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The Social Justice Case for a Metropolitan New York-New Jersey Regional Storm Surge Barrier System

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IN THIS ISSUE

In this article, the authors recount the devastation of Superstorm Sandy and demonstrate that low- and middle-income communities and communities of color suffered more from Sandy and its aftermath than wealthier neighborhoods in the region. The same communities also experienced slower and less effective rebuilding efforts. The authors consider current plans to mitigate damage from future storms of the scale of Sandy and demonstrate that these plans, by their piecemeal and district-by-district nature, will follow the same pattern of protecting affluent residential and commercial zones and leave communities that are less well-off disproportionately exposed. To correct this injustice, to treat all residents and neighborhoods fairly, and to do the most to protect the region from future storms resulting from global warming, the authors support the proposal for a region-wide storm surge barrier following well-accepted precedents established by other coastal cities around the world. Such barriers provide equal protection to diverse income and racial groups at lower cost, and with better outcomes, than local community-based barriers such as are currently planned.

Introduction

Superstorm Sandy was a post-tropical cyclone of enormous size that hit New York City in October 2012. It was approximately 1,100 miles in diameter—the largest ever measured by the National Hurricane Center. Making landfall along the New Jersey coast on the evening of October 29, Sandy and its accompanying storm surge left a trail of massive destruction and death in the New York-New Jersey metropolitan area and Connecticut—the nation's largest urban region.

In response to the storm, the United States Army Corps of Engineers (USACE) undertook the 2015 North Atlantic Coast Comprehensive Study, which identified nine geographic high-risk regions along the North Atlantic Coast that had been severely impacted by Sandy.[1] Of these nine regions, the USACE concluded that the New York-New Jersey metropolitan region's Hudson River and associated river tributaries had been impacted the most.

[1] U.S. Army Corps of Eng'rs, North Atlantic Coast Comprehensive Study: Resilient Adaptation to Increasing Risk—Main Report (Jan. 2015), http://www.nad.usace.army.mil/Portals/40/docs/NACCS/NACCS_main_report.pdf.

In response to this study, and to identify a regional coastal resiliency approach to minimize the risk of similar devastation by future severe storm surges in the New York-New Jersey metropolitan area, in 2016 the USACE commenced a study entitled the "New York-New Jersey Harbor and Tributaries Coastal Storm Risk Management Feasibility Study" (HATS).[2] HATS covers the entire 850-mile coastline of New York City; the Hudson River up to the federal dam at Troy (approximately 150 miles upstream); the lower Passaic, Hackensack, Rahway, and Raritan Rivers; the Upper and Lower Bays of New York Harbor; Newark, Jamaica, Raritan, and Sandy Hook Bays; the Kill Van Kull, Arthur Kill, and East River tidal straits; and western Long Island Sound.

Sandy's swath of destruction impacted a broad socioeconomic cross section of the population living along New York City's coastline and throughout the HATS geographic area. Recent analysis shows that Sandy had a significantly disproportionate impact on economically deprived and low-income communities across the region.[3] Yet despite this, New York City and other municipalities have responded by planning a series of highly localized, shoreline-based coastal resiliency projects that leave the vast majority of poor and low-income residents exposed to future extreme storms.

The formulation and implementation of such policies—relying solely on construction of fragmented, local storm surge defense structures—fails to protect the majority of the region's most socially and economically vulnerable citizens. This raises serious moral issues of environmental and social justice. This article compares the social justice implications of the current localized perimeter defense policy—which seeks to address both sea level rise and storm surge by means of local barriers and local land-based high barrier walls (up to 20–25 feet in height in places)—with a layered defense strategy that includes both perimeter barriers and offshore regional surge barriers.

The implementation of fragmented projects also raises federal, State and City legal issues regarding segmentation under the National Environmental Protection Act, the State Environmental Quality Review Act, and City Environmental Quality Review. The segmentation issue will be addressed in a subsequent article.[4]

The Layered Defense Strategy

This article argues that is critical for the continuing survivability, viability, and security of the entire New York-New Jersey metropolitan area to advance the option of a regional, economically feasible flood risk reduction system that transcends geographical and political boundaries and that reduces the risk of catastrophic flooding of the many coastal cities and suburban communities lying within its perimeter.

Accordingly, the Metro NY-NJ Storm Surge Working Group[5]—composed of over 60 scientists, engineers, government officials and employees from New York and New Jersey, urban planners, architects, business and community leaders, and NGO representatives—has proposed the development of a regional storm surge barrier system composed of the following components (Fig. 1):

1. an "offshore" storm surge barrier located away from high-density development across the approaches to the New York-New Jersey Harbor estuary stretching across the so-called "Sandy Hook NJ-Breezy Point NY Transect";
2. an upper East River barrier at the confluence of the East River and western Long Island Sound (where large storm surges generated in the Sound are often experienced; the surges travel down the East River, compounding flooding in the Harbor);
3. two barriers across the East Rockaway and Jones Inlets (to protect the City of Long Beach and back bay communities); and
4. two barriers across the Fire Island and Moriches Inlets (to protect Great South Bay and adjacent communities—to the east, not shown in Fig. 1).

The need for other inlets further east (e.g., Moriches and Shinnecock Inlets) and down the Jersey Shore also should be investigated.[6]

[2] *Fact Sheet - New York/New Jersey Harbor & Tributaries Focus Area Feasibility Study*, U.S. ARMY CORPS OF ENG'RS, http://www.nan.usace.army.mil/Media/Fact-Sheets/Fact-Sheet-Article-View/Article/644997/fact-sheet-new-yorknew-jersey-harbor-tributaries-focus-area-feasibility-study/ (last visited Feb. 13, 2018).

[3] Chris Sellers, *Storms Hit Poorer People Harder, from Superstorm Sandy to Hurricane Maria*, THE CONVERSATION (Nov. 19, 2017, 9:26 PM EST), https://theconversation.com/storms-hit-poorer-people-harder-from-superstorm-sandy-to-hurricane-maria-87658.

[4] Potential segmentation issues arise, for example, in the development of increasingly controversial local coastal resiliency projects such as New York City's "Big U" perimeter barrier, or "Broken J" as it is now commonly referred to by those concerned about segmentation. This project emerged from the Rebuild by Design competition, and was intended to protect Lower Manhattan with a single high dike. However, in response to budget constraints, bureaucratic divisions, and community opposition, it has since been segmented into several discrete sections.

[5] Four of the authors are on the Metro NY-NJ Storm Surge Working Group (SSWG) Executive Committee: Bowman, Golden, McVay Hughes, and Yaro.

[6] STORM SURGE BARRIERS TO PROTECT NEW YORK CITY: AGAINST THE DELUGE 259 (Douglas Hill et al. eds., 2012).

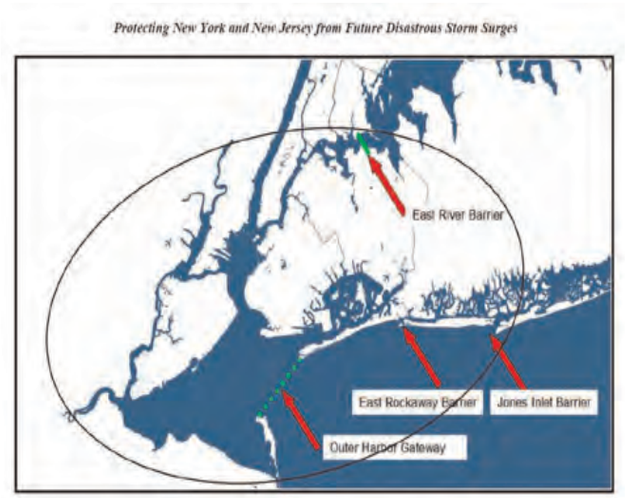

Fig. 1: Schematic diagram locating possible outer harbor and coastal storm surge barriers designed to safeguard, within the circle of protection, all five boroughs of New York City, many South Shore communities on Long Island, northern New Jersey including Hoboken and the Meadowlands, the three major airports (JFK, LaGuardia, and Newark), and Port Elizabeth and surrounding industrial infrastructure.

The perimeter barriers would be 3–6 feet in height and would be designed to protect vulnerable areas from the expected 3–6 feet in sea level rise by 2100. The second layer of defense would be a system of offshore storm surge barriers designed to protect against infrequent but potentially devastating short-term (1–3 days) storm surges of 20–25 feet in height.

This offshore regional storm surge barrier system would be built as far away from high-density population centers as possible and would be designed to follow the centuries-old Dutch tradition of essentially shortening the coastline with its numerous river mouths, navigable channels and inlets, estuaries and lagoons (such as along the South Shore of Long Island and northern New Jersey), thereby effectively protecting a thousand miles of New Jersey and New York coastline with only a few miles of barriers.

These barriers would be composed of movable navigational gates and numerous flushing sluice gates. The gates would be closed only during occasional extreme weather events, thus preventing wind and wave-driven storm surges from reaching vulnerable coastal infrastructure and communities.

It should be noted that the regional offshore barriers by necessity would need to have their gates and sluices kept wide open the vast majority of the time to allow the twice-daily motions of the tides, to discharge the various rivers to the sea, to flush the harbor of contaminants, and to allow for unimpeded navigation by ships entering and leaving New York Harbor. Thus, by design they could not possibly guard against slow-but-sure sea level rise over decades and centuries. That would be the role of the much lower perimeter seawalls discussed above.

Such a layered system of protection would not only benefit all the critical infrastructure and high-value economic assets within the circle of protection but also would protect all residents, regardless of socioeconomic circumstances.

Sandy's Physical Properties and Behavior

Sandy is the fourth costliest Atlantic extreme weather event on record, after Katrina (2005), Harvey (2017), and Maria (2017). Originating from a tropical disturbance, Sandy had its genesis in the Caribbean Sea on about October 22, 2012. Over the next few days, it rapidly intensified into a Category 3 hurricane with sustained winds of up to 115 miles per hour (mph).[7]

After traveling northward up the U.S. Eastern Seaboard, it suddenly turned toward the west late on October 28. During this period, Sandy began to transition from a hurricane into an extratropical cyclone, a process completed before the storm made landfall in northern New Jersey. In addition to becoming the largest-diameter Atlantic hurricane ever recorded by the National Hurricane Center, Sandy broke records for the lowest pressures ever observed in many cities across the northeastern United States.

As they move north, Atlantic hurricanes typically are forced east and out to sea by the prevailing westerly winds. In Sandy's case, however, this typical pattern was blocked by a ridge of high pressure over Greenland causing the core to veer westward off the East Coast.

Late on October 29, the National Hurricane Center of the National Oceanic and Atmospheric Administration (NOAA) declared that Sandy, while its inner eye was still located off the coast of southern New Jersey, had finally transformed itself into a hybrid extratropical cyclone. Soon after, the storm made landfall approximately five miles northeast of Atlantic City. Offshore giant waves—recorded by NOAA to be higher than 35 feet south of Long Island—were generated by the storm's intense winds pounding vulnerable and low relief shorelines.

[7] N.Y.C., *Sandy and Its Impacts*, *in* A STRONGER, MORE RESILIENT NEW YORK 10, 11–14 (June 2013), http://www.nyc.gov/html/sirr/downloads/pdf/final_report/Ch_1_SandyImpacts_FINAL_singles.pdf.

Gusts of 80 mph were recorded at landfall, although sustained winds fell below the 74 mph threshold meteorologists have used to define hurricanes. The reduction in wind speed resulted in the storm being downgraded to an extratropical cyclone. The downgrade in turn led to profound legal and societal implications, creating many issues regarding emergency planning, evacuation directives, and the viability of many insurance policies carried on household and commercial properties.

However, despite this reclassification of the storm below hurricane levels, by fateful coincidence the wind- and wave-driven storm surge peaked both at local high tide and during the biweekly spring tide drawn upwards by the full moon that night. This triple alignment of nature's formidable forces led to a huge coastal storm surge that entered New York Harbor through the Verrazano Narrows, leading to a measured surge of 9.5 feet *above normal high tide* at NOAA's tide station at the Battery at the southern tip of Manhattan (Fig. 2). This surge level was equivalent to a storm tide of 11.25 feet *above mean sea level* at this historic gauge, exceeding the previous official record at the same location (which was reached during Hurricane Donna in 1960).

