

Pushed, Pulled, or Stranded? Invisible Housing Immobility in the Climate Migration Conversation



AMERICAN SOCIETY OF
ADAPTATION PROFESSIONALS



Kelly Leilani Main,
Executive Director, Buy-In Community Planning
Osamu Kumasaka,
Director of Community Action, Buy-In Community Planning

Introduction

Climate Migration

Climate-induced migration ranges from mobility as a proactive adaptation strategy to forced displacement in the face of life-threatening risks. Migration can be into, within, or out of a country or region. We focused on short-range, internal migration within New York State out of neighborhoods that experienced flooding. Many climate migrants have been making – and will want to make – short-range moves, i.e., within or close to the cities or counties where they currently live in order to retain connections to the people and places they know (Eyer et al., 2018).

Experiencing flooding has been shown to increase financial insecurity. As flood hazards increase and residential homes prone to flooding are discounted more deeply, residents of limited financial means living in highly flood-prone areas may experience this as a barrier to housing mobility. Residents who are aging and/or have physical mobility challenges are also less likely to undertake moves. Such residents may have a stated preference for moving, but may feel physically, emotionally, or financially unable to do so even as they experience repetitive flood losses and degraded living conditions. We call this state that a household may experience being *stranded* in the flood zone. This strandedness concept is the main theoretical contribution of our work, a form of housing insecurity that a household might be held in as they teeter at the brink of displacement, deliberating about whether to abandon their flood-prone home.

Local governments have only used a limited set of tools and programs to work with residents in this state of strandedness. Municipalities may use their building codes to mandate that the residents elevate their homes, though this adds an additional financial strain and makes physical access more challenging. Rather than be forced by increasingly frequent and severe flooding to abandon or sell their homes for a steep discount, stranded homeowners can be offered a *home buyout* by the government. If they decide to fully abandon their homes, local governments may exercise eminent domain.

Situating in New York State

New York State and New York

- **Segregation and neighborhood racial composition.**
 - **Expensive housing.**
 - **Preference for/tendency towards short moves.** Availability of jobs, housing, amenities, kin networks, in receiving areas relative to sending areas – in the New York region, most people live within 8 miles of their mother (NYT 2015)
-
- **Push/pull factors** - how does strandedness fit it?

- Economic, socio-psychological barriers to leaving (strandedness)
- Displacement is not the only sign that something is wrong
 - Deteriorating housing quality and insecurity
 - Poor health
 - Mounting debt from rebuilding
 - Psychology / trauma
- Staying put isn't just about reluctance to leave
- Displacement isn't the only indicator that something is wrong and that individual wellbeing is deteriorating
- Framing also around more actuarial flood risk rating 2.0 and/or increasing flood insurance premiums, depressed or decreasing home values are a barrier to mobility.
- "Market correction" - but if people's home values decline then their options are limited.

Buyouts

- Spontaneous / non-assisted relocation
- Buyouts are one the primary mechanisms by which households relocate from high risk areas,
- Buyouts serve as a buffer / stop from correction of housing markets in high risk areas. It's a public intervention / fixing market externality
- Mortgage v. owning outright -
- How did the problem happen?
 - Lack of regulation on patterns of development and building codes
 - Asymmetry of information in housing market
 - Changing environmental conditions (from both climate change and impermeable surfaces)

Methods (750-1,000 words)

A description of the methods, and ultimately the methodology, for how you undertook your work - this is one of two sections that are most important to NYSERDA and should be given ample space in your writeup.

Investigation 1: Tendency towards 'like' communities amongst hurricane-affected neighborhoods in NYC

When we first began this exploration, our team attempted to examine the following question and assumptions: Some of the existing literature on migration holds that people are likely to migrate to areas of similar ethnic, racial and/or socio-demographic and socio-economic composition post-disaster in order to utilize their kinship networks for support, housing, and economic opportunity. The well-documented case of Puerto Ricans moving primarily to certain cities in the mainland United States after Hurricane Maria to be with their family, friends, and/or a familiar community supports this trend. Hundreds of Puerto Rican households moved to established Puerto Rican communities within other parts of the United States, including Florida and New York. However, they also moved to smaller

communities such as Holyoke, MA, where existing social networks and opportunities were already established. Thus, we sought to ask the question:

If a hurricane were to hit New York City, what is the demographic composition of the areas that would be most affected? AND, if those households were not assumed to return to their existing neighborhood, where else in New York State might they relocate to, given the assumption about preference for moving to like communities?

