Relationship-Building for Community Climate Collaborations:

Case Studies of Flood Resilience & Recovery Networks in the Rural Midwest

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Overview

This report examines relationship-building approaches for fostering community climate collaborations among scientists, community members, community-facing organizations, and civic groups using three case studies of flood response networks in small towns in Iowa, Illinois, and Missouri. Grounded in collaborations on flood resilience and recovery in rural Midwestern contexts, the cases consider how such groups might work to co-develop fairer systems and relationships for making decisions about risk that are rooted in principles of civic science to promote more inclusive public deliberation and engagement. The case studies highlight the following conclusions:

1. Share Stories to Advance Solutions and Hopeful Action: When possible, the stories and knowledge gathered from community engagement should be shared to advance locally relevant solutions, shape future outreach and communication strategies, and connect more directly with decision-makers to inspire shared senses of efficacy and impact, as well as to respect community members' time and knowledge.

2. Cultivate Long-Term Relationship Infrastructure and Engagement: Funders and institutional partners should provide resources and support to foster long-term connections and ongoing engagement based on relationships rather than discreet projects.

3. Elevate Social Values and Community Knowledge to Overcome Expertise Barriers: Scientists and subject matter experts should seek to familiarize themselves with the context through deep listening from the start of engagement to understand community priorities and values and to ensure that community knowledge is meaningfully incorporated from the start.

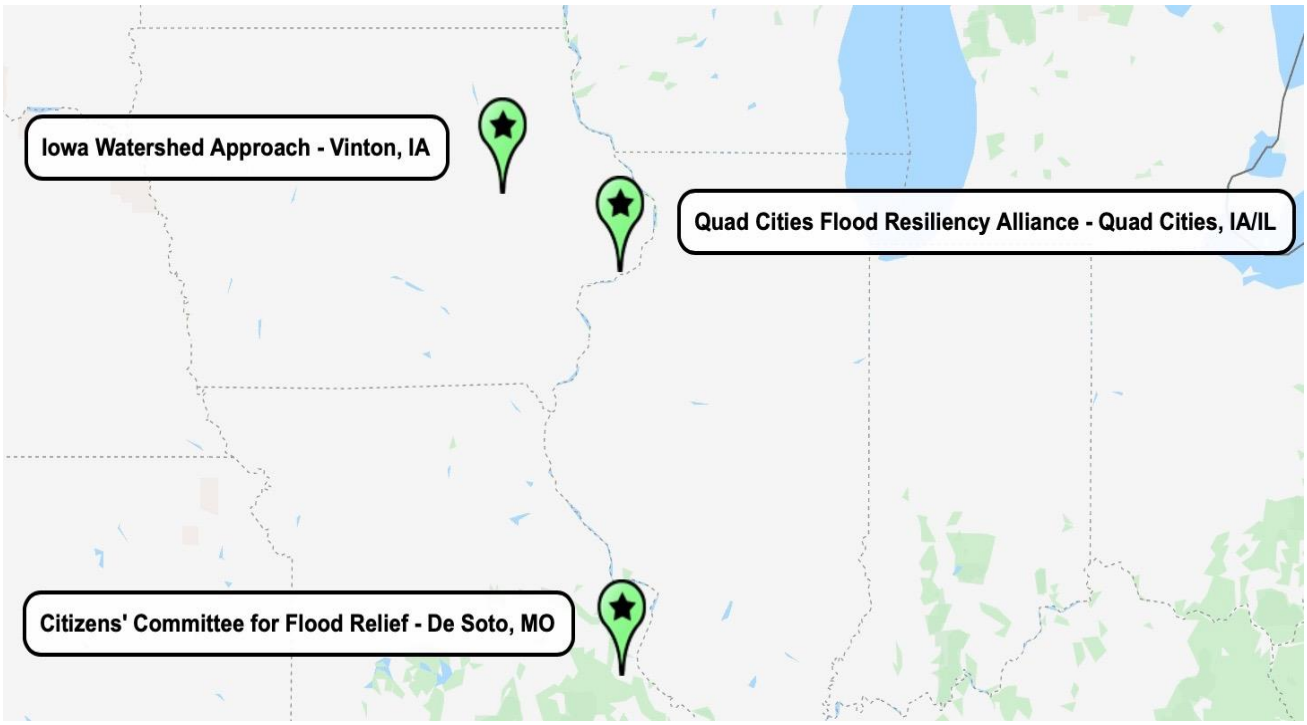
Listed below and represented on a map on the following page, each of the cases were initially started by a different set of stakeholders:

