



Wisconsin Flood Resilience Scorecard

A guided conversation for local officials to improve flood-related health outcomes in their community



WISCONSIN DEPARTMENT
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Introduction

Welcome to the Wisconsin Flood Resilience Scorecard (FRS). By completing this guide, local governments will be able to:

- Gather valuable information about flood vulnerability in their community.
- Identify potential sources of vulnerability.
- Consider recommendations for improvement on a variety of scales.

The FRS can support communities in preparing for flooding events, such as the 2008 flooding experienced in southern Wisconsin. This guide is not designed to address catastrophic events such as a 500-year flood.

This guide is intended for use by Wisconsin public officials in local government. This guide will refer to counties and municipalities collectively as "communities." It is intended to be comprehensive, encompassing three categories of vulnerability:

Module 1: Environmental—Physical and natural landscape characteristics such as soil and slope

Module 2: Institutional—Government and infrastructural capacity and content of existing policies and community plans

Module 3: Social—Cultural and socioeconomic sources of vulnerability and the potential for community partnerships



Public officials benefit from completing all three modules; however, each can be considered independently if only certain portions are of interest. While flooding intensity and the severity of outcomes are influenced by a variety of factors, this guide focuses specifically on reducing the quantity of floodwater.

Ultimately, this guide will help decision makers prioritize projects for improving flood resilience. The benefits of flood resilience are many: limiting the adverse impacts of excess runoff into streams, reducing the financial burden of replacing damaged infrastructure and homes, and limiting negative public health outcomes.

Flooding in Wisconsin

Wisconsin has an abundance of water features, including 15,000 lakes and 84,000 miles of river (Wisconsin Department of Natural Resources, 2020), which provide livelihoods and recreation for its residents. While this water contributes to rich agriculture, fishing and boating, and ample clean drinking water, it also presents a challenge as detrimental flooding events become increasingly common across the state.



According to the Pew Charitable Trusts (2019), flooding is the costliest and most common natural disaster in the United States. In 2013 Americans spent approximately \$400 per household in an average year on such extreme weather events, but expenses have likely increased with increasing frequency of natural disasters (Weiss & Weidman, 2013). Flooding was a principal cause of damage in 32 of 46 presidential disaster declarations and one of six presidential emergency declarations in Wisconsin from 1971 through June 2016 (Wisconsin Emergency Management & State of Wisconsin Homeland Security Council, 2017).

As an example, unprecedented amounts of rain tore through southern Wisconsin in August 2018, resulting in more than \$200 million dollars in damage (Kirwan & The Associated Press, 2018), as well as a statewide state of emergency declaration from Governor Scott Walker (Federal Emergency Management Agency, 2018). While average precipitation in the city of Madison for the month of August is 4.27 inches (National Oceanic and Atmospheric Administration, 2010), the storm hitting August 20th–21st of 2018 brought 11 inches in a 24-hour period (National Weather Service & National Oceanic and Atmospheric Administration, 2018b, 2018a). The official all-time Wisconsin 24-hour rainfall record is 11.72 inches from 1946, but during the August 2018 storm unofficial measurements reached up to 15 inches west of Madison in the Cross Plains area (Burt, 2019). These extreme flooding events are predicted to increase in the coming years, further exacerbating these issues.

Recent climate modeling predicts that high-intensity storms and subsequent flood events are likely to increase throughout the Upper Midwest, including Wisconsin (Wisconsin Initiative on Climate Change Impacts, 2020). While temperatures have been increasing throughout the state over the last century, precipitation patterns are more difficult to predict (Wisconsin Initiative on Climate Change Impacts, 2020). Over the past 70 years, annual precipitation has increased approximately 15%, or on average 4.5 inches throughout the state (Wisconsin Initiative on Climate Change Impacts, 2020). However, these trends are not uniform, with western and south-central Wisconsin seeing the wettest conditions and the north experiencing a drying trend (Wisconsin Initiative on Climate Change Impacts, 2020). Some of Wisconsin's most populous cities can be found in these wet areas. Wisconsin public officials will need to consider these conditions when creating emergency preparedness, hazard mitigation, response plans, and developing policies.



Creating policies, retrofitting existing structures, and developing green infrastructure solutions comes at a cost, but these steps are essential if communities hope to withstand the natural hazards of the future. Ultimately, investing in solutions earlier will minimize the much greater costs that result from damage after an event has already occurred.

Public health effects of flooding

Not only does flooding damage physical infrastructure, it can contribute to adverse health impacts for some of the state's most vulnerable populations. Flooding is the one of the greatest causes of death associated with natural disasters in the United States (Greenough et al., 2001). This includes both direct and immediate effects as well as indirect, long-term consequences. Direct effects may include drowning, electrical injuries associated with standing water, blunt trauma from objects caught in a storm surge; and hypothermia (Greenough et al., 2001). People seeking medical care may also have difficulty accessing care during a flood event (Du et al., 2010), and the effects of flooding can continue to plague individuals for days, months, or even years. Floods can damage critical facilities such as hospitals and nursing homes, which makes routine care for patients with chronic diseases exceedingly difficult. Health facilities that are overwhelmed by flood victims and physical damage may lose medical records, or have very limited resources to treat patients, while they also conduct surveillance on exposures to toxic materials or waterborne diseases. (Du et al., 2010).

While contact with floodwaters alone may not pose health risks, sewage overflows may contaminate the water with pathogens such as *Escherichia coli*, *Salmonella*, and the hepatitis A virus (Du et al., 2010). Floodwaters can also flow through industrial sites and spread chemicals and other hazardous materials (Du et al., 2010). Overcrowded conditions and lack of sanitary facilities contribute to the spread of communicable diseases, and stagnant water allows for the breeding of many disease vectors such as mosquitoes (Du et al., 2010). Finally, if cleanup is not conducted shortly after the flood event (a challenge for financially limited communities), mold is able to grow in damaged buildings. This results in the exacerbation of respiratory conditions such as asthma (Du et al., 2010).

There is also growing interest in the mental health impacts of flooding. Those who experience flood events report higher levels of depression, anxiety, and post-traumatic stress disorder (Waite et al. 2017). If a flooded individual also experiences utility disruptions, their risk of experiencing poor mental health outcomes are even greater (Waite et al. 2017). People who are displaced from their homes due to flooding also report higher depression, anxiety, and post-traumatic stress disorder (Munro et al. 2018). French et al. (2019) also found that repeat flood victims may experience slightly higher levels of reported poor mental health. This may be important in considering health equity, as individuals who lack the means to relocate may be more susceptible to repeat flood events.

It is in the best interest of community members, local government, and public health officials to minimize these adverse effects by putting preventative measures in place before events occur.

What to expect from this guide

Each module of this guide contains the following:

- A “Before you Begin” section explaining the why to use this module, who should complete it and what that person or persons will need in order to complete it;
- Definitions and acronyms that will be used throughout the module;
- The module itself;
- A series of recommendations;
- Additional resources.

It is our intention that upon completion of this guide, a community will be able to choose from a variety of solutions and tailor them to be appropriate for their financial and administrative capacity. The results can also be used to build support from regional partners and to apply for state and federal grant opportunities. Each community may find it appropriate for different staff members to complete the guide—we have provided a partial list of potentially suitable officials at the top of each module. Because this guide was designed to be comprehensive, it is possible that certain portions are not applicable to every community or that certain portions have already been thoroughly examined by a community in the recent past. Each community can customize this guide as is sensible for their needs.

Who should participate

The scorecard was designed for use by public officials and local government staff. It is up to those leading the process to recruit a team of people with the backgrounds and experiences necessary to complete this scorecard. The scorecard requires knowledge of the technicalities of infrastructure, zoning, and policy as well as knowledge of community inner workings and relationships. Those on your staff with water resources, engineering, planning, zoning, emergency management, and/or community organizing experience are recommended. Other community members, for example, those who lead health programs and long-time residents, may also be important contributors to this process because of their first-hand experiences living and working in the community.



While every community is encouraged to use the Flood Resilience Scorecard, we recognize some limitations in the usability of the FRS for Tribal nations of Wisconsin. Wisconsin has an important population of Indigenous people among 11 federally recognized Tribes that have faced severe flood events exacerbated by systemic inequities. The FRS relies on a significant amount of mapping and, in its current form, is tailored for Wisconsin's incorporated municipalities and counties. This inherently leaves some circumstances and institutional conditions of tribal nations unaddressed.

For example, many Tribes are geographically dispersed. A reservation can include many other jurisdictions, making it difficult to assess vulnerabilities or makes changes within jurisdictional lines. Similarly, Tribal nations have had a historically strained relationship with FEMA, limiting available mapping technologies of floodplains in reservations. Equally important to note is the historical reality of trauma and miscommunication Tribes have experienced. Tribal communities' possible mistrust, particularly for government agencies and their work, is levied through centuries of violence, abuse, and mistreatment, often a result of state and federal governments impeding on Tribes' sovereignty. While the FRS may not be perfectly applicable, it can still serve as a resource to Tribes. One benefit of this tool is how it is rooted in the individual community. By using local knowledge and experts who know your community best, it gives a sense of control and agency in flood resilience.

Tribes are encouraged to participate and can contact Maggie Thelen at Margaret.thelen@dhs.wisconsin.gov if interested in exploring how this document can be adapted to a specific Tribe.

Scoring

Questions are equally weighted within the guide. It does not result in a numeric score. Instead, if a community does not reach a particular threshold of favorably answered questions, they will be redirected to the appropriate recommendations section. For example, if a community has scored poorly on the “Resource Inventory and Monitoring” section of the Institutional module, the corresponding “Resource Inventory and Monitoring” section of recommendations should be consulted. Some strategies are relatively inexpensive, whereas others require a greater amount of money, staff, and technological capacity. It is possible to increase flood resilience with a variety of tools and strategies.

There are dozens of resources to be found online that can provide more information than is contained in this guide alone. Many of these tools and data, including from the FEMA, the National Oceanic and Atmospheric Administration (NOAA), the Wisconsin Department of Natural Resources (DNR) and many other authorities can be found in the "Recommendations" section.

The causes and effects of floods are complex and interconnected; it can be difficult to anticipate where and when flooding will occur and what strategies can ensure community resilience. However, this guide provides a foundation of concepts that are appropriate for communities both unfamiliar and well-versed in flood hazard mitigation.

Flood Resilience Scorecard Data Companion

Many of the questions in this guide request data that is publicly available but often difficult to obtain, analyze, or interpret. To make these data more accessible to the users of the Flood Resilience Scorecard, the developers of this guide created the Flood Resilience Scorecard Data Companion.

The data companion is a separate document that contains 32 data points that serve as answers to questions in this guide. The data companion is specific to your community, with a unique document for all 72 counties and more than 600 cities and villages in the state. If you would like to access your data companion, contact Margaret Thelen, Climate and Health Program Coordinator at the Wisconsin Department of Health Services, at Margaret.Thelen@dhs.wisconsin.gov.

The 32 data points provided in the data companion are coded to align with the question number in this guide. For example, question E-B3 in this guide related to steep slopes can be answered with the information found in the data companion listed as E-B3. Questions in this guide that refer to information that can be found in the data companion will be noted with the symbol found to the right.

The data companion is currently only available for incorporated municipalities (cities and villages) and counties in Wisconsin. Other jurisdictions such as towns or watersheds are encouraged to use the Flood Resilience Scorecard using the Data Instruction Manual described below.



Flood Resilience Scorecard Data Instruction Manual

Although the Flood Resilience Scorecard Data Companion is only available for municipalities and counties in Wisconsin, other communities and jurisdictions such as towns and watersheds are encouraged to participate. In absence of the data companion, we created the Flood Resilience Scorecard Data Instruction Manual.

The data instruction manual details how to access the data required in a step-by-step walkthrough. For each question in this guide that contains the data companion logo shown above, you may also use the Data Instruction Manual to access the data for yourself. The data instruction manual is for users both with and without access to Geographic Information Systems (GIS).

Acknowledgments

This scorecard was initially developed by Haley Briel as a professional project for M.S. completion with the Department of Planning and Landscape Architecture at the University of Wisconsin–Madison. Further development of the guide, including its current iteration, has been completed by the Climate and Health Program at the Wisconsin Department of Health Services (DHS). Editing and professional expertise have been provided by:

- Asli Gocmen, Ken Genskow, and Jim LaGro, University of Wisconsin–Madison Urban and Regional Planning Department;
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- The Association of State Floodplain Managers;
- The Climate and Health Program’s Science Advisory Group members; and
- The University of Wisconsin Sea Grant Institute.

Many thanks are in order to these individuals and organizations for their insight in developing this guide. For questions or comments concerning this guide, please contact Margaret Thelen, Climate and Health Program Coordinator, at Margaret.Thelen@dhs.wisconsin.gov.

Module One: Environmental

Overview

Topographic, climatic and land cover features are key factors in assessing flood vulnerability for a region or municipality. The composition of the landscape itself, in addition to precipitation patterns, contributes to whether a community will experience recurrent flooding. The physical parameters assessed in this module include the following.

Precipitation patterns

- Precipitation patterns are determined by the volume, distribution, intensity, duration and frequency of rainfall events. They assess the ways in which water is distributed above and below the land surface.
- Rain is most damaging in events where high volumes of water fall over a short time period. These sorts of events are projected to increase in Wisconsin, so it is important that communities prepare for both current conditions and predicted future scenarios.