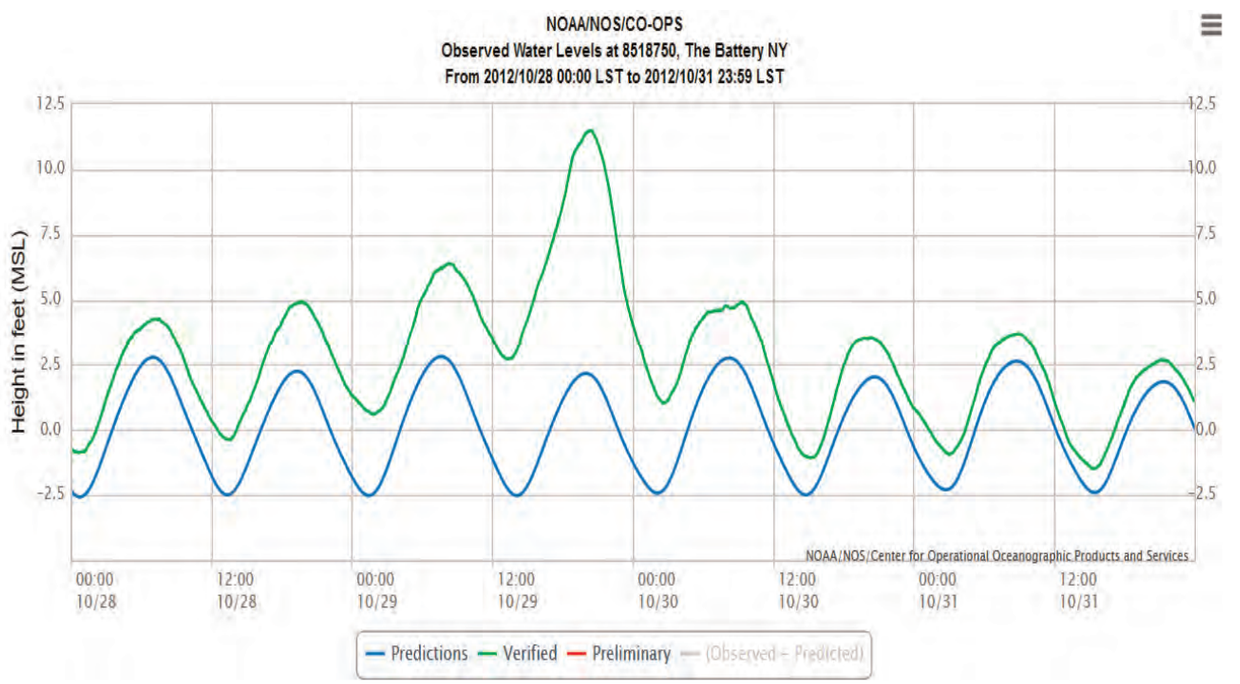

Fig. 2: Astronomical expected tide heights (settled weather – blue line) and observed sea level heights (green line) at The Battery tide station from midnight October 28 to midnight October 31, 2012. At the peak of the Sandy surge (8:25 PM, October 29), the water level was about 9.5 feet above the normally expected astronomical high tide (difference in height between the green and blue lines, known as storm surge). The storm tide is defined to be the total water level above mean sea level (MSL). For Sandy, this was approximately 11.25 feet (green line, highest peak).

Little known by experts and the public alike was the existence of a second storm surge originating in eastern Long Island Sound. Near hurricane-force northeast winds along the Sound's northeast-southwest axis drove this second major storm surge through the upper and lower East River into New York Harbor. This led to the merging of the two surges arriving from opposite directions, causing extensive flooding and damage to industrial, communications, and medical facilities on Manhattan's East Side, lower Manhattan, and coastal Brooklyn, which all border the lower East River.

Impacts of Sea Level Rise

Sea level at New York and along the New Jersey coast has increased by nearly a foot over the last hundred years, which contributed to the impact of Sandy's storm surge (Fig. 3).

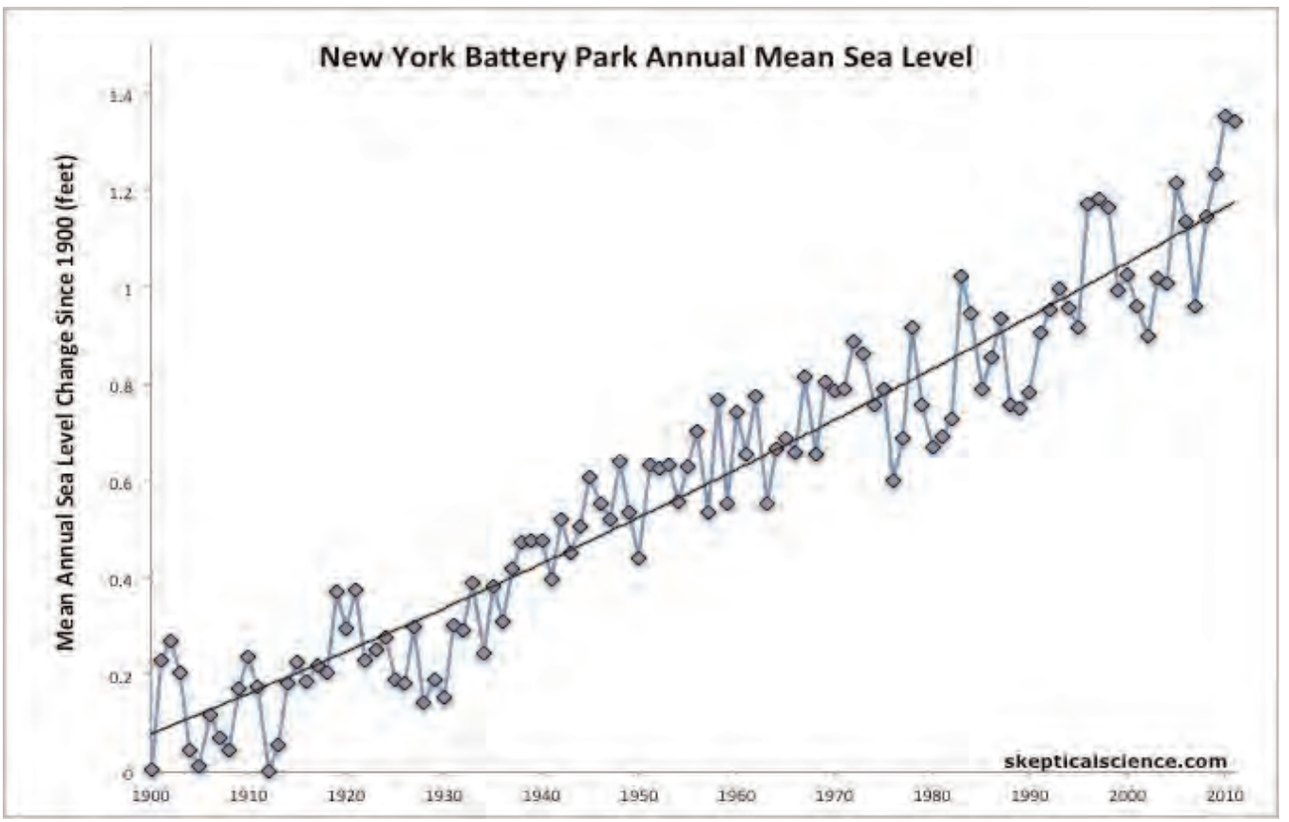

Fig. 3: Observed sea level rise at NOAA Battery tide station. The rate of the smoothed rise has been accurately measured since 1855 and is approximately 1 foot per century. This rate of change is expected to accelerate in the decades ahead.[8] Source: Skeptical Science website, licensed under CC BY 3.0.

Sea level rise is expected to accelerate in the decades and centuries ahead due in part to climate change-induced melting of the Greenland and Antarctic ice sheets. The State of New York has "officially" declared that mean sea level may be as much as six feet above present levels by 2100 (Fig. 4).[9] In the decades ahead, Superstorm Sandy's devastating storm surge is expected to become "the new normal" on the Eastern Seaboard as even less severe storms inflict increased damage as the base sea level upon which all storm surges "float" continues to rise.

[8] N.Y. STATE ENERGY RESEARCH & DEV. AUTH., FINAL REPORT NO. 14-26, CLIMATE CHANGE IN NEW YORK STATE: UPDATING THE 2011 CLIMAID CLIMATE RISK INFORMATION SUPPLEMENT TO NYSERDA REPORT 11-18 (RESPONDING TO CLIMATE CHANGE IN NEW YORK STATE) 7–8 (Sept. 2014), *available at* https://www.nyserda.ny.gov/climaid.

[9] News Release, N.Y. Dept. of Envtl. Conservation, DEC Announces New Sea-Level Rise Projection Regulation for New York (Feb. 6, 2017), http://www.dec.ny.gov/press/109195.html.

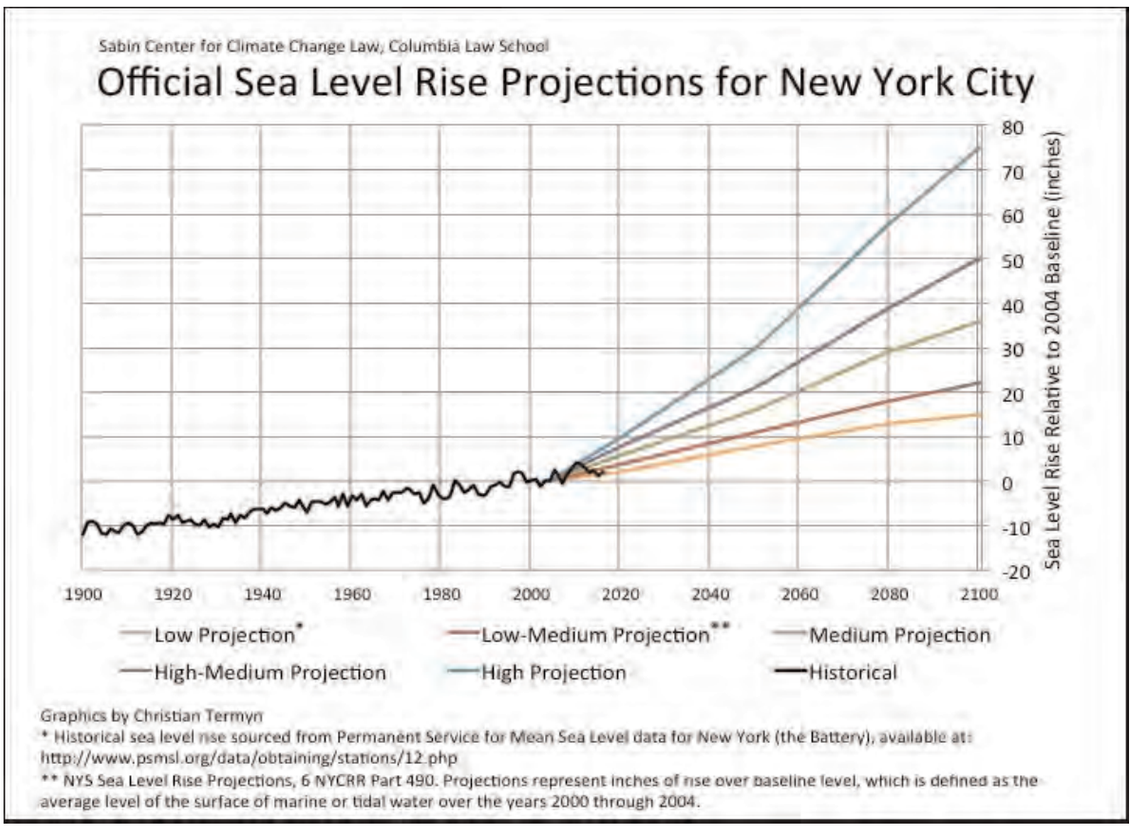

Fig. 4: Official sea level rise projections for New York City.

Which sea level rise will we "lock in"?[10] That depends on how quickly we make a wholesale reconfiguration of how we produce, store, and use energy; interact with our urban environments; and use our infrastructure.

[10] *See Surging Seas Mapping Choices*, CLIMATE CENTRAL, https://choices.climatecentral.org/ (select "When will this happen?" link) (last visited Feb. 14, 2018) ("Warming of 4 °C (7.2 °F) is close to our current path, would represent a breakdown in efforts, and corresponds to 8.9 m (29.2 ft) of locked-in global sea level rise. The span from 2-4 °C covers the likely range of possible outcomes from global climate talks at COP21 in Paris.").

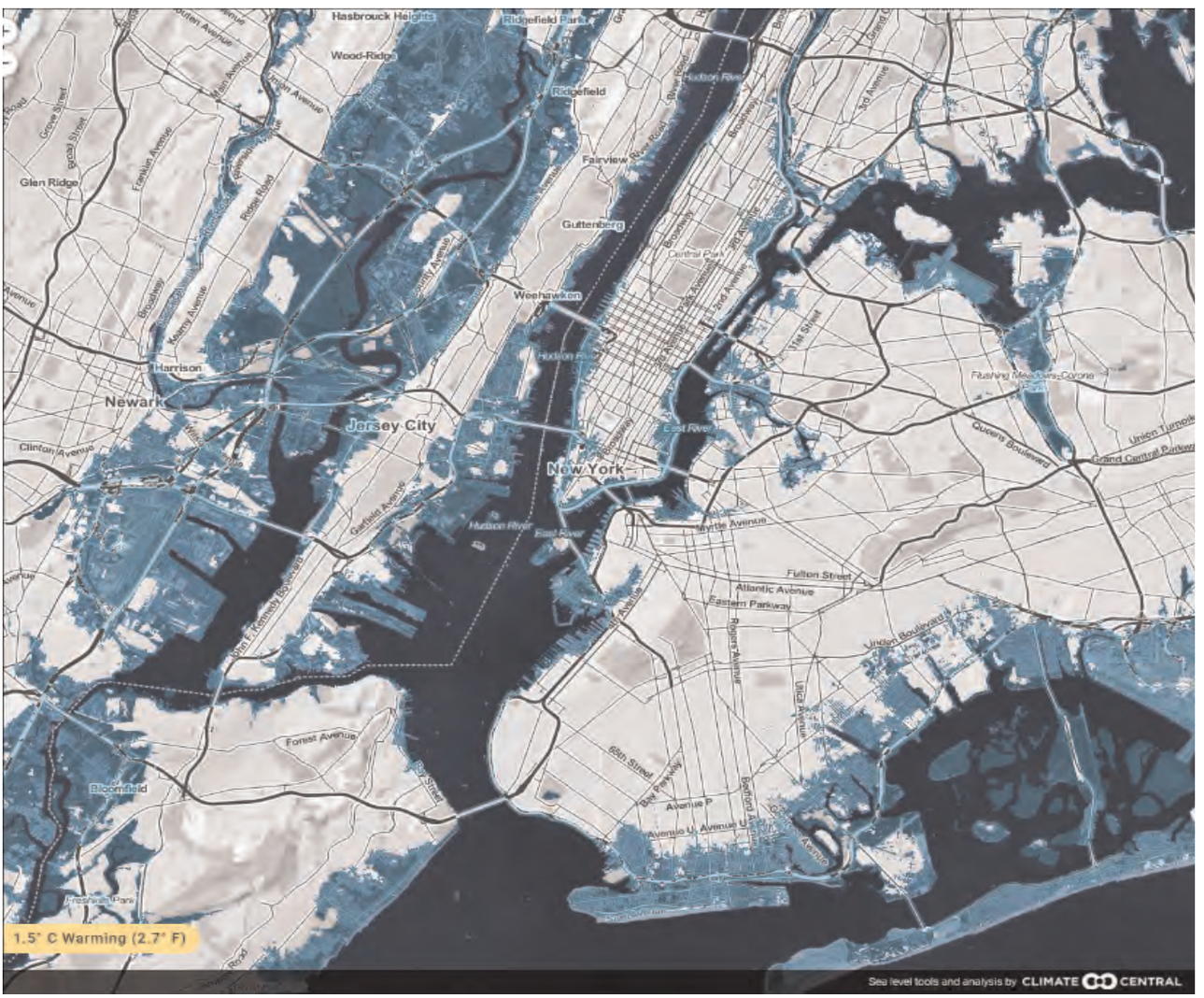

Fig. 5a: Post-2100 sea level rise locked in assuming 1.5 degrees C (2.7 degrees F) warming as estimated by Climate Central, Surging Seas Mapping Choices.[11]

[11] *Surging Seas Mapping Choices*, CLIMATE CENTRAL, https://choices.climatecentral.org/ (last visited Feb. 14, 2018).

