

# Decreasing Flood Risk in the Midwest with Regional Collaborations

Five case studies offer lessons for local, state,  
and federal partnerships



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## Decreasing Flood Risk in the Midwest with Regional Collaborations

### Introduction

Flooding causes billions of dollars in damages every year in the United States, with further but often intangible losses borne by individuals, families, and communities. Since the year 2000, flood events have affected the U.S. on an almost daily basis – an average of 300 days each year – and are projected to become more severe and frequent.<sup>1</sup>

Importantly, federal and state agencies are recognizing that more funding, capacity, and technical assistance are needed to decrease flood risk and strengthen resilience. In 2021, the Infrastructure Investment and Jobs Act included \$35 billion in funding that could be leveraged for flood resilience.<sup>2</sup> Similarly, the 2022 Inflation Reduction Act provided billions of dollars more for resilience projects that can be used to reduce flood risk, including \$3 billion for environmental and climate justice block grants, \$3.2 billion in neighborhood access and equity grants, and \$220 million for tribal climate resilience.<sup>3</sup>

However, many local governments in rural and/or disadvantaged communities lack the time, money, and expertise needed to access federal funding.<sup>4</sup> Too often the communities that need the most help are left behind. There are long-standing debates on how state and federal authorities can best help lower-capacity communities access the resources they need to address flood risk. One strategy is to use state and federal investments to support regional collaborations that bring together multiple governments and rural and urban stakeholders. By working together, neighboring communities can alleviate capacity constraints while also developing more holistic, watershed-scale solutions to flooding and water quality issues.

Importantly, this research found that there are many ways to structure regional collaborations.<sup>5</sup> Regional solutions to flood risk may be organized around watersheds, geographic or political boundaries, or shared goals. Regional collaboratives can be customized to fit the timing, capacity, and funding needs of partners. While regional collaborations are not a new strategy, little attention has been given to the innovative regional work being done in the interior United States. This report highlights five examples of regional approaches in the Midwest. Each collaborative effort highlighted in this report helped to reduce flood risk, though it was not always the primary goal. Collectively, the case studies demonstrate the diversity of collaborative approaches:

- In **Dubuque County, Iowa**, county and municipal staff took advantage of state law that enabled intergovernmental agreements for watershed management to pool resources and facilitate engagement with farmers around practices to promote soil health and water quality.
- A levee district in **Atchison County, Missouri**, partnered with federal and state agencies and The Nature Conservancy to undertake a levee setback project, providing more space for the natural floodplain.

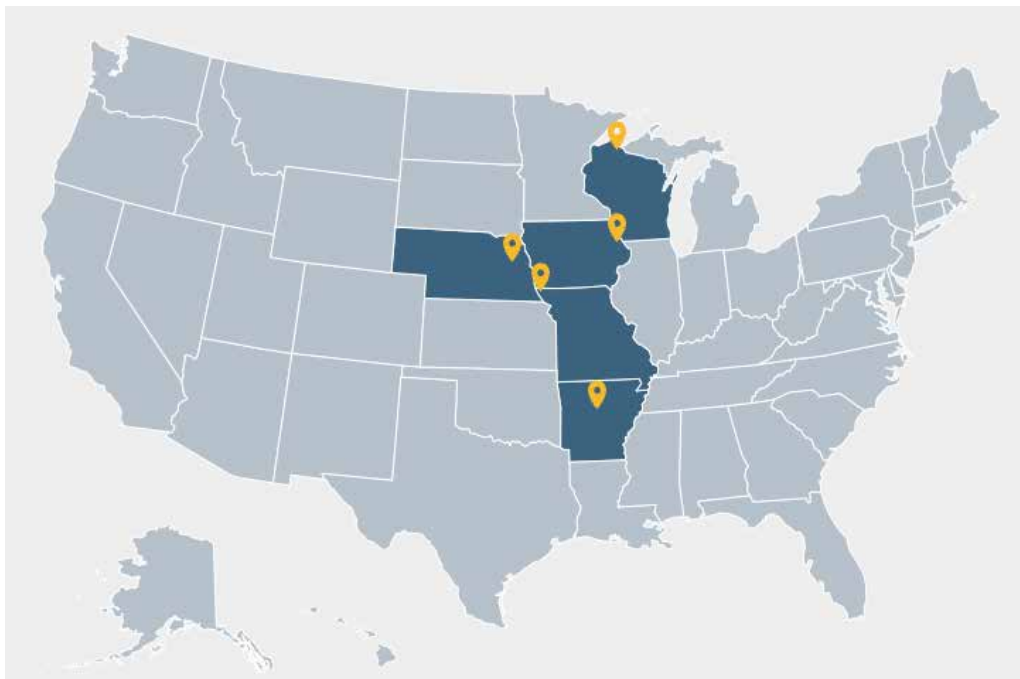
- In **Dodge County, Nebraska**, a long-term recovery group and a joint water management board worked to coordinate across the county, communities, and drainage districts to improve long-term resilience after flooding in 2019.
- The regional water utility in **Central Arkansas** used a green bond to finance watershed protection and preservation efforts to ensure drinking water quality for the region.
- In the **Marengo Watershed, Wisconsin**, local, state, federal, and tribal government partners worked with nonprofit organizations to develop a robust science-based plan to address increased erosion and sedimentation in the watershed.

Each case study includes lessons that have the potential to:

- help local governments pursue ambitious projects that unite rural and urban stakeholders around common flood and water management goals; and
- help policy makers and federal and state agency staff develop programs that more effectively encourage and support multi-jurisdictional flood and water quality projects.

## Project background and methods

In summer 2022, a team of researchers from Headwaters Economics and the Georgetown Climate Center conducted a landscape analysis of regional, multi-jurisdictional approaches to flood mitigation and watershed health. The research team selected five examples that together encompass the range of challenges and the diversity of approaches involved in such collaborations. Headwaters Economics and Georgetown Climate Center researchers interviewed project leaders involved in each of these regional efforts to understand how the partnerships formed, and how they have approached cross-jurisdictional solutions to flooding and watershed health challenges.



*This report highlights five regional approaches to flood mitigation and watershed health: Dubuque County Watersheds, Iowa; Atchison County, Missouri; Dodge County, Nebraska; Central Arkansas Water; and Marengo River Watershed Partnership, Wisconsin.*

Discussions with project leaders from each of these regions explored partnership-building, funding strategies, stakeholder engagement, planning, and implementation approaches, with an emphasis on understanding the challenges they faced and the successes they achieved in their efforts to mitigate flooding or improve watershed health.

## REPORT RECOMMENDATIONS

### Creating & strengthening regional collaborations

#### For local governments

- Build a diverse coalition to leverage multiple sources of funding, authority, and technical expertise.
- Partner with existing regional organizations to help expedite the organizing process, or formalize new partnerships through intergovernmental agreements.
- Develop communication strategies that will resonate with community members.
- Consider a variety of local funding and financing strategies to enable project expansion and operations.

#### For state and federal agencies

- Enable regional authorities for flood mitigation and watershed protection.
- Design mitigation programs that pointedly foster regional collaborations.
- Increase investments in planning and projects that reduce risk before a disaster occurs.
- Establish partnerships across regional offices of federal agencies that can mobilize easily to support regional flood mitigation projects.

## Definitions

**Flood mitigation:** Actions and measures taken before a flood occurs to save lives and reduce damage from floods.

**Resilience:** Capacity of a community, business, or natural environment to prevent, withstand, respond to, and recover from a disruption.

**Multi-jurisdictional projects:** Projects that include multiple governments and take a regional approach to solving problems.

**Watershed:** Land area that channels rainfall and snowmelt to creeks, streams, and rivers, and eventually to outflow points such as reservoirs, bays, and oceans.



Photo credit: John Wiley, Dubuque County

## Building Relationships with Farmers for Watershed Management | Dubuque County Watersheds, Iowa

### Challenge

Dubuque County's multiple watersheds face water quality challenges from agricultural runoff and other pollution sources, and the county has experienced frequent damaging flood events, including six presidential disaster declarations from flooding since 1999.

### Regional response

The Dubuque County Watersheds partnership, established through an intergovernmental agreement, has helped build relationships between government and stakeholders at the local level, generate buy-in for flood mitigation solutions, and open doors to new sources of federal, state, and local funding.

### Lessons learned

- **Start small and find champions.** Large, complex projects are daunting. Establishing small goals and successes at the beginning of collaborations can create momentum, identify community champions, and strengthen community buy-in.
- **Statewide policies can enable watershed-scale governance structures.** Neighboring jurisdictions can use legal tools like intergovernmental agreements to collaborate on watershed-scale issues, where allowed under state law.
- **Water quality and flood risk reduction goals can be achieved together.** While funding programs may target either water quality or flood risk reduction, these goals are not mutually exclusive. Project partners can realize many co-benefits as well as open up new funding sources by thinking holistically.

### Partners

- City of Dubuque | City Government
- Dubuque County | County Government
- Dubuque Soil and Water Conservation District
- Iowa Watershed Approach | Technical Assistance Provider

## Overview: Collaborating for watershed management in Dubuque County

Dubuque County is located adjacent to the Mississippi River in eastern Iowa. The county is a mix of rural, agricultural lands and denser, more populated communities, including the City of Dubuque. Throughout the county, agriculture and land use decisions have contributed to deteriorating water quality from nutrient and sediment runoff. The county has significant flood risk, compounded by development pressures and increases in impervious surfaces.

## Iowa's watershed management authorities

In 2008 Iowa experienced significant flooding, prompting the state Legislature in 2010 to authorize the creation of Watershed Management Authorities to encourage local governments to engage in collaborative planning at the watershed scales. Watershed Management Authorities are established by a "28E" (intergovernmental) agreement among two or more political subdivisions in the same Hydrologic Unit Code 8 (HUC-8) watershed.<sup>i</sup> These entities are intended to improve coordination in assessing flood risk and water quality, evaluating potential solutions, and allocating money for flood mitigation or water quality purposes. The Catfish Creek Watershed Management Authority was established in 2012 under this authority.

