

Environmental Justice Analysis of Post-Hurricane Funding and Planning

Kyle Cornish, Rachel Gonsenhauser and Alicia Zhao

Dr. Betsy Albright, Adviser

Masters project submitted in partial fulfillment of the requirements

for the Master of Environmental Management degree

Nicholas School of the Environment

Duke University

April 2020

TABLE OF CONTENTS

1. INTRODUCTION.....	9
1.1. Study Purpose.....	9
1.2. Hurricanes in North Carolina.....	9
1.2.1. Hurricane Matthew	10
1.2.2. Hurricane Florence	10
1.3. Community Resilience	11
1.4. Post-Disaster Recovery Funding.....	12
Table 1.....	13
1.5. Environmental Justice Issues.....	14
Figure 1.....	16
Figure 2.....	16
1.6. Scope of Project.....	17
Table 2.....	18
2. METHODOLOGY.....	19
2.1. Research Questions	19
2.2. Preliminary Research	19
2.3. Interviews.....	19
2.4. Funding Data Analysis.....	21
2.5. Stakeholder Analysis.....	22
Table 3	23
3. FUNDING DATA ANALYSIS	23
Table 4	25
Table 5	25
Figure 3.....	27
4.1. State Government	27
4.2. County and Local Governments	30
4.3. Councils of Governments	31
5. NONGOVERNMENTAL STAKEHOLDER ANALYSIS.....	32
5.1. Regional Nongovernmental Organizations (NGOs).....	32
5.1.1. Environmental NGOs.....	32
5.1.2. Relief Organizations.....	34
5.1.3. Foundations.....	35
5.2. Local Nongovernmental Organizations (NGOs).....	36
5.2.1. Long-term Recovery Groups (LTRGs).....	36
5.2.2. Housing Agencies	37
5.2.3. Cultural Organizations.....	38
5.2.4. Religious Organizations	40
5.3. Universities.....	41

6. DISCUSSION OVERVIEW	43
7. ANALYSIS OF BARRIERS	44
7.1. Procedural Barriers	44
7.1.1. Navigating the Funding Process	44
7.1.2. Issues of Government Capacity	45
7.1.3. Grant Program Limitations	47
7.1.4. Other Procedural Barriers	48
7.2. Informational Barriers	50
7.2.1. Information Gap between Regional and Local Organizations	50
7.2.2. Distribution of information	51
Table 6	53
7.2.3. Quality of Information.....	54
7.3. Financial Barriers	55
7.3.1. Lack of Funds	55
7.3.2. Inequitable Distribution of Funds.....	55
Table 7	57
7.4. Cultural Barriers	58
7.4.1. Language Barrier	58
7.4.2. Fear/Distrust of Government	59
7.4.3. Lack of Familiarity with Hurricanes	61
7.5. Other Barriers	61
7.5.1. Lack of Affordable Housing.....	61
Table 8	62
7.5.2. Lack of Long-term Planning	63
7.5.3. Lack of Progress.....	63
8. ANALYSIS OF RESILIENCE STRATEGIES	64
8.1. Expanded Pre-Disaster Planning	64
8.2. Building Relationships and Trust	66
8.3. Partnerships with Local Organizations	67
9. POLICY RECOMMENDATIONS	68
9.1. Expanded Pre-Disaster Planning	69
9.2. Building Relationships and Trust	70
9.3. Partnerships with Local Organizations	71
10. CONCLUSION AND NEXT STEPS	73
Appendix 1: Breakdown of Stakeholder Groups.....	76
Appendix 2: Outreach Email Template.....	78
Appendix 3: Consent Form for NGOs, Long-Term Recovery Groups, and Local Officials.....	79
Appendix 4: Consent Form for Community Members	80
Appendix 5: Interview Protocol	81

ACKNOWLEDGMENTS

We are grateful for our adviser, Dr. Betsy Albright, whose insightful guidance and unwavering support have been instrumental to the completion of this project. We would also like to thank our client at Resourceful Communities, Monica McCann and Kathleen Marks, who initiated this project and provided invaluable resources and contacts. Thank you to our 26 interviewees for their willingness to share their experiences and opinions. Finally, thank you to our professors and fellow classmates at the Nicholas School, who have inspired and supported us throughout our two years here.

EXECUTIVE SUMMARY

As disasters increase in frequency and severity with climate change, affected communities across the United States are struggling to recover in a timely manner. In recent years, North Carolina was struck by two major hurricanes: Hurricane Matthew in 2016 and Hurricane Florence in 2018, both of which induced 500-year floods. Hurricane Matthew incurred total damages estimated at \$4.8 billion¹, and Hurricane Florence more than tripled that amount at \$17 billion in damages.²

Financial considerations, both prior to and following a disaster event, are critical for disaster recovery. However, pre-existing disparities make it especially difficult for marginalized populations to receive sufficient funds. In partnership with Resourceful Communities at The Conservation Fund, our team examined how four rural counties in eastern North Carolina – Bladen, Columbus, Craven and Duplin counties – are building resilience in the aftermath of these hurricanes.

In carrying out our Master’s Project, we conducted a systematic analysis of how demographic characteristics influence access to post-hurricane financial and technical resources (primarily including those related to hurricanes Florence and Matthew), the degree of involvement communities have in determining how these resources are utilized, and strategies to build more equitable access to post-hurricane relief and recovery. Our research utilized a multi-pronged approach to answer these questions. We examined successful cases of building post-disaster community resilience in rural

¹ *State of North Carolina Supplemental Request for Federal Assistance: Hurricane Matthew Recovery*, retrieved from <https://files.nc.gov/governor/documents/files/Hurricane%20Matthew%20Relief--2017%20Federal%20Request%20%28002%29.pdf>

² North Carolina Office of State Budget and Management. (2018). *Hurricane Florence Recovery Recommendations*. Retrieved from https://files.nc.gov/ncosbm/documents/files/Florence_Report_Full_rev20181016v10.pdf.

North Carolina to find examples of local, community-based resilience solutions and we conducted an analysis of the distribution of allocated funds to our target communities.

Additionally, 26 semi-structured interviews were used in conjunction with the literature review to inform a fund analysis and stakeholder analysis. Our stakeholder analysis elaborates on the role that each stakeholder group plays in North Carolina's post-hurricane recovery funding space and other related activities including hurricane relief and resilience planning at large.

Interviews were also used to identify barriers to hurricane recovery. Results show that barriers are procedural, informational, financial, and cultural in nature. These findings were used to identify strategies that seek to build more equitable access to this process and to provide recommendations to the North Carolina state government that can be systematically implemented at the state level.

Stakeholders identified numerous strategies for community members to build resilience in their communities throughout the post-hurricane funding and planning process. Generally, effective resilience strategies fell into three distinct groups which encompassed all phases of the hurricane planning process: *expanded pre-disaster planning, building relationships and trust, and partnerships with local organizations.*

Tangible steps for entities to *expand pre-disaster planning* include, but are not limited to:

- Increasing the usage of geospatial and physical data to determine the needs of impacted individuals instead of relying on financial data.

- Housing all recovery funding under one government division rather than siphoning under multiple agencies and/or divisions to expedite the recovery funding process.
- Increasing outreach to populations that do not use the internet by posting flyers at local community establishments such as grocery stores and churches.
- Expanding education and outreach on home ownership, finances, insurance needed, and how to take advantage of National Flood Insurance Program.

The primary way that we identified to *foster trust and relationship-building* within Bladen, Columbus, Craven, and Duplin counties is to increase representation from low-income and communities of color at funding meetings and hurricane recovery discussions. Additionally, sustained community participation in this process is key.

Entities can *build partnerships with local organizations* by:

- Creating coalitions/working groups that consist of entities across multiple sectors.
- Developing a comprehensive list/listserv of organizations active in disaster recovery for each county. This would include the organizations that comprise the long-term recovery groups in each county.
- Appointing a liaison from North Carolina Voluntary Organizations Active in Disaster to the North Carolina Office of Recovery and Resiliency to foster more collaboration between the state government and regional/local organizations.

If implemented collectively, these recommendations can bolster the ability of communities in eastern North Carolina, especially rural ones, to actively plan for and

manage the disaster recovery process. However, further research is necessary to strengthen and implement these recommendations. We hope that the wide distribution of this report will shift the conversation on hurricane recovery funding from what the state government should do to improve the process to what actionable improvements they can make systematically to facilitate a more equitable funding process in eastern, rural North Carolina.

1. INTRODUCTION

1.1. Study Purpose

In partnership with Resourceful Communities at The Conservation Fund, our team examined how four rural counties in eastern North Carolina – Bladen, Columbus, Craven and Duplin counties – are building resilience in the aftermath of recent hurricanes. Particularly, we aimed to better understand how resources provided by the United States federal government and the North Carolina state government are being accessed by these communities, which were impacted by first Hurricane Matthew in 2016, and then Hurricane Florence in 2018. As we believed there to be substantial barriers to accessing post-hurricane recovery resources, particularly for members from low-income communities and communities of color, we also assessed the role race and socioeconomic status play in the recovery process.

1.2. Hurricanes in North Carolina

As natural disasters increase in frequency and severity with climate change, affected communities across the United States are struggling to recover in a timely manner. In recent years, North Carolina was struck by two major hurricanes: Hurricane Matthew in 2016, followed by Hurricane Florence in 2018, both of which have been described as 500-year floods. In addition to taking numerous human lives, these hurricanes have destroyed people’s homes as well as damaged critical infrastructure, including roads, water and sewer systems, libraries and, schools.³

³ Jarvis, C. (2019, February 20). ‘Our world has changed’ – Eastern NC bands together to urge faster hurricane recovery. *The News & Observer*. Retrieved from <https://www.newsobserver.com/news/politics-government/article226517385.html>

1.2.1. Hurricane Matthew

In October of 2016, Hurricane Matthew struck North Carolina. At least 31 people lost their lives⁴, and over 100,000 homes, businesses, and government buildings were damaged, with total damages estimated at \$4.8 billion.⁵ More than 800,000 households lost power and 635 roads were closed, and thousands of families were displaced or forced to seek safety in emergency shelters.⁶

1.2.2. Hurricane Florence

Less than two years following Hurricane Matthew, Hurricane Florence made landfall in North Carolina in September of 2018. At its peak, Hurricane Florence was a Category 4 storm spanning the width of the entire state, with higher levels of rainfall, storm surge, and flooding than were experienced during Hurricane Matthew. Responsible for at least 40 deaths, Hurricane Florence is estimated to have incurred over three times the cost of Hurricane Matthew, sustaining nearly \$17 billion in damages.⁷ The majority of these damages are estimated to be related to business (\$5.7 billion), housing (\$5.6 billion), and agriculture (\$2.4 billion).⁸

⁴ NC Gov. Cooper: *One Year Later: North Carolina Continues Recovering from Hurricane Matthew*. (2017, October 3). Retrieved January 2, 2020, from <https://governor.nc.gov/news/one-year-later-north-carolina-continues-recovering-hurricane-matthew>.

⁵ *State of North Carolina Supplemental Request for Federal Assistance: Hurricane Matthew Recovery*. Retrieved from <https://files.nc.gov/governor/documents/files/Hurricane%20Matthew%20Relief--2017%20Federal%20Request%20%28002%29.pdf>

⁶ Ibid.

⁷ North Carolina Office of State Budget and Management. (2018). *Hurricane Florence Recovery Recommendations*. Retrieved from https://files.nc.gov/ncosbm/documents/files/Florence_Report_Full_rev20181016v10.pdf.

⁸ North Carolina Office of State Budget and Management, 2018.

1.3. Community Resilience

In efforts to better prepare for and withstand the impacts of such disasters, building community resilience is often looked to as a solution. Community resilience is defined as the “existence, development, and engagement of community resources by community members to thrive in an environment characterized by change, uncertainty, unpredictability and surprise”.⁹ Members of resilient communities actively develop personal and collective capacity that they engage to respond to and influence change, to sustain and renew the community, and to develop new, future community trajectories.¹⁰ A community’s capacity can be thought of as the intersection of human capital, organizational, technical and financial resources, and social capital that can be leveraged to solve collective problems (in this case threats emerging from hurricane events).¹¹

Disaster planning plays a vital role in increasing community resilience. Compounding the vulnerabilities experienced by low-income, minority communities, many local governments have a weak commitment to planning, especially those that lack a supportive culture and tradition in planning. To mitigate this shortcoming at the local level, federal and state governments must play a stronger role in encouraging or requiring local planning for post-disaster recovery and mitigation.¹² Additionally, diverse stakeholders should be involved early in the policy process and legislation should be

⁹ Kristen Magis. (2010). Community resilience: an indicator of social sustainability. *Society and Natural Resources* 23: 401-416.

¹⁰ Ibid.

¹¹ Albright, E. A., & Crow, D. A. (2015). Learning processes, public and stakeholder engagement: Analyzing responses to Colorado’s extreme flood events of 2013. *Urban Climate*, 14, 79-93.

¹² Berke, P.R., & Campanella, T.J. (2006). Planning for post-disaster resiliency. *The Annals of the American Academy of Political and Social Science*, 604(1): 192-207.

written such that program goals are clear to implementing agencies and local governments are afforded adequate staffing and resources to implement policies.¹³

1.4. Post-Disaster Recovery Funding

Financial considerations, both prior to and following a disaster event, are critical for disaster recovery. In North Carolina, the disaster recovery process involves various groups across sectors that allocate money to impacted communities. Recovery funding is distributed by many of these entities, and in most cases originates from the federal government. Funds may cover infrastructure, housing, daily necessities, and transportation. However, housing remains a prominent issue in post-disaster recovery and is a major source of inequity.¹⁴ While multiple federal agencies and programs are involved in recovery, the primary federal programs which target housing assistance include Community Development Block Grant – Disaster Recovery (CDBG-DR) and grant programs operated by the Federal Emergency Management Agency (FEMA), which are dispersed via state government agencies (Table 1).

Subsequently, these funds are dispersed to community members through entities including long-term recovery groups (LTRGs), local governments, relief and religious organizations, foundations, and other non-governmental organizations (NGOs).

¹³ Prater, C.S., & Lindell, M.K. (2000). Politics of Hazard Mitigation. 2000. *Natural Hazards Review* 1(2): 73-82.

