Management of Vacant Land in Small Communities after Floodplain Buyouts

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Management of Vacant Land in Small Communities after Floodplain Buyouts

A Thesis Submitted to the Department of Urban Planning and Design,
Harvard University Graduate School of Design
by
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In Partial Fulfillment of the Requirements for the Degree of
Master in Urban Planning
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Abstract

What happens to bought-out vacant lands after people move out? After major flood events in the United States, FEMA buys out people’s homes in the 100-year floodplain, and the property must be maintained as open space in perpetuity under the municipal government’s ownership. While municipalities have no specific obligations for bought-out vacant land management, FEMA encourages developing open space development to utilize this land for communal and ecological purposes.

However, there are significant challenges for many municipalities around bought-out vacant land management, such as lack of resources, lack of community interest and motivation, and the checkerboard pattern of the land. How can municipalities overcome these barriers and develop context-specific land uses?

Through a case study of Princeville, North Carolina, the study analyzes how small communities approach managing bought-out vacant land. First, the study explores the motivations for bought-out vacant land planning in Princeville after Hurricane Matthew. After that, the study investigates the processes through which Princeville forged partnerships and secured funding for projects and what land use planning principles and frameworks were developed. Lastly, resident perceptions and challenges were identified to inform future planning implications.

The study found that land use planning for bought-out vacant land can be utilized to address community issues followed by disasters and buyouts, such as historic preservation, flood resilience, food access, and economic development. Municipalities can overcome the challenges in bought-out vacant lot repurposing such as lack of resources and checkerboard land patterns through partnerships, utilizing public land and acquiring additional land, and implementing land leasing and donating programs.

The study indicates the need to integrate post-buyout land management as part of the buyout process for better outcomes. Increased federal and state support for post-buyout land management and the need for an integrated platform that manages buyout properties are potential implications.
Introduction

Voluntary floodplain property acquisition, often called a *buyout*, has garnered increased public attention over the past decades as an effective climate adaptation measure. A buyout removes people and structures from a floodplain by paying homeowners the pre-flood value of their damaged properties after major flooding events. As Figure 1 shows, between 2000 and 2016, the Federal Emergency Management Agency (FEMA) funded a total of 10,249 buyouts across the United States (FEMA, 2022). It is a significant change from historical patterns of climate adaptation policies in the U.S., where flood management has heavily relied on armoring such as dams and levees (Anguelovski et al., 2016; Siders, 2019).

*Figure 1. The Number of FEMA Buyouts by Year*

Following a buyout, the land where a property once stood becomes vacant, and the property must be maintained as open space in perpetuity under municipal government ownership. The deed restriction is strictly ruled by FEMA as part of the Hazard Mitigation Grant Program (HMGP) buyout program, the country’s most extensive buyout program (FEMA, 2015).

FEMA encourages using bought-out vacant lots as open space for community and ecological purposes. Examples of allowed land uses include recreation and wetlands using management

Source: OpenFEMA Dataset: HMGP – Property Acquisitions

![Figure 1. The Number of FEMA Buyouts by Year](image-url)
practices consistent with preserving natural floodplain functions (FEMA, 2007). FEMA also emphasizes the potential for increased economic, social, and ecological values. FEMA’s guideline says it can help improve the economic value of properties adjacent to the buyout lands, boosting the tax base (FEMA, 1998).

FEMA’s guidelines are broad enough to allow municipalities to create their own paths of bought-out vacant land management. In developing strategies for managing and repurposing bought-out vacant land, communities reflect their values and priorities, governing capacity, and physical land patterns (Cardwell, 2023). For instance, in Grand Forks, North Dakota, the land acquired through buyouts was used to create a 2,200-acre greenway along the Red River that includes 20 miles of trails, golf courses, boat ramps, campgrounds, tennis courts, a soccer and football field, and ice skating rinks (The Greenway, n.d.). In Houston, Texas, the Nature Conservancy and Katy Prairie Conservancy have planted pocket prairies – small patches of native plants on urban lots – to utilize more small and scattered vacant lots in providing water absorption and filtration services for endangered species (Siders & Gerber-Chavez, 2021).

Despite a few relatively well-known best practices, there is still a significant knowledge gap in understanding the motivation, processes, and consequences of post-buyout land use planning. How do community actors come to decide the need for and the ways to maintain the bought-out vacant lots? Who are involved in the process of repurposing those lands and how do they contribute to planning? What are the enabling conditions and challenges of realizing intended land uses? Addressing these questions will become more and more important to better guide communities for post-buyout land management.

Under the overarching question of ‘What happens to the bought-out vacant lands after people move out?’, the study explores how municipalities can respond to the challenges of bought-out vacant land. Focusing on the experience of a small community, the study aims to investigate how they can possibly overcome the challenges of bought-out vacant land management such as lack of resources, lack of motivation and community interest, and physically fragmented post-buyout landscape.

Understanding the processes of post-buyout land management is critical for buyout professionals as well, who haven’t been necessarily involved in what happens after buyout. It is because bought-out vacant land use can lead to differential impacts of the buyouts on communities through residents’ interaction with post-buyout landscape (Cardwell, 2023). Abandoned lots that are not properly managed can intensify a sense of loss in communities traumatized by the flooding and their neighbor’s leaving (Zavar, 2015). But, if well planned and managed, they can be an opportunity to create a sense of communalism and spaces for community bonding through public space (Zavar & Schumann, 2020).
Case Study: Princeville, North Carolina

To critically examine how different actors interact with and envision bought-out land, a case study was chosen as a primary research method, mainly consisting of semi-structured interviews and document analysis. The case study approach allows for a holistic and in-depth exploration of social interaction; a variety of viewpoints and perspectives can be represented in a real-life context.

Princeville was chosen as a case study site for several reasons. First of all, Princeville was one of the most hard-hit communities by Hurricane Matthew in 2016 in North Carolina. Along with recovery efforts after Matthew, they developed a rigorous planning framework for bought-out vacant lands called the “Princeville Community Floodprint” (Coastal Dynamics Design Lab, 2020). Interestingly, as Princeville decided to pursue a buyout for the first time in its history after Hurricane Matthew, it was possible to connect how community conversations around the buyout informed the management of bought-out vacant land. Also, since Princeville is a fairly small community with around 2,000 residents and has limited city government resources, it could be a good example of how small communities can overcome the challenges of bought-out vacant land management. The Princeville Floodprint Community project has already been recognized within the State of North Carolina through increased funding from Rebuild NC. ¹

Data collection methods included qualitative content analysis, semi-structured interviews, and field trips. Town meeting minutes, plans, and local news articles were critically read to analyze the perspectives and roles of different actors in the buyout processes and vacant lot revitalization efforts. A total of 72 town meeting minutes between 2019 and 2023 were reviewed. Town meetings were held on a monthly basis, but in some months, more than one town meeting took place. During some months, however, meeting minutes were not archived, so it was not possible to know what was discussed during those meetings. The number of meeting minutes varied by year: 8 (2019), 17 (2020), 16 (2021), 29 (2022), and 2 (2023). I read all of them, focusing on the keywords and agendas relevant to the studies – buyout and bought-out vacant land management.

For plan review, the following five plans were reviewed: *Homeplace: A Conservation Guide for the Princeville Community, Rebuilding after Hurricane Matthew* (Coastal Dynamics Design Lab, 2017); *Greater Princeville* (Coastal Dynamics Design Lab, 2018); *Princeville Recovery Plan* (Hurricane Matthew Disaster Recovery and Resilience Initiative et al., 2018); *Princeville Community Floodprint* (Coastal Dynamics Design Lab, 2020); and *Princeville Comprehensive Plan* (Town of Princeville, 2021a). I read those plans multiple times to synthesize the major themes that emerged from each plan. *Homeplace* (2017) is a plan developed by NC State

¹ In April 2022, based on the success of the Princeville Community Floodprint Project, The NC Office of Recovery and Resiliency (NCORR) has committed funding to the NC State Coastal Dynamics Design Lab (CDDL) for the development of five North Carolina community floodprint reports over the next three years (Cohen, 2022).
University to provide Princeville residents with an option for community-specific residential renovation and reconstruction designs. It offered strategies from the household scale to the community scale, along with consideration for broader community infrastructures, development patterns, and population trends. *Greater Princeville* (2018) is a plan that provided redevelopment strategies for Princeville as part of the Hurricane Matthew recovery. Similarly, *Princeville Recovery Plan* (2018) was developed to assist Princeville’s general recovery from Hurricane Matthew. The *Princeville Community Floodprint* (2020) is a plan prepared to recommend land use strategies for bought-out vacant lands and publicly owned lands. Lastly, the *Princeville Comprehensive Plan* (2023) is a long-range plan that was developed most recently by the town.

For news articles, I reviewed about 50 media articles that were written after Hurricane Floyd (1999) and Matthew (2016) with keywords such as “Princeville Matthew Buyout,” “Princeville Floyd Rebuild,” and “Matthew Recovery.”

In addition, a total of five semi-structured interviews were conducted to complement the missing information in publicly available documents as well as to understand the distinct perspectives of different actors. The interviewees included the mayor of Princeville (politician), a city manager of Princeville (government official), a non-profit organization manager (community organization), and two residents of Princeville (resident).

During the field trip, I used photography as a method. Photographs can show depth and detail that words cannot convey (Glaw et al., 2017). Through photography, I explored post-buyout land typologies as well as the outcomes of the land revitalization projects.

**Overview**

In the Literature Review section, existing studies are introduced and categorized into three topics: challenges of maintaining vacant land; land use and repurposing of the bought-out vacant lands; and actors of bought-out vacant land management.

In the Case Study: Princeville, NC section, the context of the buyout in Princeville after Hurricane Floyd (1999) and Matthew (2016) is provided. Also, the information and synthesis about various recovery efforts between Hurricane Matthew and the completion of bought-out vacant land planning (2020) are provided for context. Based on that, vacant lot revitalization efforts through Princeville Community Floodprint are analyzed in terms of involved actors, decision-making, planning frameworks and strategies, implementation, and resident perceptions.

The discussion section summarizes the major finding of the study, and the Conclusion section introduces the implications for planning and future research.
Literature Review

Challenges of maintaining vacant lots

Vacant lot planning has been a focus of urban studies for a long time. Existing studies explore how the vacant lot management schemes vary by different empty lot characteristics, ownership status, and actors involved (Anderson & Minor, 2017; Crauderueff et al., 2012; Gobster, Hadavi, et al., 2020; Rigolon et al., 2021; Stern & Lester, 2021). Different types of urban vacant lots such as post-industrial sites, derelict sites, natural sites, and transportation related sites have been dealt in the existing literature to understand potentials and barriers in redeveloping them.

Some vacant lot studies shed lights on the role of actors in planning. They examine how politicians, city officials, neighboring residents, non-profits, and researchers bring different aspirations into the planning processes deciding land uses. They analyze the ways in which tensions arise between competing values possessed by different actors, such as aesthetics and biodiversity, public use and private ownership, and infrastructural needs and community desires (Hunold, 2020; Kenner et al., 2022; Kim, 2016).

