mitigation throughout the state. The declared Counties included: Adams, Chippewa, Clark, Crawford, Jackson, Juneau, La Crosse, Monroe, Richland, and Vernon.

Several of the communities within the declared area have successfully implemented mitigation projects. As a result of those projects, disaster losses were reduced. This is an opportunity to highlight those successes and losses avoided.

This disaster was declared at the time of writing the State of Wisconsin's Hazard Mitigation Plan update, and as such the estimated number of communities eligible for Public Assistance and the total amounts applied for in Public Assistance are pending as well as the allocation for HMGP. T

Disaster 4288-DR was the 36th Presidential Declaration in Wisconsin since 1971, and the 22nd disaster since 1990. The state had multiple declarations in 1990, 1992, 1998, 2002, and 2010. Declarations have been granted in every year since 1990 except for 1994, 1995, 2003, 2005, 2006, 2009, 2014, and 2015. In the last 25 years, all but one of the State's 72 counties, Oconto, has been directly affected by disaster declarations. Additionally, in the years since 1990, 7 requests for declarations have been denied. The unprecedented frequency and severity of natural disasters established in the last decade has continued into the present one.

Disasters 1933, 1966, 4076, 4141, 4276, and 4288 are still open declarations, therefore, final expenditures are presently unknown.

It is a goal of WEM to never return HMGP funds to FEMA if at all possible. To that end, as projects are completed, any unspent funds are obligated to other projects incurring funding shortfalls. Appendix D identifies the projects and actual amounts awarded to date for the declarations.

B.30	HMGP FUNDING HISTORY, 199	1-2016
Disaster	Initial Amount Allocated/Approved	Total Expended
912-DR-WI	\$108,684	\$ 108,684
959-DR-WI	\$38,868	\$ 38,868
963-DR-WI	\$376,374	\$ 376,374
964-DR-WI	\$391,074	\$ 391,074
994-DR-WI	\$14,004,403	\$14,004,403
1131-DR-WI	\$344,527	\$ 344,527
1180-DR-WI	\$6,265,003	\$ 6,021,672
1236-DR-WI	\$1,962,465	\$ 1,767,681

State of Wisconsin Hazard Mitigation Plan

1238-DR-WI	\$4,450,421	\$ 4,392,207
1284-DR-WI	\$812,059	\$ 806,000
1332-DR-WI	\$4,424,019	\$ 4,045,598
1369-DR-WI	\$4,390,075	\$ 3,992,074
1429-DR-WI	\$662,603	\$ 607,609
1432-DR-WI	\$1,089,584	\$ 757,725
1526-DR-WI	\$1,847,086	\$ 1,632,722
1719-DR-WI	\$5,552,079	\$4,044,758
1768-DR-WI	\$30,875,884	\$23,350,411
1933-DR-WI	\$21,338,532.	\$14,592,102
1944-DR-WI	\$1,058,284	\$815,901
1966-DR-WI	\$2,169,143	\$2,169,074
4076-DR-WI	\$2,105,069	\$2,094,133
4141-DR-WI	\$1,524,748	\$1,325,681
4276-DR-WI	\$5,000,000*	-
4288-DR-WI	\$2,200,000*	-
TOTAL	\$105,790,984	\$78,358,762.01

^{*}Based on Preliminary Damage Assessment

											В	3.31	UTA	RAL	DISA	STER	SUM	IMAR	Y, 19	90-20	016															
Disaster Declaration	874	877	912	959	963	964	994	1994 ND	1996 ND	1131	1180	1998 ND	1236	1238	1998 ND	1284	1332	2000 ND	3163	1369	1429	1432	1526	2005 ND	1719	3285	1768	1933	1944	1966	4076	4141	2013-2014 ND	4276	4288	County/Tribal Total
County																																				
Adams							1	1									1				1		1				1								1	7
Ashland																1	1														1	1		1		5
Barron																	1			1		1														3
Bayfield																1				1											1	1		1		5
Brown	1						1																1													3
Buffalo						1	1						1							1									1							5
Burnett																	1			1		1												1		4
Calumet	1						1													1			1				1	1								6
Chippewa							1											1				1	1										1		1	6
Clark							1						1								1	1	1						1				1		1	8
Columbia							1		1			1					1		1				1				1									7
Crawford	1					1	1					1	1				1			1			1		1		1					1			1	12
Dane	1		1		1		1					1					1		1				1	1		1	1			1						12
Dodge							1		1			1					1						1			1	1			1						8
Door															1				1																	2
Douglas																1				1											1			1		4
Dunn							1					1	1								1	1														5
Eau Claire							1					1						1					1													4
Florence																1																		1		2
Fond du Lac							1		1	1		1											1				1						1			7
Forest																	1																	1		2

B.31 Continued																												
Grant	1					1				1			1		1			1		1	1		1	1				10
Green	1					1	1	1					1	1				1	1	1			1					10
Green Lake						1												1		1								3
Iowa	1					1							1					1		1			1	1				7
Iron												1	1													1		3
Jackson					1	1				1			1					1				1					1	7
Jefferson			1			1	1											1	1	1								6
Juneau	1				1	1							1					1		1		1					1	8
Kenosha						1							1	1				1	1	1			1		1			8
Kewaunee	1													1														2
La Crosse						1				1					1			1	1	1							1	7
Lafayette	1					1]	L			1					1		1			1					7
Langlade																	1											1
Lincoln						1											1											2
Manitowoc	1													1														2
Marathon						1										1	1	1				1			1			6
Marinette																1												1
Marquette						1												1		1								3
Menominee						1																						1
Milwaukee						1			1		1		1	1				1	1	1	1		1		1			11
Monroe		1	1			1				1			1					1		1							1	8
Oconto																												0
Oneida												1	1															2
Outagamie	1					1									1			1										4
Ozaukee			1						1 1	L				1				1		1								6
Pepin					1	1				1					1													4
Pierce					1	1				1					1		1											4
Polk													1				1											2
Portage						1										1	1	1				1						5
Price						1						1					1											3

B.31 Continued																																				
Racine							1							1			1		1				1			1	1			1						8
Richland	1					1	1						1				1						1		1		1					1			1	10
Rock	1						1		1					1					1				1			1	1									8
Rusk							1									1	1			1		1														5
Sauk	1					1	1		1			1					1						1		1		1									9
Sawyer																1	1					1												1		4
Shawano							1															1	1													3
Sheboygan												1		1					1				1				1									5
St. Croix							1						1							1		1										1				5
Taylor																						1	1						1							3
Trempealeau						1	1						1							1			1						1							6
Vernon	1					1	1						1				1			1			1		1		1					1			1	11
Vilas																1																				1
Walworth									1								1		1				1			1	1			1						7
Washburn																	1			1		1												1		4
Washington			1								1	1											1			1	1			1						7
Waukesha			1								1	1		1			1		1				1			1	1									9
Waupaca							1															1	1													3
Waushara				1			1														1		1													4
Winnebago	1						1													1			1				1						1			6
Wood							1														1	1	1						1				1			6
Total Number of Counties per Disaster	17	1	6	1	1	10	47	1	8	2	4	13	14	5	1	10	30	2	14	18	8	19	44	1	5	11	30	3	9	11	3	8	8	9	10	
Tribe																																				
Bad River Band of																																				
Lake Superior																																		1		1
Chippewa Forest County																																				
Potawatomi																																				0
Community																																				
Ho-Chunk Nation																																				0

B.31 Continued																																		
Lac Courte Oreilles Band of Lake Superior Chippewa																																		0
Lac du Flambeau Band of Lake Superior Chippewa																																		0
Menominee Nation																																		0
Mohican Nation, Stockbridge Munsee Band																																		0
Oneida Tribe of Indians of Wisconsin																																		0
Red Cliff Band of Lake Superior Chippewa																															1	1		2
St. Croix Band of Chippewa Indians																																		0
Sokaogon Chippewa Community																																		0
Total Number of Tribes per Disaster	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	
Total Number of Counties & Tribes per Disaster	17	1	6	1	1	10	47	1	8	2	4	13	14	5	1	10	30	2	14	18	8	19	44	1	5	11	30	3	9	11	4	9	10	

State of Wisconsin Hazard Mitigation Plan

APPENDIX C: STATE MITIGATION GRANTS

					HMGP Projects	
Disaster Number	Year	Community	County	Cost HMGP Funds	Project Description	Comments
DR-874	1990	Darlington, City	Lafayette	\$ 605,572.00	commercial structures; floodproofing of 19 commercial structures	Additional \$178,608 provided locally (used for match in DR-994); local match was purchase of land for business park
DR-874	1990	DePere, City	Brown		Storm sewer project	Additional \$42,301 provided locally
DR-912	1991	Jefferson County	Jefferson	\$ 108,684.00	Acquisition of 3 residential structures	Local match provided by HUD & DNR
DR-959	1992	Waushara County	Waushara	\$ 38,868.00	Geographic Information System (GIS) mapping of an area of the 100 year floodplain of the Pine River	
DR-963	1992	Cross Plains, Village	Dane	\$ 37,000.00	Clearwater infiltration abatement project	
DR-963	1992	DeForest, Village	Dane	\$ 202,034.00	Construction of the Linde Detention Basin	Additional \$67,394 provided locally; CDBG provided \$485,000 to construct Halsor Street Detention Basin and a storm sewer leading to the basins
DR-963	1992	Sun Prairie, City	Dane	\$ 137,340.00	Development of a stormwater management plan and improvement of a storm sewer	Additional \$91,021 provided locally
DR-964	1992	Black River Falls, City	Jackson	\$ 281,929.00	Construction of storm sewers	\$43,971 provided by CDBG
DR-964	1992	Blair, City	Trempealeau	\$ 109,144.00	Modification of the Lake Henry Dam	\$109,173 provided by CDBG; \$43,460 provided by DNR
DR-994	1993	Darlington, City	Lafayette	\$ 4,175,790.00	Acquisition of 12 commercial structures; floodproofing of 19 commercial structures	\$178,608 local match for purchase of business park; \$282,084 provided by CDBG; \$187,744 provided by DNR
DR-994	1993	Eau Claire, City	Eau Claire	\$ 2,152,831.00	Acquisition of 45 residential structures and 5 vacant parcels; floodproofing of 1 commercial structure	\$461,000 provided by CDBG for local match
DR-994	1993	Eau Claire County	Eau Claire	\$ 1,217,227.00	Acquisition of 16 residential structures and 1 commercial structure; floodproofing of 2 residential structures	\$265,250 provided by CDBG for local match
DR-994	1993	Jefferson County	Jefferson	\$ 458,635.00	Acquisition of 6 structures	Part of a larger project with the FMA program that included \$500,000 CDBG funds and \$611,000 DNR funds
DR-994	1993	Pierce County	Pierce	\$ 6,000,000.00	Acquisition of 67 residential structures, 3 commercial structures, and 3 vacant parcels	Local match provided by CDBG; additional \$187,989 provided by program revenue
DR-1131	1996	Oakfield School Dist.	Fond du Lac	\$ 202,216.00	Reinforcement of walls in new school	
DR-1131	1996	Monroe, City	Green	\$ 143,311.00	Construction of a detention pond	Additional \$36,218 provided locally
DR-1180	1997	Brookfield, City	Waukesha		Acquisition of 1 residential structure	
DR-1180	1997	Eau Claire County	Eau Claire	\$ 143,090.00	Acquisition of 1 residential structure	
DR-1180	1997	Menomonee Falls, Vil.	Waukesha	\$ 1,969,799.00	Acquisition of 11 residential structures	
DR-1180	1997	Milwaukee, City	Milwaukee	\$ 1,545,412.00	Acquisition of 19 residential structures; floodproofing of 35 residential structures	
DR-1180	1997	Oak Creek, City	Milwaukee	\$ 112,182.00	Acquisition of 1 substantially damaged (SD) residential structure in Root River floodway	
DR-1180	1997	Wauwatosa, City	Milwaukee	\$ 2,168,097.00	Acquisition of 22 residential structures, 1 commercial structure, and 2 vacant parcels	\$831,325 provided by HUD Disaster Recovery; \$59,735 provided by CDBG; \$222,170 provided by DNR

Disaster Number	Year	Community	County	Cost HMGP Funds	Project Description	Comments
DR-1180	1997	West Allis, City	Milwaukee	\$ 273.00	Proposed acquisition of 1 residential structure	Owner refused to sell after prolonged effort by City
DR-1180	1997	Milwaukee County	Milwaukee	1 % /// / / / ///	Production of flood mitigation video and corresponding brochure; creation of a mitigation educational display for State Fair	
DR-1236	1998	Brookfield, City	Waukesha	\$ 140,060.00	Acquisition of 1 residential structure	
DR-1236	1998	Elm Grove, Village	Waukesha	\$ 921,601.00	Acquisition of 1 residential structure and 1 commercial structure	
DR-1236	1998	Menomonee Falls, Vil	Waukesha	\$ 397,396.00	Acquisition of 2 residential structures	Continuation of the DR-1180 project for Menomonee Falls
DR-1236	1998	Milwaukee, City	Milwaukee	\$ 91,630.00	Acquisition of 2 residential structures	Continuation of the DR-1180 project for Milwaukee
DR-1236	1998	New Berlin, City	Waukesha		Acquisition of 1 residential structure	
DR-1238	1998	Brown Deer, Village	Milwaukee	\$ 1,018,831.00	Acquisition of 9 residential structures	Local match provided by CDBG
DR-1238	1998	Kenosha County	Kenosha		Acquisition of 18 residential structures in the Fox River floodway	Local match provided by CDBG
DR-1238	1998	N. Fond du Lac, Vil.	Fond du Lac		Acquisition of 2 residential structures	
DR-1238	1998	Sheboygan, City	Sheboygan		Acquisition of 16 residential structures	
DR-1236	1998	Thiensville, Village	Ozaukee		Construction of a detention pond	
DR-1238	1998	Thiensville, Village	Ozaukee	\$ 60,000.00	Construction of a detention pond	Supplements for project under 1236-DR
DR-1238	1998	Darlington, City	Lafayette	\$ 117,478.00	Floodproofing of 1 commercial structure	Partially funded by program revenue from Pierce County DR-994 project
DR-1284	1999	Florence, Town	Florence	\$ 321,884.00	Closing of a well and opening of a new one	
DR-1284	1999	Head of Lakes Elec.	Douglas	\$ 164,157.00	Burying of overhead electrical lines	
DR-1284	1999	Superior, City	Douglas	\$ 320,000.00	Storm sewer project	
DR-1332	2000	Eau Claire, City	Eau Claire	\$ 1,537,882.00	Acquisition of 9 residential structures	
DR-1332	2000	Elm Grove, Village	Waukesha	\$ 721,319.00	Acquisition of 2 apartment buildings	
DR-1332	2000	Jefferson County	Jefferson	\$ 226,378.00	Acquisition of 2 residential structures	
DR-1332	2000	Kenosha County	Kenosha	\$ 736,294.00	Acquisition of 11 residential structures	Local match provided by CDBG
DR-1332	2000	Baraboo, City	Sauk	\$ 136,254.00	Partial demolition of commercial structure	
DR-1332	2000	Cumberland Utility	Vernon		Burying of overhead electrical lines	
DR-1332	2000	Dane County EM	Dane		Installation of surge protectors on all county sirens	
DR-1332	2000	Sun Prairie, City	Dane		Providing backflow valves to city residents	
DR-1332	2000	Shell Lake, City	Washburn		Relocation of community shelter	
DR-1332	2000	Crandon, City	Forest		Construction of a storm sewer	
DR-1369	2001	Crawford County	Crawford		Acquisition of County Highway maintenance shop	
DR-1369		DNR	Richland		Acquisition of 1 residential property	
DR-1369	2001	Douglas County	Douglas		Acquisition of 1 SD residential property	
DR-1369	2001	Grant County	Grant	\$ 420,966.00	Acquisition of 3 residential structures	
DR-1369	2001	Jefferson County	Jefferson	\$ 646,232.00	Acquisition of 5 residential structures	Continuation of Rock River project
DR-1369	2001	Kenosha County	Kenosha	\$ 631,323.00	Acquisition of 7 residential structures	Continuation of Fox River project
DR-1369	2001	Superior, City	Douglas		Acquisition of 1 residential structure	
DR-1369	2001	Trempealeau County	Trempealeau		Acquisition of 7 residential structures and 1 commercial structure	
DR-1369	2001	Dairyland Electric	Vernon	\$ 10,938.00	Implementation of Hazard Tree Training	

Disaster Number	Year	Community	County	Cost HMGP Funds	Project Description	Comments
DR-1369	2001	Burnett County	Burnett	\$ 44,265.00	Purchase/distribution of weather alert radios	
DR-1369	2001	Juneau County	Juneau	\$ 164,300.00	Purchase/installation of 33 tornado shelters	
DR-1369	2001	Shell Lake, City	Washburn	\$ 250,000.00	Completion of engineering study for water diversion project	
DR-1369	2001	Grant County	Grant	\$ 32,770.00	Floodproofing of 1 residential structure	
DR-1429	2002	Curtiss, Village	Clark	\$ 44,194.00	Acquisition of 1 residential structure	
DR-1429	2002	Elm Grove, Village	Waukesha	\$ 281,351.00	Acquisition of 1 commercial structure	
DR-1429	2002	Oliver, Village	Superior	\$ 197,568.00	Acquisition of 2 residential structures	
DR-1432	2002	Ferryville, Village	Crawford	\$ 65,028.00	Acquisition of 1 residential structure	
DR-1432	2002	Oliver, Village	Superior	\$ 120,895.00	Acquisition of 1 residential structure	
DR-1432	2002	Osceola, Village	Polk	\$ 408,016.00	Acquisition of 9 mobile homes and 1 cabin	
DR-1432	2002	St. Croix Falls, City	Polk	\$ 84,950.00	Acquisition of 1 residential structure	
DR-1432	2002	Portage County	Portage		Purchase/distribution of weather radios	
DR-1432	2002	Rusk County	Rusk		Purchase/distribution of weather radios	
DR-1429	2002	Curtiss, Village	Clark		Completion of engineering study for drainage area	
DR-1526	2004	Ferryville, Village	Crawford		Acquisition of 1 residential structure	
DR-1526	2004	Grant County	Grant		Acquisition of 3 residential structures	
DR-1526	2004	Kenosha County	Kenosha		Acquisition of 8 residential structures	
DR-1526	2004	Oshkosh, City	Winnebago		Acquisition of 2 residential structures	
DR-1526	2004	Dodge County	Dodge		Purchase/distribution of weather radios	
DR-1526	2004	Jackson County	Jackson	-	Purchase/distribution of weather radios	
DR-1526	2004	Oneida County	Oneida		Purchase/distribution of weather radios	
DR-1719	2007	Chaseburg, Village	Vernon		Acquisition of 7 SD residential properties	
DR-1719	2007	Chaseburg, Village	Vernon		Acquisition of 4 commercial properties (2 SD)	
DR-1719	2007	Gays Mills, Village	Crawford	\$ 704,232.00	Acquisition of 18 residential structures and 1 SD commercial	
DR-1719	2007	Kenosha County	Kenosha	\$ 1,299,202,00	Acquisition of 15 residential structures (3 SD)	
DR-1719	2007	Mt. Pleasant, Village	Racine		Acquisition of 2 SD residential structures	
DR-1719	2007	Oregon, Village	Dane		Acquisition of 1 SD residential structure	
DR-1719		Soldier's Grove, Vil.	Crawford	\$ 178,257.00	Acquisition of 1 residential property (2 mobile homes); elevation of 4 residential structures	
DR-1719	2007	Gays Mills, Village	Crawford	\$ 228,544.00	Acquisition of 1 residential structure, and elevation of 5 residential structures (7 SD)	
DR-1719	2007	Vernon County LCD	Vernon	\$ 128,242.00	Installation of automated high water warning system for 9 dams	
DR-1768		Elroy, City	Juneau		Acquisition of 5 SD residential structures	
DR-1768		Excelsior, Town	Richland		Acquisition of 1 SD residential structure	
DR-1768	2008	Fond du Lac, City	Fond du Lac	\$ 1,067,484,00	Acquisition of 14 SD residential structures	
DR-1768	2008	Gays Mills, Village	Crawford	\$ 701,113.00	Acquisition of 9 SD residential structures and 2 SD commercial structures; elevation of 1 SD residential structure	
DR-1768	2008	Grant County	Grant	\$ 479,300.00	Acquisition of 5 residential structures (2 SD)	
DR-1768	2008	Janesville, City	Rock		Acquisition of 9 SD residential structures	
DR-1768	2008	Jefferson, City	Jefferson		Acquisition of 3 SD residential structures	
DR-1768	2008	Jefferson County	Jefferson		Acquisition of 43 residential structures (35 SD)	

Disaster Number	Year	Community	County	Cost HMG Funds	Project Description	Comments
DR-1768	2008	Kenosha County	Kenosha	\$ 1,235,156.0	0 Acquisition of 12 residential structures (8 SD)	
DR-1768	2008	LaFarge, Village	Vernon	\$ 761,477.0	0 Acquisition of 14 SD residential structures	
DR-1768	2008	Reedsburg, City	Sauk	\$ 2,088,493.0	Acquisition of 18 residential structures (17 SD) and 2 commercial structures	
DR-1768	2008	Richland Center, City	Richland	\$ 84,481.0	0 Acquisition of 1 residential structure	
DR-1768	2008	Rock County	Rock	\$ 1,086,503.0	0 Acquisition of 6 SD residential structures	
DR-1768	2008	Rock Springs, Village	Sauk	\$ 1,390,106.0	0 Acquisition of 18 SD residential structures, 1 vacant structure, and 1 commercial structure	
DR-1768	2008	Spring Green, Town	Sauk	\$ 4,961,575.0	0 Acquisition of 28 residential structures	
DR-1768	2008	Sugar Creek, Town	Walworth		0 Acquisition of 5 SD residential structures	
DR-1933	2010	Brookfield city	Waukesha	\$ 11,561.0	0 Retrofit of 2 structures	
DR-1933	2010	Clark County ADS	Clark	\$ 138,050.9	Construction of 1 community safe room at the Adult Development Services facility	
DR-1933	2010	Clark County 5%	Clark	\$ 27,442.9	Implement public awareness campaign to increase public knowledge of Clark County's natural hazards, purchse and distribute 150 weather radios to seniors and those with special needs, and conduct a series of presentation fto local officials to increase local awareness of local hazards and their risks.	
DR-1933	2010	Clark County Electric Cooperative	Clark	\$ 18,542.0	Burying of overhead electrical lines	
DR-1933	2010	Green County	Green	\$ 71,568.9	Construction of 1 community safe room at mobile home park	
DR-1933	2010	Glendale, City	Milwaukee	\$ 795,607.4	Acquisition of 3 residential structures	
DR-1933	2010	Jefferson County	Jefferson	\$ 20,801,360.0	Acquisition of 18 residential structures	
DR-1933	2010	Lisbon, Town	Waukesha	\$ 630,706.1	7 Acquisition of 2 residential structures	
DR-1933	2010	Loyal, City	Clark	\$ 192,566.8		
DR-1933	2010	Lyons, Town	Walworth	\$ 766,093.0	Construction of 1 community safe room at mobile home park	
DR-1933	2010	Marquette County	Marquette	\$ 4,552.0	Purchase/distribution of weather radios and outreach to home-bound seniors	
DR-1933	2010	Neillsville, City	Clark	\$ 150,591.0		
DR-1933	2010	Pine Valley, Town	Clark	\$ 137,566.0		
DR-1933		Oshkosh, City	Winnebago	\$ 2,064,738.0		
DR-1933	2010	Portage County 5%	Portage		Application withdrawn	
DR-1933	2010	Prairie du Chien	Crawford		Acquisition of 1 commercial structure	
DR-1933		Vienna, Town of	Dane		Installation of culvert in flood-prone area	
DR-1933	2010	Whitefish Bay, Town of	Milwaukee	\$ 5,924,408.0	Construction of storm sewer and detention basin	
DR-1933	2010	Trempealeau County	Trempealeau	\$ 182,206.0	Design, construction, and installation of 5 combination pressure transducer/rain gauge stations, 6 river gauge stations, and 1 steam gauge station in the Trempeleau River Watershed.	
DR-1944	2010	Columbia County	Colombia	\$ 19,350.0	Installation of river gauges on Wisconsin, Fox, and Crawfish Rivers	
DR-1944	2010	Marathon County	Marathon	\$ 882,825.0	Acquisition of 7 residential structures	
DR-1944	2010	Marathon City, Village	Marathon	\$ 95,000.0	Acquisition of 1 SD residential property	
DR-1944	2010	Oneida County	Oneida	\$ 24,999.0	Purchase/distribution of weather radios	

Disaster Number	Year	Community	County	Cost HMGP Funds	Project Description	Comments
DR-1966		Bagley, Village of	Grant	\$ 373,476.00	Construction of 1 community safe room	
DR-1966		Madison, City of	Dane	\$ 1,596,279.35	Construction of 1 community safe room at mobile home park	
DR-1966		WEM Webinars	Dane	\$ 519,000.00	Development of state-wide webinars in order to educate state, local, and tribal partners on a variety of mitigation topics.	
DR-4076		Bagley, Village of	Grant	\$ 403,250.00	Construction of 1 community safe room	
DR-4076		Bayfield County Gen.	Bayfield	\$ 91,000.00	Purchase and installation of generator in county courthouse	
DR-4076		Bayfield County SR	Bayfield	\$ 317,483.00	Construction of safe room at community fairgrounds	
DR-4076		Clover, Town of	Bayfield	\$ 66,220.00	Installation of culvert in flood-prone area	
DR-4076		Crawford County	Crawford	\$ 215,375.00	Acquisition of 2 residential and 1 commercial properties	
DR-4076		Dunn County	Dunn	\$ 213,815.00	Construction of a revetment to remove one residential structure from imminent danger of landslide	
DR-4076		River Falls, City of	Pierce, St. Croix		Construction of 1 community safe room at a mixed-use local park	
DR-4076		Richland Center, City	Richland	\$ 24,136.00	Acquisition of 1 residential structure	
DR-4141		Gays Mills, Village	Crawford	\$ 143,800.00	Acquisition of 1 commercial structure	
DR-4141		Glendale, City	Milwaukee	\$ 499,990.00	Acquisition of 5 residential properties	
DR-4141		Ozaukee County	Ozaukee	\$ 200,975.00	Acquisition of 1 residential property	
DR-4141		Richmond, Town of	Walworth	\$ 4,133.24	Purchase and distribution of 200 weather radios to community	
DR-4141		Vernon County	Vernon	\$ 606,410.00	Acquisition of 14 residential structures	
		TOTAL		\$ 106,051,065		

	HMGP Plans												
Disaster Number	Year	Community	County		Cost HMGP Funds	New Plan or 5-Year Update	Plan Status						
DR-1332	2000	Baraboo, City	Sauk	\$	16,792	New	Plan is approved						
DR-1369	2001	Burnett County	Burnett	\$	55,947	New	Plan is approved						
DR-1369	2001	Dane County	Dane	\$	40,000	New	Plan is approved						
DR-1369	2001	Douglas County	Douglas	\$	55,314	New	Plan is approved						
DR-1369	2001	Grant County	Grant	\$	57,440	New	Plan is approved						
DR-1369	2001	Juneau County	Juneau	\$	17,311	New	Plan is approved						
DR-1369	2001	Shell Lake, City	Washburn	\$	19,847	New	Plan is approved						
DR-1369	2001	Sun Prairie, City	Dane	\$	2,180	New	Plan is approved						
DR-1369	2001	Superior, City	Douglas	\$	59,266	New	Plan is approved						
DR-1429	2002	Crandon, City	Forest	\$	21,000	New	Plan is approved						
DR-1429	2002	Portage County	Portage	\$	43,875	New	Plan is approved						
DR-1432	2002	Polk County	Polk	\$	40,310	New	Plan is approved						
DR-1526	2004	Columbia County	Columbia	\$	45,000	New	Plan is approved						
DR-1526	2004	Dodge County	Dodge	\$	19,894	New	Plan is approved						
DR-1526	2004	Eau Claire County	Eau Claire	\$	28,907	New	Plan is approved						
DR-1719	2007	Crawford County	Crawford	\$	41,200	Update	Plan is approved						
DR-1719	2007	Richland County	Richland	\$	29,391	New	Plan is approved						
DR-1719	2007	Vernon County	Vernon	\$	41,200	Update	Plan is approved						
DR-1768	2008	Avoca, City	Iowa	\$	28,547	New	Plan is approved						
DR-1768	2008	Burnett County	Burnett	\$	30,200	Update	Plan is approved						
DR-1768	2008	Green County	Green	\$	9,363	Update	Plan is approved						
DR-1768	2008	Green Lake County	Green Lake	\$	36,360	New	Plan is approved						
DR-1768	2008	Iowa County	Iowa	\$	39,903	New	Plan is approved						
DR-1768	2008	Juneau County	Juneau	\$	15,007	Update	Plan is approved						
DR-1768	2008	Kenosha County	Kenosha	\$	40,000	Update	Plan is approved						
DR-1768	2008	Milwaukee County	Milwaukee	\$	8,155	Update	Plan is approved						
DR-1768	2008	Rock County	Rock	\$	29,357	Update	Plan is approved						
DR-1768	2008	Sauk County	Sauk	\$	18,880	Update	Plan is approved						
DR-1933	2011	Bayfield County	Bayfield	\$	38,531	Update	Plan is approved						
DR-1933	2011	Calumet County	Calumet	\$	47,322	Update	In process						
DR-1933	2011	Columbia County	Columbia	\$	18,152	Update	Plan is approved						
DR-1933	2011	Grant County	Grant	\$	51,972	Update	Plan is approved						
DR-1933	2011	Ho-Chunk Nation	N/A	\$	31,600	Update	Plan is approved						
DR-1933		Iron County	Iron	\$	24,740	Update	Plan is approved						
DR-1933		Jackson County	Jackson	\$	40,001	Update	Plan is approved						

Disaster Number	Year	Community	County	(Cost HMGP Funds	New Plan or 5-Year Update	Plan Status
DR-1933	2011	Jefferson County	Jefferson	\$	20,120	Update	Plan is approved
DR-1933	2011	La Crosse County	La Crosse	\$	50,000	Update	Plan is approved
DR-1933	2011	Langlade County	Langlade	\$	40,000	Update	Plan is approved
DR-1933	2011	Lincoln County	Lincoln	\$	35,000	Update	Plan is approved
DR-1933	2011	Marinette County	Marinette	\$	34,459	Update	Plan is approved
DR-1933	2011	Marquette County	Marquette	\$	18,686	Update	Plan is approved
DR-1933	2011	Northwest Region	Price, Rusk, Sawyer, Taylor	\$	159,910	New	Plan is approved
DR-1933	2011	Ozaukee County	Ozaukee	\$	32,800	Update	Plan is approved
DR-1933	2011	Portage County	Portage	\$	42,027	Update	Plan is approved
DR-1933	2011	Sheboygan County	Sheboygan	\$	38,640	Update	Plan is approved
DR-1933	2011	Waupaca County	Waupaca	\$	48,205	Update	Plan is approved
DR-1944	2012	Walworth County	Walworth	\$	17,000	Update	Plan is approved
DR-1966	2012	Darlington, City of	Lafayette	\$	18,250	Update	Plan is approved
DR-1966	2012	Forest County	Forest	\$	40,000	Update	Plan is approved
DR-1966	2012	Manitowoc County	Manitowoc	\$	56,032	Update	Plan is approved
DR-1966	2012	Richland County	Richland	\$	21,057	Update	Meets requirements
DR-1966	2012	UW-River Falls	Pierce, St. Croix	\$	19,473	Update	Plan is approved
DR-4076	2013	Adams County	Adams	\$	40,000	Update	Plan is approved
DR-4076	2013	Oconto County	Oconto	\$	50,888.00	Update	Plan is approved
DR-4076	2013	Washburn County	Washburn	\$	23,885.00	Update	Plan is approved
DR-4141	2015	Dane County	Dane	\$	33,777.00	Update	In process
DR-4141	2014	Door County	Door	\$	33,000.00	New	Meets requirements
TOTAL		57 Plans		\$	2,016,173	57 local plans	

				FMA Projects	
Year	Community	County	Cost FMA Funds	Project Description	Comments
1997	Darlington, City	Lafayette	\$156,133	Acquisition of 1 commercial structure	
1998	Darlington, City	Lafayette	\$420,001	Floodproofing of 1 commercial structure and partial funding for acquisition of 1 repetitive	Supplemented by FMA 2000 funds; local match provided by global match funds
1998	Jefferson County	Jefferson	\$115,332	loss commercial structure Acquisition of 2 residential structures	under DR-994 Local match provided by global match funds under DR-912 and 994
1999	Kenosha County	Kenosha	\$166,800	Acquisition of 2 residential structures	Local match provided by global match funds under DR-1238
2000	Brookfield, City	Waukesha	\$46,267	Acquisition of 1 repetitive loss property	Supplemented by FMA 2001 funds
2000	Darlington, City	Lafayette	\$151,213	See 1998, Darlington, City above	Local match provided by DNR Urban Rivers Grant
2001	Brookfield, City	Waukesha	\$140,219	See 2000, Brookfield, City above	
2001	Kenosha County	Kenosha	\$53,448	Acquisition of 1 residential structure	Continuation of Fox River project
2002	Darlington, City	Lafayette	\$152,167	Acquisition of Darlington Firehouse	Located in the Pecatonica River floodplain
2003	N. Fond du Lac, Vil	Fond du Lac	\$119,132	Acquisition of 1 residential structure	
2003	WEM	All	\$16,320	Technical support for applicants	Personnel, travel, supplies
2005	Jefferson County	Jefferson	\$143,349	Acquisition of 1 residential structure	
2005	WEM	All	\$11,464	Technical assistance to subgrantees	Personnel, travel, supplies
2006	Kenosha County	Kenosha	\$ -	Acquisition of 1 residential structure	Grant funds returned because negotiations with property owner failed
2007	Kenosha County	Kenosha	\$124,767	Acquisition of 1 residential structure	
2007	WEM	All	\$4,020	Technical assistance to subgrantees	Personnel, travel, supplies
2009	Darlington, City	Lafayette	\$82,022	Acquisition of 1 commercial structure	
2010	Monona, City	Dane	\$111,000	Elevation of 1 residential structure	
2010	WEM	All	\$2,873	Technical assistance to subgrantees	Personnel, travel, supplies
2012	Monona, City	Dane	\$112,883	Elevation of 1 residential structure	
2012	WEM	All	\$10,720	Technical assistance to subgrantees	Personnel, travel, supplies
2013	Kenosha County	Kenosha	\$188,950	Acquisition of 1 severe-repetitive loss structure	
2013	WEM	All	\$13,153	Technical assistance to subgrantees	Personnel, travel, supplies
2014	Jefferson County	Jefferson	\$233,457	Acquisition of 1 residential structure	
2014	WEM	All	\$33,042	Technical assistance to subgrantees	Personnel, travel, supplies
TOTAL			\$2,608,730	18 mitigation projects	

	FMA Plans								
Year	Community	County	Cost FMA Funds	Comments					
1996/1997	Kenosha County	Kenosha	\$6,000	Plan is approved					
1996/1997	Ozaukee County	Ozaukee	\$9,733	Plan is approved					
1998	Crawford County	Crawford	\$17,333	Plan is approved					
1998	Eau Claire County	Eau Claire	\$8,433	Plan is approved					
1998	Jefferson County	Jefferson	\$15,239	Plan is approved					
1999	Milwaukee, City	Milwaukee	\$5,000	Plan is approved					
1999	Brookfield, City	Waukesha	\$10,000	Plan is approved					
2000	No. Fond du Lac, Vil	Fond du Lac	\$12,743	Plan is approved					
2000	Oak Creek, City	Milwaukee	\$5,000	Plan is approved					
2001	Eau Claire, City	Eau Claire	\$19,009	Plan is approved					
2002	Dane County	Dane	\$18,400	Plan is approved					
2005	La Crosse, City	LaCrosse	\$17,866	Part of County plan, plan is approved					
2006	Clark County	Clark	\$13,817	Part of County plan, plan is approved					
TOTAL			\$158,573	13 local flood mitigation plans					

				PDM Projects	
Year	Community	County	Cost PDM Funds	Project Description	Comments
2002	WEM	All	\$15,520	Technical assistance	Personnel, travel, and supplies
2002	Mississippi River RPC	All	\$50,000	Creation of local all-hazards mitigation planning guidance	
2003	WEM	All	\$32,834	Technical assistance	Personnel, travel, and supplies
2003C	Barron County	Barron	\$138,600	Burying of power lines	
2003C	Deer Park, Village	St. Croix	\$109,880	Acquisition of 1 residential structure	90% federally funded because community was designated impoverished
2003C	Kenosha County	Kenosha	\$390,073	Acquisition of 3 residential structures and 5 vacant parcels	
2003C	Middleton, City	Dane	\$17,212	Drainage remediation	
2003C	Portage County	Portage	\$787,653	Burying of power lines	
2003C	Thiensville, Village	Ozaukee	\$2,308,620	Channelization of flood area	
2003C	WEM	All	\$176,812	Technical assistance	Personnel, travel, and supplies
2005C	Darlington, City	Lafayette	\$ -	Acquisition of 1 residential structure	Project owner rejected offer; funds deobligated
2005C	State of Wisconsin	All	\$182,010	Development of structure inventory database	
2005C	WEM	All	\$88,480	Technical assistance	Personnel, travel, and supplies
2006C	Darlington, City	Lafayette	\$65,000	Acquisition of 1 residential structure	
2006C	WEM	All	\$22,141	Technical assistance	Personnel, travel, and supplies
2007C	Dunn, Town	Dane	\$650,500	Construction of community storm shelter	
2007C	WEM	All	\$70,092	Technical assistance	Personnel, travel, and supplies
2008C	WEM	All	\$23,897	Technical assistance	Personnel, travel, and supplies
2008C	Stanley, City		\$238,344	Installation of sirens and generator	Legislative PDM (LPDM) grant
2008C	WEM		\$18,906	Technical assistance	LPDM; personnel, travel, and supplies
2009C	WEM	All	\$25,579	Technical assistance	Personnel, travel, and supplies
2009C	Clark County	Clark	\$229,883	Installation of sirens	LPDM
2009C	Clark County	Clark	\$169,500	Installation of generator	LPDM
2009C	WEM	Clark	\$17,026	Technical assistance	LPDM; personnel, travel, and supplies
2010C	UW - River Falls		\$93,593	Construction of 2 safe rooms	
2010C	WEM	All	\$47,859	Technical assistance	Personnel, travel, and supplies
2015C	Prairie du Chien, City of	Crawford County	\$349,782	Construction of a community safe room	
2015C	River Falls, City of	Pierce & St. Croix Counties	\$ -	Construction of a community safe room	Project withdrawn
TOTAL			\$6,319,796	11 technical assistance grants; 15 mitigation projects	

	PDM Plans						
Year	Community	County	Cost PDM Funds	New Plan or 5-Year Update	Plan Status		
2002	Adams County	Adams	\$40,398	New	Plan is approved		
2002	Bayfield County	Bayfield	\$44,000	New	Plan is approved		
2002	Chippewa County	Chippewa	\$38,596	New	Plan is approved		
2002	Clark County	Clark	\$20,736	New	Plan is approved		
2002	Crawford County	Crawford	\$40,000	New	Plan is approved		
2002	Darlington, City	Lafayette	\$14,700	New	Plan is approved		
2002	Elm Grove, Village	Waukesha	\$4,369	New	Plan is approved		
2002	Fond du Lac County	Fond du Lac	\$73,154	New	Plan is approved		
2002	Green County	Green	\$10,406	New	Plan is approved		
2002	Kenosha County	Kenosha	\$24,200	New	Plan is approved		
2002	Milwaukee, City	Milwaukee	\$23,000	New	Plan is approved		
2002	N. Fond du Lac, Vil	Fond du Lac	\$13,027	New	Plan is approved		
2002	Oneida County	Oneida	\$28,465	New	Plan is approved		
2002	Rock County	Rock	\$17,600	New	Plan is approved		
2002	Sheboygan, City	Sheboygan	\$30,156	New	Plan is approved		
2002	Trempealeau County	Trempealeau	\$64,000	New	Plan is approved		
2002	Vernon County	Vernon	\$63,256	New	Plan is approved		
2002	Winnebago County	Winnebago	\$58,849	New	Plan is approved		
2003	Barron County	Barron	\$31,619	New	Plan is approved		
2003	Lincoln County	County	\$25,000	New	Plan is approved		
2003	Marathon County	Marathon	\$67,283	New	Plan is approved		
2003	Milwaukee County	Milwaukee	\$27,927	New	Plan is approved		
2003	Pierce County	Pierce	\$48,000	New	Plan is approved		
2003	Sauk County	Sauk	\$12,750	New	Plan is approved		
2003	Wood County	Wood	\$44,000	New	Plan is approved		
2003C	Calumet County	Calumet	\$30,000	New	Plan is approved		
2003C	Florence County	County	\$45,000	New	Plan is approved		
2003C	Ho-Chunk Nation	Tribal	\$71,850	New	Plan is approved; Ho-Chunk provided 31.08% of cost		
2003C	Kewaunee County	County	\$36,000	New	Plan is approved		
2003C	Lac du Flambeau	Tribal	\$34,817	New	Plan is approved		
2005C	Brown County	Brown	\$99,268	New	Plan is approved		
2005C	Buffalo County	Buffalo	\$60,000	New	Plan is approved		
2005C	Dunn County	Dunn	\$31,000	New	Plan is approved		
2005C	Forest County	Forest	\$30,000	New	Plan is approved		
2005C	Iron County	Iron	\$27,573	New	Plan is approved		

Year	Community	County	Cost PDM Funds	New Plan or 5-Year Update	Plan Status
2005C	Jackson County	Jackson	\$59,627	New	Plan is approved
2005C	Jefferson County	Jefferson	\$58,900	New	Plan is approved
2005C	Lacrosse County	Lacrosse	\$80,000	New	Plan is approved
2005C	Lafayette County	Lafayette	\$14,000	New	Never completed, funds returned
2005C	Langlade County	Langlade	\$30,000	New	Plan is approved
2005C	Manitowoc County	Manitowoc	\$95,133	New	Plan is approved
2005C	Marinette County	Marinette	\$50,000	New	Plan is approved
2005C	Ozaukee County	Ozaukee	\$50,000	New	Plan is approved
2005C	Sheboygan County	Sheboygan	\$53,000	New	Plan is approved
2005C	Waupaca County	Waupaca	\$ -	New	County withdrew
2005C	Waushara County	Waushara	\$37,000	New	Plan is approved
2006C	St. Croix County	St. Croix	\$42,799	New	Plan is approved
2006C	Washburn County	Washburn	\$44,000	New	Plan is approved
2006C	Shawano County	Shawano	\$69,613	New	At FEMA for review
2007C	Dane County	Dane	\$195,331	Update	Update is approved
2007C	Marquette County	Marquette	\$34,028	New	Plan is approved
2007C	Monona, City	Dane	\$47,560	New	Incorporated into Dane County's plan
2007C	Oconto County	Oconto	\$79,641	New	Plan is approved
2007C	Outagamie	Outagamie	\$71,525	New	Update is approved
2007C	UW River Falls	Pierce	\$24,990	New	Plan is approved
2007C	Walworth County	Walworth	\$41,878	New	Plan is approved
2007C	Waukesha	Waukesha	\$63,977	New	Plan is approved
2007C	WEM	All	\$402,574	Update	Agreement with UW for HAZUS flood risk assessment.
2008C	Adams County	Adams	\$40,000	Update	Update is approved
2008C	Clark County	Clark	\$31,895	Update	Update is approved
2008C	Darlington, City	Lafayette	\$19,597	Update	Update is approved
2008C	Fond du Lac County	Fond du Lac	\$42,324	Update	Update is approved
2008C	Oneida County	Oneida	\$40,000	Update	Update is approved
2008C	Racine County	Racine	\$40,000	Update	Update is approved
2008C	Winnebago County	Winnebago	\$21,290	Update	Update is approved
2009C	Barron County	Barron	\$22,481	Update	Update is approved
2009C	Douglas County	Douglas	\$23,342	Update	Update approved
2009C	Eau Claire, City	Eau Claire, Chippewa	\$29,990	New	Plan is approved.
2009C	Marathon County	Marathon	\$41,125	Update	Update is approved
2009C	Pepin County	Pepin	\$70,965	New	Plan is approved.

Year	Community	County	Cost PDM Funds	New Plan or 5-Year Update	Plan Status
2009C	Polk County	Polk	\$34,250	Update	Update is approved
2009C	Superior, City	Douglas	\$37,148	Update	Update is approved
	Trempealeau County	Trempealeau	\$43,594	Update	Update is approved
2010C	Ashland County	Ashland	\$51,020	New	Plan is approved.
2010C	Chippewa County	Chippewa	\$32,640	Update	Update is approved
2010C	Dodge County	Dodge	\$15,016	Update	Plan is approved.
2010C	Kewaunee County	Kewaunee	\$17,255	Update	Update is approved
2010C	Milwaukee, City	Milwaukee	\$40,000	Update	Update is approved
2010C	Pierce County	Pierce	\$22,373	Update	Update is approved
2010C	Sheboygan, City	Sheboygan	\$23,829	Update	Update is approved
2010C	UW - Madison	Dane	\$346,707	New	Update is approved
2010C	Wood County	Wood	\$15,935	Update	Update is approved
2011C	Brown County	Brown	\$75,096	Update	Update is approved
2011C	Crandon, City of	Forest	\$20,000	New	Plan is approved.
2011C	Dunn County	Dunn	\$34,200	Update	Update is approved
2011C	Eau Claire County	Eau Claire	\$35,000	Update	Update is approved
2011C	Florence County	Florence	\$29,838	Update	Update is approved
2011C	St. Croix County	St. Croix	\$41,790	New	Plan is approved
2011C	Vilas County	Vilas	\$40,000	New	Plan is approved
2013C	Buffalo County	Buffalo	\$40,000	Update	In Planning Process
2013C	Clark County	Clark	\$40,487	Update	Plan is approved
2013C	Fond du Lac County	Fond du Lac	\$26,709	Update	Plan is approved
2013C	Waushara County	Waushara	\$40,500	Update	Plan is approved
2013C	Winnebago County	Winnebago	\$18,994	Update	Plan is approved
2014C	Burnett County	Burnett	\$33,250	Update	In Planning Process
2014C	Douglas County	Douglas	\$38,668	Update	In Planning Process
2014C	Green County	Green	\$23,600	Update	In Planning Process
2014C	Kenosha County	Kenosha	\$40,000	Update	In Planning Process
2014C	Marathon County	Marathon	\$50,000	Update	In Planning Process
2014C	Oneida County	Oneida	\$40,000	Update	In Planning Process
2014C	Racine County	Racine	\$40,000	Update	In Planning Process
2014C	Rock County	Rock	\$24,953	Update	In Planning Process
2014C	Shawano/ Menominee Counties	Shawano/ Menominee	\$43,500	Update- Combining 2 counties	Update approved by state.
2014C	Washington County	Washington	\$106,700	New	In Planning Process

Year	Community	County	Cost PDM Funds	New Plan or 5-Year Update	Plan Status
2015C	Barron County	Barron	\$42,500	Update	In Planning Process
2015C	Crawford County	Crawford	\$40,000	Update	In Planning Process
2015C	Juneau County	Juneau	\$40,000	Update	In Planning Process
2015C	Milwaukee, City of	Milwaukee	\$40,000	Update	In Planning Process
2015C	Outagamie County	Outagamie	\$30,000	Update	In Planning Process
2015C	Pepin County	Pepin	\$50,028	Update	In Planning Process
2015C	Polk County	Polk	\$40,000	Update	In Planning Process
2015C	Trempealeau County	Trempealeau	\$40,000	Update	In Planning Process
TOTAL			\$5,285,164	112 local plans	

Contract	Applicant	County	Award	Project Description
FY94-0096	Adams County	Adams	\$255,000	Construct storm sewer to serve Front, Main, North and Roberts Streets.
FY94-0075	Appleton, City	Outagamie	\$15,225	Relocate main sewer and stabilize slope to prevent mudslide in Allicia Park.
FY94-0081	Black River Falls, City	Jackson	\$623,063	Flood Control-reconstruct levee and add floodwall to dam.
FY94-0085	Lake Delton, Village	Sauk	\$6,331	Dredge Lake Delton and stabilize slope in a ravine (administration only).
FY95-0035	Augusta, City	Eau Claire	\$59,555	Install storm sewer.
FY95-0027	Baraboo, City	Sauk	\$339,797	Slope stabilization, storm sewers, reconstruct well and install pump house controls.
FY95-0022	Baraboo, Town	Sauk	\$172,000	Stabilize slopes where flood-induced erosion threatens homes.
FY95-0030	Black River Falls, City	Jackson	\$500,000	Supplemental levee. Infrastructure replacement.

TOTAL			\$4,648,664	
FY04-10234	Shell Lake, City	Washburn	\$750,000	Construction of a drainage pipe to lower lake levels to relieve the flooding.
FY99-0504	Menomonee Falls, Vil.	Waukesha	\$171,261	CDBG DRA grant to acquire two of ten floodplain properties (land and buildings).
FY97-0291	Oakfield, Village	Fond du Lac	\$72,000	Purchase and demolish Oakfield Middle School destroyed in 7/18/96 tornado. Construct stormwater detention basin and park in its place.
FY97-0005	Blair, City	Trempealeau	\$109,173	Flood mitigation project.
FY95-0041	Prairie du Chien, City	Crawford	\$266,175	Acquisition and relocation from floodplain and some housing projects.
FY95-0032	Portage County	Portage	\$181,000	Homeowner assistance, street repairs and repair of Jordan Dam.
FY95-0040	Lyndon Station, Village	Juneau	\$277,500	Install storm sewer.
FY95-0039	Deforest, Village	Dane	\$495,000	Install storm sewer. Expand detention ponds.
FY95-0037	Darlington, City	Lafayette	\$355,584	Professional project management for business relocation, acquisition and demolition. Floodproof 41 downtown businesses.

	Non-Mitigation PF Projects (Updates Post 2011 are included in Tables D.8.1 and D.8.2)							
Contract	Applicant	County	Award	Project Description				
FY94-0092	Blair, City	Trempealeau	\$190,066	Flood-related sewer and street repair.				
FY94-0062	Foster, Town	Eau Claire	\$44,178	Replace culvert and roadway.				
FY94-0079	La Crosse County	La Crosse	\$69,264	Construct sediment trap, raise 3,700 feet of road 6 inches and pave County Highway ZN.				
FY94-0088	Mauston, City	Juneau	\$57,470	Repair drainage ditch, roadway and culverts at the intersection of the Henry's subdivision drainage ditch, Elm St. and Marshall Dr.				
FY94-00080	Wheatland, Town	Kenosha	\$112,000	Reconstruct one mile of road on Will Kumlin Road.				
FY95-0001	Crawford County	Crawford	\$322,600	Reconstruct salt storage facility and extend water main to the Olson subdivision of Soldier's Grove.				
FY95-0034	Dekorra, Town	Columbia	\$92,146	Wisconsin Lake shoreline repair and roadwork.				
FY95-0033	River Falls, City	Pierce	\$374,000	Repair road embankment/retaining wall along North main Street.				

Contract	Applicant	County	Award	Project Description
FY01-0242	St. Nazianz, Village	Manitowoc	\$400,000	Clean-up, emergency relief and security measures related to the severe storms and high
	,		,,	winds that occurred May 12, 2000.
FY02-0225	Siren, Village	Burnett	\$500,000	Emergency clean up, infrastructure and streetscape repair and replacement.
TOTAL			\$2,161,724	

	CDBG EAP Mitigation Projects							
Contract/ EAP #	Grantee Name	County	Award Amount					
87039	Fond du Lac County	Fond du Lac	\$500,000	Rehabilitation of damaged housing units, demolition and clearance of uninhabitable housing units, and construction of replacement housing units				
87195.02	Germantown, Village	Washington	\$453,750	Rehabilitation of damaged housing units, demolition and clearance of uninhabitable housing units, and construction of replacement housing units				
87195.26	Rock County	Rock	\$495,000	Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines, demolition and clearance of hazardous structures, and acquisition/relocation				
88195.01	Door County	Door	\$495,000	Rehabilitation of damaged housing units, replacement of wells and septic systems, and construction of replacement housing units				
88195.02	Sheboygan County	Sheboygan	\$495,000	Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines, demolition and clearance of hazardous structures				
89195.01	Wheatland, Town	Kenosha	\$500,000	Acquire/demolish homes/hazardous structures and provide relocation assistance to homeowners				
89195.02	Kenosha County	Kenosha	\$648,000	Acquire/demolish homes/hazardous structures and provide relocation assistance to homeowners				
89195.03	Oregon, Village	Dane	\$500,000	Acquire/demolish homes/hazardous structures and provide relocation assistance to homeowners				
89195.04	Florence County	Florence	\$352,000	Rehabilitation of damaged housing units				
89195.05	Ashland County	Ashland	\$500,000	Rehabilitation of damaged housing units, replacement of wells and septic systems, demolition and clearance of hazardous structures, construction of replacement housing units OR acquisition/relocation				
80195.01	Manitowoc County	Manitowoc	\$249,700	Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines, construction of replacement housing units, demolition and clearance of hazardous structures, and acquisition/relocation				
80195.02	Baraboo, City	Sauk	\$137,500	Rehabilitation of damaged housing units and replacement of wells/septic systems and water/sewer lines				
80195.03	Grant County	Grant	\$363,000	Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines, construction of replacement housing units, demolition and clearance of hazardous structures, and acquisition/relocation				
80195.04	Kenosha County	Kenosha	\$250,000	Acquisition/relocation and demolition and clearance of hazardous structures				
80195.05	Vernon County	Vernon	\$220,000	Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines, construction of replacement housing units, demolition and clearance of hazardous structures, and acquisition/relocation				
80195.06	Chippewa County	Chippewa	\$110,000	Rehabilitation of damaged housing units and replacement of wells/septic systems and water/sewer lines				
81195.01	Prairie du Chien, City	Crawford	\$335,000	Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines, construction of replacement housing units, demolition and clearance of hazardous structures, and acquisition/relocation				
81195.02	Burnett County	Burnett	\$750,000	Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines, construction of replacement housing units, demolition and clearance of hazardous structures, and acquisition/relocation				
81195.03	Washburn County	Washburn	\$250,000	Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines, construction of replacement housing units, demolition and clearance of hazardous structures, and acquisition/relocation				

Contract/ EAP #	Grantee Name	County	Award Amount	Project Description
				Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,
81195.04	Siren, Village	Burnett	\$250,000	construction of replacement housing units, demolition and clearance of hazardous structures, and
				acquisition/relocation
				Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,
81195.05	Rusk County	Rusk	\$720,000	construction of replacement housing units, demolition and clearance of hazardous structures, and
01105.06	T	- .	¢44.275	acquisition/relocation
81195.06	Trempealeau County	Trempealeau	\$41,375	Acquisition/relocation and demolition and clearance of hazardous structures Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,
02011 01	Kananan Taura	N 4 a wa t la a va	¢110,000	
83011.01	Kronenwetter, Town	Marathon	\$110,000	construction of replacement housing units, demolition and clearance of hazardous structures, and
				acquisition/relocation Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,
83011.02	Marinette County	Marinette	\$220,000	construction of replacement housing units, demolition and clearance of hazardous structures, and
03011.02	Ivial mette county	Widilliette	Ψ220,000	acquisition/relocation
				Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,
83011.03	Portage County	Portage	\$110,000	construction of replacement housing units, demolition and clearance of hazardous structures, and
	3	, ,	acquisition/relocation	
			Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,	
83001.04	Ladysmith, City	Rusk	\$500,000	construction of replacement housing units, demolition and clearance of hazardous structures, and
			acquisition/relocation	
				Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,
83011.05	Taylor County	Taylor	\$120,438	construction of replacement housing units, demolition and clearance of hazardous structures, and
				acquisition/relocation
83011.06	Osceola, Village	Polk	\$187,000	Acquisition/relocation and demolition and clearance of hazardous structures
	Shell Lake, City	Washburn		Acquisition/relocation and demolition and clearance of hazardous structures
				Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,
EAP #04-01	Marinette County	Marinette	\$220,000	construction of replacement housing units, demolition and clearance of hazardous structures, and
				acquisition/relocation
EAP #04-01	Two Rivers, City	Manitowoc	\$110,000	Rehabilitation of homes damaged by sewer back-up caused by broken water main
				Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,
EAP #04-02	Antigo, City	Langlade	\$165,000	construction of replacement housing units, demolition and clearance of hazardous structures, and
				acquisition/relocation Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,
EAD #05 01	Dandalah Militar	Columbia,	¢205.000	1
EAP #05-01	Randolph, Village	Dodge	\$385,000	construction of replacement housing units, demolition and clearance of hazardous structures, and
				acquisition/relocation Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,
EAP #05-03 Berlin, City	Berlin, City	Green Lake,	\$356,314	construction of replacement housing units, demolition and clearance of hazardous structures, and
LAF #03-03	Defilli, City	Waushara	\$330,314	acquisition/relocation
				Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,
EAP #05-04	Green Lake County	Green Lake	\$275,000	construction of replacement housing units, demolition and clearance of hazardous structures, and
05 0 1	C. Seri Lane County	O.CC.II LURC	Ψ2, 3,000	acquisition/relocation

Contract/ EAP #	Grantee Name	County	Award Amount	t Project Description	
				Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,	
EAP #05-05	Grant County	Grant	\$297,000	construction of replacement housing units, demolition and clearance of hazardous structures, and	
				acquisition/relocation Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,	
EAD #0E 06	Kanasha Cauntu	Kanasha	¢100.000	1	
EAP #05-06	Kenosha County	Kenosha	\$109,000	construction of replacement housing units, demolition and clearance of hazardous structures, and	
				acquisition/relocation Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,	
EAP #06-01	Adams County	Adams	\$220,000	construction of replacement housing units, demolition and clearance of hazardous structures, and	
			,,	lacquisition/relocation	
		Dichland		Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,	
EAP #06-02	Richland/Vernon Counties	Richland,	\$821,810	construction of replacement housing units, demolition and clearance of hazardous structures, and	
		Vernon		acquisition/relocation	
				Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,	
EAP #06-03	Columbia County	Columbia	\$75,000	construction of replacement housing units, demolition and clearance of hazardous structures, and	
				acquisition/relocation Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,	
FV0C 12007	Viole Villere	Diable and	¢c00,000		
FY06-12097	Viola, Village	Richland	\$600,000	construction of replacement housing units, demolition and clearance of hazardous structures, and	
				acquisition/relocation Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,	
EAP #07-01	Langlade County Housing	Langlade	\$110,000	construction of replacement housing units, demolition and clearance of hazardous structures, and	
27 11 11 07 02		_ag.a.c	Ψ==0/000	lacquisition/relocation	
				Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,	
EAP #07-02	Town of Riverview Housing	Oconto	\$466,620	construction of replacement housing units, demolition and clearance of hazardous structures, and	
				acquisition/relocation	
				Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,	
EAP #07-03	Grant County (Bagley)	Grant	\$1,011,500	construction of replacement housing units, demolition and clearance of hazardous structures,	
				acquisition/relocation, and LiDAR Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,	
EAP #07-04	La Casasa Cassata	1.5 6	¢C44.500	construction of replacement housing units, demolition and clearance of hazardous structures, and	
EAP #07-04	La Crosse County	La Crosse	\$644,500	·	
				acquisition/relocation Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,	
EAP #07-05	Vernon County	Vernon	\$10,911,363	construction of replacement housing units, demolition and clearance of hazardous structures,	
27 11 11 07 03	Trainen Geanity		Ψ=0/5==/500	, , , , , , , , , , , , , , , , , , , ,	
				acquisition/relocation, dam repairs, lake dredging, LiDAR Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,	
EAP #07-06	Richland County	Richland	\$467,500	construction of replacement housing units, demolition and clearance of hazardous structures, and	
				acquisition/relocation	
				Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,	
EAP #07-07	Village of Gays Mills	Crawford	\$3,586,900	construction of replacement housing units, demolition and clearance of hazardous structures, and	
				acquisition/relocation	

Contract/ EAP #	Grantee Name	County	Award Amount	Project Description
				Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,
EAP #07-08	Crawford County	Crawford	\$700,000	construction of replacement housing units, demolition and clearance of hazardous structures,
				acquisition/relocation, Kickapoo River mitigation, LiDAR
				Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,
EAP #07-09	Village of Chaseburg	Vernon	\$432,000	construction of replacement housing units, demolition and clearance of hazardous structures, and
				acquisition/relocation Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,
EAD #07 10	Carana Carrata	C	¢C4C7C0	
EAP #07-10	Green County	Green	\$646,760	construction of replacement housing units, demolition and clearance of hazardous structures,
EAP #07-11	Kenosha County	Kenosha	¢000 100	acquisition/relocation, and LiDAR Rehabilitation of damaged housing units, acquisition/demolition/relocation, LiDAR
EAP #07-11	Kenosna County	Kenosna	\$900,108	Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,
FY07-18182	Town of Riverview Fire	Oconto	\$180,407	construction of replacement housing units, demolition and clearance of hazardous structures, and
1107-10102	Town of Riverview The	Oconto	\$100,407	
				acquisition/relocation Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines,
EAP #08-01	Columbia County	Columbia	\$2,831,535	construction of replacement housing units, demolition and clearance of hazardous structures,
27 11 11 00 02	Seramena Seamsy	00.0	42/002/000	acquisition/relocation, dam and erosion assistance, LiDAR
EAP #08-02	Marquette County	Marquette	\$275,000	Rehabilitation of damaged housing units
EAP #08-03	Adams County	Adams	\$198,000	Rehabilitation of damaged housing units
EAP #08-04	Fond du Lac County	Fond du Lac	\$700,000	Rehabilitation of damaged housing units, LiDAR
EAP #08-05	Juneau County	Juneau	\$851,912	Rehabilitation of damaged housing units, LiDAR
EAD #00.06	j	C 1		Rehabilitation of damaged housing units, acquisition and demolition, public facilities river clean-up, flood
EAP #08-06	Sauk County	Sauk	\$9,154,551	studies and mitigation, LiDAR
EAP #08-07	Dodge County	Dodge	\$665,000	Rehabilitation of damaged housing units
EAP #08-08	Green Lake County	Green Lake	\$275,000	Rehabilitation of damaged housing units
EAP #08-09	Racine County	Racine	\$277,000	Rehabilitation of damaged housing units, LiDAR
EAP #08-10	Rock County	Rock	\$1,490,942	Rehabilitation of damaged housing units, acquisition/demolition/relocation, LiDAR
EAP #08-11	Iowa County	Iowa	\$1,027,992	Rehabilitation of damaged housing units, LiDAR
EAP #08-12	Manitowoc County	Manitowoc	\$302,500	Rehabilitation of damaged housing units, sewers, public facilities
EAP #08-13	Walworth County	Walworth	\$474,000	Rehabilitation of damaged housing units, acquisition and demolition
EAP #08-14	Jefferson County	Jefferson	\$2,309,000	Commercial property acquisition and relocation, lift station, LiDAR
EAP #08-15	Lake Delton, Village	Sauk	\$883,262	River dredging, dam, utilities, ravine
EAP #08-16	La Farge, Village	Vernon	\$523,000	Rehabilitation of damaged housing units, acquisition and demolition
EAP #08-17	Spring Green, Village	Sauk	\$2,070,237	Drainage, acquisition and demolition
EAP #08-18	Bayside, Village	Milwaukee, Ozaukee	\$59,200	Storm sewer
EAP #08-19	Janesville, City	Rock	\$2,475,887	Rehabilitation of damaged housig units, acquisition/demolition/relocation, storm sewer relocation, public facilities library and senior center
EAP #08-20	West Allis, City	Milwaukee	\$6,227,000	Rehabilitation of damaged housing units, acquisition/demolition/relocation, public facilities, catch basin, relief sewer
EAP #08-21	Beloit, City	Rock	\$45,000	Lift station repairs