¹⁴ Hersher, R., & Benincasa, R. (2019, March 5). How federal disaster money favors the rich. *National Public Radio*. Retrieved from <https://www.npr.org/2019/03/05/688786177/how-federal-disaster-money-favors-the-rich>

Table 1. Breakdown of three primary federal programs for housing assistance^{15,16}

Funding type	Originating Federal Agency	Receiving State Agency
Community Development Block Grant – Disaster Recovery (CDBG-DR)	HUD	NC Commerce and North Carolina Office of Recovery and Resiliency (NCORR)
Individual Assistance Program	FEMA	North Carolina Emergency Management (NCEM)
Hazard Mitigation Grant Program (HMGP)	FEMA	NCEM

When local governments have the capacity to respond quickly (due largely to financial health and presence of budget reserves), understand proper compliance procedures, and make recovery decisions divorced from financial limits faced by communities with less healthy finances, they have a greater degree of control over their recovery process and are able to respond in a more timely manner.¹⁷ However, policymakers must be careful about implementing programs with a top-down structure, as external financial incentives may inadvertently undermine self-sufficiency of local communities.¹⁸ Additionally, the distributional impacts of these resilience efforts should be closely monitored by actively identifying social groups, industries, and neighborhoods that will benefit from or bear the cost of these actions.¹⁹

¹⁵ NC DPS. 2019. NC Office of Recovery and Resiliency names key leaders. Retrieved from: <https://www.ncdps.gov/news/press-releases/2019/01/03/nc-office-recovery-and-resiliency-names-key-leaders>.

¹⁶ North Carolina Department of Public Safety. n.d. Grants. Retrieved from: <https://www.ncdps.gov/our-organization/emergency-management/grants>.

¹⁷ Crow, D.A., Albright, E.A., Ely, T., Koebele, E., & Lawhon, L. (2018). Do disasters lead to learning? Financial policy change in local government. *Review of Policy Research* 35(4):564-589.

¹⁸ Leichenko, R. (2011) Climate change and urban resilience. *Current Opinion in Environmental Sustainability* 3(3): pp.164-168.

¹⁹ Leichenko, 2011.

1.5. Environmental Justice Issues

Throughout the disaster recovery process, pre-existing disparities make it especially difficult for marginalized populations to receive sufficient funds. These populations often bear additional burdens compared to “mainstream” populations when exposed to identical physical phenomena.²⁰ For example, low-income households are more likely to experience disruption in employment in the wake of disasters²¹ and less likely to have the time, paperwork, and technological access to comply with rigid application requirements for federal aid.²²

Furthermore, low-income communities are more likely to live in floodplains; however, they often do not have flood insurance. Of the communities that live within North Carolina flood zones, homeowners with flood insurance have a median income of \$73,051, which is more than double the median income of those without flood insurance.²³ Flood insurance is often the best way for a household to recover from a flood, and insured survivors rebound more quickly than uninsured survivors. Low-income families therefore have a lower probability of recovering as quickly or as fully as their high-income counterparts, and therefore more reliant upon government disaster assistance.

There are also substantial discrepancies in how disasters are experienced on the basis of race and ethnicity.²⁴ Communities of color often experience increased

²⁰ Maantay, J., & Maroko, A. (2009). Mapping urban risk: flood hazards, race, & environmental justice in New York. *Appl Geogr.* 29(1): 111-124.

²¹ Flanagan et al., 2011.; Maantay and Maroko, 2009.

²² Ibid.

²³ Federal Emergency Management Agency. (2018). *Affordability Framework on the National Flood Insurance Program* | FEMA.gov. Retrieved from <https://www.fema.gov/media-library/assets/documents/163171>

²⁴ Maantay and Maroko, 2009.

vulnerability due to factors such as limited access to political power and representation, lack of access to resources, and lack of social capital.²⁵ Additionally, White and minority populations have differential access to governmental assistance, differential disruption to housing and income, and unequal opportunities to access substantial recovery capital.²⁶ On average, Whiter and richer Americans have more knowledge and power to navigate bureaucratic government procedures to receive aid, compared to minority households.²⁷ As such, distributed government aid, tends to predominantly benefit whiter, wealthier communities, exacerbating the wealth gap across racial and ethnic lines.

On average, Black residents lose wealth while White residents accumulate wealth after disasters, according to a study conducted by sociologists Junia Howell and James R. Elliot at the University of Pittsburgh (Figure 1 and Figure 2).²⁸ Their model uses county-level data on 3,400 American households to predict changes in net worth for different demographics in response to disasters such as floods, fires, and hurricanes between 1999 and 2013. This study also suggests that renters are less likely to benefit after disasters compared to homeowners, and that their claims for government aid are more likely to be denied.^{29, 30} Across the U.S., minority households are twice as likely as

²⁵ Maantay and Maroko, 2009.

²⁶ Howell, J., & Elliott, J. R. (2018). As disaster costs rise, so does inequality. *Socius*, 4, 1-3.

²⁷ Hersher and Benicasa, 2019.; Maantay and Maroko, 2009.

²⁸ Howell and Elliott, 2018.

²⁹ Wu, J., Zhang, M., Park, J., Villegas, C., Patterson, G., & Shelton, K. (2018). *Hurricane Harvey relief fund needs assessment: Phase two*. Retrieved from https://kinder.rice.edu/sites/g/files/bxs1676/f/documents/KI-2018-GHCF.HHRF-Report-3%281%29_0.pdf

³⁰ Hersher and Benincasa, 2019.

White households to rent their homes, with 58% of Black households and 54% of Hispanic households renting in 2016, compared to 28% of White households.³¹

Figure 1. After disasters, White residents gain wealth. Also, homeowners are more likely to benefit than renters. This model was developed using county-level data to show expected change in net worth as a result of disasters between 1999 and 2013.³²

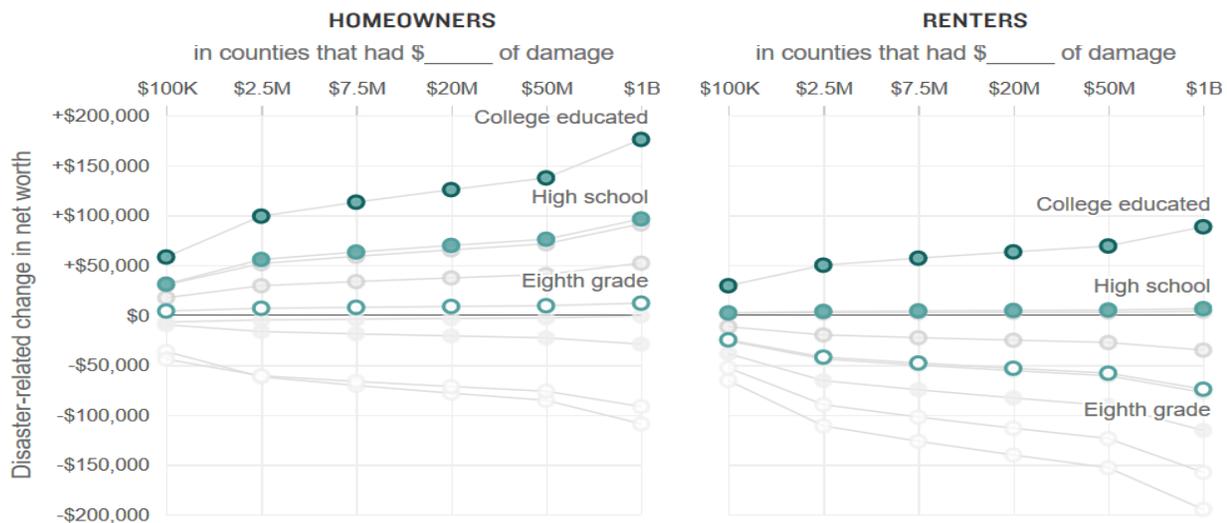
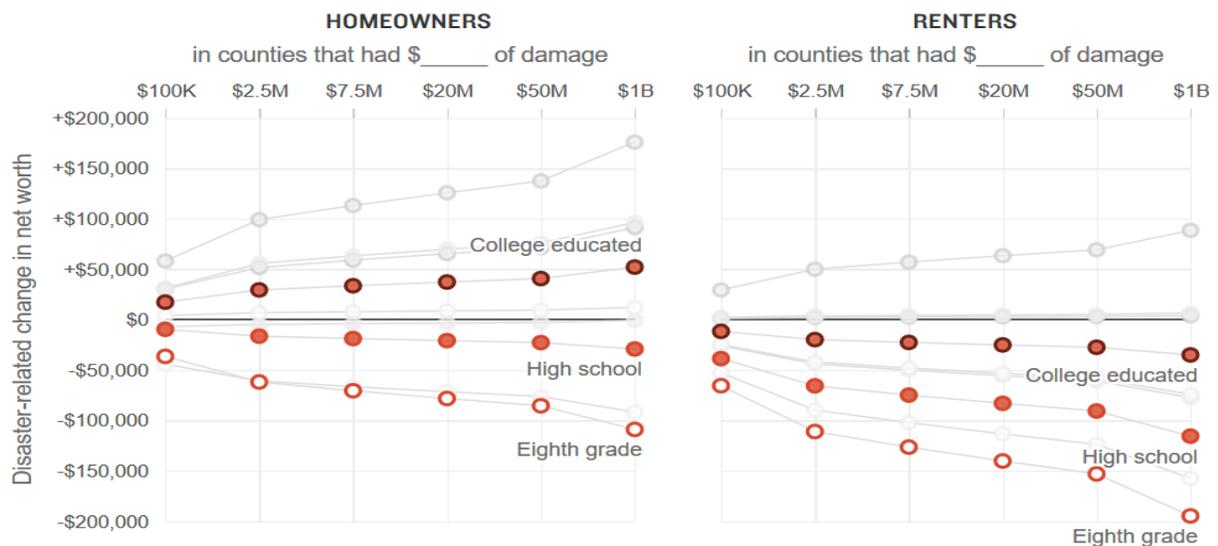


Figure 2. After disasters, Black residents lose wealth. Also, homeowners are more likely to benefit than renters. This model was developed using county-level data to show expected change in net worth as a result of disasters between 1999 and 2013.³³



³¹ Cilluffo, A., Geiger, A.W., & Fry, R. (2017, July 19). More U.S. households are renting than at any point in 50 years. Pew Research Center. Retrieved from <https://www.pewresearch.org/fact-tank/2017/07/19/more-u-s-households-are-renting-than-at-any-point-in-50-years/>

³² Howell & Elliott, 2018.

³³ Ibid.

Funding programs such as the Hazard Mitigation Grant Program (HMGP) and the Community Development Block Grants – Disaster Recovery (CDBG-DR) allocate government funds to purchase flooded homes, which allows homeowners to relocate to a safer area rather than rebuild their properties. Buyouts, too, have been shown to disproportionately go to White communities. A National Public Radio analysis of 40,000 buyouts found that most buyouts were in neighborhoods with populations more than 85% White and non-Hispanic.³⁴

Through HMGP, 75% of the buyout cost is absorbed by FEMA, and the remaining is taken up by the state and/or local government.³⁵ However, funding is limited, and FEMA must evaluate whether the state's proposed plan is cost-effective in reducing the risk of future flooding damage.³⁶ The cost-effectiveness analysis calls for the lowest costs for the benefits yielded. As a result, aid is strongly skewed towards those with higher-value properties instead of those with the greatest needs, as higher-value properties can better justify the purchasing cost.³⁷

1.6. Scope of Project

In carrying out our Master's Project, we conducted a systematic analysis of how demographic characteristics influence the following:

³⁴ Hersher and Benincasa, 2019.

³⁵ FEMA. (2018). FACT SHEET: Acquisition of Property After a Flood Event [Fact sheet]. Retrieved from <https://www.fema.gov/news-release/2018/11/13/fact-sheet-acquisition-property-after-flood-event>

³⁶ FEMA. (2020). Benefit-Cost Analysis. Retrieved from <https://www.fema.gov/benefit-cost-analysis>

³⁷ Benincasa, R. (2019, March 5). Search the Thousands of Disaster Buyouts FEMA Didn't Want You to See. *NPR.Org*. Retrieved from <https://www.npr.org/2019/03/05/696995788/search-the-thousands-of-disaster-buyouts-fema-didnt-want-you-to-see>

- Access to post-hurricane financial and technical resources (primarily including those related to hurricanes Florence and Matthew),
- The degree of involvement communities have in determining how these resources are utilized, and
- Strategies to build more equitable access to post-hurricane relief and recovery.

To limit the scope of our project, we decided to target our analysis to Bladen, Craven, Columbus, and Duplin counties. These counties are each unique with respect to the demographic makeup of their communities and the financial and technical resources they bring to bear (Table 2). These counties are predominantly rural and have experienced damages from both hurricanes Matthew and Florence. Our client Resourceful Communities has a strong community partner presence in these four counties, which provided our team access to resources by which to conduct our analysis (specifically contacts to interview). Additionally, as our client believed that more influence could be exerted on recovery funding allocations originating from the state government and relief organizations, our analysis focused on funding from these entities rather than funding coming directly from the federal government.

Table 2. Demographic data for Bladen, Craven, Columbus, and Duplin counties³⁸

County	Population	Median Household Income	Percent Poverty	Percent White
Bladen	34,130	\$32,396	24.5%	56.4%
Columbus	56,589	\$36,261	23.6%	61.5%
Craven	103,374	\$49,391	15.4%	70.2%
Duplin	59,350	\$36,678	26.3%	67.1%

³⁸ United States Census Bureau. (2019). 2013-2017 American Community Survey 5-Year Estimates. Retrieved from: <https://factfinder.census.gov/>

2. METHODOLOGY

2.1. Research Questions

Our research utilizes a multi-pronged approach to answer these questions for our four target counties in North Carolina:

1. How are North Carolina communities accessing post-hurricane recovery resources provided by the state government?
2. How is participation in post-hurricane recovery and planning exercises mediated by the socioeconomic and racial status of recipients?
3. What are the potential processes and strategies to build more equitable access to post-hurricane relief?

2.2. Preliminary Research

First, we examined successful cases of building post-disaster community resilience to find examples of local, community-based resilience solutions. Additionally, we conducted an analysis of the distribution of allocated funds to our four target communities. This analysis examined the allocation of state government funds alongside racial and sociodemographic data from the U.S. Census.

2.3. Interviews

Semi-structured interviews were the primary tool used to investigate the distribution of government resources to communities impacted by hurricanes Matthew and Florence. In addition to interviews, an extensive review of post-hurricane recovery and resilience literature was conducted in order to inform both a fund analysis and

stakeholder analysis. Interview findings were used in conjunction with the literature review to analyze the structure, function, and practices of long-term recovery groups in North Carolina.

We conducted 26 interviews with affected community members, long-term recovery groups, and resource partners. The majority of interviews were with NGO representatives (Table 3). Each interview lasted between thirty minutes and one hour. During the interviews, participants were asked to share their perceptions of recent hurricane events according to our interview protocol (Appendix 4) to give our team an idea of how rural North Carolina communities respond to disaster. The interviews were analyzed through a three-step process. First, the interview notes were processed and reviewed for grammar before being compiled on a secure Duke University-owned server. Second, salient quotes were identified, and key themes, barriers, and recommendations discussed during interviews were analyzed. Finally, information from all interviews was compiled in a Microsoft Excel spreadsheet with a focus on stakeholder analysis, barriers, and resilience strategies.