Though existing studies on a vacant lot are helpful to understand political dynamics around vacant lot planning, there is a significant lack of vacant lot planning literature focused on the lots cleared due to the buyout. Considering that bought-out vacant lots have quite distinct characteristics in terms of the presence of deed restriction and being located on highly disaster-prone area, they can result in unique political dynamics when it comes to envisioning land uses.

Management of bought-out vacant lots can come with significant challenges for many communities. Among multiple reasons, there are two issues at hand: first, bought-out vacant lots are interspersed throughout the residential area, making it hard to secure a significant area of the land that can be developed into a continuous open space. Second, bought-out lots usually show an uncoordinated checkerboard pattern of open spaces (BenDor et al., 2020a; Environmental Law Institute, 2017; Lieberknecht & Mueller, 2023; Siders & Gerber-Chavez, 2021). Buyout is often initiated in a reactionary and ad hoc manner after a flood event. The consequence of it is uncoordinated and incontiguous open spaces that limit the opportunity to create open space clusters and therefore increase the cost of maintaining small, isolated parcels in residential neighborhoods (Atoba et al., 2021; Freudenberg et al., 2016; Zavar & Hagelman III, 2016).

Another challenge is the lack of resources to manage bought-out vacant lots. Municipalities often lack information to estimate the true cost of buyouts, including the long-term cost of maintenance. Even without substantial land uses and planning for vacant lots, the costs of maintenance add up to anywhere from $192 to $1,398/acre annually, depending on frequency of
mowing and available equipment (BenDor et al., 2020b). In fact, in small communities, the maintenance is a significant stressor for people who are already stuffed with many other administrative works (BenDor et al., 2020b). The cost burden that many communities endure to maintain the open space while also experiencing a reduced tax base is a significant barrier to attempt bringing more high utility uses to these lands (Zavar et al., 2019). The negative impact of vacancy in the communities and burdens of maintaining the lots can make the buyout program fundamentally unattractive to local governments (The Pew Charitable Trusts, 2022).

Regardless of these challenges, because post-buyout land management hasn’t necessarily been considered as a part of buyout process, vacant land management is a neglected area for funding from the federal and state governments. Some of the land management practices are funded through channels like National Fish and Wildlife Foundation Grant (National Fish and Wildlife Foundation, n.d.), but they are not quite streamlined with the buyout program. As a result, most of the bought-out vacant land in the United States remain vacant that may be mowed periodically but not restored or converted to higher social and ecological use (Siders & Gerber-Chavez, 2021; Zavar & Hagelman III, 2016).

**Land use and repurposing of the bought-out vacant lands**

In line with FEMA’s guidance that open space needs to be consistent with conservation of natural floodplain functions, one of the most common land uses is green infrastructure (Zavar & Hagelman III, 2016). Green infrastructure is often defined as a strategically planned network of natural and semi-natural areas with other environmental features, designed and managed to deliver a wide range of ecosystem services, while also enhancing biodiversity (European Commission, n.d.). It provides natural buffer to storm surge and enhances floodplain functions to capture, infiltrate, store, and slow excess stormwater to reduce the risk of future flood damage.

As Table 1 demonstrates, land uses of bought-out vacant lots can range from more intensive activities (e.g., habitat management, invasive species control) to more minimal activities (e.g., maintaining fences and signs) (Environmental Law Institute, 2017). Depending on the level of maintenance activities, the cost and administrative burden can vary.

*Table 1. Common Maintenance and Management Tasks for Restored Habitats*

| - Passive habitat management (e.g. species monitoring) |
| - Active habitat management (e.g., control of invasive plant species, prescribed burning) |
| - Planning and conducting educational activities |
| - Monitoring (e.g., water quality monitoring) |
| - Enforcement (e.g., enforcing deed restrictions, management and maintenance schedules) |

Source: Environmental Law Institute. 2017. p.59
One of the project examples where they executed more intensive activities is the Linden Blue Acres Green Infrastructure and Floodplain Restoration project in New Jersey (Figure 2). The project aimed to increase storm resiliency by reducing stormwater runoff within the former residential properties acquired by the NJDEP Blue Acres program (New Jersey Section of American Water Resources Association, n.d.). The project included the development and implementation of green infrastructure-focused floodplain enhancement design including restoration of native coastal floodplain forest and meadow and floodplain wetlands. Specific programs include re-planting the parcels, installation of a walking path, and the creation of a floodplain bench for the adjacent drainage ditch (Princeton Hydro, 2020). Princeton Hydro, which is a private company, collaborated with the City of Linden, Rutgers University, New Jersey Department of Environmental Protection, Phillips 66, National Fish and Wildlife Foundation, New Jersey Corporate Wetlands Restoration Partnership, and Enviroscapes to conduct one of the first ecological restoration projects within bought-out properties.

Figure 2. Linden Blue Acres Green Infrastructure and Floodplain Restoration Project

Source: Princeton Hydro. 2020
More scholarship is examining the commemoration of natural disaster sites through the themes of landscape, memory, and place (Bowers, 2015; Martin, 2019). One of the ways to remember the place that once was and that can be found in post-buyout communities is through memorials (Bowers, 2015; Dwyer & Alderman, 2008; Zavar, 2019). The memorials have been erected to commemorate the scars of natural disasters like flooding and earthquake. For instance, Zavar (2019) surveyed 66 buyout sites within the central United States that contained over 4,300 acquired parcels, finding out that only four included a memorial or marker. Then the study analyzed the four memorials established in four different neighborhoods after flooding, figuring out finding that residents and community values were the primary focus of the memorial narratives, but the memorials had limited recognition of the flood event, former landscape/neighborhood, or buyout. Floodplain buyout commemoration is still rare – though it is more commonly found in the communities that were relocated as a whole - yet provides insight into how acquired properties are memorialized and their narratives (Zavar, 2019).

To execute these land uses, some communities have developed ways to finance improvements. In East Grand Forks, Minnesota, maintenance and management of the greenway system has been funded through an annual utility fee (Environmental Law Institute, 2017). Another example is the city of Tulsa which finances improvements to its urban greenway with stormwater fees assessed on new construction projects (Environmental Law Institute, 2017).

Communities also consider leasing the properties to a new user or transferring the property to a qualified public or non-profit owner. Such transfers can reduce the financial burden of maintenance for municipal governments and distribute management responsibilities, stakeholder participation/support, legal liability, or other considerations. However, both leases and transfers must have FEMA approval before the transaction. The new user or owner would become responsible for the property and adhering to the deed restrictions. Leases can be flexible in duration to suit both parties’ needs, ranging from short-term for a pilot project to a longer-term commitment or lease-to-own arrangement (Environmental Law Institute, 2017).

**Actors of bought-out vacant land management**

Post-buyout land use decisions reflect the actions of structures, agents, and intervening agencies (Martin, 2019; Zavar, 2016). FEMA provides general guidelines of land use categories that are allowed or not, but final uses are creatively decided by local governments, intervening agencies, and residents through local decision-making processes, budgetary spending, and implementation.

**Government**

Land use planning and regulation are central to many climate adaptation efforts, and they are primarily the responsibility of local government in most jurisdictions (Measham et al., 2011;
Zachary, 2020). In particular, for bought-out vacant land management, local governments are one of the leading actors in shaping land uses as the owners of the bought-out vacant land. They critically shape post-buyout land use by having the authority to plan, set budgetary limits, and engage different actors in the planning processes (Zavar, 2016). In small communities, there may be an elected official or city staff member in charge of all such properties. In larger communities, parks, and recreation, public works, planning, or emergency management agencies may manage floodplain buyout properties (Environmental Law Institute, 2017).

Their capacity also bounds the role of local governments in post-disaster land use planning. Some local governments will have the administrative capacity and funding to take on their responsibilities. But, in other cases, local governments will look into outside groups to aid with these tasks (Environmental Law Institute, 2017). Figure 3 shows the result from the Environmental Law Institute’s 2015 study that investigated 40 communities across North Carolina, Wisconsin, and Minnesota regarding the responsible entities that oversee acquired properties. In more than 50% of the investigated communities, public works oversaw acquired properties, and Parks and Recreation and Planning followed.

Figure 3. Entities that Oversee Acquired Properties


Researchers on climate adaptation planning have found that adaptation efforts often, directly and indirectly, harm socially and economically vulnerable groups (Anguelovski et al., 2016; Sovacool et al., 2015). They have warned of the perils of government-led top-down adaptation planning that doesn’t seek to increase participation and inclusion (Archer et al., 2014; Zachary, 2020). One of those examples is the New Orleans Green Dot Map which showed the city’s top-down strategy of where to expand the greenspace after Hurricane Katrina (Zachary, 2020). When the plan was leaked through the local media, the Times-Picayune, it created a lot of controversies
in the community. It was seen as problematic, especially because the areas covered by green dots were lower-income and predominantly black and brown communities. The plan was criticized by the public for not taking into account who was covered by the green dots, and who are allowed to return to the city after Katrina (Neil Adger et al., 2005).

Last but not least, local governments are the entities capable of developing more sustained funding mechanisms through local taxes. For instance, in Austin TX, a drainage utility fee is calculated individually for each property based on the amount and percent of impervious cover (higher fees for more impervious cover) and used for conservation work (Government of Austin, n.d.).

Residents

Key residents in the community can play an active role by introducing and suggesting certain land uses themselves or banding together to oppose the development of certain land uses (Cardwell, 2023; Zavar, 2016). Zavar (2016) analyzed the role of key residents, termed “magnetic residents” (p.41), who drove neighborhood civic action and land uses on the open space created through floodplain property acquisition (Zavar, 2016).

Relatedly, residents develop a different sense of utility about the bought-out vacant land, depending on their power to influence land use decisions (Cardwell, 2023). Cardwell (2023) compared different neighborhoods regarding residents’ roles in bought-out vacant land use decisions. In one neighborhood where community members had a personal and professional connection with the city council, residents cherished the utility of bought-out vacant land more regardless of their uses. Their differential power also impacted how they perceived the overall effectiveness of the buyout programs, such that the community where they could influence the land use tended to assess buyout programs more effectively (Cardwell, 2023).

Some studies have shed light on residents’ perception of the acquired land, whether they deem it beneficial, and what values - social, ecological, and economic - they ascribe to those lands (Zavar, 2015). Zavar (2015) analyzed that residents ascribed distinct values depending on whether they had lived in the community before the buyout, appearance or maintenance of the buyout properties, values, and ideals that they have.

Community organizations

Agendas set by agencies such as Non-Governmental Organizations (NGOs) can influence land use post-buyout land use decisions. They provide expertise, connect the general public and governments by facilitating information exchange, and legitimize public policy and programs (Kodis et al., 2021; Zavar, 2016). Especially, conservation organizations and land trusts can play a significant role as bought-out land management includes significant green infrastructure
planning component (Kodis et al., 2021). They contribute to post-buyout land use planning through building partnerships, bringing funding and innovation in acquisition, restoration, management, and political advocacy (Kodis et al., 2021). For instance, in Williamson Creek in Austin, the partnership between The Nature Conservancy, Community Powered Workshop, Public Green and Wild, National Parks Services, and Asakura Robinson conducted a community visioning and master planning process with residents (Community Powered Workshop, n.d.).