Push Factors	Pull Factors
Hurricane Inundation Zones	Similar demographic composition

Because we do not have individual-level data for each person who lives in New York State, we must utilize aggregated datasets to visualize and analyze spatial impacts such as hurricane zones. The datasets used are highlighted in the table below.

Dataset Name	Source	Format
NY State Hurricane Inundation Zones		Raster
EPA EJ Screen		Polygon
2010 Census		Polygon
NYState Parcel Data		Point

To achieve this, a multi-step process is required to understand the number of a basic intersect of the New York State Hurricane Inundation Zones dataset with socio-economic datasets such as the EPA EJ Screen tool or Census data. Next, we undertook a multi-step process to identify the relationships between these elements.

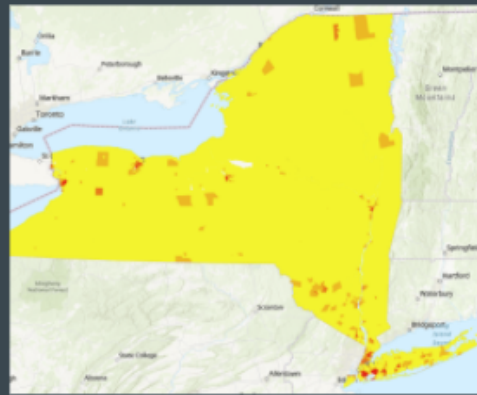
1. NYState Parcel Data -> Intersect -> Hurricane Inundation zones
 - a. Summarize number of parcels by inundation zone
2. Select from Census Tracts -> Census tracts with 80% or greater Black population
 - a. Clip OR Summarize Within (Selected tracts) -> Number of parcels affected by categories of inundation zones
3. Select from -> NYS Census tracts with greater than 80% black population
 - a. Examine existing housing availability and price

Diving Deeper: 2010 Census Data - Black Population

Are black residents affected by hurricanes likely to relocate to other parts of New York State with high percentage black population?



Census Tracts with greater than 80% Black Population + Hurricane Risk



New York State Census Tracts with greater than 80% black population

It is imperative to understand the limitations of this methodology. The first is the assumption that people are more likely to move to areas of similar racial or ethnic composition. This is not necessarily the case. Rather, it is more likely that people move within existing social networks or familial ties - only in some cases do racial or ethnic composition align with familial/social ties or networks when families consider moving. This may or may not be the case for black households but may apply differently to different groups, such as immigrant communities or others such as the Puerto Rican population described above. It would likely be more effective for policy makers to try to understand the social network and social ties of different at-risk households rather than base their analysis entirely on aggregated census tract data.

Investigation #2: Identifying involuntary housing immobility (strandedness)

The second element of our work is a methodology under development by Buy-In Community Planning, an organization dedicated to helping flood-affected households find the resources they need to relocate. In this method, we explore the concept of strandedness utilizing an existing dataset of buyouts conducted by the Governor's Office of Storm Recovery (GOSR) after Hurricane Sandy.

As in the previous methodology, we are primarily concerned with how socio-economic and demographic variables may affect the mobility or migration pathways of people affected by flood events. However, in this second investigation we focus solely on the variables associated with housing in order to identify involuntary immobility, also called strandedness.

As outlined above, to understand strandedness, we must understand the different intersectional elements that strandedness entails. We call this the geographies of availability, which include:

- Affordability: including median home price or average rental price for housing in a given area
- Availability: how many units are present and/or available in a given area
- Adaptability: can, or should the building be adapted to become more resilient?

With these as our assumptions, we explored the following research question: If homeowners interested in a buyout after Hurricane Sandy received Fair Market Value (FMV) for their home to fund their move, what would their local housing options have looked like (and who may have been 'stranded')?

This is further broken down into the following method of analysis:

Question	Method
In which neighborhoods (zip) were buyouts offered?	Spatial Join: GOSR buyouts + NYS zip codes
What was the median listing price in neighborhoods in which buyouts were offered?	Join Redfin.Com market data by zip to NYS Zip Codes
Was Median Sale Price a driving factor of buyout participation?	Regress Median Sale Price with number of buyout participants
What neighborhoods nearby were affordable to potential buyout participants?	Buffer: 8 mile radius and/or border share Calculate purchasing power of estimated buyout: $Purchasing\ Power = FMV\ offer\ (Oct.\ 2012) \div Median\ Sale\ Price\ (Oct.\ 2014)$
What neighborhoods overall are affordable to buyout participants? (regional, state, national)	Select receiving neighborhoods where median listing price is \leq sending neighborhood
How many homes were available in those neighborhoods in those years?	Use Redfin.com market data to understand market availability for affordable areas.