Within the spreadsheet, quotes and ideas from interviewees regarding the key entities involved in hurricane recovery funding and planning were recorded. Comments on perceived barriers to engaging in the hurricane recovery process were also recorded and coded as informational, financial, cultural/language, procedural, and/or other barriers. Resilience strategies were conceptualized by analyzing interviewees' comments on how to address one or more of the barriers that were communicated during the interview. These strategies were then grouped qualitatively based on likeness within three categories: expanded pre-disaster planning, building relationships

and trust, and partnerships with local organizations. The resulting compiled spreadsheet was used to inform the development of the stakeholder analysis, analysis of barriers, analysis of resilience strategies, and policy recommendations.

A list of interviewees was obtained from our client at Resourceful Communities and from our own online research of long-term recovery groups and other organizations involved in hurricane recovery efforts in North Carolina. We also collected contact information for additional interviewees using snowball sampling. Interview subjects were initially contacted via email or phone, as appropriate (Appendix 1). Once initially contacted, informed consent was gathered from participants in writing and verbally prior to interviews (Appendix 2). Once initially contacted, interviews were administered over the phone and by email. While some questions included basic identifying information, no questions were asked that involved significant risk to the participants. Notes were taken by the interviewer and stored on a secure, encrypted Duke University site. In some cases, the interview was also audio taped with the interviewee's permission and stored with notes from the interview. In order to maintain confidentiality, within any publication that stems from this research (including this one), our team will report either the job position of the interviewee or the name of the town of the interviewee.

2.4. Funding Data Analysis

A state-wide analysis of post-hurricane funding data was conducted for hurricanes Florence and Matthew to better understand community access to recovery resources. Initially, collection of funding data was completed throughout the literature review process. Data on funding distributed from the federal government to the state

government, such as FEMA's Individual and Public Assistance programs, were gathered from publicly accessible online resources to understand overall flows of federal hurricane recovery funding to the State of North Carolina.^{39,40} Additionally, our team reached out to officials from state and local governments and representatives from regional and local organizations to solicit data on allocated state funding, including CDBG-DR, Golden Leaf Foundation funds, and North Carolina Community Foundation funds, specifically within Bladen, Craven, Columbus, and Duplin counties.

2.5. Stakeholder Analysis

Finally, the makeup and function of long-term recovery groups in our target counties were analyzed. Our interviews focused on gathering information from three distinct entities associated with disaster recovery in North Carolina: government officials, nonprofit representatives, and long-term recovery groups. The stakeholder analysis was conducted by reviewing the interview notes and recordings for mention of the role of LTRGs, NGOs, governments, and universities in the hurricane recovery process.

³⁹ United States Department of Homeland Security. (2016). North Carolina Hurricane Matthew (DR-4285). Retrieved from: <https://www.fema.gov/disaster/4285>

⁴⁰ United States Department of Homeland Security. (2018). North Carolina Hurricane Florence (DR-4393). Retrieved from: <https://www.fema.gov/disaster/4393>

Table 3. Breakdown of interviews by organization type

Organization Type	Number of Interviewees	Percent of interviewees
Local Government	2	8%
State Government	3	12%
Long-term Recovery Group	4	16%
Regional NGOs	5	20%
Other Local NGOs	10	40%
University	1	4%

3. FUNDING DATA ANALYSIS

Equitable distribution of funding is critical for prompt disaster recovery. In North Carolina, the disaster recovery process involves groups across public and private sectors which allocate money to impacted communities. In most cases, recovery funding originates from the federal government and is redistributed by entities including long-term recovery groups (LTRGs), local governments, relief and religious organizations, foundations, and other non-governmental organizations (NGOs). These funds are subsequently dispersed to community members in need of aid.

Multiple federal agencies and programs are involved in recovery, but the main federal programs involved in housing assistance include Community Development Block Grant – Disaster Recovery (CDBG-DR) and grant programs operated by the Federal Emergency Management Agency (FEMA) and dispersed by state government agencies. For the purposes of this project, our analysis focused primarily on CDBG-DR funds as our client believed that more influence could be exerted on recovery funding allocations originating from the state government and relief organizations, rather than

funding coming directly from the federal government. CDBG-DR funds are the most flexible recovery funds and are meant to supplement other federal funding, attempting to fill remaining gaps and unmet needs following disaster events. CDBG-DR funds can be allocated for housing repairs and rebuilding, as well as infrastructure.

FEMA's hurricane recovery grant programs fall under three categories: Public Assistance, Individual Assistance, and the Hazard Mitigation Grant Program (HMGP). FEMA's Public Assistance program is for public infrastructure needs such as roads, bridges, buildings, and other critical infrastructure. Meanwhile, the Individual Assistance program is primarily to support individual's housing needs. Finally, the Hazard Mitigation Grant Program is for long-term planning. It allows families and homeowners to move out of flood zones, have homes elevated, or have their homes torn down and rebuilt elsewhere.

Foundations including the North Carolina Community Foundation and the Golden LEAF Foundation also distribute grants on a case-by-case basis to those with additional needs. However, all of these funds are often insufficient to adequately meet survivors' needs and are not distributed in a timely manner, which has been a substantial roadblock to community recovery. For example, nearly two years after Hurricane Florence, no CDBG-DR funding has been distributed to people who were affected by the storm and distribution is not slated to start until fall 2020.⁴¹

⁴¹ North Carolina Office of Recovery and Resiliency. (February 7, 2020). Hurricane Florence CDBG-DR Action Plan (p. 109). Retrieved from: https://files.nc.gov/rebuildnc/documents/Florence/NCORR_CDBG_DR_Florence_AP_Final_508.pdf

Table 4. Hurricane Matthew recovery funding by county (through 2/12/20)

County	Golden LEAF Foundation	FEMA-PA	CDBG-DR
Bladen	\$4,892,725.12	\$68,170.00	\$10,911,896.40
Columbus	\$4,785,912.80	\$231,145.00	\$17,432,456.70
Craven	\$996,745.00	\$276,000.00	\$2,189,987.72
Duplin	\$41,123.01	\$292,271	\$3,293,530.15

Table 5. Hurricane Florence recovery funding by county (through 2/12/20)

County	Golden LEAF Foundation	FEMA-IA	FEMA-PA	North Carolina Community Foundation
Bladen	\$768,345.00	\$3,500,000.00	\$561,000.00	\$0.00
Columbus	\$10,681.00	\$6,200,000.00	\$1,200,000.00	\$56,000.00
Craven	\$720,015.25	\$18,000,000.00	\$4,200,000.00	\$56,000.00
Duplin	\$333,000	\$12,800,000.00	\$3,800,000.00	\$56,250.00

After Hurricane Matthew, CDBG-DR funds were administered by the United States Department of Housing and Urban Development (HUD) to the State of North Carolina. These supplemental grants were meant to be distributed to people with unmet needs. Bladen and Columbus counties received the most grants among the four counties, with Columbus receiving 177 individual grants. Most of these grants were allocated toward mobile housing unit replacements – which reveals that people living in mobile housing units were unable to access other sources of post-hurricane recovery funding. Bladen and Columbus counties also received the most CDBG-DR funding overall, and per capita (Table 4). Meanwhile, Craven and Duplin counties, which

received significantly less rainfall, also received significantly less CDBG-DR funding (Table 4).

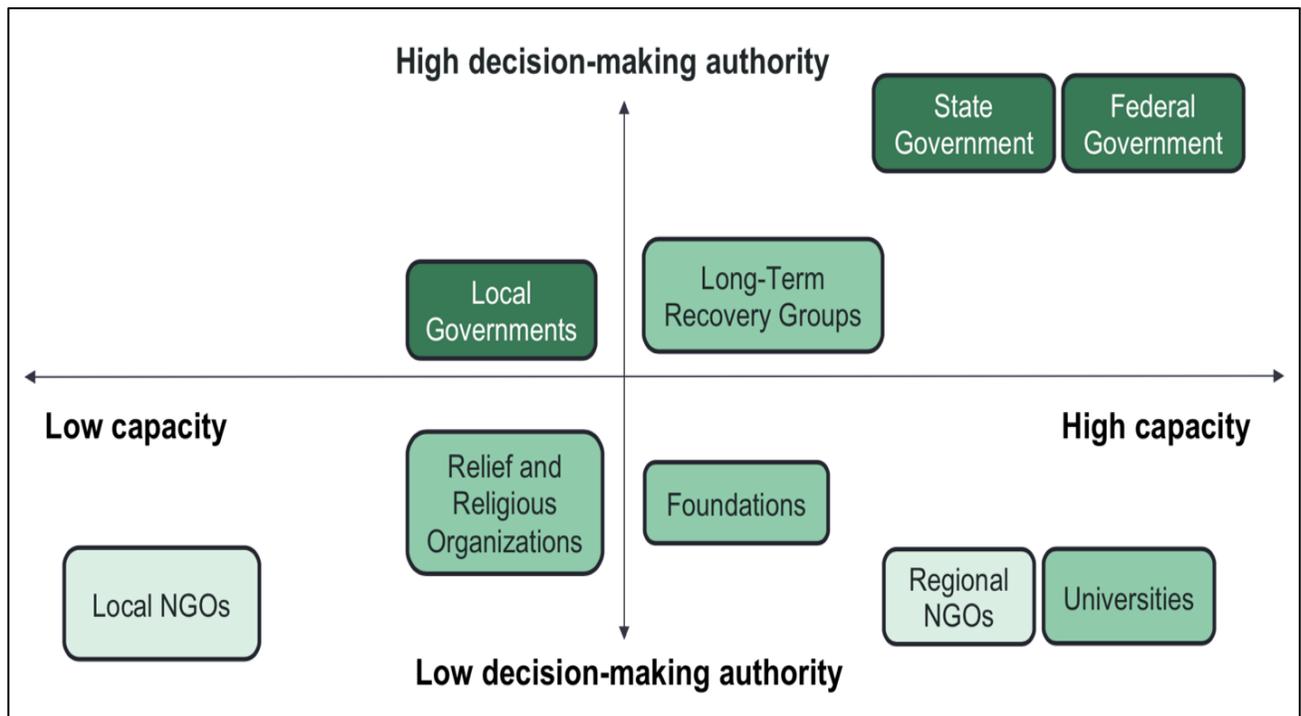
The results of our analysis of community development block grants for disaster recovery revealed that, within Bladen, Craven, Columbus, and Duplin counties, more funding went to counties with larger minority populations (Table 4). Craven County, the most populous and whitest of the four counties, received the most FEMA Individual and Public Assistance for hurricanes Matthew and Florence. Meanwhile, Columbus and Bladen counties received the most Golden LEAF Foundation funds after Hurricane Matthew. We concluded that marginalized communities experienced more unmet needs per capita in eastern North Carolina. The following stakeholder analysis will further analyze the distribution of funding.

4. GOVERNMENTAL STAKEHOLDER ANALYSIS

Our stakeholder analysis elaborates on the role that each stakeholder group plays in North Carolina post-hurricane recovery funding space and other related activities including hurricane relief and resilience planning at large. Each group plays a unique role in these processes and holds a different degree of capacity and decision-making authority over the distribution of recovery funding (Figure 1; Appendix 1, Tables 1 and 2). In this context, capacity refers to the ability of an organization to engage in the hurricane recovery process by mobilizing human, financial, and technical resources to which the group has access. Decision-making authority, on the other hand, refers to the jurisdiction or control an organization has to make decisions over the allocation and distribution of hurricane recovery funding within the State of North Carolina.

Much of the following information has been extracted from confidential interviews conducted over the course of this project. 15 out of 26 interviews (or about 58%) conducted were with individuals who do work in one or more of our four target counties. While all stakeholder groups identified here are not necessarily specific to our four target counties, interviews indicate that such groups are active in the counties of interest.

Figure 3. Stakeholders' relative capacity and decision-making authority in the hurricane recovery funding process



4.1. State Government

Several state governmental agencies house recovery programs or work adjacent to community disaster recovery. Federal funding from the Federal Emergency Management Agency (FEMA) is distributed to the North Carolina Emergency

Management (NCEM) division of the Department of Public Safety, both in the form of recovery and hazard mitigation funds (Figure 2). NCEM works with individuals, families, local and state agencies, and nonprofit and volunteer organizations to aid communities and individuals in recovering from disaster events. In parallel, federal funds from the Community Development Block Grant Disaster Recovery program (CDBG-DR), funded through U.S. Housing and Urban Development (HUD), are administered through the North Carolina Department of Commerce to fund a range of recovery activities to offset costs to communities and neighborhoods with limited resources (Figure 2). HUD worked to appropriate \$236,529,000 in CDBG funds to North Carolina for Hurricane Matthew recovery.⁴² The State of North Carolina CDBG-DR Action Plan states that this appropriation was used to “identify and calculate unmet needs for disaster relief, long-term recovery, restoration of infrastructure, and housing and economic revitalization”.⁴³ Such funds are intended to meet unmet needs still remaining after other federal assistance has been allocated, including monies from FEMA, the Small Business Administration (SBA), or private insurance.⁴⁴

While CDBG-DR funding intends to address unmet needs for long-term disaster recovery, the bureaucracy tied to funding allocation often slows the process of funding allocation. For instance, more than two years following Hurricane Matthew, North Carolina had spent only 1% (\$3.4 million) of CDBG-DR funds granted to the state from HUD due to the many barriers to distribution that are built into the funding allocation

⁴² NC Commerce. n.d. Disaster Recovery: Federal CDBG-DR. Retrieved from:

<https://www.nccommerce.com/grants-incentives/disaster-recovery/disaster-recovery-federal-cdbg-dr>.

⁴³ State of North Carolina Department of Commerce. 2017. State of North Carolina CDBG-DR Action Plan. Retrieved from: https://files.nc.gov/nccommerce/documents/files/Hurricane_Matthew_NC_CDBG-DR_Action_Plan_-_Final_0.pdf.

