Wisconsin Flood Resilience Scorecard

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





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Introduction

Welcome to the *Wisconsin Flood Resilience Scorecard* By completing this three-part guide, local governments will be able to:

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

Through these efforts the Flood Resiliency Scorecard can support communities in preparing for major flooding events, such as the 2008 flooding experienced in southern Wisconsin. This tool is not designed as preparation for or as a response to floods that would be deemed catastrophic, such as a 500-year flood.

This guide is intended for use by Wisconsin public officials on a municipal level. It is intended to be comprehensive, encompassing three categories of vulnerability: **environmental**, which refers to physical and natural landscape characteristics such as soil and slope; **institutional**, which refers to government and infrastructural capacity and content of existing policies and community plans; and **social**, which takes into account cultural and socioeconomic sources of vulnerability and the potential for community partnerships. Public officials are encouraged to complete all three modules; however, each can be considered independently if only certain portions are of interest. While flooding intensity and the severity of outcomes can be influenced by a variety of factors, this guide focuses specifically on reducing the quantity of floodwater. Other tools and programs exist that concentrate on water quality.

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 pollution runoff into streams, diminishing the financial burden of replacing damaged infrastructure and homes, and limiting negative public health outcomes.

Flooding in Wisconsin

Wisconsin is a state well-known for its abundance of water features, with 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 allows for rich agriculture, fishing and boating, and ample clean drinking water, it also presents a challenge as detrimental flooding events become increasingly common state- and nationwide.

According to the Pew Charitable Trusts, flooding is the costliest and most common natural disaster in the United States (The Pew Charitable Trusts, 2019). In 2013 Americans spent approximately \$400 per household in an average year on such extreme weather events but expenses have likely increased with increasingly common instances of natural disaster(Weiss & Weidman, 2013). Flooding has been 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 recently as August of 2018, unprecedented amounts of rain have torn through southern Wisconsin, resulting in more than \$200 million of 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). Exacerbating these issues are the predictions that these extreme flooding events are only anticipated to increase in the coming years.

Recent climate modeling predicts that high-intensity storms, as well as subsequent flood events, are likely to increase throughout the Upper Midwest including Wisconsin (Wisconsin Initiative on Climate Change Impacts, 2020) . While temperature has been increasing throughout the state over the past 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). These trends are not uniform, with western and south-central Wisconsin seeing the wettest conditions while the north is experiencing a drying trend (Wisconsin Initiative on Climate Change Impacts, 2020). Some of Wisconsin's most populous cities can be found in these wettest areas. Wisconsin public officials will need to consider these conditions when creating emergency preparedness, hazard mitigation and management plans and developing policies.

While creating policies, retrofitting existing structures and developing green infrastructure solutions come at a cost, 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 our 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 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, overwhelmed by flood victims and physical damage, may lose medical records or have very limited resources to treat patients while also conducting 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 spread of communicable diseases, and stagnant water allows for the breeding of many disease vectors such as mosquitos (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).

It is clearly in the best interests 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 is organized similarly and contains the following.

- A "Before you Begin" section explaining why to use this guide, 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 guide;
- The guide itself;
- A series of recommendations;
- And additional resources.

It is our intention that upon completion of this guide, a municipality will be able to choose from a variety of solutions and tailor them to be most appropriate for their financial and staff capacity. The results can also be used to build support from regional partners and to apply for state and federal grant opportunities. Each municipality 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 guide module. Because this tool was designed to be fully 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 municipality is welcome to customize this guide as is sensible for their needs.

Who Should Participate

The Scorecard was designed for use by public officials and municipal 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 city staff with water resources, engineering, planning, zoning, emergency management and/or community organizing experience are recommended. Other community members, e.g., 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.

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. Users of the guide are encouraged to consult the "Additional Resources" section for tools and data gathered by the Federal Emergency Management Agency (FEMA), the National Oceanic and Atmospheric Administration (NOAA), the Wisconsin Department of Natural Resources (DNR) and many other authorities on flooding issues.

The causes and effects of floods are incredibly complex and interconnected; it can be very 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 is appropriate for parties both unfamiliar and well versed in flood hazard mitigation.

Acknowledgements

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MODULE ONE: Assessing Environmental Features of Flood Vulnerability

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 heavily to whether a community will experience recurrent flooding. The physical parameters to be assessed in this portion of the scorecard 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 municipalities not only prepare for current conditions but also 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 restrict damage.

Land Use

- 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 consequently 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.

Agricultural Practices

• In areas with intensive agriculture, certain practices can cause soil compaction, leading to less water storage capacity and erosion, which can in turn pollute waterways and damage habitat.

• Careful planning of equipment usage and best management practices, such as no-till or minimal till regimes, can help avoid compaction and erosion.

Who Should Complete this Assessment?

Depending on the composition of your staff, 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?

- 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 (BSEs) 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 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" (North Carolina Forest Service, 2006) for meeting goals; for the purpose of this assessment, this goal is reducing flood damage.

Clay: According to the Soil Science Society of America, clay is 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: As adapted from the Department of Homeland Security, "critical infrastructure" refers to 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. This is the type of FIRM that most users download.

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

 $a \le 0.2\%$ 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).

Precipitation Patterns

For this section, you will not need external information. Maps are provided in each section. However, if you would like a more specific evaluation of your precipitation patterns, there may be more local data available. For the purposes of this guide, a broad understanding of precipitation patterns is sufficient.

Historic Annual Precipitation Patterns

Locate your municipality on the map.



1. Based on historic trends depicted in the map, how much average annual rainfall has your municipality 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

Change in Average Annual Precipitation

Locate your municipality on the map.



Change in Annual Average Precipitation (inches) from 1950 to 2006

2. How has your annual precipitation changed in the past 50 years?

- a. Decreased or no increase
- b. Increased no more than 3 inches
- c. Increased 3-5 inches
- d. Increased more than 5 inches



Projected Change in Frequency of >2" Precipitation Events

Projected Change in the Frequency of 2" Precipitation Events (days/decade) from 1980 to 2090 (A1B)

3. How is the frequency of heavy precipitation events anticipated to increase in your municipality?

- a. No increase predicted
- b. 0.4 to 2.0 days/decade
- c. 2.4-3.6 days per decade
- d. 4.0 or more days/decade

Scoring Precipitation Patterns

Number of "a" answers: ______ Number of "b" answers: ______ Number of "c" answers: ______ Number of "d" answers: ______

If you answered "c" or "d" to two or more questions, please refer to the Precipitation Patterns recommendations section on page 89.

Slope and Elevation

For this section, you should have a **map of your community** with critical infrastructure labeled. You will also need 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 below.

