



Local government perspectives on housing buyouts in New York after Hurricane Sandy

Miranda H. Mockrin^a and Michelle L. Johnson^b

^aNorthern Research Station, USDA Forest Service, Baltimore, MD, USA; ^bNorthern Research Station, USDA Forest Service, Bayside, NY, USA

ABSTRACT

Understanding government experience with hazard buyouts can enhance future efforts. We conducted a study of state and local government perspectives about buyouts after Hurricane Sandy in the New York area, including three jurisdictions that participated in buyouts and two that did not. Respondents differentiated outcomes for buyout participants, which they saw as financially beneficial, and outcomes for residents remaining, including limited open space and risk reduction benefits. The perceived benefits and drawbacks of buyouts were dependent on site and local government characteristics. Buyouts were seen as most appropriate as a last resort, in response to financial losses for homeowners. Increasing partnerships and opportunities for cross-jurisdictional learning, expanding time frames for buyout participation, and revisiting buyout costs and benefits over time could enhance buyout programmes.

Highlights

- Disposition, restoration, and recreation use of buyout sites was challenging.
- Limited economic and hazard reduction outcomes resulted for communities.
- Local government staff saw buyouts as an economic recovery option for homeowners.
- Long-term planning is critical for buyout benefits for remaining communities.

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1. Introduction

Across the U.S., losses from disasters are rising in coastal areas, due to climate change and development (Bagstad et al., 2007; Pielke et al., 2008). The built environment is a key driver of exposure to coastal hazards in the U.S.: population growth alone accounts for an estimated 75% of future flood risk in a changing climate (Wing et al., 2022). While development patterns are not easily changed, disasters offer an opportunity to reconsider land use and reduce future hazard losses (Brundiers & Eakin, 2018; Kim & Olshansky, 2014). Reconfiguring transportation, removing nonconforming land uses, enhancing and

CONTACT Miranda H. Mockrin ✉ miranda.h.mockrin@usda.gov 📍 Northern Research Station, USDA Forest Service, 5523 Research Park Drive Suite 350, Baltimore, MD 21228, USA

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expanding green infrastructure, limiting future development, and encouraging or requiring rebuilding with enhanced materials can all reduce exposure (Berke & Campanella, 2006; Miller, 2020).

In the US, housing buyouts are one option used to mitigate hazard exposure (Siders, 2019). Rather than rebuilding in a hazardous location, homeowners are compensated for pre-storm housing values, and the vacant land can no longer be developed. Land ownership is typically transferred to a local entity (often government, but also non-profits, or adjoining private property owners). Proponents suggest buyouts can be positive opportunities for local government and communities, creating open space that provides recreation and enhances ecological function and/or mitigates future hazards, while avoiding costly future recovery (BenDor et al., 2020; Freudenberg et al., 2016). First used in the 1970s, buyouts are increasingly common: over 43,000 properties have been bought out by the Federal Emergency Management Agency (FEMA) in more than 3,800 projects since the 1990s (Moore & Weber, 2019).

Although buyouts have become more common, their social and ecological outcomes are challenging to track, especially across different spatial and temporal scales and actors (e.g. participants, remaining homeowners, local communities/landscapes and government staff) (Binder et al., 2020). Government emphasis on targeting buyouts to places with the greatest hazard exposure and/or contiguous houses can limit the areas and number of houses participating, which may conflict with homeowner desires to facilitate household recovery through faster, more widespread buyouts (BenDor et al., 2020; Binder et al., 2020). Because participation relies on willing sellers, buyouts often result in spatially disjunct or 'checkerboarded' vacant parcels separated from each other, less likely to achieve ecological and mitigation goals (Binder & Greer, 2016; Zavar & Hagelman, 2016).

The complexity of buyout outcomes also reflects their multifaceted administration: programs are typically designed and implemented by state or local government, funded by the federal government, and dependent upon homeowner participation (Greer & Brokopp Binder, 2017). Programs are often limited to post-hazard periods, further underscoring the importance of understanding buyout program design and outcomes (Atoba et al., 2021; Kraan et al., 2021). Understanding local government perspectives and experience is key (Curran-Groome et al., 2022; Schwaller et al., 2022): local governments typically have responsibility for land use planning, hazard mitigation, and disaster recovery; often play a key role in recruiting participants and carrying out buyouts; and frequently manage resultant open spaces (Curran-Groome et al., 2022; Zavar & Hagelman, 2016).

Despite the key role local government staff can play in buyout implementation, buyouts may not be a preferred recovery or mitigation tool (Miao & Davlasheridze, 2022). Particularly when buyouts are used after the disaster, communities and local governments are navigating a complicated ecosystem of recovery funding and priorities. Programs for housing repair and mitigation are typically far larger than buyouts, and may better conform with the local government's traditional role in supporting economic development and hazard recovery (Greer et al., 2021; Pais & Elliott, 2008). Local governments are often concerned about the financial impacts of hazards, and buyouts come with costs for local governments (loss of tax revenue, open space maintenance expenses) (BenDor et al., 2020; Freudenberg et al., 2016). These considerations also change with community setting, and over time (BenDor et al., 2020). For example, buyouts may be

most readily tolerated or pursued by local governments when counties have more tax revenue and/or less reliance on real estate taxes (Miao & Davlasheridze, 2022). The financial contexts and community settings are also different from those who participate in buyouts—although buyouts are more likely to occur in higher income, urban, and/or well-resourced places, the locations that actually implement buyouts are often lower income and/or with more racial/ethnic minorities (Elliott et al., 2020; Kraan et al., 2021; Mach et al., 2019). It is less clear how existing open space and green infrastructure relate to buyout use, both in the broader community and in the immediate buyout area.