<sup>i</sup> Hydrologic Unit Codes are established by the United States Geological Survey to delineate and identify any hydrologic area in the United States. Hydrologic Unit Codes with a larger number of digits delineate smaller-scale watersheds; i.e., HUC-8 refers to 8-digit Hydrologic Unit Codes, which delineate river subbasins, whereas a 10-digit HUC-10 within the HUC-8 subbasin delineates a smaller watershed within that subbasin.

To address these challenges, partners within Dubuque County and the City of Dubuque formed intergovernmental agreements to coordinate funding and programs at different watershed scales. There was a clear need to work together and engage farmers in order to achieve water quality, flood reduction, and conservation goals.

This collaboration was driven in part by federal water quality requirements for the City of Dubuque. To obtain a federal permit to discharge stormwater into local water bodies, the city had to develop a watershed management plan and strategies for reducing nutrients in stormwater runoff. Since the larger watersheds extend beyond the jurisdiction of the city, the city chose to work with the county and other partners to consider regional drivers of deteriorating water quality. Over time, the city and county, along with the Dubuque County Soil and Water Conservation District, formed a watershed team using an intergovernmental agreement under section 28E of the Iowa Code, which is now known as Dubuque County Watersheds.

Since forming this partnership, Dubuque County Watersheds has revamped its 28E intergovernmental agreement and hired additional staff, including a full-time urban watershed coordinator and a full-time conservation agronomist.

Dubuque County Watersheds exists "to perform erosion-control, watershed protection, and flood prevention activities" benefiting all partners. The collaboration is funded through contributions from the City of Dubuque and Dubuque County, which are outlined in the updated intergovernmental agreement, as well as external sources of funding. The Soil and Water Conservation District serves as a conduit for the funding, develops the budget, and implements conservation activities with both agricultural and urban landowners.

Within Dubuque County Watersheds, a separate but parallel partnership was established to coordinate activities specifically within the Catfish Creek Watershed. This particular partnership originated under the state's 2010 enabling legislation for watershed management authorities (see sidebar). The Catfish Creek Watershed Management Authority, established in 2012, was one of the first watershed management authorities established under the 2010 legislation, as the Dubuque partners benefited from their pre-existing collaboration and intergovernmental agreement. The authority's Board of Directors has representatives appointed by the City of Dubuque, Dubuque County, City of Asbury, City of Peosta, and Dubuque Soil and Water Conservation District.

Across these parallel efforts within Dubuque County, a "start small" approach has enabled the partners to secure new funding, greater local buy-in, and great success over time as the watershed protection programs are implemented.

### Funding: Starting small and staying flexible

The Dubuque Soil and Water Conservation District began working on watershed projects in 2008, receiving grants from the Iowa Department of Agriculture and Land Stewardship and Iowa Department of Natural Resources. Since these grants were time limited, the Dubuque County Watershed approach was to create sustainable funding at the local level. Both Dubuque City and County contribute to its annual operational budget as specified in the 28E agreement.

The partnership approach has made the watershed region more attractive to federal funders. Dubuque County received a Watershed and Flood Prevention Operations Program grant from USDA Natural Resources Conservation Service to determine where flood control structures could be located in ways that would reduce flooding upstream of many of the county's farms (and thereby reduce agricultural runoff), and has received grants from FEMA as well to address flooding challenges.



## Funding highlight: Iowa leverages federal funding for statewide mitigation

Following the establishment of the first Watershed Management Authorities, in 2016 the state created the Iowa Watershed Approach to encourage more consistent and holistic approaches to decreasing flood risk, improving water quality, and strengthening community resilience in Iowa. The U.S. Department of Housing and Urban Development funded the Iowa Watershed Approach through the National Disaster Resilience Competition with a five-year, \$97 million grant, which was managed by the Iowa Flood Center, based at the University of Iowa.

As part of the Iowa Watershed Approach, the state selected nine watersheds, each with its own watershed management authority, for funding. From 2016 to 2021, 800 flood reduction and water quality projects were completed throughout the state, including wetlands restoration, reconnected floodplains, and water storage and sediment control basins. The initiative prioritized community engagement, nature-based solutions, and working at the watershed scale. HUD Deputy Secretary for Grant Programs Kevin Bush noted that the Iowa Watershed Approach “showcases how urban and rural communities can work together to increase our resilience to natural disasters.”

The Iowa Watershed Approach supported the City of Dubuque’s Bee Branch Watershed Flood Mitigation Project, allocating \$31.5 million to implement both flood mitigation improvements and a resilient homes program in the 6.5-square-mile Bee Branch Watershed.

Another source of funding for watershed improvements in the region is through sponsorship lending, allowed by the Clean Water State Revolving Fund. Through the Water Resource Restoration Sponsored Project Program, wastewater utilities can fund watershed-based projects that reduce nonpoint source pollution. The City of Dubuque applied for and received sponsorship status for a wastewater treatment project, and Iowa Department of Natural Resources refinanced the loan for the sponsored project at a lower interest rate. The city realized \$1.4 million in savings from the refinancing and was able to spend these funds within the watershed for water quality or flood protection improvements.

The Bee Branch Watershed Flood Mitigation Project is the City of Dubuque’s largest project, with a price tag of nearly \$250 million. To date, the City of Dubuque has secured \$163 million in federal and state grants and loans, including \$98.5 million from the Iowa Flood Mitigation Program, \$31.5 million from HUD’s National Disaster Resilience Competition grant to the Iowa Watershed Approach, \$5.6 million from the U.S. Department of Transportation’s Investment Generating Economic Recovery program, \$2.5 million from the U.S. Economic Development Administration, and over \$165,000 from public and private donations thanks to a public support campaign spearheaded by America’s Rivers. These diverse funding streams are typical of large-scale projects aimed at decreasing flood risk and speak to both the creativity and capacity needed at the local level to secure sufficient resources.

While the Catfish Creek Watershed project is smaller in scale when compared to the Bee Branch project, it has also benefited from diverse sources of funding. Early funding secured from the Iowa Economic Development Authority enabled the Catfish Creek Watershed Management Authority to develop its Watershed Management Plan, which lays out goals and strategies for improving watershed health and water quality in its region. Since then, the City of Dubuque has awarded a \$1.4 million water quality grant to the authority to begin implementing the plan. The Catfish Creek Watershed Management Authority was the first watershed authority in Iowa to receive such a grant.

## Achieving big wins through small steps

Over the years, Dubuque County Watersheds has successfully implemented programs that encourage farmers to adopt best practices to reduce runoff and nutrient pollution, sequester carbon, and build resilience. These programs have been rolled out slowly to give time to demonstrate successes, expand outreach efforts, and generate more funding for incentives.

*Soil and Water Outcomes Fund:* Dubuque County Watersheds serves as a pilot group for the Soil and Water Outcomes Fund, a nationwide nutrient trading program established by the Iowa Soybean Association. Through the Soil and Water Outcomes Fund, farmers can receive payments for implementing best practices that promote carbon storage and manage water usage. Because Dubuque County Watersheds and its partners already had relationships with farmers, it was well positioned to pilot this program.

Dubuque County went through a strategic planning process to determine the percentage of farms engaging with Soil and Water Conservation Fund and the percentage of farmers willing to use the recommended

conservation practices. To participate in the program, farmers meet with the county's agronomist to discuss options for implementing changes in tillage practices and cover crops. The farmer then contracts to implement no-till practices and cover crops for a certain number of acres, which is later verified by a third party, Bonafide Ventures. Bonafide Ventures runs a Nutrient Tracking Tool that estimates the reductions in nitrogen and phosphate levels, and models how much carbon will be sequestered. The credits for these savings are sold to private investors.

The Outcomes Fund administers the contracts and payments with farmers, and bills the county for the outcomes generated. The county essentially serves as a facilitator, making connections with landowners. For this program, the county dedicated \$150,000 for contracts with farmers, which the Iowa Department of Agriculture and Land Stewardship matched, resulting in \$300,000 available.

*TrueTerra Insight Engine:* The Dubuque County Watershed Program has also piloted the TrueTerra Insight Engine, a modeling tool developed by Land O'Lakes, Inc. This matrix uses a field-by-field analysis for farms to create baseline sustainability ratings (based on slope, soils, contours, crop history, yields) and recommend a mixture of conservation practices the farmers could implement. For every point increase in performance, farmers receive \$2.52 per acre, capped at \$5,000. Funding for these payments comes from local tax revenue through the land stewardship fund, which is also useful for leveraging federal and state funding.

Dubuque County Watersheds serves a valuable role not just in securing funding for these programs, but also in helping farmers navigate the process and complete some of the more time-intensive administrative aspects of the programs, which also helps to increase participation. Through these and other efforts within the county, a variety of projects have been funded and implemented on both public land and private agricultural land, including streambank stabilization projects on both public and private property, detention ponds and sediment basins on farm fields, soil quality restoration projects, farmer infield practices to reduce runoff, and other projects to reduce impervious pavements.

## Generating buy-in and engaging stakeholders

Stakeholder and elected official engagement has been a critical component to the success of the Dubuque County Watersheds partnership over the years. As the partnership has been able to showcase success and growing buy-in from farmers, elected officials have also come on board over time. The partnership has grown into a program that the mayor and elected officials and county supervisors trust.

Education and outreach around these programs are an ongoing effort. As elected officials cycle through and funding sources change over time, the partners must maintain their focus on relationship building. Much of the partnership's success has also been ascribed to farmers communicating with each other and observing the benefits of participating in the countywide watershed protection programs. Individuals involved with the partnership have observed that even though some landowners have initially been hesitant to participate in the incentive programs, many have changed their minds over time after hearing more about the programs from neighbors, friends, and family.

Engaging with policymakers and elected officials and facilitating direct connections to the agricultural community has also been an important role for the partnership. Dubuque County Watersheds has had success in communicating the importance of these practices for water quality and flood mitigation by bringing landowners to supervisory, city council, and commission meetings to share their experiences.

Elected officials also hear directly from farmers when farmers host field days. The county is often a liaison and partner to make these field days successful, but these events are driven by the farmer, who invites the visitors and does most of the talking, showcasing the successes of the program and the importance of Dubuque County Watersheds as a partner. The city helps by publicizing these field days and by providing food for participants.

This direct engagement between landowners and elected officials and local government staff demonstrates firsthand that the partnership has generated buy-in from local farmers. Feedback from farmers has also been important for the state Department of Natural Resources and USDA Natural Resources Conservation Service to help understand challenges and better design programs to meet nutrient reduction goals.

