

Public Policy Master's Project: Barriers for Municipalities to Federal Funding for Flood Mitigation

Client: Environmental Defense Fund

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EXECUTIVE SUMMARY

Background

In North Carolina, flooding is a significant and costly problem for many counties. Efforts to mitigate flooding damage or incidence take a number of forms, including property buyouts and traditional and natural infrastructure projects, many of which can be costly for counties. There are a number of federal programs designed to fund the range of mitigative measures, dependent on the type of project or assessment of risk for the municipality.

Environmental Defense Fund (EDF) wants to know the answer to a key policy question related to flood mitigation: what are the barriers, if any, limiting the utilization by local governments in North Carolina of federally available funds for mitigative projects aimed at preventing flood damage? If so, how should EDF prioritize their partnerships, planning, and resources in providing solutions to lessen these barriers?

Data Analysis

Of North Carolina's 100 counties, not all are affected by flooding issues and would necessarily need to access federal funding for mitigation projects. The counties selected for interviews were done so in two phases. First, from an initial list of 56 counties with historical incidences of flooding, a ranked selection of twenty counties was chosen based on county and population size metrics. Secondly, an additional eleven counties were added to those surveyed based on their proximity to the eastern coast of North Carolina and thus high likelihood of facing flooding.

In order to determine why counties may not be accessing full or partial federal funding for their local flood mitigation projects, interviews were conducted with county-level planning department or emergency management directors to determine their perceived barriers to accessing funding. Interviews also established flood incidence and the types of projects counties implemented in pursuit of flood mitigation. Interview responses for the types of barriers preventing counties from accessing federally available flood mitigation funding fell into three categories: staff, time, and money. These responses correlated generally with the size of the county and departmental staff, where smaller counties perceived barriers based primarily on staff, larger counties based on timing, and both types perceived difficulties based on money.

Potential Solutions

Based on the perceived barriers to accessing federal funding, a number of potential solutions were identified, which EDF can choose to implement through direct action and assistance or strategically partner with organizations to promote or provide. To address barriers caused by time and timeline constraints, EDF could provide tracking tools or preparatory assistance for counties to utilize to reduce the burdens of the grant application and planning processes. To address staffing issues, EDF could facilitate staff training or provide consistent contacts through whom county directors and employees can work with federal agencies. To address the barriers identified in funding, EDF can facilitate administrative, design-phase, and discretionary funding options to fill gaps faced by counties in the application and project processes. EDF can choose which tools to employ for different counties or target county-types across states based on county characteristics and EDF's overall priorities and capabilities.

I. Policy Question

What are the barriers, if any, limiting the utilization by local governments in North Carolina of federally available funds for mitigative projects aimed at preventing flood damage? How should Environmental Defense Fund (EDF) prioritize their partnerships, planning, and resources in providing solutions to lessen these barriers?

II. Background and Landscape Analysis

i. Flooding Damage

Flooding in coastal or other communities causes serious and often long-term post-disaster costs for governments and community members. The Federal Emergency Management Agency (FEMA) has stated that: “floods are the nation’s most common and costly natural disaster and cause millions of dollars in damage every year.”¹ In North Carolina specifically, after Hurricane Florence in 2018, Governor Cooper estimated the storm damage at almost \$17 billion.² Of that, private insurance is estimated to cover \$4.8 billion in losses.³

For poorer communities, such as those in eastern North Carolina, floods hit harder, according to a recent joint report from a risk-management/insurance company and climate change and risk policy groups.⁴ The communities are usually closer to landfills, hazardous waste sites, or other sources of pollution, and they often cannot afford to rebuild rapidly, making them more vulnerable to floods.⁵

Several factors are contributing to the exacerbation of flooding damage and complicating disaster planning as well. Scientists agree that: “warming ocean temperatures and higher sea levels are expected to intensify [the impacts of hurricanes].”⁶ This complicates municipal planning and heightens the risk and uncertainty of each potential flooding event. Some efforts to predict flood occurrence and prioritize mitigation areas have been made more difficult by exponentially erratic weather patterns, because much of the flood frequency statistics used to determine pre-disaster planning are based on past rainfall data, “which may no longer be relevant in our new and quickly changing climate.”⁷

¹ “The National Flood Insurance Program,” *FEMA*, 26 Jul 2019. <https://www.fema.gov/national-flood-insurance-program>.

² Bonner, Liz. “More big hurricanes are coming, and North Carolina needs to prepare, a new report says,” *The News & Observer*, 23 Apr. 2019. <https://www.newsobserver.com/news/politics-government/article229579694.html>.

³ *Ibid.*

⁴ *Ibid.*

⁵ *Ibid.*

⁶ “Hurricanes and Climate Change,” Center for Climate and Energy Solutions. <https://www.c2es.org/content/hurricanes-and-climate-change/>.

⁷ Dorothy, Olivia. “Floods on the Upper Mississippi in 2019,” *American Rivers*, 14 May 2019. <https://www.americanrivers.org/2019/05/life-on-the-upper-mississippi-in-2019/>.

Another factor leading to escalated flooding damage, especially in North Carolina, is the historical shift in the geographical location of the population in the U.S. toward the coasts. According to the U.S. Census Bureau, the number of people living in coastal areas in North Carolina increased by 508,000 people (114.4%) from 1960 to 2010, and currently, “between 32,000 and 260,000 single-family homes are at risk of damage from storm surge in North Carolina.”⁸

For most residents, homeowners and renter’s insurance will not cover flood damage. The National Flood Insurance program is meant to offer coverage for the people who live in these high-risk flood zones, but, according to FEMA, in North Carolina over twenty-percent of insurance claims from flooding are filed for properties that fall outside of the designations for high risk flood zones.⁹ Some blame outdated and unreliable flood risk maps for this phenomenon.¹⁰

ii. Flood Mitigation Efforts

The above factors demonstrate the accumulative costs that flooding has on communities, both for governments and individuals, and the significance that adequate, active flood prevention or mitigation can have for North Carolina’s communities.

