Weathering Change: Local Solutions for Strong Communities

2018-19 Webinar Series is generously sponsored by:

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AU | ANTIOCH UNIVERSITY NEW ENGLAND
Center for Climate Preparedness and Community Resilience

www.communityresilience-center.org

Abigail Abrash Walton, Co-Director

Strengthen communities to prepare, respond and recover in the face of climate impacts and other disruptions through collaborative, innovative solutions.

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Center for Climate Preparedness and Community Resilience

Climate Resilience Certificate for Professionals

http://www.communityresilience-center.org/climate-change-resilience-series/

Six on-line courses lead to an accredited certificate

- Each course is 4 weeks long.
- Enroll for graduate credit or for professional continuing education credits.
- Increase your skill set in climate resilience for better outcomes.
- Discover solutions to local issues you face on the job or in your community.
- Register for one course or the whole series.

ANTIOCH UNIVERSITY NEW ENGLAND
Center for Climate Preparedness and Community Resilience

U.S. Climate Resilience Toolkit

Climate Response: Costs and Financing

https://www.antioch.edu/new-england/resources/centers-institutes/center-climate-preparedness-community-resilience/climate-change-resilience-series/

Course Instructor:
Michael Simpson

Dates: May 5 – June 1, 2019

Registration deadline: April 30, 2019

This module focuses on the associated costs analyses that should accompany any on-the-ground response to projected climate impacts. The issue of financially discounting the future in light of inaction will be addressed. Finally, funding sources and financing strategies will be introduced.

U.S. Climate Resilience Toolkit

Steps to Resilience | Case Studies | Tools | Expertise | Regions | Topics

Ned Gardiner, Engagement Manager

www.toolkit.climate.gov

Meet the challenges of a changing climate by finding information and tools to help you understand and address your climate risks.

STEPS TO RESILIENCE

Use this framework to discover and document climate hazards, then develop workable solutions to lower climate-related risks. Watch the overview video or click any step to learn more.

1. Explore Hazards
2. Assess Vulnerability & Risks
3. Investigate Options
4. Prioritize & Plan
5. Take Action

Community-Based Climate Change Resilience Planning, Strategies and Case Studies

April 11, 2019

Aurash Khawarzad
Artist, Educator, and
Urban Planner

Sean Abbott-Klafter
History teacher, High School for
Environmental Studies, New York City

Weathering Change: Local Solutions for Strong Communities

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U.S. Climate Resilience Toolkit

Questions

- **Please submit questions via the Q&A section (not Chat)**
- **Select to All Panelists.**
- **If we are not able to get to your question today, we will try to address it after the webinar in our general follow up email or you may hear directly from the presenters.**

Aurash Khawarzad

Artist, Educator, and Urban Planner

Email: aak@aurashkhawarzad.com

Website: www.AurashKhawarzad.com

April 11, 2019

The Upper Manhatta(n) Project

Key Elements:

- Community outreach and education
- Multi-disciplinary research/partnerships
- Mapping and illustrations
- Tools for wide-scale action
- Model for other community planning efforts

The Upper Manhatta(n) Project

- Creating resilience to climate change
  - With creativity and advanced research
    - Based on the values of social justice

Community Engagement Process

- Partnerships with local organizations
- Scenario planning exercises
- Collective editing and design of community plan (aka Accountability)
- 6 mo +

Engagement Checklist

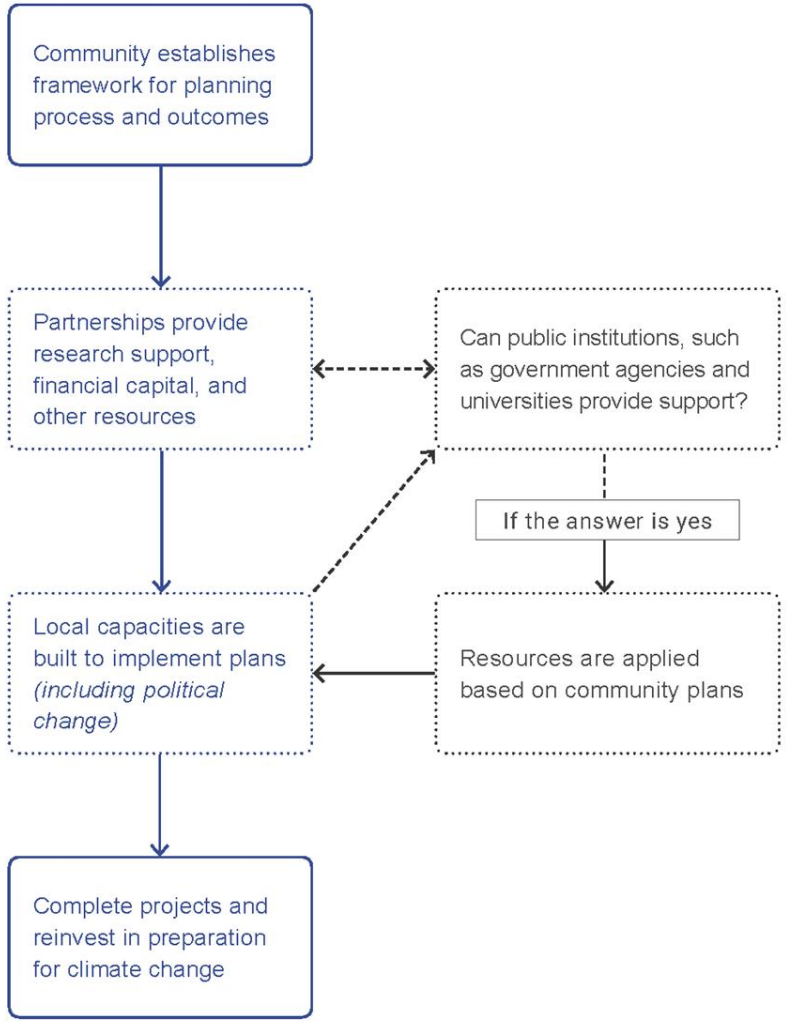
- Provide formal and informal methods of engagement
- Define “community”
- Go to your audience
- Provide assistance (transportation, childcare, food, etc)
- Know where the emergency stop button is
- Translate
- Report back

Defining Resilience

- **Overcoming social AND environmental threats**
  - **Solutions that address the root causes of social inequality and meet fundamental community needs**

Community-based Planning

- **Community establishes planning framework and key issues**
- **Private and public partnerships provide resources**
- **Community participants define process for moving forward**



“Not Waiting for Paris”

CITIES

The people of northern Manhattan are fighting climate change on their own terms

By Aura Bogado on Nov 25, 2015

Get your daily dose of good news from Grist Subscribe To The Beacon

Three years ago, Hurricane Sandy swamped lower Manhattan and forced Wall Street to close for a headline-making two days. The storm shut down northern Manhattan, too. But that part of the island, which contains the largely black and Latino neighborhoods of Harlem and Washington Heights, didn't recover as quickly. That got residents thinking about how to create a plan for their climate reality.

OP-ED

Not Waiting for Paris: Northern Manhattan Residents Develop Climate Action Plan

BY

Aurash Khawarzad, SPEAKOUT

PUBLISHED

August 10, 2015

SHARE

In December, world leaders will meet in Paris for the UN Climate Conference (COP21). Some say the fate of our planet depends on the outcome.

Community members work on the climate action plan. (Photo: Laura Meese)

For local activists working on climate change, that's a chilling thought (even in a time of record breaking heat). The fact is, world leaders are not likely to deliver the changes that frontline communities need to prevent – and survive – the climate crisis. That's why we need to take action on our own, in our communities.

Plan Sections

- Energy
- Emergencies
- Heat
- Food + Waste
- Social Hubs
- Green Infrastructure
- Housing
- Waterfronts
- Civic Engagement

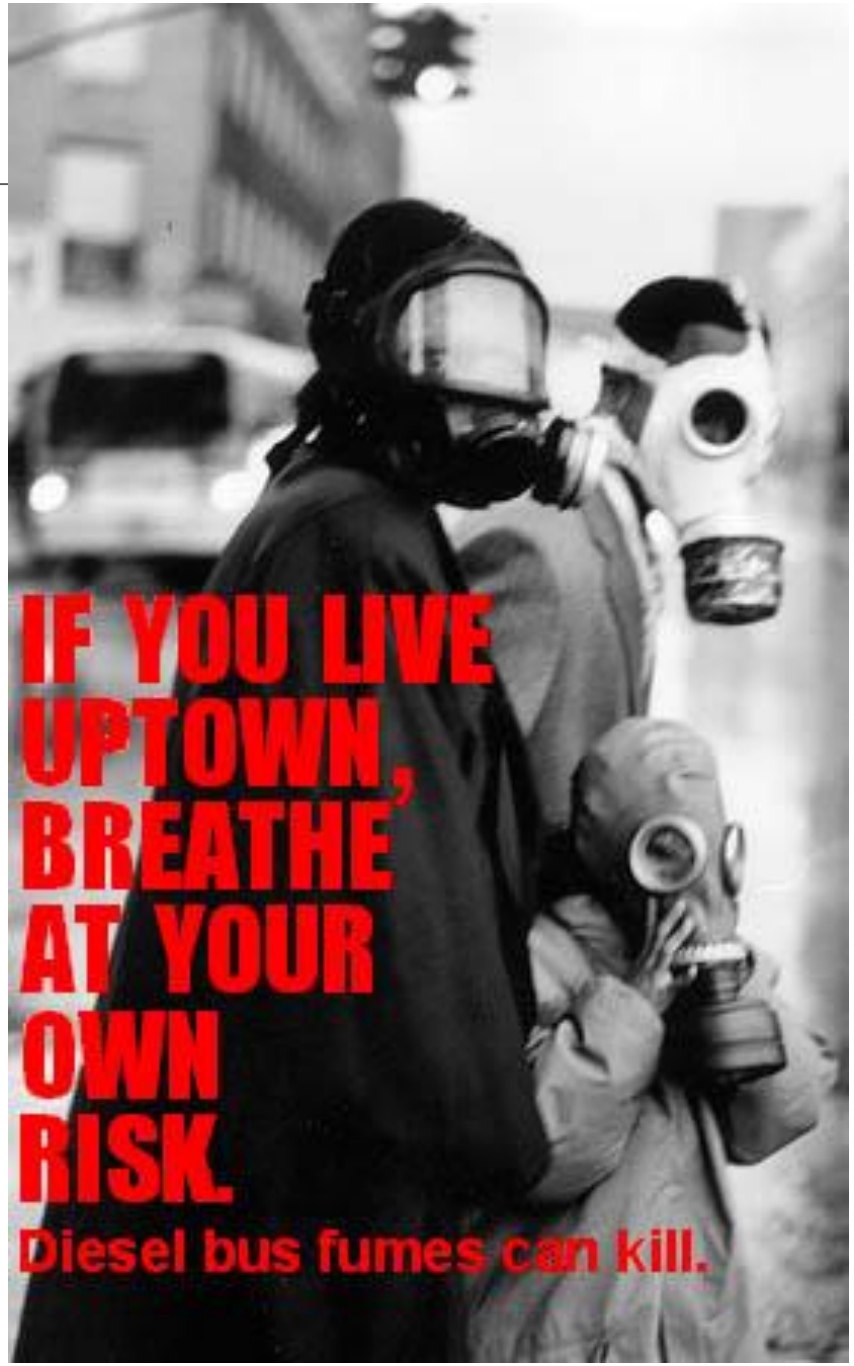
- Demographics
- Economic Inequality
- Gentrification
- Indigenous Peoples Rights
- Gender and Climate Change
- Differing Abilities

- Glossary
- Emergency Communications
- Power Map
- Organizing Principles

Environmental Justice

- Disproportionate impacts of climate change on:
  - People of color
  - Low-income earners
  - Women/LGBTQ community
  - People with differing abilities
  - Indigenous communities

(See Principles of Environmental Justice)