Communities can consider leasing and donating as a mechanism to distribute the management burden. Under the current FEMA Hazard Mitigation Assistance Programs, local governments are allowed to transfer their interest in the property after the acquisition is complete – but only to certain entities, and only with prior approval of the FEMA Regional Administrator. The organizations to which full title can be transferred are limited to (1) another public entity; (2) a non-profit organization with a conservation mission (Environmental Law Institute, 2017).

Having another organization (or agency) be the easement holders can also be a way to allocate responsibility to the other entity for maintaining and keeping competing uses away from the property. These organizations are likely to have stewardship and monitoring protocols in place for their existing land, allowing them to coordinate the necessary management and maintenance efforts, be it by their staff or community volunteers, more efficiently. Conservation organizations have a lot of experience innovating conservation mechanisms such as conservation easements and floodplain easements that can be leveraged to manage bought-out properties (Kodis et al., 2021).

**Lessons from the Literature Review**

Existing vacant lot studies indicate how different types of vacant land – based on their characteristics such as their physical features, ownership status, actors involved, and background socio-economic challenges – bring distinct management challenges. Studies on the bought-out vacant lots are neglected in the existing vacant lot study as a distinct land typology.

Existing studies point out that the fragmented physical patterns of vacant lots and the lack of resources are significant barriers that deter open space development. Especially in small communities where they are already occupied with many other administrative works, maintenance is inevitably a considerable stressor. While few case studies show the possibilities of successfully implementing bought-out vacant lot repurposing, there is still a significant knowledge gap to make these cases applicable to other communities. For many communities lacking motivations and strategies to overcome the expected challenges, there needs to be more in-depth research on municipalities' motivations, processes, consequences, and challenges.
Potential land uses can vary, while many municipalities consider the integration of green infrastructure in line with FEMA's guidance that open space needs to be consistent with the conservation of natural floodplain functions. However, land use decisions are ultimately unique to each community based on their interpretation of the regulations, community needs, actors involved, and the capacity to execute implementation. However, very few studies explore the processes and critical factors that informed each community's final land use decisions on bought-out vacant lands. Analyzing key actors, governance, and resources put into the process will be an essential resource for other municipalities faced with similar challenges.
Case Study: Princeville

Community overview

Princeville, initially founded as Freedom Hill in 1865, is the oldest town founded by freed Blacks in the United States (Wagner, 2022). At the close of the civil war, formerly enslaved African Americans seeking protection and freedom left plantations for Union troop encampments. Following the departure of Union soldiers, many of these emancipated people remained behind and settled in an area South of the Tar River that they subsequently named Freedom Hill (Town of Princeville, 2021b). A mural installed in the Heritage Park (Figure 4) captures this history in a succinct way.

Figure 4. A Mural in the Heritage Park capturing Princeville’s History

Source: A photo taken by the author
Explanation: The mural begins with an image of slaves cultivating fields, transitions with their emancipation and ends with their arrival at Freedom Hill, later named Princeville. The mural was created by three young artists – Dazzala Knight of Princeville, Randell Leech of Salisbury, and Cameron Johnson of Charlotte – along with Mark Malley, an assistant art professor at East Carolina University (The News and Observer, 2007).
Princeville took root in an economic interdependence developed with the neighboring white-majority town Tarboro, which had been the seat of local plantations. Tarboro began to develop a manufacturing sector during the 20th century, which provided employment to Princeville residents and helped support Princeville’s continuity (Mobley, 1986). That interdependence, however, continued to reproduce historical racial-economic hierarchies, with Princeville remaining the less-privileged of the two, despite the town’s own local businesses constituting a “Black Wall Street.” (Grace-McCaskey et al., 2021)

Princeville is not an exception from many African American towns in the American South in terms of the adversities they had to face since its founding, in the face of slavery, prejudice, and numerous natural disasters. For instance, in 1903, some white residents nearby lobbied the North Carolina legislature to revoke Princeville’s charter and fold the town into Tarboro (Town of Princeville, n.d.). The Tarboro Southerner, the local newspaper controlled by white supremacists, urged Tarboro to annex Princeville because blacks were deemed unruly, beyond white law and order (Town of Princeville, n.d.).

According to the 5-year American Community Survey (2021), the population of Princeville was 1,648. As Figure 5 shows, Princeville is still a predominantly Black and African American town (93.1%), even compared to Edgecombe County (56.8%). Their median household income ($37,465) is less than those of Edgecombe County and the state of North Carolina. Compared to the national median household income of $70,784 in 2021 (Semega & Kollar, 2022), it is slightly more than half. Princeville shows a high unemployment rate (12.9%) and low median house value ($83,300) compared to the County and the State.

Figure 5. Princeville’s Demographics
According to the data provided by the NC One Map, an integrated data platform provided by the State, there are roughly 1,080 properties in Princeville. Figure 6 demonstrates that most lands are currently zoned as single-family housing (87.2%) with few multifamily housing parcels (0.46%). The second largest land use is governmental uses, including governmental buildings, publicly owned parks, and publicly owned vacant lots (6.48%). Roughly 1.29% of parcels are used as agricultural land, and about 0.92% are used for religious uses. Figure 7 shows a more detailed overview of the housing units by type. About 47.7% of the total housing units are mobile homes, followed by 39.2% of 1-unit detached homes. The predominant presence of mobile homes is the outcome of the recovery from Hurricane Floyd in 1999 (Martin, 2019). With the recovery aid, many homeowners in Princeville went a bit bigger with their replacement home, for example, from three to four bedrooms in a manufactured home. But as old stick-built homes were replaced with housing that was less expensive to develop, the number of mobile
homes, which are more vulnerable to natural disasters than other housing types, tripled to compromise a significant portion of the town’s occupied housing (Martin, 2019).

**Figure 6. Land Use of Parcels in Princeville**

Source: Author, based on the land use data provided through NC One Map

**Figure 7. Housing Units by Type**

*Source: 5-Year American Community Survey 5-year Estimates. 2017-2021. Accessed through Social Explorer*
Vulnerability to the Water

Princeville is situated on land unwanted by whites, and prone to frequent flooding. Like blacks throughout the South following the Civil War, the most desired goal of the people of Freedom Hill was to become legal landowners (Mobley, 1986). Their first chance to obtain land came during Reconstruction when the property composing Freedom Hill was sold by the heirs of John Lloyd to Henry H. Shaw, a planter. Shaw then sold plots to the freedmen who could secure sufficient funds to purchase small parcels. The land—susceptible to flooding—was cheap, especially in the lean years of Reconstruction when property values fell. Other formerly enslaved people who could not buy simply continued to take temporary possession of tracts without titles (Mobley, 1986).

As a result, flooding has been inevitable for people in Princeville since its settlement. As Table 2 demonstrates, a major flood occurred very often since the foundation of the town. After a major flood in 1958, town officials approached the Army Corps of Engineers with a proposal to build a levee. A three-mile long, four-million-dollar eastern levee along the south bank of the Tar River was completed in 1967. It was told that the dike could accommodate 37 feet of water; since flood waters had never exceeded thirty-three feet, people felt safe at last from the Tar River (Town of Princeville, n.d.).

<table>
<thead>
<tr>
<th>Name</th>
<th>Year</th>
<th>Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hurricane Hazel</td>
<td>1954</td>
<td>Category4</td>
</tr>
<tr>
<td>Hurricane Helene</td>
<td>1958</td>
<td>Category4</td>
</tr>
<tr>
<td>Hurricane Donna</td>
<td>1960</td>
<td>Category3</td>
</tr>
<tr>
<td>Hurricane Hugo</td>
<td>1989</td>
<td>Category3</td>
</tr>
<tr>
<td>Hurricane Fran</td>
<td>1996</td>
<td>Category3</td>
</tr>
<tr>
<td>Hurricane Floyd</td>
<td>1999</td>
<td>Category2</td>
</tr>
<tr>
<td>Hurricane Matthew</td>
<td>2016</td>
<td>Category5</td>
</tr>
</tbody>
</table>

Source: Author, based on the Coastal Dynamics Design Lab (2017)

As shown in the Figure 8, since the completion of the levee by the U.S. Army Corps of Engineers (USACE) in the 1960s, much of Princeville has been mapped in a special designation flood zone titled “Zone X: Protected by Levee.” Mapping the flood risk in this way has incurred many conflicting views within the community about which areas are susceptible to flooding and the overall efficacy of the existing levee. The same flood zone designation had been used to plan for pre-disaster mitigation measures for a long time (Coastal Dynamics Design Lab, 2020, p.8).
Coastal Dynamics Design Lab provided alternative flood risk modeling through their research, finding that about 87% of Princeville is mapped within the 100-year floodplain of the Tar River (Coastal Dynamics Design Lab, 2020). As shown in Figure 9, they also categorized the variance in flood risk into higher, moderate, and lower risk zones within the floodplain. They considered the Tar River's water surface elevation and the topography's height to more accurately represent the flood risk (Coastal Dynamics Design Lab, 2020).
Governance

The town administration is comprised of 12 government officials that include a mayor, four commissioners, a town manager, a town clerk, three public works officials, a financial director, and a town attorney (Figure 10). They also work with individually contracted consultants and grant writers to complement the need for more workforce. The board makes all decisions in the government of commissioners by casting a vote. The mayor doesn’t have a casting vote, but when there is a tie in the vote, the mayor plays the role of a tiebreaker.

Figure 10. Princeville Town Leadership Structure

![Diagram of Princeville Town Leadership Structure]

Source: A diagram made by the author based on the Town of Princeville website and interviews


Hurricane Floyd (1999)

On September 16, 1999, Hurricane Floyd landed in eastern North Carolina. It pounded more than thirty North Carolina counties for two days and dropped an estimated 15-20 inches of rain (Bullard & Wright, 2012). The storm left 90% of the Edgecombe County towns submerged under 23 feet of water. For weeks, the town of 2,100 people was accessible only by boat, and only seven of its 718 houses were covered by flood insurance (The News and Observer, 2007). Flood waters from Floyd put Princeville under water for 11 days.

Many residents in Princeville thought that relief was slow in coming, and there was pressure from both federal and local governments to relocate (Army Corps of Engineers, 2015). In the aftermath of Matthew, FEMA and the U.S. Army Corps of Engineers (USACE) approached the town with two different offers. USACE offered to fortify the levee, raising the height of its walls and fixing flaws in the old structure, such as a divot by the railroad tracks where water could...
rush through (WRAL News, 2017). Meanwhile, FEMA offered to buy out a large share of homes in Princeville, giving residents options to live in safer areas (WRAL News, 1999). But that would mean a significant depopulation of the town. These two offers from FEMA and USACE were contradictory to each other because of the regulations developed in the Reagan era that required federal agencies like the Corps to do cost-benefit analysis – officials have to prove that the financial benefits from the project are more significant than the cost - for every project (Bittle, 2022). If FEMA bought out all the houses intended to be bought, there would be so few houses left that the USACE couldn’t justify building a levee.

The town needed to make a decision on whether to pursue a buyout or rebuild. FEMA buyouts were offered, but acceptance was rejected by most in the community. People believed that such an action would have scattered the community to new quarters outside Princeville’s original lands and potentially have made life elsewhere untenable to the lowest-income residents of the community (Army Corps of Engineers, 2015).