The aforementioned joint report identified Norfolk, VA and Charleston, SC as being better prepared for sea level rise than North Carolina,¹¹ which could have tangential lessons for flood mitigation. For example, one case study in South Carolina capitalized on a riverside conservation strategy as a secondary effect of the FEMA federal buyout program.¹² The land identified through a municipal, federal, and nonprofit partnership was transferred to a national wildlife refuge for management to; “return[] the land to a natural state and benefiting the floodplain.”¹³ In addition to environmental benefits, the counties involved also lowered flood insurance rates for their residents by removing people from high-risk areas and thus improving their national flood insurance program rating.¹⁴ This also permitted the counties’ residents to reduce disaster-response expenses while returning the land to its natural ecosystem function.

Pre-disaster flooding projects can often significantly reduce the impacts and costs associated with flooding damage. However, there is a wide range of mitigative solutions, and some can be extremely costly. The traditional structural solutions for addressing flood risk, like levees, dams,

⁸ “Fact File: North Carolina hurricane insurance,” *Insurance Information Institute*, 2019. <https://www.iii.org/article/fact-file-north-carolina-hurricane-insurance>.

⁹ “The National Flood Insurance Program,” *FEMA*, 26 Jul 2019. <https://www.fema.gov/national-flood-insurance-program>.

¹⁰ Keller, Michael et al. “Outdated and Unreliable: FEMA’s Faulty Flood Maps Put Homeowners at Risk,” *Bloomberg*, 6 Oct 2017. <https://www.bloomberg.com/graphics/2017-fema-faulty-flood-maps/>.

¹¹ Bonner, Liz. “More big hurricanes are coming, and North Carolina needs to prepare, a new report says,” *The News & Observer*, 23 Apr. 2019. <https://www.newsobserver.com/news/politics-government/article229579694.html>.

¹² Jöbsis, Gerrit. “WACCAMAW RIVER COMMUNITIES ARE ADDRESSING FLOODING,” *American Rivers*, 12 Sep 2019. <https://www.americanrivers.org/2019/09/waccamaw-river-communities-are-addressing-flooding/>.

¹³ *Ibid.*

¹⁴ *Ibid.*

bulkheads, and seawalls, are seen by many to exacerbate flood damage severity,¹⁵ and more natural mitigative measures, such as stream restoration, are increasingly preferred. These measures may not be covered within established state and federal budgeting, however, as bridge or levee infrastructure projects might be, and thus represent an additional cost for local governments. To address the cost of all of these valuable pre-disaster measures, there are a number of federal grants that eliminate or share the cost burden which states and local governments can utilize to accomplish flooding mitigation projects.

iii. Federal Funding Programs

Federal grant programs have been developed to help local governments address these issues in uncertainty and designing appropriately adapted management plans by providing varied financial assistance programs for different project types. Some grant programs, such as FEMA's Pre-Disaster Mitigation Grant Program (PDM),¹⁶ attempt to apply preventative solutions on the ground to lessen the damage that communities suffer from flooding, while others, such as the FEMA federal buyout program, attempt to relocate people and residences out of high-risk areas to minimize the damages that a flood may impose on individual residents or businesses.

In terms of potential grant programs, the federal government offers a number of options for funding states or local governments in disaster-related projects. A summary of federal funding sources from the Naturally Resilient Communities partnership¹⁷ is included below:

- FEMA Hazard Mitigation Grant Program – funding only for Presidentially declared disasters; allows for home elevations, buy-outs, and others.
- FEMA Pre-Disaster Mitigation Grant Program – helps communities prevent damage before disasters happen. Activities can only be funded if they are included in a Hazard Mitigation Plan, but funding can be applied to planning and project-based activities.
- FEMA Hazard Mitigation Assistance, Climate Resilient Mitigation Activities – hazard mitigation assistance, whether via the HMGP or the PDM programs, directed at reducing the impacts of climate change, with a special focus on flooding and droughts.
- HUD Community Development Block Grant – Disaster Recovery Program – funding for low- and moderate-income communities to help recover from disasters. The funding is only available after a Presidential disaster declaration but can be used to promote more resilient communities through buyouts, watershed protection, restoration, planning, etc.
- NOAA Regional Coastal Resilience Grants Program – applicable to nonprofit organizations, higher education institutions, regional organizations, private entities and local/state/tribal governments that work toward resiliency strategies for land and ocean use, disaster preparedness, environmental restoration, and hazard mitigation projects benefiting coastal communities.

¹⁵ “How does river restoration reduce flood risk,” *European Centre for River Restoration*, 2014.

<http://www.ecrr.org/RiverRestoration/Floodriskmanagement/tabid/2615/Default.aspx>.

¹⁶ “Pre-Disaster Mitigation Grant Programs,” *FEMA, U.S. Dept. of Homeland Security*. <https://www.fema.gov/pre-disaster-mitigation-grant-program>.

¹⁷ “Funding for Nature Based Solutions,” *Naturally Resilient Communities*. <http://nrcsolutions.org/funding/>.

- NOAA Regional Coastal Ecosystem Resiliency Grants Program – specifically focused on promoting resilience of coastal ecosystems, largely through coastal restoration activities.
- U.S. Department of the Interior’s Fish and Wildlife Service, Coastal Program – tax revenue from hunting, boating, and fishing reinvested in conservation and coastal wetland ecosystems, centered on mitigating flooding and increasing water quality, for restoration and protection of coastal wetlands, among other projects.

Determining the barriers that seemingly prevent municipalities and the state from fully utilizing the available funding sources to implement ecosystem-based pre-disaster mitigation projects is the imperative first step. Once addressed, EDF and partners can begin the process of taking steps to lower those barriers and facilitate better flood damage prevention for communities in North Carolina and lower costs for North Carolina’s residents.

III. Data Collection Methodology

The methodology for analyzing which aspects of the federal grant process municipalities felt created barriers to accessing federal funding focused primarily on qualitative data. Due to the emphasis on *perceptions* of barriers, it was important to acknowledge in the project design that qualitative data collection and analysis would encompass perceptions of reality better than quantitative analysis of aspects of municipal departments, budgets, statistics about mitigation projects implemented, or other statistics.

