(Mis)trusting the Process: How Post-Disaster Home Buyout Processes Can Degrade Public Trust

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Research Article

Keywords: Buyouts, Hurricanes, Local Governance, Recovery, Trust

DOI: https://doi.org/10.21203/rs.3.rs-551738/v1

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Abstract

Federally funded housing buyout programs are the dominant method of government-supported retreat in the United States. Done correctly, buyouts can reduce pre-disaster vulnerability and facilitate post-disaster recovery. However, the success of buyout programs hinges on successful coordination and implementation by local administrators, who represent buyout participants, manage the buyout process at the community level, and connect them to state and federal resources. Because of this, trust between local administrators and the members of their communities is crucial for project participation and successful outcomes. While local administrators play a critical role in the buyout program, their role in building trust throughout the process has been an understudied aspect of the buyout literature. To address this gap, our paper looks at the conditions following Hurricane Matthew's landfall in North Carolina, USA in 2016 through in-depth interviews with 18 local HMGP administrators, and an analysis of over 300 local newspaper articles to analyze how trust is built and lost in the buyout process. Our findings indicate that a lack of program clarity, unclear communication about the program's guidelines across all levels of governments, and extended timeframes deteriorated public trust in a manner that hindered program success and diminished program results.

1. Introduction

After a presidentially declared disaster, the U.S. federal government provides aid and assistance to disaster-affected communities through partnerships with states. One part of the recovery process may include relocating households out of risky areas, which allows for both future disaster mitigation for communities and household-level recovery for residents (Binder, Greer, and Zavar 2020). This is typically undertaken through the provision of federal funding through ‘buyout’ programs, the largest of which is the Federal Emergency Management Agency’s (FEMA) Hazard Mitigation Grant Program (HMGP). This program provides funding to local jurisdictions through state-level governments to purchase significantly damaged homes in the aftermath of disaster declarations from voluntary homeowner participants. Through HMGP, FEMA has helped fund the buyouts of close to 40,000 properties over the last three decades (Mach et al. 2019). While largely considered a cost-saving success (Rose et al. 2007), households are often wary of participating because the buyout process can be lengthy, bureaucratically cumbersome, and lack transparency (Binder, Baker, and Barile 2015).

Scholars and practitioners argue that social trust between households and buyout administrators is a key ingredient to household participation in HMGP, and shapes perceptions and experiences of overall project success (de Vries and Fraser 2007; Perry and Lindell 1997; Saunders and Smith 2020). However, there is scant research in understanding how social trust is gained or lost through the buyout process (Greer, Trainor, and Mcneil 2019). Further, there are limited studies examining the role of local administrators in the success or failure of buyout programs (Sipe and Vella 2014; Smith et al. 2021). To address this gap, our paper examines the role of trust in administering HMGP at the local level, with a focus on the following research questions:
1. What features of the buyout process deteriorate public trust?
2. How is participation in HMGP influenced by the experiences of past programs and how might it shape future programs?
3. What is the role of local administrators and government in building or eroding trust in the buyout process?

To answer these questions, this study analyzes in-depth semi-structured interviews of local administrators who oversaw buyouts in eastern North Carolina following Hurricane Matthew in 2016. In addition, we gathered over 300 newspaper articles related to Hurricane Matthew buyouts from North Carolinian newspapers to understand the disaster recovery context over three years and the public's evolving perceptions of the buyout process.

Our analysis suggests that the program's protracted timeline and the prevalence of misinformation deteriorates local trust, while emotional support and labor by local administrators helps to build and protect trusting relationships. Furthermore, our work illuminates how past HMGP processes may affect the ongoing HMGP implementation in the aftermath of Matthew. Additionally, we discuss how the post-Matthew recovery process colors perceptions of the ongoing HMGP buyouts for Hurricane Florence, which struck many of the same areas and towns in North Carolina in 2018. These findings offer insights into the importance of protecting and building trust in the disaster recovery process broadly, and buyout programs specifically.

2. Trust And The Buyout Process

2.1 HMGP Participation and Trust

After presidentially declared disasters, different funding streams become available to state and local governments, as well as affected residents. Buyouts funded through the HMGP requires an arduous process, and multiple levels of governmental cooperation (Kihslinger et al. 2017). Through HMGP, households can receive support for post-disaster mitigation options that include home elevation, home reconstruction, or a buyout (which may also be referred to as relocation, or acquisition projects), where a damaged property is purchased for the pre-flood value, and the household is able to relocate as desired. Connecting residents to federal funding, however, requires support from local and state level agencies (Ji and Lee 2021). Their roles in this process are described briefly below:

Local government administrators and officials act as representatives for interested residents. When funding becomes available, local administrators and officials have conversations with interested residents about the appropriateness of HMGP. If the resident decides that they would like to apply for HMGP funding, the local government applies to the appropriate state, territory, or tribal government on their behalf as a “sub-applicant”. In the application, the local government must emphasize the perceived long-term benefits of the mitigation effort (such as reducing future flooding) and how the proposed
actions align with the states hazard mitigation priorities as defined in the state hazard mitigation plan (Kihslinger et al. 2017).