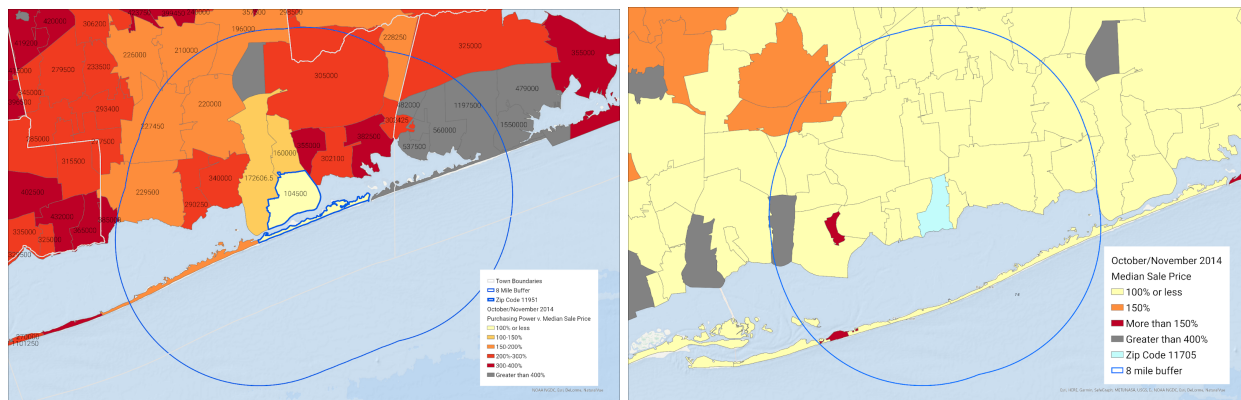
Data:

Name	Source	Type
Buyout Participation	NYS Governor's Office of Storm Recovery	Point

Monthly Median House Price by Zip Code	Realtor.com	Polygon
Zip code	NYS GIS Data Clearinghouse	Polygon

Results (250-500 words)

Our data showed that median sale price does not appear to be a driving factor for buyout application status, meaning there was little difference in buyout participation rates between high-value MSP zip codes compared to low-value MSP zip codes. However, we did identify that low-value MSP zip codes had much less purchasing power than high-value MSP zip codes when comparing the pre-storm Fair Market Value of the home (in 2012) to what the cost of housing would be in 2014. This was apparent also when utilizing the 8-mile buffer as a radius.



Purchasing power (2012 pre-storm FMV) v. median sale price (2014) for Mastich Beach (left) compared to Purchasing power (2012 pre-storm FMV) v. median sale price (2014) for Lindenhurst (right)

Discussion (500-1,000 words)

This is the other section that's of high importance to NYSERDA and should be given ample space. Focus on areas for future research and potential applications

Post-disaster voluntary buyout programs (buyouts) are an important tool for helping communities adapt to the increasing risks associated with climate change, such as extreme weather events like hurricanes. Using buyouts as a tool to facilitate managed retreat away from the highest risk areas in order to bolster resilience in less risky areas is increasingly seen as an important task in numerous states across the country. As the likelihood of extreme weather and buyout programs both increase, it is important for states and local jurisdictions to understand the potential opportunities and challenges associated with buyout programs, particularly around housing. Currently, most buyout programs do not track the reasons why households do or do not take a buyout offer. They also do not track where people relocate to after they accept a buyout. Both of these data limitations make it nearly impossible to understand the differential outcomes of different buyout programs. Thus, due to a lack of data, our

research does not provide any conclusive evidence for predicting the relationship between buyout participation and median home values after Hurricane Sandy in Long Island. However, our methodology seeks to make the point that replacement housing costs are likely to influence homeowner participation in buyout programs by revealing the relative purchasing power of buyouts that were offered in two zip codes after Hurricane Sandy. A comparison of the relative purchasing power of homeowners who were offered buyouts in Lindenhurst and Mastic Beach in 2014 using the October 2012 MSP shows that homeowners in Lindenhurst were likely to have significantly higher purchasing power with their pre-storm FMV than homeowners in Mastic Beach. As a result, we hypothesize that homeowners in Mastic Beach were less likely to accept buyout offers than those in Lindenhurst, although this is speculation.

