

# Retreat

**Flood lines exist simultaneously as a trace and forewarning, informing us where water has been and what it will ultimately claim. These lines are revealed both in elevation and in plan as traces, physical manifestations, and invisible boundaries, after the water has receded, leaving a measurable presence in physical loss and economic debt.**

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Figure 1: *(post)line* A research project on the architectural response to rising sea-levels, by Michael Jefferson and Suzanne Lettieri (JeLe), 2013. Sponsored by the Eidlitz Travel Fellowship, Cornell University, Department of Architecture and DCA Premier Grant, Staten Island Arts, with public funding from the New York City Department of Cultural Affairs. Image locations: Suwannee, Florida. Waveland, Mississippi. Biloxi, Mississippi. Horseshoe Beach, Florida. Long Beach Island, New Jersey. Cape Cod, Massachusetts.

## RETREAT

In elevation, waterlines serve as a historic measurement of water height. This datum is articulated physically by incentivized raised housing, creating a new horizon line that divides what can get wet from what must stay dry, and ultimately informing the ever-fluctuating base flood elevation (BFE).<sup>1</sup> In plan, perhaps the most politically charged manifestation of flood lines, Flood Insurance Rate Maps (FIRM),<sup>2</sup> demarcate the shifting Special Flood Hazard Areas (SFHAs),<sup>3</sup> where mandatory flood insurance applies. Beyond the physical watermarks left after a storm, these invisible lines have perhaps more massive consequences on architectural form, urban life, regional planning, and future visions for how to live with water.

## RAISE OR RAZE?

Notorious storms such as Hurricanes Sandy and Katrina have had an immense impact on the redrawing of flood maps, declaring an expanding area along the East and Gulf Coasts as high-risk flood zones. Vertically, the invisible flood line has increased to 25 feet in some areas, leaving whole neighborhoods awkwardly looming above their ground planes. The elevational line drawn after the storm surge, what one could call the “post-line,” serves as a record of past catastrophe and the growth of the peculiar architectural phenomenon of suburbia on stilts.

In other pockets along the coast, flood lines have had a very different response: one of retreat and relocation. After destructive hurricane seasons in 2011 and 2012, New York and New Jersey began testing alternatives to the raising strategy. Instead they proposed an initiative to buy out homes and to raze high-risk neighborhoods.

In the New York tri-state area, the need to explore alternative responses arose when coastal dwellers returned to the hardest-hit areas of Hurricane Sandy. While previous false-alarms had dulled the residents’ willingness to vacate their homes in the face of an oncoming storm, this time evacuation efforts were, for once meaningful. For many areas, this was the first time experiencing the implications of living near the coast and responses were varied; some left their houses to be transformed into a cocoon of mold, while others began to clean



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and salvage. In the case of Oakwood Beach, Staten Island, cleaning was a much greater task than might be imagined, since flooding from Raritan Bay's Sewage Treatment Plant not only left interiors wet but slick with other dark matter.

Often, the houses did not seem ravaged from the outside, but once inside, a nightmarish distortion of the residents' homes became apparent. For the most part, water did not crash dramatically into the houses. Instead, it squeezed its way through cracks, drafty windows, and gaps under doors. The houses filled up like fish tanks and the furniture floated aimlessly. Beds were found upended in bathrooms, and refrigerator doors were swung open with their contents scattered, while patio furniture was found miles away.

#### CONTEMPORARY GHOST TOWN

Until recently, America's ghost towns were most prevalent in the Great Plains, where the abandonment of canal and rail networks and the depletion of mines displaced one-third of the population since 1920.<sup>4</sup>

Along the coast today, however, new ghost towns are forming, not from the consequences of past misfortune, but instead as a result of future anticipation: the 100-year flood.<sup>5</sup> Compared with the aftermath of previous disastrous storms, in New York City and elsewhere, this is a staggering acknowledgment not just of a changing environment, but also of the economic inadequacy of developing susceptible coastal territories in normative ways.