Contract/ EAP #	Grantee Name	County	Award Amount	Project Description	
EAP #08-22	Rock Springs, Village	Sauk	\$1,412,900	Acquisition and demolition, sewer repairs	
EAP #08-23	Mauston, City	Juneau	\$1,321,000	Storm sewers, detention basin, riverbank flood mitigation	
EAP #08-24	Sheboygan, City	Sheboygan	\$402,000	Storm sewer	
EAP #08-25	Waukesha County	Waukesha	\$3,533,120	Rehabilitation of damaged housing units, stormwater management, dam repairs, detention pond, LiDAR	
EAP #08-28	Jefferson, City	Jefferson	\$2,161,927	Wastewater treatment, commercial acquisition, flood mitigation, floodproofing, acquisition and demolition	
EAP #08-29	Reedsburg, City	Sauk	\$2,467,681	Acquisition and demolition, public facilities storm sewers and wells	
EAP #08-30	Fond du Lac, City	Fond du Lac	\$208,300	Acquisition and demolition	
EAP #08-31	Beaver Dam, City	Dodge	\$1,857,000	Mitigation	
EAP #08-32	Wisconsin Dells, City	Sauk	\$1,000,000	Lift station	
EAP #08-34	Fox Point, Village	Milwaukee	\$75,000	Public facilities channel and storm grate installation	
EAP #08-35	Dane County	Dane	\$1,908,790	Acquisition/demolition/relocation, public facilities, LiDAR	
EAP #08-36	Adams County	Adams	\$262,600	Lidar	
EAP #08-37	Lafayette County	Lafayette	\$247,920	LiDAR	
EAP #08-38	Milwaukee County	Milwaukee	\$94,380	Lidar	
EAP #08-39	Monroe County	Monroe	\$658,390	Rehabilitation of damaged housing units, replacement of wells/septic systems and water/sewer lines, construction of replacement housing units, demolition and clearance of hazardous structures, and acquisition/relocation, LiDAR	
EAP #08-41	Avoca, Village	Grant, Iowa	\$1,700,000	Public facilities drainage swale, flood control	
EAP #08-42	Elroy, City	Juneau	\$166,500	Public facilities protection of power plant, acquisition and demolition	
EAP #08-43	Neshkoro, Village	Dodge	\$200,000	Mitigation	
EAP #08-44	Oshkosh, City	Winnebago	\$1,000,000	Detention pond	
EAP #08-45	Waterford, Village	Racine	\$1,108,200	Public facilities pump station	
EAP #08-46	Viola, Village	Richland	\$573,092	Lift station repairs, floodproofing, backwater shutoff valve	
EAP #08-50	Kendall, Village	Monroe	\$740,000	Lift station replacement	
EAP #08-51	Milwaukee, City	Milwaukee	\$8,450,000	Rehabilitation of damaged housing units, acquisition and demolition, flood mitigation	
EAP #08-52	La Valle, Village	Sauk	\$210,000	Storm sewer and street repairs	
EAP #08-57	Fall River, Village	Columbia	\$1,297,000	Relocation of lift station, dam repairs	
EAP #08-58	Westfield, Village	Marquette	\$500,000	Sewer and lift station upgrades	
EAP #08-60	Richland Center, City	Richland	\$179,000	Senior center, flood warning system	
EAP #08-62	Hustisford, Village	Dodge	\$57,584	Dam and embankment repairs	
EAP #08-63	Waterloo, City	Jefferson	\$370,000	Acquisition/demolition/relocation	
EAP #08-64	Jefferson, Town	Monroe	\$14,868	Public facilities	
EAP #08-67	Thiensville, Village	Ozaukee	\$505,000	Detention pond improvements	
EAP #08-68	Pleasant Prairie, Village	Kenosha	\$794,300	Rehabilitation of damaged housing units, stormwater management	
EAP #08-71	Port Washington, City	Ozaukee	\$206,000	Drainage improvements	
EAP #08-74	Richland County	Richland	\$2,712,500	Rehabilitation of damaged housing units, elevation, acquisition and demolition, LiDAR, mitigation study	

Contract/ EAP #	Grantee Name	County	Award Amount	Project Description	
EAP #09-01	Marion, City	Shawano/ Waupaca	\$287,000	Dam repairs	
EAP #09-02	Durand, City	Pepin	\$444,000	Storm sewer system repairs, slope stabilization & riprapping	
EAP #09-03	Pierce County	Pierce	\$560,083	Rehab housing units; street repair	
EAP #09-04	Waterville, Tn	Pepin	\$341,444	Rehab housing units; flood drainage/storm water system repairs	
EAP #10-01	Rhinelander, City	Oneida	\$103,047	Rehab housing units	
EAP #10-02	St. Croix County	St. Croix	\$384,093	Rehab housing units	
EAP #10-03	Grant County	Grant	\$283,200	Rehab housing units; Acquisition/Demolition substantially damaged housing units	
EAP #10-04	Columbia County	Columbia	\$328,778	Rehab housing units; Acquisition/Demolition substantially damaged housing units	
EAP #11-01	Kaukauna, City	Outagamie/ Calumet	\$57,876	Rehab housing units	
EAP #11-02	Burnett County	Burnett	\$151,657	Rehab housing units	
EAP #13-01	Douglas County	Douglas	\$110,000	Rehab/replacement housing units	
EAP #13-03	Crawford County	Crawford	\$89,936	Rehab housing units	
EAP #13-04	Grant County	Grant	\$226,882	Rehab housing units; Acquisition/Demolition substantially damaged housing units	
EAP #13-05	Iowa County	Iowa	\$219,169	Rehab housing units	
EAP #13-06	Boscobel, City	Grant	\$134,219	Rehab/replacement housing units	
EAP #13-07	Outagamie County	Outagamie	\$99,534	Rehab housing units	
EAP #14-01	Iowa County	Iowa	\$294,864	Rehab housing units	
EAP #15-01	Sheboygan, City	Sheboygan	\$525,856	Storm sewer system and street repairs	
EAP #15-02	Fond du Lac, City	Fond du Lac	\$187,252	Pump station generator installation	
EAP #15-03	Beloit, City	Rock	\$284,777	Installation of rip-rap on banks of Rock River	
DR-IKE 16-01	Avoca, Village	Iowa	\$370,500	Storm sewer system repairs, slope stabilization & riprapping	
DR-IKE 16-02	Beaver Dam, City	Dodge	\$425,000	Culvert replacement and street repair	
DR-IKE 16-03	Crawfod County	Crawford	\$194,900	Kickapoo River mitigation/debris removal	
DR-IKE 16-05	La Farge, Village	Vernon	\$739,550	Lift Station and sanitary sewer line repair and relocation	
DR-IKE 16-06	Vernon County	Vernon	\$393,472	Dam repair (stilling basin); Acquisiition/Demolition substantially deamaged housing units	
DR-IKE 16-07	Waterloo, City	Jefferson	\$107,375	Maunesha River mitigation	
DR-IKE 16-08	Janesville, City	Rock	\$500,000	Removal of damaged parking structure over Rock River	
EAP #16-01	Ashland, Bayfield, Burnett, Douglas, Iron, Price, Sawyer, Washburn Counties		\$2,350,000	Rehab housing units; repair public facilities, business assistance	
EAP #16-02	Buffalo County	Buffalo	\$650,000	Rehab housing units; repair public facilities, business assistance	
TOTAL			¢11E 010 070		
TOTAL			\$115,910,079		

CDBG Non-Mitigation EAP Projects								
Grantee Name County		Date of Disaster	Contract	Contract Period	Award Amount	Project Description		
Ellsworth, Town	Pierce	6/26/1998		10/16/98- 6/30/99	\$36,457	Private bridge replacement		
TOTAL					\$36,457			

	Municipal Flood Control Grant Program Projects, 2002-2016								
Year	Grant Number	Community	County		Funds	Description			
2002-03	MFC-70266-A-02	Oshkosh, City	Winnebago	\$	350,000.00	1 vacant land acquisition			
2002-03	MFC-65282-A-02	Shell Lake, City	Washburn	\$	159,000.00	2 acquisitions			
2002-03	MFC-66181-A-02	Slinger, Village	Washington	\$	69,707.19	1 vacant land acquisition			
2004-05	MFC-54106-04	Bruce, Village	Rusk	\$	283,423.90	Flood control structure			
2004-05	MFC-22111-04	Cassville, Village	Grant	\$	50,135.40	Flood control structure			
2004-05	MFC-23251-04-30th	Monroe, City	Green	\$	369,442.50	3 acquistions; construction of flood control basin			
2004-05	MFC-23251-04-Villa	Monroe, City	Green	\$	68,180.00	Acquisition of vacant land and construction of detention basin			
2004-05	MFC-51008-04	Mt. Pleasant, Town	Green	\$	394,040.00	12 acquisitions, 1 easement, 1 channel			
2004-05	MFC-70266-04-Anch	Oshkosh, City	Winnebago	\$	800,000.00	Channel restoration project			
2004-05	MFC-70266-04-Saw	Oshkosh, City	Winnebago	\$	101,500.00	FEMA to fund entire project - withdrawn			
2006-07	MFC-53206-06	Beloit, City	Rock	\$	800,000.00	Parking deck			
2006-07	MFC-33216-06	Darlington, City	Lafayette	\$	62,500.00	Property acquisition - failed			
2006-07	MFC-67206-06	Brookfield, City	Waukesha	\$	207,922.50	Dam removal, channel restoration			
2006-07	MFC-22026-05	Jamestown, Town	Grant	\$	62,930.00	Property acquisition - negotiations with property owner failed			
2006-07	MFC-67261-06	New Berlin, City	Waukesha	\$	129,317.06	Property acquisition			
2006-07	MFC-22046-05	Paris, Town	Kenosha	\$	43,584.80	Property acquisition			
2006-07	MFC-47271-06	Prescott, City	Pierce	\$	171,998.30	Elevations, property owner died, not completed			
2006-07	MFC-40291-06	Wauwatosa, City	Milwaukee	\$	800,000.00	Work started late, grant still open			
2006-07	MFC-30016-06	Wheatland, Town	Kenosha	\$	147,094.30	Fox River mitigation - negotiations with property owner failed			
2008-09	MFC-30016-08	Wheatland, Town	Kenosha	\$	546,985.10	2 acquisitions			
2008-09	MFC-62111-08	Chaseburg, Village	Vernon	\$	278,592.50	2 acquisitions			
2008-09	MFC-12131-08	Gays Mills, Village	Crawford	\$	128,590.00	2 acquisitions			
2008-09	MFC-32246-08	LaCrosse, City	La Crosse	\$	439,553.00	1 acquisition			
2008-09	MFC-13165-08	Oregon, Village	Dane	\$	474,497.30	4 acquisitions			
2008-09	MFC-09211-08	Chippewa Falls, City	Chippewa	\$	200,000.00	3 commercial acquisitions			
2008-09	MFC-08201-08	Appleton, City	Outagamie	\$	200,000.00	Floodplain lowering, channel restoration			
2008-09	MFC-51151-08	Mt. Pleasant, Village	Racine	\$		River restoration			
2008-09	MFC-22153-08	Muscoda, Village	Grant, Iowa	\$	196,350.00	Dam removal			
2008-09	MFC-53012-08	Fulton, Town	Rock	\$	200,000.00	Vacant land acquisition - withdrawn			
2008-09	MFC-70266-08	Oshkosh, City	Winnebago	\$	200,000.00	Basin drainage improvements			
2008-09	MFC-49191-08	Whiting, Village	Portage	\$	125,000.00	Drainage improvements			

Year	Grant Number	Community	County	Funds	Description
2010-11	MFC-13050-10	Roxbury, Town	Dane	\$ 650,000.00	Up to 8 acquisitions
2010-11	MFC-12131-10	Gays Mills, Village	Crawford	\$ 305,600.00	3 acquisitions
2010-11	MFC-13111-10	Cambridge, Village	Dane	\$ 226,247.00	Reclamation project
2010-11	MFC-M40702-10	MMSD	Milwaukee	\$ 595,000.00	8 acquisitions
2010-11	MFC-63146-10	La Farge, Village	Vernon	\$ 160,755.00	5 acquisitions
2010-11	MFC-32246-10	LaCrosse, City	La Crosse	\$ 262,710.00	2 acquisitions
2010-11	MFC-13028-10	Dunn, Town	Dane	\$ 98,939.96	1 acquisition
2010-11	MFC-68261-10	New Berlin, City	Waukesha	\$ 160,020.00	1 acquisition
2010-11	MFC-68206-10	Brookfield, City	Waukesha	\$ 197,305.50	Flood control project
2010-11	MFC-12131B-10	Gays Mills, Village	Crawford	\$ 71,946.00	Flood proofing
2010-11	MFC-63146B-10	Village of La Farge	Vernon	\$ 53,900.00	Elevation
2010-11	MFC-33216-10	Darlington, City	Lafayette	\$ 542,360.00	Flood proofing
2012-13	MFC-29251-12	Mauston, City of	Juneau	\$ 360,500.00	Expansion of river parcels
2012-13	MFC-40292-12	West Allis, City of	Milwaukee	\$ 108,080.00	Acquisition of one parcel
2012-13	MFC-12271-12	Prairie du Chien, City of	Crawford	\$ 285,500.00	Acquisition of 1 property
2012-13	MFC-40231-12	Glendale, City of	Milwaukee	\$ 285,500.00	Glendale's Sunny Pont Peninsula
2012-13	MFC-40251-12	Milwaukee, City of	Milwaukee	\$ 414,920.00	Acquisition of 2 parcels
2012-13	MFC-M40702-12	MMSD	Milwaukee	\$ 625,000.00	Acquisition of 12 parcels
2012-13	MFC-67261-12	New Berlin, City of	Waukesha	\$ 625,000.00	Acquisition of 4 parcels
2012-13	MFC-29221-12	Elroy, City of	Juneau	\$ 107,572.50	Acquisition/demolition of 3 parcels
2012-13	MFC-67206-12	Brookfield, City of	Waukesha	\$ 121,401.00	Acquisition of 1 parcel
2012-13	MFC-12271B-12	Prairie du Chien, City of	Crawford	\$ 219,915.00	Elevation project 5 structures
2012-13	MFC-12131-12	Gays Mills, Village of	Crawford	\$ 153,500.00	Elevation project for 6 structures
2012-13	MFC-67251-12	Muskego, City of	Waukesha	\$ 90,255.20	Flood proofing
2014-15	MFC-40702-14	MMSD	Milwaukee	\$ 271,950.00	Concordia Avenue Flood Management Project
2014-15	MFC-40702B-14	MMSD	Milwaukee	\$ 201,950.00	Root River Flood Management Project
2014-15	MFC-40251-14	City of Milwaukee	Milwaukee	\$ 320,250.00	Oak Creek Flood Management
2014-15	MFC-67251-14	City of Muskego	Waukesha	\$ 115,332.00	S76W18109 Janesville Road
2014-15	MFC-52181-14	Village of Sturtevant	Racine	\$ 101,920.00	2720 Wisconsin St Flood Control Project
2014-15	MFC-46008-14	Town of Grafton	Ozaukee	\$ 140,861.00	Edgewater Drive - Flood Mitigation Project
2014-15	MFC-40231-14	City of Glendale	Milwaukee	\$ 190,981.87	2014 Sunny Point MFC grant phase 2
2014-15	MFC-12182-14	Village of Steuben	Crawford	\$ 80,430.00	Kickapoo Damage reduction Project (2 structures)

Year	Grant Number	Community	County		Funds	Description
2014-15	MFC-07191-14	Town of Webster	Burnett	\$	637,046.73	Voluntary Acquisitions: Village of Avalanche/ Vernon CO
2014-15	MFC-16281H-14	City of Superior	Douglas	\$	136,500.00	Home Acquisition
2014-15	MFC-16281HB-14	City of Superior	Douglas	\$	399,740.00	Poplar Ave. Pond
2014-15	MFC-24206-14	City of Berlin	Green Lake, Waushara	\$	92,975.40	Marquette Street Storm Sewer Relief Project
2014-15	MFC-12271-14	Prairie du Chien	Crawford	\$	463,050.00	Prairie du Chien Flood Mitigation Project
2016-17	MFC-46008-16	Grafton, Town of	Ozaukee	\$	118,345.00	1 Acquisition
2016-17	MFC-40702-16	Milwaukee-MMSD	Milwaukee	\$	105,500.00	1 Acquisition
2016-17	MFC-29221-16	Elroy, City of	Juneau	\$	49,100.00	Mobile Home Park Acquisition
2016-17	MFC-13032-16	Madison, City of	Dane	\$	83,750.00	1 Acquisition
2016-17	MFC-28290-16	Waterloo, City of	Jefferson	\$	21,780.00	Shore Restoration
2016-17	MFC-16281-16	Superior, City of	Douglas	\$	38,500.00	Bridge removal from outlet
2016-17	MFC-54016-16	Janesville, City of	Rock	\$	380,000.00	Parking Plaza Removal
2016-17	MFC-28014-16	Jefferson, City of	Jefferson	\$	349,250.00	Erosion Control
2016-17	MFC-71018-16	Oshkosh, City of	Winnebago	\$	360,706.30	Detention Pond Construction
2016-17	MFC-29251-16	Mauston, City of	Juneau	\$	134,772.40	Detention Pond Construction
2016-17	MFC-71201-16	Appleton, City of	Outagamie	\$	360,706.30	Detention Pond Construction
	TOTAL		\$	20,1	37,668.01	

APPENDIX D: REPETITIVE LOSS REPORT

State of Wisconsin Repetitive Loss Report

October 2016

Prepared by:

Wisconsin Emergency Management 2400 Wright Street - P.O. Box 7865 Madison, WI 53707-7865

EXECUTIVE SUMMARY

The State of Wisconsin Repetitive Loss Report (RLR) was developed as an attachment to the State of Wisconsin Hazard Mitigation Plan and is intended to provide a written summary of the communities with repetitively flooded properties. The report includes a brief discussion of Wisconsin's 659 repetitive loss properties, the communities in which they are located, and the success of mitigation projects implemented through FEMA's Hazard Mitigation Assistance (HMA) programs and other state and local initiatives.

The resulting analysis of data on repetitive loss properties represents an important resource for prioritizing future mitigation projects. Per the State of Wisconsin Hazard Mitigation Plan, mitigating repetitive loss and severe repetitive loss properties is the second highest mitigation priority in the state following acquisition and demolition of substantially damaged properties.

The 2016 RLR reflects changes in data collection, findings, and Federal programs since the 2010 report was released. In preparation for drafting the 2016 Repetitive Loss Report, Wisconsin Emergency Management (WEM) exported statewide data on repetitive loss (RL) and severe repetitive loss (SRL) properties from the National Flood Insurance Program's (NFIP) Web Data Exchange. FEMA Region V also provided WEM with RL and SRL lists as part of the Flood Mitigation Assistance (FMA) program. Although FEMA and the NFIP compile their respective lists according to different criteria, there is some overlap between the two. Both the NFIP lists and the FEMA lists are summarized in this report.

Of the 659 properties listed in the NFIP database, 103 (15.6%) have been removed or protected from the threat of flooding through acquisition, elevation, floodproofing, or other mitigation measures. Acquisition is the mostly commonly chosen mitigation measure, representing 87 of the 103 mitigated properties, or 13.2% of all RL properties. Additionally, five properties on the RL list are in the process of being acquired and demolished through FEMA grant programs. Approximately 2% of the properties listed (13 properties) are recorded as mitigated due to a lack of information. Excluding mitigated properties and properties considered mitigated due to incomplete data, 538 properties in 104 NFIP communities remain flood-prone.

The Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM) program, and FMA program are the main avenues of Federal funding for RL and SRL property mitigation since the Repetitive Flood Claims and Severe Repetitive Loss programs were eliminated in 2012. Acquisitions continue to be a top priority for reducing repetitive loss, and many RL communities continue to protect life and property through acquisition projects. The success of acquisitions is most evident in communities with widespread damage such as Kenosha County, Jefferson County, the City of Wauwatosa, and the Village of Brown Deer. In these communities, acquisitions have eliminated a majority of the repetitive loss properties since acquisition first began in earnest following the 1993 floods.

TABLE OF CONTENTS

EXECL	JTIVE SUMMARY	3
TABLE	OF CONTENTS	4
LIST O	F TABLES	5
ACRO	NYMS	6
I. I	NTRODUCTION	7
A.	Purpose	7
В.	Framework	7
C.	Application	7
II.	METHODOLOGY	7
A.	Organization	7
В.	Data Collection	8
III.	DATA COLLECTION FINDINGS	8
A.	Number of Repetitive Loss Properties – NFIP Web Data Exchange	8
В.	Repetitive Loss Property Status – NFIP Web Data Exchange	8
C.	Repetitive Loss Communities – NFIP Web Data Exchange	9
D.	Severe Repetitive Loss Properties – NFIP Web Data Exchange	10
F.	Success of Acquisitions in Reducing Repetitive Flood Risk	11
G.	Number of Repetitive Loss Properties – FFY 16 FMA Repetitive Loss	12
H.	Number of Severe Repetitive Loss Properties – FFY 16 FMA Severe Repe	titive
Lo	ss 13	
IV.	IMPLEMENTATION SUMMARY	14
A.	Funding Sources	14
В.	Mitigation Recommendations and Projects	15
C.	Data Improvement and Standardization	16
D.	Updates	16
ATTAC	CHMENT A	17
ATTAC	CHMENT B	20
ΔΤΤΔ	CHMENT C	21

State of Wisconsin Hazard Mitigation Plan

LIST OF TABLES

Table 1. Repetitive Loss Property Status	9
Table 2. Repetitive Loss Communities	9
Table 3. Top Ten Repetitive Loss Communities	. 10
Table 4. Severe Repetitive Loss Communities	. 11
	4.0
Table 5. Success of Acquisition in Reducing Repetitive Losses	. 12
Table 6. FFY 16 FMA Repetitive Loss Communities	. 13
Table 7. FFY 16 FMA Severe Repetitive Loss Communities	. 13

ACRONYMS

FEMA Federal Emergency Management Agency

FFY Federal Fiscal Year

FIA Federal Insurance Administration

FMA Flood Mitigation Assistance Program

HMGP Hazard Mitigation Grant Program

NFIP National Flood Insurance Program

PDM Pre-Disaster Mitigation Program

PIN Parcel Identification Number

RFC Repetitive Flood Claims Program

RL Repetitive Loss

RLR Repetitive Loss Report

SRL Severe Repetitive Loss

WEM Wisconsin Emergency Management

I. INTRODUCTION

A. Purpose

The State of Wisconsin Repetitive Loss Report, referred to as the Repetitive Loss Report or RLR, is intended to serve as an attachment to the State of Wisconsin Hazard Mitigation Plan. The RLR provides information, by community, on the status of repetitive loss properties in Wisconsin. The report can be used as a floodplain management tool and to provide information to communities for flood mitigation grants administered by WEM.

B. Framework

FEMA, through the Federal Insurance Administration (FIA), collects data on each property in the United States when a flood insurance claim is made. When at least 2 flood losses of more than \$1,000 each have been paid in any 10-year period since 1978, the property is classified as a repetitive loss property. Information on these repetitive loss properties is collected for each state and compiled in the National Flood Insurance Program (NFIP) repetitive loss database. However, the information collected by FIA is not standardized and has errors that require correction as described in Section II.

FEMA also collects and compiles data on repetitive loss properties through its Flood Mitigation Assistance (FMA) program. Through this program, properties are classified as repetitive loss when they incur flood-related damages exceeding 25% of their market value on at least two occasions. If a property has received more than its market value in NFIP claim payments, or has incurred damages greater than or equal to 25% of its market value at least twice, it is considered to be a severe repetitive loss property.

C. Application

The NFIP Web Data Exchange repetitive loss and severe repetitive loss database and the FFY 16 FMA repetitive loss and severe repetitive loss lists are the sources of information for this report. The RLR serves as a statewide resource for addressing repetitive flood risk. Identifying communities with the greatest number of repetitive loss properties informs WEM's prioritization and funding decisions for mitigation projects. The success of these projects reduces the financial strain placed on local, state, and Federal resources by eliminating future flood losses.

II. METHODOLOGY

A. Organization

In contrast to previous reports, WEM lacked the staff and funding to conduct field verification of the information provided in the NFIP and FEMA databases for the 2016 RLR. Instead, data from the NFIP Web Data Exchange and from FEMA Region V was used to characterize repetitive and severe repetitive flood loss trends in Wisconsin.

B. <u>Data Collection</u>

WEM exported and analyzed statewide data on repetitive and severe repetitive loss properties from the NFIP Web Data Exchange in July of 2016. NFIP Repetitive Loss Update Worksheets (AW-501s) were reviewed for RL properties listed as mitigated. WEM identified properties listed on the RL and SRL lists that are also included in current mitigation projects. In addition to the NFIP database, FEMA also provided WEM with lists of repetitive and severe repetitive loss properties as defined by FEMA's FMA program. WEM compared the FEMA and NFIP lists and identified properties that were included on both lists.

Both the NFIP and FEMA databases included detailed information for each property protected by the Privacy Act. Copies of these databases are retained by the State of Wisconsin. Individual property data from each list was aggregated by community to portray trends at the municipal, county, and state levels. The following information was recorded and stored in an Excel worksheet for each community: NFIP Community Name, Community Number, Total RL/SRL Properties Listed, Total Number of Properties Acquired, Floodproofed, or In Progress, Total Number of Properties Considered Mitigated Due to Lack of Data, and Total Number of Remaining Flood-prone Properties.

III. DATA COLLECTION FINDINGS

A. <u>Number of Repetitive Loss Properties – NFIP Web Data Exchange</u>

The NFIP Web Data Exchange database used to generate this report was accessed in July 2016 and identified a total of 659 repetitive loss properties statewide in Wisconsin. This total includes properties that have been mitigated, properties that are in the process of being mitigated, and properties that are considered mitigated due to a lack of information on their location or source of flooding. A full list of NFIP communities with repetitive loss properties is provided in Attachment A.

B. Repetitive Loss Property Status – NFIP Web Data Exchange

Of the 659 repetitive loss properties identified, 103 (15.6%) are listed as mitigated by removal, elevation, or other means. A total of 13 additional properties are listed as mitigated due to an inability to verify their location and/or flood risk. WEM staff was able to further identify 5 properties that are part of ongoing mitigation projects and at least 1 mitigated property that is listed under the wrong community and incorrectly classified as flood-prone. This makes 122 repetitive loss properties (18.5%) that are not or will no longer be vulnerable to flooding by the end of 2017 (Table 1).

Table 1. Repetitive Loss Property Status

Building Status Description	Number of Properties	Percent of Total
Acquired and demolished	87	13.2%
Elevated or floodproofed	16	2.4%
Mitigation in progress	5	0.8%
Removed from RL list due to lack of data	13	2.0%
Flood-prone	538	81.6%
Total	659	100.00%

There are 538 (81.6%) repetitive loss properties that do not fall into any of the aforementioned mitigation categories. These properties are presumed to remain flood-prone.

C. Repetitive Loss Communities – NFIP Web Data Exchange

The NFIP database identifies 114 Wisconsin communities with repetitive loss properties. The majority of these communities have five or fewer repetitive loss properties, as displayed in Table 2.

Table 2. Repetitive Loss Communities

Grouped by number of repetitive loss listings

Number of			Flood-Prone	Flood-Prone
Repetitive Loss	All Communities	All Communities	Properties Only	Properties Only
Properties	(n)	(%)	(n)	(%)
0	0	0%	10	8.8%
1 to 5	93	81.6%	89	78.1%%
6 to 10	11	9.6%	8	7.0%
11 to 20	5	4.4%	5	4.4%
21 to 50	4	3.5%	1	0.9%
More than 50	1	0.9%	1	0.9%
Total	114	100%	114	100%

Excluding mitigated, in progress, and unverifiable properties allows us to focus on structures and communities that are currently at risk of experiencing flood damages. Looking at flood-prone properties only, only two of 114 communities have more than 20 RL properties; ten communities on the NFIP list do not have any properties that are actually at risk. The 10 communities with the highest number of flood-prone repetitive loss properties are described in Table 3.

Table 3. Top Ten Repetitive Loss Communities

Ranked by number of currently flood-prone properties

Rank	Community Name	Flood- Prone Properties	Mitigated Properties	Properties Undergoing Mitigation	Unverifiable Properties	Total Number of Listings
1	Milwaukee, City of	222	8			230
2	Jefferson County	21	18		2	41
3	Kenosha County	18	14			32
4	Mequon, City of	14				14
5	Gays Mills, Village of	13	7	1		21
6	Glendale, City of	12		1		13
7	Thiensville, Village of	11				11
8	Pierce County	10				10
9	Brookfield, City of	9	2			11
10	Oshkosh, City of	9				9

D. <u>Severe Repetitive Loss Properties – NFIP Web Data Exchange</u>

The National Flood Insurance Program classifies insured residential properties as severe repetitive loss properties if they fall into one of two categories: four or more claim payments over \$5,000 (including building and contents) each have been made, and the cumulative amount of these claims payments exceed \$20,000; or at least two claims have been made, with cumulative amount exceeding the fair market value of the building (building only). For both, at least two of the claims must have occurred within a ten-year period, and the claims must be made more than ten days apart. Any eligible mitigation proposal for properties that fit these criteria in Wisconsin would be an extremely high priority for mitigation funding at WEM.

NFIP's Web Data Exchange lists three SRL properties in two communities in Wisconsin. Both communities also have properties on the NFIP RL list. None of the three properties has been mitigated, is part of a current mitigation project, or is considered mitigated due to insufficient data. All three properties are thus considered flood-prone.

Table 4. Severe Repetitive Loss Communities

NFIP Community	CID#	Severe Repetitive Loss Properties
Pierce County	555574	1
Washington County	550471	2
Total	3	

E. Changes Since the 2010 State of Wisconsin Repetitive Loss Report

There has been an overall increase in number of RL properties compared to the 2010 RLR. Although some properties and communities have been removed from the list, others have been newly added. The proportion of properties that are mitigated (15-18%), in progress (0.8%), or flood-prone (roughly 80%) remains about the same as in 2010.

Although the City of Milwaukee, Jefferson County, and Kenosha County still lead the state in repetitive loss communities, some changes have occurred in the top 10 RL communities. The Cities of Wauwatosa and Darlington, previously listed at numbers four and eight, are no longer in the top 10. The City of Oshkosh is new to the list in 2016, while other communities have shifted spots. These changes are primarily due to ranking communities by the number of flood-prone properties rather than by the number of total listings, which does not necessarily represent a community's true flood risk. Risk has also been reduced in several communities through continued efforts toward acquisition, elevation, and floodproofing flood-prone structures.

The NFIP SRL list is much shorter in 2016, featuring only two communities compared to eight in 2010. The six communities no longer included on the list were removed due to mitigation and/or insufficient data.

F. Success of Acquisitions in Reducing Repetitive Flood Risk

In general, communities tend to choose acquisition rather than floodproofing as a repetitive loss mitigation strategy based on the fact that permanently removing structures from the floodplain completely eliminates the risk of structure damage, potential injuries and fatalities, and the need for emergency response activities. However, floodproofing may be a preferable strategy for communities that wish to reduce flood risk while protecting the local tax base, retaining development patterns, and/or preserving historically or culturally significant structures. If this approach is selected, structures must be protected to withstand at least "100-year" (1% chance of annual occurrence) flood event, or elevated to the Base Flood Elevation (elevation of the 100-year or 1% annual chance flood) plus two feet.

After the Midwest Flood of 1993 (FEMA-DR-994-WI), the HMGP had new resolve to address repetitive flood losses and unprecedented funding to accomplish the task. Although some acquisitions were planned prior to 1993, the size of the 1993 disaster guided future acquisition

projects by refining Wisconsin's implementation policies and procedures for acquisition grants, specifically the HMGP. The success of the post-1993 acquisitions led to an impressive reduction in repetitive losses. Today, the acquisition of flood-prone structures remains one of WEM's top priorities, and Wisconsin communities continue to make progress toward eliminating flood risk to RL properties.

Table 5. Success of Acquisition in Reducing Repetitive Losses

NFIP Community	Repetitive Loss Properties (RLPs) (n)	RLPs Acquired (n/%)	RLPs Remaining (n)
Brown Deer, Village of	9	8 (88.9%)	1
Kenosha County	32	14 (43.8%)	18
Wauwatosa, City of	24	18 (75.0%)	6
Jefferson County	41	16 (39.0%)	25*

^{*} includes two floodproofed properties and two unverifiable properties

The Village of Brown Deer and the City of Wauwatosa are two communities where acquisition projects have eliminated the majority of local repetitive loss properties. Brown Deer acquired almost 90% percent of its repetitive loss properties through the HMGP, while Wauwatosa used HMGP funds to acquire 75% of its RL properties. Kenosha and Jefferson Counties have also demonstrated a commitment to acquiring and demolishing flood-prone properties. Kenosha County has acquired almost 80 properties in total (both RL and non-RL properties) since the 1993 floods, while Jefferson has acquired 58 such properties; both communities have reduced their number of RL properties by about 40%.

G. Number of Repetitive Loss Properties – FFY 16 FMA Repetitive Loss

In addition to accessing repetitive loss data via the NFIP Web Data Exchange, WEM received data on repetitive and severe repetitive loss properties from FEMA Region V. The lists of repetitive and severe repetitive loss properties provided through the FMA program are not verified by FEMA.

FEMA defines repetitive loss properties as those that have incurred flood-related damage on 2 occasions in which the cost of the repair (on average) equaled or exceeded 25% of the market value of the structure at the time of each such flood event. There are 23 such properties included on the FFY 16 FMA repetitive loss list, located in 11 communities across the state (Table 6). Of these, WEM verifies that four properties have been or are in the process of being acquired. Three of the 19 remaining properties are insured and thus eligible for acquisition through the FMA program.

Table 6. FFY 16 FMA Repetitive Loss Communities

Community Name	Flood-Prone Properties	Mitigated Properties	Properties Undergoing Mitigation	Total Number of Listings
Dane County	1			1
Gays Mills, Village of	0		1	1
Jefferson County	4	1		5
Kenosha County	1			1
Marquette County	1			1
Milwaukee, City of	6			6
Pierce County	3	1		4
Richland County	1			1
Rock County	1			1
Steuben, Village of	0		1	1
Trempealeau, Village of	1			1

All of the communities that appear on the FFY 16 FMA list also appear on the NFIP RL list; all but one (the acquired property in Jefferson County) of the individual properties appear in both databases.

H. <u>Number of Severe Repetitive Loss Properties – FFY 16 FMA Severe Repetitive Loss</u>

Properties with at least two separate NFIP claim payments cumulatively totaling more than the market value of the property are considered to be severe repetitive loss properties under FEMA's FMA program. The FFY 16 FMA severe repetitive loss list includes 17 properties, two of which have been or are in the process of being acquired (the acquired SRL property in Jefferson County is the same property found on the FFY16 FMA repetitive loss list). One of the 15 remaining properties is eligible for acquisition under FMA.

Table 7. FFY 16 FMA Severe Repetitive Loss Communities

Community Name	Flood-Prone Properties	Mitigated Properties	Properties Undergoing Mitigation	Total Number of Listings
Berlin, City of	1			1
Crawford County	1			1
Durand, City of	1		1	2
Janesville, City of	1			1

Community Name	Flood-Prone Properties	Mitigated Properties	Properties Undergoing Mitigation	Total Number of Listings
Jefferson County	1	1		2
Milwaukee, City of	3			3
Pierce County	1			1
Prescott, City of	2			2
Steuben, Village of	1			1
Washington County	2			2
Waukesha County	1			1

All but one (the acquired property in Jefferson County) of the properties included on the FFY 16 FMA list also appear on the NFIP RL list; three properties (two in Washington County and one in the City of Prescott) appear on the NFIP SRL list. Four of the SRL properties are also listed on the FMA RL list.

IV. IMPLEMENTATION SUMMARY

A. Funding Sources

The primary source of mitigation funds is the **Section 404 Hazard Mitigation Grant Program (HMGP)**. The HMGP can provide local communities 87.5 percent (75 percent federal, 12.5 percent state) of the funds to implement immediate and long-term hazard mitigation measures following a federal disaster declaration. Communities must provide a non-Federal match of 12.5 percent either through a state or local funding source. HMGP projects are scored and selected by WEM on a variety of criteria that favor permanent and cost effective mitigation of flood damaged structures. Repetitive loss structures are excellent candidates and are a high priority for mitigation with HMGP funds.

Another source of flood mitigation funds is the **Flood Mitigation Assistance (FMA)** program. FMA is a cost-share program (75 percent Federal, 25 percent local match) administered by WEM through which states and communities can receive grants for flood mitigation planning, projects, and technical assistance. Mitigation of RL properties can be funded at a 90 percent Federal/10% local cost share, and mitigation of SRL properties can be 100% Federally funded.

The overall goal of the FMA is to fund cost-effective measures that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other NIFP-insured structures. Other goals are to:

 Reduce the number of repetitively or substantially damaged structures and the associated claims on the NFIP;

- Encourage long-term, comprehensive mitigation planning;
- Respond to the needs of communities participating in the NFIP; and
- Complement other federal and state mitigation programs with similar goals.

In order to receive FMA funds, communities must develop an all-hazards mitigation plan that identifies structures vulnerable to flood damage, including any repetitive loss properties, and shows how the community plans to mitigate those properties.

The **Pre-Disaster Mitigation Program (PDM)** is another source of mitigation funds. The program's main objective is to reduce the overall risk to lives and property while also reducing reliance on funding from Presidential disaster declarations. The state administers the program through the National Pre-Disaster Mitigation fund, which is allocated for the nation by Congress each year. Grants are awarded on a nationally competitive basis with a 75 percent Federal/25 percent local cost share.

An approved Standard State Hazard Mitigation Plan is required for the state to remain eligible for PDM funding. Local governments applying to the program must have an approved all-hazards mitigation plan. All flood projects funded through PDM must be physically located in a participating NFIP community.

The significant difference between HMGP and the other two mitigation programs (FMA and PDM) is that HMGP is tied to a Federal disaster declaration for a specific hazard event, while PDM and FMA are available annually regardless of hazard events. PDM and FMA grants are funded annually by Congressional appropriations and are awarded on a nationally competitive basis.

Previously, funding for mitigation of properties with repeated flood damage was also available through FEMA's Repetitive Flood Claims (RFC) and Severe Repetitive Loss (SRL) programs. However, the Biggert-Waters Flood Insurance Reform Act of 2012 eliminated both programs.

B. <u>Mitigation Recommendations and Projects</u>

This report provides the state with a resource to identify the properties with the most repetitive losses and to prioritize specific mitigation strategies for those properties. The state utilizes the Repetitive Loss Report statistics from past and current mitigation projects to provide guidance for future mitigation projects and reduce flood losses.

Repetitive loss data is also considered during the review of mitigation project applications. When a community submits an application for mitigation funding, the state refers to the Repetitive Loss Report to determine if repetitive loss properties exist within the community and if so, whether they are identified on the application. If RL properties are not identified yet fit within the scope of the project, the state recommends adding the repetitive loss properties to the project. RL information is also provided to local governments for use in developing flood risk reduction strategies and mitigation plans.

C. <u>Data Improvement and Standardization</u>

Data provided on the FMA RL and SRL lists is not verified. Similarly, RL and SRL information provided through the NFIP Web Data Exchange is known to contain errors. Properties on both lists are often difficult to identify due to poor location information. The consistent use of Parcel Identification Numbers (PINs) on both lists helps to standardize the data and facilitate comparison between databases. WEM will continue to work steadily at improving data quality by reviewing the lists annually and providing updated information through submission of AW-501 forms and communication with FEMA Region V.

D. <u>Updates</u>

The Repetitive Loss Report will remain an addendum to the State of Wisconsin Hazard Mitigation Plan. RLP data will be reviewed each year as new claim information becomes available from FEMA Region V and the NFIP and as repetitive loss properties are mitigated through state-administered programs.

ATTACHMENT A

List of Communities with Repetitive Loss Properties

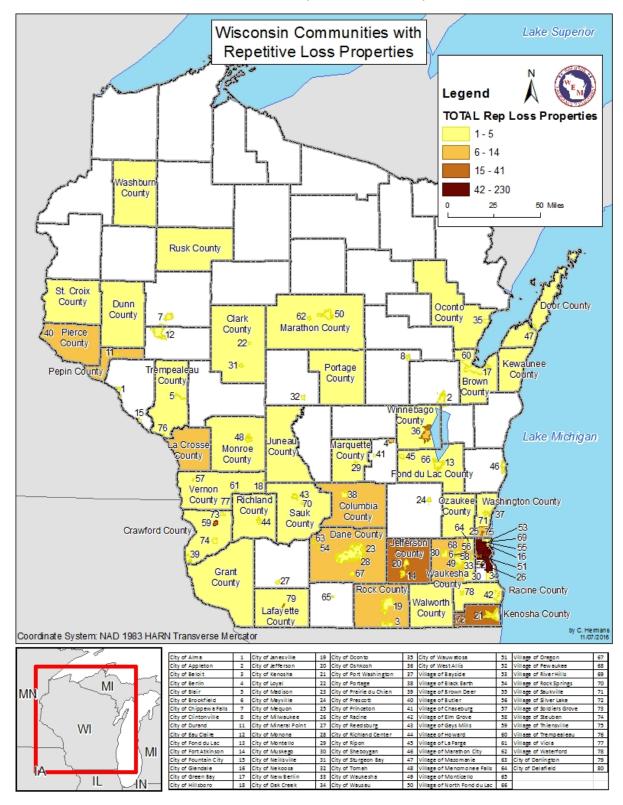
Source: National Flood Insurance Program Web Data Exchange, August 2016

		Total		Elevated /			
NFIP Community	CID#	Listings	Acquired	Floodproofed	In Progress	Unverifiable	Flood-Prone
Alma, City of	55540	1					1
Appleton, City of	55542	1					1
Bayside, Village of	550270	2					2
Beloit, City of	555544	1					1
Berlin, City of	550166	6					6
Black Earth, Village of	550079	1					1
Blair, City of	550440	2					2
Brookfield, City of	550478	11	2				9
Brown County	550020	2					2
Brown Deer, Village of	550271	9	8				1
Butler, Village of	550536	2				1	1
Chaseburg, Village of	550451	1				1	0
Chippewa Falls, City of	550044	2				2	0
Clark County	550048	1				1	0
Clintonville, City of	550494	1					1
Columbia County	550581	8					8
Crawford County	555551	2		1			1
Dane County	550077	6	1				5
Darlington, City of	550228	11	3	6			2
Delafield, City of	550479	1					1
Door County	550109	1				1	0
Dunn County	550118	1					1
Durand, City of	550320	2			1		1
Eau Claire, City of	550128	1				1	0
Elm Grove, Village of	550578	2	1				1
Fond du Lac County	550131	2					2
Fond du Lac, City of	550136	4	1				3
Fort Atkinson, City of	555554	3					3
Fountain City, City of	555555	1					1
Gays Mills, Village of	550071	21	3	4	1		13
Glendale, City of	550275	13			1		12
Grant County	555557	4					4
Green Bay, City of	550022	2					2
Hillsboro, City of	550455	4				1	3
Howard, Village of	550023	2					2
Janesville, City of	555560	3	1				2
Jefferson County	550191	41	16	2		2	21

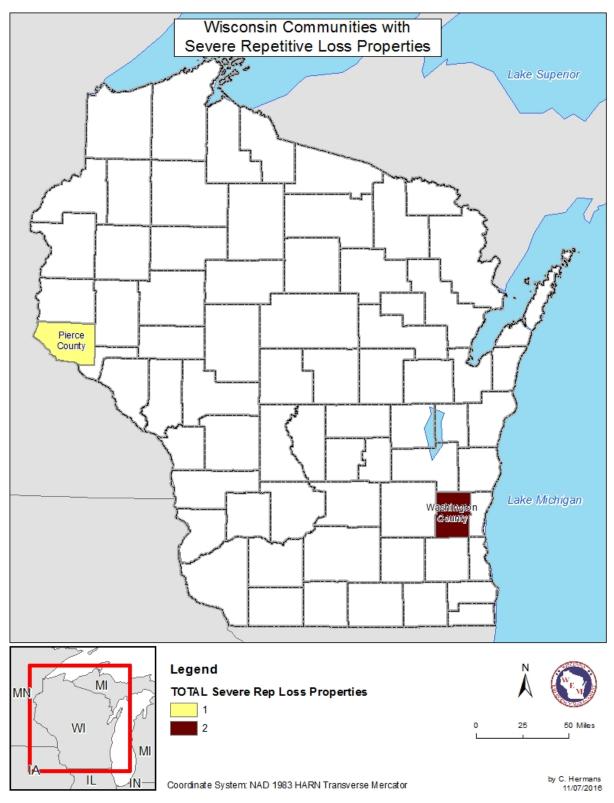
		Total		Elevated /			
NFIP Community	CID#	Listings	Acquired	Floodproofed	In Progress	Unverifiable	Flood-Prone
Jefferson, City of	555561	1					1
Juneau County	550580	1					1
Kenosha County	550523	32	14				18
Kenosha, City of	550209	1	1				0
Kewaunee County	550212	1					1
La Crosse County	550217	7					7
La Farge, Village of	550456	2	1				1
Lafayette County	550223	1					1
Loyal, City of	550052	1					1
Madison, City of	550083	1					1
Marathon City, Village of	550252	1					1
Marathon County	550245	1					1
Marquette County	550601	2					2
Mayville, City of	550103	1					1
Mazomanie, Village of	550085	1					1
Menomonee Falls, Village of	550483	1					1
Mequon, City of	555564	14					14
Milwaukee, City of	550278	230	8				222
Mineral Point, City of	550180	1					1
Monona, City of	550088	2		1			1
Monroe County	550571	1					1
Montello, City of	550266	1					1
Monticello, Village of	550163	1					1
Muskego, City of	550486	4					4
Neillsville, City of	550053	2					2
Nekoosa, City of	550516	1					1
New Berlin, City of	550487	4	2				2
North Fond du Lac, Village of	550138	1					1
Oak Creek, City of	550279	3	1				2
Oconto County	550294	2					2
Oconto, City of	550297	2				2	0
Oregon, Village of	550089	3	3				0
Oshkosh, City of	550511	9					9
Ozaukee County	550310	1			1		0
Pepin County	555570	6					6
Pewaukee, Village of	550489	1					1
Pierce County	555571	10					10
Port Washington, City of	550316	1					1
Portage County	550572	1					1
Portage, City of	550063	3					3

		Total		Elevated /			
NFIP Community	CID #	Listings	Acquired	Floodproofed	In Progress	Unverifiable	Flood-Prone
Prairie du Chien, City of	555573	3					3
Prescott, City of	555574	4					4
Princeton, City of	550171	1					1
Racine County	550347	3					3
Racine, City of	555575	2					2
Reedsburg, City of	550402	2	1				1
Richland Center, City of	555576	2					2
Richland County	550356	3					3
Ripon, City of	550140	1					1
River Hills, Village of	550280	3					3
Rock County	550363	6		1			5
Rock Springs, Village of	550403	1					1
Rusk County	550602	2					2
Sauk County	550391	2					2
Saukville, Village of	550317	1					1
Sheboygan, City of	550430	1					1
Silver Lake, Village of	550210	6	1				5
Soldiers Grove, Village of	550074	3					3
St. Croix County	555578	2					2
Steuben, Village of	555580	3			1		2
Sturgeon Bay, City of	550111	1					1
Thiensville, Village of	550318	11					11
Tomah, City of	550291	2					2
Trempealeau County	555585	5	1				4
Trempealeau, Village of	555584	1					1
Vernon County	550450	5					5
Viola, Village of	550460	1					1
Walworth County	550462	2					2
Washburn County	550606	1					1
Washington County	550471	4					4
Waterford, Village of	550354	1					1
Waukesha County	550476	6		1			5
Waukesha, City of	550491	2					2
Wausau, City of	550491	1				1	0
Wauwatosa, City of	550284	24	18				6
West Allis, City of	550285	2					2
Winnebago County	550537	2					2
TOTAL		659	87	16	5	13	538

ATTACHMENT BCommunities with Repetitive Loss Properties



ATTACHMENT CCommunities with Severe Repetitive Loss Properties



Ctata	of Mi	ccancin	Hazard	Mitia	ation	Dlan
state	OI VVI	sconstri	mazara	muua	аноп	Plan

APPENDIX E: WISCONSIN HAZARD MITIGATION TEAM

APPENDIX E: WISCONSIN SILVER JACKETS HAZARD MITIGATION TEAM

NAME	AGENCY	ADDRESS	PHONE	FAX	E-MAIL
Ackerman, Jolene	Department of Natural Resources	101 S. Webster Street	608-267-7677		Jolene.ackerman@wisconsin.gov
A1.1 1/ 1/	Division of Forestry	Madison, WI 53702	212 400 5250	212 400 5551	W 12 11 Of 11
Alderman, Kaylie	Federal Emergency Management	536 S. Clark St.	312-408-5259	312-408-5551	Kaylie.alderman@fema.dhs.gov
	Agency, Federal Insurance and	6 th Floor	312-841-2133		
	Mitigation Division	Chicago, IL 60605	(cell)		
Allen, Ashley	National Weather Service – Green Bay				Ashley.r.allen@noaa.gov
Angel, Kate	Department of Administration,	101 E. Wilson Street	608-267-7988	608-267-6917	Kathleen.angel@wisconsin.gov
	Division of Intergovernmental	9th Floor			
	Relations, WI Coastal Management Program	Madison, WI 53708			
Bush, Robin	Economic Development	111 North Canal St.,	312-353-8143,		rbush@eda.gov
	Administration (Coordinator, Env.	Suite 855	ext. 146		
	& Strategic Analysis)	Chicago, IL 60606			
Clay, Tim	Cooperative Network	1 S. Pinckney Street,	608-258-4384	608-258-4407	Tim.clay@cooperativenetwork.coop
		Suite 810			
		Madison, WI 53703-			
		2869			
Chrumka, Jason	US Army Corps of Engineers,	477 Michigan Avenue,	313-226-7762		Jason.a.chrumka@usace.army.mil
	Detroit District	Detroit, MI 48226			
Darrow, Dale	US Department of Housing and	310 W. Wisconsin	414-935-6606		Dale.a.darrow@hud.gov
	Urban Development	Avenue, Suite 950,			
	·	Milwaukee, WI 53203			
DeMedicci, Jaclyn	Office of the Commissioner of	121 E. Wilson Street			
	Insurance	Madison, WI 53707			
Devore, Jan	Department of Health Services	1 W. Wilson Street	608-264-6303		Jan.devore@wisconsin.gov
		Room 1150			
		Madison, WI 53707			
Draeger, James	Wisconsin Historical Society	816 State Street	608-264-6511		Jim.Draeger@wisconsin.gov
		Madison, WI 53706			

NAME	AGENCY	ADDRESS	PHONE	FAX	E-MAIL
Elliott, Patrick	Milwaukee Metropolitan Sewage District	MMSD 260 W. Seeboth Street Milwaukee, WI 53204	414-225-2168		pelliott@mmsd.com
Finkenbinder, Mike	Department of Transportation, Emergency Relief Program	4802 Sheboygan Ave. Room 501 Madison, WI 53705	608-266-1620		Michael.finkenbinder@dot.wi.gov
Flogstad, Greg	Mississippi River Regional Planning Commission	1707 Main Street Suite 240 LaCrosse, WI 54601	608-785-9396	608-785-9394	greg@mrrpc.com
Fleener, Darrin	Economic Development Administration (WI contact)	111 N. Canal Street, Suite 855 Chicago, IL 60606	312-405-8521		dfleener@eda.gov
Galloway, Meg	Department of Natural Resources, Division of Water	101 S. Webster Street (WT/3) Madison, WI 53707	608-266-7014		Meg.galloway@wisconsin.gov
Giglierano, Jim	Department of Administration Division of Intergovernmental Relations	101 E. Wilson St. Madison, WI 53703	608-267-6902		Jim.Giglierano@wisconsin.gov
Gray, Roxanne	Department of Military Affairs, Division of Emergency Management, Mitigation Division	2400 Wright Street P.O. Box 7865 Madison, WI 53707	608-242-3211	608-242-3248	Roxanne.gray@wisconsin.gov
Halbach, Timothy	National Weather Service	N3533 Hardscrabble Road Dousman, WI 53118- 9419	262-965-5061	262-965-4296	Timothy.halbach@noaa.gov
Herrick, Laura Kletti	Wisconsin Association of Floodplain, Stormwater and Coastal Managers; Southeastern Wisconsin Regional Planning Commission	SEWRPC, W239 N1812 Rockwood Drive, P.O. Box 1607, Waukesha, WI 53187	262-953-3224		lherrick@sewrpc.org

NAME	AGENCY	ADDRESS	PHONE	FAX	E-MAIL
Haugom, Donna	augom, Donna Wisconsin Emergency Management Association		920-674-7450	920-674-7122	donnah@jeffersoncountywi.gov
Helman, Tom	Iman, Tom National Weather Service, Green Bay		920-497-8771		Tom.helman@noaa.gov
Kaitfors, Stanley	Department of Administration, Division of Housing	101 E. Wilson Street Madison, WI 53703	608-266-0148		Stanley.kaitfors@wisconsin.gov
Kalscheur, Katherine	Department of Administration, Division of State Facilities	101 E. Wilson St. Madison, WI 53702	608-267-0509		Katherine.kalscheur@wisconsin.gov
Kuderer, Jenny	Kuderer, Jenny Wisconsin Economic Development Corporation		608-210-6820		Jennifer.kuderer@wedc.org
Legaspi, Jenny	Voluntary Organizations Active in Disaster/American Red Cross	3728 Spooner Ave. Altoona, WI 54720	715-559-1898	715-834-4888	Jenny.legaspi@redcross.org
Lepinski, Jim	Public Service Commission	P.O. Box 7854, Madison, WI 53707- 7854	608-266-0478		Jim.lepinski@wisconsin.gov
Loeffelholz, Brian	Department of Agriculture, Trade, and Consumer Protection	2811 Agriculture Drive P.O. Box 8911 Madison, WI 53708	608-224-4765		Brian.loeffelholz@wisconsin.gov
MacAskill, Gail	WEDC	201 W. Washington Avenue Madison, WI 53703	608-210-6844		Gail.macaskill@wedc.org
McCarthy, Julia	Federal Emergency Management Agency, Mitigation Division	536 S. Clark Street, 6th Floor Chicago, IL 60605	312-408-5518		Julia.mccarthy@fema.dhs.gov
Meissner, Christine	Federal Emergency Management Agency, Risk Analysis	536 S. Clark Street, 6th Floor Chicago, IL 60605	312-408-4460		Christine.Meissner@fema.dhs.gov

NAME	AGENCY	ADDRESS	PHONE	FAX	E-MAIL
Moran, Colleen	Department of Health Services, Division of Public Health	1 W. Wilson Street Room 150 Madison, WI 53707	608-266-6761		Colleen.moran@wisconsin.gov
Mueller, Scott	USDA, Natural Resources Conservation Service	8030 Excelsior Drive, Suite 200 Madison, WI 53717	608-662-4422 x 265		Scott.mueller@wi.usda.gov
Olds, Chris	Department of Natural Resources, Dam Safety/Floodplain Section	101 S. Webster Street (WT/3) Madison, WI 53707	608-266-5606		Christopher.olds@wi.gov
Phillips, Jeffrey	Department of Health Services, Division of Public Health	1 West Wilson Street P.O. Box 2659 Madison, WI 53701- 2659	608-264-9880	608-267-4853	Jeffrey.phillips@wisconsin.gov
Ramsden, John	USDA, Natural Resources Conservation Service	8030 Excelsior Drive, Suite 200 Madison, WI 53717	608-662-4422, ext. 234		John.ramsden@wi.usda.gov
Raube, Greg	Department of Safety and Professional Services	1400 E. Washington Street Madison, WI 53703	608-261-4484		Gregory.raube@wisconsin.gov
Satula, Brian	Department of Military Affairs, Division of Emergency Management	2400 Wright Street P.O. Box 7865 Madison, WI 53707	608-242-3210	608-242-3247	Brian.satula@wisconsin.gov
Shanahan, Caitlin	Department of Military Affairs, Division of Emergency Management	2400 Wright Street P.O. Box 7865 Madison, WI 53707	608-242-3214	608-242-3248	Caitlin.shanahan@wi.gov
Shea, Todd	National Weather Service	N2788 County Road FA LaCrosse, WI 54601			Todd.shea@noaa.gov
Skjolaas, Cheryl	University of Wisconsin – Cooperative Extension	201 Agriculture Engineering Bldg. 460 Henry Mall Madison, WI 53706	608-265-0568	608-262-1228	skjolaas@wisc.edu

NAME	AGENCY	ADDRESS	PHONE	FAX	E-MAIL
Sommers, Katie	Department of Military Affairs,	2400 Wright Street	608-242-3219	608-242-3248	Katie.sommers@wisconsin.gov
	Division of Emergency	P.O. Box 7865			
Staff, Michelle	Management, Mitigation Section Department of Natural Resources,	Madison, WI 53707 101 S. Webster Street	608-266-3093		Michelle.staff@wisconsin.gov
Staff, Michelle	Division of Water	(WT/3)	000-200-3093		<u>iviichelie.stait@wisconsin.gov</u>
	Division of water	Madison, WI 53707			
Stoikes, Robert	Department of Military Affairs,	2400 Wright Street	608-242-3226	608-242-3248	Robert.stoikes@wisconsin.gov
Stomes, Nobel C	Division of Emergency	P.O. Box 7865	000 2 12 0220	000 2 12 32 10	Nobel asconces wisconsining ov
	Management	Madison, WI 53707			
Stoughton,	Office of Commissioner of	125 S. Webster Street	608-264-8137	608-264-8115	Andrew.stoughton@wisconsin.gov
Andrew	Insurance	Madison, WI 53707			
Walker, John	US Geological Survey	8505 Research Way	608-217-1883	608-821-3817	jfwalker@usgs.gov
		Middleton, WI 53562			
Warnke, Mike	Department of Natural Resources,	101 S. Webster Street	608-264-6044		Michael.warnke@wisconsin.gov
	Division of Forestry, Fire and Law	Madison, WI 53702			
	Enforcement Section				
Waschbusch,	US Geological Survey	8505 Research Way	608-821-3868	608-821-3817	<u>rjwaschb@usgs.gov</u>
Robert		Middleton, WI 53562			
Wencl, Ron	US Geological Survey	2280 Woodale Drive,	763-783-3207		rwencl@usgs.gov
		Mounds View, MN			
		55112			
Wetenkamp, John	National Weather Service	N2788 County Road			John.wetenkamp@noaa.gov
		FA NATI FACO1			
14 <i>1</i> ′′ D. I.	D	LaCrosse, WI 54601	600 242 2200		
Wiseman, Robyn	Department of Military Affairs,	2400 Wright Street P.O. Box 7865	608-242-3200		Robyn.wiseman@wisconsin.gov
	Wisconsin Emergency				
	Management, Public Assistance	Madison, WI 53707- 7865			
Woodbury, David	Department of Natural Resources,	101 S. Webster Street	608-266-2598		David.woodbury@wi.gov
vvoodbury, David	Division of Enforcement and	5th Floor	000-200-2330		<u> </u>
	Science	Madison, WI 53707			

NAME	AGENCY	ADDRESS	PHONE	FAX	E-MAIL
Zieke, Margaret	Department of Military Affairs, Division of Emergency	2400 Wright Street P.O. Box 7865	608-242-3252	608-242-3248	Margaret.Zieke@wisconsin.gov
	Management, Mitigation Division	Madison, WI 53707			
Zien, Terry	US Army Corps of Engineers, St. Paul District	180 5th Street East, Suite 700 St. Paul, MN 55101- 1678	651-290-5714	651-290-5258	Terry.r.zien@usace.army.mil

Updated 11/16/16

Ctata	of Mic	cancin	Hazard	Mitiaation	Dlan
state	OT VVIS	consın	Hazara	- MILLIA ALLOR	ı Pıan

APPENDIX F: STATE ADMINISTRATION PLAN FOR THE HAZARD MITIGATION GRANT PROGRAM

STATE OF WISCONSIN

ADMINISTRATIVE PLAN

for the

HAZARD MITIGATION GRANT PROGRAM

Section 404

PL 100-707

The Robert T. Stafford Disaster Relief and Emergency Assistance Act

Division of Emergency Management

Department of Military Affairs

September 2016

STATE OF WISCONSIN HAZARD MITIGATION GRANT PROGRAM ADMINISTRATIVE PLAN

I. PURPOSE

The purpose of this Plan is to establish the organization, staffing, and process to be used by the State of Wisconsin, Division of Emergency Management, in administering and managing the Section 404 Hazard Mitigation Grant Program. It also explains how the state will meet all-hazards mitigation planning requirements.

The Hazard Mitigation Grant Program (HMGP) was created in November 1988, by Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act. The HMGP assists the state and its local governments in implementing long-term hazard mitigation measures following a major disaster declaration. In December 1993, President Bill Clinton signed the Hazard Mitigation and Relocation Assistance Act that amends Section 404 to increase federal funding of HMGP projects to 75% of a project's total eligible costs. The HMGP funding base was also amended to 15% of the projected obligated grants made under the Stafford Act Disaster Assistance Programs. In 1997 Section 404 was again amended so that HMGP funds are now available in all counties within the affected state following a major disaster declaration by the President. An interim final rule was published on February 26, 2002 for 44 CFR Parts 201 and 206 that increased the HMGP funding base to 20% of the projected obligated grants made under the Stafford Act Disaster Assistance Programs for states that have an approved Enhanced State Hazard Mitigation Plan. The objectives of the HMGP are as follows:

- To prevent future loss of life and property damage from disasters;
- To implement state and local all-hazards mitigation plans;
- To enable mitigation measures to be implemented during recovery from a disaster; and
- To provide funding for previously identified mitigation measures.

As implied above, the HMGP is closely tied to the State Hazard Mitigation Plan required in the Disaster Mitigation Act of 2000 (DMA2K) and is implemented subsequent to a Presidential Disaster Declaration. Section 404, Hazard Mitigation Grant Program (HMGP), in combination with the Flood Mitigation Assistance (FMA) and Pre-Disaster Mitigation (PDM) programs as well as ongoing programs at the county and state levels, comprise an overall pre- and post-disaster hazard mitigation strategy for the State of Wisconsin. This strategy will be further detailed and state agencies' responsibilities, pre- and post-disaster, further defined in the State of Wisconsin Hazard Mitigation Plan approved December 6, 2011.

II. AUTHORITIES AND REFERENCES

- A. Public Law 93-288, as amended by PL 100-707
- B. FEMA Regulations, 44 CFR, Part 201, Mitigation Planning
- C. FEMA Regulations, 44 CFR, Part 206, Subparts M, Minimum Standards
- D. FEMA Regulations, 44 CFR, Part 206, Subpart N, Hazard Mitigation Grant Program

- E. FEMA Regulations, 44 CFR Part 207, Management Costs
- F. FEMA Regulations, 44 CFR Part 80, Property Acquisition and Relocation for Open Space
- G. FEMA Regulations, 44 CFR, Part 10, Environmental Considerations
- H. 2 CFR Part 200, Uniform Administrative Requirements, Cost Principles and Audit Requirements for Federal Awards
- I. Hazard Mitigation Assistance Guidance and Addendum, February 27, 2015
- J. Executive Order 11988, Floodplain Management
- K. Executive Order 11990, Protection of Wetlands
- L. Executive Order 12612, Federalism
- M. Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Families
- N. Wisconsin Statutes, Chapter 323
- O. Wisconsin Statutes, Chapter 87.30
- P. Wisconsin Administrative Code NR116
- Q. State of Wisconsin Administrative Plan for the Public Assistance Program
- R. Wisconsin Emergency Response Plan
- S. Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970
- T. Wisconsin State Statue, Chapter 32; Administrative Code 202-Wisconsin Relocation Law
- U. State of Wisconsin Hazard Mitigation Plan, December 6, 2011

III. DEFINITIONS

"Act" refers to PL 93-288, the Disaster Relief Act of 1974 as amended by PL 100-707, the Robert T. Stafford Disaster Relief and Emergency Assistance Act and as further amended by the Hazard Mitigation and Relocation Assistance Act of 1993.

"Application" means the initial request for HMGP funding to be submitted to FEMA by the State (as outlined in 206.436 of 44 CFR).

"Base Flood" means the flood having a 1% chance of being equaled or exceeded in any given year; also referred to as the 100-year flood.

"Benefit Costs Analysis" (BCA) is an analysis to demonstrate that a project is cost-effective and will not cost more than the anticipated value of the reduction in both direct damages and subsequent negative impacts to the area if future disasters were to occur. Costs and benefits are computed on a net present value basis.

"Building" means a structure with two or more outside rigid walls and a fully secured roof that is affixed to a permanent site; a manufactured home or mobile home without wheels. Building does not mean a gas or liquid storage tank or a recreational vehicle, park trailer, or other similar vehicle.

"Categorical Exclusion" (CATEX) means the categories of actions that normally would not require an Environmental Impact Statement or Environmental Assessment. 44 CFR Part 10.8 identifies the categorical exclusion of actions that have no significant effect on the human environment.

"Climate Resilient Mitigation Activities" (CRMAs) are activities that support communities in

reducing the risks associated with climate change. They can mitigate any hazard, but focus on mitigating the impacts of flood and drought conditions. The activities include Aquifer Storage and Recovery, Floodplain and Stream Restoration, Flood Diversion and Storage, and Green Infrastructure Methods.

"Community" means any state or area or political subdivision thereof, or any Indian tribe or authorized tribal organization that has authority to adopt and enforce floodplain management regulations for the areas within its jurisdiction.

"Community Rating System" (CRS) is a FEMA program that provides flood insurance premium incentives for those communities in the National Flood Insurance Program (NFIP) that have gone beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding.