⁴⁴ Ibid.

process.⁴⁵ First, when the President declares a major disaster, Congress may appropriate funds to HUD. These funds can be used in impacted areas for disaster relief, long-term recovery, infrastructure restoration, housing, and economic revitalization.⁴⁶ HUD must then notify eligible states, cities, and counties that they have qualified to receive CDBG-DR grants, as individuals and communities are not permitted to directly apply for funding. HUD then allocates CDBG-DR funding to areas based on unmet needs and each award must be published in a Federal Register Notice, which, according to one government official interviewed, often further slows the funding distribution process.⁴⁷

In addition, other agencies including the North Carolina Department of Environmental Quality (NC DEQ), the Department of Natural and Cultural Resources (DNCR), the Department of Transportation (NCDOT), the Department of Agriculture and Consumer Services (NCDA&CS), and the Natural Resources Conservation Service (NRCS) by means of the County Soil and Water Conservation Districts all administer some level of hurricane planning or recovery funding. For instance, NCDA&CS operated the Hurricane Florence Agricultural Disaster Program of 2018, a one-time assistance program for agricultural producers who had suffered economic losses from the storm. This program, however, was reliant upon an appropriation of \$240 million from the North Carolina General Assembly.⁴⁸

⁴⁵ WWAY. 2019. Watchdog Report: North Carolina Hurricane Funds Delayed. Retrieved from: <https://www.wwaytv3.com/2019/05/20/report-north-carolina-hurricane-funds-delayed/>.

⁴⁶ US Department of Housing and Urban Development. n.d. Fact Sheet: Community Development Block Grant Disaster Recovery (CDBG-DR). Retrieved from: <https://files.hudexchange.info/resources/documents/CDBG-DR-Fact-Sheet.pdf>.

⁴⁷ Ibid.

⁴⁸ North Carolina Department of Agriculture & Consumer Services. N.d. Hurricane Florence Agricultural Disaster Program of 2018. Retrieved from: <http://www.ncagr.gov/agriculturaldisasterprogram/>.

Due to a need for more centralized hurricane recovery support in the state, the North Carolina Office of Recovery and Resiliency (NCORR) was founded within DPS in early 2019 as per Section 5.7.(a) of the 2018 Hurricane Florence Disaster Recovery Act.⁴⁹ Specifically, NCORR was founded with the intention of “[streamlining] the process for administering federal block grants for Hurricane Matthew recovery and planning for additional federal funding for residents affected by Hurricane Florence”.⁵⁰ In rounding out the state government presence in the recovery process, NCORR plans to work alongside NCEM on recovery, rebuilding, and resilience initiatives. Going forward, the Office will administer CBDG-DR funds from HUD for both hurricanes Matthew and Florence (Figure 2).

The State of North Carolina has been awarded \$236 million in CDBG-DR grants for Hurricane Matthew recovery.⁵¹ More than a year following the devastation of Hurricane Florence, the HUD federal notice awarding \$542 million in CDBG-DR funds was finally published in January 2020.⁵²

4.2. County and Local Governments

County governments in Bladen, Craven, Duplin, and Columbus counties all contain an Emergency Services or Emergency Management department, whose job is

⁴⁹ General Assembly of North Carolina. 2018. An Act to Enact the 2018 Hurricane Florence Disaster Recovery Act. Retrieved from: <https://www.ncleg.net/Sessions/2017E3/Bills/Senate/PDF/S3v4.pdf>.

⁵⁰ NC DPS. 2019. NC Office of Recovery and Resiliency names key leaders. Retrieved from: <https://www.ncdps.gov/news/press-releases/2019/01/03/nc-office-recovery-and-resiliency-names-key-leaders>.

⁵¹ Ibid.

⁵² North Carolina Office of the Governor. 2020. Federal Notice Allows NC to Move Forward with Hurricane Florence Recovery Program. Retrieved from: <https://governor.nc.gov/news/federal-notice-allows-nc-move-forward-hurricane-florence-recovery-program>.; North Carolina Office of the Governor. 2019. North Carolina to Receive Additional Federal Funding for Hurricane Florence. Retrieved from: <https://governor.nc.gov/news/north-carolina-receive-additional-federal-funding-hurricane-florence>.

to engage in comprehensive emergency planning and coordinate with local, state, and federal agencies to carry out mitigation, preparedness, response, and recovery.⁵³ However, in practice, many of these more rural counties do not have the capacity to provide a sustained recovery effort as the immediate demands of hurricane relief are too severe. One local official expressed that much of the recovery funding originating from the federal government stops at NCORR and that in the future, many local and county governments feel that they will be removed from the mitigation and recovery process entirely. Additionally, another local official noted that the county planning department in which they work has had to assume the duty of processing all recovery funding applications for individuals living in the county, for which the department simply does not have the adequate capacity.

4.3. Councils of Governments

The North Carolina Association of Regional Councils of Governments works to deliver federal, state, and regional services to North Carolina communities by means of the sixteen regional councils across the state. These services include programs in transportation planning, workforce development, community planning, and administration of CDBG funds and other HUD grants, among others.⁵⁴ In our counties of interest, the active Councils of Governments (COGs) include the Cape Fear COG, Lumber River COG, and the Eastern Carolina COG. Due to the general lack of information about programmatic work dedicated to recovery on many COGs' websites, it

⁵³ Craven County, North Carolina. N.d. Emergency Management. Retrieved from: <https://www.cravencountync.gov/179/Emergency-Management>.

⁵⁴ NC Regional Councils. n.d. Services. Retrieved from: <https://www.ncregions.org/services/>.

does not appear that COGs have played a consistent role in hurricane recovery in eastern North Carolina. However, each community can seek funding separately and COGs inherently work to operate based on the needs of the communities they serve. As such, it appears that some COGs provide the service of hazard mitigation and planning by means of assisting the town governments that they represent, while others may not.⁵⁵ One regional NGO representative interviewed noted that small towns depend on COGs and other such resources heavily. Additionally, one state government official interviewed commented that COGs try to help out where they are able and have the capacity. On the whole, it seems that COGs disseminate information about resources from the state government to their member governments, but may work on direct recovery efforts on a more ad hoc basis.

5. NONGOVERNMENTAL STAKEHOLDER ANALYSIS

5.1. Regional Nongovernmental Organizations (NGOs)

5.1.1. Environmental NGOs

Although most regional environmental nongovernmental organizations (NGOs) are not in the business of applying for or disseminating disaster recovery funding, many have programmatic work in the recovery space, nonetheless. The traditional model of recovery funding typically entails the state government delivering federal funding to local governments, where these local entities have the capacity to process funding. However, as back-to-back storms hit many communities already lacking such capacity, NGOs

⁵⁵ Cape Fear Council of Governments. n.d. Planning Services. Retrieved from: <https://capefearcog.org/lgs/planning-services/>.

identified and sought to close a gap in the recovery funding process. As such, many environmental NGOs and other entities have become involved in this process due to the necessity for more players.

Many regional environmental NGOs, particularly conservation organizations, have not played a substantial or consistent role in hurricane relief and recovery. For example, while many regional and state conservation organizations and local land trusts have been active with regard to traditional conservation work and floodplain protection, these groups have not proactively worked on floodplain buyouts or other storm recovery work. Instead, involvement has seemingly been happenstance and has emerged as a matter of necessity following hurricane events.

Following Hurricane Matthew, for instance, The Conservation Fund joined by other nonprofit organizations appealed to the state government to inquire whether they could be of assistance, with many groups aiming to get people out of flood-prone areas and to protect and restore floodplain areas. Specifically, The Conservation Fund has participated in the NC Recovery Support Function #7, which is part of NCEM's and FEMA's Hurricane Florence recovery efforts and specifically focuses on environmental concerns related to hurricane recovery.⁵⁶ Additionally, the Resourceful Communities program at The Conservation Fund has worked to improve community engagement following disaster, and has long-standing relationships with many community organizations, attempting to be responsive to the frustration regarding the slow pace of hurricane recovery and delivery of funding.

⁵⁶ Email correspondence with Bill Holman, NC State Director, The Conservation Fund. April 16, 2020.

Additionally, one regional NGO representative interviewed noted that on an ad hoc basis, NGOs including The Conservation Fund, Environmental Defense Fund, The Conservation Trust for North Carolina, and Audubon North Carolina, among others, have taken part in roundtable events. These roundtables work at the state level to advocate for more effective state and local policies focused on resilience, particularly relating to restoration, floodplain protection, and flooding prevention. The regional NGO representative interviewed noted that groups including the Conservation Trust for North Carolina have also worked directly with communities, notably Princeville, to assist with recovery and relocation following hurricane events.

5.1.2. Relief Organizations

Across the state, relief organizations have played a substantial role in disaster relief and recovery. Relief organizations active in North Carolina include the American Red Cross, Charity Rebuild Center, Habitat for Humanity of North Carolina, and United Way of North Carolina, among others. While these organizations are regional in scale, they often have local chapters that work closely with communities. Red Cross, for instance, aided 6,300 households damaged or destroyed following Hurricane Florence with recovery assistance of about \$15.9 million and awarded long-term recovery grants of greater than \$4 million.⁵⁷ Conversely, Habitat for Humanity has worked in more of a rebuilding capacity, wherein the organization has created a hurricane rebuild program to get displaced individuals back into their homes. Habitat for Humanity also continues to

⁵⁷ The American National Red Cross. 2020. Hurricane Florence Relief Information. Retrieved from: <https://www.redcross.org/about-us/our-work/disaster-relief/hurricane-relief/hurricane-florence-relief-information.html>.

recruit volunteers for new home construction to aid individuals and families displaced after disaster events.⁵⁸

Additionally, these organizations have worked intimately with long-term recovery groups (LTRGs), taking part in roundtable events. These events are unique from the roundtables held at the state level to inform resilience policies. Instead, these events seek to allocate money to individuals in the community with unmet needs. At these roundtables, case workers present anonymous cases of individuals and families in need of recovery funding. Organizations invited to the roundtable events then have the opportunity to pledge an amount of money of their choosing and LTRGs go on to make up the difference.⁵⁹

5.1.3. Foundations

Foundations have also played an integral role in the state's hurricane recovery process. One such organization is the Golden LEAF Foundation, which has worked for the past 20 years to increase economic opportunity in North Carolina's rural and most economically vulnerable communities by means of grantmaking, collaboration, innovation, and stewardship.⁶⁰ To that end, Golden LEAF has granted money to different entities across the state, including towns, counties, cities, churches, and medical centers. Other foundations across the state have also been at the heart of hurricane recovery. In particular, North Carolina Community Foundation allocated \$1

⁵⁸ Cape Fear Habitat for Humanity. 2019. Hurricane Florence. Retrieved from: <http://www.capefearhabitat.org/hurricane-florence/>.

⁵⁹ Robeson County Disaster Recovery Committee. n.d. What are LTRG Meetings? Retrieved from: <https://www.rcdrc.com/meetings>.

⁶⁰ Golden LEAF Foundation. 2020. About. Retrieved from: <https://www.goldenleaf.org/about/>.

million for an initial round of grant support for long-term Hurricane Florence Recovery.⁶¹ Additionally, the Foundation for the Carolinas raised over \$2.25 million that was awarded to nonprofit organizations assisting communities and individuals hard hit by Florence.⁶²

5.2. Local Nongovernmental Organizations (NGOs)

5.2.1. Long-term Recovery Groups (LTRGs)

The national Voluntary Organizations Active in Disaster (VOAD) organized in 1969, in response to Hurricane Camille, when groups realized that recovery efforts were often redundant and uncoordinated.⁶³ At the state level, the North Carolina VOAD officially chartered in 1999 in response to Hurricane Floyd. In the past 20 years, NCVOAD has served as a leader in coordinating volunteers in planning for hurricane response, recovery, and preparation. While NCVOAD has had a strong recovery presence during this period, many regional recovery organizations in the state did not emerge until after Hurricane Florence hit in the fall of 2018.

In the aftermath of Florence, several regional recovery organizations, often called long-term recovery groups (LTRGs), emerged in eastern North Carolina. LTRGs are cooperative groups typically comprised of individuals from faith-based, non-profit,

⁶¹ North Carolina Community Foundation. 2020. North Carolina Community Foundation Disaster Relief Fund allocates initial round of long-term Hurricane Florence recovery grants. Retrieved from: <https://www.nccommunityfoundation.org/news/north-carolina-community-foundation-disaster-relief-fund-allocates-initial-round-of-long-term-hurricane-florence-recovery-grants>.

⁶² Foundation for the Carolinas. n.d. Supporting our Carolina Neighbors. Retrieved from: <https://www.ftc.org/hurricaneflorencegrants>.

⁶³ North Carolina Voluntary Organizations Active in Disaster. 2019. History. Retrieved from: <https://www.ncvoad.org/cms/history>.

government, and business organizations whose purpose is to aid families and individuals in their respective communities to recover from disaster events.⁶⁴

Interviews with LTRG leaders suggest that LTRGs in many affected counties organized as community members started to realize that no focal point for resource distribution yet existed. Many LTRG leaders interviewed during the course of this project recall a lack of structured, coordinated recovery leading up to Florence, citing a need for LTRGs in the eastern part of the state, as qualification of communities for much recovery grant funding was contingent upon the establishment of such groups. Typically, LTRG leaders interviewed recalled that county governments were not equipped to adequately meet the needs of individuals during and following disaster events. As such, LTRGs were formed, often founded, and still led by individuals with religious affiliations in their communities. Since the founding of these additional groups, LTRGs have supplemented the existing disaster recovery framework by manning disaster distribution centers, applying for grant money from nonprofit organizations and government agencies, and engaging in long-term planning for future disasters. The board members of LTRGs are comprised of volunteers, many of whom also work as religious leaders in their given communities.

5.2.2. Housing Agencies

To supplement the work done by other local NGOs, housing agencies work to advocate access for quality, affordable housing, which was identified by three interviewees as a serious issue for community members during hurricane events as

⁶⁴ NC DPS. 2018. Long-term recovery groups coordinate resources in communities. Retrieved from: <https://www.ncdps.gov/blog/2018/11/27/long-term-recovery-groups-coordinate-resources-communities>.

they had nowhere to go while they waited for recovery funding. One such group is Brunswick Housing Opportunities, Inc. (BHO), which strives to “connect people to resources and opportunities that will allow them to increase their economic security, their financial resiliency, and their overall wellbeing as homeowners and residents”.⁶⁵ One local NGO representative noted that in the aftermath of Hurricane Florence, BHO assisted with immediate relief, including delivering meals and goods to households, while also helping community members navigate the FEMA funding process and holding workshops to educate the community about insurance claims. Additionally, the New Bern Housing Authority has sustained recovery efforts following Hurricane Florence in addition to the Authority’s long-term affordable housing initiatives.⁶⁶ While other housing authorities operate across the state, it does not appear that there is an abundance of such groups in counties most impacted by hurricanes Matthew and Florence.

5.2.3. Cultural Organizations

Myriad cultural organizations fill a major gap in assisting communities that are typically overlooked during the hurricane relief and recovery process. For instance, AMEXCAN (Association of Mexicans in North Carolina) specifically works to meet the needs of the Latino population in North Carolina and is the only organization of its kind

⁶⁵ Richards, Annesophia. 2017. Brunswick Housing Opportunity Empowers the Community. *Life in Brunswick County*. Retrieved from: <https://lifeinbrunswickcounty.com/brunswick-housing-opportunity-empowers-the-community/>.