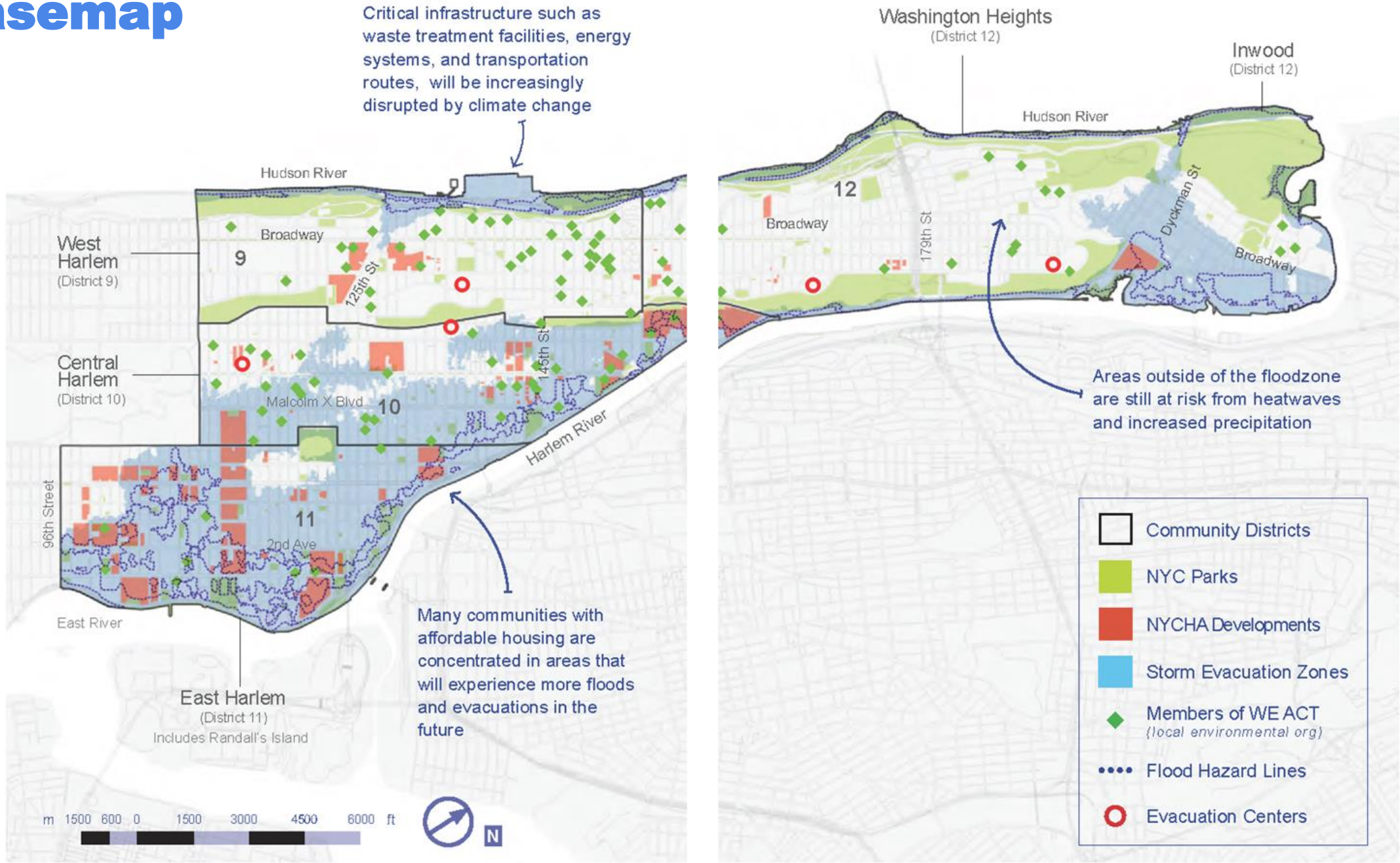


The Partners

Created and published by: Aurash Khawarzad
Research and Design Support: Mateo Fernandez-Muro, Zlatko Simonovski, Philippe Paul, Cecilia Pineda, and Myles Lenon

Collaborating organizations include: WE ACT for Environmental Justice staff and members, Kresge Foundation Environment Program, Solar One, Columbia University, The New School, Buffalo State University, Fordham Law School, City University of New York, Pratt Institute, NYS Energy Democracy Alliance, NY Renews, NRDC, Morgan Stanley Children's Hospital, Associacion de Mujeres Progresistas, Mount Sinai Children's Environmental Health Center, Brotherhood Sister Sol, Center for Social Inclusion, ALIGN, New Economy Project, WHEELS, Take Back the Land, Grassroots Global Justice, UHAB, Peoples Climate Movement NY, Corbin Hill Food Project, Red Hook Initiative, NYC Community Land Initiative, Picture the Homeless, NASA, Community Voices Heard, Mayday Space, The Point CDC, Fifth Avenue Committee, American Institute of Architects - NY Chapter, 32BJ, Manhattan Community Boards 9, 10, 11, and 12, NYC Department of Health and Mental Hygiene, Office of Emergency Management, Department of City Planning, Mayor's Office of Recovery and Resiliency, Department of Environmental Protection, NY State Energy and Research Development Agency, and many others.

Basemap


Critical infrastructure such as waste treatment facilities, energy systems, and transportation routes, will be increasingly disrupted by climate change
Hudson River
West Harlem
(District 9)
Broadway
9
125th St
Central Harlem
(District 10)
Malcolm X Blvd
10
145th St
Harlem River
96th Street
11
2nd Ave
East River
East Harlem
(District 11)
Includes Randall's Island
Many communities with affordable housing are concentrated in areas that will experience more floods and evacuations in the future
m 1500 600 0 1500 3000 4500 6000 ft
N
Washington Heights
(District 12)
Inwood
(District 12)
Hudson River
12
Broadway
179th St
Dyckman St
Broadway
Areas outside of the floodzone are still at risk from heatwaves and increased precipitation
Community Districts
NYC Parks
NYCHA Developments
Storm Evacuation Zones
Members of WE ACT
(local environmental org)
Flood Hazard Lines
Evacuation Centers

