

# **On the path to community flood resilience for the Upper Iowa Watershed: Documenting 2016 flood experiences in Freeport, Iowa**

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## **I. Introduction and Background**

Flooding is one of the most significant threats to the safety and vitality of many communities, especially in the Midwest. Numerous communities within the central United States have experienced catastrophic flooding events in recent decades causing damages to social, economic, and environmental wellbeing. Recent studies suggest that a changing climate contributes to increasing flood frequency across the Midwest region (Mallakpour & Villarini, 2015). This report focuses on the Upper Iowa River Watershed and the community of Freeport as a way to illustrate the experiences of flood victims in Midwest communities and to shed light on the concept of community flood resilience.

The concept of resilience has been deployed in a number of different fields of study, such as biology, political science, psychology, and health. For the sake of this analysis, community flood resilience refers to the ability of people living in a common watershed to plan and act collectively to mitigate, prepare for, respond to, and recover from a flood. In other words, resilience refers to a community's ability to "bounce back" from a disaster and become better prepared to manage future events. Within resilience literature (e.g. Adger, 2005; Gallopín, 2006), the terms vulnerability and adaptive capacity are used in conjunction with broader notions of resilience. For the sake of our project, we believe that vulnerability represents the likelihood that disaster will affect a community over a period of time. Adaptive capacity is the "coping capacity" of a community and includes variables which affect an individual or group's ability to recover from disaster.

### Target Area and Event

Situated in the corner of northeastern Iowa and southeastern Minnesota, the Upper Iowa Watershed is home to approximately 27,000 residents across its 1,005 square mile territory. While primarily engaged in rural activities, the watershed's unique topography consisting of rugged hills, cold-water trout streams, and meandering rivers attracts tourists and recreationalists from around the region.

Over the past 60 years, the watershed has experienced four major flooding events, taking place in 1961, 1993, 2008, and 2016. During the most recent event, between eight and fourteen inches of rainwater fell in less than 24 hours on Tuesday, August 23, 2016. Considered the second 100-year flood in less than a decade, the 2016 flood caused over 2.5 million dollars in public and private damages (Snyder, S., 2016). The majority of the damage occurred in the unincorporated community of Freeport, IA, located just outside of the watershed's largest city, Decorah, IA.

Consisting of 2,500 residents, Freeport is primarily a residential community marked by substantial demographic diversity. The section of Freeport closest to the river and sewage plant is known colloquially as "Old Freeport," and consists of housing with lower median value than in the incorporated Decorah (source: Iowa Flood Center Social Vulnerability Index) and a trailer park. The other section of

the community resides upon a hill near a local country club, in which the value of new homes often triple those found in “Old Freeport.” Freeport is bordered by the Upper Iowa River as well as two creeks that run through the southwestern part of the community. Intense rainfall in the Trout Run and Dry Run Creek watersheds were responsible for the increased intensity of flooding in Freeport during the August 2016 flood event.

The rain storm began late evening on Tuesday, August 23, 2016. Many residents reported going to bed around ten o’clock, with the forecast predicting 1/10 of an inch by morning. Awakened by the sound of collapsing basement walls around four in the morning, some residents attempted to quickly move their possessions to higher ground. To their surprise, the water rose several feet per minute and many were forced to evacuate their homes, leaving behind thousands of dollars’ worth of infrastructure damage as well as material and sentimental losses.

The resulting synthesis of experiences from the 2016 flood in Freeport details the stories of fourteen flood victims and three key informants, and summarizes the common themes of their experiences. In evaluating their common experiences, we hope our findings can be integrated into watershed resilience plans across Iowa, and serve to better protect communities for future disasters. This report is a part of a larger multidisciplinary program designed to work directly with residents of the Upper Iowa Watershed and eight other priority watersheds in the state of Iowa to enhance flood resilience in affected communities.