## Benefits for rural and urban stakeholders

Dubuque County Watersheds has helped urban and rural landowners implement better land stewardship practices through financial incentives. For urban landowners, the partnership offers cost-share programs for investments like rain gardens, vegetated swales, soil quality restoration, and wetlands enhancements. The cost-share programs for rural landowners incentivize investments in projects that decrease flood risk and nutrient discharge. Both the Soil and Water Outcomes Fund and TruTerra programs provide new revenue streams to farmers to improve conservation outcomes without compromising their business operations.

The water quality benefits of this work are well documented in EPA studies on nutrient reduction practices. In addition, Dubuque County Watersheds and the Soil and Water Outcomes Fund have partnered with the University of Dubuque to collect samples that can help measure and demonstrate the impact of these practices.

In addition to providing financial incentives for farmers, Dubuque County Watersheds is also helping to mitigate flooding that causes damage to farms. Taken together, these projects — while small individually — amount to big gains. Dubuque County Watersheds has enrolled over 17,400 acres into conservation programs, created positive impacts on more than 20,000 acres, and built multiple projects to reduce flood risk and improve water quality, including six ponds, eight sediment basins, and seven waterways. Over the course of the last three years, these programs have reduced undesirable sedimentation in the watershed by 30%. Beyond water quality and flood risk reduction, this work has also created a larger culture shift and openness toward more sustainable practices on public and private lands.

## Learn more

- Dubuque County Watershed: <https://www.dubuquecountywatersheds.org/>
- Catfish Creek Watershed Management Plan (2014): <http://www.watershediowa.org/wp-content/uploads/2018/02/Catfish-Creek-Watershed-Management-Plan-Full-Small-File-Size.pdf>
- Soil and Water Outcomes Fund: <https://www.theoutcomesfund.com/>

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## Realizing a Levee District’s Vision for Long-Term Solutions to Flooding | Atchison County, Missouri

### Challenge

Since 1952, every major flood in Atchison County has breached at least one levee. These breaches have caused significant damage to Interstate 29, railways, roads, and nearby farms.

### Regional response

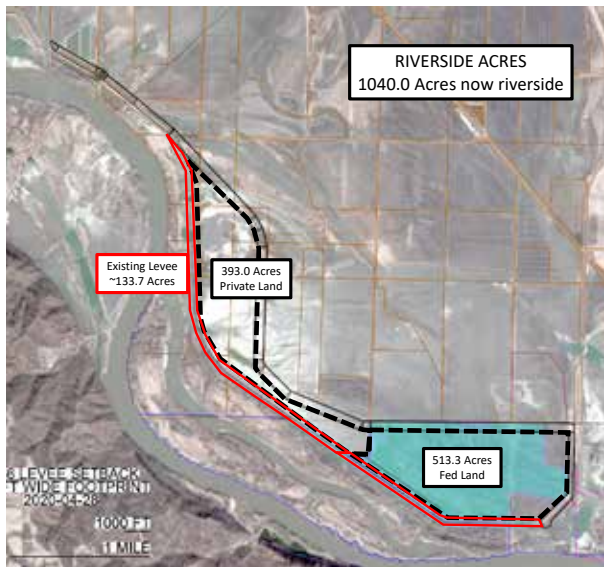
A regional project team was formed to acquire land and move a levee inland to create more space for the natural floodplain, reducing the chances of another breach.

### Partners

- Atchison County Levee District | Levee District
- U.S. Army Corps of Engineers | Federal Government
- USDA Natural Resources Conservation Service | Federal Government
- Missouri Department of Natural Resources | State Government
- Missouri Department of Conservation | State Government
- Missouri Department of Economic Development State Emergency Management Agency | State Government
- Northwest Missouri Regional Council of Governments | Regional Council
- The Nature Conservancy | Nonprofit / Technical Assistance Provider

### Lessons learned

- **Have a dedicated convener.** Large-scale, multi-jurisdictional projects often benefit from having a third-party convener. The Nature Conservancy brought all of the partners together, held weekly calls, and kept everyone focused on solutions as new challenges arose. Many of the project partners attributed their success to the consistent communication and trust-building that The Nature Conservancy enabled.
- **Garner local support and leadership.** Levee districts can build and demonstrate support on the ground, which makes state agencies more willing to provide funding. Alignment among landowners and other local stakeholders about the levee setback made this project possible.
- **Recognize many types of benefits at all levels.** Nature-based solutions provide benefits locally and regionally, ranging from flood mitigation to cost financing savings to habitat restoration.



## Overview: Atchison County Levee District and the levee setback

Atchison County is a rural county in northwestern Missouri of about 5,000 people. In 2019, the Missouri River flooded and breached levees in more than 100 locations throughout the watershed, including those in Atchison County. Given the county's history with repetitive flooding, local officials and landowners began discussing solutions that went beyond standard levee repairs.

In partnership with the U.S. Army Corps of Engineers, the Atchison County Levee District led the effort to identify and implement a solution. The levee district is governed by a four-person board that oversees three levees across 54 miles,

making it one of the largest levee districts in the United States. The levees that the district oversees and maintains were built in the 1950s. Repetitive flooding over decades have caused residents to gradually move away, leaving only a handful of houses among the agricultural land within the leveed area.

After the 2019 flood, the levee district began exploring a levee setback that would move the levee, officially named L-536, inland. The setback would create more space for the natural floodplain and reduce the chances of a future levee breach.

To implement this solution, the U.S. Army Corps of Engineers and levee district assembled a project team of local, state, federal, and nonprofit stakeholders. Because levees are part of the federal flood control system, the U.S. Army Corps of Engineers, Omaha District was responsible for the emergency levee rehabilitation and needed to approve all changes to the levee. Both the Army Corps and the levee district recognized the challenges involved with the levee setback and recruited The Nature Conservancy, a nonprofit organization, to help facilitate the project.

## Defining project team roles

Levee setbacks are a relatively new strategy for reducing flood risk. Since design and construction aspects for this type of project can vary widely on a site-by-site basis, project partners had to be open to experimentation and tackle unexpected challenges nimbly.

With so many entities involved, an early step was to define — based on existing authority, resources, and expertise — the distinct and interdependent roles each partner would play:

- *Atchison County Levee District* - Led the community engagement and was responsible for real estate acquisitions.
- *U.S. Army Corps of Engineers* - Funded and constructed the realigned levee. The Missouri River Recovery Program provided additional resources and expertise.
- *The Nature Conservancy* - Assumed a project manager role, convened the partners in weekly meetings, and assisted with real estate transactions. They also led public engagement by developing a website, documentary video, and a levee setback playbook.
- *Natural Resources Conservation Service* - Arranged easements on the land that used to be levee-protected. The levee district could not afford to buy out landowners with their own budget, so a partnership with the Natural Resources Conservation Service was established to help with acquisition costs.
- *Missouri Department of Conservation* - Leveraged conservation land to provide borrow material, real estate access, and natural resources expertise. They will also own the land enrolled in the Natural Resources Conservation Service easements that facilitated the levee setback.

- *Missouri Department of Natural Resources* - Provided permitting support and coordinated state grants.
- *Missouri State Emergency Management Agency* - Coordinated emergency disaster funding for real estate acquisition.
- *Missouri Department of Economic Development* - Assisted with early disaster funding grant applications.
- *Northwest Missouri Regional Council of Governments* - Assisted with disaster funding requests and coordinated other local efforts.

As the convener, The Nature Conservancy had a crucial role in helping the government agencies – all with different authorities – to work together. For example, the Natural Resources Conservation Service has rigid requirements for its easement program, requiring title documents be collected prior to construction. However, some of the titles needed for this project have taken years to find and verify. By prioritizing coordination and communication, The Nature Conservancy was able to help the U.S. Army Corps of Engineers define the project area in a way that allowed title collection for the Natural Resources Conservation Service to happen simultaneously. Although the project started in 2019 and is nearly complete, the project team is still finalizing contracts with landowners as of early 2023.

Several participants observed that by asking all agencies to be creative and stretch their typical ways of working, The Nature Conservancy kept the partners in a problem-solving mindset, reminded them of their shared vision to set back the levee, and kept the project moving forward.

Local buy-in was a significant factor in getting funding from the Missouri Department of Natural Resources to assist with the real estate acquisition process. Since the levee district already had relationships with the landowners, the board members took the initial lead in negotiations to demonstrate that there was local support for the project. This work served as the foundation for the levee setback, and the trust that the levee district had with the community was, in part, transferred to the partners.

## Investing in nature-based solutions

Levee projects are complex due to the mix of stakeholders and regulations involved. While the Army Corps conducted the feasibility study, design, and construction, the levee district was responsible for acquiring land easements needed for the levee footprint. The district was also responsible for compensating the landowners whose land would be converted to the riverward side of the levee.

Land acquisition for easements is both time consuming and expensive. The Atchison levee setback required coordination with five landowners. The levee district took the lead in talking with the landowners and also brought in a third-party consultant to interview the landowners early in the project. The levee district's leadership helped residents overcome any distrust of large environmental groups and the government, and at the same time the levee district was able to stay out of real estate negotiations and preserve its relationships more easily. The levee district also compensated landowners beyond the minimal price to help create buy-in for the project.

Using disaster recovery funds, the State of Missouri provided grants to The Nature Conservancy to purchase residual ownership interests from the landowners. When the project is complete, The Nature Conservancy will donate this land back to the state to increase access and public lands. Nonprofit

## Funding highlight: Creating a funding stack for large-scale projects

The levee setback required significant coordination among local, state, and federal partners, as well as a complicated mix of funding sources. While the U.S. Army Corps of Engineers funded the levee construction, real estate acquisitions required a mix of partners. At the local level, the levee district committed over \$400,000 in funds. Multiple state agencies, including Missouri's Department of Natural Resources, State Emergency Management Agency, Department of Economic Development, and Department of Conservation assisted with planning and funding the project. At the federal level, USDA Natural Resources Conservation Services assisted with easement funding for voluntary land buyouts. The Missouri River Recovery Program contributed land and borrow material for the setback, which in turn resulted in new wetlands and reconnected floodplain habitat on federal conservation land. In addition, The Nature Conservancy, a 501(c) 3 nonprofit, also raised funds to assist with acquisition. Together, the mix of partners and funding enabled this project to be built to decrease regional flood risk.

organizations like The Nature Conservancy often have more flexibility in pursuing land acquisition than state or federal agencies, further demonstrating the importance of this partnership.

