

# Community Perceptions of a Floodplain Buyout Program in Charlotte, North Carolina

Julia Cardwell (✉ [jmcard@email.unc.edu](mailto:jmcard@email.unc.edu))

UNC-Chapel Hill: The University of North Carolina at Chapel Hill <https://orcid.org/0000-0003-3481-438X>

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## Research Article

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# Abstract

Acquisition of flood risk properties is becoming an increasingly common practice for floodplain risk management. While these buyout programs are often seen as highly effective in achieving their primary goal—reducing flood risk—there are additional variables that should be considered when assessing overall effectiveness of these programs. These variables include equity concerns and post-buyout land use. This study examines the floodplain buyout program in Charlotte, North Carolina with special consideration for these additional variables, including the social variables that may impact the secondary success of floodplain buyout programs. The floodplain buyout program in Charlotte is seen as effective in reducing flood risk, but specific community and neighborhood experience with the buyout program differs significantly. While some communities feel that the flood buyouts were equitable and just, and are able to ascribe land uses to the vacant land that add community value, some communities have differing experiences. The study indicates the continued importance of community-specific examination of the effectiveness of recovery programs.

## 1 Introduction

Following continued and extensive flood loss under previously preferred structural mitigation strategies, there has been a nationwide shift towards the “mitigation era”, in which there began a proactive planning effort to both limit new development in delineated floodplains (typically the 100-year floodplain) and to remove already existing development in these areas (Godschalk et al. 1998). Property buyouts have increasingly been utilized as a non-structural option for flood control (Burby 2001; Zavar 2015). Floodplain property acquisition is seen as particularly effective because it is a permanent solution, one in which the acquired land is necessarily dedicated as open space for perpetuity, which simultaneously reduces chances for re-development in flood prone areas and reduces the existing flood risk in that area (Binder and Greer 2016). FEMA has adopted a policy of flood risk property buyout as a superior management strategy to other flood mitigation techniques (FEMA 1998). Floodplain acquisition programs have been shown to be effective at lowering the flood risk for communities by completely removing high risk properties from the flood risk landscape (Federal Emergency Management Agency 2009, 2016; Freudenberg 2016; Tate et al. 2016). However, there are also other variables that can impact the overall success of buyout programs for a community, including land-use post buyout and equity during the buyout process.

FEMA’s Hazard Mitigation Grant Program sets the standard for floodplain property acquisition, and many buyouts are funded partially through the HMGP (Tate et al. 2016). Through the HMGP, local governments are responsible for 25% of the acquisition costs, and FEMA provides the rest of the funds (Conrad et al. 1998). FEMA holds that beyond reducing flood risk, the open space produced during the buyout process can contribute to economic well-being, improve community environment and ecology, and improve quality of life, thereby furthering hazard mitigation goals and objectives (FEMA 1998). However, even for buyouts assisted by the HMGP, the land use after the buyout falls completely under the purview of local entities, and localities are responsible for any expenses incurred for land upkeep or land improvements

(Zavar 2015). Because of this, eventual land uses are often highly location specific, as government entities and community residents “adopt uses, ascribe values, and produce their own land-use norms” (Zavar 2015). Thus, evaluating the effectiveness of floodplain buyouts does not hinge solely on success in reducing flood risk, it can also depend on the success of localities in achieving community value through the open space produced.

Although FEMA provides communities and buyout managers with guidance and best use practices for the development of open-space areas created by flood buyout programs, these practices are not often achieved, and the majority of buyout sites remain vacant lots (Zavar and Hagelman 2016). Interviews with floodplain managers show that while there is a general consensus that buyouts are effective in lowering or eliminating flood risk in communities, the high percentage of vacant lots illuminate the lack of resources available to local planning entities after the buyout—especially in terms of funding and access to resources for open space planning (Zavar and Hagelman 2016). Thus, in reality, many floodplain buyout sites fail to achieve FEMA’s vision of adding community and ecological value.

Success of buyout programs can also be measured in part by examining equity in implementing the buyouts. There are, essentially, two levels of choice within a buyout program—both of which have a significant impact on both property owners, as well as the community at large. The first level of choice is by local government officials when deciding to offer buyouts in a particular neighborhood or area. The second level of choice is made by those property owners who must accept or reject the offer. However, the second level of choice is intrinsically informed by the first level, as well as the specific vulnerabilities of individual property owners. These variables have the ability to have a significant impact on the free will of property owners, and this choice is heavily impacted by social, political, and economic factors.

The initial choice by government officials regarding where to acquire properties has significant social justice implications. While these decisions are, at the most basic level, dependent on flood risk of a certain area, they often rely on cost-benefit criteria which might encourage disproportionate buyouts in low-income communities (Siders 2019). Low-value homes are more likely to be classified as substantially damaged after a flood event because of the decreased ratio between repair cost and home value, and have a higher probability of being located in a flood vulnerable area or being poorly constructed (Siders 2019). Because local actors have a great deal of authority over where they will pursue buyouts and buyout programs often lack organizational and planning transparency, there continues to be the potentiality that certain groups of people may be being unequally targeted for buyouts (De Vries and Fraser 2017; Siders 2019).

