

A panoramic view of the New York City skyline from across the water, featuring numerous skyscrapers including the Empire State Building and the MetLife building.

Welcome to our *2021 NYC Candidate School* **Heat & Coastal Resiliency**

February 22nd, 2021
5:30 pm - 7:30 pm



NYC Environmental Candidate School: Heat Resiliency

Daphne Lundi

Heat Exposure Is Deadly

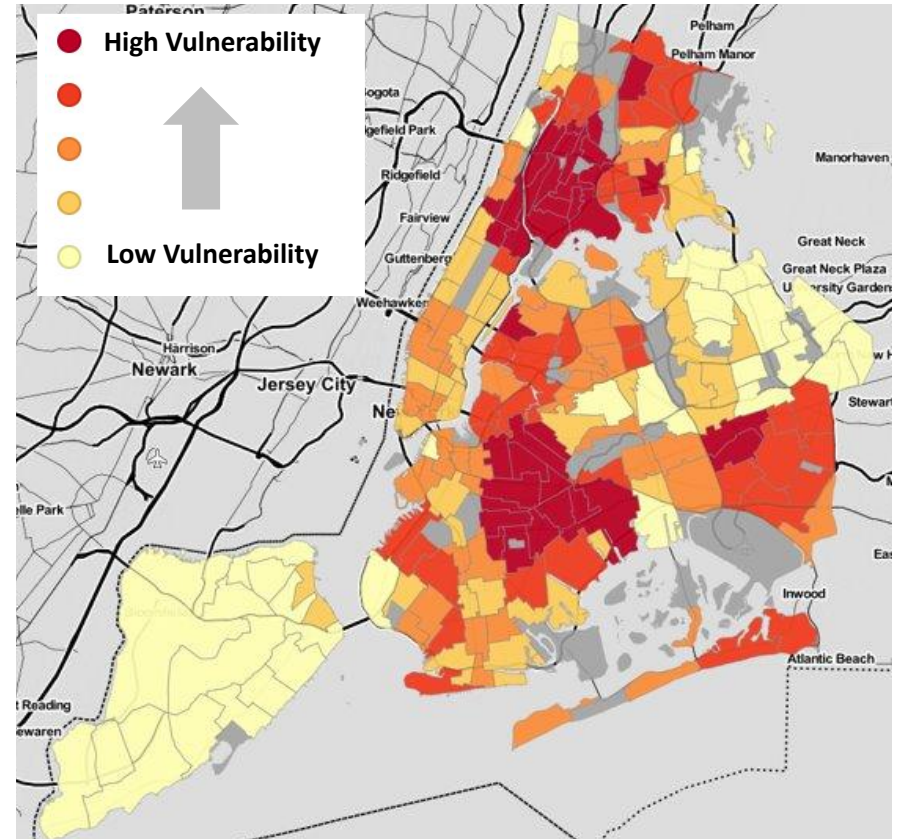
- Cities are up to 22°F hotter than their surroundings
- Indoor temperatures can be 20°F higher than outdoor temperatures without AC.
- ~85% prevalence of residential AC in NYC
- On average, each summer in NYC there are:
 - 450 heat-related ED visits
 - 150 heat-related hospital admissions
 - 13 heat-stroke deaths
 - 115 excess deaths from heat-related causes

Heat Vulnerability Index (HVI)

- Developed by the NYC Health Department and Columbia University.
- Uses social and environmental factors to determine risk of NYC neighborhoods during and immediately following extreme heat events.

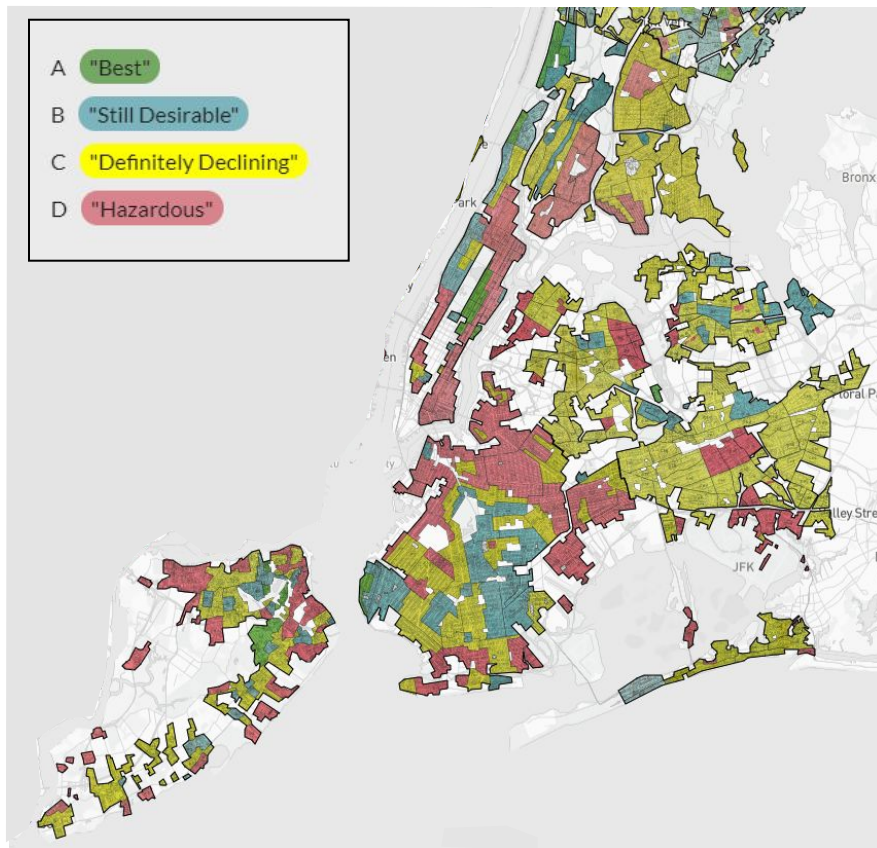
Environmental Factors: daytime surface temperature, location of green spaces

Social Factors: poverty, % of Black residents, % Air Conditioning

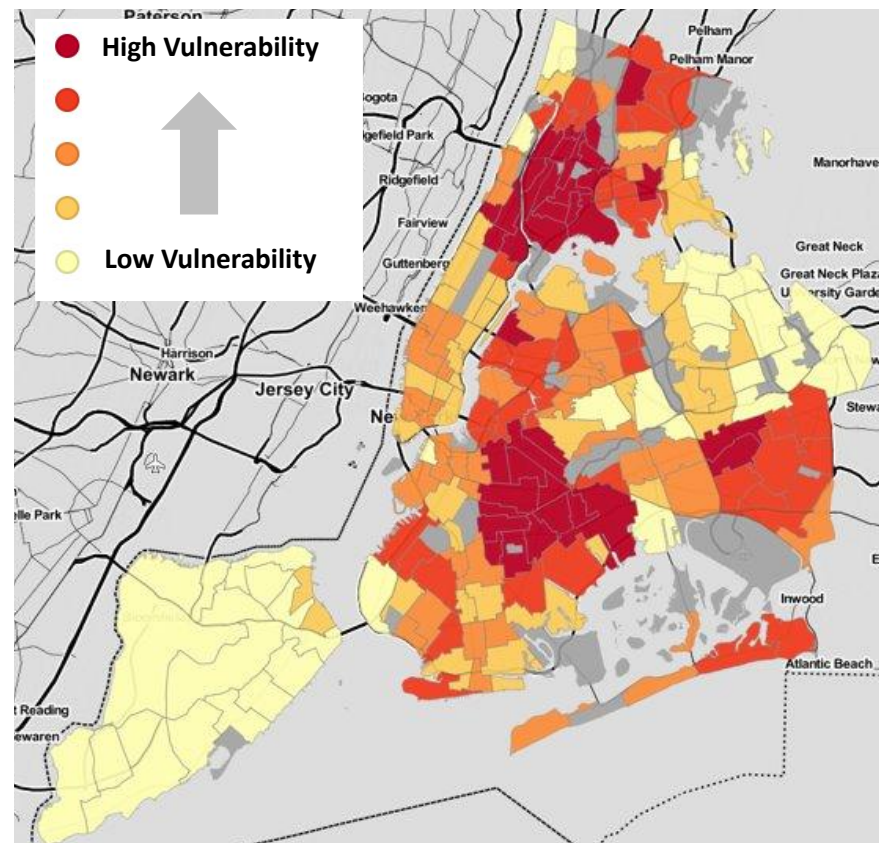


NYC Department of Health
<http://www.nyc.gov/health/heat>

Inequality Exacerbates Climate Risk



HOLC maps
<https://dsl.richmond.edu/panorama/redlining>



NYC Department of Health
<http://www.nyc.gov/health/heat>

Cool Neighborhoods NYC

City's First Heat Mitigation Plan

- \$100M allocated to tree planting in high heat vulnerable neighborhoods
- Implementation of Cool Roofs
- Improvements to Cooling Center Signage
- Climate Risk Training for HHAs and CBOs
- Be a Buddy check-ins to vulnerable New Yorkers



Targeted Tree Plantings



Anna Yatskevich

- \$100M allocated to plant street trees and park trees in high heat vulnerable areas
- Plantings improve overall tree canopy which helps to minimize urban heat island effect and improve air quality

Cool Roofs

- Free roof coatings for affordable housing and community facilities
- Reduces building energy use and waste-heat from A/C
- Reduces local temperature via clusters of light-colored surfaces.
- Roof coaters receive workforce training
- Over 10 million sq.ft. of white roofs to date



Be a Buddy NYC

- City partnered with CBOs in heat vulnerable neighborhoods to create “Buddy Systems”
- CBOs are trained in climate preparedness & risk awareness
- CBOs reach out to isolated residents in their community to make connections to existing City services.
- Enhance the response capacity & preparedness of local CBOs

A yellow poster titled "Be a Buddy!" in large blue letters. Below the title, it says "During hot weather, remind neighbors, friends and family to:" followed by two bullet points: "• Use an air conditioner, or go to a cooling center or another air-conditioned place, such as a library or mall" and "• Drink plenty of water". Below this, it says "For more information, visit nyc.gov/health/heat. Call 311 to find a cooling center." At the bottom, there are logos for NYC, Department of Health & Mental Hygiene, Emergency Management, and Department for the Aging. On the right side of the poster, there is a cartoon illustration of two men. One man, with dark skin and short black hair, is in a circular frame with a sun icon, holding a white phone to his ear. The other man, with light skin and a bald head, is in a larger circular frame, holding a blue phone to his ear. Between them is a white air conditioner unit with a digital display showing "18°".

Be a Buddy!

During hot weather, remind neighbors, friends and family to:

- Use an air conditioner, or go to a cooling center or another air-conditioned place, such as a library or mall
- Drink plenty of water

For more information, visit nyc.gov/health/heat. Call 311 to find a cooling center.

NYC | Department of Health & Mental Hygiene | Emergency Management | Department for the Aging

9

COVID-19 Summer Heat Plan

- AC program for low-income seniors
- Increased back-up generator supply
- Modified cooling center locations that allow for social distancing
- Targeted spray showers and hydrant openings
- Virtual Climate Risk Trainings
- NYC Open/Cool Streets

GetCool NYC AC Program



Traci Lawson

- \$55M allocated to purchase 74,000 air conditioners for low-income seniors
- City successfully petitioned the Public Service Commission to increase energy bill subsidy for 450K residents.

NYC Cool Streets



Official Website of the New York City Department of Parks & Recreation

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NYC Parks

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Accessibility

View FAQs

Get email updates

Shop Parks

Contact us

Donate Now

Parks

Facilities

Events

Programs

Kids

Permits

Trees

Opportunities

About

Health and Safety in NYC Parks > Cool It! NYC



Email



Print



Translate

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Cool It! NYC

If you're looking to beat the heat this summer, our guide will help you find places to stay cool! With our new Cool It! NYC map, you can find places all across the city to hydrate, refresh, and stay in the shade.

How to Stay Cool

Cool It! NYC is a Citywide plan to increase the amount of cooling features available to the public during heat emergencies, particularly in neighborhoods that face the dangers of high heat.

Hot and humid summer weather can cause heat illness and even death. To measure neighborhoods that are the most at risk during extreme heat, NYC Health and Columbia University developed the New York City Heat Vulnerability Index, or HVI. We used this data to direct new cooling elements to the places that need them most, making sure that we can serve more residents in need during extreme heat events.

Visit NYC Health's [Extreme Heat](#) page to learn more about how you can stay safe and beat the heat.

At NYC Parks, our plan focuses on three elements: spray showers, drinking fountains, and trees.

Spray Showers

During the summer, we turn on the sprinklers at hundreds of playgrounds across the city! In general, we turn on spray showers on days when the temperature reaches 80 degrees or higher. This year, we're adding hundreds of new cooling locations, which means you'll have even more ways to cool off. Our partners at NYCHA also maintain spray showers at public housing developments across the city. No matter where you are, bring the kids and have a splash!

Drinking Fountains

Each year, we turn on thousands of drinking fountains across the city, including more than 950 in areas of high need. Many of our drinking fountains are accessible, and some are designed for bottle refill—and we even have drinking fountains for your pet! Use our map to find the perfect drinking fountain in your area.

Tree Cover

To help you find New York's most shaded areas, we've highlighted parks with particularly thick tree coverage, and we're also featuring our city's leafiest blocks. Use our map to change up your commute to find a cooler route!



Water Features

Misting Stations

Cool areas to relax on days when extreme heat emergencies are in effect.

Spray Shower

Sprinklers and other kid-friendly water features for hot weather fun.

Drinking Fountains

Places to get a sip of water or refill your water bottle.

Other Cooling Locations

Spray showers and hydrant spray caps managed by City agencies.

Shade Trees

Leafiest Blocks

Visit these tree-friendly streets to enjoy the most shade on your next walk.