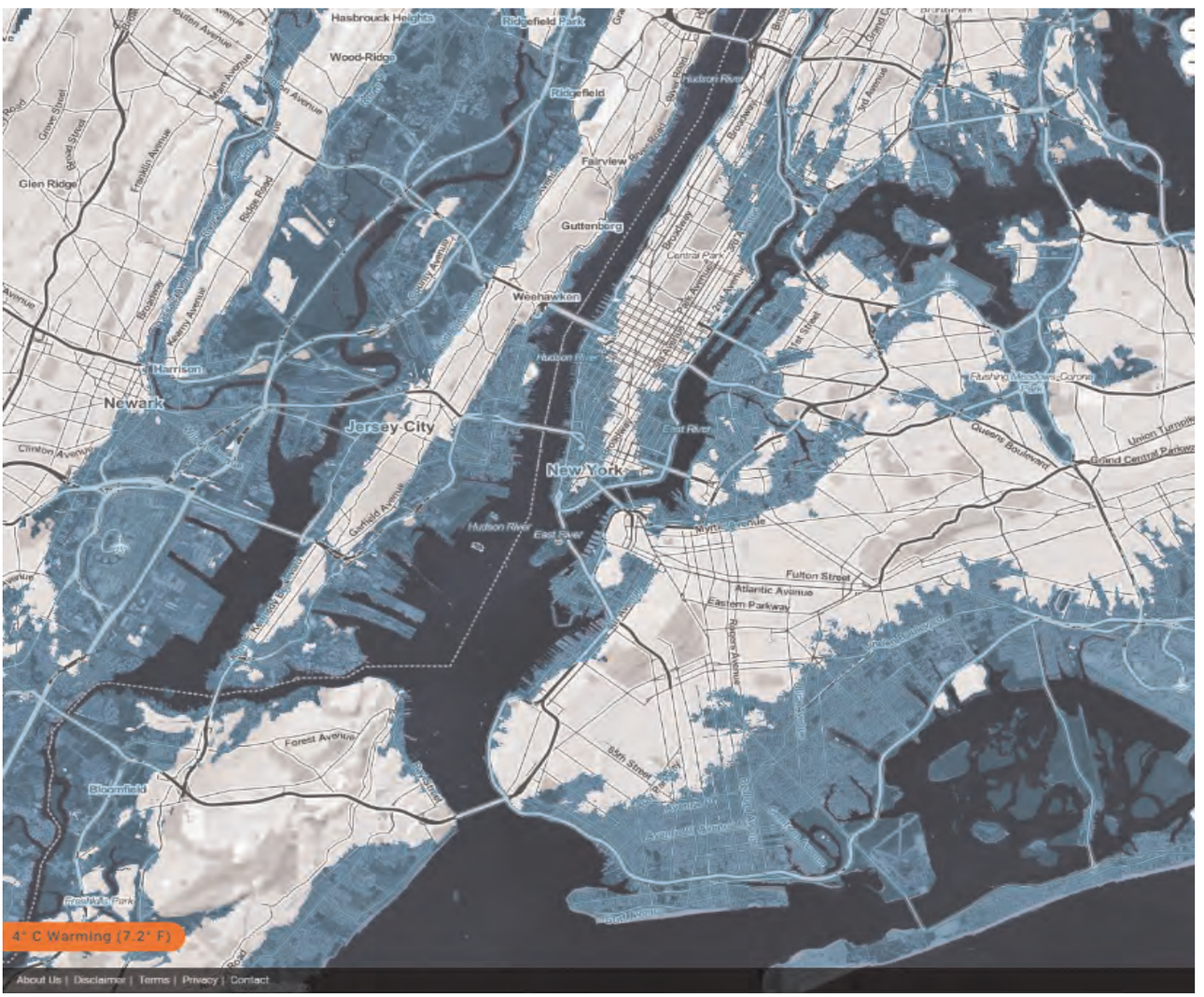

***Fig. 5b: Post-2100 sea level rise locked in assuming 4.0 degrees C (7.2 degrees F) warming as estimated by Climate Central, Surging Seas Mapping Choices.*[12]**

Sandy's Impacts on the Metropolitan Region[13]

Superstorm Sandy had a devastating impact on the New York-New Jersey metropolitan region and Connecticut. The storm caused 48 deaths in New York, 12 in New Jersey, and five in Connecticut, mostly due to drowning. The storm also resulted in an estimated $71 billion in economic damage in the New York-New Jersey region,[14] with $19 billion in losses concentrated in New York City.[15] A more recent article based on New York State Empire State Development data reported that Long Island and New York City workers lost an estimated $8.2 billion in the three days after Sandy. The article reported that production of goods and services in the metropolitan area fell by $16 billion in the same time period and equated the storm's

[12] *Surging Seas Mapping Choices*, *supra* note 11.

[13] *See Effects of Hurricane Sandy in New York*, WIKIPEDIA, https://en.wikipedia.org/wiki/Effects_of_Hurricane_Sandy_in_New_York (last edited Jan. 24, 2018).

[14] Hilary Russ, *New York, New Jersey Put $71 Billion Price Tag on Sandy*, REUTERS (Nov. 26, 2012, 7:25 PM), https://www.reuters.com/article/us-storm-sandy-cost-nyc/new-york-new-jersey-put-71-billion-price-tag-on-sandy-idUSBRE8AP0SZ20121127.

[15] Jill Colvin & Julie Shapiro, *Hurricane Sandy Cost City $19 Billion, Bloomberg Says*, DNAINFO (Nov. 26, 2012, 3:40 PM), https://www.dnainfo.com/new-york/20121126/new-york-city/bloomberg-says-hurricane-sandy-cost-city-19-billion.

impact during those three days with 135,000 people being out of work for an entire year.[16]

While the storm's immediate impacts lasted only a couple of weeks, major infrastructure systems, including mass transit and electrical and telecommunications systems, sustained lasting damage. Most of the region's mass transit, railway, and roadway tunnels flooded, causing extended disruptions to these systems. NJ Transit lost one-third of its fleet—62 locomotives and 261 rail cars were damaged[17]—when its low-lying Meadows maintenance facility in Kearny flooded during the storm. This loss resulted in months of overcrowding and delays for the nation's third-largest commuter rail system. In addition, Amtrak's Hudson and East River tunnels and the Metropolitan Transportation Authority's East River tunnels flooded, shutting down Northeast Corridor inter-city rail and NJ Transit and Long Island Rail Road commuter rail service, as well as subway service, for several days.

The storm also had massive impacts on the region's roadway systems. While roads and tunnels in low-lying areas sustained direct damage, diversion of passengers from the rail system to roads caused gridlock on the region's highways for weeks. In addition, loss of electric power for gasoline pumps, often for weeks, shut gas stations across the region and caused outages of traffic lights and signs. Flooding of petroleum terminals and dragging of navigation buoys in the Port of New York also disrupted shipping and distribution of gasoline and diesel supply for weeks. All three regional airports experienced extensive flooding and disruption of service for several days. In addition, sewage treatment facilities throughout the region were disrupted.

Sandy's Impacts on Specific Areas[18]

Lower Manhattan[19]

Extensive flooding occurred in many locations around Lower Manhattan as a result of the 9.5-foot storm surge recorded at the Battery. Electric power and steam were lost below 14th Street because of flooding and a related explosion at Con Edison's 14th Street cogeneration plant. Phone and internet service were also disrupted across the district due to flooding of switching centers. The New York Stock Exchange closed for two days, for only the third time in its history. Public housing on the Lower East Side was devastated.

Medical Areas

Extensive flooding occurred in the medical area between 14th and 34th Streets along the East River when a 14-foot storm tide struck the area, leading to evacuation and closing of Bellevue Medical Center, NYU Langone Hospital, and other facilities.

Rockaways, Staten Island, Brooklyn, and Long Island

Several low-lying areas along the region's southern shores, including Staten Island, the Rockaways, Coney Island, and areas on Long Island south of the Sunrise Highway, experienced severe flooding. Many of these places have high concentrations of public and low-income housing and populations of minority and immigrant groups, as discussed below. A major fire broke out in the Breezy Point Cooperative on the Rockaway Peninsula in Queens when emergency vehicles were unable to reach the area due to severe street flooding. Several large public housing projects and dozens of nursing homes in the Rockaways, Red Hook, Coney Island, and other communities experienced flooding, loss of heat and power, and other disruptions that lasted for several weeks.

New Jersey

Hoboken, Asbury Park, Sea Bright, and several other ocean-front communities south of Sandy Hook experienced severe flooding, resulting in extensive property damage and loss of life.

Connecticut

Long Island Sound experienced a 14-foot storm surge, causing extensive flooding in dozens of Connecticut's coastal communities. Only Stamford, which has a 17-foot hurricane barrier, was completely spared damage from the storm surge.

Disproportionate Impact on Poor and Low-Income Residents

Superstorm Sandy offered a graphic preview of just how climate change will threaten the region in the future. Any effort to contend with future storm surges of comparable or greater strength should take into account which New Yorkers will be *most* affected. Sandy demonstrated just how unequal these impacts are likely to be.

A recent Stony Brook University study shows that Sandy's destructive path across Greater New York had a disproportionate impact on the region's low- and moderate-income, and predominantly minority and immigrant, communities.[20] This research found that while business districts and privileged neighborhoods in Manhattan and elsewhere were certainly affected, less affluent

[16] James T. Madore, *Report: LI, NYC Workers Lost Estimated $8.2B in 3 Days After Sandy*, NEWSDAY (Nov. 14, 2017, 8:20 PM), https://www.newsday.com/business/sandy-economic-impact-1.14967575.

[17] Mike Frassinelli, *NJ Transit Head Puts Sandy Damage Estimate at $400M*, NJ.COM (Dec. 6, 2012, 4:52 PM), http://www.nj.com/news/index.ssf/2012/12/nj_transit_head_puts_sandy_dam.html.

[18] *Hurricane Sandy*, WIKIPEDIA, https://en.wikipedia.org/wiki/Hurricane_Sandy (last edited Feb. 14, 2018).

[19] NY RISING CMTY. RECONSTRUCTION (NYRCR) LOWER MANHATTAN PLANNING COMM., LOWER MANHATTAN: NY RISING COMMUNITY RECONSTRUCTION PROGRAM (Mar. 2014), https://stormrecovery.ny.gov/sites/default/files/crp/community/documents/lower_manhattan_nyrcr_plan_57mb.pdf.

[20] Sellers, *supra* note 3.

residents suffered far more—a finding consistent with a number of other social scientific studies of natural disasters.[21] The most debilitating damage from Sandy, as well as the slowest recoveries, came in low- and moderate-income neighborhoods of New York City's outer boroughs and beyond.

The vast majority of the region's residents who live and work in vulnerable coastal communities would be within the "circle of protection" (Fig. 1) that would be protected by the regional barrier system advocated by the authors. But this would not be the case with the piecemeal perimeter defenses being advanced by New York City and others. The downtown Manhattan-focused "Big U" plan, for example, would leave out a number of residential areas on the east and west sides of lower Manhattan. A fragmented collection of perimeter barriers would leave hundreds of thousands of residents in both downstate New York and northern New Jersey at risk from rising storm surges.