The second level of choice is enacted by individual property owners when they decide whether or not to participate in a buyout program. The freedom of this choice, however, is tempered significantly by a variety of community and personal variables (De Vries and Fraser 2017). Because an area has been identified as holding high flood risk, communication of risk from government entities plays a large role in acceptance or rejection of a buyout offer. Because risk communication language often emphasizes and draws upon residential fears of the consequences of flooding, buyouts often feel more like the only

option than a real choice (Binder and Greer 2016; De Vries and Fraser 2017). Buyout agencies may use a variety of policy tools such as moratoria on construction, declaring homes “substantially damaged”, or condemning homes to compel homeowners to take a buyout (De Vries and Fraser 2017). The period directly following a flood is a particularly salient “window of opportunity to woo” homeowners into a buyout because of the heightened sensitivity to flood risk following a flood event (De Vries 2017). This window of heightened sensitivity can be manipulated by mitigation managers as a window of opportunity for buyout (De Vries 2017).

In addition, low income homeowners may be more encouraged to take a buyout due to the financial ramifications of not selling. If property owners refuse a buyout, they may be subjected to increased flood insurance rates and the risk of being denied from other local flood mitigation opportunities (De Vries and Fraser 2017). Homeowners may also be required to make costly modifications to their home if they wish to continue receiving flood services. For low-income homeowners, this can be akin to being forced into taking a buyout (Binder and Greer 2016). This creates a dichotomy between higher income households who may have free will to make the choice to remain in their home or take the buyout and low income households who feel a financial pressure to take the buyout. All of these factors complicate the notion of “voluntary choice” espoused by FEMA and local buyout officials to the point that many people don’t believe that their choice is voluntary at all (De Vries and Fraser 2012).

Disaster literature has often utilized the concept of social vulnerability to recognize inequities in experiences and outcomes during and after extreme events. In terms of recognizing all aspects of flood risk, the concept of differing degrees of vulnerability, or “the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard” combines biophysical risk with other risk factors to give a more complex view of the susceptibility of different group to damage from a natural hazard like flooding (Blaikie et al. 2004 p 11). This means that flood risk is not just contingent on physical indicators of the potentiality of flooding (such as slope and elevation), but also on the abilities of people to deal with the consequences of flooding, and that the actual risk is formed when these physical indicators interact with social factors. Social vulnerability to flooding is produced by a number of factors that have been well explored in the literature. These factors include household income, poverty, unemployment, wealth, and home value (Fielding 2012), income, especially as it serves as a proxy for other forms of accessible capital (Rufat 2015), level of education (Masozera et al. 2007; Braun and Aßheuer 2011), socioeconomic status (Fothergill and Peek 2004), access to resources, and the ability to flee (Chakraborty et al. 2005).

Vulnerabilities also extend beyond the extreme weather event itself. Social vulnerability has also been used as a frame to explore differential recovery from flooding and other natural hazards. Studies have found that low-income and other socially vulnerable populations face challenges in navigating recovery (Fothergill and Peek 2004; Kates et al. 2006). In addition, disasters may accelerate existing economic, social and political trends for socially vulnerable populations, thus contributing to increasing inequality after extreme events (Mueller et al. 2011). Social vulnerability has been increasingly utilized as a frame of analysis for examining differential recovery after extreme events. However, its utilization has generally

been limited when examining the success of buyout programs, beyond engaging with the equity of the selection of buyout properties and relocation of these individuals and communities (Tate et al. 2016; Siders 2019; McGhee et al. 2020).

This paper explores community experience with a floodplain buyout program in Charlotte, North Carolina on three different levels—equity in the buyout process, success in reducing community flood risk, and ability to achieve FEMA’s goals for open space contributing to community value. In addition, links are drawn throughout all of these levels to explore how social variables may eventually inform how communities are able to use and relate to the buyout program and the open space created through the buyout process. The study adds to an increasing understanding that fully exploring success of flood mitigation actions goes beyond the primary goal of reducing flood risk, and that achieving secondary benefits of floodplain buyout programs is highly community dependent.

## 2 Study Area

The floodplain buyout program in Charlotte began in 1999 and is are funded by three main sources: FEMA Grants, Local Risk-Based buyouts, and Quick Buys. FEMA grants fund the majority of the buyout costs, while local buyouts and Quick Buys are funded through local storm water fees or other local funds. To date, over 450 properties have been acquired and demolished through the buyout program. Most of the buyout projects in Charlotte involved more than one buyout in a single neighborhood. Because clusters of buyouts are more likely to make an impact on the community as compared to a single buyout, this study focuses on buyout clusters as potential study sites.

## 3 Methodology

Buyout properties were identified through a geodatabase of all buyout properties that was uploaded into ArcGIS (downloaded in September 2018). Visual examination of the sites was used to identify clusters of buyout sites (10 or more buyouts within a two-block radius, or larger if the buyouts were contiguous). Each site was visited to classify land use. Supplemental materials, including news articles and the Charlotte-Mecklenburg Storm Water Services Website were also utilized to confirm land use. Because this project focuses on community experience with buyouts, non-residential areas with buyout clusters were excluded from the study.