If you have access to GIS: This is the preferred way to conduct your analysis.

To download county GIS data:

- 1. Visit FEMA's National Flood Hazard Layer (NFHL) Viewer
- 2. Zoom in to your municipality 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 to download a PDF version of your map

Note: This web interface may be quite slow at times!

Using GIS tools, you can calculate the exact area of the floodplain and what percentage of it overlaps with your municipality. You can also use the "slope tool" found in the "spatial analyst" toolbox to determine maximum change in elevation over a distance (functionally, this is steepest slope). Contact your regional planning commission for assistance if you do not have your own GIS-trained staff. County staff may also have access to elevation maps and topographic data for analysis. Contact your regional planning commission for more information.

If you do not have GIS: The National Flood Hazard Layer (NFHL) Viewer created by FEMA is a great way to view your community's flood maps with an interactive, online interface.

To download PDF versions of your flood maps:

- 1. Visit FEMA's National Flood Hazard Layer (NFHL) Viewer
- 2. Zoom in to your municipality 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 a PDF version of your map

If you do not have GIS, you might have to estimate total municipal area within a floodplain instead of providing an exact percentage or try using the Wisconsin DHS <u>Risk Assessment Flood</u> <u>Tool (RAFT)</u>. You may consider printing your FIRMs to estimate floodplain area by hand. All FIRM maps are to scale.

1. 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. About half of the community is within a floodplain
- e. More than half of the community is within a floodplain
- f. All or nearly all of the community lies within a floodplain

2. 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
- d. All critical structures are in a floodplain

3. 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. About half of the community is on a steep slope
- e. More than half of the community is on a steep slope
- f. All or nearly all of the community is on a steep slope

4. 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
- d. All critical structures are on a steep slope

5. 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

Number of "a" answers: _____ Number of "b" answers: _____ Number of "c" answers: _____ Number of "d" answers: _____ Number of "e" answers: _____ Number of "f" answers: _____

If you answered "c," "d," "e" or "f" for three or more questions, please refer to the Slope/Elevation recommendations section on page 90.

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 <u>community canopy cover look-up tables</u>.

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 will also need to determine **projected growth for your community**. You may have anecdotal information about population increases or about total development projects approved over the past ten years. This can be estimated by extrapolating population increases over time from Census data. The Wisconsin Department of Administration (DOA) released a <u>report describing population change from 2010-2040</u>. Some cities have a percent change listed, but for smaller communities a county-level projection is the best available. You can check the <u>DOA's Demographic Services Center</u> or email them at <u>DIR_Demo@wi.gov.</u>

1. What percentage of your community is listed as *impervious surface*?

- a. Less than 10 percent
- b. Between 10-25 percent
- c. Between 25-40 percent
- d. Over 40 percent

2. What percentage of your community is listed as tree/shrub or grass/herbaceous?

- a. Over 40 percent
- b. Between 25-40 percent
- c. Between 10-25 percent
- d. Less than 10 percent

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

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

4. 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, but we are anecdotally aware of the stormwater that can be accommodated by these features
- d. No, we have not conducted any professional engineering studies to determine storage capacity of our water features nor are we are not anecdotally aware of the stormwater that can be accommodated by these features

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

- a. Yes
- b. Trees are not mentioned either positively or negatively in our development guidelines
- c. No, it is discouraged

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

- a. Yes
- b. Native vegetation is not mentioned in our development guidelines
- c. No, it is discouraged

7. Does your community have any incentives programs for preserving or increasing tree cover and native vegetation?

- a. Yes, our municipality has a program to provide incentives
- b. No, but we take advantage of a state or federal incentive program
- c. No, we use no incentives program for this type of development

8. 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 has taken place in the past ten years
- b. Minimal conversion has taken place in the past ten years
- c. Extensive conversion has taken place in the past ten years

9. 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 10 years in your community?

- a. Little to no conversion is expected to take place in the next ten years
- b. Minimal conversion is expected to take place in the next ten years
- c. Extensive conversion is expected to take place in the next ten years

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

- a. Yes
- b. Some, but not all
- c. No

10a. If yes, are these areas within floodways or flood fringe?

- a. Yes
- b. Some, but not all
- c. No

11. 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

Number of "a" answers: _____ Number of "b" answers: _____ Number of "c" answers: _____ Number of "d" answers: _____

If you answered "c" or "d" for 5 or more questions, please refer to the Land Use

recommendations section on page 91.

Soils

For this section you will need **soil maps**. Questions within this section suggest usage of maps from the specified sources, the directions to obtain these maps are below. However, you may have maps delineating soil types in your community within your community plans and choose to use these instead.

Soils can be categorized in a variety of ways. For the purposes of this document, we will use these broad categories:

| Soil Type | Water Permeability |
|----------------------------|---------------------------------------|
| Sand, loamy sand | Rapid/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)

To learn about your community's soils to answer the following questions, refer to the <u>USDA's</u> <u>Web Soil Survey</u>.

- 1. Click the green button that says "START WSS."
- 2. Go to the "Area of Interest (AOI)" tab at the top left.
- 3. Under "Quick Navigation," click on "Address."
- 4. Type in the name of your municipality (ex. Platteville, Wisconsin) and click "View."
- 5. Click on the icon with a red rectangle and AOI in it in the toolbar under "Area of Interest Interactive Map."
- 6. Draw a rectangle that encompasses your municipality. (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.
- 7. Click 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."

For question 5, refer to <u>Soil Explorer</u>. This tool is much more general and user friendly than the Web Soil Survey.

- 1. On the right side of the screen, under the icon "Soil Explorer," use the drop-down menu that says "Select a Region" and choose "Wisconsin."
- 2. Choose the right-side tab that says "Natural Soil Drainage Classes."
- 3. Zoom in to your municipality. Click on the list icon in the top right corner to see what each color represents.

1. How much of the land area in your community is categorized as either *sand* or *loamy sand* (high drainage)?

- a. All or nearly all
- b. Between 60 and 80%
- c. Between 30 and 60%
- d. Between 10 and 30%
- e. Less than 10%

2. How much of the land area in your community is categorized as *sandy loam, loam* or *silt loam* (moderately high to moderate drainage)?

- a. All or nearly all
- b. Between 60 and 80%
- c. Between 30 and 60%
- d. Between 10 and 30%
- e. Less than 10%

3. How much of the land area in your community is categorized as *sandy clay loam, clay loam, silty clay loam* or *sandy clay* (moderately low drainage)?