The decision-making process involved a general vote and a council vote. In the general vote, only 50 of 2,100 residents in Princeville voted for the buyout (Bittle, 2022). The four-member town board had to make a decision on whether the town should pursue a buyout or not. Two members were opposed to pursuing a buyout, arguing that it was wrong to give up on Princeville’s legacy, and two argued that residents deserved the chance to move somewhere safer. Mayor Perkins held the tie-breaking vote, and she stood for the town to rebuild. By a three-to-two vote, the Board of Commissioners voted to reject the buyout and return home (Bittle, 2022; Bullard & Wright, 2012).

After Princeville decided to stay put, they received significant national attention. Many celebrities – Prince, Jesse Jackson, Reverend Al Sharpton, and President Clinton – visited the town or sent their solidarities publicly (Bullard & Wright, 2012; Grace-McCaskey et al., 2021). After the visit of President Bill Clinton, on February 29th, 2000, the president issued an executive order forming the President’s Council on the Future of Princeville, North Carolina (Executive Office of the President, 2000). It brought together 15 federal agencies including FEMA, HUD, and the Department of Labor along with several key members of the Cabinet.

FEMA handed out $26 million to Princeville’s more than 2,000 residents and another $1.5 million to the town to rebuild after Floyd’s floodwaters receded (WRAL News, 2009). Another critical component of rebuild efforts was the USACE’s promise and reassurance to repair the levee. It played a pivotal role in bringing back residents by providing a sense of safety. However, regardless of their promises, still, the levee hasn’t been rebuilt in 2023 after more than 20 years since Floyd, and there is no concrete plan outlined for it yet (details follow under the following ‘Hurricane Matthew’ section).
Following Hurricane Floyd, Princeville residents and the town made a strong case for the preservation of the town and its unique historical and cultural importance in American history (Adkins et al., 2021; Army Corps of Engineers, 2015). But even with the post-Floyd sentiments, the Spring of 2000 saw only 100 of 875 families move back into their homes (Army Corps of Engineers, 2015). Furthermore, more than 300 former Princeville families remained in temporary FEMA housing a year after the storm, some as far as 25 miles outside of town at a women’s prison near Rocky Mount. By 2010, most of those residents had returned, often times to new or alternative housing (Frank, 2001). Princeville’s housing stock had been rebuilt except for 22 rental homes (WHITTLE, 2005). A list of the projects included turning the old and flooded Town Hall, which once had been a school for black children in the late 1800s, into an African American cultural museum (WRAL News, 2009).

Another notable recovery effort led by the town was to acquire mobile home park along Tar River that was significantly damaged due to Floyd. The town acquired the Riverside Heritage Park through public-private partnership involving the Lowe’s Charitable and Educational Foundation which awarded $165,750 grant to Princeville to match a gift of the same size made by the North Carolina Parks and Recreation Trust Fund. The grant was obtained by the North Carolina Office of the Trust for Public Land (TPL) on behalf of the town. They conducted real estate negotiations and held the land for a year until funding arrangements were finalized (Trust for Public Land, 2003).

**Hurricane Matthew (2016)**

Seventeen years after Floyd, Hurricane Matthew made landfall in eastern North Carolina on October 8th, 2016, bringing 10 inches of rain to Princeville and up to 20 inches of rain throughout the state. The Tar River crested at over 36 feet, once again causing catastrophic flooding and damage to the town. Nearly 500 homes in Princeville flooded, and about 80 percent of the town was underwater for days (Coastal Resilience Center, 2020).

After Hurricane Matthew, Princeville’s residents were faced with new decisions, this time with different options (Bidgood, 2016). FEMA offered millions of dollars in recovery money, and representatives from the federal and state governments were urging the town’s leaders to consider buyouts (ABC11 News, 2016).

Princeville’s residents had to decide to either rebuild in place or be bought out. But the context was different from the aftermath of Hurricane Floyd. People now had knowledge that storms like Floyd could come more than once in a lifetime. They also learned that the levee was not safe. Residents, this time, were ready to take buyout offers. During an interview with the media (ABC11 News), one of the Princeville residents reasoned why they are willing to take a buyout even though they cherish Princeville’s history and their roots.
“They can put a sign (on the land) that says the Purvis family. I know where I came from. I’m blessed and thankful for what they have done. But my health. It’s not healthy staying here.” (ABC11 News, 2016).

Mayor Bobbie Jones, who had been a mayor of Princeville since 2014, was against the buyout for two reasons (based on the interview with the mayor). He agreed with the decision made in 1999, saying that if residents take a buyout and move out, the historic town will suffer (WRAL News, 2016). Another reason is the decrease in budget. They were already operating on a small budget of less than a million dollars. Regardless of the opposition from the mayor, the board of commissioners decided to pursue a buyout in a 2 to 1 vote (ABC11 News, 2016) that let qualified residents choose to potentially elevate their homes, rebuild, or buy out.

This time, various resources from different organizations were available for Princeville (Figure 11). FEMA played a significant role in disaster management by administering the HMGP program. HMGP program had three different programmatic support: acquisition, elevation, and reconstruction. Acquisition (buyout, in short) is a program where a government buys the property from the homeowner and demolishes or relocates any structures on the property. The elevation is the home being raised, so potential floodwaters may flow underneath the home. Reconstruction is demolishing the existing home, and a new, elevated home is constructed.

**Figure 11. Different Government Programs Available After Matthew in Princeville**

Source: The author, based on the town meeting minutes and interview

The USACE continued to have a presence in the community by conducting and releasing the result of the levee study. In 2015, a USACE report revealed that the levee in Princeville did not protect the town from the 100-year storm (Army Corps of Engineers, 2015). As shown in Figure 12, they proposed which side of the levee should be rebuilt (US Army Corps of Engineers, 2015). However, as Table 3 shows, the most recent finding in 2021 indicates more delays to be expected as the original level reconstruction plan may cause flooding in other areas.
Figure 12. The Proposed Levee Reconstruction

Table 3. History of Levee Reconstruction Efforts in Princeville

<table>
<thead>
<tr>
<th>Year</th>
<th>Levee Reconstruction Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967</td>
<td>For the first time in Princeville’s history, USACE completed a levee that held off floods until Hurricane Floyd’s sent water over its top (Bidgood, 2016).</td>
</tr>
<tr>
<td>1999</td>
<td>The town leadership rejected taking buyouts after Hurricane Floyd and chose to rebuild the town and fix the levee (Bidgood, 2016).</td>
</tr>
<tr>
<td>2015</td>
<td>After more than 10 years of study since 1999, USACE completed another proposal to extend the levee, which they said would have at least reduced the Hurricane Floyd’s level of destruction. (Bidgood, 2016).</td>
</tr>
<tr>
<td>2016</td>
<td>USACE returned to Princeville with its final levee study which said the previous levee was not only weaker than the Corps had thought but it also contained numerous structural defects that would render Princeville vulnerable even to smaller storms than Floyd (Bittle, 2022).</td>
</tr>
<tr>
<td>2020</td>
<td>USACE announced an estimated $39.6 million investment to complete the construction of levee.</td>
</tr>
<tr>
<td>2021</td>
<td>Updated computer modeling provided by USACE revealed that the original plan would have caused flooding in other areas. Currently, USACE is trying to come up with a better design.</td>
</tr>
</tbody>
</table>

Source: Author, based on different sources
What made the dynamics after Hurricane Matthew very different from Hurricane Floyd was the role of state actors. The NC Office of Recovery and Resilience (NCORR) was established in 2018 by the Governor of North Carolina, Roy Cooper, to support North Carolina’s recovery from natural disasters as a response to the devastation caused by Hurricane Matthew. NC Rebuild was established under the NCORR in 2019 to assist homeowners with the Hurricane Matthew and Florence recovery efforts in North Carolina. Their programs comprised two components: the homeowner recovery program and the strategic buyout program. The homeowner recovery program provides assistance to repair, rebuild, or elevate homes or to provide reimbursements for completed repairs (Rebuild NC, n.d.). The structures of the strategic buyout program are basically the same as FEMA’s buyout program, but it was administered independently from FEMA.

Another actor during Matthew recovery was the North Carolina Office of Budget and Management (NCOBM) (North Carolina Office of State Budget and Management, 2022). The disaster recovery program at the NCOBM started in the aftermath of Hurricane Floyd in 1999 with the goal of helping to rebuild communities, provide housing assistance, and support economic recovery in the wake of disaster. After Matthew, they provided funding for home repair and buyout as well as various infrastructural projects repairing drainage and stormwater management systems.

It is hard to accurately know how many buyout requests in total were filed through the three different agencies (FEMA, Rebuild NC, and NCOBM) due to the difficulty of getting data and the fact that they are operating independent from each other. According to the report from the Hurricane Matthew Disaster Recovery and Resilience Initiative (Table 4), buyouts had huge community support even though many were not funded. A total of 179 buyout requests were filed, higher than the project requests for the elevation and rebuild project combined. One hundred seventy-nine acquisition requests are a fairly significant number considering that there are 1,036 housing units in Princeville, comprising about 17% of the total housing units. Given that more than 87% of the total properties are residential in Princeville, with very few commercial properties, it is fair to expect that most of the bought-out properties were residential.

Table 4. A Summary of Princeville Hazard Mitigation Grant Application

<table>
<thead>
<tr>
<th>Type</th>
<th>Applications</th>
<th>Funded</th>
<th>Unfunded</th>
<th>Completed (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevation</td>
<td>111</td>
<td>75</td>
<td>36</td>
<td>50 (66.6%)</td>
</tr>
<tr>
<td>Demo-Rebuild</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>2 (66.6%)</td>
</tr>
<tr>
<td>Acquisition</td>
<td>179</td>
<td>22</td>
<td>157</td>
<td>12 (54.5%)</td>
</tr>
</tbody>
</table>

Source: Hurricane Matthew Disaster Recovery and Resilience Initiative et al. 2018. p.37, the progress of completion is based on the interview with the town manager in March 2023.
In 2023, the town is still in the process of recovering from Matthew. Based on the interview with the town manager in March 2023, roughly 54.5% of the acquisition projects are completed. For FEMA’s HMGP program, 12 out of 22 buyouts were completed, 50 out of 75 elevations were scheduled by June 2023, and 2 out of 3 reconstructions were completed. **Figure 13** shows the locations of the completed bought-out properties. Except for Heritage Park, which was created after Hurricane Floyd, most of the properties are concentrated in historic Princeville. Moreover, even though they are technically completed from the administrators’ perspective, properties are still standing in many lots. This shows how long buyout process can take including complete demolition.

**Figure 13. Current Status of Bought-out Lands**

Source: Author, based on the NC One Map data and photos taken during the field trip

**Community’s understanding of buyouts**

Buyouts after hurricane Matthew came with a lot of confusion. Town council meeting minutes (February 2020) indicated that residents felt like they were not guided properly throughout the process. Princeville resident Carnell Boyd said,

“I felt like I was forced to take a buyout. I was told that I would receive the appraisal value of my home before the flood, but I didn’t receive that amount…the money that was
received was not enough for me to do anything with. I felt that I signed paperwork that I didn’t understand.” (Town of Princeville, 2020a, p.2).