An additional challenge was that the USDA Natural Resources Conservation Service already owned conservation easements on land that was needed for the setback construction. To mitigate and offset the loss of these easements, the partners had to purchase new easements elsewhere. A regional MOU between the USDA Natural Resources Conservation Service and the U.S. Army Corps of Engineers enabled the construction to begin before the USDA Natural Resources Conservation Service was fully compensated. Like many of the other challenges throughout this project, this issue had the potential to derail the setback, but creativity, partner trust, and continued commitment to finding solutions motivated everyone to seek a workaround.

Construction on the levee setback began in summer 2020 and was completed one year later, making it the first levee setback at this scale in Missouri.

## Benefits for rural and urban stakeholders

The levee setback provides a variety of benefits at the local and regional scale. Locally, recreation and hunting opportunities, tourism, and wildlife habitat, improved water quality, and nutrient reduction were all seen as potential benefits in addition to the goal of flood mitigation. Regionally, having a higher-capacity levee means that the river stage of 100-year flood events will be nearly a foot lower due to the additional storage. Seven miles of the Missouri River will see a reduction in peak flow during rain events.

Moreover, after the 2019 flood, some of the land around the levee had been damaged to the point where farmers could no longer use it. Having a setback ensured that the landowners would be compensated for their land while protecting the broader community from severe flooding. Notably, landowners were receptive to selling their land for the setback project because they believed the project was necessary or because they received a fair price.

The setback also affected Mill Creek and Nishnabotna, neighboring communities outside of the Atchison County Levee District. Although they were not a part of the levee setback, the project team kept the neighboring communities in the loop by coordinating across levee districts as project planning progressed. This intentional engagement paid off as it became apparent that improvements to drainage and pumping systems in the neighboring communities were needed. The group of partners, local regional planning commissions, and state Department of Natural Resources secured funding to help. These resiliency improvements were not only important for Mill Creek and Nishnabotna, but also for Atchison County Levee District. When the downstream levee functions well, the entire system works better.

The levee setback project was complex and faced constant challenges, but it created a path for other creative flood mitigation projects going forward. The partners formed relationships that can make future projects together easier while showing that projects and partnerships like these can be successful.

At the state level, the levee setback inspired the Legislature to appropriate funding for three feasibility studies to develop comparable projects in nearby counties. The Nature Conservancy created a levee setback playbook that can be used in other parts of the river system, and they are hopeful that government officials can use the lessons learned to improve how agencies work together in general. Atchison County had a representative on a multistate Flood Recovery Advisory Working Group, which produced a report endorsing the setback and offering ways to support similar projects. By inspiring other places to explore nature-based solutions, the levee setback's benefits extend beyond Atchison County.

## Learn more

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## Acknowledgments

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Photo credit: Gary Ogden

## Formalizing Collaboration for Flood Recovery and Risk Reduction | Dodge County, Nebraska

### Challenge

A major flood in 2019 demonstrated the risk of flooding to communities throughout Dodge County.

### Regional response

Stakeholders throughout the county formed two new regional networks – the long-term recovery group and the joint water management board – to coordinate recovery and mitigation efforts.

### Lessons learned

- **Coordinate flood recovery and mitigation efforts.** While it is challenging to plan while a community is in crisis after a flood, mitigation should be part of the recovery process. Long-term recovery groups often understand the needs of community members, as well as public and private funding opportunities, that enable effective mitigation projects.
- **Establishing a formal partnership creates opportunities for new partners to become involved.** The City of Fremont, the Village of Inglewood, and Dodge County had previously partnered on flood-related projects, but developing a formal agreement to collaborate provided the opportunity for other communities and entities, such as dike and drainage districts, to join.
- **Nebraska’s natural resources districts offer an effective model for flood mitigation.** Nebraska organizes its natural resources districts around river basins, making them particularly suited for addressing regional flood risk.

### Partners:

- City of Fremont | City government
- Lower Platte North Natural Resources District
- Village of Inglewood | Local government
- Dodge County | County government
- City of North Bend | City government
- Cotterell Diking & Drainage District
- Ames Diking & Drainage District
- North Bend Drainage District
- Elkhorn Township | Local government
- Platte Township | Local government
- Sanitary & Improvement District #3 – Lake Ventura
- Sanitary & Improvement District #5 – Timberwood

## Overview: Establishing a coordinated approach to flood risk reduction

Dodge County is a rural region in eastern Nebraska with more than 37,000 people. While the majority of the county's land is farmland, it also comprises 14 townships, six villages, and four cities, including the county seat of Fremont with a population of 27,000. The Platte River forms the county's southern border and other rivers, including Elkhorn River and Rawhide Creek, contribute to the county's significant flood risk. The county's only hospital, the Fremont Airport, and multiple assisted living and senior centers, are among the area's critical infrastructure vulnerable to flooding.

In March 2019, Dodge County experienced severe and widespread flooding due to ice jams. The Platte River, Logan Creek, Maple Creek, Elkhorn River, and Pebble Creek all reached flood stage, and multiple levees breached throughout the county. In Fremont, flooding damaged 1,500 homes and buildings and overtopped roads, isolating the community for four days. The 2019 flood caused more than \$1.3 billion in economic and infrastructure damages throughout Nebraska, and Dodge County received both state and federal disaster declarations.

After the March floods, stakeholders recognized the need for the county's local governments to work together to coordinate recovery efforts and implement measures to reduce flood risk. Twelve political subdivisions formed the Dodge County Joint Water Management Advisory Board through an interlocal agreement in April 2019. Partners included Dodge County, the City of Fremont, four townships and villages, the Lower Platte North Natural Resources District, three diking and drainage districts, and two sewage districts.<sup>6</sup> The chair of the Dodge County Board is also the chair for the joint advisory board.

The joint advisory board coordinated the political entities as they identified and prioritized projects to comprehensively address drainage issues and reduce flood risk. The advisory board also assisted with community engagement and coordination with private entities outside of the partnership.

Notably, diking and drainage districts play a critical yet often unrecognized role in flood management in Dodge County. Prior to the 2019 floods, these entities had little formal interaction with either the county government or the City of Fremont. They were not included in the region's hazard mitigation plans, and some local government officials and staff did not even know they existed. The 2019 floods demonstrated the importance of the districts. Because the districts often own and maintain the levees and drainage ditches, they were tasked with repairing them.

However, these districts are often run by small volunteer boards (for example, three or four local farmers) and have limited budgets. While the districts were responsible for repairing levees impacted by the flooding, they had little capacity to access funding from federal recovery programs. By joining the joint advisory board, these districts were able to get the help they needed to assist with emergency repairs while also working together with the other partners to make more strategic, longer-term investments to reduce flood risk.

## Addressing funding concerns and amplifying voices

While the City of Fremont, the Village of Inglewood, and Dodge County had a history of working together on drainage issues prior to 2019, the flooding prompted them to expand their efforts to create a more comprehensive approach to reducing flood risk. As the group recruited new local governments and districts to join their efforts, funding was a top concern. However, the new partners were worried that they would have to contribute funding that they would not be able to afford.

The joint advisory group recognized that some of the entities were more capable of raising funds than others and agreed to split costs based on capabilities as opposed to an even split. The City of Fremont, Dodge County, and the Lower Platte North Natural Resources District provided the majority of the funding.<sup>7</sup> Partners that were not capable of raising substantial funds, like the diking and drainage districts, were not expected to contribute more than what they could afford. Further, they agreed that all projects and expenditures would have to be approved by the individual entity where the project is located, reducing the risk that a partner would have to invest in a solution that was too expensive for their budget.

Funding was both a concern and a reason for creating the joint advisory board. The members believed that together they would be better positioned to access state and federal funding. As Dodge County Supervisor Bob Missel noted, “When we come together as a collective body, we hope our voice is a little louder.”

To date, the Joint Water Management Advisory Board has helped its partners secure federal funding from FEMA’s Hazard Mitigation Grant Program and other hazard mitigation funds, HUD Community Development Block grants, USDA, and the U.S. Army Corps of Engineers.

## Addressing inequities and building long-term resilience after the flood

After the 2019 flood, FEMA officials suggested that community members form a long-term recovery group. The long-term recovery group was regional in nature, encompassing the City of Fremont, Dodge County, and parts of neighboring Washington County. While the Joint Water Management Advisory Board was focused on communitywide solutions to flood risk and infrastructure repairs, the long-term recovery group focused on assisting individuals by hiring case managers and raising money for recovery.

The long-term recovery group included members from the city and county governments, as well as the school district, food pantry, hospital, United Way, and other community organizations. The Fremont Area United Way offered to act as the fiscal agent for the group so that the group did not have to form its own nonprofit organization. Taking advantage of existing structures enabled the group to organize more quickly.

Importantly, the long-term recovery group prioritized projects that addressed inequities within the community. For instance, in Fremont, a mobile home park that was heavily damaged by the 2019 floods was also a key source of workforce housing for the region’s immigrant and Hispanic populations. Many of those impacted by the flooding struggled to access disaster assistance, whether due to language barriers, the burden of paperwork required, or structural problems with FEMA’s programs. When disaster recovery funding failed to fix the flood-damaged mobile homes, the long-term recovery group raised private money for repairs to prevent displacement. This was a key strategy for preserving the community’s economy and social fabric as there are limited alternatives for workforce housing.

While the work of the long-term recovery group and the joint water management advisory group differed, in practice their efforts often overlapped, allowing the two groups to amplify and support each other’s work. Both groups have standing meetings, and representatives often cross-attended to ensure coordination. For example, when the joint advisory group

## Funding highlight: Flexible federal funding enables disaster recovery and mitigation

The 2019 floods in Dodge County received a presidential disaster declaration, creating new pools of state and federal money for impacted communities to assist with recovery. Within months of the flooding, Nebraska’s Department of Economic Development created a new “Emergent Threat” category for its HUD Community Development Block Grant. This enabled the state to quickly allocate more than \$485,000 in funding to Dodge County and the City of Fremont to assist with the local match required by the Army Corps of Engineers to fix its levees.<sup>i</sup> The federal government has flexible rules for Community Development Block Grants, enabling the state to shift a pool of this money to disaster response.