- a. Less than 10%
- b. Between 10 and 30%
- c. Between 30 and 60%
- d. Between 60 and 80%
- e. All or nearly all

4. How much of your land area is categorized as silty clay or clay (low drainage)?

- a. Less than 10%
- b. Between 10 and 30%
- c. Between 30 and 60%
- d. Between 60 and 80%
- e. All or nearly all

5. Using the Soil Explorer, what soil drainage class is predominant in your municipality?

- a. Excessively drained or somewhat excessively drained
- b. Well drained or moderately well drained
- c. Somewhat poorly drained or poorly drained
- d. Very poorly drained

Scoring Soils

Number of "a" answers: _____ Number of "b" answers: _____ Number of "c" answers: _____ Number of "d" answers: _____ Number of "e" answers: _____

If you answered "c," "d" or "e" for three or more questions, please refer to the Soils

recommendations section on page 91.

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 <u>Wisconsin Department of Agriculture, Trade,</u> <u>and Consumer Protection (DATCP)</u> for more information.

1. Does your community have a significant amount (over 10%) of pasture or *cropland*?

- a. No
- b. No, but we have other intensive land uses that need to be managed to minimize erosion and/or compaction
- c. Yes

2. Are agricultural *best management practices* (BMPs) promoted or enforced that reduce erosion?

- a. Financial incentives exist to promote them
- b. Outreach efforts exist to promote them
- c. They are required
- d. They are permitted but not promoted
- e. They are not permitted
- f. They are not explicitly permitted or prohibited in any formal municipal plan

3. Are agricultural BMPs promoted or enforced that reduce compaction?

- a. They are required
- b. Financial incentives and outreach efforts exist to promote them
- c. Either financial incentives or outreach efforts exist to promote them
- d. They are permitted but not promoted
- e. They are not explicitly permitted or prohibited in any formal municipal plan
- f. They are not permitted

4. Do any of the following practices occur in your community to limit soil compaction or erosion due to agricultural activities?

- Fund staff time from municipal sources to educate farmers on nonpoint source pollution BMPs and cost-share opportunities funding BMP installation
- Enforce an ordinance regulating manure and biosolids being stored and spread for agricultural purposes
- Provide training on nutrient management plan development and implementation
- Host an agricultural clean sweep program at least biennially
- a. We do all of the above and more
- b. We do all of the above
- c. We do at least two of the above
- d. We do one of the above, or we do something related but not listed here
- e. We do none of the above

5. Does your community provide cost sharing, tax reductions or other incentives to encourage agricultural practices that reduce erosion and compaction?

- a. Yes, we provide ample financial support for these programs
- b. Yes, we provide some financial support for these programs
- c. No, we provide no support for these programs beyond what is provided by state and federal dollars.

6. Does your community use any land use regulations or tools to preserve farmland?

- a. Yes, we use conservation easements, transfer of development rights and/or other programs to preserve farmland
- b. Yes, we use one tool to preserve farmland
- 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

7. Does your community provide workshops or trainings for farmers to encourage BMPs?

- a. Yes, we provide regular workshops/trainings for farmers
- b. No, but we publicize and promote workshops/trainings provided by other organizations or at a county level
- c. No, we have had workshops in the past but none recently
- d. No, we have never hosted or promoted such an event

Best Management Practices

Complete the following table:

| | a. Required | b. Encouraged | c. Neither Encouraged nor Prohibited | d. Prohibited | e. N/A |
|------------------------------------|-------------|---------------|---|---------------|--------|
| 8. No till | | | | | |
| 9. Riparian buffer zones | | | | | |
| 10. Cover crops | | | | | |
| 11. Manure management plan | | | | | |
| 12. Rotational grazing | | | | | |
| 13. Nutrient management plan | | | | | |

Scoring Agricultural Practices

Number of "a" answers: _____ Number of "b" answers: _____ Number of "c" answers: _____ Number of "d" answers: _____ Number of "e" answers: _____ Number of "f" answers: _____

If you answered "c," "d," "e" or "f" for six or more questions, please refer to the Agricultural Practices recommendations section on page 92.



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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 homeowner's insurance and incentivizing flood mitigation practices.

Plan Quality and Coordination

- Having consistent maps, language and regulations around flooding, floodplains and stormwater management 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 and hazard mitigation planning.

Tools

- Infrastructure is a cornerstone of flood mitigation. In a time when infrastructure across the country is in disrepair, making sure to closely monitor existing grey 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?

Depending on the composition of your staff, 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 (e.g., comprehensive plan, hazard mitigation plan, area plans, transit plans) could complete this section.

What Will you Need in Order to Complete this Assessment?

- 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 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.
- 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 grey 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 (BSEs) 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): This is 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 "<u>Modernizing FEMA's Flood Hazard Mapping Program: Recommendations</u> 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, moveable 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.

Resource Inventory and 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 at msc.fema.gov.

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 map delineated for your community** and your **floodplain management policies**.

1. 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 do not have a FIRM but we use another map that serves this purpose (such as a Flood Hazard Boundary Map, or FHBM)
- e. No, we have no flood hazard map of any kind

1a. If you have flood maps, are they designed with small contour intervals and recently constructed streets/developments included?

- a. Yes, our flood maps have the most accurate ground elevation information possible
- b. Yes, our flood maps are either at high resolution or include newly constructed streets and developments, but not both
- c. No, our maps are not at the highest resolution possible and could benefit from improvement
- d. Unsure

2. 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 every year

3. 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
- e. N/A, we have had no previous floods

4. 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

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

- a. Yes, and we have a rating of 5 or better
- b. Yes, and we have a rating of 6 or lower
- c. No, but we have considered participating or did previously
- d. No, we have never explored this option

6. In your community, has a plan, including long-term funding and designated staff/ responsible department, been designed to keep flood hazard maps up to date?

- a. Yes, there is a specific plan that designates both funding and staff/responsible department to update hazard maps
- b. Yes, there is a specific plan that designates either funding or staff/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. Updating flood maps is not mentioned in any of our plans

7. Does your community require that developers provide detailed flood data (base flood elevation data), particularly if they are developing within an *A zone or V zone*?

- a. Yes, we require developers to provide flood data for all size developments and in all FIRM zones
- b. Yes, we require developers to provide flood data in all FIRM zones, but only if the development is 5 acres or 50 lots in size or greater
- c. Yes, we require developers to provide flood data, but only within A zones
- d. No, we do not require developers to provide flood data

Have you mapped other flood-related hazards?

| | a. Yes | b. Some, not all | c. No | d. N/A |
|--|--------|------------------|-------|--------|
| 8. Uncertain Flow Paths | | | | |
| 9. Closed-Basin Lakes | | | | |
| 10. Ice Jams | | | | |
| 11. Debris and Sediment Blockage | | | | |
| 12. Land Subsidence | | | | |
| 13. <i>Mudflow</i> Hazards | | | | |
| 14. Dam Failure Inundation | | | | |
| 15. Coastal Erosion | | | | |
| 16. River Erosion | | | | |
| 17. Channel Modification | | | | |

Scoring Resource Inventory and Mapping

Number of "a" answers: _____ Number of "b" answers: _____ Number of "c" answers: _____ Number of "d" answers: _____ Number of "e" answers: _____

If you answered "c," "d" or "e" for eight or more questions, please refer to the Resource Inventory and Mapping recommendations section on page 93.