In addition, whether true or not, there was an understanding in the community that people who pushed for the buyout and benefitted were not actually the ones who lived in Princeville (based on the interview with the mayor Bobbie Jones). Similarly, a study in Charlotte, NC, showed that many homes that were acquired are rental homes in studied buyout cases (Cardwell, 2023). According to Cardwell (2023), residents noted that the landlords, many of whom were described as “absentee” (Cardwell. 2023. p.2149) by residents, were able to benefit financially from the buyout program while the renters were displaced. In these instances, the home buyout program isn’t seen as benefitting the community, but instead, it is seen as benefitting landlords who were actively disengaged from the community while simultaneously displacing the renters. However, there is debate whether it is a more responsible action for property owners to not participate in the buyout, needlessly exposing their tenants to danger. In the case of Princeville, because there was expectation that people in Princeville would not want to participate in the buyout as they cherish their history, absentee landowners’ decisions for buyout was considered negatively.

**Home abandonment**

After Hurricane Matthew, home abandonment became one of the community concerns in Princeville. Based on the site visit guided by Kelsi Dew, a former Historical Outreach Coordinator at the City of Princeville, it was clear that several abandoned homes had not been cleared yet and, as a result, became an eyesore to the community.

Reasons for abandonment can vary. Some people had to abandon their homes due to the confusion about the buyout process. The town meeting minutes of October 2020 provided a glimpse to these problems.

“Princeville resident Michael Pittman said he submitted an application to the NC Rebuild buyout program in October 2020, four years after Matthew. Since 2016, he hasn’t done anything with the property because he wasn’t also sure how NC Rebuild would properly be able to evaluate fair market value on a home that is no longer there” (Town of Princeville, 2020c, p.1-2).”

Based on the interview with Mayor Jones, another reason for home abandonment was the financial burden that residents had to bear as they were already on a loan to recover from the 1999 Hurricane Floyd reconstruction. After Floyd, most people in Princeville rebuilt by
themselves using an SBA loan, and when Hurricane Matthew came in 2016, they couldn’t bear the financial burdens of rebuilding again.

In consequence, after Hurricane Matthew, different land typologies emerged in Princeville. As Figure 14 indicates, some lands were rendered vacant due to the buyout. Still, most of the residential buyout sites are simply mowed without any particular uses. There are derelict homes that were either abandoned or bought out. Some properties were rebuilt, like the photo on the bottom right, which was highly noticeable among other homes.

Figure 14. Post-Buyout Land Typologies in Princeville

A cleared lot after buyout

A bought-out properties still sitting without being cleared

An abandoned property after Matthew

A rebuilt property after Matthew

Source: Author, based on the field trip
Fifty-three- and Eighty-eight-acres Project

After the buyout, the Town pursued a land annexation strategy to compensate for the revenue loss from the buyout. As Figure 15 shows, the 53 acres and 88 acres projects were to annex 53 and 88 acres of land to the Town’s administrative boundary to move people and properties to the higher ground (Adaptation Clearinghouse, n.d.). The 53 acres have been acquired by the state and transferred to the Town. The Town additionally secured the funding, which includes CDBG-DR funding of $3.2 million and $2.6 million of legislative appropriation that will be directed towards infrastructure construction, partial relocation of Pioneer Court units, and fire department location (Town of Princeville, 2021b). Based on the interview, Pioneer Court, an affordable housing owned by the Princeville Housing Authority, will be one of the first properties moving into the 53 acres site. The apartment was rebuilt after Hurricane Matthew, and the Department of Housing and Urban Development (HUD) has been deeply involved in this relocation process. As HUD decided not to allow for the apartment to be rebuilt in the same space after Hurricane Matthew, the property has been sitting empty since 2016 and is currently under renovation by a new private owner. Eighty-eight acres were acquired by the Town using a legislative appropriation from 2019. Currently, Steward Inc is conducting and using planning for these areas’ locations (Town of Princeville, 2021b).

Figure 15. 53- and 88-acres site

Source: Recreated by the Author, based on the Princeville Comprehensive Plan (2021)
Vacant Lot Revitalization Efforts: Princeville Community Floodprint Project

Background and Partnership

The Town’s action on post-buyout land management first began in 2017. It included repurposing bought-out vacant properties as well as relocation of the town’s buildings and infrastructure. In August 2017, an NC State team led by Prof. Andrew Fox and the Coastal Resilience Center of Excellence, led by Prof. Gavin Smith, hosted a five-day design workshop that invited local leaders and residents to focus on three broad areas. These were relocating some residents; businesses, and town services to the 53-acre parcel; repurposing low-lying land near the river for cultural, historical, and recreational uses; and rebuilding some structures in the floodplain to make them more resistant to flooding (Hunt, 2017).

Around that time, this idea existed that there should be alternative measures to make it easier for the town to deal with future flooding. Especially, protracted federal action to reconstruct the levee in the foreseeable future urged the town to take its own measures to increase resilience. Especially, there was a lack of federal effort to reconstruct the levee in the foreseeable future urged the town to take its own measures to increase resilience. Dr. Glenda Knight, the town manager, said in the interview with the media:

“It’s very critical that Princeville find alternative methods and plans to better protect this community because the reality to the levee is that it may be some time before the experts land at a secure, safe place to pursue construction of that project” (Wagner, 2022)

The idea to conduct comprehensive planning for bought-out vacant properties didn’t come to fruition until 2019 when CTNC decided to support it with funding. CTNC was starting to engage in Princeville’s recovery efforts from 2018 and came up with project “Seeding Resilience Through Restoration and Education in Princeville” (Conservation Trust for North Carolina, n.d.) that aims to reduce flood risk at the school and the adjacent Asbury Park apartments, and to create an educational trail from the school toward the historic Princeville Museum. However, as the initial phase of this project unfolded, CTNC realized even though numerous efforts had been made in the assessment of flooding issues, few were community driven and had committed resources. CTNC found that researchers at North Carolina State University had earned the trust of Princeville government since Hurricane Matthew through various community projects in Princeville (Town of Princeville, 2020d).

CTNC and its partners secured funding to support NC State University’s Coastal Dynamics Design Lab in preparing a Princeville Community Floodprint project in cooperation with the Town of Princeville. The project is described as a robust guide to strategic resilience planning—designed to achieve four goals: (1) to mitigate the impacts of flooding in Princeville; (2) to allow
the public to access community assets; (3) to engage the local community and (4) to create a good design in the Town (Town of Princeville, 2020d). The goal of this project is to help increase social and physical resilience in Princeville, specifically through recommending land use strategies that reduce flood risk, recognize capacity gaps, and improve public safety, environmental awareness, and long-term ecological function within historically flood-prone areas (Town of Princeville, 2020d).

As Figure 16 demonstrates, the way that the Floodprint project was structured was that Coastal Dynamics Design Lab at the NC State University was primarily responsible for the plan development while CTNC was more responsible for securing funding. Even though the first seed of the project might have been planted by NC State University through design workshops and community engagement that started in 2017, funding from CTNC was critical in moving the project forward the project. CTNC supported the project financially and physically with volunteers (AmeriCorps) and the youth summer programs. They were able to secure funding from various public and private sources such as the Commission for Environmental Cooperation (public), National Fish and Foundation (public), Z.Smith Reynolds Foundation (private), and The Conservation Fund (private). Z.Smith Reynolds Foundation and the Conservation Fund basically funded the development of the plan, and the National Fish and Wildlife Foundation and Commission for Environmental Cooperation funded the implementation of the plan.

Figure 16. Institutional Partners in Princeville Community Floodprint Project

According to the interviews, both CTNC and the Town mentioned that having a rigorous standalone plan for land management played a critical part in securing funding. Phase one efforts (2020-2021) funded by the National Fish and Wildlife Foundation included establishing rain gardens around the base of the Princeville Elementary School and creating a walking trail.
connecting the school to Princeville Museum. The Rain Garden project aimed to catch excess water coming off the roof and provide educational space for teachers to engage elementary school students to understand conservation and water management. Establishing a walking trail created safe and walkable pathways between two significant places in the Town and was constructed by local high school students and local landscape architects.

Phase two (2022-present), primarily funded by the National Fish and Wildlife Foundation focused on conservation improvement, such as installing pollinator gardens and exercise equipment and some walking trails at the Heritage Park. This land had been a mobile home park and was acquired by the Trust for Public Land for conservation after Hurricane Floyd in 1999. The town also secured funding for implementation based on the plan. NC Tobacco Trust Fund ($300K) and T-Mobile Hometown Proud Grant ($50K) were particularly used for implementing the Farmers Market project. The Legislative Appropriated Funds were secured to help with the Farmers market, rebuilding the senior center and town hall rebuilds, and moving the public works department as part of the 53 acres project.

The partnership was possible because the Coastal Dynamics Design Lab and the Town of Princeville had a trusted relationship through various recovery and planning initiatives after Hurricane Matthew. The Coastal Dynamics Design Lab had been an active partner in Hurricane Matthew Disaster Recovery and Resilience Initiative (HMDRRI) that focused on providing six hard-hit communities in North Carolina with the technical assistance. As Table 5 demonstrates, in 2017, they conducted the Homeplace project aiming to provide a guide for residential renovation and construction for rebuilding after Hurricane Matthew. In 2018, they conducted the Greater Princeville Plan project, providing resources for redeveloping and placemaking the town. They proposed various ideas around rebuilding the town around key places such as trails, the town center, and the historic cemetery and suggested design measures such as signage, trees, and public art. Different pieces of work came together in the Princeville Recovery Plan project, focused on providing concrete steps for comprehensive disaster recovery. On top of that, in the Summer of 2019, Coastal Dynamics Design led the Princeville Mobile History Museum Project. They constructed a mobile museum to house temporary exhibits that celebrate and honor the historic community. It was undertaken as a way to make the aspects of Princeville’s history visible while the permanent Princeville History Museum underwent renovations due to the Hurricane Matthew (Coastal Dynamics Design Lab, n.d.). All these activities played a role in increasing mutual understanding and trust between the Town of Princeville and the Coastal Dynamics Design Lab.