Slope and elevation

- Slope refers to the steepness of a land surface, and elevation is height above sea level.
- Flooding can destabilize hillside soils and cause landslides, especially during rain events, so development should be avoided on slopes and low-lying areas at the bottom of slopes to reduce damage.

Land Use and future development

- As communities develop, a larger portion of land is covered by impervious surfaces that do not allow water to flow through them and into the ground, leading to increased velocity of stormwater moving downstream and more flooding.
- Solutions such as implementing green infrastructure or requiring developers to create water storage elsewhere to compensate for their impervious surfacing can help reduce harmful floods.

Soils

- Soil can store excess water within pores to mitigate some effects of flooding; soils with larger pore space, like soils with high gravel content, allow floodwater to infiltrate the ground more rapidly.
- Vegetative cover can take in excess water through plant roots and help prevent surface soil erosion and runoff.

Agricultural Practices

- Certain agriculture practices can cause soil compaction, leading to less water storage capacity and erosion, which can pollute waterways and damage habitat.
- No-till or minimal till regimes, can help avoid compaction and erosion. No-till or minimal till regimes can help

Who Should Complete This Assessment?

One or more of the following individuals may be appropriate to conduct this assessment:

- Floodplain manager
- GIS technician
- Civil or city engineer
- Stormwater utility/public works
- City planner
- Regional planner or natural resources management staff



What will you need to complete this assessment?

- The Flood Resilience Data Companion for your community
- Maps of your community indicating locations of key infrastructure, such as hospitals, schools, and government buildings
- Topographic maps of your community indicating areas of high slope
- Flood Insurance Rate Maps (FIRMs) from FEMA
 - » A FIRM is an official map of a community on which FEMA has delineated both the special hazard areas and the risk premium zones applicable to the community.
 - » Full FIRM panels are 36”x25.875,” so most users prefer to print a smaller version called a FIRMette which is adapted to print on a standard home printer.
 - » Individual maps can be downloaded from msc.fema.gov by entering an address or place in the search bar. Then, click the “DYNAMIC MAP PRINT MAP/FIRMette” button to download and print your map or maps. Some communities may be small enough that their entire area is contained within one map.
- Land cover data
- Population projections
- Soil maps
- Community agricultural standards, requirements, and best management practices

Definitions

1% annual chance flood event: A flood event which has a 1 in 100 probability of being equaled or exceeded in any given year, also referred to as a 100-year flood or base flood.

Zone A: Areas subject to inundation by the 1% annual chance flood event. Detailed hydraulic analyses have not been performed, so no base flood elevations (BFEs) or flood depths are shown.

Zone AE: Areas subject to inundation by the 1% annual chance flood event determined by detailed methods. Base flood elevations (BFEs) are shown.

Base flood elevation (BFE): According to FEMA, “the elevation of surface water resulting from a flood that has a 1% chance of equaling or exceeding that level in any given year” (FEMA, 2020a). The BFE is a regulatory requirement for the elevation or floodproofing of structures. In Wisconsin, this may also be referred to as the regional flood elevation. Flood protection elevation is two feet above the regional flood elevation.

Best management practices: Best management practices (BMPs) are defined as “a practice, or combination of practices, that is determined to be an effective and practicable (including technological, economic, and institutional considerations) means” (North Carolina Forest Service, 2006) for meeting goals; for the purpose of this assessment, this goal is reducing flood impacts.

Clay: A very fine-grained soil consisting of particles less than 0.002 mm in diameter (Soil Science Society of America, 2008).

Cover crop: A crop planted primarily to manage soil erosion, fertility, quality, water, and biodiversity within an ecosystem. While they sometimes are harvested for yield, this is not their main function.

Critical infrastructure: Facilities that provide essential services and are necessary for community security, health and safety. This includes emergency shelters, nursing homes, public buildings, schools, hospitals, fire and rescue stations, police stations, water treatment/sewage processing plants, utilities, railroad stations, airports, government facilities and major roadways (Department of Homeland Security, 2020).

Environmental corridor: There are both primary and secondary environmental corridors. Primary environmental corridors are concentrations of significant natural resources at least 400 acres in area, at least two miles in length and at least 200 feet in width. Secondary environmental corridors are concentrations of significant natural resources at least 100 acres in area and at least one mile in length (Southeastern Wisconsin Regional Planning Commission, 2000).

FIRMs, or Flood Insurance Rate Maps: According to the FEMA website, “Official map of a community on which FEMA has delineated the Special Flood Hazard Areas, the Base Flood Elevations and the risk premium zones applicable to the community” (FEMA, 2020b).

FIRMette: A smaller version of a FIRM that is scaled to be printable on a normal home printer.

Flood fringe: A portion of floodplain outside of a floodway including 1% annual chance flood hazard zones and 0.2% annual chance flood hazard zones. Here, lands will likely be inundated in a \leq 0.2% annual chance flood. Buildings or fill here will replace open land areas that can store waters and may increase flood levels elsewhere.

Floodway: 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. Buildings or fill in this area will increase the BFE. Floodways are often labeled as “Zone A” (meaning 1% annual chance of flooding, no elevation data) or “Zone AE” (meaning 1% annual chance of flooding and elevation data available) on FIRMs.

Impervious surface: According to the Code of Federal Regulations, an “impervious surface” is that which does not permit the absorption of fluids. This largely includes human manufactured materials such as concrete, but may also include natural surfaces such as highly compacted clay soils or bedrock (Department of Agriculture, 2020).

Loam: A soil texture consisting of roughly equal portions of sand, silt and clay. It is considered to be moderately pervious.

Manure management plan: A plan created by facilities that have manure-producing animals or apply manure to crop fields. A manure management plan describes how the facility intends to store and apply manure so that it is used responsibly and cannot pollute nearby waterways.

No-till farming: Also referred to as zero tillage or direct drilling, no-till farming is a type of farming that either has limited or no mechanical agitation of the soil.

Nutrient management plan: A strategy developed by an agricultural producer to obtain maximum return from fertilizer resources in a manner that protects the quality of nearby water resources (University of Wisconsin, 1995).

Riparian buffer zone: Vegetated areas next to water resources that protect the water from nonpoint source pollution and provide bank stabilization and aquatic and wildlife habitat (North Carolina State Extension, 2017).

Rotational grazing: An agricultural practice in which livestock is moved between pastures in order to reduce overgrazing and soil compaction (Brantly, 2013).

Sand: A naturally occurring granular material composed of finely divided rock and mineral particles. It is defined by size, being finer than gravel and coarser than silt.

Silt: A soil texture that is larger than clay, but smaller than sand particles. Silt particles range between 0.0039 and 0.0625 millimeters.

V zones: Velocity zones subject to storm surge and wave action. Buildings here will likely be damaged or demolished in the event of a large storm unless constructed to certain high standards.

Wetland: A “wetland,” for the purposes of this document, is considered “an area where water is at, near or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation which has soils indicative of wet conditions” (Wisconsin State Statutes, 2019).



E-A) Precipitation Patterns

Information in this section is available in the Flood Resilience Scorecard Data Companion. You may also look for information related to precipitation trends and projections from the Wisconsin Initiative on Climate Change Impacts.

E-A1. Based on historic trends, how much average annual rainfall has your community received?

- A. 28–31 inches/year
- B. 31.01–34 inches/year
- C. 34.01–37 inches/year
- D. More than 37 inches a year



E-A2. What is the percentage increase in precipitation for your community since 1950?

- A. 0%
- B. 5%
- C. 10%
- D. 15% or more



E-A3. How is the frequency of heavy precipitation events anticipated to increase in your community?

- A. No increase predicted
- B. 0.4 to 2.0 days/decade
- C. 2.1–3.9 days per decade
- D. 4.0 or more days/decade



Scoring Precipitation Patterns

Review your responses to the questions in this section and sum the number of times you responded with each letter. Provide that number in the appropriate row to the right.

If you answered “c” or “d” to two or more questions, please refer to the Precipitation Patterns recommendations section on page 72.

Number of “a” answers: _____
Number of “b” answers: _____
Number of “c” answers: _____
Number of “d” answers: _____

E-B) Slope and Elevation

For this section, you should have a map of your community with critical infrastructure labeled. You should also have a topographic map indicating areas of steep slope (where the topographic lines are closest to one another). If this does not exist, a map indicating areas that have been known to erode or have landslides, even through anecdotal evidence, will suffice.

You will also need to download your community's Flood Insurance Rate Maps from FEMA. See directions for this in the box to the right.

Information in this section is available in the Flood Resilience Scorecard Data Companion.

Accessing Your Flood Insurance Rate Map

1. Visit FEMA's [National Flood Hazard Layer \(NFHL\) Viewer](#)
2. Zoom in to your community or type an address into the search bar in the top left
3. Click on the parcel of interest
4. Here you will be given the option to download county GIS data or download a PDF version of your map

E-B1. What portion of your community (total area) is located within a floodplain? This includes all areas zoned A or AE.

- A. We have no floodplain in our community.
- B. Less than 10% of the community is within a floodplain.
- C. Between 10–50% of the community is within a floodplain.
- D. More than half of the community is within a floodplain.



E-B2. Do critical structures (meaning hospitals, wastewater treatment centers, police stations and other structures essential to community function) fall within a floodplain?

- A. No critical structures are in a floodplain.
- B. One or two critical structures are in a floodplain.
- C. Multiple critical structures are in a floodplain.



E-B3. What portion of your community (total area) is located on steep slopes (here meaning a slope greater than 10 degrees)?

- A. We have no steep slopes in our community.
- B. Less than 10% of the community is on a steep slope
- C. Between 10–50% of the community is on a steep slope
- D. More than half of the community is on a steep slope



E-B4. Do critical structures (meaning hospitals, wastewater treatment centers, police stations and other structures essential to community function) fall on steep slopes (greater than ten degrees)?

- A. No critical structures are on a steep slope.
- B. One or two critical structures are on a steep slope.
- C. Multiple critical structures are on a steep slope.

E-B5. Has your community experienced landslides in the past 50 years?

- A. No, we have not had landslides.
- B. Yes, we have had minor landslides a few times.
- C. Yes, we have had minor landslides frequently.
- D. Yes, we have had at least one major landslide.
- E. Yes, we have had major landslides frequently.

Scoring slope and elevation

Review your responses to the questions in this section and sum the number of times you responded with each letter. Provide that number in the appropriate row to the right.

If you answered “c”, “d”, or “e” to three or more questions, please refer to the Slope & Elevation recommendations section on page 73.

Number of “a” answers: _____
Number of “b” answers: _____
Number of “c” answers: _____
Number of “d” answers: _____
Number of “e” answers: _____

E-C) Land use and future development

For this section you will need land cover data. Land cover information can be found using the Wisconsin DNR's [Wisconsin Community Canopy Cover](#) look-up tables.

Here, you can either look up all municipalities within a county, or look up your community directly in the drop-down menus. For questions, contact Dan Buckler or a member of the Urban Forestry Team at Wisconsin DNR (Daniel.Buckler@wisconsin.gov).

You also need anecdotal information about population increases or about total development projects approved over the past ten years.

Information in this section is available in the Flood Resilience Scorecard Data Companion.

E-C1. What percentage of your community is listed as impervious surface?

- A. Less than 10%
- B. Between 10–25%
- C. Between 25–40%
- D. Over 40%



E-C2. What percentage of your community is listed as tree and shrub or grass and herbaceous?

- A. Over 40 percent
- B. Between 25–40 percent
- C. Between 10–25 percent
- D. Less than 10 percent



E-C3. Does your community have lakes, ponds, wetlands or other natural storage features in your community?

- A. No, we do not have any such features.
- B. Yes, we have at least one of these features.
- C. Yes, they constitute a sizeable portion (at least 10%) of our community.

E-C4. Has the capacity for stormwater retention in these features been established?

- A. Yes, we have had professional engineering studies conducted to determine storage capacity of our water features.
- B. Yes, we have had professional engineering studies conducted to determine storage capacity for at least one, but not all of our water features.
- C. No, we have not conducted any professional engineering studies to determine storage capacity of our water features.

E-C5. Is preservation of existing trees or increasing tree cover encouraged during development and redevelopment in your community?

- A. Yes, the preservation of trees is encouraged during development and re development in your community.
- B. Trees are encouraged for future development of new parcels, but not for existing development
- C. Trees are not mentioned in our development guidelines

E-C6. Is preservation or increase of native vegetation encouraged during development and redevelopment in your community?

- A. Yes, the preservation and increase of native vegetation is encouraged during development and re development in your community.
- B. Native vegetation is encouraged for future development of new parcels, but not for existing development
- C. Native vegetation is not mentioned in our development guidelines.



E-C7. Does your community have any incentive programs for preserving or increasing tree cover and native vegetation?

- A. Yes, our community has a program to provide incentives.
- B. No, but we actively use a state or federal incentive program.
- C. No, we use no incentives program for this type of development.

E-C8. What is the rate of conversion from non-urban (agriculture, conservation, open space, recreation) to urban land uses (commercial, industrial, residential) over the past 10 years in your community?

- A. Little to no conversion
- B. Minimal conversion
- C. Extensive conversion

E-C9. Using population projections and anecdotal evidence, what is the anticipated rate of conversion from non-urban (agriculture, conservation, open space, recreation) to urban land uses (commercial, industrial, residential) over the next 20 years in your community?

- A. Little to no conversion (Less than 5% growth)
- B. Minimal conversion (5 to 10% growth)
- C. Extensive conversion (More than 10% growth)



E-C10. Have areas that are likely to experience development over the next 10 years been identified and mapped in your community?