Given this decision about qualitative data collection, traditional statistical analysis would be largely unhelpful for deriving meaning from responses. Instead, analysis relied primarily on basic county census information and coding of interviewees’ responses to survey questions. The value of responses collected allowed for a full exploration of potential solutions that EDF could employ to lower the barriers for municipalities in accessing federal funding.

i. County Selection

At the scale most relevant to using federal funds for flood mitigation measures, counties were selected, in lieu of towns or cities. The intent in the county selection approach was to blend random selection within a stratification of select counties based on overall size metrics with a preference for flood-affected counties and counties in the eastern portion of the state.

Out of all possible 100 counties in North Carolina, a total of 56 counties were initially selected from the National Flood Insurance Program’s list of North Carolinian counties affected by flooding events in some capacity within the past few decades. From that master list, data on the county’s area and population size were each assigned a value between 1-4 based on their ranking in each quartile for that respective metric, with 1 being the lowest population or smallest area quartiles and 4 being the highest population or largest area quartiles. This resulted in each county having two scores, which were added to comprise a final score between 2-8, with 2 being the lowest possible score from having both the lowest population quartile score and smallest area quartile score and 8 being the highest possible score from having both the highest population quartile score and largest area quartile score.

The total number of counties with each respective score were tallied. Out of the total 56 counties identified, the tallied numbers of counties per score value were used to calculate the percent that each score represented. To initially keep the number of contacted counties within a manageable range for analysis, the list was limited to 20 counties. Therefore, the percentages were used to loosely calculate how many counties from each metric score should be selected.

The meta-county information used to calculate an evenly distributed selection is included below:

Table 1: Metric scoring of included counties

County Score	Count of Counties	Percent of Total	Number to Select
2	7	0.13	2
3	8	0.14	3
4	6	0.11	2
5	9	0.16	3
6	9	0.16	3
7	12	0.21	5
8	5	0.09	2
Total	56		20

Specific counties from within each score metric were randomly selected for inclusion. Once the counties were selected, their associated information for contacting relevant decisionmakers was collected, along with the apparent size of the department as implied by available information, which will be used in the *Correlations between County Responses and Characteristics* section below. The county’s director of the planning or emergency management department, or closest equivalent, was chosen as the primary contact for interviews. The majority of these departments were also titled with topics like community development, zoning, inspections, land use, etc. In most cases, requests for interviews were made with the Planning Directors, though a few were made with Chief Engineers or passed along to other administrators.

Of the 20-county master list, within a week of the original interview requests, the initial response rate was 35% or 7 out of 20 counties. The desired response rate was closer to 50%; therefore, a secondary tier of county selection was created to increase the total number of counties surveyed and thus increase the number of responses. To select additional counties, the original NFIP master list was used, with several chosen from each scoring group.

The basis for this second-tier selection was biased towards counties that were coastal counties not included on the initial list that, due to their proximity to the eastern coast, had a high likelihood of having experienced flooding issues. This biased selection was used to increase the likelihood of generating useful insight into difficulties with accessing federal funding from municipalities who have had experience with flooding, especially given that several counties had already responded negatively regarding encountering flooding issues or facing barriers in accessing federal funding. Based on this process of adding exclusively coastal North Carolina

counties, 11 counties were added to the contact list, bringing the total number of counties surveyed to 31.

ii. Interviews

Interviews were conducted on the phone and by email when responses were not obtained through phone calls. Calls followed a basic form of three main questions with a series of follow-up questions dependent on the responses. The purpose of the brevity and *ad hoc* tailoring of the questions was to allow space for the respondent to offer their opinions or ideas outside of the initial material. In this type of data collection, it was less important to use a strict question framework meant to produce identically structured responses. Instead, it was much more relevant to have respondents introduce their own experiences with federally funded flood mitigation projects in order to address the actual experiences on-the-ground of municipalities. Also, there are multiple types of grants and types of projects that those grants fund; therefore, more open-ended questioning would not bias any responses by offering only a set list of options from which to select.

For phone interviews, the respondents were given a brief description of the project describing the intent to understand barriers for North Carolinian counties to federal funding for flood mitigation. They were informed about the scope of the project and then asked for a few minutes for questions. The questions asked followed a general format with three main questions and a number of follow-up questions to supplement. More often than not, respondents provided answers to follow-up questions within their original answers. The question format was as follows:

1. Does your county deal with flooding issues?
2. Has your department or county ever implemented flood-related projects?
 - a. Has your department or county used federal funding for flood-related programs?
 - i. What were the projects?
3. Have you applied for federal grants for flood mitigation projects?
 - a. (If applicable) Why not?
 - b. What is the biggest roadblock for your county that you perceive in applying for flood mitigation funding?

The answers were attributed anonymously, to maintain confidence with respondents and allow them to speak freely about the challenges their counties faced. The answers retained association with the general characteristics of the counties, however, for reasons of analysis.

Answering machine messages were left in the cases where phone calls were unanswered, with a brief description of the project, information to return the call, and notice that they would likely be contacted again. The initial response rate was only 15%, with one returned call. To supplement the low response rate, follow-up emails were sent to all those contacted. The emails contained a simple introduction and acknowledgement of the previous phone message. It closed with contact information, including the option to email or call with responses to the enclosed questions.

For interviews conducted through email, the questions were streamlined as follows:

1. Has your county had serious issues with flooding?
2. Has your department or county ever implemented flood-related mitigation projects? Did you use a federal grant program?
3. What is the biggest roadblock for applying for (more) federal flood mitigation funding?

As stated in the *County Selection* section above, the total response rate after the initial round of contact was 15% by phone, and 35% total for phone and email responses. For the additional contacts made for the second round, the response rate was 25%, bringing the total overall response rate to roughly 31%. This number was similarly below the initial goal of 50% responding, but, considered out of an original total of 20 counties, the 10 county responses amounted to relatively 50%.