- De Soto, Missouri: A community-based organization, the Citizens' Committee for Flood Relief

- Vinton, Iowa: University researchers with the Iowa Watershed Approach

- Quad Cities, Iowa and Illinois: A civic organization, River Action, Inc.'s Quad Cities Flood Resiliency Alliance with smaller towns in the greater Quad Cities region

Figure 1: Map of Case Studies



The case studies examine how scientists and collaborators might play more effective roles in local science engagement. In addition, they consider how local science engagement could better connect with and be framed by community members' knowledge, values, and experiences. Toward these ends, the case studies are informed by each of the following considerations, which were co-created with stakeholders from each of the cases:

- *Who Started the Collaboration and Why:* What distinct motivations led to the collaborations and from whom – a community group, scientists, or civic organization? How did these motivations shape the arrangement of decision-making and information-sharing, among other collaborative approaches? What barriers or challenges endured?

- *Stakeholders' Civic Reasonings and Interests:* What are each set of actors' interests? From where or whom do they access information? How might future engagement better align with those interests and civic reasonings?

- *Shared Experiences of Flood and Senses of Belonging:* Do the flood resilience and recovery networks incorporate shared experiences and senses of belonging into processes of engagement and if so, how? How might further engagement promote belonging?

- *Inclusive Community Resilience:* How have the networks improved their ability to respond to flooding? Has the focus on flooding opened connections across other forms of vulnerability, such as those related to socioeconomic status, COVID-19, etc.?

Why the Mississippi River Basin

The Mississippi River Basin provides a salient context to explore a central question for the emergent field of civic science: how might we co-create enduring connections to merge science and civil society more meaningfully? The region's experiences with increasing severities of flooding, rapid deindustrialization, and regional disparities in terms of access to and participation in science characterize and inform the broader contemporary civic life of the United States. Although the Mississippi River continues to serve as a so-called "economic highway" that is responsible for over $83.6 billion in annual revenue, the historic human manipulations of the watershed that were designed for an industrial economy often do not serve contemporary needs and deepen existing inequalities by making some communities more vulnerable to flooding and water quality concerns.

Political communication and media tend to reduce public attitudes about the environment to a distinct rural-urban divide. However, rural perspectives on climate are not merely the result of deficits of concern or information. Instead, people in rural communities are often concerned about the effects of changing weather patterns on their livelihoods and communities.[1] In addition, rural perspectives on climate have been characterized as being informed by mistrust of administrative rulemaking on the environment and perceived threats to ways of life.[2] By focusing on community climate collaborations in rural contexts, this report provides insights for developing more effective, community-driven rural climate communication to advance opportunities for engagement among scientists, civic organizations, and communities for shared discovery.

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[1] Robert Bonnie, Emily Pechar Diamond, and Elizabeth Rowe. 2020. "Understanding Rural Attitudes Toward the Environment and Conservation in America." *Nicholas Institute for Environmental Policy Solutions*.

[2] Arlie Russel Hochschild. 2018. *Strangers in Their Own Land*: *Anger and Mourning on the American Right*. The New Press, p. 277 - 279; Katherine J. Cramer. 2016. *The Politics of Resentment: Rural Consciousness in Wisconsin and the Rise of Scott Walker*. The University of Chicago Press, p. 157 - 159.

Participatory Methods

This case study project complements a separate yet related landscape study of relationship-building approaches for the broader field of community climate collaborations. For each case, I interviewed people from all sets of stakeholders, including scientists, community members, local government officials, and nonprofit staff. Through a public forum, representatives from each case study were able to actively engage in designing final recommendations for the project and reflections for the case study analysis. A summary of the recommendations from the landscape report is provided below:

Recommendations from Landscape Report on Community Climate Collaborations

1. Build deeper engagement with and understandings of stakeholders' motivations and interests.
2. Establish upstream approaches for co-creating on issues with publics as a norm.
3. Foster long-term engagement with informal social networks.
4. Articulate clear goals for PES, even when direct outcomes are not anticipated.
5. Include publics who are not represented or empowered by science and scientific institutions.