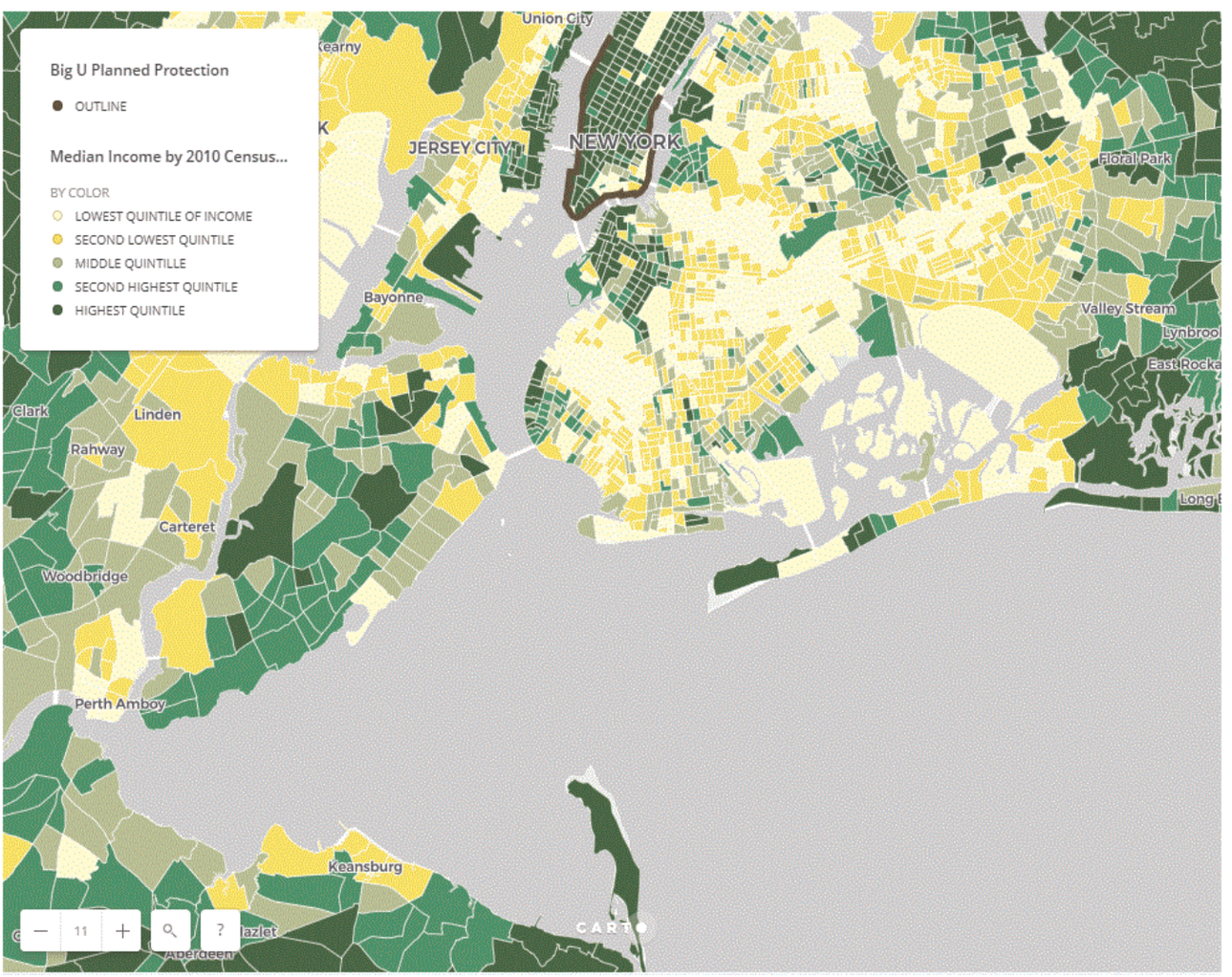

Fig. 6: Median incomes for communities unaffected by the limited geographic area protected by the so-called "Big U" seawall around lower Manhattan.[22] Map by Christopher Sellers using Carto; Sources: FEMA, HUD, NHGIS.

The region's physical geography determined where Sandy's worst impacts were concentrated. While high winds brought down trees on cars, homes, and power lines across the region's interior, flooding from the ocean brought the most damage. Unusual for a tropical storm, rainfall was modest, limiting urban and riverine flooding. Therefore, coastal communities

[21] *See* PIERS BLAIKIE ET AL., AT RISK: NATURAL HAZARDS, PEOPLE'S VULNERABILITY, AND DISASTERS (1994); Micah L. Ingalls, *Not Just Another Variable: Untangling the Spatialities of Power in Social–Ecological Systems*, ECOL. & SOC'Y 22(3):20 (2017).

[22] For more information and zoom-capable detail, see https://csellers.carto.com/builder/b03a84a7-c6b0-4725-88b2-1dc9333081be/embed.

bore the brunt of the storm, especially when low-lying or unshielded by dunes or other built structures. Ocean-facing or ocean-proximate locales—from the Jersey Shore to Staten Island to Brooklyn, Queens, and Nassau and Suffolk Counties—endured the storm's harshest impacts (see Fig. 7).

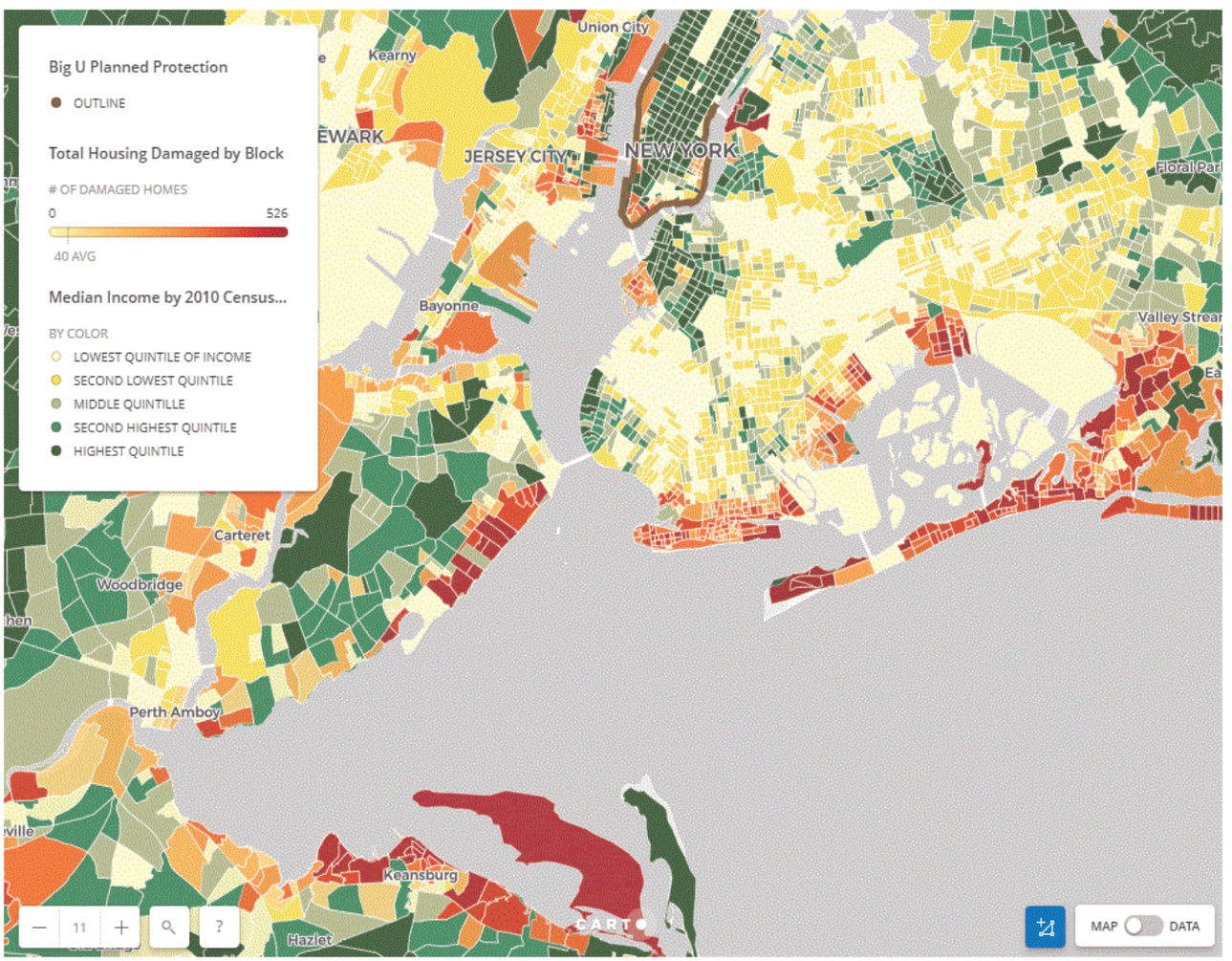

Fig. 7: Total housing damaged by Sandy, by census block group.[23] Map by Christopher Sellers using Carto; Sources: FEMA, HUD, NHGIS.

The storm's onslaught sounded "like a jet plane was landing on your street," Rockaway resident Richard Blanck remembered; on his own front porch, he suddenly found himself ankle-deep in flood water.[24] The water rushed so fast into Staten Island's Ocean Breeze neighborhood that in the time it took Michael Taurozzi to move his car to higher ground, it had risen a foot and a half, and would reach waist-high before he and his family fled.[25] In Nassau County's Long Beach, "those few residents in the poor neighborhoods of town who owned cars saw them swallowed up, and disabled, by the salty water."[26] Further out on

[23] For more information and zoom-capable detail, see https://csellers.carto.com/builder/98e2e58f-79cc-4a5f-8c41-4ca96b63d51d/embed.

[24] Stephen Nessen, *Sandy Sent This Die-Hard Rockaway Resident Far Inland*, WNYC (Oct. 26, 2017), https://www.wnyc.org/story/five-years-after-sandy-one-life-long-rockaway-family-heads-inland/.

[25] Matthew Schuerman, *Deadly Topography: The Staten Island Neighborhood Where 11 Died During Sandy*, WNYC (Feb. 25, 2013), https://www.wnyc.org/story/271288-tricked-topography-how-staten-island-neighborhood-became-so-dangerous-during-sandy/.

[26] Ben Hallman, *Sandy-Damaged Long Beach, NY, Stranded By Agency Disorganization*, HUFF. POST (Nov. 5, 2012), https://www.huffingtonpost.com/2012/11/01/sandy-long-beach-ny_n_2061291.html.

Long Island in Suffolk's Mastic Beach, 100 residents were stranded in flooded homes and had to be rescued by the fire department.[27]

These communities, among the hardest hit by Sandy, shared vulnerabilities of location, lying as they did along the metropolitan area's southerly shores. However, they also shared a similar historical pattern of development. Across the region, much of the higher elevations and more sheltered waterfront areas have been converted mostly into residences of the wealthy, with Manhattan and Long Island's Gold Coast on its North Shore the prime examples. By contrast, the lower-lying south shores of the metropolitan area have drawn a mixture of residents that is generally less affluent than the region's average. As Sandy showed us, these coastal communities are among the most vulnerable in the region to the intensifying storms expected to be strengthened by warmer waters over the next century.

One especially telling measure of Sandy's differential impacts across Greater New York was where people died. Of the 43 deaths caused by Sandy within the city itself, only two occurred in Manhattan. The largest concentration, 11 drownings, occurred in Ocean Breeze, Donegan Park, and Midland Beach, three nearly contiguous neighborhoods on Staten Island's low-lying easterly shore. Most of these neighborhoods lie within a bowl of marshy land that had only drawn more permanent residences beginning in the 1960s and 70s. Median incomes in these census tracts run from slightly under to nearly half the median income of New York City as a whole.[28]

The susceptibility of this area to rapid flooding was exacerbated, state investigators concluded, by the geography of the New York Bight and the Lower Bay, which the proposed regional surge barrier system will address. As the surge moved northward off the ocean, the narrowing margins of Lower New York Bay funneled its rising waves toward Staten Island's eastern shore. "As a result, peak storm tides in the waterways off Staten Island were roughly five feet higher than those that struck the lower Manhattan Battery."[29]

The Stony Brook study concentrated especially on the destruction of homes. They began with the residences of those people who registered significant damage with the Federal Emergency Management Agency (FEMA) following Sandy. Mapping that data, it was clear that more northerly coastlines across Greater New York, which were generally more affluent, suffered lighter damage than those that were more southerly and ocean-facing. The hardest-hit communities were not just less wealthy; many of them also had large proportions of racial minorities and immigrants.[30]

Social and Racial Dimensions of Flood Damage

For centuries, the region's newest arrivals and low- and moderate-income communities have been located along its low-lying and flood-prone waterfronts. This was due, in part, to the waterfront's long history as a working landscape—the site of much industry, shipping, and commerce that made New York and adjoining areas of New Jersey's Hudson and Passaic River waterfronts the nation's most important port. Shoreline communities in or near the region's Manhattan core, such as the Lower East Side, the Rockaways, Coney Island, and Long Beach, have long furnished housing and entertainment for first- and second-generation European immigrants. After World War II, as many succeeding generations left for suburban housing, an economic decline set in, even as African-American and Hispanic communities shut out of the suburbs began moving in. These circumstances enticed Robert Moses and other planners to site public or publicly subsidized housing in low-lying waterfront communities, further concentrating minorities along the city's more vulnerable coastlines.[31]

So when Sandy's storm surges struck the region, some of the worst devastation struck these places, and in particular many of New York City's public housing projects, 54% of them outside Manhattan.[32]

Dwindling public and financial support for public housing in recent decades resulted in worn and deteriorating facilities that exacerbated the vulnerability of public housing residents. In the high-rise projects from the Baruch Houses on Manhattan's Lower East Side to the Red Hook Houses in Brooklyn, damage occurred not just to the ground floors but also to electrical and mechanical equipment often located in basements or outdoors. The damage left residents in the dark and cold for weeks.