Plan Quality and Coordination

For this section, you will need to assemble **all of your community plans.** 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.

| 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: | | | |

List the plans your community uses below:

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

- a. All of them
- b. Over half of them
- c. Less than half of them
- d. None

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

- a. All of them
- b. Over half of them
- c. Less than half of them
- d. None

3. Are the flood-prone zones identified in one plan the same flood-prone zones as identified in others?

- a. Yes, all plans agree on which areas are deemed flood prone
- b. Yes, most plans agree on which areas are deemed flood prone
- c. No, different areas are designated flood prone in different plans
- d. No, flood-prone zones are not designated in most of our plans
- e. No, flood-prone zones are not designated in any of our plans

4. How many of your community's plans restrict 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

5. 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 robust elements of floodplain management included in our other plans
- d. No, no such plan or plan elements exist

6. Are floodplains in your community designated as an *open space zoning* district (such as recreation or conservation) that will limit the costs of flooding 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, development on the floodplain is not limited

7. 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 robust elements of open space and stormwater management included in our other plans
- d. No, no such plan or plan elements exist

8. Are designated *stormwater management plans* required from developers in your community?

- a. Yes, stormwater management plans are required of developers
- b. No, but there are robust elements of stormwater management included in other plans
- c. No, no such plan or plan elements exist

9. Does your community have guidelines or procedures to ensure that all departments have compatible messages and goals concerning stormwater?

- a. Extensive efforts have been made to coordinate messaging
- b. Some efforts have been made to coordinate messaging
- c. No efforts have been made to coordinate messaging

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

- a. Always
- b. Sometimes
- c. No

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

- a. 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

12. 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

13. Has your community investigated strategies used by other communities to determine *best management practices (BMPs)* that would be appropriate for your own community?

- a. Yes
- b. We have previously or very minimally
- c. No

14. 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

Number of "a" answers: _____ Number of "b" answers: _____ Number of "c" answers: _____ Number of "d" answers: _____ Number of "e" answers: _____

If you answered "c," "d" or "e" for seven or more questions, please refer to the Plan Quality and Coordination recommendations section on page 93.

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.

1. 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

2. 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 funds allocated to hire limited term employees or consultants to perform these duties
- c. No, but we have performed site assessments in the past
- d. No, we have no staff or funds for such assessments

3. 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 our municipal 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

4. 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 either relies on limited term staff or temporary consultants to utilize it
- 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

4a. If yes, have you utilized 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

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

- a. Yes, we have reached out to regional partners and have determined all resources available
- 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

Number of "a" answers: _____ Number of "b" answers: _____ Number of "c" answers: _____ Number of "d" answers: _____

If you answered "c" or "d" for three or more questions, please refer to the Staff and Technological Capacity recommendations section on page 94.

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

1. Does your community have a combined sewer system (CSS)?

- a. Yes
- b. No

1a. 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

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

- a. Yes, they are both permitted and encouraged
- b. Yes, they are permitted
- c. Yes, some but not all are permitted
- d. Green infrastructure is not mentioned in our plans
- e. No, it is explicitly prohibited

3. Do your community's transportation plans promote *green infrastructure* in new street design?

- a. Yes, it is both permitted and encouraged
- b. Yes, it is permitted
- c. Green infrastructure is not mentioned in our street design policies
- d. No, it is explicitly prohibited

4. Does your community identify key *green infrastructure* areas during land use plan development?

- a. Yes
- b. No

5. Does your community analyze abandoned 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. Yes, we analyze sites, but none suitable have been found
- d. No, this is not our practice
- e. No, we have no abandoned sites

6. 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 actively promote such a site at the regional/county level
- c. No, we do not have or promote any sites

7. Does your community have an award or appreciation program for businesses or individuals

who adopt stormwater conservation or green infrastructure practices?

- a. Yes, we sponsor and publicize our own appreciation program
- b. Yes, we promote and publicize a program from another organization
- c. No, we have no such program

Gray Infrastructure

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

- a. No
- b. Unsure
- c. Yes

8a. If yes, has your community identified all of such existing structures?

- a. Yes, all structures within the community have been identified
- b. Yes, some structures have been identified, but some may have been overlooked
- c. No, there are structures that have not been identified yet
- d. No, no such effort has been conducted

8b. 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

8c. 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

8d. 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 designated staff to reevaluate flood structures, but criteria for this evaluation is subjective
- d. Yes, there is either designated staff or a regular schedule, but not both
- e. Flood structure evaluations are only conducted after a flood event has occurred

8e. Does your community have *emergency action plans* to prepare downstream communities if a dam failure were to occur?

- a. Yes, such a plan exists and community members are aware of it and have access to it
- b. Yes, such a plan exists, but it is only accessible to community members upon request
- c. Yes, but the plan is outdated and needs to be redone to reflect current needs
- d. No, such a plan does not exist
- e. No, we either do not have dams or the dams we have are not anticipated to affect downstream communities in a significant way

Non-structural

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

| | a. Required | b. Encouraged | c. Permitted, but not encouraged | d. Not mentioned in plans | e. Explicitly prohibited |
|---|-------------|---------------|--|---------------------------------|-----------------------------|
| 9. Buyouts of flood-prone land | | | | | |
| 10. Cluster development | | | | | |
| 11. Transfer of development rights | | | | | |
| 12. Purchase of development rights | | | | | |
| 13. Requiring on- site compensatory storage | | | | | |
| 14. Directed downspouts to pervious areas | | | | | |
| 15. Stormwater impact fees | | | | | |

| 16. Low-impact development principles | | | |
|---|--|--|--|
| 17. Requirement of engineering study to determine stormwater impacts of new development | | | |

18. Do you prohibit any residential or commercial development in floodplains?

- a. All residential and commercial development in floodplains is banned
- b. Just one of these types of development is banned
- c. No types of development are banned
- d. We do not have floodplains in our community

19. Has your community purchased and removed structures in floodplains?

- a. Have removed all residential and commercial structures from floodplains
- b. Have removed some but not all residential and/or commercial structures from floodplains
- c. Have inventoried structures in floodplains and developed a plan for removal
- d. Have not removed any structures nor planned to do so
- e. Do not have any buildings in floodplains

20. Do you involve emergency responders and other local government departments early in the planning process to discuss street design for flood resilience?