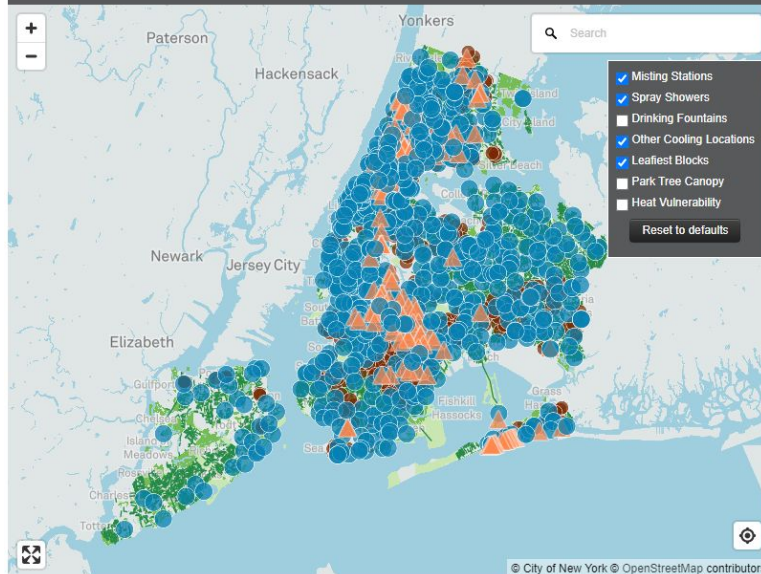
Tree Canopy

For cool rest and relaxation, head to these areas in NYC Parks with the most tree cover.

High Heat Vulnerability Index Areas

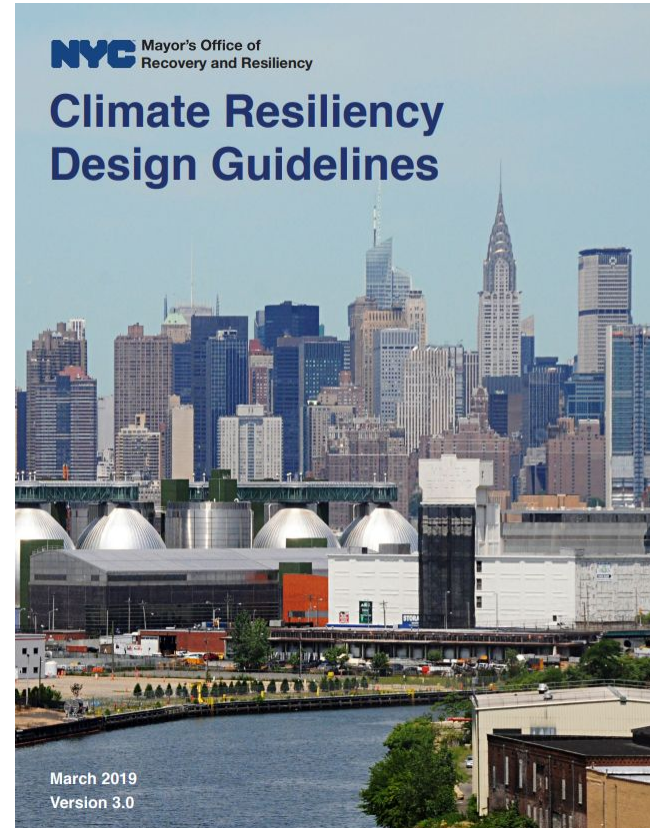
Heat Vulnerability Index 4 Community Boards with the second-highest risk of heat injury or death.

Heat Vulnerability Index 5 Community Boards with the highest risk of heat injury or death.



What Still Needs To Be Done

- Integrate understanding of heat risk and other hazards into city regulatory frameworks
- Increase green infrastructure and cooling features in public realm
- Funding streams for CBOs and retrofits of community facilities



Thank You

Daphne Lundi
daphne.lundi@gmail.com



WE ACT FOR ENVIRONMENTAL JUSTICE

Empowering Communities to Power Change

Sonal Jessel, Director of Policy

@WEACT4EJ

WHO WE ARE

Since 1988, we have worked to build healthy communities by ensuring that people of color and/or low income participate meaningfully in the creation of sound and fair environmental health and protection policies and practices.



**NORTHERN
MANHATTAN
BASED**

**MOBILIZE
PEOPLE OF
COLOR
AND/OR
LOW INCOME**

**ENVIRONMENTAL
AND
CLIMATE
JUSTICE**

**COMMUNITY
-BASED
PARTICIPATORY
RESEARCH**

**PLANNING
AND
PRACTICES**

**FEDERAL,
STATE, AND
LOCAL
POLICY**

FOCUS AREAS



**CLEAN
AIR**



**CLIMATE
JUSTICE**



**HEALTHY
HOMES**



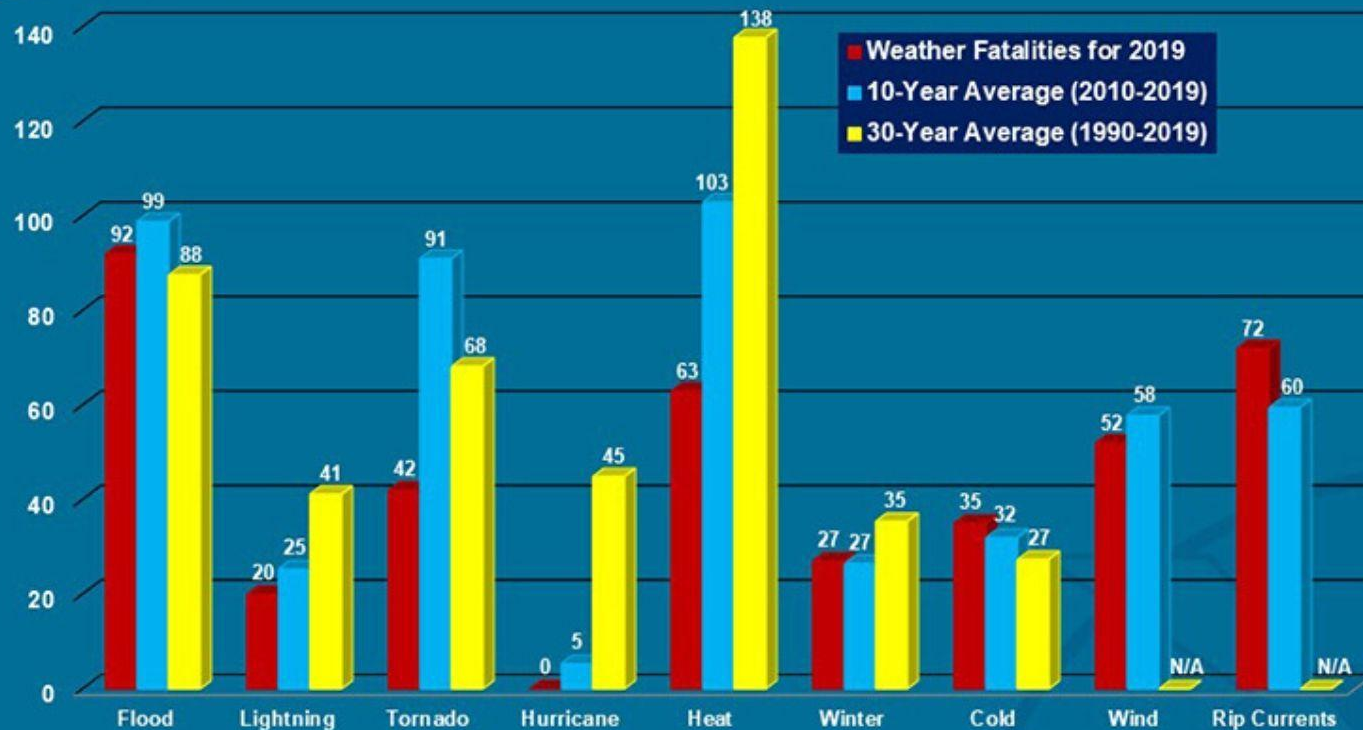
**SUSTAINABLE
& EQUITABLE LAND
USE**



**GOOD
JOBS**



Weather Fatalities 2019



**THIS GRAPH DOES
NOT TELL THE
WHOLE STORY!**

"WE ARE IN THE SAME STORM, BUT NOT ALL IN THE SAME BOAT"



WHO'S ESPECIALLY AT-RISK TO EXTREME HEAT IMPACTS?

- Older adults
- Children
- People with chronic illness
- Pregnant people
- Outdoor workers

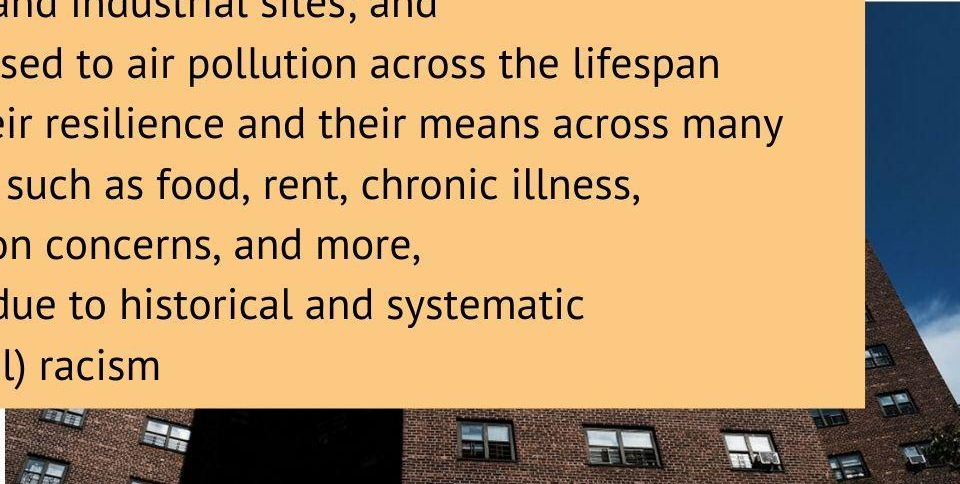


WHO'S ESPECIALLY AT-RISK TO EXTREME HEAT IMPACTS?

- Older adults
- Children
- People with chronic illness
- Outdoor workers

...but also people who

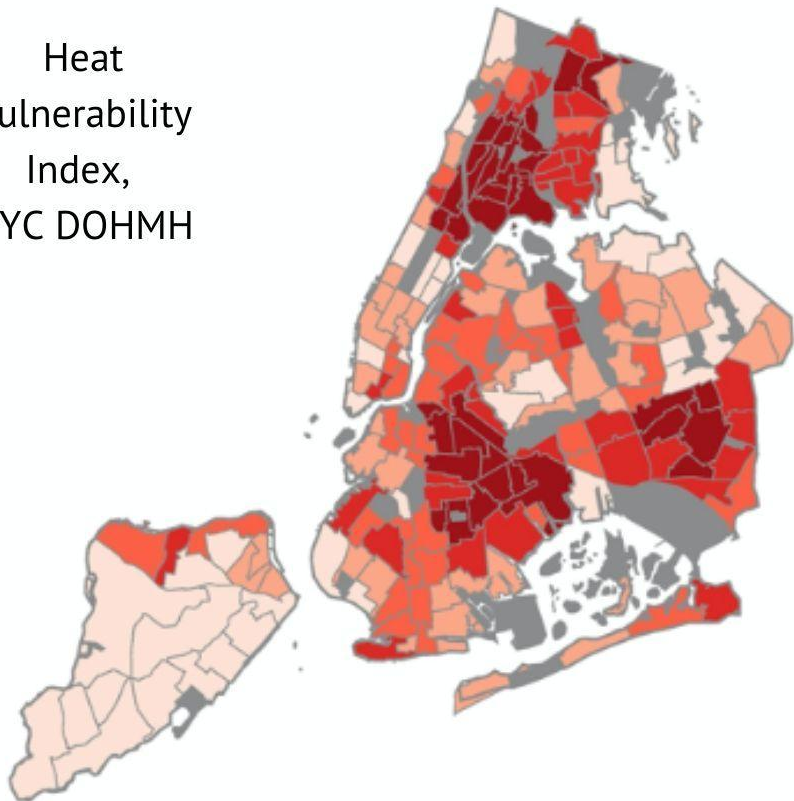
- live in older, poorly maintained apartment buildings;
 - live in crowded apartments with intergenerational living;
 - live in neighborhoods with less green space access,
 - live in neighborhoods with more air pollution from buildings and industrial sites; and
 - been exposed to air pollution across the lifespan
 - stretch their resilience and their means across many hardships, such as food, rent, chronic illness, immigration concerns, and more,
-and it is all due to historical and systematic (environmental) racism



An aerial photograph of the New York City skyline during the 'golden hour' of late afternoon. The Empire State Building stands prominently on the right side of the frame, its spire reaching towards a clear, light blue sky. The sun is low on the horizon, casting a warm, golden glow over the dense cluster of skyscrapers and buildings that fill the rest of the image. The text 'CHALLENGES THIS SUMMER' is superimposed in the center of the image, in a large, bold, black, sans-serif font.

CHALLENGES THIS SUMMER

Heat
Vulnerability
Index,
NYC DOHMH



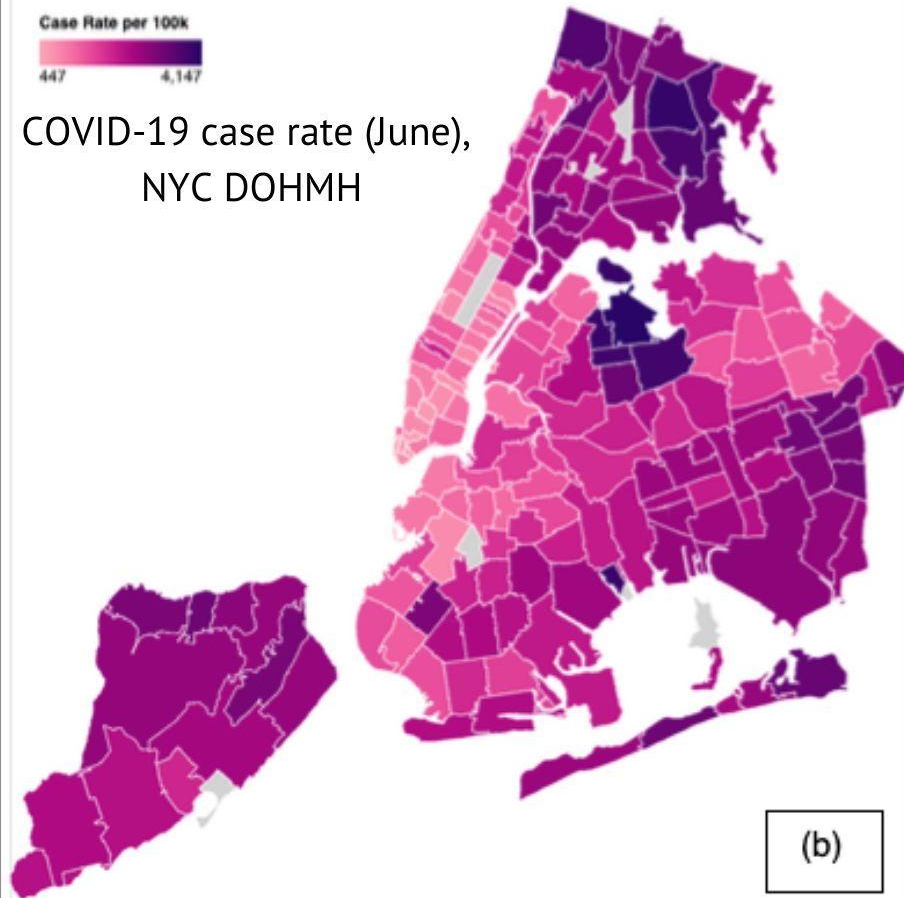
Score (Lowest 1 - Highest 5), 2018



(a)

Case Rate per 100k
447 4,147

COVID-19 case rate (June),
NYC DOHMH



(b)

HEAT, HEALTH, & EQUITY INITIATIVE

What is the issue? The effects of extreme heat disparately impacts Northern Manhattan communities. It is a rising issue that has a negative impact on people's health

Initiative Objective:

Collaborate with residents and partners to create an intersectoral, community-driven plan that leads to effective, equitable policies and resource allocation that addresses extreme heat, an urgent climate change-related threat.