To better understand the government perspective on buyouts, across a range of socioeconomic and open space/development conditions, we conducted a case study analysis of New York State funded buyouts after Hurricane Sandy, with participants from local governments in five coastal locations (three locations that participated in buyouts and two that did not). We used interviews with local and state governments to examine perceptions of buyout benefits, drawbacks, and overall suitability for each community. We interviewed local government staff in locations that extended from densely developed New York City to suburban and exurban Long Island and varied in the amount of open space, socioeconomic conditions, and use of other buyout/redevelopment efforts. By including two places that did not participate in state-led buyouts after Sandy were able to better understand local government perspectives on buyout suitability, including places where buyout use was expanding after Sandy. We linked those perspectives with community characteristics, to consider how respondents perceived buyout benefits and drawbacks, in relation to social and ecological settings. For all locations, we considered how experience with Sandy buyouts had further encouraged or discouraged future buyout use, and concluded with considerations for buyout program implementation and design.

2. Methods

This study emerged from a broader effort to document post-Sandy open space outcomes and planning efforts, with an emphasis on the use of natural and nature-based features (NNBF) (Johnson & Mockrin, *in press*). For this paper we focus solely on buyout programs, the main way open space lands were created post-Sandy. We briefly overview Sandy's events, recovery programs, and locations, with more detail available (Johnson & Mockrin, *in press*).

2.1. Hurricane Sandy and buyout programs

On October 29, 2012, Hurricane Sandy made landfall in southern New Jersey, leading to widespread damage in coastal New York and New Jersey (159 fatalities, 650,000 homes damaged, and \$50 billion dollars in damages) (Hurricane Sandy Rebuilding Task Force, 2013). The Disaster Relief Appropriations Act of 2013 allocated \$60 billion to six states, including \$15 billion from the HUD's Community Development Block Grants-Disaster Recovery (CDBG-DR). New York State created a new office to oversee assistance and recovery, the Governor's Office of Storm Recovery (GOSR), which then created programs for housing recovery and assistance, including buyouts, acquisitions (purchasing homes that could be auctioned and repaired), and financial assistance for elevation and

repairs (GOSR, 2017). These housing programs were only one facet of state-driven response, which also included other assistance with housing, emergency response, business and infrastructure recovery, and community-led planning efforts ('NY Rising plans') (GOSR, 2017).

Buyouts were, therefore, state (GOSR) administered programs, with local governments as key partners in determining where buyout areas would be located (GOSR, 2019) and in outreach to eligible homeowners. Design for buyout area selection was based on past and current flooding exposure (GOSR, 2017), collective interest from homeowners, and effective partnerships with local officials (as described in buyout program documentation, that state and municipal officials had '*a mutual understanding of the benefit of removing residents/homes from the floodplain permanently and converting the site to a coastal buffer zone*') (GOSR, 2019). Buyout program goals, as initially envisioned by GOSR, were broad: disposition was to occur

in a manner that further restores confidence among the public, enhances quality of life, and increases community resiliency by: (1) decreasing housing density in the floodplain; (2) creating open space; (3) creating new recreational opportunities; and, (4) enhancing environmental quality and promoting ecotourism

with 'parcels transformed into wetlands, open space, or stormwater management systems, creating a natural coastal buffer to safeguard against future storms' (GOSR, 2017).

GOSR buyout areas changed over time but settled on three in Staten Island in New York City and six in Suffolk County on Long Island, with 721 buyouts total statewide (GOSR, 2021). New York City declined to participate in any other boroughs and Nassau County also declined to participate in GOSR buyouts. Acquisitions were similar in scope to buyouts ($n = 551$) with far more participating in repair/elevation programs ($n = 3,500$) (GOSR, 2017). New York City received a separate \$4.2 billion from HUD CDBG-DR and had its own recovery programs. Acquisition participation was limited (10 properties) (New York City, 2021), and initially New York City declined to create buyout programs, so Staten Island GOSR sites were the only post-Sandy buyouts. After GOSR buyouts were implemented, New York City did further explore buyout use, with a handful of homes participating in Queens and Staten Island (see more in Study areas, and Table 2).

2.2. Study areas

We selected interview locations from New York City and Long Island using data on Sandy flooding from FEMA, data on GOSR buyout programs, and place-level sociodemographic data from the U.S. Census (U.S. Census 2015) (Figure 1). On Long Island, there are several levels of local government: county, town (where most land use planning occurs), incorporated villages or unincorporated hamlets. To capture similar scales we focused on villages and unincorporated hamlets on Long Island and neighbourhoods in New York City (Table 1).

For New York City we had two interview locations, Oakwood Beach, Staten Island, which participated in GOSR buyouts, and Edgemere, Queens, which did not. On Long Island, we had one interview location in Nassau County, Oceanside, which did not participate in GOSR buyouts (there were no GOSR buyouts in Nassau County), and two interview

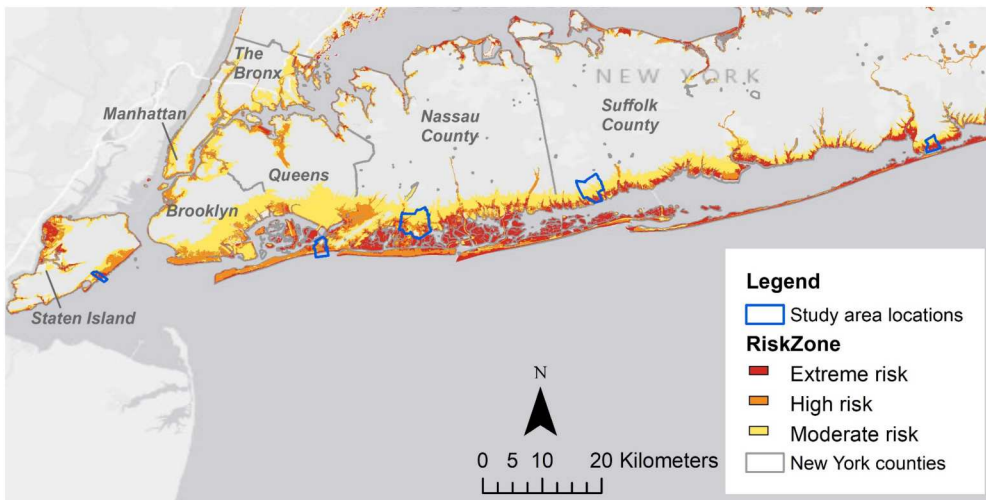


Figure 1. Study area, including locations for interviews, from east to west: Oakwood Beach (Staten Island, NYC); Edgemere (Queens, NYC); Oceanside (Nassau County, Long Island); Lindenhurst; and Mastic Beach (both Suffolk County, Long Island). Risk from the New York Department of State Risk Zones mapping project (NYSDOS, 2013).