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2 Priorities include the development of disaster recovery plans; the development and implementation of a housing relocation strategy; the creation of open space guidance; and the flood retrofit of historic guidance. HMDRII is a project of the North Carolina Policy Collaboratory that was established by the North Carolina General Assembly in 2016 to utilize and disseminate the research expertise across the University of North Carolina System for practical use by state and local government.
Table 5. A Timeline for the Princeville Community Floodprint Project

<table>
<thead>
<tr>
<th>Phase</th>
<th>Time</th>
<th>What happened</th>
<th>Lead</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partnership and Trust Building</td>
<td>2017</td>
<td><strong>Homeplace: A Conversation Guide for the Princeville Community, Rebuilding After Hurricane Matthew</strong>&lt;br&gt;<strong>Design Workshop</strong></td>
<td>Matthew Disaster Recovery and Resilience Initiative</td>
</tr>
<tr>
<td></td>
<td>2018</td>
<td><strong>Greater Princeville Plan</strong>&lt;br&gt;<strong>Princeville Recovery Plan</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2019</td>
<td><strong>Princeville Mobile History Museum Project</strong></td>
<td>NC State Univ.</td>
</tr>
<tr>
<td>Plan Development &amp; Approval</td>
<td>2020</td>
<td><strong>April</strong>&lt;br&gt;NC State Costal Dynamics Design Lab people provided the board with a presentation of the three floodprint and land management plan options. Board members agreed that the options were well thought out and they were very impressed. The plan was approved 4-0.</td>
<td>NC State Univ.</td>
</tr>
<tr>
<td></td>
<td>2021</td>
<td><strong>July</strong>&lt;br&gt;Prof.Fox gave an update on four primary project components: trail and additional improvements, installation of sustainable stormwater devices, development of a 24-bed community garden, and planting of 50 street trees to enhance Main Street and Mutual Blvd.</td>
<td>NC State Univ. &amp; CTNC</td>
</tr>
<tr>
<td></td>
<td>2022</td>
<td><strong>Sept</strong>&lt;br&gt;Prof.Fox and Mrs.Bartlebaugh updated that the grant is to fund street tree implementation, stormwater management and community agriculture.</td>
<td></td>
</tr>
<tr>
<td>Phase</td>
<td>Time</td>
<td>What happened</td>
<td>Lead</td>
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<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td></td>
<td>Oct</td>
<td>Dr. Leslie from NC State’s Coastal Dynamics Design Lab updated the board on the streetscape plan. She shared the result of the survey that were used to gain input from citizens on which species of trees they would like to see planted along the street.</td>
<td></td>
</tr>
<tr>
<td>2023</td>
<td>Feb</td>
<td>Dr. Leslie updated the board on pre planning with the planting of trees for stormwater management. She presented an illustration of the high-risk area that the team is planning to plant trees throughout the downtown areas.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>April</td>
<td>Dr. Leslie updated on street tree planting, stormwater management, and community agriculture project.</td>
<td></td>
</tr>
</tbody>
</table>

Source: Author based on the town meeting minutes

It is hard to tell when the Coastal Dynamics Design Lab team exactly started to work on Princeville Community Floodprint project due to the lack of evidence in the town meeting minutes and the inability to interview the team. However, it is fair to assume that it happened between the start of 2020, right after they secured the funding from CTNC, and September 2020 when it was approved by the board. Based on the town meeting minute in April 2020, they presented several land use options they developed to the board, and they were approved. There weren’t any specific discussions during the town board meetings between April and September about the Floodprint project.

Based on the interview with CTNC, different forms of outreach and community engagement were used even though it is hard to know specific timelines of the community engagement. According to CTNC, the community engagement was conducted in the form of listening sessions also known as charrettes, voting and polling either in-person or online through web and social outreach, community events open for questions and discussion, and board approval of final recommendations and designs. After it was approved there were several planning meetings and several community outreach events to share the plan and get feedback on where implementation should start in 2021 (based on the interview with Kelsi Dew).
Land Use Suggestions and Value Analysis

Recommended land uses from the Floodprint revolved around three primary themes: **conservation, cultivation, and wetland connections**. These categories were developed as they are “strategically align with FEMA-approved regulations and have been stitched together to create a unified framework for the repurposing of vacant, vulnerable, and underutilized parcels in Princeville.” (p.2) The plan also organizes proposed projects and programs by immediate near and long term initiatives; of which, funding had already been secured to implement some of the immediate-term recommendations (Town of Princeville, 2020d).

A process of how they came up with the land use strategies was to: 1) identify all parcels within Princeville’s jurisdiction that are either assumed vacant or under public ownership (such as a park), 2) analyze all parcels in Princeville to assess their suitability with each of FEMA’s approved land use strategies, 3) identify vacant, municipally-owned, and publicly accessible properties that may be combined to enhance the functions of certain land use strategies, and 4) propose a select series of incubator projects to incentive new uses on and management activities for vacant properties (Coastal Dynamics Design Lab, 2020). By expanding the analysis of the lands to publicly owned land, not only bought-out properties, they tried to expand the options of possible land uses.

They defined guiding principles for planning as following in the report:

> “The intent is to create a planning framework that comprehensively organizes cultural, recreational, and environmental assets within a series of park-like amenities.” (Coastal Dynamics Design Lab, 2020. p.27)

By asserting the values, they made a value judgment on what kind of amenities they wanted to create through vacant lot revitalization. Based on that, as **Figure 17** demonstrates, they suggested several land uses categorized into conservation, cultivation, and wetland connection. For conservation, creating a contiguous riverfront park was suggested as a core land use strategy by connecting Powell Park and Heritage Park. Community agriculture was suggested for cultivation. Trail, river restoration, and streetscape improvement were suggested as part of the wetland management strategy (Coastal Dynamics Design Lab, 2020).
They incorporated several different values and criteria to come up with potential land uses. Even though some of the values and criteria were explicitly mentioned in the plan, some were more implicit. Based on a critical reading of the plan, the following values and criteria were considered to come up with land uses: FEMA regulation, connectivity, feasibility, adaptability, scalability, and shovel readiness.

The plan actively incorporated FEMA regulations as well as their open space planning guidelines. From the beginning, they narrowed down the potential land uses to outdoor recreation, campgrounds, nature reserves, buffer zones, unpaved parking, wetland management, grazing, and cultivation (Coastal Dynamics Design Lab, 2020), which are FEMA-recommended land uses. Even though this is more of a guideline rather than a set list of allowed land uses, starting with these uses determined the boundaries of the possibilities.

The value of connectivity was emphasized as they actively sought to connect the use of bought-out properties to the existing land uses so that they could make synergies.

“The underlying land-planning strategies of the Princeville Community Floodprint are: 1) to combine and consolidate clusters of properties where they exist; and 2) connect them to
existing publicly accessible parks, conservation easements, and city/county/state-owned parcels.” (Coastal Dynamics Design Lab, 2020. p.27)

The value of connectivity was also highlighted in that the land uses of bought-out properties can be utilized to connect the historic core of Princeville to newly annexed development sites – 53 acres and 88 acres.

“This wetland management and planting design are the best practices for visually and physically connecting places of interest in Princeville’s historic civic core to the proposed development at the 53 and 88 acres annexes.” (Coastal Dynamics Design Lab, 2020. p.50)

Feasibility was also considered as they reasoned why community agricultural land uses might be feasible compared to others considering the possibility of land leasing.

“Critical to ensuring the long-term viability of cultivated lots is the successful selection of a qualified recipient and/or manager of each property…By doing so, town staff can reduce the time and cost inputs associated with maintaining vacant lots and in return the new land managers can take responsibility for the necessary upkeep while also using the land to start and/or grow an agriculture-based micro-enterprise.” (Coastal Dynamics Design Lab, 2020. p.66)

Relatedly, scalability was also considered in terms of how suggested land uses can be upscaled to bring broader social and economic benefits.

“There are precedent examples in North Carolina that Princeville can look to in order to…determine ways to leverage new community gardens and microfarming operations through larger initiatives, such as a Princeville Farmers Market.” (Coastal Dynamics Design Lab, 2020. p.66)

Adaptability was one of the criteria they considered. As there had been different planning and initiatives going on in Princeville prior to the Floodprint project, they tried to make it adaptable to the goals of other projects.

“More than a static plan, the Princeville Community Floodprint establishes customizable, highly adaptive strategies for repurposing vacant and/or buyout properties into natural infrastructure assets. The goals of the plan are to inform, organize, and facilitate the ongoing planning, design, and implementation of communal greenspaces that mitigate localized flood risks; sustainably managed stormwater; and active and passive recreational uses, including physical activity, community events, environmental
education, habitat restoration, and heritage-based tourism.” (Coastal Dynamics Design Lab, 2020. p.55)

Finally, when they tried to phase out different land uses suggested, they actively considered the shovel readiness. Shovel readiness basically meant the ownership status as many of their land use suggestions included additional land acquisition by the Town of Princeville as well as working with land trust to execute conservation easement.

“Classifying the lots in this way [phasing out the implementation of suggested land use projects] indicates whether the town 1) already owns a parcel; 2) is likely to own a parcel in the near future (i.e., HMGP acquisition property); or 3) needs to consult with legal aid and/or project partners regarding the potential of owning a particular parcel in the more distant future (i.e., vacant, privately owned parcels).” (Coastal Dynamics Design Lab, 2020. p.103)

Implementation Strategies

To realize and sustain suggested land uses, they recommended further property acquisition and leasing as implementation measures, especially for the conservation project along the river that tries to connect two different parks – Powell Park and Heritage Park – private owners owned a lot of properties in the middle. They recommended the town leadership work with an established, locally operated land trust to streamline the technical complexities of conservation easements (Coastal Dynamics Design Lab, 2020. p.65).

One of the recommendations for implementation was introducing a leasing and donating mechanism for the select properties to community groups. The report recommended the town to match an approved land use of a buyout property, such as cultivation, with groups that have the ability to manage the property for that use (e.g., a community farm) within the legal framework of a shared-use public-private contract agreement (Coastal Dynamics Design Lab, 2020). They also mentioned that the agreements can be executed through either 1) a lease program (similar to renting the property from the town at little-or no-cost, with the option to renew the lease); or 2) donation of the property to the aligned group (Coastal Dynamics Design Lab, 2020).

ollowed by the plan's approval in September 2020, the board of commissioners immediately started discussing the introduction of the leasing program as soon as possible. During the town meeting in October 2020, they discussed that finding certain areas they want to lease will be needed so that they can explain them on the town's website (Town of Princeville, 2020c). Especially The town's attorney strongly proposed that the town should have a lease agreement to maintain their lot, and the lease agreement should include the rights and responsibilities of those leasing the properties (Town of Princeville, 2020c).
The Town of Princeville will pilot a vacant lot lease program on the lot in front of Macedonia Baptist Church (Figure 18) in 2023. According to the interview, a community garden will be built to produce food for the congregation and neighboring residents.

*Figure 18. A Lot in front of Macedonia Baptist Church*

![Map of The Town of Princeville](https://via.placeholder.com/150)

Source: Author, based on the NC One Map and field trip

**Project Implementation**

The implementation of suggested land uses had started before and during the plan development. But many projects have started since September 2020 after the plan was approved. According to the town meeting minutes in April 2021, NC State University Coastal Dynamics Design Lab’s professor Fox shared the update on the Heritage Park Trail and that students had been working on the educational signage along the way. And he suggested the possibility of the town’s acquisition of a house across the elementary school which will allow more space for the heritage trail.

As Table 5 (above, p.36) indicates, the efforts to implement the ideas suggested in the plan is ongoing in 2023. They settled down with the four major projects to focus on, that are 1) continuing the ongoing work such as trail and additional improvements at Heritage Park, 2) the installation of sustainable stormwater devices to help reduce flooding, 3) developing a 24-bed...
community garden, 4) planting of 50 street trees to enhance Main Street and Mutual Blvd (Town meeting minutes, July 2022).

**Figure 19** shows some of the project outcomes including the heritage trail, a rain garden in front of the elementary school, a pollinator garden at the Heritage Park, and the Farmers Market. Even though they are not necessarily the projects that are done on the bought-out properties, these show the possibility of what conservation work on the ground could look like for bought-out vacant properties.