The state receives these applications and ranks them based on state priorities and requirements at the state and federal level. While the primary eligibility criteria are cost effectiveness, environmental considerations, and technical feasibility, the state may consider other objectives when determining project priorities. For example, they may look to prioritize the properties with the highest benefit-cost analysis, concentrate buyouts within certain high-impact areas, distribute funding across all declared counties, or develop other selection criteria. Because major hurricanes often occur years apart, priorities may not be the same from one HMGP funded recovery to the next (Smith 2014).

The state submits the approved and ranked project to FEMA, which confirms that they meet federal eligibility. If adequate funding is available, funds are first distributed to the state-level government, and then to the local governments. Once they have the approval, the local government can proceed with HMGP projects, including buyouts. This process, from disaster to approval, takes an average of 1.9 years; after which, it commonly takes several more years for the project to close out (Weber and Moore 2019).

Although the program and process is daunting, HMGP and other buyout initiatives have the potential to reduce community and household level risk, create amenities, and provide taxpayer cost-savings, which can make them broadly appealing (Rose et al. 2007). This appeal is necessary because the HMGP requires voluntary participation; therefore willing involvement on the part of impacted residents is necessary for the program's success (Binder, Greer, and Zavar 2020). Belief that HMGP programs will be run efficiently and effectively is necessary for engaging greater numbers of individuals, which creates more flexibility in prioritizing the most at-risk households, allows for the formation of contiguous open land that can be put to more productive use, and can even reduce future flood risk for surrounding properties through adaptive measures (Salvesen et al. 2018; Zavar and Hagelman III 2016). Therefore, creating conditions that encourage more eligible participants to apply has compounding benefits.

The current literature establishes a number of factors that make residents more or less likely to participate in buyout programs, including pre- and post-disaster community conditions, place attachment, the extent of damage, risk perceptions, and certain demographic characteristics (Greer, Trainor, and Mcneil 2019). However, the role of social capital, defined as “the resources available through bonding, bridging, and linking social networks along with the norms and information transmitted through those connections” (Aldrich 2012, 33), and how it affects the decision for residents to participate in buyout programs is poorly understood. The social capital literature suggests that reasons for increased HMGP participation include existing social ties, trust in the managers of the buyout program, and community engagement (Binder, Baker, and Barile 2015). Of these factors, there is a particular dearth of research on trust in particular (de Vries and Fraser 2012; Binder, Baker, and Barile 2015). Our paper helps to address this gap by evaluating the development and degradation of trust between residents and government employees through a buyout program from the perspective of the local government administrators of HMGP and contemporaneous local newspaper articles.
For the purpose of this analysis, we define trust in line with the work by Kasterson et al. (1992). As the authors note, trust has been defined in a number of different ways, each conceptualizing trust in the context of different processes (e.g., cognitive, behavioral, emotional, etc.). We rely on the specific concept of *social trust*, defined “as a person's expectation that other persons and institutions in a social relationship can be relied upon to act in ways that are competent, predictable, and caring” (Kasterson, Golding, and Tuler 1992, 169).

Within the buyouts literature, de Vries and Fraser (2007, 2012) have undertaken much of the research emphasizing the importance of trust. In some of the earliest work on the subject, de Vries and Fraser (2007) implemented a survey of 152 property owners from Greenville and Kinston, North Carolina, participating in the buyout program after Hurricane Floyd (1999), as well as interviews with 12 local government representatives and buyout stakeholders in the same cities. In their latter work on the subject, de Vries and Fraser (2012) expand the survey and interviews to include residents and administrators in Grand Forks, North Dakota, and San Antonio, Texas, in addition to Kinston and Greenville. In both studies they found evidence to suggest that mistrust in public employees or in the process made the decision to participate in buyout programs less desirable for residents, suppressing participation.

2.2 Building and Degrading Trust

While the work in the hazards literature that has introduced the role of trust in the buyout process is critically important, it does not provide a sufficient theoretical frame for this analysis. For that purpose, we rely on the larger body of literature focused on risk perception for further insight into the trust processes.

Risk perception research has strong ties to disaster hazards research, and these fields can overlap in many areas. However, historically, risk perception literature has focused more on the role of trust in public office as it relates towards faith in regulations, or the acceptance of or objection to the siting of technologically uncertain industries, such as nuclear or chemical facilities (Slovic 1987; Kasterson, Golding, and Tuler 1992). Further work has tied the literature on the public's risk analysis of technology and industries to the public's risk analysis of natural hazards. This work has found that trust is particularly important when residents have low knowledge about the hazard and are faced with uncertainty, as is often the case with natural hazards, as trust encourages reliance on the advice of authorities when residents cannot trust their own personal judgement (Wachinger et al. 2013; Paton 2007).