The CDC’s Social Vulnerability Index (SVI) uses 14 different social variables (grouped into four overall vulnerability themes) to determine the relative social vulnerability of every Census tract in the United States. The fourteen variables are: below poverty, unemployed, income, No High School Diploma, Aged 65 or Older, Aged 17 or Younger, Older than Age 5 with a Disability, Single-Parent Households, Minority, Speak English “Less than Well”, Multi-Unit Structures, Mobile Homes, Crowding, No Vehicle, Group Quarters (Wolkin et al. 2015). These 14 variables make up the four themes of Socioeconomic Status, Household Composition & Disability, Race/Ethnicity/Language, and Housing/Transportation (Wolkin et al. 2015). This SVI provides a useful large scale indication of social vulnerability across the United States. However,

flooding is an extremely localized and place specific hazard. A census tract has a population size between 1,200 and 8,000 people and therefore doesn't represent well the small number of households within that entire tract that might be affected by flooding.

Instead, for this study, a new social vulnerability index was created utilizing American Community Survey data (2016 5YR Estimates) that allows for analysis of Mecklenburg County on a census block group level (between 600 and 3,000 people with an optimum size of 1,500). The variables were calculated and then ranked specifically in comparison to other census block groups in Mecklenburg County (as opposed to the entire United States) to create relative scores specific to the area of study. While the variables used in this new Social Vulnerability Index generally mirror those used by the CDC, the American Community Survey doesn't contain the exact same variables as the Census, and some of the variables used in the CDC index are more or less applicable to flooding and the specific bounds of this project. To begin, 6 American Community Survey variables were selected: Race (B02001), Aggregated Income Deficit in the Past 12 Months for Families by Family Type (Poverty) (B17011), Median Household Income (in 2015 Inflation Adjusted dollars) (B19013), Poverty Status by Disability Status by Employment Status for Population 20 to 64 years (B23024), Tenure by Vehicles Available (B25044), Household Language by Household Limited English Speaking Status (C16002). Each variable was then ranked as it compared only to other census block groups in Mecklenburg County. After the ranking, each variable was then assigned a percentile rank for each census block group. The percentile ranks for each of the six variables were averaged together to create an overall social vulnerability index score.

Twenty-one semi-structured interviews were conducted with community members and participants in the buyout program (between January and March of 2019). These interviews, which took place by phone and in-person, lasted between 10 minutes and two hours, with the majority lasting approximately 30 minutes to an hour. Two routes were utilized to identify potential respondents. Community non-profits located near the study sites were identified using web-based non-profit lists as well as Google Maps. About 20 local non-profits were contacted. The study purposes were explained and each non-profit was asked if they knew people who would be willing to participate in the study. This avenue was largely ineffective, and only one non-profit passed on the name of a potential respondent. Additionally, the City of Charlotte's Neighborhood Organization Contact List was used to identify neighborhood organizations near the study sites. The contacts for neighborhood associations were approached and asked for help in identifying potential respondents. The vast majority of respondents were identified using this method.

## **4 Results**

Results from the semi-structured interviews were organized into themes surrounding various aspects of the success of the buyout program—from reducing flood risk, to equity in the buyout process, to post buyout land use and the impact of that land use on the community.

### **4.1 "Thank God it's Better Now"- Impact of Acquisition Program on Flooding**

Across all of the study sites, affected communities feel that the floodplain acquisition program has been beneficial and effective in terms of reducing flood risk. The removal of high-risk homes has removed a stressor on the community, and the additional stream modifications made by Mecklenburg County Storm Water Services after buyouts provide an additional perceived reduction in flood risk for the neighborhood.

Echoing FEMA's goal to reduce flood risk by offering a permanent solution to high risk flood properties, the buyout program is seen as effective on the most basic level because "those houses are just gone". As one resident noted, significant flooding has still occurred in his community, but the impact was much lower because "there weren't houses to be affected". Another resident recognized that "those mitigation projects served the purpose of stopping those houses from flooding again, [he] thinks those houses would have flooded again". The same resident noted that "it feels good not to have to worry about it". This difference in flood risk was especially evident to long-term residents of flood risk neighborhoods. As one older resident recalls, "I lived here when this place flooded all the time. It really seems like what they've done here has helped". He recalls the stress on the neighborhood that repeated flooding caused—citing community concern for their affected neighborhoods and a feeling of always being on edge waiting for another flood event.

Another part of the county's flood risk mitigation programming involves creek and stream modification to reduce flooding on land purchased through the buyout program. This often includes re-meandering streams to combat the problematic effects of Charlotte's historic dredging and straightening programs, creating storm water retention ponds, and other stream restoration actions like revegetating the stream banks. These actions were noted often by residents as increasing the effectiveness of the county's mitigation strategy, especially when taken in contrast with prior mitigation measures. "The county has spent a lot of time modifying the creek. They had to undo all they've done before", said one resident, referencing the prior dredging program on Little Sugar Creek. This shift to returning the streams and the floodplain to more natural conditions was generally seen as a positive thing as residents recognized the poor planning involved in development in a floodplain, as well as how this development had increased flooding. As one community member laments, "the sixties were just a different time. They weren't thinking about the future". In this sense, the value of the open space created by the acquisition program has realized its flood control potential. One resident noted that "when you remove a house, the rain doesn't pour off of it; it can just sink into the ground there, so I think that it helps". The county taking steps to reverse the impact of poor development planning is seen as a good faith effort in rectifying flood risk for communities affected by flooding.

