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‘Getting as far away from the ocean as possible was very important to us.’
DANIELLE MANCUSO, who left Staten Island after Hurricane Sandy.

Metropolitan
The New York Times

WILL NEW YORK BE READY

FOR THE NEXT TIME?

TOP, MICHAEL APPLETON FOR THE NEW YORK TIMES; ABOVE, JADE DOSKOW FOR THE NEW YORK TIMES

Top, devastation on Staten Island after Hurricane Sandy hit in 2012; above, an elevated house under construction in Broad Channel, Queens, this past summer.

HURRICANE SANDY: 10 YEARS LATER

Despite the risks, we continue to build at the water’s edge.

BY GINIA BELLAFANTE | PAGE 5

A look back, and how parts of the city are preparing for the future.

ARTICLES ON PAGES 6-11

HURRICANE SANDY: 10 YEARS LATER

JOHN TAGGART FOR THE NEW YORK TIMES

The Williamsburg, Brooklyn, waterfront in August 2021. Hurricane Sandy seems to have had little effect on demand for waterfront condominiums in the city.

THE STORM DIDN'T STOP WATERFRONT DEVELOPERS

By GINIA BELLAFANTE

When Hurricane Sandy made landfall in New York 10 years ago — flooding 17 percent of the city's total landmass and resulting in 43 deaths, thousands of evacuations and power outages that affected two million people — Northerners who had paid only passing attention to Gulf Coast weather events instantly saw how rising sea levels could really mess with them. About 70 percent of the buildings tagged by the city as severely impaired or outright destroyed were on or very near the coastline. It seemed, in those hellish, chaotic days after the storm, as people mucked out the lobbies of expensive condominiums in Dumbo and walked through the destruction in the Rockaways, that New Yorkers would finally retreat from the harbor.

But that is not what happened. Over the past decade, we have gone in a very different direction, populating the waterfront even more enthusiastically, especially along the East River in Brooklyn and Queens. According to the city's Buildings Department, 225 permits have been issued for new apartment buildings in flood zones since Jan. 1, 2013. The effect of that has been to etch a kind of climate denialism into the skyline of one of the country's most liberal places, punctuating how resistant we are to truly meaningful change, even as the city has pledged to reduce carbon emissions by 80 percent by 2050 and has committed to the principles of the Paris Agreement.

The most significant shift in how we have built after Hurricane Sandy has been more stringent rules for flood-resistant construction. New buildings now routinely place mechanicals higher up, often on the roof rather than in basements, where they might be gutted in the next ruinous storm. Sometimes lobbies and residential floors are raised above ground level, a standard practice in Miami. But older buildings are under no mandate to put these measures in place, which leaves 96.5 percent of them in the current floodplain unfortified. "At the moment, we don't have a good framework for planning for the future," Brad Lander, the city comptroller, told me.

In the short term, at least, it is in the city's economic interest to indulge the fetish for the waterfront and allow continued development. As more and more buildings have appeared, the value of real estate in these threatened areas has climbed to around $176 billion, bringing in $2 billion in property taxes each year, during a period when the city's finances have been destabilized by the pandemic. All of this comes from a new report out of Mr. Lander's office, which also makes clear that the expansion of the floodplain will put additional land in jeopardy. Without expensive "protective infrastructure," that property's value would go down or it would leave the tax rolls entirely, either because it could be abandoned or left to managed retreat programs of the kind that took shape after Sandy on Staten Island, where 473 homes in imperiled neighborhoods were torn down.

Whatever self-righteous disapproval New Yorkers may have directed at Texans and Floridians, year after year, hurricane after hurricane, as they rebuilt their houses on ever-higher stilts rather than abandon beach living, the devastation here did little to infringe on our own shoreline romance. Several years ago at a conference on the future of cities, sponsored by The New York Times, the former hedge fund investor and environmentalist Tom Steyer spoke about the dangers of climate change. Mr. Steyer, who has been a major donor to Democratic candidates who have pledged to avoid the worst scenarios, took questions from the audience, addressing them with deep knowledge and passion. But when someone asked about our compulsion to continue building and living on the water, he essentially responded with a shrug. The love of water was primal; what, really, could be done?

Four years before the hurricane, in 2008, an old printing warehouse on the water in the newly developing Brooklyn Bridge Park arrived on the market as a luxury condominium building. After the storm, many residents were without heat and hot water for several weeks. None of this had much effect on demand to live there. Within the coming years, three new apartment buildings went up along the park — one of them with rental units and the other two with condominiums that sold for many millions of dollars.

This disconnect isn't limited to luxury development. During Sandy, over 100 homes in Breezy Point, on the far western tip of the Rockaway Peninsula, were lost to a raging electrical fire caused by the storm. By 2014, dozens of houses in the community had been rebuilt. By 2017, most of the neighborhood had been restored. Today, a modest beach cottage in Breezy Point costs about $1.5 million.

For much of the 20th century, the urban waterfront was not considered a luxury asset. As the wealthy escaped the summer heat in Newport, R.I., or up on the cliffs of the Hudson, the poor swam — and frequently died — in the East River. So many buildings belonging to the New York City Housing Authority wound up on the water precisely because the land was flood-prone and thus of low value. At some point — presumably when "coastal" became the default adjective preceding "elite," when factories converted to creative space, when the industrial waterfront began to seem ripe for high-end domestication — what was once regarded as disadvantage bore a new cachet.