- a. Yes
- b. Sometimes
- c. No

Scoring Tools

Number of "a" answers: _____ Number of "b" answers: _____ Number of "c" answers: _____ Number of "d" answers: _____ Number of "e" answers: _____ Number of "f" answers: _____

If you answered "c,", "d," "e" or "f" for 10 or more questions, please refer to the Tools

recommendations section on page 95.

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.

1. Does your community have clear, regularly updated evacuation plans for all regions of your municipality?

- a. Yes
- b. Some, but not all regions
- c. No

2. Has your community identified repetitive loss properties?

- a. Yes, and they are up to date
- b. Yes, but it has been 5 years or more
- c. Some, but not all, have been identified
- d. No, repetitive loss properties haven't been tracked over time

3. Does your community have a process to determine whether a home has been *"substantially damaged"* following a flood event? (e.g., FEMA Residential Substantial Damage Estimator program)

- a. Yes
- b. No, but the community relies on county or regional resources to fill this need
- c. No

4. Does your community have dedicated staff for evaluating flood damage?

- a. Yes, the community has regular dedicated staff with the explicit duty of evaluating flood damage
- b. No, but the community relies on 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

5. What is done after a house is evaluated and deemed *substantially damaged* in your community?

- a. The house must either be rebuilt to meet clear requirements or the property is bought and converted to open space or other low-impact development
- b. The house must be rebuilt to stricter standards, but not exceeding state requirements
- c. The house may remain structurally as it was before the flooding, with the financial burden resting on the homeowner
- d. There is no standardized protocol for this situation

6. 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

7. Has your community established flood resilience goals, both long and short term, to gauge success of your efforts?

- 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

8. 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 over both the short and 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

Number of "a" answers: _____ Number of "b" answers: _____ Number of "c" answers: _____ Number of "d" answers: _____

If you answered "c" or "d" for four or more questions, please refer to the Implementation and Enforcement recommendations section on page 96.



MODULE THREE: Building Social Resilience through Outreach and Partnerships

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. 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 municipality's overall flood vulnerability.
- 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.

Note: Many social factors relating 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.



Who should complete this assessment?

Depending on the composition of your local staff, individuals from 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 in order to complete this assessment?

• 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 easily found at factfinder.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

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/disability theme, 4) minority status/language theme and 5) housing/transportation theme.

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 from svi.cdc.gov 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.

Steps for completion:

- 1. Go to svi.cdc.gov.
- 2. Click on the "interactive map" icon.
- 3. Enter your community's name in the search bar in the upper right-hand corner of the map.
- 4. In the legend tab to the left, uncheck "overall vulnerability."

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/disability theme," making sure all other categories are unchecked. For questions 5 and 6, check "minority status/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 from svi.cdc.gov and conduct a GIS analysis to isolate variables of interest.

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.

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

- a. Lowest (bottom 4th)
- b. Second lowest
- c. Second highest
- d. Highest (top 4th)

2. Has your community determined how these *priority populations* (those who are unemployed or of low income/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 lie
- c. No, but the community has the staff and resources to complete such a project
- d. No, and the community does not have the staff and resources to complete such a project

2a. 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?

- a. Yes, the community has worked directly with neighborhood representatives or leaders and have both determined which services/amenities would bolster their resilience and provided them
- b. Yes, the community has reached out to neighborhood representatives or leaders and has begun the process of determining their needs
- **c.** No, the community has not made efforts to expand services in *priority population* communities

2b. If your community has found particular neighborhoods or communities in which these risk factors are concentrated, have community engagement practices been utilized, neighborhood emergency procedures been created and/or supplies been secured?

- Yes, community engagement practices are fully utilized, neighborhood emergency procedures and supplies have been secured for all of the community's major population centers, using input from individuals who live within those neighborhoods
- b. Yes, some community engagement practices have been utilized and/or the community has general emergency procedures for all neighborhoods, but they are not tailored to individual neighborhood needs
- c. Yes, some neighborhoods have been engaged or 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

Household Demographics

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

3. Using the CDC's SVI map, what is your community's household composition/disability vulnerability?

- a. Lowest (bottom 4th)
- b. Second lowest
- c. Second highest
- d. Highest (top 4th)

4. Has your community determined how these *priority populations* (persons aged 65 or older, persons aged 17 or younger, persons with disabilities and single-parent households) are spatially distributed?

- a. Yes, the community quantitatively identified where *priority populations* are concentrated using mapping technology
- b. No, but the community has anecdotal evidence or local knowledge about where these populations may lie
- c. No, but the community has the staff and resources to complete such a project
- d. No, and the community does not have the staff and resources to complete such a project

4a. If your community has found particular neighborhoods 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 worked directly with neighborhood representatives or leaders and have both determined which services/amenities would bolster their resilience and provided them
- b. Yes, some community engagement practices have been utilized and/or the community has reached out to neighborhood representatives or leaders and has begun the process of determining their needs
- c. No, the community has not made efforts to expand services in *priority population* neighborhoods

4b. If your community has found particular neighborhoods in which these risk factors are concentrated, have community engagement practices been utilized, neighborhood emergency procedures developed and/or supplies been secured?

- a. Yes, community engagement practices have been utilized, neighborhood emergency procedures have been created and supplies have been secured for all of our major population centers, using input from individuals who live within those communities
- b. Yes, some attempts at community engagement have been made and the community has general emergency procedures for all neighborhoods, but they are not tailored to individual neighborhood 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

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.

5. Using the CDC's *SVI* map, what is your community's minority status and language vulnerability?

- a. Lowest (bottom 4th)
- b. Second lowest
- c. Second highest
- d. Highest (top 4th)

6. Has your community determined how these *priority populations* (minorities and persons 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 about where these populations may lie
- c. No, but the community has the staff and resources to complete such a project
- d. No, and the community does not have the staff and resources to complete such a project

6a. If your community has found particular neighborhoods in which these risk factors are concentrated, have efforts been made to expand services in those areas?

- a. Yes, the community has worked directly with neighborhood representatives or leaders and have both determined which services/amenities would bolster their resilience and provided them
- b. Yes, the community has reached out to neighborhood representatives or leaders and has begun the process of determining their needs
- c. No, the community has not made efforts to expand services in *priority population* communities

6b. If you have found particular neighborhoods in which these risk factors are concentrated, have community engagement practices been utilized, neighborhood emergency procedures been created and/or supplies been secured?