The presidential disaster declaration also enabled the county and city to receive federal funding from other disaster programs, including FEMA, the US Small Business Administration, and HUD’s Community Development Block Grant - Disaster Recovery, amongst others. In addition to funding disaster relief, some of these federal resources are being used to create long-term resilience, such as investing in affordable housing.<sup>ii</sup>

<sup>i</sup> Nebraska Department of Economic Development. (2019). Fremont, Dodge County are awarded CDBG funding to repair damaged levees. Retrieved from <https://opportunity.nebraska.gov/fremont-dodge-county-are-awarded-cdbg-funding-to-repair-damaged-levees/>

<sup>ii</sup> Hammel P. (2022, July 11). Omaha, Fremont to share in \$10 million in housing grants for ‘bomb cyclone’ flood recovery. Nebraska Examiner. Retrieved from <https://nebraskaexaminer.com/briefs/omaha-fremont-to-share-in-10-million-in-housing-grants-for-bomb-cyclone-flood-recovery/>



prioritized projects that elevated homes, the long-term recovery group helped secure matching funds for the federal grant.

Both groups agree that the future of Fremont and Dodge County requires both groups – an organization focused on individual needs and a group focused on communitywide solutions – to reduce flood risk. Together, the organizations ensure regional coordination between solutions that address flood risk and community needs.

## Benefits to rural and urban stakeholders

Since 2019, the Joint Water Management Advisory Board has identified 15 projects totaling \$22.8 million to address drainage issues and flood risk. The projects range from improving drainage ditches to fixing levee breaches, investing in river monitoring gauges, establishing a public warning system, and creating watershed improvement plans. These projects will provide a range of benefits to stakeholders in the City of Fremont and in the rural areas of the county.

For example, the Dodge County Joint Water Management Advisory Board secured a \$745,000 grant from the USDA Natural Resources Conservation Service’s Watershed Flood Prevention and Operations program to conduct the Rawhide Creek Watershed Plan and Environmental Assessment. Engineers are creating a model of the watershed to understand existing conditions and will then measure benefits of potential investments to decrease flood risk. The goal is to identify projects to reduce flood risk to agricultural property, homes, and businesses throughout the 142,000 acres of watershed. Potential projects identified include property buy-outs and flood-proofing homes, channel and levee improvements, cropland conversion, increasing water storage by oxbow restoration, and wetlands restoration.

The Elkhorn Township Drainage Project is another example of a project prioritized by the advisory board that benefits both urban and rural stakeholders. Stormwater management improvements made within the City of Fremont’s boundaries will also decrease downstream flooding to agriculture lands within the township.

While the Village of Winslow is not a formal member of the Joint Water Management Advisory Board, there is clear and ongoing communication between the village and the board. The 2019 flood destroyed much of the village and most of the homes were considered a total loss. With assistance from Dodge County’s emergency management department and the University of Nebraska, the village decided to relocate and rebuild the community at a higher elevation to decrease its flood risk. This involves 53 voluntary buy-outs at an estimated cost of \$5 million. This project emphasizes the extreme impacts of flooding in Dodge County and also the range of innovative solutions that stakeholders are identifying.

Notably, the Dodge County Joint Water Management Advisory Board offers a relatively low-cost solution to coordinating work regionally. Each of the partners retains its responsibilities for constructing, managing, and maintaining projects within its jurisdiction. The goal of the advisory board is to ensure that those various projects build upon each other to offer a more comprehensive solution to decreasing flood risk.

## Partner focus: The Lower Platte North Natural Resources District

Nebraska organizes its natural resources districts around river basins, making them particularly suited for addressing regional flood risk.<sup>i</sup> The districts were formed through legislation passed in 1969, which consolidated 154 special purpose resource districts into 24 streamlined natural resources districts. Additional merging later resulted in 23 districts. The districts are funded through property taxes and have a variety of programs including flood control, soil erosion, groundwater management, and others. Nebraska’s natural resources districts are generally seen as a higher-capacity form of conservation district because they have a stable source of funding and strong local authority.

The Lower Platte North Natural Resources District is a key partner in the Joint Water Management Advisory Board. It spans across portions of seven counties in east-central Nebraska, covering nearly 62,000 people and more than 1 million acres of land. This district has 15 full-time employees. In addition to providing funding to the Joint Water Management Advisory Board, the district also provides leadership and assistance in projects to reduce flood risk.<sup>ii</sup>

<sup>i</sup> Hyer RB, ed. (2009). A History of Nebraska’s Natural Resources Districts. Lincoln, NE: Nebraska Department of Natural Resources. Retrieved from [https://www.npnrd.org/assets/site/History/History\\_of\\_NRDs0709.pdf](https://www.npnrd.org/assets/site/History/History_of_NRDs0709.pdf)

<sup>ii</sup> Lower Platte North Natural Resources District. (2023). Long Range Implementation Plan, Fiscal Year 2023. Retrieved from <https://lpnrd.org/wp-content/uploads/2022/10/FY2023-Long-Range-Plan-FINAL.pdf>

## Learn more

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- Rawhide Creek Watershed Flood Risk Reduction Plan, Dodge County, Nebraska. A virtual tour to learn about the communities and flooding history of the Rawhide Creek Watershed: <https://storymaps.arcgis.com/stories/9cb7e97dd8fe42e8bb3d27c2a05298a6>

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## Leveraging a Utility’s Leadership to Finance Watershed Protection | Central Arkansas Water

### Challenge

Lake Maumelle and its tributaries supply drinking water to the City of Little Rock and surrounding counties, but due to development pressure, the watershed’s forests – which are essential to drinking water quality – are at risk.

### Regional response

Central Arkansas Water, a regional water authority, charges a monthly watershed protection fee to help raise funds for a large-scale conservation effort to protect water quality. In November 2020, it issued the nation’s first-ever certified green bond to be used to acquire forests for watershed protection as part of the utility’s water infrastructure.

### Lessons learned

- **Recognize the value of utilities for regional projects.** As regional authorities, utilities serve multiple jurisdictions and are well positioned to complete water quality and flood mitigation projects at a regional scale. They have an existing governance structure and often are trusted within the community, which can help facilitate large-scale projects.
- **Innovative financing mechanisms can create new opportunities.** Green bonds for source water protection are not a traditional part of utility finance, but they can be a strategic and successful way to raise capital for large-scale, nature-based solutions.
- **Identify co-benefits of water quality and flood risk-reduction investments.** Watershed protection is good for not only meeting the utility’s goals but also recreation, sustainable forestry, and habitat preservation.

### Partners

- Central Arkansas Water | Water Utility
- World Resources Institute | Technical Assistance Provider
- Alliance for Global Water Adaptation | Technical Assistance Provider
- Encourage Capital | Technical Assistance Provider
- Sustainalytics | Third-Party Verification

### Overview: Central Arkansas Water

Water utilities provide the infrastructure – pipes, storage, and treatment facilities – to gather and distribute safe drinking water to communities. Whether publicly or privately owned, water utilities often supply water to multiple jurisdictions. Utilities typically rely on user rate fees to raise revenue for operations,

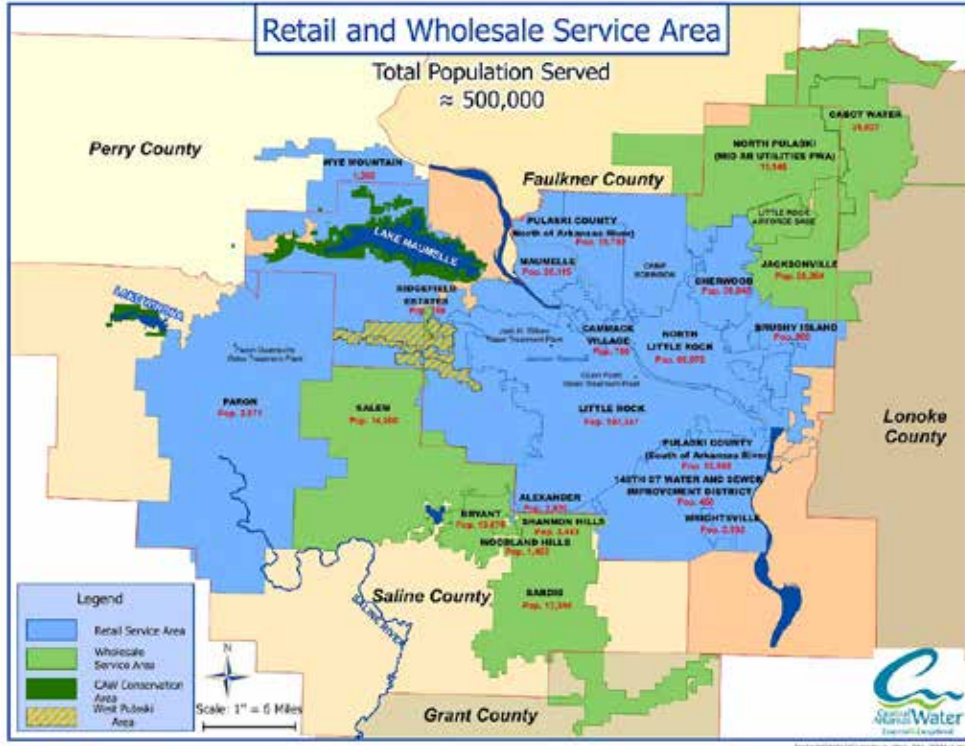
maintenance, and capital improvements. Because they have an existing revenue source, governance structure, relationships with customers, and cross-jurisdictional scope, water utilities are well positioned to work at the regional level.

Central Arkansas Water is a publicly owned water utility in the greater Little Rock area, serving approximately 500,000 people across eight counties. While the utility serves a largely rural region, the majority of ratepayers live in the Little Rock and North Little Rock metropolitan areas.

Central Arkansas Water has a governance structure common to many water utilities. The Board of Commissioners includes four members representing the City of Little Rock and three members representing the City of North Little Rock. Members are appointed by the Little Rock Board of Directors and the North Little Rock City Council and serve terms of seven years.