IV. Interview Responses

Responses varied widely in content and context. The responses were coded and narrowed in terms of general categorical response. Some of the responses were easy to code, such as a simple dichotomous response to whether the county experienced serious issues with flooding. Others, such as which barriers were perceived in accessing federal funding, were more difficult to separate into a limited number of distinct response classes, due to the intentionally open-ended nature of that question. In reality, however, even the simple, dichotomous questions elicited multi-tiered, at times contradictory, responses.

Furthermore, the response coding was also used to maintain the anonymity of the counties, as mentioned above. A sample of county responses is included below:

Table 2: County responses to interview survey questions

County	Flooding?	Funding?	Project Type	Barrier	Reason
(redacted)	Y	Y	Mitigation	Staff, Money	Low administrative grant funds
	Y	Y	Buyouts	Staff	
	N	Y	Buyouts	Staff	Revolving FEMA employees
	Y	Y	Buyouts	NA	Flood ordinance
	N	N		NA	
	Y	Y	Buyouts	NA	Not an issue recently
	N	N		Money	Need discretionary funding
	Y	Y	Buyouts, Mitigation	Time	Need study/design funding
	Y	Y	Buyouts, Mitigation	Time	Cumbersome, applicants withdraw before funding
	Y	Y	Buyouts, Mitigation	Time, Money	Timeline too long, reimbursements

i. Flooding

The majority of counties contacted acknowledged having some level of damage from flooding within the past few decades. The range of frequency and severity with flooding issues varied widely. Seven counties reported having consistent, even severe damage to property and houses from flooding within the past decade. Two of these acknowledged issues with flooding from some of the bigger, recent hurricanes that left houses and properties damaged. One county specifically noted that, though flooding was not a significant issue in the past, there was increasingly an issue with flooding due to hurricanes within the last decade.

On a more granular level, one county specifically broke down the three main types and sources of significant flooding that they experience. Two sources were major rivers that accounted for the majority of flooding incidents experienced within the past decade. The county identified the Atlantic Ocean and Intracoastal Waterway as sources of flooding as well.

The responses from the eastern and coastal counties included threats from hurricanes and damage caused by proximity to the ocean, as well as flooding caused by overrun rivers. Counties that were more inland clearly focused more on issues with river flooding, though they similarly noted major flooding from hurricanes in the past decade.

There were three counties that reported having not had significant issues with flooding in their counties, though through further explanation, these responses were qualified. As a point of clarity, one county responded that flooding was not an issue to the best of the director's knowledge. Another qualified that, compared to the notoriety and high severity of flooding issues they encountered while working in another state, their county did not have significant flooding issues. One county director responded that they did not have issues with flooding, but later clarified that they did not have *severe* issues with flooding, meaning that they had incidents of flooding that did not have impacts on housing. To further clarify, this respondent later mentioned that there may have been property damage from the flooding that resulted from Hurricane Florence but no significant damage to houses.

Clearly, by this means of clarification, one cannot correlate these negative responses to whether a county has had issues or damage from flooding with the absence of actual flooding issues. The negative responses typically seemed to leave open the possibility of historical or less severe or damaging incidents of flooding. This fact of potentially inflated negative responses regarding flooding incidence in North Carolinian counties is relevant when considering the two succeeding general questions about whether these counties used or did not use federal funds for mitigation projects and what their perceived barriers to funding access were.

ii. Type of Projects Pursued

Overall, the most common type of federal funding identified was Hazard Mitigation Grant Program (HMGP) funding. As outlined in the *Federal Funding Programs* section above, HMGP funds federal buyouts, home elevation, and other measures. Two counties also identified several other funding programs accessed, like Flood Mitigation Assistance (FMA), Pre-Disaster Mitigation (PDM), and Community Development Block Grants (CDBG).

Buyouts

The most commonly identified type of federally funded flood mitigation project utilized by counties was the FEMA federal property buyout program, with five out of ten counties citing this as their singular or primary type of federally funded project. One county even reported having established a hurricane recovery office that partially assisted residents whose properties suffered repetitive losses from flooding incidents with the buyout program funded by FEMA. The mechanics of the FEMA buyout program are outlined briefly in the *Flood Mitigation* section above. The popularity of this response is unsurprising given that this program is the most well-known type of federal flood mitigation funding.

Despite the plethora of federal funding options outlined in the *Federal Funding Programs* section above, the majority of people are most familiar with the buyout program, most likely because it has the most direct interface with homeowners than other forms of mitigation. In the federal property buyout program, the county takes the lead on proposing a conglomeration of damaged or threatened homes and properties within flood risk areas to be considered for a buyout, thus the majority of homeowners, especially in flood-prone or high flood risk areas, are likely familiar with the program. Other mitigation efforts tend to be on-the-ground projects that, while visible to county residents, are not as resident-interfacing as the buyout program.

In addition to more notoriety and personal interface, federal buyouts are more clearly linked and associated with flood response than some other efforts, and they tend to have relatively high success rates in terms of minimizing future property damage for county residents. The logic behind this is clear: federal buyouts are used to remove people and homes from properties that have been damaged or are at evident risk of damage. Moving people and property out of designated flood zones is a very direct way of minimizing the amount of financial damage caused by flooding events. Additionally, the federal buyout program can often be implemented as a reactive measure, identifying properties after they have suffered damage and moving people to prevent future damage; therefore, its perceived success rate is high.

One county was specific in pointing out, however, that there are certain drawbacks to the federal buyout program as well, at least as a large-scale solution. From a municipal standpoint, despite the assurance of permanently removing people from risky areas, buyouts can have economic consequences for the overall municipal budget. When residents are removed and relocated through the federal buyout program, their property is most often turned into greenspace due to the development restrictions placed on the property. Although the development restrictions make sense in the logic of buying-out the rights to build on high-risk properties, the consequences of converting to green or open space is that the town or county can no longer collect property tax from that property, thus shrinking their tax base and municipal revenues.