The highest storm surges—17.5 feet in Long Beach and 14 feet in parts of the Rockaways—brought additional damage. What these places faced is illustrated by the ordeal of Melissa Miller, who rented in Long Beach's Channel Park Homes, a low-rise public

[27] *Heavy Damage in Mastic Beach*, AP/LONG ISLAND PRESS ARCHIVE (Oct. 31, 2012), http://archive.longislandpress.com/2012/10/31/heavy-damage-in-mastic-beach/.

[28] This is based on data from Steven Manson et al., IPUMS National Historical Geographic Information System: Version 12.0 [Database] (2017), http://doi.org/10.18128/D050.V12.0.

[29] NY RISING CMTY. RECONSTRUCTION PROGRAM, EAST & SOUTH SHORES STATEN ISLAND: NY RISING COMMUNITY RECONSTRUCTION PLAN 22–23 (Mar. 2014), https://stormrecovery.ny.gov/sites/default/files/crp/community/documents/statenisland_nyrcr_plan_20mb.pdf.

[30] *Mapping Sandy's Inequalities*, CTR. FOR THE STUDY OF INEQUALITIES, SOCIAL JUSTICE, & POLICY, https://inequality.studies.stonybrook.edu/wordpress/mapping-sandys-inequalities/ (last visited Feb. 14, 2018).

[31] Jonathan Mahler, *How the Coastline Became a Place to Put the Poor*, N.Y. TIMES (Dec. 3, 2012), http://www.nytimes.com/2012/12/04/nyregion/how-new-york-citys-coastline-became-home-to-the-poor.html.

[32] This is based on a dataset from the U.S. Department of Housing and Urban Development housed in *ArcGIS REST Services Directory: Public_Housing_Authorities (FeatureServer)*, ARCGIS, https://services.arcgis.com/VTyQ9soqVukalItT/ArcGIS/rest/services/Public_Housing_Authorities/FeatureServer (last visited Feb. 14, 2018).

housing development. She watched in dismay as five inches of sewage-contaminated water gushed through her apartment.[33]

The Stony Brook researchers also found that Latino communities were slightly underrepresented in the most damaged areas on Long Island, but among the most affected on Staten Island. They were among the recent arrivals who over the past generation had supplanted Irish and Italian Americans in the community of Midland Beach, where the storm's deaths were concentrated. When a 20-foot storm tide washed into this and other beachfront communities on Staten Island's eastern shore, it quickly overwhelmed Eugene Contrubis's single-story bungalow before he could escape. He drowned—as did seven others within the surrounding eight blocks.[34]

Many schools in predominantly Latino and African-American communities were flooded by the storm surge. While 33 schools were inundated in Manhattan, floods engulfed over three times as many (111) along the shores of Brooklyn, Queens, and Nassau County. As the geographic analysis demonstrated, the inundation of schools proved widespread in shore communities of New Jersey as well (Fig. 8 and Fig. 9).

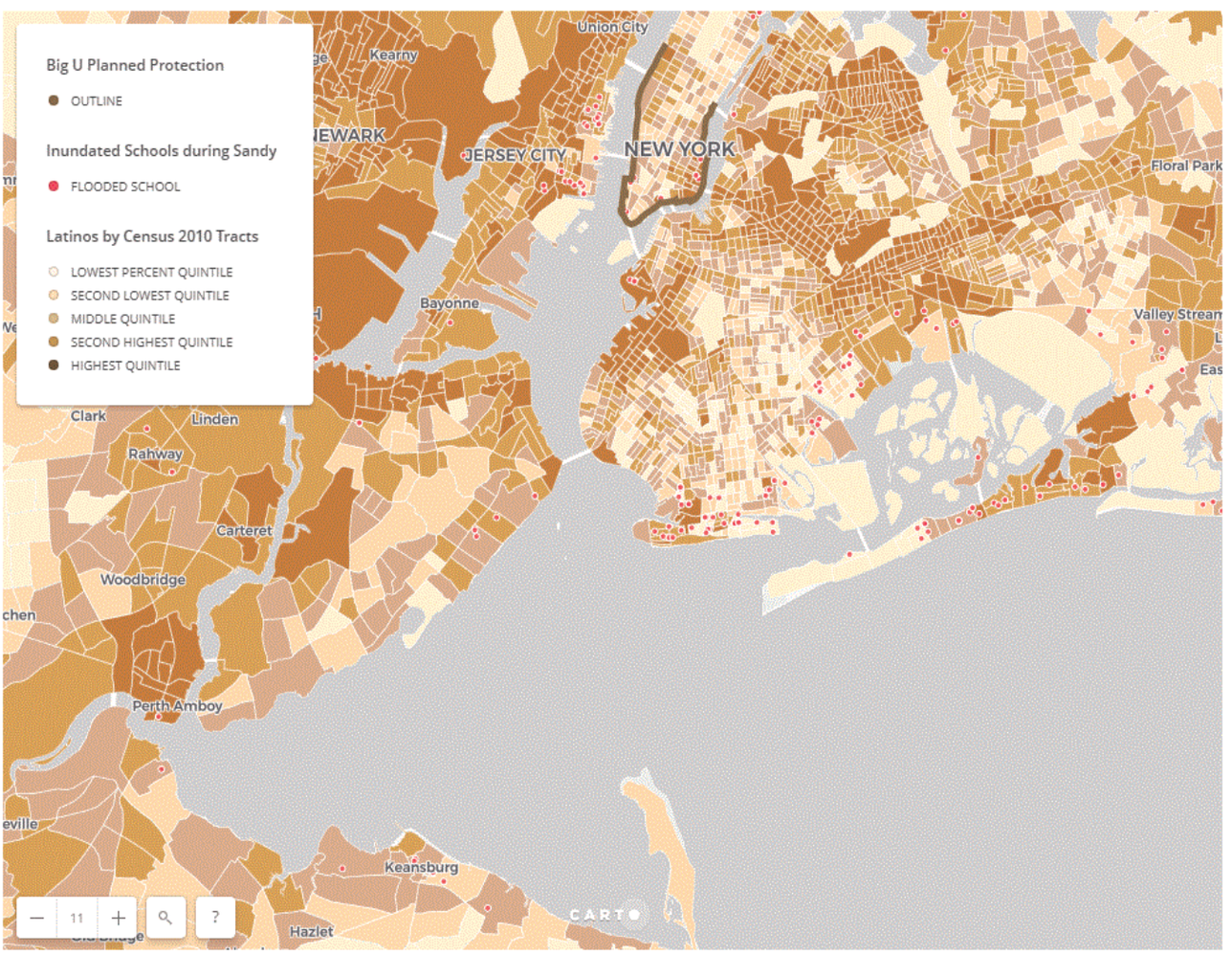

Fig. 8: Inundated schools (red dots) during Sandy with percentage of Latinos by census tract, 2010 census.[35] Map by Christopher Sellers using Carto; Sources: FEMA, HUD, NHGIS.

[33] *Long Beach Residents Still Struggling After Sandy*, NEWS 12 LONG ISLAND, http://longisland.news12.com/story/34743023/long-beach-residents-still--struggling-after-sandy (last visited Feb. 14, 2018).

[34] Kirk Semple & Joseph Goldstein, *How a Beach Community Became a Deathtrap*, N.Y. TIMES (Nov. 10, 2012), http://www.nytimes.com/2012/11/11/nyregion/how-a-staten-island-community-became-a-deathtrap.html.

[35] For more information and zoom-capable detail, see https://csellers.carto.com/builder/50ba439c-231b-4ff0-b336-e37350c00a12/embed.

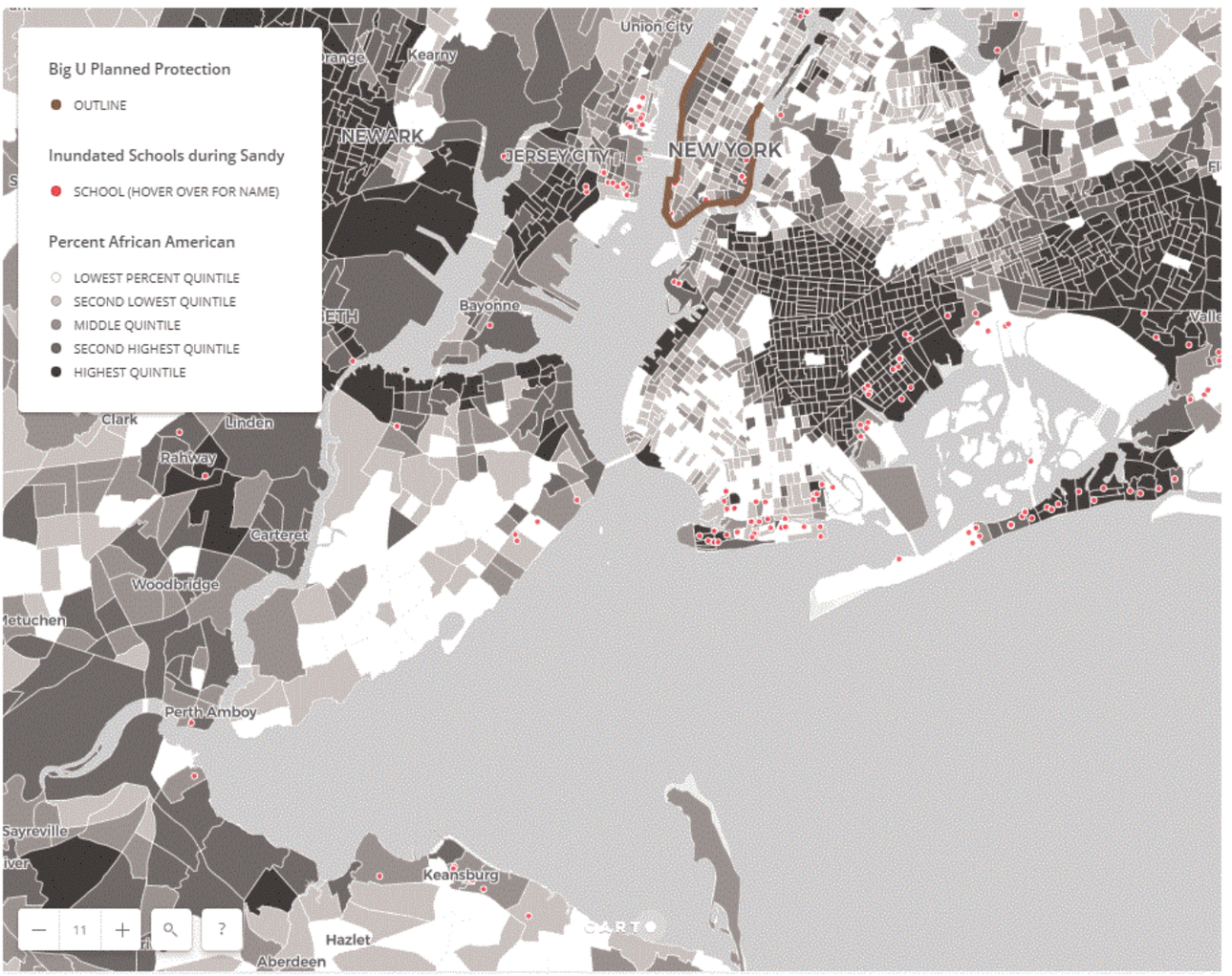

Fig. 9: Inundated schools (red dots) during Sandy with percentage of African-Americans by census tract, 2010 census.[36] Map by Christopher Sellers using Carto; Sources: FEMA, HUD, NHGIS.

But along the mostly more affluent coastlines of Manhattan and Staten Island, as with the northern and southeastern shorelines of Long Island, hardly any schools flooded, even in the most stricken communities. More affluent Bayville, in northern Nassau, suffered an 11-foot storm surge, but its schools, situated on higher, dryer ground, lay out of harm's way.

Impacts on Rich Versus Poor Neighborhoods

In a few communities, nearly every house was flooded, with decimating effects on the largest and smallest homes alike. In Nassau's Long Beach, located on a barrier island, two-thirds or more of the homes suffered "heavy or strong damage."[37] Unlike in Staten Island's Midland Beach or many parts of the Rockaways, Long Beach is overwhelmingly white and also has many wealthier citizens and homes, with median incomes and housing values above those of the region as a whole. But the broader pattern across those parts of the metropolitan area south of Manhattan, from Staten Island across Brooklyn and Queens out to Long Island's Nassau and Suffolk Counties, was that wealthier communities weathered Sandy's waves better than poorer ones.

The differential destruction across Staten Island offers a case in point. Its lower-income East Shore neighborhoods were the

[36] For more information and zoom-capable detail, see https://csellers.carto.com/builder/7a2cf6c4-c85a-46dc-8e6e-4e8de3428a19/embed.

[37] *Stricken Neighborhoods–Case Studies*, CTR. FOR THE STUDY OF INEQUALITIES, SOCIAL JUSTICE, & POLICY, https://inequality.studies.stonybrook.edu/wordpress/stricken-neighborhoods-case-studies/ (last visited Feb. 14, 2018).

hardest hit of any part of the city, with 70% or 80% of the homes in several census tracts enduring severe damage.[38] But the borough's most expensive and sprawling homes, along a spine of hills through the island's center, and its sheltered northern shore suffered relatively little from the storm. More middle-income residents along its southern coastline, from Tottenville to Annadale and Eltingville on Staten Island, benefited from a more steeply sloped coastal topography than Staten Island's gently sloped, bowl-like eastern shore. These higher-income communities were also protected by an extensive network of waterfront parks, including Great Kills, Wolf Pond, and Lemon Creek Parks, which helped block and absorb Sandy's onslaught.