The utility owns and operates two primary source water reservoirs, Lake Maumelle and Lake Winona. The lakes are surrounded by forests that are critical for maintaining water quality. The region is experiencing development pressure that could compromise water quality as forested land is replaced by residential homes with associated impermeable surfaces, leading to increases in polluted rainwater runoff. For the past 15 years, Central Arkansas Water has been leading efforts to conserve land within Lake Maumelle’s 137-square-mile watershed to protect water quality while preserving compatible recreation opportunities. This work has been funded through ratepayer fees and, more recently, the first-ever certified green bond for water protection.

As a utility, Central Arkansas Water has defined mandates, responsibilities, and governance structures guiding its work and decisions. While utilities may not often engage in regional conservation projects, their revenue and governance structures provide an ideal starting point for projects that span jurisdictional boundaries, improve water quality, and decrease flood risk. Although the primary foci of this conservation effort are water quality protection and land conservation, green bonds can also be used for projects that reduce flood impacts.



## The first certified green bond for watershed protection

Central Arkansas Water's efforts in land conservation are supported by World Resources Institute, a nonprofit organization that has partnered with the utility for over ten years. With guidance from World Resources Institute, the utility established, and overtime gradually increased, a watershed protection fee charged to ratepayers to fund conservation investments.

The fee is based on water-meter size and starts at \$0.90 per meter, per month for a household with a standard meter. The fee currently generates \$2 million in revenue annually. Prior to a recent rate increase, the fee generated approximately \$1 million annually, of which \$500,000 to \$700,000 of that was used for conservation acquisitions and easements, while the remainder was applied to debt servicing of previous acquisitions. This budget enabled many smaller conservation efforts but did not enable the utility to pursue large-scale acquisitions that could yield greater water quality and other ecological benefits.

In order to generate the capital needed for larger-scale acquisitions, the utility and World Resources Institute partnered to issue the nation's first-ever certified green bond for forest land protection as part of the utility's water infrastructure. As an innovation in the green finance field, the bond was complicated to create but paid off in benefits. The bond raised \$31.8 million for projects across the utility with \$6 million for forest land acquisitions and conservation easements. The bond is backed with revenue from the watershed protection fee. Most of the conserved properties will also host sustainable forestry operations, and a portion of the timber revenues will go toward repayment of the bond. All of Central Arkansas Water's current forest lands in the Lake Maumelle watershed are certified under the Sustainable Forestry Initiative.

About two-thirds of the proceeds from the bond are being directed toward sustainable gray infrastructure investments (e.g., pipe replacement and upgrades to treatment plants), while the remaining \$10 million from the bond is being invested in landscape-scale acquisitions. Out of the funds being used for land conservation, \$3 million will refinance existing purchases while the goal of the remainder is to buy larger-scale tracts of land.

Central Arkansas Water has already begun buying smaller-scale tracts of land, focusing on properties that are in target conservation and riparian areas, most of which were owned by private land owners or timber investment management organizations. The utility prioritizes direct acquisitions on undeveloped lands but at times also invests in conservation easements. The utility is also seeking ways to leverage their funds for federal grants that require a local match.

Central Arkansas Water has a goal of conserving 70% of the Lake Maumelle watershed. The bond and the partnership with World Resources Institute will help Central Arkansas Water further this goal by an estimated 12% increase in acres protected (pending federal grant awards), as well as conserving 76% of the major tributary riparian parcels.

## The value of partnerships

World Resources Institute and Central Arkansas Water have a longstanding partnership that has established the trust and relationships needed to experiment with new forms of financing and conservation.

World Resources Institute helped Central Arkansas Water develop their rate surcharge, forming the

## Funding highlight: Green bonds

Green bonds are tools to raise revenue for projects that have climate, sustainability, and/or environmental climate benefits. They function similarly to other bonds, in that they are issued by local governments or corporations and must be backed by the issuing entity's balance sheet. Since the first green bond was issued in 2007, the market has increased rapidly, passing \$1 trillion in global cumulative issuance in 2020.<sup>1</sup> The first municipal green bond was issued by Massachusetts in 2013. The Climate Bond Standard Board certifies green bonds, ensuring that projects receiving revenue actually create environmental benefits.

As demonstrated by Central Arkansas Water's project, green bonds can be a useful tool for utilities. Utilities tend to have stable cash flows and are likely to pay off their debt, which is attractive to investors, and the bond enables investment in the utility without having to implement additional surcharges.

i Climate Bonds Initiative. Explaining green bonds. Retrieved from <https://www.climatebonds.net/market/explaining-green-bonds>



foundation of their relationship. With pressing conservation and water quality challenges, Central Arkansas Water recognized the need to raise larger amounts of capital upfront – a difficult and time-consuming task for their staff of five. Returning to World Resources Institute for their financing expertise, they first explored a carbon bank project. At the time, this was not a viable option, and they started to explore green bonds instead.

As it was the first green bond used in the United States to protect drinking water through acquisition of forestland, the partners had no clear path to the bond’s development and implementation. World Resources Institute brought their experience in creating different financing mechanisms to this project, encouraging Central Arkansas Water to consider innovative and previously unexplored financing options, to identify solutions to challenges throughout the process, and to stretch what they could do as a traditional water utility.

World Resources Institute also helped connect the utility with additional partners who brought their own resources and expertise to the project: Encourage Capital served as an advisor that could identify the needs of traditional investors who might be interested in purchasing the bond; the Alliance for Global Water Adaptation helped ensure that the bond would meet certification requirements; and the third-party verification entity Sustainalytics checked that the bond would qualify for certification.

With the support of these partners, Central Arkansas Water issued the bond and raised private capital for acquiring and protecting the forests around its primary source of drinking water. Although developing the bond involved a learning curve for everyone involved, the engagement and technical assistance provided by partners made the green bond possible for the utility.

Central Arkansas Water is also a member of the Mid-Arkansas Water Alliance, which focuses on meeting the region’s water needs. Whether project-specific technical assistance or larger coalitions, partnerships enable Central Arkansas Water to benefit from others’ expertise and share its own experiences.

## Regional benefits for rural and urban stakeholders

From the beginning, Central Arkansas Water and the World Resources Institute ensured that the use of the bond’s proceeds would lead to “water-positive impacts.” This meant developing an understanding of how the conservation projects could fit in at the watershed scale and be sustainably managed – even in an uncertain future climate. They also assessed the impacts on greenhouse gas emissions relative to alternatives, and determined that the nature-based solutions lowered emissions considerably more than traditional gray infrastructure.

## Investing in capacity building and community engagement

Central Arkansas Water’s watershed protection fee has its roots in the utility’s 2007 Lake Maumelle Watershed Management Plan, which involved extensive stakeholder engagement with nonprofit organizations, landowners, community clubs, local governments, and ratepayers. The plan recommended that the utility invest heavily in its capacity, including creating a watershed council and hiring a watershed administrator and coordinator.

In addition to capacity, the plan identified land acquisition around Lake Maumelle as a key strategy for protecting water quality, reducing water treatment costs, and preserving water storage to help manage water quantity. Community stakeholders identified a fee as a preferred option for raising revenue for conservation projects. The watershed protection fee was implemented in 2009. Importantly, ratepayers receive financial returns on the fee as the watershed management efforts reduce water treatment costs over time.

Over the last 15 years, Central Arkansas Water has continued to proactively engage with stakeholders as it tweaked the rate surcharge, helping landowners to understand what the fee goes toward, reporting outcomes, and tracking progress. While the utility was initially concerned about ratepayer pushback on the fee, they encountered few concerns.

Community engagement – particularly when there is long-term trust with the community – can create opportunities for innovative financing. Constituents supported paying more for clean drinking water, both for themselves and future generations. Since the bond has been issued, Central Arkansas Water has written articles about it and added educational materials to ratepayer bills to continue its commitment to community engagement.



Moreover, the bond is certified under the Climate Bonds Initiative’s water infrastructure criteria, a third-party certification standard that provides transparency and assurance that the proceeds go toward environmentally sound and hydrologically viable projects.

The bond’s primary benefit is protecting water sources for the greater Little Rock area. Before the bond was issued, the utility lacked capacity to proactively seek out ecologically valuable lands to acquire and simply responded to families that approached them with offers to sell their land for conservation, resulting in a more piecemeal approach to land acquisition. The utility scored the properties quarterly – using criteria such as how developable the parcel was, soil characteristics, land cover, and proximity to other CAW-owned properties – ranked them, and funded as many as they could. Now, with more capital, Central Arkansas Water can be more proactive and select larger tracts of land that have a greater impact on watershed protection and, ultimately, residents’ drinking water.

Additional benefits of the protected watershed include recreation opportunities around Lake Maumelle, reduced threats to wildlife, reducing flood risk, and sustainable forestry operations.<sup>2</sup>

## Learn more

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## Acknowledgments

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Photo credit: Trout Unlimited

## Restoring Regional Wetlands to Reduce Flood Risk and Improve Water Quality | Marengo River Watershed Partnership, Wisconsin

### Challenge

Land use decisions have impaired the Marengo River watershed's vast wetlands, resulting in habitat fragmentation and destruction and deteriorated water quality, but no single entity was positioned to address those challenges at the necessary scale.

### Regional response

The Marengo River Watershed Partnership leveraged local, state, and federal resources to create a watershed action plan, establish a land conservation incentive program, and invest in projects to restore regional wetlands.

### Lessons learned

- **Build momentum with short-term wins that can be celebrated.** Large-scale watershed studies are complex and time consuming to conduct. Recognizing milestones and completing smaller projects throughout the process can keep partners engaged.
- **Technical data should be translated into language for a general audience.** Communication strategies should focus on why people should care about the project's goals as opposed to technical details.
- **Program managers are needed and may be found in regional organizations as well as local governments.** Large-scale projects – particularly when they have federal funding and the associated reporting requirements – will likely need full-time, paid project managers.