For more detailed recommendations for three stakeholder groups – funding and institutional partners, scientists and subject matter experts, and researchers and evaluators of public engagement with science – view the full landscape report here: https://www.aaas.org/sites/default/files/s3fs-public/content_files/Climate-Landscape-Report.pdf

Citizens' Committee for Flood Relief

Case Factbook

Overview: The Citizens' Committee for Flood Relief was established to promote and implement solutions to reduce the impact of flooding by working alongside civic leaders. With support from volunteer scientists, the community group became a "major stakeholder" in a U.S. Army Corps of Engineers Floodplain Management Plan study, developed early warning systems to detect floods, secured technical assistance from the American Planning Association to develop green infrastructure plans and a pilot project, and is currently pursuing efforts to fund buyouts of flood-prone properties in conjunction with the nonprofit Buy-In.

Location: De Soto, Missouri

Catalyst: Grassroots community organization

Approaches: Community science research, grassroots advocacy, social media

Key Collaborators: Anthropocene Alliance, Thriving Earth Exchange, United States Army Corps of Engineers, American Planning Association, Buy-In, H3 Studio

Stakeholders: Community organization, flood-affected community members, De Soto city officials

Relevance to Landscape Report Recommendations: 2. Establish upstream approaches for co-creating on issues with publics as a norm; 5. Include publics who are not represented or empowered by science and scientific institutions.

Since 2016, De Soto experienced four sudden floods from the Joachim Creek. The flash floods swept away cars and put community members' safety and wellbeing at risk in the town of 6,500 people. The neighborhoods in De Soto that are most at risk for flooding have many residents with low or fixed incomes, including retirees. During an emergency boat evacuation, an elderly community member died of a heart attack from the stress of the event. Two other community members drowned as they were trapped in their cars.

After witnessing firsthand how flooding risks were becoming more regular and severe, Susan Liley, a retiree and long-term resident of De Soto, was compelled to act: "Some of our officials kept telling us that flooding is normal. I am from this area and I know this isn't normal, so I knew that I had to do something."

Concerned by the trauma that the major flooding events had caused in De Soto, Liley started conversations on social media hoping to inspire action. Initial Facebook conversations led to in-person meetings with flood-affected community members at the

Redeemer Lutheran Church in De Soto. Over time, the meetings inspired Liley to co-found the Citizens' Committee for Flood Relief with Paula Arbuthnot, an engineer and long-term resident of the De Soto area.

"Stories about how floods and climate change affect real people matter," Arbuthnot explained. "But we tend to think of people who are impacted as *needy people*, but these are *people that we need*."

By elevating the stories and knowledge of the "people that we need," the Citizens' Committee for Flood Relief aimed to empower flood-affected and concerned community members to advocate for solutions for their community's flood problems.

Arbuthnot and Liley brought together civic leaders at the local, state, and federal levels to promote flood mitigation and resilience measures. Liley said of her experience of becoming a "flood grandma" who was known in the community for her anti-flood work: "I had been involved with the Girl Scouts, but I had never done anything quite like this."

The Citizens' Committee connected with Harriet Festing, Co-Founder and Executive Director of the Anthropocene Alliance, a nationwide coalition of frontline communities fighting for climate and environmental justice related to flooding and coastal sea-level rise. With Festing's support as a network-weaver, the Anthropocene Alliance connected the Citizens' Committee for Flood Relief with a team of volunteer scientists with the American Geophysical Union's Thriving Earth Exchange. Festing's contributions to the anti-flood advocacy efforts in De Soto were so meaningful that Liley named one of her cats in Festing's honor.

The team of scientists began by meeting virtually with members of the Citizens' committee to identify shared goals. Later, the team of scientists visited De Soto during a number of field trips to develop relationships with the Citizens' Committee and to learn more about De Soto.

Dan Hanes, a volunteer scientist from St. Louis University, found the early visits to be helpful in developing initial relationships prior to planning the engagement in De Soto: "I would encourage scientists who want to do this kind of engagement to spend time visiting the community before the project itself is underway. It is especially important to gain a deeper sense of the local context, challenges, and opportunities."

With the technical knowhow and sounding board from the volunteer scientists, the Citizens' Committee developed relationships with the U.S. Army Corps of Engineers Silver Jackets Program who undertook a study to develop a flood management plan with people from De Soto. With the support of the Thriving Earth Exchange scientists and the Anthropocene Alliance, the Citizens' Committee was able to position themselves officially as a "major stakeholder" for the study.