- A. Yes
- B. Some, but not all
- C. No

E-C11. If yes, are these areas within the floodplain?

- A. No
- B. Some
- C. Yes

E-C12. Have environmental corridors been established within your community?

- A. Yes, and more are being developed
- B. Yes, at least one corridor exists
- C. No, no environmental corridors exist

Scoring land use and future development

Review your responses to the questions in this section and add the number of times you responded with each letter. Provide that number in the appropriate row to the right.

If you answered “C” or “D” to six or more questions, please refer to the land use and future development recommendations section on page 73.

Number of “A” answers: _____
Number of “B” answers: _____
Number of “C” answers: _____
Number of “D” answers: _____

E-D) Soils

Information in this section is available in the Flood Resilience Scorecard Data Companion. If you do not have access to the Flood Resilience Scorecard Data Companion for your community, use the Data Instruction Manual or the USDA’s Web Soil Survey to better understand the soils in your community and how they affect flood resilience. The directions to obtain these maps from the USDA’s Web Soil Survey are below.

To access the USDA’s Web Soil Survey:

1. Go to USDA’s [Web Soil Survey](#)
2. Select the green button that says “START WSS.”
3. Go to the “Area of Interest (AOI)” tab at the top left.
4. Under “Quick Navigation,” select on “Address.”
5. Type in the name of your community (ex. Platteville, Wisconsin) and select “View.”
6. Select on the icon with a red rectangle and AOI in it in the toolbar under “Area of Interest Interactive Map.”
7. Draw a rectangle that encompasses your community. (Note: if this isn’t perfect, that is okay. We are hoping to get a broad understanding of soils here.) This will create your area of interest.
8. Select the tab “Soil Map.” On the left-hand side of the screen, you will find a full list of soil types and their percentages in your area of interest. Note that this list is very comprehensive; if a soil type is listed as “Palsgrove silt loam, 2 to 6 percent slopes, moderately eroded,” for example, just consider it “silt loam.”

Soils can be categorized in a variety of ways. More permeable soils generally hold more water, meaning less runoff and greater flood resilience.

Soil type	Water permeability
Sand, loamy sand	Rapid and very rapid (>6 inches/hour)
Sandy loam	Moderately rapid (2-6 inches/hour)
Loam, silt loam	Moderate (0.6-2 inches/hour)
Sandy clay loam	Moderately slow (0.2-0.6 inches/hour)
Clay loam, silty clay loam	Moderately slow (0.2-0.6 inches/hour)
Sandy clay	Moderately slow (0.2-0.6 inches/hour)
Silty clay, clay	Very slow and slow (<0.2 inches/hour)

Table adapted from the Missouri Department of Elementary and Secondary Education “Soils Interpretation Help Sheet” (Missouri Department of Elementary and Secondary Education, 2008)

E-D1. What percentage of your community has poorly drained soils?

- A. Less than 5%
- B. Less than 10%
- C. Between 10–30%
- D. Between 30–50%
- E. More than 50%



E-D2. What percentage of your community has very poorly drained soils?

- A. None (0%)
- B. Less than 5%
- C. Between 5–10%
- D. More than 10%



E-D3. What percentage of your community contains soils with low (bottom quartile) available water storage?

- A. Less than 5%
- B. Less than 10%
- C. Between 10–30%
- D. Between 30–50%
- E. More than 50%



Scoring soils

Review your responses to the questions in this section and add the number of times you responded with each letter. Provide that number in the appropriate row to the right.

If you answered "C", "D", or "E" to two or more questions, please refer to the Soils recommendations section on page 74.

Number of "A" answers: _____

Number of "B" answers: _____

Number of "C" answers: _____

Number of "D" answers: _____

Number of "E" answers: _____

E-E) Agricultural practices

For the section below, you will need to review your community's agricultural standards and requirements. While your community may not have specific regulations, you may fall under the jurisdiction of county-level regulations. You may find this information on your county's website. Contact your county conservation officer or the Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP) for more information. This section is most relevant for counties, but municipalities may choose to complete it as well.

Information in this section is available in the Flood Resilience Scorecard Data Companion.

E-E1. Does your community have a significant amount (over 10%) of pasture or cropland?

- A. Yes
- B. No

If you answered "No" to this question, skip to Module Two.



E-E2. Are agricultural best management practices (BMPs) promoted or enforced that reduce erosion, limit compaction, and/or promote infiltration?

- A. Financial incentives exist to implement them
- B. Outreach efforts exist to promote them
- C. They are permitted but not promoted
- D. They are not mentioned in any plans

E-E3. Does your community provide resources to producers in order to reduce erosion, limit compaction, and/or promote infiltration? This can include:

- Funding staff time to educate farmers on nonpoint source pollution BMPs and cost-share opportunities funding BMP installation.
- Enforcing an ordinance regulating manure and biosolids being stored and spread for agricultural purposes.
- Providing training on nutrient management plan development and implementation.

- A. We do all of the above and more
- B. We do all of the above
- C. We do one of the above, or we do something related but not listed here
- D. We do none of the above

E-E4. How commonly do agricultural producers in and around your community use practices to reduce erosion, limit compaction, and/or promote infiltration? These practices can include:

- No till
- Riparian buffer zones
- Cover crops
- Rotational or managed grazing
- Contour strip cropping

- A. Almost all producers implement these practices
- B. Most producers implement these practices
- C. Very few producers implement these practices
- D. These practices are uncommon in our community



E-E5. Does your community provide cost sharing, tax reductions, or other incentives to encourage agricultural practices that reduce erosion, limit compaction, and/or promote infiltration?

- A. Yes, these programs are funded enough to meet demand.
- B. Yes, we provide some financial support for these programs.
- C. No, but we have staff that can provide technical assistance to implement these practices.
- D. No, we provide no support for these programs beyond what is provided by state and federal dollars.

E-E6. Does your community use any land use regulations or tools to preserve farmland? This can include farmland preservation zoning, transfer of development rights, and conservation easements.

- A. Yes, we actively use at least one tool to preserve farmland.
- B. We have these tools available, but they are not widely used.
- C. We encourage preservation but don't have any regulations or incentives to ensure it.
- D. No, we don't actively engage in farmland preservation.

E-E7. What percentage of cropland acres in your county are under a Nutrient Management Plan?

- A. More than 50%
- B. Between 35–50%
- C. Between 10–35%
- D. Less than 10%



Scoring agricultural practices

Review your responses to the questions in this section and add the number of times you responded with each letter. Provide that number in the appropriate row to the right.

If you answered "C", "D", "E", or "F" to three or more questions, please refer to the Agricultural Practices recommendations section on page 74.

Number of "A" answers: _____

Number of "B" answers: _____

Number of "C" answers: _____

Number of "D" answers: _____

Number of "E" answers: _____

Number of "F" answers: _____

Module Two: Institutional

Overview

Planning and mitigation are less costly and more efficient approaches to building resilience than response and recovery. Successful planning relies on coordination across multiple levels of government and organizations, strong community plans, and well-informed floodplain regulation. The institutional parameters to be assessed in this portion of the scorecard include:

Resource inventory and mapping

- Up-to-date maps of floodplains, flood hazards, and past flood impacts are important to community development and emergency response planning and can inform policy and regulation so as to best prevent future property damage and loss.
- Enrollment in FEMA's National Flood Insurance Program (NFIP) and Community Rating System provide protection for community members and property by providing flood insurance commonly left out of regular homeowners insurance and incentivizing flood mitigation practices.

Plan quality and coordination

- Having consistent maps, language, and regulations around flooding across all community plans strengthens future planning and limits confusion.
- Including an array of different stakeholders, departments, and expertise in community planning will move your community toward a more comprehensive and holistic approach to flood resilience.

Staff and technological capacity

- Having your staff trained in floodplain management or collaborating with trained staff within your region allows your community to plan for flooding with the most up-to-date and well-informed practices.
- Access to geographic information systems (GIS) or other mapping technology in your community or through regional connections is essential to flood mitigation planning.

Tools

- In a time when infrastructure across the country is in disrepair, making sure to closely monitor existing gray infrastructure and implement green infrastructure whenever possible in future development helps build flood resilience.
- Outside of infrastructure, your community can also implement numerous non-structural policy tools that regulate and incentivize proper floodplain and stormwater management.

Implementation and enforcement

- Having a sound process to assess properties deemed "Substantially Damaged" by FEMA is important in order to get the best relief and support possible after a flood event.
- Having flood resilience goals can help your community streamline, prioritize, and collaborate effectively around flood mitigation and management.

Who should complete this assessment?

One or more individuals from the following groups may be appropriate to conduct this assessment:

- City planning staff
- Community development staff
- Economic development staff

Alternatively, whoever knows the most about your community plans (for example comprehensive plan, hazard mitigation plan, area plans, transit plans) could complete this section.

What will you need to complete this assessment?

- The Flood Resilience Scorecard Data Companion or the Data Instruction Manual
- All land-use-related community plans, such as your stormwater management plan, comprehensive plan, and so on
- Flood Insurance Rate Maps (FIRMs) from FEMA
 - » A FIRM is an official map of a community on which FEMA has delineated both the special hazard areas and the risk premium zones applicable to the community.
 - » Full FIRM panels are 36”x25.875,” so most users prefer to print a smaller selected version called a FIRMette, which is adapted to print on a standard home printer.
 - » Individual maps can be downloaded from [the FEMA Flood Map Service Center webpage](#) by entering an address or place in the search bar. Then, select **DYNAMIC MAP PRINT MAP/ FIRMette** to download and print your map or maps. Some communities may be small enough that their entire area is contained within one map.
- Any other flood-related maps within your community plans and/or reports
- Flood or hazard mitigation-related policies
- Knowledge of the status of both current and planned green and gray infrastructure within your community



Definitions

A Zone: areas subject to inundation by the 1% annual chance flood event. Detailed hydraulic analyses have not been performed, so no base flood elevations (BFEs) or flood depths are shown.

Best Management Practices: Best management practices (BMPs) are defined by the North Carolina Forest Service as “a practice, or combination of practices, that is determined to be an effective and practicable (including technological, economic, and institutional considerations) means” for meeting goals; for the purpose of this assessment, this goal is reducing flood damage.

Certified Floodplain Manager (CFM): a national floodplain management certification program administered by the Association of State Floodplain Managers (ASFPM). A floodplain manager is a professional trained in strategies and policies to reduce flood losses and protect natural resources and functions of floodplains.

Channel modification: human-induced changes to the natural flow and location of a stream channel

Closed-basin lakes: lakes that have either a small outlet or no outlet and may remain above flood stage for years

Coastal erosion: the wearing away of material from a coastal profile, including the removal of beach, sand dunes or sediment by wave action, tidal currents, wave currents, drainage or high winds

Combined sewer system (CSS): a system that is designed to collect rainwater runoff, domestic sewage and industrial wastewater in the same pipe (US EPA, 2020)

Combined sewer overflow (CSO): When the volume of wastewater exceeds the capacity of a CSS (e.g., during heavy rainfall events or snowmelt), untreated stormwater and wastewater overflow and discharge into nearby streams, rivers and water bodies, which has negative implications for local water quality (US EPA, 2020).

Community Rating System (CRS): a program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP (defined below) standards

Dam failure inundation area: the area that would be flooded if a dam were to be damaged and no longer function

Emergency Action Plan: A written document required by particular OSHA standards to facilitate and organize employer and employee actions during workplace emergencies, including floods.

Future conditions hydrology: Flood discharges are modeled and mapped by communities based on projected land use conditions, not just current conditions. More information can be found in the FEMA document “Modernizing FEMA’s Flood Hazard Mapping Program: Recommendations for Using Future-Conditions Hydrology for the National Flood Insurance Program.”

Geographic information system (GIS): software designed to store, retrieve, manage, display and analyze all types of geographic and spatial data

Green infrastructure: A flood management technique that uses vegetation, soils and other elements and practices to enhance on-site stormwater infiltration and treatment utilizing natural processes. These techniques can be used in partnership with traditional gray infrastructure, such as dams and levees.

Green roof: a flat or slightly sloped building roof that is partially or completely covered with vegetation and a growing medium, planted over a waterproof membrane

Hazus: A nationally applicable standardized methodology developed by FEMA that contains models for estimating potential losses from earthquakes, floods and hurricanes. It uses GIS technology to estimate physical, economic and

social impacts of disasters.

Ice jam: Pieces of floating ice carried with a stream's current can accumulate and create an obstruction to streamflow which is called an ice jam. They generally develop near river bends, mouths of tributaries, points where the river slope decreases, downstream of dams and upstream of bridges or obstructions (National Weather Service, n.d.).

Land subsidence: the gradual settling or sudden sinking of the Earth's surface due to subsurface movement of earth materials (United States Geological Survey, 2020)

Mudflow: a river of liquid mud similar in consistency to a milkshake

National Flood Insurance Program (NFIP): A federal program administered by FEMA that enables property owners in participating communities to purchase insurance against flood losses, in return for that community adhering to certain development regulations.

