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white paper series: planning

PLANNING AND RESILIENCE:

Opportunities in Early Disaster Recovery

EXECUTIVE SUMMARY

Early recovery is a critical juncture point in the disaster cycle to uplift people from hardship and instability while preparing, communicating, and understanding the geospatial terrain of damage. To better understand early recovery, our team set out on a field visit to Southeastern Louisiana to gather fundamental knowledge about gaps in early recovery that exist within communities. In speaking with a range of stakeholders, including residents, organizations, and government officials, fractures began to emerge that illuminated the gaps that were stalling early recovery functions. Our takeaways revealed the distrust of institutional support, voids in services, strained communication networks, and uncoordinated damage assessment methods. These emerging themes contextualized the complex process of early disaster recovery that includes a multitude of actors and specialties.

Urban planners are in a unique position to align the functions and actors within early disaster recovery, yet their role has been limited. In bringing planning to the forefront of early disaster recovery, we can shorten the time for restoration of critical services and meet long-term resilience goals. Drawing from our field visit experiences, in conjunction with our research, we developed three takeaways for innovation within the field, specifically at the intersection of planning and early disaster recovery. These include planners as intermediaries, the merging of technology and local support, and the use of damage assessments.

1.1 Introduction

As global temperatures continue to rise, coastal communities are bearing the brunt of the impacts of climate change. More intense storms, rising sea levels, and extreme heat are just a few of the impacts that have placed communities at greater risk. This is true of Louisiana, where the lower parishes have been subject to repeated climate disasters, most recently Hurricane Ida in August 2021. The Gulf of Mexico is predicted to experience up to two feet of sea level rise by 2050, and storms will continue to become more frequent and more powerful, threatening the displacement of entire coastal communities.[1] The frequency of severe weather events can leave certain communities in a constant state of recovery with each disaster compounded by the last. Further, many communities find themselves without the resources or tools to properly recover and build resiliency.

Recovery is a complex process involving many interconnected functions that fall within social, environmental, and built systems. Each function plays an important role in bringing communities out of distress and back to a functional state. Urban planners are at the intersection of many of these cross-cutting fields, yet their role in early recovery has been limited. Additionally, planners are often situated at the local or regional level, allowing them to work closely with communities and conduct field work. The absence or limited role of planning in early recovery and the unpredictable nature of disasters produces unplanned activities that can further harm vulnerable communities. In bringing planning to the forefront of early disaster recovery, timelines for the restoration of critical services can be shortened and long-term resilience goals can be met.[2] Through exposing these critical gaps in the early recovery phase, this paper aims to outline juncture points in which urban planners can intervene for increased decision making support.

1.2 Early Disaster Recovery

Early recovery occurs just after emergency relief and life-saving support following a natural disaster but before long-term recovery efforts. In the emergency phase of recovery, first responders execute immediate disaster response decision making to address emergency

needs, such as medical attention or evacuation assistance. On the contrary, long-term recovery is a period of infrastructure and housing reconstruction, workforce development, and, in general, large-scale programs. Long-term recovery entails significant rehabilitation to the urban environment as funded through large grant programs and massive aid packages. Early recovery, therefore, represents a middle ground between emergency needs and long-term projects. In this stage of recovery, local disaster professionals offer cash assistance, rental stipends, food distribution, and temporary housing assistance.[3] The motivations of this stage are to protect people from continual hardship and instability while preparing, communicating, and understanding the geospatial terrain of damage. Early disaster recovery toes a fine line between balancing speed in resolving immediate damage, and addressing long-term disaster goals that promote resilience. While early recovery is currently understudied and seemingly inefficient, this period of rebuilding programs and redevelopment has the potential to increase overall recovery effectiveness and instill greater resilience in communities.[4]

Organizations such as the National Disaster Preparedness Training Center (NDPTC) at the University of Hawai'i at Manoa offer tools, workshops, and training materials to educate and prepare local communities and responders for natural disasters. With interests in federally managed programs and local community capacity building, these organizations can provide fundamental training for each stage of recovery. To aid in early disaster recovery, the NDPTC is currently developing tools and training designed to be leveraged in this disaster period. One of these tools is the Rapid Integrated Damage assessment (RIDA), a method intended to intervene in disaster management for improved discovery and prioritization of needs in communities. The mission of this project is to generate innovative, equitable, transferable, and actionable solutions that enhance on-street image capture and satellite imagery machine learning processes while integrating social methods that can offer insights into vulnerabilities and social assets.