In addition, the Citizens' Committee for Flood Relief's work led to the development of a warning system so that residents can track rainfall and water levels on their phones and

receive more advance warnings of potential flood risks. Meanwhile, Liley continues to post photos of flooding events to keep recent memories alive between disaster events. In addition, the Committee helped to install a flood gauge with previous flood levels demarcated so people do not forget about the risks.

The volunteer scientists decided to play what they described as a consultative role with the Citizens' Committee for Flood Relief members, helping the group to interpret reports and outline "the full gamut" of possible actions rather than recommending specific approaches to address flooding in De Soto.

Robert Jacobson of the United States Geological Survey explained, "We were there to provide a policy neutral standpoint. We answered questions and helped [the Citizens' Committee] to interpret long reports, for instance, but we all agreed that our job was not to advocate for any particular policy, sources of research funding, and so on."

However, maintaining this consultative role was challenging during instances of disagreements about flooding in De Soto. For example, several community members who were originally involved with the Citizens' Committee for Flood Relief pursued a class action lawsuit related to disagreements about whether and to what extent local entities bore responsibility for flood risks.

Reflecting on his own learning from the experience, Jacobson said, "We realized that a lot of the technical challenges were at times not as important as some of the socioeconomic ones."

Each of the scientists mentioned that the experience also helped them understand what kinds of research questions were of most interest to local communities and how they might make their research and expertise more relevant to the public. In addition, they expressed dismay at the competitive system of funding for participatory research with communities, which prevented them from being able to sustain the collaboration more long-term.

After five years of environmental justice advocacy, the Citizens' Committee for Flood Relief continues to advocate to get people out of harm's way. In the summer of 2021, the Committee received a grant from the National Fish and Wildlife Foundation to pursue a green infrastructure project. Soon thereafter, they received technical assistance related to green infrastructure from the American Planning Association. John Hoal, Principal at H3 Studio in St. Louis, Missouri, is leading the green infrastructure planning. Earlier in 2021, the Citizens' Committee for Flood Relief began collaborating with a nonprofit called Buy-In, which worked with the city to successfully secure funding from the U.S. Department of Housing and Urban Development's Community Development Block Grant to begin the process of identifying which homes will be bought out and securing federal funding to do so.

Liley concludes: "I continue to talk to anybody who will listen. . . I hope we can find ways to buy out some of the houses that have been flooded over and over again. In the

meantime, I hope we find ways to get the younger people in our community involved so that they can be a part of the solutions, too."

Arbuthnot adds: "Replacement housing is also needed. In the very near future, this will have to be a careful balance between helping the flood victims to understand that there is adequate replacement housing available for them and for the Committee and other members of the community to understand that sound engineering principles can make it possible to build replacement housing without adding to the flooding in the Joachim River."

Resources About the Citizens' Committee for Flood Relief:

Anthropocene Alliance story on De Soto: https://anthropocenealliance.org/citizens-committee-for-flood-relief/

Buy-In: https://buy-in.org/

Citizens' Committee for Flood Relief Facebook Page:
https://www.facebook.com/groups/609613372545223

Interview with Susan and Paula:
https://www.youtube.com/watch?v=M05iRCJZUrg

Thriving Earth Exchange project summary:
https://thrivingearthexchange.org/project/cityofdesoto-mo/

Flood Resilient Vinton - Iowa Watershed Approach

Case Factbook

Overview: Documenting local experiences with the social aspects of flood resilience and recovery, Flood Resilient Vinton developed story maps through a series of community conversations, interviews, and flood scenario planning activities. The project explores how university researchers, alongside regional and local nonprofits, can help to build relationships that begin to establish lines of communication among community members, scientists, and local decision-makers to advance flood resilience, preparedness, and recovery.

Location: Vinton, Iowa

Catalyst: University researchers

Approaches: Community conversations, public deliberation, story maps, interviews

Key Collaborators: Iowa Watershed Approach, U.S. Department of Housing and Urban Development, the Rockefeller Foundation, and Iowa Valley Resource Conservation & Development

Stakeholders: Community organizations, University of Iowa researchers, flood-affected community members, Vinton city officials, Benton County officials, Benton County Disaster Coalition

Relevance to Landscape Report Recommendations: 1. Build deeper engagement with and understandings of stakeholders' motivations and interests; 5. Include publics who are not represented or empowered by science and scientific institutions.