The economy avidly supported these new tastes. In a book released earlier this year, "Fire and Flood: A People's History of Climate Change From 1979 to the Present," the author Eugene Linden, who has warned about global warming for 30 years, points to the failures of an insurance industry that overlooked the threat of climate crisis in the name of writing lucrative homeowner policies. As a result, millions around the country moved not away from but into wildfire zones and areas at risk of hurricanes while, at the same time, reinsurers came up with complex financial instruments that could contain and spread risk.

Although an $8 million apartment in a flood zone might seem like a terrible long-term investment, the very wealthy have come up with workarounds to mitigate their vulnerability. Mr. Linden has witnessed rich New Yorkers buy luxury condominiums in waterfront developments simply to keep a foothold in the city as they relocate to Florida to lower their tax burdens. In a few years, as he explained, the apartments pay for themselves in tax savings. "They are fully aware of climate change," he said of the buyers, "but they're saving $3 million a year in taxes." In this equation, whatever depreciation might attach later on hardly matters.

What of the rest of us? The tens of thousands of people who live along the city's 520 miles of coastline will be left to depend on municipal government's ability to extract federal funds and complete a full range of projects meant to minimize the damage of storm surge with a sense of urgency that has so far not materialized.

Thirty-five NYCHA developments containing more than 60,000 people endured major damage during Sandy. At the Red Hook Houses, which suffered some of the most brutal assault, residents had to wait nearly five years for repairs to boilers and roofs to even begin.

The comptroller's report, which calls the progress on Sandy "plodding," is not optimistic. The city has been slow to the spend the money it has already been given: A decade later, it has gone through only 73 percent of the $15 billion in federal money earmarked for recovery and resilience. The next time, Washington might not be so generous.

ROBERT STOLARIK FOR THE NEW YORK TIMES

Cleaning up after Hurricane Sandy left New York was a huge undertaking.

HURRICANE SANDY: 10 YEARS LATER

ROBERT STOLARIK FOR THE NEW YORK TIMES

Along a jetty in Queens as Hurricane Sandy approached on Oct. 29, 2012.

IMAGES CAPTURE DISTRESS AND UNITY

TODD HEISLER/THE NEW YORK TIMES

A piano on Staten Island was among the countless items destroyed by the deluge.

By JOHN LELAND

A climate event hits — Fiona, Ian, Sandy — and the wreckage is on a monumental scale. But it also strikes on a smaller, more intimate scale, in disrupted lives multiplied thousands of times over. How to measure the damage? In dollars or lost lives, certainly, or whole neighborhoods sunken in torrents of untamed water.

But also: a brother and sister huddling for warmth in an apartment without heat or electricity; a woman retrieving her furniture from her neighbor's yard; a home aide helping a frail man onto an emergency cot; a rescue worker too fatigued to keep going, but keeping on anyway. When Hurricane Sandy hit New York City 10 years ago, leading to at least 43 deaths and an estimated $19 billion in damages, photographers for The New York Times fanned across the metropolitan area to document the devastated cityscape. But they also bore witness to the individual struggles of people trying to hang on to what they could.

The city that the photographers ventured into during the storm and in the days afterward was not the one from a week earlier. Parts remained underwater or impassable. Whole areas were immersed in darkness. You could cross a block on Broadway in the mid-20s, and on one side, you would see a city without traffic signals, and on the other, one that appeared untouched. Everyone had a memory. Mine was of walking past a new apartment building, on the night of the storm, when a planter on a high terrace blew through the glass guardrail, showering pedestrians with glass splinters and the planter's remains. My son's was of hearing that two friends were killed by a falling tree.

Times photographers found New Yorkers whose lives might never be the same.

Every corner of the city experienced a different storm and a different recovery. Communities not often in the news — the Rockaways in Queens, Midland Beach on Staten Island, where residents described the storm surge in language typically reserved for tidal waves — cried out for attention. Times photographers arrived to find New Yorkers whose lives might never be the same.

Like other calamities, Hurricane Sandy — and the efforts to rebuild afterward — left some of its deepest scars in vulnerable communities, exacerbating conditions of inequality. New Yorkers with means could get out of the city or move to hotels. But thousands of restaurant workers, store cashiers, home health aides and others often toiled at their jobs until the last minute of Sandy's approach. Then they had to improvise their way home, arriving in neighborhoods where the disaster was already hitting. And the city's police, fire, utility and emergency medical workers seemed to be everywhere.

Their images still have the power to unnerve us, even as the iconic pictures of damaged infrastructure become tamed through familiarity. Buildings could be replaced; lives could only be altered. Ten years after the waters receded, the human stories are still ongoing. The photos here tell some of those stories; others come back in unquiet memory. Who were the people who lived through the storm, and what did they look like at the moment when everything changed?

DAMON WINTER/THE NEW YORK TIMES

Cars bobbed in a parking garage near Wall Street, where floodwaters were topped with fuel.

MICHAEL APPLETON FOR THE NEW YORK TIMES

Joshua Valentin, then 3, bundled up Johnny, his 3-month-old brother, as the power in their Red Hook, Brooklyn, apartment remained out nearly a week after the storm hit.

MICHAEL KIRBY SMITH FOR THE NEW YORK TIMES

With supplies of basics like food and gasoline severely limited, New Yorkers waited in long lines like this one in Bedford-Stuyvesant, Brooklyn.

MICHAEL KIRBY SMITH FOR THE NEW YORK TIMES

The volunteer Fabrizzio Avila, then 15, kept warm with a cup of soup amid donated clothing in Midland Beach on Staten Island.