Open space zoning district: A zoning strategy that requires new construction on a parcel to be located on only a portion—typically half—of the parcel. The remaining open space is permanently protected under a conservation easement (Arendt, 1992)

Permeable pavement: an alternative paving surface that allows stormwater runoff to filter through voids in the pavement surface into an underlying stone reservoir, where it is temporarily stored and/or infiltrated

Rain garden: a garden of native shrubs, perennials and flowers planted in a small depression, designed to temporarily hold and soak in rain water runoff that flows from roofs, driveways, patios or lawns

Repetitive loss property: any insurable building for which two or more claims of more than \$1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling 10-year period, since 1978

River erosion: the wearing away of rock and soil found along the riverbed and banks

Stormwater management plan: a plan made by a community to identify potential sources of stormwater pollution on a construction, industrial or municipal site and describe best management practices to reduce pollutants in stormwater discharge from these sites

Substantially damaged: In Wisconsin, a property is considered substantially damaged if the cost of repairs is 50% or more of the structure's equalized assessed value as listed before the damage occurred (Wisconsin Department of Natural Resources, n.d.).

Uncertain flow paths: alluvial fans, movable bed streams or other floodplains where the channel moves during a flood

V Zone: Velocity zones subject to storm surge and wave action. Buildings located here will likely be damaged or demolished unless constructed to certain high standards.

I-A) Resource Inventory & Mapping

This section includes an assessment of your community’s up-to-date flood maps, historical records, and other background information necessary to inform planning for the future.

For this section you will need to find your community’s Flood Insurance Rate Maps (FIRMs); please visit the [FEMA Map Service Center](#).

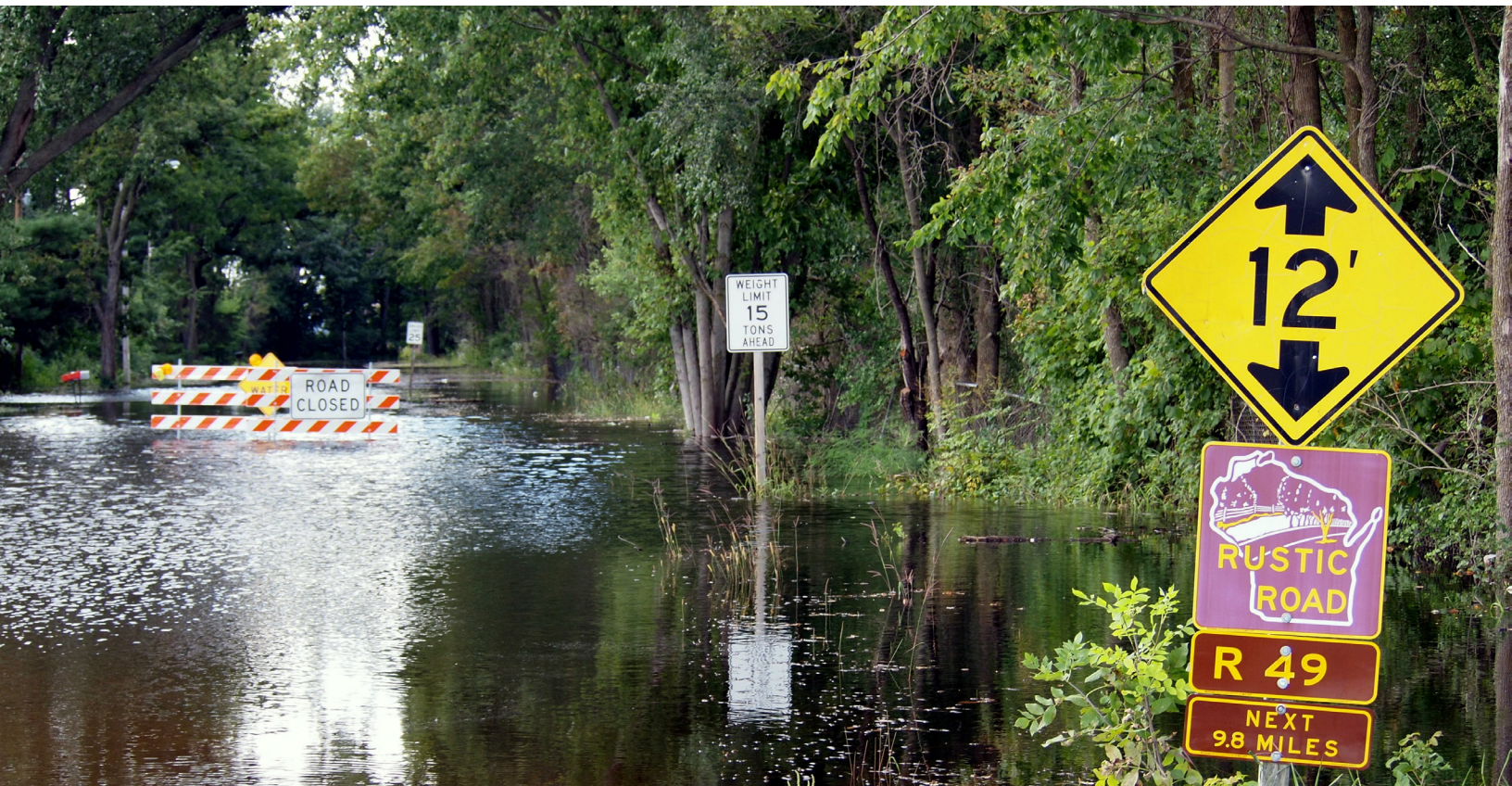
Here, you can input an address or set of longitude and latitude coordinates to focus in on your community, and you will be directed to your FIRMs. There may be more than one, depending on the size of your area of interest.

On the map itself, there is a date listed that indicates the most recent update of your map (it is indicated as “eff. 2/3/2016”). In this example, the FIRM for this selected area was last updated February 3, 2016. This is important for evaluating whether another update is necessary.

To complete this section, it may also be helpful to have any other flood-related maps delineated for your community and your floodplain management policies.

I-A1. Does your community have a Flood Insurance Rate Map(s)?

- A. Yes, and it has been updated <5 years ago.
- B. Yes, but it hasn’t been updated in >5 years.
- C. Yes, but only part of our community has been mapped.
- D. No, we have no flood hazard map of any kind.



I-A2. How frequently have major flood events impacted your community in the past ten years?

- A. Never
- B. Infrequently
- C. Approximately every other year
- D. At least once a year

I-A3. Has your community mapped the extent of previous flood events?

- A. Yes, all previous floods have been mapped and documented.
- B. Yes, some of the previous floods have been mapped and documented.
- C. Previous flood extents have been documented but not mapped.
- D. Previous flood extents have been neither documented nor mapped.

I-A4. Does your community participate in the National Flood Insurance Program (NFIP)?

- A. Yes, and we are in full compliance.
- B. Yes, but we are not in full compliance.
- C. No, but we have considered participating or did previously.
- D. No, we have never explored this option.



I-A5. How many NFIP policies are in force in your community?

- A. None
- B. Less than five
- C. Between five and 50
- D. More than 50



I-A6. What is the total coverage of your community's NFIP policies in force?

- A. None
- B. Less than \$1 million
- C. Between \$1–\$5 million
- D. More than \$5 million



I-A7. How many NFIP claims have been filed in your community?

- A. None
- B. Less than 10
- C. Between 10–50
- D. More than 50



I-A8. Does your community participate in the Community Rating System program through the National Flood Insurance Program (NFIP)?

- A. Yes, it does.
- B. No, but we have considered participating or did previously.
- C. No, we have never explored this option.



I-A9. In your community, has a plan, including funding and designated staff or a responsible department, been designated to keep flood hazard maps up to date?

- A. Yes, there is a plan or policy that designates both funding and staff, or responsible department to update hazard maps.
- B. Yes, there is a plan or policy that designates either funding or staff, or responsible department, but not both.
- C. Updating flood maps is mentioned in our plans, but with no specifics as to funding or staff/responsible department.
- D. We do not take an active role in updating flood maps.

I-A10. Does your community require that developers provide detailed flood data (base flood elevation data), particularly if they are developing within a flood zone?

- A. Yes, we require developers to provide flood data for all size developments anywhere in the community, not just the floodplain.
- B. Yes, we require development anywhere in the community to provide flood data, but only for larger developments and not residential homes.
- C. Yes, we require developers to provide flood data, but only within floodplain zones.
- D. No, we do not require developers to provide flood data.

I-A11. Are you aware of any of the following flood-related hazards affecting your community?

- Uncertain flow paths
- Closed-basin lakes
- Ice jams
- Debris and sediment blockage
- Land subsidence
- Mudflow hazards
- Dam failure inundation
- Coastal erosion
- River erosion
- Channel modification

- A. Yes
- B. No
- C. Unsure

I-A12. If yes, how many of the flood-related hazards that affect your community have you mapped?

- A. We have mapped all flood-related hazards that affect our community.
- B. We have mapped some of these hazards.
- C. We have not mapped these hazards.

Scoring resource inventory and mapping

Review your responses to the questions in this section and add the number of times you responded with each letter. Provide that number in the appropriate row to the right.

If you answered “C”, “D”, or “E” to six or more questions, please refer to the Resource Inventory & Mapping recommendations section on page 76.

Number of “A” answers: _____

Number of “B” answers: _____

Number of “C” answers: _____

Number of “D” answers: _____

Number of “E” answers: _____

I-B) Plan quality and coordination

For this section, you will need to assemble all of your community plans, zoning code, and ordinances. These may include comprehensive land use plans, transportation plans, economic development plans, downtown improvement plans, historic district plans, coastal zone management plans, watershed management plans, and so on.

List the plans your community uses below:

Plan name	Identifies current flood-prone zones	Identifies future flood-prone zones	Restricts damage-prone development in such zones
Plan 1:			
Plan 2:			
Plan 3:			
Plan 4:			
Plan 5:			
Plan 6:			
Plan 7:			
Plan 8:			

I-B1. How many of your community's plans identify current flood-prone zones?

- A. All of them
- B. Some of them
- C. None

I-B2. How many of your community's plans identify future flood-prone zones?

- A. All of them
- B. Some of them
- C. None

I-B3. How many of your community's plans suggest restricting development in flood-prone zones, current or future?

- A. All of them
- B. Over half of them
- C. Less than half of them
- D. None

I-B4. Is there a designated floodplain management plan in your community?

- A. Yes, and it has been updated in the past five years.
- B. Yes, but it has not been updated in the past five years.
- C. No, but there are elements of floodplain management included in our other plans.
- D. No, no such plan or plan elements exist.

I-B5. Are floodplains in your community designated as an open space zoning district (such as recreation or conservation) that will limit flood damage?

- A. Yes, all areas within the floodplain are zoned to limit development.
- B. Some, but not all, of the floodplain is zoned to limit development.
- C. No, floodplains are not zoned to limit flood damage.

I-B6. Is there a community-wide open space or parks plan that specifies the role of open space in stormwater management?

- A. Yes, and it has been updated in the past five years.
- B. Yes, but it has not been updated in the past five years.
- C. No, but there are elements of open space and stormwater management included in our other plans.
- D. No, no such plan or plan elements exist.



I-B7. Are designated stormwater management plans required from developers in your community?

- A. Yes, stormwater management plans are required of developers.
- B. Stormwater management plans are required of developers in flood zones or for larger developments.
- C. No, we do not require stormwater management plans from developers in our community.

I-B8. How frequently do your departments communicate on stormwater planning and issues to develop compatible messages and goals concerning stormwater?

- A. Extensive efforts have been made to coordinate messaging and goals.
- B. Some efforts have been made to coordinate messaging and goals.
- C. No efforts have been made to coordinate messaging and goals.

I-B9. Does the community involve staff with scientific training in water issues when developing comprehensive land use plans?

- A. Always
- B. Sometimes
- C. No



I-B10. Are regular interdepartmental meetings or trainings held regarding flood-based issues in your community?

- A. Yes, once a year or more.
- B. These meetings are only held as issues emerge.
- C. We rarely host such meetings, but have in the past.
- D. No, these sorts of meetings are not held.

I-B11. Do you work with other governmental agencies or other communities on water-related hazards projects?

- A. Yes
- B. We have before, but it is inconsistent
- C. No

I-B12. Are your community's comprehensive plans, stormwater reports and other water resources management documents easily accessible to the public and officials?

- A. Yes, these documents are available and easy to locate online for public and official use.
- B. Yes, these documents are available, but only upon request.
- C. No, these documents are available for officials, but not for the public.
- D. No, these documents are difficult to access or do not exist at all.

Scoring plan quality and coordination

Review your responses to the questions in this section and sum the number of times you responded with each letter. Provide that number in the appropriate row to the right.

If you answered "C", "D", or "E" to seven or more questions, please refer to the Plan Quality & Coordination recommendations section on page 76.

Number of "A" answers: _____

Number of "B" answers: _____

Number of "C" answers: _____

Number of "D" answers: _____

Number of "E" answers: _____

I-C) Staff and technological capacity

For this section, you will need to review flood-related policies and descriptions of staff responsibilities to determine roles and functions related to flooding. While you don't need specific materials, you may need to consult community plans.

I-C1. Does your community have a designated department to address flooding issues?

- A. Yes, one specific department has been identified to address flooding issues.
- B. No, but specific employees from multiple departments have been identified to address flooding issues.
- C. No, responsible departments are not identified until a flooding event has already happened.

I-C2. Does your community have staff to perform site assessments specifically to evaluate flood potential?

- A. Yes, we have designated staff to perform site assessments.
- B. No, but we have performed site assessments in the past.
- C. No, we do not perform site assessments.

I-C3. Does your community have any individuals on staff who have completed the Certified Floodplain Manager (CFM) program through the Association of State Floodplain Managers?