"Contractor" means any individual, partnership, corporation, agency, or other entity (other than an organization engaged in the business of insurance) performing work by contract for the federal government or a state or local agency.

"Cost-Effectiveness" is determined by a systematic quantitative method for comparing the costs of alternative means of achieving the same stream of benefits for a given objective. The benefits in the context of hazard mitigation are avoided future damage and losses. Cost-effectiveness is determined by performing a BCA.

"Designated Area" means any emergency or major disaster-affected portion of a state that has been determined eligible for federal assistance.

"Disaster Recovery Center" (DRC) is strategically-located center in a disaster area opened after a Presidential Disaster Declaration. Federal, state, and local agencies with disaster assistance programs temporarily locate in the DRC to assist individuals in completing their applications and answer questions of individual disaster victims. Mitigation information is also made available at the DRC.

"Disaster Mitigation Act of 2000" (DMA2K) is the Act that created all-hazards mitigation planning requirements for states and local communities as a condition for receiving federal disaster assistance. It also created the Pre-Disaster Mitigation program.

"Emergency" means any occasion or instance for which, in the determination of the President, federal assistance is needed to supplement state and local efforts and capabilities to save lives and to protect property and public health and safety, or to lessen or avert the threat of a catastrophe in any part of the United States.

"Enhanced State Hazard Mitigation Plan" is the hazard mitigation plan approved under 44 CFR Part 201.5 as a condition of receiving increased funding for the HMGP.

"Environmental Assessment" (EA) is an assessment prepared when a project does not qualify for a categorical exclusion and serves to determine whether an Environmental Impact Statement is needed.

"Environmental Benefits" are direct or indirect contributions that ecosystems make to the environment and human populations. For FEMA BCA, certain types of environmental

benefits may be realized when homes are removed and land is returned to open space uses. Benefits may include flood hazard reduction; an increase in recreation and tourism; enhanced aesthetic value; and improved erosion control, air quality, and water filtration.

"Environmental Impact Statement" (EIS) is a report prepared for all actions significantly affecting the environment.

"Federal Award" is the federal financial assistance that a non-federal entity receives directly from FEMA or indirectly from a pass-through entity or instrument such as the FEMA-State Agreement, cooperative agreement, or other agreement setting forth the terms and conditions of the financial assistance.

"Federal Award Date" is the date when the federal award is signed by the authorized official of the federal awarding agency.

"Federal Coordinating Officer" (FCO) means the person appointed by the FEMA Regional Administrator, or in his absence the Deputy Regional Administrator, to coordinate Federal Assistance in an emergency or major disaster.

"Federal Hazard Mitigation Officer" (FHMO) is the FEMA employee responsible for carrying out the overall responsibilities for hazard mitigation and for Subparts M and N of 44 CFR, including coordinating post-disaster hazard mitigation actions with other agencies of government at all levels.

"FEMA-State Agreement" is an agreement that states the understandings, commitments, and conditions for assistance under which FEMA disaster assistance shall be provided in a Presidential Disaster Declaration. This agreement imposes binding obligations on FEMA, states, and their local governments in the form of conditions for assistance that are legally enforceable.

"Finding of No Significant Impact" (FONSI) is a determination that an action will have no significant impact on the environment.

"Flood Insurance Rate Map" (FIRM) is the official map of a community on which FEMA has delineated both the special flood hazard areas and the risk premium zones applicable to the community.

"Flood Mitigation Assistance" (FMA) is a pre-disaster grant program that provides assistance to state and local governments for developing flood hazard mitigation plans, implementing flood hazard mitigation projects, and providing technical assistance in reducing or eliminating flood hazards for structures insurable under the NFIP and to address repetitive loss claims.

"Floodplain" is any land area that FEMA has determined has at least a 1% chance in any given year of being inundated by floodwaters from any source.

"Floodway" is the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

"Freeboard" is a factor of safety usually expressed in feet above a specified flood level for

purposes of floodplain management.

"Governor's Authorized Representative" (GAR) is the person empowered by the Governor to execute, on behalf of the state, all necessary documents for disaster assistance.

"Grant" means an award of financial assistance. The total HMGP grant award for the state shall not exceed 15% (20% for states with an approved Enhanced State Hazard Mitigation Plan) of the estimated total eligible federal share of assistance provided under the Stafford Act.

"Hazard Mitigation Grant Program" (HMGP) means the program authorized under Section 404 of the Stafford Act that provides funding for certain mitigation measures and that are in conformance with the State Hazard Mitigation Plan.

"Hazard Mitigation Planning" is a process used by governments to identify risks, assess vulnerabilities, and develop long-term strategies for protecting people and property from the effects of future natural hazard events.

"Hazard Mitigation Strategy" is a report developed by the State Hazard Mitigation Officer (SHMO), the Federal Hazard Mitigation Officer (FHMO), FEMA National Flood Insurance Program (NFIP) personnel, and the Wisconsin Department of Natural Resources (DNR) after a Presidential Disaster Declaration is issued. This report will identify mitigation opportunities and issues to be addressed for the declaration.

"HMGP Lock-In Ceiling" is the maximum amount of HMGP funds available in a particular disaster (15% of other FEMA disaster assistance programs or 20% of other FEMA assistance programs for states with an approved Enhanced State Hazard Mitigation Plan).

"Individuals and Households Program" is the supplementary federal assistance provided under the Stafford Act to individuals and families adversely affected by a major disaster or emergency.

"Joint Field Office" (JFO) is a location that functions as the focal point for directing and coordinating disaster operations after a declaration.

"Local Government" means any county, city, village, town, public authority, school district, special district, intrastate district, council of governments (regardless of whether the council of governments is incorporated as a nonprofit corporation under state law), regional or intrastate government entity, or agency or instrumentality of a local government; any Indian tribe or authorized tribal organization or organization that is not a federally-recognized tribe; and any rural community, unincorporated town or village, or other public entity for which an application for assistance is made by the state or a political subdivision thereof.

"Major Disaster" is any natural catastrophe (including any hurricane, tornado, storm, high water event, wind-driven water event, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, or drought) or, regardless of cause, any fire, flood or explosion, in any part of the United States, which in the determination of the President causes damage of sufficient severity and magnitude to warrant major disaster assistance under the Stafford Act to supplement the efforts and available resources of states, local governments, and disaster relief organizations in alleviating the damage, loss, hardship, or

suffering thereby.

"Management Costs" are any indirect costs, administrative expenses, and any other expenses not directly chargeable to a specific project that are reasonably incurred by a recipient or subrecipient in administering and managing the HMGP award or subaward.

"Market Value" is generally defined as the amount of cash, or terms reasonably equivalent to cash, for which in all probability the property would have sold on the effective date of the evaluation, after a reasonable exposure time on the open competitive market, from a willing and reasonably knowledgeable seller to a willing and reasonably knowledgeable buyer, with neither acting under the any compulsion to buy or sell, giving due consideration to all available economic uses of the property at the time of the valuation.

"Mitigation" means any sustained action taken to reduce or eliminate the long-term risk to human life and property from natural hazards.

"Mitigation Measure" means any mitigation measure, project, or action proposed to reduce the risk of future damage, hardship, loss or suffering from disasters.

"National Environmental Policy Act" (NEPA) is the act which requires that actions affecting the environment comply with specific policies and procedures.

"National Flood Insurance Program" (NFIP) means the program authorized by 42 U.S.C. 4001-4128 which provides the availability of flood insurance in exchange for the adoption of minimum local floodplain management ordinances that regulate development in the special flood hazard area.

"Non-Federal Cost Share" is that portion of the costs of a federally assisted project or program not borne by the federal government.

"Pre-Disaster Mitigation Program" (PDM) is a program authorized by Section 203 of the Stafford Act, 42 U.S.C. 5133, as amended by Section 102 of the Disaster Mitigation Act of 2000 (DMA), Pub. L. 106-390, 114 Stat. 1552, to assist states and communities in implementing sustained pre-disaster natural hazard mitigation programs to reduce overall risk to the population and structures while also reducing reliance on funding from disaster declarations.

"Period of Performance" (PoP) is the time during which the non-federal entity may incur new obligations to carry out the work authorized under the federal award. The federal awarding agency or pass-through entity must include start and end dates of the PoP in the federal award.

"Post-FIRM" describes a building for which construction or substantial improvement occurred after December 31, 1974, or on or after the effective date of an initial FIRM, whichever is later.

"Pre-FIRM" describes a building for which construction or substantial improvement occurred before December 31, 1974, or before the effective date of an initial FIRM.

"Preliminary Damage Assessment" (PDA) is a joint federal/state assessment effort conducted within 3 to 5 days of a disaster to refine, or correct, previous damages estimates for both the

public and private sectors, that are used in the Governor's decision on whether or not a federal disaster assistance request is in order, the figures from which are then utilized to substantiate any such request.

"Private Nonprofit Facility" means any non-governmental agency or entity that currently has (i) an effective ruling letter from the Internal Revenue Service granting tax exemption under section 501(c), (d), or (e) of the Internal Revenue Code of 1954; or (ii) satisfactory evidence from the state that the organization or entity is a nonprofit organized or doing business under state law.

"Program Income" means gross income received by the recipient or subrecipient directly generated by a grant-supported activity, or earned only as a result of the grant agreement during the grant period.

"Project" means any mitigation measure, project, or action proposed to reduce risk of future damage, hardship, loss, or suffering from disasters. The term "project" may be used interchangeably with the term "mitigation measure".

"Project Worksheet" is a report of damages to publicly-owned facilities caused by a major disaster or emergency including location, description, and estimate of required work.

"Public Assistance" means federal financial assistance provided to state and local governments or to eligible private nonprofit organizations for eligible disaster-related costs.

"Public Assistance Officer" (PAO) is the federal/state person designated to administer the Public Assistance program for a particular disaster declaration.

"Public Assistance Permanent Work" is the restorative work that must be done, through repairs or replacement, to restore an eligible facility on the basis of its pre-disaster design and in conformity with current applicable codes, specifications, and standards.

"Public Entity" means an organization formed for a public purpose whose direction and funding is provided by one or more political subdivisions of the state.

"Public Facility" means the following facilities owned by the state or local government: a flood control, navigation, irrigation, reclamation, public power, sewage treatment and collection, water supply and distribution, watershed development, or airport facility; any non-federal aid street, road, or highway; and any other public building, structure, or system, including those for educational, recreational, or cultural purposes; or any park.

"Purchase Offer" is the initial value assigned to the property, which is later adjusted by applicable additions and deductions, resulting in a final offer amount to a property owner.

"Qualified Alien" is defined at 8 U.S.C. 1641.

"Qualified Conservation Organization" means a qualified organization with a conservation purpose pursuant to 26 CFR 1.170A-14 and applicable implementing regulations, which is such an organization at the time it acquires the property interest and that was such an organization at the time of the major disaster declaration, or at least two years prior to the opening of the grant application period.

"Recipient" means the government to which an award is made and which is accountable for the use of the funds provided. The recipient is the entire legal entity even if only a particular component of the entity is designated in the grant award document. For purposes of this regulation the State of Wisconsin is the recipient.

"Regional Administrator" is a director of a FEMA Regional Office, or his/her designated representative. As used in this Plan, Regional Administrator also means the Federal Coordinating Officer (FCO) who has been appointed to exercise the authority of the Regional Administrator for a particular emergency or major disaster.

"Section 404" of the Stafford Act authorizes the Hazard Mitigation Grant Program that provides funding for cost-effective hazard mitigation measures.

"Section 406" of the Stafford Act authorizes Public Assistance awards to repair, restore, or replace damaged facilities belonging to public and private nonprofit entities, and other associated expenses, including emergency protective measures and debris removal.

"SF-424" (Standard Form 424) is the Application for Federal Assistance to be included as part of the State Hazard Mitigation Application.

"Special Flood Hazard Area" (SFHA)means an area having special flood, mudslide, and/or flood-related erosion hazards, as shown on the hazard identification maps published by the NFIP.

"Stafford Act" is the Robert T. Stafford Disaster Relief and Emergency Assistance Act, PL 100-707, signed into law November 23, 1988, which amended the Disaster Relief Act of 1974, PL 93-288, and which was further amended in 1993 by the Hazard Mitigation and Relocation Assistance Act.

"Standard Flood Insurance Policy" means the flood insurance policy issued by the Federal Insurance Administrator or an insurer pursuant to an arrangement with the Administrator pursuant to federal statutes and regulations, known as a write-your-own (WYO) company.

"Standards" means codes, specifications, or standards for the construction of facilities.

"State Administrative Plan for the HMGP" means the plan developed by the state to describe the procedures for administration of the HMGP.

"State Hazard Mitigation Plan," a requirement of DMA2K, is the state plan that includes a systematic evaluation of the nature and extent of vulnerability to the effects of natural hazards and identifies the actions needed to minimize future vulnerability to said hazards. The plan further delineates state agency responsibilities, both pre- and post-disaster, in implementing the State Hazard Mitigation Program. This plan is approved under 44 CFR part 201, as a condition of receiving Stafford Act Assistance as outlined in 201.4. This plan is reviewed and revised every five years. If it is warranted and time permits, it will also be revised after each presidentially-declared disaster.

"State Coordinating Officer" (SCO) is the person appointed by the Governor to act in cooperation with the FCO to manage disaster recovery efforts.

"State Financial Management Officer" (SFMO) is the representative of the state government

who is responsible for managing the HMGP accounts, processing payment requests, developing financial procedures, and maintaining financial records.

"State Hazard Mitigation Officer" (SHMO) is the representative of the state government who is the primary point of contact with FEMA, other state and federal agencies, and local units of government in the planning and implementation of pre- and post-disaster mitigation programs and activities required under the Stafford Act. The SHMO is also appointed as one of the Alternate GARs.

"Subapplicant" is the entity, such as a community/local government, federally-recognized tribe, or private nonprofit that submits a subapplication to the applicant for FEMA assistance. Once funding is awarded, the subapplicant becomes the "subrecipient."

"Subaward" is an award provided by a pass-through entity to a subrecipient for the subrecipient to carry out part of a federal award received by the pass-through entity.

"Subrecipient" means the government or other legal entity to which a subaward is made and which is accountable to the recipient for the use of the funds provided. Subrecipients can be state agencies, local governments, private nonprofit organizations, or Indian tribes, as outlined in 206.433 of 44 CFR.

"Substantial Damage" is damage of any origin sustained by a building whereby the cost of restoring the building to its before-damage condition would equal or exceed 50% of the equalized assessed value of the building before the damage occurred.

"Substantial Improvement" is any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50% of the equalized assessed value of the structure before the "start of construction" of the improvement. This term includes structures that have incurred "substantial damage," regardless of the actual repair work performed.

"Wisconsin Silver Jackets Hazard Mitigation Team" (WSJHMT) (formally the Interagency Disaster Recovery Group and Wisconsin Hazard Mitigation Team) is coordinated by Wisconsin Emergency Management and is composed of key federal and state agency representatives and other public or private sector bodies or agencies. The purpose of the WSJHMT, which functions both pre- and post-disaster, is to evaluate hazards, identify strategies, coordinate resources, and implement measures that will reduce the vulnerability of people and property to damage from hazards. This group is also responsible for updating the State of Wisconsin Hazard Mitigation Plan.

IV. PROGRAM MANAGEMENT AND ADMINISTRATION RESPONSIBILITY

The Governor of the State of Wisconsin has designated the Department of Military Affairs (DMA), Wisconsin Emergency Management (WEM), as the state agency responsible for management and administration of the HMGP, PDM, and FMA programs. The Administrator of the Division is the official who has overall management responsibility for the program. The responsibility for program coordination, implementation, and administration is delegated to Katie Sommers who serves as the Division's State Hazard Mitigation Officer (SHMO). The SHMO complies with federal requirements and involves appropriate state and

local governments in the pre- and post-disaster hazard mitigation program.

The SHMO maintains close coordination with the Department of Natural Resources (DNR), Bureau of Watershed Management, Dam/Floodplain Section. As the state's lead floodplain management agency, DNR plays a key role in providing technical assistance for the mitigation programs and in developing the Hazard Mitigation Action Plan in flood disasters.

V. STAFFING AND ASSIGNMENT OF RESPONSIBILITIES

A. Staffing

The staffing pattern for administering the HMGP will be flexible and capable of expansion, depending upon the estimated number of applicants for the program and upon the type of disaster. At a minimum, it will consist of the Mitigation Section Supervisor, State Hazard Mitigation Officer (SHMO), two Disaster Response and Recovery Planners, the Financial Management Officer, and appropriate members of the Wisconsin Silver Jackets Hazard Mitigation Team (WSJHMT).

If necessary, the GAR/SCO will employ temporary hires to assist the SHMO and provide program support. The need for such hires will be determined by the Mitigation Section Supervisor and SHMO and will serve as the basis for determining State Management Costs. The State Management Cost Project Narrative will be submitted to the Regional Administrator for approval.

B. Responsibilities

1. Governor's Authorized Representative/State Coordinating Officer (GAR/SCO)

The Adjutant General (TAG) serves as the GAR. The Administrator of Wisconsin Emergency Management or the Bureau Director of Response and Recovery serves as the Alternate GAR/SCO and has overall management responsibility for the program. He/She is the state official who is ultimately responsible for ensuring that the state properly carries out the HMGP and hazard mitigation planning responsibilities on a day-to-day basis and subsequent to a Presidential Disaster Declaration. In this regard, the Alternate GAR/SCO will monitor the activities of the SHMO and the WSJHMT. The Alternate GAR/SCO will do the following:

- a. Ensure an Administrative Plan is developed, outlining how the state will administer the Hazard Mitigation Grant Program.
- b. Ensure that a process exists for identifying potential hazard mitigation projects and for prioritizing those projects.
- c. Ensure that all potential applicants are notified of the program and receive the assistance to which they are entitled.
- d. Ensure that a proper initial application and any necessary supplemental applications, including Standard Form 424 (SF-424), are submitted in a timely fashion to the Regional Administrator.
- e. Ensure that technical assistance is provided to potential subapplicants and/or eligible subrecipients.
- f. Ensure that adequate procedures are developed for the timely distribution of

- financial assistance to eligible subrecipients.
- g. Ensure that a system is developed to monitor completion of approved projects within federally required timeframes.
- h. Ensure that a system exists to monitor subrecipients' accounting practices to maintain compliance with 2 CFR Part 200.
- i. Ensure that appropriate state agencies are on the WSJHMT and assist in the development or update of the State of Wisconsin Hazard Mitigation Plan.
- j. Ensure that DMA2K requirements, including development or update of the State of Wisconsin Hazard Mitigation Plan, are met and closely tied to administration of the HMGP.
- k. Ensure participation of the appropriate local agencies in the administration and implementation of the HMGP and all-hazards mitigation planning requirements.

2. State Hazard Mitigation Officer (SHMO)/Alternate GAR

The SHMO is responsible for program coordination, implementation and administration and also serves as an Alternate GAR. The SHMO will accomplish the necessary program work required of the state to deliver the HMGP to eligible subapplicants and to meet the planning requirements of DMA2K. The SHMO with assistance from the Mitigation Section staff will do the following:

- a. Update the Administrative Plan that outlines how the state will administer the HMGP and implement the Plan in a Presidential Disaster Declaration.
- b. Implement a process for identifying potential hazard mitigation projects and for prioritizing among those projects.
- c. Coordinate with the FHMO in developing the Disaster Spend Plan by identifying funding priorities for projects, and revise projections each month throughout the life cycle of the disaster.
- d. Coordinate with State/Federal Public Assistance Officers (PAOs) to ensure that all eligible Section 406 mitigation opportunities are explored and funded through the Public Assistance program.
- e. Coordinate with the FCO, SCO, FHMO, Human Services staff and local officials in establishing mitigation requirements at the DRCs.
- f. Submit to FEMA Regional Administrator a request for State Management Costs along with a Management Cost Project Narrative.
- g. Notify potential subapplicants of the program and brief them, with appropriate handout materials, on elements of the program.
- h. Coordinate with the FHMO in developing the Hazard Mitigation Strategy after a declaration.
- i. Provide technical assistance to potential subapplicants and/or eligible subrecipients in developing and submitting applications.
- j. Conduct the required benefit-cost analyses using FEMA's BCA policies and methodology for proposed HMGP projects.
- k. Complete the NEPA review process for proposed projects. This will include the following tasks:
 - Coordinate with the FEMA Regional Environmental Officer (REO), Project

- Officer, and other state and federal agencies during project development to address environmental issues;
- Complete formal consultations required specifically of federal agencies under federal environmental laws other than NEPA including, but not limited to, formal endangered species consultation or historic preservation Memoranda of Agreement and Programmatic Agreements; undertake environmental review tasks (including tasks related to the National Historic Preservation Act);
- Gather necessary environmental data through the applicant, past studies, and informal consultation with state and federal agencies;
- Recommend level of review under NEPA:
- Evaluate potential effects of the proposed project and identify any measures necessary to avoid or minimize these effects;
- Evaluate and document alternatives to the proposed action that will avoid or minimize impacts;
- Demonstrate that the project will incorporate any measures required to mitigate the adverse effects on EHP resources;
- Ensure the costs of known measures to treat adverse effects are reflected in the project budget cost estimate;
- Complete and submit the EHP Checklist and Record of Environmental Consideration (REC) and all supporting documentation at the same time, or prior to, the submission of the project application; and
- Ensure that the required public notices are completed and that the Environmental Closeout Declaration is completed and signed by the subrecipient.
- I. Prepare and submit the initial HMGP application and any supplemental applications per federal requirements.
- m. Monitor subrecipients per 2 CFR Section 200.331 including reviewing financial and programmatic reports; following up and ensuring that the subrecipient takes prompt and appropriate action for any deficiencies discovered through audits, on-site reviews, and other monitoring activity; and issue a management decision for audit findings.
- n. Develop and implement a system for monitoring the status of approved projects, for processing time extension requests and appeals, and for closing out completed projects.
- o. Coordinate with the State Financial Management Officer (FMO) in monitoring subrecipient accounting systems to meet requirements 2 CFR Part 200.
- p. Review and revise the State of Wisconsin Hazard Mitigation Plan according to planning requirements ensuring coordination as required and appropriate with administration of the HMGP.
- q. Involve and coordinate with appropriate state agencies through the WSJHMT in meeting HMGP and planning requirements. In a Presidential Disaster Declaration, this includes identifying potential projects and providing technical assistance to subrecipients.
- r. Involve the appropriate local agencies and the County/Tribal Emergency

Management Director in the administration of the HMGP and planning requirements. This includes participation in the development or update of local hazard mitigation plans or plan amendments and monitoring the status of hazard mitigation projects.

- s. Follow-up with state agencies and local governments to ensure that appropriate hazard mitigation actions are taken subsequent to a disaster. This involves coordination of plans and actions of local governments to assure that they are not in conflict with each other or state plans.
- t. Ensure that the activities, programs and policies of state agencies related to hazard evaluation, vulnerability, and mitigation, are coordinated and contribute to the overall lessening or avoiding of vulnerability to natural hazards.

3. State Financial Management Officer (SFMO)

The SFMO is the Budget and Policy Analyst and will do the following:

- a. Manage the accounts that are opened specifically for the HMGP including performing financial disbursements and financial revisions, processing payment requests, closing out the program accounts (deobligations), and processing bills for collection, if any.
- b. Process payment requests and enter disbursements into the state financial management system.
- c. Develop financial procedures for implementing the provisions of 2 CFR Part 200.
- d. Receive subrecipient single audits and review for compliance.
- e. Maintain financial records of all disbursements to subrecipients and prepare fiscal documents for processing the final claim, process the final state payment, and close the file (account).
- f. Maintain records of State Management Costs eligible for reimbursement as provided for in FEMA regulations.
- g. Maintain proper accountability of records related to the procurement of property and services under the HMGP.

4. Wisconsin Silver Jackets Hazard Mitigation Team (WSJHMT)

The WSJHMT functions on both a day-to-day and disaster basis. Its members include representatives of the following state agencies: the Departments of Military Affairs, Natural Resources, Administration, Transportation, Human Services, and Agriculture, Trade and Consumer Protection; the State Historical Society; the Public Service Commission; the Office of Commissioner of Insurance; the University of Wisconsin Extension; Wisconsin Economic Development Corporation; and other agencies as deemed appropriate. In addition, a representative from the Regional Planning Commissions; the Wisconsin Association of Floodplain, Stormwater and Coastal Managers; Wisconsin Emergency Management Association; and Volunteer Organizations Active in Disasters also participate. The following federal agencies are included on the WSJHMT: U.S. Department of Agriculture, Economic Development Administration, Federal Emergency Management Agency, U.S. Geological Survey, U.S. Army Corps of Engineers, and the U.S. Department of Housing and Urban

Development. Different personnel from the agencies may be involved depending upon whether the activity is pre- or post-disaster, the nature of the disaster, and the type of damage it has generated. The purpose and goal of the WSJHMT is to assist the local governments in the recovery phase, provide technical assistance when possible, prevent duplication of efforts and funding, identify and prioritize mitigation projects, and identify funding options for implementing mitigation projects, whether through the individual agencies or by "packaging" various funding programs. This group is also responsible for reviewing and revising the State of Wisconsin Hazard Mitigation Plan per planning requirements.

When a disaster occurs, the SHMO will convene the WSJHMT to brief them on the situation and any actions that have been taken to date. The agencies will provide an update on any funding sources and/or technical assistance they may be able to provide during the recovery phase. The WSJHMT will assist the SHMO in implementing the HMGP and in fulfilling hazard mitigation planning requirements. The WSJHMT will assist the SHMO in identifying potential hazard mitigation projects and providing technical assistance to eligible subrecipients. The WSJHMT will meet on a regular basis after a declaration, even weekly if necessary, to coordinate recovery efforts. The SHMO is responsible for making meeting arrangements and developing the agenda as well as chairing the meetings. In addition to the above activities, the WSJHMT will review pre-applications to identify funding sources and establish funding priority as well as prevent any duplication of programs. The WSJHMT will work to package funding where possible to ensure implementation of mitigation projects. In addition, the SHMO is the chair of the RSF Mitigation Subcommittee on the Wisconsin Recovery Task Force (WRTF) and the members of the WSJHMT are therefore, automatically members of the RSF Mitigation Subcommittee.

Agency participation in post-disaster hazard mitigation activities is authorized under Chapter 323 of the Wisconsin Statutes, specifically under the Governor's Declaration of an Emergency. Such a gubernatorial proclamation directs appropriate state agencies to contribute whatever resources are at their disposal, including personnel, to the response and recovery effort and to make their involvement an agency priority.

5. Local Hazard Mitigation Officer/Team (LHMO/LHMT)

The County/Tribal Emergency Management Director (or his/her designee) will act as the LHMO. The LHMO will call upon other local agencies to act as members on the Local Hazard Mitigation Team (LHMT) and participate, as necessary, in implementing the HMGP. The LHMO will be the point of contact for projects within his/her jurisdiction deemed eligible for HMGP funding and will provide information and reports to the SHMO as requested. The LHMO will coordinate with HMGP subrecipients in administration of the HMGP. In addition, the LHMO will coordinate with the SHMO in supporting the efforts of reviewing and revising the local all-hazards mitigation plan.

VI. ALL HAZARDS MITIGATION PLANNING REQUIREMENTS

- A. Immediately following the declaration of a disaster, the SHMO will meet with as many affected local governments as feasible for the purpose of surveying the damaged area. The survey is intended, among other things, to identify the following:
 - 1. The prevalent hazard or type of hazard which resulted in damage, the type and extent of that damage, and possible mitigation measures that could be considered in the recovery process.
 - 2. Possible measures for funding under the HMGP or other federal or state mitigation, disaster assistance, or financial assistance programs.
 - 3. The FHMO and SHMO will contact appropriate federal and state agencies for participation in the surveys as required. In flood disasters, DNR, because of its technical expertise, will be asked to take a key role in the survey. Further, they will determine which counties/tribes/communities will be evaluated based upon the extent of the damages and the frequency of occurrence. Every effort will be made to survey each of the counties/tribes included in the declaration. If an actual on-site survey cannot be done, then a phone survey will be done with the County/Tribal Emergency Management Director to identify specific mitigation opportunities.

B. All-Hazards Mitigation Planning

- 1. WEM has primary responsibility for preparation of the State of Wisconsin Hazard Mitigation Plan, which is a requirement to receive assistance under the Stafford Act. At the time of a declaration of a major disaster, the state will make every effort to review and revise this Plan to take into account special needs identified for that particular declaration. (CFR 201.4)
- 2. At a minimum, the plan will be adopted by the state and will contain the following:
 - a. Documentation of the planning process to include coordination among agencies and integration with other planning efforts.
 - b. An evaluation of the natural hazards in the state and/or in the designated disaster area to include a vulnerability analysis and risk assessment.
 - c. A description and analysis of state and local hazard management policies, programs, and capabilities already in place or available to mitigate the hazards.
 - d. Hazard mitigation goals and objectives and proposed strategies, programs, and actions to reduce or avoid long-term vulnerability to hazards.
 - e. A description of how the state will coordinate with local mitigation planning efforts.
 - f. A method the state will follow to provide funding or technical assistance to local governments.
 - g. A description of how the state will prioritize jurisdictions that will receive mitigation planning and project grants and other state assistance.
 - h. A method for implementing, monitoring, evaluating, and updating the mitigation plan. At a minimum, this will occur every five years to ensure that implementation occurs as planned, and to ensure that the plan remains current.

- 3. The purpose of the Plan is to assist the state and local governments in developing hazard mitigation capabilities and programs as part of their day-to-day or normal operations. The Plan will also be modified or expanded to take into account special needs identified in declared declarations areas within the state.
- 4. WEM is responsible for monitoring and evaluating implementation of the State of Wisconsin Hazard Mitigation Plan and for updating and resubmitting the Plan to FEMA for approval every five years.

VII. SECTION 404 HMGP ELIGIBILITY

- A. <u>Subapplicant Eligibility</u> The following are eligible to apply for the HMGP:
 - 1. State and local governments (For project grants, they must have an approved all-hazards mitigation plan with the proposed measure meeting the goals/objectives identified in their plan. If they do not have an approved plan, they may apply for a planning grant.)
 - 2. Certain private nonprofit organizations or institutions that own or operate a private nonprofit facility as defined in 44 CFR 206.221(e) and further clarified in the Federal Register/Vol. 68, No. 120/ Monday, June 23, 2003/Notices.
 - 3. Indian tribes or authorized tribal organizations (For project grants, they must have an approved all-hazards mitigation plan with the proposed measure meeting the goal/objectives identified in their plan. If they do not have an approved plan, they may apply for a planning grant.)
- B. <u>Project Eligibility</u> To be eligible for the HMGP, a project must meet the federal minimum project criteria listed below. In addition to the federal criteria, the State of Wisconsin may consider other basic criteria when evaluating potential HMGP projects, including the subapplicant's compliance with the NFIP; compliance with state and local floodplain regulations; and participation in the CRS. (It should be noted that the HMGP cannot fund projects retroactively.)
 - 1. Be in conformance with the FEMA-approved state, local, or tribal hazard mitigation plan.
 - 2. Have a beneficial impact upon the project area.
 - 3. Be in conformance with 44 CFR Part 9, Floodplain Management and Protection of Wetlands and 44 CFR Part 10, Environmental Considerations.
 - 4. Solve a problem independently or constitute a functional portion of a solution where there is assurance that the project as a whole will be completed. (Projects that merely identify or analyze hazards or problems without a funded, scheduled implementation program are not eligible.)
 - 5. Be both feasible and effective at mitigating the risks of the hazard for which the project is designed. A project's feasibility is demonstrated through conformance with accepted engineering practices, established codes, standards, modeling techniques,

- or best practices. Engineering designs are accepted if a registered professional engineer (or other design professional) certifies that the design meets the appropriate code or industry design.
- 6. Be cost-effective and substantially reduce the risk of future damage, hardship, loss, or suffering resulting from a major disaster. The state, in applying for the subaward, must demonstrate this by documenting that the project meets the following criteria:
 - a. Addresses a problem that has been repetitive, or a problem that poses a significant risk if left unsolved (i.e. evaluating the hazard in terms of the frequency and intensity of expected occurrences).
 - b. Costs no more than the anticipated value of the reduction in both direct damages (property) and subsequent negative impacts (loss of function, deaths, injuries) to the area if future disasters were to occur. This is typically demonstrated by completing a BCA utilizing FEMA software to calculate a benefit-cost ratio (BCR). Projects for which the benefits exceed the cost are generally considered costeffective.
 - i. The acquisition of structures that are declared substantially damaged (from any origin) and located in a riverine SFHA on a preliminary or effective FIRM is considered cost effective.
 - ii. The acquisition of structures located in an SFHA on the FIRM where the total project cost averages \$276,000 or less per structure is considered cost-effective.
 - iii. The elevation of structures located in an SFHA on the FIRM where the total project cost averages \$175,000 or less per structure is considered cost-effective.
 - iv. Acquisition projects with a BCR of 0.75 are allowed to incorporate environmental benefits. FEMA has developed and incorporated economic values for green open space and riparian areas into the BCA toolkit for acquisition projects.
 - iv. For 5% Initiative projects, with a narrative that indicates there is a reasonable expectation that future damage or loss of life or injury will be reduced or prevented by the activity are considered cost effective.
 - c. Has been determined to be the most practical, effective, and environmentallysound alternative after consideration of a range of options, including the "no action" alternative.
 - d. Contributes, to the extent practicable, to a long-term solution to the problem it is intended to address.
 - e. Considers long-term changes to the areas and entities it protects, and has manageable future maintenance and modification requirements.
- C. <u>Types of Projects</u> Projects may be of any nature that will result in protection to public or private property. Eligible projects include, but are not limited to, the following:
 - 1. Acquisition, demolition, and/or relocation of structures from hazard-prone areas.

- 2. Retrofitting of facilities, such as elevation or floodproofing, to protect structures from future damage in accordance with ASCE 24-14.
- 3. Mitigation reconstruction.
- 4. Development of state or local mitigation standards to protect new and substantially improved structures from disaster damage.
- 5. Localized and non-localized flood risk reduction projects, such as debris basins, retention ponds, stormwater improvements, or small floodwalls.
- 6. Infrastructure retrofits are measures to reduce risk to existing utility systems, roads and bridges.
- 7. Construction activities that will result in protection from hazards, such as community or residential safe rooms.
- 8. Soil Stabilization.
- 9. Wildfire mitigation.
- 10. Generators to protect critical facilities.
- 11. Climate Resilient Mitigation Activities (CRMAs) such as green infrastructure, floodplain and stream restoration, flood diversion and storage, and aquifer storage and recovery.
- 12. Other projects that will be evaluated on their own merits against program requirements. This could include projects that address climate adaptation and resiliency.
- 13. 5% Initiative Projects such as education and awareness, purchase and distribution of NOAA Weather Radios, river and stream gauges, etc.
- 14. Advance Assistance for the development of mitigation strategies and to obtain data to prioritize, select, and develop complete subapplications.
- 15. Development or update of an all-hazards mitigation plan.

D. Funding

- 1. <u>Federal</u> FEMA will make HMGP funds available to the State of Wisconsin in accordance with the following federal regulations:
 - a. The total federal funds provided shall not exceed 15% (20% if the state has an approved Enhanced State Hazard Mitigation Plan) of the estimated total eligible federal funds spent on the Public and Individual Assistance programs for each disaster declared under the Stafford Act.
 - b. The federal funds provided will be based on the cost-sharing provisions outlined in the FEMA-State Agreement. The federal share of hazard mitigation projects may not exceed 75% of the eligible cost of those projects.
 - c. HMGP funds cannot be used for activities for which FEMA determines the more specific authority lies with another federal agency or program. HMA funds are not

- intended to be used as a substitute for other available program authorities, nor can they be used as a match for other federal funds. (Regulations explaining the cost-share requirements can be found at 2 CFR Part 200.306.)
- d. A set-aside of up to 5% of the total HMGP funds for each declaration is available for the state to use at its discretion for mitigation measures (5% Initiative funds). Projects or activities eligible under the set-aside are those projects that are difficult to evaluate against traditional program cost-effectiveness and eligibility criteria but are generally recognized to provide a benefit in reducing potential losses from a future disaster. In-lieu of the traditional BCA, WEM will include a narrative that identifies the mitigation benefits and indicates that there is a reasonable expectation that future damage, loss of life, or injury will be reduced or prevented. 5% Initiative projects must still be reviewed for compliance with environmental laws. (The 5% can be increased to 10% for activities that promote disaster-resistant codes for all hazards.)
- e. A set-aside of up to 7% of the total HMGP funds for each disaster is available to the state for state, local, or tribal hazard mitigation planning.
- 2. <u>State</u> State funding for HMGP projects is authorized under Chapter 323, Wis. Statues and will be made available when a Presidential Disaster Declaration is received. The non-federal share will be split evenly between the state and the subrecipient.
- 3. <u>Subrecipient</u> The non-federal share is split evenly between the state and the subrecipient and can come from any funding source (state, local, nonprofit, or private) provided it is not federal funds or used as match for other federal funds. The nonfederal share does not need to be cash; third party in-kind services and/or materials may be accepted. Funds in excess of the cost-share requirement may be provided from a combination of other federal, state, local, nonprofit, or private funding sources.
- 4. Lock-in Ceiling The lock-in ceiling is the guaranteed level of HMGP funding for a particular disaster and is provided twelve months from the date of declaration. An initial estimate is provided within 35 days of the declaration in conjunction with calculation of the preliminary lock-in amount for State Management Costs. The twelve-month lock-in is the maximum amount available. Prior to the twelve-month lock-in, total obligations are limited to not more than 75% of any current estimate. In rare circumstances, a catastrophic disaster may result in major fluctuations in the disaster assistance programs expenditures used to determine the HMGP estimates. FEMA, at the request of the recipient, may conduct an additional review after the twelve-month lock-in. If the review shows that the amount of funds available is different than previously calculated, the final lock-in amount will be adjusted accordingly. Additionally, funds for projects approved and obligated prior to the 12-month lock-in will not be deobligated when the lock-in is less than the previous estimate.
- 5. <u>Advance Assistance</u> This allows advancing up to 25% of the HMGP ceiling or \$10 million, whichever is less, to recipients and subrecipients, to provide states and tribes

resources to develop mitigation strategies and obtain data to assist in prioritizing, selecting, and developing complete HMGP subapplications by the application deadline. The state may request Advance Assistance by submitting an HMGP application to the Regional Mitigation Division Director identifying the proposed use of the funds including detailed costs for each proposed activity and milestones for submitting completed HMGP subapplications to FEMA. Advance Assistance is subject to the HMGP cost-share requirement and is part of the HMGP ceiling amount.

VIII. IDENTIFICATION AND NOTIFICATION OF APPLICANTS

- A. <u>Identification</u> It is the SCO's responsibility to ensure that potential subapplicants for the HMGP are identified. This is primarily accomplished by the SHMO through the following means:
 - 1. Identifying those communities that have adopted a FEMA-approved all-hazards mitigation plan.
 - 2. Acquiring information during the Preliminary Damage Assessment (PDA), Applicant Briefings, and community visits conducted after the declaration is granted.
 - 3. Reviewing the State of Wisconsin Hazard Mitigation Plan, especially the portion of that contains an inventory of projects previously identified for funding should it become available.
 - 4. Maintaining a list of previously identified projects through exchanges from potential subapplicants.
 - 5. Consultation between the SHMO and FHMO.
 - 6. Activities of the WSJHMT.
 - 7. Acquiring information from the Public Assistance Officer on possible projects based on information from approved Project Worksheets or through contacts with subapplicants for the Public Assistance program.
- B. <u>Notification</u> The SCO is also responsible for ensuring that potential subapplicants are notified of the availability of HMGP funding and of program requirements. This will be accomplished by the SHMO as follows:
 - 1. At the Applicant Briefing(s) for the Public Assistance program, the SHMO and the SPAO will coordinate a presentation of HMGP information. An overview of the program, to include the eligibility requirements, will be presented at the briefing(s). The intent will be to create early awareness of the program and to communicate that more detailed information will be provided, as necessary, at a later date.
 - 2. A letter will be mailed to all potential subapplicants within the declaration area, at a minimum, advising of the availability of the HMGP funds. Accompanying the letter will be an HMGP Pre-Application Form that interested subapplicants must return to the SHMO. In addition, communities outside the declared disaster area may apply to the program. A Pre-Application will be mailed to communities with previously

- identified projects and/or previous exchanges with WEM as well as the County/Tribal Emergency Management Directors in non-declared counties. In addition, the Pre-Application and information is posted on WEM's website.
- 3. The HMGP Pre-Application Form is intended to assist the state in making an initial determination on project eligibility and prioritization prior to the subrecipient completing a formal application package. A Ranking and Scoring Pre-Application Worksheet is completed by the SHMO and the results are presented to the WSJHMT. The full project application package will be sent to the subapplicants, based on the estimated amount of funding available, whose projects have the highest priority ranking, are most viable, and have the greatest potential for funding. (See Section IX.D. Reviewing, Ranking, and Selecting projects.) Letters will be mailed to subapplicants whose projects are denied.
- 4. The SHMO may meet with communities completing the full application package to assist them in the application process. County/Tribal Emergency Management Directors will also be invited. The briefing will include the following: general program overview; eligibility; application process; selection process; project management; and technical assistance.
- 5. At the discretion of the SHMO and FHMO, a press release describing the program may be developed and issued.

IX. PROGRAM ADMINISTRATION

- A. Initial Application Process
 - 1. Within 60 days of the disaster declaration the state will notify FEMA in writing of its intent to participate or not participate in the HMGP. This is actually done twice, in that the Governor requests the HMGP in his request for a Presidential Disaster Declaration and the SCO/SHMO sends a letter to the Regional Administrator affirming that the state intends to participate in the HMGP. As needed, the SHMO will call upon FEMA Region V for technical assistance on program administration or management.
 - 2. The SHMO is responsible for ensuring that HMGP Subapplication Packages are distributed to all potential subapplicants. Potential subapplicants are those who have already gone through the Pre-Application process and whose projects have been selected for further funding consideration.
 - 3. Subapplicants for HMGP funding must submit a completed Subapplication Package within the timeframe specified by the SHMO. Submission of subapplications for mitigation projects are encouraged as soon as possible after the disaster occurs so that mitigation opportunities are not lost during reconstruction.
 - The Application Package will include a completed HMGP Application Form, signed Assurances, and any other documents deemed necessary to support the project including, but not limited to, those contained in Attachment D (see Section XIII. for a list of documents). The SHMO will use the information to complete the BCA and to

- assess the environmental impacts of the proposed project.
- 4. The subrecipient is required to have a FEMA-approved all-hazards mitigation plan to be eligible for project funds. A subrecipient who does not meet this requirement can apply for HMGP planning funds to develop a plan. The plan would have to be completed and approved within one year from the declaration date, and prior to receiving a project subaward.
- B. Special Considerations for Property Acquisition/Relocation Projects

Because of their unique nature, special considerations are required in the administration of acquisition and relocation projects. Subrecipients must comply with the special considerations found in 44 CFR 206.434(e); and Part 80, Property Acquisition and Relocation for Open Space; and any other related guidance. Section X covers the requirements for property acquisition and relocation in detail.

In general, properties eligible for acquisition include those where:

- The property will be acquired from a willing, voluntary seller.
- Property contains an at-risk structure, including those that are damaged or destroyed due to an event. In some cases, undeveloped, at-risk land adjacent to an eligible property with an existing structure may be eligible.
- All incompatible easements or encumbrances can be extinguished.
- The property is not contaminated with hazardous materials at the time of acquisition, other than incidental demolition or household waste.
- If the structure on the property is to be relocated, the relocated structure must be placed on a site located outside of any SFHA, outside of any regulatory erosion zones, and in conformance with any other applicable state or local land use regulations.
- The property cannot be part of an intended, planned, or designated project area for which the land is to be acquired by a certain date, and/or where there is an intention to use the property for any public or private future use inconsistent with the open space deed restrictions and FEMA acquisition requirements (examples includes roads and flood control levees).
- Once funds are awarded, the property will not be subdivided prior to acquisition, except for portions outside the identified hazard area, such as the SFHA or any risk zone identified by FEMA.

As part of the project subapplication, subrecipients must attach the Statement of Assurances for Property Acquisition Projects with the Warranty Deed Restrictions included. (See Attachment D.) In addition, the subrecipient must include with the subapplication, the completed and signed Notice of Voluntary Interest for each property owner that intends to participate in the project. The project subapplication will also include the Benefit-Coast Analysis Property Data Worksheet for each property, and a Budget Cost Worksheet. (See Attachment D.)

Upon acquisition of the property, the state will contact every three years the communities that have purchased land with HMGP monies and have them verify in writing that the open space requirements per 44 CFR 80.19(d) are being adhered to.

C. Special Considerations for Projects in Special Flood Hazard Areas (SFHAs)

For projects related to mitigation of properties in SFHA (e.g. elevation and floodproofing), each participating property owner's signed Acknowledgement of Conditions for having a property in an SFHA mitigated with FEMA subaward funds must be provided to the recipient and FEMA prior to award. The Acknowledgement must address the information identified on the Model Acknowledgement of Conditions for Mitigation of Property in an SFHA with FEMA Grant Funds (Attachment D), and have equivalent effect. Elevation of structure(s) must be in conformance with 44 CFR Part 60, Wisconsin Administrative Code NR116, and the local floodplain ordinance. Design for all structure elevation projects must be in accordance with ASCE 24-14. The lowest floor of the structure must be two feet above the base flood elevation or higher. Upon completion of the elevation of the structure, an Elevation Certificate verifying "as built" must be completed to ensure that the structure complies with local, state, and federal floodplain management requirements.

D. Reviewing, Ranking, and Selecting Projects

- 1. The SHMO and other mitigation staff will review the Pre-Applications submitted for HMGP funding. The eligibility of the subapplicants will be verified. The review of the Pre-Applications may reveal that eligible projects are competing for limited HMGP funding. The SHMO and staff will score, rank and prioritize the project based on FEMA and state criteria, information provided in the Pre-Application, and information gathered from site visits or community meetings.
- The SHMO will convene the WSJHMT to discuss the Pre-Applications and identify
 potential funding sources for projects as well as make sure there is no duplication of
 efforts among the agencies involved. Projects that are eligible for technical or
 financial assistance through other state or federal agencies will be referred to those
 agencies.
- 3. Based on the recommendations of the WSJHMT and the state priorities, the SHMO will make a formal recommendation to the SCO as to which projects should be selected for further HMGP funding consideration.
- 4. The SCO will make the final decision regarding the selection of projects for potential funding. Formal HMGP Subapplication Packages will be sent to those communities selected for further subaward consideration.
- 5. It should be noted that since 1993, FEMA has placed the acquisition of floodplain property as a priority for HMGP funding; and since 1998 FEMA has further designated the acquisition of repetitive loss and severe repetitive loss properties as their top priority. The following have been adopted as the state priorities for HMGP funds:

- a. Acquisition and demolition of floodplain properties determined to be substantially damaged per a community's floodplain zoning ordinance;
- b. Acquisition and demolition of repetitive loss and severe repetitive loss structures;
- c. Acquisition and demolition of damaged floodplain properties;
- d. Acquisition and demolition of floodplain properties;
- e. Acquisition and demolition of flood damaged properties not in the floodplain;
- f. Elevation or floodproofing or retrofitting flood damaged structures in the floodplain;
- g. Elevation or Floodproofing or retrofitting flood damaged structures not in the floodplain;
- h. Other hazard reduction projects (such as community or residential safe rooms, detention ponds, storm sewer improvements, protection of utilities, drainage, etc.).

Additional criteria:

- a. Mitigation activities that fit within an overall plan for development in the community, disaster area, or state;
- b. Mitigation activities that if not taken will have a severe detrimental impact on the community such as the loss of life, loss of essential services, damage to critical facilities, or economic hardship;
- c. Mitigation activities that have the greatest potential for reducing future disaster losses;
- d. Mitigation activities that are designed to accomplish multiple objectives, including damage reduction, environmental enhancement, historic preservation, tourism/recreation, economic recovery/development, and building community resilience to climate change;
- e. The community's level of interest and demonstrated degree of commitment to mitigation programs and activities.
- 6. The SHMO will review the formal HMGP applications to ensure that adequate information has been provided and the project meets the minimum eligibility requirements. The SHMO will contact the community to obtain any necessary additional information and involve appropriate members of the WSJHMT in the review process.

E. Submission of State Application for HMGP Funding

- Following completion of the subapplications and as soon as possible after the
 Presidential Disaster Declaration, the SHMO will submit them to the FEMA Region V
 Administrator. This will be accomplished within 12 months of the declaration. If
 necessary, two 90-day requests may be made to extend the application period. All
 funds will be obligated within two years of the declaration, whenever possible.
- 2. The SHMO will forward to FEMA the Subapplication Package that will contain the following:
 - a. DMA Form 139 (Section 404-HMGP Disaster Application) that includes:

Wisconsin HMGP Administrative Plan

- i. Name of the subrecipient and its assigned FIPS and DUNS number
- ii. Primary and secondary contact person for the project
- iii. Project cost estimate
- iv. Project title and description
- v. Project location (including maps)
- vi. Detailed scope of work for the project
- vii. Pictures of project
- viii. Work schedule with key milestones. The schedule should take into account time needed to meet any EHP conditions identified in the REC as well as time to obtain required permits.
- ix. Detailed budget with supporting documentation. The budget should support the activities identified in the scope of work. The budget should also include any anticipated costs for EHP compliance and identify any pre-award costs.
- x. Considered alternatives
- xi. Mitigation plan compliance
- xii. Environmental considerations
- xiii. Commitment for local match
- b. DMA Form 1017A (Assurances for Construction and Non-Construction)
- c. Statement of Assurances for Property Acquisition Projects (if applicable) with attached warranty deed restrictions
- d. Signed Notice of Voluntary Interest Form (if applicable)
- e. Model Acknowledgement of Conditions for Mitigation of Property in a Special Flood Hazard Area (if applicable)
- f. Completed BCA along with documentation and a narrative consistent with HMGP regulations
- g. Environmental review (Record of Environmental Consideration) consistent with 44 CFR Part 10
- 3. The SHMO will enter into NEMIS all appropriate information for each application
- 4. An email will be sent to FEMA informing them that a Subapplication Package has been forwarded to their office.

F. Phased Projects for Complex Projects

In rare circumstances it is beyond the subapplicant's technical and financial resources to provide the complete technical information required for a full eligibility or EHP review of a complex project. The state and FEMA may provide technical assistance to the subapplicant to develop a complete body of technical data by approving a subapplication to complete a Phase I design, engineering, EHP, or feasibility study. The Phase I study provides FEMA with the technical information concurred on by the subrecipient, the state, and FEMA to determine project eligibility. If the results of the Phase I review indicate that the project is eligible, technically feasible, cost-effective, and compliant with EHP requirements, the project would then be eligible for funding for construction under a Phase II approval. Phase I study finding is part of the project's total

estimated cost and is subject to the cost-share requirements.

G. Project Approval

- 1. Once a subapplication is submitted, FEMA Region V will complete an eligibility review within 60 days, or will request additional information. The Regional Administrator may extend this 60 day review for certain projects in extraordinary circumstances.
- 2. The state will provide any additional information requested within 30 days of the informal request. FEMA may provide technical assistance at the state's request.
- 3. If there is still additional information required, the state will provide it within 14 days of the request.
- 4. If the information is still not provided, FEMA will initiate a formal request for information and if the information is not provided by the state within 30 days the subapplication will be considered ineligible for funding and a denial letter will be sent.
- 5. Projects over \$1 million federal share will be reviewed to determine whether the project is a candidate for Strategic Funds Management (SFM.) If the project is appropriate for SFM, FEMA, the recipient, and the subrecipient will review the budget and work schedule to ensure that the project supports incremental obligation. Obligations are executed in increments based on the project meeting an established project milestone schedule until the project is completed. Projects that require an approved source of funding (full obligation) by the state procurement process in order to enter into procurement and contracting and projects in which most of the funds will be expended within six months are not required to use SFM.
- 6. After FEMA's mitigation staff approves a subapplication over \$1 million, they will forward a draft press release to Region V External Affairs Officer (EAO). The EAO will notify the appropriate congressional members and the SHMO. The project approval and announcement is considered "close hold" information, not to be shared until the congressional member is about to make the announcement. If the congressional member chooses not to make the announcement, the EAO will coordinate with the state's Public Affairs Officer and the SHMO on the use of a joint federal/state release.
- 7. If the project has been approved, the SHMO will prepare the subaward package that includes the approval letter; FEMA obligation documents; the Record of Environmental Consideration including any EHP award conditions; and the State-Local Hazard Mitigation Grant Program Assistance Agreement that will be signed by WEM and the subrecipient before the project can commence.
- 8. After the State-Local Hazard Mitigation Grant Program Assistance Agreement has been signed, the subrecipients will be directed to commence work on the project. The SHMO will provide the subrecipient with appropriate information on HMGP requirements, including how to request reimbursement of funds, the requirement to submit quarterly progress reports, requests for time extensions, the closeout process, etc.

H. Project Management

- WEM will be the recipient for project management and accountability of funds in accordance with 2 CFR Part 200.331. Approved subrecipients for HMGP funding are accountable to WEM (the recipient) for funds awarded to them.
- 2. The WEM Financial Management Officer (SFMO) will manage the accounts funded by FEMA for approved projects under the HMGP. The SFMO will not draw federal funds from the account until advised by the SHMO and FEMA has obligated funds for this purpose. The SFMO and SHMO will be jointly responsible for ensuring that all procurements using HMGP funds will follow the policies and procedures outlined in 2 CFR Part 200. By signing the Assurances that are part of the subapplication, the subrecipient is so agreeing.
- 3. The SHMO and the subrecipient will implement a record keeping and financial system for each project based upon the approved work schedule.
- 4. Subrecipients will submit Quarterly Status Reports to the SHMO. The due dates for these reports are January 15, April 15, July 15, and October 15. The SHMO in turn will submit a Quarterly Progress Report to FEMA within 30 days of the end of the quarter including reporting period, date of report, POC name and contact information; project identification information and project number, subrecipient, and project type; significant activities and developments since previous Quarterly Progress Report including comparison of accomplishments against the work schedule; percent completion and whether the project is on schedule; a discussion of any problems, delays, or adverse conditions that impair the ability to meet the scheduled completion date; status of costs and amount disbursed; whether an extension to the PoP is anticipated; incremental funding amounts (SFM), if any; and for acquisition projects the status of properties acquired that quarter. The SFMO is responsible for submitting the financial Quarterly Progress Reports to FEMA.
- 5. Upon completion of the subaward, the SHMO will certify to FEMA that costs incurred in the performance of eligible work are allowable, that the approved work was completed, and that the mitigation measure is in compliance with the Federal-State Agreement and the State-Local HMGP Assistance Agreement. A project closeout worksheet providing a complete assessment of project accomplishment will also be prepared by the SHMO and submitted to FEMA. The SFMO is responsible for submitting the final financial report to FEMA.
- 6. Subrecipients will maintain financial records and receipts necessary to document all their expenditures relative to their projects. Such records may include specifications, bid tabulations, contract awards, invoices, receipts, checks, job orders, equipment usage, payroll information, journal vouchers, and any other necessary documentation that would be required for an audit. A sample spreadsheet will be provided to each subrecipient. In procuring property and services, the recipient and subrecipients must follow the same policies and procedures used for procurement with non-federal funds and the requirements set forth in 2 CFR Section 200.317. In addition,

- subrecipients must follow 2 CFR Sections 200.318 through 200.326.
- 7. The SHMO will monitor and evaluate project accomplishments, and adherence to the approved scope of work, work schedule, and budget. Problems will be reported immediately to FEMA. If a subrecipient is found to be non-compliant with any of the agreed upon terms of the HMGP, the SHMO will take actions appropriate for the circumstances. In accordance with 2 CFR Part 200.308, the SHMO will obtain FEMA's approval whenever there is a proposed SOW change or a budget amendment is required.
- 8. The SHMO will monitor subrecipients and disclose to FEMA in writing real or potential conflict of interest that arise during the administration of the federal award within 15 days of becoming aware of the conflict.
- 9. The SHMO will review requests for reimbursement of expenditures, time extension requests, cost overruns, and appeals.
 - a. Reimbursement of Funds
 - 1) The reimbursement of funds will be based on expenditures already incurred within the dollar amount of the approved project.
 - 2) Advancement of funds may be made in some extraordinary situations upon prior approval of the state. The subrecipient will be advised to deposit any advance HMGP funds into a separate non-interest bearing bank account. If any interest is generated, the subrecipient will be instructed that those funds shall be expended for project administrative purposes before any additional project funds are drawn down. Subrecipients should reconcile earned interest each calendar quarter. If earned-and-expended interest exceeds \$100 at any time during the calendar year, all interest in excess of \$100 shall be returned to the U.S. Treasury. Documentation of actual expenses must be submitted to WEM within three business days of the subrecipient using advanced funds to make payment. Any excess advanced funds must be used toward future documented expenses for the same project or returned to WEM.
 - 3) A request for funds during project implementation must be submitted in writing to the SHMO. The request must be accompanied by adequate supporting documentation for both project and any in-kind match (2 CFR Part 200). The retention period begins at the time the subrecipient's closing report has been accepted by the state. (2 CFR Part 200)
 - 4) When the request is approved, disbursement documentation will be prepared and forwarded to the SFMO for processing. When the reimbursement check is received, the SHMO will forward it, along with a cover letter, to the subrecipient.
 - 5) If the request is denied, the subrecipient will be so advised, in writing, and given the reason for the denial.
 - b. Time Limits and Extensions
 - 1) Time Limits Generally, projects must begin within 90 days of subaward

- approval and be <u>completed</u> per the approved work schedule (no later than three years from the date funds were obligated for the project). The specific time schedule for each project will be detailed in the approved project subapplication. Exceptions may be granted for certain types of projects and/or extraordinary circumstances.
- 2) <u>Time Extensions</u> If a subrecipient is unable to complete a project by the time specified in the project application, the subrecipient must immediately notify the SHMO in writing and request a time extension. The request should explain why the completion deadline will not be met and what project work remains, and include a revised schedule for the remaining tasks in the project with a probable date for project completion. After reviewing the time extension request, the SHMO will notify the subrecipient of the decision.

If the extension request means that their activity period will go beyond the disaster close date, the SHMO will request up to a one-year disaster PoP extension. The SHMO will make this request to Region V at least 60 days prior to the close of the disaster. If at the end of the 1-year extension another extension is requested by the subrecipient, the SHMO again will submit the request to Region V at least 60 days prior to the "new" disaster close date. The disaster PoP cannot exceed seven years.

c. Cost Overruns

- 1) Subrecipients will be required to notify the SHMO in writing as soon as they determine that they will have a cost overrun. The letter should include the dollar amount of the overrun, the reason for the overrun, and provide appropriate justification and documentation (invoices, copies of contracts, pictures, etc.) to support the additional costs.
- 2) The SHMO will evaluate each cost overrun. If the evaluation indicates that the cost overrun is justified, if HMGP funds are available for an amendment to the subaward, and if the project remains cost-effective including the overrun, the SHMO will submit a request, along with supporting documentation, to the FHMO for review and approval prior to the subrecipient incurring costs.
- 3) The subrecipient will be notified in writing of the FHMO's decision on the overrun.

d. Appeals

- 1) An applicant may elect to appeal any decision made by the SHMO or FEMA on its project.
- 2) Such appeals must be made in writing to the SHMO and contain new or additional information that justifies reconsideration.
- 3) The subapplicant appeal must be submitted to the SHMO within 60 days of the date of the letter notifying the subapplicant of the action being appealed.
- 4) Upon receipt of an appeal from a subapplicant, the SHMO will review the material submitted and forward the appeal with a written recommendation to the FEMA Regional Administrator within 60 days.

- 5) The FEMA Regional Administrator has 90 days to make a determination on the appeal or to request additional information from the state.
- 6) If the FEMA Regional Administrator denies the appeal, the subapplicant may appeal again through the SHMO and FEMA Regional Administrator. This second appeal is sent to the FEMA Assistant Administrator for the Mitigation Directorate within 60 days of the Regional Administrator's denial. The Assistant Administrator for the Mitigation Directorate's appeal determination within 90 days will be FEMA's final administrative decision on the matter.

10. Program Income

Certain types of hazard mitigation projects will allow the subrecipient to earn income in the course of implementing the project (i.e. through salvage of property prior to demolition, etc.). FEMA encourages non-federal entities to generate program income to help defray program costs. Program income shall be applied to the project or deducted, in accordance with 2 CFR Part 200.80 and 200.307, from the total project costs. Subrecipients are advised to use non-interest bearing accounts.

11. Project Completion and Closeout

- a. Within 30 days of project completion, the subrecipient will notify the SHMO in writing. The written closeout letter and notification will include a final report along with the final reimbursement request, a signed copy of the Environmental Closeout Declaration and any required permits demonstrating compliance with EHP conditions.
- b. The SHMO will review the documentation to ensure that all claims and costs are eligible and that work performed is in compliance with the approved scope of work.
- c. The SHMO will authorize final payment of the federal and state shares of the subaward. Program income will be deducted from the total project costs per 2 CFR Section 200.307. In addition, the SHMO will also authorize payment of allowable subrecipient management costs, in accord with FEMA regulations and the State Administrative Plan. Such expenses will be listed separately from actual project-related expenditures.
- d. A site visit will be made by WEM staff to do a final inspection and take photographs of the completed project including geospatial coordinates.
- e. Upon completion of a project, the SHMO will prepare a Project Closeout Worksheet and submit it to FEMA for their approval and signature. In addition, the SHMO will request that FEMA complete the grant closeout process.
- f. When all projects under a single disaster have been completed, the SHMO will prepare the Declaration Closeout Letter and Worksheet for the HMGP and forward it to FEMA for their approval and signature requesting that HMGP for the declaration be closed. The SFMO will close out the HMGP financially by submitting SF-425, certifying project completion. All valid expenditures made in the performance period will be liquidated within 90 days of the expiration of the PoP. The SF-425 and closeout report will be submitted to FEMA no later than 90 days after the end date of the PoP.

12. Audits

- a. WEM and each subrecipient expending \$750,000 or more in federal financial assistance shall ensure that audits are conducted in accordance with 2 CFR Part 200, Subpart F.
- b. The SFMO will review audits for the recipient and subrecipient and report any problems to the SHMO and FEMA. The SHMO or SFMO will take appropriate or required action.
- c. If there is evidence of noncompliance, the SFMO will take appropriate corrective action within six months.
- d. If FEMA elects to conduct a federal audit of the HMGP, the recipient and all subrecipients will cooperate as necessary.

13. Technical Assistance

If a subapplicant requires technical assistance in the course of applying for and/or implementing a Hazard Mitigation Project, he/she should contact the SHMO. The SHMO will call upon appropriate agencies from the WSJHMT or coordinate with other state or federal agencies, or the regional planning commissions to provide such assistance.

14. Management Costs

In accordance with 44 CFR Part 207, the state can request FEMA provide a subaward equal to 4.89% of the HMGP ceiling for Management Costs. The subaward is awarded after the state provides adequate documentation to FEMA that supports the costs and activities for which funding will be used. Management costs can include indirect costs, administrative expenses, and any other expenses not directly chargeable to a specific project that are reasonably incurred by the recipient or subrecipient in administering and managing the HMGP program and awards.

- a. State Management Costs (SMCs) cover the cost to support activities and administer the HMGP. SMCs generally represent regular and overtime time salaries and associated fringe benefits of state personnel administering the HMGP and may include personnel costs for state staff housed in departments other than the Division of Emergency Management. Eligible staff costs include the state's cost of regular fulltime or part-time contractual personnel dedicated to the HMGP, and personnel with whom the state has contracted for specific tasks necessary for management and administration of the HMGP program such as certified review appraisers. The costs for goods and services, equipment, travel, per diem, lodging, financial transactions fees associated with project payments, and the subscription to the State Historical Society database to conduct historical and archaeological reviews also are components of SMC.
- b. The state may pass through to subrecipients management costs for their costs associated with the administration of their approved HMGP subaward. Costs can include those incurred for requesting, obtaining, and administering the subaward. This includes the costs for submitting quarterly reports, preparing requests for reimbursements, conducting inspections, completing closeout documents, and any

Wisconsin HMGP Administrative Plan

required audits. Subrecipient management costs may be up to 1% (one percent) of the final net eligible costs in their FEMA-approved HMGP subaward.

Additional funds may be requested in extraordinary situations with adequate documentation and if management cost funds are available.

The subrecipient must maintain documentation on management cost expenses. The subrecipient is not required to provide documentation to the state, but must maintain records for a minimum of three years after closeout of the HMGP for the disaster. Activities and costs that can be charged directly to the HMGP subaward with proper documentation are not eligible for management cost funding and should be charged as project costs.

The state will track funds expended for subrecipient management costs for each subrecipient on its budget summary spreadsheet as well as cumulatively for all subrecipients for the disaster.