MICHAEL KIRBY SMITH FOR THE NEW YORK TIMES

A police team rescued Haley Rombi, then 3, in the Dongan Hills neighborhood of Staten Island.

DAMON WINTER/THE NEW YORK TIMES

The moon lighting the Avenue of the Americas in Lower Manhattan, much of which lost power.

MARCUS YAM FOR THE NEW YORK TIMES

Neighbors pitched in to clear Nevada Avenue in Long Beach, N.Y., where sand covered the roadway.

HURRICANE SANDY: 10 YEARS LATER

IN THE CITY, STEPS TO REBUILD AND PREPARE

By ANNE BARNARD

Hurricane Sandy woke up New York City to an existential crisis. It made clear that climate change — rising seas, more powerful storms and extreme heat spurred by burning fossil fuels — is no abstract idea to a city built on islands and swamps. Leaders promised bold action: not just to repair the damage, but to reshape New York to thrive in a chaotic climate.

A decade later, we are only just beginning to act, and the path forward is murky. The metropolitan area has seen billions of dollars committed to rebuilding and protecting hard-hit areas; sweeping new laws to cut emissions and build resilience; a growing climate and environmental justice movement. Cutting-edge projects, like restoring wave-calming oyster beds and building "living breakwaters," come with revived attention to the waterfronts that first made New York a great world city.

THE NEW YORK TIMES

But the verdict is clear: We have not done enough. We are not moving fast enough. We do not have a comprehensive plan or a clear route to one, despite the energetic efforts of leaders, agencies and communities. So say scientists, urban planners, officials and front-line residents, in scores of interviews and hundreds of pages of government, academic and advocacy reports.

Dauntingly, no single solution can protect the whole city. Each neighborhood has its own topography, architecture and demographics, and thus its own needs. So, trying to grasp the whole, we explored five hard-hit areas, each grappling with its own set of challenges.

The good news: Everywhere was a ferment of experiments, collaborations, innovations. Everywhere were people who since the hurricane have changed their lives. A home health aide turned environmental researcher. An ex-contractor monitoring marsh grass. Retirees who, to protect others, let wetlands reclaim the only homes they had known. A security technician taking Fridays off to problem-solve a shared predicament with strangers from faraway neighborhoods. Can all their dynamism add up to a solution?

Photographs by JADE DOSKOW for The New York Times

Hurricane Sandy knocked out power and water for the 6,000 residents of the Red Hook Houses, which are now undergoing flood-proofing at a cost of $550 million.

Red Hook, Brooklyn Frustrated With Progress, Locals Take Action

HURRICANE SANDY FLOODED nearly every block of Red Hook, a wind-battered lump of Brooklyn jutting into New York Harbor. The surge knocked out power and water at the Red Hook Houses, New York City's second-largest public-housing complex, and it deluged storefronts and townhouses along gentrifying Van Brunt Street.

Karen Dawn Blondel, an engineering assistant, watched water sweep into the Houses: "A slow flush," as she put it, "then panic." Like most of the other 6,000 tenants there, she would spend a month heating water on her gas stove to stay warm. To Joseph Gibson-Pitt, who was 14 when his neighborhood was inundated, Red Hook seemed to go "back in time." Past Van Brunt, the main commercial street, the flood destroyed century-old houses, displacing homeowners like Tim Gilman-Sevcik, a creative director in advertising, and many of his neighbors.

Ten years later, fighting for recovery and climate resiliency has become part of Red Hook's daily life, even its identity. Every year on Sandy's anniversary, neighbors march in the Barnacle Parade with homemade floats and sometimes placards demanding faster climate action. Construction sites and sandbags dot the streets. Resiliency is a neighborhood motto.

Take a Thursday in October: Middle-school students planted trees to catch rainwater and relieve heat near workers laboring on a $550 million project to flood-proof the Houses, where Ms. Blondel now works on environmental-justice issues. Blocks away, her cousin taught high school students to build sensors to track air pollution. Off a nearby pier, Mr. Gibson-Pitt, now training to install solar panels, helped Mr. Gilman-Sevcik, who runs a resiliency organization, build a kelp farm to experiment with aquatic plants as storm defense.

Yet pride can't undo racial and economic fissures carved by housing discrimination, environmental inequality and industrial decline. Nor can it tame what a report by the city comptroller, Brad Lander, published this month, called "the current fractured and ad hoc nature of resiliency planning."

In Red Hook, Karen Dawn Blondel, above left, works on environmental-justice issues. Jim McMahon, above, a cartographer, made a map of the flood that is now a key reference document.

Today, it's unclear whether Red Hook will remain habitable — although city officials say this is the plan — or for how long. Many residents welcome two major flood protection projects, the long-awaited, federally funded Houses upgrade, and a city-run plan to protect low areas along Van Brunt and the waterfront. The plan envisions raised streets and walls topped with an extension of the Brooklyn Greenway bike path.

But few in Red Hook are confident that the neighborhood will get its due.

One result of the uncertainty: People trickle away, often those with the fewest choices, fraying Red Hook's fabric. In the immediate aftermath of the storm, there was an exodus of businesses, homeowners and renters who could not afford to front cash for repairs or wait out the slow, confusing process of the city's Build It Back program. One recent afternoon, German Moreno, 61, was preparing to leave his home of 20 years, in the Houses' Red Hook East section. He surveyed a bare expanse of dirt, tarps and construction tools, teeming with the unmistakable squeaks of rats.