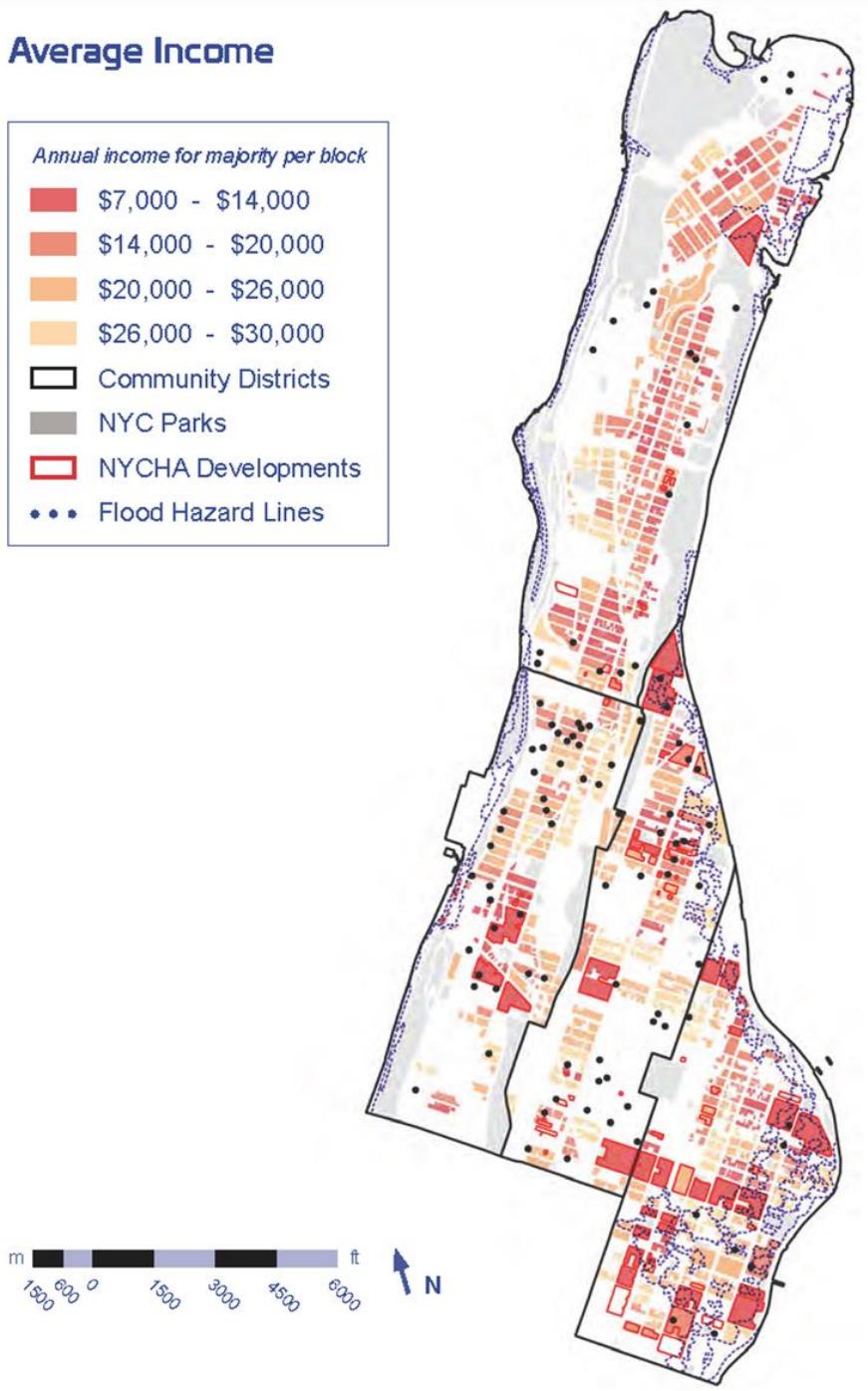

PLAN FOR RESILIENCE TO CLIMATE CHANGE
Coastal Protection
Coastal areas are in need of green infrastructure that provides ecosystem and flood protections. NYC is currently implementing a coastal protection project worth $3.7 billion and has released the first-ever comprehensive coastal protection plan, A Stronger, More Resilient New York. The plan seeks to deepen public participation in waterfront restoration and protection by executing the Waterfront Management Advisory Board and includes pledges to undertake feasibility studies for construction and restoration of floodprone areas. DEP has also spent over $40 million to-date on wetlands restoration and other coastal protections. What remains to be seen is the extent to which developments will encompass community-based plans or be leveraged to gentrify waterfront areas.
#ONENYC
Networked technology controls energy usage and monitors environmental conditions.
Cooperatively Owned Microgrids
Both the City and state government have called for an expansion of distributed generation (DG) technology, including wind, solar, and geothermal. This plan supports the implementation of DG in the form of microgrids that are deployed in vulnerable areas and/or are managed by local communities. The City is currently undertaking a microgrid feasibility study and removing policy roadblocks to microgrid construction by working with ConEd and the Public
Service Corps to review ConEd's standby tariffs to lessen economic impediments to DG. Microgrids provide multiple benefits, including reliable power when the main grid experiences a blackout, reductions in energy costs, more control for residents over their own energy consumption, and employment opportunities.
Reforming the Energy Vision
Community Land Trusts (CLT)
Organizing property ownership through a CLT is one way to preserve affordable housing by removing properties from the speculative market. CLTs also allow participants to collectively use space for local agriculture, energy production, recreation, and even social services such as childcare. Such shared governance structures can help rebuild the commons in terms of how we use space/resources.
CAAAV
NYC community land initiative
Cooper Square Committee
Cooperatively Owned Housing
The City plans to create and/or preserve 200,000 units of affordable housing between 2015 and 2025. This will be done by maximizing use of City-owned land, mandating inclusionary zoning, and providing tax incentives to developers, among other things. However, many are skeptical that these efforts will provide the necessary amount of housing at truly affordable prices (particularly for vulnerable populations such as the homeless, criminalized populations, the elderly, etc.). Therefore, new cooperative homeownership mechanisms such as community land trusts must be explored.
Social Hubs
Community meeting spaces are crucial to support ongoing planning efforts as they are necessary for local organizations to host educational programs, hold meetings, produce materials, use for storage, etc. Having a local hub open for community use can support centralized planning and production activities while remaining grounded in local needs and capacities.
Lower East Side Ecology Center
MAP BAY
WORD UP
THE PUBLIC SCHOOL
Design for Pedestrians + Bicyclists
OneNYC calls for a bike lanes in areas "with limited bike infrastructure". This includes bike lanes on the Harlem River bridges and on other auto-oriented streets. The City's privately-owned bikeshare service, Citibike, should be expanded to encompass Uptown areas, while being on a more public nature. For example, equipments should be manufactured locally.
NO LONGER EMPTY
Water conservation systems
Multipurpose Infrastructure
New design guidelines should be implemented so that waterfronts promote industrial activities while remaining accessible to the public. This can be done through constructing green spaces that both mitigate flood damage and support water-based transportation should be constructed. These spaces are also important for cooling the urban heat island and supporting physical activity, local agriculture, and more.
DRP
City of New York Parks & Recreation
NYCPLANNING
NYSERDA
NYC
The North River Sewage Treatment Plant is in the floodplain
Local Markets
Manufacturers, farmers, and other 'makers' within the hub can sell their goods at local markets, which support non-conventional commerce, including bartering networks and alternative currencies.
SOLIDARITY nyc
GREEN WORKER COOPERATIVES
Ferry Service
The West Harlem Piers (pictured below) is a good location to add ferry services for daily commuters and to create alternate evacuation routes. OneNYC calls for several new ferry routes.
Goods from the Hudson Valley
Farms in the Hudson Valley can make use of improved waterfront infrastructures to ship food into NYC, which can strengthen NY state's economy, while providing healthier food options for local food deserts. OneNYC plans to invest $100 million in marine terminals for freight movements.
CORBIN HILL FOOD PROJECT
Tech Incubator
By working with universities, public agencies, community organizations and members of the "maker" community, a tech incubator can be built to help local tech artists and entrepreneurs develop socially responsible products, such as improved software for running green technologies. OneNYC plans to support "Clean Tech" industries by creating an Advanced Manufacturing Network, that will provide affordable workspaces, business support services and workforce training programs. NYCEDC has also funded several business incubators, including one that focuses on renewable energy.
COLUMBIA UNIVERSITY
NYCEDC
The City College of New York
NY Designs
Space for Social Services
Flexible space within residential buildings can be used for social services such as childcare and healthcare, as a meeting space for local groups, and for other activities that can build social cohesion while allowing more freedom for working class people to pursue employment and engage in other forms of social reproduction.
Local Brewery
A local brewery in the manufacturing district can build on local tradition and culture while creating a local craft food industry.
Local Media Production *
Dedicated space for critical media outlets, training for citizen journalism, and cooperatively owned equipment for digital and hard copy media production.
32BJ SEIU
CUNY The Murphy Institute
ALIEN NY
THE WORKING WORLD
JACOBS
VERSO
Manufacturing Facilities
New York's coastal and interior areas provide many opportunities for light industrial activities (manufacturing of consumer goods), which can both provide jobs for low-income residents and produce tools for local climate resilience. Public and private financial institutions, organized labor, and local organizations that focuses on workforce development can work together to create local employment opportunities, develop green energy technology (solar, wind, etc.), green transport equipment (bikeshare systems) and other basic necessities such as textiles and foodstuffs. Organized labor is already exerting a strong influence on City climate policies. The City Council has announced that it will fund 22 new cooperatively owned businesses in FY 2016.
Live/Work Spaces
One of the most effective (yet currently underutilized) tools for communities in relation to climate change is the arts, however, it is difficult for young artists to secure live/work spaces in NYC, forcing them to leave NYC for other cities. As a result, OneNYC pledges to develop 1,500 live/work spaces, including 500 affordable units, by 2024.
135th Street Marine Waste Transfer Station
For several years the Marine Waste Transfer Station at 135th Street pulled the Hudson River alongside West Harlem, the neighborhood of Hamilton Heights, and other nearby areas with a 24-hour stream of garbage trucks and barges. The now-abandoned facility represents an exciting opportunity to create a permanent, climate-resilient center that can support local organizations, educational/cultural programs, freight movement, citizen science, and other climate-related efforts.
Indigenous Rights *
Pictured to the Lenape Wampum, the purple indicates the course of a Haudenosaunee canoe and a European ship, travelling parallel but never touching. The white stripes represent peace and friendship.
Community Bank
Financial services should be provided by local institutions connected with the community. Local/pro finance can shift the focus of banks away from their short-term profit, towards long-term investment in infrastructure, development of small businesses, and other much-needed investment in and shared resources that will benefit the community.
Places of Worship
Churches, mosques, synagogues, and other religious institutions provide flexible spaces for community planning and emergency services, while conveying important climate-related messages through religious practices. Many churches, urged on by Pope Francis, are joining the struggle for climate justice.
Urban Agriculture
Local agriculture is an integral component of climate resiliency as it helps build communities' self-reliance while reducing the massive petrochemical footprint of existing industrialized food systems. The City plans to increase its number of community gardens by partnering with schools, helping gardeners sell their produce at farmstands, and supporting urban farms through the Building Healthy Communities initiative. NYCHA's Gardening and Greening program is also working to expand accessibility to community gardens. Our partners, such as the Corbin Hill Food Project, are deeply engaged with these issues and are wrapping out an effective model for a sustainable food system in Northern Manhattan.
Participatory Budgeting
In April 2015, over 51,000 NYC residents voted on how to allocate $32 million to various locally-developed capital projects across 24 NYC Council Districts. Participatory Budgeting is a clear example of how residents can be made to engage directly with governance systems to tailor policy to their needs. Given the level of site specificity essentially effectively address climate change issues, PB should be expanded to encompass more of the City's budget, green projects, and longer-term investments.
The Rainforest Alliance
UNION
The Point
SisterSol
GreenThumb
CORBIN HILL FOOD PROJECT
GREEN CITY FORCE
GRID Alternatives
Resilient Housing
True victory in the climate struggle is not simply based on the preservation of physical conditions, but also on the achievement of lasting security for communities that are under threat of displacement. Therefore, affordable housing should be a priority for climate advocates, just as it is for the Mayor's office and many NYers. Supporting NYCHA by removing its infrastructure is a necessary first step, but we must also ensure that further price hikes do not happen in the NYCHA property leased to private developers does not cause further gentrification. Simultaneously, alternative models for transitional housing, such as the Sugarhill development by Broadway Housing Communities should be explored.
It is particularly important to ensure that homes are cool enough for the winter. Between 2000 and 2011, 85% of those who died from heat in NYC died in their own homes.
Enterprise
BHC
UHAB
NYC
CEPF
OEM
Office of Emergency Management
Healthcare
Healthcare services should not only be expanded to provide aid to more people; they must also be made resilient enough to continue to function during the next superstorm, heatwave or other crisis. Post-Sandy healthcare resilience efforts include installing infrastructures to protect against flooding, building distributed generation systems (and microgrids), and connecting precarious demographic groups with health services. Healthcare providers should establish connections with local emergency response systems so that people who need special health services during a crisis can be reached and treated quickly.
1333 Broadway
Drew Hamilton Houses
Dyckman Houses
Jackie Robinson Houses
Wagner Houses
Sugarhill Houses
Research Institutions
Universities and government agencies can align their research capabilities, including access to technology, in order to support community-based plans. Creating information pipelines between academia and the community can support grassroots research and policymaking, built awareness about climate emergencies (such as weather predictions and resilient sites, while providing opportunities for students to build partnerships with the communities of New York City.
NASA
NOAA
PARSONS
Pratt
Development Conglomerates
Multi-national development corporations, in conjunction with powerful city agencies, are aligning to transform basic infrastructure as a result of climate change. This includes sea-walls, new transport systems, and energy grids.
Global Finance
Amalgamation of banks, foundations, creditors, and others, control the flow of capital for investments in infrastructure, philanthropic donations, and other measures for enhancing resiliency.
nyserda
SKANSKA
Statoil
NYC Economic Development Corporation
NY GREEN BANK
Rockefeller Brothers Fund
amalgamated bank
NewYork-Presbyterian
NYAM
Mount Sinai Hospital
HARLEM HOSPITAL CENTER
Metropolitan Waterfront Alliance
NYCPLANNING
NYC Mayor's Office of Sustainability
Mayor's Office of Recovery & Resiliency
Information Kiosks
After Hurricane Sandy, locally-produced signage played an important role in connecting people with networks and resources that supported recovery efforts. Public signs and stands should be created across the City to provide information on cooling center locations, evacuation zones, and other important resources.
Flooding Barriers **
The thirteen-plus miles of coastline in Upper Manhattan are home to thousands of residents, small businesses, manufacturing spaces and important pieces of municipal infrastructure. Many of these, particularly in East Harlem, are located within the Hurricane Evacuation Zone and should therefore be hardened against flooding. Flood protections should be planned using design guidelines that prioritize the creation of public space, access to the waterfront, and bicycle route connectivity.
OCCUPY SANDY
NYC DCAS **
LinkNYC
RELATED
Environmental Justice Networks
Non-governmental organizations have formed coalitions to increase their organizing capacity and influence in policy making.
ENERGY DEMOCRACY NETWORK
WE ACT
RUCKUS SOCIETY
Black and Afro-Latin Nationalism *
For decades Black and Latin@ New Yorkers have fought for justice by demanding access to land, reparations, and greater rights within how their communities are governed.
Illustration Key
Organizations in this illustration are given the following designations. They represent entities that have been engaged by the creators of the plan or informed it in some way.
* Anti-capitalist
** Re appropriated
*** Legacy
Map pictured right
Projected sea level rise
NYCHA Developments
Upper Manhattan Study Area
Study Area
This plan uses research collected in Upper Manhattan from 2014-2015. Research included interviews with residents and professionals, along with scientific data collection from satellites and sensors.
Created by: Aurash Khawarzad + Mateo Fernandez-Muro

Power Map


A Energy
B Emergencies
C Heat
D Food and Waste
E Social Hubs
F Green Infrastructure
G Governance
H Housing
I Waterfronts
Community
WEACT FOR ENVIRONMENTAL JUSTICE
COMMUNITY VOICES HEARD
Fifth Avenue Committee
MAY DAY
The Brotherhood Sister Sol
RED HOOK INITIATIVE
The Laundromat Project
WORD UP
THE POINT
CORBINHILL FOOD PROJECT
City and State
NYC Office of the Mayor
NEW YORK CITY DOT
NYC Environmental Protection
NYC Health
NEW YORK STATE
NYC Citywide Administrative Services
NYC Mayor's Office of Recovery & Resiliency
NYC Mayor's Office of Sustainability
NYC Department of Health
OEM
NEW YORK CITY HOUSING AUTHORITY
nyserda Energy Innovation Solutions
NYCPLANNING
Intermediary
NRDC
New Economy Project
SOLARone
ALIGN
csi
hester street collaborative
596 ACRES
ACLU
THE WORKING WORLD
Healthcare
Mount Sinai Hospital
HARLEM HOSPITAL CENTER
NYAM
Community Healthcare Network
Education/Research
Pratt
FORDHAM LAW SCHOOL
COLUMBIA UNIVERSITY
CUNY
NEW
NASA
AARON
WHEELS
Climate Change Coalitions
PEOPLE'S CLIMATE MOVEMENT
NY RENEWS
CLIMATE WORKS FOR ALL
NEW YORK STATE ENERGY DEMOCRACY ALLIANCE
GRASSROOTS GLOBAL JUSTICE ALLIANCE
Housing
COMMUNITY LEAGUE OF THE HEIGHTS
CLOTH
UHAB
PICTURE THE HOMELESS
RIGHT TO THE CITY
NYC community land initiative
Investment / Finance
THE KRESGE FOUNDATION
amalgamated bank
FORD FOUNDATION
Rockefeller Brothers Fund
NY GREEN BANK
people's
Enterprise
BlocPower
Development/Manufacturing/Workforce
GREEN CITY FORCE
GRID ALTERNATIVES
conEdison
SolarCity
AECOM
MADE IN NYC
ROSA LUXEMBURG FOUNDATION
32BJ SEIU
SKANSKA
Statoil
NEW YORK CITY NETWORK of WORKER COOPERATIVES
Williams