- c. Determination of Management Cost Funding
 - 1) 35 days after the declaration date (or soon thereafter), FEMA will provide the state with the preliminary estimate amount for management costs based on projections of the federal share of the HMGP for the disaster. If requested by the state, FEMA will obligate up to 25% of the estimated SMC lock-in amount at this time.
 - 2) Six months after the date of declaration FEMA may obligate an additional 10% in SMC to the state if justified.
 - 3) 12 months after the date of the declaration, FEMA will determine the final lock-in amount for SMC based on the projections at that time of the federal share for the disaster. FEMA will obligate the remainder of the lock-in amounts to the state.

d. Requesting State Management Cost Funding

Following notification from FEMA of the preliminary estimate and within 120 days of the declaration date, WEM will submit an HMGP project narrative that describes the activities, projected personnel requirements, subrecipient management costs (if applicable), and other costs related to the management of the program for that disaster. In extraordinary circumstances FEMA may approve a request by the state for an extension for submitting the project narrative. Documentation to the support the SMC request will include the following:

- 1) The state's plan for expending and monitoring the funds and ensuring sufficient funds are budgeted for grant closeout.
- 2) An estimate of the percentage of pass-through funds the state will make available to subrecipients.

FEMA will approve or reject the HMGP project narrative on SMC within 30 days of receipt. If FEMA rejects the narrative, it will provide the state definitive reasons for the denial as well as clearly identify the additional documentation required for approval. The state will have 30 days to submit a revised narrative for consideration and approval.

Wisconsin HMGP Administrative Plan

Six months after the declaration date, the state may request an additional obligation of 10% of SMC funds if needed, based on the revised six-month estimate. This request for additional funds will include documentation to support the request.

12 months after the declaration date, FEMA will notify the state of the final lock-in amount. The state will submit a final SMC funding request, based upon the final lock-in amount, to the FEMA Regional Administrator. The final SMC funding request will include any necessary revisions to the required supporting documentation. FEMA will obligate the remaining funds upon approval of the final request.

The state's quarterly reports will include HMGP recipient and subrecipient SMC expenses.

The PoP end date for HMGP SMC will be 8 years from the date of the declaration, or six months after the last PoP end date of the other subawards, whichever is sooner.

15. Recipient and subrecipients must retain all records pertaining to the project for a period of 3 years (or longer) from the date of submission of the final expenditure report for the HMGP for the declaration in accordance with 2 CFR Sections 200.333 through 200.337.

X. SPECIAL CONSIDERATIONS FOR PROPERTY ACQUISITION/RELOCATION PROJECTS

Because of their unique nature, special considerations are required in the administration of acquisition and relocation projects. Subrecipients must comply with the special considerations, 44 CFR 206.434(e); Part 80, Property Acquisition and Relocation for Open Space; Hazard Mitigation Assistance Guidance Addendum, Part A; and any other related guidance.

A. State Roles and Responsibilities

- 1. Serve as the point of contact by coordinating with the subrecipients and with FEMA to ensure that the project is implemented per regulations.
- 2. Provide technical assistance to the subrecipients.
- 3. Ensure that projects are not framed in a manner that has the effect of circumventing federal regulations.
- 4. Ensure that the proposed activity complies with federal regulations including that the property acquisition activities remain voluntary in nature, and that the subrecipient and property owner(s) are aware of said requirement.
- 5. Submit subapplications in accordance to program schedules and requirements with all required information for FEMA to determine eligibility, technical feasibility, cost effectiveness, and environmental compliance.
- 6. Review any proposals for subsequent transfer(s) of property interest, obtain FEMA approval, and ensure that uses are compatible with open space requirements.
- 7. Review any proposals for leases or easements on property interest, obtain FEMA approval, and ensure the uses are compatible with open space requirements.

- 8. Make neither applications for nor provide federal disaster assistance or other FEMA assistance for the property or any open-space related improvements after the property is acquired.
- 9. Ensure that acquired properties remain in open space use in perpetuity.
- 10. Report on property compliance with open space requirements after award closeout. This will be done every three years by sending a letter on May 1 to all past property acquisition project subrecipients and requesting signed certification that will be due July 1.

B. Subrecipient Roles and Responsibilities

- 1. Coordinate with the state and property owner(s) to ensure that the project is implemented in compliance with federal regulations.
- 2. Submit subapplications to the state in accordance to program schedules and requirements with all required information for the state and FEMA to determine eligibility, technical feasibility, cost effectiveness, and environmental compliance.
- 3. Ensure that projects are not framed in a manner that has the effect of circumventing federal regulations.
- 4. Coordinate with the property owner(s) to ensure that they understand the benefits and responsibilities of the project and that participation in the program is voluntary.
- 5. Develop the project subapplication and implement the project in accordance with federal regulations ensuring that all terms of the required deed restrictions and subaward are enforced.
- 6. Consult with the U. S. Army Corps of Engineers and the state Department of Transportation to ensure that no future planned improvements, projects, or enhancements are under consideration that will affect the property(-ies).
- 7. Ensure that there are fair procedures and processes to compensate property owners and tenants for such items as determining property values and/or the amount of the mitigation offer, and reviewing property owner disputes regarding such offers.
- 8. Make neither application for federal disaster assistance, flood insurance, or other FEMA benefits for the property nor any open-space related improvements after the property is acquired.
- 9. Take and retain full ownership or if transferring or leasing the property, obtain state and FEMA approval.
- 10. Submit to the state and FEMA proposed uses on the property for open space compatibility determinations.
- 11. Monitor and report on property compliance, and respond to state requests for the status of compliance of the property, after the subaward is closed.

C. Pre-Award Requirements

FEMA may fund eligible pre-award project costs at its discretion and as funds are
available. Recipients and subrecipients may be reimbursed for eligible pre-award
costs for activities directly related to the development of the project proposal. The
costs can only be incurred during the open application period. Costs incurred prior to
subaward that are associated with actual implementation of the project are not
eligible.

D. Post-Award Requirements

1. Project Implementation

- a. The subrecipient will not acquire property contaminated with hazardous materials. A contaminated property must be certified clean prior to acquisition. This excludes disposal of incidental demolition and household hazardous wastes. Subaward funds cannot be used for clean-up or remediation of contaminated properties.
- b. The subrecipient will obtain a title insurance policy to ensure that it acquires property with clear title. The property interest generally must transfer by a Warranty Deed. Any incompatible easements or other encumbrances to the property must be extinguished before acquisition.
- c. The offer to purchase is based on the current fair market value of the property or the "pre-event" market value for the major disaster under which funds are available. When multiple disasters have affected the same property, the state and subrecipient(s) shall determine which is the relevant event.
- d. A property owner who did not own the property at the time of the event, or who is not a national of the United States or qualified alien, is not eligible for an offer to purchase based on pre-event market value for the property. Subrecipients will ask each participating property owner to certify that they meet the requirement prior to offering pre-event market value. If they are unable or unwilling to certify, they may be offered no more than the post-flood fair market value. If the property is under foreclosure, the offer to the bank will be post-flood fair market value or the remaining balance on the mortgage, whichever is less.
- e. Certain tenants who must relocate as a result of the project are entitled to relocation benefits under the Uniform Relocation Assistance and Real Property Acquisition Policies Act (such as moving expenses, replacement housing rental payments, and relocation assistance advisory services). They are also entitled to relocation assistance under the State's Relocation Assistance Law, State Statute 32.25.
- f. If an offer to purchase for a residential property is less than the cost for the homeowner occupant to purchase a comparable replacement dwelling outside of the floodplain in the same community, the subrecipient may make available a supplemental payment to the property owner in accordance with required criteria.
- g. The subrecipient must notify each property owner in writing of what it considers the fair market value of the property. The market value will be determined by an appraisal completed by a state-certified and licensed appraiser. The state will hire

- a Certified Review Appraiser who will review and approve the appraisals. The offer will clearly state that the property owner's participation in the project is voluntary. At the time the offer to purchase is presented, the property owner will be asked to sign the Statement of Voluntary Participation. If the property owner disagrees with the appraisal, they may get their own appraisal at their own expense and submit to the state for review.
- h. When pre-flood fair market value is utilized, the subrecipient will reduce the offer to purchase by the amount of any duplication of benefits (DOB). Deductions are not taken for any amounts the owner can verify with receipts that were expended on repairs or cleanup. DOB can consist of flood insurance proceeds, housing assistance, or other recovery assistance.
- i. Structures on the acquired property must be demolished or relocated within 90 days of acquisition. The FEMA Regional Administrator may grant an exception to this deadline only for a particular property based on written justification if extenuating circumstances exist, but a final date for removal must be specified.
- j. The subrecipient, upon settlement of the property, shall record the required Warranty Deed restrictions.

2. Land Use and Oversight

- a. Acquired property shall be dedicated to and maintained in perpetuity as open space for the conservation of natural and floodplain functions. Open space uses may include parks for outdoor recreational activities, wetlands management areas, nature preserves, cultivation, grazing, camping (except where adequate warning time is not available to allow for evacuation), unimproved unpaved parking lots, buffer zones, and other uses FEMA determines compatible with open space.
- b. Allowable uses generally do not include walled buildings, levees, dikes, floodwalls, paved roads, highways, bridges, cemeteries, landfills, storage of hazardous or toxic materials, above or below ground pumping and switching stations, above or below ground storage tanks, paved parking, off-site fill or other uses that obstruct the natural and beneficial functions of the floodplain.
- c. No new structures or improvements will be built on the property except those listed below and will be floodproofed or elevated to at least 2 feet above the base flood elevation:
 - 1) A public facility that is open on all sides and functionally related to a designed open space or recreational use.
 - 2) A public restroom.
 - 3) A structure that is compatible with open space and conserves the natural function of the floodplain, and which the FEMA Regional Administrator approves in writing before construction of the structure begins.
- d. Any improvements shall be in accordance with proper floodplain management regulations, policies, and practices.
- e. No federal entity or source may provide disaster assistance for any purpose nor

- may any application for such assistance be made to any federal entity or source for the acquired property.
- f. The property is not eligible for flood insurance coverage for damage to structures after the property is acquired except for pre-existing structures being relocated off the property as a result of the project.
- g. After acquisition of the property, the subrecipient shall convey any interest in the property only if the FEMA Regional Administrator, through the state gives prior written approval in accordance with federal regulations:
 - 1) The request must include a signed statement from the proposed transferee acknowledging and agreeing to be bound by terms of the federal regulations, and documents its status as a qualified conservation organization if applicable.
 - 2) Subrecipient may convey the property only to another public entity or a qualified conservation organization.
 - 3) Subrecipient may convey an easement or lease to a private individual or entity for purposes compatible with the uses described above with prior approval of the FEMA Regional Administrator.
 - 4) Conveyance of any property must reference and incorporate the original deed restrictions, and include a provision for the property's ownership to revert to the subrecipient or state in the event that the transferee ceases to exist or loses it eligible status.
- h. FEMA and the state have the right to enter upon the property, at reasonable times and with reasonable notice, to inspect the property to ensure compliance.
- i. Every three years the subrecipient will provide a report to the FEMA Regional Administrator, through the state, certifying that they have inspected the property within the preceding month and that the property continues to be maintained consistent with the federal open space requirements and the subaward.
- j. The subrecipient, state and FEMA are responsible for taking measures to bring the property back into compliance if the property is not maintained according to federal regulations.
 - 1) The state will notify the subrecipient and any holder of the property in writing and advise them that they have 60 days to correct the violation.
 - 2) If the subrecipient or any current holder of the property fails to demonstrate a good faith effort to correct the violation within the 60-day period, the state shall enforce the terms of the subaward by taking measures it deems appropriate.
 - 3) FEMA may take measures it deems appropriate including, but not limited to withholding FEMA mitigation awards and assistance from the state and subrecipient; requiring transfer of title; and bringing an action at law or inequity in a court of competent jurisdiction against the state, subrecipient and/or respective successors.

E. Close-out Requirements

Upon closeout of the subaward, the subrecipient, through the state, shall provide FEMA the following:

- 1. A copy of the recorded Warranty Deed for each property with the FEMA-required deed restrictions included.
- 2. A photo of each property that was acquired after project completion.
- 3. The latitude and longitude coordinates for each property acquired.
- 4. For repetitive loss or severe repetitive loss properties, a completed FEMA Form AW-501 documenting the completion of mitigation.
- 5. Other information as deemed appropriate by the FEMA Regional Administrator and the state.

XI. PROGRAM ADMINISTRATION BY STATES

The state (recipient) may participate in the Program Administration by States (PAS) initiative and be delegated additional defined responsibilities by FEMA based on an analysis of state staffing plan, award management and hazard mitigation experience, and demonstrated past performance. In return for assuming additional responsibilities, the state will have increased control and oversight in implementing the HMGP. The state may apply for PAS at any time by submitting a request letter to the FEMA Regional Office indicating which activities the state is interested in managing and containing the supporting documentation. The FEMA Regional mitigation staff will review and evaluate the request within 30 days against certain criteria. If the Region determines the state meets the criteria, they will work with the state on drafting an operational agreement. If denied, FEMA will send a letter indicating the reasons why the request was denied. The operational agreement outlines the agreed-upon delegations. The agreement will define applicability, FEMA and state responsibilities, and the process for withdrawing from the program if FEMA determines the state is not administering the HMGP in a satisfactory manner. Updated operational agreements will be developed for each declared disaster after which the state requests delegation of some elements of HMGP administration. In addition the state will update the HMGP Administrative Plan to including an addendum outlining the components the state will administer for the particular disaster.

XII. PLAN REVIEW AND UPDATING

A. This Administrative Plan will be reviewed annually to ensure compliance with law, implementing regulations, and state policies. It will be updated as needed to reflect regulatory or policy changes, or to improve program administration. Upon update, it will be submitted to FEMA Region V for review and approval.

The FEMA Regional Administrator shall acknowledge receipt of the plan in writing to WEM and the SHMO. Written comments from FEMA shall state whether the plan is approved, shall detail any shortcomings, and shall include a suggested method and timeline for correction, if necessary.

B. Following a Presidential Disaster Declaration, the SHMO will prepare within 30 days any updates, amendments, or revisions to the plan that are required in order to meet current policy guidance or changes in the administration of the Hazard Mitigation Grant Program. The plan will be submitted to FEMA Region V for approval.

XIII. ATTACHMENTS

- A. State Notification Letter of Intent to Participate in the HMGP
- B. Pre-Application:
 - 1. HMGP Pre-Application Cover Letter
 - 2. HMGP Pre-Application (DMA Form 141)
- C. Pre-Application Ranking:
 - 1. Pre-Application Ranking Instructions
 - 2. Pre-Application Ranking Form (DMA Form 140)
- D. HMGP Formal Application Package:
 - 1. Instructions for Applicants
 - 2. Environmental Assessment Requirements

Acquisition Projects

- 3. Cover Letter Acquisition
- 4. Checklist Acquisition
- 5. Section 404-HMGP Disaster Application Acquisition (DMA Form 139A)
- 6. Statement of Assurances for Property Acquisition Projects
- 7. Model Warranty Deed Restrictions
- 8. Budget Cost Worksheet Acquisition
- 9. Property Data Worksheets Acquisition
- 10. Declaration and Release (FEMA Form 90-69B)
- 11. Notice of Voluntary Interest
- 12. Model Statement of Voluntary Participation

Elevation Projects

- 13. Cover Letter Elevation
- 14. Checklist Elevation
- 15. Section 404-HMGP Disaster Application Elevation (DMA Form 139B)
- 16. Budget Cost Worksheet Elevation
- 17. Property Data Worksheet Elevation
- 18. State Model Acknowledgement of Conditions for Mitigation of Property in SFHA with FEMA Grant Funds
 - a. FEMA Model Acknowledgement of Conditions for Mitigation of Property in SFHA with FEMA Grant Funds

Structural and Other Projects

- 19. Cover Letter Structural/Other
- 20. Section 404-HMGP Disaster Application (DMA Form 139) Structural/Other

- 21. Damage Assessment Worksheet
- 22. Application Tips Safe Room
 - a. Checklist Safe Room
- 23. Application Tips Localized Flood Control
 - a. Checklist Localized Flood Control
- 24. Checklist Generator
- 25. Instructions for Applicants Planning
- 26. Section 404-HMGP Disaster Application Planning
- 27. Assurances (DMA Form 1017A)
- 28. EHP Checklist (page 146 in FEMA's 2015 HMA Guidance)
- E. National Environmental Policy Act:
 - 1. Request Letter for Categorical Exclusion Information
 - 2. Concurrence Form
 - 3. Record of Environmental Consideration
 - 4. Public Notice Procedures
 - 5. Final Public Notice
 - 6. Environmental Closeout Declaration
- F. Notification Letter of Subaward Approval
- G. State/Local Assistance Agreements:
 - 1. State/Local HMGP Assistance Agreement (Acquisition)
 - 2. State/Local HMGP Assistance Agreement (Elevation)
 - 3. State/Local HMGP Assistance Agreement (Structural/Other)
 - 4. State/Local HMGP Assistance Agreement (Planning)
- H. Request for Reimbursement of Funds (DMA Form 167)
- I. Sample Budget Summary Spreadsheet
- J. Subrecipient Quarterly Status Report
- K. Recipient Quarterly Report Spreadsheet
- L. Subaward Closeout:
 - 1. Subaward Closeout Request Letter
 - 2. Project Subaward Closeout Worksheet (DMA Form 143)
 - 3. Planning Subaward Closeout Worksheet (DMA Form 143A)
 - 4. State Management Costs Subaward Closeout Request
- M. Declaration Closeout:
 - 1. Declaration Closeout Request Letter
 - 2. Declaration Closeout Worksheet (DMA Form 142)
- N. Land Use Requirements:
 - 1. Open Space Monitoring Letter
 - 2. Open Space Certification Form
- O. State Management Costs Project Narrative

<u>Date</u>
Mr/s.
Regional Administrator
Federal Emergency Management Agency
536 South Clark Street, 6 th Floor
Chicago IL 60605
Dear:
I would like to inform you of the Ctote's intention to analy for the Costion 404 Harrard
I would like to inform you of the State's intention to apply for the Section 404, Hazard Mitigation Grant Program under declaration FEMA-XXXX-DR-WI declared Month DD
YYYY. The State of Wisconsin Hazard Mitigation Plan was approved as an enhanced
plan on Month DD, YYYY with an expiration date of Month DD, YYYY.
plan on allowing 22, 1211 with an emphasion date of allowing 22, 1211
Pre-applications for the Hazard Mitigation Grant Program will be sent to communities
statewide in the near future. My staff has also started coordination with the Wisconsin
Department of Natural Resources.
If you have any questions, please call, State Hazard Mitigation Officer, at (608) 242-XXXX, or, Mitigation Section Supervisor, at (608) 242-XXXX
, Witigation Section Supervisor, at (008) 242-AAAA
Sincerely,
y,
, State Coordinating Officer
Wisconsin Emergency Management
Cc:, Director, Mitigation Division, FEMA, Region V

DATE: Month DD, YYYY

TO: Local Officials and Zoning Administrators in communities included in Federal

Disaster Declaration FEMA-XXXX-DR-WI

County and Tribal Emergency Management Directors

County Board Chairpersons

Local Officials of other selected communities

FROM: State Hazard Mitigation Officer Mitigation Section Supervisor

SUBJECT: PRE-APPLICATION FOR THE SECTION 404-HAZARD MITIGATION

GRANT PROGRAM

As a result of Presidential Disaster Declaration FEMA-XXXX-DR-WI, funding is available for mitigation activities through the Section 404-Hazard Mitigation Grant Program. The counties that were included in the declaration as a result of (disaster type) between (dates) are (list counties).

The Hazard Mitigation Grant Program (HMGP) provides grants to state and local governments, eligible private non-profit organizations, and Indian tribes to fund **long-term, permanent mitigation measures** following a major disaster declaration. These grants are available statewide and are 75% Federally funded through the Federal Emergency Management Agency (FEMA) and 12.5% state funded through Wisconsin Emergency Management (WEM), with a 12.5% required local match. The local match can be a soft or in-kind match; it can also be provided by other funding sources as long as they are non-Federal. In addition, the local match can be greater than 12.5% of the total project cost. The HMGP funds available for this declaration are estimated at \$_____ and are based on 15% (20%) of the federal funds spent on the Public Assistance (and Individual Assistance Programs) for the declaration.

The objective of the program is to eliminate or reduce future disaster damages to improved **property.** Grants can be used to fund projects on public or private property. Eligible projects include, but are not limited to, the acquisition and relocation of flood-prone properties, floodproofing or retrofitting measures including elevation, wind resistant retrofitting or construction, and construction of community and residential safe rooms. Other fundable projects include the development of mitigation standards to protect structures from disaster damages and small localized flood reduction projects such as detention ponds. Stormwater management system improvements are also fundable, as are Climate Resilient Mitigation Activities as defined by FEMA (including aquifer storage and recovery, floodplain and stream restoration, flood diversion and storage, and green infrastructure). In addition, funds are available for developing or updating local all-hazards mitigation plans. A project can be considered for funding even if damages did not occur during this event as long as the application shows that past damages have occurred and that the project can reduce future damages. Mitigation for hazards other than flooding can be considered as long as the project meets program criteria. The program does not fund disaster repairs, equipment purchases, plans or studies that provide analysis without implementation, or projects that are already started or completed.

To be eligible for HMGP funding, specific criteria must be met:

- 1. The community must be participating and in good standing in the National Flood Insurance Program (NFIP) if a special flood hazard area (SFHA) has been identified by FEMA.
- 2. The proposed project must be cost-effective and show that the benefits of the project will outweigh the cost. It must pass the Benefit Cost Analysis, which is typically the most difficult requirement for project approval.
- 3. The project must be environmentally sound. Environmental documentation will be required prior to funding.
- 4. The applicant must show that at least two other alternatives were considered, and that the alternative selected is the most feasible approach to addressing the identified problem. The applicant must demonstrate that the proposed project will eliminate or substantially reduce future disaster damages.
- 5. The applicant must have a FEMA-approved all hazards mitigation plan. The proposed mitigation measure must be in conformance with the goals and objectives of the local hazard mitigation plan as well as the State Hazard Mitigation Plan. Those communities without a FEMA-approved plan may apply for HMGP funds for the development of such a plan. The plan would have to be completed, adopted, and approved by FEMA within one year of the declaration prior to receiving any project grant funds. In addition, those communities that have an approved mitigation plan may apply for HMGP funds to revise or update their existing plan to meet the five-year plan update requirement. Wisconsin Emergency Management encourages the development of countywide hazard mitigation plans.

HMGP funds are available statewide. Communities in the declared area will receive priority consideration and are strongly encouraged to apply for this program. For each proposed project, complete the enclosed Pre-Application Form and attach any pertinent supporting information. Submit it to this office no later than (date).

WEM staff will review, score, rank, and prioritize submitted pre-applications to determine which projects meet the program requirements and align with State and Federal mitigation priorities. Applicants whose proposed projects have the greatest potential for funding approval will be asked to submit a detailed formal application. After a formal review process, projects that meet the program requirements and have the greatest potential for preventing or reducing future disaster damages will receive HMGP grant approval based on available grant dollars.

Both FEMA and the State prioritize the acquisition, demolition, relocation, floodproofing, or elevation of floodplain properties. HMGP pre-applications for such projects will receive priority consideration, with the mitigation of substantially damaged structures receiving the highest priority. Substantially damaged properties are those structures that have incurred damages that exceed 50% of the equalized assessed value. HMGP funds can be used to fund structural projects if the project will eliminate or substantially reduce damages to improved property.

Pre-applications that do not receive further consideration for HMGP funding will be referred to the Wisconsin Hazard Mitigation Team members for funding under other programs that may be available through the agencies represented in the group.

Mitigation projects not funded through HMGP under this declaration may be considered under other FEMA mitigation programs such as the Pre-Disaster Mitigation and Flood Mitigation Assistance Programs. These programs have annual funding cycles. The application period for these programs is from ______ until ______. The Hazard Mitigation Assistance (HMA) Unified Program Guidance can be found at: https://www.fema.gov/hazard-mitigation-assistance.

If you have any questions, please feel free to call me at (608) 242-3211; Katie Sommers at (608) 242-3222; Caitlin Shanahan at (608) 242-3214; or Margaret Zieke at (608) 242-3252.

Enclosures:

Pre-Application, Section 404-Hazard Mitigation Grant Program, DMA Form 141 Hazard Mitigation Grant Program

Cc: Wisconsin Emergency Management Regional Directors Wisconsin Hazard Mitigation Team Regional Planning Commissions

STATE OF WISCONSIN

Division of Emergency Management Section 404-Hazard Mitigation Grant Program FEMA-4276-DR-WI Pre-Application Form

1.	APPLICANT:		COUNTY:
2.	PRIMARY CONTACT PERSON:		
	TITLE:		
	STREET ADDRESS:		
	CITY:		STATE: ZIP:
3.	ALTERNATE CONTACT PERSON:		
	TITLE:		
	TELEPHONE:	_ E-MAIL:	
4.	TYPE OF PROJECT		
5.	Acquisition and demolition Elevation/floodproofing Relocation Flood diversion/storage Aquifer storage and recovery Floodplain/stream restoration Infrastructure retrofit MITIGATION PLANNING Name of surrent All Llagards Mitigations	n	Wildfire Mitigation Soil Stabilization Education Other
	Name of current All-Hazards Mitigati	ion Plan:	
	Plan approval date:	Plan	expiration date:
	Reference to proposed project/mitig	ation action i	n Plan (attach copy of relevant section):
	Page number(s)		

DMA Form 141 ATTACHMENT B

6.	PROJECT LOCATION Road or street address, legal description, latitude/longitude, etc. Include legible maps/drawings of the location. Attach a map showing the range and section for the project area.
7.	IS PROJECT LOCATED IN A 100-YEAR FLOODPLAIN?
	No
	Yes (attach FIRM map): Floodway Flood fringe
8.	PROJECT DESCRIPTION For acquisition projects, please include a description of how the resulting open space will be used.
9.	DESCRIPTION OF THE PROBLEM TO BE MITIGATED BY PROJECT
10.	DESCRIPTION OF PAST DAMAGES Include damages to improved property, infrastructure, as well as public safety costs, economic impact, etc.

DMA Form 141 ATTACHMENT B

11.	PAST DAMAGE FREQUENCY List the number of times or the years that the event has occurred causing damages or other problems.
12.	HOW WILL THE PROPOSED PROJECT ELIMINATE OR REDUCE FUTURE DAMAGES?
13.	OTHER ALTERNATIVES CONSIDERED FOR SOLVING THE PROBLEM: List at least two. One alternative can be "do nothing."
14.	TOTAL ESTIMATED COST OF THE PROJECT: Attach any available supporting documentation, such as preliminary engineering designs, estimated costs from contractors, studies or reports, pictures, etc.
15.	POTENTIAL SOURCE(S) OF FUNDING FOR APPLICANT SHARE (12.5%):

Please attach any additional supporting information that is pertinent to the proposed project.

DMA Form 141 ATTACHMENT B

RETURN COMPLETED PRE-APPLICATION FORM NO LATER THAN ______ TO:

STATE OF WISCONSIN DEPARTMENT OF MILITARY AFFAIRS WISCONSIN DIVISION OF EMERGENCY MANAGEMENT **ATTN: STATE HAZARD MITIGATION OFFICER 2400 WRIGHT STREET** P.O. BOX 7865 MADISON, WI 53707

STATE OF WISCONSIN HAZARD MITIGATION GRANT PROGRAM FEMA-4276-DR-WI

Pre-Application Ranking Instructions

Introduction

It is the responsibility of the State to identify and select hazard mitigation projects to be recommended to the Federal Emergency Management Agency (FEMA) for final approval and funding of the Hazard Mitigation Grant Program (HMGP) under the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988.

In order to do this, the Division of Emergency Management established the Wisconsin Interagency Disaster Recovery Group (IDRG) now referred to as the Wisconsin Hazard Mitigation Team (WHMT) after the 1993 mid-west floods. WEM will review, evaluate, and rank eligible preapplications and present the findings to the WHMT for further review and discussion of funding options among the programs available through the various agencies represented. The WHMT members include representatives of the following State agencies: The Departments of Military Affairs, Administration, Commerce, State Historical Society, Natural Resources, Transportation, Health Services, Safety and Professional Services, and Agriculture, Trade and Consumer Protection, the Public Service Commission, the Office of Commissioner of Insurance, and other agencies as deemed appropriate. In addition, a representative from the Regional Planning Commissions, the Wisconsin Association of Floodplain, Stormwater and Coastal Managers, Wisconsin Emergency Management Association, Volunteer Organizations Active in Disasters, Cooperative Network, and the University of Wisconsin-Extension also participate. The following federal agencies are included in the Group: U.S. Department of Agriculture, Economic Development Administration, Federal Emergency Management Agency, U. S. Geologic Service, U. S. Army Corps of Engineers, and the Department of Housing and Urban Development.

Before an applicant will be considered for HMGP funding, it must meet minimum criteria set by FEMA and the State. These criteria include:

- 1. The proposed project must align with the goals of the local and State Hazard Mitigation Plans.
- 2. The proposed project must not encourage development in Special Flood Hazard Areas.
- 3. Communities that have mapped flood hazard areas must participate in the National Flood Insurance Program and be in good standing.
- 4. The proposed project must be listed in the community's All-Hazard Mitigation plan and in conformance with the comprehensive land use plan or capital improvements program where such plans and programs exist.

Procedures

The WEM Mitigation staff will review HMGP pre-applications to ensure that the proposed projects are eligible and meet the above criteria. Based on this review, staff will then rank the

pre-applications. After discussion with the WHMT, a list of recommended projects based on ranking and funding availability will be submitted to the WEM Administrator for approval. Some projects may be referred to other agencies for appropriate funding. In addition, the WHMT will "package" funding for projects where possible to maximize the funding that is available. Proposed projects with the highest priority will be invited to complete a formal application for HMGP funding.

Priority/Ranking System

Proposed projects will be evaluated based on Project Type, Site Vulnerability, Project Benefits, and other considerations. Non-structural projects, including those that involve acquisition, relocation, and elevation, will receive top priority for funding.

STATE OF WISCONSIN HAZARD MITIGATION GRANT PROGRAM FEMA-4276-DR-WI

Pre-Application Ranking

APPLICANT:	COUNTY:		
AMOUNT REQUESTED: \$	SCORE:	RANK:	

	Points	Points
PROJECT TYPE	Possible	Received
Ineligible Activities Warning systems; purchase of equipment; dams, levees, large floodwalls or berms; planning without implementation	Ineligible projects will not be reviewed.	
Non-Structural Mitigation		
Acquisition		
Residential	35	
Critical Facility	35	
Commercial	25	
Relocation		
Residential	30	
Critical Facility	30	
Commercial	20	
Elevation		
Residential	25	
Critical Facility	25	
Commercial	15	
Planning (with implementation)	10	
Zoning ordinance and/or building code development and implementation	15	
Educational Programs for public officials and citizens	15	
Climate Resilient Mitigation Activities		
Aquifer Storage and Recovery	15	
Floodplain and Stream Restoration	20	
Flood Diversion and Storage	15	
Green Infrastructure	20	
Other	15	

DMA Form 140 ATTACHMENT C

Structural Mitigation		
Small Localized Flood Reduction		
Storm Water Drainage Improvements		
Detention/Retention Ponds	10	
Storm Sewer Improvements		
Other		
Safe Rooms		
Retrofitting Existing Facility	10	
Residential Safe Rooms	15	
Community Storm Shelter	20	
Bluff/Soil Stabilization	5	
Channelization	5	
Construction of small levees, berms, or floodwalls for critical facilities	5	
Erosion and sediment control	5	
Generators for critical facilities	5	
Other	5	
Project Type Section Sub-Total	35	

SITE VULNERABILITY	Points Possible	Points Received
Flood Event Frequency		
5 or more events in the last 30 years	25	
4 events in the last 30 years	20	
3 events in the last 30 years	15	
2 events in the last 30 years	10	
1 events in the last 30 years	5	
0 events in the last 30 years	0	
Does the Project involve removing structures from the:		
Floodway	10	
Flood Fringe	5	
Does the project provide mitigation for:		
Repetitive loss properties?	15	
Severe repetitive loss properties?	20	
Does the project mitigate substantially damaged properties?	20	
Does the project address multiple hazards?	10	
Site Vulnerability Section Sub-Total	85	

DMA Form 140 ATTACHMENT C

PROJECT BENEFITS	Points Possible	Points Received
Does the project alleviate or reduce the need for emergency services during disasters?	5	
Does the project alleviate or reduce damages to improved structures?	10	
Does the project have a beneficial impact on more than one community or is it multi-jurisdictional?	10	
Does the project solve a problem independently or is it part of another solution with assurance that the project will be completed?	5	
Is the project a long-term solution to a repetitive or imminently dangerous situation?	10	
Does the project directly prevent death and injury by reducing a person's vulnerability to the hazard?	5	
Does the project substantially reduce future disaster costs?	10	
Does the project reduce the cost of repairing repetitive damages?	10	
Does the project restore floodplains and/or wetlands?	5	
Does the project have multiple objectives such as damage reduction, environmental enhancement and economic recovery?	10	
Does the project promote economic growth and community development?	10	
Does the project promote development of recreational areas/historic areas?	10	
Does the project provide flood protection beyond the 100-year flood event?	10	
Does the project alleviate or reduce the negative impacts of changing future conditions and natural hazard risks, as identified in the Risk Assessment component of the State Hazard Mitigation Plan?	10	
Project Benefits Section Sub-Total	120	

OTHER ITEMS TO CONSIDER	Points Possible	Points Received
Is the project in the declared area?	10	
Mitigation Plan		
Approved and adopted	10	
In development or update	5	
Expired/no plan	0	
Does the proposed project involve the use of innovative approaches to mitigation or mitigation measures?	5	

DMA Form 140 ATTACHMENT C

Has the applicant submitted the project under a previous disaster?	5	
Are other agencies willing to provide funds towards funding the project?	10	
Is the applicant willing to put funds towards the project over and above the 12.5% local match?	10	
Are there HMGP funds available to fund the entire project?	5	
Will the project require future maintenance?	-10	
Has the community successfully implemented previous mitigation grants?	10	
Does the community participate in the CRS?	5	
Other Items Section Sub-Total	70	

TOTAL SCORE	300	
PROJECT RANK		1

HAZARD MITIGATION GRANT PROGRAM INSTRUCTIONS FOR SUBAPPLICANTS

About the Hazard Mitigation Grant Program (HMGP)

The HMGP is a federal program administered in the state by the Wisconsin Division of Emergency Management (WEM). The objective of the program is to reduce repetitive losses from natural disasters. This is accomplished by funding cost-effective projects that eliminate or reduce future disaster expenditures for repair or replacement of public and private property, and for the relief of personal loss, hardship, and suffering. *Note: Projects cannot be retroactively funded through HMGP. Therefore, projects already in progress or completed will not be considered.*

Minimum Project Criteria

- 1. To be eligible for HMGP funding, a project must meet the following minimum criteria:
- 2. Conform with the state and local hazard mitigation plans.
- 3. Have a beneficial impact upon the designated disaster area, whether or not located in the disaster area.
- 4. Conform with 44 CFR Part 9, Floodplain Management and Protection of Wetlands, and 44 CFR Part 10, Environmental Considerations. (Refer to the attached Environmental Assessment Requirements.)
- 5. Solve a problem independently or constitute a functional portion of a solution where there is assurance that the project as a whole will be completed. Projects that merely identify or analyze hazards or problems are not eligible.
- 6. Be cost-effective and substantially reduce the risk of further damages, hardship, loss, or suffering resulting from a major disaster. WEM, using information supplied by the subapplicant, must demonstrate this to the Federal Emergency Management Agency (FEMA) by documenting that the project
 - A. Addresses a problem that has been repetitive, or a problem that possesses a significant risk if left unsolved.
 - B. Will not cost more than the anticipated value of the reduction in both direct damages and subsequent negative impacts to the area if future disasters were to occur. Benefit-cost analyses will be conducted on subapplications submitted to determine cost effectiveness of the proposed project.
 - C. Has been determined to be the most practical, effective, and environmentally sound alternative after considering a number of options.
 - D. Contributes, to the extent practicable, to a long-term solution to the problem it is intended to address.
 - E. Considers long-term changes to the areas and entities it protects, and has manageable future maintenance and modification requirements.
 - F. Is in conformance with the goals and objectives of the community's hazard mitigation plan.

Additional Criteria

In addition to the above federal criteria, a community must have a FEMA-approved hazard mitigation plan to be eligible for project funds. Subapplicants that do not have a hazard mitigation plan will be required to develop a plan and have the plan approved within 12 months of the declaration to be considered for funding.

Instructions for Completing the Subapplication for HMGP

Eligible subapplicants must apply for the HMGP through WEM. The HMGP subapplication will be reviewed and evaluated by WEM and FEMA before a final decision regarding project approval is made. No projects will be retroactively funded through the HMGP.

- 1. Read and review all of the attached documents carefully.
- 2. Complete the Disaster Subapplication for Section 404-Hazard Mitigation Grant Program Funding (DMA Form 139 or 139A) as thoroughly and accurately as possible. Be sure to sign and date the subapplication.
- 3. Sign and date the Assurances (DMA 1017A).
- 4. Send two copies of the signed and completed subapplication and any supporting documentation along with the Assurances to the address provided on the subapplication.
- 5. Along with the hard copy, submit the subapplication and supporting documentation electronically if possible.

Subapplicants will be notified by letter of the approval/disapproval of their application. This will be done after thorough review at the earliest possible date.

Questions regarding the subapplication process or program administration should be directed to Roxanne Gray, Mitigation Section Supervisor, at (608) 242-3211, roxanne.gray@wi.gov; Katie Sommers, State Hazard Mitigation Officer, at (608) 242-3222, katie.sommers@wi.gov; Caitlin Shanahan, Disaster Response and Recovery Planner, at (608) 242-3214, caitlin.shanahan@wi.gov; or Margaret Zieke, Disaster Response and Recovery Planner, at (608) 242-3252, margaret.zieke@wi.gov.

STATE OF WISCONSIN
Department of Military Affairs
Division of Emergency Management
2400 Wright Street
P.O. Box 7865
Madison, WI 53707-7865

STATE OF WISCONSIN Division of Emergency Management

Hazard Mitigation Grant Program (HMGP) Environmental Assessment Requirements

The National Environmental Policy Act (NEPA) of 1969, Public Law 91-190, as amended, requires that environmental information be available to public officials and citizens before decisions are made and actions are taken. This information is consolidated and analyzed in environmental documents, either Environmental Assessments or Environmental Impact Statements. It is FEMA's responsibility to prepare the environmental document, although the project subapplicant will be required to provide much of the basic information, including any special studies that need to be performed. Coordination with all appropriate agencies and individuals is very important.

The environmental review must be completed before FEMA can make a funding determination. Depending on the project, this process can be quite time consuming.

Certain projects funded under HMGP may be categorically excluded from an environmental review. There are 18 categories of projects that may be excluded from an extensive environmental review. Projects that fit within one of the categories do not receive blanket exclusions. The subapplicant must still demonstrate that the project will not have any associated "extraordinary circumstances" within the project area. Presence of extraordinary circumstances will require an Environmental Assessment or Environmental Impact Statement.

<u>Authority</u>: Projects funded under the HMGP must comply with all appropriate environmental laws and regulations including the National Environmental Policy Act (NEPA) of 1969, PL 91-190, as amended; Executive Order 11988, Floodplain Management; and Executive Order 11990, Protection of Wetlands. Detailed guidance for implementing NEPA can be found in FEMA regulations at 44 CFR Part 10. 44 CFR Part 9 addresses compliance with Executive Orders 11988 and 11990. Other environmental legislation that may be applicable in this process includes: Section 7 of the Endangered Species Act of 1973, Section 106 of the Historic Preservation Act of 1966, Section 40(b)(1) of the Clean Water Act of 1977, and Section 10 of the Rivers and Harbors Act of 1899.

Further information regarding the environmental review requirements that must be met for a particular (potential) HMGP project will be forwarded by Wisconsin Emergency Management to the applicant, as appropriate.

Date

Subapplicant Address City, State Zip

Dear XXXX:

As a result of federal disaster declaration FEMA-4276-DR-WI declared (date), funding was made available through the Hazard Mitigation Grant Program (HMGP) to provide subawards to local governments to fund long-term and permanent mitigation measures. The subawards are 75% federally funded through the Federal Emergency Management Agency (FEMA) and 12.5% state funded through this Division. The remaining 12.5% is the required local match. The local match can be greater than 12.5%. The objective of the program is to prevent or reduce future disaster damages. Subawards can be used to fund projects on either public or private property.

The amount of federal funds available for the HMGP is equivalent to 20% of the federal funds spent through the Public Assistance program for the declaration. It is estimated that there will be approximately \$XXXX in HMGP funds available for this declaration. This office received XX pre-applications exceeding \$XXXX. As you can see, the demand for mitigation dollars far outweighs the amount of funding available.

The Wisconsin Division of Emergency Management (WEM) has completed a thorough review of the pre-applications. As advised in the letter you received with the pre-application, those projects involving acquisition, demolition, relocation, and floodproofing or elevation of floodplain properties will remain the State's highest priority for HMGP projects. Projects that will make the biggest impact for preventing or reducing future disaster damages and have the potential for receiving subaward approval are invited to participate in the formal subapplication process for further subaward consideration.

(Subapplicant) submitted a pre-application for (type of project) in the amount of \$XXXX. Based on WEM's review of this proposal and program criteria, (subapplicant) is invited to participate in the formal subapplication process for further subaward consideration.

Enclosed is the HMGP application packet along with worksheets to assist you in gathering the information and data required for the application. Please read the instructions carefully and be as thorough and accurate as possible in completing the forms.

The application requests detailed information that is needed for this office to complete the necessary reviews, including the cost/benefit analysis and environmental considerations. Where actual data or information is not available, you should provide the most accurate estimates. You may have to survey the property owners to get the information required. Based on the limited HMGP funds available, I am requesting that the application include prioritizing the properties in the order they would be acquired. You may want to start with primary residences and with properties that incur the most flood damages. **Due to the competitiveness of the program, it is important that you answer all the questions as completely as possible. An incomplete application cannot be processed.**

There are specific criteria that must be met by applicants in order to be eligible for funding:

- 1. The community must be participating in and in good standing with the National Flood Insurance Program. The Wisconsin Department of Natural Resources may conduct a site visit during the application review process to determine if a community is compliant.
- 2. The proposed project must be in conformance with the goals and objectives of the community's All-Hazard Mitigation Plan.
- 3. The proposed project must be cost-effective. This means that the project will have to show that the benefits of the project outweigh its cost. In order to demonstrate this, the application must contain the necessary detail. Only those projects that are cost-effective will receive further consideration for HMGP funding. FEMA recently issued a policy that allows pre-calculated benefits to be used for acquisition projects. Acquisition of properties located in the 100-year floodplain as delineated on the Flood Insurance Rate Map (FIRM) or based on best available data, that costs less than or equal to \$276,000 is considered cost-effective. For projects that contain multiple structures, the average cost of all structures in the project must meet the stated criterion. This reduces time and resources needed for data collection, analysis, and review.
- 4. The project must be environmentally sound. Some HMGP projects may receive a categorical exclusion (CATEX) from an environmental assessment. The applicant will still have to demonstrate that the proposed project will not have any associated "extraordinary circumstances" within the project area. The presence of extraordinary circumstances will require an environmental assessment (EA) or environmental impact statement (EIS). WEM will prepare the required documents, although applicants will be required to provide the basic information needed to complete these documents. FEMA has the ultimate responsibility for making sure that all projects meet the requirements of the National Environmental Protection Act (NEPA).
- 5. Applicants will have to show that other <u>alternatives</u> were considered (the "do nothing" alternative and one other), and that the proposed project is the most feasible and will actually solve the described problem.

In addition to the above criteria, below are certain other program requirements that you should be aware of for proposed acquisition projects:

- Property owners must **voluntarily** elect to participate in the program.
- The acquired property will be deed restricted, requiring that it will be maintained as open space in perpetuity, and that no future federal disaster assistance will be made available at the site.
- Replacement housing for those whose properties are acquired cannot be in another 100year/1-percent-annual-chance floodplain.
- Property will be purchased based on the fair market value (FMV) as determined by an appraisal. The cost for appraisals is an eligible project cost. (Appraisals do not need to be completed for the HMGP application. It is suggested that you estimate FMV based on tax assessments, recent sales in the area, etc.)
- Projects involving properties where there are tenants will need to conform to the Uniform Relocation Assistance and Real Property Acquisition Policies Act (URA) and the state's Relocation Law for tenants.

For additional information regarding the Hazard Mitigation Grant Program visit https://www.fema.gov/hazard-mitigation-grant-program.

For information and guidance regarding acquisition project requirements, review the FY15 Hazard Mitigation Assistance (HMA) Guidance Addendum, Section A, Property Acquisition and Structure Demolition or Relocation for Open Space, located at https://www.fema.gov/media-library/assets/documents/103279.

The application is due in this office **no later than (date)**. If (subapplicant) completes the application prior to the above date, it should be submitted to this office so that we can begin to review the application and complete the required cost/benefit analysis.

A thorough review will be completed on all formal applications received for HMGP funding. Based on the limited funds available, the program will be very competitive, and only those projects that are cost-effective and make the biggest impact in reducing future disaster damages will receive further consideration for grant funding. Therefore, it is imperative that all the questions in the applications be answered completely and accurately.

If you have any questions, need additional information, would like to schedule a meeting, please do not hesitate to contact me at (608) 242-3222; Roxanne Gray at (608) 242-3211, Caitlin Shanahan at (608) 242-3214, or Margaret Zieke at (608) 242-3252.

Sincerely,

Katie Sommers, CFM
State Hazard Mitigation Officer
Wisconsin Emergency Management

Cc: Regional Emergency Management Director
County Emergency Management Director
Department of Natural Resources

HAZARD MITIGATION GRANT PROGRAM ACQUISITION/DEMOLITION APPLICATION CHECKLIST

Completed and signed Section 404-HMGP Application
Signed Assurances for Construction and Non-Construction Projects
Signed Statement of Assurances for Property Acquisition Projects with FEMA Model Deed Restrictions attached
Parcel map identifying properties to be acquired
Flood Insurance Rate Map (FIRM) with properties in the special flood hazard area identified (available at https://msc.fema.gov/portal)
Property Data Worksheet for each property included in the project, including:
 ☐ Flood Insurance Rate Map (FIRM) with property location ☐ Signed Notice of Voluntary Interest by property owner ☐ Signed FEMA Form 90-69B, Declaration and Release ☐ Photographs of property (front, side and back views) ☐ Documentation to support cost estimate
Hazard Mitigation Plan information, including: Name of plan and date approved Copy of goals/objectives and mitigation strategy/action item that reference the proposed project
Detailed project budget
Commitment Letter for the local match
Proof of consultation with U.S. Corps of Engineers (USACE)
Proof of consultation with the Wisconsin Department of Transportation (WisDOT)
Any other supporting material

SECTION 404 HAZARD MITIGATION GRANT PROGRAM DISASTER SUBAPPLICATION FOR ACQUISITION/DEMOLITION

Disaster Declaration	n #: FEMA-4276-DR-WI	Declaration Date: August 9, 2016
(Political s	ubdivision, quasi-government, n	onprofit organization)
FIPS Code:	O-U-N-S Number:	FEIN Number:
Street/PO Box:		
City:	ZIP Code:	County:
Primary Contact:		
Title:	E-	Mail:
Office Phone:	c	ell Phone:
Secondary Contact:		
Title:	E-	Mail:
Office Phone:	c	ell Phone:
Mitigation Grant Pro the program contain appropriate forms.	gram and hereby certifies that ned in federal and state progr	ion for financial assistance under the Hazard the subapplicant will fulfill all requirements o am guidelines including the submission of all able local codes and standards as well as othe
dedicated to support support the undertal	t the 12.5% local share of the sing of the project during the s	nat the funding and/or resources which will be e project are available and will be utilized to specified performance period. Evidence of this federal governments upon request.
•	ntation is true and correct, a	f, that information in this subapplication and not that it has been duly authorized by the
Subapplicant's Sign	ature:	Date Signed:
Printed Name and 1	itle:	
NOTE: If your projec	t is approved, work must begin v	vithin 90 days of the obligation of funds.

All questions must be answered completely and accurately. WEM and FEMA staff reviewing the application will not be familiar with your community, the specific project area and the need for the proposed project. Therefore, it is the responsibility of the applicants to ensure that their application addresses all of the required items. This is particularly important given the competitive nature of the grant program. If you are unsure as to the meaning of a particular question, contact WEM prior to attempting to answer that question.

1. PROJECT COST ESTIMATE

Section 404-HMGP Funds Requested:

Total	\$
Federal Share (75%)	\$
State Share (12.5%)	\$
Subapplicant Share (12.5%)	\$
Other Funding Sources:	\$

2. PROJECT TITLE AND DESCRIPTION

3. **PROJECT LOCATION** (Include maps)

Road or street address, geographic landmarks, longitude/latitude, legal description, etc. Include a copy of the Parcel Map (Tax Map, Property Identification Map, etc.) with each property in the project clearly marked on the map. Include legible map/drawings of the location.

Include a current locally adopted floodway map or flood insurance rate map (FIRM) indicating the project location. FIRMs are typically available from your local floodplain administrator who may be located in the planning, zoning, or engineering office Maps and Flood Insurance Studies can also be downloaded from the FEMA Map Service Center at https://msc.fema.gov/portal. For more information about FIRMs, contact your local agencies or visit FEMA's FIRM website at http://www.fema.gov/flood-insurance-rate-map-firm. Flood Insurance Study information is available at http://www.fema.gov/flood-insurance-rate-map-firm.

4. DETAILED DESCRIPTION OF PROPOSED PROJECT

Complete the enclosed *Property Data Worksheet* for each structure in the project along with required attachments. NOTE: **Property owners must be willing to participate voluntarily**. Interested property owners must sign a *Notice of Voluntary Interest*.

5. POSITIVE IMPACTS

Describe positive impacts besides reducing damages that the proposed project will provide.

6. WORK SCHEDULE AND ESTIMATED COMPLETION DATES

Include a work schedule for the proposed project (**not to exceed 36 months**). The schedule should indicate major milestones or phases of the project and the expected completion date of each phase. Phases of a project for acquiring property would consist of the following activities: Survey property owners for interest in the program; prioritize structures to be acquired based on funding availability; develop program procedures/policies; develop relocation assistance plan for rental property tenants (if applicable); conduct title searches, appraisals, and closings; structure demolition and site clean-up; project closeout.

7. COST BREAKDOWN

Provide a breakdown of cost elements (see the attached *Budget Cost Worksheet*). Cost estimates must be established using nationally published or local cost estimating guides. If a cost estimate is based on a contractor's bid or historic costs from another activity or project within the community, documentation must be provided.

8. ALTERNATIVES CONSIDERED

Describe other options or alternatives that have been considered to deal with the problem, the estimated cost, and why they were selected, rejected, or eliminated from consideration. In addition to the proposed project, **you must provide at least one other alternative besides "do nothing."** Provide justification for the selection of the proposed project over the other alternatives. The reason may be monetary, environmental, or physical, or related to the degree of effectiveness, maintenance costs, other reasonable causes, or a combination of these factors.

9. CONSULTATION WITH OTHER FEDERAL AGENCIES

Properties acquired must be permanently converted to open space and are unavailable for any future development. Include proof of consultation with the Wisconsin Department of Transportation (WisDOT) and the U.S. Army Corps of Engineers (USACE) to ensure that no future improvements or development is planned that would affect the properties included in the acquisition project.

10. LAND USE PLAN

For acquisition or relocation projects, summarize the land-use plan for use of the property following acquisition. **Property acquired through the HMGP must remain in open space uses** per 44 CFR 206.434(e) and per 44 CFR 80.19.

11. STATEMENT OF ASSURANCES FOR PROPERTY ACQUISITION PROJECTS AND FEMA MODEL DEED RESTRICTIONS

A signed Statement of Assurances for Property Acquisition Projects with FEMA Model Deed Restrictions must be included.

12. HAZARD MITIGATION PLAN

Hazard mitigation projects must be in conformance with the goals and objectives of the local approved all-hazards mitigation plan.

- Provide the name of the Local Hazard Mitigation Plan and date approved.
- Provide a copy of the goals/objectives and the mitigation strategy/action item that references the proposed project from the approved hazard mitigation plan.

13. ENVIRONMENTAL CONSIDERATIONS

An environmental assessment is required for certain projects before the grant can be approved. It is FEMA's responsibility to prepare the environmental document, although the applicant will be required to provide much of the information, including any special studies that need to be performed. Complete the EHP Checklist and submit with application.

14. MATCH COMMITMENT LETTER

Attach a letter from the chief elected official or resolution that the community is committed to providing the required 12.5% local match.

15. ASSURANCES

Sign and include the Assurances for Non-Construction and Construction Projects (DMA Form 1017A.)

16. ADDITIONAL COMMENTS/INFORMATION

Include any additional pertinent information that will support the proposed project and assist with the review of the application.

MAIL THE COMPLETED APPLICATION TO:

Wisconsin Emergency Management ATTN: State Hazard Mitigation Officer 2400 Wright Street P.O. Box 7865 Madison, WI 53707-7865

WISCONSIN DIVISION OF EMERGENCY MANAGEMENT State-Local Hazard Mitigation Grant Program Statement of Assurances for Property Acquisition Projects

SEND THIS STATEMENT OF ASSURANCES WITH THE PROJECT APPLICATION, OR SEND TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY AT THE TIME OF APPLICATION.

NOTE: If you have questions regarding any of these assurances, please consult the program guidance and contact the sponsoring agency.

Duniant Culannal	1:		
Project Subappl	licant:		

The subapplicant hereby assures and certifies that the project will comply with the property acquisition and relocation requirements per 44 CFR Part 206.434(e) and Part 80, and related federal and state guidance.

As the duly authorized representative of the subapplicant, I certify that the subrecipient:

- 1. Will ensure that participation by property owners is voluntary. The prospective participants have been informed in writing that participation in the program is voluntary, and that the sub-applicant will not use its eminent domain authority to acquire the property should negotiations fail.
- 2. Will ensure each property owner will be informed, in writing, of what the subapplicant considers to be the fair market value of the property. The subapplicant will use the Statement of Voluntary Transaction to document this, and will provide a copy of this document for each property after grant award.
- 3. Will ensure that each participating property owner certifies that they are a National of the United States or qualified alien before the property owner can receive a pre-event value for the property pursuant to 44 CFR, Part 80.17(c)(4). Participants who refuse to certify, or who are not Nationals of the United States or qualified aliens, will receive no more than the appraised current market value for their property.
- 4. Will accept all of the requirements of the FEMA grant and the deed restriction governing the use of the land, as restricted in perpetuity to open-space uses. The subapplicant will apply and record a deed restriction on each property in accordance with the language in the attached FEMA Model Deed Restriction. The community will seek FEMA approval for any changes in language differing from the Model Deed Restriction.
- 5. Will demonstrate that it has consulted with the U.S. Corps of Engineers regarding the subject land's potential future use for the construction of a levee system, and will reject future consideration of such use if it accepts FEMA assistance to convert the property to permanent open space.
- 6. Will demonstrate that it has coordinated with the Wisconsin Department of Transportation to ensure that no future planned improvements or enhancements that will affect the subject property are under consideration.
- 7. Will remove existing structures within 90 days of settlement.

- 8. Post award, will ensure that a property interested is conveyed only with the prior approval of the FEMA Regional Administrator and only to another public entity or to a qualified conservation organization, pursuant to 26 CFR 1.170A-14.
- 9. Will submit every three years to the recipient, who will then submit to the FEMA Regional Administrator, a report certifying that it has inspected the subject property within the month preceding the report, and that the property continues to be maintained in a manner consistent with the provisions of the grant. If the subject property is not maintained according to the terms of the grant, the recipient and FEMA, its representatives, designated authorities, and assigns are responsible for taking measures to bring the property back into compliance.
- 10. Will not seek or accept the provision, after settlement, of disaster assistance for any purpose from any federal entity with respect to the property, and FEMA will not distribute flood insurance benefits for that property for claims related to damage occurring after the date of the property settlement.

As the duly authorized representative of the subapplicant, I hereby certify that the subrecipient will comply with the identified assurances and certifications.

SIGNATURE OF SUBAPPLICANT'S AUTHORIZED AGENT:

Signature of Authorized Certifying Official	Date
Title and Organization	
Subapplicant Jurisdiction	

FEMA MODEL DEED RESTRICTIONS

Exhibit A is FEMA's Model Deed Restrictions that support 44 CFR Part 80 requirements. Applications requesting mitigation assistance to acquire properties for open space purposes must include a copy of the deed restriction language proposed to meet these requirements. The deed conveying the property to the locality must reference and incorporate Exhibit A (or equivalent name). Any variation from the model deed restriction can only be made with prior approval from FEMA's Office of Chief Counsel. Such requests should be made to the FEMA Regional Administrator through the relevant State or Tribal Office. Exhibit A shall be attached to the deed when recorded.

Exhibit A

In reference to the property or properties ("Property") conveyed by the Deed between [property owner] participating in the federally-assisted acquisition project ("the Grantor") and the [the local government], ("the Grantee"), its successors and assigns:

WHEREAS, The Robert T. Stafford Disaster Relief and Emergency Assistance Act, ("The Stafford Act"), 42 U.S.C. § 5121 et seq., identifies the use of Disaster Relief Funds under § 5170, **Hazard Mitigation Grant Program Section 404 ("HMGP")**, including the acquisition and relocation of structures in the floodplain;

WHEREAS, the mitigation grant program provides a process for a local government, through the State, to apply for federal funds for mitigation assistance to acquire interests in property, including the purchase of structures in the floodplain, to demolish and/or remove the structures, and to maintain the use of the Property as open space in perpetuity;

WHEREAS, [State or Tribe] has applied for and been awarded such funding from the Department of Homeland Security, Federal Emergency Management Agency ("FEMA"), and has entered into a mitigation grant program Grant Agreement dated [date] with FEMA and herein incorporated by reference; making it a mitigation grant program grantee.

WHEREAS, the Property is located in [Village/City/County], [Village/City/County] participates in the National Flood Insurance Program ("NFIP") and is in good standing with NFIP as of the date of the Deed;

WHEREAS, the [local government], acting by and through the [local government Board], has applied for and been awarded federal funds pursuant to an agreement with [State] dated [date] ("State-Local Agreement") and herein incorporated by reference, making it a mitigation grant program subgrantee;

WHEREAS, the terms of the mitigation grant program statutory authorities, Federal program requirements consistent with 44 C.F.R. Part 80, the Grant Agreement, and the State-local Agreement require that the Grantee agree to conditions that restrict the use of the land to open space in perpetuity in order to protect and preserve natural floodplain values;

NOW, therefore, the grant is made subject to the following terms and conditions:

1. Terms. Pursuant to the terms of the [select mitigation grant program] statutory authorities, Federal program requirements consistent with 44 C.F.R. Part 80, the Grant Agreement, and

the State-local Agreement, the following conditions and restrictions shall apply in perpetuity to the Property described in the attached deed and acquired by the Grantee pursuant to FEMA program requirements concerning the acquisition of property for open space:

- a. <u>Compatible uses</u>. The Property shall be dedicated and maintained in perpetuity as open space for conservation of natural floodplain functions. Such uses may include: parks for outdoor recreational activities; wetlands management; nature reserves; cultivation; grazing; camping (except where adequate warning time is not available to allow evacuation); unimproved unpaved parking lots; buffer zones; and other uses consistent with FEMA guidance for open space acquisition, Hazard Mitigation Assistance, Requirements for Property Acquisition and Relocation for Open Space.
- b. <u>Structures</u>. No new structures or improvements shall be erected on the Property other than:
 - i. A public facility that is open on all sides and functionally related to a designated open space or recreational use;
 - ii. A public rest room; or
 - iii. A structure that is compatible with open space and conserves the natural function of the floodplain, including the uses described in Paragraph 1.a., above, and approved by the FEMA Administrator in writing before construction of the structure begins.

Any improvements on the property shall be in accordance with proper floodplain management policies and practices. Structures built on the Property according to paragraph b. of this section shall be floodproofed or elevated to at least the base flood level plus two foot of freeboard, or greater, if required by FEMA, or if required by any State, Tribal, or local ordinance, and in accordance with criteria established by the FEMA Administrator.

- c. <u>Disaster Assistance and Flood Insurance</u>. No federal entity or source may provide disaster assistance for any purpose with respect to the Property, nor may any application for such assistance be made by any Federal entity or source. The Property is not eligible for coverage under the NFIP for damage to structures on the property occurring after the date of the property settlement, except for pre-existing structures being relocated off the property as a result of the project.
- d. <u>Transfer</u>. The Grantee, including successors in interest, shall convey any interest in the Property only if the FEMA Regional Administrator, through the State, gives prior written approval of the transferee in accordance with this paragraph.
 - i. The request by the Grantee, through the State, to the FEMA Regional Administrator must include a signed statement from the proposed transferee that it acknowledges and agrees to be bound by the terms of this section, and documentation of its status as a qualified conservation organization if applicable.
 - ii. The Grantee may convey a property interest only to a public entity or to a qualified conservation organization. However, the Grantee may convey an

- easement or lease to a private individual or entity for purposes compatible with the uses described in paragraph (a), of this section, with the prior approval of the FEMA Regional Administrator, and so long as the conveyance does not include authority to control and enforce the terms and conditions of this section.
- iii. If title to the Property is transferred to a public entity other than one with a conservation mission, it must be conveyed subject to a Conservation Easement that shall be recorded with the deed and shall incorporate all terms and conditions set forth in this section, including the easement holder's responsibility to enforce the easement. This shall be accomplished by one of the following means:
 - a. The Grantee shall convey, in accordance with this paragraph, a conservation easement to an entity other than the title holder, which shall be recorded with the deed, or
 - b. At the time of title transfer, the Grantee shall retain such conservation easement, and record it with the deed.
- iv. Conveyance of any property interest must reference and incorporate the original deed restrictions providing notice of the conditions in this section and must incorporate a provision for the property interest to revert to the State, Tribe, or local government in the event that the transferee ceases to exist or loses it eligible status under this section.
- 2. <u>Inspection</u>. FEMA, its representatives, and assigns, including the State or Tribe shall have the right to enter upon the Property, at reasonable times and with reasonable notice, for the purpose of inspecting the Property to ensure compliance with the terms of this part, the Property conveyance and of the grant award.
- 3. <u>Monitoring and Reporting</u>. Every three years on [Date], the Grantee (mitigation grant program Grantee), in coordination with any current successor in interest, shall submit through the State to the FEMA Regional Administrator a report certifying that the Grantee has inspected the Property within the month preceding the report, and that the Property continues to be maintained consistent with the provisions of 44 CFR Part 80, the property conveyance, and the grant award.
- 4. <u>Enforcement</u>. The Grantee (mitigation grant program subgrantee), the State, FEMA, and their respective representatives, successors and assigns, are responsible for taking measures to bring the Property back into compliance if the Property is not maintained according to the terms of 44 CFR Part 80, the property conveyance, and the grant award. The relative rights and responsibilities of FEMA, the State, the Grantee, and subsequent holders of the property interest at the time of enforcement, shall include the following:
 - a. The State will notify the Grantee and any current holder of the property interest in writing and advise them that they have 60 days to correct the violation.
 - i. If the Grantee or any current holder of the property interest fails to demonstrate

- a good faith effort to come into compliance with the terms of the grant within the 60-day period, the State shall enforce the terms of the grant by taking any measures it deems appropriate, including but not limited to bringing an action of law or in equity in a court of competent jurisdiction.
- ii. FEMA, its representatives, and assignees may enforce the terms of the grant by taking any measures, it deems appropriate, including but not limited to 1 or more of the following:
 - a) Withholding FEMA mitigation awards or assistance from the State or Tribe, and Grantee; and current holder of the property interest.
 - b) Requiring transfer of title. The Grantee or the current holder of the property interest shall bear the costs of brining the Property back into compliance with the terms of the grant; or
 - c) Bringing an action at law or in equity in a court of competent jurisdiction against any or all of the following parties; the State, the Tribe, the local community, and their respective successors.
- 5. <u>Amendment</u>. This agreement may be amended upon signatures of FEMA, the State, and the Grantee only to the extent that such amendment does not affect the fundamental and statutory purposes underlying the agreement.
- 6. <u>Severability</u>. Should any provision of this grant or the application thereof to any person or circumstance be found to be invalid or unenforceable, the rest and remainder of the provisions of this grant and their application shall not be affected and shall remain valid and enforceable.

[Signed by Grantor(s) and Grantee, witnesses and notarization in accordance with local law.]