## **II. Methods**

We specifically studied Freeport to understand community flood resilience due to the location-specific nature of flood management and response. In understanding the unique experiences of Freeport residents and the resources available to them, we identified common experience and obstacles, in context. Throughout our research and analysis, we sought to understand the flood experiences of those in Freeport with an eye toward building community resilience to future flooding events.

Our research team conducted a total of 17 interviews - which included 14 Freeport households and three additional key informant interviews - during the summers of 2017 and 2018. Nearly all interviewees were from the low-lying “Old Freeport” and all interviewees had directly experienced flooding in their homes. Interviews were semi-structured, meaning we used a common set of questions for all interviews (see Appendix A.1; A.2), but that they were conversational enough to allow for personal stories and additional questions as contextually appropriate. We selected interview participants using snowball sampling, in which subjects recommend additional informants. The residents of Freeport represented a mixture of individuals from “Old Freeport” and those living on the hilltop. A list of open-ended questions (Appendix A.1; A.2) were used to assess networks and resources available for response as well as acts of resilience needed for future events. We supplemented the interviews with municipal news sources and academic literature regarding flood management, education, ecological and social resilience, and climate change.

In general, interviews lasted between thirty and ninety minutes and all interviews were recorded using a digital voice recorder. Our research team transcribed interview audio verbatim and analyzed written transcripts to identify repeated themes. We used an iterative and emergent process for identifying themes to organize our analysis of transcripts, and focused on identifying common and repeating

themes across all interviews. Multiple members of our team read interview transcripts, discussed common themes, and ultimately identified a series of nested “codes” that we then used to analyze all interview transcript texts. At this point, transcripts were coded using Nvivo 12 software to subcategories for themes such as “Adaptability,” “Impacts & Functions,” and “Networks.” A list of coding subcategories is included in Appendix A.3. In our results, we present those themes most commonly reported amongst interviewees, using both representative quotations to illustrate those themes and a table of supporting thematic data to demonstrate their consistency across interviews.

### III. Results and Discussion

Analysis of interview transcripts with Freeport residents identified several core themes outlining their experience in the flood of 2016. While experiences varied widely, we identified the following three themes to categorize and report the primary shared findings of the interviews:

1. Response
2. Impact
3. Resilience

Interviewees shared stories and information cataloging the severity of the physical, economic, and psychological impacts associated with the 2016 flood and its aftermath. They further detailed the frustrations and successes of current flood management and response, particularly pertaining to the networks and resources available during the recovery. These explanations of impacts and response helped to lead to reflections on the resilience of their community and suggestions for increasing preparedness and protection in the future. Finally, the interviews highlighted the unique set of circumstances which amplified the vulnerability of their community and helped to illustrate the challenges that will be faced by attempts to prevent or mitigate future flooding.

#### 1. RESPONSE

##### 1A. Notification

Many Freeport residents seemed to be aware of the rising water well before danger was imminent, while others reported not receiving notification of the flood until someone knocked on their door telling them to evacuate or until they were awakened by the sound of their basement wall collapsing. [additional quotations to support]

Overall, most interviewees believed better monitoring of river levels and more effective, timely notification of flooding is necessary.

- *“One suggestion that I could make is that there could be another hydraulic meter out by the golf course” (FR\_FR02).*
- *“And I wish there was either the fire alarm, or the tornado drill thing, or six o’clock whistle, whatever you want to call it. I wish that was louder, and I wish if there was a chance, just like they ring it for tornados, why I can’t it be rung for floods?” (FR\_FR03)*

The unpredictability of the 2016 floods and the fact that they occurred overnight made initial communication with the community particularly challenging. While response-related communication emerged as a particular concern, interviewees also noted opportunity for more centralized communication mechanisms into the recovery phase, including a digital communication board at a

public location such as at the recycling center in Freeport. Indeed, when utilities are down and community members disperse due to displacement by flood waters, building both informal communication strategies among residents - such as phone trees or group texts - and formal communication strategies, such as formal flood alerts, will continue to be important.