- A. Yes, we have at least one CFM on staff.
- B. No, but we consult with at least one CFM at a regional or county level.
- C. No, we do not have access to a CFM.

I-C4. Does your community have access to geographic information system (GIS) software or other mapping technology?

- A. Yes, at least one department has access to GIS and has committed full time staff trained in it.
- B. Yes, at least one department has access to GIS, but it has limited training or capacity to use the software.
- C. No, but we have had some analyses done previously in GIS by an external partner.
- D. No, we have no staff or software to support mapping in-house, nor have such maps been made.

I-C5. If yes, have you used tools in GIS including the Flood Loss Estimation Model or FEMA's Hazus?

- A. Yes, we have explored and used additional flood-specific tools through GIS.
- B. Yes, we have at least explored additional flood-specific tools.
- C. No, we have not explored these options in GIS.



I-C6. Has your community worked in collaboration with other regional partners to enhance staff and technological capacity?

- A. Yes, we frequently work closely with regional partners on projects.
- B. Yes, we have reached out to at least one regional partner to initiate collaboration.
- C. No, we have not made attempts to coordinate with regional partners for flood resilience.

Scoring staff and technological capacity

Review your responses to the questions in this section and add the number of times you responded with each letter. Provide that number in the appropriate row to the right.

If you answered “C” or “D” to three or more questions, please refer to the Staff & Technological Capacity recommendations section on page 77.

Number of “A” answers: _____

Number of “B” answers: _____

Number of “C” answers: _____

Number of “D” answers: _____

I-D) Tools

For this section, you will need knowledge of both structural (physical infrastructure such as dams and rain gardens) and non-structural (policies and regulations) tools related to flooding. This may just be common knowledge among your staff or contained within community plans.

Structural

I-D1. Does your community have a combined sewer system (CSS)?

- A. Yes
- B. No



I-D2. If yes, has your community experienced a combined sewer overflow (CSO)?

- A. No, this has never been a problem in our community.
- B. Yes, it has happened, but more than ten years ago.
- C. Yes, it happens, but not regularly.
- D. Yes, this happens at least once a year.



Incentivizing and promoting green infrastructure

I-D3. Are green infrastructure strategies such as green roofs and permeable pavement permitted and encouraged in your community's plans?

- A. Yes, they are actively encouraged.
- B. Yes, they are permitted.
- C. Some but not all are permitted.
- D. Green infrastructure is not mentioned in our plans.

I-D4. Do your community's transportation plans promote green infrastructure in new street design?

- A. Yes, it is actively encouraged.
- B. Yes, it is permitted.
- C. Green infrastructure is not mentioned in our street design policies.

I-D5. Does your community analyze sites for possible redevelopment as green infrastructure sites?

- A. Yes, sites have been both identified and redeveloped into green infrastructure sites already.
- B. Yes, sites have been identified, but not yet redeveloped.
- C. We have redeveloped sites for green infrastructure in the past.
- D. No, this is not our practice.



I-D6. Does your community have demonstration sites for green infrastructure such as rain gardens or green roofs to use as educational tools to inform the public of benefits?

- A. Yes, we have at least one such demonstration site.
- B. No, but we have other resources where people can learn more about green infrastructure.
- C. No, we do not have or promote any sites.

I-D7. Does your community have an incentive for businesses or individuals who adopt stormwater conservation or green infrastructure practices?

- A. Yes, we sponsor and publicize our own program.
- B. Yes, we promote and publicize a program from another organization.
- C. No, we have no such program.

Gray infrastructure

I-D8. Are there structural flood barriers, such as dams, levees, floodwalls, or berms within your community?

- A. No
- B. Unsure
- C. Yes



I-D9. Have these structures been evaluated for structural stability?

- A. Yes, all structures have been evaluated by an engineer within the past five years.
- B. Yes, some structures have been evaluated by an engineer within the past five years.
- C. Yes, all structures have been evaluated, but not within the past five years.
- D. Yes, some structures have been evaluated, but not within the past five years.
- E. No, structures have not been evaluated professionally at any point.

I-D10. Are these structures sound and able to manage the amount of stormwater they were initially designed for?

- A. Yes, all structures are structurally sound.
- B. Yes, most structures are structurally sound.
- C. No, most or all structures are insufficient or damaged.
- D. We have not conducted such an analysis.



I-D11. Is there an established, regular schedule and designated staff to reevaluate structural stability, based on clear criteria?

- A. Yes, there is designated staff to reevaluate flood structures on an annual basis.
- B. Yes, there is designated staff to reevaluate flood structures, but this is not conducted on any regular schedule.
- C. Yes, there is either designated staff or a regular schedule, but not both.
- D. Flood structure evaluations are only conducted after a flood event has occurred.

I-D12. Does your community have emergency action plans to prepare downstream communities if a structural failure were to occur?

- A. Yes, such a plan exists and community members have access to it.
- B. Yes, such a plan exists, but it is only accessible upon request.
- C. Yes, but the plan has not been updated in the past 5 years.
- D. No, such a plan does not exist.

Non-structural

Do you participate in any of the following land use regulatory strategies for land known to be flood prone?

	A. Yes, we have implemented that practice.	B. Yes, our plans call for that strategy to be used.	C. Our plans do not specify this strategy, but we have used it in the past.	D. We have not implemented this strategy and it is not mentioned in our plans.
I-D13. Buyouts of flood-prone land				
I-D14. Cluster development				
I-D15. Transfer of development rights				
I-D16. Requiring on-site compensatory storage				
I-D17. Directed downspouts to pervious areas				
I-D18. Stormwater impact fees				

I-D19. Do you prohibit any residential or commercial development in floodplains?

- A. We do not have floodplains in our community.
- B. Development is regulated at least to NFIP standards.
- C. No types of development are banned.

Scoring tools

Review your responses to the questions in this section and sum the number of times you responded with each letter. Provide that number in the appropriate row to the right.

If you answered "C", "D", or "E" to 13 or more questions, please refer to the Tools recommendations section on page 78.

Number of "A" answers: _____

Number of "B" answers: _____

Number of "C" answers: _____

Number of "D" answers: _____

Number of "E" answers: _____

I-E) Implementation and enforcement

For this section, you will need to know about your community's procedures for evaluating flood damage and the long-term planning process. No specific materials are required; you should rely on local knowledge.

I-E1. Does your community have clear, regularly updated evacuation plans for all regions of your community?

- A. Yes
- B. Some, but not all areas
- C. No

I-E2. How many repetitive loss structures are in your community?

- A. Zero
- B. Three structures or fewer
- C. Four–10 structures
- D. More than 10 structures



I-E3. Does your community have a process to determine whether a home has been “substantially damaged” following a flood event? (for example, FEMA Residential Substantial Damage Estimator program)

- A. Yes, it does.
- B. No, but the community works with county or regional resources to fill this need.
- C. No, it does not.

I-E4. Does your community have dedicated staff for evaluating flood damage? If you select "C" or "D", skip to question I-E6.

- A. Yes, the community has regular dedicated staff with the explicit duty of evaluating flood damage.
- B. No, but the community works with county or regional resources to fill this need.
- C. No, the community has not had flooding that necessitates this staff.
- D. No, the community needs this staff but does not have them.

I-E5. What is done after a property is evaluated and deemed substantially damaged in your community?

- A. The property is required to convert to open space or other low-impact development.
- B. The house may be rebuilt, but to state or NFIP standards.
- C. The house may be rebuilt structurally as it was before the flooding.
- D. There is no standardized protocol for this situation.

I-E6. Is there a system in place in your community to reevaluate flood policies over time and ensure they have been successful?

- A. Yes, the community reevaluates policies regularly and updates them with new information.
- B. Yes, the community has reevaluated policies, but not in recent years.
- C. No, the community does not have a system to regularly reevaluate flood policies.

I-E7. Has your community established specific and quantifiable flood resilience goals?

- A. Yes, the community has established goals that are both specific and quantifiable.
- B. Yes, the community has established goals, but they are broad and not quantifiable.
- C. No, the community has not established clear flood resilience goals.

I-E8. Has your community established funding sources and strategies, both long and short term, to meet identified goals?

- A. Yes, the community has a clear idea of where flood resilience funding will come from for the long term.
- B. Yes, the community has a clear idea of where flood resilience funding will come from over the short term, but not the long term.
- C. No, the community has not established funding sources or strategies for the future.

Scoring implementation and enforcement

Review your responses to the questions in this section and sum the number of times you responded with each letter. Provide that number in the appropriate row to the right.

If you answered "C" or "D" to four or more questions, please refer to the Implementation & Enforcement recommendations section on page 79.

Number of "A" answers: _____

Number of "B" answers: _____

Number of "C" answers: _____

Number of "D" answers: _____

Module Three: Social

Overview

The socioeconomic and cultural sources of vulnerability affect a community's ability to withstand and recover from flood damage. Understanding flooding's effects on health can also help a community develop a more holistic and equitable approach to resiliency. Many social factors related to flood vulnerability are correlated and interconnected. We have chosen a few select topics for which data can be accessed by the public; however, knowledge of local conditions is essential for creating a full picture of your community's social vulnerability.

The social parameters to be assessed in this portion of the scorecard include:

Sociodemographic characteristics

- Assessing the social vulnerabilities of your community is essential to understanding the community's overall flood vulnerability.
- Understanding who the most vulnerable groups in your community are the least likely to be able to access resources to prepare for or recover from a flooding emergency.

Transportation and Housing

- Members of your community, especially the most vulnerable, will need transportation to emergency facilities and/or access to emergency supplies in the case of a flood.
- The overall state of housing may influence how much damage could occur in the case of a flood. Usually, older houses are less structurally sound and were not built with intense precipitation events in mind.

Health indicators

- Flooding can have both short-term and long-term health consequences and has the potential to affect all aspects of a person's health; therefore, access to medical care determines overall emergency flood preparedness and response.
- Knowing the capacity of your health care providers in emergency situations is crucial to determining if you will need to coordinate support for your health facilities and/or transportation to health facilities outside of your community.

Community Partnerships

- Engaging at-risk populations through local committees or advisory groups helps ensure more equitable and holistic community planning and emergency response.
- Having supportive resources available to community members can help keep them safe, financially support them, and help rebuild during and after a flood.

Education and Outreach

- Having shared language around flooding and ensuring access to the best information and educational materials available opens doors for community members to engage in flood preparedness efforts.
- Providing these spaces for community members to share their flood concerns will inform which kinds of information and support to make available to them.

Health Impacts of Flooding (Du et al., 2010)

Immediate consequences

- Drowning
- Electrocution
- Hypothermia
- Lack of access to medical records prescription drugs or electric medical equipment (e.g., respirators)
- Contact with sewage-related pathogens
- Contact with waterborne vectors (e.g., mosquitoes)

Long-term consequences

- Mold induced asthma
- Injuries while making repairs to flood damage
- Spread of communicable diseases in shelters
- Financial burden of recovery— strains resources for healthy food and routine healthcare
- Physiological effects
- Mental health and post-traumatic stress

Who should complete this assessment?

One or more of the following groups may be appropriate to conduct this assessment:

- Urban planners
- Local public health officials
- Emergency management
- Community development staff
- Community organizers
- Representatives from community partnerships or non-profits

What will you need to complete this assessment?

- The Flood Resilience Scorecard Data Companion for your community or the Data Instruction Manual.
- The Center for Disease Control’s [Social Vulnerability Index](#) (SVI) rankings for your community.
- Census data or the most recent demographic data for your community. Ideally, the most recent American Community Survey or decennial census data should be used when possible. This can be found at data.census.gov.
- Maps showing or local knowledge of the distribution of priority populations within your community.
- Local knowledge of community partnerships, collaborations, and outreach occurring that may support your community in the event of a flood.

Definitions

Ambulatory care sensitive condition: Conditions for which good outpatient care can potentially prevent the need for hospitalization, or for which early intervention can prevent complications or more severe disease (Agency for Healthcare Research and Quality, 2001).

Composite index: Formed when individual indicators, such as poverty and minority status, among others, are compiled into a single index on the basis of an underlying model. The composite index should ideally measure multidimensional concepts that cannot be captured by a single indicator (Organisation for Economic Co-Operation and Development, 2013). The CDC’s Social Vulnerability Index is an example of a composite index.

Cost burdened: According to the US Department of Housing and Urban Development, a household is cost burdened when over 30% of income is dedicated to housing costs. However, this measure has been contested and may not be appropriate for your community (PD&R Edge, 2014).

Culturally significant landmarks: Structures or buildings that contribute to the sense of community, history, or tradition within your community. Examples may include monuments, historical buildings, or museums.

Priority populations: Populations that may be at higher risk for adverse flood outcomes based on sociodemographic features and should therefore be prioritized for financial and technical assistance. Examples include older adults, low-income individuals, and communities of color.

Social vulnerability: The sociodemographic characteristics of a person or community, such as access to a vehicle or English language proficiency, that affect their capacity to anticipate, confront, repair, and recover from the effects of a disaster.

Sociodemographic: A combination of socioeconomic and demographic characteristics

S-A) Sociodemographic characteristics

For this section, you will be using the Center for Disease Control's SVI. This is an interactive, online tool that can assess the vulnerability of your census tract or county in five different ways: 1) overall vulnerability, 2) socioeconomic theme, 3) household composition and disability theme, 4) minority status and language theme, and 5) housing and transportation theme. The Flood Resilience Scorecard Data Companion contains the data for your community, but you may want to familiarize yourself with this online tool to better understand social vulnerability in your community.