Grantor's Signature
Date
Name (printed or typed)
Grantee's Signature
Date
Grantee's Name
Grantee's Title

HAZARD MITIGATION GRANT PROGRAM BUDGET COST WORKSHEET

ACQUISITION/RELOCATION PROJECTS

ADDRESS	TYPE*	ESTIMATED FMV	TITLE SEARCHES	APPRAISALS	ABSTRACTS/ TITLE INSURANCE	LEGAL FEES	SURVEYS (if required)	CLOSING COSTS	RELOCATION ASSISTANCE COSTS**	DEMOLITION/ SITE RESTORATION	OTHER COSTS***	тот	AL
												\$	-
												\$	-
												\$	-
												\$	-
												\$	-
												\$	-
												\$	-
												\$	-
												\$	-
												\$	-
TOTAL		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$	-

^{*} TYPE: Unimproved Land (vacant), Primary Residence, Secondary or recreational property, rental property (2-4 family), rental property (multi-family 5 or more units), Mobile Home, Commercial, Public or other (specify).

Attach all documentation to support the cost estimate. (Cost estimates must be established using nationally published or local cost estimating guides. If the cost estimate is based on a contractor's bid or historic costs from another similar activity or project within the community, documentation must be provided.)

Wisconsin HMGP Administrative Plan

^{**} RELOCATION ASSISTANCE COSTS: Tenants are entitled to relocation assistance as required by the Uniform Relocation Assistance and Real Property Acquisition Polices Act of 1970 (URA) as well as State Relocation Law, State Chapter 32.19-32.27, Commerce Code Chapter 202, whichever pays more.

^{***} OTHER COSTS: Include costs for project management, relocation specialist, and other costs associated with implementing the project. In addition, "supplemental housing" payments if meets requirements. See page 26 of HMA Guidance Addendum, http://www.fema.gov/media-library/assets/documents/103279.

ACQUISITION/DEMOLITION PROJECT PROPERTY DATA WORKSHEET

TY: STATE: <u>WI</u> ZIP:						
PARCEL/TAX NUMBER	TOWN/RANGE/SECTION	COUNTY				
LATITUDE	LONGITUDE	(decimal, six digits)				
LOCATED IN FLOODPLAIN:	FloodwayFloodfringe					
ATTACH FIRM MAP WITH P	ROPERTY LOCATION					
FLOOD INSURANCE: No	Yes Policy # Policy Prov	ider				
Rental: Single Family2-4 F	dence Secondary Residence Family Multi-Family (5-more units lic Building Other (explain)					
	r of renters per unit Current Re RA/State)	ntal Payments				
	e or more color photographs (two co view of each structure to be acquire					
FEMA Form 009-0-3, Declara	ation and Release: The property own	er/s sign and attach form.				
Voluntary Interest Form: The	e property owner(s) must sign and att	ach.				
ANY KNOWN ENVIRONME	ENTAL HAZARDS (hazardous mat	erials, contamination, pas				

ESTIMATED COSTS FOR ACQUISITION/DEMOLITION:

Cost estimates must be established using nationally published or local cost estimating guides. If a cost estimate is based on a contractor's bid or historic costs from another activity, documentation must be provided.

Fair Market Value (attach tax record): Appraisal:	Pre-Event	or Post-Event*
Title Work/Insurance:		
Legal Fees:		
Surveys:		
Closing Costs:		
Relocation Assistance (tenants):		
Comparable Housing (if applicable):**		
Demolition (including asbestos inspection/remo	val, etc.):	
Site Restoration:		
Other Costs (list):		
TOTAL ESTIMATE:		

http://www.fema.gov/media-library/assets/documents/103279

^{*}See pages 22-23, Section A.6.9, Purchase Officer: Value of Property, in the HMA Guidance Addendum dated February 27, 2015.

^{**}See page 26, A.6.9.4, Additions to the Purchase Price, in the HMA Guidance Addendum dated February 27, 2015. http://www.fema.gov/media-library/assets/documents/103279.

O.M.B. No. 1660-0002 Expires July 31, 2017

DEPARTMENT OF HOMELAND SECURITY Federal Emergency Management Agency DECLARATION AND RELEASE

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this data collection is estimated to average 2 minutes per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and submitting this form. This collection of information is required to obtain or retain benefits. You are not required to respond to this collection of information unless a valid OMB control number is displayed on this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing the burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington, DC 20472-3100, Paperwork Reduction Project (1660-0002) NOTE: Do not send your completed form to this address.

PRIVACY ACT STATEMENT

AUTHORITY: The Robert T. Stafford Disaster Relief and Emergency Assistance Act as amended, 42 U.S.C. § 5121 -5207 and Reorganization Plan No. 3 of 1978; 4 U.S.C. §§ 2904 and 2906; 4 C.F.R. § 206.2(a)(27); the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (Pub. L. 104-193) and Executive Order 13411. DHS asks for your SSN pursuant to the Debt Collection Improvement Act of 1996, 31 U.S.C. § 3325(d) and § 7701(c) (1).

PRINCIPAL PURPOSE(S): This information is being collected for the primary purpose of determining eligibility and administering financial assistance under a Presidentially-declared disaster. Additionally, information may be reviewed within FEMA for quality assurance purposes and used to assess FEMA's customer service to disaster assistance applicants.

ROUTINE USE(S): The information on this form may be shared outside of FEMA as generally permitted under 5 U.S.C. § 552a(b) of the Privacy Act of 1974, as amended. This includes sharing this information with state, tribal, local, and voluntary organizations to enable you to receive additional disaster assistance and as necessary and authorized by other routine uses published in DHS/FEMA-008 Disaster Recovery Assistance Files System of Records, 78 Fed. Reg. 25,282 (April 30, 2013), and upon written request, by agreement, or as required by law.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent the individual from receiving disaster assistance.

DECLARATION AND RELEASE

In order to be eligible to receive FEMA Disaster Assistance, a member of the household must be a citizen, non-citizen national or qualified alien of the United States. Please read the form carefully, sign the sheet and return it to the Inspector, and show him/her a current form of photo identification. Please feel free to consult with an attorney or other immigration expert if you have any questions.

I hereby declare, under penalty of perjury that (check one):

I am a citizen or non-citizen national of the United States.

I am the parent or guardian of a minor child who resides with me and who is a citizen, non-citizen national or qualified

By my signature I certify that:

Only one application has been submitted for my household.

alien of the United States. Print full name and age of minor child:

I am a qualified alien of the United States.

- * All information I have provided regarding my application for FEMA disaster assistance is true and correct to the best of my knowledge.
- * I will return any disaster aid money I received from FEMA or the State if I receive insurance or other money for the same loss, or if I do not use FEMA disaster aid money for the purpose for which it was intended.

I understand that, if I intentionally make false statements or conceal any information in an attempt to obtain disaster aid, it is a violation of federal and State laws, which carry severe criminal and civil penalties, including a fine up to \$250,000, imprisonment, or both (18 U.S.C. §§ 287, 1001, and 3571).

I understand that the information provided regarding my application for FEMA disaster assistance may be subject to sharing within the Department of Homeland Security (DHS) including, but not limited to, the Bureau of Immigration and Customs Enforcement.

I authorize FEMA to verify all information given by me about my property/place of residence, income, employment and dependents in order to determine my eligibility for disaster assistance; and

I authorize all custodians of records of my insurance, employer, any public or private entity, bank financial or credit data service to release information to FEMA and/or the State upon request.

		- 1		
AME(print) SIGNATU		JRE	DATE OF BIRTH	DATESIGNED
INSPECTOR ID # FEM		APPLICATION #	DISASTER#	
ADDRESS OF DAMAGED PROPERTY		CITY	STATE	ZIP CODE

NOTICE OF VOLUNTARY INTEREST

(Name of Community), WISCONSIN Floodprone Property Acquisition Project

Homeowner Interest Sign-up Sheet and Voluntary Interest Notice

Please complete this form if you are interested in further exploring your options for reducing your flood losses. Signing this *does not* commit you to any action.

Property Address:		
Owner(s) Mailing Address:		
Owner(s) Name(s):		
Contact Phone Number:		
The local government is requiproject for open-space acquis Government will use its emine space purposes if you choose program, or if negotiations fa	ition is <i>voluntary</i> . Neither then then then then the net to acqui not to participate in a Hazard	e <i>State</i> nor the <i>Local</i> re the property for open-
Owner's Signature	Date	
Owner's Signature	Date	
Owner's Signature	 Date	

Statement of Voluntary Participation for Acquisition of Property for Purpose of Open Space FEMA's Hazard Mitigation Grant Program

lΗ	S AGREEMENT is made and entered into on (date), by and
эe	ween (name of subrecipient), hereinafter referred to as
'sı	brecipient," and (property owner), hereinafter referred to as ler." The parties agree as follows:
L.	Seller affirms that I/we own the property located at (legal address), hereinafter referred to as "property."
2.	Subrecipient has notified seller that the subrecipient may wish to purchase the referenced property, and, if seller agrees to sell, seller must permanently relocate from property.
3.	Subrecipient has identified that the purchase offer valuation on the property as of (date) is \$ as determined by appropriate valuation procedures implemented by subrecipient and based on FEMA acquisition requirements provided in 44 CFR Part 80, and relevant program guidance as documented below for FEMA's Hazard Mitigation Grant Program.
1.	Subrecipient has notified the seller that neither the State nor the local government will use eminent domain authority to acquire the property for open space purposes if the seller chooses not to participate or if negotiations fail.
5.	Subrecipient has notified seller that if seller agrees to sell the property to subrecipient, the transaction is voluntary and the seller is not entitled to relocation benefits provided by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, which are available to property owners who must sell their properties involuntarily.
5.	Subrecipient affirms that it has provided the notifications and explained the information described in the preceding paragraphs to seller, and the property identified above is not a part of an intended, planned, or designated project area where all or substantially all of the property within the area is to be acquired within specific time limits.
7.	This agreement shall expire on (date of closing), unless seller has voluntarily sold property to subrecipient by that date.

	Date
Property Owner Signature	
	Date
Property Owner Signature	
	Date
Subrecipient's Authorized Agent Signature	

Date

Subapplicant Address City, State Zip

Dear XXXX:

As a result of federal disaster declaration FEMA-4276-DR-WI declared (date), funding was made available through the Hazard Mitigation Grant Program (HMGP) to provide subawards to local governments to fund long-term and permanent mitigation measures. The subawards are 75% federally funded through the Federal Emergency Management Agency (FEMA) and 12.5% state funded through this Division. The remaining 12.5% is the required local match. The local match can be greater than 12.5%. The objective of the program is to prevent or reduce future disaster damages. Subawards can be used to fund projects on either public or private property.

The amount of federal funds available for the HMGP is equivalent to 20% of the federal funds spent through the Public Assistance program for the declaration. It is estimated that there will be approximately \$XXXX in HMGP funds available for this declaration. This office received XX pre-applications exceeding \$XXXX. As you can see, the demand for mitigation dollars far outweighs the amount of funding available.

The Wisconsin Division of Emergency Management (WEM) has completed a thorough review of the pre-applications. As advised in the letter you received with the pre-application, those projects involving acquisition, demolition, relocation, and floodproofing or elevation of floodplain properties will remain the State's highest priority for HMGP projects. Projects that will make the biggest impact for preventing or reducing future disaster damages and have the potential for receiving subaward approval are invited to participate in the formal subapplication process for further subaward consideration.

(Subapplicant) submitted a pre-application for (type of project) in the amount of \$XXXX. Based on WEM's review of this proposal and program criteria, (subapplicant) is invited to participate in the formal subapplication process for further subaward consideration.

Enclosed is the HMGP application packet along with worksheets to assist you in gathering the information and data required for the application. Please read the instructions carefully and be as thorough and accurate as possible in completing the forms.

The application requests detailed information that is needed for this office to complete the necessary reviews, including the cost/benefit analysis and environmental considerations. Where actual data or information is not available, you should provide the most accurate estimates. You may have to survey the property owners to get the information required. Based on the limited HMGP funds available, I am requesting that the application include prioritizing the properties in the order they would be elevated. You may want to start with primary residences and with properties that incur the most flood damages. **Due to the competitiveness of the program, it is important that you answer all the questions as completely as possible. An incomplete application cannot be processed.**

There are specific criteria that must be met by applicants in order to be eligible for funding:

- 1. The community must be participating in and in good standing with the National Flood Insurance Program. The Wisconsin Department of Natural Resources may conduct a site visit during the application review process to determine if a community is compliant.
- 2. The proposed project must be in conformance with the goals and objectives of the community's All-Hazard Mitigation Plan.
- 3. The proposed project must be cost-effective. This means that the project will have to show that the benefits of the project outweigh its cost. In order to demonstrate this, the application must contain the necessary detail. Only those projects that are cost-effective will receive further consideration for HMGP funding. FEMA policy allows pre-calculated benefits to be used for elevation projects. Elevation of properties located in the 100-year floodplain as delineated on the Flood Insurance Rate Map (FIRM) or based on best available data, that costs less than or equal to \$175,000 is considered cost-effective. For projects that contain multiple structures, the average cost of all structures in the project must meet the stated criterion. This reduces time and resources needed for data collection, analysis, and review.
- 4. The project must be environmentally sound. Some HMGP projects may receive a categorical exclusion (CATEX) from an environmental assessment. The applicant will still have to demonstrate that the proposed project will not have any associated "extraordinary circumstances" within the project area. The presence of extraordinary circumstances will require an environmental assessment (EA) or environmental impact statement (EIS). WEM will prepare the required documents, although applicants will be required to provide the basic information needed to complete these documents. FEMA has the ultimate responsibility for making sure that all projects meet the requirements of the National Environmental Protection Act (NEPA).
- 5. Applicants will have to show that other <u>alternatives</u> were considered (the "do nothing" alternative and one other), and that the proposed project is the most feasible and will actually solve the described problem.

In addition to the above criteria, below are certain other program requirements that you should be aware of for proposed elevation projects:

- Property owners must **voluntarily** elect to participate in the program.
- The property owner, and any subsequent owners, is required to purchase and maintain flood insurance to an amount at least equal to the project cost or to be the maximum limit of coverage made available with respect to the particular property.
- The community must legally record with the Register of Deeds a notice that includes the name of the current property owner regarding the notice of flood insurance requirements (the property owner and community must sign and return with the application the "Acknowledgement of Conditions for Mitigation of Property in a Special Flood Hazard Area with FEMA Grant Funds").
- Elevation of structures must be designed in accordance with ASCE 24-14, Flood Resistant Design and Construction.
- Elevation of structures must be constructed in compliance with 44 CFR Part 60, NR 116, and the local floodplain ordinance.

For additional information regarding the Hazard Mitigation Grant Program visit https://www.fema.gov/hazard-mitigation-grant-program.

For information and guidance regarding acquisition project requirements, review the *FY15 Hazard Mitigation Assistance (HMA) Guidance Addendum, Section E, Structure Elevaton*, located at https://www.fema.gov/media-library/assets/documents/103279.

The application is due in this office **no later than** (**date**). If (applicant) completes the application prior to the above date, it should be submitted to this office so that we can begin to review the application and complete the required cost/benefit analysis.

A thorough review will be completed on all formal applications received for HMGP funding. Based on the limited funds available, the program will be very competitive, and only those projects that are cost-effective and make the biggest impact in reducing future disaster damages will receive further consideration for grant funding. Therefore, it is imperative that all the questions in the applications be answered completely and accurately.

If you have any questions, need additional information, would like to schedule a meeting, please do not hesitate to contact me at (608) 242-3222; Roxanne Gray at (608) 242-3211, Caitlin Shanahan at (608) 242-3214, or Margaret Zieke at (608) 242-3252.

Sincerely,

Katie Sommers, CFM
State Hazard Mitigation Officer
Wisconsin Emergency Management

Cc: Regional Emergency Management Director
County Emergency Management Director
Department of Natural Resources

HAZARD MITIGATION GRANT PROGRAM ELEVATION APPLICATION CHECKLIST

Completed and signed Section 404-HMGP Application
Signed Assurances
Parcel map with properties identified
Flood Insurance Rate Map (FIRM) with properties identified in the special flood hazard area. (http://msc.fema.gov/portal)
Property Data Worksheet for each property included in the project.
 □ Flood Insurance Rate Map (FIRM) with property location □ Signed "Acknowledgement of Conditions for Mitigation of Property in a SFHA with FEMA Grant Funds" □ Photographs of property (front, side and back views) □ Documentation to support cost estimate
Detailed Budget with supporting documentation
 Hazard Mitigation Plan Information Name of plan and date approved Copy of goals and objectives and that mitigation strategy/action item that reference the proposed project
Commitment Letter for the local match
Statement that the project will be in compliance with NFIP standards in 44 CFR Part 60, NR116 and local floodplain management ordinance (provide reference for local ordinance).
Statement/certification that the structures will be designed in accordance with ASCE 24-14, Flood Resistant Design and Construction.
Attach any other material that will support the project.

SECTION 404-HAZARD MITIGATION GRANT PROGRAM DISASTER SUBAPPLICATION FOR ELEVATION

Disaster Declaration #: FEN	MA-4276-DR-WI	Declaration Date: August 9, 2016
Applicant:		
(Political subdivisi	on, quasi-government, n	onprofit organization)
FIPS Code: D-U-N-	S Number:	FEIN Number:
Street/PO Box:		
City:	ZIP Code:	County:
Primary Contact:		
Title:	E-	Mail:
Office Phone:	C	ell Phone:
Secondary Contact:		
Title:	E-	Mail:
Office Phone:	c	ell Phone:
Mitigation Grant Program a the program contained in	nd hereby certifies that federal and state progr ject will meet all applica	ion for financial assistance under the Hazard the subapplicant will fulfill all requirements of am guidelines including the submission of a able local codes and standards as well as othe
dedicated to support the 1 support the undertaking of	L2.5% local share of the the project during the s	nat the funding and/or resources which will be e project are available and will be utilized to specified performance period. Evidence of thi federal governments upon request.
	is true and correct, a	f, that information in this subapplication and that it has been duly authorized by the
Subapplicant's Signature:		Date Signed:
Printed Name and Title:		

NOTE: If your project is approved, work must begin within 90 days of the obligation of funds.

All questions must be answered completely and accurately. WEM and FEMA staff reviewing the application will not be familiar with your community, the specific project area and the need for the proposed project. Therefore, it is the responsibility of the applicants to ensure that their application addresses all of the required items. This is particularly important given the competitive nature of the grant program. If you are unsure as to the meaning of a particular question, contact WEM prior to attempting to answer that question.

1. PROJECT COST ESTIMATE

Section 404-HMGP Funds Requested:

Total	\$
Federal Share (75%)	\$
State Share (12.5%)	\$
Subapplicant Share (12.5%)	\$
Other Funding Sources:	\$

2. PROJECT TITLE AND DESCRIPTION

3. PROJECT LOCATION (Include maps)

Road or street address, geographic landmarks, longitude/latitude, legal description, etc. Include a copy of the Parcel Map (Tax Map, Property Identification Map, etc.) with each property in the project clearly marked on the map. Include legible map/drawings of the location.

Include a current locally adopted floodway map or flood insurance rate map (FIRM) indicating the project location. FIRMs are typically available from your local floodplain administrator who may be located in the planning, zoning, or engineering office Maps and Flood Insurance Studies can also be downloaded from the FEMA Map Service Center at https://msc.fema.gov/portal. For more information about FIRMs, contact your local agencies or visit FEMA's FIRM website at http://www.fema.gov/flood-insurance-rate-map-firm. Flood Insurance Study information is available at http://www.fema.gov/flood-insurance-rate-map-firm.

4. DETAILED DESCRIPTION OF PROPOSED PROJECT

Elevation of structures must be designed in accordance with ASCE 24-14, Flood Resistant Design and Construction, or its equivalent as minimum design standards. Include a statement certifying that the project will be completed in conformance with design criteria. Certification that the project was completed in accordance with the design requirements will be required at project closeout. Information regarding ASCE 24-14 can be found at https://www.fema.gov/media-library/assets/documents/14983. Additional program guidance and requirements for elevation of structures can be found at https://www.fema.gov/media-library/assets/documents/103279. Complete the enclosed **Property Data**Worksheet for each structure in the project along with required attachments.

5. POSITIVE IMPACTS

Describe positive impacts besides reducing damages that the proposed project will provide.

6. WORK SCHEDULE AND ESTIMATED COMPLETION DATES

Include a work schedule for the proposed project (**not to exceed 36 months**). The schedule should indicate major milestones or phases of the project and the expected completion date of each phase. Phases of a project for acquiring property would consist of the following activities: Survey property owners for interest in the program; prioritize structures to be acquired based on funding availability; develop program procedures/policies; develop relocation assistance plan for rental property tenants (if applicable); conduct title searches, appraisals, and closings; structure demolition and site clean-up; project closeout.

7. COST BREAKDOWN

Provide a breakdown of cost elements (see the attached *Budget Cost Worksheet*). Cost estimates must be established using nationally published or local cost estimating guides. If a cost estimate is based on a contractor's bid or historic costs from another activity or project within the community, documentation must be provided.

8. ALTERNATIVES CONSIDERED

Describe other options or alternatives that have been considered to deal with the problem, the estimated cost, and why they were selected, rejected, or eliminated from consideration. In addition to the proposed project, **you must provide at least one other alternative besides "do nothing."** Provide justification for the selection of the proposed project over the other alternatives. The reason may be monetary, environmental, or physical, or related to the degree of effectiveness, maintenance costs, other reasonable causes, or a combination of these factors.

9. COMPLIANCE WITH NFIP

The application needs to include a statement that the project will be in compliance with NFIP standards found in 44 CFR Part 60, NR116, and the local floodplain management ordinance (provide reference.)

10. SFHA ACKNOWLEDGEMENT OF CONDITIONS

For elevation of structures, flood insurance must be maintained for the life of the structure to an amount at least equal to the project cost regardless of transfer of ownership of such property. A legal notice must be recorded with the land records (property deed) with the requirement to maintain flood insurance over the life of the structure. To ensure that these requirements are met the property owner must agree to and sign the attached "Acknowledgement of Conditions for Mitigation of Property in a Special Flood Hazard Area with FEMA Grant Awards."

11. HAZARD MITIGATION PLAN

Hazard Mitigation projects must be in conformance with the goals and objectives of the local approved all hazard mitigation plan.

- Provide the name of the Local Hazard Mitigation Plan and date approved.
- Provide a copy of the goals/objectives and the mitigation strategy/action item that references the proposed project from the approved hazard mitigation plan.

12. ENVIROMENTAL CONSIDERATIONS

An environmental assessment is required for certain projects before the grant can be approved. It is FEMA's responsibility to prepare the environmental document, although the applicant will be required to provide much of the information, including any special studies that need to be performed. Complete the EHP Checklist and attach with the application.

13. MATCH COMMITMENT LETTER

Attach a letter from the chief elected official or resolution that the community is committed to providing the required 12.5% local match.

14. ASSURANCES

Sign and include the Assurances for Non-Construction and Construction Projects (DMA Form 1017A.)

15. ADDITIONAL COMMENTS/INFORMATION

Include any additional information that will support the proposed project, which you feel is appropriate for use in reviewing this application.

MAIL THE COMPLETED APPLICATION TO:

Wisconsin Emergency Management
ATTN: State Hazard Mitigation Officer
2400 Wright Street
P.O. Box 7865
Madison, WI 53707-7865

HAZARD MITIGATION GRANT PROGRAM BUDGET COST WORKSHEET

FLOODPROOFING AND ELEVATION PROJECTS

ADDRESS	TYPE*	TEMPORARY LIVING EXPENSES (if required)	SURVEYS	DESIGN & ENGINEERING FEES	PERMIT/ INSPECTION COSTS	CONSTRUCTION COSTS**	OTHER COSTS***	TOTAL
								\$ -
								\$ -
								\$ -
								\$ -
								\$ -
								\$ -
								\$ -
								\$ -
								\$ -
								\$ -
TOTAL		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

^{*} TYPE: Primary residence, secondary or recreational property, rental (2-4 family), multi-family rental (5 or more units), mobile home, commercial, public, or other (specify).

Attach all documentation to support the cost estimate. (Cost estimates must be established using nationally published or local cost estimating guides. If the cost estimate is based on a contractor's bid or historic costs from another similar activity or project within the community, documentation must be provided.)

Wisconsin HMGP Administrative Plan D-33

^{**}Identify construction costs on next sheet.

^{***} OTHER COSTS: Include costs for project management and other costs associated with implementing the project. This includes legal fees (if any), completion of the required Elevation Certificate, recording ther required deed restrictions, etc.

BUDGET COST WORKSHEET CONSTRUCTIONS COSTS

TOTAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$	-
										\$	-
										\$	-
										\$	=
										\$	-
										\$	-
										\$	-
										\$	-
										\$	-
										\$	=
										\$	=
ADDRESS	DISCONNECT/ CONNECT UTILITIES	ELEVATE UTILITIES	DEBRIS	FOUNDATION	LIFTING ELEVATION	BASEMENT FILL	ELEVATION OF EXISTING DECKS, PORCHES,	CONSTRUCTION MANAGEMENT	OTHER*	,	TOTAL

^{*}OTHER: Includes such things as asbestos abatement if required, repair of lawns, landscaping, sidewalks and driveways damaged during elevation work, etc.

Wisconsin HMGP Administrative Plan

ELEVATION PROJECT PROPERTY DATA WORKSHEET

LATITUDE (decimal, six digits)	PROPERTY ADDRESS:		
ELEVATING HOW MANY FEET:FINAL ELEVATION: (The structure must be elevated at a minimum to the Base Flood Elevation (BFE)/100-year flood elevation plus two feet of freeboard.) ATTACH FIRM MAP WITH PROPERTY LOCATION FLOOD INSURANCE: No Yes Policy # Policy Provider *BUILDING TYPE: No Basement: 1-story 2-story Split-Level With Basement: 1-story 2-story Split-Level Manufactured Home *FOUNDATION TYPE: Basement Crawlspace Elevated on Posts, Piers, or Columns Slab on Grade Other *BUILDING USE: Primary Residence Secondary Residence Rental: Single Family 2-4 Family Multi-Family (5-more units) Commercial Property Public Building Other (explain) RENTAL PROPERTY: Number of renters per unit Current Rental Payments	C111.		
*LOCATED IN FLOODPLAIN: Floodway Floodfringe Regional Flood Elevation First Floor Elevation Elevation of Lowest Finished Floor Vertical Datum: NGVD29 or NAVD88 ELEVATING HOW MANY FEET: FINAL ELEVATION: (The structure must be elevated at a minimum to the Base Flood Elevation (BFE)/100-year flood elevation plus two feet of freeboard.) ATTACH FIRM MAP WITH PROPERTY LOCATION FLOOD INSURANCE: No Yes Policy # Policy Provider *BUILDING TYPE: No Basement: 1-story 2-story Split-Level With Basement: 1-story 2-story Split-Level Manufactured Home *FOUNDATION TYPE: Basement Crawlspace Elevated on Posts, Piers, or Columns Slab on Grade Other *BUILDING USE: Primary Residence Secondary Residence Rental: Single Family 2-4 Family Multi-Family (5-more units) Commercial Property Public Building Other (explain) RENTAL PROPERTY: Number of renters per unit Current Rental Payments	PARCEL/TAX NUMBER	TOWN/RANGE/SECTION	COUNTY
First Floor Elevation Elevation of Lowest Finished Floor Vertical Datum: NGVD29 or NAVD88 ELEVATING HOW MANY FEET: FINAL ELEVATION: (The structure must be elevated at a minimum to the Base Flood Elevation (BFE)/100-year flood elevation plus two feet of freeboard.) ATTACH FIRM MAP WITH PROPERTY LOCATION FLOOD INSURANCE: No Yes Policy # Policy Provider *BUILDING TYPE: No Basement: 1-story 2-story Split-Level With Basement: 1-story 2-story Split-Level Manufactured Home *FOUNDATION TYPE: Basement Crawlspace Elevated on Posts, Piers, or Columns Slab on Grade Other *BUILDING USE: Primary Residence Secondary Residence Rental: Single Family 2-4 Family Multi-Family (5-more units) Commercial Property Public Building Other (explain) RENTAL PROPERTY: Number of renters per unit Current Rental Payments	LATITUDE	LONGITUDE	(decimal, six digits)
(The structure must be elevated at a minimum to the Base Flood Elevation (BFE)/100-year flood elevation plus two feet of freeboard.) ATTACH FIRM MAP WITH PROPERTY LOCATION FLOOD INSURANCE: No Yes Policy # Policy Provider *BUILDING TYPE: No Basement: 1-story 2-story Split-Level With Basement: 1-story 2-story Split-Level Manufactured Home *FOUNDATION TYPE: Basement Crawlspace Elevated on Posts, Piers, or Columns Slab on Grade Other *BUILDING USE: Primary Residence Secondary Residence Rental: Single Family 2-4 Family Multi-Family (5-more units) Commercial Property Public Building Other (explain) RENTAL PROPERTY: Number of renters per unit Current Rental Payments	First Floor Elevation El	levation of Lowest Finished Floo	
*BUILDING TYPE: No Basement: 1-story 2-story Split-Level With Basement: 1-story 2-story Split-Level Manufactured Home *FOUNDATION TYPE: Basement Crawlspace Elevated on Posts, Piers, or Columns Slab on Grade Other *BUILDING USE: Primary Residence Secondary Residence Rental: Single Family 2-4 Family Multi-Family (5-more units) Commercial Property Public Building Other (explain) RENTAL PROPERTY: Number of renters per unit Current Rental Payments	(The structure must be elevate	ed at a minimum to the Base	· · · · · · · · · · · · · · · · · · ·
*BUILDING TYPE: No Basement: 1-story 2-story Split-Level With Basement: 1-story 2-story Split-Level Manufactured Home *FOUNDATION TYPE: Basement Crawlspace Elevated on Posts, Piers, or Columns Slab on Grade Other *BUILDING USE: Primary Residence Secondary Residence Rental: Single Family 2-4 Family Multi-Family (5-more units) Commercial Property Public Building Other (explain) RENTAL PROPERTY: Number of renters per unit Current Rental Payments	ATTACH FIRM MAP WITH PRO	PERTY LOCATION	
No Basement: 1-story 2-story Split-Level With Basement: 1-story 2-story Split-Level Manufactured Home *FOUNDATION TYPE: Basement Crawlspace Elevated on Posts, Piers, or Columns Slab on Grade Other *BUILDING USE: Primary Residence Secondary Residence Rental: Single Family 2-4 Family Multi-Family (5-more units) Commercial Property Public Building Other (explain) RENTAL PROPERTY: Number of renters per unit Current Rental Payments	FLOOD INSURANCE: No Yes	s Policy # Policy P	rovider
*BUILDING USE: Primary Residence Secondary Residence Rental: Single Family 2-4 Family Multi-Family (5-more units) Commercial Property Public Building Other (explain) RENTAL PROPERTY: Number of renters per unit Current Rental Payments	No Basement: 1-story2-story With Basement: 1-story2-sto	•	
Rental: Single Family2-4 Family Multi-Family (5-more units) Commercial Property Public Building Other (explain) RENTAL PROPERTY: Number of renters per unit Current Rental Payments		·	
RENTAL PROPERTY: Number of renters per unit Current Rental Payments	Rental: Single Family2-4 Fam	nily Multi-Family (5-more u	nits)
Cost of Eligible Relocation (URA/State)	RENTAL PROPERTY: Number of	f renters per unit Current	
	Cost of Eligible Relocation (URA/	'State)	

PHOTOGRAPHS: Attach three or more color photographs (2 copies of each) showing a front view, a side view, and a back view of each structure to be acquired. Attach photographs to the worksheet for that property.

ESTIMATED COSTS FOR ELEVATION:

Cost estimates must be established using nationally published or local cost estimating guides. If a cost estimate is based on a contractor's bid or historic costs from another activity, documentation must be provided.

Design and Engineering Fees:

Surveying:

Soil Inspections:

Legal Fees:

Permit/Inspection Fees:

Disconnection and Reconnection of Utilities:

Elevation of Utilities:

Extending lines and pipes:

Construction:

- Debris disposal
- Erosion control
- Physical elevation
- Foundation
- Fill for basement
- Elevation of existing decks, porches or stairs
- Construction of stairs, landings, rails for access

Construction Management:

Asbestos Abatement:

Temporary Living Expenses during Displacement:

Repair of Lawns, Landscaping, Sidewalks, and Driveways:

Elevation Certificate (FEMA Form 086-0-33):

Deed Recordation Fees:

Other Costs (list):

TOTAL ESTIMATE:

NFIP COMPLIANCE: Elevation must be in compliance with NFIP standards in 44 CFR Part 60, NR 116, and the local floodplain management ordinance. Describe the Elevation Method to be used.

ASCE 24-14 COMPLIANCE: The project must be constructed in conformance with the design criteria in ASCE 24-14, Flood Resistant Design and Construction, and codes and standards. Verification and certification will be required at project closeout.

SFHA REQUIREMENTS: Attach the "Acknowledgement of Conditions for Mitigation of Property in an SFHA with FEMA Grant Awards" singed by the property owner(s).

MODEL ACKNOWLEDGEMENT OF CONDITIONS FOR MITIGATION OF PROPERTY IN A SPECIAL FLOOD HAZARD AREAS (SFHA) WITH FEMA GRANT FUNDS

Property Owner
Street Address
City, State, ZIP Code
Deed Dated, Recorded
Tax Map, Block, Parcel
Base Flood Elevation at the site is feet NGVD 29/NAVD 88 (Circle one)
Map Panel Number, Effective Date

As a recipient of federally-funded hazard mitigation assistance under the Hazard Mitigation Grant Program, as authorized by 42 U.S.C. §5170c, the property owner accepts the following conditions:

- 1. That the Property Owner has insured all structures that will **not** be demolished or relocated out of the SFHA for the above-mentioned property to an amount at least equal to the project cost or to the maximum limit of coverage made available with respect to the particular property, whichever is less, through the National Flood Insurance Program (NFIP), as authorized by 42 U.S.C. §4001 *et seq.*, as long as the Property Owner holds title to the property as required by 42 U.S.C. §4012a.
- 2. The Property Owner will maintain all structures on the above-mentioned property in accordance with the floodplain management criteria set forth in Title 44 of the Code of Federal Regulations (CFR) Part 60.3 and City/County Ordinance as long as the Property Owner holds title to the property. The criteria below meets the requirements of the local Ordinance, which are more restrictive and supersede those set forth in Title 44 of the CFR Part 60.3 as outlined in Attachment A, FEMA Model Acknowledgement of Conditions. These criteria include, but are not limited to, the following measures:
 - Lowest floor of structure must be elevated on compacted fill at or above the Flood Protection Elevation (Base flood elevation plus two feet.);
 - ii. Dryland access shall be provided to the elevated structure. If existing street are below the Regional Flood Elevation, the community may only approve the project if one of the following options is implemented;

The community has an adequate natural disaster plan which has been approved by Wisconsin Emergency Management and the Wisconsin Department of Natural Resources; or

Local police, fire and ambulance services have provided written assurances that wheeled vehicles can access the affected properties during a regional flood event.

iii. No mechanical, electrical, plumbing devices, or appurtenant will be installed below the Flood Protection Elevation.

For a complete, detailed list of these criteria, see City/County Ordinance attached to this document.

3. The above conditions are binding for the life of the property. To provide notice to subsequent purchasers of these conditions, the Property Owner agrees that the City/County will legally record with the county or appropriate jurisdiction's land records a notice that includes the name of the current property owner (including book/page reference to record of current title, if readily available), a legal description of the property, and the following notice of flood insurance requirements:

"This property has received Federal hazard mitigation assistance. Federal law requires that flood insurance coverage on this property must be maintained during the life of the property regardless of transfer of ownership of such property. Pursuant to 42 U.S.C. §5154a, failure to maintain flood insurance on this property may prohibit the owner from receiving Federal disaster assistance with respect to this property in the event of a flood disaster. The Property Owner is also required to maintain this property in accordance with the floodplain management criteria of Title 44 of the Code of Federal Regulations Part 60.3 and City/County Ordinance."

4. Failure to abide by the above conditions may prohibit the Property Owner and/or any subsequent purchasers from receiving Federal disaster assistance with respect to this property in the event of any future flood disasters. If the above conditions are not met, FEMA may recoup the amount of the grant award with respect to the subject property, and the Property Owner may be liable to repay such amounts.

This agreement shall be binding upon the respective parties' heirs, successors, personal representatives, and assignees.

THE CITY/COUNTY OF
A municipal corporation
By: [Name, Title]
Of the City/County of
&
[Name of Property Owner]
WITNESSED BY:
[Name of Witness]
[Seal]
Notary Public

FEMA Model Acknowledgement of Conditions For Mitigation of Property in a Special Flood Hazard Area With FEMA Grant Funds

Property Owner				
Street Address				
City			ZIP Code	
Deed Dated		Recorded		
Base Flood Elevation at th	e site is	feet (NGVD).		
Map Panel Number		, Effective Date		

As a recipient of Federally-funded hazard mitigation assistance under the Hazard Mitigation Grant Program, as authorized by 42 U.S.C. §5170c / Pre-Disaster Mitigation Program, as authorized by 42 U.S.C. §5133 / Flood Mitigation Assistance Program, as authorized by 42 U.S.C. §4104c / Severe Repetitive Loss, as authorized by 42 U.S.C. §4102a, the Property Owner accepts the following conditions:

- 1. That the Property Owner has insured all structures that will **not** be demolished or relocated out of the SFHA for the above-mentioned property to an amount at least equal to the project cost or to the maximum limit of coverage made available with respect to the particular property, whichever is less, through the National Flood Insurance Program (NFIP), as authorized by 42 U.S.C. §4001 *et seq.*, as long as the Property Owner holds title to the property as required by 42 U.S.C. §4012a.
- 2. That the Property Owner will maintain all structures on the above-mentioned property in accordance with the flood plain management criteria set forth in Title 44 of the Code of Federal Regulations (CFR) Part 60.3 and City/County Ordinance as long as the Property Owner holds title to the property. These criteria include, but are not limited to, the following measures:
 - i. Enclosed areas below the Base Flood Elevation will only be used for parking of vehicles, limited storage, or access to the building;
 - ii. All interior walls and floors below the Base Flood Elevation will be unfinished or constructed of flood resistant materials;
 - iii. No mechanical, electrical, or plumbing devices will be installed below the Base Flood Elevation; and
 - iv. All enclosed areas below Base Flood Elevation must be equipped with vents permitting the automatic entry and exit of flood water.

For a complete, detailed list of these criteria, see City/County Ordinance attached to this document.

3. The above conditions are binding for the life of the property. To provide notice to subsequent purchasers of these conditions, the Property Owner agrees that the City/County will legally record with the county or appropriate jurisdiction's land records a notice that

includes the name of the current property owner (including book/page reference to record of current title, if readily available), a legal description of the property, and the following notice of flood insurance requirements:

"This property has received Federal hazard mitigation assistance. Federal law requires that flood insurance coverage on this property must be maintained during the life of the property regardless of transfer of ownership of such property. Pursuant to 42 U.S.C. §5154a, failure to maintain flood insurance on this property may prohibit the owner from receiving Federal disaster assistance with respect to this property in the event of a flood disaster. The Property Owner is also required to maintain this property in accordance with the flood plain management criteria of Title 44 of the Code of Federal Regulations Part 60.3 and City/County Ordinance."

4. Failure to abide by the above conditions may prohibit the Property Owner and/or any subsequent purchasers from receiving Federal disaster assistance with respect to this property in the event of any future flood disasters. If the above conditions are not met, FEMA may recoup the amount of the grant award with respect to the subject property, and the Property Owner may be liable to repay such amounts.

This Agreement shall be binding upon the respective parties' heirs, successors, personal representatives, and assignees.

THE CITY/COUNTY OF
A municipal corporation
By:
[Name, Title]
of the City/County of
&
[Name of Property Owner]
WITNESSED BY:
[Name of Witness]
[SEAL]
Notary Public

Date

Subapplicant
Address
City, State ZIP Code

Dear XXXX:

As a result of federal disaster declaration FEMA-4276-DR-WI declared (date), funding was made available through the Hazard Mitigation Grant Program (HMGP) to provide subawards to local governments to fund long-term and permanent mitigation measures. The subawards are 75% federally funded through the Federal Emergency Management Agency (FEMA) and 12.5% state funded through this Division. The remaining 12.5% is the required local match. The local match can be greater than 12.5%. The objective of the program is to prevent or reduce future disaster damages. Subawards can be used to fund projects on either public or private property.

The amount of federal funds available for the HMGP is equivalent to 20% of the federal funds spent through the Public Assistance program for the declaration. It is estimated that there will be approximately \$\frac{XXXX}{XXXX}\$ in HMGP funds available for this declaration. This office received \$\frac{XX}{XXX}\$ pre-applications exceeding \$\frac{XXXXX}{XXXX}\$. As you can see, the demand for mitigation dollars far outweighs the amount of funding available.

The Wisconsin Division of Emergency Management (WEM) has completed a thorough review of the pre-applications. As advised in the letter you received with the pre-application, those projects involving acquisition, demolition, relocation, and floodproofing or elevation of floodplain properties will remain the State's highest priority for HMGP projects. Projects that will make the biggest impact for preventing or reducing future disaster damages and have the potential for receiving subaward approval are invited to participate in the formal subapplication process for further subaward consideration.

(Subapplicant) submitted a pre-application for (type of project) in the amount of \$XXXX. Based on WEM's review of this proposal and program criteria, (subapplicant) is invited to participate in the formal subapplication process for further subaward consideration.

Enclosed is the HMGP subapplication packet that includes the subapplication (DMA Form 139), Assurances (DMA Form 1017A), general instructions, and environmental assessment requirements. Please read the instructions carefully, and be as thorough and accurate as possible in completing the forms. The answers to questions 4 through 7 of the subapplication should be documented as thoroughly as possible. This information is critical in determining the cost effectiveness for the proposed project.

The subapplication requests detailed information that is needed for this office to complete the necessary reviews, including the benefit-cost analysis and environmental review. Where actual data or information is not available, you should provide the most accurate estimates. **Due to the competitiveness of the program, it is important that you answer all the questions as completely as possible.**

There are specific criteria that must be met by subapplicants in order to be eligible for funding:

- 1. The community must be participating, and in good standing with the National Flood

 Insurance Program. The Department of Natural Resources may conduct a site visit during the subapplication review process to determine if a community is compliant.
- 2. The proposed project must be in conformance with the goals and objectives of the community's FEMA-approved hazard mitigation plan.
- 3. The proposed project must be cost-effective. This means that the project will have to show the benefits of the project outweigh the costs. In order to demonstrate this, the subapplication must contain the necessary detail. Only those projects that are cost effective will receive further consideration for HMGP funding.
- 4. The project must be environmentally sound. Some HMGP projects may receive a categorical exclusion from an environmental assessment. The subapplicant will have to demonstrate that the proposed project will not have any associated "extraordinary circumstances" in the project area. Presence of extraordinary circumstances will require an environmental assessment or environmental impact statement. WEM will prepare the required documents, with subapplicants providing the information required. FEMA has the responsibility for making sure that all projects meet the requirements of the National Environmental Protection Act (NEPA).
- 5. Subapplicants will have to show that other <u>alternatives</u> ("do nothing" and one other) were considered, and that the proposed project is the most feasible and will solve a problem.

A thorough review will be completed on all formal subapplications received for HMGP funding. There will be (number) formal subapplications totaling \$XXXX under consideration. Based on the limited funds available, the program will be very competitive and only those projects that meet the benefit-cost requirement and make the biggest impact in reducing future disaster damages will receive further consideration for subaward funding. Therefore, it is imperative that all the questions in the subapplications be answered completely and accurately.

For additional information regarding the HMGP visit https://www.fema.gov/hazard-mitigation-grant-program.

The subapplication is due in this office **no later than (date)**. If (subapplicant) completes the subapplication prior to the above date, it should be submitted to this office so that we can begin our review and complete the required benefit-cost analysis.

If you have any questions or need additional information or would like to schedule a meeting, please do not hesitate to contact me at (608) 242-3222; Roxanne Gray, Mitigation Section Supervisor, at (608) 242-3211; Caitlin Shanahan, Disaster Response and Recovery Planner, at (608) 242-3214; or Margaret Zieke, Disaster Response and Recovery Planner, at (608) 242-3252.

Sincerely,

Katie Sommers, CFM
State Hazard Mitigation Officer

Cc: Regional Emergency Management Director
County Emergency Management Director
Department of Natural Resources

SECTION 404 HAZARD MITIGATION GRANT PROGRAM DISASTER SUBAPPLICATION

Disaster Declara	ation #: FEMA-4276-DR-WI	Declaration Date: August 9, 2016
• •		
(Politi	cal subdivision, quasi-governmen	t, nonprofit organization)
FIPS Code:	D-U-N-S Number:	FEIN Number:
Street/PO Box:		
City:	ZIP Code:	County:
Primary Contac	t:	
Title:		E-Mail:
Office Phone: _		_ Cell Phone:
Secondary Cont	tact:	
Title:		E-Mail:
Office Phone: _		_ Cell Phone:
Mitigation Grant the program con appropriate form	t Program and hereby certifies the ntained in federal and/or state p	tion for financial assistance under the Hazard nat the subapplicant will fulfill all requirements or rogram guidelines including the submission of al licable local codes and standards as well as othe
dedicated to su support the und	pport the 12.5% local share of lertaking of the project during t	r, that the funding and/or resources which will be the project are available and will be utilized to he specified performance period. Evidence of this and/or federal governments upon request.
supporting doc	, ,	lief, that the information in this application and , and that it has been duly authorized by the
Subapplicant's	Signature:	Date Signed:
Printed Name a	and Title:	

Note: If the project is approved, work must begin within 90 days of the obligation of funds.

All questions must be answered completely and accurately. Wisconsin Emergency Management (WEM) and FEMA staff reviewing the application will not be familiar with your community, the specific project area, or the need for the proposed project. Therefore, it is the responsibility of the subapplicant to ensure that their subapplication addresses all of the required items. This is particularly important given the competitive nature of the program. If you are unsure as to the meaning of a particular question, contact WEM prior to attempting to answer that question.

1. PROJECT COST ESTIMATE

Section 404-HMGP Funds Requested:

Total:	\$
Federal Share (75%):	\$
State Share (12.5%):	\$
Subapplicant Share (12.5%):	\$
Other Funding Sources:	\$

2. PROJECT TITLE AND DESCRIPTION

3. PROJECT LOCATION (Include maps and photographs)

Road or street address, geographic landmarks, latitude and longitude in decimal degrees (NOT degrees/minutes/seconds), legal description, etc. Provide a map showing the range and town sections for the project area. Indicate the project site on this map.

Include a current locally adopted floodway map or flood insurance rate map (FIRM) indicating the project location. FIRMs are typically available from your local floodplain administrator who may be located in the planning, zoning, or engineering office. Maps can also be downloaded from the FEMA Map Service Center at https://msc.fema.gov/portal. For more information about FIRMs, contact your local agencies or visit FEMA's FIRM website at http://www.fema.gov/flood-insurance-rate-map-firm. Flood Insurance Studies are available at http://www.fema.gov/flood-insurance-study.

Include several photographs of the location for the proposed project site.

4. DETAILED DESCRIPTION OF PROBLEM

Provide a detailed description of the problem to be solved and damages to be reduced or eliminated as a direct result of the proposed project. Indicate whether the problem is repetitive. Take into account damage to public and private property, both residential and commercial, threats to public health and safety, and government response costs (fire, police, public works, human services, etc.). Include the total number of persons and structures including both residential and commercial that will benefit from this project. Also, include infrastructure that may be protected as a result of the project.

5. DETAILED SCOPE OF WORK FOR PROPOSED PROJECT

Provide a detailed scope of work for the proposed mitigation project. A registered professional engineer (or other accredited design professional) should certify that the design meets the appropriate code or industry design and construction standards. Appropriate standards or codes should be referenced.

6. HAZARDS TO BE MITIGATED/LEVEL OF PROTECTION

a.	Select the type of hazard(s) the proposed project will mitigate:
	Flood Wind Other
b.	Fill in the level of protection the proposed project will provide (e.g. 23 structures protected against the 100-year [1% annual chance] flood). List data in flood levels (10-, 25-, 50-, 100-year) and/or mph winds.
	structures protected against the
	If other, describe.

7. COST EFFECTIVENESS OF THE PROPOSED PROJECT

Answer the following questions as completely and accurately as possible and provide as much detail as possible for each question. This information is critical to the calculation of a benefit-cost analysis and must be provided. Where actual data is not available, use the most accurate estimates.

- a. What is the project life in number of years (permanent or long-term as opposed to temporary or short-term)? (For example, "If the project is maintained, the project will last X number of years.")
- b. Damages (dollar amount) from this event as well as all past events including Presidentially declared disasters and non-declared events. Indicate damage history including the month and year of each occurrence, storm event level (10-, 20-, 50-year, etc.), a description of the event, and damages/costs associated with the event. Indicate the actual or estimated dollar losses for each event including government response costs (fire, police, public works, human services, etc.), damages (including contents) to residential and commercial structures, damages (including contents) to critical facilities (schools, hospitals, etc.), damages to infrastructure (roads, sewer, public buildings, parks, etc.), as well as any other facilities affected. (Use the enclosed Damage Assessment Worksheet.)

Actual dollar losses for all the above categories are essential for performing the benefit-cost analysis.

Also include other negative impacts on the community from the events such as economic decline, increased unemployment due to the event, disruption of essential services, interruption to local business operations, threats to public safety, etc.

- c. Indicate the frequency at which damages occur if the proposed project is not implemented, as well as the frequency to which the project would provide protection, i.e., 5-, 10-, 50- or 100-year storm, etc.
- d. Identify residual damages that would result in an event that would exceed the level of protection provided by the project.

e. Describe any other positive impacts besides reducing damages that the proposed project will provide.

8. INDEPENDENT SOLUTION

Will the proposed project solve the problem independently or is it part of a larger solution? If part of a larger solution, indicate when the project as a whole will be completed.

9. WORK SCHEDULE AND ESTIMATED COMPLETION DATES

Include a work schedule for the proposed project. The schedule should indicate major milestones or phases of the project and the expected completion date of each phase. (e.g. engineering, design, permit process, project management, construction, etc.)

10. BUDGET

Provide a breakdown of cost elements such as pre-award costs, engineering and design, project management, construction, materials, equipment, etc. **Lump sums are not acceptable. Contingencies are limited to 1-5%.**

Include appropriate documentation that demonstrates a national published standard or local estimating guide was used to establish the budget for the proposed project. If the budget is based on a contractor's bid or historic costs from another activity, detailed documentation must be provided. **Cost-plus-percentage-of-cost contracts are not allowed.**

11. ROUTINE MAINTENANCE

Identify the annual maintenance costs directly related to the project's effectiveness, and who is responsible for the maintenance. **Applicants are responsible for any and all future maintenance costs on an approved project.** Attach a letter committing to providing the required annual maintenance for the life of the project.

12. ALTERNATIVES CONSIDERED

Describe in detail three options (the proposed project plus two other alternatives) that have been considered to deal with the problem, the estimated cost, and why they were selected, rejected, or eliminated from consideration. In addition to the proposed project, **you must provide at least one other alternative besides "do nothing."** Describe the impacts on the project area if no action is taken. Provide justification for the selection of the proposed project over the other alternatives. The reason may be monetary, environmental, or physical, or related to the degree of effectiveness, maintenance costs, other reasonable causes, or a combination of these factors.

13. ENVIRONMENTAL CONSIDERATIONS

An environmental review is required for certain projects before the subaward can be approved. It is FEMA's responsibility to prepare the environmental document, although the applicant will be required to provide much of the information, including any special studies that need to be performed. Complete the EHP Checklist and attach to the application.

14. HAZARD MITIGATION PLAN

Hazard mitigation projects must be in conformance with the goals and objectives of the local, FEMA-approved hazard mitigation plan.

- Provide the name of the local hazard mitigation plan and date approved.
- Provide a copy of the goals/objectives and the mitigation strategy/action item that references the proposed project from the approved hazard mitigation plan. **Only include sections of the plan that are relevant to the proposed project**.

15. MATCH COMMITMENT LETTER

Attach a letter from the chief elected official or resolution that the community is committed to providing the required 12.5% local match.

16. COMPLETE AND ATTACH THE APPLICABLE WORKSHEETS

For localized flood reduction projects, use the **WEM Localized Flood Reduction Checklist**.

For community safe room projects, use the **WEM Tornado Community Safe Room Checklist**.

17. ADDITIONAL COMMENTS/INFORMATION

Include any additional pertinent information that will support the proposed project and assist with the review of the application.

MAIL THE COMPLETED APPLICATION TO:

Wisconsin Emergency Management ATTN: State Hazard Mitigation Officer 2400 Wright Street P.O. Box 7865 Madison, WI 53707-7865

DAMAGE ASSESSMENT WORKSHEET

EVENT (description, federal disaster declaration number or non-declared)	DATE (month, year)	STORM EVENT (10-, 20-, 50- year, etc.)	ESSENTIAL SERVICES DISRUPTED (water, sewer, electric, etc.)	GOVERNMENT RESPONSE COSTS (fire, police, EMS, public works, human services)	DAMAGES TO STRUCTURES INCL. CONTENTS (residential & commercial)	DAMAGES TO CRITICAL FACILITIES INCL. CONTENTS (schools, hospitals, etc.)	DAMAGES TO INFRASTRUCTURE (roads, sewers, public buildings, parks, etc.)
				\$	\$	\$	\$
				\$	\$	\$	\$
				\$	\$	\$	\$
				\$	\$	\$	\$
				\$	\$	\$	\$
				\$	\$	\$	\$
				\$	\$	\$	\$
				\$	\$	\$	\$
				\$	\$	\$	\$

ATTACH SUPPORTING DOCUMENTATION

Wisconsin HMGP Administrative Plan D-49



Wisconsin Emergency Management

COMMUNITY SAFE ROOM APPLICATION INFORMATION

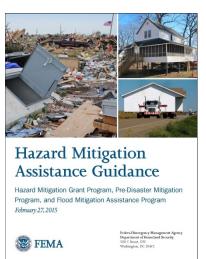




This handout outlines basic requirements for a Hazard Mitigation Grant Program (HMGP) or Pre-Disaster Mitigation (PDM) grant application to construct a community safe room. FEMA defines a safe room as an interior room, a space within a building, or an entirely separate building, designed and constructed to provide near absolute life safety protection for its occupants from tornados or hurricanes. A safe room is designed and constructed to meet the criteria in FEMA P-361 or the most current edition of FEMA P-320.

Safe rooms may be classified into two categories: residential and community safe rooms. A residential safe room serves occupants of dwelling units and has an occupant load not exceeding 16 persons. <u>A community safe room is any safe room not defined as a residential safe room including not only public, but also private safe rooms for businesses and other types of organizations.</u>

An applicant interested in preparing and submitting a grant application to construct a community safe room should be familiar with the applicable FEMA Hazard Mitigation Assistance (HMA) programs. Please review the following documents for information and guidance on development of an application that satisfies all requirements.



Hazard Mitigation Assistance Guidance (February 27, 2015 Edition)

This publication provides guidance on FEMA's Hazard Mitigation Assistance (HMA) programs including the Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM), and Flood Mitigation Assistance (FMA). The HMA programs provide funding opportunities for eligible mitigation activities that reduce disaster losses and protect life and property from future damages.

- ► Part II addresses HMA program requirements and the importance of "frontloading" eligibility requirements early in application process. This is valuable information to consider prior to submitting an application to FEMA.
- ▶ Part IV describes application and submission information including general applicant guidance, scope of work, schedule, and cost estimates.

Available for free online at:

http://www.fema.gov/media-library/assets/documents/103279



Hazard Mitigation Assistance Guidance Addendum

Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, and Flood Mitigation Assistance Program

February 27, 2015



Federal Emergency Management Agenc Department of Homeland Security 510 C Street, S.W. Washington, DC 20472

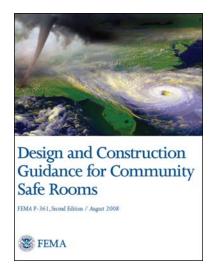
Hazard Mitigation Assistance Guidance Addendum (February 27, 2015 Edition)

This publication describes project specific requirements under the Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM) program, and Flood Mitigation Assistance (HMA) program.

- ▶ Part C is specific to Safe Rooms and includes:
 - > Table 2: HMA-Funded Safe Room Minimum Usable Floor Area per Safe Room Occupant;
 - ➤ Table 3: Example Community Safe Room Size;
 - Table 4: Eligible and Ineligible Components of Residential and Community Safe Rooms.

Available for free online at:

http://www.fema.gov/media-library/assets/documents/103279

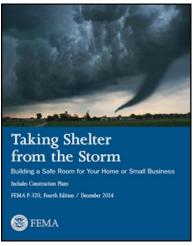


Safe Rooms for Tornadoes and Hurricanes: Guidance for Community and Residential Safe Rooms (FEMA P-361, Third Edition, March 2015)

The third edition provides guidance on the planning, design, construction, and operation of safe rooms. The guidance is intended for architects, engineers, building officials, local officials and emergency managers, and prospective safe room owners and operators.

Available for free online at:

http://www.fema.gov/media-library/assets/documents/3140

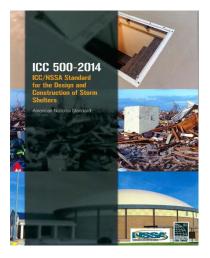


Taking Shelter from the Storm: Building a Safe Room for Your Home or Small Business (FEMA P-320, Fourth Edition, December 2014)

The fourth edition provides guidance for small safe rooms providing shelter for 16 or fewer people primarily for use in new homes and small businesses. Some information is also useful in existing buildings.

Available for free online at:

http://www.fema.gov/media-library/assests/documents/2009



ICC/NSSA Standard for the Design and Construction of Storm Shelters (ICC 500-2014)

This publication is optional reference material on the design and construction of storm shelters. Published jointly by the International Code Council (ICC) and National Storm Shelter Association (NCCA) this standard provides the minimum design and construction requirements for storm shelters that provide safe refuge.

Available for purchase at: http://shop.iccsafe.org/icc-500-2014-icc-nssa-standard-for-the-design-and-construction-of-storm-shelters-1.html

DESIGNING THE SAFE ROOM

Applicant should consult with a qualified design professional (such as an engineer, architect, or contractor) on the planning and design of the proposed safe room. The design professional should be familiar with the current edition of FEMA-P-361 with special attention on Part B and Appendix C.

- Chapter B3 pertains to structural design criteria;
- ► Chapter B4 pertains to siting criteria;
- ▶ Chapter B5 pertains to means of egress, access, and accessibility criteria;
- ► Chapter B6 pertains to fire safety;
- Chapter B7 pertains to essential features and accessories; and
- Appendix C provides a designer checklist.

Early in application development the decision will need to be made whether the safe room will be a single-use or multi-use structure. The type of safe room will determine what costs will be eligible expenses under the hazard mitigation assistance programs.

CREATING THE APPLICATION

Please refer to the Hazard Mitigation Assistance Guidance Addendum, Part C. Safe Rooms, for application requirements. Eligible safe room applications must include information documenting compliance with the following:

- ► Applicable guidance, codes, and regulations including:
 - Safe Rooms for Tornadoes and Hurricanes: Guidance for Community and Residential Safe Rooms (FEMA P-361) available for free download at: http://www.fema.gov/media-library/assets/documents/3140;
 - Relevant HMGP or PDM program guidance requirements;
 - > And, any applicable local codes and regulations (such as planning, zoning, and building).
- ▶ Identified population for the safe room including:
 - Number, composition, and supporting reason (risk assessment);
 - > Information on how the identified population will travel to the safe room.
- ▶ Travel Time Considerations including:
 - > The identified population must be able to safely reach the safe room within 5 minutes;
 - ➤ Based on a maximum walking travel time of 5 minutes or a maximum driving travel distance of one-half (0.5) mile.
- ➤ Sizing (See Table 2: HMA-Funded Safe Room Minimum Usable Floor Area per Safe Room Occupant on page 46 of the Addendum). Providing at minimum:
 - 5 square feet per standing or seated occupant;
 - ➤ 10 square feet per wheelchair user occupant;
 - > 30 square feet per medical Bed user occupant.
 - And, at least **ONE** wheelchair user occupant per 200 total occupants or portion thereof.
- ▶ Provide information for the Benefit-Cost Analysis (BCA), as outlined in page 5 of this packet.
- ▶ Descriptive statement acknowledging the requirements to prepare an Operations & Maintenance plan, including a description of the maintenance procedures and a brief statement about the operation of the safe room.
- Signed assurances for construction projects (provided by Wisconsin Emergency Management).

COST ELIGIBILITY

Please refer to the Hazard Mitigation Assistance Guidance Addendum for a complete list of eligible and ineligible costs for community safe rooms. *Table 4: Eligible and Ineligible Components of Residential and Community Safe Rooms* lists items that may or may not be paid for by FEMA grant programs.

Eligible:

- Structural systems capable of resisting the design wind loads that directly support or protect the safe
 room to provide near-absolute, life-safety protection (including walls, ceiling, roof decking and roof
 support structures)
- Doors, windows, and opening protection
- Protection of backup mechanical, electrical, ventilation, and communication equipment necessary to provide life-safety for the safe room
- Signage
- Communications, including LAN drops and wiring if used for emergency communication during an event
- Alternate source or power
- First aid supplies and equipment
- Fire-suppression systems (sprinklers systems and fire extinguishers)
- · Electrical lighting and outlets
- Americans with Disabilities Act (ADA) requirements
- Ventilation
- Heating, Ventilation, and Air Conditioning (HVAC) used for required ventilation
- Accessible toilets and hand washing stations in safe room
- Design activities (planning, engineering, architecture design fees)
- Engineering study to calculate undefined flood elevations
- Engineering peer review
- Site preparation and building foundation materials and construction
- Inspections, including special inspections
- Soil test
- Storage room for food, water, and safety equipment
- Costs associated with the acquisition of land (or land value)
- Operation and Maintenance (O&M) Plan development

Ineligible:

- HVAC not used for required ventilation
- Safe room maintenance
- Restroom fixtures not required by code or FEMA P-361
- Paint on walls and ceilings of safe room
- Floor coverings subfloors not required for life safety
- Removal of structures from developed land
- Kitchen cabinets, countertops, and other equipment not required for life safety
- Security cameras and Emergency Operation Center (EOC) type equipment
- Landscaping
- Parking and all non-building elements unless required for ADA compliance
- Community-wide, mass notification systems

BENEFIT-COST ANALYSIS REQUIRED DOCUMENTATION

HMGP and PDM safe room project applications must demonstrate project cost-effectiveness through an acceptable Benefit-Cost Analysis (BCA). Provide the following information so that WEM may develop the required BCA. The checklist will provide all the information required to perform the BCA.