The same county put forth that the most obvious solution to this issue would be to incentivize or encourage removed residents to relocate within the county. Although this would not prevent the number of taxable properties from decreasing, it would at least ensure that it was not doubly shrinking from losing both taxable property and residents to pay taxes. However, the county noted that this can be a big challenge in counties already dealing with housing supply shortages and is only useable as a mitigative tactic as long as there are qualifying properties to buyout.

Mitigation

Whereas buyouts are seen as a definite solution to moving people and properties out of harm's way from flooding, there were efforts mentioned by two counties that were meant to mitigate the damage from flooding. Some of the funding was used for housing alterations or repairs, commonly in the form of home elevation. This is, similarly to a buyout, a measure of flooding response meant to lessen the damage to personal property by physically moving the people and property at risk. Home elevations are logically more palatable for individual property owners than having to relocate through the buyout program. The tradeoff, however, is that home elevations are only successful at protecting property if they are elevated *enough* to avoid subsequent damage. Therefore, there is a smaller concession but also smaller risk reduction.

Two counties acknowledged having accessed federal and state grants for mitigation-related projects. Some referred generally to the funding sources, while others were much more specific, for example citing funding through their Soil and Water Conservation District from the Emergency Watershed Protection (EWP) Program in the Natural Resource Conservation Service of the USDA. This funding was put to work on a project that removed vegetative debris that had accumulated due to storm damage from watersheds and other water systems. This same county also mentioned that they are in the process of beginning a larger EWP project to similarly remove debris, downed trees, and sediment buildup resulting from Hurricane Florence.

Ultimately, the majority of mitigative measures mentioned by county personnel, whether being relocation or augmentation, appeared to largely be reactive responses to remediate issues and prevent further damage. Another school of thought in the mitigation space is to implement proactive, preventative measures that lessen the impact and effects of storm surges rather than address the damage and after-effects. These are more related to natural augmentation strategies like river restoration and the vegetative debris removal mentioned above.

iii. Barriers to Accessing Funding

Barriers to accessing federal funding for county flood mitigation projects fell generally into three overarching categories, though the specifics of the barriers differed widely within these categories. The three generalized categories of barriers were staff, time and money. Also of note, four counties claimed to not encounter barriers in accessing federal funding. For three, they claimed that flooding was not an issue or had not been an issue recently. Therefore, they assumed that they did not need to access federal grant funding, despite at least one of those counties having used federal funding for property buyouts in the past.

Given that at least one of the counties responding negatively to facing barriers had also responded positively to having flood-related issues and to utilizing federal funding for flood mitigation projects, the results may have been returning a "false negative" of sorts. In this case, the county respondent noted that flooding had not been as significant of an issue recently, and thus that individual could not recall accessing federal funding or facing specific barriers, even though federally funded mitigation projects had been implemented in the county previously. It is possible, though not inherent, that their predecessor did encounter barriers to accessing federal funds for the projects implemented. Unfortunately, no solid conclusion can be drawn from the information available.

Furthermore, two counties responded that they did not perceive barriers to flood mitigation projects, despite having implemented federally funded projects. In these cases, the only type of federally funded mitigation project recounted was the federal buyout program. As mentioned in the *Types of Projects Pursued* section above, buyouts typically seem to be the most well-known type of federal flood mitigation. Although the actual decision process about when to accept a property for buyout relies on a complicated cost-benefit analysis,¹⁸ the perception of its process is that it is more straight-forward than indirect projects like stream restoration or living shorelines. Perhaps due to its familiarity and palatability, counties are better prepared for utilizing the HMGP for federal buyouts and thus do not perceive barriers to the same degree as with other types of grants.

Staff

Three counties responded to questions about the barriers preventing them from accessing federal funding grants for flood mitigation projects with the explanation that their overall or grant-specific staff was too limited to easily complete the process of grants and project implementation. These responses varied in terms of identifying where in the overall process the limited staff became most relevant. For example, one respondent identified a lack of full-time engineers and grant writers as their biggest roadblock in accessing federal funding. Another county's Emergency Management coordinator noted that they lacked trained personnel at the county level to manage grants, which led them to contract out their grant paperwork to private contractors.

On the agency side, one county mentioned that the consistent changing of FEMA employees due to the revolving nature of their position made it difficult for county employees to access federal funding. They said that the county would consistently begin to build rapport and a relationship with a certain employee involved in the grant application or oversight position, which would facilitate the grant application process. However, shortly, the employee would be rotated out, and the county would have to start fresh in building trust and relationships with new FEMA personnel. Although the grant processes do not change depending on the FEMA employee in charge of an application, due to the sometimes-cumbersome nature of the grant process, it can still very much benefit a county to have a working relationship with grant makers to facilitate the process in any way.

Time

In a similar sentiment, two respondents mentioned specifics about the timeframe as a major barrier in accessing federal funding. One county respondent identified the biggest roadblock as the application and approval process. They noted that the timeframes in which to apply are very short, which is especially an issue when grants for projects require approval from a Board of County Commissioners, particularly in the case of matching local funds. Additionally, the waiting time after an application has been submitted can be very long. For residents awaiting assistance or action in the wake of a flood, any delay can be significantly detrimental to them physically and economically. Unfortunately, this can reflect on the county departments and decisionmakers themselves due to the political unpopularity of delaying emergency responses.

¹⁸ "FACT SHEET: Acquisition of Property After a Flood Event," *U.S. Dept. Homeland Security*, 13 Nov. 2018. <https://www.fema.gov/news-release/2018/11/13/fact-sheet-acquisition-property-after-flood-event>.

Another respondent thought that, though the application process is cumbersome, they were largely able to complete the application. The issue with the timeframe came more into play during the project implementation phase. In the county director's view, the implementation of grants and projects is very time-consuming and led many applicants to withdraw before the funding was ever available. The time requirements for having the projects designed and ready for bids prior to approval can also be infeasible, according to at least one county. Also, because the grants accessed do not allow work on-the-ground for projects to start until the grant application is approved and the contracts signed, any work that is started before the final approval cannot be reimbursed by the federal funds of the grant allocation.