Risk perception literature shows that a fundamental characteristic of trust is that it is delicate. If you classify trust processes as protecting trust, building trust, and degrading trust, then it is well established that the latter is significantly easier to accomplish than the first two. As a result, events and actions that deteriorate trust have an outsized impact on the overall trust relationship compared to those that build or maintain trust (Slovic 1993). This delicacy illustrates the importance of actions that protect existing trust relationships during turbulent times.
Returning to our definition of social trust, our article centers the interviews with the perspective that protecting, building, and degrading trust occurs in four key ways: competence or incompetence, commitment or unreliability, caring or uncaring, and predictability or unpredictability (Ozawa 2018; Kasperson, Golding, and Tuler 1992). These terms are defined by Kasperson (1992, 170) and echoed by Ozawa (2018, 23) specifically as:

1. “Commitment: Trust relies on perceptions of uncompromised commitment to a mission or goal, and fulfillment of fiduciary obligations or other social norms.
2. “Competence: Trust is gained only when the individual or institution) in a social relationship is judged to be reasonably competent in its actions over time. While expectations may not be violated if these individuals or institutions are occasionally wrong, consistent failures and discoveries of unexpected incompetence and inadequacies can lead to a loss of trust.
3. “Caring: Trust relies on a perception that an individual or institution will act in a way that shows concern for and beneficence to trusting individuals.
4. “Predictability: Trust rests on the fulfillment of expectations and faith. Consistent violations of expectations nearly always result in distrust... However, predictability does not necessarily require consistency of behavior. Complete consistency of behavior would require unchanging actions or beliefs, even in the face of contradictory information, and also more consistency in values and related behavior than most individuals, groups, or institutions possess.”

Importantly, there isn't a process for trust building or deterioration that is consistent across all levels of interactions. Actions that increase trust in individual-to-individual interactions may degrade trust between individuals and institutional representatives (Kasperson, Golding, and Tuler 1992). For example, a government administrator may profess a lack of knowledge about an issue to a resident. Based on prior studies, this honesty may increase the trust between the two individuals, but could degrade trust in the institution on the part of the resident, who may see this as a lack of competence (Kasperson, Golding, and Tuler 1992). Therefore, it is important to note the level of any interaction that is building or degrading trust and the various ways in which that interaction may influence trust on other levels.

3. Methods And Data

3.1 Study Area

North Carolina is one of the most vulnerable states in the nation to hurricanes and tropical storms and their associated floods (North Carolina Climate Office 2019). In addition to Hurricane Matthew, significant storms that have affected North Carolina in recent years include Hurricanes Fran (1996), Floyd (1999), Florence (2018), Michael (2018), and Dorian (2019). Related to this, North Carolina had the fourth most FEMA-funded buyouts of any state at the time of Hurricane Matthew (Mach, Kraan, Adger, et al. 2019).

Hurricane Matthew made landfall on October 8, 2016. In North Carolina, nearly 35,000 households experienced flood damage and about 5,000 experienced “major” or “severe” home damage (Department
According to the Department of Commerce (2017), the geographic extent of storm damage was concentrated, with 52 percent of major or severely damaged homes located in just 13 towns. However, while severe flood damage was focused geographically, the overarching extent of areas affected covered almost half the state. As a result, households in 50 counties across eastern North Carolina were declared eligible for FEMA Individual Assistance disaster aid (see Figure 1).

Hurricane Matthew’s flood damage occurred disproportionately in socially vulnerable communities. Between a half to two-thirds of homeowner affected by the flooding, and eighty-six percent of the affected renters, had low or moderate incomes (Department of Commerce 2017). Furthermore, neighborhoods deemed severely impacted had a disproportionate number of low-income residents, residents of color, and households without access to a car (Department of Commerce 2017). This creates the condition where many of those who are eligible to participate in the HMGP buyouts have limited resources to commit to the process and withstand uncertainty.

3.2 Interviews

Between May and September of 2019, we conducted semi-structured interviews of local HMGP administrators throughout eastern North Carolina. While this was three years after Hurricane Matthew made landfall, approvals for buyout projects had only been processed recently and residents were, in many cases, still waiting on relief. In order to select interviewees for this study, we began by identifying all jurisdictions that were declared eligible for FEMA Individual Assistance, as shown in Figure 1, and identified which jurisdictions participated in the Hurricane Matthew HMGP. This narrowed our list of potential sites down to 34 jurisdictions. Using local government websites to identify the emergency manager and relevant county employees involved in disaster recovery in each jurisdiction, we developed a list of potential administrators to interview.

We contacted individuals on this list via email and phone to inquire about their role in the recovery process and whether they would be available for an interview. Following this initial outreach, we utilized a snowball sampling method to identify the primary administrator of the HMGP in each jurisdiction. In all but two cases, our interviewees had been the primary administrators of their local Hurricane Matthew program from the outset in 2016. Each jurisdiction included in the study had at least one property approved by FEMA for an acquisition, reconstruction, or elevation through the HMGP. The single jurisdiction with the greatest number of projects had over 100 properties approved for the program.