To understand the organization's role, and other disaster recovery roles at large, we looked toward the lower parishes in Louisiana that have dealt with and recovered from a series of natural disasters. Using fieldwork and on-the-ground experiences of community restoration, we uncovered what early recovery looks like, how disaster professionals alleviate obstacles, and what tools are needed to increase recovery speeds through decision making support.

1.3 Hurricane Ida and Louisiana as a Case

To better understand early recovery, our team of University of Michigan graduate students visited Southeastern Louisiana in February 2022 to observe damage and recovery efforts through talking with residents, organizations, and officials who experienced the impacts of Hurricane Ida in August 2021. Hurricane Ida caused parishes such as Jefferson, St. Charles, and Lafourche major destruction and damage. Homes were uprooted entirely from wind, neighborhoods experienced flooding, and lives were lost. These communities have experienced natural disaster events for years. With residents staying in their neighborhoods regardless of disaster damage, informal and formal networks of resilience and recovery have emerged using their extensive recovery knowledge from prior experiences. Figure 1.1 below highlights the purposeful selection of the lower parishes of Louisiana as a case study. Being in the midst of early recovery and the beginning stages of long-term recovery, it provided a unique opportunity to learn from these on-the-ground experiences and to identify particular challenges such as resource distribution and data access.

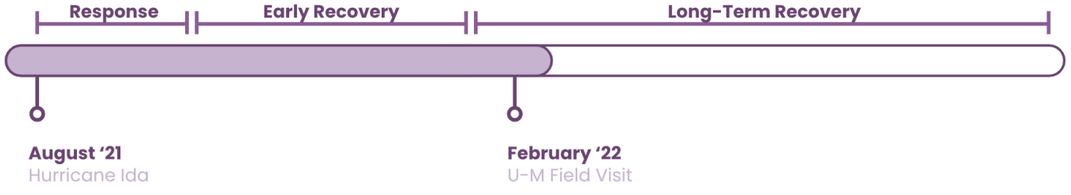

Figure 1.1: A disaster timeline including the landfall of Hurricane Ida and our field visit to the Louisiana lower parishes.

Our team designed a field visit grounded at the local level to draw from the wealth of knowledge that exists in these communities to gather fundamental knowledge about the gaps in early recovery. We strategically sought to speak with organizations that were independent community actors and organizations, such as small scale non-profits, faith-based organizations, and micro-level disaster responders. Additionally, these stakeholders represented geographical differences in the urban and rural contexts that brought light to the differing recovery timelines.

Once on the ground, our team observed the complex environment of disaster recovery. In Southeastern Louisiana, various parishes had commonalities in structural damage, as seen through indicators like blue tarps and trailers. We heard from disaster professionals and affected residents alike about the challenges in communicating information with one another, the frustrations in receiving aid, and the communal distrust of institutions and government. On the ground research illuminated gaps in early recovery that permeate through communities. Following our field visit, we used an affinity diagram to distill fundamental themes taken from our observations and conversations.

Through this method, four primary areas of interest become evident: governmental mistrust, strained organizational capacities, uncoordinated communication, and damage assessment methods.

Observations

In Southeastern Louisiana, locals expressed that there are fractures in the early recovery process. The key takeaways comment on the distrust of outside organizational support, gaps in services, and strained communication networks. Altogether, while notable gaps stall recovery, local actors and organizations step up to provide the most tailored, effective, and efficient solutions for repair and resilience.

Trust in Government is Low

The Descendants Project, an organization whose mission is to support descendant communitities in the river parishes, did not plan to provide disaster relief when they began operating in 2020. Jo Banner, a founder of the non-profit group now says it is a central piece to their organization following Hurricane Ida. Before and after Hurricane Ida, environmental advocacy groups contacted Banner, offering to provide resources and financial support to the community. The groups offering assistance trusted The Descendants Project, as Banner says, because they were non-governmental. That same sentiment was also ingrained in the community, as they turned to organizations like the Descendants Project to ask for resources such as food assistance, ice and water, and tarps. Some of the requests were beyond their capabilities. "We can't help them in that extent to what they need. We can try, but we are limited. But so was the trust they had with us versus going to the administration for help," Banner says.