*Figure 19. Project Outcomes*

Heritage Trail

Rain Garden

Pollinator Garden

Farmers Market

Source: Author (Heritage Trail, Rain Garden, and Pollinator Garden) and Kelsi Dew (Farmers Market)
Resident perceptions

Based on the two interviews done with residents in Princeville, it was possible to figure out differing opinions about the Floodprint project. One resident who was very involved in the community initiatives said the Floodprint has a meaning of executing tangible actions in Princeville where a lot of residents were tired of waiting for state and federal governments’ action.

“The Floodprint Project has a meaning of the town taking the initiative into its own hands instead of waiting for the Army Corps of Engineers to do something about the levee. Through conservation work, it can address small-scale localized flooding in a way that town can take control.”

Another meaning of the project is to take care of the town traumatized by the buyout.

“It is about making the steps to the future instead of going and say we are just rolling over buyout and we are leaving. It is a way to hold onto cultural and historical significance for community members here.”

It also had a meaning of introducing more practical land uses that can provide higher utility for residents included and solving the community problems.

“Doing the farmers market and community garden can improve food access in Princeville where we don’t have grocery store.”

Meanwhile, there were also more pessimistic opinions from another resident that,

“While we are making these plans for the physical space, the mental space is overlooked. The mental space needs to be taken care of to help engage people, a greater effort for communication to help people to buy into what they are wanting to do….good examples could be to bring people to give them learning experience about how other communities flooded or experienced natural disasters rebounded from it. And if we could implement some of these things to help our people, it would be great.”

The Floodprint project was led by NC State University and CTNC, even though they tried to engage communities as much as they could. Based on the interview with one of the residents, it seemed like there is a desire in the community to have more learning experiences from other communities that share similar flooding experiences.

It was also possible to observe some of the active roles from a resident when it comes to suggesting land use. One of the residents “sent a request to the town through email to consider
using one or more of the vacant spaces as a Serenity Garden and Labyrinth. He informed the Board that a Serenity Garden and Labyrinth would consist of a combination of trees, shrubs, and both annual and perennial flowers. He informed the board that the location would be a form of tranquility for citizens and visitors.” (Town of Princeville, 2020b)
Discussion

Adapting to climate change in the United States comes down to a painful decision to rebuild or move people out. Buyouts are becoming increasingly common in many communities as part of the post-disaster recovery process and long-term adaptation (Freudenberg et al., 2016; The Pew Charitable Trusts, 2022). However, as seen in Princeville's case, a buyout is not an easy option to pursue. Communities fear losing their history and legacy and letting go of their critical tax base.

Municipalities bear the brunt of flooding and buyouts for a long time through the presence of bought-out vacant land. Such lots remain in the community as a deed-restricted open space for perpetuity, mostly under municipal ownership. Moreover, they come with significant maintenance challenges due to their checker-board patterns, municipal lack of resources and governing capacity, and lack of community interest and knowledge about utilizing them. As a result, most communities do simple mowing as a maintenance activity even though mowing itself requires a substantial budget (Zavar & Hagelman III, 2016).

The thesis tried to understand comprehensively what happens to the bought-out vacant lots after people move out. Through a rigorous understanding of the motivation, process, and challenges of repurposing and maintaining these lots, planners can better support communities. The following sections are the points for discussion based on findings.

The role of built environment improvement in flood-prone communities

Improving the built environment into a more resilient landscape is integral to post-disaster recovery. Reconstruction of physical infrastructure and repopulation of residences is one of the major recovery measures. More and more communities are incorporating nature-based solutions to adapt to the increased climate risks (Calfapietra & Cherubini, 2019).

Despite the traumatic experience of flooding and substantial buyouts, bought-out vacant lots can present new opportunities for recovery. They can be a vehicle to introduce high-utility land uses that can contribute to addressing community problems. Town of Princeville, NC State University’s Coastal Dynamics Lab and CTNC developed and implemented various landscape-focused interventions such as establishing walking trails, installing sustainable stormwater management features, creating community gardens, and planting trees along the major corridors. They aimed to address chronic and buyout-induced community problems through these uses.

Planning activities can spur meaningful resident engagement. Based on the interview, it was identified that residents want substantial engagement actions that can deeply heal the trauma of the disaster and buyouts beyond merely institutional mobilization of a participatory process.
Post-buyout land use planning has the potential to encourage substantial community engagement, but it needs further exploration in terms of how planners can help design those processes.

The role of partnerships and funding to incentivize new land uses

The case study shows how partnerships and funding could play a critical role in incentivizing new land uses. Repurposing and maintaining bought-out vacant land is a challenging task for communities like Princeville, where they have a limited government workforce (e.g., absence of dedicated planning staff), while there is an increasing number of community issues that need to be addressed after major disasters.

The role of universities and non-profit organizations was noticeable in the case study in supporting the community to develop new land use strategies and mobilizing different funding pools. Especially external grants from both public and private sources could be a vital resource for paying initial construction costs, therefore incentivizing municipalities to conduct more active open space development.

Securing external funding can also be essential in other small communities, where they have limited capacity to develop their own financing mechanisms. For instance, stormwater fees (Environmental Law Institute, 2017) used in some municipalities to fund conservation work may not be able to be deployed in lower-income small communities. In many small communities where the median income is relatively low, imposing additional financial burdens on households may not be a politically feasible option.

Increased funding from the higher levels of government needs to be available to support these communities in the future. Princeville’s case potentially indicates how these supports could be part of the reparation. The fact that early Princevilleans were forced to occupy the most vulnerable land in North Carolina after the civil war and therefore suffered from repetitious flood events is a stark example of environmental racism. Taking into account environmental racism could mean prioritizing these communities in funding for community-based actions to increase long-term resilience. Further research is needed to develop concrete measures of how higher levels of government can institutionalize these supports as part of the larger reparation.

Developing an analytic framework that captures community priorities and values

The analysis of the “Princeville Community Floodprint” plan shows that a coherent set of values and criteria can be developed and incorporated to suggest potential land use strategies. Coastal Dynamics Design Lab reviewed FEMA-recommended land uses as a starting point for land use planning. And then, they narrowed the land uses down by considering the following values: connectivity, feasibility, adaptability, scalability, and shovel readiness. In their own analysis,
they integrated other vacant and publicly owned lands to overcome the checkerboard pattern of the bought-out vacant lands.

These sets of values and the ways that Coastal Dynamics Design Lab approached the analysis can be replicated in other communities. However, the ways in which those values are contextualized will be distinct in each community. Considering that competing community priorities arise after disasters, having a coherent set of value criteria will be helpful to prioritize specific land uses.

**Strategies to overcome the checkerboard pattern of bought-out vacant lots**

One of the ideas suggested by the Coastal Dynamics Design Lab to effectively implement proposed land uses is utilizing publicly owned land and conducting additional land acquisition to secure significant contiguity of the land. The study reaffirms the suggestions from the existing literature that securing contiguous open space could be critical in repurposing (Atoba et al., 2021). However, as hinted by the plan itself, additional land acquisition could take a long time or not be realistic. Especially conducting it within the municipal budget while experiencing a significant reduction in the tax base due to the buyout could be extremely difficult.

As an alternative, measures such as conservation easement – a voluntary, legal agreement that permanently limits uses of the land in order to protect its conservation values - that doesn’t require ownership change could be considered to reduce the burden of acquisition. It will require close collaboration between the local government, land trust, and private property owners. Further case study and research about the adoption of conservation easement for the bought-out vacant lot revitalization will be needed to develop more concrete governance implications.

**Sustainable long-term maintenance mechanisms for bought-out vacant lots**

Though the case study proves that initial funding helps incentivize new land uses, the question of who will own the land and be responsible for everyday maintenance in the long term is still uncertain. One of the ideas being implemented in Princeville is a land leasing program (Coastal Dynamics Design Lab, 2020). It is a model where the town matches an approved land use of a buyout property with groups that can manage the property for that use within the legal framework of a shared-use public-private contract agreement. The Town of Princeville is preparing the first land lease pilot program in front of the community church to convert the lot to a community garden to produce food for the congregation and neighboring residents.

The formats of land leasing programs can vary in terms of the timeframe for leasing, cost for leasing, and potential ownership change. Further research will be necessary to monitor how the
land leasing program could work in different settings and to develop performance metrics to evaluate the program’s success.

**Holistic land management after disasters**

Delays and uncoordinated characters of the buyout are critical barriers to holistic land management after buyouts. In the analysis process to develop land use strategies, Coastal Dynamics Design Lab assumed that all bought-out properties were cleared and ready to be reused. However, it was found through the field trip that some properties were still sitting on the land after more than six years after Matthew due to delays in the buyout processes.

The slowness of the buyout process was pointed out as a problem among many practitioners and researchers for a long time, even without the connection to the post-buyout land use planning. However, it is worth noting that it makes post-disaster planning even more challenging as it is difficult for municipalities to predict when those properties will become vacant and ready for repurposing. This could be a barrier to holistic land management that considers the connectivity between different properties and strategic planning aligned with existing community assets.

Abandoned but not bought out properties are an additional concern. They are not only an eyesore to the community but also an impediment to holistic land management. Those abandoned properties, for various reasons – being ineligible for government programs and the property owners being cost-burdened to rebuild by themselves – are sitting without interventions. Managing the problem of abandoned properties may require intervention from higher levels of government, but further research is needed to address the root problems and potential solutions.
Conclusion

The thesis set out to answer three sets of questions: 1) how do community actors come to decide the ways to maintain the bought-out vacant lot? 2) who are involved in the process of repurposing those lands, and how do they contribute to planning? 3) what are the challenges of realizing intended land uses? Princeville, NC, was chosen as a case study site to answer these questions, given significant planning activities for bought-out vacant land through an initiative called the “Princeville Community Floodprint” (Coastal Dynamics Design Lab, 2020). Princeville is also a small town with a population of less than 2,000 and 12 officials working for the government. Their story could have meaningful implications for other small towns in the United States dealing with similar challenges.

For the first research question, the study found that the post-buyout land use planning ideas are deeply connected to the community’s history and unique challenges before and after buyouts. For the second research question, the study found that partnerships with universities and non-profit organizations and external funding opportunities are critical to developing a comprehensive plan and implementation. For the third question, the study found that increased support from higher levels of government and the role of sustained local partnerships can be vital to overcome long-term maintenance challenges. The details for each finding are explained in the following sections.

Post-buyout land use planning is deeply interconnected to the community’s history and unique challenges before and after buyouts.

Princeville used vacant land repurposing to heal the grief of buyouts and memorialize the town's historical significance. Historical preservation was one of the major narratives as they tried to preserve the town's legacy, which was at risk of being lost due to the pursuit of a buyout in the aftermath of Hurricane Matthew. The corresponding idea was to establish a heritage trail between two major places in Town: Princeville Elementary School to Princeville Museum. The ways in which they tried to remember the town's history were also shown in their efforts to connect the town's historical core to the newly annexed land (53 and 88 acres) through an ecological network.

Repurposing vacant lots was also perceived as a way to address challenges of the community, such as lack of economic opportunities and lack of access to fresh food. Community gardens and farmers markets were highlighted as a way to increase food access for people in Princeville, where they don't have any grocery stores in their jurisdiction. Relatedly, synergies with the ongoing initiatives, such as the farmers market, were highlighted as well.
Repurposing vacant lots had the meaning of increasing flood resilience when there is a significant lack of actions from higher levels of government. For Princeville, it was a protracted levee reconstruction by USACE since they have been studying for more than 20 years without tangible actions in the foreseeable future. In the absence of action, Princeville had to create some sense of safety after Hurricane Matthew through the Princeville Community Floodprint project.

