

Beyond Sandbags: Resilience in the Face of Extreme Weather

Findings and Recommendations

Executive Summary

Let's start with the good news: with smart planning, partnerships, and community leadership, there are many significant steps Wisconsin can take to be more resilient as our weather becomes increasingly intense and variable, but we need to face the facts to accomplish this.

As our global climate continues to change, storms in the upper Midwest are intensifying, and we are experiencing more precipitation – a lot of it in the form of heavy rain and thunderstorms. We know the results: too many damaging floods that destroy property, damage crops, pollute streams, and sometimes even take lives. Across the nation, billion-dollar disasters related to climate and extreme weather are increasing. In 2018 alone, damage to public and private property from flooding in Wisconsin's Dane County was estimated at \$150 million dollars. Whether through our tax dollars, insurance premiums, or the price of produce at the grocery store, we are all absorbing these costs.

It doesn't have to be this way. To anticipate and prevent flooding from extreme weather, we need to invest in planning and prevention, from state and federal agencies to local village councils. We need to be better prepared to protect human communities, public health, farm productivity and healthy ecosystems.

In the late summer of 2019 we gathered 40 leaders from around the state to get their best ideas on how to move forward. Here are some of their top recommendations:

First, they urged us to remember we all live in a flood plain, though this is easy to forget. Flooding can happen nearly anywhere it rains in Wisconsin, especially given the increasing occurrence of historically rare precipitation events—such as 15 inches of rain in a single day. This problem affects everyone, not just those who live close to a river or a major body of water.

Second, when it comes to strategies, one size does not fit all, which is why our advisors strongly urged state agencies and local communities to invest in watershed planning across the state; water moves in different ways in different landscapes, and every major watershed needs its own individualized plan to prepare for conditions in a changing climate.

Third, rural areas face particular challenges: flooding impacts can affect a wide geographical area and resources for planning, prevention and disaster response are very limited. Our working group bluntly stated: "We have to stop starving local government."

Fourth, the group strongly agreed that Wisconsin's freshwater ecosystems will be more resilient if we have healthy agricultural lands. Healthy soils and erosion control practices can reduce runoff, flooding, and pollution.

Finally, Wisconsin needs an action plan to be resilient. State government needs a point person or lead agency to coordinate planning and implementation of those plans. Local communities need access to financial and technical resources; agencies like UW-Extension could play a key role. Codes and regulations are important but will not save us, and neither will engineering solutions. Rather, we need a new way of thinking about how we live with water. We can build on models and learn from promising approaches. These include Ontario's draft guidelines for incorporating climate change into watershed planning, the Milwaukee Metropolitan Sewerage District's whole watershed strategies, tribal resilience planning, and resilience planning in the state of Oregon's Office of Emergency Management.

From rural landscapes to urban centers, Wisconsin will be more resilient if we have a strategy to protect people and the environment, and support thriving communities. It will take initiative, collaboration, focused strategies, and resources. We are confident that Wisconsin has this capacity, and we hope that you will be part of the solution.

Introduction

On August 29, 2019, the Wisconsin Academy and partners hosted a collaborative, insightful, and hopeful meeting at the University of Wisconsin Platteville–Baraboo-Sauk County Thomas C. Pleger Science Building. Forty people attended, representing a diversity of sectors including academia, environmental nonprofits, community action agencies, local and state government, and private insurance companies.

During the meeting, key leaders and participants first identified areas of agreement regarding the **state of knowledge** related to threats and risks from extreme precipitation in Wisconsin communities. Participants then divided into small groups to discuss practical **recommendations** for reducing both the risk and scale of the impacts they had previously identified.

This report summarizes the findings and recommendations from a pre-meeting survey and the discussion that took place during this leadership roundtable. A short video distilling this information is also available at: <https://www.wisconsinacademy.org/beyond-sandbags-0>.