#### 1B. Formal Networks Provided Immediate Response

Law enforcement, fire department, and emergency management all worked to provide an immediate response to the 2016 floods and this was highlighted in many interviews. Despite the fact that response efforts by formal networks were debated by some within the community, it is evident that they worked to ensure a quick recovery from flood damages. Deploying hundreds of volunteers through partner organizations like the Salvation Army and American Red Cross, the county emergency management was instrumental in helping residents clean out their homes. Additionally, they worked to transform the county recycling center into a universal location for people to get rid of their flood damaged possessions and communicate available resources. County employees spent hundreds of hours, working beyond their allotted hours, with flood victims in their homes cleaning, listening to individual's stories, and offering emotional support. These efforts did not go unnoticed by Freeport residents.

- *"I was at a hearing at the church over here afterwards with the board of supervisors and a couple people from the state, and there were a couple local property owners that were just upset that the emergency response was so lax and so problematic. I stood up and I said, "Wait a minute! I've been involved in emergencies in five states and over the years many, many times. I can tell you from my personal experience that the emergency response to this flood was tremendous. And the volunteers that have stepped forward to help have just been unbelievable" (FR\_FR08).*
- *"I had Red Cross, Salvation Army, I sent them all to Freeport and they literally went door to door" (KI\_KI03).*
- *"Salvation Army was out here for three days...They were wonderful. They came down the street in a four-wheeler, bringing stuff: sandwiches, chips, water, cleaning supplies. Salvation Army was absolutely phenomenal!" (FR\_FR04)*
- *"Many of the county recycling staff members ended up visiting homes for a day or two after the flood, and talking to them for two hours about how they lost everything. We aren't social workers, but we did our best" (KI\_KI01)*
- *"My friends and my family that came and gutted stuff and carried out and trashed and of course we had to take a lot of it over to our recycling place. Thank the Lord for the recycling center" (FR\_FR07).*

#### 1C. Informal social networks were important in long-term response and recovery

For the majority of interviewees, their informal social networks were recognized as the community's foundation for recovery and response. Informal social networks often included an individual's family, friends, neighbors, coworkers, volunteers, religious institutions, local businesses, and strangers. These groups provided resources for labor, funding, food, emotional support, and communication.

- *"I think the city of Freeport itself had a lot of people going around knocking on doors and things" (FR\_FR02).*

- *“Anytime we, one of us, could find out something, then we’d tell another one and then they tell another one until the word spread” (FR\_FR03).*
- *“It’s just really nice to live in a community where people are so caring. I mean, the fact that they all pulled together and helped, brought food and water and donations. People called me all the time, “Do you need this or do you need that?” (FR\_FR01)*
- *“I knew we would be helped by the community and I knew were surrounded with good people that wanted to help but I didn’t realize it was to the level that it was. I cried more about the people helping us than the loss of our stuff” (FR\_FR04).*
- *“The community itself was wonderful. Like I said, those days after you know, the first week for sure, you couldn’t even walk down the road, there were so many people wanting to help” (FR\_FR12)*
- *“The sense of community in northeast Iowa is just phenomenal. I mean, looking at elsewhere and experience the absence of it, it’s something people just assume and take for granted here. It’s just a different place in the world” (FR\_FR08).*

Thus, the informal social networks, both within and outside of Freeport were critical in the response and recovery of flood victims. For many, the connections formed during the most recent disaster will enable them to be better prepared for the next one.

#### 1D. Formal and INFORMAL NETWORKS IMPORTANT at DIFFERENT STAGES

Comparing across interviewees, residents of Freeport noted that they relied on different networks and resources during distinct phases of the flood management cycle (Fig. 1). While formal networks were most important in mitigation, preparedness and short-term response, informal networks played a larger role in long-term response and recovery.