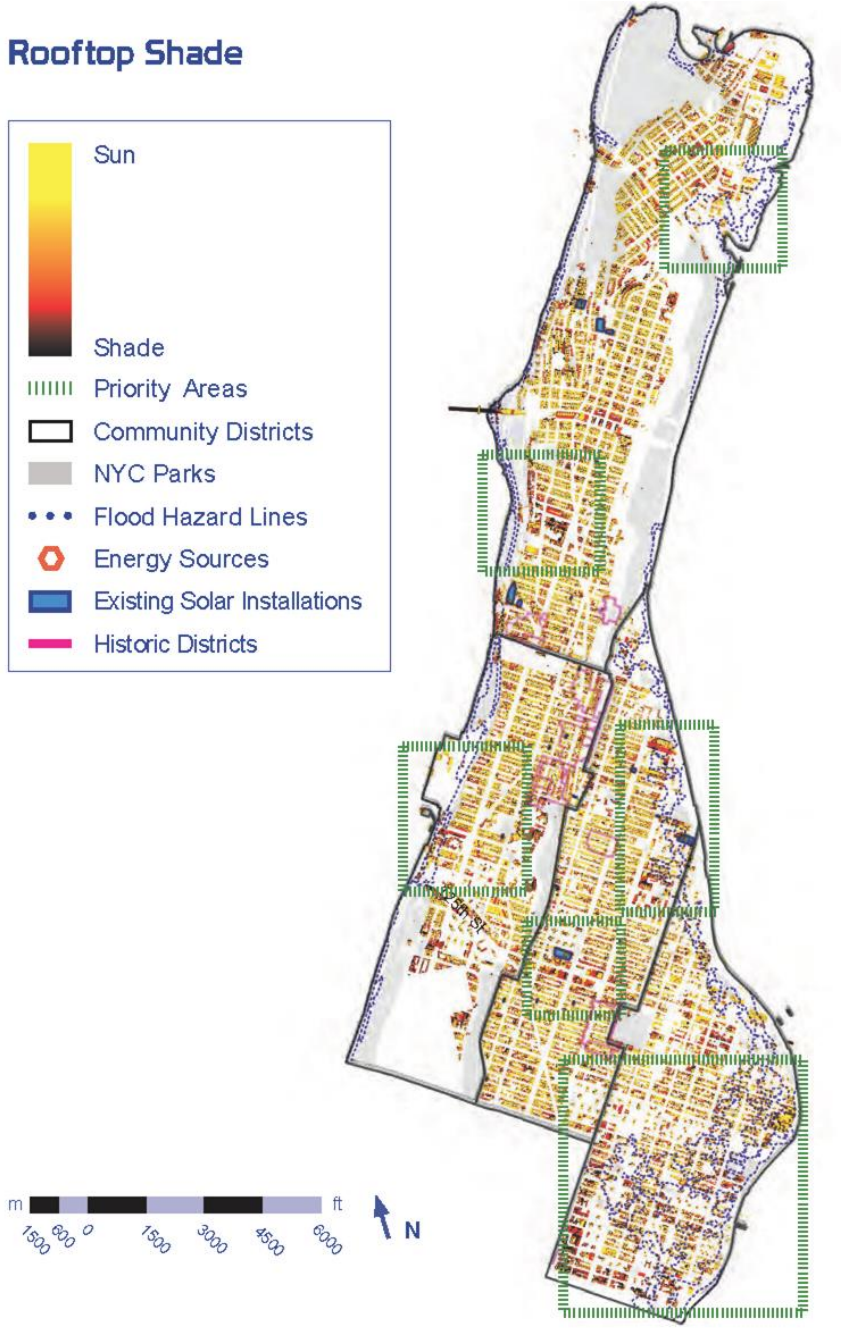
Social-Economic Inequality

- Acknowledging widespread poverty and wealth gap
- Ensuring inclusion in public policies and economic opportunity in resilience economy



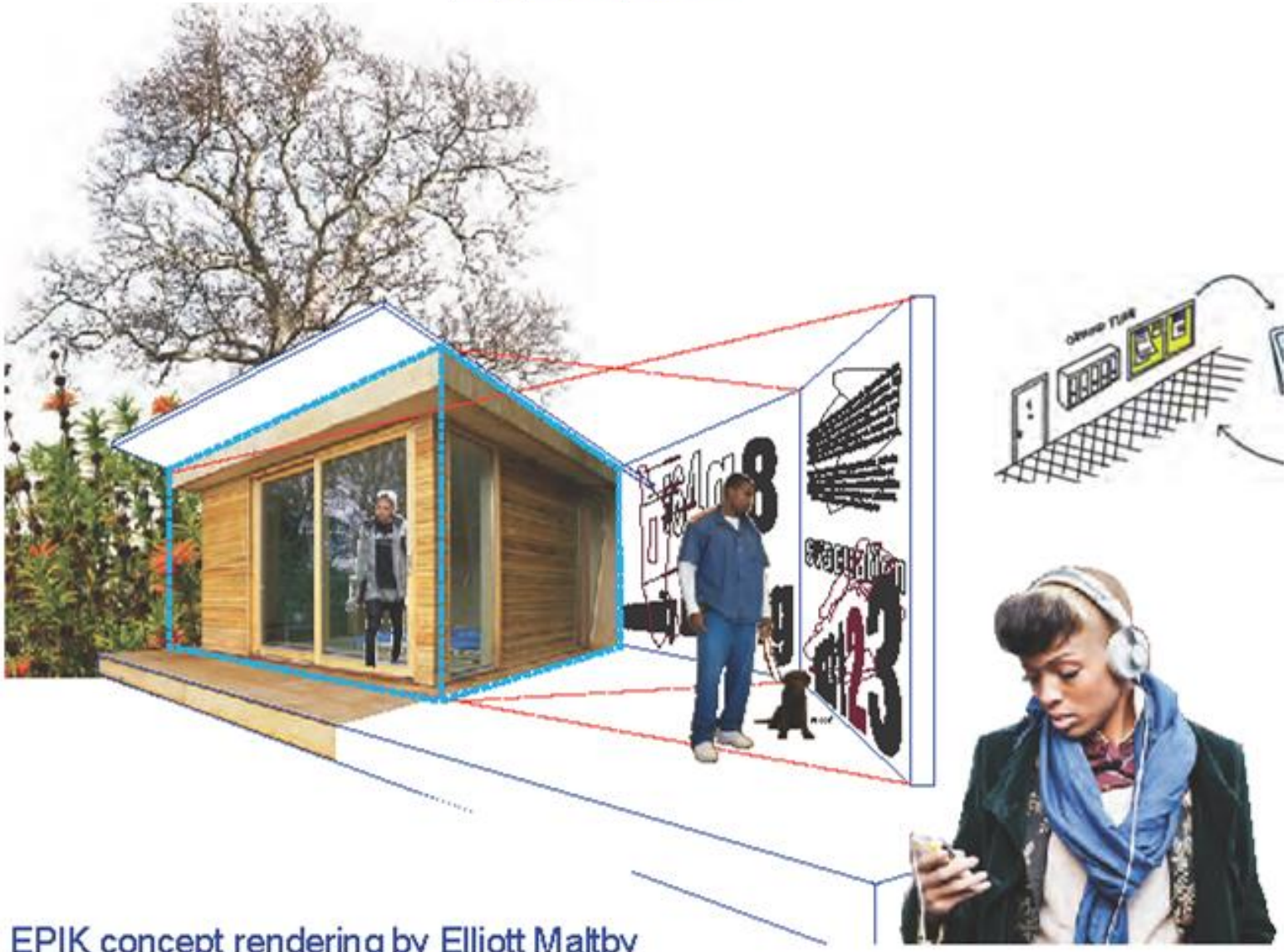
Energy

- Cooperatively owned infrastructure
- Microgrids in vulnerable areas
- Focus on affordable housing and HDFC coops



Emergencies

Emergency Preparedness Information Kiosk (EPIK)



EPIK concept rendering by Elliott Maltby

Communications

An emergency communication system enables one-way and two-way communication of messages when normal communications systems, including telephone and internet, are not functional. Storms, earthquakes, weapons attacks, and other events can physically damage infrastructure that makes communicating impossible, or they can cause high call volume, which can also take down a comms system. The equipment pictured here can maintain comms during those times, they include: two-way radio, short-wave radio, and HAM radio.

Electricity and Supplies

Solar panels and battery storage systems can provide electricity for emergency communications, light, heat, and preservation of medical supplies, among other vital services, when the main energy grid has gown down due to an emergency. When there isn't an emergency this technology and serve as a demonstration project teaching about renewable energy.

Programming

Provide space and resources for programming including education, entertainment, research, and other activities that bring people together to discuss climate change and preparedness. Pictured here the Gramsci Monument installation in the Bronx.

Case Study: Red Hook Initiative (RHI)

The Red Hook Initiative has been pioneering a combination of community programming and physical infrastructure to prepare Red Hook, Brooklyn, for their next emergency.

To-date they have launched "Local Leaders", a bi-annual emergency preparedness training series conducted in English and Spanish for NYCHA residents to become leaders of the response and recovery efforts of any emergency or disaster. Over 125 Local Leaders have participated in the program, including partners such as NYC agencies, EMTs, FDNY, and organizing groups.

Another major project of RHI is the development of a microgrid for the Red Hook Houses, which were severely damaged after Superstorm Sandy. The Federal Emergency Management Agency (FEMA) has awarded a $438 million contract for "new playground equipment, sidewalks, renovation of floor and flooring .. new boilers, additional flood protection as well as building two new power plants." The plan includes 12 new 'utilities pods' that will distribute green energy and will be elevated in order to be avoided flooding in the future.

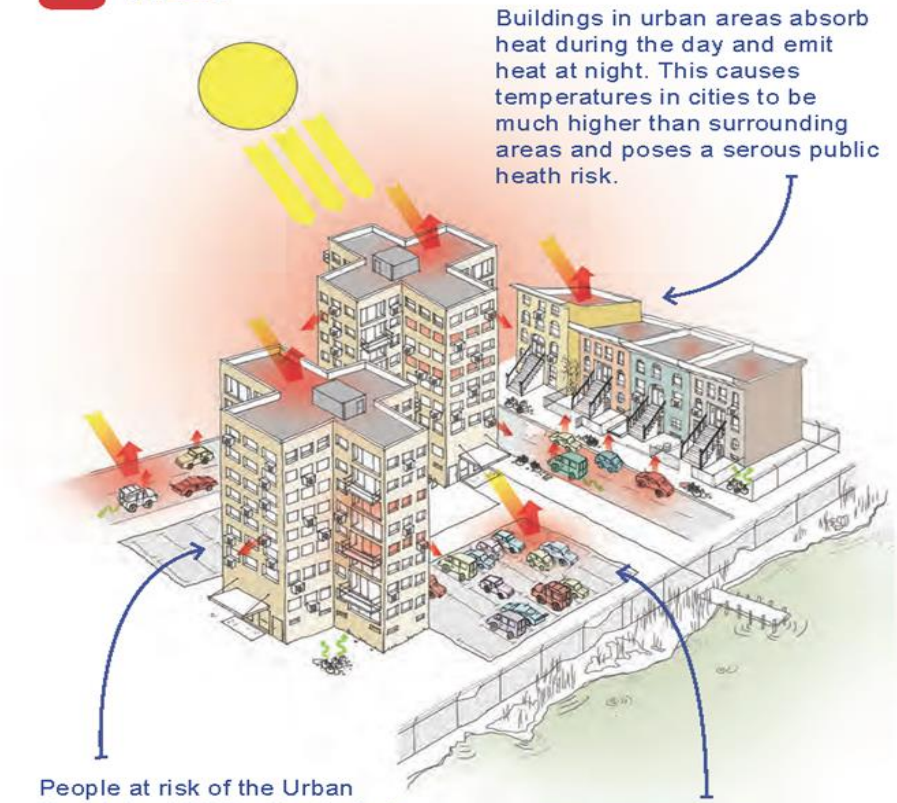
The new energy infrastructure will also support a communty-wifi program created by Red Hook to ensure communications in preparation for and during an emergency. The wi-fi system is also paired with physical messaging boards placed around the community. The digital and physical messaging boards allow community members to share resources, including skills that can help train their neighbor in preparedness. The messaging board allows communities to take agency over the services that are provided and allow for rapid action during a crisis.

Other activities of RHI include mobilizing community power and local networks to distribute food and financial support, staff the NYC Recovery Center, connect unemployed residents to recovery jobs, and provide social service case management.
More at: http://rhicenter.org/

Top: Red Hook Initiative Offices. Middle: Website for the Red Hook Hub where people can exchange messages in support of emergency preparedness and outreach activities. Bottom: Microgrid infrastructure planned for Red Hook Houses.