**Partnerships and external funding opportunities are critical to developing a comprehensive plan for bought-out vacant land management and implementation.**

Princeville overcame the challenges of lack of resources through partnerships with key actors in the region: the NC State University and Conservation Trust for North Carolina (CTNC). The Coastal Dynamics Design Lab at NC State University brought the idea of holistic planning for vacant land in the community and elaborated through a coherent planning process. CTNC brought resources that made planning and implementation possible through their partners and funders. Under the town’s leadership, these two organizations could collaborate and fully realize their strengths.

Princeville’s case shows the importance of continued partnerships. The Princeville Community Floodprint is the result of continued collaboration with multiple stakeholders on various recovery projects since Hurricane Matthew. NC State University and the Town of Princeville developed mutual trust and a deep understanding through those collaborations. State-level mechanisms that enabled collaboration between state universities and partners played an important role in making the initial phase of cooperation possible through Hurricane Matthew Disaster Recovery and Resilience Initiative (HMDRRI). Established in 2017 in the aftermath of Hurricane Matthew, it involved active university engagement of faculty and students as well as professional planning experts in addressing community and state-level needs associated with recovery from Matthew.

The case study also confirmed that public and private funders could play a significant role in paying for the initial plan development and project implementation costs. Based on interviews, local governments may need additional incentives to work on the projects involving some level of construction, such as obtaining grants and help from external actors. Increased opportunities from public funders, such as national and state government-affiliated foundations, to support projects on this land will contribute to increased motivation.

NC State University – the knowledge partner - developed its own analytic framework to suggest land use strategies and project proposals such as connectivity, feasibility, adaptability, scalability, and shovel readiness. Residents primarily participated in the process through community engagement conducted by the NC State University, done in the forms of charrettes, voting and polling (in person or online through web and social outreach), and community events open for questions and discussion. However, some of the residents suggested the land use
through the route outside of the set community engagement framework by sending a request to the town to consider using one or more of the vacant spaces as a Serenity Garden and Labyrinth (Town of Princeville, 2020b).

The role of local governments in making the final decisions was also critical, which was reflected in the role of the board of commissioners in Princeville. The board actively invited NC State University and CTNC to get updates about their progress and discuss potential options. Based on the meeting minute records, Coastal Dynamics Design Lab and CTNC were invited nine times between 2020 and 2023 to the board meetings to discuss the findings and implementation mechanisms.

**Increased support from higher levels of government and the role of sustained local partnerships can be vital to overcome long-term maintenance challenges.**

The study confirmed that the external funding that can incentivize the introduction of new land uses can be helpful. However, still a long-term management scheme – that includes the questions of who owns the lot in the long term and be responsible for everyday maintenance - is quite uncertain. The case study hinted land leasing of the properties to qualified community organizations could be one way to address it.

Even though some of the public funding sources support post-buyout management activities, there is an increased need for substantial funding opportunities to reduce the long-term financial burden of maintenance. It may require perspective changes to view the post-buyout land management as a part of the holistic buyout process: administrative and financial support from the higher levels of government may be needed in the post-buyout land use planning, like other phases of buyouts.
Implications for planning practice

Implications for planning practices are divided into two sets of recommendations: one for the municipal governments and local partners and the other for the state and federal agencies.

The study indicates that developing a comprehensive plan for repurposing and maintaining the bought-out vacant lots can help secure additional resources for active open space development. Land uses can be a useful vehicle to address the communities' unique challenges before and after buyouts. Forging partnerships with knowledge partners, non-profit and community organizations can help communities overcome a lack of resources. Table 6 includes more detailed lessons and recommendations.

Table 6. Lessons for the Municipal Governments and Local Partners

<table>
<thead>
<tr>
<th>Lessons</th>
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<tr>
<td>1. Land use planning for bought-out vacant properties can be utilized to address community problems. After the buyout, communities are faced with different challenges; some are more chronic ones (e.g., lack of food access, lack of economic opportunities, and lack of community activities), and some are more directly originated from the buyout (e.g., losing community legacy, land annexation). Bringing active land uses to the bought-out vacant lots can help build a path to recovery.</td>
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<tr>
<td>2. Municipalities can overcome the initial cost of land use planning and construction by building a partnership with universities and NGOs. The case of Princeville shows the role of state universities and (local and regional) conservation organizations as an example.</td>
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<tr>
<td>3. A standalone land use plan for bought-out vacant lots can be helpful to mobilize public and private funding sources. Beyond the agencies listed in this document, more and more public and private funders are interested in funding nature-based community projects. A coherent plan that connects community-specific narratives and open space planning can increase the chance of funding.</td>
</tr>
<tr>
<td>4. FEMA guidelines for suggested land uses are not a definitive list of legally allowed land uses, but they could be a useful starting point. Through 44 C.F.R § 80.19 (2021), FEMA provides an exemplary framework of the allowed and not-allowed land use categories. Though it can be a good starting point for considering potential land uses, limiting the potential land uses to the FEMA recommended land uses can set the boundaries of possibilities too narrowly. Land uses can be creative enough to address community needs as long as it is maintained as open space.</td>
</tr>
<tr>
<td>5. Land use ideas can be developed and narrowed down with several criteria: connectivity, feasibility, adaptability, scalability, and shovel readiness. Connectivity means the extent to which the bought-out lots are connected to other vacant lots, open and</td>
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public spaces, and community amenities. Feasibility means the cost to implement and continue the necessary upkeep is realistically attainable. Scalability refers to the extent to which suggested land uses can be upscaled to bring broader social and economic benefits. Adaptability means how the land uses can be adaptable to the goals of different ongoing community projects. Shovel readiness refers to how it is implementable in the short term, given the site conditions, additional need for land acquisition, and cost.

6  Additional land acquisition and utilizing public land can be an excellent strategy to secure enough continuous land to fully realize the potential of repurposing bought-out vacant land. It might be worth considering working with the land trust to implement a conservation easement that doesn’t require ownership change.

7  Land leasing and donating programs may be worth considering to make long-term management more feasible. As FEMA recommends, municipalities may 1) convey a property interest to a public entity or a qualified conservation organization or 2) convey an easement or lease to a private individual or entity for purposes compatible with the deed restriction. The potential ways in which local governments let lessee abide by the suggested land uses still need further exploration, but it may be possible to do it through a typical RFP process.

8  Substantial community engagement is necessary to provide educational value and trauma-healing opportunities to residents living in post-disaster communities. One of the desires identified during the interview was to interact with other communities that have gone through similar experiences so that they can learn from each other.

To better support small communities in bought-out vacant lot management, state and federal governments have roles to play: increased administrative and financial support for post-buyout land management and establishing an integrated platform to better currently siloed buyout programs administered by different agencies. Table 7 includes more detailed lessons and recommendations.

Table 7. Lessons for State and Federal Agencies

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<th>Lessons</th>
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<td>Bought-out vacant land management has to be considered as part of the whole buyout process, where financial and administrative support are needed from the higher levels of government. Especially in small towns with few municipal staff and limited financial resources, they are more likely to struggle with maintenance.</td>
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State agencies may fund planning and implementation for bought-out vacant land through increased funding. NC Office of Recovery and Resiliency recently committed funding to the NC State University’s Coastal Dynamics Design Lab for developing five North Carolina community Floodprint reports over the next three years. As shown in the case study, funding for planning can be the first step in supporting land management activities as well as inviting and leveraging other resources.

Establishing an integrated platform that municipal governments can easily access for all buyout and rebuild projects will be helpful. Limited access to information from municipal government, different state and federal programs operated in silos, and the lack of communication have been pointed out as significant barriers. Information about when the buyout projects will be finished helps to plan for post-buyout land uses effectively.
Implications for Future Research

Lessons from Princeville can be applicable in many small communities in the United States, as they face similar challenges for bought-out vacant land management. However, more case studies are needed to understand the commonalities and differences between these cases. In selecting the cases, the size of the community, sensitivity to the buyout, and income-level of the communities can be diversified for better comparison. More case studies of municipalities to explore the activities and challenges of small towns in managing bought-out vacant properties will help develop more generalizable lessons. Below are the potential areas for further research to understand and address the challenges of land management more in-depth.

Land leasing program for bought-out vacant land management

As seen in Princeville’s case study, land leasing for bought-out vacant lands is likely to be an attractive option for many local governments. It can not only reduce the financial burdens of managing the land for the municipal government but also create new economic opportunities led by private actors (e.g., community farms that return economic gains for operators). Due to these reasons, more and more municipalities are considering land lease programs. For instance, Greenville in North Carolina has administered the land lease program for over 20 years to reduce their management burden.

Currently, there is little research on how a land leasing program could work in the context of bought-out vacant land management. Meanwhile, in vacant lot planning studies, there are many studies assessing the programs that transfers vacant public land to private sector ownership (Ganning & Tighe, 2015; Gobster, Hadavi, et al., 2020; Gobster, Rigolon, et al., 2020; Rigolon et al., 2021). Building on the findings of these studies, further research on assessing existing land leasing programs for bought-out properties and its challenges will help municipalities to develop their own land lease program.

Alternative Financing mechanisms for bought-out vacant land management

Financing mechanisms for bought-out vacant land management is an under-researched area. Based on the case study, it is apparent that municipalities need increased funding opportunities for bought-out land management. Existing studies partially deal with municipalities using tax-based financing mechanisms such as stormwater and drainage fees to fund conservation efforts (Environmental Law Institute, 2017; Watershed Protection Department of Austin, 2022). But they are barely applicable in small communities where their socio-economic conditions are not favorable to increasing tax. Further research on how small communities can find and utilize external funding opportunities as well as develop their financing mechanisms will help support long-term management.
Potential forms of reparation

Princeville’s case shows how the history of slavery evolved into environmental racism, where early Princevilleans were forced to occupy the most vulnerable riparian land in North Carolina after the Civil War. Taking into account environmental racism could mean prioritizing these communities in funding for community-based actions to increase long-term resilience, such as community-driven open space development for bought-out vacant lots. Further research is needed to develop concrete measures of how higher levels of government can institutionalize these supports as part of the larger efforts for reparation.

Addressing property abandonment through multi-level governance

The case study found property abandonment is a non-negligible issue in the post-disaster community. Property abandonment can happen for various reasons, such as excessive financial burden for individual property owners to upgrade the property and non-eligibility for government recovery programs. Property abandonment is an important issue from a land management standpoint because their presence not only undermines the beautification efforts after a disaster but also diminishes the potential of repurposing contiguous lots.

Further research on how different levels of government can deal with the causes and symptoms of property abandonment after disasters will help guide more holistic land management practices in post-disaster communities.

Deep community engagement for healing trauma

The study indicated that the post-buyout land use planning could be a vehicle to conduct substantial community engagement that heals the trauma of the post-disaster community. Community engagement has been a focus of urban studies for a long-time. Building on the copious literature on community engagement, studies addressing the principles, approaches, and methods of engaging post-disaster communities will help design more inclusive processes.
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