**Figure 1.** The cycle of flood risk management. Interviewees from Freeport indicated formal networks of emergency response organizations were important during flood mitigation, preparedness, and initial response, and that informal networks of family and friends were critical during the recovery phase. *Source: The Iowa Flood Center.*

## 2.IMPACT

### 2A. Substantial Economic Impact

One prominent theme from all interviews was the direct economic impact of the floods. While the numbers varied greatly, all individuals interviewed sustained some financial impact and many were substantially impacted. The financial costs included: clean-up, repair and rebuilding, temporary

housing, and lost household items. For some households, the cost of repairs was close to the initial cost of purchase. According to one interviewee:

*"I think we probably spent \$54,000 to rebuild, and we paid \$56,500 when we bought it 23 years ago"* (FR\_FR01).

The financial costs also had implications for life planning, including retirement planning. For example, another interviewee noted

*"He was planning on retiring September...but for some reason it wasn't meant to be"* (FR\_FR03).

In addition, many interviewees reported using crowd fundraising sites such as "GoFundMe" to assist with the costs and damages. This demonstrates the challenge of individually absorbing the costs associated with flooding, as well as the gaps in flood insurance programs for Freeport residents. Further, measures of social vulnerability to flooding put together by the Iowa Flood Center indicate that the area of "old Freeport" most hit by flooding may be more vulnerable than the town of Decorah due to lower median household income and higher unemployment rates.

## 2B. Indirect impacts primarily from lost work/income

In addition to the direct financial impacts associated with clean up and repair, many interviewees explained the indirect economic effects, primarily through loss of work. Interviewees reported a number of reasons for loss of work including blocked routes, no access to clothing, time required for clean up and emotional impact of dealing with losses and clean up. One participant described the combined impact of these in saying *"I can't go to work. I have nothing. This is what I have: the clothes on my back. And I was in no emotional state to go in the first place"* (FR\_FR01) while another noted, *"I probably lost 2 weeks of income"* (FR\_FR06).

## 2C. Displacement from home was common

Many Freeport residents were displaced from their homes due to the physical impacts of the flood on their homes, as well as due to the need for rebuilding and repair.

- *"I think being homeless was hard very, very hard to realize... that all my life I had a home and in a half an hour it was taken away"* (FR\_FR03).

In addition, two of the households we interviewed never returned to their homes and ultimately moved to other houses in the area.

- *"We've never been back. You know, I just can't go back"* (FR\_FR02).

Even after residents returned to their homes, some residents reported continued disruption far beyond the period of physical displacement.

*"It was at least six months before we got any semblance of a decent routine"* (FR\_FR08)

In all households we interviewed, Freeport residents felt the physical impact of flooding on their homes for months beyond the flood. In some cases, homes were not back to their pre-flood state even two years later due to the extensive needs for repair and rebuilding.

## 2D. Emotional impact was significant and long lasting

In addition to the financial and physical impacts, the floods had a significant emotional impact on all of the residents to whom we communicated.

- *“Another problem I have...kind of PTSD, or whatever, every time it rained. I still can’t stand the sound of a dripping faucet because that’s the first sound I heard when I went into the house” (FR\_FR04).*
- *“I remember the school asking how are the kids? How are the kids? And you know, you think they’re okay; they say they’re okay, but deep down, are they?” (FR\_FR12)*
- *“It’s an awful feeling ... I was just getting comfortable with rain. You know, 8 years and I thought, “Okay, I can sleep now;” Now, I am right back to where I was before” (FR\_FR07).*

The 2016 floods were particularly flashy and rapid, compounding the mental and emotional trauma of the event. In the days leading up to the flood event, there was no opportunity for physical or mental preparation. Many residents awoke to their homes surrounded by water, or water in their homes already.

### **3.RESILIENCE**

#### **3A. Vulnerability**

##### **3A(1). Lack of information leaves some residents more vulnerable**

Overall, residents of Freeport reported feeling uninformed about the decisions and response process taken by emergency management personnel.