These newly articulated ghost-towns are guided by FEMA flood maps and are manifested both through raising (elevating houses) and razing (neighborhood buyouts). In either case, they define a vacated zone, one relating to the individual and one to the collective. The individual zone consists of the territory in between the vacant ground plan and occupied raised-house above, while the collective zones are the demolished neighborhoods that lie between the ocean and the urban fabric that is not yet threatened by flooding. This technocratic method of mapping ultimately creates a new version of the American ghost-town, one preemptively designed by policy.

#### BUYOUTS

While the elevated architectural form of raised houses has been pervasive along the coast, the debt incurred by rebuilding after repeat flood events (\$28 billion paid by the U.S. Treasury as of March 2013, and \$527 billion of National Flood Insurance liability as of 2011)<sup>6</sup> has convinced major political figures that the urban strategy of removal may be a more viable solution.

Since FEMA's initiation of the buyout program in 1993, discrete instances of buyouts, predominantly in riverine areas, have occurred in Missouri, Kentucky, Georgia, and Iowa. In

Figure 2: *raze versus raise* The architectural consequences of flooding: razed house, Staten Island, New York and raised house, Waveland Mississippi.



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each case, the sites encountered subsequent floods, saving millions of dollars<sup>7</sup> and proving the strategy's success. Compared to rebuilding, buyouts are rare (37,707 properties bought out nationwide, out of a possible 2,409,526 flood-insurance policies),<sup>8</sup> but the recent promotion of "managed retreats" in New York and New Jersey have invigorated this strategy as an option that environmentalists believe is a more forward-thinking response to coastal flooding.<sup>9</sup>

The process of managed retreats involves the use of public funds for the government to purchase private land, demolish existing structures, and convert land back to its natural state, serving as a sponge for adjacent neighborhoods in times of flooding, but also an area declared for perpetual public use in the nonflood state.<sup>10</sup>

The first community in New York City to participate in this program is the Oakwood Beach section of Staten Island, where the majority of residents have accepted the pre-Sandy value of their homes, allowing the state to convert the neighborhood into a park and natural buffer zone for future floods.<sup>11</sup>

The role of economics as an agent in the redrawing of coastal architecture and urbanism is significant and complicates the direct relationship between the post-line and built form. The unviability of buyouts in many areas can be understood as yet another force that articulates the invisible boundaries that dictate urban and architectural quality. For instance, land value and labor costs have a tremendous impact on the feasibility of buying out entire neighborhoods. In Oakwood Beach, the average buyout expense was over \$400,000 per home plus high costs for the phasing of demolition,<sup>12</sup> compared to just \$53,000 per home in past riverine-based buyouts. This economic spike resulted in fewer homes along the coast being bought out than originally anticipated. Along with the stark differences in land value, 45 percent of the country's GDP comes from coastal counties,<sup>13</sup> which results in an inevitably

Figure 3: New York Metropolitan Federal Buyout Programs: Blue Acres, USDA, NY Rising Buyout. Extracted from the Regional Planning Association Report, *Buy In for Buyouts*, 2014.



- 4 uneven approach: the protection of economically valuable areas, and targeted buyouts for more economically and socially vulnerable areas.

Furthermore, the sentimental attachment to a home and the dismantling of communities is a difficult choice for residents and a hard sell for politicians.<sup>14</sup> Since buyouts are voluntary, the sentimental attachment to place is an important aspect that advocates for buyout strategies must confront.

A solely empirical approach has negative consequences for the future of buyouts. As has been demonstrated in New York State's recent reduction (from 10,000 to 400),<sup>15</sup> buyouts will be deemed too expensive and insensitive if they are not more carefully considered for their full potential. These territories are not simply marginalized and vacated (either in plan or elevation), but they become the contentious zones that define a burgeoning era of climate change and resilient response. The sinuous watermark in plan does not abide by our political boundaries but declares its own, creating disjuncture in the urban fabric, and revealing opportunities (or obligations) for reclaiming the ground plane through urban, landscape, and architectural experimentation that negotiates between land, water, built edge, and public space.