locations in Suffolk County that both participated in buyouts, Lindenhurst and Mastic Beach. We had initially selected Lindenhurst, and after discussion with county officials added Mastic Beach, because of its long history of engaging in buyouts (see more below). During Sandy, all study areas were heavily flooded, with two fatalities in Oakwood Beach.

Given their coastal locations, all our sites had been built in low-lying areas, and in some cases on infill. Sites had different amounts of public open space, ranging from more than 33% of the area in NYC's Oakwood Beach and Edgemere, to approximately 5% for Oceanside and Lindenhurst (Table 1, Figure 1).

Housing in all sites were mostly modest single- or two-family homes, inhabited by working-class communities. Housing values were moderate for the region, and reflected proximity to New York City, with the lowest housing values in Suffolk County (Table 1). The Edgemere and Mastic Beach sites had a higher proportion of minority residents (defined as non-white, in the context of the U.S.), while Oceanside had higher incomes (Table 1).

When Sandy occurred, both Edgemere and Mastic Beach had long histories of economic challenges, housing abandonment, and vacant lots, although with different histories. Mastic Beach had been lower-income relative to other locations on Long Island for decades, experienced underwater mortgages and housing foreclosures after 2008, and had numerous undeveloped parcels within wetlands (created during real estate speculation decades ago). Edgemere had initially been a seasonal resort location in the 1800s and early 1900s, but as vacation destinations changed, the site became the focus of 'urban renewal' under Robert Moses in the mid-1990s, with existing housing demolished, transportation links changed to prioritise automobiles, and extensive public housing was built. Edgemere is our only site that is majority renters. Between 1970 and

Table 1. Coastal sites for interviews, including three with buyouts (B).

	New York City		Nassau County	Suffolk County	
	Oakwood Beach (B)	Edgemere	Oceanside ¹	Lindenhurst ² (B)	Mastic Beach ³ (B)
Total population	3,174	13,361	31,078	27,386	12,869
Race					
-Percent white alone	95.1	14.0	93.9	93.7	85.5
-Percent Black alone	0.0	80.4	0.6	1.7	8.8
-Percent Hispanic (any race)	8.1	29.4	6.9	9.5	10.0
Median income (households)	\$66,029	\$16,224-\$41,018	\$101,521	\$85,345	\$67,462
Percent with Bachelor's degree (age 25+)	25	9.4-12.3	42	21	11
Percent owner-occupied	88.0	11.7	85.1	79.9	69.2
Median home value	\$438,100	\$228,000-441,200	\$476,900	\$392,100	\$273,100
Public open space in acres (% of total)	602 (31.2%)	1285 (37.5%)	405 (5.6%)	262 (4.5%)	415 (14.7%)
Study area size (acres) ⁴	1,930	3,428	7,245	5,775	2,826

Housing and population data: U.S. Census Bureau American Community Survey, 2006-2010. Public open space data is compiled from multiple sources (Johnson & Mockrin, [in press](#)).

1. Unincorp (hamlet), Town of Hempstead.

2. Village, Town of Babylon.

3. Unincorp (prev. village), Town of Brookhaven. Just before and after Sandy, Mastic Beach was an incorporated village but returned to the Town of Brookhaven in 2016.

4. Area based on place boundaries from the Census with an additional half-mile buffer to include buyouts.

Table 2. Buyout participation over time.

	Pre-Sandy buyouts	Sandy (GOSR) buyouts ¹	Post-Sandy buyouts
Oakwood Beach, NYC	-	308	1
Edgemere, NYC	Eminent domain/renewal ²	-	10 HPD buyouts ³
Oceanside, Nassau	-	-	-
Lindenhurst, Suffolk	-	61	-
Mastic Beach, Suffolk	Buyouts of vacant parcels	39	25 NRCS buyouts ⁴ ~40-50 Vacant donations ⁵ Ongoing: tax-delinquent properties

1. Data obtained from GOSR (see methods).

2. Not voluntary buyouts but long history of eminent domain and 'urban renewal', with over 100 lots acquired by New York City between 1970 and 1990s.

3. New York City (2020).

4. Suffolk County Legislature (2018).

5. Number from interview.

1990s, New York City acquired over 100 lots in Edgemere as part of an 'urban renewal area' through eminent domain, however, redevelopment goals were only partially realised before the 2008 recession ([Table 2](#)).

Before Sandy, all locations had experienced hurricane damage, wind or flooding, including Hurricane Gloria (1985), Halloween or 'Perfect Storm' (1991), a large Nor'easter (1992), and Hurricane Irene (2011). Oakwood Beach was unique in it also experienced wildfires that threatened homes (in wetlands areas dominated by invasive *Phragmites* grasses). Each of these communities also regularly experienced 'nuisance' or 'sunny day flooding' during high tides or heavy rains, because of low-lying topography, high water

table, and in some cases, existing infrastructure (i.e. streets or combined sewer exacerbated flooding) (Figure 1).

2.2.1. Buyout participation

Before Sandy, only Mastic Beach had voluntary buyouts: the purchase of undeveloped parcels started in the 1980s, to preserve wetlands and lessen septic pollution (Table 2).