SAFE ROOM	Required	Comments
Contact Information	Name Address County Lattitude/longitude	 ▶ Include contact information ▶ Is building historic? ▶ County required for tornado probability lookup
Scope of Work (SOW)	Problem description and proposed solution Description of existing condition Design criteria Work schedule Schematic design plans, detailed engineering drawings, or completed design plans	► Information is available from the engineer, architect, or contractor responsible for safe room design
Project Type	New or retrofit Stand-alone or internal Community or Residential	➤ Refer to SOW to determine the type of safe room project
Cost Estimate	Source of estimate and support Base year and any deviations Anticipated environmental or historic expenses Other related construction ,demolition, and site relocation costs (such as surveying, permitting, preparation, material disposal) Other acquisition costs (such as appraisals, legal recordation, displacement costs, and maintenance)	 ▶ All anticipated project costs should be detailed including maintenance cost over the useful life of the project ▶ Source should be professional with relevant expertise ▶ Provide the design, contractor, or Standard Cost Estimating software estimates ▶ Avoid use of lump sum costs
Maximum Occupancy	The maximum number of people that the Safe Room is designed to hold Include description of estimate method for identifying the safe room population	 ▶ Information is available from the engineer, architect, or contractor responsible for safe room design ▶ Occupancy data can also come from state or national sources, such as the US Census Bureau
Gross Area (Square Feet)	Total area from wall to wall for the portion of the building being used as a Safe Room Include a description of the estimate method or reference or copy of engineering or architectural specifications used.	 For a stand-alone safe room the gross area is the entire area of the building. For an internal safe room the gross area is based on the area of the building where structural elements are proposed to be upgraded to FEMA standards.
Usable Area (Square Feet)	Usable Area is gross floor area less unusable area (tables, chairs, storage, etc.). Include a description of estimate method or reference used to determine safe room area. Provide copy of engineering or architectural. drawings and identify safe room on plans	 Information is available from the engineer, architect, or contractor responsible for safe room design Must meet criteria for minimum square feet per person from FEMA P-361
Design Wind Speed	□ Find location on Safe Room design wind speeds for tornados. □ Reference or provide copy of engineering or architectural specifications used. Identify debris resistant criteria.	 ► FEMA P-361, Figure B3-1. Safe room design wind speeds for tornados (page B3-7) ► Design must be effective for the risk associated with the location.
Radius	 □ Estimate a radius around the Safe Room location □ Provide a copy of a radius map using aerial □ photography showing the proposed safe room □ location and radius 	 ▶ GIS map or other local or census map ▶ A maximum acceptable value is 0.5 mile radius or 5 minute walking distance
Structure Types	☐ Structure types that occupants are currently using ☐ Include on radius map information about structure types	► A maximum of two structure types may be selected. Select the town most predominant structure types
Occupancy	☐ Estimate what percentage of the total population within the radius would occupy each structure type during the day, evening, and night	▶ Information from tax records, property managers, or census data



Wisconsin Emergency Management





COMMUNITY SAFE ROOM GRANT APPLICATION CHECKLIST

	Eligibility			
1	Is this application for a community safe room?	Yes	No If no,	Stop
2	Do you have a current FEMA approved local hazard mitigation plan?	Yes	No If no,	Stop

	Location of Proposed Safe Room	
3	Street Address:	County:
	City:	Zip:
	Latitude:	Longitude:
=		
	Point of Contact	
4	First Name:	Last Name:
	Email:	Telephone Number:
	Street Address:	
	City:	Zip:

	Type of Proposed Safe Room							
5	New safe room or retrofit of an existing structure?		New ► Installed in the initial construction of the building		Retrofit Installed in an existing building			
6	Stand-alone safe room or part of an existing structure?		Stand-Alone		Internal			
7	Part of a structure with cultural or historic significance?		Yes		No			

	Project Considerations						
8	Does the application include other considered mitigation alternatives?		Yes		No	Page #:	
9	Is the safe room an independent solution (i.e., not part of a greater project)		Yes		No	Page #:	

	Design				ATTACHIVIENT
10	Is the wind zone region for the safe room location identified in the application? ► See Figure B3-1, FEMA P-361	Yes		No	Page #: Wind Zone #:
11	Does the application include a site plan and drawings of the proposed safe room? From a qualified design professional such as an engineer, architect, or contractor	Yes		No	Page #:
12	Is the design wind speed stated on the drawings? ► See Figure B3-1, FEMA P-361	Yes		No	Page #: Wind Speed #: mph
13	Gross square footage of the safe room?			sq. ft.	Page #:
14	Is this a single-use or multi-use safe room? ► See B1.2.1 Single-Use and Multi-Use Safe Rooms, FEMA P-361	Single-Use		Multi-Use	Page #:
15	Is space provided for safe room supplies within the safe room area?	Yes		No	Page #:
16	What is the usable safe room floor area? ► See B5.2.1.1 Calculation of Usable Floor Area of a Community Safe Room, FEMA P-361	sq. ft.			Page #:
17	Number of doors: ► See B5.2.1.2 Number of Doors for a Safe Room, FEMA P-361				Page #:
18	Do the plans comply with the ADA? ► See B5.2.1.4 Americans with Disabilities Act, FEMA P-361	Yes		No	Page #:
19	Are access and functional needs considered? ▶ See B5.2.1.4.2 Access and Functional Needs, FEMA P-361	Yes		No	Page #:
20	Do the plans address locks and latching? ► See B5.2.3 Locks and Latching, FEMA P-361	Yes		No	Page #:
21	Do the plans comply with all applicable Federal, State and local codes? ▶ e.g., ICC -500, FEMA P-361, State building codes, local zoning	Yes		No	Page #:
22	Do the drawings include a statement that the safe room was designed to FEMA P-361?	Yes		No	Page #:

	Floodplain			
23	Is the safe room site located in a mapped floodplain? ► Safe rooms should not be located in SFHA. See Table B4-1, FEMA P-361	1% 100 Year	NI-	D "
23		0.2% 500 Year	No	Page #:
24	Is the safe room site located in a mapped floodway? ► Community safe rooms shall be located outside of a floodway. See Table B4-1, FEMA P-361	Yes If yes, Stop and revise site plan	No	Page #:
25	Is the safe room site located behind a non-certified levee?	Yes	No	Page #:
26	If the surrounding area is flooded, would access to the safe room be possible?	Yes	No	Page #:
27	Does the application include the Flood Insurance Rate Map (FIRM) or other documentation that identify the project location relative to the floodplain?	Yes	No	Page #:

	On the Court of the Property					ATTACHIVIENT D
	Cost Estimate and Funding					
28	What is the Project Useful Life (PUL)? ► See Appendix D of FEMA BCA Reference Guide PUL values ≤ 16 people (30 yr), New (50 yr)	years				Page #:
29	Is a detailed cost estimate for design and construction included? Lump-sum cost estimates are not acceptable		Yes		No	Page #:
30	Are all identified costs eligible? ► See Table 4: Eligible and Ineligible Components of Residential and Community Safe Rooms and Part C.4.4 of Hazard Mitigation Assistance Guidance Addendum (February 27, 2015 Edition)		Yes		No	Page #:
31	What is the total cost of the project? ► Cost estimates submitted with an application should include only eligible costs	\$	-	Page #:		
32	What is the total annual maintenance cost of the safe room? ► Annual cost over the PUL to maintain the safe room (e.g. roof replacement, HVAC service, supplies)	\$				Page #:
33	Is the local match from a non-federal funding source?		Yes		No	Page #:
34	Is land value being used as part of the non-federal local match? ► Land acquisition is an eligible project cost. If the land is already owned by the applicant the land value can be used as local match.		Yes		No	Page #:

	Construction					
35	What is the primary safe room construction material (choose one):		Concrete; reinforced, precast Masonry, reinforced			Page #:
36	What is the proposed foundation type?					Page #:
37	What is the proposed depth of foundation and/or footings?					Page #:
38	Has the ground at the proposed site previously been disturbed?	Yes Year: No First Disturbance			Page #:	
39	Please describe any other anticipated ground disturbances:				Page #:	
40	Do the plans include information on the roof structure and roof covering?		Yes		No	Page #:
41	Primary power source:				Page #:	
42	Do the plans meet ventilation requirements? ► See B7.2.2 Ventilation, FEMA P-361		Yes		No	Page #:
43	Do the plans meet sanitation requirements? ►See B7.2.3 Sanitation Management, FEMA P-361		Yes		No	Page #:
44	Don the plans meet lighting requirements? ► See B7.2.4 Lighting, FEMA P-361	Yes No		Page #:		
45	Standby (emergency) power source: ► See B7.2.5 Standby (Emergency) Power, FEMA P-361					Page #:
46	Do the plans address water? ►See B7.2.6 Water Supply, FEMA P-361		Yes		No	Page #:

	Occupancy						
47	Does the application provide a general description of the surrounding area and population of the community that will use this safe room? • e.g. manufactured home park, college/university campus		Yes No		Page #:		
48	What is the radius size of the community that will use this safe room for tornadoes? ► Maximum of 0.5 miles				miles	Page #:	
49	Does the application include an aerial map depicting the safe room location with radius?		Yes		No	Page #:	
50	Is there an existing safe room or area of refuge at the identified site?		Yes		No	Page #:	
51	What is the maximum occupancy? ► See Table B5-1 Occupant Density for Tornado Community Safe Rooms, FEMA P-361					Page #:	
52	Is the safe room properly sized for the number of people it aims to protect?		Yes		No	Page #:	
53	What are the predominant structure type(s) that people will leave to go to the safe room? ► You may only indicate up to two types	Institutional Building (e.g., hospital, dormitory) Manufactured Housing (includes mobile homes) One- or Two-Family Residences Open Areas (parkland, fairgrounds, etc.) Pre-engineered Metal Building (e.g., auditorium) School (K-12) Small Professional Building (unreinforced masonry)					
54	Determine the percent of the total occupancy coming from each structure type, as identified in line #53. Total occupancy percentage MUST equal 100% for at least one time period Total occupancy percentage for both structure types cannot equal more than 100% for any hour						
ı					Time		entage
	Structure Type 1:		Day		M – 6:00 PI		
		_	Evening		M – Midnigl		
	0		Night		ht – 6:00 Al		
	Structure Type 2:		Day		M – 6:00 Pl		
		_	Evening Night		M – Midnigl ht – 6:00 Al		
			. 119111	iviiding	0.00 AI	V.	

							ATTACHIVIENT D
	Operation and Maintenance	The following mu Operations and I			docume	ented in the ap	oplication and/or
55	Does the application include a statement acknowledging the requirement for an Operation and Maintenance (O&M) Plan? ► See Chapter A4 Operation and Maintenance Considerations for Community Safe Rooms, FEMA P-361 ► Development of an Operation and Maintenance Plan is an eligible cost			Yes		No	Page #:
56	Is signage addressed? ▶ e.g., directional, occupancy, informational ▶ See A4.3.2 Signage, FEMA P-361 ▶ Signage is an eligible cost			Yes		No	Page #:
57	Are access and functional needs of potential occupants addressed? ► See A4.3.4 Information on the Access and Functional Needs of Potential Safe Room Occupants, FEMA P-361 ► Compliance with ADA is an eligible cost			Yes		No	Page #:
58	Are alert signals and drills addressed? ► See A4.3.5 Alert Signal and Drills, FEMA P-361 ► Note, community-wide, mass notification systems are not eligible cost			Yes		No	Page #:
59	Are pets addressed? ► See A4.3.6 Pets, FEMA P-361			Yes		No	Page #:
60	Is communication addressed? ► See A4.4.2 Communications Equipment, FEMA P-361			Yes		No	Page #:
61	Are emergency supplies addressed? ► See A4.4.3 Emergency Supplies, FEMA P-361			Yes		No	Page #:
62	Is parking addressed? ► See A4.5.1 Parking, FEMA P-361 ► Note, parking and all non-building elements unless required for ADA compliance, are not eligible cost			Yes		No	Page #:
63	Is entering and access to the safe roaddressed? ► See A4.5.2 Entering the Safe Room, FEM			Yes		No	Page #:



Wisconsin Emergency Management



FLOOD MITIGATION PROJECTS TIPS FOR ASSEMBLING A SUCCESSFUL APPLICATION

THE BASICS OF FLOOD REDUCTION PROJECTS

Minor localized flood reduction projects lessen the frequency and severity of flooding and decrease predicted flood damages. Examples of these types of projects include:

- Installation or modification of culverts
- Stormwater management activities (i.e. creating retention, detention basins, and other stormwater improvement-type projects)

In order to be eligible, these projects:

- MUST NOT duplicate flood prevention activities of other Federal agencies
- MAY NOT constitute a section of a larger flood control system (i.e. it must be an INDEPENDENT solution)
- MUST NOT be a result of negligence or failure to complete routine maintenance
- MUST NOT remedy a code violation to bring a jurisdiction back into compliance with a legal settlement, court order, or State law
- MAY NOT be a major flood control project related to the construction, demolition, or repair
 of dams, dikes, levees, floodwalls, seawalls, groins, jetties, breakwaters, and erosion
 projects related to beach nourishment or renourishment
- CANNOT address unmet needs from a disaster that are unrelated to mitigation
- CANNOT address operation, deferred or future maintenance, repairs, or replacement of
 existing structures, facilities, or infrastructure (i.e. dredging, debris removal, replacement of
 obsolete utility systems, bridges, and facility repair/rehabilitation)

COST EFFECTIVENESS

Mitigation projects must be deemed cost-effective in order to be eligible to receive Hazard Mitigation Assistance (HMA) funding. This means that your project must pass a FEMA-validated benefits-cost analysis (BCA). The results of the BCA must produce a Benefit-Cost Ratio (BCR) equal to or greater than 1.0; in other words, this means that the benefits must be greater than or equal to the costs. Only applications with a BCR greater than or equal to 1.0 will be considered.

In order for Wisconsin Emergency Management to assist with the BCA, you MUST provide:

• DOCUMENTED damages from two events of known frequency/recurrence interval What this means:

You must know the recurrence interval the <u>two (2) separate flood events</u> (i.e. 100-year or 1% annual chance, 25-year or 25% annual chance, etc.) and you must provide documentation that indicates damages from two (2) separate events. You may use historical records or data from the National Weather Service (NWS) to find out the recurrence interval.

 DOCUMENTED damages from <u>three events of unknown frequency/recurrence</u> interval

What this means:

For events where you do not know the recurrence interval, you must provide documentation that indicates damages from three (3) separate events.

The following checklist will help you assemble required documentation and materials for a more complete application. As minor localized flooding projects are complex, additional information will likely be required; however, by following this checklist, we will have a solid base to build from and create an application that has a higher likelihood of receiving funding from FEMA.



Hazard Mitigation Assistance Guidance Addendum

Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, and Flood Mitigation Assistance Program

February 27, 2015



Federal Emergency Management Agent Department of Humsland Socurity 500 C Sinset, S.W. Washinston, DC 10473

Hazard Mitigation Assistance Guidance and Addendum Guidance

(February 27, 2015 Editions)

All sub-applicants are reminded to closely examine the Hazard Mitigation Assistance Unified Guidance (February 27, 2015 Edition). Project eligibility and application requirements for each of the mitigation programs are explained in more detail.

This publication is available for free online

at: http://www.fema.gov/media-library/assets/documents/103279

roject Point of Contact Information			
Contact First Name:			MSCONO
Contact Last Name:			
Contact E-mail Address:			(W
Contact Phone Number:		_	EE
Contact Address:			M
Contact City:	Contact Zip Code:		WOOD MANAGE
Proposed Project Site Address:			HMGP PDM FMA
City:	County:		
Zip Code:	_		
atitude of Project Site:			HAZARD FLOOD
ongitude of Project Site:			MITIGATION PRE-DISASTER MITIGATION ASSISTANCE

WEM Flood Reduction Project Application Checklist

Obtained?	Item Required	Documentation Summary	Potential Sources
Yes, Page #	Mitigation Project Description	Refer to your SOW to determine the mitigation project type. Select from: Drainage Improvement Other Flood Proofing Measures	The project manager or engineer can provide the SOW. Engineering designs may provide this information.
Yes, Page #	Decision Making Process	Did you provide a justification of the decision making process that resulted the identification of the project proposed in the application? ▶ Did you consider at least three alternatives including the one you are proposing? ▶ Other alternatives that were considered and why they were rejected ▶ Why is THIS solution the best one?	Include a written description in your application, outlining all alternatives you explored (at least two other alternatives that you did not select PLUS the proposed project), and why you selected the particular project you are applying for funding to complete.
Yes, Page # No	Damage History	An application must contain information on damage history at that particular project location. This information should clearly explain the purpose and need for the project. Damage history includes information such as: Damage figures and dates Details about the storm event(s) Type of damages: structural, contents, other	Potential sources of damage figures include: ► Insurance claims ► Property owner surveys ► Receipts, invoices, cost estimates from contractors ► Updated flood map information or data ► Wisconsin DNR ► State NFIP (National Flood Insurance Program) Representatives ► National Weather Service National Climatic Database Center (NCDC) ► U.S. Army Corps of Engineers (USACE) ► U.S. Geological Survey (USGS) ► Water management agencies ► Local newspaper stories
Yes, Page #	Detailed Scope of Work (SOW)	The SOW should include: ► Problem description and proposed INDEPENDENT solution ► Description of existing conditions (historic damages, etc) ► Work schedule ► Cost estimate, provided by a credible source ► Engineering schematics, detailed engineering drawings, or engineering designs ► The proposed level of protection for the project (i.e., it will mitigate up to the 50-yr event)	 ➤ The SOW is provided from the project manager. ➤ Valid costs must be reasonable, allowable, allocable, and necessary as required by 2 CFR Part 200, "Uniform Administrative Requirements, and Audit Requirements for Federal Awards, applicable program regulations, and the Hazard Mitigation Assistance Unified Guidance ➤ Costs MUST be directly related to mitigating the hazard. ➤ See pages 32 to 33, "Eligible Activities," of the Unified Hazard Mitigation Assistance. ➤ A credible source includes a knowledgeable professional, such as an engineer. ➤ Project must be an independent solution, not a phase in a larger, more complex project.

Wisconsin HMGP Administrative Plan D-(62)

Obtained?	Item Required	Documentation Summary	Potential Sources	
Yes, Page #	Basis for Damages (Select One): Historical Damages Expected Damages	The SOW will identify/determine the basis for damages, either historical or expected.	The project manager or engineer can provide this information. Expected damages can be obtained from a study (i.e. H&H analysis) performed by a credible source. Remember to include any studies with your application (i.e. H & H analysis)	
☐ Yes, Page # ☐ No	Project Useful Life (PUL)	 ► The estimated amount of time (in years) that the mitigation action will be effective. ► PUL depends on type of mitigation (refer to "Project Useful Life Summary," provided with this checklist, which outlines standard and acceptable values determined by FEMA) 	Information should be provided in the application; however, if subapplicant fails to provide a PUL, FEMA standard values will be used. If the FEMA standard values are not used, additional documentation is required from the project manager, or the project engineer to justify the PUL.	
Yes, Page # No	All anticipated project costs, including annual maintenance costs, should be detailed over the useful life of the project. The use of lump sum costs are not acceptable. The Cost Estimate should include: ▶ The estimate source and an itemized list of costs ▶ The base year of all cost estimates and any changes to the anticipated construction date ▶ Anticipated environmental resource remediation or historic property treatment measures ▶ Other related construction/demolition/ relocation costs, such as survey permitting, site preparation, site maintenance, site assessment, legal costs and material disposal ▶ Other acquisition costs, such as appraisals, legal recordation, displacement costs, and maintenance		Provide estimate from contractor or line-item cost estimate based on Standard Cost Estimating software or local similar historical costs in present day dollars. Source should be government representative or professional with relevant expertise. Cost estimate should be provided an official document, such as company letterhead. Include contact information of the contractor or official who provided the cost estimate (i.e. business card or e-mail signature)	
Yes, Page #	Base Year of Costs:	 The year in which the mitigation project's cost was estimated. If cost estimates are several years old, WEM may adjust the costs for inflation (i.e. adjust between base year and present year) 	Information available from sub-applicant.	
Yes, Page # No	Total Estimated Cost for the Project: \$		Source be obtained from a credible, knowledgeable official or professional with relevant experience (include contact info)	
Yes, Page #	Annual Maintenance Cost for the Project: \$ Includes only the maintenance that is directly associated with maintaining the mitigation function of the project. Note: The project is a project includes an annual inspection of the culvert or cleaning drains		Source be obtained from a credible, knowledgeable official or professional with relevant experience (include contact info)	
Yes, Page #	Local Match Requirement	Does the community have a NON-FEDERAL source to provide for the local match?	Remember to provide a signed letter of commitment from a representative/official from the local jurisdiction.	
Yes, Page # No	Signed Assurances	Has a legal representative of your jurisdiction signed the "Assurances for Construction and Non-Construction Projects" provided by Wisconsin Emergency Management, or FEMA Forms FF20-16 A & C	Remember to return a signed copy of the form that was provided with your formal application materials.	
Yes, Page # No	Local Commitment to Annual Maintenance Costs	You must provide a signed letter of from a community official stating that the jurisdiction is committed to performing annual maintenance.	Remember to provide a signed letter of commitment from a representative/official from the local jurisdiction.	
Yes, Page #	If your project will reduce damages to residences/buildings, for each structure please include: ► Name ► Latitude & Longitude ► Address ► County	Include contact information and whether building is historic, if known.	Documents available from ► Homeowner ► Local building inspector ► Local tax assessor's office ► Title documents	

Wisconsin HMGP Administrative Plan D-(63)

Obtained?	Item Required	Documentation Summary	Potential Sources
Yes, Page #No	Damages Before Mitigation	Provide the year of occurrence and number of days of a loss of function before the mitigation project is completed (i.e., a bridge was unusable for 5 days after a flood). REMEMBER, YOU MUST HAVE A MINIMUM OF TWO HAZARD EVENTS OF KNOWN FREQUENCY OR THREE EVENTS OF UNKNOWN FREQUENCY If based on historical occurrence, provide written documentation from a credible source. If number of days of loss of function is derived or estimated, provide written explanation of the method used, including all assumptions. The historical loss must have been a loss that the mitigation project would have mitigated. For physical damages (i.e. road damages, residential losses, etc) and private loss-of-function damages, provide a total dollar amount that sums documented damages. Sort these losses into categories, such as physical damages to structures and contents, infrastructure (bridges, roads, culverts, etc.), loss of function (displacement, loss of rental or business income), casualties, and emergency management costs When there are multiple events occurring in the same year (i.e. there was a flood in April and a flood in September), provide sub-totals for each event Remember that these losses must be documented (insurance claims, invoices with proof of payment, contractor estimates, etc.)	Documentation may be obtained from: ► Insurance records ► Receipts proving payment; invoices or estimates from contractors with proof of payment (i.e. cancelled checks, credit card statement) ► Pictures from event of damages ► Signed statements from homeowners ► Flood Insurance Study (FIS) or Flood Insurance Rate Map (FIRM) ► U.S. Geological Survey (USGS) stream gauge data ► Newspaper accounts citing credible sources (such as a public agency) ► Copies of engineering/technical expert reports ► Letter from a subject matter expert who has independently calculated frequencies and damages (including his/her methodology) ► An official from a public utility, public works, or transportation department, technical report, or study ► National Weather Service ► National Climatic Data Center ► FEMA project worksheets, damage survey reports NOTE: Property owners must included documentation for damages from the most recent event, but may include a certified signed statement for previous events. For example, if there were two events of known recurrence interval, one in 2010 and one in 2008, a property owner could provide receipts and cancelled checks from the 2010 event and a signed statement about damages incurred as a result of the 2008 event.
Yes, Page #	Loss of Function by Type (more detailed information for each loss of function in following rows)	FEMA allows certain loss of function values to count towards the damages associated with past occurrences. You may choose one or more facility types for loss of function, but you must provide documentation: Utilities Roads/bridges Non-residential buildings	 ▶ Provide photocopies of tax records, hard copy or electronic photos, appraisals, or maps. ▶ Data is available from assessor, owner, local tax appraiser or surveyor office, or title documents.
Yes, Page # No	Value of Services: Utilities Electrical Water Wastewater Other: (If applicant chooses other, include a description of the service in your application)	For each utility service's loss of function to count towards your benefits of the proposed mitigation project, YOU MUST PROVIDE: ▶ A brief facility description ▶ Type of service ▶ Number of customers served (in affected area only) ▶ Value per unit of service (\$/person/day) ** If you select "Other," provide the portion of the population that will be affected by the mitigation. ** If you do not provide documented value per unit of service (\$/person/day) FEMA Standard Values for Loss of Services for utilities will be used: ▶ Loss of electric power: \$131/person/day ▶ Loss of potable water: \$103/person/day ▶ Loss of wastewater: \$45/person/day	 Documentation is available from the agency providing the service. Local utility company data should indicate the number of affected customers. Determine the number of customer connections and then use census data to determine that average number of people at each location. Any number outside of the FEMA Standard Values must be documented with a letter from the utility that would be affected. Provide letters or technical studies from utilities that include engineering estimates or historic evidence of impact on service due to an event.

Wisconsin HMGP Administrative Plan D-(64)

Obtained?	Item Required	Documentation Summary	Potential Sources
Yes, Page #	Value of Services: Roads/Bridges	For each road's/bridge's loss of function to count towards your benefits of the proposed mitigation project, YOU MUST PROVIDE: ► Estimated number of one-way traffic trips per day ► Additional time per one-way trip due to the detour ► Number of additional miles, and the Federal mileage reimbursement rate for a private vehicle (\$/mile). FEMA Standard Values for Loss of Service for roads: ► Loss of road/bridge service: \$38.15/vehicle/hour Mileage: Use current Federal Mileage Rate ► 2016 rates can be found at: https://www.irs.gov/uac/Newsroom/2016-Standard-Mileage-Rates-for-Business-Medical-and-Moving-Announced Maps indicating the location of road closure and the proposed detour route should be included.	This information is available from a professional engineer, planner, or county DOT manager with signature authority. ► Any number outside of the FEMA Standard Values must be documented with a letter from the utility that would be affected. Estimated number of one-way traffic trips can be calculated using traffic count studies, resident statements, etc. ► Remember to include a copy of the traffic count, study, or copies of signed statements from residents. Maps can be made using GIS software, Google Maps, or hard copies of printed community/county maps. ► Remember to note the detour route that was used, location of road closure Potential sources for additional one-way trip travel time are: ► Google Maps ► Engineer ► DOT ► Local planner
Yes, Page # No	Loss of Public Services (Non-Residential Buildings) Select the facility type(s) addressed in your application: Fire Station Police Station Hospital Other:	You must provide a brief description of the facility (can be a list, does not have to be a narrative), that provides the following information: ▶ Area served (City/County, etc.) ▶ Type of area (Urban, Suburban, Rural, OR Wilderness) ▶ Number of people served ▶ Distance in miles from the facility providing a service to the next nearest facility performing the same service FACILITY-SPECIFIC INFORMATION Fire Stations: ▶ Does the fire station provide EMS services? ▶ If so, provide distance in miles to the next nearest fire station that provides EMS services. Hospitals: ▶ Number of people normally served by the alternative hospital Police Stations: ▶ Number of police officers working at the station ▶ Number of officers serving the same area if this station is shut down due to a disaster	If your public service falls under "other," YOU MUST PROVIDE the annual operating budget associated with the facility. If you have this sort of documentation, WEM will contact you further about what we need to run a Benefit-Cost Analysis If you do not have this documentation, we cannot include it in the analysis Documentation is available from the agency providing the service or an agency's published annual report.
Yes, Page # No	Analysis Duration: (provide a year)	Provide the oldest year that an affected utility, building, road, or bridge was built. This will provide a period of history for the historical losses. ► For structures less than 10 years old, write in the FEMA minimum of 10 years. (and make a note on your application that you are using the FEMA minimum) ► For older structures for which flood damage/loss data or construction activities indicate a significant change in local flow conditions (i.e. a new flood insurance study or flood insurance rate map was created), the analysis can be assumed to begin on the date when the change first occurred.	 For most structures, documents are available from homeowner, local building inspector, local tax assessor's office, or title documents. For structures that witnessed significant changes in flow conditions, provide the Flood Insurance Study or Hydrology and Hydraulics Study that accounts for the change in local flow conditions. Documentation of changes in local flow conditions is available from a hydrologist or engineer.

Wisconsin HMGP Administrative Plan D-(65)

Obtained?	Item Required	Documentation Summary	Potential Sources
	Damages After Mitigation (aka "residual damages)	Nearly all mitigation projects have some residual damages. Most projects will not completely eliminate damages after mitigation, but will reduce damages by a certain percentage or up to a certain design level event or recurrence interval (the level of protection). What damages occur if an event exceeds the level of protection the project provides? (i.e. residual damages) Documentation includes a letter from an official or a copy of a written technical study. Provide written explanation of the method used, inculding all assumptions. NOTE: The only project that results in no damages after mitigation is acquisition and demolition.	This information is available in the SOW or from the project manager. Documentation may be obtained from: ► An official from a public utility, public works, or transportation department ► Technical report or study ► Mitigation project specifications or technical documents related to project development.
Is there anything else that yo	u would like WEM to consider? [please include	location in the application]	

Wisconsin HMGP Administrative Plan D-(66)



HAZARD MITIGATION ASSISTANCE PROGRAMS **GENERATORS BENEFIT-COST ANALYSIS CHECKLIST**



BACKGROUND

Generators are emergency equipment that provide a secondary source of power to a facility. Generators and related equipment (hook-ups) are eligible for funding through the Pre-Disaster Mitigation (PDM) program and the Hazard Mitigation Grant Program (HMGP), provided they protect a critical facility, are cost-effective, contribute to a long-term solution to the problem, and meet all other program criteria. Critical facilities may include police and fire stations, hospitals, and water and sewage treatment facilities. A generator that is a component of a larger project (e.g. a safe room, elevation of lift stations, etc.) is also eligible.

COST-EFFECTIVENESS

Generator projects must be cost-effective and pass the FEMA Benefit-Cost Analysis (BCA) (unless the generator will be funded under the 5% Initiative through HMGP). The benefits of the project must outweigh the cost. In order to complete the required BCA, the following information must be provided. Without the information, a BCA cannot be completed and the project will be ineligible.

PROVIDED	ITEM REQUIRED	DOCUMENTATION	POTENTIAL SOURCES
	Project Useful Life	> FEMA default for generators is 19 years	Manufacturer warranty
		> Default may be altered if the manufacturer warranty or	
		other documentation can demonstrate another value	
	Project Cost	Size and specifications should be reasonable,	Manufacturer's specifications
		appropriate, and necessary to continue the critical	Contractors
		function of the facility	Vendors
		Quotes or estimates from vendors, contractors, etc.	Should match the Scope of Work and Cost
		Include purchase cost as well as installation	Estimate in the application
	Facility and Value	➤ Water or Wastewater Services	Facility manager on official letterhead
	of Service	 Population/customers/households served by 	Hospital administrator on official letterhead
		the facility	Fire/Police Chief on official letterhead
		Hospitals	
		 Number of people served by the hospital 	
		 Distance (miles) between the hospital and next 	

Wisconsin HMGP Administrative Plan D-67

PROVIDED	ITEM REQUIRED	DOCUMENTATION	POTENTIAL SOURCES
		nearest hospital that would treat people if the hospital was inoperative Number of people normally served by the alternate hospital Police Stations Type (metro, city, or rural) Number of people served by the station Number of officers that work at the station and would serve the same area if the station were shut down by a disaster Fire Station	
		 Number of people served by the station Type (urban, suburban, rural, wilderness) Distance in miles to the nearest fire station that would provide protection if the station were shut down by a disaster EMS services provided by the fire station if applicable 	
	Recurrence Determination	 May vary by location, and cause of failure (wind, flood, etc.) The date of events facility was inoperable due to power failure The number of days per event the facility was inoperable due to power failure Generally, two documented events are required. If three or more past events are provided, the BCA module can calculate the reoccurrence interval. 	 Letter from a subject matter expert who has calculated frequencies Facility manager on official letterhead Hospital administrator on official letterhead Fire/Police Chief on official letterhead Data from county or facility websites Government websites Media releases, newspapers Engineering analysis National Weather Service: Precipitation Frequency Data Server at http://hdsc.nws.noaa.gov/hdsc/pfds/ USGS: Stream gauge data can be used to extrapolate frequency information for flood events Snow and Ice: http://nsidc.org/data/search/data-

Wisconsin HMGP Administrative Plan

PROVIDED	ITEM REQUIRED	DOCUMENTATION	POTENTIAL SOURCES
			 search.html FEMA project worksheets from past damages Insurance claims, damage repair records, data from state/local agencies
	Estimated Yearly	Only those costs directly associated with maintaining	Manufacturer
	Maintenance Cost	the mitigation function of the generator	Facility manager
	Additional Losses	 Any documented losses that are a direct result of interrupted power service that a generator would have mitigated Damages to the facility Damages to other properties Emergency service costs 	 Facility manager on official letterhead Hospital administrator on official letterhead Fire/Police Chief on official letterhead Data from county or facility websites Receipts from property owners Insurance claims, damage repair records, data from state/local agencies
	Analysis Duration	Provide the year the facility was built	Facility manager, local building inspector, etc.

ADDITIONAL RESOURCES

- FEMA Job Aid: Eligibility of Generators as a Fundable Project by the HMGP and PDM, http://www.fema.gov/media-library-data/1424368115734-86cfbaeb456f7c1d57a05d3e8e08a4bd/FINAL Generators JobAid 13FEB15 508complete.pdf
- www.fema.gov/benefit-cost-analysis
 - o BCA Tool Version 5.2.1
 - o BCA Reference Guide
 - o BCA Reference Guide Supplement
- ➤ BCA Technical Assistance: bchelpline@fema.dhs.gov, or 1-855-540-6744
- National Weather Service Precipitation Frequency Data Server: http://hdsc.nws.noaa.gov/hdsc/pfds/
- National Snow and Ice Data Center, http://nsidc.org/data/search/data-search.html
- FEMA Hazard Mitigation Assistance Guidance, http://www.fema.gov/media-library/assets/documents/103279

Wisconsin HMGP Administrative Plan D-69

HAZARD MITIGATION GRANT PROGRAM (HMGP) PLANNING GRANT APPLICATION INSTRUCTIONS

The Hazard Mitigation Grant Program (HMGP)

The HMGP is a federal program administered in the State by the Wisconsin Division of Emergency Management (WEM). The program's objective is to reduce repetitive losses from natural disasters. This is accomplished by funding all-hazards mitigation plan development and cost-effective projects intended to eliminate/reduce future disaster expenditures for the repair/replacement of public and private property, and for the relief of personal loss, hardship, and suffering. Note: Projects cannot be retroactively funded through HMGP. Therefore, projects already in progress or completed will not be considered.

The purpose of an HMGP planning grant is to assist communities in developing or updating comprehensive all-hazards mitigation plans. The funds may be used to develop and update tribal and local mitigation plans which meet the planning criteria outlined in 44CFR Part 201 pursuant to Section 322 of the Stafford Act. A local government must have a FEMA-approved all-hazards mitigation plan to receive HMGP project grant funds. Countywide or multi-jurisdictional plans are encouraged for a comprehensive approach to hazard identification, evaluation, and mitigation.

The Federal Emergency Management Agency (FEMA) will contribute up to 75% of the eligible costs with WEM providing 12.5%. A 12.5% local match must be provided by a non-federal source. The local match can be supplied through cash, contributions, or in-kind services.

Minimum Planning Grant Criteria

The applicant will use an all-hazards mitigation planning process that consists of the following activities:

- Organization of a planning process that involves the public
- Coordination with other communities, agencies, and organizations
- Identification of all hazards within the community
- Development of a risk assessment based on the identified hazards
- Development of goals and a mitigation strategy
- Review of possible mitigation actions
- Development of an action plan
- Adoption of the plan
- Implementation, evaluation, and revision of the plan

Applications that do not include adequate description of the planning activities will be less competitive.

Eligible activities under an HMGP planning grant include conducting local planning discussions, paying for salaries/hiring a planner, surveying structures at risk, and assessing losses.

Instructions for Completing the Application for HMGP

Applicants must apply for an HMGP planning grant through WEM. WEM will review and evaluate the grant applications and forward them to FEMA for approval. To apply:

- 1. Complete the HMGP Planning Grant Application (DMA Form 117). Sign and date the application.
- 2. Sign and date the Assurances (DMA Form 1017A).
- 3. Submit the application and supporting documentation electronically, if possible.
- 4. Send the completed Application and Assurances to katie.sommers@wi.gov or Wisconsin Emergency Management, 2400 Wright Street, P.O. Box 53707-7865, Madison, WI 53707-7865, Attention: Katie Sommers.

Applicants will be notified by letter of the approval/disapproval of their applications.

Questions regarding the application process or program administration should be directed to Katie Sommers, State Hazard Mitigation Officer, at (608) 242-3222 or katie.sommers@wi.gov, or to Caitlin Shanahan, Disaster Response and Recovery Planner, at (608) 242-3214 or caitlin.shanahan@wi.gov.

STATE OF WISCONSIN
Department of Military Affairs
Division of Emergency Management
2400 Wright Street
P.O. Box 7865
Madison, WI 53707-7865

HAZARD MITIGATION GRANT PROGRAM PLANNING GRANT SUBAPPLICATION FEMA-4276-DR-WI

Date: Date

Subapplicant: State/Local/Tribal Government or Private Non-Profit

DUNS Number: DUNS Number FIPS Code: County FIPS Code

Primary Contact: First Name, Last Name

Title: Title

Address: Address Line 1

Address Line 2

City, State, ZIP Code

Office Phone: Office Phone with Area Code Cell: Cell Phone with Area Code

Email Address: Email Address

Secondary Contact: First Name, Last Name

Address (if different Address Line 1 from above): Address Line 2

City, State, ZIP Code

Office Phone: Office Phone with Area Code Cell: Cell Phone with Area Code

Email Address: Email Address

I certify, to the best of my knowledge and belief, that the information in this subapplication and supporting documentation is true and correct, and that it has been duly authorized by the governing body of the subapplicant. It is also understood that no billable work will begin until the subapplication is approved and a subrecipient agreement is executed with the applicant (Wisconsin Emergency Management).

Signature:

Name: First Name, Last Name

Title: Title

Date: Date

All questions must be answered completely and accurately. If necessary, attach additional pages that reference the question number.

1. Cost Estimate and Budget

Type of Plan: Choose an item.

<u>HMGP Funds Requested</u> \$Total Planning Funds

Federal (75%): \$Federal Share (max. 75%) State (12.5%): \$State Share (max. 12.5%)

Match (12.5%): \$Match Amount (min. 12.5%) Attach match commitment

letter.

Other: \$Other Funding Sources

Identify Source

Estimated Budget

Salaries: \$Amount Fringe Benefits: \$Amount

Describe: who, activity, number of hours, hourly salary rate, hourly

benefits rate, list of benefits included, etc.

Contractual: \$Amount Attach cost estimate.

Supplies: \$Amount

Describe.

Printing/Postage: \$Amount

Describe: number of items printed and/or mailed, cost per item.

Equipment: \$Amount

Describe.

Travel: \$Amount

Describe: number of trips, miles per trip, documented mileage rate.

Public Meetings: \$Amount

Describe: number of meetings, room rental fee; food/beverage

ineligible.

In-Kind: \$Amount

Number of local officials, hours, hourly rate; unless otherwise

documented use volunteer rate of \$22.48 per hour.

Other: \$Amount

Describe.

2. Participating Jurisdictions and Populations

Counties, tribes, cities, villages, universities, colleges, and private nonprofits; include recent population estimates for each county, tribe, city, and village. **Attach area map.**

3. Local Hazards and Damages

3.A. Briefly describe the hazards that impact the planning area: Hazards

3.B. Briefly describe damages incurred from listed hazards. Factor in damage to public and private property and infrastructure; threats to public health and safety; and government response costs (fire, police, public works, social services, etc.).

Damages

4. Scope of Work

4.A. Describe the basic planning process that will be used. Planning Process

4.B. Identify other planning initiatives in the community (e.g. flood mitigation, stormwater, capital improvement, smart growth, and comprehensive planning) and how they relate to and/or support all-hazards mitigation planning.

Community Planning Initiatives

- 4.C. Describe the strategy for including the public in plan formation and review: outreach methods, targeted audience, geographic representation, and estimated number of meetings (at least two one before finalizing the draft plan, one after finalizing but before plan adoption). Public Participation
- 4.D. Describe how the planning process will benefit the community. Expected Benefits

5. Work Schedule and Estimated Completion Dates

Task	Timeframe (e.g. Months 2-4)
Develop Planning Team	Enter Timeframe
Hold Kickoff Meeting	Enter Timeframe
Develop Community Profiles	Enter Timeframe
Identify and Describe Hazards	Enter Timeframe
Complete Risk/Vulnerability Assessment	Enter Timeframe
Develop Goals and/or Objectives	Enter Timeframe
Develop Mitigation Actions	Enter Timeframe

Develop Plan Maintenance Process	Enter Timeframe
Public Participation/Meetings	Enter Timeframe
Submit Draft Plan to State	Enter Timeframe
Revise Plan Based on State Review	Enter Timeframe
Submit Draft Plan to FEMA	Enter Timeframe
Formal Adoption	Enter Timeframe
Enter Description	Enter Timeframe
Enter Description	Enter Timeframe
Enter Description	Enter Timeframe

6. Additional Comments and Information

Enter Comments

ASSURANCES CONSTRUCTION AND NON-CONSTRUCTION PROJECTS

As the duly authorized representative of the applicant, I certify that the applicant:

- 1. Has the legal authority to apply for federal assistance, and the institutional, managerial, and financial capability (including funds sufficient to pay the non-federal share of project costs) to ensure proper planning, management, and completion of the project described in this application.
- 2. Will give the awarding agency, the Comptroller General of the United States, and if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the assistance; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.
- 3. Will comply with the requirements of the assistance awarding agency with regard to the drafting, review, and approval of construction plans and specifications (construction projects).
- 4. Will provide and maintain competent and adequate engineering supervision at the construction site to ensure that the complete work conforms to the approved plans and specifications and will furnish progress reports and such other information as may be required by the assistance awarding agency or State (construction projects).
- 5. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.
- 6. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.
- 7. Will comply with the Intergovernmental Personnel Act of 1970 [42 U.S.C. (4728-4763)] relating to prescribed standards for merit systems for programs funded under one of the nineteen statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 CFR 900, Subpart F).
- 8. Will comply with the Lead-Based Paint Poisoning Prevention Act [42 U.S.C. (4801 et seq.)] which prohibits the use of lead-based paint in construction or rehabilitation of residential structures.
- 9. Will comply with all federal statutes relating to non-discrimination. These include but are not limited to:
 - (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color, or national origin;
 - (b) Title IX of the Education Amendments of 1972, as amended [20 U.S.C. (1681-1683, and 1685-1686)], which prohibits discrimination on the basis of sex;

DMA Form 1017A ATTACHMENT D

(c) Section 504 of the Rehabilitation Act of 1973, as amended [29 U.S.C. (794)], which prohibits discrimination on the basis of handicaps;

- (d) The Age Discrimination Act of 1975, as amended [42 U.S.C. (6101-6107)], which prohibits discrimination on the basis of age;
- (e) The Drug Abuse Office and Treatment Act of 1972 (P.L. 93-255), as amended, relating to non-discrimination on the basis of drug abuse;
- (f) The Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to non-discrimination on the basis of alcohol abuse or alcoholism;
- (g) 523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. 290 dd-3 and 290 ee-3), as amended, relating to confidentiality of alcohol and drug abuse patient records;
- (h) Title VIII of the Civil Rights Act of 1968 [42 U.S.C. (3601 et seq.)], as amended, relating to non-discrimination in the sale, rental, or financing of housing;
- (i) Any other non-discrimination provisions in the specific statute(s) under which application for federal assistance is being made; and
- (j) The requirements of any other non-discrimination statute(s) which may apply to the application.
- 10. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provides for fair and equitable treatment of persons displaced or whose property is acquired as a result of federal and federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of federal participation in purchases.
- 11. Will comply with the provisions of the Hatch Act [5 U.S.C. (1501-1508 and 7324-7328)] which limit the political activities of employees whose principal employment activities are funded in whole or in part with federal funds.
- 12. Will comply, as applicable, with the provisions of the Davis-Bacon Act [40 U.S.C. (276a to 276a-7)], the Copeland Act [40 U.S.C. (276c) and 18 U.S.C. (874)], and the Contract Work Hours and Safety Standards Act [40 U.S.C. (327-333)] regarding labor standards for federally-assisted construction subagreements (construction projects).
- 13. Will comply with the flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a Special Flood Hazard Area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is \$10,000 or more.
- 14. Will comply with the following environmental standards:
 - (a) Institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514;
 - (b) Notification of violating facilities pursuant to EO 11738;

DMA Form 1017A ATTACHMENT D

- (c) Protection of wetlands pursuant to EO 11990;
- (d) Evaluation of flood hazards in floodplains in accordance with EO 11988;
- (e) Assurance of project consistency with the approved state management program developed under the Coastal Zone Management Act of 1972 [16 U.S.C. (1451 et seq.)];
- (f) Conformity of federal actions to state (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended [42 U.S.C. (7401 et seq.)];
- (g) Protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended, (P.L. 93-523); and
- (h) Protection of endangered species under the Endangered Species Act of 1973, as amended, (P.L. 93-250).
- 15. Will comply with the Wild and Scenic Rivers Act of 1968 [16 U.S.C. (1271 et seq.)] related to protecting components or potential components of the national wild and scenic rivers system.
- 16. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended [16 U.S.C. (470)], EO 11593 (identification and preservation of historic properties), and the Archaeological and Historic Preservation Act of 1974 [16 U.S.C. (469a-1 et seq.)].
- 17. Will implement the award in accordance with 44 CFR Part 13, Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments.
- 18. In accordance with the provisions of Section 319 of P.L. 101-121, and implementing regulations at 44 CFR Part 18, the subrecipient will submit to the Department of Military Affairs, Division of Emergency Management, a "Certification Regarding Lobbying" and "Disclosure of Lobbying Activities" (Form SF-LLL) for Public Assistance awards of \$100,000 or more. The subrecipient shall require that the language of this certification be included in all award documents for all subawards of \$100,000 or more at all tiers (including subcontracts, subawards, and contracts under awards) and that all subrecipients shall certify and disclose accordingly. "Certifications Regarding Lobbying" and Forms SF-LLL must be submitted to the Department of Military Affairs with the subrecipient's request for final reimbursement.
- 19. Will comply with all applicable requirements of all other federal laws, executive orders, regulations, and policies governing this program.
- 20. Will comply with the required financial and compliance audits in accordance with the Single Audit Act of 1984, as listed below.

FEDERAL AUDIT REQUIREMENTS

All non-Federal entities, to include State Governments, Native American Tribal Governments, Local Governments, Institutions of Higher Education, Hospitals or other Non-Profit Organizations, that expend \$750,000.00 or more during the non-Federal Entity's fiscal year in Federal awards must have a single or program specific audit conducted for that year in

DMA Form 1017A ATTACHMENT D

accordance with the Single Audit Act of 1996 (P.L. 104-156) and the Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards (2 CFR Part 200, Subpart F).

Audits shall be made annually unless the non-Federal entity meets the provisions for biennial audits provided in 2 CFR Part 200, Subpart F. Any biennial audit must cover both years with the biennial period.

The Audit shall be made by an independent auditor. An independent auditor is a state or local government auditor or a public accountant who meets the independence standards specified in the General Accounting Office's Standards for Audit of Governmental Organizations, Programs, Activities, and Functions.

The audit report shall state that the audit was performed in accordance with the provisions of 2 CFR Part 200, Subpart F.

The reporting requirements for audit reports shall be in accordance with the American Institute of Certified Public Accountants "State and Local Governments – Audit and Accounting Guide" issued in 2016. The federal government has approved the use of the audit guide.

In addition to the audit report, the subrecipient shall provide comments on the findings and recommendations in the report, including a plan for corrective action taken or planned and comments on the status of corrective action taken on prior findings. If corrective action is not necessary a statement describing the reason it is not should accompany the audit report.

The subrecipient agrees that the Pass-through entity, the Legislative Auditor, the State Auditor, and any independent auditor designated by the Pass-through entity shall have such access to subrecipient's records and financial statements as may be necessary for the Pass-through entity to comply with the Single Audit Act and 2 CFR Part 200, Subpart F.

Recipients of Federal awards from subrecipients are also required to comply with the Single Audit Act and 2 CFR Part 200, Subpart F.

The subrecipient agrees to retain documentation to support the schedule of expenditures of Federal awards.

The audit must be completed and the reporting package described in 2 CFR Part 200, Subpart F must be submitted within the earlier of 30 calendar days after receipt of the auditor's report(s), or nine months after the end of the audit period.

If required to undergo a single or program-specific audit, an electronic copy of the Audit Reporting Package (including Form SF-SAC) should be submitted to the Federal Audit Clearinghouse (FAC) at: https://harvester.census.gov/facides/. Once the Audit Reporting Package is filed with the FAC, email Wisconsin Emergency Management (WEM) at DMASingleAudits@wisconsin.gov to notify WEM that your Audit Reporting Package has been submitted.

DMA Form 1017A ATTACHMENT D

STATE ASSURANCES OF DISASTER APPLICATION SUBRECIPIENTS

In accordance with the State Department of Military Affairs, Division of Emergency Management, State Administrative Plan, as a subrecipient I agree to the following:

1. Subrecipient's Duties

The subrecipient shall perform the tasks specified in the State Administrative Plan and shall complete the tasks therein during the period specified in the Federal/State Agreement.

2. Terms for Reimbursement

- (a) The Department of Military Affairs, Wisconsin Division of Emergency Management, shall reimburse the subrecipient their eligible costs incurred by the subrecipient in accordance with the Hazard Mitigation Grant Program. This reimbursement will be made from funds made available through the Federal Emergency Management Agency (P.L. 93-288 as amended by P.L. 100-707) and the State Legislature. The subrecipient shall be reimbursed only for those costs specified in the approved Hazard Mitigation Grant and supplements thereto.
- (b) The Department of Military Affairs, Division of Emergency Management, shall reimburse the federal and state shares to the subrecipient in accordance with the requirements specified in the Federal/State Agreement.
- (c) All claims for reimbursement shall be supported by written documentation including, but not limited to, receipts and invoices.
- (d) Reimbursement for costs will not be paid on any encumbrance made by the subrecipient prior to the dates as specified in an approved award.

3. Records and Documentation

- (a) The subrecipient shall be responsible for keeping records that fully disclose the amount and disposition of funds and the total costs of each project for which the funds are provided. The accounting procedures utilized by the subrecipient shall provide for the accurate and timely recording of the receipt of funds and expenditures.
- (b) The books, records, documents, and accounting procedures and practices of the subrecipient relevant to this agreement are subject to examination by the Department of Military Affairs, by either the legislative auditor or state auditor as appropriate, and by the federal government.
- (c) The subrecipient shall obtain an annual (or biennial covering both years) financial and compliance audit, made by an independent auditor, in accordance with the Single Audit Act of 1996 (P.L. 104-156) and 2 CFR Part 200, Subpart F, as applicable. See 19, page 3.
- (d) All accounts and records shall be retained by the subrecipient for a period of three years after completion of the final audit of the declaration or until all litigation, claims, or audit findings involving the records have been resolved, whichever is later.

DMA Form 1017A ATTACHMENT D

(e) The subrecipient shall provide written quarterly progress reports on a form prescribed by the Department of Military Affairs, Division of Emergency Management.

4. Miscellaneous

- (a) When the Department of Military Affairs, Division of Emergency Management, finds that there has been a failure to comply with the provisions of this agreement or with provisions of the Hazard Mitigation Grant Program, or that the purposes for the funds have not been, or will not be fulfilled, notwithstanding any other provisions of this agreement to the contrary, the Department of Military Affairs, Division of Emergency Management may take such action as it deems necessary and appropriate to protect the interest of the federal government and State of Wisconsin, including the refusal to disburse additional funds and requiring the repayment of any funds already disbursed.
- (b) The State of Wisconsin and the Department of Military Affairs, Division of Emergency Management, its agents and employees shall not be liable to the subrecipient, or to any individuals or entities with whom the subrecipient contracts for any direct, incidental, consequential, or other damages sustained or incurred as a result of activities, actions or inactions on the part of the subrecipient for services rendered pursuant to the Award Agreement. The subrecipient agrees to indemnify and save and hold the Department of Military Affairs, Division of Emergency Management, its agents and employees harmless from all claims or causes of action arising from the performance of this award by the subrecipient or subrecipient's agent or employees.
- (c) The Department of Military Affairs' authorized agent for the purposes of this contract is Jeff Whittow, Administrative Officer, Division of Emergency Management.

Signature of Authorized Certifying Official	Date	
Title and Organization		

E. EHP Checklist

"Yes" indicates that the environmental regulation or statute may apply to your project. Please provide relevant information and/or documentation to support your answers. This list is not all-inclusive.

Enviro	onmental Regulation or Statute	Yes	No	
Nation	al Historic Preservation Act (NHPA)			
1.A	Would the proposed project affect, or is the proposed project in close proximity to, any buildings or structures 50 years or more in age?			
1.B	Will the proposed project involve disturbance of ground?			
Endan	gered Species Act (ESA)			
2.A	Are federally listed or endangered species, or their critical habitat, present in or near the project area and, if so, which species are present?			
2.B	Will the proposed project remove or affect vegetation?			
2.C	Is the proposed project in or near (within 200 feet), or likely to affect, any type of waterbody or body of water?			
Clean	Water Act (CWA) and Rivers and Harbors Act			
3.A	Will the proposed project involve dredging or disposal of dredged material, excavation, the addition of fill material, or result in any modification to water bodies or wetlands designated as "waters of the United States" as identified by the U.S. Army Corps of Engineers or on the National Wetland Inventory?			
Execut	ive Order 11988 (Protection of Floodplains) and Executive Order 11990 (Protection	of Wetla	nds)	
4.A	Does a Flood Insurance Rate Map, Flood Hazard Boundary Map, hydrological study, or some other source indicate that the project is located in, or will affect, a 100-year floodplain, a 500-year floodplain (if a critical action), an identified regulatory floodway, or an area prone to flooding?			
4.B	Is the proposed project located in, or will it affect, a wetland as listed in the National Wetland Inventory?			
4.C	Will the proposed project alter a watercourse, water flow patterns, or a drainage way, regardless of its floodplain designation?			
4.D	Is the proposed project located in, or will it affect, a floodplain or wetland? If yes, the 8-step process summarized in HMA Job Aids must be completed.			
Coastal Zone Management Act (CZMA) and Coastal Barrier Resources Act (CBRA)				
5.A	Is the proposed project located in the State's designated coastal zone?			
5.B	Is the proposed project located in a Coastal Barrier Resources System Unit or Otherwise Protected Area?			
Farmland Protection Policy Act (FPPA)				
6.A	Will the proposed project convert more than 5 acres of "prime or unique" farmland outside city limits to a non-agricultural use?			

Environmental Regulation or Statute			No	
	Resource Conservation Recovery Act (RCRA) and Comprehensive Environmental Response, Compensation, and Liability Act			
7.A	Is there reason to suspect there are contaminants from a current or past use on the property associated with the proposed project?			
7.B	Are there are any studies, investigations, or enforcement actions related to the property associated with the proposed project?			
7.C	Will any project construction or operation activities involve the use of hazardous or toxic materials?			
7.D	Are any of the current or past land uses of the property associated with the proposed project or are any of the adjacent properties associated with hazardous or toxic materials?			
Execut	Executive Order 12898 (Environmental Justice for Low Income and Minority Populations)			
8.A	Are there any low-income or minority populations in the project's area of effect or adjacent to the project area?			
Other Environmental/Historic Preservation Laws (including applicable State laws) or Issues				
9.A	Are other environmental/historic preservation requirements associated with this project?			
9.B	Are any controversial issues associated with this project?			
9.C	Have any public meetings been conducted, public notices been circulated, or public comments been solicited on the proposed project?			

Date

WDNR Environmental Review Coordinator Southeast Regional Headquarters Department of Natural Resources PO Box 12436 Milwaukee WI 53212-0436

Subject: Categorical Exclusion

Project

Dear Name:

The Wisconsin Division of Emergency Management is in the process of evaluating a Hazard Mitigation Grant Program application for project and location. This application falls under Presidential Disaster Declaration DR-XXXX. The structures are in the XXXX River floodway and floodplain. These properties are located on the Flood Insurance Rate Map(s) number and are located at address.

The Federal Emergency Management Agency (FEMA) and our office are considering the use of a Categorical Exclusion for the environmental review, as defined in 44 CFR 10.8(d)(2)(vii), to meet the requirements of the National Environmental Policy Act. Please review the enclosed to ensure that the proposed project does not violate regulatory authorities under your jurisdiction. Indicate on the enclosed concurrence form that the demolition of these properties does not have the potential to impact wetlands; floodplains; rare, threatened, or endangered species; a wildlife refuge; a wilderness area; or a wild and scenic river. Also, please verify that there will not be a negative impact on wetlands, the floodplain, or the air quality at this site.

I ask that you please reply as soon as possible but no later than date. Your efforts in this matter are greatly appreciated. If you have any questions concerning this request, please call me at (608) 242-3222 or Roxanne Gray at (608) 242-3211.

Sincerely,

Name

State Hazard Mitigation Officer Wisconsin Emergency Management

Enclosure (use general concurrence form)

LOCATION FEMA-XXXX-DR-WI HAZARD MITIGATION GRANT PROGRAM

Consideration for Categorical Exclusion as defined in 44CFR 10.8(d)(2)(vii)

CONCURRENCE

<u>DESCRIPTION</u> : Project and location . (Township, Range, Section).	. This residence	e is in the flood _i	olain of <mark>XXXX River</mark> .
☐ I have reviewed the above description authorities of this agency, and concur environment.			•
☐ I have reviewed the above description and authorities of this agency, and is potential negative impact on the environmentative impacts are (explain and attack	have determined conment, and fur	that the project ther investigation is	will or may cause a
Signature		I	Date
Name, Title, and Agency			

Please mail or email to:
Katie Sommers, State Hazard Mitigation Officer
Wisconsin Division of Emergency Management
2400 Wright Street, P.O. Box 7865
Madison, WI 53707-7865
katie.sommers@wi.gov

PLEASE RESPOND ASAP BUT NO LATER THAN DATE

Applicant: SUBRECIPIENT

Disaster/Emergency/Program/Project Title: DR-XXXX-WI/PDMXX/etc. **Record of Environmental Consideration (REC)** See 44 Code of Federal Regulations Part 10. **Project Name/Number:** Project Name <u>Project Location</u>: Project address / town range section / lat long <u>Project Description</u>: Basic description of the project – location/construction details, project objectives or purpose, dimensions/compliance with standards, if applicable. **Documentation Requirements** No documentation required. (**Review concluded.**) (short version) All consultation and agreements implemented to comply with the National Historic Preservation Act, Endangered Species Act, and Executive Orders 11988, 11990, and 12898 are completed and no other laws apply. (Review concluded.) (long version) All applicable laws and executive orders were reviewed. Additional information for compliance is attached to this REC. **National Environmental Policy Act (NEPA) Determination** Statutorily excluded from NEPA review. (Review concluded.) Categorical Exclusion - Category Single Project No extraordinary circumstances exist. Are project conditions required? YES (See Section V.) NO (Review concluded.) Extraordinary circumstances exist (see section IV). Extraordinary circumstances mitigated. (See Section IV comments.) Are project conditions required? YES (See Section V.) NO (Review concluded.) ___ Environmental assessment required. See FONSI for determination, conditions, and approval. Environmental assessment required. See FONSI for determination, conditions, and approval. Comments: The Federal Emergency Management Agency (FEMA) and our office are considering the use of a Programmatic Environmental Assessment for the environmental review. The Finding of No Significant Impact (FONSI) was signed on DATE. **Reviewer and Approvals** REC prepared by: Your name FEMA Environmental Reviewer Name: Signature _____ Date FEMA Regional Environmental Officer or delegated approving official

Reviewer Name: YOUR NAME

Applicant: SUBRECIPIENT

Disaster/Emergency/Program/Project Title: DR-XXXX-WI/PDMXX/etc Name: Signature Date I. Compliance Review for Environmental Laws (other than NEPA) A. National Historic Preservation Act No type of activity with potential to affect historic properties. (**Review concluded.**) Applicable executed Programmatic Agreement (insert date) . Otherwise, conduct standard Section 106 review. Activity meets Programmatic Allowance # Are project conditions required? YES (See Section V.) NO (Review concluded.) HISTORIC BUILDINGS AND STRUCTURES No historic properties 50 years or older in project area. (Review concluded.) Building or structure 50 years or older in project area and activity not exempt from review. No Historic Properties Affected determination. (FEMA finding/SHPO/THPO concurrence on Are project conditions required? YES (See Section V.) NO (Review concluded.) Historic Properties Affected determination. (FEMA finding/SHPO/THPO concurrence on file.) Property a National Historic Landmark and National Park Service was provided early notification during the consultation process. If not, explain in comments. No Adverse Effect determination. (FEMA finding/SHPO/THPO concurrence on file.) Are project conditions required? YES (See Section V.) NO (Review concluded.) __ Adverse Effect determination. (FEMA finding/SHPO/THPO concurrence on file.) Resolution of Adverse Effect completed. (MOA on file.) Are project conditions required? YES (See Section V.) NO (Review concluded.) ARCHAEOLOGICAL RESOURCES Project affects only previously disturbed ground. (Review concluded.) Project affects undisturbed ground. Project area has no potential for presence of archeological resources. Determination of No Historic Properties Affected. (FEMA finding/SHPO/THPO concurrence on file.) (Review concluded.) Project area has potential for presence of archeological resources. No Historic Properties Affected determination. (FEMA finding/SHPO/THPO concurrence on file.)

Reviewer Name: YOUR NAME

ATTACHMENT E **Reviewer Name: YOUR NAME** Applicant: SUBRECIPIENT Disaster/Emergency/Program/Project Title: DR-XXXX-WI/PDMXX/etc Are project conditions required? YES (See Section V.) NO (Review concluded.) Historic Properties Affected determination. NR eligible resources not present. (FEMA finding/SHPO/THPO concurrence Are project conditions required? YES (See Section V.) NO (Review concluded.) NR eligible resources present in project area. (FEMA finding/SHPO/THPO concurrence on file.) No Adverse Effect determination. (FEMA finding/SHPO/THPO concurrence on file.) Are project conditions required? YES (See Section V.) NO (Review concluded.) Adverse Effect determination. (FEMA finding/SHPO/THPO concurrence on file.) Resolution of Adverse Effect completed. (MOA on file.) Are project conditions required? YES (See Section V.) NO (Review concluded.) Comments: A MONTH YEAR review of the Wisconsin Architecture & History Inventory and the Archeological Inventory shows that (NO/SOME/SEVERAL) historic structures would likely be impacted by this project. Describe any potential archeological site disturbances or State Historic Preservation Office (SHPO) requests for special monitoring conditions. A Public Notice was posted in the PUBLICATION NAME on DATE. Correspondence/Consultation/References: Sent review request letters to the SHPO on DATE. See SHPO letter dated DATE regarding PROJECT. See SHPO concurrence form dated DATE regarding PROJECT. **B. Endangered Species Act**

No listed species and/or designated critical habitat present in the action area. (Review concluded.)
Listed species and/or designated critical habitat present in the action area.
No effect to species or designated critical habitat. (See comments for justification.)(Review concluded.)
May affect, but not likely to adversely affect species or designated critical habitat. (FEMA determination/USFWS/NMFS concurrence on file.) (Review concluded.)
Likely to adversely affect species or designated critical habitat.
Formal consultation concluded. (Biological Assessment and Biological Opinion on file.)
Are project conditions required? YES (See Section V.) NO (Review

concluded.)

Applicant: SUBRECIPIENT

Reviewer Name:	YOUR NAME			
Disaster/Emerger	ncy/Program	/Project Title:	DR-XXXX-WI/I	PDMXX/etc.

Comments: The USFWS endangered, threatened, proposed, and candidate species list for COUNTY NAME includes the SPECIES NAME (STATUS), SPECIES NAME (STATUS), ETC. The
USFWS concurred that The WDNR also concurred that this project WILL/WILL NOT have
adverse impacts to endangered species or their habitat.
Correspondence/Consultation/References: Letters were sent to CONTACT NAME of the USFWS and CONTACT NAME of WDNR on DATE. WDNR concurred on DATE and USFWS concurred on DATE.
CONTINUE OF THE CONTENT OF CONTEN
C. Coastal Barrier Resources Act
Project is not located in Coastal Barriers Resources System or Otherwise Protected Area.
Project does not affect a coastal barrier within the COBRA System (regardless of in or out). (Review concluded.)
Project is located in a coastal barrier system and/or affects a coastal barrier. (FEMA determination/USFWS consultation on file.)
Proposed action an exception under Section 3505.a.6. (Review concluded.)
Proposed action not excepted under Section 3505.a.6. Are project conditions required? YES (See Section V.) NO (Review concluded.)
Comments: n/a
Correspondence/Consultation/References: <mark>n/a</mark>
D. Clean Water Act
Project site located outside of and would not affect any waters of the U.S. (Review concluded.)
Project site located in or would affect waters, including wetlands, of the U.S.
Project exempted as in-kind replacement or other exemption. (Review concluded.)
Project requires Section 404/401 permit, including qualification under Nationwide Permits. Are project conditions required? YES (See Section V.) NO (Review concluded.)
Are project conditions required? YES (See Section V.) NO (Review concluded.) Comments: The project WILL/WILL NOT involve disposal of dredged material, excavation, filling, or other modifications to waters in the United States. A Department of the Army permit IS/IS NOT required for
Are project conditions required? YES (See Section V.) NO (Review concluded.) Comments: The project WILL/WILL NOT involve disposal of dredged material, excavation, filling, or other modifications to waters in the United States. A Department of the Army permit IS/IS NOT required for this project. Correspondence/Consultation/References: Concurrence letters were sent to CONTACT NAME of the USACE and CONTACT NAME of the WDNR on DATE. USACE concurred on DATE and WDNR responded
Are project conditions required? YES (See Section V.) NO (Review concluded.) Comments: The project WILL/WILL NOT involve disposal of dredged material, excavation, filling, or other modifications to waters in the United States. A Department of the Army permit IS/IS NOT required for this project. Correspondence/Consultation/References: Concurrence letters were sent to CONTACT NAME of the USACE and CONTACT NAME of the WDNR on DATE. USACE concurred on DATE and WDNR responded on DATE that this project WILL/WILL NOT impact the waters of the United States.
Are project conditions required? YES (See Section V.) NO (Review concluded.) Comments: The project WILL/WILL NOT involve disposal of dredged material, excavation, filling, or other modifications to waters in the United States. A Department of the Army permit IS/IS NOT required for this project. Correspondence/Consultation/References: Concurrence letters were sent to CONTACT NAME of the USACE and CONTACT NAME of the WDNR on DATE. USACE concurred on DATE and WDNR responded on DATE that this project WILL/WILL NOT impact the waters of the United States. E. Coastal Zone Management Act
Are project conditions required? YES (See Section V.) NO (Review concluded.) Comments: The project WILL/WILL NOT involve disposal of dredged material, excavation, filling, or other modifications to waters in the United States. A Department of the Army permit IS/IS NOT required for this project. Correspondence/Consultation/References: Concurrence letters were sent to CONTACT NAME of the USACE and CONTACT NAME of the WDNR on DATE. USACE concurred on DATE and WDNR responded on DATE that this project WILL/WILL NOT impact the waters of the United States. E. Coastal Zone Management Act Project does not affect a coastal zone area (regardless of in or out). (Review concluded.)
Are project conditions required? YES (See Section V.) NO (Review concluded.) Comments: The project WILL/WILL NOT involve disposal of dredged material, excavation, filling, or other modifications to waters in the United States. A Department of the Army permit IS/IS NOT required for this project. Correspondence/Consultation/References: Concurrence letters were sent to CONTACT NAME of the USACE and CONTACT NAME of the WDNR on DATE. USACE concurred on DATE and WDNR responded on DATE that this project WILL/WILL NOT impact the waters of the United States. E. Coastal Zone Management Act Project does not affect a coastal zone area (regardless of in or out). (Review concluded.) Project is not located in a coastal zone area. (Review concluded.)