State of Knowledge

Through a pre-meeting survey and presentations and discussions at the meeting, our team at the Wisconsin Academy identified numerous topics of strong agreement among participants about “what we know” about climate-related threats. Examples include broad acknowledgement of:

1. The role of climate change in driving the frequency and intensity of extreme precipitation events in Wisconsin;
2. The serious gap in state and local capacity (e.g., funding, expertise, staffing and regulatory authority) to engage in precautionary and preventative strategies to avoid precipitation-driven disasters, and the lack of an identified lead agency or point person in state government;
3. The impacts resulting from state practices described as “starving local government,” which participants flagged as a significant barrier to advancing local planning, resilience strategies, and grappling with disaster recovery;
4. The ways in which rural challenges are distinct from those of larger urban areas (e.g., volunteer-based services, financial constraints, large geographical areas served), and thus require different strategies than those in communities such as Madison or Milwaukee; these strategies need to be cognizant of cultural characteristics such as self-reliance and distrust of government, which necessitate that public participation processes be transparent and inclusive; and

5. The lack of a straightforward “road map” for how individuals or communities dealing with flood-related disasters can access resources and assistance, which is exacerbated by confusion about the role of various agencies and their limitations.

Recommendations

Through expert presentations and small group discussions at the meeting, participants identified numerous recommendations for how Wisconsin can become more resilient in the face of extreme weather. Two priority actions rose to the top: watershed planning and rural resilience and resources.

Watershed Planning

One small group, focused on watershed planning, identified the need to address climate-driven flooding and other water-related challenges, such as water quality and supply, through comprehensive watershed planning across the state (as opposed to traditional planning). The group noted that these plans need to:

1. Anticipate the impacts of a changing climate to help us live with water in a new era, and not solely depend on engineering solutions to save us. This includes using green infrastructure, updating floodplain maps, identifying risks, and applying land use strategies that factor in climate change.
2. Adopt “whole watershed” planning approaches. Models discussed include the greater Milwaukee area’s strategies led by the Milwaukee Metropolitan Sewerage District (MMSD) and the province of Ontario’s watershed guidelines. Both include “upstream” strategies and significant investments in community engagement. By contrast, participants noted that Texas also has a watershed plan for climate change, but its focus is water supply.
3. Consider hydrological history and current conditions, both of which influence the way water moves through a watershed. Considerations include, for example, a watershed’s ability to absorb and store rainfall through healthy wetlands and riparian areas, its likelihood of gullying and erosion, and “flashiness” (which exacerbates downstream flooding and polluted runoff).

Rural Resilience and Resources

The small group focused on rural resilience identified the following needs and observations.

Needs:

1. Define resilience for rural Wisconsin (i.e., What is a healthy environment?) so we know what we are striving to achieve.
2. Rural (and all of) Wisconsin needs to redefine our relationship with water and work with, not against, hydrological systems to support sustainable communities and the environment.

3. Rural areas not only need to grow their infrastructural capacities for crisis response; they also need more physical and mental health support services and counseling. This requires additional resources.
4. Communities need comprehensive flood recovery planning processes that build consensus around local strategies. These plans need to connect to community master plans, including plans for disaster prevention.

Observations:

1. Education and outreach are critical for building community understanding of the challenges and the solutions. The group discussed the educational aspects of Iowa's State Fair as an example, and the need to revive those components in Wisconsin. They also talked about the importance of supporting and leveraging youth education programs such as 4-H, as well as empowering producers to provide leadership in local solutions. They also discussed ways to leverage "cultural brokers" to gain access to and better engage with communities.
2. Agricultural strategies are integral to rural resilience strategies, from land use management for adaptation to potential mitigation (i.e., natural carbon storage). These kinds of practices could be incentivized or commodified to support rural landowners and communities. Additionally, landscape restoration strategies are a key component of rural resilience.
3. Wisconsin needs to consider reallocation of planning and emergency resources (e.g., state and federal aid, technical support for local leaders, and emergency management) and consolidate or synchronize funding opportunities. In the state of Oregon, for instance, the Chief Recovery Officer plays this coordinating role.
4. Transportation and road systems must be considered in resilience strategies, ranging from the capacity to evacuate areas under threat and the distances covered for emergency services to the physical impacts that roads, culverts, and other transportation infrastructure may have on the way water moves through a local landscape.
5. Likewise, communication is critical for coordination, and needs to be factored into resilience planning, including access to broadband service.
6. A state-facilitated sister city project could connect communities with others as models of assistance and planning.