After Sandy, Oakwood Beach emerged as the most active site of buyout participation, spurred by Sandy fatalities and previous hazard experiences (floods, brush fires) (Binder & Greer, 2016). In total, GOSR purchased 308 contiguous parcels, effectively an entire neighbourhood (Figure 2). After demolition, over 100 parcels (3 ha) were transferred to a soccer

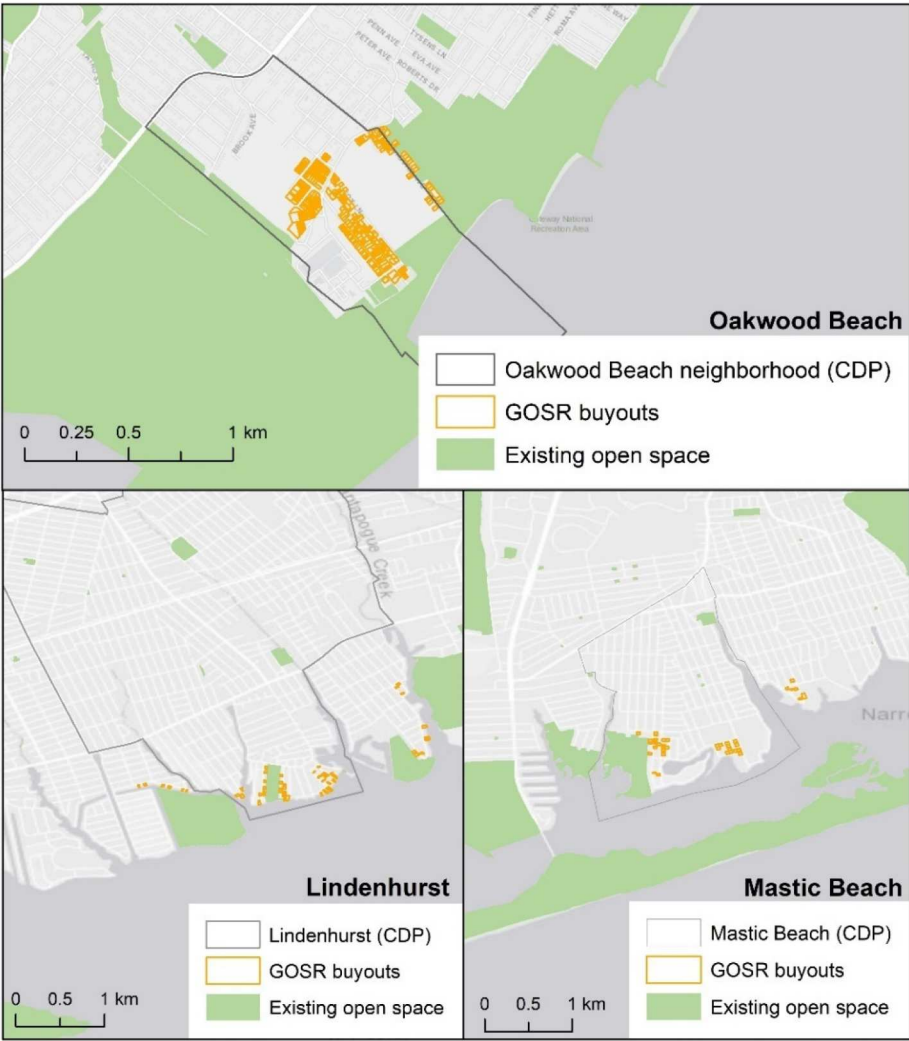


Figure 2. Location of buyouts and open space for communities that participated in GOSR buyouts: (a) Oakwood Beach, Staten Island, NYC; (b) Lindenhurst, Suffolk County; and (c) Mastic Beach, Town of Brookhaven, Suffolk County.

association and several properties to local non-profits (e.g. Veteran's Association) (Johnson & Mockrin, [in press](#)). Other lots will be used as access for a sea wall project and the remaining lots will be transferred to NYC Parks, for natural areas and recreation.

There were no GOSR buyouts in Edgemere in Queens. Over time land use planning in Edgemere created a new goal of repurposing city land inappropriate for housing to create open space (New York City, 2017). NYC's Housing and Preservation Department (HPD) is developing a land trust to further this long-term open space creation (New York City, 2020) and New York City's acquisition program expanded to a limited number of buyouts (e.g. seven in Edgemere as of 2020) ([Table 2](#)).

On Long Island, Nassau County declined to participate in GOSR buyouts, and there were no buyouts after Sandy. Suffolk County had a total of 155 GOSR buyouts, primarily in Lindenhurst and Mastic Beach (Johnson & Mockrin, [in press](#)). Lindenhurst had 61 GOSR buyouts, the most in Long Island, but largely in a checkerboard or dispersed pattern ([Figure 2](#)). In total, 39 properties were transferred to Lindenhurst Village in 2019 (Bonilla, 2019), 20 lots were sold to neighbouring properties, and the Village plans to use other parcels to enlarge a developed park (ballfields) and provide public access to water. There were no buyouts after GOSR-funded ones ([Table 2](#)).

Further east in Suffolk County, Mastic Beach had 39 GOSR-funded buyouts, the 2nd largest concentration on Long Island. Similar to Lindenhurst, sites were dispersed throughout the community ([Figure 2](#)) (Johnson & Mockrin, [in press](#)). GOSR buyout lots became part of a wetland restoration project, managed in collaboration with The Nature Conservancy. After Sandy, buyouts continued through multiple programs ([Table 2](#)). USDA's Natural Resources Conservation Service (NRCS) purchased 25 properties in collaboration with the county and Town of Brookhaven, and donations of vacant lots continued. In total, over 40 vacant lots were donated to the Town of Brookhaven. County legislation passed in 2020 means any tax-delinquent residential properties in the area will be demolished and preserved as open space ([Table 2](#)).