- *“So there were things that we were not aware of...like some of the early warnings like the flood alerts and that kind of stuff on your phone... I didn't know that existed. I didn't know that you could buy a thing in your basement that could tell you when the moisture level changes, so I learned about all those things afterwards” (FR\_FR13).*
- *“Maybe there should be big forums where people can go and we can learn. I think we also have to educate ourselves on knowing what's available and what we are responsible for, because in finding out, we are responsible for a whole lot more than we even knew” (FR\_FR12).*

Thus, residents noted that they were now aware that resources existed, and a desire to self-educate in order to become more flood-prepared.

##### **3A(2). Climate Change and Floodplain Management**

Some interviewees noted their perception of increased frequency and severity of flooding. Some, not all, connected this to climate change and land use changes in the area. This was highlighted as one of the ongoing challenges for the future in Freeport and similar communities. Some residents are becoming active voices in their community to mitigate the causes of flooding, such as agriculture and floodplain development.

- *“The golf course has been flooded three times now... That's unheard of. Thirty years ago that would happen once every 20 years. Now it's happened three times or more here in one summer. So yeah, I think there is climate change and unless maybe you experience it, you don't realize that it's happening even though people are telling you it's happening, and maybe it's happening someplace else, but it's happening here too” (FR\_FR13).*

- *“They've eliminated all of these wetlands. They've tilled all these fields...That water doesn't stay in the ground. It all runs” (FR\_FR09).*
- *“They should've never let Walmart and [the other businesses] come in, but they need to quit rezoning floodplains to commercial!” (FR\_FR07).*

Others believe further flooding is inevitable and seem to doubt whether adaptation is possible.

- *“I would say probably the most challenging part is [knowing] how we [can] best protect people that live here the next time. I feel like my hands are tied, but I don't know where to turn” (FR\_FR03).*
- *“...they could not have done anything. It was way too fast” (FR\_FR03).*
- *“It's a Mother Nature situation, you know?” (FR\_FR01).*

### 3A(3). A forgotten community? Unincorporated areas

Many Freeport respondents expressed a feeling that their community was easily forgotten or did not receive the same attention as Decorah, increasing their vulnerability to flooding. They spoke of the importance of raising awareness of the relationship between decisions made upstream and their associated consequences downstream.

- *“There are 2,500 people in Freeport; we need some kind of flood protection other than... an evacuation plan or something like that, because they don't really work unless you've got a lot of time. And this will happen again. It's almost a guarantee” (FR\_FR06).*
- *“I feel like there are people, some people who do care but their voices aren't really being heard as much as the people who are making decisions. They either don't care or don't understand or don't think what their decisions they're making aren't impacting us. And just like our decisions are impacting the river downstream” (FR\_FR12).*
- *“I mean, we're not the richest people, but we're not the poorest people. But we're good people. We work hard, we go and shop all over Decorah, we pay our taxes, and we take care of our property and... I just don't like the fact that I have no representation and no voice in so many of what's going on here. And yet, I am considered Decorah” (FR\_FR07)*
- *“We don't get priority out here and that's always been obvious since I moved here. We're an appendage they don't like to have. I don't care if they annex us I'll pay the taxes. That wouldn't bother me. Go ahead.” (FR\_FR07)*
- *“Do unto others downstream as you would want them to do upstream unto you. And that is so true. It's not like just where you're at” (FR\_FR12).*

### 3B. Adaptive Capacity

#### 3B(1). Personal/Household Resilience

For many residents of Freeport, the recovery process is still taking place two years after the flood. Yet, they continue to look forward to a future where floods are becoming regular occurrences. Respondents made several changes with the hope of preparing themselves in the event that a flood of the magnitude should occur again. These measures include physical improvements, raising furnaces and water heaters, creating calling chains, and educating themselves on emergency procedures.