Thus, the redrawing of the inhabited coastline is manipulated by not only the visible watermarks left behind, but invisible socioeconomic forces as well, with the selection of which areas are to be razed depending on three factors: environmental conditions, contribution to GDP growth, and the psychological desire to stay. If buyouts are to occur at a larger scale, becoming an economically viable and socially acceptable option, incentives will have to cease for raising and rebuilding, and vacated areas must be reused in a more productive way, tapping into the complexity of negotiating private land, coastal ecosystems, storm defenses, and public space.

Figure 4: Vanishing land of the American East and Gulf Coast. Based on a 2012 study in the journal *Science* showing a 25' sea level rise in the coming centuries.

## CONTINGENCE

In 1950, a storm of Hurricane Sandy's magnitude was considered a 435-year flood. Presently, it is considered a 100-year flood; and in 2100 it is projected to be a 20-year flood.<sup>16</sup> As the daunting predictions of climate change are unveiled—and as the economic realities persist<sup>17</sup>—the invisible flood lines and FEMA maps will inevitably be redrawn time and again, surely exacerbating socioeconomic problems and leaving its own destructive architectural wake along the coast. Given this predicted future, how can we productively work within the vacated zones and the realities of a fluctuating coastal horizon?

Isolated examples expand the territory of managed retreats and attempt to squeeze more life out of the vacated zones. In a report by the Regional Plan Association, current buyout areas and existing open spaces are overlaid, using the new vacancies as a way to stitch and reconnect open space, weaving in between the developed areas.<sup>18</sup> Along the same lines, a "Rebuild by Design" proposal by Sasaki Associates with Rutgers University and Arup focuses on the transformation of a buyout area into an ecotourism destination, linking inland towns that have failed to thrive economically with the newly vacated areas, that are envisioned to serve as natural tourist attractions.<sup>19</sup> Schemes such as the above are beginning to recognize the necessity to overlay physical risk with cultural need in order to move toward a cohesive solution between nature and people. This kind of conditional approach is what Keller Easterling calls "Interplay" in her article of the same name. Easterling proposes that homogenous zones of the coast are broken down by rating properties based on risk and benefits, allowing independent entrepreneurial exchanges that would rely more on qualitative indicators versus a purely quantitative language.<sup>20</sup>

Unlike our traditional notion of rating properties (i.e., LEED) for their independent value, Easterling proposes a rating system that would reveal both the potentials and risks of exchanging coastal properties for other programs and scales of use. This perhaps is the most potent idea that links the three strategies above, where less emphasis is put on the autonomous object and more on the search for interdependent relationships between the planned and unplanned, the economically challenged and economically viable, and a collective mindset that finds value in relating architecture and landscape.

## OWNERSHIP

Flood zoning today is framed in such a way as to preserve an independent and form-oriented mode of urbanism. That is to say, insurance incentives and flood policies establish a voided ground plane in its entirety without considering that a more nuanced manipulation could achieve, but this would rely on the contingent and reciprocal relationship of what are today privately owned parcels of land.

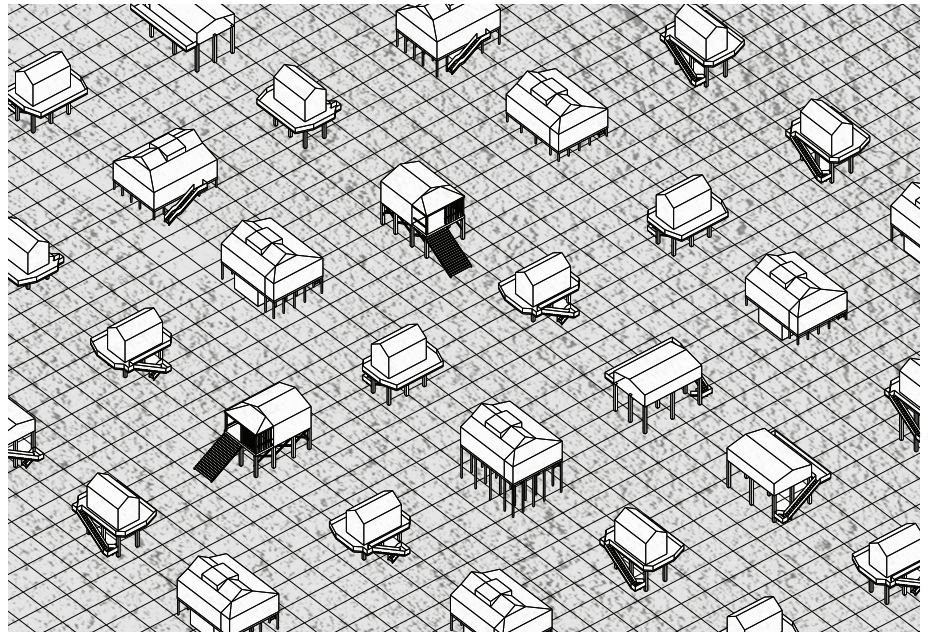
The immediate aftermath of storms is the most valuable moment to rethink such an interdependent urbanism. It is a time when neighborhoods are caught between the exchange of ownership and the legal use of the land. Tentatively, three types of property emerge, defining the coastal ghost-town: the ruin, the razed plot, and underside of the raised house. These types define temporary vacancies that already reveal both positive and negative latent uses: a collection of boarded-up houses act as a breakwater for adjacent neighborhoods, vacant plots where houses once stood are converted into community gardens, and the undersides of elevated homes are illegally occupied by housing additions for storage or treated as a leftover hardscape space for parking.