Other Observations

Milwaukee Metropolitan Sewerage District (MMSD)

MMSD's experience in resilience planning shed light on several key elements of success that other communities may find valuable. Intergovernmental collaboration was key, as was political leadership. Communication and public education were also crucial. Adequate funding, selecting the right spokesperson, working with the media, staying ahead of the message (i.e., going from polluter to protector), and framing the discussion (i.e., discussing multiple co-benefits including economic savings) were all critical to success. Sustainable funding was also important for MMSD (though this remains a significant challenge for smaller communities that have more modest financial resources.)

Responsive Government

One small group envisioned what a more responsive government and key characteristics of responsive government could look like. They noted the importance of coordinating across communities in a watershed, and developing climate resilience plans that include many localities. Having best practices in place for crisis at the county and village level, including communications resources and protocols, would allow local government to respond quickly and effectively. Restoring local journalism could help keep communities apprised of local meetings, inform residents, and hold officials accountable. Identifying and involving trusted authorities like UW-Extension could support education and move resilience plans forward in communities. Finally, they discussed the importance of capitalizing on “teachable moments,” such as after floods, to inform future response strategies and build community support for resilience planning.

Codes

Though a useful tool in the box, the general consensus of the group was that codes will not save us. While this may be true, codes can impact the built environment by providing a bottom line.

Individual Resilience

There are many actions that individuals can take, which collectively sum to significant action. In fact, resilience can have a snowball effect, as one person’s level of preparedness can impact their neighbors, either positively or negatively. Participants observed that there are two sides of resilience: being proactive and bouncing back. At the same time, there are structural barriers to individual resilience. For instance, homeowners receive more information than renters do and have more authority and financial incentive than renters to make investments and changes with the longer view in mind. Moreover, behavior change and personal responsibility are not accessible for all, such as lower-income individuals who cannot afford to personally invest in changes. As such, we must consider equity in proposed solutions. In terms of risk mitigation, it is important to educate insurance agents about flood insurance, and more people should consider purchasing flood insurance, given that we are all at some level of flooding risk. The group acknowledged the lack of “getting credit” for things you prevent as a key barrier for preparedness and resilience. In light of this, they suggested that there should be more discussion about how to incentivize disaster prevention.

Takeaways

Over the day, participants affirmed what scientists have been telling us: extreme storms in the upper Midwest have been on the rise over the last 15 years, and the trend is continuing. Our group noted that flooding does not only originate from a swollen river or lake, but also from intense, localized inundation— where the storm water simply has no place to go but into basements and low-lying areas.

Early in our small group discussions, it became clear that any plan to deal with climate change-driven flooding needs to embrace the concept of watershed planning, not just traditional planning. Plans need to evolve with evolving needs while anticipating the impacts of a changing climate to help us live with water in a new era. “Whole watershed” planning approaches in the greater Milwaukee area and Ontario offer potential models for Wisconsin.

Our many participants from small communities around the state also made the compelling case that we need to stop starving local governments and constraining rural communities’ ability to address unique local needs.

Rural resilience in the face of climate-related threats came up repeatedly throughout the day. For instance, in rural communities affected by heavy flooding, emergency responders are often volunteers with limited resources facing overwhelming challenges. Local planners may also have multiple other job assignments and similar resource constraints. Most small communities lack the funding to recover from a flooding disaster, making it consequently more challenging to fund preventative measures, such as new bridge and culvert design, re-location to reduce risk and vulnerability, and watershed protection. The group also noted how a strong rural ethic of hard work and self-reliance can sometimes obstruct individuals from asking for help. This same ethic, coupled with a distrust of government, can make watershed planning and regional cooperation very challenging. Our discussions about supporting rural resilience pointed to the need for a culture shift that begins with listening, valuing local expertise, funding 4-H programs and schools, and offering assistance when asked – much more than short-term disaster relief in a crisis.