- *“I feel a little more peace of mind that if we ever get water in the basement again, God forbid, that at least my washer, and my drier, and my electrical panel and my hot water heater are all upstairs” (FR\_FR01)*
- *“I’ve done everything I know to do here. I’ve put in a sump pump. I’ve changed the way my basement is. I no longer have any carpet. I no longer have the sheet rock on the bottom of the floor. I have gone to meetings” (FR\_FR07).*

### 3B(2). Building community and civic engagement out of adversity

Regardless of formal changes to increase resilience, it is clear that the Freeport community is stronger as a result of the 2016 floods. The response and recovery has contributed to a dynamic landscape of civil engagement. In sharing their stories, residents of Freeport have been given the opportunity to reflect upon the moments, both painful and beautiful, that shape the identity of a community made stronger through tragedy.

- *“I say the best thing is if you can laugh, and find the funny things, and the beautiful things. The flood was ugly, but oh, we met [good] people and became friends” (FR\_FR03)*
- *“I’ve learned how important community and friendships are. I’ve learned, you know, it’s okay to rely on others. It’s okay to get help. I’ve learned to be more aware of what’s going on around you as far as community and what they’re doing” (FR\_FR12).*
- *“Our neighborhood is so close. We are going to have a one year anniversary the day of...the flood...We are having a picnic.” (FR\_FR03).*

## IV. Implications and Conclusions

While the primary purpose of this study is to gather information and reports from Freeport residents on the flood of 2016, we would be remiss if we did not include some concluding thoughts on implications of what we learned. These implications should be seen as prompts for community discussion, not specific recommendations for action. Thus, most are phrased as questions, not definitive statements.

### 1. Response

How can response time and effectiveness be improved in future flood events?

- **Early notice:** What can be done to ensure early notice for as many residents as possible? - Ensuring early notice of a major flood event for as many residents as possible is a crucial step in minimizing the impacts to people and property. Since Freeport is unincorporated, additional challenges exist, but this report suggests the need for a look at warning systems utilizing multiple technologies and approaches. We heard little about tele-communications warning systems,
- **Uneven response** - The prevalence of the perception of an uneven response between Decorah and Freeport is an issue that needs further discussion.
- **Informal networks:** How can we enhance informal networks throughout the watershed, but especially in communities like Freeport? These networks are crucial both for short and long-term response.
- **Coordination:** What will best facilitate coordination of governmental and non-governmental organizations, especially the need for enhanced communication (phone trees, siren, centralized

communication in the community, communication between emergency managers and community).

- **Community public spaces:** What are some locations that could be emergency response sites for Freeport? Winneshiek County Recycling Center? Employee room at one of the local manufacturers? Rockwell Collins, IRP?

## **2. Impact**

While the direct impacts of flooding can seem inevitable, actions can be taken to foresee and plan for these impacts with the ultimate goal of minimizing long-term negative consequences. Softening the negative impacts of flooding and speeding recovery requires some attention to:

- getting people back to work. Reopening roads must be a priority as well as providing sufficient short-term relief to allow individuals to return to work as soon as possible.
- temporary housing for the displaced. How can communities plan for temporary housing for those unable to return to their homes for awhile? This can be formal housing from the municipality or facilitating discussions within informal networks about housing options in the event of major flooding.
- availability of credit / money to rebuild. How can a community ensure that individuals have access to the capital they need to complete repairs to damaged property?
- mental health support to help individuals and families deal with the emotional impacts of flooding. While the focus is often on direct impacts, long-term recovery also depends upon individual mental health.

## **3. Resilience**

How can Freeport (and all communities) reduce their vulnerability to flooding and enhance their adaptive capacity? This big question is the guiding star for this entire project. Here we highlight a few elements:

- The Iowa Watershed Approach organized through the Upper Iowa River Watershed Management Authority should help to slow down water on the land. What else can be done to reduce vulnerability along the flood way?
- How could Freeport residents strengthen the informal communication and social networks necessary to enhance community resilience?
- Residents of Freeport could organize to have a voice in local decision making.