The scene contrasts, at least for now, with the New York City Housing Authority's award-winning resiliency project, promising flood walls topped with grass, courtyards raised above level, like the utilities that have started moving into elevated sheds. When residents complain about slow progress and the removal of trees and playgrounds during a pandemic, housing officials blame federal delays and inevitable hassles. But after years of temporary boilers, noisy generators and constant construction — plus a "falling apart" bathroom and ceiling and a dog constantly exposed to rat poison — Mr. Moreno is done waiting.

"I can't take it any more," he said.

Red Hook's natural and political history set it up for disaster. It was mostly salt marsh in 1776; cannons fired from Fort Defiance repelled a British ship, letting revolutionaries fight another day. For a century, it was a major port, built on haphazard landfill. Irish and Italian dockworkers lived in the Red Hook Houses until container shipping moved their jobs to New Jersey. Black and Puerto Rican residents became the majority in a redlined, polluted transit desert, isolated by new highways, the Gowanus Canal and, later, drug gangs.

Ms. Blondel moved there in 1982. She did not yet riff expertly about the risks of living near sea level, atop a fill of oyster shells and timber, less than 10 feet above groundwater, downhill from sewers, near a toxic canal that overflowed in heavy rain. She did complain, though, as she drafted blueprints and inspected buildings, about backlogged maintenance, mold-spawning leaks and cracks, lead paint, broken drains and sump pumps — problems that would make Hurricane Sandy disproportionately harmful here. (By 2050, a quarter of the city's public housing will sit in expanding flood zones.)

In Sandy's first hours, with official responders overwhelmed, people helped one another stay safe, clean and fed. Red Hook neighbors — from the Houses and the townhouses — carried bottled water up dark stairs for the stranded. Restaurants on Van Brunt cooked for the neighborhood. Ikea, its newish, flood-proof building dry, offered aid centers, gave out furniture and ran free ferries. Jim McMahon, a local cartographer, gathered witness accounts and photos to make a map of the flood, a key reference document today.

There were dissonant notes. Mayor Michael R. Bloomberg came to celebrate the reopening of Fairway, the upscale grocery store, in December 2012, but he skipped the Houses, home to more than half of Red Hook. The Fine Fair, the supermarket more popular with those residents, never reopened. Eighty percent of Red Hook's first major grant, through a foundation, went to small businesses along Van Brunt, mostly boutiques and restaurants.

Red Hook's recovery, some researchers argued, spurred "disaster gentrification," attracting buyers who could afford flood measures and high insurance rates. Mr. McMahon, the mapmaker, put it differently: Hipsters and artisanal stores "just exploded," he said. "It's like people want to live in a flood zone. It's crazy — what wake-up call?"

But common problems remained. The Houses' senior center took five years to reopen. The whole area waited nearly nine years for even temporary flood protection. It arrived in the form of rows of four-foot sandbags, separated by large gaps to be closed in emergencies by deployable barriers — ones meant for storms smaller than Sandy.

So what *is* being done for future climate events? The Red Hook Initiative, a local nonprofit, has trained more than 200 residents to help guide neighbors through any new disaster, and set up a solar-powered Wi-Fi system. And through the City University of New York, Ms. Blondel's cousin, Carolyn Ferguson, combines science, activism and career training to teach local students to monitor pollution from trucks in the area.

"Environmental justice," Ms. Ferguson said. "It's for everybody."

'It's like people want to live in a flood zone. It's crazy — what wake-up call?'
JIM McMAHON
RED HOOK RESIDENT

Lower Manhattan Heated Struggle Over Endangered Green Spaces

THE STORM SURGE WAS utterly indiscriminate in destroying neighborhoods. But the response from the city clearly showed its priorities. Within 48 hours after Hurricane Sandy hit Lower Manhattan, with its iconic skyline and the financial engine of Wall Street, the New York Stock Exchange was up and running again. Across the river, many public housing residents in Red Hook waited close to a month for heat and electricity.

When the Sandy conversation turned from immediate recovery to future resilience, the focus landed again at the foot of Manhattan. Few doubted that job No. 1 was to build a state-of-the-art new waterfront. New York, it was often said, would now show the world how to climate-proof a great city.

A global design competition ensued. Starchitects, young thinkers on the cutting edge of resiliency work and global engineering firms pitched visions for different parts of the city. Of the winners, the most high-profile design, known as the BIG U, envisioned a necklace of flood barriers — varying grassy berms and elegant promenades — hugging the curves of Lower Manhattan. In conceptual drawings, they were pretty, pleasant and fun.

With consensus and marketing behind the project, not to mention billions of dollars committed from city and federal coffers, you might assume that something like the BIG U had already been triumphantly unveiled, before the hurricane's 10th anniversary. You would be wrong.

This month, instead of basking in a ribbon-cutting, the BIG U — or rather a segment of the string of projects it became in real life — was cited as a kind of cautionary tale in the comptroller's report. Three times.

The reasons are at the heart of so many urban planning conflicts in New York, where every block of shoreline can be contested over personal, economic, historical, environmental, social-justice, cultural, health or other issues. And the city has more than 520 miles of coastline, in rich and poor areas alike.

But first, the citations: The chain of resiliency projects around Lower Manhattan, the successors to the BIG U concept, create the kind of "resource disparity" to be avoided. The one that is furthest along, the 2.4-mile stretch called East Side Coastal Resilience, by itself has $1.9 billion in committed capital funds, compared with zero in many neighborhoods. And it is far from done, having spent just 13 percent of that budget, with a use-it-or-lose-it deadline looming in 2025.