## **4.2 Inequities in Experience**

While all interviewees believed that the buyout program was effective at its first objective—reducing flood risk in a community—inequities between sites and experiences provide some of the most salient evidence for the importance of community specific examination of the effectiveness of floodplain management efforts and the buyout program more specifically. Certain community dynamics, including the history of interactions with government entities, the perceived accessibility of government officials, sentiment

towards flooding, and extent of economic and social capital are heavily influenced by the unequal power landscape in Charlotte. Differing social and economic situations, and how this interacts with people's ability to effectively engage with the buyout program, significantly impacts the ability of buyout land to act as a benefit to the community in line with FEMA's goal to improve the community environment.

#### **4.2.1 "They Would Have Lost Everything if They Hadn't Sold" vs. "They Had the Means to Stay" - Perceptions of Choice in the Acquisition Program**

The majority of houses in Charlotte were acquired after a major flood event where there was significant flood damage to the property. In addition, many of the homes acquired were sites of repeat flooding and had sustained significant damages over the years. Because of the prevalence of post-disaster mitigation, and the additional financial benefits offered to those people who participate in the buyout program, participation in the acquisition program is often seen as a necessity. However, in some cases, residents were able to bypass participation in the program because they had the financial capital to remain in place. The ability to reject a buyout offer also allowed these residents to avoid the potential impacts of displacement.

One of the biggest benefits of the buyout program is that homeowners are offered the market price for their home calculated as if the house hadn't sustained flood damage. Flooding damage, as well as the location factor of existing in a floodplain, can have a significant impact on home value. Because of this, the price the county offers in their acquisition program provides a significant financial incentive to sell. This was seen as the "tipping point" for many people on the fence about selling. Because of the extent of flood damage sustained by many of these houses—one resident remembers people having to be "rescued from their rooftops" because the water was so high—and the complications of working through flood insurance to get home repairs (or not having flood insurance at all), many people felt a personal pressure to sell. This pressure was also driven by the county's focus on post-disaster mitigation. Because these residents were approached after a serious flood event in which their property has been damaged, and not before, many of them experienced increased sensitivity to flood risk and its continued impact which contributed significantly to their decision to sell.

The financial ramifications of flooding are remarkable and play a significant role in perception of the program. As one resident whose home had been acquired through the program put it—"we're the lucky ones.". She recognized the difficulty that she would have in selling her house in the future since she would have to disclose the flood risk, and the difficulties that she would face in making the necessary repairs to her home to be able to continue living there. To her, "there really wasn't another option". Many people living close to buyout areas are still waiting for their chance to participate in the program. As one resident, who is eligible for buyout but wasn't on the "first tier" explained: "I'm on some sort of a list. It's a bit like purgatory, I keep waiting for the county to contact me". The benefits of the acquisition program are well known to other people with heightened flood risk, many of whom haven't had the opportunity to participate in the program but would like the opportunity.

In many cases, especially for individuals or communities with limited financial capital, the financial ramifications of owning and living in a flood risk property take precedence over other considerations simply because of necessity. This was especially true for interview respondents surrounding some of the more socially vulnerable buyout sites (including sites 4 and 10). Because of financial necessity in more socially vulnerable areas, the many other variables that may impact someone's willingness to sell their home, such as community connection, sense of place, and connectedness to the home, are disproportionately minimized for these residents. There are homeowners, however, who have the financial resources to give larger weight to these other complicating variables when making the decision whether or not to sell their home. This creates a dichotomy between those homeowners with the necessary resources to disregard, or place lower emphasis on the financial ramifications, and those who must place this as paramount.

In Charlotte, this creates a differential impact in the properties that are acquired. In several flood risk neighborhoods, property owners who were approached about participation in the buyout program refused participation in the program. One resident who knew two people (at Site 5) who refused a buyout cited their connection to their community for being the reason they wanted to stay. Even though those people "aren't eligible for insurance now", meaning that the financial ramifications of a flood would be even higher, "they just didn't want to move, and they had the resources not to". Because not everyone has the appropriate resources to refuse the county's offer of a buyout, even if they would prefer to stay in their homes, the buyout program created a differential impact for individuals of different means. The impact of this program is especially relevant at one site (Site 5) because new houses, "multimillion dollar" houses, continue to be built in this community, specifically in areas that still hold flood risk. Several residents spoke towards the propensity for these newer houses to have special modifications, such as a high foundation, to help lower the flood risk. Because making these modifications are an impossibility for many community members, their flood risk is heightened.

#### **4.2.2 "They Were Blatantly Displaced" vs. "They Made So Much Money"- How Far can Buyout Money Take Someone?**

Although all homeowners were offered a fair value price for their homes, the particular financial dynamics of the buyout program held differential impact at different buyout sites. In particular, owners found themselves in better financial circumstances than renters. Some of the greatest instances of displacement came from renters, many of whom weren't aware of the flood risk of the property. In addition, those homeowners in neighborhoods which had witnessed an increase in average home value benefitted disproportionately from the buyout program as compared to neighborhoods where home value had stayed more stagnant.

Site 7, the Chantilly Ecological Sanctuary, lies on land that formerly housed the Cavalier Apartments and half of the Doral Apartment Complex. These apartment buildings, which had experienced significant and repeated flooding and fell in some of the most high flood risk areas in the county, were also highly populated by low-income renters, including people using the housing choice voucher program. Many

former residents of the apartment buildings, many of whom benefited from the low rent, recall that they were not appropriately notified of their flood risk (Hartnett 2003). As for those people following the buyout, one current resident notes that “they were displaced. They were grossly displaced, I mean they don’t live in this community anymore”. The acquisition of those two apartment complexes significantly decreased opportunities for low-cost housing in Chantilly. Unable to afford the growing price of homes and apartments in the Chantilly neighborhood, those renters who lost their housing when the Cavalier and Doral Apartments were forced out of the community.