From larger cities to rural communities, participants agreed that educating residents, elected officials, insurance agents, and others involved in resilience planning is critical. Sometimes re-education is necessary, as smaller communities may have more turnover in staff tasked with planning and emergency response. Moreover, successful initiatives have learned to find the right message and messenger to advance resilience strategies.

In order to shift from a pattern of disaster response to a more proactive approach of preparedness and integrating resilience into communities, state agencies and local communities need to invest in watershed planning across Wisconsin. We need to acknowledge and address the unique challenges that rural communities face, and support healthy practices in agricultural and conservation lands. Rather than hindering local control, the state needs to coordinate with—and serve as a resource for—local government. Finally, Wisconsin needs a plan for resilience, and there are a number of leading examples from which the state can draw. Wisconsin has the capacity to develop and implement a strategy to make our communities and environment more resilient.

Appendix: Summary of Pre-Event Survey Responses

Prior to the meeting, we asked participants to respond to a pre-meeting survey. The survey helped map the current lay of the land in Wisconsin's resilience strategies, and also identified top needs and response strategies. We reviewed the themes to emerge from the survey, and added additional topics.

Lay of the Land

In the pre-event survey we asked for initial impressions on a variety of topics. Responses are briefly summarized under each question.

1. Who is in the vanguard of leadership on this topic?
 - Local leaders: communities who have experienced flooding disasters, Milwaukee/Milwaukee Metropolitan Sewerage District (MMSD), Dane County
 - Tribal governments: e.g. Lac du Flambeau and Bad River Anishinaabe
 - State: Department of Administration (DOA) Land Information Program, Governor's office, Wisconsin Emergency Management, Department of Natural Resources (DNR)
 - Other states: Illinois, Iowa, Minnesota, California, Washington, Eastern coast states
 - Federal: U.S. Army Corps of Engineers (USACE), Federal Emergency Management Agency (FEMA)
 - Others: Wisconsin Initiative on Climate Change Impacts (WICCI), non-governmental organizations (NGOs), American Farmland Trust, Association of State Floodplain Managers, Wisconsin Silver Jackets

2. Are responsive strategies supported by funding and other resources?
 - Not enough/minimal funding
 - Need more incentives
 - Available funding includes:
 - Some federal funding
 - Through state/federal/local taxes
 - Some funding by local governments to floodplain managers and planning agencies (e.g., Southeastern Wisconsin Regional Planning Commission (SEWRPC))
 - Some state funding: Office of Energy Innovation (OEI), grants for dam removal
 - The private sector is carrying efforts.

3. What economic incentives or partnerships exist to support resilience strategies?
 - Many respondents noted "none" or "unaware"

- State partnerships include: public-private partnership with utilities for emergency planning, information sharing, and coordination; Business Emergency Operations Center Initiative (telecommunications, fuel industry); nonprofit disaster relief orgs (Red Cross, Salvation Army)
- DATCP & DNR
- Some FEMA and HUD grants for funding
- Organizations like the Sand County Foundation, American Rivers, WI Soil and Water Conservation Society, farmer co-op groups, WI Silver Jackets team can assist with outreach

4. What scenarios or approaches could advance state-level resilience planning in Wisconsin?

- State leadership from Governor's office, DATCP, DNR
- Change in Legislature
- Pressure from powerful interest groups (realtors, WMC, Big Ag)
- Establish a Climate Action Plan for Wisconsin with buy-in from State agencies, private sector, municipalities, citizens
- Use existing disaster assistance programs (e.g., WEM's Wisconsin Disaster Fund and WisDOT's Disaster Damage Aids program)
- Interagency Council at state level
- Include resilience when State Hazard Mitigation Plan is updated (by 2021)
- Local govt. & NGOs collaborate on regional planning
- Engage local communities one at a time, look at vulnerabilities, make site-specific plans
- Get disparate voices at the table
- Increase construction standards in hazard-prone areas
- Fund emergency management planning & training
- Pilot watershed/natural flood management initiatives in various landscapes
- Update WICCI effort with larger focus on improving rules and regs