Reviewer Name: YOUR NAME Applicant: SUBRECIPIENT Disaster/Emergency/Program/Project Title: DR-XXXX-WI/PDMXX/etc. Comments: n/a Correspondence/Consultation/References: n/a F. Fish and Wildlife Coordination Act Project is not located in or does not affect a waterway/body of water. (Review concluded.) Project affects, controls, or modifies a waterway/body of water. Coordination with USFWS conducted. No Recommendations offered by USFWS. (Review concluded.) Recommendations provided by USFWS. Are project conditions required? YES (See Section V.) NO (Review concluded.) Comments: n/a Correspondence/Consultation/References: n/a G. Clean Air Act Project will not result in permanent air emissions. (Review concluded.) Project is located in an attainment area. (Review concluded.) Project is located in a non-attainment area. Coordination required with applicable state administering agency. Are project conditions required? YES (See Section V.) NO (Review concluded.) Comments: EXAMPLE: This project may result in temporary air emissions as a result of construction activities, such as dust and machine exhaust; however, there will be no long-term impacts. Correspondence/Consultation/References: **H. Farmlands Protection Policy Act** Project does not affect prime or unique farmland. (Review concluded.) Project causes unnecessary or irreversible conversion of prime or unique farmland. Coordination with Natural Resource Conservation Commission required. Farmland Conversion Impact Rating, Form AD-1006, completed. Are project conditions required? YES (See Section V.) NO (Review concluded.) Comments: n/a Correspondence/Consultation/References: n/a **I. Migratory Bird Treaty Act** Project not located within a flyway zone. (Review concluded.)

Project located within a flyway zone.

Disaster/Emergency/Program/Project Title: DR-XXXX-WI/PDMXX/etc.	Applicant: SUBRECIPIENT
Project does not have the potential to take migratory bir	ds. (Review concluded.)
Project has the potential to take migratory birds.	
Contact made with USFWS.Are project conditions required? YES (See Section Concluded.)	tion V.) NO (<u>Review</u>
Comments: Response letter from the USFWS dated DATE noted that _are known to nest on any structures or habitat which may be disturb should begin and be completed before the initiation of the breeding breeding has concluded.>	ed by project construction, activities
Correspondence/Consultation/References: <mark>Letter was sent to CONTA USFWS responded on DATE.</mark>	NCT NAME of the USFWS on DATE.
J. Magnuson-Stevens Fishery Conservation and Management A	ct
Project not located in or near Essential Fish Habitat. (Review co	ncluded.)
Project located in or near Essential Fish Habitat.	
Project does not adversely affect Essential Fish Habitat. (Review concluded.)
Project adversely affects Essential Fish Habitat. (FEMA de concurrence on file.)	termination/USFWS/NMFS
NOAA Fisheries provided no recommendation(s).	(Review concluded.)
NOAA Fisheries provided recommendation(s).	
Written reply to NOAA Fisheries recommended.Are project conditions required? YES (concluded.)	·
Comments: <mark>n/a</mark>	
Correspondence/Consultation/References: <mark>n/a</mark>	
K. Wild and Scenic Rivers Act	
Project is not along and does not affect Wild or Scenic River (WS	SR). (Review concluded.)
Project is along or affects WSR.	
Project adversely affects WSR as determined by NPS/USF (NPS/USFS/USFWS/BLM consultation on file.)	S. FEMA cannot fund the action .
Project does not adversely affect WSR. (NPS/USFS/USFW Are project conditions required? YES (See Section V.)	
Comments: <mark>n/a</mark>	

Correspondence/Consultation/References: n/a

Applicant: SUBRECIPIENT

Reviewer Name: YOUR NAME
Disaster/Emergency/Program/Project Title: DR-XXXX-WI/PDMXX/etc.

L. Other Relevant Laws and Environmental Regulations

There IS/IS NO contamination based on a MONTH YEAR BRRTs review and letter to CONTACT NAME, WDNR, dated DATE. Concurrence form received from WDNR on DATE.

II. Compliance Review for Executive Orders
A. E.O. 11988 - Floodplains
Outside floodplain and No Effect on floodplains/flood levels. (Review concluded.)
Located in floodplain or effects on floodplains/flood levels.
No Adverse Effect on floodplain and not adversely affected by the floodplain. (Review concluded.)
Beneficial Effect on floodplain occupancy/values. (Review concluded.)
Possible adverse effects associated with investment in floodplain, occupancy or modification of floodplain environment.
 8 Step Process Complete - documentation on file. Are project conditions required? YES (See Section V.) NO (Review concluded.)
Comments: See attached floodplain map MAP NUMBER, dated DATE, COUNTY, Wisconsin, proposed project area is located <example: area="" flood="" hazard="" in="" of="" outside="" special="" the="" x="" zone="">. A Public Notice was posted in the PUBLICATION NAME on DATE.</example:>
Correspondence/Consultation/References: Request for information sent to WDNR on DATE. Concurrence form returned from the WDNR on DATE.
B. E.O. 11990 - Wetlands
Outside wetland and No Effect on wetland(s). (Review concluded.)
Located in wetland or effects wetland(s).
Beneficial Effect on Wetland. (Review concluded.)
Possible adverse effect associated with constructing in or near wetland.
Review completed as part of floodplain review.
 8 Step Process Complete - documentation on file. Are project conditions required? YES (See Section V.) NO (Review concluded.)
Comments: Staff reviewed WDNR wetland maps and sent concurrence form to WDNR. The WDNR concurred that this project WILL/WILL NOT have any adverse impacts on wetlands. A Public Notice was posted in the PUBLICATION on DATE.
Correspondence/Consultation/References: Request for information sent to WDNR on DATE. Concurrence form returned from the WDNR on DATE.

ATTACHMENT E **Reviewer Name: YOUR NAME Applicant: SUBRECIPIENT** Disaster/Emergency/Program/Project Title: DR-XXXX-WI/PDMXX/etc. C. E.O. 12898 - Environmental Justice for Low Income and Minority Populations No low income or minority population in, near, or affected by the project. (Review concluded.) Low income or minority population(s) in or near project area. No disproportionately high and adverse impact on low income or minority population(s). (Review concluded.) Disproportionately high or adverse effects on low income or minority population(s). Are project conditions required? YES (See Section V.) NO (Review concluded.) Comment: Per data from EPA Environmental Justice Maps and Reports, < EXAMPLE: there are no large concentrations of minority or low income populations in or near the project area and the proposed project will not adversely impact the health or physical environment of minority or low income populations. No action is required.> Correspondence/Consultation/References: See reports from EPA Environmental Justice for LOCATION including 2010 Census information. III. **Other Environmental Issues** Identify other potential environmental concerns in the comment box not clearly falling under a law or executive order (see environmental concerns scoping checklist for guidance). Comments: Correspondence/Consultation/References: **Extraordinary Circumstances** * A "Yes" under any circumstance below may require an Environmental Assessment (EA) with the

IV.

Based on the review of compliance with other environmental laws and Executive Orders, and in consideration of other environmental factors, review the project for extraordinary circumstances.

exception of (ii) which should be applied in conjunction with controversy on an environmental issue. If the circumstance can be mitigated, please explain in comments. If no, leave blank.

Yes	
_ (i)	Greater scope or size than normally experienced for a particular category of action
(ii)	Actions with a high level of public controversy
iii)	Potential for degradation, even though slight, of already existing poor environmental conditions
iv)	Employment of unproven technology with potential adverse effects or actions involving unique or unknown environmental risks
(v)	Presence of endangered or threatened species or their critical habitat, or archaeological, cultural, historical, or other protected resources
(vi)	Presence of hazardous or toxic substances at levels which exceed federal, state, local, or tribal

regulations or standards requiring action or attention

ATTACHMENT E

	Name: YOUR NAME mergency/Program/Project Title: DR-XXXX-WI/PDMXX/etc.
(vii)	Actions with the potential to affect special status areas adversely or other critical resources such as wetlands; coastal zones; wildlife refuges; wilderness areas; wild and scenic rivers; and sole or principal drinking water aquifers
(viii)	Potential for adverse effects on health or safety
ix)	Potential to violate a federal, state, local, or tribal law or requirement imposed for the protection of the environment
(x)	Potential for significant cumulative impact when the proposed action is combined with other past, present, and reasonably foreseeable future actions, even though the impacts of the proposed action may not be significant by themselves.
Commer	nts:
V. <u>E</u>	Environmental Review Project Conditions
General	comments:
Project 0 1.	Conditions:

Monitoring Requirements:

PUBLIC NOTICE PROCEDURES for FEMA Region V Environmental Assessments

NEPA is a planning and disclosure process. Therefore both NEPA and EO 11988 require notification of the public

- (A) when a project and its alternatives are initially being developed and scoped; and
- (B) after the completion of the final draft environmental assessment, and before the signing of the *Finding of No Significant Impacts (FONSI)* and any action taken.

The requirements of (A), which is referred to as a **NOTICE OF INTENT**, can usually be met by one of the following:

- 1. Publishing at the beginning of a disaster FEMA's *General Notice for a Presidential Declaration*, which issues notification that funds will be provided under the Stafford Act to undertake projects.
- 2. Publishing a **NOTICE OF INTENT** in a local newspaper to undertake a project, providing the alternatives, and then giving the public 15 days to respond.
- 3. Holding one or more public meetings on the project to solicit public comments.

Exactly which of the above vehicles is used to meet the requirements of (A) will usually be determined by the scope of the proposed project, agency coordination, and previous notification and scoping work performed by the applicant. Any comments received during this phase of notification should be addressed in the EA.

The requirements of (B), which is referred to as a **FINAL NOTICE**, can usually be met by the following:

- 1. Publishing a **FINAL NOTICE** in a local newspaper and giving the public 15 days to respond.
- 2. If no comments are received, the FONSI can be signed and the project can proceed.
- 3. If comments are received they can be addressed individually and/or in a rewrite of the EA.
- 4. If significant negative comments are received, the project should be put on hold until the issues are resolved.

SPECIAL NOTE

The above requirements are also to be applied to a project deemed to be a categorical exclusion (CATEX) from the preparation of an environmental assessment, but involves EO 11988 (floodplains) and/or EO 11990 (wetlands) and/or potentially or existing contentious issues.

(SAMPLE) FINAL PUBLIC NOTICE

PUBLIC NOTICE OF A PROJECT PENDING FUNDING BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

Notification is hereby given of the Federal Emergency Management Agency's (FEMA's) pending intent to provide Hazard Mitigation Grant Program funding for community name to short project description. Funds will be provided in accordance with the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended.

Under the National Environmental Policy Act (NEPA) and EO 11988, FEMA is required to provide public notice of any proposed actions in or affecting floodplains or wetlands.

Community, county, Wisconsin proposes to detailed project description including location, impact on the floodplain and/or wetlands, and why it is the best and/or only solution to the problem.

FEMA's review has determined that no significant impact to the existing floodplain will result from this project.

Within 15 days, interested persons may submit comments, obtain more detailed information about the action, or request a copy of the findings by contacting FEMA's Region V office which is located at 536 S. Clark, Chicago, IL 60605. Requests can also be made to local program person-phone number-e-mail address or to Nicholas Mueller, FEMA Regional Environmental Officer at (312) 408-5540 or nicholas.mueller@dhs.fema.gov.

When describing the project, do not use addresses or names, as this would violate the privacy act.

ENVIRONMENTAL CLOSEOUT DECLARATION

It is the Federal Emergency Management Agency's (FEMA's) responsibility to verify that environmental laws and executive orders are met prior to approval of FEMA-funded awards. In order to comply with this responsibility it is necessary to ensure that the requirements of the environmental documents have been met prior to award closeout.

The applicant or applicant's agent must verify that the conditions stated in the Record of Environmental Consideration, FONSI or Environmental Assessment, or any other environmental approval documentation were met. They must provide copies of all permits or other required documentation to the State, which will be provided to FEMA at the time of closeout.

Funding will be jeopardized if the environmental conditions listed in the project approval documents were not followed and/or required permits were not obtained.

Project conditions

This is to be completed and signed after project completion and submitted as part of the grant closeout documentation.

grant closeout doc	cumentation.		
Program Grant	HMGP		
Disaster Related	DR- <mark>XXXX</mark> -WI		
Project Number	XX-X		
Project Title	Community name, project type	<mark>oe</mark>	
appropriate permits issues listed under ti	litions listed in the environmenta and supporting documents are of the Project Conditions section of t ental Assessment were encounted dination with FEMA.	attached. I further o he Record of Enviro	attest than none of the onmental Consideration,
Signature of Applica	ant or Applicant's Agent	Date	
Signature of State F	Program Manager	Date	
Signature of Region	al Environmental Officer,	————— Date	

FEMA-Region V

Date

Authorized Representative Community
Address
City, State ZIP Code

Dear XXX:

I am pleased to inform you that the Federal Emergency Management Agency (FEMA) has approved funding for applicant's Hazard Mitigation Grant Program (HMGP) subapplication submitted under Disaster Declaration FEMA-4276-DR-WI declared August 9, 2016. The subaward is approved in the amount of \$XXX for project description.

FEMA provides 75% of the funding or \$XXX, Wisconsin Emergency Management (WEM) provides 12.5% or \$XXX, and the remaining \$XXX is the community's required 12.5% local match.

Enclosed are two originals of the State-Local Hazard Mitigation Grant Program Assistance Agreement. Please carefully review the Agreement and sign both copies. Keep one copy for your records and return the other to this office. This Agreement must be signed before funds can be drawn on the subaward.

Per the agreement you are required to submit Quarterly Status Reports, DMA Form 168 (enclosed), within 15 days of the end of each quarter (October 15, January 15, April 15, and July 15), and a final report covering all aspects of the project within 30 days of project completion.

To receive reimbursement of expenses you will need to complete and submit to this office a Request for Reimbursement of Expenses, DMA Form 167 (enclosed), along with supporting documentation (invoices and proof of payments). Advancement of funds requires prior approval from this office and will only be made in extraordinary circumstances. The final request for reimbursement is due within 30 days of completion of the project.

Please refer to the Assurances for Construction and Non-Construction Projects, DMA Form 1017A, and the State-Local Hazard Mitigation Grant Program Statement of Assurances for Property Acquisition Projects, signed and submitted with the application, for other state and federal laws and program requirements relating to the subaward which must be adhered to.

Under the HMGP, acquisition projects must meet the following criteria:

- Property owner(s) must voluntarily elect to participate in the program. The community will need to provide the Statement of Voluntary Participation signed by the property owner and the community based on the fair market value of the property as determined by the approved appraisal.
- The acquired property will be deed restricted requiring that it be maintained as open space in perpetuity, and stipulating that no future disaster assistance will be made available at the site.

The deed conveying the property to the community must reference and incorporate Exhibit A, Model Deed Restrictions.

- Replacement housing for those whose properties are acquired must not be in another 1% annual flood chance zone.
- The property will be purchased based on the fair market value (FMV) as determined by an appraisal. Pre or post-flood FMV may be used. If utilizing pre-flood FMV, the offer to purchase will need to take into consideration any duplication of benefits.
- The project will have to conform to the Uniform Relocation Assistance and Real Property Acquisition Policies Act (URA) and the State Relocation Law (State Statute 32.185-32.27) for tenants only.

FEMA and this office provide subaward funds and program guidance; however, the community is responsible for administering the subaward and implementing the project. The community is not authorized to make an offer on the property until the appraisal has been completed and authorization has been granted by this office. Duplications of benefits (DOB) that may apply must be disclosed and will be deducted from the offer.

Substantially damaged properties that have a standard flood insurance policy at the time of flooding may be entitled to Increased Cost of Compliance (ICC) payments to bring the structure into compliance with local floodplain requirements. In the case of acquisition, ICC funds can be utilized for demolition costs up to \$30,000. In addition, ICC funds can be applied towards the local match.

In completing the project, the community will need to adhere to the conditions indicated in the enclosed approval letter for the REC (Record of Environmental Consideration) dated date.

After reviewing this letter and the attachments, please contact me to schedule a meeting to discuss program policies and procedures for subaward administration and project implementation.

If you have questions, please call me at (608) 242-3211; Katie Sommers, State Hazard Mitigation Officer, at (608) 242-3222; Caitlin Shanahan, Disaster Response and Recovery Planner, at (608) 242-3214; or Margaret Zieke-Patterson, Disaster Response and Recovery Planner, at (608) 242-3252.

Sincerely,

ROXANNE K. GRAY Mitigation Section Supervisor Wisconsin Division of Emergency Management

Enclosures:

State-Local Hazard Mitigation Grant Program Assistance Agreement

- Quarterly Status Report, DMA Form 168
- Request for Reimbursement Request, DMA Form 167
- Budget Summary Form
- Statement of Voluntary Participation
- Exhibit A, Model Deed Restrictions
- FEMA approval letter dated date
- FEMA NEPA approval letter dated date
- Record of Environmental Consideration signed date

Cc: Regional Emergency Management Director
County Emergency Management Director

WISCONSIN DIVISION OF EMERGENCY MANAGEMENT State-Local Hazard Mitigation Grant Program Assistance Agreement (FEMA-DR-4276-WI) Acquisition

This Assistance Agreement between the Wisconsin Division of Emergency Management (WEM/ the recipient) and (community name) (the subrecipient) shall be effective on the date signed by WEM and the subrecipient. It shall apply to all Hazard Mitigation Grant Program (HMGP) assistance provided by or through WEM to the subrecipient as a result of Wisconsin's Presidential Disaster Declaration FEMA-DR-4276-WI.

The purpose of this agreement is to formally recognize the goals of the HMGP and to establish guidelines by which HMGP funds are to be used. This agreement is in addition to the requirements outlined in DMA Form 1017A, Assurances for Construction and Non-Construction Projects, and the State-Local Hazard Mitigation Grant Program Statement of Assurances for Property Acquisition Projects that was signed by the above mentioned subrecipient and submitted with the HMGP subapplication.

Be it resolved by the subrecipient, that the individual named below:

(Name and Title)

has the legal authority and is hereby authorized to execute documents for and on behalf of the subrecipient. The designated individual is to be the authorized representative for obtaining HMGP funds.

The subrecipient hereby assures and certifies that the project will comply with the applicable State of Wisconsin and FEMA regulations. Also, the subrecipient gives assurance and certifies with respect to and as a condition for the subaward the following at a minimum:

- 1. This Assistance Agreement in the amount of \$XXXX will serve as the contract between WEM and the subrecipient for the purpose of acquisition and demolition of (number) properties located in the floodplain of the (water body). 75% or \$XXXX is the federal share funded through FEMA. 12.5% or \$XXXX is the state share funded through WEM. The remaining 12.5 percent or \$XXXX is the required local program match (may not be comprised of other federal funds or match to other federal funds, i.e. EMPG, EPCRA). If there is a cost under-run for the project, final reimbursement for the federal and state share of the project costs will be adjusted based on actual costs of the project. If costs exceed the amount approved, the subrecipient is responsible for the costs in excess of the approved subaward.
- 2. The subrecipient will adhere to the special conditions as identified in the approval letter for the Record of Environmental Consideration (REC) dated (date), in completing the project.
 - The subrecipient must follow all applicable local, state, and federal laws, regulations, and requirements for the abatement and disposal of lead, asbestos, and other routinely encountered hazardous substances. If there is an unusual material encountered or there is an extraordinary amount of lead, asbestos, or other routinely encountered material,

- the subrecipient must also contact the recipient and the relevant agency with authority for regulation of the material.
- If ground-disturbing activities occur during implementation, the subrecipient will monitor excavation activity, and if any artifacts or human remains are found during excavation processes all work is to cease, and the subrecipient will notify WEM, FEMA, and the State Historic Preservation Officer (SHPO).
- If petroleum underground storage tanks or septic systems are present, they should be abandoned according to State Regulations.
- If private water supply wells are present, they should be properly abandoned per Wis. Admin. Code NR 812.26. All unused wells shall be properly filled and sealed before demolition work begins, and wells discovered during demolition work must also be properly filled and sealed in accordance with NR 812.26. Submit Well Abandonment Report Forms (DNR Form #3300-5) to DNR.
- A Notification of Demolition and/or Renovation and Application for Permit Exemption (Wis. Admin. Code NR 406, 410, and 447) may be required. Contact DNR to request additional information and permit application materials.
- Steel, concrete, and other demolition materials should be recycled to the extent possible. Waste that cannot be recycled must be characterized and managed properly.
- During demolition of the structure, placement of equipment and stockpiling of structural debris will be confined to the front and back of the structure; heavy equipment will, where possible, be kept on the driveway, the street or other hard surfaces.
- No on-site disposal of demolition debris will be allowed; all debris resulting from the demolition must be deposited in an approved landfill area; no debris can be deposited in wetland or floodplain areas. A local or state permit may be necessary for construction in the floodplain and must be obtained prior to any construction on this project.
- If demolition activities result in an area of disturbance of more than 10,000 square feet within 300 feet of the waterway, then a Chapter 30 permit approval will be required. Application can be found at http://dnr.wi.gov/permits/water/. If dewatering is required, the dirty water removed should be pumped into a stilling basin before it is allowed to enter any waterway.
- No on-site granular material will be excavated or stripped to use for capping the foundation and/or for final landscaping.
- Erosion control measures as defined by the WDNR must be used before and after any demolition activities are implemented.
- The subrecipient must secure an erosion control permit under Wis. Admin. Code NR 216 if the property will impact more than one acre.
- Private septic tanks must be abandoned according to Wis. Admin. Code NR 812 and per Wisconsin Department of Commerce codes.
- Best management practices will be applied to the property.
- If deviations from the proposed scope of work result in design changes, the need for additional ground disturbance, additional removal of vegetation, or in any other unanticipated changes to the physical environment, the subrecipient must contact WEM immediately and a re-evaluation by FEMA under NEPA and other applicable environmental laws will be conducted by FEMA.

- 3. The prospective participants were provided and signed the written "Notice of Voluntary Participation Statement" which states that participation in the program is voluntary and that the subrecipient will not use eminent domain authority to acquire the property should negotiations fail.
- 4. The subrecipient will provide the **Statement of Voluntary Participation** signed by the property owner and the subrecipient based on the fair market value of the property as determined by the approved appraisal for the property.
- 5. The subrecipient has consulted with the U.S. Army Corps of Engineers and determined that no plans exist for the property for the construction of flood damage reduction levees including berms, floodwalls and dikes; has rejected consideration of such measures in the future in the project area; and instead has chosen to proceed with acquisition of permanent open space.
- 6. The subrecipient has coordinated with the State Department of Transportation to ensure that planning or future use documents do not contain any planned improvements or enhancements to federal highway aid systems or other state transportation projects that would affect the property proposed for acquisition.
- 7. The subrecipient will provide certification that each participant who will receive pre-event fair market value is a National of the United States or qualified alien by asking all acquisition project participants (property owners) to certify that they are either a National of the United States or a qualified alien. Participants who refuse to certify, or who are not Nationals of the United States or qualified aliens, will receive no more than the appraised current fair market value for their property.
- 8. The existing structure will be removed within 90 days of acquisition. The FEMA Regional Administrator may approve a time extension in extenuating circumstances. Time extension requests must be submitted in a timely manner and prior to the 90 days.
- 9. Once this Assistance Agreement is signed and returned to WEM, the subrecipient may begin the project and the authorized representative may request reimbursement of expenses as identified in the budget included in the approved subapplication. The subrecipient will need to complete and submit to WEM a Request for Reimbursement of Expenses with appropriate documentation in order to receive subaward funds. Advancement of funds may be made in some extraordinary situations upon prior approval of the recipient.
 - COSTS INCURRED PRIOR TO FEMA APPROVAL OF THE SUBAWARD, UNLESS PRE-AWARD COSTS WERE INCLUDED AND APPROVED IN THE SUBAPPLICATION, ARE NOT ALLOWABLE COSTS FOR THE SUBAWARD.
 - The recipient may pursue all available remedies for the recoupment of any payments that have been inadequately documented or determined by the recipient to have been improperly made or expended for any reason.
- 10. The authorized representative will be required to submit Quarterly Status Reports to the State Hazard Mitigation Officer (SHMO) within 15 days of the end of the quarter (January 15, April 15, July 15, and October 15 each year). Said report will include the status of the project

including property acquisition and demolition data, anticipated completion date, and financial information.

11. The subrecipient will meet the following timeline for completing this project:

Start Date No later than (date)

Completion Date (date)

If the subrecipient is delayed in their completion of the project by an event beyond their control, a request for an extension must be received in writing 90 days prior to the completion date.

- 12. The performance period for the HMGP project subaward will be (date) to (date).
- 13. The final request for reimbursement and a final report covering all aspects of the project will be due 30 days after project completion. The project is considered complete after demolition of structures and restoration of all properties to open space uses. The final report must include the following:
 - Copies of signed Offer Agreement(s) and/or Offer Decline(s)
 - Signed Statement(s) of Voluntary Participation by the property owner(s)
 - Copies of Title Opinion(s) and/or Title Insurance
 - Closing Settlement Statement(s)
 - Transfer(s) of Sale
 - Copies of the recorded Warranty Deed(s) with the required FEMA deed restrictions
 - Photo(s) of the property site(s) after project completion
 - Copy of relocation plan approval letter and relocation assistance documents, if applicable
 - Copies of permits and forms as identified in the approval letter for the Record of Environmental Consideration and in number 2 of this document
 - Signed Environmental Closeout Declaration
- 14. The subrecipient will comply with applicable provisions of the State's Relocation Law, Wisconsin Statutes Chapter 32, Section 32.19-32.27, (per Attorney General opinion dated January 12, 1979) and Wis. Admin. Code Adm 92 for tenants of rental properties.
- 15. The subrecipient will comply with Federal Uniform Relocation Assistance and Real Property Policies Act of 1970, as amended, (49 CFR Part 24) for tenants of rental properties.
- 16. The HMGP funds requested for the project shall not duplicate benefits received from any other disaster assistance program.
- 17. The subrecipient will comply with the requirements of the Privacy Act. Information covered by the Privacy Act (i.e. names, addresses, award amounts, etc., of applicants) may be released to agencies for the sole purpose of preventing duplication of benefits. Information may not be used for outreach, canvassing, referral, or other similar programs. Information should not be provided to agencies not directly concerned with the acquisition program.

- 18. Any profits made from the sale, recycle, reuse, etc., of any properties acquired through the HMGP program will be used towards the mitigation project or deducted from the subaward amount.
- 19. Property acquired through the HMGP must be maintained in perpetuity for open space per 44 CFR Part 80.19, Land Use and Oversight. The property cannot be used to construct flood damage reduction levees, transportation facilities, or other incompatible purposes. No new structure will be erected on the property other than a restroom or public facility that is open on all sides and functionally related to open space use. Construction of any structure must be pre-approved by FEMA and WEM. Any structure must be constructed in compliance with the state and local floodplain management ordinances, meet NFIP minimum requirements, and be compatible with open space uses and floodplain management policy and practices. Allowable open space uses can include, but are not limited to, parks, nature preserves, cultivation, grazing, and unimproved pervious parking areas.
- 20. The deed conveying the property to the subrecipient must reference and incorporate Exhibit A, Model Deed Restrictions, attached to the State-Local HMGP Statement of Assurances for Property Acquisition Projects signed by the subrecipient on (date).
- 21. The subrecipient must submit to the recipient every three years a report certifying that it has inspected the subject property within the month preceding the report, and that the property continues to be maintained consistent with the provisions of the subaward. If the subject property is not maintained according to the terms of the subaward, the recipient and FEMA, will take measures to bring the property back into compliance.
- 22. The subrecipient is responsible for the continued maintenance of acquired property upon completion of the project, and is responsible for ensuring that the property is maintained in accordance with required land use restrictions.
- 23. Per 44 CFR Part 80.19(b) approval must be obtained from the recipient agency and the FEMA Regional Administrator before entering into a lease or easement, or conveying ownership of the property to any other party. The subrecipient may convey a property interest only to a public entity or to a qualified conservation organization. Conveyance of any property interest must reference and incorporate the original deed restrictions. If the subaward is still open, any income from sale or lease of the land must be deducted from the overall cost of the project.
- 24. No future disaster assistance for any purpose from any federal source will be sought or provided with respect to the acquired property.
- 25. The subrecipient will use HMGP funds solely for the purpose for which they are provided.
- 26. The subrecipient shall maintain good standing with the National Flood Insurance Program (NFIP) and comply with local regulations pertaining to the NFIP.
- 27. The subrecipient will update their floodplain ordinance to meet the current Wisconsin Department of Natural Resources requirements.
- 28. The subrecipient will comply with all other policies and guidelines established by FEMA and WEM in administering the HMGP.

- 29. The subrecipient will follow 2 CFR Part 200, Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards:
 - Transfer of funds among budget cost categories in any approved budget with a federal share in excess of the Simplified Acquisition Threshold (\$150,000 at the time this agreement was drafted) shall receive the prior approval of FEMA when such cumulative transfers among those cost categories exceed 10% of the total budget. (2 CFR Part 200.308(e))
 - Cost-sharing requirements found in 2 CFR Part 200.306.
 - Requirements for equipment and supply purchases and procurement found in 2 CFR Part 200 Sections 313, 314, and 322, respectively.
- 30. The subrecipient will follow 2 CFR Part 225, Cost Principles for State, Local, and Indian Tribal Governments.
- 31. Any publication resulting from work performed under this agreement shall include an acknowledgement of FEMA financial support and a statement that the publication does not constitute an endorsement of FEMA or reflects FEMA's views. The recipient and FEMA are free to copyright any original work developed under this agreement, and reserve a royalty-free, nonexclusive, and irrevocable right to reproduce, publish, or otherwise use, and to authorize others to use the work for government purposes.
- 32. The subrecipient will not enter into cost-plus-percentage-of-cost contracts for completion of the HMGP project.
- 33. The subrecipient will not enter into any contract with any party that is debarred or suspended from participating in federal assistance programs. (See https://www.sam.gov.)
- 34. Records shall be retained three years following the date the HMGP is closed for Wisconsin's Presidential Disaster Declaration FEMA-4276-DR-WI in accordance with 2 CFR Part 200.333.

SIGNATURE OF SUBRECIPIENT'S AUTHORIZED REPRESENTATIVE:

	Date:	
Name (printed)	Title	
Jurisdiction		
SIGNATURE OF THE RECIPI	ENT (WISCONSIN DIVISION OF EMERGENCY	MANAGEMENT):
	Date:	

WISCONSIN DIVISION OF EMERGENCY MANAGEMENT State-Local Hazard Mitigation Grant Program Assistance Agreement (FEMA-DR-4276-WI) Elevation

This Assistance Agreement between the Wisconsin Division of Emergency Management (WEM/ the recipient) and (community name) (the subrecipient) shall be effective on the date signed by WEM and the subrecipient. It shall apply to all Hazard Mitigation Grant Program (HMGP) assistance provided by or through WEM to the subrecipient as a result of Wisconsin's Presidential Disaster Declaration FEMA-DR-4276-WI.

The purpose of this agreement is to formally recognize the goals of the HMGP and to establish guidelines by which HMGP funds are to be used. This agreement is in addition to the requirements outlined in DMA Form 1017A, Assurances for Construction and Non-Construction Projects that was signed by the above mentioned subrecipient and submitted with the HMGP subapplication.

Be it resolved by the subrecipient, that the individual named below:

(Name and Title)

has the legal authority and is hereby authorized to execute documents for and on behalf of the subrecipient. The designated individual is to be the authorized representative for obtaining HMGP funds.

The subrecipient hereby assures and certifies that the project will comply with the applicable State of Wisconsin and FEMA regulations. Also, the subrecipient gives assurance and certifies with respect to and as a condition for the subaward the following at a minimum:

- 1. This Assistance Agreement in the amount of \$XXXX will serve as the contract between WEM and the subrecipient for the purpose of elevation of (number) properties located in the floodplain of the (water body). 75% or \$XXXX is the federal share funded through FEMA. 12.5% or \$XXXX is the state share funded through WEM. The remaining 12.5 percent or \$XXXXX is the required local program match (may not be comprised of other federal funds or match to other federal funds, i.e. EMPG, EPCRA). If there is a cost under-run for the project, final reimbursement for the federal and state share of the project costs will be adjusted based on actual costs of the project. If costs exceed the amount approved, the subrecipient is responsible for the costs in excess of the approved subaward.
- 2. The subrecipient will adhere to the special conditions as identified in the approval letter for the Record of Environmental Consideration (REC) dated (date), in completing the project.
 - The subrecipient must follow all applicable local, state, and federal laws, regulations, and requirements for the abatement and disposal of lead, asbestos, and other routinely encountered hazardous substances. If there is an unusual material encountered or there is an extraordinary amount of lead, asbestos, or other routinely encountered material, the subrecipient must also contact the recipient and the relevant agency with authority for regulation of the material.

- If ground-disturbing activities occur during implementation, the subrecipient will monitor excavation activity, and if any artifacts or human remains are found during excavation processes all work is to cease, and the subrecipient will notify WEM, FEMA, and the State Historic Preservation Officer (SHPO).
- During elevation of the structure, placement of equipment and stockpiling of structural debris will be confined to the front and back of the structure; heavy equipment will, where possible, be kept on the driveway, the street or other hard surfaces.
- No on-site disposal of demolition debris will be allowed; all debris resulting from the demolition must be deposited in an approved landfill area; no debris can be deposited in wetland or floodplain areas. A local or state permit may be necessary for construction in the floodplain and must be obtained prior to any construction on this project.
- No on-site granular material will be excavated or stripped to use for capping the foundation and/or for final landscaping.
- Best management practices will be applied to the property.
- If deviations from the proposed scope of work result in design changes, the need for additional ground disturbance, additional removal of vegetation, or in any other unanticipated changes to the physical environment, the subrecipient must contact WEM immediately and a re-evaluation by FEMA under NEPA and other applicable environmental laws will be conducted by FEMA.
- 3. Property owners elevating their structures must voluntarily elect to participate in the program.
- 4. Property owners elevating their structures must follow and adhere to the requirements in the signed Model Acknowledgement of Conditions for Mitigation Property in a Special Flood Hazard Area.
- 5. For properties in a Special Flood Hazard Area, property owners elevating their structures must agree to maintain flood insurance on the structure to an amount equal to the project cost or to the maximum limit of coverage available for their property, whichever is less.
- 6. Property owners elevating their structures in the Special Flood Hazard Area must agree that the community will legally record with the County Register of Deeds Office a notice of flood insurance requirements per the signed Acknowledgement of Conditions. The notice will read as follows:

This property has received federal hazard mitigation assistance. Federal law requires that flood insurance coverage on this property must be maintained during the life of the property regardless of transfer of ownership of such property. Pursuant to 42 U.S.C. §5154a, failure to maintain flood insurance on this property may prohibit the owner from receiving federal disaster assistance with respect to this property in the event of a flood disaster. The property owner is also required to maintain this property in accordance with the floodplain management criteria of the Title 44 of the Code of Federal Regulations part 60.3 and City/County Ordinance.

- 7. The community must adhere to the requirements of the local floodplain zoning ordinance to bring the structure into full conformance. This means that the structure will need to be elevated to the base flood elevation plus two feet.
- 8. An owner's agreement for elevation must be signed between the community and the property owner before work can commence on the property. The owner is responsible for any repairs or improvements to the structure. The subaward will only cover eligible costs associated with the actual elevation of the structure as identified in the subapplication.
- 9. Once this Assistance Agreement is signed and returned to WEM, the subrecipient may begin the project and the authorized representative may request reimbursement of expenses as identified in the budget included in the approved subapplication. The subrecipient will need to complete and submit to WEM a Request for Reimbursement of Expenses with appropriate documentation in order to receive subaward funds. Advancement of funds may be made in some extraordinary situations upon prior approval of the recipient.

COSTS INCURRED PRIOR TO FEMA APPROVAL OF THE SUBAWARD, UNLESS PRE-AWARD COSTS WERE INCLUDED AND APPROVED IN THE SUBAPPLICATION, ARE NOT ALLOWABLE COSTS FOR THE SUBAWARD.

The recipient may pursue all available remedies for the recoupment of any payments that have been inadequately documented or determined by the recipient to have been improperly made or expended for any reason.

- 10. The authorized representative will be required to submit Quarterly Status Reports to the State Hazard Mitigation Officer (SHMO) within 15 days of the end of the quarter (January 15, April 15, July 15, and October 15 each year). Said report will include the status of the project including property acquisition and demolition data, anticipated completion date, and financial information.
- 11. The subrecipient will meet the following timeline for completing this project:

Start Date No later than (date)

Completion Date (date)

If the subrecipient is delayed in their completion of the project by an event beyond their control, a request for an extension must be received in writing 90 days prior to the completion date.

- 12. The performance period for the HMGP project subaward will be (date) to (date).
- 13. The final request for reimbursement and a final report covering all aspects of the project will be due 30 days after project completion. The project is considered complete after elevation of structures. The final report must include the following:
 - Copies of the elevation certificate(s)
 - Proof of the property owners' flood insurance coverage
 - Copies of the required notice(s) of flood insurance that has been filed with the County
 - Photo(s) of the property site(s) after project completion

- Latitude and longitude coordinates for each property in the project
- Identification of repetitive loss properties in the project
- Copies of permits and forms as identified in the approval letter for the Record of Environmental Consideration and in number 2 of this document
- Other information as required
- Signed Environmental Closeout Declaration
- 14. The HMGP funds requested for the project shall not duplicate benefits received from any other disaster assistance program.
- 15. The subrecipient will comply with the requirements of the Privacy Act. Information covered by the Privacy Act (i.e. names, addresses, award amounts, etc., of applicants) may be released to agencies for the sole purpose of preventing duplication of benefits. Information may not be used for outreach, canvassing, referral, or other similar programs. Information should not be provided to agencies not directly concerned with the acquisition program.
- 16. The subrecipient will use HMGP funds solely for the purpose for which they are provided.
- 17. The subrecipient shall maintain good standing with the National Flood Insurance Program (NFIP) and comply with local regulations pertaining to the NFIP.
- 18. The subrecipient will update their floodplain ordinance to meet the current Wisconsin Department of Natural Resources requirements.
- 19. The subrecipient will comply with all other policies and guidelines established by FEMA and WEM in administering the HMGP.
- 20. The subrecipient will comply with all applicable federal, state, and local codes and standards as pertain to this project.
- 21. The subrecipient will follow 2 CFR Part 200, Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards:
 - Transfer of funds among budget cost categories in any approved budget with a federal share in excess of the Simplified Acquisition Threshold (\$150,000 at the time this agreement was drafted) shall receive the prior approval of FEMA when such cumulative transfers among those cost categories exceed 10% of the total budget. (2 CFR Part 200.308(e))
 - Cost-sharing requirements found in 2 CFR Part 200.306.
 - Requirements for equipment and supply purchases and procurement found in 2 CFR Part 200 Sections 313, 314, and 322, respectively.
- 22. The subrecipient will follow 2 CFR Part 225, Cost Principles for State, Local, and Indian Tribal Governments.
- 23. Any publication resulting from work performed under this agreement shall include an acknowledgement of FEMA financial support and a statement that the publication does not constitute an endorsement of FEMA or reflects FEMA's views. The recipient and FEMA are free to copyright any original work developed under this agreement, and reserve a royalty-

- free, nonexclusive, and irrevocable right to reproduce, publish, or otherwise use, and to authorize others to use the work for government purposes.
- 24. The subrecipient will not enter into cost-plus-percentage-of-cost contracts for completion of the HMGP project.
- 25. The subrecipient will not enter into any contract with any party that is debarred or suspended from participating in federal assistance programs. (See https://www.sam.gov.)
- 26. Records shall be retained three years following the date the HMGP is closed for Wisconsin's Presidential Disaster Declaration FEMA-4276-DR-WI in accordance with 2 CFR Part 200.333.

SIGNATURE OF SUBRECIPIENT'S AUTHORIZED REPRESENTATIVE:

	Date:	
Name (printed)	Title	
Jurisdiction		
SIGNATURE OF THE RECIP	TENT (WISCONSIN DIVISION OF EMERGE	NCY MANAGEMENT):
	Date:	
State Hazard Mitigation Office	er	

WISCONSIN DIVISION OF EMERGENCY MANAGEMENT State-Local Hazard Mitigation Grant Program Assistance Agreement (FEMA-DR-4276-WI) Non-Acquisition

This Assistance Agreement between the Wisconsin Division of Emergency Management (WEM/ the recipient) and (community name) (the subrecipient) shall be effective on the date signed by WEM and the subrecipient. It shall apply to all Hazard Mitigation Grant Program (HMGP) assistance provided by or through WEM to the subrecipient as a result of Wisconsin's Presidential Disaster Declaration FEMA-DR-4276-WI.

The purpose of this agreement is to formally recognize the goals of the HMGP and to establish guidelines by which HMGP funds are to be used. This agreement is in addition to the requirements outlined in DMA Form 1017A, Assurances for Construction and Non-Construction Projects that was signed by the above mentioned subrecipient and submitted with the HMGP subapplication.

Be it resolved by the subrecipient, that the individual named below:

(Name and Title)

has the legal authority and is hereby authorized to execute documents for and on behalf of the subrecipient. The designated individual is to be the authorized representative for obtaining HMGP funds.

The subrecipient hereby assures and certifies that the project will comply with the applicable State of Wisconsin and FEMA regulations. Also, the subrecipient gives assurance and certifies with respect to and as a condition for the subaward the following at a minimum:

- 1. This Assistance Agreement in the amount of \$XXXX will serve as the contract between WEM and the subrecipient for the purpose of elevation of (number) properties located in the floodplain of the (water body). 75% or \$XXXX is the federal share funded through FEMA. 12.5% or \$XXXX is the state share funded through WEM. The remaining 12.5 percent or \$XXXXX is the required local program match (may not be comprised of other federal funds or match to other federal funds, i.e. EMPG, EPCRA). If there is a cost under-run for the project, final reimbursement for the federal and state share of the project costs will be adjusted based on actual costs of the project. If costs exceed the amount approved, the subrecipient is responsible for the costs in excess of the approved subaward.
- 2. The subrecipient will adhere to the special conditions as identified in the approval letter for the Record of Environmental Consideration (REC) dated (date), in completing the project.
 - The subrecipient must secure all permits per Wisconsin Statutes and comply with regulatory standards.
 - The subrecipient must follow all applicable local, state, and federal laws, regulation, and requirements for the abatement and disposal of lead, asbestos, and other routinely encountered hazardous substances. If there is an unusual material encountered or there is an extraordinary amount of lead, asbestos, or other routinely encountered material,

- the subrecipient must contact the recipient and the relevant agency with authority for regulation of the material.
- If ground-disturbing activities occur during implementation, the subrecipient will monitor excavation activity, and if any artifacts or human remains are found during excavation processes all work is to cease, and the subrecipient will notify WEM, FEMA, and the State Historic Preservation Officer (SHPO).
- The subrecipient must secure an erosion control permit under Wis. Admin. Code NR 216 if the property will impact more than one acre.
- Best management practices will be applied to the property.
- If deviations from the proposed scope of work result in design changes, the need for additional ground disturbance, additional removal of vegetation, or in any other unanticipated changes to the physical environment, the subrecipient must contact WEM immediately and a re-evaluation by FEMA under NEPA and other applicable environmental laws will be conducted by FEMA.
- 3. Once this Assistance Agreement is signed and returned to WEM, the subrecipient may begin the project and the authorized representative may request reimbursement of expenses as identified in the budget included in the approved subapplication. The subrecipient will need to complete and submit to WEM a Request for Reimbursement of Expenses with appropriate documentation in order to receive subaward funds. Advancement of funds may be made in some extraordinary situations upon prior approval of the recipient.

COSTS INCURRED PRIOR TO FEMA APPROVAL OF THE SUBAWARD, UNLESS PRE-AWARD COSTS WERE INCLUDED AND APPROVED IN THE SUBAPPLICATION, ARE NOT ALLOWABLE COSTS FOR THE SUBAWARD.

The recipient may pursue all available remedies for the recoupment of any payments that have been inadequately documented or determined by the recipient to have been improperly made or expended for any reason.

- 4. The authorized representative will be required to submit Quarterly Status Reports to the State Hazard Mitigation Officer (SHMO) within 15 days of the end of the quarter (January 15, April 15, July 15, and October 15 each year). Said report will include the status of the project including property acquisition and demolition data, anticipated completion date, and financial information.
- 5. The subrecipient will meet the following timeline for completing this project:

Start Date No later than (date)

Completion Date (date)

If the subrecipient is delayed in their completion of the project by an event beyond their control, a request for an extension must be received in writing 90 days prior to the completion date.

- 6. The performance period for the HMGP project subaward will be (date) to (date).
- 7. The final request for reimbursement and a final report covering all aspects of the project will be due 30 days after project completion. The final report must include copies of all permits

- and forms identified in the approval letter for the Record of Environmental Consideration and photos of the completed project.
- 8. The HMGP funds requested for the project shall not duplicate benefits received from any other disaster assistance program.
- 9. The subrecipient will use HMGP funds solely for the purpose for which they are provided.
- 10. The subrecipient shall maintain good standing with the National Flood Insurance Program (NFIP) and comply with local regulations pertaining to the NFIP.
- 11. The subrecipient will update their floodplain ordinance to meet the current Wisconsin Department of Natural Resources requirements.
- 12. The subrecipient will comply with all other policies and guidelines established by FEMA and WEM in administering the HMGP.
- 13. The subrecipient will comply with all applicable federal, state, and local codes and standards as pertain to this project.
- 14. The subrecipient will follow 2 CFR Part 200, Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards:
 - Transfer of funds among budget cost categories in any approved budget with a federal share in excess of the Simplified Acquisition Threshold (\$150,000 at the time this agreement was drafted) shall receive the prior approval of FEMA when such cumulative transfers among those cost categories exceed 10% of the total budget. (2 CFR Part 200.308(e))
 - Cost-sharing requirements found in 2 CFR Part 200.306.
 - Requirements for equipment and supply purchases and procurement found in 2 CFR Part 200 Sections 313, 314, and 322, respectively.
- 15. The subrecipient will follow 2 CFR Part 225, Cost Principles for State, Local, and Indian Tribal Governments.
- 16. Any publication resulting from work performed under this agreement shall include an acknowledgement of FEMA financial support and a statement that the publication does not constitute an endorsement of FEMA or reflects FEMA's views. The recipient and FEMA are free to copyright any original work developed under this agreement, and reserve a royalty-free, nonexclusive, and irrevocable right to reproduce, publish, or otherwise use, and to authorize others to use the work for government purposes.
- 17. The subrecipient will not enter into cost-plus-percentage-of-cost contracts for completion of the HMGP project.
- 18. The subrecipient will not enter into any contract with any party that is debarred or suspended from participating in federal assistance programs. (See https://www.sam.gov.)
- 19. Records shall be retained three years following the date the HMGP is closed for Wisconsin's Presidential Disaster Declaration FEMA-4276-DR-WI in accordance with 2 CFR Part 200.333.

SIGNATURE OF SUBRECIPIENT'S AUTHORIZED REPRESENTATIVE:

	Date:	
Name (printed)	Title	
Jurisdiction		
SIGNATURE OF THE RECIP	IENT (WISCONSIN DIVISION OF EMERGE	NCY MANAGEMENT):
	Date:	
State Hazard Mitigation Office	er	

WISCONSIN DIVISION OF EMERGENCY MANAGEMENT State-Local Hazard Mitigation Grant Program Assistance Agreement (FEMA-DR-4276-WI) Planning

This Assistance Agreement between the Wisconsin Division of Emergency Management (WEM/ the recipient) and (community name) (the subrecipient) shall be effective on the date signed by WEM and the subrecipient. It shall apply to all Hazard Mitigation Grant Program (HMGP) assistance provided by or through WEM to the subrecipient as a result of Wisconsin's Presidential Disaster Declaration FEMA-DR-4276-WI.

The purpose of this agreement is to formally recognize the goals of the HMGP and to establish guidelines by which HMGP funds are to be used. This agreement is in addition to the requirements outlined in DMA Form 1017A, Assurances for Construction and Non-Construction Projects that was signed by the above mentioned subrecipient and submitted with the HMGP subapplication.

Be it resolved by the subrecipient, that the individual named below:

(Name and Title)

has the legal authority and is hereby authorized to execute documents for and on behalf of the subrecipient. The designated individual is to be the authorized representative for obtaining HMGP funds.

The subrecipient hereby assures and certifies that the plan will comply with the applicable State of Wisconsin and FEMA regulations. Also, the subrecipient gives assurance and certifies with respect to and as a condition for the subaward the following at a minimum:

- 1. This Assistance Agreement in the amount of \$XXXX will serve as the contract between WEM and the subrecipient for the purpose (developing or updating) an all-hazards mitigation plan. 75% or \$XXXX is the federal share funded through FEMA. 12.5% or \$XXXX is the state share funded through WEM. The remaining 12.5 percent or \$XXXXX is the required local program match (may not be comprised of other federal funds or match to other federal funds, i.e. EMPG, EPCRA). If there is a cost under-run for the project, final reimbursement for the federal and state share of the project costs will be adjusted based on actual costs of the project. If costs exceed the amount approved, the subrecipient is responsible for the costs in excess of the approved subaward.
- 2. Once this Assistance Agreement is signed and returned to WEM, the subrecipient may begin the planning process and the authorized representative may request reimbursement of expenses as identified in the budget included in the approved subapplication. The subrecipient will need to complete and submit to WEM a Request for Reimbursement of Expenses with appropriate documentation in order to receive subaward funds. Advancement of funds may be made in some extraordinary situations upon prior approval of the recipient.

COSTS INCURRED PRIOR TO FEMA APPROVAL OF THE SUBAWARD, UNLESS PRE-AWARD COSTS WERE INCLUDED AND APPROVED IN THE SUBAPPLICATION, ARE NOT ALLOWABLE COSTS FOR THE SUBAWARD.

The recipient may pursue all available remedies for the recoupment of any payments that have been inadequately documented or determined by the recipient to have been improperly made or expended for any reason.

The subrecipient may request reimbursement of planning expenses up to 90% of the federal share of the subaward or \$XXXX as work progresses on the (development or update) of the plan. The remaining funds will not be paid until the plan is completed and approved by FEMA, and adequate documentation for the total costs incurred for the subaward has been submitted.

FEMA will recoup mitigation planning subaward funds for subawards that do not meet the deliverable criteria of an adopted, FEMA-approved mitigation plan by the end of the period of performance. The amount recouped will be based on the following guidelines:

- Jurisdictions with plans that have been Approved Pending Adoption by FEMA, but are not yet formally adopted (in accordance with FEMA regulations) by the end of the period of performance must return a minimum of 10% of the subaward.
- Jurisdictions with plans that have been reviewed by FEMA, but require revisions to meet requirements must return a minimum of 25% of the subaward if the required revisions have not been completed by the end of the period of performance.
- Jurisdictions with plans that have not been submitted to FEMA for review by the end of the period of performance must return 100% of the subaward.
- 3. The authorized representative will be required to submit Quarterly Status Reports to the State Hazard Mitigation Officer (SHMO) within 15 days of the end of the quarter (January 15, April 15, July 15, and October 15 each year). Said report will include the status of the plan including anticipated completion date and financial information.
- 4. The subrecipient will submit a copy of their draft plan that meets the planning criteria found in 44 CFR Part 201.6 or 201.7 along with a completed FEMA or State Plan Review Tool or Crosswalk to WEM by (date) for review. The final plan must be completed and approved by FEMA prior to (date). If the subrecipient is delayed in their completion of the project by an event beyond their control, a request for an extension must be received in writing 90 days prior to the completion date.
- 5. The performance period for the HMGP project subaward will be (date) to (date).
- 6. The final request for reimbursement and a final report will be due 30 days after plan completion or 30 days prior to the end of the period of performance, whichever is sooner.
- 7. The subrecipient will use HMGP funds solely for the purpose for which they are provided.
- 8. The subrecipient shall maintain good standing with the National Flood Insurance Program (NFIP) and comply with local regulations pertaining to the NFIP.

- 9. The subrecipient will comply with all other policies and guidelines established by FEMA and WEM in administering the HMGP.
- 10. The subrecipient will comply with all applicable federal, state, and local codes and standards as pertain to this plan.
- 11. The subrecipient will follow 2 CFR Part 200, Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards:
 - Transfer of funds among budget cost categories in any approved budget with a federal share in excess of the Simplified Acquisition Threshold (\$150,000 at the time this agreement was drafted) shall receive the prior approval of FEMA when such cumulative transfers among those cost categories exceed 10% of the total budget. (2 CFR Part 200.308(e))
 - Cost-sharing requirements found in 2 CFR Part 200.306.
 - Requirements for equipment and supply purchases and procurement found in 2 CFR Part 200 Sections 313, 314, and 322, respectively.
- 12. The subrecipient will follow 2 CFR Part 225, Cost Principles for State, Local, and Indian Tribal Governments.
- 13. Any publication resulting from work performed under this agreement shall include an acknowledgement of FEMA financial support and a statement that the publication does not constitute an endorsement of FEMA or reflects FEMA's views. The recipient and FEMA are free to copyright any original work developed under this agreement, and reserve a royalty-free, nonexclusive, and irrevocable right to reproduce, publish, or otherwise use, and to authorize others to use the work for government purposes.
- 14. The subrecipient will not enter into cost-plus-percentage-of-cost contracts for completion of the HMGP plan.
- 15. The subrecipient will not enter into any contract with any party that is debarred or suspended from participating in federal assistance programs. (See https://www.sam.gov.)
- 16. Records shall be retained three years following the date the HMGP is closed for Wisconsin's Presidential Disaster Declaration FEMA-4276-DR-WI in accordance with 2 CFR Part 200.333.

SIGNATURE OF SUBRECIPIENT'S AUTHORIZED REPRESENTATIVE:

	Date:	
Name (printed)	Title	
Jurisdiction		
SIGNATURE OF THE RECIPIEN	NT (WISCONSIN DIVISION OF EM	ERGENCY MANAGEMENT)
	Date:	
State Hazard Mitigation Officer		

STATE OF WISCONSIN DEPARTMENT OF MILITARY AFFAIRS DIVISION OF EMERGENCY MANAGEMENT

2400 Wright Street, P.O. Box 7865 Madison, WI 53707-7865

Section 404 Hazard Mitigation Grant Program REQUEST FOR REIMBURSEMENT OF EXPENSES

Date Enter Date

Subrecipient Community Name County County Name Total Award Amount (federal+state+local) \$Enter Amount Local match cannot be time charged to any other federal grants or time used as match for other federal grants (i.e. EMPG, EPCRA). \$Enter Amount Amount Spent to Date (federal+state+local) **\$**Enter Amount Amount Reimbursed to Date (federal+state+local) Amount Spent Since Last Request (federal+state+local)* \$Enter Amount Requested Reimbursement (87.5% of amount spent since \$Enter Amount last request) Requested Advance – PRIOR APPROVAL REQUIRED \$Enter Amount (see attached instructions) * Attach supporting documentation including invoices, proof of payments, bid tabulations, contracts, etc. Signature – Subrecipient's Authorized Representative Reimbursement Approved \$_____ Signature – State Mitigation Representative Date

Disaster # FEMA-4276-DR-WI

When receiving funds in advance of spending them, the following must be adhered to:

- 1. If possible funds should be expended within three business days of receipt.
- 2. Deposit any advance HMGP funds into a separate non-interest-bearing bank account.
- 3. If any interest is generated, it must be reported to the State and spend for project administrative purposes before any additional funds are drawn down.
- 4. Subrecipients should reconcile earned interest each calendar quarter. If earned-and-expended interest exceeds \$100 at any time during the calendar year, all interest in excess of \$100 shall be returned to the U.S. Treasury.

BUDGET SUMMARY FOR REIMBURSEMENT REQUEST

NAME OF SUBRECIPIENT ACQUISITION PROJECT FEMA-4276-DR-WI

	FMV	APPRAISALS	TITLE SEARCHES	ABSTRACTS/ TITLE INS.	LEGAL FEES	SURVEYS	CLOSING COSTS	RELOCATION ASSISTANCE	DEMOLITION SITE RESTORATION	OTHER COSTS	TOTAL
BUDGET											
30202.		1									
REQUEST NO. 1											
BALANCE											
REQUEST NO. 2											
BALANCE											
REQUEST NO. 3											
BALANCE											
REQUEST NO. 4											
BALANCE											
REQUEST NO. 5											
BALANCE											
REQUEST NO. 6											
BALANCE											
REQUEST NO. 7											
BALANCE											
REQUEST NO. 8											
BALANCE											

Transfer of funds between budget cost categories in the approved budget shall receive the prior approval of FEMA when such cumulative transfers among those cost categories exceed 10% of the total budget.

Wisconsin HMGP Administrative Plan

STATE OF WISCONSIN DEPARTMENT OF MILITARY AFFAIRS DIVISION OF EMERGENCY MANAGEMENT

2400 Wright Street, P.O. Box 7865 Madison, WI 53707-7865

QUARTERLY STATUS REPORT Contact and Program Information

Name (Last, First)	
Title	
Subgrantee	
Phone Number	
E-mail	
County	
Project Number	
Disaster # (HMGP)	FEMADR-WI
Federal Fiscal Year (PDM & FMA)	
Quarterly Report Date	Jan 15 th April 15 th July 15 th Oct 15 th Year
Quarterly Report Submittal Date	
	Flood Mitigation Assistance (FMA)
Funding Program	Pre-Disaster Mitigation Competitive Project Grant (PDM)
	Section 404 Hazard Mitigation Grant Program (HMGP)
	Acquisition/Floodproofing
Type of Project	
Type of Froject	Other (specify)
	Guier (speeny)
Date Grant was Approved	
Start Date of Project/Plan	
Is the Project/Plan on Schedule? (yes / no	
If no, provide an explanation why and a new e	estimated
completion date below.	
Estimated Project/Plan Completion Date	
Amount of Approved Grant (100%)	
Approximate Amount Spent to Date (100	0%)
Anticipated (Overrun / Underrun) (Circle	One)

DMA Form 168 ATTACHMENT J

ACQUISITION

	-	
1.	Number of properties to be acquired:	
2.	Number of appraisals completed to date:	
3.	Number of appraisals completed this quarter:	
4.	Value of appraisals to date:	
5.	Number of offers accepted to date:	
6.	Number of offers accepted this quarter:	
7.	Number of properties acquired to date:	
8.	Number of properties acquired this quarter:	
9.	List the address of all properties acquired this quarter and the date acquired.	
10.	Estimated properties to be acquired in the next quarter:	
11.	Approximate acquisition costs to date: (Include title insurance, legal fees, taxes, etc.)	
12.	Approximate relocation benefits to date:	
13.	Number of structures demolished to date:	
14.	Number of structures demolished this quarter:	
15.	Estimated structures to be demolished in the next quarter:	
16.	Total acquisition costs to date:	
17.	Federal, state, or local permits required this quarter:	YesNumberNone (Attach copies of permits obtained this quarter.)
	FLOODPI	ROOFING
•		

1.	Number of structures to be floodproofed:	
2.	Number of structures floodproofed to date:	
3.	Number of structures floodproofed this quarter:	
4.	Approximate cost of floodproofing to date:	
5.	Approximate relocation benefits to date:	
6.	Estimated # structures to be floodproofed next quarter:	

DMA Form 168 ATTACHMENT I

DIVIA FORM 108	ATTACHIV
. Estimated floodproofing costs for next quarter:	
. Federal, state, or local permits required this quarter:	Yes Number None Attach copies of permits obtained this quarter.
ADDITIONAL QUESTI	ONS OR COMMENTS
Other costs incurred to date: Item	Amount
2. Narrative summary of progress on project or plan:	: (attach additional sheets if necessary)
3. Percentage of work completed:	
4. Problems encountered and assistance needed:	
5. Other information pertinent to the overall project	or plan:
SIGNA	TURES
SUBRECIPIENT'S AUTHORIZED REPRESENTATIVE	DATE
STATE HAZARD MITIGATION OFFICER	

WISCONSIN STATE HMGP QUARTERLY REPORT QUARTER END DATE

	ı	1	1	CURRECTRIFFIE	1			T		1						
SUBAWARD	COMMUNITY	APPROVAL	PERIOD OF	SUBRECIPIENT	STATUS CODE	COST CODE	TIME EXTENSION	FEDERAL	CTATE CHARE	LOCAL SHARE	TOTAL	AMOUNT	FEDERAL	DATE OF LAST	AMOUNT	AVAILABLE
NUMBER	COMMUNITY	DATE	PERFORMANCE	DATE	STATUS CODE	COST CODE	(Y/N)	SHARE	STATE SHAKE	LOCAL SHARE	SUBAWARD	DISBURSED	AMOUNT	DRAWDOWN	REMAINING	ADMIN.
				DATE			(Y/N)									
PROJECTS																
PLANNING																
	LOCAL TOTALS							\$ -	\$ -	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
	STATE MGMT.									T	-	- T	7		1	
	GRAND TOTALS							\$ -	\$ -	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
	0.0							<u> </u>	1	1	Ť	*	Ť		Ť	1
				İ						1				1		
				1						1						
				1						1				1		

Wisconsin HMGP Administrative Plan

<DATE>

FEMA Mitigation Specialist DHS-FEMA Region V 536 S. Clark Street, 6th Floor Chicago, IL 60605

RE: PROJECT < PROJECT NUMBER> < SUBGRANTEE>

ъ	
L)ear	٠
Dear	 ٠

This letter is to request closeout of the above referenced Hazard Mitigation Grant Program (HMGP) project under Federal Disaster Declaration FEMA-XXXX-DR-WI.

Our records indicate that \$XXXX in Federal project funds have been disbursed to <SUBGRANTEE> for the purposes of (insert a brief description of the project) located in <MUNICIPAL/COUNTY>, Wisconsin. Additionally, \$XXXX (12.5%) was provided by the State, and the subrecipient provided the remaining \$XXXX (12.5%). Our office is also requesting deobligation of \$XXXX in Federal project funds, as indicated in this mailing.

Enclosed with this letter are (list out all the enclosures that require signature). Please return a signed copy of each form to our office for our records. We have also enclosed (insert other items enclosed).

If you have any questions, please call me at (608) 242-3222 or Roxanne Gray, Mitigation Section Supervisor, at (608) 242-3211.