At several sites, including Site 10 and Site 13, many of the homes that were acquired were rental homes. Residents noted that the landlords, many of whom were described as “absentee” and disengaged from the community, were able to benefit financially from the buyout program, while the renters were displaced. One resident expressed their frustration that these landlords who “couldn’t care less about the neighborhood” were able to make a financial gain from the buyout program. Another resident called it “unfair that those owners got such a good deal for the home that they owned because they weren’t contributing to the community”. In these instances, the home buyout program wasn’t seen as benefitting the community. Instead, it was seen as benefitting landlords who were actively disengaged from the community, while simultaneously displacing the disadvantaged renters living there.

At Site 5, many residents noted that the properties that were acquired were generally “smaller homes that were presumably lower income”. The result of the acquisition program at this site was that “those houses, and those people, are just gone”. One resident compared the results of the displacement of these people to “a sort of gentrification in the area”. Because those houses that were acquired were of lower value than other houses in the neighborhood, resettlement within the neighborhood was an impossibility.

Site 9, which falls in the Country Club Heights area of Charlotte, has witnessed a dramatic increase in home value in the past 10 years. In this case, residents didn’t resettle in the same area, but for a drastically different reason. One resident recalls that “most of the people [she] knows made so much money because the house had appreciated so much value that they were able to move to nicer places”. People in this neighborhood were able to benefit from the growing value of homes in their area, whereas they would have a much more difficult time selling their home on the open market, given the flood risk. Growth of home value is directly related to the changing neighborhood dynamics. Country Club Heights has witnessed a lowering in average social vulnerability as average income increases and the location becomes more desirable.

The specific circumstances of individuals and communities played a large role in the fate of those people whose homes were acquired through the buyout program. While some people were able to resettle in their same neighborhood, others were displaced. Even further, some homeowners actually saw their financial situation improve after participation in the buyout program. These differential effects relate specifically to vulnerabilities, or lack of vulnerability, of these individuals and communities, creating a situation in which more vulnerable groups are more likely to be displaced while less vulnerable groups are more likely to see their situation stay the same or improve.

### **4.2.3 “A Huge Community Builder” vs. “They Said They Were Doing This For Us... No, No, No”- Differing Opinions of Current Land Use**

Perhaps the most salient differential impact of the county’s buyout program comes with community interaction with the land post buyout and differing opinions of current land use. In some sites, the land vacated by the buyout program is seen as a community asset, where the land is increasing community value and community resilience. In other sites, however, the land is seen as a detriment to the community—often due either to a lack of county maintenance or engagement, or a disregard for needs of the community when planning for the land use. The divergent impact of the land use on community sentiment is related directly to the community interaction with the land as a feature of the intersection of the county’s power to ultimately decide the use of the land and the community’s desire to be an active participant in planning procedures, and how well those two desires are mediated and informed by community specific factors.

### **4.2.4 Country Club Heights Community Garden and Biddleville-Smallwood Community Garden**

At several of the buyout sites, Mecklenburg County has utilized the open land created to establish community gardens. Two of these community gardens, both run by Mecklenburg County, illuminate the differential impact of land use on a community. The County Club Heights Community Garden was driven by the community, has high community buy in, and is seen as an asset to the value of the County Club Community more generally. The Biddleville-Smallwood Community Garden is underutilized, has high turnover rate for the plots, and a lack of engagement from community members, contributing to its failure to act as a beneficial use for the community of the land vacated by the buyout program. The differences in the effectiveness of these two gardens relates strongly to the opportunity for community engagement in planning post-buyout land use, and the way that this community engagement is tempered or increased due to community specific factors.

Site 9, which now houses the Country Club Heights Community Garden and a large open space beside the garden, is seen as a huge asset to the community. Community members regularly engage with the land, both as a “park-like space”, as well as a community garden. It’s seen as a community builder, where the open area becomes a space for community growth. The community garden was actually started without permission as an attempt by the self-described “incredibly strong community” to utilize the vacant land. There were several figureheads in the community who fought strongly for the community garden as an appropriate land use for the buyout land, and called for accountability from the county in maintenance and continued engagement with the land. After the attempt by the county to shut down the garden, the founders and supporters of the garden “went to talk to their friends in city council and got permission” for the garden to continue. As one resident described, Country Club Heights community members have had “the time and energy” to fight and be involved in the land. Not unremarkably, they also had the proper county connections, and an appropriate channel (e.g., friends in city council) to be able to leverage these connections to engage the county’s limited resources for post-buyout land use development.

Site 2, which houses the Biddleville-Smallwood Community Garden tells a different story. This garden, which was implemented by the county with limited community engagement in the planning process, is largely vacant. While there is large waiting list to plant the County Club Heights Community Garden and desire to continue gardening the plots year after year, there is large turnover in the few plots utilized by community members in the Biddleville-Smallwood Garden. The turnover rate is so large that almost each growing season “nobody comes back”. The garden is unable to act as a community asset because there is a lack of engagement from the community in response to the current land use development on the vacated land.