We interviewed 18 local administrators who came from a variety of different positions in local government and a variety of different jurisdictions. The communities represented included seven counties, and four towns, who managed a total of 249 HMGP projects. The roles and departments of interviewees included: Planning, Community Development, Emergency Management, Fire Department, Disaster Recovery, Jurisdiction Manager, Building Official, and Public Information Liaison. The diversity in the roles and day-to-day duties of the administrators interviewed reflects the diversity in education, skills, and experiences of those responsible for local hazard mitigation.
Interviews lasted between 15 and 60 minutes and were conducted remotely via telephone. With interviewee approval, each interview was recorded and transcribed verbatim. Interviews focused on the process of administering the Hurricane Matthew HMGP, centering on three main areas:

1. The process of recruiting program applicants and engaging residents in recovery;
2. The perceived capacity of, and available resources for, administering the HMGP in that jurisdiction; and
3. The role and perceived effectiveness of, as well as the nature of communication with, representatives responsible for HMGP at the state level.

Though interviewees were asked to focus on their experiences during Hurricane Matthew, we did ask about the local impacts of Hurricane Florence and whether that storm, which struck in 2018, had affected Hurricane Matthew recovery. In addition, several interviewees addressed their work on other recovery programs like the Community Block Group Development-Disaster Recovery program.

Using an open coding approach, we analyzed and coded the interview transcriptions. Through close reading of the transcriptions, the research team worked collaboratively to develop a codebook and identify relevant keywords. The six overarching themes included in the codebook were: program clarity and efficiency, government coordination, institutional knowledge and capacity, community engagement, timing, and references to other storms. Two members of the research team then independently coded each interview using the codebook with MAXQDA software. To ensure the quality of the data analysis, individual short paragraphs were established as the standard unit of analysis and Cohen's Kappa (1960) statistic was calculated as a measure of intercoder reliability. The Kappa value of 0.65 suggests there was substantial agreement between the independent coders. Once intercoder reliability had been established, we identified the major findings of the interviews by merging the coded data, finalizing the codebook, and manually addressing any outstanding disagreements.

3.3 Article Data Collection

In addition to the interviews, we also pulled newspaper articles relating to Hurricane Matthew and the HMGP program from local and state-level publications in North Carolina. We used the “America’s News” database by NewsBank inc., which offers tens of millions of full-text articles nationwide, including documentation from over 800 newspapers. This gave us the ability to search through multiple sources for related articles. Our search was undertaken on 02/10/2020, and used the following search terms:

- "Hurricane Matthew" in 'All Text' AND "Buyout" in 'All Text'
- Restricted sources to 'Newspaper'
- Restricted location to 'North Carolina'

After our initial search, we had 453 hits. Thirty-one of the articles were deleted because they focused narrowly on pig farms (which faced major environmental issues related to Hurricane Matthew, but which were largely unrelated to our focus on the housing buyout program). An additional ninety-three were
deleted because they were duplicates or deemed by the research team as irrelevant or failing to capture information on the buyout experience (e.g., a notice that there would be an upcoming community meeting). This left us with 329 articles, which we analyzed for information on hurricanes that took place both before Hurricane Matthew (most notably, Hurricane Floyd in 1999) and after (most notably, Hurricane Florence in 2018). Additionally, we performed text searches for important keywords such as *frustration*, *wait*, *trust*, and *relief*, as well derivatives (e.g., *waiting*). Relevant sections around keywords were read in-full to contribute to a greater understanding of the conditions in the aftermath of Hurricane Matthew and the residents’ interactions with different levels of government through this process.

4. Results And Discussion

4.1 Length of Time & Frustration

As we covered in the literature review, the buyout process is arduous, involves multiple layers of communication, and regularly takes several years to complete. Unsurprisingly, a recurring theme found in the data was that the program delays and the lengthy time frame required for program approval and distribution of HMGP funds created problems for both residents and local administrators, leading to feelings of frustration. In fact, ten of the interviewees emphasized residents’ frustration with the prolonged buyout process, as exemplified in the following quote:

*We have just made the first acquisition offers within the last 30 days [close to three years after Hurricane Matthew]. Just how slow these programs are creates frustration for these people. Some have moved out, some have moved back in, some have [left the program].* -Interview

In addition, our interviewees noted that longer buyouts do not only impose greater stress on participants, but also increase the likelihood for the household to be affected by future flooding. This was noted in thirteen of the interviews, and is reflected in the following statement:

*But it shouldn't take three years for a grant application to get approved and another year for the house to get elevated. Because, in that time, that house could have been flooded four more times! You know, it's crazy. And so I understand the frustration.* -Interview

This finding is also evidenced in our analysis of newspaper articles, where mentions of frustration became more prevalent as the process dragged on, with increased hits on this keyword around anniversaries of the disaster, the end of the year, and in August or September of 2018, around the time of Hurricane Florence (see Figure 2). The following quotes illustrate this point:

*It has been a year since Hurricane Matthew damaged or destroyed at least 200 properties in Kinston and Lenoir County and officials are still waiting on federal funding for the buyout program.*

*Sam Kornegay, Lenoir County emergency planner, said his office has received many calls from people affected by the flooding that followed Matthew in October 2016. "They are asking 'Where we're at?'”*
Kornegay said. “How long is it going to take?’ We’ll know soon and then they will know. We’re on FEMA time.”