This tool is intended to provide a broad view of social vulnerability at a population level. For a more specific understanding of your vulnerable communities and how they are spatially distributed, you may choose to download the [SVI data](#) and conduct a GIS analysis to isolate variables of interest as well as estimated counts for individual variables constituting each theme.

This section uses the socioeconomic theme, household composition/disability theme and minority status/language themes specifically.

For questions 1 and 2, check “socioeconomic theme” on the legend, making sure all other categories are unchecked. For questions 3 and 4, check “household composition and disability theme,” making sure all other categories are unchecked. For questions 5 and 6, check “minority status and language theme,” making sure all other categories are unchecked.

The maps will show all four SVI themes, which should correspond to the four categories of questions in the scorecard. Here, you will be able to see how vulnerable your community is as compared to others in Wisconsin. If your community encompasses multiple census tracts, you may have to take the average for the purposes of this assessment.

This tool only provides a broad understanding of social vulnerability. To complete this section, you will also need a map or local knowledge of the spatial distribution of priority populations. For a more specific understanding of your vulnerable populations and how they are spatially distributed, you may choose to download the [SVI data](#) and conduct a GIS analysis to isolate variables of interest.

How to Access the CDC SVI

- Go to svi.cdc.gov.
- Click on the “interactive map” icon.
- Enter your community's name in the search bar in the upper right-hand corner of the map.
- Click on the Legend tab in the upper right corner and select "Socioeconomic Theme - Tracts"



Socioeconomic features

In the CDC's SVI map, the variables included in the socioeconomic theme are persons below poverty line, persons unemployed, persons over 25 with no high school diploma, and per capita income. These variables will be aggregated together into one composite value.

S-A1. Using the CDC's SVI map, what is your community's socioeconomic vulnerability?

- A. 0.00–0.249
- B. 0.25–0.499
- C. 0.50–0.749
- D. 0.74–1.00



S-A2. Has your community determined how these priority populations (those who are unemployed or of low income and/or education attainment) are spatially distributed?

- A. Yes, the community has quantitatively identified where priority populations are concentrated in our community using mapping technology.
- B. No, but the community has anecdotal evidence or local knowledge about where these populations may be concentrated.
- C. No, the community has not determined where these populations are spatially distributed.

S-A3. If your community has found particular neighborhoods or communities in which these risk factors are concentrated, have efforts been made to expand services in those areas? Services could include employment trainings, assistance for low-income individuals, or outreach for social services programs.

- A. Yes, the community has expanded resources and services in areas of greatest risk.
- B. The community is in contact with leaders and residents in high-risk areas but has not provided additional resources or services.
- C. No, the community has not made special efforts to expand services in priority population communities.

S-A4. If your community has found particular neighborhoods or communities in which these risk factors are concentrated, has your community engaged in education and outreach, created neighborhood emergency procedures, and/or secured additional supplies (for example generators, sandbags)?

- A. Yes, we do all of the above for neighborhoods in which we have quantitatively determined these risk factors are concentrated.
- B. Yes, we do some of the above in areas we believe require more resources and supplies.
- C. We engage in the measures listed above, but for the community as a whole and not specific at-risk neighborhoods.
- D. No, areas where risk factors are concentrated do not have emergency procedures and/or additional supplies.

Household demographics

In the CDC's SVI map, the variables included in the household composition and disability theme are persons aged 65 or older, persons aged 17 or younger, non-institutionalized civilians with disability and single-parent households. These variables are aggregated together into one value.

S-A5. Using the CDC's SVI map, what is your community's household composition and disability vulnerability?

- A. 0.00–0.249
- B. 0.25–0.499
- C. 0.50–0.749
- D. 0.74–1.00



S-A6. Has your community determined how these priority populations (elderly, youth, those with disabilities) are spatially distributed?

- A. Yes, the community has quantitatively identified where priority populations are concentrated in our community using mapping technology.
- B. No, but the community has anecdotal evidence or local knowledge about where these populations may be concentrated.
- C. No, the community has not determined where these populations are spatially distributed.

S-A7. If your community has found particular neighborhoods or communities in which these risk factors are concentrated, have efforts been made to expand services such as medical care in those areas?

- A. Yes, the community has expanded resources and services in areas of greatest risk.
- B. The community is in contact with leaders and residents in high-risk areas but has not provided additional resources or services.
- C. No, the community has not made special efforts to expand services in priority population communities.

S-A8. If your community has found particular neighborhoods or communities in which these risk factors are concentrated, has your community engaged in education and outreach, created neighborhood emergency procedures, and/or secured additional supplies (i.e. generators, sandbags)?

- A. Yes, we do all of the above for neighborhoods in which we have quantitatively determined these risk factors are concentrated.
- B. Yes, we do some of the above in areas we believe require more resources and supplies.
- C. We engage in the measures listed above, but for the community as a whole and not specific at-risk neighborhoods.
- D. No, areas where risk factors are concentrated do not have emergency procedures and/or additional supplies.

Minority status and language

In the CDC's SVI map, the variables included in the minority status and language theme are minorities (all persons except white, non-Hispanic) and persons aged 5+ who speak English "less than well." These variables will be aggregated together into one value.

S-A9. Using the CDC's SVI map, what is your community's minority status and language vulnerability?

- A. 0.00–0.249
- B. 0.25–0.499
- C. 0.50–0.749
- D. 0.74–1.00



S-A10. Has your community determined how these priority populations (minority populations, those who speak English "less than well") are spatially distributed?

- A. Yes, the community has quantitatively identified where priority populations are concentrated in our community using mapping technology.
- B. No, but the community has anecdotal evidence or local knowledge about where these populations may be concentrated.
- C. No, the community has not determined where these populations are spatially distributed.

S-A11. If your community has found particular neighborhoods or communities in which these risk factors are concentrated, have efforts been made to expand services in those areas? Services could include translated documents or a publicized list of contacts for resources available to non-English or minority populations.

- A. Yes, the community has expanded resources and services in areas of greatest risk.
- B. The community is in contact with leaders and residents in high-risk areas but has not provided additional resources or services.
- C. No, the community has not made special efforts to expand services in priority population communities.

S-A12. If your community has found particular neighborhoods or communities in which these risk factors are concentrated, has your community engaged in education and outreach, created neighborhood emergency procedures, and/or secured additional supplies (for example generators, sandbags)?

- A. Yes, we do all of the above for neighborhoods in which we have quantitatively determined these risk factors are concentrated.
- B. Yes, we do some of the above in areas we believe require more resources and supplies.
- C. We engage in the measures listed above, but for the community as a whole and not specific at-risk neighborhoods.
- D. No, areas where risk factors are concentrated do not have emergency procedures and/or additional supplies.

Scoring sociodemographic characteristics

Review your responses to the questions in this section and add the number of times you responded with each letter. Provide that number in the appropriate row to the right.

If you answered "C" or "D" to four or more questions, please refer to the Sociodemographic Characteristics recommendations section on page 80.

Number of "A" answers: _____

Number of "B" answers: _____

Number of "C" answers: _____

Number of "D" answers: _____

S-B) Transportation and housing

For this section, you will be using the CDC's SVI. This is an interactive, online tool that can assess the vulnerability of your census tract or county in five different ways: 1) overall vulnerability, 2) socioeconomic theme, 3) household composition and disability theme, 4) minority status and language theme, and 5) housing and transportation theme. This section uses the housing and transportation theme specifically. The Flood Resilience Scorecard Data Companion contains the data for your community, but you may want to familiarize yourself with this online tool to better understand social vulnerability in your community.

Here, you will be able to see how vulnerable your community is as compared to others in Wisconsin. If your community encompasses multiple census tracts, you may have to take the average for the purposes of this assessment.

In the CDC's SVI map, the variables included in the housing and transportation theme are multi-unit structures, mobile homes, crowding, no access to a vehicle, and group quarters. These variables will be aggregated together into one value.

How to Access the CDC SVI

- Go to svi.cdc.gov.
- Click on the "interactive map" icon.
- Enter your community's name in the search bar in the upper right-hand corner of the map.
- Click on the Legend tab in the upper right corner and select "Housing/Transportation - Tracts"

S-B1. Using the CDC's SVI map, what is your community's housing/transportation vulnerability?

- A. 0.00–0.249
- B. 0.25–0.499
- C. 0.50–0.749
- D. 0.74–1.00



S-B2. Has your community determined how these priority populations (poor housing quality, limited transportation options and connectivity) are spatially distributed?

- A. Yes, the community has quantitatively identified where priority populations are concentrated in our community using mapping technology.
- B. No, but the community has anecdotal evidence or local knowledge about where these populations may be concentrated.
- C. No, the community has not determined where these populations are spatially distributed.

S-B3. If yes, has your community made plans to expand transportation and housing options for these communities?

- A. Yes, the community has expanded public transit options, improved pedestrian mobility, or built new housing to accommodate this need.
- B. Yes, community plans call for expanded transit, pedestrian mobility, and/or new housing specifically in these neighborhoods.
- C. Community plans generally call for expanded transit, pedestrian mobility, and/or new housing, but not specifically for these neighborhoods.
- D. No, the community has not taken action on this issue.



S-B4. If yes, has your community secured emergency supplies and created procedures for transportation in these neighborhoods?

- A. Yes, neighborhood emergency procedures and supplies have been secured for all of these areas, and these resources were developed in coordination with residents of the area.
- B. Yes, the community has general emergency procedures for all neighborhoods, but they are not tailored to individual community needs.
- C. Yes, some neighborhoods have their own emergency procedures, but not all.
- D. No, neighborhoods have not made these plans themselves and the community also has not provided them.

S-B5. What is the pedestrian connectivity score for your community? If you do not have a data companion for your community, visit [Walkscore](#) and search for your community. Divide the walkscore by 100 and use that value to answer this question.

- A. Greater than 0.50 (high connectivity)
- B. 0.25–0.499
- C. 0.10–0.249
- D. Less than 0.10 (low connectivity)



S-B6. What percentage of homes in your community were built before 1970?

- A. Less than 25%
- B. Between 25–50%
- C. Between 50–75%
- D. More than 75%



Scoring transportation and housing

Review your responses to the questions in this section and add the number of times you responded with each letter. Provide that number in the appropriate row to the right.

If you answered "C" or "D" to three or more questions, please refer to the transportation and housing recommendations section on page 80.

Number of "A" answers: _____

Number of "B" answers: _____

Number of "C" answers: _____

Number of "D" answers: _____

S-C) Health indicators

American community survey questions

All responses to these questions can be found in the Flood Resilience Scorecard Data Companion. If you do not have access to the Flood Resilience Scorecard Data Companion for your community, use the Data Instruction Manual to learn how to access the data.

S-C1. What is the percentage of persons without health insurance in your community?

(For reference: The Wisconsin state average in 2015 was 5.7%, according to the Wisconsin Council on Children and Families)

- A. 0–4%
- B. 4.1–6%
- C. 6.1%–10%
- D. Over 10%



S-C2. What is the percent of persons under 65 years with a disability?

(For reference: state average in 2015 was 7.4%, according to American Community Survey data)

- A. 0–4%
- B. 4.1–6%
- C. 6.1%–10%
- D. Over 10%



County Health Rankings

All responses to these questions can be found in the Flood Resilience Scorecard Data Companion. If you do not have access to the Flood Resilience Scorecard Data Companion for your community, use the Data Instruction Manual to learn how to access the data.

Keep in mind this data is at a broader scale than individual communities. If you have local knowledge, please supplement this analysis with it. Not all communities within one county may have the same conditions.

S-C3. What is the ratio of population to primary care physicians in your county?

- A. 500 or fewer: 1
- B. Between 501 and 1000: 1
- C. Between 1001 and 3000: 1
- D. Between 3001 and 6000: 1
- E. Over 6000: 1
- F. Missing data



S-C4. What is the ratio of population to mental health providers in your county?

- A. 500 or fewer: 1
- B. Between 501 and 1000: 1
- C. Between 1001 and 3000: 1
- D. Between 3001 and 6000: 1
- E. More than 6000: 1
- F. Missing data



S-C5. What is the number of hospital stays for ambulatory care sensitive conditions per 100,000 Medicare enrollees in your county?

- A. Fewer than 4,000
- B. Between 4,001 and 5,500
- C. Between 5,501 and 7,000
- D. More than 7,000
- E. Missing data



Local knowledge

For this section, because publicly accessible data may not be available, you should rely on local knowledge of health facilities within your community to determine these particular vulnerabilities, using either precise values or your best educated guess. An additional resource that may be helpful is the Centers for Disease Control and Prevention (CDC). Review the resources listed in the recommendations section for more information.

S-C6. Are there hospitals or community medical facilities within your community?

- A. Yes, there are several, and they are distributed well throughout the community.
- B. Yes, there are several, but some parts of the community may have trouble accessing them.
- C. There are one or two such facilities in our community, but they may have limited resources or accessibility.
- D. The community relies on medical facilities in another community entirely.



S-C7. What is the average drive time to a hospital or a medical facility from the community's most populous residential areas?

- A. The average resident is within walking distance of a medical facility.
- B. Medical facilities are within 10 minutes of driving or less for the average resident.
- C. Medical facilities are within 30 minutes of driving or less for the average resident.
- D. Medical facilities are more than 30 minutes for the average resident.

S-C8. Are there assisted living facilities or nursing homes within your community?