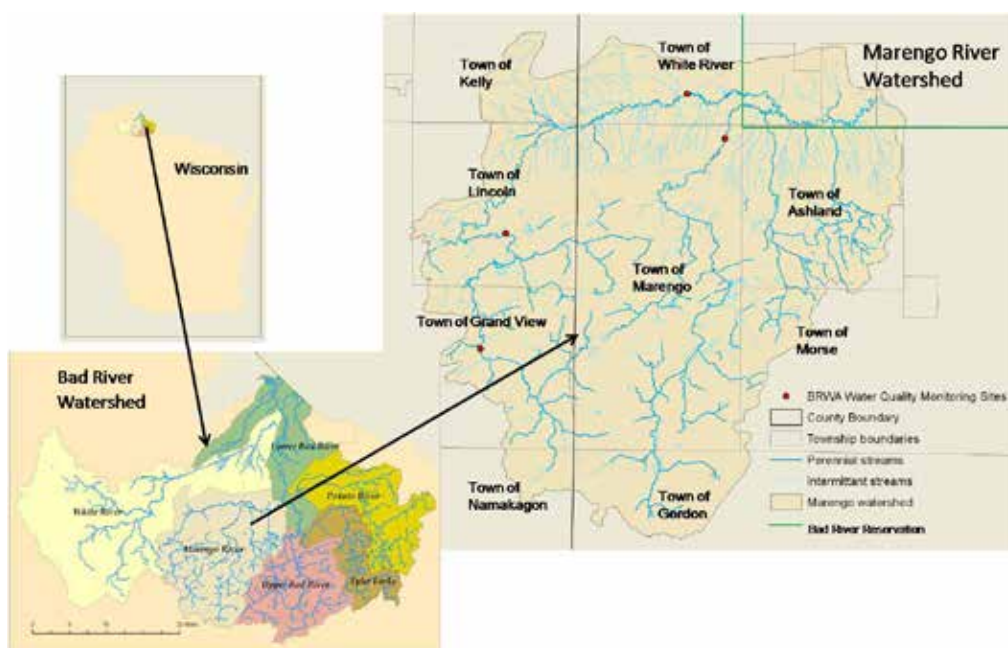
### Partners in the Marengo River Watershed Partnership

- Superior Rivers Watershed Association (previously known as the Bad River Watershed Association) | Technical Assistance Provider
- Wisconsin Wetland Association | Technical Assistance Provider
- Ashland County Land and Water Conservation District | County Government
- Bayfield County Land and Water Conservation District | County Government
- Bayfield Regional Conservancy | Technical Assistance Provider
- Mashkiiziibii Natural Resources Department, Bad River Band of Lake Superior Tribe of Chippewa Indians | Tribal Government
- Great Lakes Indian Fish and Wildlife Commission | Tribal Government
- Northwoods Cooperative Weed Management Area | Regional Collective Group

- Towns of Ashland, Gordon, Grand View, Kelly, Lincoln, Marengo, Morse, and White River | Local Governments
- Trout Unlimited – Wild Rivers Chapter | Technical Assistance Provider
- Extension – University of Wisconsin-Madison | State Government
- USDA Natural Resources Conservation Service | Federal Government
- US Environmental Protection Agency | Federal Government
- US Bureau of Indian Affairs | Federal Government
- US Fish and Wildlife Service | Federal Government
- US Forest Service | Federal Government
- US Geological Survey | Federal Government
- West Wisconsin Land Trust | Technical Assistance Provider
- Wisconsin Department of Natural Resources | State Government

## Overview: A regional, equity-based approach to wetlands restoration

Located in the Lake Superior Basin of northern Wisconsin, the Marengo River watershed is a mosaic of wetlands and rivers spread over 139,000 acres. Land use changes from decades of forestry and agricultural practices have altered the region, resulting in erosion and sedimentation, habitat fragmentation and alteration, excess nutrients, and high bacteria counts.



**Source:** Superior Rivers Watershed Association, *Marengo River Watershed Partnership Project Watershed Action Plan*, Figure 2.1 Location of the Marengo River watershed and administrative boundaries, at [https://www.superiorrivers.org/wp-content/uploads/2021/03/Marengo\\_Watershed-Plan.pdf](https://www.superiorrivers.org/wp-content/uploads/2021/03/Marengo_Watershed-Plan.pdf).

The Bad River Reservation is within the Marengo River Watershed, and both the Bad River Tribe (Mashkiziibii) and the State of Wisconsin have authority to enforce water quality standards. Importantly, the watershed has burial sites, resource harvest camps, and resources that have cultural significance to the Bad River Tribe, such as traditional rice beds and spawning habitats for lake sturgeon.

In response to the interconnected problems of deteriorating water quality and flood risk, stakeholders formed the Marengo River Watershed Partnership in 2009 to coordinate watershed improvement and land use planning activities. Superior Rivers Watershed Association, a nonprofit organization, coordinates the partnership.

The Marengo partnership secured a grant from the U.S. Environmental Protection Agency to create

a watershed action plan. Building upon previous research and plans created by the region's local governments, the Lake Superior Basin Partner Team, USGS, and the Bad River Tribe, the Marengo River Watershed Partnership Action Plan inventoried challenges within the region and prioritized solutions. It provided a roadmap for the partnership's activities.

The plan adopted "slow the flow" as its guiding mantra and focused on restoring wetlands throughout the region to better absorb water and limit runoff. The partnership completed its action plan in 2011 and it was certified by the Environmental Protection Agency in 2013. The Superior Rivers Watershed Association completed an update to the plan in 2023.

## Pooling funding and resources

Marengo watershed is a rural region with local governments that have small budgets, minimal staffing, and limited capacity. When a flood occurs, these local governments and their staff often are overstretched by recovery and infrastructure repair efforts. By joining the regional partnership, these small towns are better equipped to address the root causes of flooding and secure resources.

The Marengo River Watershed project has received funding from a number of public and private sources, including the National Fish and Wildlife Foundation, the Laura Jane Musser Fund, the Wisconsin Department of Natural Resources, the U.S. Department of Agriculture, U.S. Fish and Wildlife Service, the Johnson Family Foundation, and the Great Lakes Restoration Initiative.

Individual partners have also received funding to support watershed restoration. The Mashkiiziibii Natural Resources Department has independently developed a climate adaptation program. After severe flood events in 2016 and 2018, Ashland County received a FEMA Pre-Disaster Mitigation Program grant (now known as the Building Resilient Infrastructure and Communities program, or BRIC) to create a test case for natural flood mitigation within the Marengo River Watershed. The Wisconsin Wetlands Association is also working to diversify funding for hazard mitigation opportunities, such as by partnering with the Wisconsin Department of Transportation.

## A team approach to project management and community engagement

The partnership took a strategic approach to ensuring that the Marengo River Watershed Action Plan reflected community concerns and priorities, as well as the best science and data available. Stakeholders divided into the following teams:

- Citizen Involvement Team: Designed to ensure that the plan represented community and stakeholder voices. Stakeholders provided input on water quality standards, identified issues of concern, and contributed to the development of action items.
- Technical Team: Provided technical expertise and guidance, reviewed data, and provided recommendations for prioritizing solutions.
- Steering Team: Developed and prioritized watershed projects based on input from the Citizen Involvement and Technical Teams.

Each team had a role in ensuring that the goals of the citizens, local governments, and partnered organizations were included in the project.

During the revision of the watershed action plan, the Wisconsin Wetlands Association engaged local governments, community members, and other stakeholders. Engagement strategies included design charrettes, community interviews, and one-on-one interviews with local officials and infrastructure managers to better understand what problems existed throughout the watershed. Workshops and informational sessions were offered throughout the duration of the



Photo credit: Superior Rivers Watershed Association

project allowing local government staff the opportunity to see the plan and provide recommendations. This proved an effective way to collect and communicate information from each partner and stakeholder throughout the watershed, ensuring that the best information is integrated into the revision of the plan.

## Benefits for rural and urban stakeholders

The Marengo River Watershed Partnership improves water quality and reduces flood risk for residents who live in the region's more densely populated areas and in areas that are more sparsely populated. The partnership has helped increase participation in land conservation and landowner incentive programs to help with best management practices and reduce nonpoint source pollution in the Marengo watershed.

Since the initial plan in 2013, stakeholders and partners have implemented a variety of projects in the Marengo River Watershed.<sup>8</sup> At the county level, Ashland County updated its Land and Water Resource Management Plan, enacted the Agricultural Performance Standards and Animal Waste Storage ordinance (2018), and developed 16 grazing plans in the Marengo River Watershed on 1,582 acres. Bayfield County has updated the Land and Water Resource Management Plan, created an Aquatic Invasive Species control program, and administered Wisconsin Department of Natural Resources' Wildlife Damage Abatement and Claims Program. Stakeholders have helped with landowner outreach, conducted assessments on stream geomorphology and hydrology impact on flooding, and implemented a major streambank restoration project (2017). The Mashkiiizibii Department of Natural Resources has a number of projects which include developing an anaerobic digestion facility, refining 401 water quality standards, and publishing a climate adaptation plan.

The revised action plan includes a variety of land conservation and landowner incentive programs serving as best management practices throughout the Marengo Watershed. These practices include nutrient management, managing concentrated flow areas on cropland/pastures, waterway crossings for farm machinery and cattle, livestock fencing, riparian buffers, streambank protection, conservation tillage, managed-intensive grazing, wetland restoration, and wildlife habitat enhancement. Funding for incentive programs to encourage these conservation practices is available from state and federal agencies.<sup>9</sup>

In the Marengo River Watershed, the two particular areas that are prone to excessive peak flow volumes are the soil transition zone and the clay plain zone. These are areas where past and present human activity have caused the watershed to become more susceptible to excessive flows leading to increased erosion and sedimentation problems affecting aquatic habitat and water quality. A major benefit of restoring wetlands and improving water quality created under the project was the concept and practice of "slow the flow." This is a process of retaining water runoff from heavy storms on the landscape and delaying its delivery to streams primarily located in the soil transition zone and the clay plain zone. These wetlands then serve as an important tool for mitigating the impacts of rain. This process is needed to protect stream channels because without reducing overland flow and runoff, efforts to improve aquatic and riparian habitats will have limited success.

## Funding highlight: State funding for a flood risk reduction pilot program in Ashland County

Following the flood events of 2016 and 2018 and advocacy efforts of the Wisconsin Wetlands Association, the Wisconsin State Legislature passed Act 157 in 2019 to provide \$150,000 from the state environmental fund for flood risk reduction pilot projects in Ashland County. The purpose of the projects is to explore new methods of reducing flood and erosion risk through nature-based approaches.