5. What poses barriers to progress?

- Policy
 - Lack of political will, driven by special/economic interests
 - Opposition by state legislature
 - Existing standards and regulations
- Funding & Resources
 - Insufficient funding & economic incentives
 - Limited capacity / competing priorities
- Complexity of issues / interdisciplinary nature:
 - Difficulty in collaboration across so many agencies and partners
- Information
 - Lack of public familiarity on climate change impacts, resilience, and adaptation

- Perception of lack of risk (starting to change)
- Data gaps
- Communication

6. What role should the federal or tribal governments play?

- Funding
- Incentives for state planning
- Research
- Providing expertise and technical assistance to states
- Setting standards and guidelines
- National policy
- International agreements

7. What role should state government play?

- Research support and analysis
- Setting standards and guidelines
- Outreach and education
- Interagency coordination
- Define WI-specific vulnerabilities
- Provide a long term resilience/adaptation planning framework
- Administer federal funds and allocating state funds from state budget for overarching resilience planning (a mandate to focus on this issue right away)
- Legislation to fund/allow local planning efforts

8. What role should local/government play?

- Assess local needs and tailor solutions to community
- Convene local stakeholders
- Implement local ordinances
- Project implementation
- Outreach and education

9. What roles should other sectors play?

- NGOs:
 - Help ID local needs and equity concerns
 - Provide additional capacity to local govts.
- Business: Adopting internal policies and support government efforts
- UW & Extension:
 - Science to support decision-making
 - Educational opportunities
- Private citizens: Responsible choices

10. Does Wisconsin need a leadership network or task force?

- Most said "Yes!"

- Who should convene/support?
 - Federal and state government
 - Governor or existing association of counties/munis
 - State agencies (e.g., DNR, Emergency Management, DOA) and associations representing stakeholders
 - Wisconsin Academy
 - UW system
 - WISCAP

Preliminary Recommendations

Survey respondents also shared a variety of ideas for what Wisconsin could do to increase resilience in the face of extreme weather.

1. **We need better data, modeling, and maps:** Floodplain data is outdated. Wisconsin needs hydrologic/hydraulic studies, localized climate change predictive data, and to update statewide LiDAR (Light Detection and Ranging)
2. **Adopt/enforce codes, standards, and ordinances:** Wisconsin needs to adopt/enforce codes (building/zoning/floodplain) at the state and federal levels, increase the state floodplain ordinance to 500-year (vs. 100-year) floodplain, and establish stricter storm water infrastructure design standards
3. **Infrastructure:** Wisconsin needs to advance green infrastructure, provide funding for infrastructure adaptation in small communities, steer development from vulnerable areas through land use planning, and identify opportunities for dam removal
4. **Natural flood management:** Wisconsin needs to fund pilots to study nature-based solutions like wetland restoration, restore rivers/coastlines to reconnect to riparian floodplains
5. **Sustainable agriculture/forestry:** Wisconsin needs to plant trees (replace dying ash), incentivize resilient farming practices, and bolster development of local food sheds (the geographical area between where food is produced and consumed)
6. **Integrate energy in resilience strategies:** Wisconsin needs to continue to improve energy efficiency and diversify energy sources through renewables and incorporate microgrids for critical infrastructure.
7. **Holistic approach:** Wisconsin's resilience strategies need to consider all hazards collectively (precipitation, flooding, drought, public health, storm water, wind).
8. **Collaboration:** Wisconsin needs to collaborate across many players and stakeholders to advance solutions. These collaborations include public-private partnerships, local government buy-in to broader efforts, State agency coordination, encouragement and support for grassroots efforts, local entities demanding state-level resilience planning, aligning state/county/local policies, regional/watershed collaboration, and working with start-ups.
9. **Education and outreach:** Wisconsin needs public/political outreach, emergency response training, local/community awareness, sharing of model plans via county/municipal/nonprofit contacts, and a communications strategy.