- A. Yes
- B. No

S-C9. If yes, are assisted living facilities or nursing homes equipped with emergency supplies and generators to maintain care in the event of a flood?

- A. Yes, the community funds ample food, potable water and generators so that care is not disrupted during flood events.
- B. Yes, facilities have access to some of these amenities, but through their own means of funding.
- C. We have not coordinated with these facilities or assessed their emergency supplies.
- D. No, facilities are lacking in either food, potable water, generators, or multiple of these.

Scoring health indicators

Review your responses to the questions in this section and add the number of times you responded with each letter. Provide that number in the appropriate row to the right.

If you answered "C", "D", "E" or "F" to five or more questions, please refer to the Health Indicators recommendations section on page 80.

Number of "A" answers: _____

Number of "B" answers: _____

Number of "C" answers: _____

Number of "D" answers: _____

Number of "E" answers: _____

Number of "F" answers: _____

S-D) Community partnerships

For this section, you should use local knowledge and experts to answer questions about community partnerships and collaborations with populations that may experience greater flood vulnerability.

S-D1. Are any culturally significant landmarks found within floodplain boundaries?

- A. No, no such structures or landmarks are within floodplain boundaries.
- B. One such structure or landmark is within floodplain boundaries.
- C. Multiple culturally significant structures and/or landmarks are within floodplain boundaries.

Does your community maintain regular committees/advisory groups that represent these groups?

Population	A. The community regularly meets with representatives from this population.	B. The community does not meet with this population regularly, but we work closely with another group that does.	C. This population is able to participate in standard public procedures.	N/A: This group does not exist in our community.
S-D2. African American community				
S-D3. Hmong community				
S-D4. Hispanic community				
S-D5. Native American/tribal community				
S-D6. Older adults (aged 65 and older)				
S-D7. Individuals with disability				

S-D8. Do you have neighborhood plans with flood-relevant information?

- A. Yes, all neighborhoods have their own plans including development regulations and other flood-relevant information.
- B. Yes, some neighborhoods have plans with flood-relevant information.
- C. We have neighborhood plans but they do not have flood-relevant information.
- D. No, our community has one plan that is generalized for all neighborhoods to use.



S-D9. Are all plans in your community (including emergency evacuation) made available in multiple languages?

- A. Yes, plans are translated into all languages identified in our community.
- B. Yes, plans are translated into some, but not all of the languages identified in our community.
- C. No, plans are only available in English.

S-D10. Does your community partner with local charities or nonprofits to support flood-damage victims?

- A. Yes, we provide financial and technical support.
- B. Yes, but these partners are responsible for their own financial and technical needs.
- C. No, the community does not have local partners for flood recovery or support.

S-D11. Has your community formally identified local shelters, schools or churches that can provide temporary housing for flood-damage victims?

- A. Yes, we have formally identified multiple shelters that provide temporary housing for flood-damage victims and they are sited in areas of greatest need.
- B. Yes, we have formally identified one shelter, but it may or may not be sited in an area close to priority populations.
- C. We have not formally identified shelters, but we generally know what facilities can serve this purpose.
- D. No, there are no such shelters in our community.

Scoring community partnerships

Review your responses to the questions in this section and add the number of times you responded with each letter. Provide that number in the appropriate row to the right.

If you answered "C" or "D" to seven or more questions, please refer to the Community Partnerships recommendations section on page 80.

Number of "A" answers: _____

Number of "B" answers: _____

Number of "C" answers: _____

Number of "D" answers: _____

S-E) Education and outreach

For this section, you will use local knowledge about education and public outreach in your community. This information may be described in policies and plans or is known by staff members.

S-E1. Does your community have dedicated funding for water education or staff members whose duties include outreach and programming on water-related issues?

- A. Yes, the community has dedicated staff responsible for water education and has secured funding for these efforts.
- B. No, the community has no permanent staff or funding, but it has temporary/seasonal positions dedicated to outreach and education or relies on regional or county scale programs.
- C. No, the community does not have any staff members responsible for water education.

S-E2. Does your community have and publicize a list of contacts that the public can reach out to about water and stormwater questions?

- A. The community both has and publicizes a list of contacts for public use.
- B. The community has a list of contacts, but it is not publicized.
- C. The community does not have a list of contacts for public use.

S-E3. Does your community host any events/workshops to educate the public on stormwater issues or green infrastructure?

- A. Yes, the community regularly hosts events that are well advertised for the public.
- B. Yes, the community has had events in the past.
- C. No, but the community publicizes events/workshops organized by other organizations.
- D. No, the community has not had such events.

S-E4. Does your community host an annual water-focused community educational event, like a Lake Day or River Day, that incorporates flood information?

- A. The community organizes, promotes, and sponsors such an event each year.
- B. The community publicizes and supports efforts for such an event each year.
- C. The community had such an event, but it did not incorporate flood information.
- D. The community does not have such an event.

S-E5. Does your community host public participation events at which members of the community can express their concerns about or desires for flood planning?

- A. Yes, the community regularly hosts public participation events that include flood topics.
- B. Yes, the community occasionally hosts public participation events that include flood topics.
- C. Yes, the community hosts such events after a flood event has already occurred.
- D. No, we do not host public participation events related to flooding.



S-E6. Has your community created any brochures, signs, posters, websites or videos to educate the public on stormwater issues?

- A. Yes, the community has created multiple types of outreach materials and made them publicly available.
- B. Yes, the community has created some outreach materials and made them publicly available.
- C. No, but the community has outreach materials developed by another organization to suit this purpose.
- D. No, the community has no stormwater outreach materials for public use.

S-E7. Has your community posted signs designating the boundaries of watersheds, floodplains, or bodies of water on roadways, trails, and public spaces?

- A. The community has posted signs on all major streams, lakes, and boundaries of watersheds and floodplains.
- B. The community has posted some signs of this nature.
- C. The community has no such signs.

S-E8. Does your community distribute information to waterfront property owners about shoreline management and flood protection?

- A. The community does not have any waterfront property owners.
- B. Yes, the community regularly reaches out to waterfront property owners to provide information on best practices.
- C. Yes, the community reaches out to waterfront property owners when they first move into their homes with some information.
- D. No, but there is information on our website that a resident could find if they sought it out.
- E. No, there is no information for waterfront property owners on our website or elsewhere.

S-E9. Are Flood Insurance Rate Maps easily accessible to the public?

- A. Yes, maps are available online and include a description of how they should be interpreted and understood.
- B. Yes, maps are available online but have no information as to how they should be interpreted and understood.
- C. Yes, maps are available, but only by request during business hours.
- D. No, maps are not easily accessible to the public.

Scoring education and outreach

Review your responses to the questions in this section and add the number of times you responded with each letter. Provide that number in the appropriate row to the right.

If you answered "C", "D", "E", "F" to six or more questions, please refer to the Education & Outreach recommendations section on page 81.

Number of "A" answers: _____

Number of "B" answers: _____

Number of "C" answers: _____

Number of "D" answers: _____

Number of "E" answers: _____

Number of "F" answers: _____

Recommendations

In this section, you will find recommendations, resources and contacts to learn more about how to improve your community's resilience to flooding. Recommendations are grouped into the same sections as the guide itself. Keep in mind that you may benefit from recommendations in a variety of sections, not just those that you were suggested for you based on your scoring during the assessment. It may be valuable to review all or many suggestions below before choosing the best course of action. Please note that this list of recommendations is not exhaustive and does not represent the full spectrum of possibilities for your community.

Module 1: Environmental

Precipitation Patterns

Flow modeling to properly site stormwater storage features

- Hire engineering consultants or partner with engineering/water resources students at a local university to model stormwater flow.
 - » ArcGIS, the [EPA's Storm Water Management Model \(SWMM\)](#), and [HydroCAD](#) have tools within it to conduct such an analysis. Price can vary among these products.
- Use models to determine where stormwater storage features would be most beneficial.
 - » There are many stormwater storage features available to you; some can be used as recreational areas in times of low flood risk.
 - » Some guidelines about retention features are provided by the EPA in their [Stormwater Wet Pond and Wetland Management Guidebook](#).
- Contact the National Weather Service to access more detailed local precipitation information.

Enhance and preserve natural habitat with water-storing capacity

- Enforce low-density or open-space development in floodplains (this can also be used as a Community Rating System credit).
- Increase tree cover and vegetation.
 - » The DNR's [Wisconsin Community Tree Map](#) allows you to see which trees are growing in your community and where and calculate the benefits that those trees offer. For more information, contact the [Urban Forestry Program](#) at Wisconsin DNR.
 - » The U.S. Forest Service's [i-Tree Landscape tool](#) can help you identify where and what type of trees could benefit your community. For more information, contact Dan Buckler at Daniel.Buckler@wisconsin.gov.
 - » Many cities provide tax rebates, stormwater fee discounts or stormwater credits for both preserving existing trees and planting new. One report that describes such programs is [Tree Credit Systems and Incentives at the Site Scale](#), prepared for Urban and Community Forestry, Vermont Department of Forests.
- Make efforts to restore wetlands that have previously been developed.
 - » The Minnesota Board of Water and Soil Resources has a [Minnesota Wetland Restoration Guide](#) that may

serve as a good first step for site evaluation, design and management.

- Identify and preserve remaining wetlands.
 - » The Wisconsin DNR has a [Wetland Identification Program](#) to help individuals locate wetlands that may be on their property.
 - » The Wisconsin DNR provides ideas of conservation activities in [Chapter 11 of their Wetland Restoration Handbook](#).

Slope & Elevation

Site new development out of harm's way or design with hazards in mind

- Avoid development on steep slopes and in the floodplain, particularly for critical infrastructure. For existing structures, retrofit to higher flood standards.
 - » If substantial damage is done (50% or more of the structure's equalized assessed value as listed before the damage occurred is lost), the structure should be rebuilt in a different place or to high flood standards.
 - » The State of Wisconsin has some building design standards for flooding, such as requiring the lowest floor of a building to be situated at 2 feet above base flood elevation. These regulations should be met but also considered the minimum. More information can be found on the [DNR's Floodplain website](#).
 - » [Chapter NR 116](#) of the Wisconsin Administrative Code describes Wisconsin development standards in the floodway and flood fringe. Again, this should be considered the minimum.
- Sequence construction projects in steps to minimize construction disturbance.
- Reinforce unstable hillslopes with deeply rooted grasses.

Map landslide potential using historic and elevation data

- If applicable, gather spatial data about where landslides have historically occurred.
- If applicable, map areas with potential for landslides.
 - » Post visible public signage warning of this danger.
 - » Make landslide potential maps accessible online for the public to view.

Land Use

Map development patterns and predict future land change

- Identify areas likely to develop over the next ten years and delineate floodplain areas and wetlands to be preserved.
 - » If you are located in a county that borders the Great Lakes, you may be able to use the [C-CAP Land Cover Atlas](#) from NOAA to determine percent change of various land use types.

Work with developers to encourage responsible growth

- Require that developers provide detailed flood data about potential impacts of their projects.
- Require developers to create compensatory storage features on site when increasing impervious surfacing.
- Provide educational opportunities for developers to learn smart growth principles or to learn about the benefits of green infrastructure.
- Provide incentives to developers who follow smart growth principles or utilize green infrastructure in their new developments.
- Provide density bonuses to those developers who limit the percentage of impervious surfacing on their property.

Preserve pervious surfacing and open space

- Increase tree and vegetative cover. Re-evaluate parking needs and, if possible, decrease minimum parking requirements.
 - » U.S. Forest Service’s i-Tree Landscape tool can help you identify where and what type of trees could benefit your community. For more information, contact Dan Buckler at Daniel.Buckler@wisconsin.gov.



Soils

Encourage vegetation to prevent erosion. Plant native deeply rooted grasses and other vegetation on slopes and at shorelines to reduce runoff.

Work with farmers to encourage best management practices. Encourage agricultural best management practices that minimize soil compaction. Please refer to the “Agricultural Practices” recommendations section for more.

Assess soils prior to site selection for new development or critical structures. Use the USDA's [Web Soil Survey](#) to find the location of different soil types in your community.

Agricultural practices

Provide opportunities for farmers to learn about best management practices from the municipality and from each other.

- Host educational workshops for farmers to learn about best management practices to manage nutrients and avoid soil compaction or erosion.
 - » The Wisconsin [Department of Agriculture, Trade, and Consumer Protection](#) (DATCP) provides farmer education grants to local organizations to teach farmers how to develop their own nutrient management plans.
 - » The Wisconsin DNR provides information about [agricultural standards](#), with links for more information.
 - » Another potential partner is the [Wisconsin Land and Water Conservation Association](#).
- Find farmers who are utilizing best management practices and enlist them as partners. Provide incentives to farmers who participate in a mentorship program.

Monitor progress and reward farmers who adhere to best management practices. Enact a regular schedule to monitor if farmers are meeting Total Maximum Daily Load (TMDL) requirements and provide incentives to those who meet these standards. Also refer to the Department of Natural Resources Administrative Code ([Ch. NR 151](#)) for more information.



Module 2: Institutional

Resource inventory and mapping

Update existing floodplain maps

- Compare FIRMs with local flood knowledge and check for discrepancies.
 - » Contact FEMA to receive an updated FIRM, or submit a [Letter of Map Amendment](#) (LOMA) if discrepancies exist, or if maps are too old to include contemporary development.
 - » Find more information about the creation of new flood maps on the [Wisconsin DNR website](#).
 - » Become a cooperating technical partner with FEMA. In this case, costs to update maps will be shared with FEMA and your community will have higher priority for a new flood study.
- Contact FEMA to include future conditions hydrology on your FIRMs. If the community requests, FEMA will include this information and designate it as Zone X (Future Base Flood).
- Contact [Wisconsin state NFIP Coordinator](#) for more local information.
- Gather historic data about where and how intensely flooding has happened in the past to identify critical areas.