The lack of faith in government is multifaceted, and

Image 1.1: Members of our team with Jo Banner (center-right) of the Descendants project at Banner's cafe, Fee-Fo-Lay Cafe

Image 1.2: Members of our team with Laura Mann (left) of lowernine.org

oftentimes lies in the collective memory of previous disaster events and recovery actions. Following Hurricane Katrina, neighborhoods within New Orleans were faced with disparate recovery options predicated on their access to resources, levels of income/wealth, and overall vulnerability. Laura Mann, Executive Director of lowernine.org, an organization focused on long-term recovery in the Lower Ninth Ward, discussed the discriminatory nature of federal aid and how that impacted recovery in the Lower Ninth Ward. Of note was the disbursement of aid based on indicators such as pre-storm property values, but not on the overall resilience or financial ability of households to successfully recover. In effect, the Federal Government failed to provide adequate support to some of the most vulnerable communities who had been impacted by the storm, thus compromising the trust of community members in a larger institutional response.

In addition to inadequate federal and state responses, local governance, according to Banner, also falls short in preparation for disaster response. "We are Louisiana, hurricanes are not new, but we have a government that acts like it is. So every storm that comes, here we are acting like it is the very first time we are going through a storm." Further, Banner attributes the inaction to the political fractures that exist between the Parish President and the Parish Council that prevent them from coordinating efforts following a storm. After Hurricane Ida, Banner says the neglect of the parish caused her to not even pay attention to what they were doing. The inaction of the parish has led Banner to stop relying on the government as being able to help. "I hate to say it, but I don't even consider them as part of the equation anymore," says Banner.

While The Descendants Project will move forward with the resources, connections, and contributors they have for now, Banner does acknowledge the benefits that could come out of coordinating with the parish. However, that process will not happen by accident; it will need to happen with intention. "There is some healing that needs to take place and some bonds that need to be restored." Banner further says, "Maybe what we need is a mediator to get us where we are all working together so we are not so disjointed where bitterness is coming out, because we could utilize some tools that the parish have and make that work for us." For Banner, it also means coming to the community outside of disasters to build connections with the community and to learn about its culture. It also means placing trust in the community itself. One example of this is how some of The Descendant Project contributors, such as Bloomberg and The Rockefeller Foundation, take bureaucratic red tape out of the process. In doing this, it gives organizations the trust to spend money how they want, and the flexibility to get the supplies they need following a disaster.

Voids are Closed by NGO's

Local knowledge that percolates in communities flows first to non-governmental organizations, which fill the civil society space created in the void where the government and firms do not effectively operate. In the event of a disaster, relief and recovery activities are conducted by a wide range of organizations, but as discovered in research in Louisiana, the organizations with an ear closest to the ground are the non-profits, faith-based entities, and community organizations. Local governments will not have enough resources to handle such an event. Dr. Robert Collins at Dillard University confirmed this by testifying to the fact that, "Resources needed [to face] a disaster event exceed the capacity of city government." He also notes that "FEMA comes in to support but much of the response is non-profit driven." However, in many instances, local organizations are being stretched thin and are not adequately supported for the roles they have evidently taken on.

However, while governmental entities cannot take on the burden alone, their rigid protocols hinder recovery efforts led by local organizations to bridge the gap. Lanor Curole from the United Houma Nation says FEMA's system is a fundamental flaw in the governmental disaster process. "FEMA is structured on this military model that is supposed to address people in their most vulnerable time. And the last thing that non-military people need is a rigid structure in that time." Further, Curole believes if FEMA were willing to structure their system differently, that it would result in a more efficient process in the distribution of resources. Though, the existing procedures FEMA rely on end up being an additional stressor, says Curole, instead of being a helper. The United Houma Nation ends up allocating resources and energy to help individuals navigate that process. These rigid systems are not malleable to the situation that further strains organizations.

Allocating resources to help those navigate bureaucratic systems only strips organizations' limited capacity away from the many other needs that they are relied upon to assist with. It is this compounding nature that tribes like the United Houma Nation, along with other community-based organizations, have to navigate to ensure needs like mental health are being addressed in their communities. The impact of Hurricane Ida was also heightened from organizations having to respond to two distinct disasters: a biological disaster in the COVID-19 pandemic and the natural disaster of the hurricane itself.

Image 1.3: Members of our team take a tour at Second Harvest Food Bank with Jay Vise (right)

To layer onto these strained organizational capacities, storms only continue to increase in frequency and severity. However, even after rebuilding over and over, the same issues persist. Some of this can be attributed to FEMA and other aid that is strictly focused on building back what existed prior to the storm. "They're very much about mitigation," says Curole in talking about FEMA, "There's no room for adaptation. And so, it's all about, let's get you back to where you were before, but there's nothing about planning or addressing the issues to prevent further damage or adapting to the environment to address future issues to those extents." A different process, focused on creating resilient futures, could prevent organizations from having to repeatedly address the same gaps that are exposed when disasters strike.