HEAT

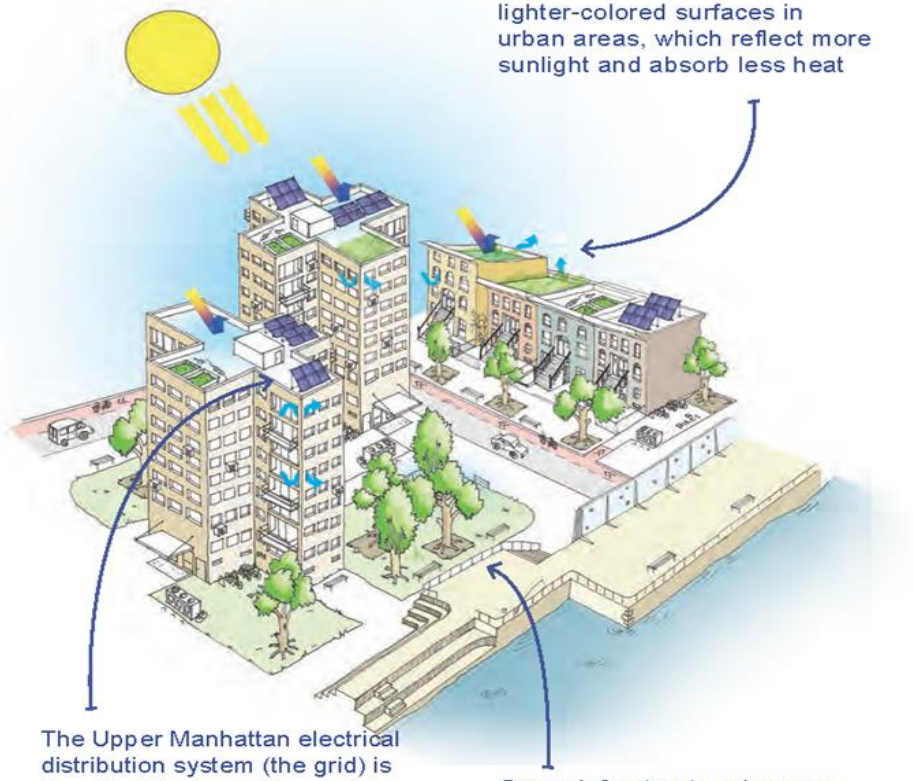
3C Heat



Buildings in urban areas absorb heat during the day and emit heat at night. This causes temperatures in cities to be much higher than surrounding areas and poses a serous public heath risk.

People at risk of the Urban Heat Island (UHI) effect include people without air conditioning in their home, people who spend long hours outdoors, the elderly who may suffer from other health complications, and other people with unsafe indoor air environments and the lack of resources to improve their conditions.

Historically there has been an underinvestment in trees and green infrastructure based on race and class. These areas have more concrete and impervious surfaces, which makes for hotter surface temperatures and ambient areas.



Green roofs and the use of lighter-colored surfaces in urban areas, which reflect more sunlight and absorb less heat

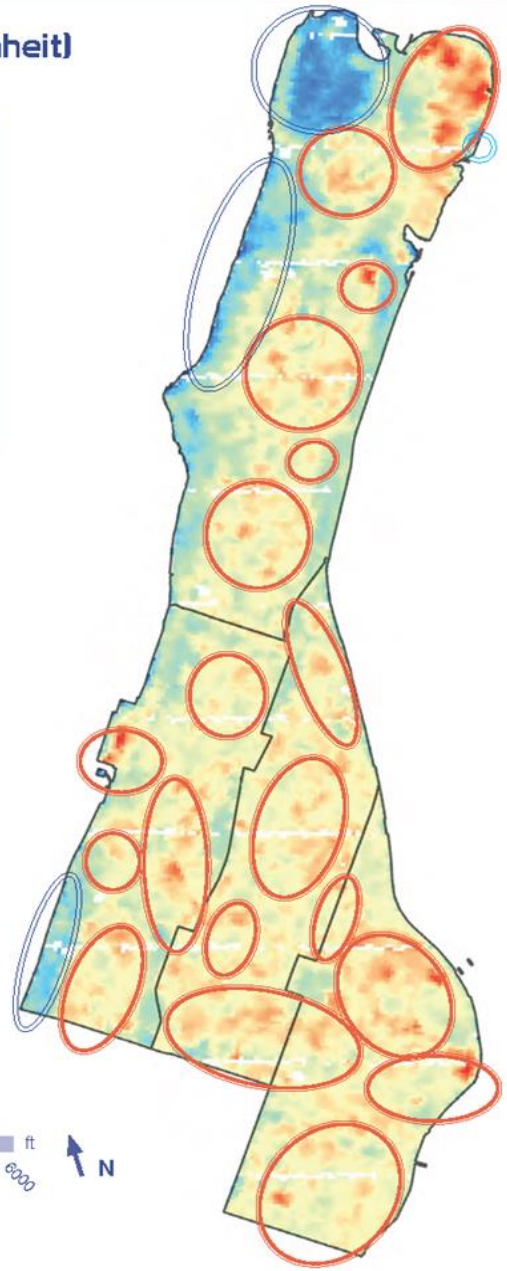
The Upper Manhattan electrical distribution system (the grid) is the oldest in the nation, making it more susceptible to blackouts and service disruptions than other places. Solar energy can reduce the likelihood of a blackout by reducing the strain put on energy infrastructure by hot weather, and by connecting with storage systems which can provide energy if there is a blackout.

Green infrastructure in areas with a lot of pavement and other impervious surfaces can help prevent flooding while reducing temperatures. Temperatures along the waterfront can be 10 degrees cooler.

Temperature (Fahrenheit)

- 70
- 80
- 90
- 100
- 110
- Existing Cool Roofs
- Hot zones
- Cool zones

Temperatures on July 11, 2011



m 1500 600 0 1500 3000 4500 6000 ft

N

Land Cover

- Tree canopy
- Grass/shrub
- Bare soil
- Buildings
- Paved

m 1500 600 0 1500 3000 4500 6000 ft

N

Harlem Heat Project

Stories About

WNYC News

Cooling Centers Open (If You Can Find Them)

Last year, after a WNYC investigation, New York City officials promised to provide large signs to make locations more visible. But in East Harlem at least, they are nowhere to be seen. Aug 8, 2018

▶ Listen 1 min

WNYC News

Making New York Cool Again

WNYC's Harlem Heat Project wrapped up its work — for now — with a brainstorming session about how to protect people from extreme heat during the summer. Here are some ideas. Oct 24, 2016

▶ Listen 4 min

WNYC News

ABOUT THE SERIES

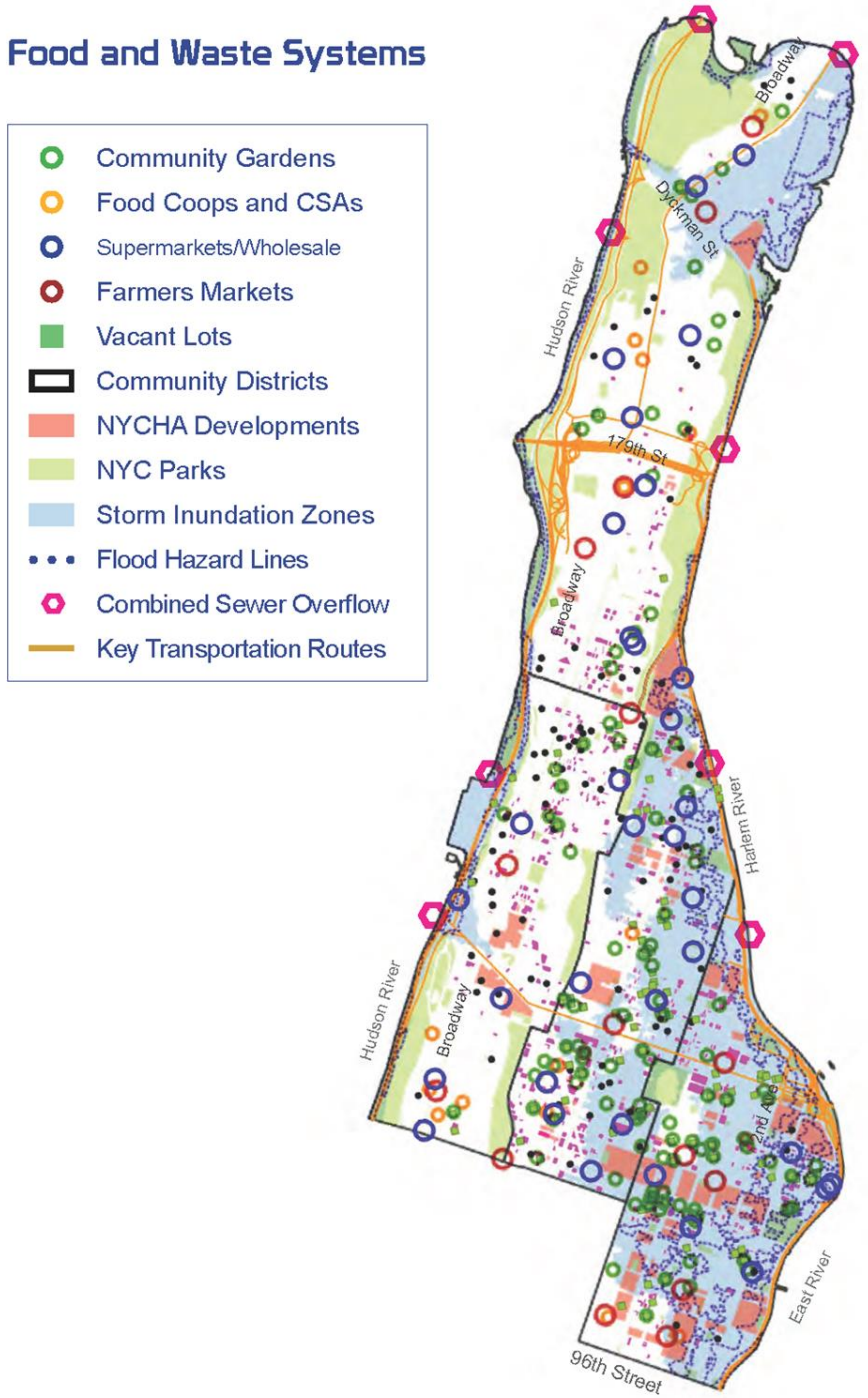
Produced with AdaptNY and ISeeChange, along with WE ACT for Environmental Justice. WNYC's resilience reporting is supported by The Rockefeller Foundation.

ADAPT NY

I SEE CHANGE
COMMUNITY CLIMATE & WEATHER JOURNAL

Food & Agriculture

- **Multi-purpose infrastructure (community gardens)**
- **Protecting food resources in flood plains**



Case Study: Corbin Hill Food Project

Corbin Hill Food Project is a food hub that connects the fresh produce from local and regional farmers to food deserts in Harlem, Washington Heights and the Bronx. Corbin Hill seeks to utilize their own land and other agricultural resources in New York State to produce affordable, nutritious food. Their coop also reduces the distance food travels from farm to plate, which cuts down the pollution produced by our food system.

Corbin Hill "collects and delivers fresh farm food, simultaneously accomplishing two missions: linking local farmers to new customers and providing food for people who resident in places with limited access to fresh farm food and who have low incomes." Corbin Hill allows individual or group orders, and even wholesale orders in bulk. Variety of vegetables and fruits are offered, as well as fresh USDA organic turkey meat. To-date, Corbin Hill has developed a network of 30 family-owned New York farms and deliver food to more than 47,000 individuals in Upper Manhattan. They have partnered with community organizations to create tailored boxes, which sell at a price much lower than the standard price. For example, by working with Harlem Children's Zone, they have been able to get fresh produce to families of Headstart kids – kids whose parents may not always be able to afford such things, especially when sold at standard grocery prices. Through other partnerships, they are also able to offer boxes for seniors are priced at $8 and family-specific boxes, range from $14 to $20.