HEAT, HEALTH, & EQUITY INITIATIVE

What is the project? A convening of a coalition of health, climate change, advocacy partners, and residents to develop a community-driven policy plan for reducing vulnerability to extreme heat. The plan seeks to research and build upon two community-identified policy targets:

1. **The Low-Income Home Energy Assistance Program (LIHEAP)**
2. **NYC's Cooling Center Program**



COMMUNITY LEADERSHIP

Community members from across Northern Manhattan will work with WE ACT to build the Implementation Plan, to help spread awareness about climate justice and extreme heat, and participate in workshops to become experts in this topic.

PLANNING WORKSHOPS

93 total community members engaged across the 4 community districts of Northern Manhattan, in workshops designed to gather information about what needs community has when it comes to extreme heat and the use of energy.

STRATEGY COMMITTEE

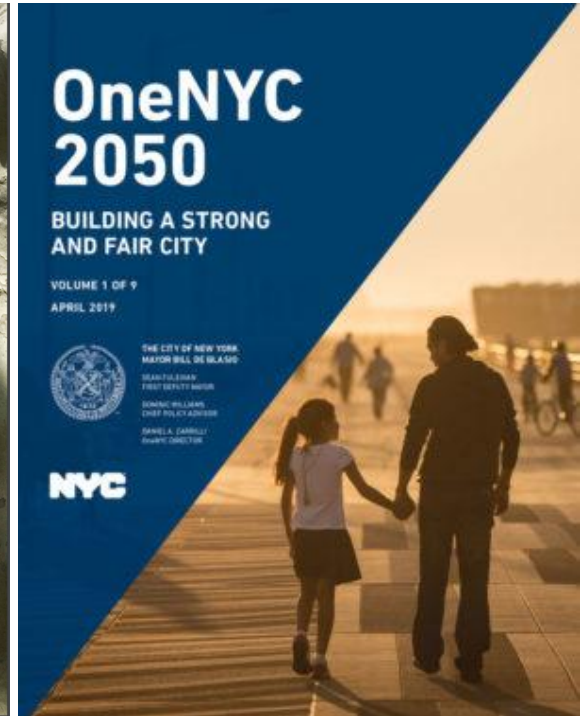
Group of experts and advocates that will provide information needed about LIHEAP and Cooling Centers needed to build the campaign. They advise on the project overall.

IMPLEMENTATION PLAN

Final item due for this project - a plan for a 3-year campaign that uses policy advocacy to improve upon LIHEAP (state-level) and cooling center (city-level) programs

Cooling Centers in NYC

Cooling Center Program NYC



WE ACT + Cooling Center Advocacy





COOLING CENTERS: HOW DO WE CREATE EFFECTIVE COOLING SPACES?

COOLING CENTERS

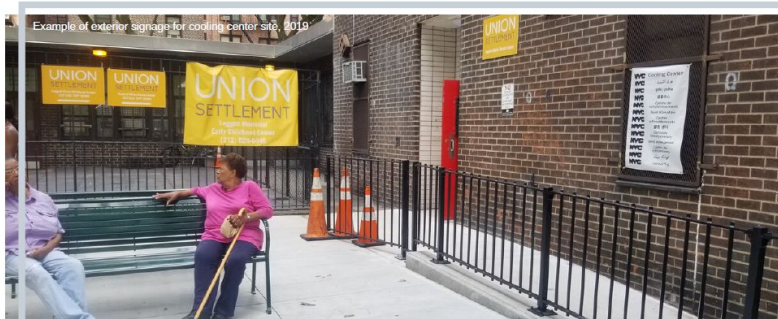
Providing equitable access to cool spaces on hot days

- Improve NYC Cooling Center program:
 - more public communications
 - extending hours and days open
 - training staff to recognize heat illness
 - **improving wayfinding & signage**
 - fixing A/C infrastructure at sites
- **Reimagine the cooling center model**



A CALL FOR NYC COOLING CENTER IMPROVEMENTS:

RESULTS FROM WE ACT FOR ENVIRONMENTAL JUSTICE'S
COOLING CENTER AUDIT PROJECT



We need cooling centers to
come to the people. We
need cooling centers that are
neighborhood specific,
culturally relevant, and
inviting.

THANK YOU!

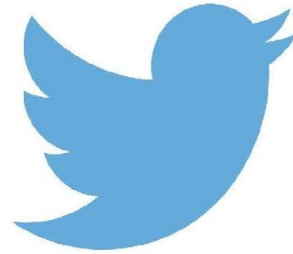
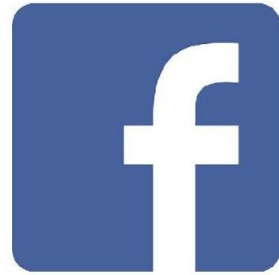


Member of
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New York
CFC# 82615

Learn more: weact.org

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Contact:

Sonal Jessel

Director of Policy

sonal@weact.org

Urban Heat Islands



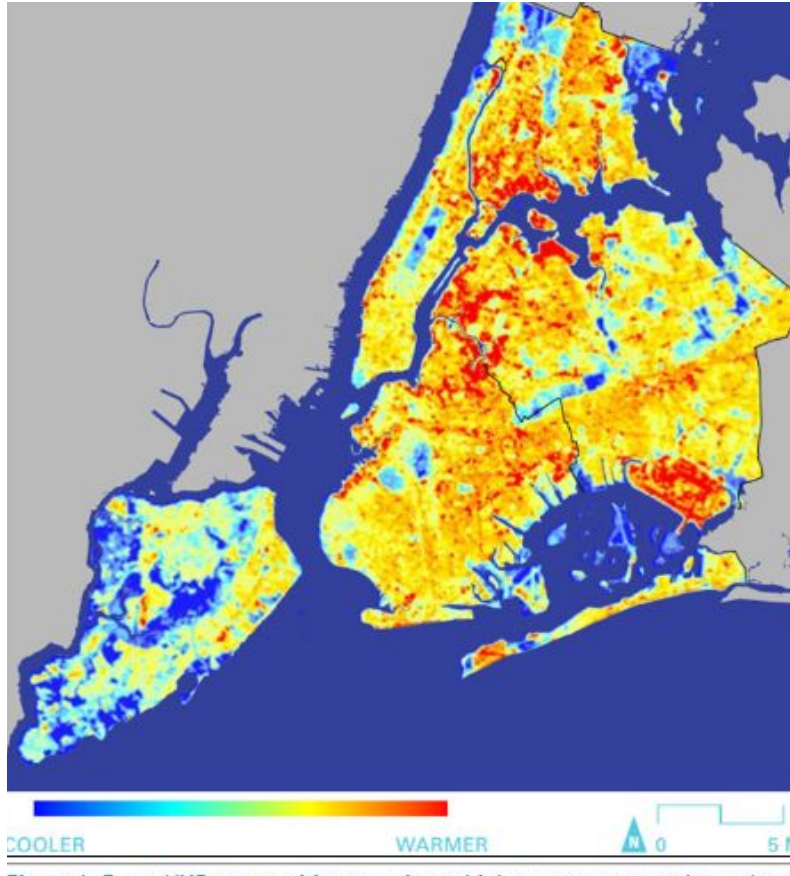
Trees New York



Trees New York , a 501 ©(3) nonprofit organization, was founded in 1976 as a volunteer response to city cutbacks in tree-related community service

Our mission is plant, preserve and protect New York City's urban forest through education and community participation. For over three decades, Trees New York has been at the forefront of environmental advocacy in New York City

What is an urban heat island (UHI)?



An urban area where temperatures are higher than the surrounding areas due to human activities, including altering the environment.

Urban heat islands were first noted by Luke Howard in 1820 in London.

Image from:
https://www1.nyc.gov/assets/orr/pdf/Cool_Neighborhoods_NYC_Report.pdf, based on LANDSAT thermal data 2009

New York City's UHI

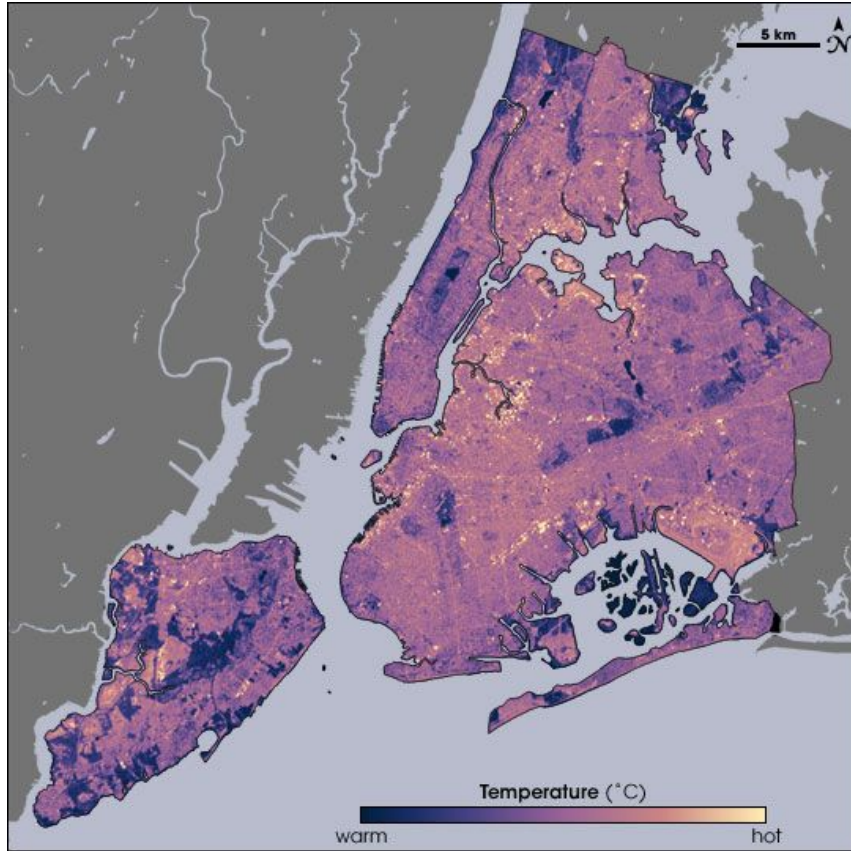
- Comparing Central Park and a group of 27 Suburban and Rural weather stations between 1900 and 1997, NYC's average UHI went from 2°C to 2.5°C over that time, and continued to grow.

Rosenzweig, C., W. Solecki, L. Parshall, S. Gaffin, B. Lynn, R. Goldberg, J. Cox, and S. Hodges 2006. Mitigating New York City's heat island with urban forestry, living roofs, and light surfaces. Presentation at 86th American Meteorological Society Annual Meeting, Jan. 31, 2006, Atlanta, Georgia.

- On July 24, 2016, the nighttime UHI reached 8°C (14°F). Think of the difference between an 85 and 99 degree day.
- UHI intensity differs across the city, based on multiple factors, including building height and the distance from the ocean.

Ramamurthy, P., González, J., Ortiz, L., Arend, M., Moshary, F., 2017. Impact of heatwave on a megacity: an observational analysis of New York city during July 2016. Environ. Res. Lett. 12, 054011, 3.

NYC Urban Heat Island and Vegetation



Images from: <https://earthobservatory.nasa.gov/features/GreenRoof/greenroof2.php>. New York City on August 14, 2002, at 10:30 a.m. (Maps by Robert Simmon, using data from the [Landsat](#) Program.)

Shading



Trees shade the sidewalk, street, and possible building walls from warming by the sun. As the tree gets larger, the benefits get larger. This is why the NYC Parks department tries to plant the largest tree possible in a tree bed.