The report also offers up the East Side project — which reshapes the riverfront from 25th Street down to the Lower East Side, aiming for a tricky balance of flood protection, parkland and waterfront access and felling 1,000 trees in East River Park along the way — as a "well documented" example of "complex community dynamics" that show "how challenging it can be to find consensus in practice."

That undoubtedly refers, with dry understatement, to repeated scenes of protesters chaining themselves to doomed trees.

As in most New York resiliency disputes, people on both sides seem to agree that there is an urgent climate crisis, but disagree, sometimes vehemently, on how to approach it.

That is the case again on another stretch of the U, which runs for several blocks in Battery Park City on the west side of Lower Manhattan. Some residents, like Britni Erez, 40, are fighting a $221 million plan that would demolish another popular green space, Robert F. Wagner Jr. Park, and rebuild it about 10 feet higher, roughly 20 feet above sea level, while burying a flood wall underneath the lawns.

Ms. Erez said she and others against the plan are not climate deniers, but like East Side residents who fought the demolition of East River Park, they feel sure there must be an option that would be gentler on the park they love. They have help from Wagner Park's original designers, who have proposed an alternative plan to build a wall behind the lawns and gardens in the existing park. "We don't have much open space, so every square foot of green space is important," Ms. Erez said. "It's New York City."

Sea wall construction under the F.D.R. Drive near 23rd Street.

But officials with Battery Park City Authority, a state-run public-benefit corporation that oversees Wagner Park, have refused to delay their plan. They say they have looked at other options and addressed community concerns in six years of community meetings and assessments and come to a different decision.

"There are things that won't be the same as they were before, and many folks liked the way they were before," said Gwen Dawson, a vice president at the authority who said she sympathized with residents who are experiencing what is increasingly recognized as "climate grief."

As the comptroller's report notes, "conversations about neighborhood change are hard." But it counsels against dodging even the most "sensitive" issues, which the report cloaked in blandness, like "new waterfront infrastructure" (changing views, parks or beaches) and "climate migration" (having to leave your sinking home).

The comptroller argues for a citywide climate adaptation plan that creates a "clear framework" for assessing each neighborhood's risks and options holistically, considering all factors and incentives from zoning changes to buyouts and relocation assistance.

The City Council passed just such a law last year, requiring City Hall to make just such a plan. But like the comptroller, the Council has trouble making City Hall do things.

CONTINUED ON FOLLOWING PAGE

The East Side Coastal Resilience project, which will reshape a stretch of the riverfront, has $1.9 billion in committed capital funds, compared with zero in many neighborhoods.

A TIMELINE OF THE STORM

OCT. 11-26, 2012
The Beginning
A tropical wave leaves the west coast of Africa and within a week reaches the Caribbean Sea, where it develops into a hurricane by Oct. 24. It makes landfall in Jamaica, then Cuba, before passing through the Bahamas, where it increases greatly in size.

OCT. 26-29
On High Alert
As the hurricane turns toward the United States, the New York region declares a state of emergency. Airlines cancel flights. New York City closes schools and suspends subway, bus and commuter train service. The stock exchange closes, and Broadway goes dark.

OCT. 29
Devastating Flooding
The storm makes landfall near Atlantic City, N.J., in the evening. The size of the storm, which arrives near high tide, results in extensive and severe flooding in New Jersey and New York.

OCT. 29-30
72 Deaths
As it moves ashore, the hurricane becomes one of the deadliest storms in U.S. history, resulting directly in the deaths of 72 people. In New York, there were 48 deaths, the most for any state, followed by New Jersey with 12. Five people in Connecticut died.

OCT. 29-30
Houses Burn
Breezy Point, Queens, is ravaged. Flooded streets impede firefighters, and a blaze fueled by the storm's winds burns down 126 homes. It is one of the worst residential fires in the city's history.

OCT. 29-31
Hospitals Evacuate
Bellevue Hospital Center, New York's flagship public hospital, evacuates more than 700 patients and shuts down after its backup power generators fail. NYU Langone Medical Center also evacuates more than 200 patients after its backup power system fails.

NOV. 2
Race Canceled
After a public outcry, the New York City Marathon is canceled for the first time since it began in 1970. Critics opposed holding the race on Nov. 4 while many New Yorkers were still without power and suffering from storm damage. Nearly 50,000 runners expected to compete.

NOV. 9
Gas Crisis
The city begins rationing gasoline for the first time since the 1970s. Parts of Long Island and New Jersey also start rationing gas after the storm causes widespread supply problems and knocks out power to gas stations.

DEC. 7
Presidential Order
President Barack Obama issues an executive order creating the Hurricane Sandy Rebuilding Task Force to coordinate rebuilding efforts. It will be led by the housing secretary, Shaun Donovan, a former city housing commissioner.

DECEMBER
Looking at Resiliency
City officials convene the Special Initiative for Rebuilding and Resiliency to look at how to make the city's communities, buildings and infrastructure more resilient to climate change.

HURRICANE SANDY: 10 YEARS LATER

IN THE CITY, STEPS TO REBUILD AND PREPARE

South Beach, Staten Island. On the island's southeastern shore, Hurricane Sandy arrived as a 14-foot storm surge that ravaged blocks of bungalows and small apartment buildings.

Staten Island Within the Flood Zones, Those Who Leave and Those Who Stay

WHAT DOES A COASTAL COMMUNITY need after a natural disaster? Maybe it needs wildflowers and geese, fields of vegetation and wide-open spaces, where foxes and deer roam. Maybe it doesn't need houses at all. Maybe it needs more destruction.