Food coops usually have the following benefits:

* Open membership
* Member Ownership - Each member has an ownership stake
* Member Control. A co-op share comes with the right to vote for the organization's leaders, board members, and strategic initiatives
* Commitment to Education, Enrichment, and Community Development
* Focus on Local, High-Quality Food and Products
* Supporting Local, Small-Scale Agriculture

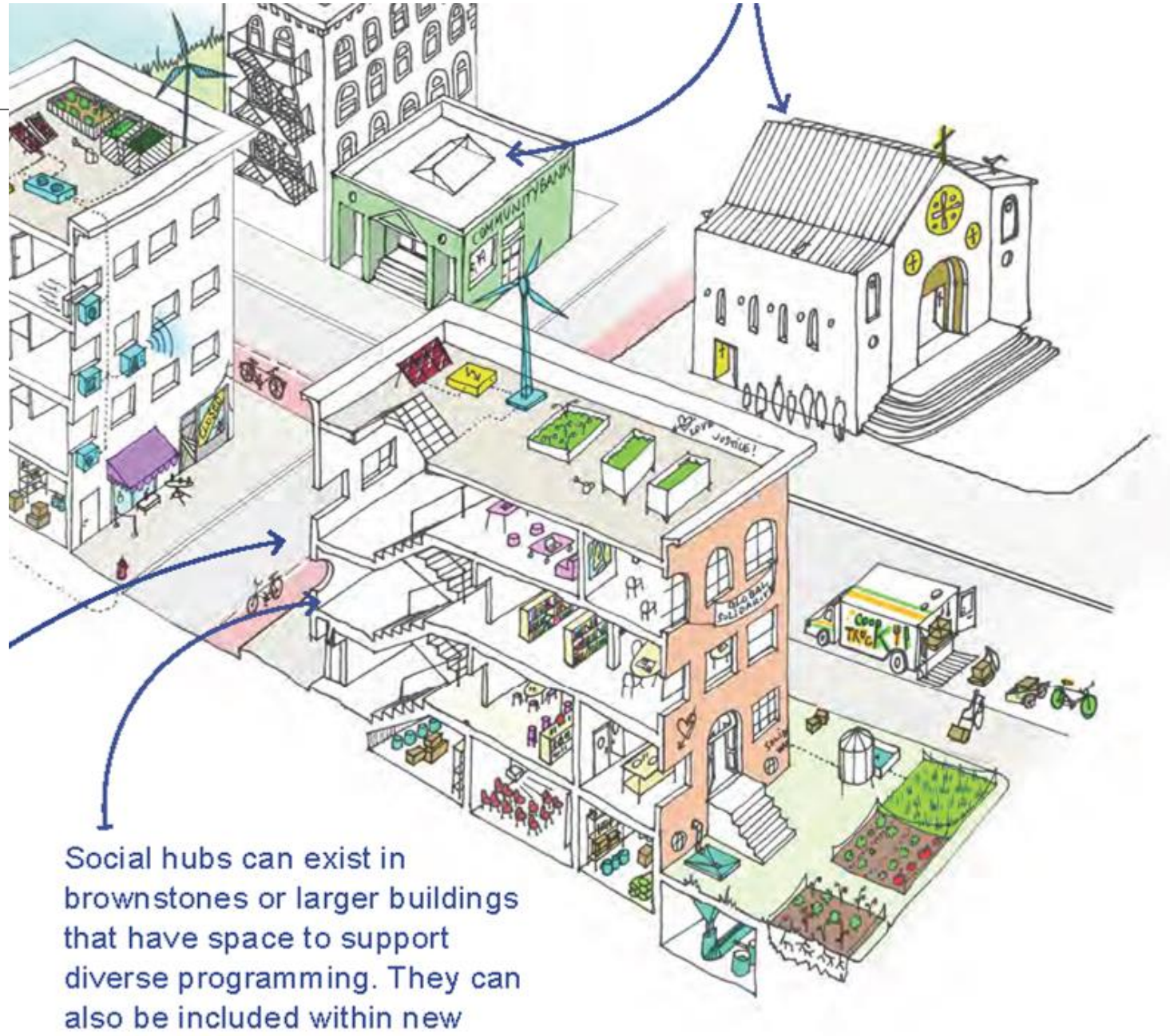
More at: http://corbinhill-foodproject.org/

CORBINHILL
FOOD PROJECT

Top: Members of Corbin Hill working at the cooperatively held farm in Upstate New York. Bottom: coop members pick up their farmshares at a distribution point in Harlem, New York.

Social Hubs

- Incubators for local organizations
- Educational centers
- Emergency shelters
- Community-land trusts structure



Case Study: Immigrant Movement International

Immigrant Movement International (IMI) is a community space and think tank that "recognizes (im)migrants' role in the advancement of society at large and envisions a different legal reality for human migration; increase the visibility of immigrants; raise public awareness of issues pertinent to immigrants through different zones of contact."

The space was developed by Cuban artist Tania Brugera, in partnership with the Queens Museum, as a method of engaging/supporting local immigrant populations in Corona, Queens. The space, a former beauty supply store, has classroom and storage facilities, and is strategically located near key public spaces, transportation, and the Queens Museum. IMI offers comprehensive educational programming including English classes, computer instruction, legal help and impromptu performances, health, and legal services. These programs are offered at no cost in order to empower immigrants personally and politically; community space where practical knowledge is merged with creative knowledge through and with a holistic approach to education open to all regardless of legal status.

Programming also works to link isolated Latin American populations with local Asian cultures. It does this with art, such as theater workshops that function as safe places to work out stress, reimagine reality and rehearse political interventions.

The IMI manifesto states their main goals are free movement, right to be included, the right to be an explorer. They believe that means movement and the functionality of international borders should be re-imagined in the service of humanity. The driving motto of the organization is that "the right to be included belongs to everyone".

More at: http:// immigrant-movement.us/wordpress

Images of the IMI workshop space at Roosevelt Avenue and 133rd St in Corona, Queens.

Green Infrastructure Types

Green Roof

Green roofs can intercept between 15% and 90% of rooftop runoff. Absorption will vary based on the type of growing medium and plant cover variability. Targeted green roofs can make sure high-risk areas are protected.

Rain Garden

A rain garden is a planted depression or a hole that allows rainwater runoff from impervious urban areas, like roofs, driveways, walkways, parking lots, and compacted lawn areas, the opportunity to be absorbed. The schist depicted on page 82 makes it difficult for rain gardens to effectively drain water in some areas.

Permeable Materials

Permeable materials describes a range of pavements and other building techniques that allow the movement of stormwater through the surface of a material into natural filtration. In addition to reducing runoff, they can trap suspended solids and filters pollutants from the water. Permeable paving can infiltrate as much as 70% to 80% of annual rainfall. Construction costs may be 50% more than conventional asphalt and concrete. Permeable pavements may give urban trees the rooting space they need to grow to full size.

Community Garden

A community garden is any piece of land gardened by a group of people, utilizing either individual or shared plots on private or public land. Gardens play a critical role in stormwater management both in absorbing water and in bringing people together to deal with the aftermath of a major climate event.

Coastal Buffers

Measures aimed at protecting the coast against coastline retreat, floods, loss of biodiversity, and more. Buffers are a natural method, as opposed to building hard infrastructure, the coast and the hinterland from erosion. Buffers can include landscaped areas and natural wetlands, to name a few.

Daylighting

Deliberately exposing some or all of the flow of a previously covered river, creek, or storm water drainage that were buried in culverts or pipes, covered by decks, or otherwise removed from view. Daylighting re-establishes a waterway in its old channel where feasible, or in a new channel threaded between the buildings, streets, parking lots, or other hard surfaces. Some daylighting projects recreate wetlands, ponds, or estuaries. All require the removal of concrete, or de-paving. Pictured here is the Cheonggyecheon River in Seoul, South Korea, which was once covered by a freeway, and the Saw Mill Creek in Yonkers, New York.

Case Study: Water Square, Rotterdam

Rotterdam, Netherlands is one of the wettest cities in Europe. The city has taken an innovative approach at The Benthemplein Water Square, "the first 'water square' in the world"

This public space is composed of three basins. During dry days they serve as a basketball court, skate park, and performance arts podium. On the rainy days, via stainless steel gutters, the square (basins) absorbs the rain water from the atmosphere as well as the rain water from roofs from the nearby buildings. In this way, the rain water during heavy rains is retained which mollifies city's sewage system during peak rainy days. The storage capacity is 449,000 gallons. After the rains, the absorbed water in the square is poured out in underground infiltration, but is also used for watering nearby trees.

The largest and deepest pool occupies the center of the square and is only filled when there is a lot of heavy rain, which turns a "water wall" on one of its four sides into a spectacular, abundant cascade. On the northern side of the square, just in front of the main entrance of the church, there is a smaller pool, trapezoidal in shape, and also with tiered seating, as well as a central island which can be used as a stage for dancing. When the third pool is dry, it is used by people who practice their skills on bicycles, skateboards, rollerblades, and other wheels.

All the water-bearing elements have a shiny metallic surface, while the ponds are finished in different tones of blue. The pre-existing trees remain in their former places but are now surrounded by garden plots with tall grasses, flowers and continuous concrete benches.

In New York, the city has an ambitious plan to build a park within a ten minute walk for every resident. This means that many new public spaces will be built in places like East and Central Harlem. These spaces each present an opportunity to build green infrastructure that cools temperatures and retains stormwater.

More at: http://urbanisten.nl/

Top: A basin that doubles as a gaming court in Water Square.
Middle: The gaming court holding water after a heavy rain.
Bottom: Section diagram showing the multiple water drainage and storage facilities that are integrated into the park as useable space or aesthetic features.

135th Street Marine Transfer Station

One opportunity for community waterfront redevelopment is the 135th Street Marine Waste Transfer Station. Local groups have long been planning for its redevelopment as an environmental center with hydroponics and aquaculture center, a boathouse, a recreational facility, exhibition space, and other facilities. The 20,000-square-foot space, which served as Manhattan's only round-the-clock garbage depot, has been vacant since 1999 and has become a hazard for the fragile Hudson River ecosystem. The facility has been decommissioned as a waste facility by New York State and is currently in possession of New York City's Department of Citywide Administrative Services (DCAS). As West Harlem gentrifies, there is more interest in waterfront redevelopment, however the facility, which caused decades of pollution, should be developed according to local plans, which include access and ownership over the future community center's resources space and programs.

Images on opposite page: Exterior and interior of the Marine Transfer Station taken in 2015

Images on this page: Redevelopment concepts presented by the AIA and Pratt Institute

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April 11, 2019

Preparing NYC for Climate Change

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PREPARING NYC FOR CLIMATE CHANGE

POLICY / DESIGN / ENGINEERING

April 11th, 2019

What is Preparing NYC for Climate Change?

A 9th grade (14-15-year-old students) curriculum inspired by the Upper Manhattan Project

Created by staff at the High School for Environmental Studies in collaboration with Aurash Khawarzad

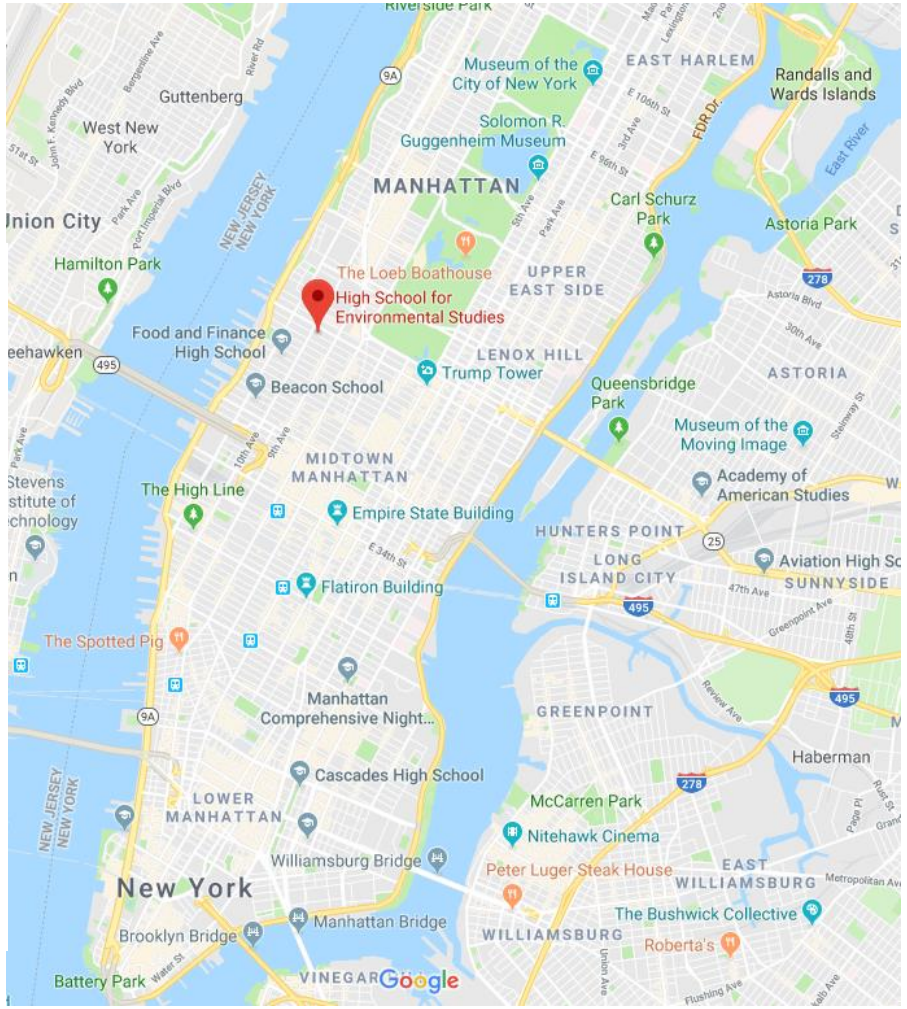
What is the High School for Environmental Studies?