2.3. Data collection and analysis

We conducted semi-structured interviews with state and local government and recovery leaders on buyout experiences and outcomes. Interview questions were the same in each location and focused on community development and conditions before Sandy, damages and immediate response post-Sandy, housing buyouts and community recovery, land use and disaster policies, and future resilience. Interviews took place between December 2017 and November 2019 (at least 5 years after Sandy), to allow for buyout outcomes to emerge. We conducted interviews with an IRB-approved protocol (E18-133, SM 1). In total, we interviewed state, county, and municipal (city, town, village) or unincorporated hamlet officials for each community, as appropriate ($n = 16$, two states, four counties, and 10 at the municipal/unincorporated hamlet level).

The nature of nested governmental entities and responsibilities meant that state, Suffolk County, and New York City staff could each speak to more than one location. We identified key respondents based on a review of government websites and planning documents, including New York Rising plans. Some participants suggested others to interview. We reached out to multiple levels of government, and at least three people in government for each site, and stopped our interview efforts when we reached saturation-that

is, when participants did not suggest further contacts or issues to explore. In total, the number of respondents per location ranged from a low of three in Edgemere (NYC) to a high of seven in Mastic Beach (Suffolk County). Roles included administrators, civil engineers, emergency managers, environmental/floodplain/park specialists, land use planners, as well as positions focused on recovery and resiliency specialists. Given our emphasis on professional government staff experienced with buyouts and risk mitigation post-Sandy, we concluded that this targeted sample allowed us to explore a sufficient range of local governmental site-level perspectives and experiences.

We had all interviews professionally transcribed and analysed interview data using NVivo Pro 11 (QSR, 2014). Interviews ranged in length from 41 to 120 min, with most interviews lasting between 60 and 90 min (average = 72 min). We used a combination of deductive and emergent coding, with two cycles of code development. We began with an initial set of thematic codes, following our research questions and identified through reading a sample of transcripts. Then, we refined themes after a more in-depth examination of interviews (Corbin & Strauss, 2015). Codes focused on the community context, hazard events, land use planning and development over time, buyout outcomes and experiences, as well as broader social and ecological recovery outcomes. Following respondents, distinguished buyout outcomes and experiences for homeowners vs. local government and communities remaining in coding. We had a total 18 of codes about buyouts and communities and three codes for time (past, present/since Sandy, and future). We coded each interview individually, and then before analysis and results, we discussed and revised any divergence to ensure intercoder reliability and consistency. For all quotes we present we also note if the person was from state or local government (including for these purposes county/municipal/unincorporated areas) and if their community had buyouts or not.

3. Results

We first describe government perspectives on Sandy buyout programs for communities and local governments, followed by their perspectives on participating homeowner experience. We then describe how study participants were relating buyout benefits and drawbacks, at community and homeowner levels, to social and environmental settings. We conclude with findings about buyout practice over time, and how Sandy's experience had further encouraged or discouraged buyout use.

3.1. Buyout processes and outcomes for local governments and communities

When discussing often lengthy buyout processes and outcomes emerging for local government and communities, respondents—both from places that had used buyouts and those that had not—often focused on concerns about financial and open space outcomes. There was less discussion of benefits, but positive outcomes from buyouts were noted most clearly in Oakwood Beach and Mastic Beach, two of the places that participated in buyouts.

3.1.1. Financial considerations

The most immediate financial concern for communities was the loss of real estate taxes, particularly for smaller governments (e.g. towns and villages) on Long Island. Ultimately,

given the size and scope of buyouts, respondents reported financial loss had been minimal. Respondents were also concerned that open space interspersed with housing would depress real estate values over time, through the presence of ‘unmanicured’ open space and by signaling hazard risks to other owners or prospective owners.

Real estate agents were flat out saying ‘I don’t want to tell [buyers] that this house was destroyed in Sandy and the state bought the property so it can never be built on because they don’t think homes should be here anymore’. [16, Local, buyouts]

Respondents also noted additional costs for open space management would emerge. New York State was paying for maintenance (i.e. mowing) until a new owner was identified, but in all buyout sites, from smaller communities to New York City, governments were reluctant to take on long-term management.

Grass is great until you have to cut it every couple of days. You know, [GOSR] wants to see a park. Well, now you have extra traffic. You have people coming into neighborhoods [that communities don’t want]. Now we have loitering ... We’re having very serious reservations about reverting back to the green space because there’s no trust in maintenance. [19, Local, no buyouts]

We’re experiencing this citywide (NYC) where if a parcel is not adjacent to an agency like Parks who does land management, there’s really not been anybody to take it over and I think some sort of land banking interim taskforce agency is something we desperately need. [13, Local, buyouts]

There was little discussion of potential *financial benefits* to governments or communities (e.g. averted hazard response, reduced need for infrastructure, or enhanced real estate values through open space amenities). Respondents did express appreciation for the averted costs of rebuilding for homeowners (see 3.2).

3.1.2. Open space—amenities and hazard reduction

Beyond finances, government respondents had a range of perspectives on amenities and hazard reduction outcomes of buyouts, related to participation and form. Where buyout participation had been limited and buyouts checkerboarded, government staff noted community concerns about open space aesthetics and function.

Some people were saying, ‘I want a house on either side of me. I don’t want my one house sticking up from the marsh by itself. We’re a community and I want my neighbors to rebuild as well as myself’. Some people were very offended by the idea that we were identifying areas as not suitable for rebuilding. [15, Local, buyouts]

Some respondents thought the recreation and amenity value of small, dispersed open spaces were limited, which contributed to long disposition processes. For example, Lindenhurst officials were disappointed to realise they could not use buyouts as marinas and were leery of maintaining small parks. Eventually, many of these parcels were sold to neighbours under a ‘Lot Next Door’ program. Here as well, some respondents thought this program had limited benefit, given the restrictions on use, but others valued opportunities to expand small parcels. Memorialisation and other intentional uses of buyout lots of land to facilitate healing (Zavar & Schumann, 2019) was not mentioned in interviews. Respondents also noted that checkerboarding meant buyouts contributed little to hazard reduction. Checkerboarding did not allow for NNBF or for the

creation of ‘living shorelines’. In fact, Lindenhurst insisted that bulkheading be restored on bought-out lots to protect remaining housing, look acceptable to neighbours, and allow access to boats for those who purchased lots.