In the spirit of interdependency, perhaps these in-flux property types could be ascribed value in relation to one another. One way in which this could be played out is that the ground plane could be isolated as an element of exchange in itself. Rather than the current trend to raise or raze properties, one could raise and raze, exchanging and eliminating what was

## ENDNOTES

1. "Federal Emergency Management Agency Base Flood Elevation," <http://www.fema.gov/national-flood-insurance-program/base-flood-elevation> (March 26, 2015).
2. "Federal Emergency Management Flood Insurance Rate Map," <https://www.fema.gov/floodplain-management/flood-insurance-rate-map-firm#> (September 28, 2015)
3. "Federal Emergency Management Special Flood Hazard Area," <https://www.fema.gov/floodplain-management/special-flood-hazard-area> (March 26, 2015)
4. Steven G. Wilson, "Population Dynamics of the Great Plains," US Census Bureau, <http://www.census.gov/prod/2009pubs/p25-1137.pdf> (2009)
5. One-hundred-year flood, aka the 1 percent annual chance flood: the accepted national standard used to assess, manage, and rate flood risk. "Federal Emergency Management Flood Zones," <https://www.fema.gov/floodplain-management/flood-zones> (March 26, 2015)
6. Shiva Polefka, "Moving Out of Harm's Way," Center for American Progress, <https://www.americanprogress.org/issues/green/report/2013/12/12/81046/moving-out-of-harms-way/> (December 12, 2013)
7. Shiva Polefka, "Moving Out of Harm's Way," Center for American Progress, <https://www.americanprogress.org/issues/green/report/2013/12/12/81046/moving-out-of-harms-way/> (December 12, 2013)
8. Shiva Polefka, "Moving Out of Harm's Way," Center for American Progress, <https://www.americanprogress.org/issues/green/report/2013/12/12/81046/moving-out-of-harms-way/> (December 12, 2013)
9. "Managed Retreat Strategies," National Oceanic and Atmospheric Administration, [http://coastalmanagement.noaa.gov/initiatives/shoreline\\_ppr\\_retreat.html](http://coastalmanagement.noaa.gov/initiatives/shoreline_ppr_retreat.html) (October 22, 2007)
10. "New Report Offers Legal Tools to Limit Risks of Climate Change for Coastal Communities," Columbia Law School, [http://www.law.columbia.edu/media\\_inquiries/news\\_events/2013/october2013/managed-retreat-handbook](http://www.law.columbia.edu/media_inquiries/news_events/2013/october2013/managed-retreat-handbook) (October, 2013)
11. The program began with ambitious plans for the majority of properties within the 500-year flood zone areas of Staten Island and Long Island, but the state has since scaled back and Oakwood Beach today is a collection of boarded-up houses, cleared plots, and a few resistant occupants.
12. Virginia N Sherry, "\$100 million and counting for Staten Island buy-out program," <http://www.silive.com/eastshore/index.ssf/2014/08/buy-outs.html> (August 29, 2014)
13. National Oceanic and Atmospheric Administration, "State of the Coast: The Coast—Our Economic Engine," available at [http://stateofthecoast.noaa.gov/coastal\\_economy/welcome.html](http://stateofthecoast.noaa.gov/coastal_economy/welcome.html) (2011)

Figure 5: The propagated raised house exemplifies an abstract relationship to the ground plane.