Communication Networks are Strained

As soon as meteorological reports begin tracking storms to the area, organizations start reaching out to one another. For the United Houma Nation, Curole says environmental justice organizations reach out prior to a storm letting them know they are on standby to assist with relief and recovery resources. The Second Harvest Food Bank of Greater New Orleans and Acadiana also send out similar messages to their networks by sending out emails and calls as soon as they receive a report showing a potential disaster. Connecting with their networks not only builds capacity for food distribution, but also opens communication channels for the transfer of information about what is happening in communities, if there is damage, and what resources those communities need. No matter how much legwork is put in before the storm, they must stay nimble. As Curole points out, "We kind of have a go-to of what we know are like the basics that everybody will really

need, but no two storms are ever the same." It is for this reason that coordination and communication are so important. In talking about responding to community needs, Paige Vance, Impact Operations Manager at Second Harvest Food Bank, says "it's like walking on a beach, it is shifting all the time."

To navigate the changing landscape, Vance leans heavily on her coordinators who are on the ground and have established relationships. Second Harvest also relies on informal reports from phone calls or emails sent to them by partner organizations. The employees at Second Harvest maintain strong personal social networks, which allow them to see for themselves what is going on. Jay Vise, Director of Marketing and Communications, says they have run out of room on their T-shirts for all the disasters they have responded to, but that is also a testament to the strength of the relationships they have built over the years. Vance further accentuates the strong relationships by saying how the coordinator's ties to the community are so strong that they are familiar with the social cues of who might exaggerate a little or, conversely, who never complains, which helps in assessing the validity of certain reports. As much as these relationships are a strength, the rapid influx of information following a disaster makes it difficult to keep up. While Vise places deep value in their relationships, he also acknowledges its limitations. "It has always been a challenge to successfully share information about who is responding where, where the need is, and where the duplication is. There has got to be a better way to track who is doing what." Other organizations, like the Descendants Project, shared similar sentiments, questioning how they can build greater network connectivity of partner organizations and disaster professionals.

For other organizations, it is not so easy to extract information on specific individuals who might have been significantly affected by a disaster. The Jefferson Council on Aging is a specific example, since the senior population can become isolated from their communities. One of their primary missions is to deliver meals to seniors, using meal deliveries as an opportunity to check in with the senior population and communicate information to them. "The best eyes and ears we have to the seniors is through the people who deliver the meals. Before they hand over the meal, they're supposed to check in on them and make sure that person is okay, that they're not experiencing food shortages, and that their house is fairly clean." The United Houma Nation conveyed similar sentiments of having difficulty getting in touch with certain individuals who are more isolated than others. To combat this, they developed a database that includes individuals' plans for where they will be during the storm and following the storm. Knowing the plans of all its members allows them to narrow in on individuals who may be isolated from social networks and resources. It is also just a way to remind their community to prepare for the storm.

> "How do we layer all those things together, so that we can make the best educated decision?"

In addition to communicating operations with partner organizations following a disaster, places like Second Harvest also need to communicate their daily operations and schedule to the wider community. But for Vise, it is more than just sharing information. "Managing the output of information is almost as important as finding out where the need is because you want to be proactive and tell people, here is where we are responding right now, but [you don't want] two days later someone sees that post and goes there and no one is there." But even with rapidly updating schedules and communicating operations with community leaders and organizations, managing the flow can only do so much when most information is spread through word of mouth. The United Houma Nation and the Descendants Project both indicated that word of mouth is the main source of spreading information, especially following a disaster when electricity and Internet services are likely down.

New agencies and organizations such as NOLA Ready echo these remarks on formal and informal communication channels. The agency works primarily in response compared to long-term recovery, yet as one staff member highlights, "where I wish we had more help is on the planning and preparedness side." It is not easy managing multiple response and recovery efforts post-disaster, exacerbating information sharing channels. Before and after storms, NOLA Ready says how connections to "small scale partnerships really ramps up so we're filtering information from just all over the place." While the local office staff still work closely with the state and other parish governments, one of the main objectives is to filter information received through channels such as social media and word of mouth from community contacts. The filtering of information that groups like NOLA Ready perform is imperative to life saving efforts. Some of the biggest obstacles that lie ahead is sorting through information in a timely manner, and making this information relevant to people ahead of time.