A small town of 5,000 residents along the Cedar River, Vinton has been shaped by numerous experiences with flooding throughout its history. In 2008 and 2016, Vinton experienced floods that were a part of "Major Disaster Declarations." For these reasons, the community was selected to be a part of the Iowa Watershed Approach's work to promote deeper understandings of the social elements of flood resilience in communities, rather than focusing on technical solutions alone.

Former AAAS Leshner Fellow Craig Just, an associate professor of engineering at the University of Iowa, works to engage vulnerable Iowans with flood planning, rather than relying on highly technical approaches alone: "We started by recruiting at mobile food pantries and by knocking doors in flood-affected communities to build relationships with some of the most affected community members with a focus on low- to moderate-income individuals."

As a part of a nearly $100 million grant from the U.S. Department of Housing and Urban Development (HUD), the Iowa Watershed Approach has developed Water Management

Authorities in nine watershed areas that have experienced flooding during the previous decade. The water management authorities engage community members to develop plans to reduce flood risk and improve water quality with the goal of developing a scalable model for water management that empowers communities across the U.S.

Kate Giannini, a communications specialist with the Iowa Watershed Approach, adds: “Through the Iowa Watershed Approach, we have the knowledge and expertise to create flood resilient physical landscapes upstream of communities knowing that creating flood storage in the upper portions of watershed that will benefit downstream stakeholders. These physical improvements happened upstream of Vinton, and within the community. But too often enough, the social resources are absent. The [local engagement] process not only introduced new partners to the table but made lasting connections outside of a disaster event, which increases the communication and awareness when the next hazard occurs. . . The [community engagement process in Vinton] created opportunities not only for infrastructure, but also for educational and collaborative partnerships.”

In Vinton, the Iowa Watershed Approach team held community meetings, scenario role playing exercises, and interviews to foster relationships within the community around shared experiences and to develop story maps and improve the use of social resources in watersheds in planning efforts**.**

Paul Schmitt, an associate with Iowa Valley Resource Conservation & Development, interviewed many of the flood-affected community members while a graduate student in the English department at the University of Iowa and coordinated much of the community stories project that took place from October 2018 to May 2020. The stories project used what Schmitt describes as a bottom-up approach to understand flood preparedness, response, and recovery at the personal and interpersonal levels in Vinton.

Describing this approach, Schmitt explains: "The bottom-up approach was used because marginalized groups are often left out of the decision-making process for flood preparedness, response, and recovery. In particular, economically disadvantaged people often are hit proportionally harder by disasters. We found it important to hear from folks about their lived experiences after major flooding events in order to work toward more equitable strategies for flood resilience."

A long-term retired resident of Vinton who was a part of those conversations noted: “Before this, I hadn’t been able to share all that was going on before. . . When things like that happen, sometimes all you have is your friends and neighbors but then we never have the chance to think about what we would do before the next time.”

Many of Vinton residents’ stories are featured in a 2020 report about the Flood Resilient Vinton project, including an account by a cattle farmer whose cows sought refuge on their house porch during the flood. Taking a boat to the house each day for a week to feed the cattle until water levels receded, the farmer symbolized Vinton’s perseverance.

The stories and insights from community members' experiences demonstrate the depth of engagement, which researchers say was helped by centering community voices from the start. For instance, the researchers were mindful to stay to the side of events, rather than playing too much of a front-stage role in making the conversations overly structured.

Describing these approaches, Schmitt says: “So much about making the community conversations work was about getting everyday people in a room, with scientists not at the front or leading the conversation. The community conversations developed solidarity among people in Vinton around shared experiences. It allowed them to be more candid about what were often emotional and traumatic experiences by centering their experience throughout the community conversations. . . While this was a challenge because it was time consuming and there were often tangents, it was important to hear them. Oftentimes, that’s what counts.”

The City of Vinton will use the Iowa Watershed Approach’s engagement efforts to date to seek future funding for infrastructure projects and community engagement initiatives. They will maintain relationships with the watershed management authority, as well as with local and state organizations, and seek out new relationships for further community participation.

Reflecting on his experiences working with Vinton, Just concludes: “Vinton is moving forward with building the flood control pond/wetland on the south side of town, which is a nice next step. . . The challenge for Vinton is that despite our best efforts, we could not come up with a competitive proposal for BRIC funding. Getting federal dollars into these less-populated areas will be a mission of mine for years to come.”