Money

Three counties out of the ten responding mentioned overall or additional costs as a major component in creating a barrier to accessing federal funding for counties. For example, one county mentioned, as above, that federal funding is often allocated as a reimbursement for projects, meaning that a county may be largely responsible for funding a project initially. Depending on the timeframe of the grant process, which, as stated above, can be fairly long, county budgets that are already constrained may not be comfortable with the additional burden that some programs entail. As also mentioned above, the timelines for some projects, including the design and bid phase through to on-the-ground implementation, may not be quick enough to allow time to wait for grants to process in the context of an emergency. This may cause counties to begin the process of responding to emergency needs with their own funding if federal grant applications are taking too long, which is money for which they are ultimately not reimbursed.

This is also likely a factor in shaping which projects counties pursue. Because programs like the federal buyout partial funding program only requires the disbursement of funding when homes have been identified and acquired, they do not put counties into situations where they may have to cover expenses before the funding allocations have been secured. On the other hand, for more structural or natural mitigative efforts, due to the additional planning phases and often the need for counties to spend time to approve plans prior to submission for funding, they are seemingly more likely to require a county to extend funds that may or may not be covered by the final federal funding allocation.

Even one county that initially claimed not to experience barriers in accessing federal funding for flood mitigation projects felt that funding allocations were too restrictive to be fully useful. One county commented that federal funding would be better if more funds were allocated as discretionary funding to cover unexpected or administrative costs. Given that the purpose of federal grant funding is to cover or share coverage of the costs associated with municipal projects and alleviate financial burdens for smaller-scale governments, being too restrictive in funding timing or use, while possibly meant to maintain project integrity, seems to actually serve to dissuade counties from attempting to get any funding for projects at all.

The three identified categories of barriers are clearly inherently tied. Staff is limited by the ability of a county department to hire and pay people. The amount of time that an employee has to dedicate to grant applications is a direct effect of the number of employees directed or qualified to manage applications. The amount of money a department can pay for outside contractors to complete grant applications or its ability to cover the upfront costs of a project while awaiting reimbursement can determine the severity of the impediment caused by lengthy

timelines. Ultimately, any approach EDF takes in addressing barriers will likely need to combine solutions from each category.

iv. Correlations between County Responses and Characteristics

In reintegrating previously collected data into the coded interview responses, certain correlations can be observed. The previously collected data here refers to the county-specific size and population information identified and information about the assumed size of a county’s related department noted in the *County Selection* section above. This was matched with an abbreviated version of the counties’ responses, a sample of which is shown below:

Table 3: County characteristics and responses

County Score	Dpmt. Size	Flooding?	Funding?	Barrier
3	1	Y	Y	Staff, Money
3	3	Y	Y	Staff
5	5	Y	Y	NA
6	5	N	N	NA
7	2	Y	Y	NA
8	14	N	N	NA
5	14	Y	Y	Time

Even from this smaller sample, certain correlations immediately appear. For example, the two counties with the lowest county score, meaning smallest population and area, were also the two counties shown that cited small staff as a major barrier to accessing federal funding for flood mitigation efforts. Conversely, the counties with the highest scores claimed to not face barriers in accessing federal funding. The trends with department size are somewhat less adhering to size-dependence, though two of the smaller departments cited staff shortages as a barrier, while the larger listed departments from the sample did not cite staff size as an issue.

As expected, this seems to imply that smaller counties, and especially smaller departmental staffs, that face issues from flooding are primarily finding staff limitations to inhibit their ability to maximize federal funding opportunities. On the other hand, one of the largest county departments noted that timelines were a major barrier in accessing funding. Having adequate staff may still not be able to alleviate the barriers from having to track, plan, and align projects on a cumbersome or stunted timeline.

The concepts uncovered in this correlative analysis are neither novel nor unexpected. However, they can serve to allow EDF to proactively offer tailored services to counties based on their general characteristics or based on communities EDF chooses to prioritize. These trends are likely to track across different states as well, so EDF can expand its provision of chosen solutions across coastal regions nationwide.

V. Potential Solutions

Given the specific challenges that counties in North Carolina are facing in accessing federal funding for flood mitigation projects, EDF has the potential to offer possible solutions for municipalities by intervening with resources, planning, and partnerships to address different barriers from multiple angles. As a preliminary disclaimer; some of these proposed solutions or aspects of them may be outside of the purview or mission of EDF. These solutions are aimed at addressing the core of identified county barriers, but they are also designed to be broad and loose enough in structure to be widely applicable or malleable for different types of implementers or applicable in multiple situations. Ultimately, EDF can choose to partner with appropriate actors to implement solutions or pass along the loose conceptualizations of certain projects to other organizations or actors who may be interested in carrying them out.

The major places for intervention that EDF can consider are either in trying to change the rules and practices from the federal agency side in order to alleviate pressures and challenges to municipalities. The thrust of any efforts here would clearly be legislative advocacy or other methods of petitioning for rule change. On the other side, EDF can offer support to towns and counties themselves to aid them in overcoming identified barriers to federal funding access. In this case, support could take the form of creating or facilitating the use of tools or resources aimed at reducing identified barriers.

Partners

In any type of chosen assistance, EDF also has the option of involving standing or new partners in collaborating on service provision or coalition building. Partnerships could be utilized to help cover specialty knowledge areas or extend audience outreach beyond the spaces that EDF currently occupies. EDF could chose to pursue any combination of three main types of partners: non-governmental and non-profit, governmental, or for-profit entities.

Non-profits and NGOs would be the traditional partners for EDF to pursue on this issue. Specifically, organizations working in the flood mitigation and emergency response or prevention field could be strong potential partners due to their closely aligned areas of expertise and likely established networks with municipalities and other organizations in this space. EDF could also pursue partnerships with more broadly missioned non-profits and NGOs involved in environmental or municipal-focused areas. These partnerships can be fruitful for both sides, since EDF can offer the resources of a nation-wide environmental institution and opportunities to participate in innovative solutions for municipal funding access in return for local-level access.