Currently, some buyout programs utilize incentives to help households relocate within certain jurisdictions. For example, North Carolina developed Hurricane State Acquisition and Relocation Funds (SARF) to provide relocation assistance to homeowners whose primary residence was damaged during Hurricane Matthew and is being acquired in an HMGP or DRA buyout, including homeowners whose assistance from HMGP or DRA is not enough to provide comparable housing outside of a flood area. SARF provides up to an additional \$50,000 for households who find replacement housing that is more expensive than their current home. While these incentives programs are incredibly important for providing additional capital for households with depressed home values, such incentives may not be enough to make relocation financially feasible for other households. For households with elderly or disabled residents, or for those living on fixed incomes, it may be impossible for them to secure a mortgage on a new home, or they may not find housing that is suitable for their needs. This is why supply is also critically important - in many communities, the sheer lack of availability of housing within a fixed price range compounds the challenges associated with housing. Thus, buyout programs are inextricably linked to the affordable and available housing crisis that affects nearly every corner of the country. As a result, if states are interested in supporting equitable assisted relocation initiatives, they would be well suited to support the maintenance and development of affordable housing in areas that are not vulnerable to climate impacts such as flooding. Without creating enabling environments to move, the most vulnerable people are likely to remain stranded in place, waiting for the next disaster to occur.

Please respond to these questions to inform ASAP's composite writeup

What do you know now about how to predict climate migration that you didn't know at the beginning of the project?

In what ways is preparing to receive migrants who are moving because of climate-related push or pull factors the same as preparing to receive migrants who are moving primarily because of other push or pull factors, and in what ways is it different?

In both circumstances, the availability and affordability of housing is a critical priority. However, when it comes to people who are moving due to climate-related push factors, such as relocation after extreme weather, those households who arrive may be arriving with a large sum of money from buyout programs, which may significantly impact local markets. This was a major issue in Chico after the Camp Fire in Paradise, where households that received large insurance payouts were able to put down payments on housing in the city, pricing out many lower income families and driving housing prices upward.

In what ways is predicting migration that's related to climate-related push and pull factors the same as predicting migration that's related to other push and pull factors, and in what ways is it different?

Many people who chose to migrate due to climate-related push factors may be recovering from the experience of living through a major disaster that may have destroyed their home and their belongings. Like other migrants, some of those households may have the financial resources to relocate, while others do not. However, in the case of climate-related impacts (i.e. increase in severity of extreme weather events such as hurricanes due to intensity or higher storm surge due to increasing SLR), funding may be allocated through the federal government's Stafford Act allocations to facilitate recovery through FEMA's HMGP program. This flood of money is one of the most significant opportunities that affected jurisdictions have to increase their resilience and/or adapt to climate impacts. Facilitating managed retreat programs through voluntary property acquisitions (buyouts) is one way to permanently eliminate exposure to flood risk while enabling people access to capital to relocate to safer neighborhoods. Thus, these events and funding streams have the potential to facilitate large-scale climate migration through policy design and programming. They are also a very straightforward way of predicting who is moving related to climate (extreme weather/disaster) events. In such a circumstance, all of the program participants are 'climate migrants', and there is an opportunity to develop strong data analytics around their thoughts and preferences for relocation. However, existing programs generally do not gather this kind of data.

What trajectory did your team take to get from what was initially proposed in the application to what you're planning to deliver now?

What influenced your thinking, and therefore influenced you to modify the project?

What barriers did you encounter to delivering on your original idea?

What enabled your work or had a positive impact on moving your work forward?

Introduction

Background

Relevant Literature About NYS Climate Migration

Climate Migration to NYS

- Central America / Mexico, Puerto Rico, Caribbean Islands, [Bangladesh](#), and other sending areas
- [Three-way nexus between climate vulnerability, migration, and health](#)

Within NYS

- [New York's Invisible Climate Migrants](#) - "economic climate retreat"
- NY Buyout Program Studies
 - [Were the Post-Sandy Staten Island Buyouts Successful in Reducing National Vulnerability?](#)
- [Immigration and Migration within NYS](#)

Leaving NYS

- Julia Beckwith (2019), [Modeling Climate Driven Urban Migration in the United States](#)

Existing Policy on Climate Change and Migration in NYS

Review NYSDRDA, other state agencies, and other NY cities' planning or research relevant to the topic of climate migration (if any)

- ClimAID?:
 - [Responding Climate Change in New York State \(ClimAID\) - NYSDRDA](#)
 - Chapter 2
 - Appendix 2
- [New York Rising Buyout and Acquisition Policy Manual](#)
- Original GOSR research on buyouts?
- Other state agencies that have researched or planned for climate-driven migration?
- NYC Comprehensive Waterfront Plan
 - 2010
 - 2021 Update
- [NYC Build It Back](#)
- [NYC Hurricane Relief Centers - any plans or protocols for those?](#)
- [Green New Deal for Public Housing](#)
- [Resilient Edgemere Community Plan](#)
- [Policy Approaches to Climate Migration: Lessons From Latin America and the Caribbean](#)