Out on Long Island, Mastic Beach was more vulnerable than the wealthy communities of the Hamptons for similar reasons. Known by the late twentieth century as "the poor man's Westhampton Beach," Mastic's shoreline properties had remained less expensive in part because of how close they lay to sea level and the water table. The village had only just acquired authority to adopt zoning that might place some limits on residential development when the storm struck. Sandy's surge easily engulfed a thousand of its homes and caused cesspools to overflow, mixing the invading seawater with sewage.[39]

Next door, however, Westhampton Beach itself experienced minimal impacts. Higher as well as more affluent, it also had lower housing density compared to Mastic Beach and long-standing zoning that helped keep residential buildings out of flood zones. Even before Sandy, Westhampton Beach had long pursued the preservation of dunes and other natural topography that effectively mitigated wave damage from Sandy as well as other storms.

Repair and Rebuild Challenges

Disadvantaged residents and communities did not just suffer more from the storm's initial blow; they have also faced harder struggles to repair and rebuild.

In better-off North Shore towns on Long Island such as Bayville, 86% of those with severely damaged homes had flood insurance, nearly three times more than in Coney Island/Brighton Beach, where only 30% of households had flood insurance.[40] Further examination of FEMA data showed that in damaged areas of Brooklyn with predominantly African-American residents, only 14% of homeowners were insured.[41] Those without insurance had to await disaster grants from FEMA or New York that often took years to process.

Over the last five-plus years, FEMA as well as New York City's Build It Back program have accomplished much across Staten Island, but also frustrated many Sandy victims with the slowness and paltriness of their aid. Five years out from the storm, nearly a thousand families still await the completion of construction supported by the City's Build It Back program.[42]

And while Bayville on Long Island's North Shore was beginning its third phase of rebuilding in 2016, those in Long Beach's Channel Park Homes still awaited adequate repairs by the city housing authority. As reported by the group ERASE Racism, Melissa Miller had received only a new refrigerator and some replacement drywall, along with a "sanitizing" that still left her apartment with a nauseating smell.[43]

The vast destruction Sandy left in its wake—scores of deaths and an estimated $71 billion in property and other damage—is precisely what New York City's defenses against future rising storm surges should seek to mitigate. Sandy exposed vulnerabilities that had long been present: communities in low-lying areas, many of them occupied by minority or less affluent residents, that lack sufficient infrastructure and flood insurance.

The vast majority of these residents will be left out of the City's proposal to build more than 160 perimeter barriers, including the Big U, and non-structural measures. By comparison, the entire core of the metropolitan region would be protected by the proposed offshore system of movable storm surge barriers. This assessment of the disproportionate impact that Sandy had on the region's low- and moderate-income households and minority and immigrant communities demonstrates that the argument for the offshore barrier system is not just about technical advantages;[44] it is about environmental and social justice.

Two recent developments strengthen the case for this region-wide approach. One, the future of the National Flood Insurance Program is uncertain. We do not know if or how much the federal government will assist in rebuilding our communities after the next Superstorm Sandy. Two, Moody's, a major credit rating agency, recently added climate to credit risks and now warns cities to address their climate exposure or face rating downgrades. Climate risk in portfolios is something that investors are increasingly focusing on as recently seen by the strong showing of over 450 leaders—who ranged from institutional investors to state and city pension fund fiduciaries to corporate

[38] *Stricken Neighborhoods–Case Studies*, *supra* note 37.

[39] Sidney C. Schaer, *In Defense Of Mastic Beach*, NEWSDAY, Jan. 30, 1993, at 7; Steve Henn, *Hard-Hit Long Island Awaits Power As Temps Drop*, NPR (Nov. 5, 2012, 5:46 PM), https://www.npr.org/2012/11/05/164360159/hard-hit-long-island-awaits-power-as-temps-drop.

[40] *Stricken Neighborhoods–Case Studies*, *supra* note 37.

[41] This conclusion is based on analysis of data available at https://egis-hud.opendata.arcgis.com/datasets/bc4e8a6e4a384b729cb95a09ebf2047b_0.

[42] Katie Honan, *Timeline: City's Build It Back Program Riddled With Missteps and Delays*, DNAINFO (Oct. 26, 2012, 12:28 PM), https://www.dnainfo.com/new-york/20161026/rockaway-park/build-it-back-hurricane-sandy-timeline-history; Carl R. Howard, *Climate Change Blog 6*, N.Y. STATE BAR ASS'N (Nov. 17, 2017, 12:13 PM), http://communities.nysba.org/blogs/carl-howard/2017/11/17/climate-change-blog-6.

[43] *Resident Narratives from Channel Park Homes*, ERASE RACISM NY, http://www.eraseracismny.org/past-actions/441 (last visited Feb. 14, 2018).

[44] *See Mapping Sandy's Inequalities*, *supra* note 30.

executives—that Ceres brought together for the Investor Summit on Climate Risk[45] at the United Nations on January 31, 2018.

Without assurances that there is a federal program in place to cover extensive damages for the next extreme weather event and without a comprehensive implemented resiliency program, the cost of doing business could significantly increase, and some investors may even not want to take the risk. Eventually it could lead to economic decay where those who can will move out, leaving behind those who cannot, as increased nuisance flooding and large weather events increase in frequency, size, and damage. Some homeowners already have a hard time covering the cost of FEMA flood insurance. The FEMA maps are currently in the process of being updated, which may result in higher costs for homeowners.

Conclusion

The New York-New Jersey metropolitan region was devastated by Superstorm Sandy and remains acutely vulnerable to continuing devastation from rising sea levels and extreme storms. These storms and the storm surges they create have regional impacts. But they also disproportionately damage to low- and moderate-income residents and minority and immigrant communities.

The social justice solution of a NY-NJ Metropolitan Regional Storm Surge Barrier System has been put forth in this article as a critical component of a layered defense against sea level rise and storm surges. While local perimeter land-based seawalls will be necessary to provide protection from rising sea levels over the decades and centuries ahead, huge storm surges are best addressed by a layered defense system built around a regional storm surge barrier system that vastly shortens the coast line (in this situation roughly 1,000 miles down to 10 miles) and provides comprehensive protection against the devastation caused by occasional but massive storm surges.

Only such a combined layered regional storm surge and sea level rise barrier system will provide comprehensive protection for all of the region's residents and communities, regardless of their economic or social status, for the next 100 years.

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Christopher Sellers, MD, PhD, is Director of the Center for the Study of Inequalities, Social Justice, and Policy and Professor of History at Stony Brook University. His research concentrates on the history of environment and health; of cities, suburbs, and industries; and of inequality and democracy, with a focus on the United States and Mexico.

Robert D. Yaro is Professor of Practice in City & Regional Planning at the University of Pennsylvania and serves on the SSWG Executive Committee. He retired as President and CEO of Regional Plan Association in New York in 2014 after 25 years with the organization.

LEGAL DEVELOPMENTS

ENERGY

Surrogate's Court Found That Decedent Intended Conveyance of "Mineral Rights" to Include Oil and Gas Interests

The Erie County Surrogate's Court found that a reference in a decedent's will to "all mineral rights in Pennsylvania and elsewhere" was intended to encompass all subsurface rights, including oil and gas interests. The decedent's will devised such rights to a partnership formed by the decedent's three children. Respondents in the proceeding—who had acquired by a quitclaim deed all oil, gas, and mineral properties belonging to the decedent's estate—had argued that under Pennsylvania law "mineral rights" does not include oil and gas interests and that the decedent's will therefore did not convey oil and gas rights to the partnership. The court said that in a will construction proceeding the law of the domicile controls the interpretation of the will because the question of the testator's intent is a question of fact, not law. Applying New York law, the court considered prior wills, letters, and memoranda of the decedent and the testimony of the attorney who drafted the will, and concluded that

[45] *See Investor Summit on Climate Risk*, CERES, https://www.ceres.org/events/investor-summit-climate-risk (last visited Feb. 14, 2018).

while the understanding of the attorney draftsperson that the decedent wished mineral rights, including oil and gas interests, to go to the partnership was not controlling, the attorney's understanding was consistent with the decedent's use of the term "mineral rights" in his own letters and memoranda. The court further concluded that even if Pennsylvania law governed construction of the will, the respondents would not prevail because the clear and convincing evidence that the decedent intended "mineral rights" to include oil and gas interests would rebut the presumption that "minerals" was not intended to include natural gas or oil. *In re Estate of Goodyear*, 2017 NYLJ LEXIS 3686 (Surrogate's Ct. Erie County Dec. 18, 2017).

LEAD

Federal Court Ordered Real Estate Broker Who Did Not Disclose Lead Paint Hazard to Pay More than $50,000 of Restitution to Purchasers of Lockport Home

A real estate broker who did not disclose known lead-based paint hazards to the purchasers of a residence in the Town of Lockport was sentenced to time served, fined $1,000, and ordered to pay restitution of $53,326.07 to the purchasers, whose child was diagnosed with lead poisoning a little more than a year after they purchased the home. The broker pleaded guilty in September 2017 to one count of violating the Residential Lead-Based Paint Hazard Reduction Act of 1992. *United States v. Walck*, No. 1:17-mj-01103 (W.D.N.Y. Jan. 9, 2018). [*Editor's Note:* This case was previously covered in the December 2017 issue of *Environmental Law in New York*.]

OIL SPILLS & STORAGE

DEC Commissioner Ordered Owner of Former Gas Station to Pay $57,200 in Penalties

New York State Department of Environmental Conservation (DEC) Commissioner Basil Seggos ordered the owner of a former gas station and current motor vehicle repair shop in the Town of Norwich to pay $57,200 in civil penalties for violations of a 2013 modification consent order as well as violations of the petroleum bulk storage regulations. The penalties consisted of $15,000 previously suspended contingent on compliance with the consent order; $30,000 for failing to permanently close three underground gasoline tanks; $10,000 for failing to update and renew the facility's registration; and $2,200 for failing to comply with regulatory requirements for two other tanks. The respondent had failed to color code fill ports and had not conducted annual monitoring or alternative leak detection testing. If the respondent fails to bring the other tanks into compliance within 30 days, he must permanently close them after providing notice to DEC. *In re Bilow*, 2018 N.Y. ENV LEXIS 1 (DEC Jan. 2, 2018).

SEQRA/NEPA

Federal Court Declined to Dismiss Challenge to Plum Island EIS

The federal district court for the Eastern District of New York denied the federal government's motion to dismiss a lawsuit challenging the environmental impact statement (EIS) prepared pursuant to the National Environmental Policy Act (NEPA) for the proposed sale of Plum Island, an 840-acre island in Long Island Sound that was originally used as an army fort but has been used as an animal disease research facility since the 1950s. The court rejected the defendants' arguments that the claims were not ripe, that the plaintiffs did not have standing, and that the court should decline to exercise jurisdiction based on the doctrine of prudential mootness. With respect to ripeness, the court found that the plaintiffs met the test set forth in *Ohio Forestry Association, Inc. v. Sierra Club*, 523 U.S. 726 (1998). The court said withholding judicial consideration could cause significant hardship to the plaintiffs because they might not have another opportunity to seek "appropriately robust environmental review," that there was no reason to believe judicial review would "inappropriately interfere with further administrative action," and that nothing in the record suggested there would be "a benefit to awaiting further factual development of the issues presented." The court also cited *Ohio Forestry* dicta indicating that "a NEPA claim can never be riper than at the time of the procedural failure." With respect to standing, the court found that the plaintiffs—which included environmental organizations and individuals—had satisfied their burden by alleging their members' past and continued use of the Plum Island environment. The court said it was "inconsequential" that the defendants had not yet determined how the island would be sold. The court also said invoking the doctrine of prudential mootness was not appropriate because the defendants were not in the process of conducting any supplemental environmental review that would render the current EIS and record of decision "interlocutory." *Connecticut Fund for the Environment, Inc. v. United States General Service Administration*, 2018 U.S. Dist. LEXIS 5272 (E.D.N.Y. Jan. 11, 2018).

State Supreme Court Said Challenge to City Agreement for Manhattan Helicopter Tours Was Untimely

The Supreme Court, New York County, dismissed a lawsuit challenging the approval by the Franchise and Concession Review Committee of the City of New York of an agreement that extended the terms of a 2008 contract for tourist helicopter rides in Manhattan. The petitioner alleged that the City had violated the State Environmental Quality Review Act and also made common law claims. The court held that the claims were time-barred because the petitioner did not file a petition within four months of the resolution approving the extension of the 2008 contract. The court rejected the argument that the petitioner

could choose which commencement procedures it would use because it had styled the lawsuit as a hybrid proceeding. (The petitioner filed a summons with notice at the end of the four-month limitations period and then filed a complaint three months later.) The court further found that the common law claims were also time-barred because they arose from the City's decision to enter into the agreement. The court said the petitioner could not use common law causes of action to collaterally attack the resolution approving the agreement. *Stop the Chop NYNJ, Inc. v. Franchise & Concession Review Committee of the City of New York*, 2018 N.Y. Misc. LEXIS 129 (Sup. Ct. New York County Jan. 11, 2018).