-Article, The Free Press, November 2017

[Community development manager, Andrew] DeIonno added, ‘It’s not hard to understand their frustration. After all, we’re talking three years and the money is there. We understand why they are upset when they call or come out here.’

-Article, Tarboro Weekly, Dec 2019

Newlyweds [names redacted] were living in the Forest Hills community in 2016 when their new home of just three months was flooded by Matthew... “I think now the feeling is more frustration than anything because we keep being told, 'Oh, it's (buyout)coming. It's coming. Oh, there's this. Oh, there's that.' So we still have nothing to show for all of the talk that we hear.”

-Article, The Goldsboro News, September 25, 2018

In some cases, this frustration led to anger against local administrators and accusations of impropriety in the buyout process. These conditions appear to deteriorate public trust in the local administrators while also straining relationships with state employees who residents clearly believe share responsibility in the blame for delays. This was evidenced in the interviews with two administrators working for small towns:

Well, we've [the administrator and residents] had ups and downs. You know, we've become friends. I think that they trust me, but they got so frustrated with the process and they would get angry and they would be upset and they would accuse me of things. They accused me of not caring because they were black and I’m white, and if they had been white, this process would have taken, would have been done a long time ago. -Interview

I feel like the last program during Matthew, probably, they [the residents] felt like the state wasn’t here to help them so a lot of them are applying for ICC [Increased Cost of Compliance] coverage through their flood insurance. -Interview

Reflecting back to the extant literature on trust, we see evidence in our interviews that the length of time was related to perceptions of uncaring, which, in turn, degrades trust. In response to the wait, residents were frustrated, stressed, or upset. This may have a causal relationship with attrition in program participation over the length of the buyout process, or that attrition may be caused by other compounding factors.

Recoveries from other hurricanes can give insight into how waiting reduces the success of the program overall. For example, in the aftermath of Hurricane Harvey in Texas, an administrator with a local agency implementing the HMGP in Houston estimated that upwards of 20% of owners who applied to buyouts changed their minds by the time they were approved (Binder, Greer, and Zavar 2020). Additionally, the
length of time means that some of the poorest residents cannot afford a buyout, because they cannot afford spending money on both the property they can no longer live in, and the property that they temporarily move to for an extended duration of time. Finally, many residents waiting on buyouts remain in flood-damaged properties, where dangerous conditions, such as structural damage or mold, can lead to negative health outcomes. The result of waiting is decreased trust, negative health outcomes, and a waste of time and resources for the homeowner and also for all levels of government.

4.2 Transparency and Misinformation

Our findings suggest that another factor that affects trust is misinformation coming from all levels of government. There were a number of references by local administrators to receiving incorrect, misleading, or simply unclear information from federal or state administrators that they perceived as increasing confusion among participants. This is reflected in other contemporary research, where community officials note that they get little help from the state (Smith et al. 2021).

One example of confusing information from the state level occurred when approval letters were sent out to residents that stated that their homes met the standards necessary for participation in the program. According to the county-level administrator, residents and some local administrators interpreted the letter as approving them for a program buyout when, in reality, it was merely a confirmation that they met the minimum standards for approval. However, due to funding limitations, not all residents that received the letter would be approved as not all qualified projects could be funded. Noting this issue, one county-level administrator commented on how this process played out:

You know you expect to get the correct guidance at the state level. And not throwing them under the bus – a lot of things they were trying to do and they were trying to make it [the HMGP recovery] as efficient as possible. But the standards of FEMA and the federal government have for these programs is really strict depending on what you apply for and there's not one that mimics the other. And so, if you’re not really familiar with those federal guidelines as to how that program has to go – you end up telling people things and not on purpose – but you end up telling people things that are not entirely true...We were giving information to citizens that was given to us from the state and it was just not true. We've had a lot of negative feedback in that aspect. –Interview

This is echoed in news reports of resident experiences:

They [a buyout applicant household] asked FEMA what they needed to do in between the time the elevation could be done and then getting the house ready. They were told they could go ahead and rebuild and the house would be elevated once it was finished,

she said.

“So we began building, I believe is was March of 2017,” she said. “The house was finished in November 2017. But we got a letter in August 2017 saying that there was no more money and that they wouldn’t elevate us.”
To manage their uncertainty about the veracity and clarity of the information they were receiving, local government administrators tried to insulate residents from what they felt were confusing state directives. In some cases, this meant waiting to pass along information to participants until they could verify directions from the state or ensure that information from the state would not change. In other situations, it meant placing the onus on state representatives to report information that may have created unwarranted optimism about aspects of the recovery, such as the potential for additional funding streams, as one interviewee notes:

Well, a representative from the state was here and discussed that [CBDG Disaster Recovery Assistance]. Because we’re very careful about telling them about any additional funds because we don’t want to get their hopes up. Because we know a lot of times when the state tells us they’re going to do something, we never see it. So, we have to be really guarded with that information. We don’t want to be blamed for getting anybody’s hopes up and then not delivering. So we let the state bring that up, and we didn’t say anything else about it. -Interview