In the Staten Island hamlets of Oakwood Beach, Ocean Breeze and Midland Beach, on the island's southeastern shore, Hurricane Sandy arrived as a 14-foot storm surge that ravaged blocks of tidy bungalows and small apartment buildings. These were modest communities where families tended to remain for generations, lured by the beach lifestyle and willing to overlook the floodwaters that regularly flowed over their low-lying lands.

Sandy was something different.

Whole blocks of houses were destroyed, and 24 people in Staten Island lost their lives, more than in any other borough. More than 5,000 residents applied for federal emergency assistance.

For many, it meant a reckoning: Did it really make sense to keep restoring or rebuilding homes on lands so prone to flooding? The communities were built on wetlands as affordable housing on the city's fringes, replacing a natural buffer against rising seawater. Sandy made that development strategy seem no longer viable.

Instead of rebuilding, the state — bolstered by federal funds — adopted a strategy known as "managed retreat," buying damaged homes for the purpose of destroying them and returning the land to a state of nature, to protect against the next storm surge. Unlike many emergency-response programs, the buyout strategy was initiated by homeowners in the area, who organized locally.

In Oakwood Beach and other neighborhoods, the state bought damaged homes and cleared them.

"That's a unique thing in a place like New York City, where people have issues with housing affordability," and may not be able to afford to move, said Tyler Taba, a senior manager for climate policy at the Waterfront Alliance, a coalition of activists, businesses and civic organizations that supported the plan. Residents had the option to stay.

As an incentive, the Governor's Office of Storm Management offered homeowners the pre-Sandy market value of their damaged properties, plus a sweetener of up to 15 percent.

It was an offer many residents found hard to resist. "We were afraid the next storm would be even worse," said Danielle Mancuso, who was six months pregnant when Sandy hit. She and her family took the buyout and eventually bought a house in Goshen, N.Y., in the lower Hudson Valley. "Getting as far away from the ocean as possible was very important to us," she said.

The state bought more than 500 homes, clearing most of them to return the land to nature. The most recent house was destroyed this May.

But a small group of residents did not want to leave, or could not, or thought that if they left, the neighborhood where they raised their children would ultimately pass to developers for luxury beachfront housing. So they stayed, leaving the communities semi-populated, with solitary homes dotting expanses of open land. Wild turkeys, which thrived in the new open spaces, outnumbered the human inhabitants. Public services like garbage pickup and road maintenance declined, and drivers never knew when their cars would get stuck in mud puddles or be damaged by potholes.

Of the residents who moved elsewhere in Staten Island, a significant share chose parts that were similarly vulnerable to flooding.

Housing advocates argue that responses to storm damage often follow the same contours as economic inequality. Buyout programs like Staten Island's tend to be offered to low-income areas, depleting their bonds of community. Wealthier areas, by contrast, get expensive remediation programs.

"It's a huge problem," said Mr. Taba of the Waterfront Alliance. "When we think about relocating people, the conversation goes to the Rockaways, Coney Island, Staten Island. We don't hear it for the financial district and the Lower East Side. We hear about billion-dollar infrastructure resiliency programs. Where's the BIG U for Staten Island?" he asked, referring to a 10-mile protective barrier proposed for the lower third of Manhattan. In areas of Long Island that suffered severe coastal damage in Sandy, the state buyout program got few takers; most people chose instead to rebuild.

And on Staten Island and in other coastal wetland areas, the Sandy buyout should be just the beginning, said Greg Jacob, a senior policy analyst at the Nature Conservancy in New York.

"We need to start preparing the island now for the next big storm," Mr. Jacob said. "We need to do these buyouts in a pre-emptive manner, not a reactive one after the damage is done."

As storms like Sandy become more common, managed retreat programs may spread to more neighborhoods, including affluent ones. But for now, as the real estate website Curbed noted in 2016, New York developers are pushing in the opposite direction, building up the waterfronts in Williamsburg and Greenpoint, in Brooklyn, and Long Island City, in Queens, all prone to storm surges.

Since 2014 more than 2,000 buildings have gone up in the 100-year floodplain, according to the comptroller's report. The city tax base relies on these areas. If managed retreat comes to them, where will all those people go? *JOHN LELAND*

'We need to start preparing the island now for the next big storm.'
GREG JACOB
A SENIOR POLICY ANALYST, THE NATURE CONSERVANCY

Hollis, Queens Fatal Floods Where Sandy Didn't Reach

NOTHING ABOUT HOLLIS SAYS, "This is the kind of place where the rain might drown you in your basement." The neighborhood sits in the heart of Queens, nowhere near an ocean, a bay or even a visible creek — Hurricane Sandy barely registered there, bringing wind and light rain but no floods — and its sedate streets of closely packed single-family homes have not stopped broadcasting the borough's siren song for new New Yorkers looking for their first house.

This is what lured Ramrattie and Ragendra Shivprasad and their two young sons to Hollis in 1997, soon after immigrating from Guyana. They fell for the cozy little rows of houses, their triangle roofs just like a child would draw.

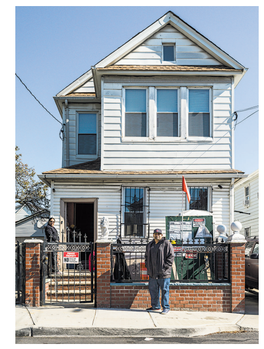
So committed were they to saving for a house there that they lived for a time on the dark underside of the picket-fenced neighborhood, in a windowless basement. When they finally bought their place on 183rd Street, and a man their son Amit knew from his after-school grocery job asked if his relatives, just arrived from Trinidad, could rent the basement, they jumped at the chance to ease their debts and help a family climbing the ladder behind them.