Interviewees’ perspectives on open space outcomes and hazard reduction were more positive in Oakwood Beach and Mastic Beach, locations with more open space and wetlands. Respondents here expressed more tolerance of delayed restoration and evolving and piecemeal buyouts. In Oakwood Beach, buyout participation and location created additional stormwater infiltration and buffer for people who lived to the north of the buyout site, and one respondent expressed satisfaction with the aesthetic outcomes.

If you drive out there, it is returned to nature ... It’s amazing how you give nature five years, you tear down a house, and it’s just phragmites, grass, for the most part it’s really, with the exception of the roads, turning back to nature. [I4, State]

In contrast, another respondent with ecological expertise cautioned that no restoration work had occurred beyond a basic reseeding effort, and the mix of coastal areas, upland vegetation, and freshwater wetlands would require more specific restoration. Disposition had still taken years, without a clear path to transferring parcels to the local government. Ultimately, most parcels were transferred to New York City Parks nine years after Sandy. Lengthy disposition processes, and the need for surveys for boundaries and contaminants, contributed to restoration delays.

In Mastic Beach, there were already partnerships with a non-profit land management organisation, which facilitated open space disposition and maintenance. These buyouts were dispersed, but perhaps because of the history of undeveloped parcels in Mastic Beach, respondents placed less emphasis on aesthetics of buyouts interspersed with housing. Mastic Beach, and larger Suffolk County, also had concerns about septic pollution, which had motivated buyout use (including vacant parcels) before Sandy. Mastic Beach was the only location that had undertaken planning to consider how additional open space could enhance tourism and recreation, including links with nearby protected areas.

Nobody has publicly accessible waterfront to this extent that we have. It is just this absolute gem that nobody’s doing anything with. It’s been my fight to be like, come on, let’s do this. This has to become popular. This has to be people birding and kayaking and running and walking and birding and fishing. [I8, Local, buyouts]

With support from a National Coastal Resilience Grant through the National Fish and Wildlife Foundation, Mastic Beach is now in the final planning stages for ecological restoration, which will also enhance recreation access (Cohn et al., 2022).

3.2. Buyout processes and outcomes for homeowners

When considering buyout experiences, respondents noted multiple financial benefits of buyouts for participating homeowners, including avoiding protracted rebuilding processes, and the challenges and expense of living in a flood-prone area. We note these perceptions were based on their position as local government staff and community leaders; our respondents did not have the ability to track outcomes for homeowners over time. However, these perspectives were informed by their observations of continued nuisance flooding and difficulty repairing homes. After Sandy, respondents indicated nuisance or

sunny day flooding issues continued or worsened. Even if homes were elevated, roads and lawns were routinely inundated, causing disruption (e.g. residents had to park cars on higher ground and walk home in waders, and rehab lawns after saltwater damage).

Respondents also identified challenges with buyout use and implementation. Respondents were concerned that even generous buyout payments might not allow homeowners to avoid flood-prone areas in New York when relocating. The 2008 housing crisis had left some homeowners with significant debts and/or mortgages, which were larger than payouts. Respondents emphasised that participating in buyouts, or any housing program, including elevations and acquisitions, was time-intensive and challenging. Finally, multiple respondents suggested homeowners be given more time to enrol in buyouts, and thought buyout participation would have increased over time if homeowners had been able to further pursue them.

People were kind of shell-shocked. After the storm there was six months of ‘we’re going to build it better, bigger, stronger’ and after that ‘Maybe it’s not such a good idea to build where we’re going to flood out again’. [People] were worn out from dealing with bureaucracy and moldy homes and having to wade down their streets. [I5, Local, buyouts]

3.3. Merging perspectives to pursue or avoid buyouts

When formulating their conclusions about the suitability of buyouts in their communities, interviewees were integrating their experience with buyout benefits and drawbacks with the characteristics of their communities. Because respondents primarily identified participating homeowners as the beneficiaries of buyouts, not the remaining communities, the hazard exposure and social characteristics of residents—relative to losses—emerged as the main reasons to pursue or avoid buyouts. When losses exceeded the coping capacity for homeowners, buyout programs were most acceptable to government staff, notably in Oakwood Beach and Mastic Beach. Here, the exposure led to a perception that housing ‘never should have been built’, rebuilding housing was irresponsibly placing people in harm’s way, and that the toll of losses, particularly human life, was too much to be sustained.

We don’t think a lot of this stuff should be rebuilt. We want our residents to receive assistance to relocate to safer areas, but we don’t want to see every house that was destroyed rebuilt. They never should have been built in the first place and we’ll just be rebuilding them two or three years from now again. [I5, Local, buyouts]

Conversely, for Oceanside, residents were coping with nuisance flooding thus far, with interest in mitigation and stormwater management investments. When discussing hazard exposure, interviewees focused on the higher socioeconomic status of respondents (housing values, high quality locally funded and managed schools) and community (high civic engagement, presence of families who had lived there for generations).

An area like Oceanside where the property values held and they had a high property value, people weren’t going to fold. They were gonna have to double down and put the efforts into rebuilding. [I1, Local, no buyouts]

We note that Oakwood Beach also had a multi-generational, tight-knit community, but—crucially—did not have higher incomes/housing values relative to New York City,

particularly in relation to the losses sustained. Because they were part of a larger city, schools, tax base, and services were not linked to the local residents in the same way as Oceanside (e.g. the tax base in Oceanside directly supported the local school district).