### **Questions for further study**

- What are the positive and/or negative feedback effects from a flood event?
- How does being an unincorporated town affect flood response, emergency management's ability to coordinate with other governmental agencies, NGO's, etc.?

**NOTE:** The full report including appendices is available at <https://www.luther.edu/sustainability/outreach/community-flood-resilience/>

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## Appendix

### A.1

#### Examining and Enhancing Flood Resilience in the Upper Iowa Watershed

##### *Interview Guide for Flood Impacted Residents*

#### Background and Introduction:

1. We'd like to start by learning about you – can you tell us a **little about yourself**?
2. How **long have you lived** in Freeport/local area?
3. How **many people** are in your household? Do you have any dependents that live other places?
4. What **draws you** to the area? What keeps you here?
5. **How often** have you experienced the impacts of flooding in your home?

#### Flood Experience: Your Flood Story

6. Can you tell us about **your experiences with the most recent flood in 2016**? What was your story?

#### *Follow-up prompts:*

- A) What **did you do when you realized the flood** was happening?
- B) Were there **particular people or organizations** that you immediately made contact with?
- C) Did you have any **organizations or emergency response reach out** to you?
- D) How did the **flood affect your daily activities and for how long**?
  - Work?
  - Childcare?
  - Other?
- E) How **long did it take for you/your family** to recover from the summer of 2016 flood.
  - What **kind of clean-up and construction** did you have to do on your home?
  - How **did this recovery compare to any past floods** you have experienced?
- F) Were there **particular organizations/individuals** along the way that were most helpful in your flood recovery process?

- o In *what ways were* they helpful? What kind of support did they provide?
- o Were there organizations/individuals you expected support from that you didn't receive?
- G) Did the flood **affect your personal relationships with others**?
  - o If yes, how so?

Reflecting More Broadly:

7. Why, in your view, **do you think the floods of 2016 were such an issue** for Freeport? Why did we see such severe flooding?

8. Since the flood, have you **done anything differently** to protect yourself, your family, or your property from flooding?

- Did you **consider relocating** or did you know you were going to stay?

10. What, in your experience, are **some things our community can be doing better to prepare** and respond to flooding events?

- Throughout the flood and recovery process – did you experience **any barriers**? Things that you felt you wanted or needed to do that you couldn't? If so, what were they?
- What were your greatest frustrations throughout the flood response process?
- Were there gaps in how the community handled response efforts?

11. What are some **take-aways or lessons** that you have drawn from the flooding events you've experience?

- Are there things you would do differently next time, if you experienced another flood?

12. Do you have any **concerns about the future of this area and its vulnerability to flooding**?

- Is climate change something you ever think about? How significant is the threat of climate change in your personal perception of future flooding?

13. Is there **anything you didn't get the chance to talk** about that you think we should know in order to understand your experience or the ways that our community and people in the Upper Iowa Watershed can be more resilient to flooding?

14. Are there any people in your neighborhood that you think might be willing to share their stories?

## A.2

### Examining and Enhancing Flood Resilience in the Upper Iowa Watershed

#### *Interview Guide for Emergency Responders*

##### Background and Introduction:

1. **How long** have you worked as an emergency responder? What is your particular role with your organization?
2. What **brought you** to this current position? Why do you choose to do this work?
3. Can you tell me a little bit about **your organization in regard to emergency response**? What is your organization's specific role and what are some of the typical activities that you partake in with regards to emergency response and recovery?