SOLID WASTE

Wholesale Beverage Distributor Must Pay Largest-Ever Bottle Bill Penalty

A New Jersey-based wholesale beverage distributor and New York State reached a settlement to resolve claims that the distributor violated New York's Returnable Container Act, often referred to as the "Bottle Bill," by selling bottled and canned beverages for which a New York deposit had not been initiated. The settlement, memorialized in a consent judgment entered in the Supreme Court, New York County, provided that the distributor would pay $1 million in civil penalties and investigation costs, with $450,000 suspended. The settlement amount includes $150,000 previously paid by the distributor ($100,000 for a civil penalty and $50,000 for costs of the State's investigation). The $550,000 total settlement payment is the largest penalty ever under the Bottle Bill. The suspended portion of the penalty will terminate after a three-year period during which the distributor agreed not to sell regulated beverage containers in New York. If the distributor decides to sell regulated beverage containers in New York after the three-year period ends, it must provide notice to the State and adopt a record-keeping system to track where and from what sources it acquires the regulated beverage containers it sells in New York. In a press release, the New York attorney general's office said the distributor's alleged illegal activities created an unfair price advantage in New York, caused refund accounts of registered deposit initiators to be reduced when the distributor's "non-initiated" containers were redeemed, and deprived the State of revenue. The penalties paid by the distributor were to be directed to the Environmental Protection Fund. *Seggos v. North Bergen Beverage, LLC*, Index No. 16-451876 (Sup. Ct. New York County Jan. 11, 2018).

DEC Commissioner Imposed $3,000 Penalty for Violations at Automobile Junkyard

DEC Commissioner Basil Seggos found that two respondents associated with an automobile junkyard and scrap processing site in the Town of Sterling violated requirements to register a petroleum bulk storage facility and to submit a 2015 annual vehicle dismantler report. The commissioner ordered the two respondents to pay a $3,000 civil penalty. The respondents registered the aboveground storage tank and submitted the vehicle dismantling report after DEC commenced the enforcement proceeding. DEC originally alleged additional regulatory violations of illegal storage of construction and demolition waste for longer than 18 months and operation of a solid waste management facility without a permit, but withdrew those causes of action after the administrative law judge denied DEC staff's motion for an order without hearing. *In re Carrier Salvage & Recycling, LLC*, 2018 N.Y. ENV LEXIS 5 (DEC Jan. 9, 2018).

DEC Commissioner Imposed $10,000 Penalty for Illegal Storage of Waste Tires

DEC Commissioner Basil Seggos ordered a man to pay a $10,000 civil penalty for storing more than 1,000 tires without a permit at two sites in the Town of Black Brook, resulting in the release of more than 10 cubic yards of solid waste into the environment. Evidence in the record indicated that the respondent was storing between 3,500 and 4,000 tires at the two sites. Although the respondent sought a beneficial use determination (BUD) from DEC in 2015 to allow him to use discarded tires to construct a retaining wall to prevent erosion, he did not respond to DEC staff requests for additional information in support of the BUD petition. He also did not respond to a letter from the DEC commissioner during the course of this enforcement proceeding. In addition to ordering payment of the penalty, the commissioner ordered the respondent to reduce the total number of waste tires at the two sites to below 1,000, to transport the tires to a location authorized to accept waste tires within 30 days, and to submit documentation to DEC demonstrating that he had complied. *In re Blaise*, 2018 N.Y. ENV LEXIS 2 (DEC Jan. 2, 2018).

TOXIC TORTS

Federal Court Concluded That New York Would Allow Cross-Jurisdictional Tolling of Banana Plantation Pesticide Claims; Order Certified for Interlocutory Appeal

The federal district court for the Southern District of New York concluded that New York law would provide for tolling of the statute of limitations for purported class members' claims during the pendency of a class action in another jurisdiction. The district court therefore denied a chemical company's motion to dismiss a lawsuit brought by plaintiffs who lived or worked on banana plantations in Costa Rica, Ecuador, and Panama during the 1960s through the 1980s and who alleged they suffered personal injuries resulting from exposure to the pesticide dibromochloropropane. The plaintiffs in this case were not parties to a putative class action filed by plaintiffs with similar claims in 1993 in Texas state court. The Texas state court plaintiffs voluntarily dismissed their action in 2010 "after a long train of procedural misadventures." The plaintiffs

filed the instant case in 2011. In considering whether the plaintiffs' claims were tolled by the Texas action, the district court noted that New York courts "have not squarely addressed whether New York law permits cross-jurisdictional tolling" and that courts in the Southern District had evenly split 2-2 on whether the New York Court of Appeals would allow it. This district court concluded that "although the matter is not free of doubt," New York "mostly likely" would recognize it. In reaching this conclusion, the court was not persuaded that it should avoid applying uncertain New York law in a way that would expand the availability of state remedies. Instead, the court said its role was to predict how the New York Court of Appeals would resolve the uncertainty based on whether cross-jurisdictional tolling "would align with, or offend, New York state policy." The district court noted that New York courts had extended the federal principle allowing tolling during class actions to class actions originally filed in New York, and also noted that lower New York courts had already allowed tolling of claims following non-merits dismissals of class actions in other jurisdictions. The district court was unpersuaded that recognizing cross-jurisdictional tolling "would open the floodgates to New York litigation" or "would invite 'unending' tolling" of statutes of limitations. After concluding that New York would recognize cross-jurisdictional tolling, the court held that Texas state court orders in 1995 that conditionally dismissed the action on forum non conveniens grounds "did not clearly disallow class status." The district court held that putative class members "could reasonably have relied thereafter on the continued maintenance of the . . . putative class action" to protect their rights. The district court *sua sponte* certified this order for interlocutory appeal, indicating that the cross-jurisdictional tolling issue was a "strong candidate" for certification to the New York Court of Appeals. *Chavez v. Occidental Chemical Corp.*, 2018 U.S. Dist. LEXIS 5032 (S.D.N.Y. Jan. 10, 2018).

Appellate Division Said Product's Label Complied with Federal Hazardous Substances Act and Affirmed Dismissal of Personal Injury Action

The Appellate Division, Fourth Department, affirmed dismissal of an action claiming the defendant failed to warn the plaintiff of the risks associated with muriatic acid manufactured by the defendant. The plaintiff alleged that he had sustained injuries as a result of inhaling fumes from muriatic acid while using the product to clean an indoor swimming pool. The Fourth Department found that the defendant had established as a matter of law that the product's label satisfied the Federal Hazardous Substances Act and that therefore the action should be dismissed. The appellate court rejected the plaintiff's argument that the product was misbranded because it did not contain an "affirmative statement of the principal hazard or hazards" of the product and "precautionary measures describing the action to be followed or avoided," as required by the statute. The court found that the statement "VAPOR HARMFUL" was sufficient to comply with the statute and to warn users that inhalation of the muriatic acid fumes was harmful. The court also found that the label listed adequate precautionary measures that were "directed at minimizing or avoiding the principal hazard or hazards of the product." *Hudson v. Sunnyside Corp.*, 155 A.D.3d 1532, 64 N.Y.S.3d 425 (4th Dept. 2017).

WATERS

Former Paper Mill Employee Sentenced for Falsifying Data and Reports Regarding Wastewater Discharges

A resident of the Town of Gouverneur was sentenced in the federal district court for the Northern District of New York to serve a three-year probation term, perform 200 hours of community service, and pay a $1,000 fine after pleading guilty to three felony counts of violating the Clean Water Act in connection with discharges of wastewater containing excessive levels of biochemical oxygen demand (BOD) into the Raquette River. The defendant was in charge of environmental compliance at a paper mill in the Town of Norfolk. He admitted that between January 2013 and September 2015 he hid and falsified data regarding the BOD levels in the mill's wastewater, allowing the facility to violate its Clean Water Act permit repeatedly. He also admitted to falsifying 29 discharge monitoring reports that were submitted to DEC. *United States v. Ward*, No. 8:17-cr-00117 (N.D.N.Y. Jan. 31, 2018). [*Editor's Note:* This case was previously covered in the December 2017 issue of *Environmental Law in New York*.]

Federal Court Allowed Connecticut Agency and New York Town to Intervene in Challenge to Designation of Long Island Sound Disposal Site

The federal district court for the Eastern District of New York granted the Connecticut Department of Energy and Environmental Protection's (DEEP's) and the Town of Southold's motions to intervene in New York's lawsuit challenging the U.S. Environmental Protection Agency's (EPA's) designation of a disposal site for dredged materials in eastern Long Island Sound. New York alleged that the designation violated the Administrative Procedure Act, the Ocean Dumping Act, and the Coastal Zone Management Act. DEEP sought to intervene as a defendant, while Southold sought to intervene as a plaintiff. The court said it was not necessary to address the factors for intervention as of right, even though DEEP and Southold likely satisfied the requirements. Instead, the court determined that it was appropriate to grant their requests for permissive intervention given that the parties would not be prejudiced by delay since Southold and DEEP filed their motions before EPA responded to the complaint and before any conferences were held. The court further found there were "obviously" common questions of fact and law; that both DEEP and Southold had direct, substantial, and legally protectable interests in the designation; and that their interests might not be completely aligned with the corresponding

parties' interests. *Rosado v. Pruitt*, 2018 U.S. Dist. LEXIS 388 (E.D.N.Y. Jan. 2, 2018).

Federal Court Said Long Island Aggregate Recycling Facility Did Not Require Stormwater Permit

The federal district court for the Eastern District of New York dismissed a Clean Water Act citizen suit brought against the operator and manager of a Long Island facility where "recognizable uncontaminated concrete, asphalt pavement, brick, soil or rock," known as "RUCARBS," is crushed for wholesale and reuse as road base, drainage stone, or aggregate replacement. The plaintiff, Sierra Club, asserted that the facility required a Multi-Sector General Permit to cover stormwater discharges because it was an industrial facility covered by standard industrial classification (SIC) code 5093 for "Scrap and Waste Materials." The court, however, agreed with the defendants that the operator was not engaged in industrial activity as defined by the Clean Water Act and was therefore not required to obtain a stormwater runoff permit. The court said the plain language of the SIC codes supported the defendants' argument that SIC code 5032, for "Brick, Stone, and Related Construction Materials," was a better fit for their business. The court also rejected Sierra Club's argument that all "recycling" businesses should fall within the Clean Water Act definition of industrial facilities. In addition, the court noted as a threshold matter that it was not bound by DEC's opinion that no stormwater permit was required; the court said it was the court's role in the first instance to determine whether the operator was engaged in industrial activity. *Sierra Club, Inc. v. Con-Strux, LLC*, 2017 U.S. Dist. LEXIS 213309 (E.D.N.Y. Dec. 29, 2017).

Court of Appeals Upheld New York City Water Board's Decision to Increase Rates While Granting One-Time Credit to Certain Property Owners

In a split decision, the New York Court of Appeals reversed lower court rulings that enjoined the New York City Water Board from implementing a rate increase for the 2017 fiscal year and a one-time bill credit for owners of properties identified as Tax Class 1, a category that included approximately 80% of the Water Board's account holders and encompassed small residential and condominium properties. The Water Board collects revenues to support the water and sewer systems. The rationale for the one-time credit was that the City had announced that it would forbear collecting rents from the Water Board for the water supply and wastewater infrastructure through the 2020 fiscal year. The Court of Appeals found that the petitioners had not met their heavy burden of demonstrating that the one-time credit was unreasonable. The court rejected the argument that the Water Board did not have a rational basis for allocating the benefits from the rent forbearance to the Tax Class 1 account holders. The court wrote that "the distinction between beneficiaries and others did not have to be drawn with surgical precision . . . and must be upheld in the absence of invidious discriminations or a differential that is entirely unsupported by rational goals." The Court of Appeals also found that the rate increase was justified, even given the rent forbearance. The court cited an affidavit submitted by the Water Board that stated that the one-time credit did not remove the need for an increase because rates are set to maintain revenue stability over multiple years. In addition, the court said the Water Board had not acted ultra vires or levied a tax. Judge Rivera dissented, joined by Chief Judge DiFiore. Judge Rivera wrote that although the court's review was "narrow," it could not "rubberstamp" the Water Board's decisions. She found that the record provided no evidence that the Board acted rationally in approving the rate increase and credit. *Matter of Prometheus Realty Corp. v. New York City Water Board*, 2017 N.Y. LEXIS 3780 (N.Y. Dec. 19, 2017). [*Editor's Note:* This case was previously covered in the September 2016 and May 2017 issues of *Environmental Law in New York*.]

WETLANDS

Federal Court Dismissed Third-Party Contribution and Indemnification Claims by Defendant in Clean Water Act Enforcement Action

The federal district court for the Western District of New York dismissed a third-party complaint filed by the defendants in a Clean Water Act enforcement action. In the underlying complaint, the United States alleged that the defendants unlawfully discharged fill materials into 16.5 acres of wetlands that qualified as "waters of the United States" in violation of the Clean Water Act and an EPA administrative order. The defendants alleged in the third-party complaint that they had permitted 25 third-party defendants to dump fill on the property. The court held that neither contribution nor indemnification was available to the defendants under New York law. With respect to contribution, the court said the third-party defendants were not liable for damages for the same injury to property, as required for a statutory contribution claim under C.P.L.R. § 1401. The court noted that in this "quintessential regulatory enforcement action," the United States' alleged injury was not to property and that the relief sought was not damages. With respect to indemnification, the court said that even if the third-party defendants had an independent duty to obtain or confirm the existence of a permit before discharging fill material, such a duty would not absolve the defendants of their independent duty to comply with the Clean Water Act and the EPA order. The court also noted that the defendants' admission that they permitted the dumping of the fill meant that they were partially at fault and not eligible for common law indemnification under New York law. The court denied the defendants' motion to amend their complaint, finding that doing so would be futile. *United States v. Whitehill*, 2018 U.S. Dist. LEXIS 8224 (W.D.N.Y. Jan. 18, 2018).