Since the passing of Act 157, additional state and federal partners have come on board to provide additional funding for the flood resilience and risk reduction efforts in Ashland County. In total, over \$650,000 has been secured for these efforts, enabling more extensive projects to be explored in one catchment. The county intends to pilot several different approaches to reduce erosion and slow the flow of water, including some innovative methods that have not yet been used in Wisconsin but have been tested in other states like Vermont.

The county and other partners in the Marengo Watershed hope to learn from these innovative nature-based projects — and the permitting and funding barriers — so that they can be more readily implemented elsewhere in the region in the future. The county's demonstration projects have been incorporated into the forthcoming updated nine-key-element plan for the Marengo Watershed, which includes a much stronger emphasis on flood risk reduction compared to the 2013 plan.

The Marengo River Watershed Partnership provides a forum for discussing challenges to the watershed and coordinating activities to implement the watershed action plan. Protecting the quality of the watershed ensures that clean water, carbon storage, and diverse ecosystems are available into the future.

## Learn more

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## Lessons Learned: Recommendations for Creating and Maintaining Regional Collaborations

This report highlights the diverse and creative ways that local governments can work together to decrease flood risk at regional and watershed scales. The collaborations have a wide range of governmental and nongovernmental partners, are driven by unique mixes of challenges and goals, and leveraged different sources of funding and financing.

Despite these differences there are common themes that enabled their successes and common challenges that served as barriers delaying progress. The recommendations below describe how local, state, and federal governments can better develop and support regional flood mitigation or watershed management efforts.

### Recommendations for local government

#### 1. Build a diverse coalition to leverage multiple sources of funding, authority, and technical expertise.

Regional projects that cross jurisdictional boundaries can unite rural and urban stakeholders in new ways, opening a wide range of paths to success. For example, staff from Dodge County and the City of Fremont had previously not interacted with members of the diking and drainage districts, yet flooding in 2019 demonstrated the districts' importance in managing flood risk. By collaborating, the districts received additional support while the city and county benefited from the districts' on-the-ground relationships with landowners.

Coalitions also benefit when state and federal government partners are involved. These stakeholders can help project proponents navigate the various bureaucracies that may arise in moving a project from planning to design to implementation, especially with navigating regulatory hurdles and piecing together funding sources. Partnerships with colleges, universities, and other research institutions can bring technical expertise and additional capacity to develop the data and science needed for well-informed projects. When many different groups and levels of government are involved, a neutral third-party convener can help maintain effective communication and keep the project moving forward.

#### 2. Invest time and effort in regional coordination, and consider starting small as a way to build momentum.

Multi-jurisdictional projects are as much about people as they are about the science and hydrology of a region. Relationships and trust are critical to achieving success. Where relationships among governments and nongovernmental partners already exist, they can be leveraged to act when the time is ripe for advancing a regional effort. Often collaborations that involve stakeholders with deep, long-term relationships are better positioned to experiment with creative solutions.



During the early years of regional collaborations, project proponents can enhance success by identifying smaller goals and milestones to generate “wins” and develop buy-in from landowners and other stakeholders. Small successes often lead to more resources, which lead to larger successes.

### **3. Partner with existing regional organizations, or formalize new partnerships through intergovernmental agreements.**

No two regional approaches to flood mitigation or watershed health are identical, but in many cases, a multi-jurisdictional coalition can be built from an existing structure or entity. By leveraging partnerships or regionally focused entities that already have a governance structure in place, project proponents can reduce the amount of time that might otherwise be needed to establish administrative and decision-making structures or processes. Almost every collaboration described in this report leveraged regional authorities, including conservation, levee, drainage, and flood control districts, and other governmental or quasi-governmental organizations working on flood risk reduction, water quality, and related challenges.

Many states authorize local governments and other public agencies to establish intergovernmental agreements and exercise any commonly held powers jointly. Typically, this broad authority comes from an interlocal or intergovernmental cooperation law enacted by the state legislature and is construed liberally in favor of cooperative actions.<sup>10</sup> Public agencies working together in this way can often formalize their coordinated efforts through an interlocal agreement or contract, and in some instances may even be able to create a new legal and/or taxing entity for this purpose. Both the Dodge County Joint Water Management Board and the Dubuque County Watershed Program are examples of regional coordination formalized through an intergovernmental agreement.

### **4. Develop communication strategies that will resonate with community members.**

Meaningful education and outreach efforts are key to developing trust and buy-in from both community members and the officials needed to sign off on regional-scale projects. The most effective plans translate complex data and technical information into simple messages about project goals and why people should care. The messenger is important as well. In some communities, for example, residents may be more likely to listen to their friends and neighbors than an outside or special interest group.

Communicating about the co-benefits of a project can also help bring along additional stakeholders that may have differing priorities. For example, many of the flood mitigation projects in these case studies also provided water quality benefits that attracted an even larger coalition of support.

### **5. Consider local funding and financing strategies to enable project expansion and operations.**

Regional projects require collaboration among various local governments and organizations. The time and money required to sustain these efforts can be significant, and operations funding can be challenging to secure. While there is significant funding from recent policymaking (such as the Infrastructure Investment and Jobs Act and the Inflation Reduction Act), much of the funding earmarked for local governments is for upfront capital costs as opposed to long-term operations and maintenance costs.

Many of the case studies highlighted in this report benefitted from local funding sources from participating local governments. In some cases, project leaders or partners might hold revenue-generating authority that can be leveraged for these purposes. This was the case with the utility in Central Arkansas, where a watershed protection fee was used to support watershed health through acquisition and preservation efforts. In the utility’s experience, community members were more than willing to pay for projects that would ensure clean water.

## Recommendations for state and federal government

### 1. Empower regional authorities to undertake flood mitigation and watershed protection.

The five case studies in this report highlight the benefits of regional entities with decision-making authority over flood mitigation and watershed health. In several of the highlighted case studies, the project benefited from regional entities created by state law. For example, Iowa authorized the creation of watershed management authorities in 2010 in response to severe flooding that affected the state in 2008. Similarly, Nebraska's natural resource conservation districts were created by the state legislature, provide statewide coverage, and are organized by watersheds, making them ideal partners for regional flood risk reduction projects.

However, the specific governmental powers bestowed to regional entities by states vary significantly. Watershed management authorities in Iowa can engage in planning activities and allocate money for flood mitigation purposes, but cannot independently generate new revenue through taxation. In contrast, watershed districts in Missouri can levy annual taxes in a limited fashion to help fund construction, operation, and maintenance of improvement projects and unlock federal sources of funding for watershed protection and flood prevention. Nebraska's natural resource districts also have taxing authority.

Regional entities that can generate revenue and acquire property may be better positioned to advance watershed-scale flood risk-reduction solutions. States should consider imparting this authority to regional entities managing innovative responses to the growing threat of floods.

### 2. Design mitigation programs that foster regional collaborations.

State and federal agencies interested in enabling more regional projects may need to redesign application processes and other program elements to offer more flexible funding. Collaborators in each of the regional projects in this report noted barriers in state and federal programs that prevented certain projects or created challenges in collaboration. Interviewees noted that short application timelines for funding programs often make it challenging to gather team members for regional projects.

Many of the interviewees also noted that managing a regional project is time consuming due to the number of groups and local governments involved, yet finding funding for ongoing operations can be challenging since federal programs are often designed to fund capital costs as opposed to relationship building. Federally-funded regional hubs, such as USDA's Rural Partners Network and the EPA's Environmental Justice Thriving Communities Technical Assistance Centers Program, can and should play a role in helping to develop relationships in places that have historically not worked together regionally.

### 3. Increase investments in planning and projects that reduce risk before a disaster occurs.

Mitigation projects are the most cost-effective approach to disasters: for every \$1 the federal government invests in mitigation, taxpayers save an average of \$6.<sup>11</sup> However, most federal funding related to disasters goes toward response and recovery efforts, as opposed to mitigation.<sup>12</sup> Many sources of federal mitigation funding (e.g., FEMA's Hazard Mitigation Grant Program or HUD's Community Development Block Grant - Disaster Recovery Grants) are only available after a disaster declaration.<sup>13</sup> Other sources of mitigation funding are distributed via competitive grants, which often fail to reach rural and disadvantaged communities that simply do not have the resources needed to submit successful applications.<sup>14</sup>

While mitigation funding has substantially increased under both the Trump and Biden administrations, federal mitigation programs are still underfunded, as demonstrated by over-prescribed programs. For example, FEMA's Building Resilient Infrastructure and Communities program received four times its available budget in grant requests in FY2021.<sup>15</sup> State and federal programs can best support local governments by increasing funding for mitigation and planning, providing technical assistance, and designing programs to ensure that they meet the needs of rural and disadvantaged communities. Formula

and/or block grants, direct payments to local governments, and long-term compacts are alternative funding mechanisms to competitive grants that could help ensure rural communities are not left behind.

#### **4. Federal cross-agency collaborations should support regional flood mitigation projects.**

Flood mitigation projects often require multiple sources of federal funding to succeed. However, more funding sources come with greater administrative challenges. In some cases, permitting processes or funding cycles might not align across funding agencies, which can act as a barrier or delay to moving projects along.

Federal agencies can minimize these barriers by proactively establishing relationships with other funding or partner agencies in their regions. For example, in Atchison County, a memorandum of understanding between the U.S. Army Corps of Engineers and Natural Resources Conservation Service enabled the construction of the levee setback to begin before new easements were fully purchased, helping to expedite the project.

#### **An opportunity to encourage regional flood mitigation efforts**

Currently, there is policy momentum supporting flood mitigation efforts. The Infrastructure Investment and Jobs Act of 2021 and the Inflation Reduction Act of 2022 are making significant investments across the country and in rural communities. Against this backdrop, local governments may benefit from thinking regionally and investing in new partnerships to tackle their pressing flood risk and watershed problems. State and federal programs can encourage these approaches by designing programs and funding sources in ways that strengthen capacity, provide flexible funding, and facilitate long-term, intergovernmental collaboration.

# Endnotes

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