As such, this breakdown of trust, not only between the residents and government administrators but also between different levels of government, appears to have impeded the flow of information to those who needed it most. Further, delays in information from the state led to situations where the residents blamed their local administrators for unresponsiveness. To address this, some administrators tried to be as upfront as possible with the information that they had been given. Four of the interviews highlighted the importance of transparency as a way of protecting against the degradation of trust, reflected in this statement:

We created an entire website on our page on the Hazard mitigation grant program, feel free to look at that. All we can do just put a status update, as of August 9th, we’ve heard nothing back from the state and are still in a holding pattern. The folks [residents] that I talk to… say you guys have been great; I’m not mad at you, just generally frustrated etc… so I think that the people that we communicate with on a weekly or biweekly time frame, they understand. The distrust might not be there [between local administrators and residents], but distrust boils over to the state or federal level absolutely. -Interview

Based on the interview data, we find that confusion and miscommunication between different levels of governments has two main effects. First, it creates frustration and mistrust when residents feel they are being misled, corroding the relationship between the local administrators and their constituents. Second, if the local administrators do not trust higher levels of government to provide accurate and timely information, then they are more reticent to pass on information that they do receive. Overall, these findings suggest that conditions of uncertainty degraded trust across all levels of government, and led to conditions where, rightly or wrongly, residents had less information to act upon. This aligns with previous work in this area (see, for example: Slovic 1993; Kasperson, Golding, and Tuler 1992; Ozawa 2018). To address this, transparency about decision making at all levels and consistent communication with residents is needed to build and protect public trust (He et al. 2015).
4.3 Emotional Involvement

Despite the challenges local administrators face throughout the process, and the resulting friction with residents, local administrators appear to have prioritized the care of their constituents. This is reflected in stories of emotional involvement with, and investment in, residents throughout the process, which, in turn, interviewees believed led to greater faith in the process on the part of those residents. This emotional support was seen by many administrators as a core aspect of their job. Referring to the perceived successes of the HMGP program, one interviewee – a county administrator who started his position after Matthew struck in 2016 – highlighted, the value of connecting and supporting their residents:

*With me just taking over in December [2018], just being able to contact the property owners, being able to talk to them. Some of them have expressed things that are going on with them and I just try to keep, try to keep them thinking about the positive things, that it’s almost to the finish line, we’re almost there, just trying to get them those assurances. I’m not in their position but I know it cannot be fun.* -Interview

Another aspect of this emotional investment is a feeling on the part of local administrators of responsibility to, and protectiveness of, their constituents. Many local administrators argued that they had a duty to protect their citizens against the confusion and delays they believed were coming from the state and federal level. The following statement notes how this was conceptualized in one department:

*If there’s anything I can tell people it’s that if we’re waiting on something, it’s not going to be waiting on me for something. We want to get the job done on behalf of our citizens. As a county government, we’re that first line of defense per se.* -Interview

These findings suggest that these moments of emotional connection, accessibility, and protectiveness help to mitigate the deterioration of public trust even as the HMGP program stretched on, burdening residents and government employees alike. Through these forms of caring and investment, local administrators can help maintain the goodwill of residents, even as other features of the hierarchical process are beyond their control. This suggests that a greater emphasis within the HMGP program needs to be placed on local government’s role in emotional support during the buyout process so that resources can be put towards creating the capacity for local administrators to engage with their residents in this way.

4.4 Past and Future Storms

Because North Carolina has participated in a significant number of HMGP buyouts (North Carolina Climate Office 2019), previous and future storms are often in the minds of vulnerable residents. As a result, we examined the data to better understand how public perceptions about the HMGP recovery process are shaped by the buyout processes, and media coverage of the program, that occurred during previous storms. In this case, the most notable example was Hurricane Floyd in 1999. Further, as two major hurricanes have directly struck North Carolina since Hurricane Matthew (Hurricane Florence in 2018 and Hurricane Dorian in 2019), we theorized that the successes and failures of the Hurricane Matthew
recovery program may influence perspectives on future storms. This gets to the core of our second research question: How is participation in HMGP influenced by the experiences of past programs and how might it shape future programs?

We find evidence that prior experiences with disaster recovery, whether positive or negative, can shape perceptions about the current post-disaster context. For example, those that lived through Hurricane Floyd in 1999 and could recall the speed of the associated buyout program – the second largest HMGP project at the time – expressed high baseline levels of trust in government following Hurricane Matthew. Historically, HMGP projects take an average 1.9 years to reach the approval phase (Weber and Moore 2019). In contrast, over 1,000 properties were approved for a buyout within just seven months of Hurricane Floyd (FEMA 2000; Weber and Moore 2019). Because this prior buyout program was considered to be successful, it seemed to fuel interest in participating in the Hurricane Matthew buyout program. This response is captured in this comment:

*I think that a lot of it came from word of the mouth in the community or a personal history after Hurricane Floyd. People who were a little more leery of government were saying that we were going to come in and buy your house and make it all better... They didn’t participate after Hurricane Floyd, but that one was so successful so when this one [Hurricane Matthew’s HMGP program] came up, we had people that did want to participate because they knew it was going to be successful.* -Interview

The notion that individuals draw relationships between past and future storms is further supported by the analysis of local newspaper articles. In a review of local newspaper articles referencing Hurricane Matthew and HMGP, we found that references to Hurricane Floyd were common in the initial months after Matthew made landfall (see Figure 3). Overall, a total of 76 articles mention Hurricane Floyd. After Hurricane Florence made landfall (August – September 2018), Florence recovery also became a feature of many Hurricane Matthew articles. In total, Hurricane Florence was mentioned in 85 articles over 16 months (see Figure 4).