⁶⁶ Wetherington, Todd. 2020. Martin Blaney stepping down as Housing Authority head. *Sun Journal*. Retrieved from: <https://www.newbernsj.com/news/20200226/martin-blaney-stepping-down-as-housing-authority-head>.

in the state.⁶⁷ According to a local NGO representative interviewed, following Hurricane Florence, AMEXCAN was actively involved in the grant application process, provided hurricane-related information in Spanish to the community, and assisted migrant farmworkers with H-2A visas who were very isolated from the community and not informed about the recovery process.

To specifically serve the farmworker community in North Carolina, the Episcopal Farmworker Ministry assists migrant and seasonal farmworkers and their families by offering direct services, developing programs that empower farmworkers, and encouraging systematic changes of state and local agricultural policy.⁶⁸ One local NGO representative interviewed noted that in response to Hurricane Florence, the Episcopal Farmworker Ministry helped individuals in the community with basic needs including food, water, hygienic items, and cleaning supplies. In partnership with other organizations, the Episcopal Farmworker Ministry ultimately reached 4,000 workers in camps in impacted areas during this effort. The organization also assisted with the recovery process, helping farmworkers who were stranded at camps with no transportation, assisting with home repairs, and developing disaster guides for immigrants.

Additionally, several communities impacted during hurricanes Matthew and Florence include members of Native American tribes. The Coharie Intra-Tribal Council actively works to serve the health, community development, and cultural needs of the tribe.⁶⁹ One local NGO representative interviewed commented that the Coharie Intra-

⁶⁷ Amexcan. n.d. Amexcan Vision. Retrieved from: <http://amexcannnc.org/blog/mision-y-vision/>.

⁶⁸ Episcopal Farmworker Ministry. 2020. Mission. Retrieved from: <https://episcopalfarmworkerministry.org/about/>.

⁶⁹ Coharie Tribe. 2020. Programs. Retrieved from: <https://coharietribe.org/programs/>.

Tribal Council provided outreach following hurricane events, intending to develop a network of NGOs. Additionally, the Council provided assistance for those who lacked insurance coverage, reached out to the community to mobilize resources available, and worked to help community members find new housing. While the mission of these cultural organizations is to serve their specific communities, interviews indicate that they often also work to help the greater town, county, or region in which their specific community is situated so their limited resources can be put to the most beneficial use.

5.2.4. Religious Organizations

Churches and ministries have played also a critical role in statewide hurricane relief and recovery. The North Carolina Conference of The United Methodist Church (NCCUMC) has been particularly active in storm response, with Disaster Ministries devoted to rebuilding houses and uplifting communities following hurricanes Matthew and Florence.⁷⁰ When Hurricane Matthew hit in 2016, NCCUMC set up four disaster recovery centers across the state, receiving funding from both the United Methodist Committee on Relief (UMCOR) and from the state government to set up and maintain operations. In the case of Hurricane Florence, NCCUMC applied for a \$1.4 million grant to cover six months of relief and applied for an additional \$6.4 million to continue relief efforts in June of 2019.⁷¹ Aside from NCCUMC, there are many other differently affiliated churches that engage in relief and recovery efforts in our target counties. For example, Baptist and Presbyterian churches across the state have aided in

⁷⁰ North Carolina Conference of The United Methodist Church. 2020. Disaster Ministries. Retrieved from: <https://nccumc.org/disaster/>.

⁷¹ North Carolina Conference of The United Methodist Church. 2019. Connections: Generosity After the Storms. Retrieved from: <https://nccumc.org/bishop/connections-generosity-after-the-storms/>.

construction, run distribution centers, and in many cases were integral to the creation of LTRGs, as many are run by the religious leaders of these communities. Additionally, groups like Catholic Charities of the Diocese of Raleigh have rounded out this effort from the religious community, distributing supplies to families in areas hard hit by storms.⁷²

Genesis 457 Community Development Corporation, which serves Craven County among others, has also been active in the relief and recovery process.⁷³ A local NGO representative interviewed commented that Genesis 457 played a substantial role in response and recovery efforts in eastern North Carolina, including setting up distribution centers and distributing resources to communities.

Endeavors, though technically a faith-based organization, serves a very niche role in the relief and recovery process by providing disaster case management services. Specifically, Endeavors works with LTRGs, municipalities, and other local NGOs to provide case management services including comprehensive recovery plans, connections to immediate resources, individual case management, recovery estimates, and home repairs.⁷⁴

5.3. Universities

While perhaps not thought of as traditional stakeholders, universities in North Carolina have played an important role in the hurricane recovery and resiliency planning

⁷² Catholic Charities of the Diocese of Raleigh. 2020. Hurricane Florence. Retrieved from: <https://www.catholiccharitiesraleigh.org/hurricane-florence/>.

⁷³ Peletah Ministries. 2016. Genesis 457 CDC. Retrieved from: <https://www.peletahministries.com/genesis-457-cdc/>.

⁷⁴ Endeavors. N.d. Disaster Case Management. Retrieved from: <https://www.endeavors.org/programs/dcm/>.

process. The Coastal Dynamics Design Lab at North Carolina State University's (NC State) College of Design was cited by interviewees as a big player in the recovery space and is known to have credibility in the many communities with which they have worked. Following Hurricane Matthew, the Coastal Dynamics Design Lab worked in six communities (Princeville, Windsor, Seven Springs, Lumberton, Fair Bluff, and Kinston) to facilitate community discussions between hurricane survivors, designers, community planners, and government officials.⁷⁵ This unique project places importance on survivors' perspectives, allowing them to decide when, how, and where to re-build, rather than offering top-down solutions as is typical of many such interactions between communities and outside actors. The *Homeplace* project offers strategies that can be applied at the household or community scale, and explicitly makes considerations of regional infrastructure, development patterns, and population trends.⁷⁶ The initiative of *Homeplace* is ultimately to "build local capacity of North Carolina's flood-prone communities, providing them with design, planning, and policy strategies and tools to promote the long-term function, health, and vitality of their residents and neighborhoods".⁷⁷ To this end, the Coastal Dynamics Design Lab has crafted community-tailored recommendations that can be integrated into each community's existing recovery plans, allowing for survivors to be active in their own recovery process.⁷⁸

⁷⁵ Coastal Dynamics Design Lab. n.d. *Homeplace: Conversation Guides for Six Communities, Rebuilding After Hurricane Matthew*. Retrieved from: <https://www.coastaldynamicsdesignlab.com/homeplace>.

⁷⁶ *Ibid.*

⁷⁷ *Ibid.*

⁷⁸ *Ibid.*

Additionally, one local NGO representative interviewed noted that many communities have collaborated with students from universities across the state, with student teams volunteering to assist with repairs and clean-ups following hurricane events during school breaks. UNC Wilmington and UNC Pembroke have been particularly active in this space, as students have collaborated with groups on case management and best practices for disaster response. Particularly in New Bern, Craven Community College has actively collaborated with the local community to participate in recovery efforts following Hurricane Florence.⁷⁹

6. DISCUSSION OVERVIEW

By synthesizing the findings from our team's qualitative analysis of hurricane recovery funding and from interviews conducted with governmental and nongovernmental stakeholders, we sought to address our research questions regarding the impact of demographic characteristics on a community's access to post-hurricane resources and the degree of community involvement in determining how these resources are mobilized.

Specifically, our team conducted a state-wide analysis of post-hurricane funding data for hurricanes Florence and Matthew to better understand community access to recovery resources in Bladen, Craven, Duplin, and Columbus counties. Funding data collected from publicly available documents and directly from correspondence with state government agencies and foundations was overlaid with demographic data from the

⁷⁹ Desroiser, Holly. 2018. Craven CC, community continue recovery efforts after hurricane. *Sun Journal*. Retrieved from: <https://infoweb.newsbank.com/apps/news/document-view?p=AMNEWS&docref=news/16F21857F40736C0&f=basic>.

U.S. Census to identify where gaps in funding may lie. Additionally, by means of 26 semi-structured interviews conducted with stakeholders in government, resource organizations, and communities, our team identified barriers to hurricane recovery for impacted community members and examined examples of local, community-based resilience strategies.

In turn, these findings were used to identify strategies that seek to build more equitable access to this process and to provide recommendations to the North Carolina state government that could systematically implement these resilience strategies at the state level.

7. ANALYSIS OF BARRIERS

7.1. Procedural Barriers

7.1.1. Navigating the Funding Process

All 26 individuals interviewed touched on difficulties of successfully navigating the recovery funding application process. Specifically, individuals and families with easier access to information and decisionmakers tended to be more apt at navigating the bureaucracy of this application process, and these individuals tended to be predominantly wealthy and White. One interviewee commented that the ability get into local politics is not independent of race and that in many of the counties hardest hit by hurricanes Matthew and Florence, “people have very little confidence in their local governments based on...historical discrimination”.

This barrier of navigating the funding process is similarly faced by many small community groups and nonprofit organizations lacking organizational capacity or

experience writing grant applications, with one interviewee commenting that “groups are just not accustomed and are not staffed to capacity to develop a grant application”. Two interviewees cited a need for skilled staff, such as those who can manage funds or have the technical knowledge to understand infrastructure and natural systems. A local nonprofit representative said: “It doesn’t matter how much money is available if there is nobody on the ground who can take the money and use it.”

7.1.2. Issues of Government Capacity

One county government official interviewed expressed that particularly in rural counties or municipalities, governmental entities are understaffed and often experience substantial staff turnover.⁸⁰ As such, many local governments face challenges with processing the funding applications that come through their departments. This presents a large hurdle for counties and municipalities, as they are not able to hire more staff due to inadequate funding but are still expected to meet the demands of survivors living within their jurisdiction. A state government official noted that FEMA distributes funds to counties assuming that each county has four or five planners. However, this is often not the case.

There are also not enough contractors available to help conduct repair work, according to two interviewees. In Columbus County, for example, heating, ventilation, and air conditioning (HVAC) services are in demand. While the county has volunteers who can help with other essential needs such as plumbing, they lack workers who have HVAC expertise. Approximately a dozen homes have been repaired but they still need

⁸⁰ Albright, E.A., & Crow, D.A. (2015). Learning processes, public and stakeholder engagement: analyzing responses to Colorado’s extreme flood events of 2013. *Urban Climate*, 14: 7993.

HVAC services, which can cost around \$5,000 to \$6,000 per household, according to an LTRG representative. As a temporary solution, these homes are using space heaters.

Issues of capacity resulting from constrained budgets and bureaucratic inefficiencies also produce substantial delays in the recovery funding process at the federal, state, and local level. For instance, a county government official interviewed noted that residents who applied for Hazard Mitigation Grant Program (HMGP) monies from FEMA over a year ago still have yet to receive any sort of communication about their application status, unless they take it upon themselves to contact the state or county government. Similarly, Hurricane Matthew occurred more than three years ago and the CDBG-DR grant money passed down through the state is just starting to be distributed. A former county commissioner interviewed stated that they were still signing off on papers seven years following Hurricane Floyd, which hit North Carolina in 1999, illustrating just how long the recovery process takes in practice.

One issue cited as exacerbating these delays is the fact that different governmental entities process different types of recovery funding. On this point, one interviewee commented that “[there are] three different shades of red tape that everything is wrapped up in. There’s not one division that everything is channeled under”. While the emergence of NCORR helps ameliorate this issue, the Office only processes CDBG grants originating from HUD, whereas housing all recovery funding under one division might expedite the recovery funding process. Additionally, poor communication between different levels of government and local communities was cited during five interviews as a cause of funding allocation delays and inadequate response

to survivors' needs. This claim is supported by the literature, which holds that the potential for local policy learning and implementation following disasters is strengthened when local governments have strong, collaborative intergovernmental relationships with state agencies.⁸¹

According to a state government official, Craven County has an effective, robust local government, which is able to better respond to natural disasters. Duplin County has a history of doing mitigation work from Hurricane Floyd and has additional staff for its disaster management programs.

7.1.3. Grant Program Limitations

Another constraint in the recovery funding process that was mentioned in three interviews are restrictions on how grant money can be used and dispersed. In particular, one LTRG leader cited this as a limitation, as the grant allocations that LTRGs make must be strictly reported on and have limitations regarding which types of recovery activities the grants can fund. Additionally, one regional NGO representative commented that many governmental funding programs were designed and created with a confined set of goals, particularly in that they traditionally prioritized short-term recovery funding over long-term planning and resilience. At least eight interviewees noted that a shift to preparation and long-term planning to ensure that processes are in place prior to the next storm is necessary to adequately address the needs of disaster

⁸¹ Crow, D.A., & Albright, E.A. (2019). Intergovernmental relationships after disaster: state and local government learning during flood recovery in Colorado. *Journal of Environmental Policy & Planning*: 1-18.

survivors. However, the long time period necessary for this institutional shift presents a considerable obstacle.

7.1.4. Other Procedural Barriers

Prior to recovery funding being passed down from federal government agencies to state and local governments in North Carolina, agencies at the federal level employ practices that present further procedural barriers to hurricane survivors seeking compensation. For instance, one government official interviewed noted that FEMA utilizes a cost-benefit analysis framework to guide their decision making regarding which homes to buy out following disaster events. This procedure often puts poorer families at a severe disadvantage as a project must yield a cost-benefit ratio of at least one, meaning that the benefits of the hazard mitigation project sufficiently outweigh the costs.⁸² In practice, this means that the losses avoided must outweigh the costs of the project, favoring homes with higher property values, which institutionally creates disparities in the funding decision process.⁸³

Additionally, one state government official noted that procedural limits regarding the potential duplication of benefits prevents many survivors from receiving an adequate amount of recovery funding. FEMA's Duplication of Benefits (DOB) specifically refers to assistance from multiple sources that can be used for the same mitigation purpose or activity.⁸⁴ This procedure attempts to prevent governmental agencies from spending

⁸² FEMA. n.d. Benefit-Cost Analysis. Retrieved from: <https://www.fema.gov/benefit-cost-analysis>.

⁸³ Hersher, R., & Benincasa, R. 2019, March 5. How Federal Disaster Money Favors The Rich. *NPR.Org*. Retrieved from https://www.npr.org/2019/03/05/688786177/how-federal-disaster-money-favors-the-rich_

⁸⁴ FEMA. n.d. Duplication of Benefits. Retrieved from: <https://www.fema.gov/hmgrp-appeal-keywords/9126>.

federal dollars on something that, plausibly, other federal dollars have already been spent on. Many families become ineligible for CDBG-DR funding from NCORR, for example, when they have already received some amount of recovery funding from FEMA. While preventing the duplication of benefits to one individual or family might seem logical, this often prevents survivors from receiving buyouts from NCORR as the money received from FEMA must be subtracted out, preventing families from qualifying for the buyout altogether.