##### Understanding Emergency Planning and Preparedness

4. Is your organization **actively involved in flood preparedness** and planning in the Upper Iowa Watershed? If so, in what capacity?
  - Plan writing?
  - Training and response?
  - Education and outreach?
5. Does your organization **partner or collaborate** with others regarding flood planning and preparedness?
  - Who are some of those key partners?
  - In what ways do you collaborate?
6. Are there particular local, state, or federal **policies/programs that are important for influencing your obligations** with regard to flood preparedness?
  - If so, what are they? And what is the nature of the obligations?
7. In your view, what are some **strengths of the flood preparedness** in the UIR? What is working well?
8. What are some **opportunities for improvement** or growth with regards to flood preparedness and planning?
  - Are there **barriers** to making those improvements? If so, what are they?

Understanding Flood Response & Recovery:

9. What was your **organization's role during the 2016 flood events** in the Upper Iowa Watershed? Can you walk us through some of the important elements of the timeline of your organization's response?

10. Were **there differences in the response** between the 2016 flood and previous events (2008)?

- If so, how were they different?
- Did your organization change
- Were there particular challenges associated with the 2016 event? If so, what were they?

11. Who were some of your **key partners** during the response and recovery process?

- Are there protocols for communication across organizations during flood response? If so, how does that work?

12. What is the **role of non-governmental organizations** in flooding response and recovery?

- Who are some of the key players? What are their roles?
- How are you working with them?

13. What are **some strengths of our current flood response** systems?

14. What do you see as some of the **challenges or opportunities for improvement** in our current flood response systems? How can we improve?

- Are there barriers to change? What are they?
- How do local, state, and national-level policies and programs affect your organization?

Reflecting more Broadly: Assessing the Landscape

15. How **well prepared are communities** in the UIR to deal with floods presently?

- How have you seen community resilience and preparedness to flooding change over your time as a responder?

16. Do you see particular places or people **more vulnerable** to flooding?

- What factors do you think impact their ability to prepare and respond?
- Are there gaps in knowledge about flooding, available preparedness and protection programs, insurance plans, or funding that you've experienced amongst affected residents?

17. What, in your view, **can we do to help** our organizations, communities, and residents to be more resilient in the face of flooding?

18. Is flooding becoming **more of a threat or challenge for communities** in the UIR watershed? If so, why do you think that is? What is driving that?

19. What are some **take-aways or lessons** that you have drawn from the flooding events you've experience?

20. Do you have any **concerns about the future of this area and its vulnerability to flooding**?

- Is climate change something you ever think about? How significant is the threat of climate change in your personal perception of future flooding?

21. Is there **anything you didn't get the chance to talk** about that you think we should know in order to understand your experience or the ways that our community and people in the Upper Iowa Watershed can be more resilient to flooding?

**A.3.**

<b>Research Theme</b>	<b>Coding Subcategory</b>
Adaptive Capacity	Flood Insurance Vulnerability
Impacts & Functions	Displacement Employment & Income Physical Damages/Costs Emotional Trauma Material Infrastructure Damage School
Formal Networks	County Emergency Management FEMA Fire Department Perceived Lack of Response
Informal Networks	Religious Institutions Local High School Family Friends Red Cross Salvation Army Local Businesses Local College Neighbors Strangers
Problem Framing	Agriculture Climate Change Floodplain Development Inevitability River Change Weather & Geography
Community Resilience	Gaps Infrastructure Politics
Personal Resilience	Personal Relationships Physical Improvements
Resources	Communication Emotional Support



	Food Funding Housing Labor
Other Themes	Previous Flooding Social & Economic Class Upstream vs. Downstream

## References

- Adger, N., Hughes, T., Folke, C., Carpenter, S., & Rockström, J. (2005). Social-ecological resilience to coastal disasters. *Science*, 309 (5737), 1036-1039.
- Gallopín, G. (2006). Linkages between vulnerability, resilience, and adaptive capacity. *Global Environmental Change*, 16 (3), 293-303.
- Mallakpour, I., and G. Villarini, The changing nature of flooding across the central United States, *Nature Climate Change*, 5, 250-254, 2015.
- Snyder, S., personal communication, June 26, 2018.