The differences in these two gardens relate most directly to community influence in the planning stage of the buyout land use. While land use in Country Club Heights was driven by the community, acutely representing community desire, the Biddleville-Smallwood land use was implemented by the county with limited community engagement. The fact that community members in Country Club Heights were able to leverage connections to help reflect their community desires in land use point to this power being a significant factor in successful community engagement with post buyout land. Because this is not a possibility for every community due to a variety of factors (lack of these connections, lack of time or ability to engage with county officials, distrust of government officials, etc.), this ability demonstrates a difference in power relations between these two communities. While Biddleville-Smallwood represents an area of high social vulnerability—with especially higher than county average rates of non-white populations and levels of poverty—Country Club Heights represents lower levels of social vulnerability (and is trending even lower) and is also located adjacent to even higher-income, lower social vulnerability areas of Charlotte such as Chantilly and Plaza-Midwood. The largest impact of these different levels of vulnerability is especially visible in the difference in time and resources available for engagement with post buyout land use. As one resident noted—“it’s hard to fight. It’s such a big ask for the community to be involved in the land... A lot of people don’t have the resources or time to fight”.

#### **4.2.5 Chantilly Ecological Preserve and Hidden Valley Ecological Garden**

Both the Chantilly Ecological Preserve (Site 7) and the Hidden Valley Ecological Garden (Site 13) were attempts by the county to preserve and re-discover the ecological value of land vacated by the floodplain buyout program. The land uses of these two sites are explicitly ecological in nature and encourage community engagement with a natural area acting appropriately as a floodplain. However, while the Chantilly neighborhood attributes high community value to the Chantilly Ecological Preserve, the Hidden Valley Ecological Garden is seen as an “eyesore” and a detriment to the community. Differences in the community experience of these two ecological areas also relate directly to perceived county engagement with the land, and level of community influence in the planning and execution of the land development.

The Chantilly Ecological Preserve falls on the land vacated by the Doral and Cavalier Apartment Complexes. One of its biggest values to the community is the increase of open space. As one resident noted, the preserve has benefitted the neighborhood “a ton, because [the community] went from having an apartment complex in a floodplain to now having a big open park”. Residents note that the ecological

preserve is frequented by community members, who especially appreciate the stream modifications and the increase in plant and animal life. Inherent in Chantilly's buyout site is the privilege of residents to have access to this open space that "everyone just feels great about" at the cost of the displacement of the lower income residents who had lived in those apartment buildings. The Chantilly Ecological Preserve was developed closely with the community, and the county facilitated effective partnerships with non-profits such as the Charlotte Public Tree Fund to foster continued engagement in the buyout site by both county and non-profit entities, as well as the community itself. Community members feel like their desires were reflected in the state of the current land use, which contribute to the general understanding of the Ecological Preserve as adding value to the community.

On the other hand, the Hidden Valley Ecological Garden, which was the first large scale floodplain buyout project undertaken by the county, is seen as a failure. As one resident described it—"the ecological park was the worst mistake that they (Mecklenburg County) ever made". The two most significant factors in the limited success of the Hidden Valley Ecological Garden are a perceived lack of interest and engagement from the county with the project, and the failure of the county to fulfill the promises made in the planning stages of the garden. As one resident noted, "once they landscaped it, Mecklenburg County has yet to come back to the community to ask about the park. In the years since the garden has been erected, they might have reached out once or twice". This lack of engagement is seen as neglect, especially when compared to other flood sites that the community perceives as having more engagement. As a community member pointed out, "if you look at other sites (flood sites), it's absolutely unacceptable for Mecklenburg County to neglect this area. Absolutely unacceptable". The same resident questions "how consistent Charlotte has been in floodplain management. [He] doesn't know how equitable the county has been in their flood mitigation programs. [He] think[s] that they might have done a better job in other parts of the county". The lack of maintenance of the Ecological Garden has resulted in trash accumulation, mosquito issues in the summer, and downed portions of the fencing around the garden. Further, residents believe that there is a feedback loop where the lack of county engagement results in deteriorating conditions of the Garden, which further disincentivize county engagement. As one resident mentioned, he "think[s] that [their] county representatives know what's going on and that's why they haven't made visits to the community".

Beyond the lack of engagement, community members feel like the promises the county made about the use of the Garden have not been fulfilled, that the county has "reneged on their promises". The community strongly supported the original creation of the garden because "it was developed and designed so that school children could benefit from studying the ecological garden—animals and plant life. That is not happening". One community member estimates that it's been at least 10 years since he heard of the Garden being used for educational purposes—"we didn't want it for us, we're not using it. We wanted it for the kids". Because of this, when community members talk about the Ecological Garden, "everyone gets a little heated under the wind because the city came in and said they were going to do this and that and they never did".

Because the main reason for community support of the Garden never became an actuality, the Garden is perpetually underutilized. Despite walking trails and educational signs, the main use of the Garden is as a cut-through to the apartments across the road. Community members agree that the extremely limited engagement of community members with the Garden means that the garden cannot act as community asset, and that currently it is not contributing to the community. Residents feel strongly that redevelopment or increased county engagement is essential because the county is using “[the community’s] money, [the community’s] taxes, so they have a responsibility to develop the land so that it is contributing to the community”.