With buyouts most commonly deemed appropriate relative to losses and community coping capacity, there was far less discussion of community-level social and ecological benefits that could emerge from buyouts. Community-level hazard reduction through green infrastructure only occurred (primarily in Oakwood Beach) *after* widespread participation, which was seen as appropriate because of socioeconomic conditions and mounting loss. Although Mastic Beach had an interest in enhancing community open space and lessening septic pollution, this was a location with substantial open space before Sandy. Limited open space in other places was not a motivating factor for buyouts (i.e. not for hazard reduction, recreation, or ecological benefits).

This limited emphasis on benefits contrasted with the stated GOSR program goals of enhancing ecological function and benefits for communities (recreation, hazard reduction). Similarly, we found a disconnect between buyout documentation emphasizing collaboration with local governments in site selection for buyouts, and the limited partnerships and minimal local government recruitment for buyouts.

The governor when he was pushing [buyouts], he was getting a lot of pushback, some towns were actively campaigning, telling the residents not to sign up for the buyouts ... [it's not] a new concept, but it's a tough concept. How do you get elected officials to walk away from property? Especially private-owned properties. Nothing was publicly owned and there wasn't any immediate use for it. How do you tell people with roots in the community and all that 'Okay we're just going to draw a line and everybody south of this line, it's time to pack up'? [16, Local, buyouts]

I think a lot of this falls back to ... I'll use the word carefully, guidance of the Governor's office. I don't want to use the word leadership because I don't think there was leadership. Leadership involves vertical and horizontal communication. This was a dump of blue ice out of an airplane. Okay? It came down. [19, Local, no buyouts]

These experiences after Sandy with buyouts resulted in some locations that were uninterested in future buyout use, and other locations where buyouts were expanding. With limited perceived community benefits, both Oceanside and Lindenhurst remained unenthusiastic about future buyouts given concerns about budgets and social conditions (place attachment, quality of the school district). In both sites, there was limited open space, but creating additional green infrastructure was considered unrealistic or un compelling.

As described above, the site with the most successful participation, Oakwood Beach, emerged from the scope of the losses and community organisation in pursuit of buyouts, not the result of local government interest or planning. Respondents saw this experience as more of an anomaly, rather than as an example to be replicated.

[Oakwood Beach] actually approached the state, this was something they had been wanting to do for a while and the timing was right so that was a poster child. Every workshop I went to, it was like 'look what we did on Staten Island?' and I said 'that's great, it's not going to happen on Long Island (chuckle). I said, 'I'm sorry, I would like it to, it would make my life a lot easier but it's not going to happen.' [16, Local, buyouts]

In Oakwood Beach, there were residents who died, and I think that the level of destruction was so great in Oakwood Beach that they were fairly quick to come to the conclusion that they didn't want to live there anymore, and that's really an exception in New York. Many residents in New York, even areas that face significant flooding or significant damage, have really resisted the idea of relocating. [I2, local, buyouts]

Expanding buyout use was occurring only in Mastic Beach and Edgemere, as part of broader land use planning (Johnson & Mockrin, [in press](#)).¹ In both places, these discussions about buyouts and land use were a continuation of longer-term efforts. In Mastic Beach, buyouts had started decades earlier with empty lots. However, in Edgemere, there had been a much longer history of 'urban renewal' (e.g. use of eminent domain to raze older and seasonal housing, public housing construction, emphasis on car transportation/limited public transportation options) (New York City, [2017](#)). We note these are also the two locations with lower household incomes and a higher proportion of Black residents ([Table 2](#)).

4. Discussion

A deeper understanding of local government perspective on buyouts, and the ways in which local governments incorporate—or decline to pursue—buyouts in hazard recovery is an understudied aspect of buyout practice. Although buyouts are often positioned as a tool to deliver ecological and associated open space benefits for communities, our work suggests that additional coordination and planning, with an emphasis on the scale and needs of local communities, are critical to delivering those benefits. Across our sites, including those that had used buyouts after Sandy and those that had not, the negative outcomes of buyouts and concerns were most commonly emphasised.

Across sites, many of the concerns we heard from government staff focused on financial considerations, although these financial outcomes played out differently based on community size, both immediate and averted costs. In smaller places, respondents were concerned about the immediate financial impacts of buyouts on their real estate taxes. We note that in our study, Mastic Beach's use of buyouts after Sandy also coincided with the village's return to a larger level of government (Town of Brookhaven). If Mastic Beach had remained an incorporated village of less than 15,000 residents in 4.5 mi², the loss of real estate taxes from buyouts and the burden of administering future open space would have compounded with ongoing economic and quality of life issues, but the much larger Brookhaven has a population of 485,000 and a size of over 500 mi². However, if a jurisdiction is substantially larger, the financial benefits may diminish compared to government size and services. Even with ~300 contiguous buyouts in Oakwood Beach, the averted costs of infrastructure and losses were still small in comparison to the coastal hazard exposure and budget of New York City. Government services and responsibilities, including avoided hazard losses, are often dispersed throughout departments, making it challenging to track these financial tradeoffs over time (BenDor et al., [2020](#)).

Similar to other studies, we found respondents grappling with uncertain open space outcomes of buyouts, particularly in densely developed communities with checkerboarded buyouts (Atoba et al., [2021](#); Brody & Highfield, [2013](#); Calil et al., [2015](#)). These outcomes were mentioned even in places that had not used GOSR buyouts in our study. Such challenges may persist long after buyouts: Zavar and Hagelman ([2016](#)) found that 32% of

sites purchased through FEMA in the 1990s remained vacant for decades, not converted into higher-utility open spaces. In our study, even when there was extensive open space or substantial buyout participation (notably, Oakwood Beach and Mastic Beach), it could still take a decade for stewards and restoration plans to emerge. Mastic Beach was the only site with a pre-existing partnership that facilitated ecological restoration.