EDF will likely find easy partnerships with the municipalities in need of assistance; however, there is also potential for EDF to form partnerships at both the state and federal levels as well. If EDF chooses to spend time and effort attempting to lobby for changes to the flood mitigation and planning or grantmaking process or focus, then they would clearly need to engage federal-level lawmakers and agencies. However, they could also choose to engage in softer style reform by forming partnerships with federal agency personnel that could be leveraged to implement tools or strategies that EDF believes could alleviate some of the barriers to municipalities in accessing federal funding for flood mitigation projects largely or for specific projects that have external environmental benefits that are of particular interest to EDF. They could initiate similar

partnerships at the state level with similar objectives, though the exact mechanisms will likely differ.

However, it could also be interesting for EDF to explore innovative partnerships with other types of stakeholders in providing the advocacy or resources for municipalities to overcome barriers to flood mitigation funding. For example, EDF could test the waters in forming collaborations to address some of these barriers with corporate partners. The actual solutions developed and the strategies behind them would have to navigate a complicated series of legal pathways and social or governmental perceptions of corporate intent. This report will not examine this option in terms of specifics, but, theoretically, the solutions outlined below could be tailored to fit potential corporate partnerships for EDF.

i. Time

A major barrier in the federal funding allocation system is the amount of time needed to navigate and access grant funding, as counties noted above. Some counties said that, in general, the process is cumbersome and lengthy, even to those that found it comprehensible or who had specialist staff dedicated to grant applications. Others found that the time windows for submitting approved plans were too short to accommodate design, bidding, and the municipal approval processes. Addressing issues of either lengthy timelines or short time windows is perhaps the most complex out of the barriers identified by North Carolinian counties. Dealing with the barrier of time is also difficult to address in isolation, since staff shortages and budgetary constraints are inextricably linked and often tie into issues with time.

In most cases, the timelines of the different grant processes themselves are set from within the agency. Therefore, in deciding resource allocation, EDF can choose to focus its efforts, resources, partnerships, etc. on changing the federal funding application and allocation timelines or on directly assisting municipalities by alleviating the time burden for towns and counties. In the case of the former, EDF can rely on lobbying and other procedural means to achieve changes in the flood mitigation grant programs at the federal level. In the case of the latter, EDF could opt to provide services and tools that facilitate the federal grant application processes, thus alleviating some of the time and knowledge constraints that might be affecting counties' abilities to access federal funding.

One example of a tool that EDF could provide to municipalities to partially alleviate time constraints could be a tracking platform that is able to hold and manage the timeframes of multiple applications for multiple grants. Ideally, in order to address the issue of cumbersome, the platform could include imbedded data for all possible federal funding mechanisms and project types, provide easily recognizable indicators for steps in the grant timelines, and perhaps even have the potential to auto-submit complete grants or grant components when they are due.

Another timing barrier in need of a potential solution is the perception that the different grant timeframes are too short to accommodate the steps necessary to fully plan and implement different mitigation projects. To address this, EDF could consider using their resources and partners to assist municipalities in the preparatory stages of project implementation to facilitate

getting projects to the funding stage. Identifying the main cause of timing delays is essential to determining where best to allocate resources to each municipality.

For example, the bulk of time could be lost due to municipalities spending a lot of time reviewing project bids and waiting for the town and/or county to approve them because they have to review all of the aspects of each project and do not have a streamlined process for doing so. If EDF could prepare either educational materials or perhaps municipal assistants that can help to outline project characteristics or components that would satisfy grant requirements, as well as fit within municipal legal frameworks, beforehand, this could potentially help eliminate time spent later in the process. Additionally, EDF or their partners could provide technology for or work with municipalities to develop a schedule that would allow them to process and apply for funding for priority projects, while completing the review and approval steps for other projects that can be queued for the subsequent round of funding allocations.

EDF could also choose to partner with organizations on the flood mitigation implementation side in order to create a resource-base that might decrease the amount of time that employees spend creating contracts or vetting project implementation crews. They could choose to provide a regional listing of vetted potential partners for municipalities that complete some of the projects that require more on-the-ground work or designs. By providing easily accessible options for municipalities to use when deciding if and which federally funded projects to implement, EDF can lessen the time burden and, ideally, expand the options for flood mitigation that cities and counties are considering.

ii. Staff

Three respondents identified a thinly stretched staff and lack of trained personnel as a major barrier to funding access. One director proposed that a larger percentage of the grant awards be dedicated to covering administrative costs, which would likely also require the total grant award to be raised to adequately cover project costs. Another respondent also mentioned staffing availability as a major inhibitor in their federal funding access. EDF could step in at the point of deficiency in staffing by offering a number of potential service gap provisions.

Training

Several counties mentioned that a difficulty they encountered in the application process for accessing federal funding was that they lacked the appropriate staff members to lead the applications or projects. One potential solution that EDF could offer municipalities, either in-house or through partnerships, could be to provide some form of training for county employees hoping to access federal funds. If EDF were to provide training from within their organization, it could range widely in terms of scope and design. The timeframe could be styled as a crash course over the span of a few days to cover the basics of the processes for different types of grants and different types of projects. Alternatively, it could offer a longer-term training program that involves more detail into the variations in grant and project types. Even farther on the in-depth end of the time spectrum, EDF could facilitate comprehensive federal grant training programs for department directors that work more like accreditation and can perhaps be woven into other types of professional training.

With each of these models, EDF could potentially offer their services in-house to provide trainings, either through contractors, interns, or staff who can divert some time to designing and running the programs. However, especially with the more time-intensive or longer-term models, EDF could, rather than designing and offering training in-house, partner with organizations already in the training or grant facilitation space. Whether those partners already offer training or educational materials, EDF could help them develop a more in-depth and hands-on type of educational training and produce and market it on a larger scale.

The tradeoffs in this option are the time spent by county employees in the trainings versus the utility of the information that they could gain through this education. Having increased knowledge of federal-funding-qualifying flood mitigation projects could, for example, improve the ability of county staff to identify worthwhile projects or bids and allow them to expedite their considerations of different projects. Deeper dives into different types of flood mitigation projects could allow them to set priorities as a county to focus more on a certain type of project, which could allow them to streamline their search process or expedite certain potential applications that fall within their prioritization.