Only in hindsight did these arrangements strike them as unsafe. Basement apartments — mostly illegal — are a fact of life in much of Queens. City Hall estimates there are 50,000 across the city, often packed with large families or multiple roommates.

Then, last year, nine years into the city's attempt to grapple with Sandy's wake-up call, the climate crisis sent another. Downpours trailing Hurricane Ida dropped so much water, so quickly, that streets turned into lakes and rivers — not in the waterfront neighborhoods devastated by Sandy but inland, on hillsides and in hollows where rainwater flows, gushes and collects.

Ida killed at least 16 people in New York, many of them in basement apartments across the city. Among them were Tara and Nick Ramskriet, who by then had lived in the Shivprasads' basement for 14 years.

Though the death and destruction were not on Sandy's scale, the unexpected ferocity of the floods was just as shocking. The revelation this time was that the mantra "prepare for the next Sandy" was a gross understatement. The city also had to worry about sudden downpours — a more regular occurrence than hurricanes, intensified by the heating of the planet — which requires a whole other set of complex, expensive fixes.



Amit Shivprasad and his mother, Ramrattie Shivprasad, in front of their home, which flooded last year during Hurricane Ida.

City and state agencies scrambled to work on new flood maps, emergency warning systems and proposals for drainage systems, porous streetscapes and rain gardens. As with Sandy, there was much to build on, a global playbook of resiliency ideas that combine built and natural infrastructure. Buried streams, like Tibbetts Brook in the Bronx, are being "daylighted" to absorb more runoff. Playgrounds are being designed with reservoirs to store excess runoff. Storm drains are to be cleaned more regularly. Sewers are being expanded; in southeast Queens, where Hollis sits, the city was already working on a $2 billion drainage project.

But just as Hurricane Sandy revealed the vulnerability of neglected public housing, Ida threw into relief the housing shortages that drive thousands of people to illegal basement apartments and the backlog of localized flood problems in Hollis and elsewhere that residents had begged the city to address.

"They knew," Amit Shivprasad, now 40, said during a recent visit to the family house, which is still undergoing repairs. Over the years, he and his neighbors had called 311 repeatedly to report floods on their block.

They had been more prepared than most. In 2002, when the Shivprasads still lived in a nearby basement, a flood destroyed most of their belongings. So in their new house they had built plywood barriers that they slipped into their doorframes when it rained.

But in Ida's flood, the weight and pressure of water was so strong that it collapsed the house's foundation, filling the basement to the ceiling in what seemed like an instant, trapping the two tenants. Even the city's attempt to improve things may have worsened them: Workers installing bigger storm drains had left some grates covered with plastic, Amit said, to keep water out of the work area and protect equipment. This practice was common enough that Amit's father frequently went out with his machete before storms to slash the plastic so the water could drain.

But what did surprise the Shivprasads was the news brought by a Gothamist reporter: Their block was built over a pond, shown on a 1907 map. It had been filled in and forgotten; the area was not even designated as a flood zone. Other Ida deaths, too, happened in places with buried waterways.

A year later, Amit has a new calling. He has printed up T-shirts with the old map and the slogan, "No one cares that we live on a pond." He takes off every Friday from his work as a security technician at Credit Suisse and works the phones. He pushes the city to reverse its decision not to pay any claims for damages from the floods, arguing that officials should never have allowed the neighborhood to be built, and that the city should buy out residents and turn the block back into a pond — the same conversation taking place in areas devastated by Sandy.

"We'd take it in a heartbeat," Amit said, adding that while there are still people willing to buy on his block, he doesn't want another family of migrants to "work, work, work, work, work" to buy a dream house in a place where it maybe should not be. "I don't want this to happen to anyone," he said.

Jamaica Bay A Balance of Engineering and Ecology

A CENTRAL RESILIENCY QUESTION demands attention on New York City's most magical commute, past seaside shacks, over sea grass, speeding above glassy water that seems close enough to touch — the A train to Far Rockaway, Queens. The tracks across Jamaica Bay hang so low that Hurricane Sandy stopped the subways there for a full year.

Brett F. Branco usually drives over the causeway, stopping just north of Broad Channel, an island neighborhood in Queens pierced by canals. There, he walks into the reedy marshes and tries to answer the big question, by measuring the elevation and stability of tidal mud flats around West Pond, a 45-acre nature refuge. How much, he wonders, should we fight the water, and how much should we welcome it?

A decade ago, Sandy breached the rim of land enclosing the pond, one of countless microhabitats that make the bay a centerpiece of urban biodiversity; last year, the Jamaica Bay Conservancy restored the shoreline with sediment and thousands of native plants. Now Dr. Branco, the executive director of the Science and Resilience Institute at Jamaica Bay, a Brooklyn College research center, wants to know how the rejuvenated wetland is reducing erosion.

The research is one of many efforts to test the ability of coastal ecosystems to protect themselves — and humans — from storms and rising seas. Behind it is a deeper question animating many adaptation debates: Do we try to tame the elements, building walls, gates and berms? Or do we interact with them, creating or restoring natural shorelines that absorb water, adapting structures that can accommodate its flows and moving those that cannot?

To a growing cadre of scientists and designers, the answer is a mix, determined by "hyperlocal conditions": each place's shape and ecology, as well as the needs of people who live there.

"Pitting our engineering prowess against nature is a constant battle and can't solve the whole thing," Dr. Branco said. "As we protect human health and infrastructure, we also have an obligation to protect ecosystems and habitats, especially in New York City; we're living on estuaries and marshes, our equivalent of rainforests." He added, "We want to know if we can do both at the same time."