While reflections back to Hurricane Floyd recovery support the idea that past program success can be parlayed into future program success, it is unclear that the opposite holds true. Despite the issues they identified with the Hurricane Matthew recovery process, many local administrators were not concerned that the Matthew program would negatively impact participation in a post-Florence program. In fact, they expected Florence buyouts to run smoothly because of the short time-frame between the back-to-back hurricanes. This can be attributed to increased experience and capacity of administrators, as well as increased familiarity with the program among residents, which the interviewees anticipated would transfer to a more knowledgeable, organized, and streamlined HMGP process.

In some ways, the events of Matthew and Florence mirror the learning process that took place after Hurricane Fran in 1996, which was subsequently capitalized on in the response to Hurricane Floyd in 1999 (see, for example: Fraser et al. 2003; Smith 2014). Therefore, while our evidence shows that successful recoveries increase interest in future recoveries, it does not necessarily follow that future participation will be depressed by experiences of program mismanagement and delays. Rather, back-to-
back disasters and recoveries may insulate the effects of negative perceptions on public trust. This can occur in two ways: first, the short timespan between disasters almost ensures continuity of experience in most local offices, which can improve capacity and response; and two, the stress of multiple storms will increase the number of willing participants even if the residents feel uncertain about the trustworthiness of government representatives. The latter point is illustrated in this excerpt from a news article:

*After Matthew, a handful of residents tried to return to their houses. They stayed away, Currie [Whiteville city manager] said, after Florence.*

"There's really no one living over there now, it's basically an abandoned area of town," Currie said. "It's sort of like pictures you see from Hurricane Katrina of the Lower Ninth Ward over in New Orleans."

-Article, Tribune News Service, December 2019

However, the relationship between repeat storms and recovery participation needs further research to better understand the development and loss of trust through multiple storm events.

4.5 Limitations and Future Work

One important note about this study is that, while we did try to triangulate the interviews with the context provided by newspaper articles, the findings rely heavily on interviews with local government officials and administrators. Comments that they had about misinformation or unclear information that they received from the state or FEMA are not verified by other parties. We did not interview state or federal government stakeholders and therefore, were not able to obtain a bi-directional perspective on trust. Similarly, we did not interview residents regarding their relationships to local administrators. As such, our results largely reflect local administrator's *perceptions* of the actions and feelings of other program stakeholders. This is a perspective that has been missing from research to-date, but future studies should explore the role of trust in the buyout process from the perspectives of other stakeholders. In doing so, future research will illuminate whether the dynamics noted in our results are evident throughout different levels of government involved in the process.

Additionally, our interview and newspaper article analysis found that the buyout process for Matthew may impact participation in future buyout programs since the buyout process that occurred in the aftermath of Hurricanes Floyd and Fran in the late 90's influenced participation in the current Matthew buyout. There is support for this in the literature on the relevance of trust in bureaucratic processes (Ozawa 2018; Kasperson, Golding, and Tuler 1992; Slovic 1993) and in buyout programs, specifically, (de Vries and Fraser 2012; Kick et al. 2011), as well as studies illustrating how the deterioration of trust is associated with snags in the recovery process (Binder, Greer, and Zavar 2020). However, longitudinal studies of buyout processes are called for to examine the evolution of trust from one recovery program to the next.

5. Conclusion & Policy Recommendations
As we move further into an era of climate change and disruption, buyout programs will only become increasingly necessary and wider spread (Siders, Hino, and Mach 2019; IPCC 2018). While the HMGP supports one of the longest ongoing buyout programs in the world (Mach, Kraan, Hino, et al. 2019), it is not at all clear that the federal government has been learning from past mistakes or successes to create long-term programmatic improvements or refinements (Greer and Binder 2017). This is specifically evident in North Carolina’s state government response, as lessons from Hurricane Floyd were not successfully implemented after Hurricane Matthew (Smith 2014). Our work contributes to the growing literature calling for systematic improvements to the program necessary to ensure long-term success for both the participating municipalities and residents (Binder and Greer 2016; Salvesen et al. 2018; Lynn 2017; Howell and Elliott 2019).

To conclude, we return to our initial research questions. Our first questions asked: what features of the buyout process deteriorate public trust? Consistent with existent literature on trust and institutions (Slovic 1993; Kasper, Golding, and Tuler 1992; Ozawa 2018), we show that the length of time, clarity of information, and timely updates affect the relationship between stakeholders in this process. Specifically, our study suggests that prolonging the buyout process erodes trust between residents and buyout administrators.