Buyouts can also be limited in cases of “heir properties”, defined as “land held communally by family members of a landowner who has died intestate”.⁸⁵ As heir properties are informal arrangements that do not operate within the standard property rights system set up in the United States, issues can often arise when landholders attempt to leave the property.⁸⁶ For instance, in the aftermath of Hurricane Katrina, survivors who lacked clear title to their homes were denied assistance to rebuild their homes, highlighting how the heirs’ property model can become a burden following disaster events.⁸⁷ According to one regional NGO representative interviewed, heir properties tend to be most prevalent in lower income, Black communities and present a substantial procedural barrier in the hurricane recovery process. As FEMA will not issue a check to buy out a property unless an individual can provide proof of ownership, most heir properties can never be bought out. This further exacerbates disparities in the recovery funding process, again tipping the scale toward Whiter, wealthier communities

⁸⁵ Dyer, J.F. & Bailey, C. 2018. A Place to Call Home: Cultural Understandings of Heir Property among Rural African Americans. *Rural Sociology*: 73(3).

⁸⁶ Ibid.

⁸⁷ Sea Grant North Carolina. 2016. Splitting Heirs: The Challenges Posed by Heirs’ Property Ownership to Coastal Resilience Planning. Retrieved from: https://ncseagrant.ncsu.edu/ncseagrant_docs/coastallaw/pubs/heirs_property.pdf.

gaining access to recovery resources that poorer, minority communities are unable to utilize.

7.2. Informational Barriers

Access to information was identified as a substantial barrier by LTRG leaders, nonprofit representatives, and government officials alike. When high-quality information is readily available, impacted individuals feel a sense of empowerment, according to a local NGO representative. Currently, many communities are frustrated with their inability to access decision makers, both at the local and state level. LTRGs and nonprofits often fill the role of communicating information to community members by holding forums, community outreach meetings, and support groups.

7.2.1. Information Gap between Regional and Local Organizations

Institutional knowledge often rests within large regional groups such as the North Carolina Voluntary Organizations Active in Disaster (NC VOAD). While smaller community organizations who are not a part of NC VOAD do not have the same breadth of knowledge about funding and other available resources. “Pre-existing relationships make a big difference,” a state government official said. “Not having those relationships creates a barrier to information and other kinds of resources that could be traded among people who already know one another and have that working relationship.”

According to two local NGO representatives, relief funds were distributed to organizations who were “at the table” for these high-level meetings which discuss the allocation of funding and other resources, yet most local nonprofit organizations were

not invited. “You call for dinner, and you only text those who you wanted to invite,” a local NGO representative said. “It’s hard to eat when you weren’t invited to dinner.”

The entities present at NC VOAD meetings predominantly consist of large, regional organizations such as the American Red Cross and North Carolina Baptist Men. While these organizations have high capacity, they are unfamiliar with the affected communities and thus ineffective at conducting local recovery work. Instead, community members often seek help at the local community organizations, such as housing agencies, which have low capacity and lack the funds and resources to properly assist all of those who need help. Additionally, a local NGO representative noted a lack of representation at the funding meetings, particularly for communities of color and low-income communities, which creates yet another barrier for these populations to receive necessary assistance.

7.2.2. Distribution of information

The distribution of information to impacted individuals was highlighted as another barrier to successful recovery by eight interviewees. It is essential for state and local governments to reach impacted individuals by performing outreach through all appropriate outlets. Without efforts in this area, only a self-selecting group of people will gain information about post-hurricane recovery efforts.

For example, a county government official stated that many lower-income and elderly community members did not apply for funding because they lack access to the Internet and do not read newspapers; some do not even own a cell phone. These populations rely on word-of-mouth rather than social media or the newspaper to receive

pertinent information. A caseworker noted that some clients came to the case management agency only after seeing repairs being done at their neighbors' homes. "If you don't know a lot of people, you don't know where to get resources in the area," the caseworker said.

Facebook was also noted by a local NGO representative as a viable but underused outlet for rural populations. The representative cited the Town of Princeville as a successful case of using Facebook to communicate with affected community members.

In an examination of the online presence of the LTRGs across the four counties, every county has a Facebook page, but Duplin County is the only county that does not have a website (Table 6). Bladen County has nearly triple the number of followers on Facebook (646) compared to Craven (223) and Duplin (210) counties, and more than four times the number of followers compared to Columbus County (152). Columbus County and Craven County, however, have a more robust and informative website compared to Bladen County. The websites of the former two have information on their board of directors and recovery resources, while the website of the latter does not. Further, Craven County is the only LTRG with a calendar of upcoming events posted on their website. Overall, it appears that the Duplin County's online presence is not as strong as that of the other three counties, while Bladen County reaches the highest number of people via their Facebook page, but does not have as much information on their website as the Columbus and Craven counties.

Table 6. Comparison of LTRG online presence in Bladen, Columbus, Crave and Duplin counties.

County	Population	Website	Facebook Page	Followers on Facebook
Bladen	34,720	Yes	Yes	646
Columbus	57,230	Yes	Yes	152
Craven	104,450	Yes	Yes	223
Duplin	59,453	No	Yes	210

The timing of meetings can also determine which individuals receive information. Evening meetings generally have a higher turnout than those that occur during the day, according to three interviewees. Many individuals, especially those belonging to more vulnerable populations, cannot afford to leave work during the day, work late, and need to take care of their families after work. Further conflicts arise when multiple groups hold meetings at the same time. More organization among groups is essential to coordinate the flow of information, according to a local NGO representative.

Further, individuals who are in the greatest need of help often do not have the capacity to seek assistance. The lack of outreach to vulnerable community members was identified as a barrier in three interviews. “It’s difficult for people to get involved when their houses are under water,” a local NGO representative said. For example, North Carolina has the fifth largest migrant farmworker population in the U.S.⁸⁸ However, as the government has limited knowledge on where migrant farmworkers are

⁸⁸ *Facts about North Carolina Farmworkers.* (2012). Farmworker Ministry Committee of the North Carolina Council of Churches. Retrieved from <http://www.ncchurches.org/wp-content/uploads/2014/04/NC-Farmworkers-2012.pdf>

located and many camps are hidden⁸⁹, outreach to these populations is often non-existent. Although some information is translated into Spanish, the Spanish version typically only reaches urban areas and misses the rural populations, said another local NGO representative.

7.2.3. Quality of Information

Not only is it important that information reach all affected individuals, the provided information should also be relevant and easily digestible. For instance, FEMA 's Flood Insurance Rate Maps (FIRMs) for Duplin County are no longer useful, according to a representative from the county. The interviewee noted that these maps are outdated and do not account for the 500-year storms that have hit North Carolina in recent years. Even updated maps do not account for flooding from rainfall or the impacts of climate change, despite evidence that flood elevations are increasing at a rapid rate.⁹⁰

Misunderstanding and confusion can result when information is not communicated effectively. For instance, some impacted individuals mistakenly believed that their flood damages would be covered under home insurance, when in reality flood insurance is needed to cover flood damages. Also, terms such as “means of repairing a house” can be difficult for community members to understand, according to a local NGO representative. The federal government also does not provide adequate information on how to best use distributed funds, according to another local NGO representative. As a

⁸⁹ Summers, P., Quandt, S. A., Talton, J. W., Galván, L., & Arcury, T. A. (2015). Hidden Farmworker Labor Camps in North Carolina: An Indicator of Structural Vulnerability. *American Journal of Public Health, 105*(12), 2570–2575. Retrieved from <https://doi.org/10.2105/AJPH.2015.302797>

⁹⁰ Wagner, M. (2020, January 21). New flood insurance maps drawing critical reaction in NC. *Carolina Public Press*. Retrieved from <https://carolinapublicpress.org/29740/new-flood-insurance-maps-drawing-critical-reaction-in-nc/>

result, some affected individuals exhaust the funds on daily expenses and have little leftover for long-term repairs.

7.3. Financial Barriers

7.3.1. Lack of Funds

All interviewees agreed that there are not enough funds for communities to sufficiently recover from Hurricane Matthew and Hurricane Florence. Many community members are on different waiting lists to receive funding and assistance, said a local NGO representative.

Particularly, there is a lack in funds to aid in hurricane preparation and planning efforts. In recent years, the North Carolina General Assembly has eliminated funding for community organizations to conduct proactive work, according to a regional NGO representative. The representative added that capacity needs to be rebuilt at the state level to allow for proactive planning.

7.3.2. Inequitable Distribution of Funds

All interviewees concurred that funds are not distributed equitably, and that individuals with immediate needs are failing to receive critical funds. The hardest hit communities, as identified by the interviewees, include marginalized communities, middle class families, and renters. While marginalized communities and renters being socially vulnerable populations is consistent with findings from our literature review, the identification of middle-class families was surprising.

Marginalized communities, which include communities of color and low-income communities, are expected to experience further hardships post-hurricane, according to two interviewees. For instance, Native American communities often work in the agriculture industry and live in poor conditions, and therefore lack the means to sufficiently recover from a hurricane. “Their pay is not conducive to them keeping up the maintenance they need to make sure that their house doesn’t become substandard,” said a local NGO representative. “They’re struggling just to live and survive.” A regional NGO representative said that because of differences in access to information and other resources, White people tend to receive funds first and Black people are then left with insubstantial funds.

Many highly undesirable properties are located in places with the highest flood hazards, a state government official said. Low-income populations, who are living paycheck-to-paycheck, are only able to afford these less expensive, undesirable properties, putting them more at risk to flooding simply due to the location of their homes. Additionally, they often lack property and flood insurance, making it especially difficult for them to recover after a hurricane.

Middle-class families on the cusp of being considered low-income are also expected to be disproportionately impacted by hurricanes, according to two interviewees. It is not uncommon to hear of cases in which middle-class families are renting an apartment while still paying mortgage on their damaged homes. Due to the additional expenditures on temporary housing, these families are unable to fix their homes without external sources of assistance. At the same time, however, their income level renders them ineligible for receiving additional funds from the government.

For example, CDBG-DR funding requires that the household be at least at or below 80% of the median income for the area.⁹¹ In our target counties, 80% of the median household either below or only slightly above the poverty threshold for a family of four in the U.S., which is \$26,200 in 2020 (Table 7).⁹² Bladen County’s 80% threshold is in fact lower than the poverty threshold. The income levels in these communities are typically so low that the only people who qualify for government funds likely do not own a house, said a local NGO representative.

Table 7. 80% threshold of median household income in Bladen, Columbus, Craven and Duplin counties.⁹³

County	80% Median Household Income
Bladen	\$ 25,917
Columbus	\$ 29,009
Craven	\$ 39,513
Duplin	\$ 29,342

Renters, particularly those with low income, are also highly impacted, according to a local NGO representative. Federal disaster relief and recovery programs have a tendency to favor homeowners over renters, as renters typically cannot receive funds for damages to their rental homes.⁹⁴ Although affected individuals staying in unsafe

⁹¹ *Community Development Block Grant Program*. (2019, December 17). U.S. Department of Housing and Urban Development. Retrieved from https://www.hud.gov/program_offices/comm_planning/communitydevelopment/programs

⁹² *Poverty Guidelines*. (2020, January 8). U.S. Department of Health & Human Services, Office of the Assistant Secretary for Planning and Evaluation. Retrieved from <https://aspe.hhs.gov/poverty-guidelines>

⁹³ United States Census Bureau. (2019). 2013-2017 American Community Survey 5-Year Estimates. Retrieved from: <https://factfinder.census.gov/>

⁹⁴ Mickelson, S.S., Patton, N., Gordon, A., & Rammler, D. (2020). *Fixing America’s broken disaster housing recovery system—Part one: Barriers to a complete and equitable recovery*. National Low Income Housing Coalition. Retrieved from https://nlihc.org/sites/default/files/Fixing-Americas-Broken-Disaster-Housing-Recovery-System_P1.pdf

housing conditions may be referred to transition to longer-term housing⁹⁵, the housing situation in North Carolina is such that there is often nothing available to rent, said the representative.

7.4. Cultural Barriers

Marginalized populations often face additional cultural barriers, according to three interviewed individuals. For example, immigrants often do not receive sufficient assistance from the government. Many migrant farmworkers are ineligible for disaster unemployment insurance or FEMA disaster assistance.⁹⁶ As of 2017, Duplin County had the second highest number of migrant workers in North Carolina at 5,110 people. Bladen, Columbus, and Craven counties had 3,253 workers, 2,118 workers, and 568 workers, respectively.⁹⁷ Two interviewees stressed a need for increased Latino representation in local and regional organizations to more adequately support these populations.

7.4.1. Language Barrier

Latino communities, which include a majority of immigrants in rural North Carolina, face a language barrier when seeking help and applying for funding. Some of the information distributed by the government only in English, which makes it difficult for

⁹⁵ *Hurricane Resources*. (n.d.). North Carolina Housing Finance Agency. Retrieved from <https://www.nchfa.com/about-us/hurricane-resources>

⁹⁶ *North Carolina Farmworkers and Disasters Fact Sheet*. (2019). Farmworker Advocacy Network. Retrieved from <https://www.ncjustice.org/wp-content/uploads/2019/09/FAN-NC-Farmworkers-and-Disasters-Fact-Sheet.pdf>

⁹⁷ Lambar, E. F., & Thomas, G. (2019). The health and well-being of North Carolina's farmworkers: the importance of inclusion, *North Carolina Medical Journal*, 80(2), 107–112. Retrieved from <https://doi.org/10.18043/ncm.80.2.107>

these populations gain access to important information. Often, they will have to call organizations that they trust in order to have the information translated, according to a local NGO representative. The representative said that sometimes inspectors would not even enter people's homes if Latino families were not able to convey the extent of the damages in English.

There is some effort in Duplin County to bridge this gap, according to a LTRG representative for the county. During Hurricane Florence, the Duplin LTRG used the countywide ConnectEd tool through the school system to reach every home, with announcements in both English and Spanish. This helped reach many survivors, according to the representative. A Bladen LTRG representative said that their organization also makes an effort to translate all of their materials into Spanish and noted that their caseworker can speak Spanish.

7.4.2. Fear/Distrust of Government

Due to pre-existing biases, marginalized communities generally distrust the government. For example, many immigrant communities have a difficult time trusting local authorities due to targeting by the immigration authorities. This often results in a reluctance to seek help and fill out paperwork, as they fear the government will find out about their documentation status and prevent them from gaining citizenship, according to three interviewees. These immigrants are also unlikely to attend meetings about post-hurricane recovery.

Many Latino families did not want to apply for funding, according to a local NGO representative. Their cultures present men as the providers in society, a mindset which

has discouraged many husbands from seeking help due to a sense of shame associated with being unable to take care of their families.