DEC Commissioner Imposed $52,500 in Civil Penalties for Wetlands Violations at Staten Island Residential Property

DEC Commissioner Basil Seggos found that two individuals had violated a 2015 consent order requiring them to remove a children's play set and other structures placed in a regulated freshwater wetland adjacent area and deed-restricted area at a residential property on Staten Island. The 2015 consent order also required the respondents to plant trees and shrubs in an area that had been landscaped and maintained as a lawn. The respondents had not done so; nor had they made three of four installment payments toward the $10,000 civil penalty imposed in the consent order. In addition, they had erected a new children's play set in the deed-restricted area and had placed gym equipment in the regulated freshwater wetland adjacent area and deed-restricted area without a permit. While the respondents argued that the 2015 consent order should be vacated because their former attorney had not properly advised them and because they were being treated unfairly, the DEC commissioner agreed with the administrative law judge that the respondents had made no showing that the grounds for vacating an order under C.P.L.R. § 5015 applied. The commissioner imposed a total of $52,500 in civil penalties, comprising the remaining $7,500 of the penalty that the respondents had agreed to pay in the 2015 consent order; an additional $5,000 that had been suspended contingent on compliance with the 2015 consent order; $30,000 for violations of the consent order; and $10,000 for unauthorized installation of the new children's play set and gym equipment in violation of the Environmental Conservation Law and DEC regulations. *In re Basile*, 2018 N.Y. ENV LEXIS 6 (DEC Jan. 9, 2018).

WILDLIFE & NATURAL RESOURCES

Florida Couple Pleaded Guilty to Illegal Importation of Fischer Lovebirds

A Florida couple pleaded guilty in the federal district court for the Eastern District of New York to one count of conspiring to illegally import wildlife. The defendants conspired to bring 12 Fischer Lovebirds from Indonesia into the United States in 2015. Fischer Lovebirds are protected under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and their importation requires possession of a valid CITES export permit prior to importation and declaration of the wildlife to the United States Fish and Wildlife Service upon receipt in the United States. The defendants conspired to have the shipment paperwork for the Fischer Lovebirds identify them as Rosy-Faced Lovebirds, an unprotected species. The United States Attorney's Office said each defendant faced a maximum sentence of five years' imprisonment. *United States v. Burgos*, No. 17-CR-329 (E.D.N.Y. Jan. 18, 2018).

NEW YORK NEWSNOTES

Proposed Amendments to Solvent Cleaning Regulations Would Expand Their Coverage

DEC announced that it was proposing amendments to the current regulations for "Solvent Metal Cleaning Processes" to make them consistent with the Ozone Transport Commission's (OTC) Model Rule for Solvent Degreasing (2012) and so that the regulations comply with EPA's Industrial Cleaning Solvents Control Technique Guidelines (2006). The proposed amendments would redesignate 6 N.Y.C.R.R. Part 226 as Subpart 226-1 and would add a new Subpart 226-2 to apply to "Industrial Cleaning Solvents." The redesignated Subpart 226-1 will apply to all solvent cleaning process, not just to the cleaning of metal. The new Subpart 226-2 may apply to any facility that emits three tons or more of volatile organic compounds (VOCs) from cleaning solvents annually. Use of cleaning solvents already subject to or exempt from other regulations is not subject to the new Subpart 226-2, which imposes work practice, record-keeping, and storage requirements and imposes restrictions on VOC content. In addition to expanding coverage to all solvent cleaning processes, changes in Subpart 226-1 would impose a new/replacement VOC requirement for cold cleaners.

Attorney General Weighed in on Need for Legislative Authorization for New Parking Spaces on Parkland

The New York Attorney General's Office issued an informal opinion letter (No. 2017-1) stating that a municipality's conversion of eight boat-trailer parking spaces located on parkland to 30 general municipal parking spaces for passenger vehicles would require legislative authorization because the parking spaces would be made available for non-park purposes. The parking spaces, which were located near the boat ramp for a marina, would not be reserved for use by those using the marina. The letter also suggested that even the transfer of control of the spaces from one municipality to another (in this case, from the Town of Brookhaven to a village within the Town) might require legislative authorization even though there would be no transfer of title.

NYISO Published Proposal for Incorporating Energy Storage Resources

In December 2017, the New York Independent System Operator (NYISO), which manages New York's electric grid, published a report on the technical, regulatory, and market landscape for energy storage resources (ESR) in New York. The report, "The State of Storage: Energy Storage Resources in New York's Wholesale Electricity Markets," also set forth

NYISO's proposal for a wholesale market participation model for ESRs. The model includes three phases that would be implemented from 2017 to 2023. In the Energy Storage Integration Phase (2017-2020), NYISO will identify parameters for ESR "offers" to buy or sell energy and create an ESR participation model. During the Energy Storage Optimization Phase (2019-2022), ESR managers may cede control over the energy level of the ESRs to NYISO so that NYISO may use its software to economically schedule buying and selling cycles. During the third phase, Renewable and Storage Aggregation (2020-2023), NYISO will analyze the pairing of ESRs with intermittent resources including renewable resources to establish a "controllable, dispatchable unit."

New York City Ended 2017, Started 2018 with New Laws on Construction Noise, Indoor Mold and Allergens, Energy Efficiency, and More

As the 2014-2017 New York City Council session came to an end, a number of laws were enacted that address environmental, land use, and energy issues in the city:

- *No. 4 Fuel Oil Phase-Out.* Local Law 31 of 2018 accelerates the phase-out of No. 4 fuel oil at power plants. Power plants may no longer use No. 4 fuel oil after January 1, 2025. (Previously the deadline was January 1, 2030.) The law also allows power plants an option to continue using residual fuel oil (also known as No. 6 fuel oil) until December 31, 2021 (rather than the otherwise applicable deadline of January 1, 2020), but bars facilities that choose this option from switching to No. 4 fuel oil after that date. (Local Law 31 of 2018)
- *Solar Energy.* Two laws were enacted requiring the development of plans to increase voluntary solar energy use in business improvement districts and by City employees. (Local Law 232 of 2017, Local Law 230 of 2017)
- *Office of Alternative Energy.* Another law created an Office of Alternative Energy within the Department of Buildings. The Office will establish a program to assist with alternative energy projects, coordinate with other agencies to encourage installation and maintenance of alternative energy projects, and make recommendations for streamlining approval processes. (Local Law 233 of 2017)
- *Long-Term Energy Plan.* Local Law 248 of 2017 requires the preparation of a long-term energy plan for New York City by the end of 2019, to be updated every four years. (Local Law 248 of 2017)
- *Alternative Fuels and Ferries.* Local Law 27 of 2018 requires the Commissioner of the Department of Transportation to conduct a study of using alternative fuels in city ferries. (Local Law 27 of 2018)
- *School Bus Fuel.* Local Law 28 of 2018 requires that diesel fuel-powered school buses use ultra low sulfur diesel and requires a study of the feasibility of using biodiesel in school buses. (Local Law 28 of 2018)
- *Energy Efficiency.* Two laws were enacted addressing energy efficiency in buildings. One law provides for the City's triennial energy code updates in 2019 and 2022 to match the State's "stretch" energy code and requires that the Department of Buildings propose predicted energy use targets for covered buildings in the 2025 cycle, as well as subsequent cycles. The second law requires, beginning in 2020, that covered buildings obtain an energy efficiency score using the City's benchmarking tool, and that the score and a corresponding energy efficiency "grade" (A through F, or N) be posted by public entrances and be made available online. (Local Law 32 of 2018, Local Law 33 of 2018)
- *Indoor Asthma Allergen Hazards.* Another new law added new sections to the Housing Maintenance Code regarding the obligations of multiple dwelling building owners to control pests and other asthma allergen triggers such as indoor mold. The law requires owners to conduct investigations at least annually in all dwelling units and common areas for indoor allergen hazards. The law classifies the presence of visible mold in any room as an indoor mold hazard violation unless the mold is on tile or grout, and sets schedules for the correction of the mold hazards depending on whether the violation is non-hazardous, hazardous, or immediately hazardous. The law also sets requirements for correction of violations involving the presence of cockroaches, mice, rats, and other pests. Owners must remediate all visible mold and pest infestations in vacant apartments before reoccupancy. In addition, the law addresses Department of Housing Preservation and Development (HPD) responsibilities and describes work practices that are to be required for correcting indoor mold hazards. The law also amends the Health Code to include provisions regarding educating physicians and encouraging them to refer patients, with their consent, to HPD or the Department of Health and Mental Hygiene (DOHMH) to request investigations of patients' primary residences. (Local Law 55 of 2018)
- *Mold Assessment, Abatement, and Remediation.* Another law established minimum standards for mold assessment, abatement, and remediation in buildings containing 10 or more dwelling units or located on a zoning lot containing at least 25,000 square feet of non-residential floor area. The owner, managing agent, and employees of the owner or managing agent of such a building may not perform the mold assessment, abatement, and remediation. Such activities must be performed by a person licensed under the New York State Labor Law. (Local Law 61 of 2018)

- *Pesticides and Playgrounds.* Local Law 71 of 2018 requires that the Department of Parks and Recreation clean playground equipment within 24 hours of pesticide spraying by any City agency. (Local Law 71 of 2018)
- *Water Tank Inspections.* Amendments to the Health Code were enacted requiring that drinking water tank annual inspection information be made available on the DOHMH website and also requiring DOHMH to provide guidance to the public on inspection requirements, submission of complaints, and access to inspection information. (Local Law 239 of 2017)
- *Urban Agriculture Website.* Local Law 46 of 2018 requires development of an urban agriculture website by July 1, 2018, with content to be provided by the Department of City Planning, the Department of Small Business Services, the Department of Parks and Recreation, and other agencies and stakeholders. Information on the site is to include zoning requirements, assistance in obtaining information about specific properties, and information about community gardens. (Local Law 46 of 2018)
- *Construction Noise.* Amendments to the Noise Control Code require that noise mitigation plans for construction sites be posted on the City's website and also displayed in a conspicuous manner at the construction site. Construction noise is also addressed by other amendments to the Noise Control Code, including a requirement for adoption of rules setting timeframes for inspections in response to after-hours noise complaints. The amendments also reduce, from 8 dB(A) currently to 7 dB(A) in 2020, the amount by which aggregate sound levels from a construction site may exceed ambient sound levels during a time when an after-hours authorization is in effect. The amendments also impose absolute limits on sound levels during such times. In addition, the amendments contain a new authorization for stop work orders when work violates certain construction noise requirements in a manner that poses a threat to human health and safety. (Local Law 10 of 2018, Local Law 53 of 2018)

WORTH READING

Charlotte A. Biblow, *Working Through New York City's E-Designation Program*, N.Y.L.J., at 3 (Jan. 25, 2018)

Env't N.Y., *Making Sense of Energy Storage: How Storage Technologies Can Support a Renewable Future* (Dec. 2017), https://environmentnewyork.org/sites/environment/files/reports/energy%20rr.pdf

Anthony S. Guardino, *Landmarks Preservation Law Given Broad Reading by Court*, N.Y.L.J., at 5 (Jan. 24, 2018)

UPCOMING EVENTS

April 9, 2018

City of Science: Climate Change and Evolution, The Graduate Center, City University of New York, New York City. For information, see https://www.gc.cuny.edu/All-GC-Events/Calendar/Detail?id=43712.

April 11, 2018

6th Annual Conference on Sustainable Real Estate, NYU School of Professional Studies Schack Institute of Real Estate, NYU Kimmel Center, New York City. For information, see http://www.scps.nyu.edu/academics/departments/schack/conferences-events/sbe-conference.html.

April 19, 2018

Columbia Global Energy Summit, Columbia University, Low Library, 535 West 116th Street, New York City. For information, see http://energypolicy.columbia.edu/events-calendar/2018-columbia-global-energy-summit-0.

April 20, 2018

Fourteenth Annual Symposium on Energy in the 21st Century: Creating Resiliency for the Future with Cleaner, More Affordable Renewable Energy, The Links at Erie Village, East Syracuse. For information, see http://energy21symposium.org/.

April 25, 2018

Annual Lloyd K. Garrison Lecture on Environmental Law, Pace Law School, White Plains. For information, see http://www.law.pace.edu/enviro-events.

April 25–26, 2018

Climate Change, Coasts, and Precaution: 2018 Pace Environmental Law Review Symposium, White Plains and New York City. For information, see http://www.law.pace.edu/enviro-events.

April 27, 2018

2018 RPA Assembly, Regional Plan Association, Grand Hyatt New York, 109 East 42nd Street, New York City. For information, see http://assembly.rpa.org/.

May 1–2, 2018

International Conference on Sustainable Cities, Fordham University Lincoln Center Campus, McNally Amphitheatre, 113 West 60th Street, New York City. Organized by Fordham, Columbia, and NYU. For information, see https://www.web.fordham.edu/info/27343/international_conference_on_sustainable_cities.

May 2, 2018

2018 Hudson River Symposium: Contaminants in the Hudson River and Watershed—A Look at the Status, Trends, and the Response of Natural Resources, Hudson River Environmental Society, State University of New York at New Paltz, Student Union Building. For information, see http://www.hres.org/joomla/.

May 2, 2018

Third Annual Sustainability Investment Leadership Conference, Grant Thornton, 757 Third Avenue, New York City. For information, see https://silcny.com/.

May 7–8, 2018

Independent Power Producers of New York, Inc. Annual Showcase and Spring Conference, Albany Capital Center, Albany. For information, see http://www.ippny.org/page/events-3.html.

May 19, 2018

NY Climate Solutions Summit, Syracuse. For information, see http://nyclimatesummit.org/.

May 21–22, 2018

2018 Energy Efficiency Finance Forum, American Council for an Energy-Efficient Economy, DoubleTree by Hilton Hotel Tarrytown, Tarrytown. For information, see https://aceee.org/conferences/2018/eeff.

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