Evapotranspiration

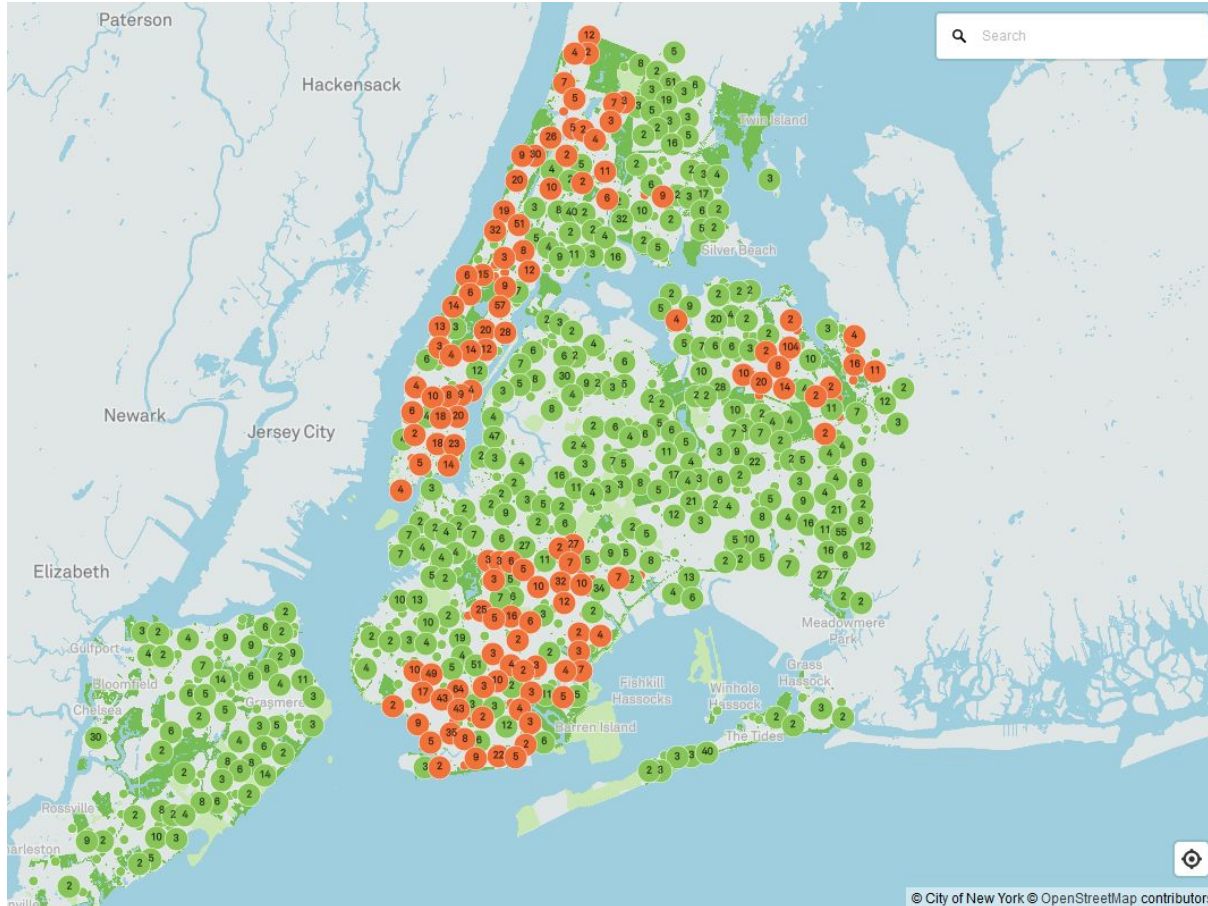
Heat absorbed from the environment to evaporate water and for transpiration (evaporation from plant leaves).
Latent heat of vaporization (evaporation) for water is 2260Kj per liter.



Is there a greenspace/minimum for cooling?

- 33% - 40% pervious surfaces or canopy cover may be a base for meaningful temperature reduction. Johnson, S., Z. Ross, I. Kheirbek, K. Ito 2020. Characterization of intra-urban spatial variation in observed summer ambient temperature from the New York City Community Air Survey. Urban Climate 31 (2020) 100583, 6-9.
- NYC tree cover was estimated at 21% citywide in 2012. Smaller areas can vary considerably from this. Brooklyn was estimated at 16%, the Bronx at 23% and Staten Island at 30%. O'Neil-Dunne, J. 2012. A Report on the City of New York's Existing and Possible Tree Canopy. https://www.nrs.fs.fed.us/urban/utc/local-resources/downloads/TreeCanopy_Report_NYC2010.pdf. Accessed 2-17-2021
- The tree cover was based on 2010 data, so does not include a lot of the trees planted by the Million Trees NYC planting program.

Street Tree planting locations in NYC



<https://www.nycgovparks.org/trees/street-tree-planting/locations>
Accessed 2-17-2021

Additional pervious surface and tree benefits

- Remove air pollution from the air – NYC's Street trees remove 1.25 million pounds of air pollution a year
- Remove atmospheric CO2 and store Carbon -
- Reduce air pollution by reducing energy use
- Storm water interception, reducing combined sewer overflows. – NYC's Street trees intercept 1.07 Billion Gallons of storm water a year
- Habitat and food source for wildlife
- Psychological benefits for people

Thank you! Contact:

Sam@treecity.org





NYLCVEF CANDIDATE SCHOOL

Coastal Resilience Across New York City's 520 Miles

February 22, 2021

MISSION WATERFRONT ALLIANCE
INSPIRES AND EFFECTS RESILIENT,
REVITALIZED, AND ACCESSIBLE
COASTLINES FOR ALL COMMUNITIES.

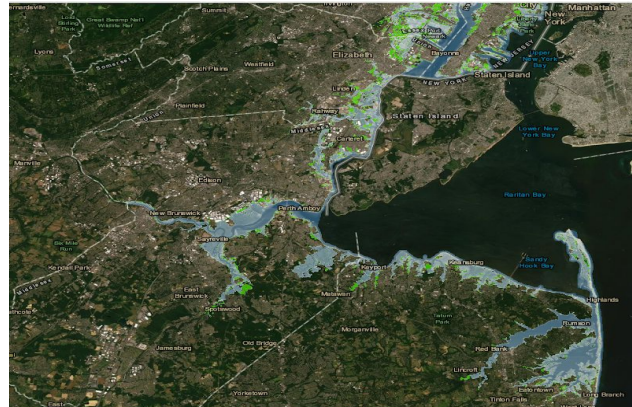


@ourwaterfront

Close to 800,000 in the floodplain

TODAY

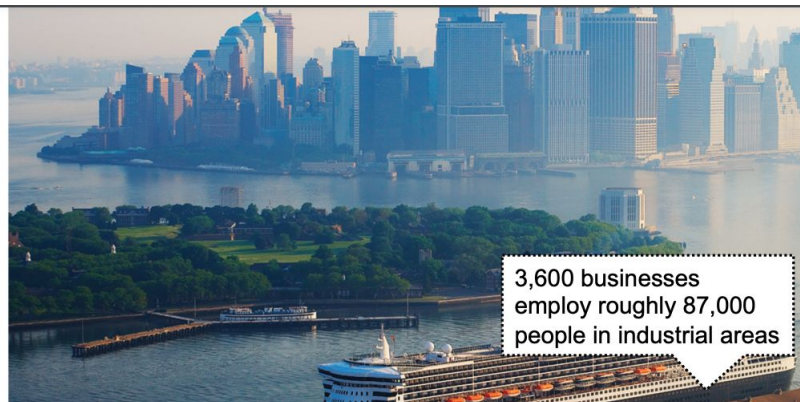
(1% + 0.2% floodplain)





Alley Pond Creek, Queens

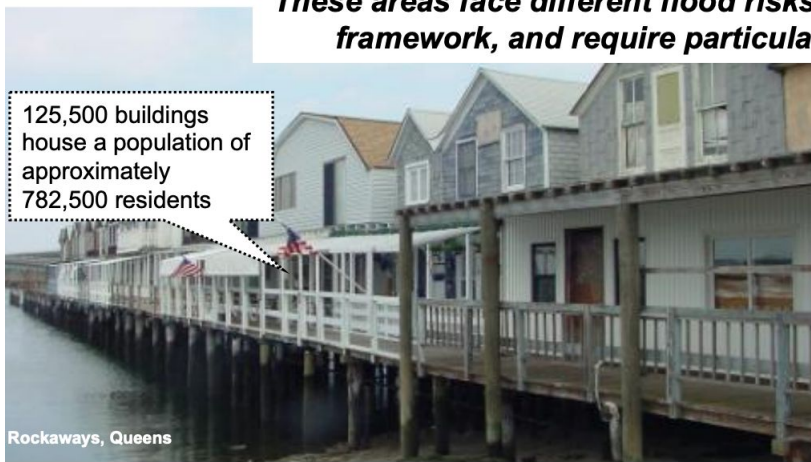
Close to 20% of the city's land area is in the floodplain



3,600 businesses employ roughly 87,000 people in industrial areas

Upper Bay

***The floodplain is diverse.
These areas face different flood risks and issues with the current regulatory framework, and require particular strategies to make them resilient.***



Rockaways, Queens

125,500 buildings house a population of approximately 782,500 residents

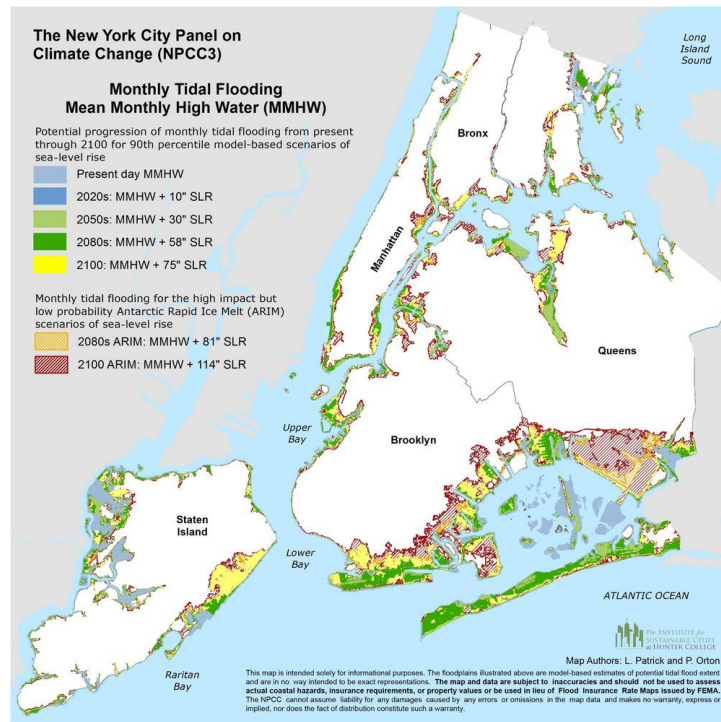


Williamsburg, Brooklyn

14,500 businesses employ close to 270,000 people in commercial corridors



FORWARD LOOKING: According to the New York City Panel on Climate Change, sea levels are expected to increase between 8 to 30 inches by the 2050s, and as much as 15 to 75 inches by the end of the century. With these risks, the number of people, businesses, and land affected – will greatly increase.



It's not just statistics.
It's our **CULTURE,**
RECREATION AND
INSTITUTIONS.



It's our **HOMES**



@ourwaterfront



After Sandy, gas lines stretch for miles

by Aaron Smith and Tony Maglio @CNMoney

November 1, 2012, 1:00 PM ET

Recommend 20



N.Y. / REGION

Sewage Flows After Storm Expose Flaws in System

By MICHAEL SCHWIRTZ NOV. 29, 2012



Workers this week replacing pumps at the Bay Park sewage-t

RELATED COVE

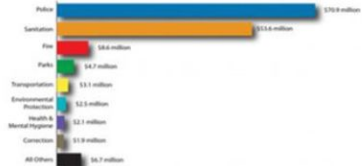


TIMES TOPIC
Hurricanes
Hurricane S

GOVERNMENT & POLITICS

Hurricane Cost City at Least \$154 Million in Overtime

BY DAVID W. CHEN JANUARY 4, 2013 2:05 PM



House approves \$50.7 billion in Superstorm Sandy emergency victims late Tuesday

BY JOSEPH STRAW

NEW YORK DAILY NEWS

Updated: Tuesday, January 15, 2013, 11:31 PM



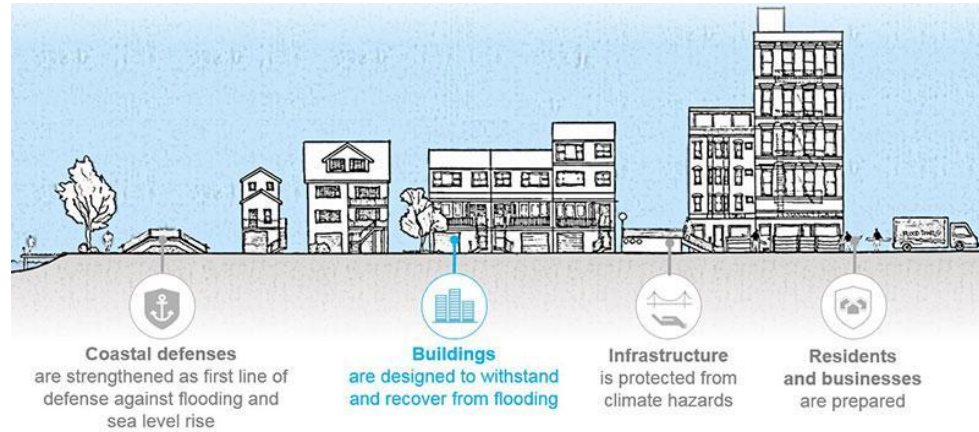
@ourwaterfront

What has been done since Sandy? A SNAPSHOT:

- Rockaway Beach Boardwalk – completed
- T-Groin Project in Sea Gate – completed
- Big U in Lower Manhattan – on-going
- East Side Coastal Resiliency
- Living Breakwaters – on-going
- Hunts Point Lifelines – on-going
- Staten Island Coastal Storm Risk Management project – delayed
- Red Hook Integrated Flood Protection system – delayed
- 35 NYCHA Developments damaged receiving resiliency funding through FEMA



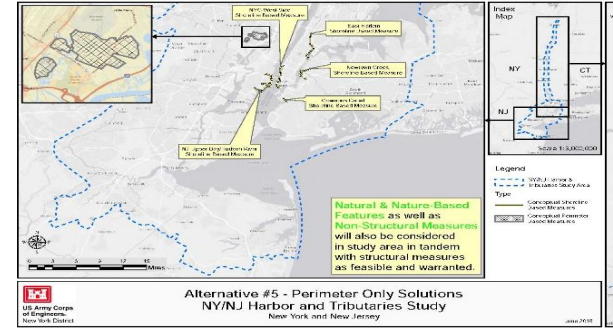
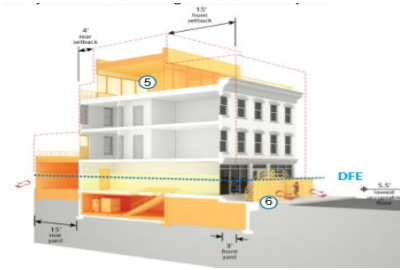
Hurricane Sandy was catastrophic and highlighted the vulnerability of the city's buildings.



Following Hurricane Sandy, the City adopted temporary emergency zoning rules that made it easier for New Yorkers to rebuild. **Zoning for Coastal Flood Resiliency** would update those rules with lessons learned and make them permanent. Currently in ULURP process.