In addition, perceived misinformation or incomplete information from higher levels of government led to conditions where local government administrators did not trust their state or federal partners. Specifically, a lack of program clarity and clear communication about program guidelines were an oft noted hindrance to success. This breakdown rippled down to residents. Feeling as if their communication with state and federal representatives was lacking, local administrators reported holding back information from residents for fear that the information would be incorrect or change. Not providing timely information about the program may make residents feel as if they are being misled by the local administrators and, consequently, sow distrust.

This demonstrates a breakdown of the process that makes project success harder to achieve. To address this, we recommend that state agencies develop online portals where residents can track in real-time the status of the program and their application. We also recommend that FEMA adjusts the HMGP program to allow for the provision of faster assistance by providing advanced funding to the states and local governments. Investments should be made in getting resources to residents earlier, even if doing so reduces some degree of confirmation and oversight at the federal and state levels. If this is not possible, stopgap money should be made available to participants without counting as a duplication of benefits. Engaging in the HMGP recovery process requires taking on additional funds – such as continuing to pay for a mortgage on a property that was, quite literally, underwater, as well as rent or a second mortgage on a home suitable for habitation. To decrease inequitable outcomes of the program, more support needs to be made available between application, acceptance, and closeout.

Local governments see HMGP as a way to mitigate long term risk, but residents see it as a way to achieve personal recovery (Binder, Greer, and Zavar 2020). Thus, the slowness of the process can lead to stress
and frustration among residents, particularly those with limited resources who cannot wait to find suitable housing. Evidence from other recovery processes (Binder, Greer, and Zavar 2020) indicates that the inability or unwillingness to remain in a program that takes years to support personal recovery leads to major attrition, burdening implementing agencies and affecting the likelihood of program success. Our findings suggest that it would be possible to increase faith in the project through an expedited time frame, ensuring more options in future recoveries that could support a more robust mitigation strategy dependent on connecting adjacent or concentrated properties (Salvesen et al. 2018). This can be achieved through pre-event application development. Additionally, if funding for pre-event planning made it possible to provide for additional staff focused on disaster impacts, then it would be easier for knowledge from one recovery to the next could be retained at the local level.

Our second question asked how trust processes of the post-Matthew HMGP reflect past and future programs. On this issue, our results were mixed. While there was support that the success of previous buyout programs, specifically the one implemented in the aftermath of Hurricane Floyd, increases subsequent project success, more research is needed to show how poor experiences and the recurrence interval of storms influence future participation and outcomes. Regardless, our findings suggest that there is a lingering impact of previous disaster recoveries on future disaster recoveries, creating an increased emphasis on maintaining and promoting project success from resident perspectives.

Finally, in terms of our third question on the role of local administrators in building or eroding trust in the buyout process, we see patterns that indicate that it would be valuable to increase support for local governments. One way in which local officials and administrators appear to maintain strong trusting relationships with the community is to be invested in emotional care of their residents. Emotional investments in the well-being of community members can help to mitigate problems with program delays and misinformation. However, buyout administrators at the local level wear many hats and frequently have commitments beyond the administration of the buyout program.

This finding echoes other literature arguing that limited resources and loss of accumulated knowledge on behalf of local governments can cause buyouts to fall well short of optimized benefits of the program (Zavar and Hagelman III 2016). Therefore, we argue that increased support and resources from the federal or state level throughout the process would have compounding benefits at a variety of scales, from household to regional levels. Some areas for increasing support include monetary supplements for local governments, resource sharing, education, idea exchange on adaptive land use management for newly bought out properties, among others. Additional resources for hiring the appropriate number of grant administrators has shown to be helpful in creating successful recoveries (Smith, Lyles, and Berke 2013; Smith 2014)

Government buyout programs are complex and bureaucratically cumbersome, requiring significant assistance from local administrators for program participants throughout the process. As such, the relationships that local government officials and administrators build with their communities and potential buyout participants is critical to the success of the program. HMGP is a voluntary program and,
therefore, requires residents to opt-in to accept a government buyout. If no or few residents choose to opt into the program, the government does not achieve its goals of reducing or mitigating future disaster losses. In contrast, increased buy-in for the program can lend itself to scenarios where local governments gain more use from the bought-out parcels, in turn, increasing returns on investments. The key to achieving this is creating and sustaining a program in which residents can trust.

**Declarations**

**Declarations:** this paper is based upon work graciously supported by the North Carolina Community Foundation Disaster Relief Fund.

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**Figures**
Figure 1

Counties declared for FEMA Individual Assistance after Hurricane Matthew; adapted from FEMA North Carolina Disaster Declaration (FEMA 2016). Individual Assistance designations open up federal funding opportunities for programs that provide support for disaster survivors after a Presidentially declared disaster. Note: The designations employed and the presentation of the material on this map do not imply the expression of any opinion whatsoever on the part of Research Square concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. This map has been provided by the authors.
Figure 2

Number of times “Frustration” was mentioned in our sample of articles over time

Figure 3

Number of times “Floyd” was mentioned in our sample of articles over time
Figure 4

Number of times "Florence" was mentioned in our sample of articles over time