- a. Yes, community engagement practices have been utilized, neighborhood emergency procedures have been created and/or supplies have been secured for all of our major population centers, using input from individuals who live within those communities
- b. Yes, the community has general emergency procedures for all neighborhoods, but they are not tailored to individual neighborhood 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

Scoring Sociodemographic Characteristics

Number of "a" answers: _____ Number of "b" answers: _____ Number of "c" answers: _____ Number of "d" answers: _____

If you answered "c" or "d" for three or more questions, please refer to the Sociodemographic Characteristics recommendations section on page 98.

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/disability theme, 4) minority status/language theme, and 5) housing/transportation theme.

This section uses the housing/transportation theme specifically. Steps for completion:

- 1. Go to svi.cdc.gov.
- 2. Click on the "interactive map" icon.
- 3. Enter your community's name in the search bar in the upper right-hand corner of the map.
- 4. In the legend menu to the left, uncheck "overall vulnerability" and check "housing/transportation theme."

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.

You will also need to find **your community's walkability score.** Use the website <u>walkscore.com</u> for questions 3 and 4. Visit the website and type in the name of your community in the large white search bar.

Household Demographics

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

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

- a. Lowest (bottom 4th)
- b. Second lowest
- c. Second highest
- d. Highest (top 4th)

2. Has your community determined how these vulnerable households are spatially distributed?

- a. Yes, the community has conducted GIS analysis or other mapping to determine where vulnerable households are located
- b. No, but the community has anecdotal evidence about where these populations are located
- c. No, but the community has the staff and resources to complete such a project
- d. No, and the community does not have the staff and resources to complete such a project

2a. 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 bikeability or built new housing to accommodate this need
- b. No, but the community has dedicated staff and funding to address this issue
- c. No, the community has not taken action on this issue

2b. If yes, has your community secured emergency supplies and created procedures for transportation in isolated and/or densely populated areas?

- Yes, neighborhood emergency procedures and supplies have been secured for all of our major population centers, using input from individuals who live within those communities
- 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

3. Using Walkscore.com, what is the average walkability score for your community?

a. 75 to 100 (very walkable to walker's paradise, daily errands do not require a car)

b. 50 to 74 (somewhat walkable to very walkable, most errands can be accomplished on foot)

- c. 25 to 49 (car-dependent, most errands require a car)
- d. Less than 25 (car-dependent, almost all errands require a car)
4. Using Walkscore.com, what is the average transit score for your community?

- a. 75 to 100 (excellent transit to rider's paradise, world-class public transportation)
- b. 50 to 74 (good to excellent transit, many nearby public transportation options)
- c. 25 to 49 (some transit, a few nearby public transportation options)
- d. Less than 25 (minimal transit, it is possible to get a bus)

5. What is the average age of housing structures in your community?

- a. Built after 2000
- b. Built 1980 to 2000
- c. Built between 1960 and 1979
- d. Built between 1940 and 1959
- e. Built before 1940
- f. Unknown

Scoring Transportation and Housing

Number of "a" answers: _____ Number of "b" answers: _____ Number of "c" answers: _____ Number of "d" answers: _____ Number of "e" answers: _____

Number of "f" answers: _____

If you answered "c," "d," "e" or "f" for three or more questions, please refer to the Housing and Transportation recommendations section on page 98.

Health Indicators

American Community Survey Questions

For this section, you will need to access your **community's census data**. This can be found through the American Factfinder page of the United States Census Bureau. If you know how to access this information on your own, use methods comfortable to you. If you are not familiar with accessing census data, follow the below instructions:

- 1. Navigate to <u>data.census.gov/cedsci/?g=0100000US&tid=ACSDP1Y2018.DP05</u>
- 2. Scroll down to "tables" and click the tab "view tables."
- 3. Click the tab "customize table."
- 4. Click the "geographies" tab.
- 5. Choose "tract."
- 6. In "within state" choose "Wisconsin."
- 7. In "within county," choose the county in which your community is located.
- 8. Select all of the boxes for the census tracts in which your community is located.
 - a. If you do not know the number of your census tract, you may go to <u>census.gov/geo/maps-data/maps/2010tract.html</u> and download a map that includes this information.
- 9. Make sure your community's census tracts are the only "selected geographies" at the bottom of the "geographies" window. Close the "geographies" tab.
- 10. Click the "topics" tab.
- 11. Click to check the "disability" box and the "health insurance" box.
- 12. Close the "topics" tab.
- 13. In the resulting table, you will find total population estimates also divided into age groups with and without disabilities. You will need to convert these to percentages for our questions.

For question 1:

(Total Under 18 Years, No Health Insurance Coverage + 18 to 64 Years, No Health Coverage + 65 Years and Over, No Health Coverage)/ Total Population

For question 2:

(Total Under 18 Years With a Disability + Total 18 to 64 years With a Disability)/ (Total Under 18 Years + Total 18 to 64 Years)

1. 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%

2. 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. 0-5%
- b. 5.1%-7.5%
- c. 7.6%-10%
- d. Over 10%

County Health Rankings & Roadmaps

For this section, you will need your **community's health rankings**. You can access them through the <u>County Health Rankings & Roadmaps Web interface</u>.

Here you will find information at a county level concerning health factors, clinical care quality of life and more. While many of these variables are relevant to flooding, here we will be focusing on those that relate to local capacity for providing clinical care: mental health providers, preventable hospital stays and primary care physicians.

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.

Directions for completion:

- 1. Navigate to <u>countyhealthrankings.org.</u>
- 2. Scroll down the page to the gray map of the United States. Click on Wisconsin.
- 3. Click the "measures" tab near the top of the newly opened page.
- 4. Use the orange box on the left side of the screen under "select a measure," navigate health factors > clinical care > primary care physicians, mental health providers, and preventable hospital stays (to answer questions 3, 4 and 5 below, respectively).
- 5. For each of the above three variables, you can hover your mouse over the county in which your community exists. That value is what you will use for the below questions.

3. 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

4. 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. Over 6000: 1
- f. Missing data

5. 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 4,000 and 5,500
- c. Between 5,600 and 7,000
- d. Over 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 "Module Recommendations" section for more information.