No single solution/scale



Who is in charge? COORDINATION IS KEY

NYC MOR	NYCDCP
NYC DDC	NYCDEP
NYC Parks	NYCOEM
NYC OEM	NYC OMB
NYC DOT	NYC EDC

NYSDEC	NYS Parks
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Empire State Development	
US Army Corps	PANYNJ
US HUD	FEMA



@ourwaterfront

Many plans and processes (SNAPSHOT):

- NYC Comprehensive Waterfront Plan (DCP) – every 10 years
- Climate Design Guidelines (MOR)
- NYC Parks Designing for Flood Resiliency
- PlaNYC --> OneNYC
- Waterfront Management Advisory Board



WHAT'S MISSING?

A well-funded and comprehensive resilience strategy for **ALL 520 MILES** that takes into account:

- **Management and citywide coordination**
- **Risk and vulnerability assessments**
- **Equitable and community driven**
- **Resilience in all infrastructure**
- **Green workforce**



WHAT WATERFRONT ALLIANCE IS WORKING ON?

RISE TO RESILIENCE - advocating for urgent policy, governance, and financial changes to address our region's climate risks at the local, state and federal level. www.rise2resilience.org

WEDG® (Waterfront Edge Design Guidelines) - shifting the market towards more resilient, sustainable, and accessible waterfront development through a ratings system (think LEED for the waterfront). wedg.waterfrontalliance.org





- The harbor is central to the economy and regional recovery
- The climate is changing and so should our waterfronts
- Public access is key to breaking down physical and social barriers at the water's edge
- A sustainable and resilient port and maritime sector is a 21st century economic driver



THANK YOU

Karen Imas, VP of Programs
kimas@waterfrontalliance.org
www.waterfrontalliance.org



An aerial photograph of a coastal region. On the left, a large airport with multiple runways and taxiways is visible, surrounded by green fields. To the right of the airport, a city with dense residential and commercial buildings stretches along the coast. A sandy beach runs parallel to the city. The ocean is visible on the right side of the image. The text 'Coastal Resiliency: A Local Perspective' is overlaid in white, centered in the upper half of the image.

Coastal Resiliency: A Local Perspective

February 2021



RISE's mission

We inspire all generations of Rockaway residents to care for their environment and community. We provide civic engagement and youth development programs that advance social equity and the physical well being of our vibrant, coastal community.



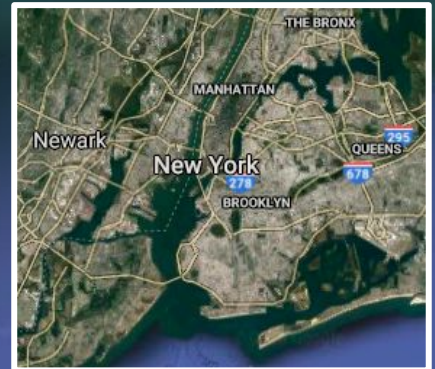
The RISE Center

A historic firehouse that RISE developed into a hub for our youth and community engagement initiatives. The RISE Center includes:

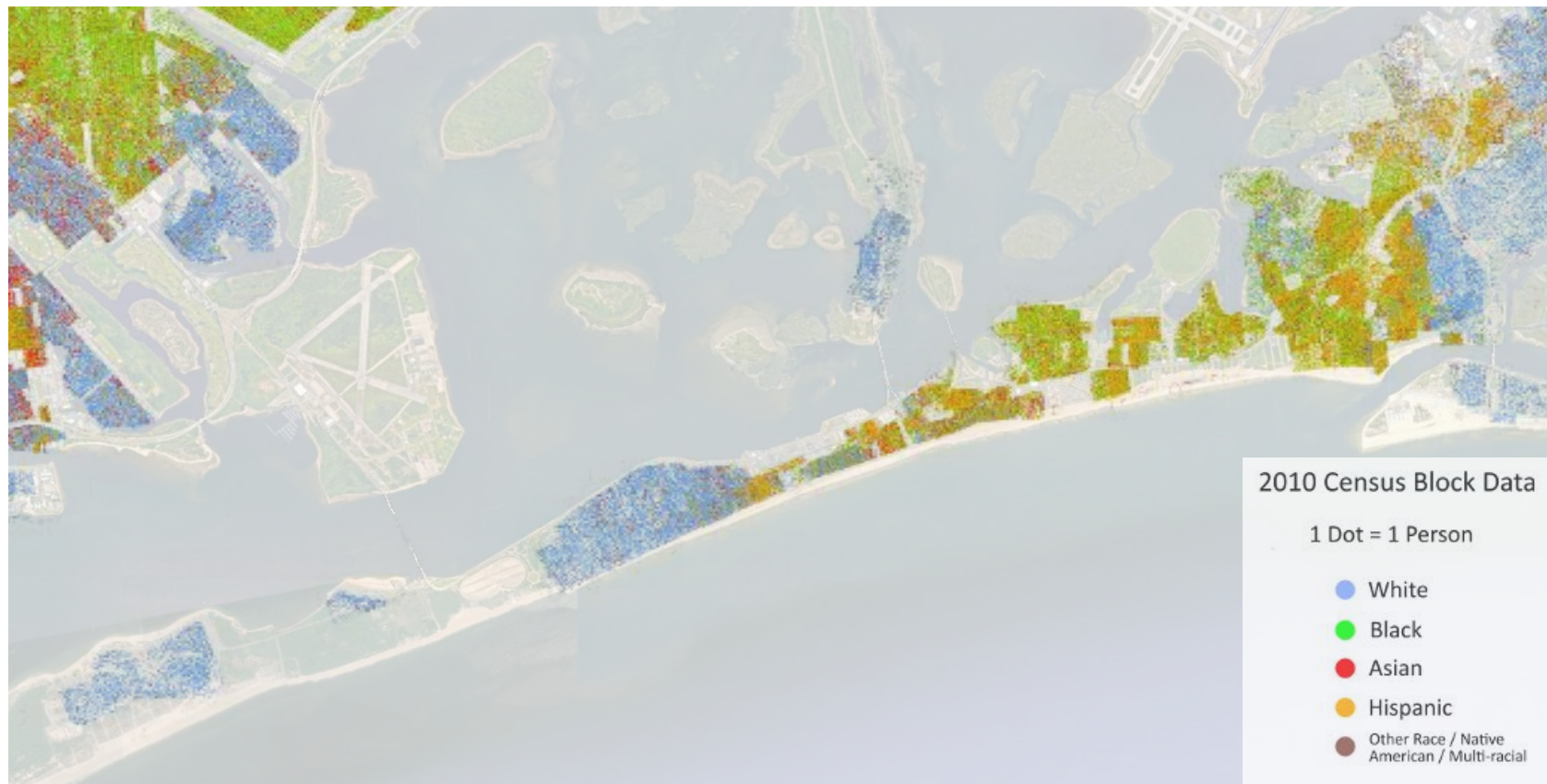
- 7,000 sq ft + 2,000 sq ft garden
- 1st floor: flexible gallery & event space
- 2nd floor: classroom & meeting space
- Headquarters for RISE's programs
- Space for community events, workshops, & gatherings



The Rockaways



East v. west



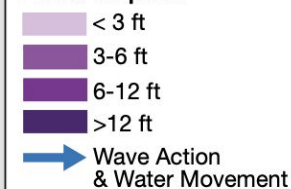
Waterfront conditions



Vulnerability

Map of Rockaway Beach, New York, showing vulnerability to sea level rise. The map is color-coded: light green for areas with 1-2 feet of elevation, medium green for 2-4 feet, and dark green for 4-6 feet. Major roads like Rockaway Beach Blvd, Edgemere Ave, and Boardwalk are labeled. Parks and basins such as Bayswater Point State Park, Rockaway Community Park, Little Bay, and Norton Basin are also marked. Blue arrows indicate the direction of sea level rise from the ocean.

Flood Depths



Source:
FEMA Sandy Modeling Task Force Final High
Resolution Surge Area- Field-Verified Febru-
ary 14, 2013. Basemap: New York City De-
partment of City Planning, MAPPluto v13.1;
Buildings; Street Centerlines



Source: Rockaway East NYRCR

Local flooding conditions

2017



Local flooding conditions

Feb. 2021

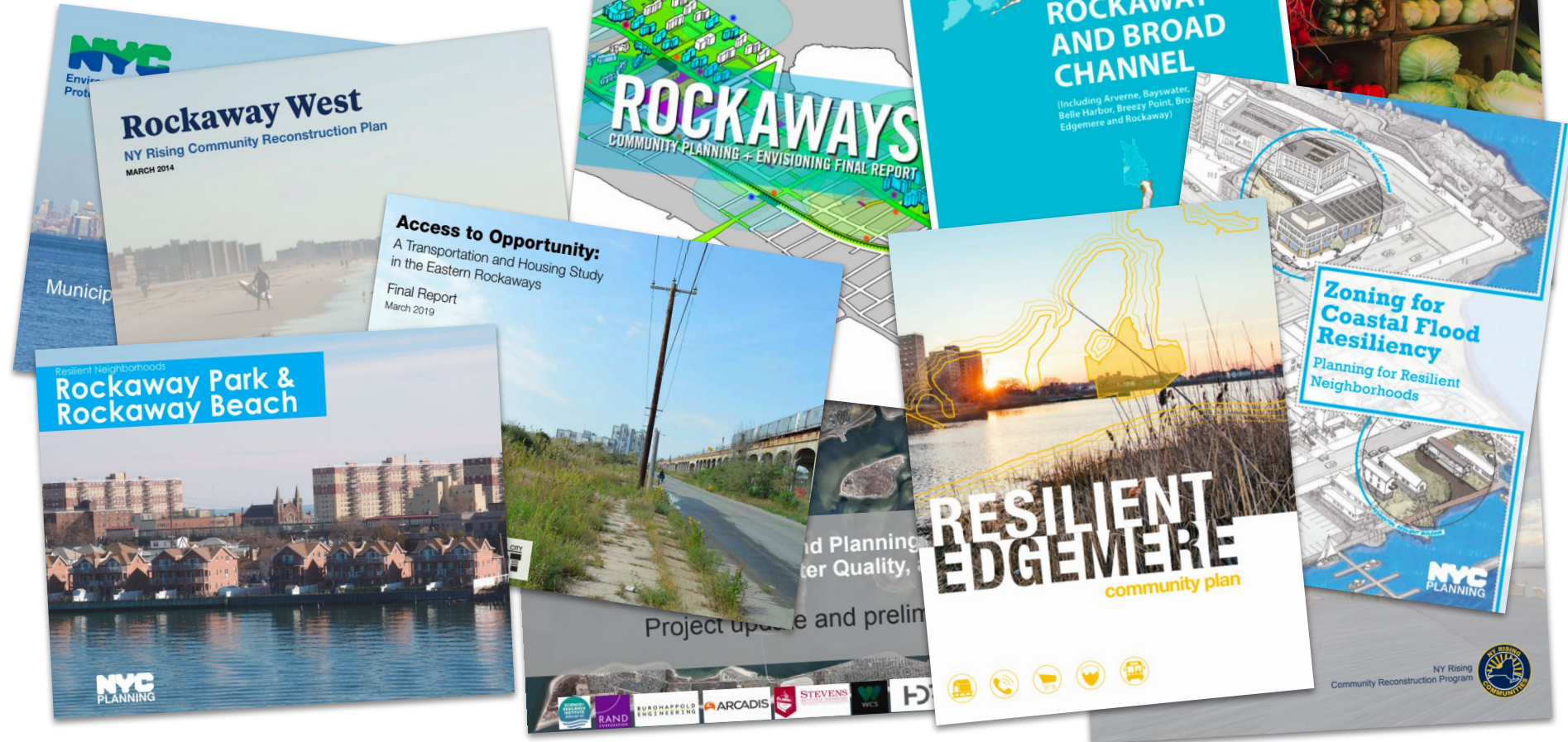


Erosion

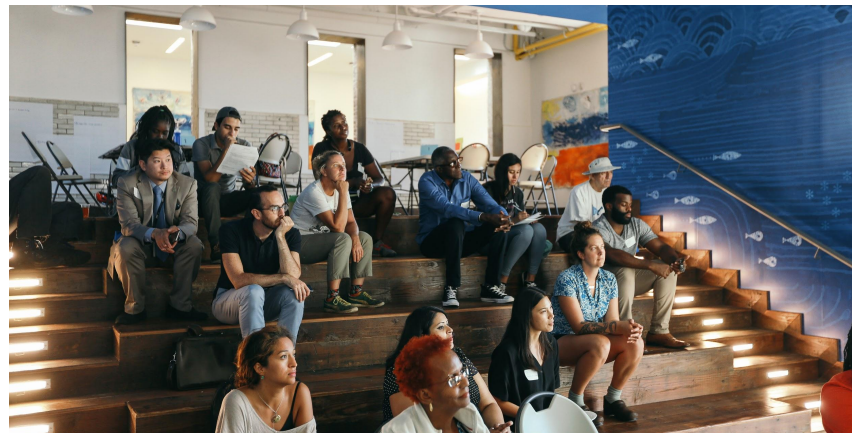
Feb. 2019



Planning fatigue



Let residents lead



Support community stewardship





Thank You!

THANK YOU FOR JOINING US!

Stay connected by following us on social media!