Doing nothing is not an option. If sea levels rise six feet by 2100, the high-end estimate of the city's climate panel, most of the neighborhoods around the bay will be inundated daily by high tide alone; future storms will only be worse.

Brett F. Branco, the executive director of the Science and Resilience Institute at Jamaica Bay, at the Jamaica Bay Wildlife Refuge.

In Jamaica Bay, the right balance can vary from block to block, not always aligning with the area's patchwork politics.

James Hardat, 40, a research assistant, trudged through mud one recent morning with Dr. Branco, keeping an eye out for blue herons. He traded in his tile-work career after the Trump administration pulled out of the Paris climate accords.

Distraught, he wanted to make amends for his construction projects that wasted materials and helped heat the planet; he decided to study environmental science at Queens College and work on habitat restoration. But he has found allies in pro-Trump, S.U.V.-driving volunteers who join him in planting marsh grasses in their bayside neighborhoods.

"They were putting all that energy into protecting their area," he said.

FloodNet, a growing citywide sensor network that tracks real-time flood data, has energetic collaborators on streets plagued by tidal flooding, whether they fly thin-blue-line flags or Black Lives Matter banners. And in Broad Channel, Dr. Branco's mix of natural and built solutions is on display. Residents have welcomed hefty construction to raise streets and build bulkheads; they also pitch in to restore wetlands and build byways for turtles.

In the nearby enclave of Edgemere, on a promontory studded with weathered and collapsing bungalows, one structure stands out: a house with warm yellow stucco, a Trinidadian flag and a garden of marigolds. Cortnie Walker, a union ironworker, bought it in 2005, leaving Flatbush, Brooklyn, so his daughter could play outside and he could walk by the water every day.

But since Sandy, Mr. Walker said, the place feels less like a neighborhood. Risks are starting to mar the rare, affordable beauty that has lured generations of middle-class homeowners.

"People want to stay and be safe," he said, "but they need a little more assistance."

He wants to learn more about an elaborate and expensive proposal by the Army Corps of Engineers to install bulkheads — a mix of flood walls and plantings — in flood-prone neighborhoods. He hopes it can help.

The Walkers are lucky enough to have a second floor, where they rode out Sandy, but neighbors in bungalows were forced to climb onto their roofs. Many then moved away. Some rental properties became halfway houses; more were torn down or boarded up, some dozen of them sold to the city in a climate buyout program to turn the land into a natural buffer. The Walkers would like to raise their boiler from the basement, but without new city incentives, the cost would be prohibitive.

Past the Walkers' porch, toward the water, grasses and salt-loving plants overflow from empty lots, their seed tops glowing in sunset light. It is a place Dr. Branco thinks about frequently. "All those phragmites and goldenrod — these are the boundaries between the water and the land," he said. "Maybe this is nature telling us where they should be."

A TIMELINE OF THE STORM

JAN. 28, 2013
Emergency Aid
Congress approves nearly $51 billion in emergency aid after months of pleas by the governors of New York and other storm-damaged states. The money will help millions rebuild their homes and businesses and pay for the repair of highways and transit systems.

JUNE
Road Map for the City
The city releases "A Stronger, More Resilient New York," a 438-page report that analyzes the city's climate risks and provides a road map to protect its neighborhoods and infrastructure with more than 250 specific recommendations.

JUNE 2014
The BIG U
A federal competition for resiliency projects, Rebuild by Design, awards $920 million to six winning ideas. The largest amount, $335 million, goes to the BIG U, which would build a system of flood barriers around the southern end of Manhattan. (Status: In progress.)

MARCH 2015
Housing Complexes
New York City is awarded a $3 billion FEMA grant to repair and stormproof 33 public housing complexes, where the hurricane's storm surge flooded buildings and left some residents without power and heat for weeks. (Status: In progress.)

AUGUST
Coming Back Slowly
Nearly three years after the storm, only a small fraction of homes destroyed by Hurricane Sandy have been rebuilt, in part because of delays, confusion and problems with government assistance programs, including the city's Build It Back initiative.

JANUARY 2019
Subway Repairs
A 15-month shutdown of the L train between Manhattan and Brooklyn is averted after Gov. Andrew M. Cuomo swoops in with a last-minute plan to make repairs to a Sandy-ravaged tunnel on nights and weekends. (Status: Completed.)

FEBRUARY
A Massive Sea Wall?
The Army Corps of Engineers releases a list of options for protecting the metropolitan area from future storms. One is a six-mile-long set of gates stretching from Breezy Point, Queens, to Sandy Hook in New Jersey, estimated to cost $119 billion. (Status: Canceled.)

MARCH
Different Plan
Mayor Bill de Blasio lays out his "new plan" to climate-proof Lower Manhattan: Extend the coastline two blocks into the East River at a cost of $10 billion. (Status: Revised.)

DECEMBER 2021
A Taller Extension
Two days before Mr. de Blasio leaves office, the city's Economic Development Corporation issues a $7 billion plan to protect Lower Manhattan that would create a multilevel public waterfront as high as 18 feet and extending 200 feet into the East River. (Status: In progress.)

SEPTEMBER 2022
Make That 12 Gates
The Army Corps unveils a $52 billion proposal for protecting the region from future storms. Instead of one long wall outside the harbor, the plan is to build 12 movable sea barriers across bays and inlets of New York Harbor.

By WINNIE HU and PATRICK McGEEHAN