Sincerely,

Katie Sommers, CFM

State Hazard Mitigation Officer Wisconsin Emergency Management

Enclosures



WISCONSIN EMERGENCY MANAGEMENT PROJECT CLOSE-OUT WORKSHEET



SUBRECIPIENT: «Subgrantee»	COUNTY: «County»		
DISASTER DECLARATION: «Disaster_Number»	PROJECT NO.: «Project_Number»		
POINT OF CONTACT: «Prefix» «First_Name» «Last», «Title»	PHONE: «Phone_Number»		

	Amount Obligated	Amount Expended	Requested for De-Obligation
Federal Share (75%)	«Obligated_Federal_Share»	«Expended_Federal_Share»	Calculate
State Share (12.5%)	«Obligated_State_Share»	«Expended_State_Share»	Calculate
Local Share (12.5%)	«Obligated_Local_Share»	«Expended_Local_Share»	Calculate
Total Project Funds	«Total_Obligation»	«Total_Expended_Project_Funds»	Calculate
Management Costs	«Obligated_Mgmt_Costs»	«Expended_Mgmt»	Calculate

NOTE: Total Project Funds DOES NOT include Management Costs (only Federal, State, and Local funds used for project)

Item #	Completed:	Criteria:	Status / Date Completed:
1		FEMA Approval / Obligation	Grant Approval: «Grant_Approval_Date»
2		State Approval Letter	Insert Date
3		Signed Assurances	Insert Date
4		Signed State / Local HMGP Agreement	Recipient: Insert Date (Original) Insert Date (Amendment #X) Subrecipient: Insert Date (Original) Insert Date (Amendment #X)
5		Quarterly Reports	Insert dates
6		Project Completed Within Approved Scope of Work	Verified
7		Local Match Verified: 12.5%	Verified as payments were made
8		Overrun Documentation	N/A
9		On-Site Project Inspection	Insert Date
10		Environmental Closeout Declaration Signed	Subrecipient: <mark>Insert Date</mark> Recipient: <mark>Insert Date</mark>
11		Mitigation Plan Completed, Approved, and Adopted	«County» County Mitigation Plan expires on <mark>Insert Date from planning</mark> status table
12		Final Payment Authorized and Issued	Issued on Insert Date
13		Bill for Collection	N/A

DMA Form 143 ATTACHMENT L

14		WEM Notifies FEMA of Close-Out	Notified on Insert Date
15		Deobligation	Requested on Insert Date
COMMEN	COMMENTS:		

ACQUISITION PROJECTS

Item #	Completed:	Criteria:	Status / Date Completed:
1		Final List of Properties Acquired-Property Inventory	See attached Property Inventory
2		Approved Relocation Plan	
3		Demolition Contracts Awarded and Underway	
4		Demolition Completed	
5		Case Files Complete (WEM Acquisition File Checklist including photos and GPS coordinates for each property)	
6		Total Parcels Acquired (specify Residential, Commercial, Vacant, or Development Rights Purchased)	
7		Total Funds Expended on Acquisition Including Relocation (specify Residential, Commercial, Vacant, or Development Rights Purchased)	Total Project Funds: Federal Project Funds:
8		Form AW-501 (Required for flood insured, repetitive loss structures. Completed in Squanet.)	

ELEVATION

Item #	Completed:	Criteria:	Status / Date Completed:	
1		Final List of Properties Elevated- Property Inventory		
2		Case Files Complete (WEM Elevation File Checklist including photos with GPS coordinates for each property and proof of flood insurance)		
3		Total Structures Elevated (specify Residential or Commercial)		
4		Total Funds Expended on Elevations Including Relocation for Tenants (specify Residential or Commercial)	Total Project Funds: Federal Project Funds:	

DMA Form 143 ATTACHMENT L

5		Elevation Certificate Completed	
6		Form AW-501 (Required for flood insured, repetitive loss structures. Completed in Squanet.)	
COMMEN	ITS:		

CONSTRUCTION / OTHER PROJECTS

Item #	Completed:	Criteria:	Status / Date Completed:
1		Bid Specifications and Bid Tabulation	Copies retained at State of Wisconsin
2		Contract Award	
3		Verification of Expenditures	Verified with each request for reimbursement
4		Total Funds Expended	Total Project Funds: Federal Project Funds:
5		Applicable Permits	
COMMEN	ITS:		•

REVIEWERS

SIGNATURE		DATE	
	State Hazard Mitigation Officer		
SIGNATURE		DATE	
	FEMA Hazard Mitigation Specialist		



WISCONSIN EMERGENCY MANAGEMENT PLANNING CLOSE-OUT WORKSHEET



SUBRECIPIENT: «Subgrantee»	COUNTY: «County»	
DISASTER DECLARATION: «Disaster_Number»	PROJECT NO.: «Project_Number»	
POINT OF CONTACT: «Prefix» «First_Name» «Last», «Title»	PHONE: «Phone_Number»	

	Amount Obligated	Amount Expended	Requested Deobligation
Federal Share (75%)	«Obligated_Federal_Share»	«Expended_Federal_Share»	Calculate
State Share (12.5%)	«Obligated_State_Share»	«Expended_State_Share»	Calculate
Local Share (12.5%)	«Obligated_Local_Share»	«Expended_Local_Share»	Calculate
Total Project Funds	«Total_Obligation»	«Total_Expended_Project_Funds»	Calculate

^{*}NOTE: Total Project Funds DOES NOT include Management Costs (only Federal, State, and Local funds used for plan)*

Item #	Completed:	Criteria:	Status / Date Completed:
1		FEMA Approval / Obligation	«Grant_Approval_Date»
2		State Approval Letter	Insert Date
3		Signed Assurances	Insert Date
4		Signed State / Local Agreement	Recipient: <mark>Insert Date</mark> Subrecipient: <mark>Insert Date</mark>
5		Quarterly Reports	Insert dates
6		Adopted Plan Approved by FEMA	Insert Date
7		Local Match Verified	Verified as payments were made
8		Overrun Documentation	N/A
9		Final Payment Authorized and Issued	Issued on Insert Date
10		Bill for Collection	N/A
11		De-obligation (FEMA)	Request sent on Insert Date
12		WEM Notifies FEMA of Close-Out	Request sent on Insert Date

REVIEWERS

SIGNATURE		DATE	
	State Hazard Mitigation Officer		
SIGNATURE		DATE	
	FEMA Hazard Mitigation Specialist		

<DATE>

FEMA Mitigation Specialist DHS-FEMA Region V 536 S. Clark Street, 6th Floor Chicago, IL 60605

Door	
Dear	 •

This is to request closeout and de-obligation of the following Hazard Mitigation Grant Program subgrant under Presidentially Declared Disaster FEMA-XXXX-DR-WI, declared (date):

Wisconsin State Management Costs, FEMA-DR-XXXX.X-M

\$XX,XXX.XX in Federal funds was obligated. Our records indicate that \$XX,XXX.XX in Federal funds was used to provide guidance, technical assistance, salaries, benefits, materials and supplies. Please de-obligate the remaining \$X,XXX.XX in Federal funds. A deobligation request form is enclosed.

A copy of the SF-428 Report is enclosed for your records. Salary and benefit cost sheets are retained in our State files. No inventions were made or patents applied for or received by Wisconsin Emergency Management in the execution of the grant. No personal property over \$5,000.00 was purchased by Wisconsin Emergency Management under the grant. If you have any questions, please feel free to call me at (608) 242-3222 or Roxanne Gray at (608) 242-3211.

Sincerely,

Katie Sommers, CFM
State Hazard Mitigation Officer
Wisconsin Emergency Management

Enclosure

Date

Mitigation Specialist

Hazard Mitigation Assistance Branch Mitigation Division, FEMA 536 S. Clark Street, 6th Floor Chicago, IL 60605

Dear _____

This letter is to request closeout of the Hazard Mitigation Grant Program under disaster FEMA-DR-XXXX-WI.

There were ____ projects funded under this disaster:

• List projects with subrecipient names (Project Number)

State Management Costs:

• Wisconsin Emergency Management (Project Number)

Additionally, this award funded _____ local hazard mitigation plans:

• List subrecipient names (Project Number)

Closeout reports have been forwarded to FEMA for all of the projects, plans, and our State Management Costs.

Our records indicate that \$XXXX (\$XXXX in project/planning funds, and \$XXXX in recipient State Management Costs) in Federal funds have been disbursed.

Our financial department has submitted SF-425 for the fiscal closeout of the entire HMGP under disaster FEMA-DR-XXXX-WI. Copies of the SF-425 and submission letter are enclosed. No inventions were made or patents applied for or received by Wisconsin Emergency Management or any subrecipients in the execution of the award. No personal property over \$5,000.00 was purchased by Wisconsin Emergency Management or any subrecipients under the award.

Also enclosed are two signed copies of the Disaster Close-Out Worksheet and copies of the final financial reports for this disaster. Please return a signed copy of each closeout worksheet to our office.

If you have any questions, please call me at (608) 242-3222 or Roxanne Gray at (608) 242-3211. Sincerely,

Katie Sommers, CFM

State Hazard Mitigation Officer

Enclosures

- Disaster Closeout Worksheets (2)
- SF-425 and closeout submission letter for DR-XXXX-WI

Cc: WEM Financial Specialist



WISCONSIN EMERGENCY MANAGEMENT PROJECT CLOSE-OUT WORKSHEET



DECLARATION: FEMA-XXXX-DR-WI	DECLARED:
COUNTIES:	
POINT OF CONTACT: Katie Sommers, State Hazard Mitigation Officer	PHONE: (608) 242-3222
HMGP ADMINISTRATIVE PLAN APPROVED	ES NO
STANDARD STATE ALL-HAZARDS MITIGATION PLAN	ES NO
ENHANCED STATE ALL-HAZARDS MITIGATION PLAN	ES NO
DISASTER AWARD FEMA-DR-X	xxx-wi

Subrecipient Award Number Federal State Local Subrecipient Admin State Management Costs Projects Plans

DISASTER GRANT FEMA-DR-XXXX-WI

Item #	Completed:	Criteria:	Status/Date Completed:	
1		Federal/State Agreement	State: Date	
		rederal/State Agreement	Federal: <mark>Date</mark>	
2		State Management Plan	<mark>Date</mark>	
3		Drainet Application	State Management Costs	<mark>Date</mark>
3		Project Application	<u>Subrecipients</u>	<mark>Date</mark>
4		FEMA Obligation of Funds	State Management Costs	<mark>Date</mark>
4		FEMA Obligation of Funds	<u>Subrecipients</u>	<mark>Date</mark>
5		Quarterly Programmatic and	Datos	
3		Financial Reports	Dates	

DMA Form 142 ATTACHMENT M

6	State Notifies FEMA of Closeout	<mark>Date</mark>
7	Other Issues	N/A
COMMEN	TS:	

STATE MANAGEMENT COSTS (1944.1-M)

Item #	Completed:	Criteria:	Status / Date Completed:
1		Deobligation Request	
2		State Notifies FEMA of Closeout	
COMMEN	TS:		

All projects under FEMA-XXXX-DR-WI are completed, and closeout reports have been submitted to FEMA. WEM requests closeout of the mitigation component of this disaster.

REVIEWERS

SIGNATURE	State Hazard Mitigation Officer	DATEtion Officer	
SIGNATURE	FEMA Hazard Mitigation Specialist	DATE	

September 30, 2016

«MRs» «First» «Last» «Address_1» «Address_2» «City», WI «Zip»

Dear «MRs» «Last»,

The «Jurisdiction» received hazard mitigation assistance to acquire properties susceptible to recurring flood damage. 44 CFR (Code of Federal Regulations) Part 80.19 Land Use and Oversight applies as of December 3, 2007 to all property acquisitions funded through mitigation programs, regardless of the date they were acquired. These regulations require such properties to be maintained for open space, recreational, or wetlands practices in perpetuity. The «Jurisdiction» is responsible for the continued maintenance of these properties and for certifying that they are maintained in accordance with federal regulations.

Per 80.19(d), a report certifying that the properties continue to be maintained for uses compatible with the warranty deed restrictions must be submitted to our office every three years. This letter is to inform you that we are once again completing our three-year compliance certification for properties acquired with Federal mitigation dollars.

Please find attached a listing of properties in your jurisdiction that were acquired with FEMA mitigation funds. These properties are bound by the State-Local Grant Assistance Agreement and by the warranty deed restrictions enacted as part of the acquisition, and must comply with 44 CFR Part 80.19. After verifying that the listed properties are compliant, **please sign and return the certification form to this office no later than July 1, 2019**. Feel free to note any outdated, incorrect, or missing information so that we may update our records. For further information on FEMA's open space land use requirements, please see the attached excerpts from 44 CFR and the 2015 Hazard Mitigation Assistance Guidance.

If you have any questions, please contact Caitlin Shanahan at (608) 242-3214.

Sincerely,

Katie Sommers, CFM
State Hazard Mitigation Officer

Enclosures

Community Name				
Disaster Number	Acquired From	Address	Parcel Number	
DR-XXXX	Firstname, Lastname	Street, City	XXX-XXXX-XXXX	
		SCUNS		
		7		
		4,34		
		TVI TVI		
All the above listed	properties remain in public o	wnership and are being used for purpos art 80.19.	ses compatible with FEMA	
Signed		Date		
Name	Title _			

Wisconsin HMGP Administrative Plan

Date

Mitigation Division Director Federal Emergency Management Agency Region V 536 S. Clark Street, 6th Floor Chicago, IL 60605

SUBJECT: Hazard Mitigation State Management Costs FEMADR-WI
Dear Mr./Ms:
Pursuant to 44 CFR 207.7(d), the State of Wisconsin hereby requests the approval and obligation of State Management Costs for administration and management of the Hazard Mitigation Grant Program (HMGP), under the following conditions:
The HMGP will be operated by the State for the above disaster in accordance with the State Administrative Plan dated and approved
State Management Costs will be funded by 100% Federal funds committed through the Division of Emergency Management.
3. Actual approved Management Costs are requested for administering the HMGP in the amount of \$ (100%) in accordance with the enclosed State Management Cost Plan for FEMADR-WI.
Please advise, State Hazard Mitigation Officer, at (608) 242-3222 upon approval and obligation of these funds.
Sincerely,

Enclosures

State Coordinating Officer

Wisconsin Emergency Management

cc:
, State Hazard Mitigation Officer
, WEM Administrative Officer
, Mitigation Specialist, FEMA Region V

HAZARD MITIGATION GRANT PROGRAM STATE MANAGEMENT COST PLAN NARRATIVE FEMA-___DR-WI

This narrative describes the disaster event; the activities, personnel requirements, and other costs for which the State (recipient) will use management cost funding; and the State's plan for monitoring HMGP management expenditures.

THE DISASTER

С	escri	ption	of the	disaster	is	provided	here.
_						0.0.000	

The FEMA 30-day estimate for the federal HMGP award for this disaster is ______. Based on these figures, the current estimate of the HMGP Management Grant for this disaster is \$_____.

HMGP RECIPIENT MANAGEMENT ACTIVITIES

The State's Management of the _____-DR Hazard Mitigation Grant Program is fully described in the State of Wisconsin Administrative Plan for the Hazard Mitigation Grant Program, dated

The State's Hazard Mitigation staff consists of the following positions at Wisconsin Emergency Management: Mitigation Section Supervisor, State Hazard Mitigation Officer, and two Disaster Response and Recovery Planners. Additional Hazard Mitigation Specialists will be hired as needed to administer the declaration. Position descriptions for the various positions are attached.

The State Hazard Mitigation Officer (SHMO) serves as the Alternate Governor's Authorized Representative (GAR), and is responsible for the management and administration of the HMGP for this declaration. In addition, the SHMO leads the Wisconsin Hazard Mitigation Team (WHMT). The Mitigation staff will assist the SHMO in the management and administration of the HMGP.

The _		DR F	IMGP is managed simultaneously with the HMGP for the following open disasters:
			The State anticipates the HMGP for the open disasters will run concurrently
throu	ıgh		

The SHMO has the overall responsibility for managing and administering the HMGP for the various disasters. In the event of multiple disasters, other staff may be reassigned to assist in administering the program, or temporary hires may be used.

Mitigation staff document time spent working on a given disaster using timesheets. When multiple disasters are involved, Mitigation staff identify hours worked on each disaster by separating them according to declaration number on the timesheets. The time is then charged to State Management Costs for the appropriate declaration.

The narrative that follows provides a synopsis of the recipient activities for the _____-DR HMGP to be funded by the management grant.

PROJECT AND APPLICATION DEVELOPMENT AND REVIEW PROCESS

The state received $\overline{}$ pre-applications from potential subrecipients for project activities totaling
\$ Upon completion of review, scoring, and ranking of the pre-applications, and based on
State priorities and funding availability, formal applications were sent to potential
subrecipients to be completed for further funding consideration. The application deadline for
the formal applications is
Planning grant applications were made available with a deadline. The State received
planning grant applications.

In addition, State Mitigation staff will coordinate with members of the WHMT to identify potential funding projects as well as to "package" funding where possible.

State staff will provide individual technical assistance upon request by potential applicants, including visits to potential mitigation project sites. The goal of these activities is to help potential applicants improve the quality of their projects and grant applications, thereby increasing their chance of obtaining funding.

The State will provide training as needed. This could include Project Development, Planning, Buyout, and Benefit-Costs Analysis, or other workshops as required. This training will assist the subrecipients in developing viable project applications that will meet state and Federal criteria.

APPLICATION REVIEW

State staff will review submitted applications to determine whether they are complete, and whether the projects are cost-effective and environmentally sound. Application reviews may include site visits and completion of benefit-cost analyses. State staff will forward consultation letters to state and Federal agencies to meet National Environmental Protection Act (NEPA) requirements, and prepare the Record of Environmental Consideration (REC).

Based on funding availability and State priorities, recommendations for funding will be shared with the WHMT and the Wisconsin Emergency Management (WEM) Administrator. State mitigation staff will assemble the required documentation and submit project and planning grant subapplications to FEMA for environmental and historic preservation reviews and final approval. Throughout this process, State staff will communicate with applicants regarding the status of their applications.

PROJECT IMPLEMENTATION AND CLOSEOUT

Project implementation begins at grant award with the development of the State-Local HMGP Assistance Agreement with subrecipients. State staff monitors progress on each project by reviewing quarterly reports, processing requests for reimbursements as work is completed, maintaining regular communications, and conducting site visits. Staff provides technical assistance on an as-needed basis to subrecipients. Mitigation staff prepare State quarterly reports to be submitted to FEMA, and provide other documentation as required by grant award documents and program requirements.

Upon completion of a project, Mitigation staff will conduct a final inspection on the project and prepare grant closeout documents per the State Administrative Plan. Upon completion and closeout of all projects, Mitigation staff will prepare a HMGP declaration closeout report. The Financial Management Officer (FMO) prepares the required financial closeout reports. Final inspections are completed to ensure that the project is implemented according to the scope of work as described in the approved project applications and per the grant agreement. For local mitigation planning grants, staff provide technical assistance, review and comment on draft plans, and submit final plans to FEMA for review and approval. In addition, Mitigation staff conduct a planning workshop once a year.

MONITORING MANAGEMENT COST EXPENDITURES

The State will monitor management cost expenditures as outlined in the following sections of the *State of Wisconsin Administrative Plan for the HMGP*: Section IX – Program Administration, G – Project Management. The State will track its management cost expenditures for each subrecipient.

MANAGEMENT COSTS

The State is Requesting Management Costs in the amount of \$_____. Attached is a State Management Cost budget worksheet with supporting documentation to support the costs requested.

AUDITS

The Financial Management Officer reviews local government audits for program compliance and reports any problems to the SHMO and FEMA. The FMO will take appropriate action within six months if there is non-compliance.

APPLICATION ON BEHALF OF STATE:					
WEM Administrator State Coordinating Officer	Date				

HAZARD MITIGATION – STATE MANAGEMENT COSTS FEMA- - DR-WI

Project Costs through XXXX

Mitigation Section Supervisor

	<mark>Year</mark>	<mark>Year</mark>	<mark>Year</mark>	<mark>Year</mark>
Salary	\$	\$	\$	\$
Fringe	\$	\$	\$	\$
Indirect	\$	\$	\$	\$
Total	\$	\$	\$	\$

(Assumes XXX, XXX, XXX hours respectively, and X% and X% increases in XXXX and XXXX)

State Hazard Mitigation Officer

	<mark>Year</mark>	<mark>Year</mark>	<mark>Year</mark>	<mark>Year</mark>
Salary	\$	\$	\$	\$
Fringe	\$	\$	\$	\$
Indirect	\$	\$	\$	\$
Total	\$	\$	\$	\$

(Assumes XXX, XXX, XXX hours respectively, and X% and X% increases in XXXX and XXXX)

Response and Recovery Planner

	<mark>Year</mark>	<mark>Year</mark>	<mark>Year</mark>	<mark>Year</mark>
Salary	\$	\$	\$	\$
Fringe	\$	\$	\$	\$
Indirect	\$	\$	\$	\$
Total	\$	\$	\$	\$

(Assumes XXX, XXX, XXX hours respectively, and X% and X% increases in XXXX and XXXX)

Response and Recovery Planner

	<mark>Year</mark>	<mark>Year</mark>	<mark>Year</mark>	<mark>Year</mark>
Salary	\$	\$	\$	\$
Fringe	\$	\$	\$	\$
Indirect	\$	\$	\$	\$
Total	\$	\$	\$	\$

(Assumes XXX, XXX, XXX hours respectively, and X% and X% increases in XXXX and XXXX)

Mitigation Specialist

	<mark>Year</mark>	<mark>Year</mark>	<mark>Year</mark>	<mark>Year</mark>
Salary	\$	\$	\$	\$
Fringe	\$	\$	\$	\$
Indirect	\$	\$	\$	\$
Total	\$	\$	\$	\$

REVIEW APPRAISER

	<mark>Year</mark>	<mark>Year</mark>	<mark>Year</mark>	<mark>Year</mark>
Private Sector	\$	\$	\$	\$

(Assume XXX appraisals at \$XXX per appraisal)

EQUIPMENT & SUPPLIES

<mark>Year</mark>	<mark>Year</mark>	<mark>Year</mark>	<mark>Year</mark>
\$	\$	\$	\$

TRAVEL AND PER DIEM

<mark>Year</mark>	<mark>Year</mark>	<mark>Year</mark>	<mark>Year</mark>
\$	\$	\$	\$

ESTIMATED SUBRECIPIENT MANAGEMENT COSTS

<mark>Year</mark>	<mark>Year</mark>	<mark>Year</mark>	<mark>Year</mark>
\$	\$	\$	\$

TOTAL STATE MANAGEMENT COSTS

<mark>Year</mark>	<mark>Year</mark>	<mark>Year</mark>	<mark>Year</mark>
\$	\$	\$	\$

TOTAL STATE MANAGEMENT COSTS \$

TASKS ASSIGNMENTS AND ACTIVITIES HAZARD MITIGATION GRANT PROGRAM

STATE HAZARD MITIGATION OFFICER

This position is responsible for the day-to-day management and administration of the Section 404-Hazard Mitigation Grant Program (HMGP) made available as a result of Presidential Disaster Declaration FEMA——DR-WI

Duties will include the following:

- 1. Work with FEMA Mitigation staff in the Joint Field Office following the disaster declaration.
- 2. Assist FEMA in the development of the hazard mitigation early implementation strategy report, and update as required.
- 3. Attend the applicants' briefing for the Public Assistance Program and provide information on Section 404-HMGP.
- 4. Conduct briefings and meetings with potential HMGP applicants.
- 5. Solicit, accept, and review pre-applications from counties and municipalities interested in applying for hazard mitigation assistance.
- 6. Assist communities in completing formal HMGP applications and provide technical assistance as needed.
- 7. Prepare and submit the State's application for Section 404-HMGP funding for submission to FEMA through NEMIS.
- 8. Assist communities in implementing approved projects and monitor subrecipient compliance with Section 404-HMGP requirements.
- 9. Monitor subrecipient progress in meeting project goals.
- 10. Coordinate with the Federal and State Public Assistance Officers on hazard mitigation projects that interface with the Public Assistance Program under Section 406.
- 11. Answer written and oral inquiries regarding the 404-HMGP, attend and conduct meetings pertaining to HMGP, and coordinate with FEMA Region V staff.
- 12. Update the 404-HMGP Administrative Plan as required.
- 13. Develop state guidance in administering the 404-HMGP, and issue to subrecipients.

- 14. Responsible for providing technical assistance and support to the Wisconsin Hazard Mitigation Team (WHMT).
- 15. Develop agendas and conduct the WHMT meetings.
- 16. Coordinate with members of the WHMT to facilitate their processing of applications and providing of assistance to municipalities.
- 17. Identify and coordinate with other Federal and state agencies for funding of mitigation projects.
- 18. Coordinate with Public Information staff on the development of press releases regarding mitigation activities.
- 19. Other disaster related assignments as directed by the State Coordinating Officer.

TASK ASSIGNMENTS AND ACTIVITIES HAZARD MITIGATION GRANT PROGRAM

DISASTER RESPONSE AND RECOVERY PLANNER

This position will function under the supervision of the State Hazard Mitigation Officer (SHMO) and the Mitigation Section Supervisor, and will assist in implementing the Section 404-Hazard Mitigation Grant Program (HMGP) made available as a result of Presidential Declaration FEMA-DR-WI.

Duties will include assisting the SHMO in the following:

- 1. Attend and participate in briefings and workshops for potential HMGP applicants.
- 2. Solicit and accept pre-applications from counties and municipalities interested in applying for HMGP assistance.
- 3. Review pre-applications and at direction of the SHMO, send formal applications to municipalities eligible for HMGP funding.
- 4. Assist communities as required in completing formal applications in funding.
- 5. Assist in preparing the state's application for HMGP funding for submission to FEMA including the environmental and historic preservation review for CATEX projects.
- 6. After funding is approved, assist communities as required in implementing approved projects. Monitor subrecipient compliance with Section 404-HMGP requirements, including time extensions and closeouts after projects are completed.
- 7. Issue payments to subrecipients based on completed work and monitor subrecipients progress in meeting project goals.
- 8. Coordinate with the Public Assistance Officer on hazard mitigation projects that interface with the Public Assistance Program under Section 406.
- 9. Answer oral and written inquiries relating to the HMGP.
- 10. Attend meetings as required.
- 11. Compose correspondence to FEMA Region V to obtain clarification of issues relating to 404 funding.
- 12. Assist in the development of state guidance in administering the 404-HMGP.

- 13. Assist the SHMO in conducting WHMT meetings by developing agendas, handout materials, and other information.
- 14. Attend and participate in WHMT meetings.
- 15. Coordinate with other Federal and state agency WHMT members to facilitate their processing of applications and providing assistance to municipalities.

TASK ASSIGNMENT AND ACTIVITIES HAZARD MITIGATION GRANT PROGRAM

MITIGATION SPECIALIST (Permanent and Temporary Hires)

This position will provide support to Mitigation staff administering the Hazard Mitigation Grant Program made available as a result of Presidential Disaster Declaration FEMA-____-DR-WI.

Duties will include the following:

- 1. Solicit and accept pre-applications from municipalities interested in applying for HMGP assistance.
- 1. Review pre-applications and at direction of SHMO, send formal applications to municipalities eligible for HMGP funding.
- 2. Assist communities as required in completing formal applications in funding.
- 3. Perform benefit-cost analysis and environmental reviews on potential projects.
- 4. Assist in preparing the state's application for HMGP funding for submission to FEMA.
- 5. Answer oral and written inquiries relating to the HMGP.
- 6. Attend meetings as required.
- 7. Compose correspondence to FEMA Region V to obtain clarification of issues relating to 404 funding.
- 8. Assist the SHMO in conducting WHMT meetings by developing agendas, handouts, and other materials.
- 9. Attend and participate in WHMT meetings.
- 10. Coordinate with other Federal and state agency WHMT members to facilitate their processing of applications and providing assistance to municipalities.

APPENDIX G: AUTHORITIES

APPENDIX G: AUTHORITIES

Public Law 93-288, the federal disaster assistance law was passed by Congress in 1973. The Robert T. Stafford Disaster Relief and Emergency Assistance Act, i.e., The Stafford Act, amended PL 93-288 in 1988 and was further amended in 1994, 1997, 2000 and 2002, allows for discretionary disaster assistance to states. The President of the United States has the discretion to declare a disaster and direct the Federal Emergency Management Agency (FEMA) to assist states when a disaster overwhelms a state's capability to respond and recover. The Stafford Act also allows for partial funding for state emergency management programs for disaster preparedness, response, recovery and mitigation if the state agrees to a performance contract. Title 44 of the Code of Federal Regulations, Emergency Management and Assistance, describes the administrative policies, rules and regulations governing the application of the Stafford Act and FEMA's role as a federal agency.

The federal and state legislation that addresses hazard mitigation is listed below. These are the authorities that empower Wisconsin's mitigation activities.

Federal Authorities

Part 201 of Title 44 of the Code of Federal Regulations, Mitigation Planning: Sections 201.1 through 201.7 describe the policies and procedures for state, local, and tribal all hazards mitigation planning as required by the provisions of section 322 of the Stafford Act. These sections require that state and local governments and tribal organizations to develop hazard mitigation plans to qualify for continued receipt of federal disaster assistance.

Section 203 of Title 44 of the Code of Federal Regulations, Pre-Disaster Mitigation: Established a pre-disaster mitigation program to provide funding for cost-effective hazard mitigation measures to states and local governments.

Subpart N of Section 206 of Title 44 of the Code of Federal Regulations, Hazard Mitigation Grant Program: Sections 206.430 through 206.440 describe the requirements for implementing the Hazard Mitigation Grant Program at the state level.

Subpart H of Section 206 of Title 44 of the Code of Federal Regulations, Public Assistance Eligibility: Section 206,226(e) allows cost effective hazard mitigation measures as in allowable cost in restoration projects.

Part 207 of Title 44 of the Code of Federal Regulations, Management Costs: The purpose is to implement Sections 324 if the Stafford Act to provide management costs in administering the Public Assistance and Hazard Mitigation Grant Programs.

Part 78 of Title 44 of the Code of Federal Regulations, Flood Mitigation Assistance: The Flood Mitigation Assistance program was created as part of the National Flood Insurance

Reform Act of 1994 with the goal of reducing or eliminating claims under the National Flood Insurance Program through mitigation activities. Flood Mitigation Assistance is a pre-disaster grant program awarding separate grants for flood mitigation planning as well as flood mitigation projects.

Part 79 of Title 44 of the Code of Federal Regulations, Flood Mitigation Grants: The purpose of this part is to prescribe actions, procedures, and requirements for administration of the hazard mitigation grant programs made available under the National Flood Insurance Act of 1968, as amended, and the Flood Disaster Protection Act of 1973, as amended, 42 U.S.C. 4001 *et seq.* The Biggert-Waters Flood Insurance Reform Act of 2012 (PL 112-141) consolidated the Repetitive Flood Claims and Severe Repetitive Loss grant programs into the Flood Mitigation Assistance.

Part 80 of Title 44 of the Code of Federal Regulations, Property Acquisition and Relocation for Open Space: This part provides guidance on the administration of FEMA mitigation assistance for projects to acquire property for open space purposes under all FEMA hazard mitigation assistance programs. It provides information on the eligibility and procedures for implementing projects for acquisition and relocation of at-risk properties from the hazard area to maintain the property for open space purposes.

Part 9 of Title 44 of the Code of Federal Regulations, Floodplain Management and Protection of Wetlands: This part sets forth policy, procedure and responsibilities to implement and enforce Executive Order 11988, Floodplain Management, and Executive Order 11990, Protection of Wetlands.

State Authorities

Wisconsin State Statute, Chapter 323 (Emergency Management): Authorizes and establishes the organization for state and local emergency management programs, which are charged with the responsibility to the state and its subdivisions to cope with natural and technological disasters. Includes authorization for Wisconsin Emergency Management to require satisfactory completion of an annual plan of work from local county emergency management directors in return for receiving partial funding from the state for local emergency management positions.

Wisconsin Statutes, Chapter 87: Authorizes the Wisconsin Department of Natural Resources to construct, maintain and alter flood control structures.

Wisconsin Administrative Rules, NR 115: Establishes minimum shoreland protection rules.

Wisconsin Administrative Rules, NR 116: Describes the Wisconsin Department of Natural Resources Floodplain Management Program. Section 87.30 Wisconsin Statutes requires

communities to zone their flood hazard areas in accordance with minimum statewide standards that are established in NR 116.

Wisconsin Administrative Rules, NR 117: Describes the Wisconsin Department of Natural Resources minimum statewide standards for how local communities zone their shorelands and wetlands.

Wisconsin Administrative Rules, NR 199: The Municipal Flood Control and Riparian Restoration Program provides grants to local governments to minimize flooding and flood-related damages by acquiring property, floodproofing structures, creating open-space flood storage areas, constructing flood control structures and restoring the flood-carrying capacity and natural and beneficial functions of watercourses.

Governor's Executive Order 67: Requires all state actions affecting construction of any structure or facility to be consistent with and obey state statutes regulating floodplains, wetlands, erosion and shoreland management.

Governor's Executive Order 73: Requires flood mitigation for state owned or leased property and otherwise prohibits state government buildings from being built in a 100-year floodplain for most facilities or the 500-year floodplain for critical facilities.

Wisconsin Building Codes: Wisconsin Administrative Code SPS 361 - 366 includes the Wisconsin Uniform Commercial Building Code and the adopted provisions of the International Code Council codes: International Building Code, International Energy Conservation Code, International Mechanical Code, and the International Fuel Gas Code. Wisconsin Administrative Code SPS 320-360 includes the State's Uniform Dwelling Code (UDC) for one and two-family dwellings.

Wisconsin State Statute 66.1001, Comprehensive Planning Law: After January 1, 2010, communities are required to have a comprehensive plan if they want to make land use decisions. All community programs and actions that affect land use must be guided by, and consistent with, the community's comprehensive plan.

State of Wisconsin Administrative Plan for the Hazard Mitigation Grant Program:

Describes Wisconsin Emergency Management's policies and guidelines for administering the HMGP portion of disaster assistance funds in accordance with Subpart N of Section 206 of Title 44 CFR.

Wisconsin State Statute, Chapter 31: Ensures that dams are safely built, operated and maintained. NR 333 provides design and construction standards for large dams and requires all large dams to have Emergency Action Plans (EAP). EAPs identify potential emergency conditions at a high hazard dam and prescribe procedures to be followed to eliminate the loss of life and minimize property damage. NR 335 covers the administration of the Municipal Dam Repair and Removal Grant Program. DNR is responsible for administration of these regulations.

Wisconsin State Statute 26, Chaper 917, and Wisconsin Administrative Rule NR 47:

Provides Forest Fire Protection Grants to increase forest fire protection and suppression capabilities through cooperative efforts with local fire departments. Priority factors include 1) whether the fire departments serve areas that are part of a forest fire control area; 2) fire departments respond to wild fires within their jurisdiction at no cost to the DNR; and 3) fire departments with a majority of members meeting NFPA 1051 standards for wildland fire fighting training. Municipal fire departments that have executed a forest fire suppression agreement acceptable to the DNR are eligible to apply. There is a 50% local match required. Eligible fire departments can receive a maximum grant award of \$10,000. Eligible county fire associations can receive a maximum grant award of \$25,000.

APPENDIX H: ACRONYMS

APPENDIX H: ACRONYMS

ADA American Disabilities Act

ASCE American Society of Civil Engineers

ASFPM Association of State Floodplain Managers

BFE Base Flood Elevation
BCA Benefit Cost Analysis
BCR Benefit Cost Ratio

BCEGS Building Code Effectiveness Grading Schedule

CATEX Categorical Exclusion

CFDA Catalog of Federal Domestic Assistance
CDBG Community Development Block Grant

CFR Code of Federal Regulations
CRS Community Rating System

DATCP Department of Agriculture, Trade, and Consumer Protection

DHS Department of Health Services

DHS Department of Homeland Security

DMA2K Disaster Mitigation Act of 2000

DNR Department of Natural Resources

DOA Department of Administration

DOB Duplication of Benefits
DOP Duplication of Programs

DOT Department of Transportation
DRM Disaster Recovery Manager
EA Environmental Assessment

EDA Economic Development Administration
EHP Environmental and Historic Preservation

EIS Environmental Impact Statement

EO Executive Order

EOC Emergency Operations Center FCO Federal Coordinating Officer

FEMA Federal Emergency Management Agency

FFE First Floor Elevation

FHMO Federal Hazard Mitigation Officer

FIMA Flood Insurance and Mitigation Administration

FIRM Flood Insurance Rate Map
FIS Flood Insurance Study

FMA Flood Mitigation Assistance

State of Wisconsin Hazard Mitigation Plan

FMO Financial Management Officer FONSI Finding of No Significant Impact

GAR Governor's Authorized Representative

GIS Geographic Information System
GSTF Greatest Savings to the Fund

HAZUS Hazards US

HMA Hazard Mitigation AssistanceHMPG Hazard Mitigation Grant ProgramHUD Housing and Urban Development

IA Individual Assistance

IAO Individual Assistance Officer

IAP Incident Action Plan

IBC International Building Code
ICC Increased Cost of Compliance
ICS Incident Command System

IDRG Interagency Disaster Recovery Group

JFO Joint Field Office

LCA Local Capability Assessment

MMSD Milwaukee Metropolitan Sewage District

MOU Memorandum of Understanding

MRRPC Mississippi River Regional Planning Commission

NEMIS National Emergency Management Information System

NEPA National Environmental Policy Act
NFIF National Flood Insurance Fund
NFIP National Flood Insurance Program
NFIRA National Flood Insurance Reform Act
NFPA National Fire Protection Association
NHPA National Historic Preservation Act

NRCS Natural Resources Conservation Service
OCI Office of Commissioner of Insurance
OMB Office of Management and Budget

PA Public Assistance

PAO Public Assistance Officer

PAS Program Administration by States
PDA Preliminary Damage Assessment

PDM Pre-Disaster Mitigation

PDM-C Pre-Disaster Mitigation Competitive

PNP Private Non-Profit

State of Wisconsin Hazard Mitigation Plan

POC Point of Contact

POP Period of Performance

PPD-8 Presidential Policy Directive 8
PSC Public Service Commission

PW Project Worksheet

QPR Quarterly Progress Reporting

RA Regional Administrator

REC Record of Environmental Consideration

REO Regional Environmental Officer

RFI Request for Information

RiskMAP Risk Mapping Assessment and Planning

RLP Repetitive Loss Property
RLR Repetitive Loss Report

RPC Regional Planning Commission

SARWG State Agency Resource Working Group

SCA State Capability Assessment
SCO State Coordinating Officer
SFHA Special Flood Hazard Area
SFM Strategic Funds Management

SFMO State Financial Management Officer
SHMO State Hazard Mitigation Officer
SHMP State Hazard Mitigation Plan
SHMT State Hazard Mitigation Team

SHS State Historical Society

SOW Scope of Work

SRIA Sandy Recovery Improvement Act

SRL Severe Repetitive Loss
UDC Uniform Dwelling Code

URA Uniform Relocation Assistance
USDA U. S. Department of Agriculture
UW-EXT University of Wisconsin – Extension

WAFSCM Wisconsin Association for Floodplain, Stormwater and Coastal Managers

WEM Wisconsin Emergency Management WHMT Wisconsin Hazard Mitigation Team

WIHRO Wisconsin Interagency Hazard Mitigation Recovery Office WIVOAD Wisconsin Volunteer Organizations Active in Disasters

WSJHMT Wisconsin Silver Jackets Hazard Mitigation Team

WRTF Wisconsin Recovery Task Force

APPENDIX I: AGENCY CONCURRENCES

The undersigned has reviewed the State of Wisconsin Hazard Mitigation Plan and concurs that it is a working document that will improve Wisconsin's ability to minimize the effects of hazards and resist disaster, thereby protecting the health, safety, and economy of its citizens. As a member of the Wisconsin Silver Jackets Hazard Mitigation Team, this agency has contributed to the development and update of the Plan, and will continue to implement the actions outlined therein. The agency will continue to provide support for and participate in the plan update process as well as recovery efforts after each federal disaster declaration.

The Department of Agriculture, Trade, and Consumer Protection will implement the following hazard mitigation action items detailed in Section 3 of the Plan: 2.1 through 2.2.

Ben Brancel, Secretary

Wisconsin Department of Agriculture, Trade, and

Consumer Protection

The undersigned has reviewed the State of Wisconsin Hazard Mitigation Plan and concurs that it is a working document that will improve Wisconsin's ability to minimize the effects of hazards and resist disaster, thereby protecting the health, safety, and economy of its citizens. As a member of the Wisconsin Silver Jackets Hazard Mitigation Team, this agency has contributed to the development and update of the Plan, and will continue to implement the actions outlined therein. The agency will continue to provide support for and participate in the plan update process as well as recovery efforts after each federal disaster declaration.

The Department of Natural Resources will implement the following hazard mitigation action items detailed in Section 3 of the Plan: 3.1 through 3.28.

Cathy Stepp, Secretary

Wisconsin Department of Natural Resources

The undersigned has reviewed the State of Wisconsin Hazard Mitigation Plan and concurs that it is a working document that will improve Wisconsin's ability to minimize the effects of hazards and resist disaster, thereby protecting the health, safety, and economy of its citizens. As a member of the Wisconsin Silver Jackets Hazard Mitigation Team, this agency has contributed to the development and update of the Plan, and will continue to implement the actions outlined therein. The agency will continue to provide support for and participate in the plan update process as well as recovery efforts after each federal disaster declaration.

The Department of Administration will implement the following hazard mitigation action items detailed in Section 3 of the Plan: 1.1 through 1.13.

Scott Neitzel, Secretary

Wisconsin Department of Administration

The undersigned has reviewed the State of Wisconsin Hazard Mitigation Plan and concurs that it is a working document that will improve Wisconsin's ability to minimize the effects of hazards and resist disaster, thereby protecting the health, safety, and economy of its citizens. As a member of the Wisconsin Silver Jackets Hazard Mitigation Team, this agency has contributed to the development and update of the Plan, and will continue to implement the actions outlined therein. The agency will continue to provide support for and participate in the plan update process as well as recovery efforts after each federal disaster declaration.

The Public Service Commission of Wisconsin will implement the following hazard mitigation action items detailed in Section 3 of the Plan: 7.1 through 7.6.

Ellen Nowak Chair

Wisconsin Public Service Commission

The undersigned has reviewed the State of Wisconsin Hazard Mitigation Plan and concurs that it is a working document that will improve Wisconsin's ability to minimize the effects of hazards and resist disaster, thereby protecting the health, safety, and economy of its citizens. As a member of the Wisconsin Silver Jackets Hazard Mitigation Team, this agency has contributed to the development and update of the Plan, and will continue to implement the actions outlined therein. The agency will continue to provide support for and participate in the plan update process as well as recovery efforts after each federal disaster declaration.

The Wisconsin State Historical Society will implement the following hazard mitigation action items detailed in Section 3 of the Plan: 11.1 through 11.5.

Ellsworth H. Brown, Director

Wisconsin State Historical Society

APPENDIX J: FEMA APPROVAL AND STATE HAZARD MITIGATION PLAN REVIEW TOOL

DEC 0 2 2016

U.S. Department of Homeland Security Region V 536 South Clark Street, Floor 6 Chicago, IL 60605



Brian M. Satula Administrator Wisconsin Emergency Management 2400 Wright Street, P.O. Box 7865 Madison, Wisconsin 53707-7865

Dear Mr. Satula:

I am pleased to inform you that the Federal Emergency Management Agency (FEMA), within the Department of Homeland Security (DHS), formally approves the State of Wisconsin Hazard Mitigation Plan update for 2016, officially adopted by the State of Wisconsin. The plan is now in compliance with the Disaster Mitigation Act of 2000 requirements for an updated Standard State Mitigation Plan and the requirements for an updated Enhanced State Hazard Mitigation Plan.

The approval of this plan ensures the continued availability of non-emergency Stafford Act funding for the next 5 years within the State of Wisconsin. This includes the Pre-Disaster Mitigation Program, Flood Mitigation Assistance Program, Hazard Mitigation Grant Program (at an increased 20% level), Fire Management Assistance Grant Program, and Public Assistance Grants (Categories C-G). In addition the approval of this plan allows the State of Wisconsin to be eligible for the reduced cost share (90/10) for grants awarded under the Flood Mitigation Assistance Program. All requests for funding however, will be evaluated individually according to the specific eligibility and other requirements of the particular program under which the application is submitted.

If you have any questions regarding this planning process, please contact Christine Stack, Mitigation Division Director, at 312-408-5570 or christine.stack@fema.dhs.gov.

Sincerely,

Janet M. Odeshoo

Acting Regional Administrator

agualles. Odestra

B.1 Plan Review Tool Summary

State: Wisconsin	Title and Date of Plan: WI State Mitigation Plan 2016	Date of Submission: Full Draft Submitted by November 30, 2016	
State Point of Contact (Name / Title): Katie Sommers, State Hazard Mitigation Officer			
Address: 2400 Wright St., Madison, WI, 53707			
Agency: Wisconsin Emergency Management Agency			
Phone Number: (608) 242-3222	E-Mail: Katie.Sommers@wisconsin.	gov	

Date Received in FEMA Region: Full Draft Received by November 30, 2016			
FEMA Reviewer (Planning – Name / Title):	Date:		
Christine Meissner, Mitigation Planner	12/02/2016		
FEMA Reviewer (HMA – Name / Title):	Date:		
Kaylie Alderman, Hazard Mitigation Officer	11/30/2016		
FEMA Reviewer (Name / Title):	Date:		
Cathleen Carlisle, Mitigation Planner, HQ	11/15/2016		
FEMA Reviewer (Name / Title):	Date:		
Lilah Haxton, HMA Emergency Management Specialist, HQ	12/01/2016		
FEMA Approver (Name / Title):	Date:		
Janet M. Odeshoo, Acting Regional Administrator	12/02/2016		
Plan Status (Not Approved, Approvable Pending Adoption, Approved):	Date:		
Approved	12/02/2016		

SUMMARY	YES	NO
STANDARD STATE MITIGATION PLAN		
Does the plan meet the standard state mitigation plan requirements?	X	
REPETITIVE LOSS STRATEGY		
Does the plan include a Repetitive Loss Strategy? [see S6 / RL1; S8 / RL2; S9 / RL3; S10 / RL4; S13 / RL5; and S15 / RL6]	Х	
ENHANCED STATE MITIGATION PLAN		
Does the plan meet the enhanced state mitigation plan requirements?	X	

B.2 ${\it Standard\,State\,Mitigation\,Plan\,Regulation\,Checklist}$

REGULATION CHECKLIST – STANDARD PLAN	Location in Plan	M/NM*
*M=Met; NM=Not Met		
STANDARD (S) STATE MITIGATION PLAN		
Planning Process		
S1. Does the plan describe the planning process used to develop the plan? [44 CFR §§201.4(b) and (c)(1)]	Section 2	M
S2. Does the plan describe how the state coordinated with other agencies and stakeholders? [44 CFR §§201.4(b) and (c)(1)]	Section 2	M
Required Revisions:		
Hazard Identification and Risk Assessment	T .	
S3. Does the risk assessment include an overview of the type and location of all natural hazards that can affect the state? [44 CFR §201.4(c)(2)(i)]	Appendix A	M
S4. Does the risk assessment provide an overview of the probabilities of future hazard events? [44 CFR §201.4(c)(2)(i)]	Appendix A	M
S5. Does the risk assessment address the vulnerability of state assets located in hazard areas and estimate the potential dollar losses to these assets? [44 CFR §§201.4(c)(2)(ii) and 201.4(c)(2)(iii)]	Appendix A	M
S6. Does the risk assessment include an overview and analysis of the vulnerability of jurisdictions to the identified hazards and the potential losses to vulnerable structures? [44 CFR §§201.4(c)(2)(ii) and 201.4(c)(2)(iii)]	Appendix A and Appendix E	M
S7. Was the risk assessment revised to reflect changes in development? [44 CFR §201.4(d)]	Appendix A	M
Required Revisions:	•	
Mitigation Strategy and Priorities		
S8. Does the mitigation strategy include goals to reduce / avoid long-term vulnerabilities from the identified hazards? [44 CFR §201.4(c)(3)(i)]	Section 3 (Part 3.1)	M
S9. Does the plan prioritize mitigation actions to reduce vulnerabilities identified in the risk assessment? [44 CFR §§201.4(c)(3)(iii) and (iv)]	Section 3	M
S10. Does the plan identify current and potential sources of funding to implement mitigation actions and activities? [44 CFR §201.4(c)(3)(iv)]	Section 3	M
S11. Was the plan updated to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities? [44 CFR §201.4(d)]	Section 3	М
Required Revisions:		
State Mitigation Capabilities	la	
S12. Does the plan discuss the evaluation of the state's hazard management policies, programs, capabilities, and funding sources to mitigate the hazards identified in the risk assessment? [44 CFR §201.4(c)(3)(ii)]	Section 3 (Part 3.2.1) and Section 6	M
Required Revisions:	1	

REGULATION CHECKLIST – STANDARD PLAN	Location in Plan	M/NM*
*M=Met; NM=Not Met	FIGII	
Local Coordination and Mitigation Capabilities		
S13. Does the plan generally describe and analyze the effectiveness of local and tribal, as applicable, mitigation policies, programs, and capabilities? [44 CFR §201.4(c)(3)(ii)]	Section 4	M
S14. Does the plan describe the process to support the development of approvable local and tribal, as applicable, mitigation plans? [44 CFR§§201.3(c)(5) and 201.4(c)(4)(i)]	Section 4	М
S15. Does the plan describe the criteria for prioritizing funding? [44 CFR §201.4(c)(4)(iii)]	Section 4	М
S16. Does the plan describe the process and timeframe to review, coordinate and link local and tribal, as applicable, mitigation plans with the state mitigation plan? [44 CFR §§201.3(c)(6), 201.4(c)(2)(ii), 201.4(c)(3)(iii), and 201.4(c)(4)(ii)]	Section 4	М
Required Revisions:		
Plan Review, Evaluation, and Implementation		
S17. Is there a description of the method and schedule for keeping the plan current? [44 CFR §§201.4(c)(5)(i) and 201.4(d)]	Section 5	M
S18. Does the plan describe the systems for monitoring implementation and reviewing progress? [44 CFR §§201.4(c)(5)(ii) and 201.4(c)(5)(iii)]	Section 5	M
Required Revisions:		
Adoption and Assurances		
S19. Did the state provide documentation that the plan has been formally adopted? [44 CFR §201.4(c)(6)]	Appendix L	M
S20. Did the state provide assurances? [44 CFR §201.4(c)(7)]	Section 1	М
Required Revisions:		
Repetitive Loss (RL) Strategy		
RL1. Did Element S6 (risk assessment) address RL and SRL properties? [44 CFR §§201.4(c)(2)(ii), 201.4(c)(2)(iii), and 201.4(c)(3)(v)]	Appendix E	M
RL2. Did Element S8 (mitigation goals) address RL and SRL properties? [44 CFR §§201.4(c)(3)(i) and 201.4(c)(3)(v)]	Appendix E	M
RL3. Did Element S9 (mitigation actions) address RL and SRL properties? [44 CFR §§201.4(c)(3)(iii) and 201.4(c)(3)(v)]	Appendix E	M
RL4. Did Element S10 (funding sources) address RL and SRL properties? [44 CFR §§201.4(c)(3)(iv) and 201.4(c)(3)(v)]	Appendix E	M
RL5. Did Element S13 (local and tribal, as applicable, capabilities) address RL and SRL properties? [44 CFR §§201.4(c)(3)(ii) and	Appendix E	М
RL6. Did Element S15 (prioritizing funding) address RL and SRL properties? [44 CFR §§201.4(c)(4)(iii) and 201.4(c)(3)(v)]	Appendix E	М
Required Revisions:		

B.3 Enhanced State Mitigation Plan Regulation Checklist

REGULATION CHECKLIST – ENHANCED PLAN	Location in	M/NM*
*M=Met; NM=Not Met	Plan	
ENHANCED (E) STATE MITIGATION PLAN		
Meet Standard State Mitigation Plan Elements		
E1. Does the Enhanced plan include all elements of the standard state mitigation plan? [44 CFR §201.5(b)]	Section 2, Appendix A, Section 3, Section 4, Section 5, Appendix E,	М
Required Revisions:		
Integrated Planning	<u> </u>	
E2. Does the plan demonstrate integration to the extent practicable with other state and/or regional planning initiatives and FEMA mitigation programs and initiatives? [44 CFR §201.5(b)(1)]	Section 6 (Parts 6.1, 6.2, 6.6, and 6.8	M
Required Revisions:		
State Mitigation Capabilities	C+: C / D+	N 4
E3. Does the state demonstrate commitment to a comprehensive mitigation program? [44 CFR §201.5(b)(4)]	Section 6 (Part 6.8)	M
E4. Does the enhanced plan document capability to implement mitigation actions? [44 CFR §§201.5(b)(2)(i), 201.5(b)(2)(ii), and 201.5(b)(2)(iv)]	Section 6 (Part 6.3)	M
E5. Is the state effectively using existing mitigation programs to achieve mitigation goals? [44 CFR §201.5(b)(3)]	Sections 6 (Parts 6.5 and 6.7)	M
Required Revisions:		
HMA Grants Management Performance	I	
E6. With regard to HMA, is the state maintaining the capability to meet application timeframes and submitting complete project applications? [44 CFR §201.5(b)(2)(iii)(A)]	Section 6.4	M
E7. With regard to HMA, is the state maintaining the capability to prepare and submit accurate environmental reviews and benefit-cost analyses? [44 CFR§201.5(b)(2)(iii)(B)]	Section 6 (Parts 6.4.1 and 6.4.2)	M
E8. With regard to HMA, is the state maintaining the capability to submit complete and accurate quarterly progress and financial reports on time? [44 CFR §201.5(b)(2)(iii)(C)]	Section 6 (Part 6.4.3)	М
E9. With regard to HMA, is the state maintaining the capability to complete HMA projects within established performance periods, including financial reconciliation? [44 CFR §201.5(b)(2)(iii)(D)]	Section 6 (Part 6.4.4)	М
Required Revisions:		

B.4 Strengths and Opportunities for Improvement

STRENGTHS AND OPPORTUNITIES FOR IMPROVEMENT

INSTRUCTIONS: The purpose of the "Strengths and Opportunities for Improvement" section is for FEMA to provide more comprehensive feedback on the state mitigation plan to help the state advance mitigation planning. The intended audience is the state staff responsible for the mitigation plan update. FEMA will address the following topics:

- 1. Plan strengths, including specific sections in the plan that are above and beyond the minimum requirements; and
- 2. Suggestions for future improvements.

FEMA will provide feedback and include examples of best practices, when possible, as part of the Plan Review Tool, or, if necessary, as a separate document. The state mitigation plan elements are included below in italics for reference but should be deleted as the narrative summary is completed. FEMA is not required to provide feedback for each element.

Required revisions from the Regulation Checklist are not documented in the Strengths and Opportunities for Improvement section.

Results from the Strengths and Opportunities for Improvement section are not required for Plan Approval, but may inform discussions during the Program Consultation.

Describe the mitigation plan strengths, including areas that may exceed minimum requirements, and describe areas for future improvements to the mitigation plan.

Hazard Identification and Risk Assessment

- ✓ To reduce redundancies and align with EMAP recommendations, the state integrated the THIRA into the state mitigation plan. The THIRA is included as an appendix to the state plan and serves as the required natural hazard risk assessment section.
- ✓ The state used a new methodology in place of HAZUS for the 2016 plan update-- newly-developed statewide parcel data and SFHA data were used to determine the value of improved structures located on parcels that are at least partially located in the SFHA for each county. The state acknowledges that the parcel information for flood risk is not conclusive and should develop a method of tracking vulnerable assets from the risk assessments of local mitigation plans to supplement this information.
- A recommendation from the 2011 state plan review tool was for the state to incorporate more demographic and land use information into the risk analysis. For the 2016 plan update, the statewide parcel inventory used in the risk assessment reflects the most up-to-date information on development patterns in the state. The state also incorporated heat vulnerability index maps into the risk assessment for extreme heat. It is recommended the state continue to include additional detail related to land development in the most densely populated areas and continue to work with state partners on incorporating data into the state plan that conveys risk in the most populated areas and for the most vulnerable populations in the state.
- The state greatly scaled up climate change information since the previous plan iteration, including best available data developed through WICCI, and consulted with NRDC to include climate change-oriented mitigation actions. It is recommended the state continue in this trajectory and work with WICCI to provide meaningful regional interpretations of the data (the downscaled data shows regional variations

in temperature and precipitation changes around the state over the past 50 years) so local and tribal communities can use that information to inform their local and tribal mitigation plans.

- ✓ A recommendation from the 2011 state review tool was for the state to continue to improve its risk assessment of state-owned facilities. For the 2016 plan, WEM obtained a much more comprehensive list of state-owned buildings from the Department of Administration and included PA data to convey risk through previous damage. The state plan should continue to document the impacts to state facilities and critical infrastructure by analyzing damage and impacts from previous major disasters.
- Resource: State Mitigation Planning Key Topics Bulletin: Risk Assessment https://www.fema.gov/media-library-data/1464972786707d686a56e54284eb815b1624224dfaa5b/RiskAssessment KeyTopics Bulletin Final.pdf

Mitigation Strategy

- The state plan goals for 2016 were updated to reflect the expanded risk assessment (THIRA), which also covers manmade and technological hazards. There was a significant increase in the amount of mitigation actions for the 2016 state plan update (41 new actions). Almost every participating lead agency identified new actions to implement over the next 5 years. Some of the long-term actions carried over from previous plan iterations do not have an action update summary or the plan simply states 'status unchanged'—every action should have a summary of progress made.
- WDOT is planning a statewide assessment and inventory of culverts, this type of information is valuable for state and local mitigation planning. FEMA's PA data indicates that more than 50% of the costs of natural disasters in Wisconsin are associated with the rebuilding of roads and bridges. It is recommended the state agencies continue to coordinate and share vulnerability data related to roads and outreach to local road commissions and public works departments responsible for roads.
- Due to time constraints the REC appendix was not included in the 2016 state plan update but the state indicates they will maintain and update a separate document related to risk and mitigation actions of electric utilities. It is recommended the state expand their outreach to water and wastewater utilities as well. According to FEMA's PA data, sewage treatment facilities, water treatment plants, and water pumping stations are vulnerable to hazards such and flooding and erosion. https://www.epa.gov/sites/production/files/2016-08/documents/160815hazardmitigationfornaturaldisasters.pdf
- The state acknowledges in Section 5 that monitoring plan implementation and tracking progress made can sometimes be inconsistent throughout the 5 year lifecycle of the plan. The state and FEMA will use annual consultation meetings as a platform for tracking implementation of the state plan. It is also recommended the state work with their WSJHMT partners to develop a tracking method for mitigation actions that is consistent and ideally draws from tracking methods states are already using to monitor their programmatic activities. Since the state meets with their WSJHMT team twice a year (or as needed), a quarterly progress reporting system could be established.
- Resource: State Mitigation Planning Key Topics Bulletin: Mitigation Strategy https://www.fema.gov/media-library-data/1478260600306-117bda8ab179bd301b0b61b52a143485/StateMitigationPlanning MS Bulletin V9 508.pdf

State Capability and Comprehensive Programming

The state has a sustained, proven commitment to hazard mitigation and as such is designated as an enhanced state. With respect to integrated planning and comprehensive programming, this is demonstrated through the states coordination structures and inter-agency programming and initiatives (ex-WSJHMT, the various task force, committees and work groups, and public-private partnerships discussed in Section 6). An organizational recommendation for future plan updates: because of the state's long history with mitigation, it is increasingly difficult to tease out the information that is relevant to just the last 5 years of the plan's lifecycle. The state may want to consider an appendix for Past Accomplishments to maintain 'institutional memory' of progress made.

- WEM demonstrates robust state coordination-- from the initial formation of the IDRG in 1993 and SHMT in 2000 to the establishment of the WHMT in 2003. The WHMT is now called the WSJHMT but is a change in name only, WI was successfully leading a state-led, interagency group prior to the development of SJ charters across the country. WEM continues to integrate WSJHMT into other coordination mechanisms, most recently state agencies of WSJHMT also serve as chairs to the RSF committees, serving this dual role enhances communication and information sharing across recovery and mitigation sectors of emergency management. It is clear the state has recruited a diverse membership of state agencies to the SWJHMT that represent cross-sector expertise.
- The state plan update does a good job in identifying the existing programs, policies, regulations, plans and initiatives of state agencies that address natural hazards and support mitigation. The table included in Section 3 discusses how the program/policy/plan addresses mitigation and identifies the gaps and unmet needs of each. It is recommended moving forward that the WSJHMT consider these unmet needs as they develop new mitigation actions (if it is within their authority and ability to address these unmet needs).
- ✓ The plan includes a valuable description of the WDNR's RiskMAP efforts. WEM has been an active partner in the RiskMAP meetings and we encourage the state planning team to continue this commitment.
- Resource: State Mitigation Planning Key Topics Bulletin: Mitigation Capabilities https://www.fema.gov/media-library-data/1474922239359-986b9b410443b41d944df0165dcafc79/MitCapabilities_KeyTopics_Bulletin_508.pdf
- Resource: State Mitigation Planning Key Topics Bulletin: Planning Process https://www.fema.gov/media-library-data/1468867403587-36535211c7c892fb7b1956e961d05a49/PlanningProcess KeyTopics Bulletin 508.pdf

> HMA Grants Management Performance

The comments below are specific to project activity over the last four quarters, which references the following projects: DR-1933-Uncommitted Funds Pilot (1933.8 Glenddale, 1933.222 Lisbon, 1933.41 Jefferson) and FY16 PDM/FMA (PDM Ozaukee Acquisition, PDM River Falls Safe Room, FMA Pepin Acquisition)

- ✓ Wisconsin has the capability to meet application time frames and submit eligible, complete applications with clear Scopes of Work. All applications in the past four quarters were submitted prior to the application deadline and entered into their respective tracking systems (eGrants and NEMIS). The applications included all required documentation, including eligibility and completeness checklists. Any requests for information from FEMA were minor and the state responded within the requested timeframe. All applications were determined to be complete within 90 days of submission (the three Uncommitted Funds Pilot projects were complete within 30 days of submission).
- Wisconsin has the capability to prepare and submit environmental reviews and BCAs. The past four quarters, all BCA documentation and EHP consultation requests were submitted either with the application or within 90 days of the deadline. Wisconsin coordinates with the Regional Environmental Officer to front load the EHP process to make sure that all EHP consultations and requirements are

completed in a timely manner; they are also working closely with the Region on development of a Section 106 Programmatic Agreement. Participation in related training activities this past year include: Climate Resilient Mitigation Activities webinar (March 2016); BCA for Drought and Ecosystems Services webinar, (May 2016); Annual Archaeology Consultant workshop (March 2016); EHP Directive webinar (October 2016)

- ✓ Wisconsin uses a reimbursement system for about 95% of financial transactions. In some cases of extra-ordinary circumstance, the state will advance the money, typically to smaller communities, based on prior approval of the state. The sub-grantee will be advised to deposit any advance HMGP funds into a separate non-interest bearing bank account. If any interest is generated, the sub-grantee will be instructed that those funds shall be expended for project administrative purposes before any additional project funds are drawn down.
- ✓ Wisconsin consistently submits QPRs on time and completes all grant close-out activities within the 90 day liquidation period after the period of performance ends. The past four quarters Wisconsin submitted detailed QPRs that accurately described the progress of each open sub-grant. The state completed all work on sub-grants prior to the end of the POP. If a POP extension was needed, the request was submitted prior to the required 60 day deadline.
- Closeout packets were timely, orderly and aligned with the SOW and EHP requirements. Acquisition closeouts identified each acquired property and the reimbursement spreadsheets showed which quarter each draw down occurred and which line item the cost was attributed too. The state submitted SF-425s on time, within 90 days from the end of the performance period, unless FEMA granted an extension. All de-obligations were submitted with or prior to close out of the grant.
- Based on the most recent monitoring visit to Wisconsin in May of 2015, the state consistently complied with the Financial Management standard requirements outlined in 44CFR Part 13 and demonstrated that actual expenditures are being documented and are consistent with the SF-424.
- Based on an audit performed in 2015, the A-133 report did not contain any major findings related to HMA programs.

Local (and Tribal) Coordination and Mitigation Capabilities

- The state included an analysis of local hazard mitigation plans that either reference or integrate climate change, a great addition to Section 4. FEMA hopes the state will use this analysis to solicit CRMA applications from those communities. Starting with counties/municipalities that have a demonstrated interest and/or political will to address climate change would be a great place to start with these new PDM/FMA funding priorities.
- ✓ The state has a demonstrated commitment to local planning-- providing annual technical assistance workshops and resources to locals to develop mitigation plans. It is recommended for the state to analyze planning trends and assess whether communities that consistently update their mitigation plans are applying for HMA funds to implement the plan. If there is a gap between producing a plan and producing an application to implement the plan, this may indicate local capacity gaps that would warrant additional technical assistance. As a WSJHMT partner, what role could UW-Extension have in providing capacity-building support to local communities through their subject matter expertise and community programming?
- The state plan highlights integration with the Department of Administration's comprehensive planning program in Section 6, how does the state want to see this coordination continue in the next 5 years? In Adams County, Colorado the county's comprehensive plan is a full-integration of the mitigation plan (i.e. not separate stand-alone documents). Perhaps there is an opportunity for the state to promote

comprehensive plan and mitigation plan integration in WI where communities can apply for HMA planning grants to finance portions of the comprehensive plans that relate to the requirements for a hazard mitigation plan.

https://www.adcogov.org/sites/default/files/2012%20Comprehensive%20Plan.pdf

✓ Wisconsin has been a leader in supporting the development of tribal hazard mitigation plans. It is recommended the state continue to work with tribal communities on plan development and provide technical assistance for submission of eligible HMA applications for plan implementation.

Additional Comments

✓ Per planning guidance and regulations, FEMA will review a state plan within 45 days of receipt from the state (when possible). For the 2016 WI state plan update, a complete draft was not provided to FEMA 45 days prior to the 2011 state plan expiration. While FEMA and the state ultimately coordinated a review procedure that would ensure there would be no lapse in plan coverage, it is expected for future updates that a complete draft is submitted in a timely matter that allows for meaningful feedback and data considerations.