Instagram & Twitter: @nylcv

Facebook.com/nylcv

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nylcv.org



REBUILD BY DESIGN



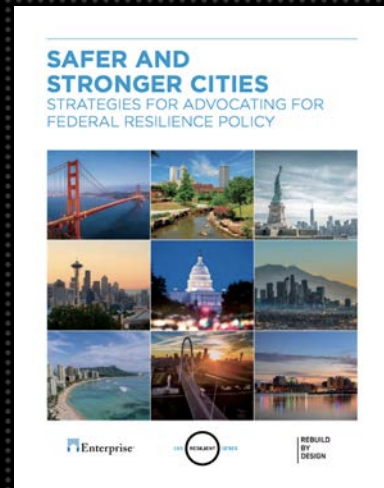
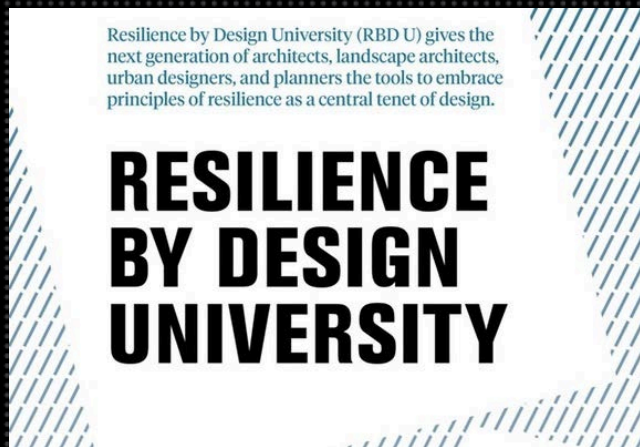
REBUILD
BY
DESIGN

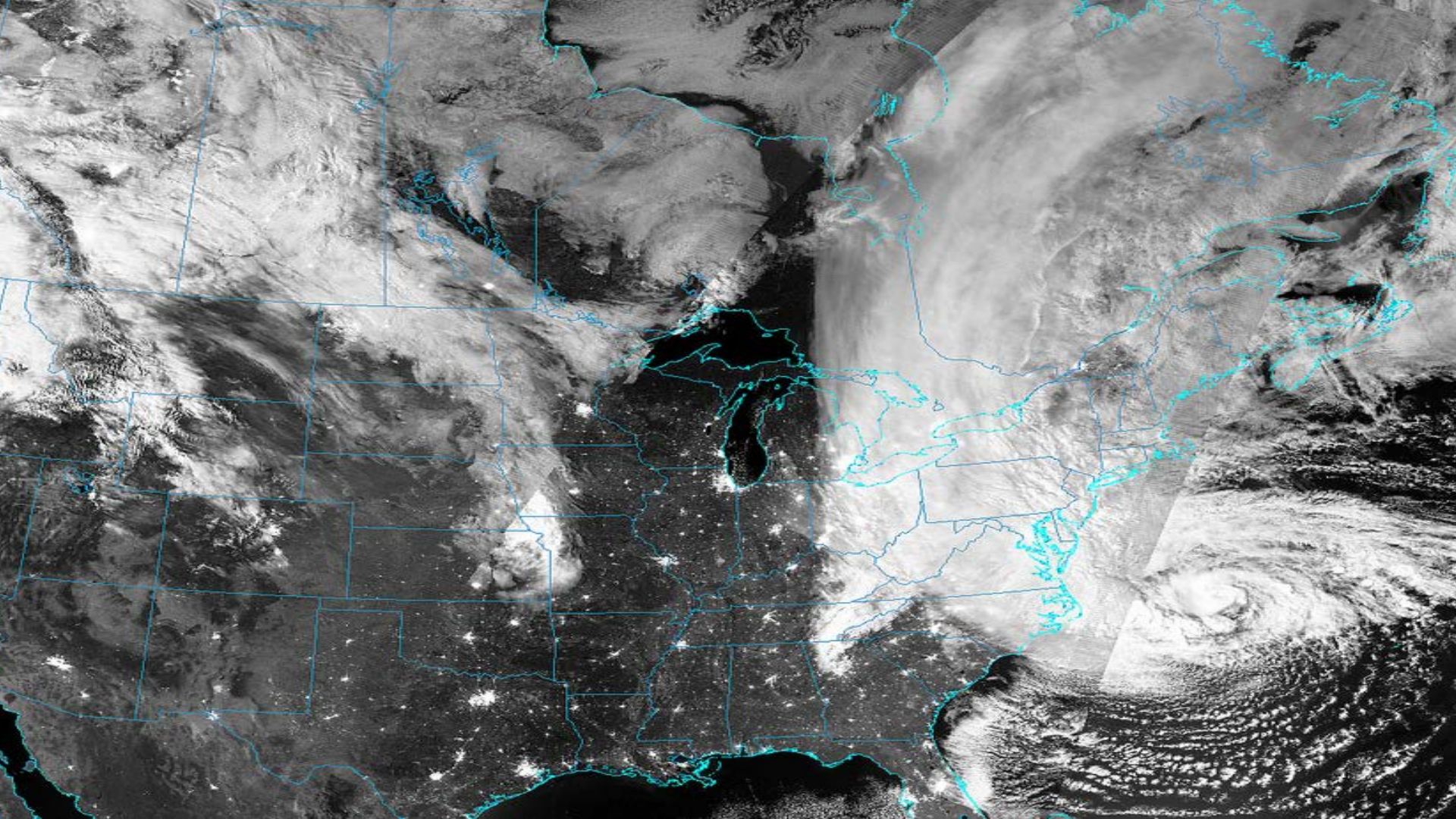
WHAT WE DO

1 Large Scale Regional Design Competitions

2 Innovative Processes to Address Cities' Challenges

3 Research and Policy

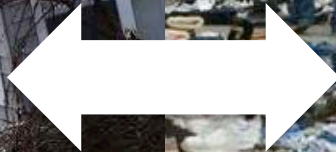








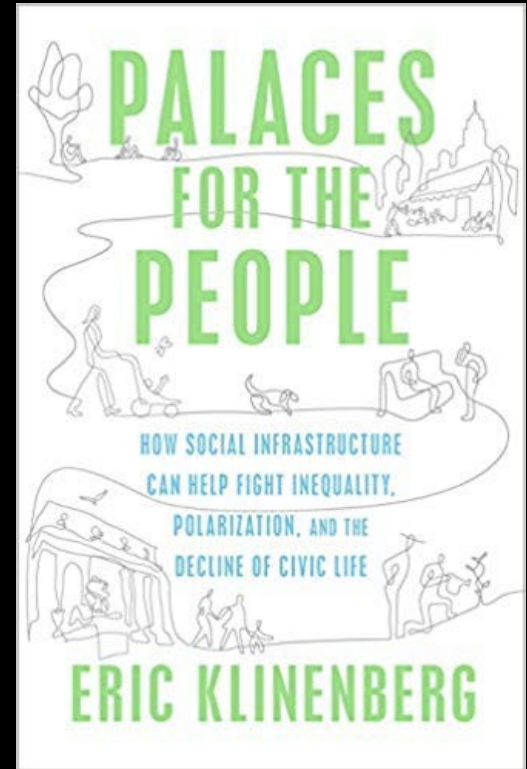
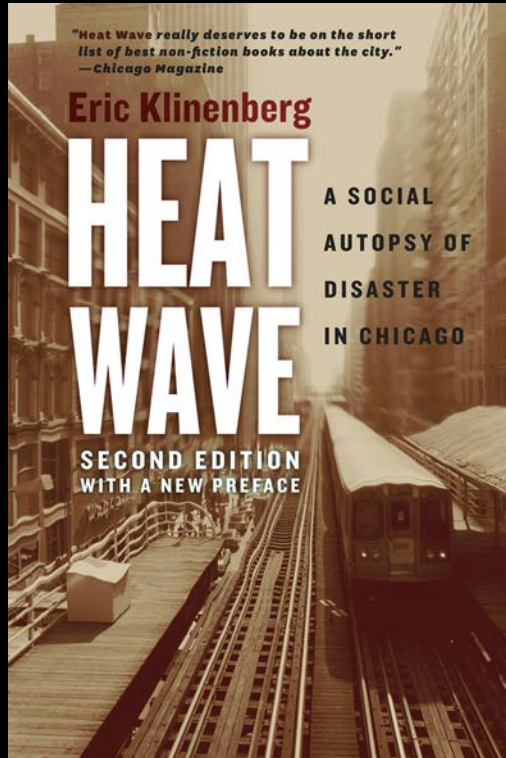
PHYSICAL



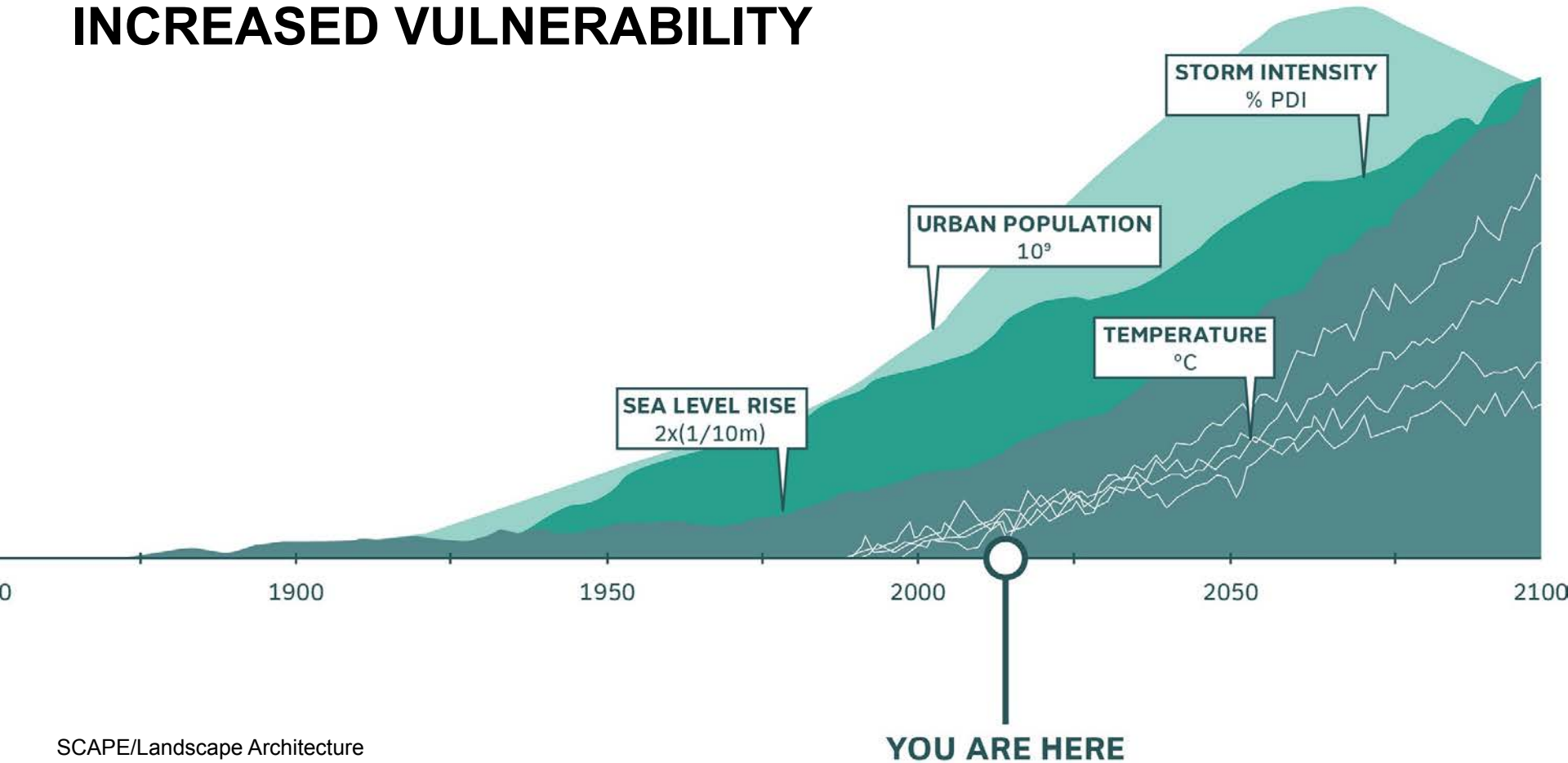
SOCIAL

SOCIAL RESILIENCE

1995 Chicago Heat
Wave Killed 700
people

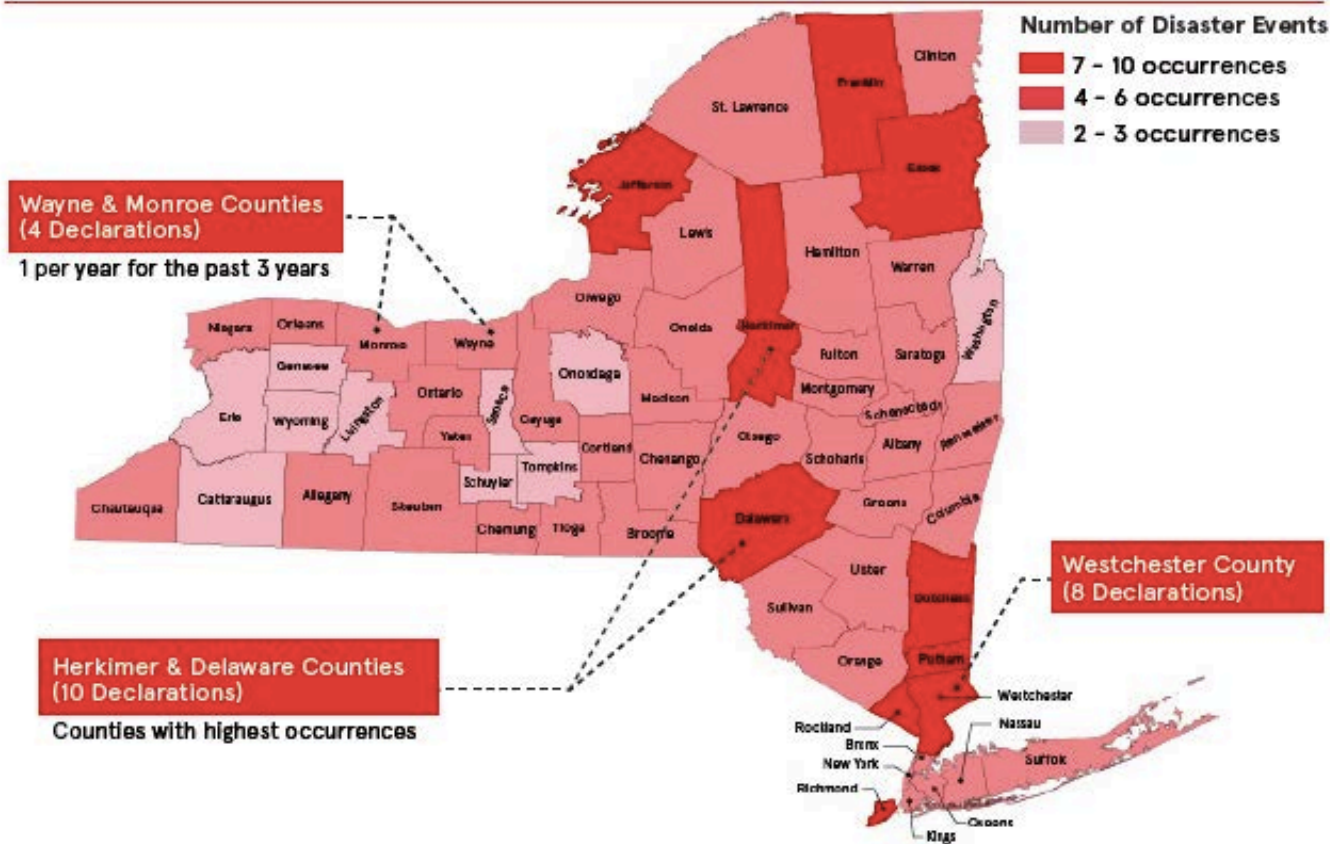


INCREASED VULNERABILITY



Map of Disaster Declaration Frequency in New York Counties, 2011 – 2019

REBUILD
BY
DESIGN



- 90% of New Yorkers live near a body of water
- Since 2011, every county has had at least two disasters for flooding
- 60% have had more than five

WOULD YOU BET THE HOUSE ON THIS?