Local government respondents took care to characterise their perspectives as different from those of federal and state government and homeowners. While state documents stated a desire to partner with local governments, for many local government staff—even places that participated in buyouts—these relationships were not necessarily collaborative or cooperative (May & Burby, 1996). Respondents, particularly those from Long Island, cast themselves as responding to or being acted upon by state efforts. Our findings concur with others who have noted a disconnect in buyout interest and practice between higher levels of government and the local level, where the work of buyouts often occurs (Cottar et al., 2021; Doberstein et al., 2020).

Acceptance or interest in buyouts on the part of local government was most clearly tied to the perspective that the costs of recovery had exceeded homeowners' capacity for recovery. Indeed, low- and middle-income homeowners in New York City faced formidable financial challenges after Sandy—most of their savings were in their homes and out of pocket recovery expenses cost 2.4 times annual per capita incomes (Madajewicz, 2020). Emphasis on hazard exposure and homeowner resources often accompany buyout participation from lower-income and more socially vulnerable areas (Elliott et al., 2020; Kraan et al., 2021; Mach et al., 2019). Such areas may be more readily categorised as 'substantially damaged', limiting rebuilding options under Federal floodplain policy, buyout payments are lower, and participants may be interested 'upgrading' their neighbourhood (Greer et al., 2021; Loughran & Elliott, 2019). However, our respondents did not emphasise these attributes of homes and residents, nor longer-term structural economic and social forces that had led to these areas being developed, raising questions about equity.

Such places that 'never should have been built' do not emerge spontaneously, but reflect historic drives of inequality and discrimination, as well as decades of government policies on hazard mitigation and housing (Zavar & Fischer, 2021). Race and ethnicity were not discussed by respondents, but we note that both Mastic Beach and Edgemere had larger proportions of Black populations, in Edgemere's case, a population shaped by 'urban renewal', use of the eminent domain, and large-scale development of public housing in the mid-1900s. The links between economic context, hazard exposure, mandatory relocations, and voluntary buyouts deserve more focused study. For example, in Harris County, Texas eminent domain (property acquisitions) to build flood infrastructure was widely used in places where voluntary buyouts are now used today, demonstrating how hazard mitigation builds upon what the authors term 'racialized landscapes already influenced by past housing and hazard mitigation policies' (Zavar et al., 2023).

Finally, we note that our respondents deemed buyouts largely successful for participants, but understanding outcomes for buyout participants and those who rebuilt in place remains an active area of study (Koslov et al., 2021; McGhee et al., 2020). Long-term, buyout participants lose community ties and may face future hazard exposure and additional social challenges, depending on where they relocate (Barile et al., 2019; Loughran & Elliott, 2019; McGhee et al., 2020). Given that homeowner outcomes were often the largest benefit our local government staff saw, how would local government

support for or participation in these programs change if these homeowner outcomes were better tracked over time?

Combined, the experiences and perspectives of local government in this study suggest ways that research could further advance our understanding of buyouts and improve buyout use:

- *Re-examine buyout costs and benefits, by audience and scale.*

Considering multiple vantage points and scales—governments, eventual open space land stewards/owners, broader communities, homeowners who rebuild, buyout participants—can further help elucidate buyout design and goals. It is unclear what the optimal community size/budget, level of buyout participation, and existing open space configuration would be to ensure better ecological and financial outcomes over time for governments and communities remaining. Revisiting cost–benefit models in collaboration with different levels of government could help further explore and catalogue economic benefits and drawbacks at different temporal and spatial scales (Atoba et al., 2021; Nelson & Camp, 2020). Such efforts can also be linked to additional work incorporating human and social costs of buyouts (Tate et al., 2016), including accurate risk reduction calculations for relocated households, and equity considerations for participating and remaining households (Barile et al., 2019; Binder et al., 2019)

- *Longer-time frames for research and buyout use.* Sandy, and the GOSR buyouts created in response, were only often only one point in time during a longer process of considering housing, land use, and hazards in these communities. Longer time frames for research on both homeowner and community outcomes could further elucidate how buyout use was changing over time. When programs are locally managed and buyout enrolment extends over longer time frames there may be more opportunities to enhance program design and equitable outcomes (Shi et al., 2022). In buyout administration, our participants suggested using a longer time frame for buyout enrolment would provide much-needed flexibility for homeowners facing worsening nuisance flooding.

- *Knowledge sharing between sites.* Despite being in the same metropolitan region, recovering from the same storm, and in some cases, participating in the same buyout program, links and knowledge sharing between governments were informal in our study. Research on this information sharing would be helpful in further understanding how practitioners learn about buyouts—for example, we found communities that had not used buyouts had concerns about the outcomes they saw emerging in other locations, while positive buyout outcomes were discussed only by respondents from places that had used buyouts. More formal knowledge sharing such as site visits and exchanges could help further advance buyout practice and innovation between sites.

4.1. Limitations

Although this study provides valuable perspective on buyout implementation and outcomes, from the perspective of local governments, it reflects perspectives from one

group of stakeholders (government staff) and retroactively characterises buyout programs. Research could be further expanded with additional government respondents, community members/groups (residents, non-profits, eventual landowners/stewards), and homeowners who participated in buyouts. For example, our respondents reported their perspectives on homeowners' participation and community tolerance for 'unmanicured' vacant lots, but research could further assess homeowner and resident perspectives on buyouts or lots (Binder et al., 2023; Gobster et al., 2020; Nassauer & Raskin, 2014). As a process that takes years to unfold, it is challenging to study buyouts. We acknowledge that we only have access to respondents' perspectives at one point in time, which risks missing how viewpoints evolved over time and some of the turnover in staff. Ideally, longitudinal studies could collect data over time.

Note

1. Our study occurred before Hurricane Ida, which has led to renewed discussion around buyouts in New York City (Maldonado, 2021).

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