6. 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

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

- a. Medical facilities are within 10 minutes of driving or less for the average resident
- b. Medical facilities are within 30 minutes of driving or less for the average resident
- c. Medical facilities are between 30 and 45 minutes of driving for the average resident
- d. Medical facilities are 45 minutes or farther for the average resident

8. Are there assisted living facilities or nursing homes within your community?

- a. The community has multiple assisted living facilities or nursing homes
- b. The community has at least one assisted living facility or nursing home
- c. The community has no assisted living facilities or nursing homes in our community, but some of our residents rely on such facilities outside of our community limits
- d. No, the community has no assisted living facilities or nursing homes in our community

8a. 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, such facilities are provided ample food, potable water and generators so that care is not disrupted during extreme weather events

b. Yes, we provide some food, water and generators, but not necessarily in abundance or to every facility

c. Yes, some facilities have access to some of these amenities, but largely through their own means of funding

d. No, a majority of facilities are lacking in either food, potable water, generators or multiple of these

Scoring Health Indicators

Number of "a" answers: _____ Number of "b" answers: _____ Number of "c" answers: _____ Number of "d" answers: _____ Number of "e" answers: _____ Number of "f" answers: _____

If you answered "c," "d" or "e" for four or more questions, please refer to the Health Indicators

recommendations section on page 98.

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.

1. Are any culturally significant landmarks found within floodplain boundaries?

- a. No, no such structures or landmarks are within floodplain boundaries
- b. One such structure/landmark is within floodplain boundaries
- c. Multiple culturally significant structures/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 group in 1+ advisory groups | b. The community does not meet with this population regularly, but we work closely with another group that does | c. The community does not make special efforts to engage with this community | d. N/A (this group does not exist in our community) |
|---|---|---|---|---|
| 2. African American community | | | | |
| 3. Hmong community | | | | |
| 4. Hispanic community | | | | |
| 5. Native American/tribal community | | | | |
| 6. Older adults (aged 65 and | | | | |

| older) | | |
|--------------------------------|--|--|
| 7. Individuals with disability | | |
| 8. Other | | |
| | | |

9. Do the committee or advisory groups listed above meet regularly and proactively, or only after a flooding event has occurred?

- a. Yes, this committee has regularly scheduled meetings multiple times a year
- b. Yes, this committee has regularly scheduled meetings approximately once a year
- c. No, this committee only meets after a flooding event has occurred
- d. No, no such committee exists

10. Are community partners involved in the development of community plans?

- a. Yes, community partners such as those listed in the table above are involved
- b. Yes, community partners review the plans, but do not help develop them
- c. No, community partners are not involved in the development of community plans

11. Do you have neighborhood plans?

- 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. No, our community has one plan that is generalized for all neighborhoods to use

12. 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

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

- a. Yes, including 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

14. Are there local shelters, schools or churches that can provide temporary housing for flood-damage victims?

- a. Yes, there are multiple shelters that provide temporary housing for flood-damage victims and they are sited in areas closest to priority populations
- b. Yes, there is at least one shelter, but it may or may not be sited in an area close to *priority populations*
- c. No, there are no such shelters in our community

Scoring Community Partnerships

Number of "a" answers: _____ Number of "b" answers: _____ Number of "c" answers: _____ Number of "d" answers: _____

If you answered "c" or "d" for seven or more questions, please refer to the Community Partnerships recommendations section on page 98.

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.

1. Does your community have dedicated funding for water education or staff members whose duties include water education?

- a. Yes, the community has full-time staff responsible for water education and has secured funding for these efforts
- b. Yes, the community has part-time staff responsible for water education and has secured funding for these efforts
- c. 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
- d. No, the community does not have any staff members responsible for water education, but some funding is allocated for potential projects
- e. No, the community does not have staff or funding for water education

2. 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

3. 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 that were well advertised
- c. Yes, the community has had events in the past, but they were not well advertised or attended
- d. No, the community has not had such events, but plans have been made for the future
- e. No, the community has not had such events, and there are no plans to do so in the future

4. Does your community host an annual water-focused community educational event, like a Lake 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 in the past, but there are no plans to repeat it
- d. The community does not have such an event

5. 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, the community does not host such events, but the regional or county level does and we promote them
- e. No, public participation related to flooding does not exist in our community

6. 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 one or two of the above outreach materials and made them publicly available
- c. Yes, the community has outreach materials, but they are not easily accessed by the public
- d. No, but the community has outreach materials developed by another organization to suit this purpose
- e. No, the community has no stormwater outreach materials for public use

7. 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 relies on signs of this nature posted by the Department of Natural Resources
- d. The community has no such signs

8. Does your community reach out to and distribute information to waterfront property owners about shoreline management and flood protection?

- a. Yes, the community regularly reaches out to waterfront property owners to provide information on best practices
- b. Yes, the community reaches out to waterfront property owners when they first move into their homes with some information
- c. No, but there is another organization within our community that provides this service
- 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
- f. N/A, the community does not have any waterfront property owners

9. Does your community provide any residential incentive programs to promote stormwater conservation practices like rain gardens or downspout disconnection?

- a. Yes, the community has multiple incentive programs that are both well-funded and welladvertised
- b. Yes, the community has one or two incentive programs that are both well-funded and well-advertised
- c. Yes, the community has one or two programs, but they are only available some of the time due to funding restrictions
- d. No, we used to have such programs, but no longer offer them
- e. No, the community does not offer incentive programs at a municipal level, but residents are directed to other federal or state level programs
- f. No, the community does not offer any incentive programs
- g. No, some stormwater conservation practices such as downspout disconnection are actively prohibited in our community

10. Does your community offer a program providing stormwater runoff audits for private property owners?

- a. Yes, the community has such a program that is well-funded, advertised and free
- b. Yes, the community has such a program that is well-funded and advertised, but at a fee
- c. Yes, the community has such a program, but it is only available some of the time due to funding restrictions
- d. No, the community does not offer stormwater runoff audits at a municipal level, but we direct residents to other federal or state level programs
- e. No, the community does not offer any stormwater runoff audits nor advertise other programs

11. Does your community give water-themed presentations at schools, organize water themed activities for schools or assist in curriculum-building around water?

- a. Yes, the community provides curriculum and local training opportunities for teachers to incorporate water into their lesson plans
- b. Yes, the community provides either curriculum or training, but not both
- c. No, but the community promotes other local and regional partners who do such activities
- d. No, such activities are not done

12. Can both elected officials and the general public access stormwater reports and water resources management plans?

- a. Yes, such reports exist and are easily accessed electronically by both the public and elected officials
- b. Yes, such reports exist but are only available by request during business hours
- c. No, such reports do not exist

13. Can both elected officials and the general public access flood hazard maps?

- 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 available to both officials and the public
- e. No, maps do not exist

Scoring Education and Outreach

Number of "a" answers: _____ Number of "b" answers: _____ Number of "c" answers: _____ Number of "d" answers: _____ Number of "e" answers: _____

Number of "f" answers: _____ Number of "g" answers: _____

If you answered "c," "d," "e," "f" or "g" for six or more questions, please refer to the Education and Outreach recommendations section on page 99.