Royal flush 	0.000154%
Straight flush (not including royal flush) 	0.00139%
Four of a kind 	0.0240%
Full house 	0.144%
Flush (excluding royal flush and straight flush) 	0.197%
Straight (excluding royal flush and straight flush) 	0.392%
Three of a kind 	2.11%
Two pair 	4.75%
One pair 	42.3%
No pair / High card 	50.1%

A 100-YEAR FLOOD
REFERS TO A
1% CHANCE OF
FLOODING EACH
YEAR.

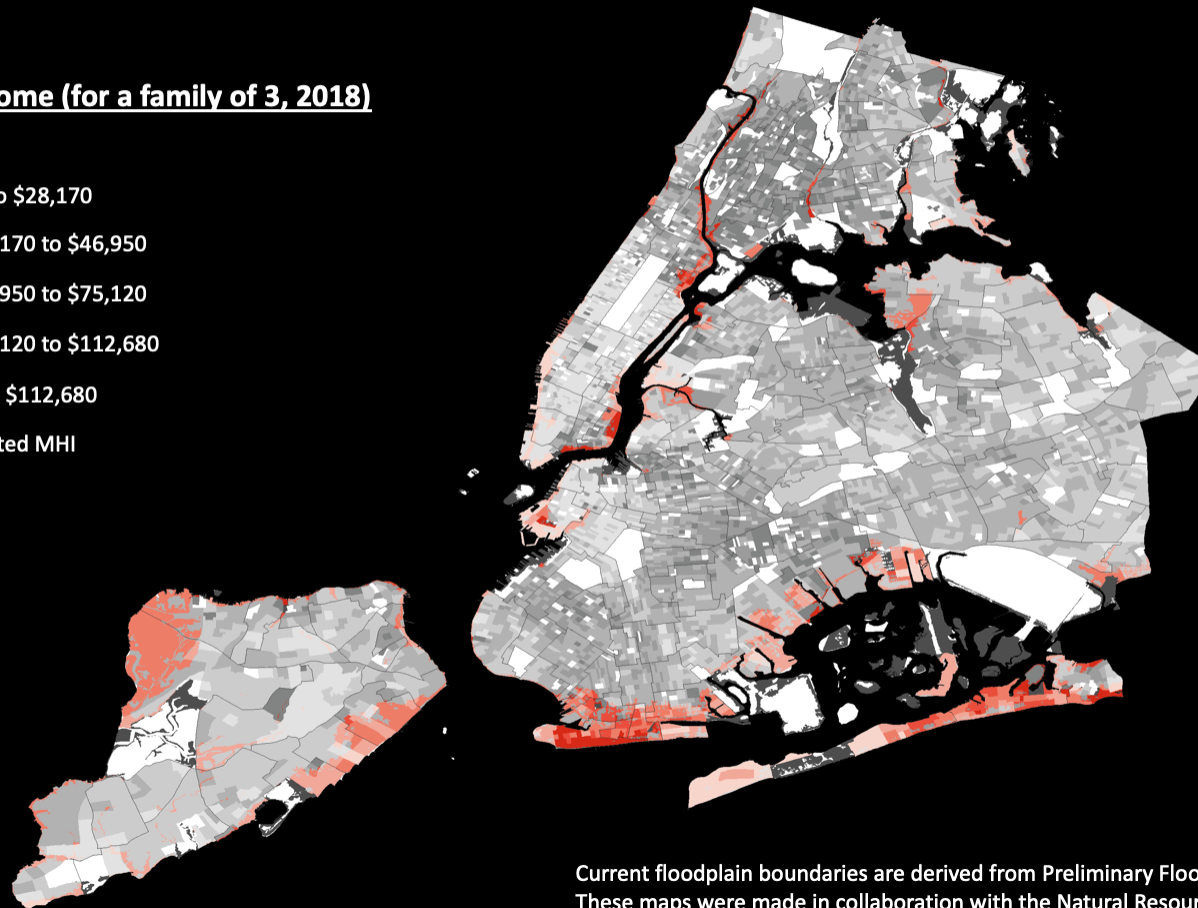
A 100-YEAR FLOOD IS
TWICE AS LIKELY AS
GETTING A STRAIGHT
IN POKER.

BY 2050, A 100-YEAR
FLOOD WILL BE
MORE LIKELY THAN
GETTING THREE OF A
KIND.

MEDIAN HOUSEHOLD INCOME OF RESIDENTS LIVING IN THE NYC FLOODPLAIN: 2015

Median Household Income (for a family of 3, 2018)

In the 100-year floodplain



**REBUILD
BY
DESIGN**

Current floodplain boundaries are derived from Preliminary Flood Insurance Rate Maps (PFIRM). These maps were made in collaboration with the Natural Resources Defense Council (NRDC).

Today, 1.3 Million or 14 percent of the population of NYC live in or adjacent to the floodplain

10%

10%

10%

10%

10%

10%

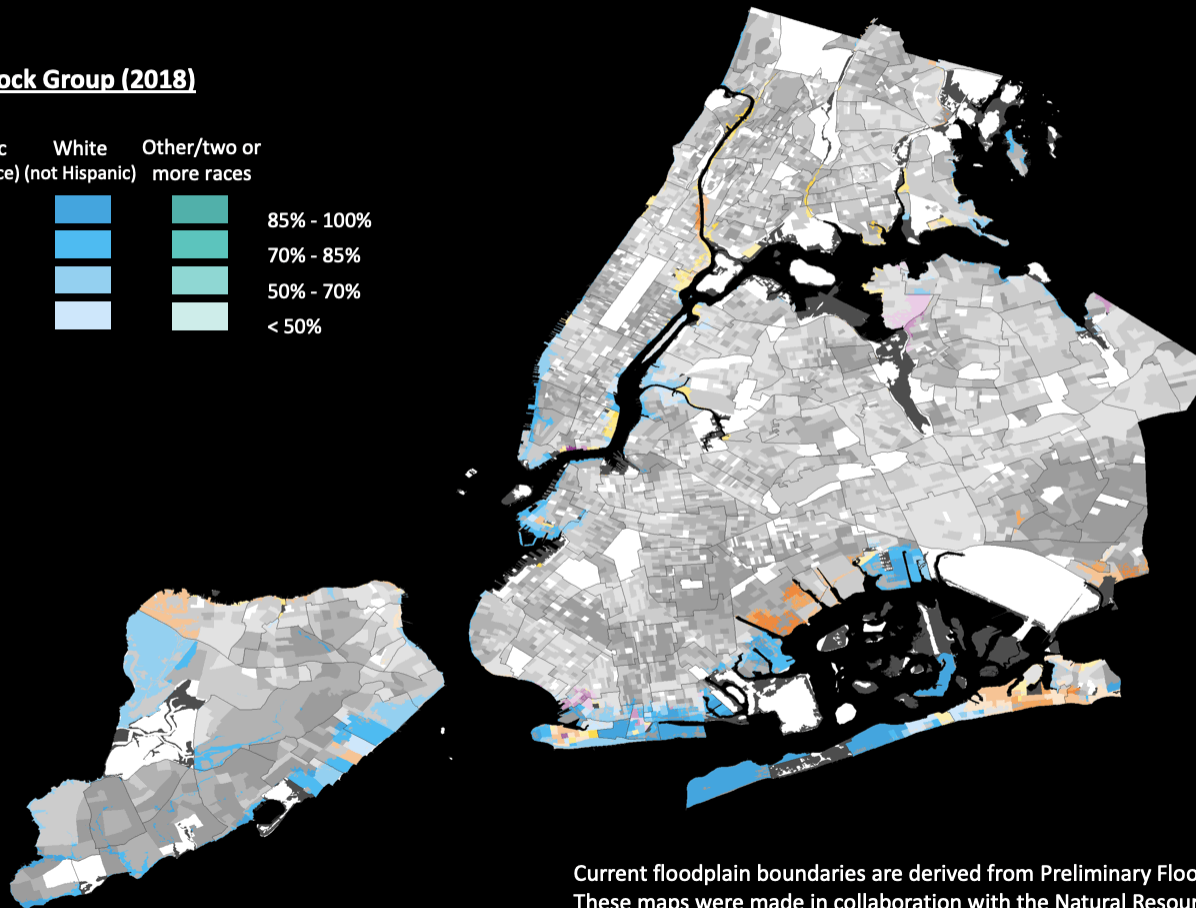
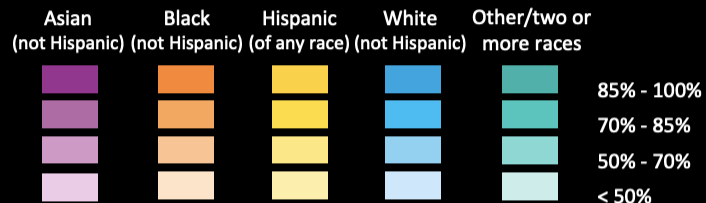
Over half, are in areas considered “low income” by HUD.

That number will increase to 2.2 Million by 2100

RACIAL & ETHNIC BREAKDOWN OF RESIDENTS LIVING IN THE NYC FLOODPLAIN: 2015

Racial/Ethnic Plurality by Block Group (2018)

In the 100-year Floodplain



REBUILD
BY
DESIGN

Current floodplain boundaries are derived from Preliminary Flood Insurance Rate Maps (PFIRM). These maps were made in collaboration with the Natural Resources Defense Council (NRDC).



**Today, 56% of people who live in or adjacent
the floodplain do not identify as white.**

In 2100, that number will rise to 66%.

PLANNING AHEAD PAYS OFF

In the US, \$1 Spent on Disaster Planning
Yields \$6 in Future Benefits

- Flood Protection
- Public Health
- Property Value (Research reveals that property values increase as flood risk reduces 2% to 7%)
- Enhanced Ecology
- Cleaner Water
- Carbon Sequestration
- Reduction in stormwater runoff
- Increased recreation and tourism
- Increased aesthetics

-National Institute of Building Sciences issued *Natural Hazard Mitigation Saves: 2017 Interim Report*.

Disastrous spending: Federal disaster-relief expenditures rise amid more extreme weather

In 2011 and 2012 the United States experienced an onslaught of floods, storms, droughts, heat waves, and wildfires. We estimate that the federal government spent \$136 billion total from 2011 to 2013 on disaster relief, which adds up to nearly \$400 per household per year. These costs will continue to increase as extreme weather becomes more frequent and/or severe due to climate change. We must act now to reduce the industrial carbon pollution responsible for climate change and help communities become more resilient to extreme weather.

Funding for disaster recovery and relief for 3 major events (in billions of dollars)

Flooding in Mississippi and Missouri rivers
Disaster Supplemental Appropriations 2012



Superstorm Sandy
Disaster Supplemental Appropriations 2013



Federal spending on disaster recovery and relief by department (in billions of dollars)

FY 2011–2013



**HOW SHOULD WE
PROTECT OURSELVES**

HINT: NOT LIKE THIS!

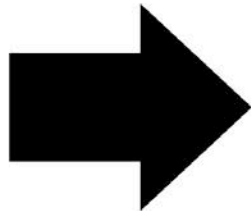


Osabe, Japan



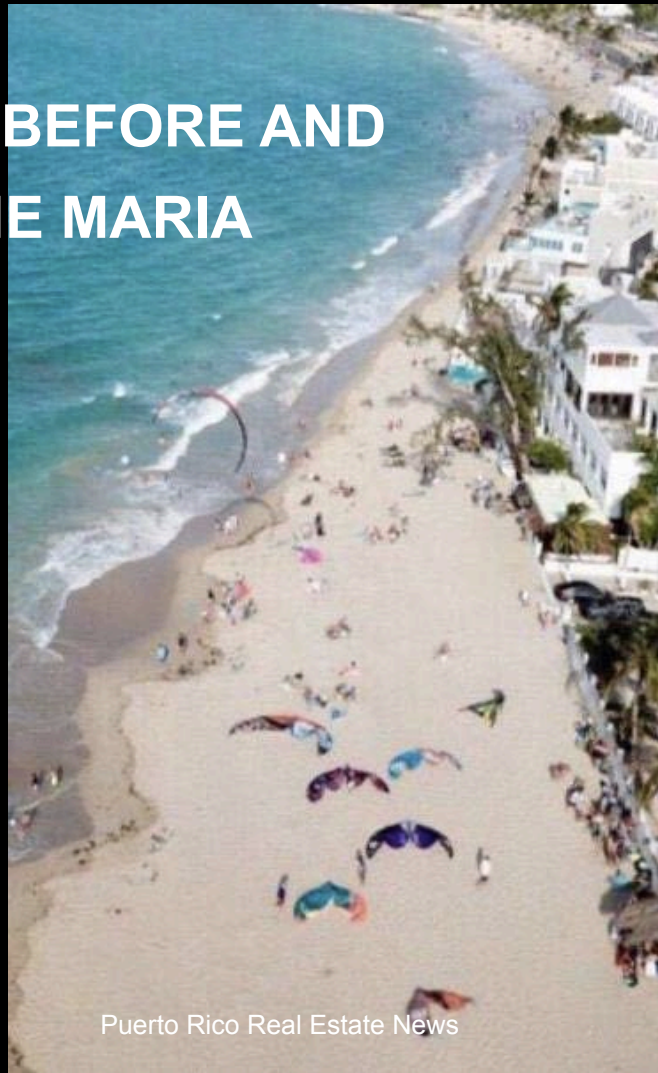


**Should we allow nature to take
what it wants?**





OCEAN PARK, PR BEFORE AND AFTER HURRICANE MARIA



Puerto Rico Real Estate News



OCEAN PARK, PR TODAY





Or do we adapt?