Although both the Chantilly Ecological Preserve and the Hidden Valley Ecological Garden were attempts by the county to reclaim the natural value of an area, thus creating a community asset on land reclaimed by the floodplain buyout program, this was realized in only one of these cases. The Chantilly Ecological Preserve was successful because of active engagement of community members in aspects of the planning and execution of the Ecological Preserve, as well as the facilitation of county-community and non-profit-community connections that created accountability for the fulfillment of the vision of the Ecological Preserve. The Hidden Valley community, on the other hand, feels a lack of engagement and responsibility coming from the county, which has created discontentment towards both the Garden and the county (“I think I would vote against supporting Parks & Rec right now”). Residents attach this disconnect between the plan and the actuality of the Ecological Garden as representative of a history of being disregarded and undervalued by the county in comparison to wealthier, and whiter, areas (including Chantilly) of the city.

#### **4.2.6 Vacant Land**

Like many other buyout programs across the country, the majority of land acquired in Charlotte’s floodplain buyout program is now vacant. Generally community members are ambivalent towards vacant areas, beyond recognizing the value for reducing flood risk. In many situations, there’s confusion about the purpose of the land, who owns it, and what’s allowed to be done on it. In some areas (like Site 1) access to the land is prohibited. In other places, the land is “just there”, but isn’t actively utilized as community space. Still, in other sites, community members have a negative view of the open space, believing it could increase crime, and that it is not maintained well by the county.

Most of the buyout sites are slated, at some point, to become part of Charlotte’s greenway system. However, only one is actively part of a greenway so far. This is largely due to delays in greenway implementation. Although Mecklenburg County planned to have 129 miles of connected greenway by 2018, today there is just around 50. Many residents have heard of the vacated land in their community eventually becoming a greenway, but there is confusion as to when this will become a reality. Many residents recall conversations with county officials, seeing their community on master plan maps, or even seeing the beginnings of greenway projects in their community (a common beginning phase of greenway development is a “dirtway” that is unpaved but tracks the path of a potential greenway), but haven’t seen much further progress. This reflects an issue common in buyout programs—there is engagement and

accountability from the county during the actual buyout process, but then a sharp decrease after the land is actually acquired.

Many community members feel that if their land was connected through a greenway there would be more accountability from the county to show continued interest in the land post buyout. Unfortunately, there is currently inequities in funding for greenways. The current plan for funding involves finishing sections in the wealthier “wedge” area of Charlotte, while passing over less affluent areas like Hidden Valley which are also supposed to be connected on greenway trails (Portillo 2019). As one Hidden Valley resident described it, “we got screwed on the deal”. Because the lack of engagement from county officials has been understood as a cornerstone of community understanding of many of the most socially vulnerable flood sites, instances of increased disengagement amplify an already existing problem

## 5 Conclusion

Floodplain buyout programs operate in a unique space where buyouts are made possible by federal funds, but the responsibility for execution of buyouts, and responsibility for the future of buyout land belongs to localities. Although FEMA has established guidelines for post-buyout use in a manner that will add community value, it is up to the locality to execute these guidelines. Because of a variety of limitations (financial, staffing, etc.), these guidelines are often not realized (Zavar and Hagelman 2016), and this was evident in this study. In Charlotte, North Carolina, the floodplain buyout program is clearly and significantly reducing flood risk in some of the most flood vulnerable neighborhoods and communities. However, exploring the success of the program through different lenses produces significant variability in results.

The vision of the buyout program as voluntary is achieved to different degrees in different neighborhoods and communities in Charlotte, relating back to the social and economic characteristics of these communities and the specific individuals considering a buyout. While some people feel a financial pressure to sell because of the potentially devastating financial ramifications of not selling, others can absorb these ramifications. Individuals with significant social and financial capital can “minimize negative environmental externalities and appropriate positive externalities in particular places, with unjust socioenvironmental consequences” because of their “social surplus” that allows them mitigate their flood risk (Collins 2010 pp 260, 265). Although individuals who refuse a buyout are no longer eligible for some government programs for flood assistance, and experiencing another flood event will leave them solely responsible for the financial ramifications, the ability of these people to minimize these importance of these financial considerations allows them to deny a buyout for other important reasons—the value they put on their community or their home, the connections they’ve made, or any number of other reasons. The fact that some people have the ability to consider all these important factors and some don’t point to potentially inequitable outcomes of the program. The financial situation a buyout participant finds themselves in after a buyout also varies significantly. In some areas, renters were displaced, to the benefit of their absentee landlords. In other places, houses had accrued so much value that these individuals were actually able to move to “nicer places”.

Another important indicator of secondary success from a buyout program, beyond the primary goal of reducing flood risk for a community, is the value of the post-buyout land for the community. In Charlotte, the value of this land differs significantly in different contexts, and the ability to “adopt uses, ascribe values, and produce their own land-use norms” was not realized in all buyout areas (Zavar 2015). The most important factors that influence community valuation of post buy-out land is the influence that the community is able to have in mediating the land use. In some neighborhoods in Charlotte, community members have been successful in influencing land use to create a space that they believe will contribute to their community. In other neighborhoods, communities have been unsuccessful in this practice for a variety of reasons—lack of time, lack of connections to appropriate government entities, lack of organizational capacity.