Gaps in Damage Assessments

Governmental institutions and organizations all have different processes and methods to assess damage following a storm. Damage assessments create a contingency for aid, which is why it is paramount for organizations to have their communities prepared. In our interview with the Jefferson Council on Aging, Al Robichaux, the Executive Director, mentions that they give thumb drives to their seniors for them to have their insurance, their birth certificates, their marriage license, and all other documents that are relevant following disasters in one place. Robichaux says the importance of thumb drives lie in there ability to store any documents seniors will need immediately after a disaster to begin the insurance process and to get timely FEMA assistance. Other groups use similar tactics to have their communities prepared for insurance claim processes. In addition to using their disaster survey to assess needs, The United Houma Nation also encourages tribal members to upload photos of damage in their communities to advocate for their needs and document the disaster's impacts. It also aids in collecting information from their communities to see where damage is located. Both instances underline the importance of putting systems in place during the prepardness stage to increase recovery timelines.

Some organizations attempt to make navigating these processes easier through spatial assessment from aerial imagery. We discovered from the United Houma Nation how aid organizations like the Red Cross started using comprehensive imagery to assess housing damage for determining access to benefits. Curole says the Red Cross would input an address and make aid determination based on what they saw in the drone imagery. However, as Curole points out, "unless you're very quick about getting it [image capture] done immediately after the storm, it tends to penalize people that are quick about responding."

In this process, Curole says the Red Cross did not factor in common elements following disasters, such as tarps covering the roof. This prevented families and individuals who were quick to place tarps over their damaged roof before the image capturing from being able to receive aid from the Red Cross since they did not recognize tarps as a viable proof of damage. In other damage assessment processes, blue tarps are a strong indicator of the prevalence of damage. In talking with Tab Troxler, St. Charles assessor, we gained insight into how his office used aerial and street level imagery to discount property taxes as a form of aid. Troxler's office took the extra step to classify damage on a 0-4 scale, ranging from undamaged to destroyed, to better reflect the damage evident to the structures and closer aligned with the FEMA classification.

But tools used in the field are duplicative and vast. The NOLA Ready team recognizes the helpfulness of tools for, say, debris management but with a cautionary note. "There are a lot of tools that don't end up getting used... the struggle I feel that we've had [is] user acceptance like user accessibility and functional aspects of the tool. You know, it gets complicated when you have a tool that can do too much stuff." Organizations are overwhelmed with complex tools, even deciphering information and streamlining communication channels. NOLA Ready highlights that the operators of the tool are important considerations for development. If a damage assessment or debris management mapping tool does get created, NOLA Ready questions who should use the tool and "how do we layer all those things together, so that we can make the best educated decision?"

1.4 Spaces for Intervention

The themes taken from our field visit offered a nuanced understanding of on-the-ground responses and recovery. The fractures we observed in planning and prioritization of efforts for recovery illuminate the need for emerging technology and social methods that have the ability to merge the gaps that impede early recovery in communities. Drawing from our field visit experiences, in conjunction with our research, we developed three opportunities for innovation within the field, specifically at the intersection of planning and early disaster recovery. These include planners as intermediaries, the merging of tech and local support, and the use of damage assessments.

Planners as Intermediaries

Following a disaster, community trust can be damaged when recovery decisions are not grounded in an understanding of the cultural norms, local leadership, and nuances of a specific locality. As we heard from the United Houma Nation and the Descendants Project, localized context is fundamental in early recovery not only to properly leverage assets and leadership, but to also ensure the whole community is included. Planners are in a unique position to be an intermediary between the communities and broader relief and recovery organizations. With knowledge of local context and community assets, planners bring an important perspective of how early recovery can be best undertaken in these communities.

Further, planners have a range of tools that can be used to set the foundation for understanding the dynamics of communities such as social network analysis, asset mapping, and vulnerability assessments. These are tools that are utilized prior to a disaster in the preparedness stage and are vital for an effective early recovery. As such, the role of planners as intermediaries is not exclusive to the early recovery stage and requires consistent communication and coordination with communities. Planners serve as a critical linkage between local officials, responders, planners, and community leaders; these relationships can be leveraged to build cohesion and strengthen partnerships prior to a disaster event.

Merging of Technical and Local Support

The use of technology and its applications in disasters has rapidly progressed, but as we heard on the ground, these techniques often do not include localized knowledge, assets, or networks. The lack of integration between technology, such as machine learning and aerial imagery, and local techniques creates fractures within the disaster recovery field that result in inequitable recoveries. While technical support may be efficient in locating damage following a disaster; it does not offer critical information about local leadership and social networks that can then be relied upon for maximization of resource deployment.