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 One

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.
 - Information about SWMM can be found on the <u>EPA's website</u>
- 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 <u>Stormwater Wet Pond and Wetland Management Guidebook</u>.
- Contact regional planning agencies 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 Wisconsin DNR at DNRUrbanForestryAssessment@wisconsin.gov.
 - The U.S. Forest Service's <u>i-Tree Landscape tool</u> 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 <u>Tree Credit Systems</u> and <u>Incentives at the Site Scale</u>, 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 <u>"Minnesota</u> <u>Wetland Restoration Guide"</u> that may serve as a good first step for site evaluation, design and management.
- Identify and preserve remaining wetlands.
 - The Wisconsin DNR <u>provides resources</u> to help individuals locate wetlands that may be on their property.
 - The Wisconsin DNR provides ideas of conservation activities in chapter 11 of their <u>Wetland Restoration Handbook</u>.

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 website under <u>floodplains</u>.
 - 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 each construction project 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 <u>C-CAP Land Cover Atlas</u> 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.
 - U.S. Forest Service's <u>i-Tree Landscape tool</u> 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.
- Re-evaluate parking needs and, if possible, decrease minimum parking requirements.

Soils

Encourage vegetation to prevent erosion

- Plant native deeply rooted grasses and other vegetation.
 - U.S. Forest Service' <u>i-Tree Landscape tool</u> can help you identify where and what type of trees could benefit your community.
 - For more information, contact Dan Buckler at <u>Daniel.Buckler@wisconsin.gov.</u>

Work with farmers to encourage responsible management practices

• Encourage agricultural best management practices that minimize soil compaction. Please refer to the "Agricultural Practices" recommendations section for more.

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 <u>farmer education grants</u> to local organizations to teach farmers how to develop their own nutrient management plans.
 - The Wisconsin DNR provides information about <u>agricultural standards</u>, with links for more information.
 - Another potential partner is the <u>Wisconsin Land and Water Conservation</u> <u>Association</u>.
- 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 <u>Department of Natural Resources Administrative Code</u> (Ch. NR 151) for more information.

Module Two

kesource Inventory and Mapping

Update existing floodplain maps

- Compare FIRMs with local flood knowledge and check for discrepancies.
 - If discrepancies exist or if maps are too old to include contemporary development, contact FEMA to receive an updated FIRM.
 - More information about the creation of new flood maps can be found on the <u>Wisconsin DNR website</u>.
 - Become <u>a cooperating technical partner with FEMA</u>. 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 <u>Wisconsin state NFIP Coordinator</u> 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 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 (as described in the table in the guide). These include land subsidence, coastal erosion and so on.
 - 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 (e.g., economic development plan, capital improvements plan).

Make sure all updated plans agree about flood priorities and vulnerable areas

- Review all of your city plans to ensure that they are consistent in their flood language and that they all identify the same vulnerable areas.
 - Guidance can be provided by the Texas A&M <u>Plan Integration for</u> <u>Resilience Scorecard</u>.

Leverage regional partnerships

- Contact other area communities to see what language they have included in their plans to coordinate strategies on a regional level.
 - Plan semi-regular (at least annual) meetings with these communities to share strategies and compare successes/failures.

Staff and Technological Capacity

Hire new staff trained in floodplain management or emergency management

- Hire staff trained in GIS or other mapping technology.
- Hire a grant writer to both research existing grant opportunities and apply for them.
- If possible, buy GIS or other software, or dedicate staff to learn free tools such as FEMA's HAZUS.
 - HAZUS can be downloaded on the FEMA website.

Train existing staff in floodplain management or emergency management

- 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.
- FEMA's Emergency Management Institute (EMI) offers several trainings, including some that are free. All emergency management, fire, police and emergency volunteers should complete at least Incident Command System (ICS)-100, and potentially ICS-200.
- Wisconsin Emergency Management's Emergency Response training.
 - Training Portal—more information from Gary Wieczorek, program supervisor: <u>gary.wieczorek@wisconsin.gov.</u>

Reach out to potential regional or national partners

- Consider partnering with local UW extension to see if there are students who could complete research or projects in collaboration with you.
- Become involved with the <u>League of Wisconsin Municipalities</u> to share knowledge with other cities that also have flooding issues.

- Become a participant 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%.
 - More information can be found on the <u>NFIP website</u>.
 - Wisconsin state NFIP Coordinator: Michelle Staff, michelle.staff@wisconsin.gov.
- Contact your <u>regional planning commission</u> to see if they can fill any of these purposes for you.
- Contact Wisconsin Emergency Management.
- Contact the National Association of Counties (NACo).

Create coalitions and partnerships between staff and residents

- Activate your local emergency planning committee (LEPC).
 - A local emergency planning committee should include (at a minimum): 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.
 - This group should meet at least twice a year to evaluate emergency procedures and to determine strategies for educating the public.
 - More information about what these groups do can be found at in this <u>fact</u> <u>sheet</u> create 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.
 - More information can be found in <u>this document</u>.

Tools

Gray Infrastructure

- Hire engineers to both identify and evaluate the state of the built environment.
- Using flow modeling, 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.
 - A potential resource is FEMA's <u>Checklist for Vulnerability of Flood-Prone</u> <u>Sites and Buildings</u>.

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 or on public land).
- When a demonstration site is created, host a community event to encourage the public to visit and learn about its benefits.
- 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!

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.
 - The Building Code Effectiveness Grading Schedule (BCEGS) may be useful 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.
 - Research funding strategies, local, statewide and nationally, to meet these goals.
- Host either tabletop exercises or full-scale exercises to test your preparedness and response capabilities.
 - Wisconsin Emergency Management can provide guidance about how to run such exercises. Contact Gary Wieczorek, program supervisor: gary.wieczorek@wisconsin.gov



Module Three

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 in the <u>Uniform</u> <u>Dwelling Code</u> 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.
- If possible, 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.
 - Advisory committee members can serve as points of contact for their neighborhoods to disseminate information.

Education and Outreach

To determine which groups may be important to engage with, and what messaging strategies could be useful, consult the CDC's <u>Planning for an Emergency: Strategies for</u> <u>Identifying and Engaging At-Risk Groups.</u>

- Hire at least one full-time staff member whose duties include water education.
 - If that is not possible, 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 in the event of hazardous event.
 - The Wisconsin DHS also includes messaging guidance in their <u>Flood</u> <u>Toolkit</u>.
- 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 <u>StormReady</u>, 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 to raise public awareness about hazard-prone areas.
- 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.
 - o <u>Calumet City</u> is an example.

Primary Resources

ASFPM No Adverse Impact Toolkit

FEMA Community Flood Resilience Toolkit- New Jersey

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