The importance of differing levels of social capital, and the ability of communities with high levels of social capital to influence how land in their community is utilized after buyout, relates directly to community sentiment to these buyout areas. While bonding social capital (connecting individuals similar in demographics and circumstances) is often relied upon immediately after a natural disaster or extreme weather event, bridging capital (connecting different social groups), and linking capital (connecting communities with power, such as government officials) are essential for appropriate recovery (Aldrich and Meyer 2015). However, access to bridging and linking capital is often hampered by social vulnerability (Aldrich 2010; Hawkins and Maurer 2010) The inability of certain social groups to access the bridging and linking capital that is essential to full recovery contributes to unequal recovery landscapes of a community after these events. Those neighborhoods which could rely heavily on their linking social capital to inform land use were those ones that were most satisfied with the contributions of this buy-out land to community value. Those neighborhoods without access to this linking capital were those that were least satisfied and least able to attribute community value to the buyout land.

The setup of buyout programs—with federal financial assistance available only for the buyout stage, and not for post buy-out land use, situates this post buy-out land use as a secondary goal that lacks the same value of the buyout itself. Many localities aren’t motivated to focus on the value of this buyout land because the primary goals have already been achieved. Instead, those communities that are able to attribute value to this buyout land, beyond just value in reducing flood risk, are those who have the ability to fight for assistance in imbuing this land with value. Those other communities that don’t have these resources must make do with what engagement the county is willing to offer—which often results in either continued vacant space or land uses (like community gardens or ecological preserves) that don’t actually increase the value of that land to the community it serves.

## **Declarations**

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Availability of data and material: The American Community Survey data used in this study can be downloaded at <https://data.census.gov/cedsci/>

Code availability: Not Applicable

Authors' contributions: Not Applicable

Compliance with Ethical Standards: No potential conflicts of interest, IRB Certified exempt research with oral consent

Consent to Participate: All participants in this study gave freely-given, informed consent

Consent for publication: The author gives consent for publication.

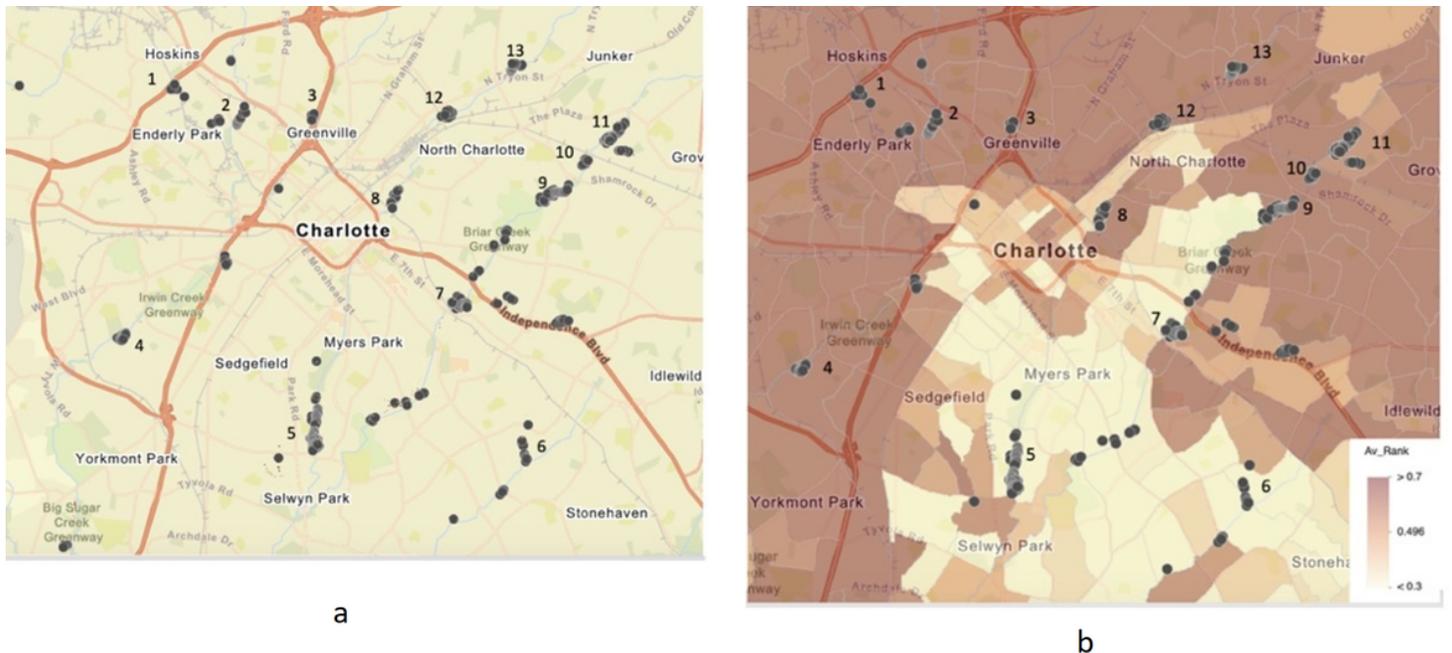
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## Figures



**Figure 1**

Visualizations of the 13 sites identified, including social vulnerability index (right). Legend shows the average percentile rank of each census block group



## Figure 2

Images from Site 5, now part of the Little Sugar Creek Greenway



## Figure 3

Images from Site 10



## Figure 4

Images from County Club Heights Community Garden (left) and Biddleville-Smallwood Community Garden (right)



## Figure 5

Images of Hidden Valley Ecological Garden (left) and Chantilly Ecological Preserve (right)



## Figure 6

Images of Vacant Sites (Site 1, Site 3, Site 4, Site 6, Site 8, Site 11)