Instead of reaching out to their local government, impacted individuals from minority racial or ethnic groups often choose to seek help from a trusted source, such as the community action agency that runs the food bank, according to a local NGO representative. On the other hand, if a Black-run or Native American-run nonprofit organization were designated as the official entity through which community members could apply for assistance, White residents would be less inclined to seek help there, said the representative.

For those who do apply for funding, the process is often so convoluted that they are unmotivated to try again. “Not only have [the migrant workers] been affected by something traumatizing, the process itself is traumatizing,” said a local NGO representative. The representative gave an example of immigrants who had completely lost their homes and went through the complicated process of applying to FEMA. They were denied, but the rejection notice came in English. “Nobody cared to send something in a language they could understand,” the representative said.

Additionally, marginalized communities are often unwilling to give out their information to people with whom they are unfamiliar. “You’re asking people who aren’t tech savvy to make a call and ask questions that they can’t see and don’t trust,” a local NGO representative said. They prefer to talk to people that they know regionally or locally.

7.4.3. Lack of Familiarity with Hurricanes

It is important to consider that hurricanes do not occur in the home countries of many immigrants. Not only are these populations unfamiliar with eastern North Carolina's geography, they are also especially uninformed about preparing for disasters as well as seeking help afterward. Some migrant farmworkers in North Carolina were never notified by their employer of the mandatory evacuation order.⁹⁸ A local NGO representative described a case of farmworkers spending the hurricane on a school bus, and another case of a family taking shelter under a bridge during the hurricane. Clearly, these families did not receive any information about shelters. Additionally, the involvement of government agents in relief efforts can create a barrier, as immigrants associate these agencies with immigration enforcement.⁹⁹ Many immigrants turned away when they saw policemen in front of the shelters, according to the representative. They also typically lack a mode of transportation, which makes evacuation to a shelter more difficult.¹⁰⁰

7.5. Other Barriers

7.5.1. Lack of Affordable Housing

Affordable housing was identified as a major concern by five interviewees, which included LTRG representatives and NGO representatives. However, it does not seem to be a priority for the state government, according to a local NGO representative. The

⁹⁸ *North Carolina Farmworkers and Disasters Fact Sheet*. (2019). Farmworker Advocacy Network. Retrieved from <https://www.ncjustice.org/wp-content/uploads/2019/09/FAN-NC-Farmworkers-and-Disasters-Fact-Sheet.pdf>

⁹⁹ Ibid

¹⁰⁰ Ibid

proportion of affordable housing units is much lower than the poverty rate across all four counties (Table 8).

Table 8. Poverty rates and affordable housing units in Bladen, Columbus, Craven and Duplin counties

County	Population	Percent Poverty	Percent Affordable Housing Units
Bladen	34,720	24.5%	5%
Columbus	57,230	23.6%	8%
Craven	104,450	26.3%	5%
Duplin	59,453	15.4%	6%

Many impacted individuals must still pay the mortgage on their damaged homes. This diminishes funds that could be used to purchase a new house, leaving them no choice but to stay in a hotel or rent an apartment. Even so, the housing situation in North Carolina is such that there are few properties available to rent.

As homes are destroyed, it becomes increasingly difficult for impacted community members to live in their hurricane-struck communities, according to a local NGO representative. This is due to a lack of safe and affordable housing, as well as a lack of jobs in the area, the representative said. Some communities have been described as deserted, with community members seeking housing and work elsewhere. A regional NGO representative expressed their concern about people losing ties to their communities as they move away.

7.5.2. Lack of Long-term Planning

Many affected community members fail to consider their long-term plan when using allocated funds, according to four interviewees. “They are so focused on the challenges of the storm that’s just passed and getting something underway that allows them to live day-to-day or fearing the next storm,” said a regional NGO representative.

Some individuals often spend funds received from the federal government on daily living expenses rather than on home repairs, which creates an issue when they apply for additional funding elsewhere. When allocating funds, LTRGs and other nonprofit organizations need to have some accountability to FEMA to avoid duplication of benefits, according to an LTRG representative. When the Columbus LTRG leaders decide on funding allocations to pay for temporary housing, for example, they want to ensure that applicants are considering a long-term recovery plan and not simply relying on these short-term funds.

7.5.3. Lack of Progress

Impacted community members experience fatigue when they are given hope but do not notice any tangible change in their situation, three interviewed individuals said. After experiencing numerous floods and subsequent planning processes, community members develop cynicism about whether progress will be made. A university representative mentioned that community members are wary of extractive work, which takes information out of the community but fails to result in benefits back to the residents.

8. ANALYSIS OF RESILIENCE STRATEGIES

Community resilience is a major indicator of social sustainability. Throughout rural North Carolina, communities are actively engaged in building community resilience in order for their communities to thrive despite the threats posed by natural disasters such as hurricanes. Stakeholders identified numerous strategies for community members to build resilience in their communities throughout the post-hurricane funding and planning process. Generally, effective resilience strategies fell into three distinct groups which encompassed all phases of the hurricane planning process: (1) expanded pre-disaster planning, (2) building relationships and trust, and (3) partnerships with local organizations.

8.1. Expanded Pre-Disaster Planning

Thorough planning for disasters before they happen was identified by stakeholders as an important way to build resilience within communities. The scope of pre-disaster planning is broad but planning organizations and emergency disaster response plans were noted as useful structural tools to bolster pre-hurricane resilience efforts. Stakeholders noted that county-specific disaster planning organizations have an opportunity to build community resilience by working closely with county governments to inform county disaster response plans. In practice, this could look like closer, sustained collaboration between LTRGs and local governments. Multiple stakeholders also stressed the importance of identifying high-risk individuals, such as those living in floodplains, prior to disasters in order to rapidly address issues post-disaster. In addition to expanded structural and procedural pre-disaster planning, physical land management

was identified as a strategy to reduce the impacts of flooding on vulnerable populations. In particular, stakeholders discussed floodplain management strategies such as flooding prevention (i.e. ditching) and floodplain restoration as ways to lessen the harmful effects of flooding in vulnerable communities. The ability for communities to build resilience prior to disasters has not been adequately realized and offers an invaluable opportunity for communities to get involved in planning for disasters before they strike.

In order for stakeholders to intentionally expand pre-disaster planning, there needs to be a sustained level of collaboration between organizations and agencies. Rather than waiting for a disaster to strike and collaborating solely within the context of recovery, entities with the capacity to do so should seek to build resilience by establishing pathways of communication and collaboration with local governments and organizations prior to catastrophic events. Investing in the capacity of under-resourced groups and having a sustained, proactive planning effort can improve equity and make eastern North Carolina more resilient. This strategy could also facilitate the ability of people from diverse populations and communities to play an active role in hurricane planning before a storm. Governments have a particularly important role to play within this context to build resilience, as they are resource hubs and have traditionally been ineffective at reaching people in local communities. With the establishment of NCORR, North Carolina has a new opportunity to build a more robust structure for ongoing hurricane relief, which would greatly support community resilience, especially in vulnerable areas.

8.2. Building Relationships and Trust

Strong relationships between government stakeholders, resource agencies, and community members are an essential piece of resilience in North Carolina. Building these relationships takes the time and resources required for government representatives to meet people in their communities and listen to and understand their concerns and needs. Meeting people where they are starts with traveling to communities, listening, and sharing information accessible to a diverse group of individuals. Groups that meet people on the ground are essential for building trust and mutual ownership. As one stakeholder noted, "building trust doesn't happen in a FEMA office." It is important to note that building relationships and trust takes time, which means it is best to engage in this strategy to build resilience prior to a disaster, when fewer people are at immediate risk and time is a more readily available resource. Ultimately, building relationships and trust is a way to strengthen collaboration in communities to expand the reach of information in both directions: from communities to governments and organizations and vice versa.

Relationship building can enhance policy learning, or adaptation of local policies to increase resilience of communities in the face of extreme events, which represents a crucial tool in improving disaster response temporally. The extent of this learning depends, however, on how communities engage with stakeholders and the public, the types of intergovernmental relationships that form, and associated resource flows.¹⁰¹ While collaborative intergovernmental relationships matter to successful disaster recovery, higher levels of learning occur only when local government is also connected

¹⁰¹ Albright, E.A., & Crow, D.A. (2015). Learning processes, public and stakeholder engagement: analyzing responses to Colorado's extreme flood events of 2013. *Urban Climate*, 14: 7993.

to state government through its financial, technical, or personnel needs related to disaster recovery.¹⁰²

8.3. Partnerships with Local Organizations

Stakeholders identified partnering with local organizations as a crucial way to build resilience in communities. Many interviewees noted that local community organizations are much more effective at reaching people and distributing services in their communities compared to outside government groups; thus, the hurricane recovery process needs more collaboration between community organizations and local, state, and federal governments. Governments need to develop stronger partnerships with existing nongovernmental organizations that are on the ground in communities to gain access to and engage community members, especially in rural areas. Collaborating with people who live and work in affected counties and have a greater understanding of the hazards and vulnerabilities of their communities could greatly improve the ability of governments and resource agencies to disseminate information and provide resources in a timelier manner. Investing time and resources toward conducting outreach directly to communities, and to organizations with relationships to communities, will build community resilience and enhance the recovery process.

Consulting with and involving communities in recovery decisions and plans that will directly impact them is critical for improving policy responses to natural disasters.

¹⁰² Crow, D.A., & Albright, E.A. (2019). Intergovernmental relationships after disaster: state and local government learning during flood recovery in Colorado. *Journal of Environmental Policy & Planning*: 1-18.

Community members must be given an opportunity to evaluate and address their own vulnerabilities to hazards, identify and invest in their own networks of assistance and information, and build capacity to solve problems.¹⁰³ Participatory processes are influenced by the extent and type of flood damage and resource availability. Communities that experience extensive flood damage across multiple sectors and have limited financial capacity appear to be more likely to form in-depth deliberative processes and broad, multi-sector initiatives.¹⁰⁴ Additionally, more collaborative intergovernmental relationships foster more robust policy learning when local governments are connected to state governments via financial, technical, and personnel resources during the disaster recovery process.¹⁰⁵ However, state and local governments must prioritize inclusivity of participatory processes, as otherwise the recovery process may further marginalize low capacity communities, often comprised of low-income individuals of color.

9. POLICY RECOMMENDATIONS

Having considered the barriers and resilience strategies identified through our interviews, we propose the following recommendations for the state government of North Carolina, which seek to address each of the resilience strategies we identified. While our client is Resourceful Communities, our team has decided to target the North Carolina state government in developing our recommendations as we believe they have both high capacity and high decision-making authority over the hurricane recovery

¹⁰³ Norris et al., 2007.

¹⁰⁴ Albright and Crow, 2015; Crow and Albright, 2019.

¹⁰⁵ Albright and Crow, 2019.

funding process. As such, we believe that they are the most equipped to significantly influence relevant systemic processes. In developing these recommendations, we have attempted to suggest tasks that are specific, actionable, and that address each of these resilience strategies.

9.1. Expanded Pre-Disaster Planning

Expanded pre-disaster planning was identified as a crucial step to building community resilience. In order to address procedural, informational, and financial barriers related to communities' ability to access and engage in hurricane recovery efforts, we recommend that entities with medium to high capacity should expand their pre-disaster planning efforts. State, federal, and, to some extent, local governments have the greatest capacity to expand their pre-disaster planning efforts and should do so in order to build a strong foundation with which to approach hurricane response and recovery efforts. Specifically, interviewees suggested that county-specific disaster planning organizations can build resilience by working closely with county governments to inform county disaster response plans. In practice, this will likely entail sustained collaboration between LTRGs and local governments.

We identified four tangible steps for the North Carolina state government to *expand pre-disaster planning* include, but are not limited to:

- Increasing the usage of geospatial and physical data to determine the needs of impacted individuals instead of relying on financial data.

- Housing all recovery funding under one government division rather than siphoning under multiple agencies and/or divisions to expedite the recovery funding process.
- Increasing outreach to populations that do not use the internet by posting flyers at local community establishments such as grocery stores and churches.
- Expanding education and outreach on home ownership, finances, insurance needed, and how to take advantage of National Flood Insurance Program.

If these recommendations are incorporated into systematic policy in preparation for disasters, then governments will be better able to expediently meet the needs of impacted communities.

9.2. Building Relationships and Trust

Strong relationships between government agencies and other stakeholders are essential to building resilience in rural North Carolina, and building these relationships requires time and trust-building. In order to address procedural and cultural barriers that exist in the post-hurricane recovery process, entities with high authority over the allocation and distribution of post-hurricane recovery funds should systematically engage in building trust and meaningful relationships with other entities involved in the process, especially local organizations and local governments with greater investments in their own communities. This process requires time and intentional commitment from all parties wishing to establish closer connections with local groups which foster increased collaboration and transparency. Relationship-building can enhance policy learning and the adaptation of local policies to increase community resilience; however,

the extent of learning depends on strong intergovernmental relationships and open resource flows.

The primary way that we identified to foster trust and relationship-building within Bladen, Columbus, Craven, and Duplin counties is to increase representation from minority groups and low-income populations at funding meetings and hurricane recovery discussions. Additionally, sustained community participation in this process is key.

For example, explicitly inviting low-income and minority community members to attend funding meetings, or even making a concerted effort to hire managers to the organizations present at these meetings that are more representative of the community could work toward this end. Additionally, changing the times and locations of these meetings and providing food or snacks could break down many of the barriers to representation and participation that our interviewees have mentioned. This change would simultaneously bring a more diverse group of stakeholders into discussions around hurricane relief planning while building trust with people who have close connections with their own local communities.

9.3. Partnerships with Local Organizations

Finally, fostering partnerships with local organizations is integral to building community resilience. Expanded pre-disaster planning and relationship-building both require expanding and creating new, mutually beneficial partnerships with local organizations in each county. The state government has the obligation to partner with local organizations to help build community resilience. These partnerships have the

potential to increase the effectiveness of post-hurricane recovery processes by streamlining the flow of information, particularly between state government and local governments and other organizations. Many individuals interviewed expressed that local community organizations are most effective at reaching people and distributing services in their communities. As such, collaboration between community organizations and local and state governments is necessary to the recovery process, particularly in these rural counties.

Entities can *build partnerships with local organizations* by:

- Creating coalitions/working groups that consist of entities across multiple sectors.
- Developing a comprehensive list/listserv of organizations active in disaster recovery for each county. This would include the organizations that comprise the long-term recovery groups in each county.
- Appointing a liaison from North Carolina Voluntary Organizations Active in Disaster to the North Carolina Office of Recovery and Resiliency to foster more collaboration between the state government and regional/local organizations.

If implemented, these recommendations would bolster the ability of communities in eastern North Carolina, especially rural ones, to actively plan for and manage the disaster recovery process.