However, given that at least one county noted that they felt relatively comfortable with the grant application process overall, it is possible that a general training for flood mitigation project types and federal funding options might not add much to the county's knowledge base. Moreover, if the lack of trained and specialized staff within a county department is a function of a department not having adequate funding or the time to train employees, then an EDF-sponsored training could be useful. However, if the lack of training is due to a lack of time on the part of the department employees themselves, then offering assistance in the form of an additional time commitment may not be as useful.

Revolving Employees

A response to identifying barriers to federal funding access also identified a lack of consistency in FEMA employees. This was communicated as being due to the revolving appointments that many of them serve, which reportedly lead to consistent turnover in the contacts that longer-term municipal employees make over the course of filing grant applications annually. Although consistent contacts are not necessary for successful grant applications, given the number of other challenges that municipal employees face, having established relationships within the federal granting agency could certainly help.

Clearly, EDF cannot change the revolving appointment systems within FEMA or create permanent positions. However, EDF could potentially serve in this gap of employee relationship continuity by providing or partnering to provide a liaison between municipalities and FEMA granting departments. The role of liaison would be to establish a consistent relationship with county departments, as well as to be knowledgeable and experienced enough in the grantmaking and grant application arena to be able to facilitate data and information transfers between the two parties, within legal constraints.

Another possible solution to this specific barrier could be to take a deeper look at the root of why revolving employees causes counties to feel that they are less able to access federal funding for flood mitigation projects. The respondent that introduced this concept explained that having rapport and a built relationship with the employees was better, but this could still be due to an

underlying difficulty experienced by the municipality that seemed to be alleviated by consistency. EDF's role in this case could be to help the municipality identify the underlying barriers and steer them toward the appropriate solution.

iii. Money

Lastly, a number of counties mentioned costs as a major barrier to their accessing federal funding. Again, as with barriers from timelines, EDF can choose where best to invest their time and effort. EDF could choose to lobby for agency rule changes that reconfigure the funding allocations in either amount or categorization. On the side of the municipalities, EDF could provide their own type of stopgap grant funding or partner with organizations that provide easily accessible grant allocations for counties to access to cover the gaps in funding.

Administrative Funding

One of the types of costs that counties reported encountering as a barrier to accessing federal funding was in administrative costs. This was partially mentioned in relation to issues with staff shortages, since restricted personnel and additional administrative costs often prevent the grant applications for federal funding from ever being completed.

One respondent proposed that the federal grant allocations should specify a higher percentage for administrative costs within their awards. In order to achieve this, EDF could choose to lobby for changes in the structure of grant allocations, though to ensure no sacrifice to funding for the project implementation phase, any recommendations would likely increase the overall size of the grants. This could have potential consequences that EDF or their partners would have to fully consider prior to choosing.

EDF could, alternatively, choose to provide or partner to provide direct funding for counties to complete grant application materials. This process is likely already available in a number of instances, but EDF could actively identify counties that may need bridge funding or may benefit from accessing federal grants for flood mitigation but are not utilizing them. In the case that counties are unable to cover administrative costs due to budget constraints caused by the reimbursement process, EDF could even partner, possibly with corporations or other types of investors, to initiate impact bonds for flood mitigation projects that would have lower returns in exchange for their environmental benefits, especially in the case of stream restoration or other natural mitigation methods.

As referenced in both the *Time* and *Staff* solutions sections above, there are also tools and resources that EDF can provide to municipalities that will help to alleviate the pressures of administrative budget constraints. For example, providing to municipalities the grant tracking tools or training resources outlined in the sections above would also help to alleviate administrative budget constraints, as long as the constraints are driven by the lack of time and resources.

Design Phase Funding

Another barrier that counties mentioned for accessing federal funding is the costs of design and planning for bidding before the construction phase, in addition to funding for the construction and project implementation phase. One county respondent mentioned that the HMGP program was considering the approach the county designed that would include funding for the study and design phases of the projects specifically related to an application they submitted related to the aftermath of Hurricane Florence. However, the county had not received a response from HMGP at the time of the interview.

EDF could choose to concentrate their efforts on submitting a structural change for funding, much as with the administrative funding solution above. They could also provide the type of bridge funding, as described above, to assist municipalities in covering the costs of planning their mitigation projects. With more funding allocated to the design and planning phases, cities and counties would not have to stretch their resources to be able to fully consider the array of federally funded projects available to them. This is perhaps another reason why the majority of respondents noted having used federal funding for the better-known buyout program and other structural augmentation mitigation efforts, as opposed to the natural mitigative efforts that one county mentioned.

Beyond these options, EDF could also provide a study or resource with predictive metrics that could help towns and counties determine the best fit and likelihood of receiving grant funding. EDF could also provide resources for municipalities to develop more comprehensive flood mitigation plans that are geographically broad and focus on long-term planning. In fact, EDF could use its personal or partner's connections with municipalities to develop regional flood mitigation agreements that allows cities and counties to coordinate their federally funded projects in strategic ways that reduce the burden on any given county. This could potentially reduce the extra financial burden that counties face during the design phase, as well as other phases, and allow them to tailor their flood mitigation projects under the direction of a larger strategic coalition.

Discretionary Funding

More broadly than the previous two types of funding stopgaps, one county mentioned that their biggest barrier in accessing and utilizing federal funding for flood mitigation was that they needed more flexibility in the funding allocations, meaning more discretionary funding. They believed that discretionary funding would be more beneficial to them if they were able to employ one-time or one-off emergency projects in immediate response to flood damage.

As with the other types of grant allocation changes, EDF could choose to lobby for changes in the grantmaking process. However, in this case, as an immediate need, EDF could choose to partner with organizations or, more importantly, partner funders to create an emergency fund for grants for small projects as needed by cities and counties. EDF could have general guidelines for the types of projects funded through this program, which would allow them to provide information on a wider array of project types than counties may be familiar with or have implemented.