> "It has always been a challenge to successfully share information about who is responding where, where the need is, and where the duplication is."
>
> *-Jay Vise*

Planners have a role in layering these two distinct support types to give greater contextualization of damage within communities. The achievement of integrating the two rely on building vertical and horizontal connectivity with the many organizations and stakeholders that are involved in disaster recovery. This includes the sharing of information and data that can offer greater representation of local realities. In aligning aspects such as data sharing, planners can aid in producing a more coordinated recovery where each action is folded into other measures to prevent it from happening in isolation.

Additionally, technical operations need to be mindful of usability for communities. Community organizations that we spoke with understand the importance of leveraging online systems; however, they also recognize their own technical limitations and shared concern about algorithms behind certain systems. Therefore, planners should work with technologists to develop tools that can be leveraged by communities and can offer guidance on more technical products used by emergency professionals and technologists following disasters.

Damage Assessment

No two storms are alike, which is why rapidly understanding damage in the aftermath of a disaster is essential in providing resources to communities which align with their needs. Further, damage assessments influence the amount of aid and the communities it flows into. However, assessments of damage occur in a multitude of ways, both formally and informally. As we heard from partners on the ground, organizations compile and use their own damage assessments in a variety of ways to determine resources distribution or to just make it easier for their communities to navigate the FEMA claims process. The different techniques and strategies to damage assessment is not necessarily unwelcome, as it offers greater understanding of damage, but the way it is communicated and transferred creates barriers in fully realizing its potential. As we saw with the St. Charles Assessors office, when damage assessments are used properly, they can have significant impacts. By using aerial imagery to classify structure damage on a 0-4 scale, the Assessors Office is able to extract a greater contextualization

of damage while aligning their process with FEMA's damage scale for efficient aid distribution.

Planners can play a central role in working with communities and institutions to create a system where damage assessments are better shared and understood. In doing so, it will produce a more detailed picture of where the damage is located for more accurate resource deployment and will streamline financial aid to communities to rebuild.

1.5 Conclusion

Early disaster recovery is not a process that can happen in isolation, especially in areas where the frequency of storms is as pronounced as Southeastern Louisiana. Planners have an integral role to play in coordinating efforts throughout the entire disaster process. Carrying out pre-disaster assessments such as identifying vulnerable communities, synthesizing social networks, and performing asset mapping are just a few of the tools planners could use to foster enhanced coordination within and between communities and governments.

In addition to building out local knowledge connectivity within communities, planners also have a role in creating continuity between interested communities, organizations, and governmental entities of varying scales. Our field visit illuminated a wide-ranging scope of efforts, from the micro grassroots level operating on residential knowledge to technically-oriented efforts that assess damage nodes. While there are certainly ways to improve on the tools used in the field, the more pressing concerns lie in aligning the efforts to create a unified and holistic response.

While both local support tools and technical support tools are powerful in their own right, on their own, they leave out crucial considerations that can bring greater contextualization to disaster recovery. By incorporating the speed and informational insights technologies provide and layering it with social vulnerability and social network considerations, resources and support can reach those who need it most in a more timely manner.

In our partnership with the NDPTC, our team has worked with the development of a decision support tool that assists with early recovery efforts. The method is complex, built on many stages and intricate processes, still in its earliest inceptions. The method has the potential to intervene in the current state of early recovery efforts to recognize local capacities, linkages, and knowledge. Our field visit played a critical role in influencing the development of the method so that community voices were built into the process and its methods. In addition, our on the ground experience guided our technical work bringing insights from local professionals and the gathering of context-sensitive data. To uncover and learn more about early recovery and our research, our team has developed a series of white papers and working papers on machine learning, aerial imagery, and social methods.

ENDNOTES

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RISING ABOVE THE DELUGE

Planning and Resilience: Opportunities in Early Disaster Recovery

Prepared by U-M Deluge Capstone Team

about this project

This project is a joint effort by students and faculty within the Master of Urban and Regional Planning program at the University of Michigan and the National Disaster Preparedness Training Center (NDPTC) as a Capstone project for the Winter 2022 semester.

A key focus of the University of Michigan team is to work in a manner that promotes the values of equity, uplifting local voices, transparency and honesty. As a result, the outcomes of this capstone aim to speak to both our collaborators at the NDPTC and the local communities impacted by disasters across the United States. Our responsibilities as researchers will also include the implementation and/or recommendation of innovative solutions to issues surrounding machine learning, damage assessments, prioritization determinations, and social infrastructure networks.

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