10. CONCLUSION AND NEXT STEPS

Our research has highlighted actionable steps that can be taken to address issues in the current hurricane recovery funding framework, but further research is necessary to strengthen and implement these recommendations. First, we see a need to collect more data on recovery funding, as our team was only able to access limited data for the purpose of our analysis. This report focuses on funds originating from the federal government, as this was where data was the most widely available. For future analyses, data on recovery funding originating from the state should be collected and compared to our existing fund analysis. Additionally, as recovery funding is distributed so slowly, data often takes a while to become available following a hurricane. This limited the scope of our data analysis to solely Hurricane Matthew; future analyses should seek to also analyze data from Hurricane Florence once they become available.

A substantial limitation presented throughout the course of this project was access to diverse representation of individuals to participate in interviews. First, we were unable to interview community members, and as such, are missing valuable firsthand perspectives from people who have experienced navigating the recovery funding process. Additionally, we were unable to achieve equal representation from all counties examined and, as such, did not collect as much information from individuals working in Craven and Bladen counties. Finally, our pool of interviewees had very little representation from the migrant worker community and Native American community, which indisputably limited the perspectives we were able to consider while formulating policy recommendations for the state government. For future research, making a

deliberate effort to interview these groups will provide a more holistic view of the hurricane recovery funding process in North Carolina.

A final limitation we experienced while conducting interviews was that many interviewees compared the hurricane recovery response following Hurricane Floyd in 1999 and those following hurricanes Matthew and Florence. However, given that Hurricane Floyd occurred more than two decades ago, there was little information available in the literature to substantiate these claims.

A crucial step to changing the recovery funding landscape in North Carolina is actively engaging representatives from the state government, namely those from NCORR, to start a conversation about how best to implement the recommendations we have developed. Additionally, this report will be shared with legislators at the NC General Assembly, with our client Resourceful Communities, and with our interview participants. We hope that the wide distribution of this report will shift the conversation on hurricane recovery funding from what the state government should do to improve the process to what actionable improvements they can make to systematically facilitate a more equitable funding process in eastern, rural North Carolina.

Appendices

Appendix 1: Breakdown of Stakeholder Groups

Appendix 2: Outreach Email Template

Appendix 3: Consent Form for NGOs, Long-Term Recovery Groups, and Local Officials

Appendix 4: Consent Form for Community Members

Appendix 5: Interview Protocol

Appendix 1: Breakdown of Stakeholder Groups

Table 1. Government stakeholders, their role in the NC hurricane recovery process, and their relative capacity and decision-making authority over recovery funding allocations.

Stakeholder Group	Role	Capacity	Level of Authority
Federal government	Allocate recovery money to state governments	High	High
State government	Allocate federal recovery funding to local government	High	High
Councils of governments (COGs)	Administer recovery funding and provide the service of hazard mitigation and planning on an ad hoc basis	Moderate	Low
Local government	Process recovery funding applications and distribute	Low	Moderate

Table 2. Nongovernmental stakeholders, their role in the NC hurricane recovery process, and their relative capacity and decision-making authority over recovery funding allocations.

Stakeholder Group	Role	Capacity	Level of Authority
<i>Regional NGOs</i>			
Environmental NGOs	Conduct high-level work on resilience and hazard mitigation	High	Low
Relief organizations	Provide immediate relief via rebuilding and assist with recovery funding	Moderate	Low
Foundations	Distribute grant money to survivors	Moderate	Low
<i>Local NGOs</i>			
Long-term recovery groups	Disseminate information to survivors and apply for recovery funding to distribute to community	Moderate	Moderate
Housing agencies	Assist with immediate hurricane relief and provide education on housing and insurance matters	Low	Low
Cultural organizations	Apply for recovery funding, and provide outreach and relief for community members	Low	Low
Religious organizations	Apply for recovery funding and provide relief	Moderate	Low
<i>Other</i>			
Universities	Conduct research, provide relief volunteers, and work with communities on resilience planning projects	High	Low

Appendix 2: Outreach Email Template

Dear [Name of interviewee],

We need your input to better understand how the resources provided by the North Carolina state government and the U.S. federal government are being accessed and distributed to the frontline communities impacted by hurricanes Florence and Matthew. We are an interdisciplinary team of researchers from Duke University and we are doing research on post- Hurricane relief and recovery funding in North Carolina. You've been invited to participate in this Duke University research project because of your involvement with [affiliation, e.g. hurricane relief] in [name of county, e.g. Bladen, Columbus, Craven, Duplin] county. We are particularly interested in hearing experiences from [name of county] because of the impact that hurricanes Florence and Matthew have had on those communities.

We would like to schedule an interview that will last between thirty minutes and an hour. This can be done in-person, via phone, or via a video call. During the interview, we hope to learn more about your experience with, and response to, hurricanes Florence and Matthew. Your participation would be greatly appreciated and will help us develop a more thorough understanding of how North Carolina communities respond to disaster. What time is most convenient for you between [range of selected dates and times]?

Looking forward to hearing back from you soon!

Sincerely,
Kyle Cornish, Rachel Gonsenhauser, Alicia Zhao (Student Researchers)
Elizabeth Albright (Advisor)

Appendix 3: Consent Form for NGOs, Long-Term Recovery Groups, and Local Officials

Statement of Informed Consent

Key Information:

You have been invited to participate in an interview that is part of a Duke University research project. The Duke University research team is working in conjunction with Kathleen Marks and Monica McCann from the Resourceful Communities team at The Conservation Fund. The purpose of this interview is to gather information on your experience regarding recovery funding following hurricanes Florence and Matthew. The interview administered will be used to inform successful resiliency strategies in rural North Carolina.

This interview will be conducted by three student-researchers from Duke University and will take between 30 minutes and one hour. During the interview, you will be asked to share your opinions and experiences. There is no certain answer that the researchers are hoping to hear from you.

There are no direct benefits from participation in this study. Risks associated with this study are minimal and include the possibility that you may choose to divulge potentially embarrassing information. There is minimal risk associated with a series of questions that asks your community and professional experience.

Your participation in this interview is entirely voluntary. You have the right to skip any question in the interview, if you choose.

To protect your privacy, only first names will be used during the interview and no names or personal information will be used in any material written about the interview. We may share your individual responses along with your job title or the town you live in but will not include your name.

We plan to keep your name, town, and contact information on a secure, encrypted Duke University site for the purpose of re-contacting you should any follow-up questions arise. With your permission, the interview will be audio taped. No one but the Duke student-researchers, Ms. Marks and Ms. McCann will have access to the audio tape and your files. This tape and the file containing identifying information will be destroyed within five years of the completion of our study. Information from the interview, with direct identifiers removed, will be kept for future research.

If you have any questions about this interview, please ask now. If you have any questions later, please contact Professor Elizabeth Albright at (919)-613-8153. If you have any questions about your rights as a research participant, please contact the chair of the Human Subjects Committee at (919) 684-3030.

I have read the information in this consent form and have been given the opportunity to discuss it and ask questions.

[] I allow the discussion to be audio taped

[] I do not allow the discussion to be audio taped

Print name Sign name Date

Appendix 4: Consent Form for Community Members

Statement of Informed Consent

Key Information:

We would like to invite you to participate in a Duke University research project. Our team is working with Monica McCann and Kathleen Marks from the Resourceful Communities team at The Conservation Fund. We would like to interview you to learn about your experience with recovery funding following hurricanes Florence and Matthew in fall 2018. This interview will be used to help create successful hurricane recovery plans in North Carolina.

This interview will be conducted by three student-researchers from Duke University. The interview will take between 30 minutes and one hour. During the interview, you will be asked to share your opinions and experiences. There is no certain answer that the researchers are hoping to hear from you.

There are no direct benefits from participation in this study. There may be risks from this study, including the possibility that you may choose to share potentially embarrassing information.

There is very little risk associated with a series of questions that ask about your community and experience. However, this information will not be used to identify you individually.

Your participation in this interview is entirely voluntary. You can choose to skip any question in the interview, if you choose.

To protect your privacy, only first names will be used during the interview and no names or personal information will be used in any material written about the interview. We may share your individual responses along with the town you live in but will not include your name.

We plan to keep your name, town, and contact information on a secure, encrypted Duke University site for the purpose of re-contacting you should any follow-up questions arise. With your permission, the interview will be audio taped. No one but the Duke student-researchers, Ms. Marks and Ms. McCann will have access to the audio tape and your files. This tape and the file containing identifying information will be destroyed within five years of the completion of our study. Information from the interview, with direct identifiers removed, will be kept for future research.

If you have any questions about this interview, please ask now. If you have any questions later, please contact Professor Elizabeth Albright at (919)-613-8153. If you have any questions about your rights as a research participant, please contact the chair of the Human Subjects Committee at (919) 684-3030.

I have read the information in this consent form and have been given the opportunity to discuss it and ask questions.

[] I allow the discussion to be audio taped

[] I do not allow the discussion to be audio taped

Appendix 5: Interview Protocol

Environmental Justice Analysis of Post-Hurricane Funding and Planning

Principal Investigator: Elizabeth A. Albright
Key Personnel: Alicia Zhao, Rachel Gonsenhauser, Kyle Cornish

INTRODUCTION & OBJECTIVE

We are interested in better understanding how the resources provided by the North Carolina state government and the United States federal government are being accessed and distributed to the communities impacted by Hurricane Florence and Hurricane Matthew. From our observations of the rural communities in eastern North Carolina who were most impacted by these natural disasters, it appears that there are significant barriers to accessing both the post-disaster financial and other government resources and to having a voice in planning how their communities will recover and plan for future events. These barriers appear to be exacerbated when impacted communities have high proportions of members with low socioeconomic status and from racial and/or ethnic minority groups.

Bladen – Craven – Columbus – Duplin

We aim to conduct a systematic analysis of how these demographic characteristics influence the following:

- Access to post-hurricane financial and technical resources (including those related to hurricanes Florence, Matthew and older events).
- The level of involvement that communities are able to have in determining how these resources will be used.

Specifically, we seek to answer the following questions:

1. How is access to post-hurricane recovery resources in North Carolina provided by the state and federal government?
2. How is participation in post-hurricane recovery and planning exercises mediated by the socioeconomic and racial status of recipients?
3. What are the proven and potential processes and strategies to build more equitable access to post-hurricane relief?

Environmental Justice Analysis of Post-Hurricane Funding and Planning

Principal Investigator: Elizabeth A. Albright
Key Personnel: Alicia Zhao, Rachel Gonsenhauser, Kyle Cornish

INTERVIEW QUESTIONS FOR AFFECTED COMMUNITY MEMBERS

1. Can you please provide your full name?

BEGIN RECORDING HERE

2. Please tell me about your experience during Hurricane Florence or Matthew:
 - a. Where were you?
 - b. How were you affected?
 - c. What did you see the next day?
3. How did people in your community respond to the hurricane?
4. What are your feelings about what happened?
5. What is the memory you will hold with you 20 years from now?
6. Now that a year has passed, are you back home?
 - a. Are your neighbors back home?
 - b. What are major changes that you've noticed since the hurricane?
7. How aware were you of resources available for post-hurricane funding?
 - a. Did you have access to the resources that you needed following the hurricane?
 - b. Who did you turn to for support?
 - c. What support did you receive?
 - i. If you got information, how and where did you get it from?
 - ii. Did you receive assistance from FEMA?
8. Have you noticed any inequities in post-hurricane funding and planning?
9. What would you like to see happen during the recovery stage? (e.g. equity, information, resources, outreach, communication, etc.)
10. Can you think of anybody else to talk to?

Environmental Justice Analysis of Post-Hurricane Funding and Planning

Principal Investigator: Elizabeth A. Albright
Key Personnel: Alicia Zhao, Rachel Gonsenhauser, Kyle Cornish

INTERVIEW QUESTIONS FOR LONG-TERM RECOVERY GROUPS

1. Can you please provide your full name, professional title, and group that you work for?

BEGIN RECORDING HERE

2. Tell us about your role in the hurricane recovery process.
 - a. What role do LTRGs in North Carolina play in disaster relief?
 - b. What role do NGOs in North Carolina play in disaster relief?
 - c. What role does the state government play in disaster relief?
 - d. What role do colleges and universities in North Carolina play in disaster relief?
3. Which populations were most impacted by the hurricane and how were they supported?
4. What funds were distributed to your community to help with hurricane relief?
 - a. Were these funds sufficient for your community's needs?
5. How do you define "who" got the relief funds?
 - a. What was the application process like?
6. Which funds have been critical in terms of hurricane recovery?
 - a. Have they been dispersed in a timely manner?
 - b. Do you feel that the funds were distributed equitably?
 - c. Could you provide some examples?
7. What processes have you gone through to acquire recovery funding?
 - a. Are you working on any grant applications?
8. How do you define "who" is involved in post-hurricane recovery and planning exercises?
 - a. What was the process for choosing these people?
 - b. What are some barriers to participation for other community members?
9. Who are the people or organizations in your community that make decisions about funding?
 - a. Who has influence or connections to these decision makers?

10. Who are the relevant decision makers locally?
 - a. Who has influence or connections to these decision makers?
11. If you could have improved anything in the process, what would you have changed?
12. Can you think of anybody else to talk to?
13. Do you have any data/resources related to the distribution of funds that you would be willing to share?

Environmental Justice Analysis of Post-Hurricane Funding and Planning

Principal Investigator: Elizabeth A. Albright
Key Personnel: Alicia Zhao, Rachel Gonsenhauser, Kyle Cornish

INTERVIEW QUESTIONS FOR RESOURCE AGENCIES

2. Can you please provide your full name, professional title, and agency/organization/institution that you work for?

BEGIN RECORDING HERE

3. Tell us about your role in the agency/organization/institution and in hurricane recovery.
 - a. What role does the government play in disaster relief?
 - b. What role do NGOs in North Carolina play in disaster relief?
 - c. What role do colleges and universities in North Carolina play in disaster relief?
4. Who are some of the long-term recovery groups for your community?
 - a. How have they been involved in hurricane relief efforts?
5. How do you define "who" got the relief funds?
6. How do you define "who" is involved in post-hurricane recovery and planning exercises?
 - a. What was the process for involving these people?
 - b. What are some barriers to participation for other community members?
7. Who are the people or organizations in your community that make decisions about funding?

8. Who are the relevant decision makers locally?
 - a. Who has influence or connections to these decision makers?
9. Have you noticed any inequities in post-hurricane funding and planning?
10. How do you think long-term recovery groups can make post-hurricane relief efforts more equitable?
 - a. Any successful approaches you know of?
11. Do you have relevant data you would be willing to share with us?
12. Can you think of anybody else to talk to?
13. Do you have any data/resources related to the distribution of funds that you would be willing to share?