- 14 Federal Emergency Management states two challenges, specifically: (1) loss of roots, and (2) despite efforts to compensate one fairly, property acquisition may not make one “whole” again. “Hazard Mitigation Assistance–Property Acquisition (Buyouts),” <https://www.fema.gov/application-development-process/hazard-mitigation-assistance-property-acquisition-buyouts> (October 28, 2014)
- 15 Freeman Klopott, “Cuomo Seeks \$400 Million to Buy New York Beachfront Homes,” <http://www.bloomberg.com/news/articles/2013-02-04/cuomo-said-to-look-for-400-million-to-buy-new-york-beachfront-homes>; and Elizabeth Rush, “Leaving the Sea: Staten Islanders Experiment with Managed Retreat,” <http://urbanomnibus.net/2015/02/leaving-the-sea-staten-islanders-experiment-with-managed-retreat/>. (February 11, 2015)
- 16 Shiva Polefka, “Moving Out of Harm’s Way,” Center for American Progress, <https://www.americanprogress.org/issues/green/report/2013/12/12/81046/moving-out-of-harms-way/> (December 12, 2013)
- 17 The National Flood Insurance Program has been close to bankruptcy twice in the last 10 years. Elizabeth Rush, “Leaving the Sea: Staten Islanders Experiment with Managed Retreat,” Urban Omnibus <http://urbanomnibus.net/2015/02/leaving-the-sea-staten-islanders-experiment-with-managed-retreat/> (February 11, 2015)
- 18 Lincoln Institute of Land Policy and Regional Plan Association, “Buy In for Buyout, Roundtable,” (December 11, 2014)
- 19 Sasaki, Rutgers, and Arup, “Resilience + The Beach,” [http://www.rebuildbydesign.org/wordpress/wp-content/uploads/briefing/Sasaki\\_IP\\_Briefing\\_Book.pdf](http://www.rebuildbydesign.org/wordpress/wp-content/uploads/briefing/Sasaki_IP_Briefing_Book.pdf) (March, 2014)
- 20 Keller Easterling, “Interplay,” *Harvard Design Magazine* 39, <http://www.harvarddesignmagazine.org/issues/39/interplay> (2014)

once private territory under the house for potential combinatory design, programmatic and landscape mitigation strategies. In razed areas, former residents could potentially have the option to maintain their former plots of land as semipublic zones for gardens and recreation. A rezoned ground plane could serve functionally as flood absorption and mitigation strategies but would also challenge the individual, territorial relationship to site, allowing a reframing of the meaning of detachment and relocation. Yet another way to envision a reliant response is to rebuild only in strategic locations that can simultaneously and systematically work with and protect the ecological context and the existing built context.

The vacancies of coastal ghost-towns are sites of anticipation and offer diverse scenarios for change. Whereas the traditional ghost-town is defined by an end point after which inhabitation ceases to exist, the coastal ghost-town evolves over time, lying in wait for the next storm. Like a blighted landscape, the ghostly effects creep inland as the seas rise, inevitably claiming new territories. It is in these sites that people wait, either hovering above or cautiously at grade, for the next 100-year flood which will inevitably reshape how they will live. While we are collectively waiting, the voided ground condition, created by either raising or razing, would be most effective if the conditions of ownership were malleable and interdependent. Strategically grouping and finding continuity among former parcels of land would alleviate the disjunction between partially raised and razed neighborhoods, an option to maintain razed plots would provide resistant home owners a tangible connection to what was lost, and ruins could be put to productive use, potentially diverting water within a larger-scale strategy. There is no doubt that the built realm will continue to exist along the coast, but as inhabitation evolves so too should the mind-set of how we reclaim and reposition the ground plane between the polarities of that which is raised or razed.