Giannini adds: “The challenge is city capacity and continued motivation. The ground-up approach of this project really helps with acknowledging that not one entity can handle this level of collaboration and coordination. It really takes a community of partners working together. The Benton County Disaster Recovery Coalition seems like a great group to keep these partners coordinated.”

Resources About Flood Resilient Vinton:

AAAS Leshner Fellow Craig Just: https://www.aaas.org/news/craig-justs-leshner-fellowship-spawns-collaborations-iowa-nigeria

Benton County Disaster Recovery Coalition: https://www.facebook.com/Benton-County-Disaster-Recovery-Coalition-516335268563534/

Flood Resilient Vinton 2020 Report: https://www.floodresilientvinton.com/wp-content/uploads/2020/07/VintonReport_FINAL_07132020_compressed-file-for-web.pdf

Flood Resilient Vinton Website: https://www.floodresilientvinton.com/

Iowa Public Radio River to River Program with Paul Schmitt: https://www.iowapublicradio.org/show/river-to-river/2020-02-14/a-forty-year-old-cold-case-troy-price-resigns-and-stories-of-flood-resilience-in-vinton

Iowa Watershed Approach: https://iowawatershedapproach.org/

University of Iowa's "Vinton Defining Flood Resilience": https://stories.uiowa.edu/vinton-defining-flood-resilience

Quad Cities Flood Resiliency Alliance - the Greater Quad Cities Area

Case Factbook

Overview: The Quad Cities Flood Resiliency Alliance provides a forum for river stakeholders to share information, resources, flood prevention or mitigation policies and to develop relationships with river neighbors for assistance before, during, and after flood events.

Location: Quad Cities Region, Iowa/Illinois

Catalyst: Civic organization

Approaches: Network-building, training

Key Collaborators: City governments; Scott, Muscatine, and Louisa Counties in Iowa; Rock Island, Whiteside, Mercer, and Henry Counties in Illinois

Stakeholders: River Action, Inc., City and County Governments, Community Members

Relevance to Landscape Report Recommendations: 3. Foster long-term engagement; 4. Articulate clear goals for public engagement with science.

While the Quad Cities are known for innovative approaches to addressing flooding and climate change, such as restoring the Nahant marsh in Davenport, IA to serve as a massive "floodwater sponge," many of the smaller towns in the greater Quad Cities area have struggled to prepare for and address flooding challenges.

Working to address this disparity, the Quad Cities Flood Resiliency Alliance connects 26 communities in the region, from Clinton, Iowa, to New Boston, Illinois, to build capacity within city government and to promote relationships for resource sharing on flood resilience across the region. The Alliance has met quarterly since October 2018.

The Alliance connects and engages city officials in smaller communities in the region on the National Flood Insurance Program's Community Rating System (CRS), including assisting with application and enrollment, training floodplain managers, and establishing pre-disaster relationships among communities to enable sharing of resources across the region.

Kathy Wine, the executive director of River Action, Inc., has worked to address flooding in the Quad Cities for decades, hopes that the alliance can help smaller communities access resources to improve the region's preparedness to flooding. She explains: "We were inspired to develop the Alliance after hearing about the work that Ottawa, Illinois, has done to address flooding challenges at a conference. We thought to ourselves, why aren't our communities taking full advantage of the same kinds of resources?"

At the time of the Alliance's founding, only three of the towns and cities that make up the Quad Cities Flood Resiliency Alliance were enrolled with the National Flood Insurance Program's Community Rating System (CRS). The CRS encourages a variety of activities that exceed the minimum requirements of the National Flood Insurance Program to foster more comprehensive floodplain management. Through creditable activities, the CRS enables towns to improve their ratings, from a "10," which denotes no participation in the CRS system and no flood insurance rate discount, to a "1," which provides a 45% premium flood insurance rate discount

However, city officials describe the process for becoming enrolled in the CRS as being onerous, especially for smaller communities with limited staffing and time. To address these challenges, the Alliance provided a weeklong training program in 2020 to prepare city staff from five of the towns to become certified floodplain managers and to share their expertise to assist in accessing enrollment in the CRS. The Alliance's goal is to eventually have one certified floodplain manager in each of the communities.