VENICE, 1927



ADAPTATION?



Euronews



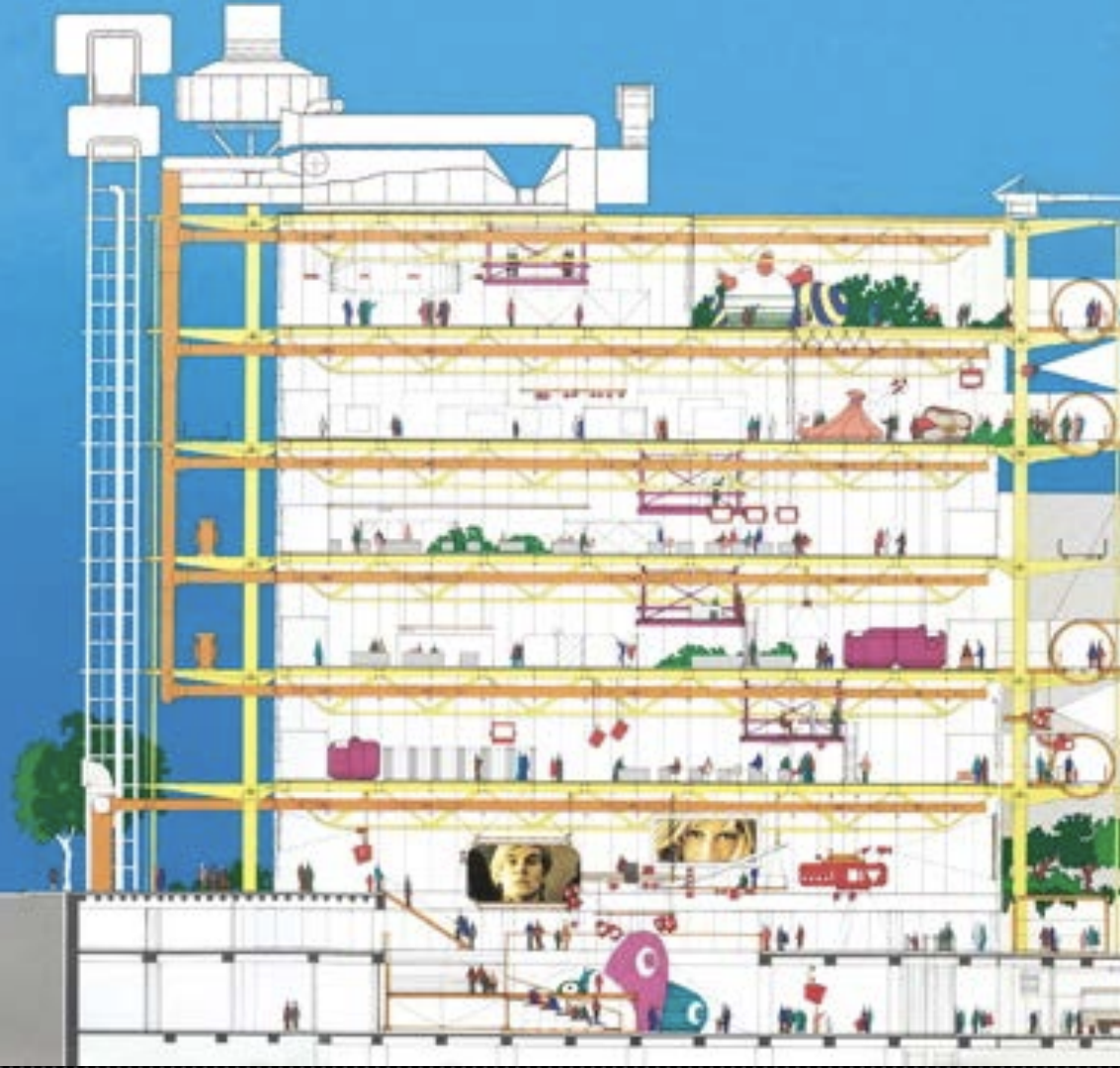


CAN WE HAVE BOTH?



PROMOTE INNOVATIVE MULTI- PURPOSE INFRASTRUCTURE

Le Centre Pompidou



CAN WE LEARN FROM PRODUCT DESIGN?

**“Innovation is taking two things that already exist
and putting them together in a new way”**

- Tom Freston



HAND HELD SINGLE PURPOSE

1979



SINGLE PURPOSE WITH MORE STORAGE

1984



EVOLUTION OF MUSIC INNOVATION

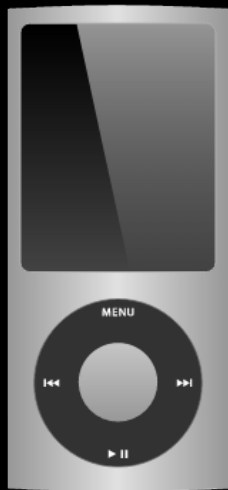
1,000 Songs



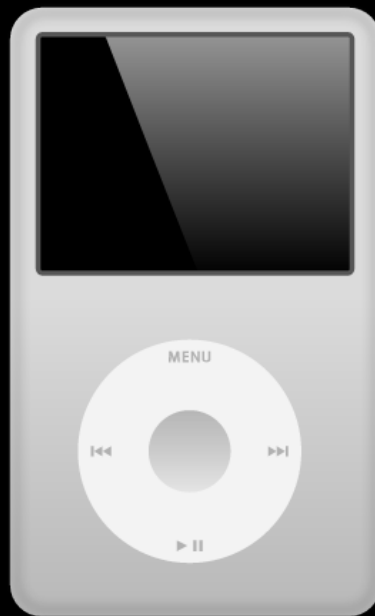
240-
1000
Songs



1000 -
1500
Songs



1000 - 1500 Songs



2000 Songs



TODAY

Stores 43, 000 Thousands of
Songs

Alarm Clock

Watch

Calendar

Camera

Courier Mail

Watch Movies and Television

Create To-Do Lists

Map

Encyclopedia

Weather

Newspaper





EXAMPLES OF MULTIBENEFIT INFRASTRUCTURE

DENMARK:

Waste to Energy Power Plant + Ski Slope





BAHRAIN

Offices + Hotel + Energy



NETHERLANDS

Parking Garage + Flood Protection



NETHERLANDS

Playground + Flood Protection





1.
Playground



2. **Water
Square**



3. **Rain
Storage**

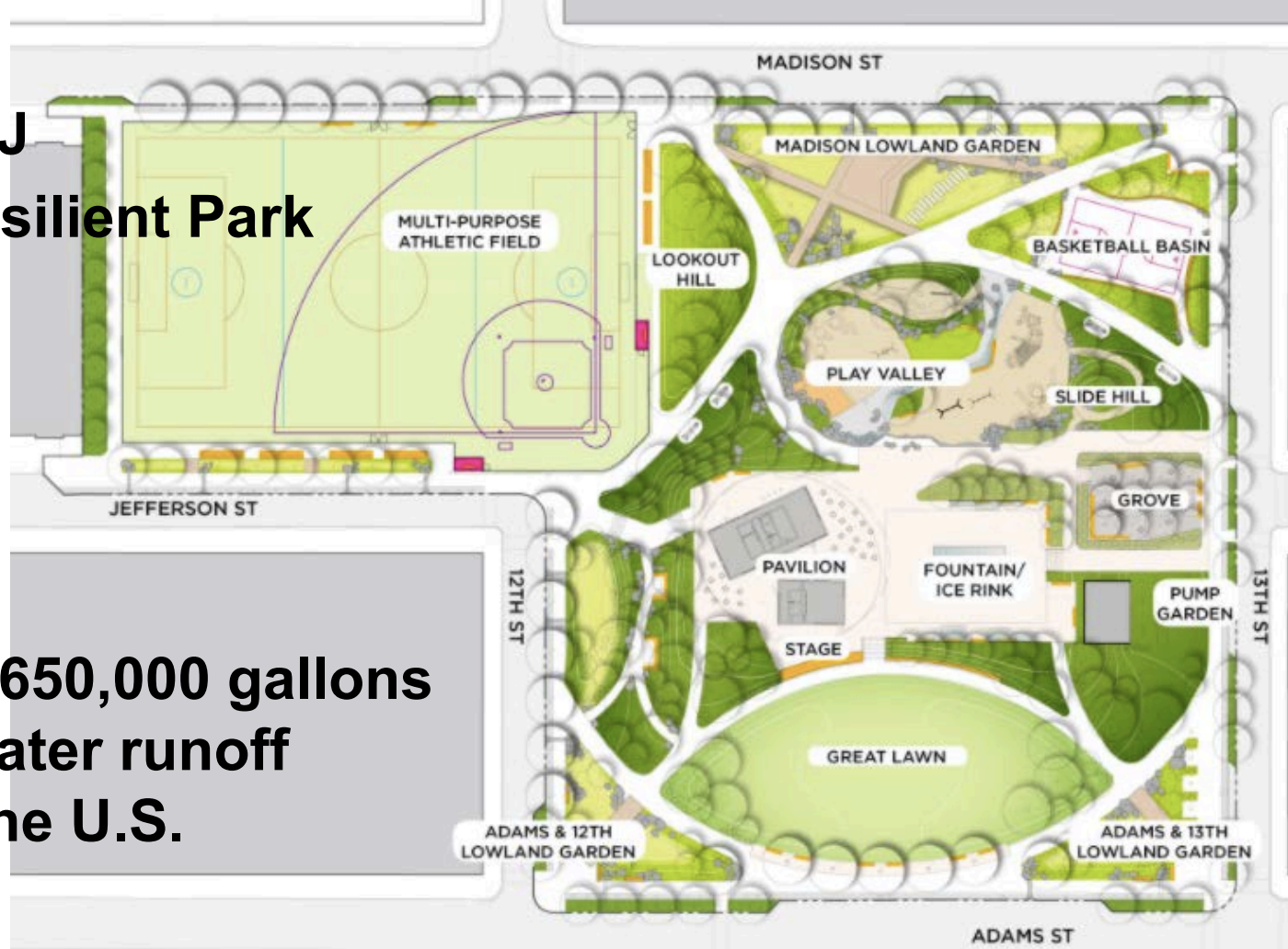


4. **Ice Skating
Rink**

HOBOKEN, NJ

Northwest Resilient Park

- Six acres
- Storage for 650,000 gallons of storm water runoff
- Largest in the U.S.



Multi-Purpose Athletic Field

Great Lawn

Woodland Hills

Central Terrace

Park Pavilion

Play Valley

Fitness Loop

Multi-Purpose Athletic Field

Water System



THE OPPORTUNITY

Protect:

Infrastructure, Public Housing, Small and Large Businesses, Food Supply Network, Energy Supply and Neighborhoods

Restore:

Ecology, Wetlands, Oyster farming, Bird Habitat, Rivers, Natural Systems

Create:

Jobs, Access to Fresh Food, Access to the Waterfront, Resiliency Centers, Housing, Transportation Options

Increase:

Economic Vitality, Livability and Social Resiliency

DESIGN **WITH** COMMUNITIES NOT **FOR** COMMUNITIES



DOWNLOAD OUR BOOK: www.rebuildbydesign.org



THE BOOK
IS HERE

Download a copy of the book that tells the story of Rebuild by Design, including the research, collaborations and comprehensive projects that were created from this award-winning process.

REBUILD
BY
DESIGN

THE BIG U

BIG (Bjarke Ingels Group)

One Architecture

Starr Whitehouse

Buro Happold

Level Agency for Infrastructure

James Lima Planning + Development

Green Shield Ecology

AEA Consulting, Arcadis

Project Projects,

Parsons School of Constructed

Environments

THE BIG “U”: Manhattan, NYC

Aim: To protect a 10 mile flood zone around the low-lying areas of Manhattan.

Addresses multiple issues:

- Flooding from storm surge
- Protection of low income public housing
- Improvement of recreational space
- Safe access to waterfront over highway
- Improved connectivity to neighborhoods
- Enhanced Biodiversity



LIVING BREAKWATERS

PREPARED FOR REBUILD BY DESIGN, 2014
SCAPE LANDSCAPE ARCHITECTURE

Parsons Brinckerhoff

Dr. Philip Orton

Stevens Institute of Technology Ocean & Coastal

Consultants SeArc Ecological Consulting

LOT-EK, MTWTF, The Harbor School and Paul Greenberg

Living Breakwaters: Staten Island, NYC

Primary Aim: Reduce Beach Erosion

Addresses multiple issues:

- Reduce Risk
- Restoration of Ecological Habitat
- Recreational Opportunities for Boating
- Middle School Science Education
- Community Building
- Economic Development



HUNTS POINT LIFELINES

PennDesign / OLIN
HR&A Advisors
eDesign Dynamics
Level Infrastructure
Barretto Bay Strategies
Buro Happold
McLaren Engineering
Group
Philip Habib & Associates

Flood Protection



Cleanways



LIFELINES

Livelihoods



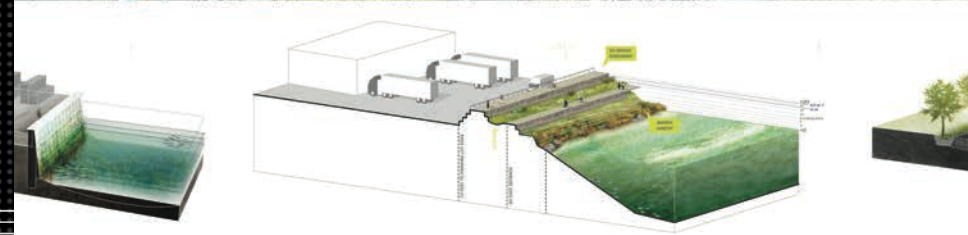
***Emergency Supply
Chain***

Hunts Point “Lifelines”: South Bronx NYC

Primary Aim: Protection of NYC
Regions' Food distribution center

Addresses multiple issues:

- Flooding from rain events and storm surge
- Public health
- Food security
- Employment
- Recreation and waterfront access
- Energy reliability & efficiency
- Protecting low-income community
- Education engagement



THANK YOU!

Amy Chester, Managing Director
achester@rebuildbydesign.org