HSES is a public high school in Manhattan

From 2017-18 Demographic Snapshot

Enrollment	1194
Free or reduced priced lunch	81%
English language learners	8%

Asian	12%
Black	16%
Hispanic	63%
White	7%
Other	2%
Students with disabilities	19%



Preparing NYC for Climate Change

Key Question:

How can we start to prepare high school students to create local solutions to climate change?

Our Answer:

We use the same environmental justice principles used to create the Upper Manhattan Project to create a high school curriculum

Curriculum Structure

Unit 1: Overview of Climate Change
Essential Question: What is climate change and why is it occurring?

Unit 2: Climate Change in NYC
Essential Question: How is climate change currently impacting NYC and what impacts are projected in the future?

Unit 3: Developing Solutions
Essential Question: How can we mitigate the impacts of climate change and build resilient communities?

Currently being piloted during the spring semester in a 2 day a week course taught to all 9th grade students at HSES

Desired Learning Outcomes

Students will learn the basics of climate science

Students will be able to explain the local impacts of climate change

Students will learn how to conduct community research

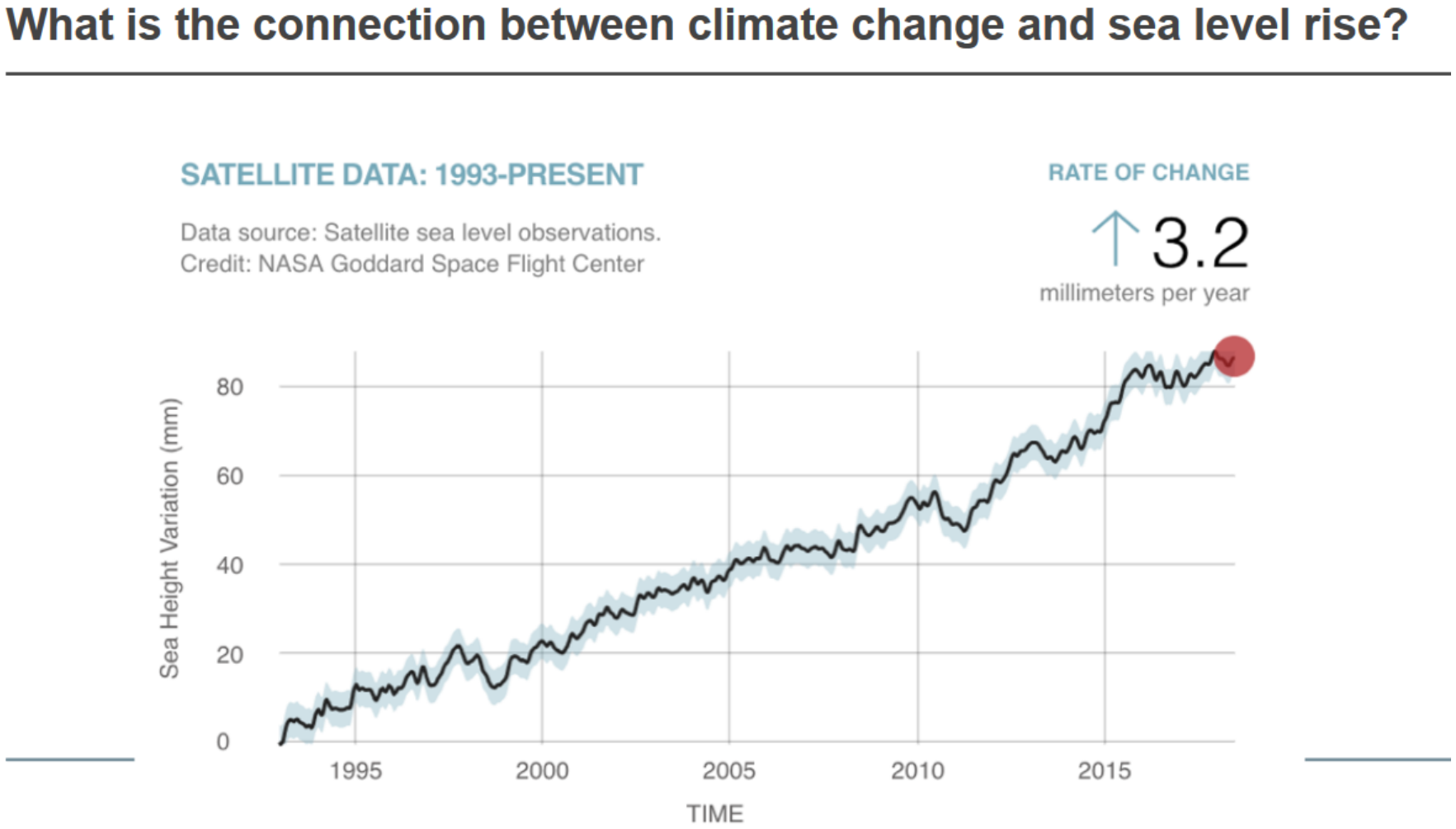
- **Create surveys, analyze maps and census data**

Students will learn basic principles of sustainable urban development

Students will develop a final action project which demonstrates a synthesis of their learning

Curriculum Example: Sea Level Rise

We began by looking at the data on sea level rise and the connection between climate change and sea level rise globally



Curriculum Example: Sea Level Rise

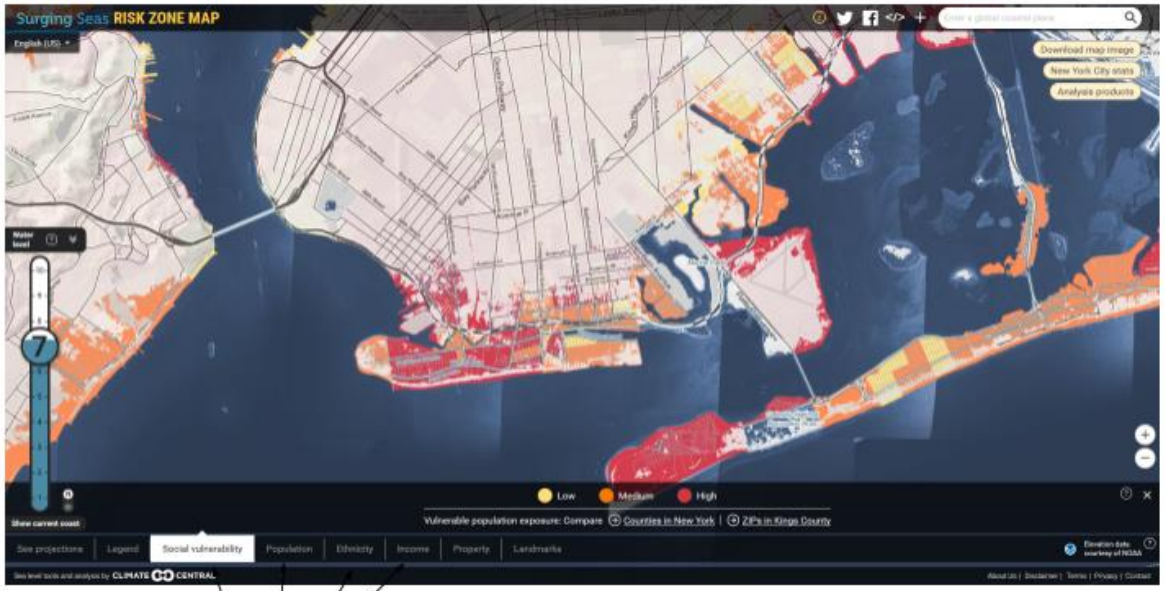
In the next lesson students picked a neighborhood and used the Climate Central Surging Seas tool to research projected impacts of sea level rise on NYC

Students selected a neighborhood to focus on

Observations

For this part of the activity also open https://www.google.com/maps and search for the name of your neighborhood. You will need google maps and the flooding map.

Part 1. Vulnerability



Use these to begin exploring who will be impacted in this neighborhood

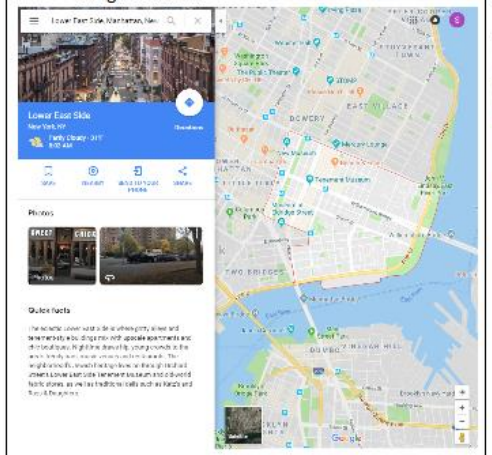
Does your neighborhood have a lot of people with high social vulnerability?

How many people will be directly impacted by flooding?

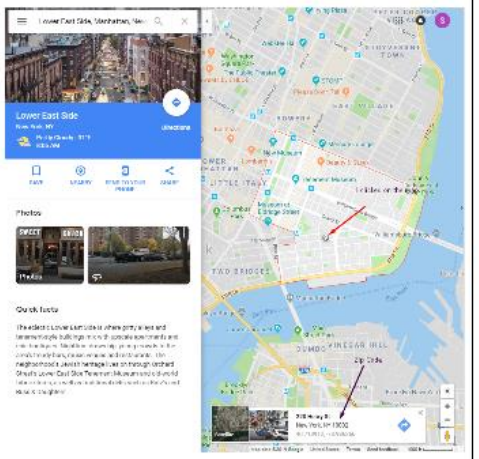
Curriculum Example: Sea Level Rise

In order to assess the social vulnerability of the population in the neighborhood they selected students used the US Census FactFinder site to conduct demographic research on the neighborhood

1. Open google maps and search for your neighborhood

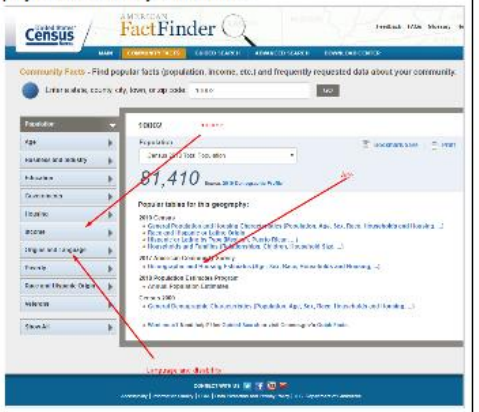


2. Click on any place in the map to find the zip code in the neighborhood



3. Go the census site and search for the zip code

4. You can find, age, income , language and physical disability data here!



What is the percentage of people in your neighborhood under 18? Over 65?

Curriculum Example: Sea Level Rise

Students were then tasked with developing a plan to make the neighborhood more resilient to flooding. They were provided with a menu of green infrastructural options (only a few pictured here)

Preparing for Flooding: Infrastructure

Use the list below to make the neighborhood you selected more resilient to sea level rise and flooding

PROTECT EXISTING FORESTS AND WETLANDS

Description: The most economical way to absorb and clean water is to protect existing coastal forests and wetlands. These areas should be protected and expanded where possible.

Benefits: Coastal forests and wetland help absorb and store floodwaters; reduce erosion along stream banks; improve water quality through filtration; improve air quality; increase groundwater recharge; provide recreation; provide wildlife habitat.

Limitations: These steps require conservation of undeveloped forest and wetland areas. Healthy and larger forests and wetlands will provide more protection.

Maintenance required: Measures include controlling pollution and invasive species and conducting controlled burns.

STORMWATER WETLANDS

Description: Stormwater wetlands consist of a natural area that has been constructed to absorb water during storms/flooding. Wetland plants like grasses, moses, trees and shrubs are often used to create a wetland environment.

Benefits: This design provides flood control for large storms; improves water quality through pollutant removal; provides aesthetic appeal [looks nice]; increases property value; and improves air quality.

Limitations: It requires a lot of space and is may not be well-suited for urban areas.

Maintenance required: Participants must control invasive species and ensure planting survival and density.