Maintain existing floodplain maps

- Create a specific plan for updating maps that includes potential funding sources and identifies the responsible municipal department.
- Publicize and make these maps clearly available online for all community members to access.

Supplement these maps with other hazard-related maps

Map the extent of other flood-related hazards. These include land subsidence, coastal erosion and others. This is an opportunity to get Community Rating System credit.

Plan quality and coordination

Review and update all community plans to include language about flood resilience

- Include at least one scientific or engineering consultant when any new community plans are developed to ensure that language about stormwater is included.
- Review and update your emergency operations plan.
- Review and update your hazard mitigation plan.
- Review and update your comprehensive plan and other plans your community may use (for example, economic development plan, capital improvements plan).

Staff and technological capacity

Hire or train existing staff in floodplain management or emergency management

- Hire staff trained in GIS or other mapping technology. Review and update your emergency operations plan.
- Hire a grant writer to both research existing grant opportunities and apply for them.
- Buy GIS or other software, or dedicate staff to learn free tools such as [FEMA's HAZUS](#), if possible.
- Compensate at least one staff member to complete the [Certified Floodplain Manager](#) training offered through the Association of State Floodplain Managers. Contact: cfm@floods.org.
- Have all emergency management, fire, police, and emergency volunteers should complete Incident Command System (ICS)-100, and potentially ICS-200. FEMA's [Emergency Management Institute](#) (EMI) offers several trainings, including some that are free.
- Take the Wisconsin Emergency Management's [Emergency Response Training](#). Training Portal—more information from Kevin Wernet program supervisor: kevin.wernet@wisconsin.gov

Reach out to potential regional or national partners

- Consider partnering with a local [UW extension office](#) to see if there are college students who could complete research or projects in collaboration with you.
- Become involved with the [League of Wisconsin Municipalities](#) to share knowledge with other cities that also have flooding issues.
- Participate in FEMA's [National Flood Insurance Program](#) (NFIP) and the [Community Rating System](#) (CRS). Note that many of the recommendations in this document count for CRS credit.
 - » Depending on the level of participation, flood insurance premium rates for policyholders in these communities can be reduced up to 45%.
 - » Wisconsin state NFIP Coordinator: [Brian Cunningham](#).
- Contact your regional planning commission to see if they can provide any technical or administrative assistance.
- Contact Wisconsin Emergency Management for trainings or help with applications to grants or subsidized loans.

Create coalitions and partnerships between staff and residents

- Activate your [Local Emergency Planning Committee](#) (LEPC).
 - » Include elected officials; police, fire, civil defense, and public health professionals; environment, transportation, and hospital officials; facility representatives; representatives from vulnerable populations or that represent these vulnerable populations; and the media in your local emergency planning committee .
 - » Meet at least twice a year to evaluate emergency procedures and to determine strategies for educating the public. LEPCs are eligible for emergency planning grants, which provides matching funds for computer equipment and hazardous materials response equipment.
 - » Find more information about what these groups do in this [fact sheet created by FEMA](#).
- Start a [Community Emergency Response Team](#) (CERT).
 - » FEMA has a recommended training for volunteers involved in such teams. This is a good way to engage residents without professional background in emergency management.
 - » Volunteers can be a powerful and affordable addition to your emergency response.

Tools

Gray infrastructure

- Hire engineers to both identify and evaluate the state of the built environment.
- Use flow modeling, and have engineers determine whether these structures are capable of handling volumes of water associated with a 1% annual chance flood event.
- Prioritize infrastructure projects for flood resilience within your capital improvements plan (CIP).
- Establish a schedule to conduct this evaluation at regular intervals into the future, based on clear and established criteria.
- View FEMA's [Checklist for Vulnerability of Flood-Prone Sites and Buildings](#).

Green infrastructure

- Audit your local codes and ordinances using Wisconsin Sea Grant's guide [Tackling Barriers to Green Infrastructure](#).
- Ensure that green infrastructure is not unnecessarily prohibited in any plans.
- Include language about green infrastructure in transportation plans, not only allowing for it but actively encouraging it.
- Analyze abandoned sites for possible redevelopment as green infrastructure sites.
- Create demonstration sites for green infrastructure to use as educational tools (potentially at schools, local government offices, or on public land).
- Host a community event to encourage the public to visit and learn about its benefits when a demonstration site is created.
- Set clear guidelines about long-term maintenance responsibilities for green infrastructure sites.

Non-structural

Adopt or update your Flood Damage Prevention Ordinance. This activity can earn you credit for the National Flood Insurance Program and Community Rating System. Wisconsin DNR has created a [model floodplain ordinance](#) for communities to adopt.

Implementation and enforcement

Determine a clear procedure for assessing flood damage once an event has occurred

- Determine a clear and objective process to determine whether a home has been “substantially damaged” following a flood event.
 - » Use the [Building Code Effectiveness Grading Schedule](#) (BCEGS) as a guide if you do not already have building codes.
 - » Consider requiring a lower threshold for damage before a building is required to meet new building flood requirements (the standard is 50% damaged, but some places, such as the state of Indiana, lowered it to 40% damaged).
- Hire or designate existing staff members as responsible for evaluating flood damage.

Develop long- and short-term goals

- Establish both long- and short-term flood resilience goals to help gauge the success of your efforts. Review the funding resources identified at the end of this document.
- Host either tabletop exercises or full-scale exercises to test your preparedness and response capabilities.
 - » The [Extreme Event Game](#) from LabX is one example of an exercise.
 - » Wisconsin Emergency Management can provide guidance about how to run such exercises. Contact [Kevin Wernet](#), program supervisor.



Module 3: Social

Sociodemographic Characteristics

Evaluate, using GIS, where priority populations are concentrated. Once such an evaluation is conducted, prioritize emergency supply and shelter locations to be sited near these populations.

Housing and Transportation

- Evaluate, using GIS, where priority populations are concentrated. Use this to inform where public transit stops need to exist and to prioritize emergency supply and shelter locations.
- Ensure that all new housing meets building standards beyond those required by state standards. For more information about building requirements, see the [Uniform Dwelling Code for Wisconsin](#).

Health Indicators

- Provide educational materials to local public health officials. Provide these in all languages spoken by residents.
- Create an emergency plan for medical facilities and nursing homes to be in place before an emergency takes place.
- Determine potential sites for new medical facilities closer to identified priority populations. If not possible, determine a location in which basic medical supplies can be stored in case of emergency.

Community Partnerships

- Create and publicize a list of community organizations that may provide assistance to their neighbors during and after flood events.
- Create an advisory committee representing priority populations.
 - » Allow this committee to review all flood-relevant community plans to ensure that their needs are met.
 - » Create neighborhood-scale evacuation and emergency action plans that are appropriate for these populations' needs.
 - » Determine a regular schedule to meet and reevaluate these plans or other flood-relevant needs this group may have.
 - » Suggest advisory committee members serve as points of contact for their neighborhoods to disseminate information.

Education & Outreach

To determine which groups may be important to engage with, and what messaging strategies could be useful, consult the CDC's [Planning for an Emergency: Strategies for Identifying and Engaging At-Risk Groups](#).

- Designate at least one full-time staff member whose duties include water education. Hire an intern or provide college credit to a student to perform these duties.
- Publicize, both electronically and in printed copies, a list of contacts that the public can reach out to about stormwater related questions.
- Plan an annual water-focused community educational event to spread the word about how individuals can better plan for flooding.
- Create a communication plan to be used during hazardous events. The Wisconsin DHS also includes messaging guidance in their [Flood Toolkit](#).
- Host public participation events to learn what questions and concerns exist in the community concerning flooding (these might be well attended following a storm event).
- Have open houses where your community's flood maps are available and residents can attend and receive professional guidance on how to interpret them.
- Participate in [StormReady](#), a National Weather Service program to guide communities on how to communicate with their residents and strengthen safety programs.
- Create brochures, signs, posters, websites, or videos to educate the public on stormwater issues. You may be able to adapt existing materials.
- Post signs designating the boundaries of floodplains and watersheds to raise public awareness about hazard-prone areas and improve the connection between people and their watershed.
 - » You can find more information on these types of signage at the [North American Lake Management Society website](#).
 - » The Wisconsin Department of Transportation regulations on informational watershed signage is available at their [website](#).
- Work with local schools to build flood-relevant curricula and projects.
- Provide incentive programs for homeowners to install green infrastructure or to conduct stormwater runoff audits. Consider identifying one neighborhood as a pilot community before creating a municipal-wide project.
- Redesign your municipal website to be public friendly, with clear and obvious links to flood-relevant resources, incentive programs, flood hazard maps, and water resource management plans.

Funding Resources

Federal

Federal Emergency Management Agency (FEMA)

[Hazard Mitigation Assistance Grants](#): Provides funding for eligible mitigation measures that reduce disaster losses.

[Flood Mitigation Assistance Grants](#): Funds can be used for projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the National Flood Insurance Program.

[Building Resilient Infrastructure And Community \(BRIC\)](#): Support states, local communities, Tribes and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards.

Department of Housing and Urban Development (HUD)

[Community Development Block Grants \(CDBG\)](#): Provides grants to states, cities, and counties to develop viable urban communities by providing decent housing and a suitable living environment, and by expanding economic opportunities, principally for low- and moderate-income persons.

National Park Service (NPS)

[Land and Water Conservation Fund](#): This grant program helps urban communities address outdoor recreation deficits by supporting projects in cities and urbanized areas that create new outdoor recreation spaces, reinvigorate already existing parks, and form connections between people and the outdoors.

[Rivers, Trails And Conservation Assistance Program](#): Partners with community groups, nonprofits, Tribes, and state and local governments to design trails and parks, conserve and improve access to rivers, protect special places, and create recreation opportunities.

Department of Agriculture (USDA)

[Community Facilities Direct Loan & Grant Program](#): Provides affordable funding to develop essential community facilities in rural areas. An essential community facility is defined as a facility that provides an essential service to the local community for the orderly development of the community in a primarily rural area.

[Water And Waste Disposal Loan & Grant Program](#): Provides funding for clean and reliable drinking water systems, sanitary sewage disposal, sanitary solid waste disposal, and storm water drainage to households and businesses in eligible rural areas.

[Conservation Innovation Grants \(CIG\)](#): Supports the development of new tools, approaches, practices, and technologies to further natural resource conservation on private lands. CIG partners work to address our nation's water quality, air quality, soil health and wildlife habitat challenges, all while improving agricultural operations.

[Special Evaluation Assistance For Rural Communities And Households \(SEARCH\)](#): Helps very small, financially distressed rural communities with predevelopment feasibility studies, design, and technical assistance on proposed water and waste disposal projects.

Environmental Protection Agency (EPA)

[Recreation Economy For Rural Communities](#): Planning assistance program to help communities develop strategies and an action plan to revitalize their main streets through outdoor recreation.

[Urban Waters Small Grants Program](#): Help local residents and their organizations, particularly those in underserved communities, restore their urban waters in ways that also benefit community and economic revitalization.

[Greening America's Communities](#): Help cities and towns develop an implementable vision of environmentally friendly neighborhoods that incorporate innovative green infrastructure and other sustainable design strategies.

[Environmental Justice Collaborative Problem-Solving Cooperative Agreement Program](#): Provides financial assistance to eligible organizations working on or planning to work on projects to address local environmental and/or public health issues in their communities.

Economic Development Administration (EDA)

[Public Works And Economic Adjustment Assistance Program](#): Support work in Opportunity Zones by leading to the creation and retention of jobs and increased private investment, advancing innovation, enhancing the manufacturing capacities of regions, providing workforce development opportunities, and growing ecosystems that attract foreign direct investment.

Fish and Wildlife Service

[North American Wetlands Standard or Small Grant](#): Supports public-private partnerships carrying out projects in the United States that further the goals of the North American Wetlands Conservation Act. These projects must involve long-term protection, restoration, and/or enhancement of wetlands and associated uplands habitats for the benefit of all wetlands-associated migratory birds.

[National Urban And Community Forestry Challenge Cost-Share Grant Program](#): Supports critical management of existing and future urban and community forests to promote disaster risk reduction and community resilience and better prepare communities for the increasingly destructive impacts of climate change.

State

[Municipal Flood Control Grant Program](#) (DNR): Assists cities, villages, towns, and metropolitan sewerage districts concerned with municipal flood control management.

[Clean Water Fund Program](#) (DNR): Provides affordable financial assistance to municipalities for publicly-owned wastewater and water-quality-related storm water infrastructure projects that are needed to achieve or maintain compliance with federal and state regulations.

[Safe Drinking Water Loan Program](#) (DNR): Provides affordable financial assistance to municipalities for publicly-owned drinking water infrastructure projects that are needed to protect public health and achieve or maintain compliance with federal and state regulations relating to water supply.

[Urban Forestry Grants](#) (DNR): Provides regular, startup, or catastrophic storm grants that support the creation or further development of urban forestry programs and help recover from storms.

[Producer-Led Watershed Protection Grants](#) (DATCP): Provides funding to producer-led groups that focus on nonpoint source pollution abatement activities.

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