In addition, the Alliance is working to establish pre-disaster relationships and information-sharing so that when flooding occurs, communities in the region might better share pre-existing resources, experiences, and expertise.

Resources About the Quad Cities Flood Resiliency Alliance:

Quad Cities Flood Resiliency Alliance: http://www.riveraction.org/QCFRA

River Action, Inc.: http://riveraction.org/

How We Respond Story about the Nahant Marsh (Davenport, IA):
https://howwerespond.aaas.org/community-spotlight/thinking-outside-the-box-how-davenport-uses-marshes-to-combat-floods-and-climate-change/

National Flood Insurance Program's Community Rating System:
https://www.fema.gov/floodplain-management/community-rating-system

Conclusions

The following themes emerge when reflecting on these case studies, which provide lessons for community engagement on local environmental challenges more broadly:

Share Stories to Advance Solutions and Action:
In each of the collaborations, community stories, experiences, and knowledge were gathered and analyzed to highlight the social and personal aspects of flood preparedness, recovery, and resilience. Interviewees from the collaborations regularly emphasized the importance of ensuring the active participation of community members and local leaders in determining how and where their insights are shared. Especially when engaging with communities on deeply personal and traumatic experiences, community members should have more agency in how their knowledge and stories are translated into recommendations, subsequent engagement, communication efforts, and so on.

When community members and local leaders do not see how their contributions during engagement are being incorporated or having an impact, interviewees explained that this leads to disillusionment among community collaborators that stands in the way of long-term, reciprocal relationship-building and trust. With deeper understanding of community members' and local leaders' motivations and goals, the findings from engagement should be shared to advance locally relevant solutions, inform future outreach and communications strategies, as well as connect with decision-makers. Engagement must be built on sustained, genuinely mutually beneficial practices to accomplish shared goals.

Cultivate Long-Term Relationship Infrastructure and Engagement:
The cases highlight the importance of intentional relationship infrastructure to nurture connections among scientists, community members, and civic organizations. The Anthropocene Alliance, Thriving Earth Exchange, Iowa Watershed Approach, and Quad Cities Flood Resiliency Alliance provide promising examples of relationship infrastructure that connect across silos of research and practice to advance community climate collaborations that are more intimately connected with community knowledge. AAAS's Local Science Engagement Network (LSEN), with pilot centers in Missouri and Colorado, provides an emergent example of relationship infrastructure and a promising platform for cultivating long-term, boundary-spanning relationships.

According to engagement practitioners and thought leaders associated with each case study, additional resources are needed to foster relationship infrastructure with more everyday social networks – such as religious communities, recreational groups, and community organizations. They suggest that such contexts provide better opportunities to meet people where they are and engage with more diverse perspectives and people who are presently marginalized or underserved by scientific institutions.

Engagement practitioners from each network mentioned difficulties associated with maintaining long-term relationships beyond individual project cycles, which they say serves as an additional barrier for realizing deeper, more reciprocal relationships for

engagement. Therefore, funders and institutional partners need to strategize to provide better resources and support to foster long-term connections and ongoing engagement based on relationships rather than distinct projects alone.

Elevate Social Values and Community Knowledge to Overcome Expertise Barriers:

Scientists often begin collaborating with communities with motivations to serve in consultative roles: to help collaborators interpret technical reports, understand potential action steps, and support community science research projects. Local history, context, experience, and community priorities help frame the problem by regularly invoking social values that influence data gathering, interpretation, and paths for action.[3] At times, these values and priorities appear to create tension with the scientists' understanding of their consultative, “honest broker” role.

As the subject matter experts demonstrated in the case studies, scientists should seek to familiarize themselves with the community context by beginning their engagement with deep listening to understand community priorities and values. Leading with social values and community priorities will help to overcome persistent “expertise barriers,” in which community collaborators might otherwise instinctively defer to experts’ opinion even though they hold decision-making power.[4] Overcoming expertise barriers and framing the engagement with community knowledge from the start will help make scientists’ research more successful in finding more meaningful, locally relevant solutions with communities.

[3] Sheila Jasanoff. 2008. “Speaking Honestly to Power.” *American Scientist*, Vol 96(3).

[4] Shobita Parthasarathy. 2010. “Breaking the Expertise Barrier: Understanding Activist Strategies in Science and Technology Policy Domains.” *Science and Public Policy*, 35(7), p. 355-367.