Sea Walls / Barriers

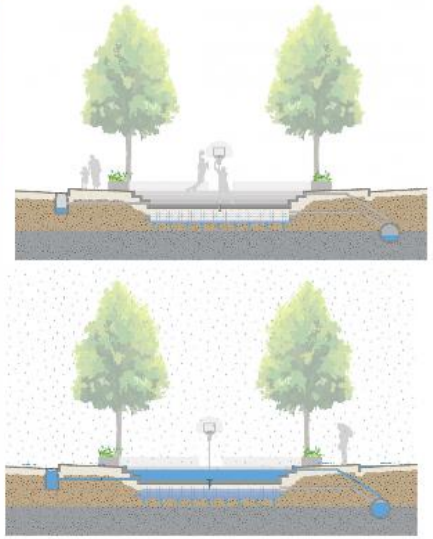
Description: A physical barrier is built to protect against rising water levels. Sea walls are often built of concrete, steel or large rocks.

Benefits: Provide a barrier protecting a city from flooding. Many cities around the world, like Amsterdam, have effectively used sea walls. They can be constructed in a way that allows public access to the coastline

Limitations: They can be very ugly and can block public access to the water. Their construction can impact marine ecosystems. They are only effective against water levels below the height of the wall. For example, a 10 foot high sea wall will be ineffective against a storm surge of 12 feet.

Maintenance Required: Constant impact from waves will cause erosion and deterioration of sea walls over time. Replacement will eventually be needed.

Water Squares

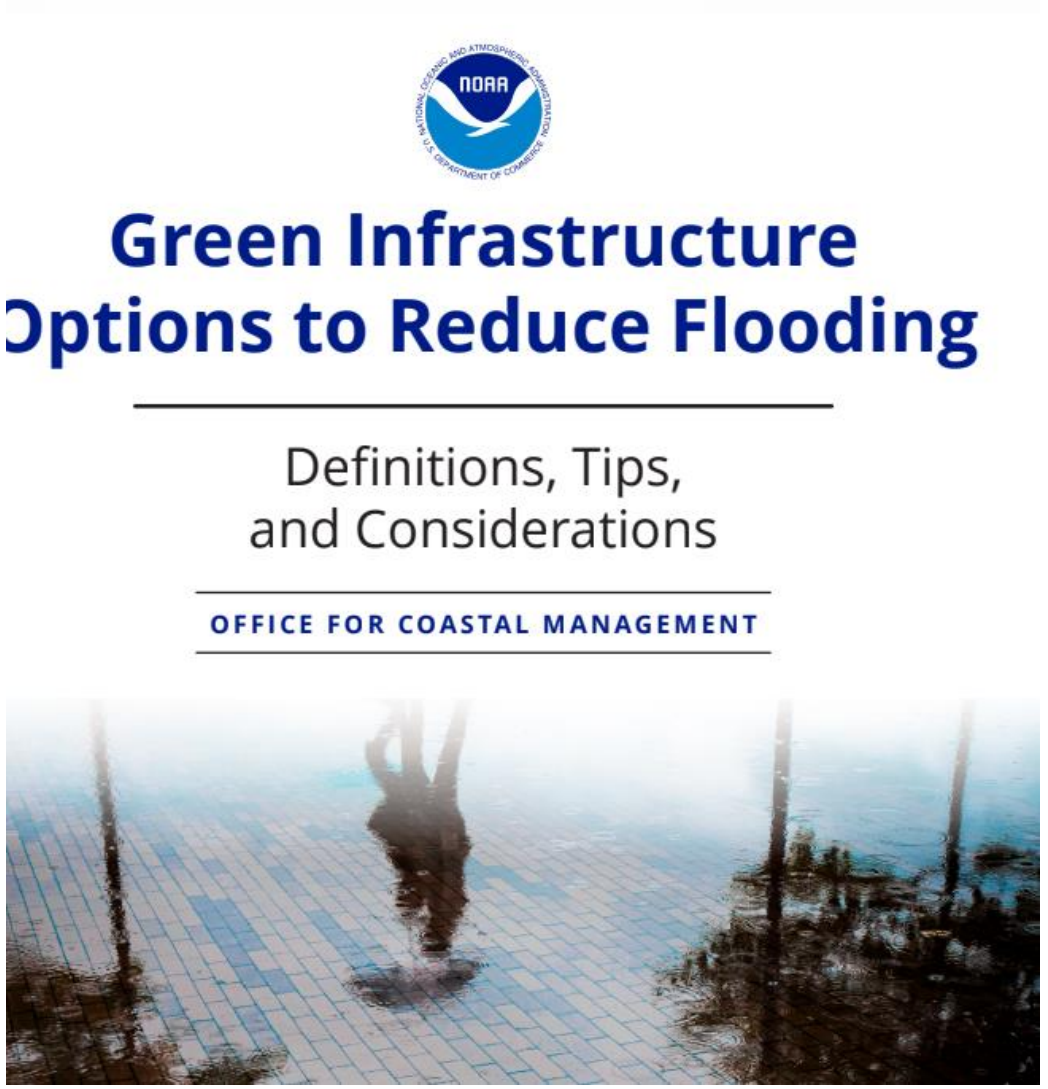


Description: Water squares are public spaces that can also store water in the case of a flood or heavy rains. The squares feature lower-lying areas that can be submerged in the case of heavy rainfall/flooding. The water run-off from the surrounding neighborhood is connected to the square by open drains or rainwater drainage systems. After rainfall, the lowest parts of the water square fill up first, and the water in fact remains there longest. Water squares often serve as parks when they are not storing water.

Benefits: Water squares can store a significant amount of water and protect the neighborhood.

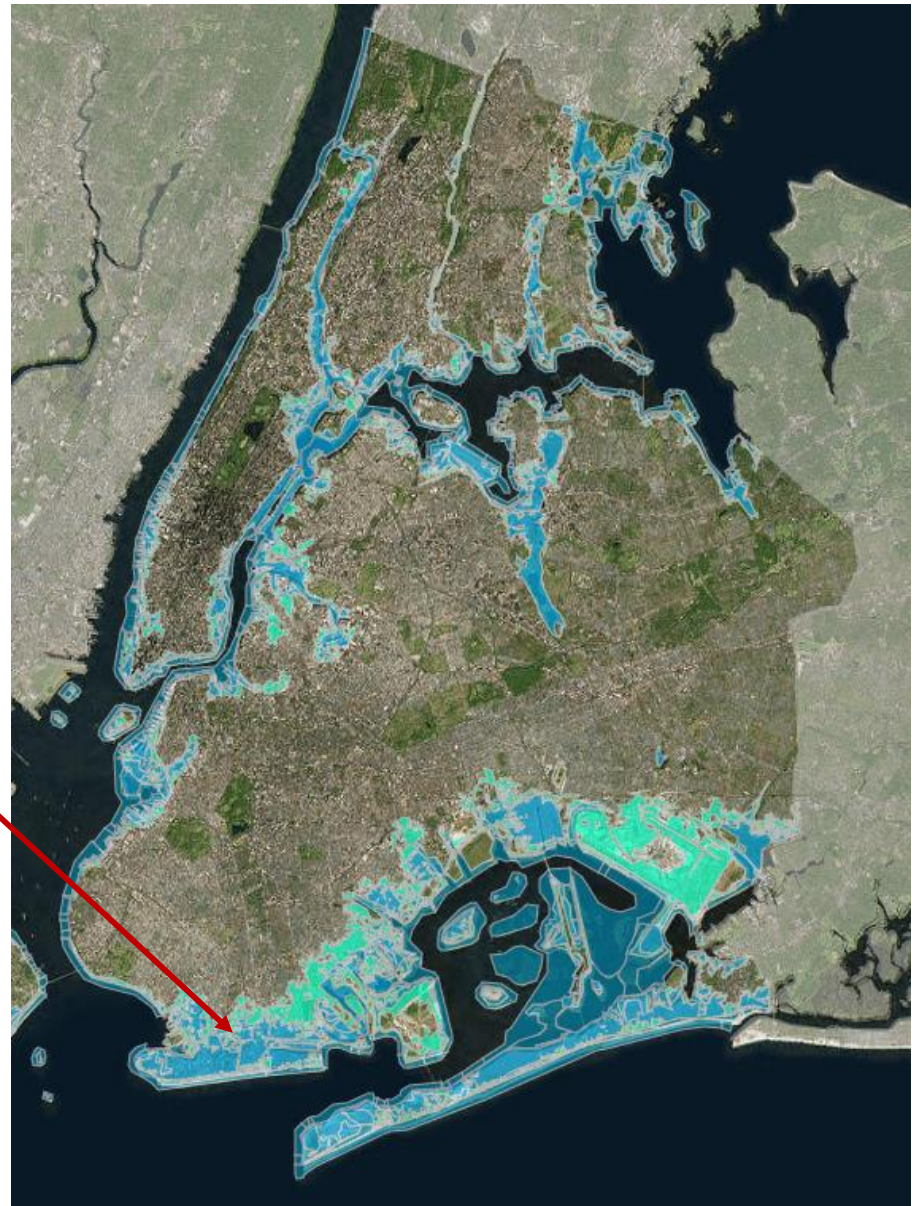
Curriculum Example: Sea Level Rise

This resource from NOAA was particularly helpful!



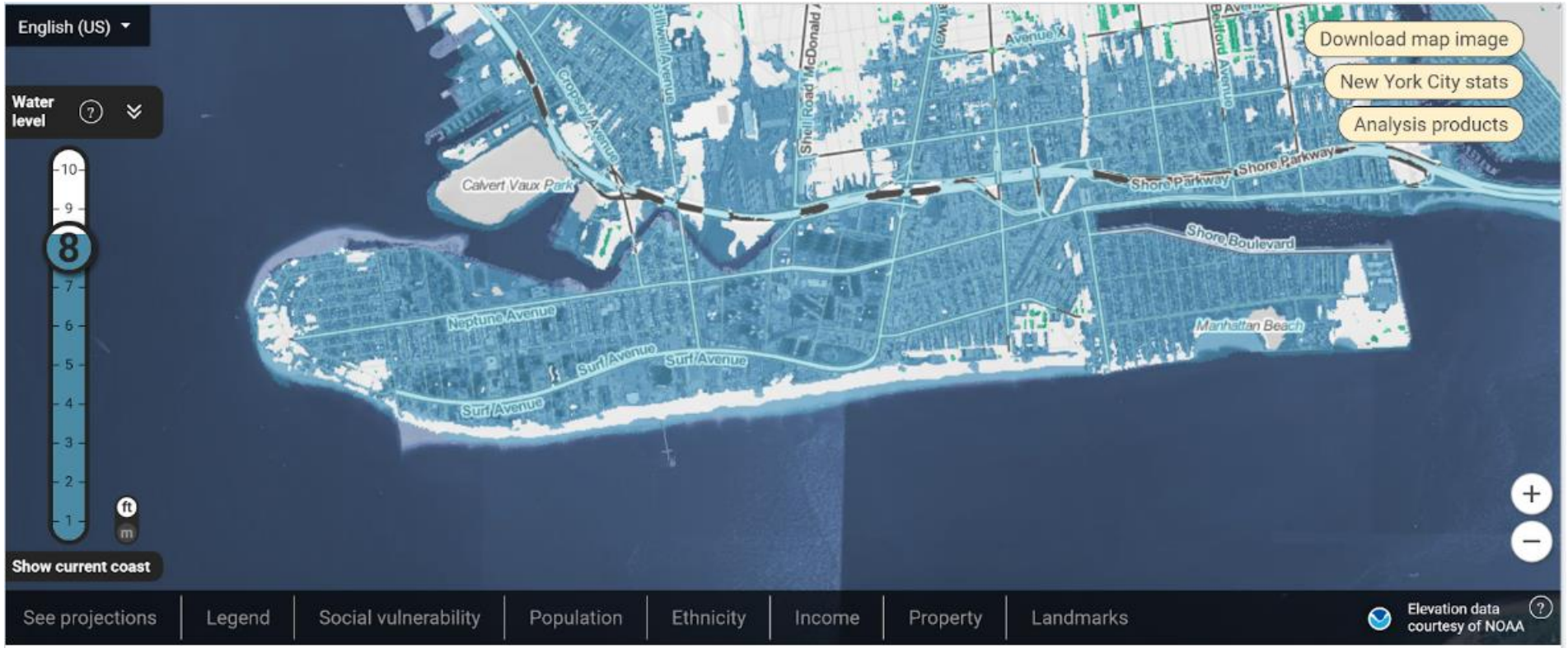
Curriculum Example: Sea Level Rise

The next several slides discuss the Coney Island neighborhood of NYC which is particularly vulnerable to flooding



Student Work Example

This is a screenshot from a student's presentation on how to prepare the Coney Island neighborhood for flooding

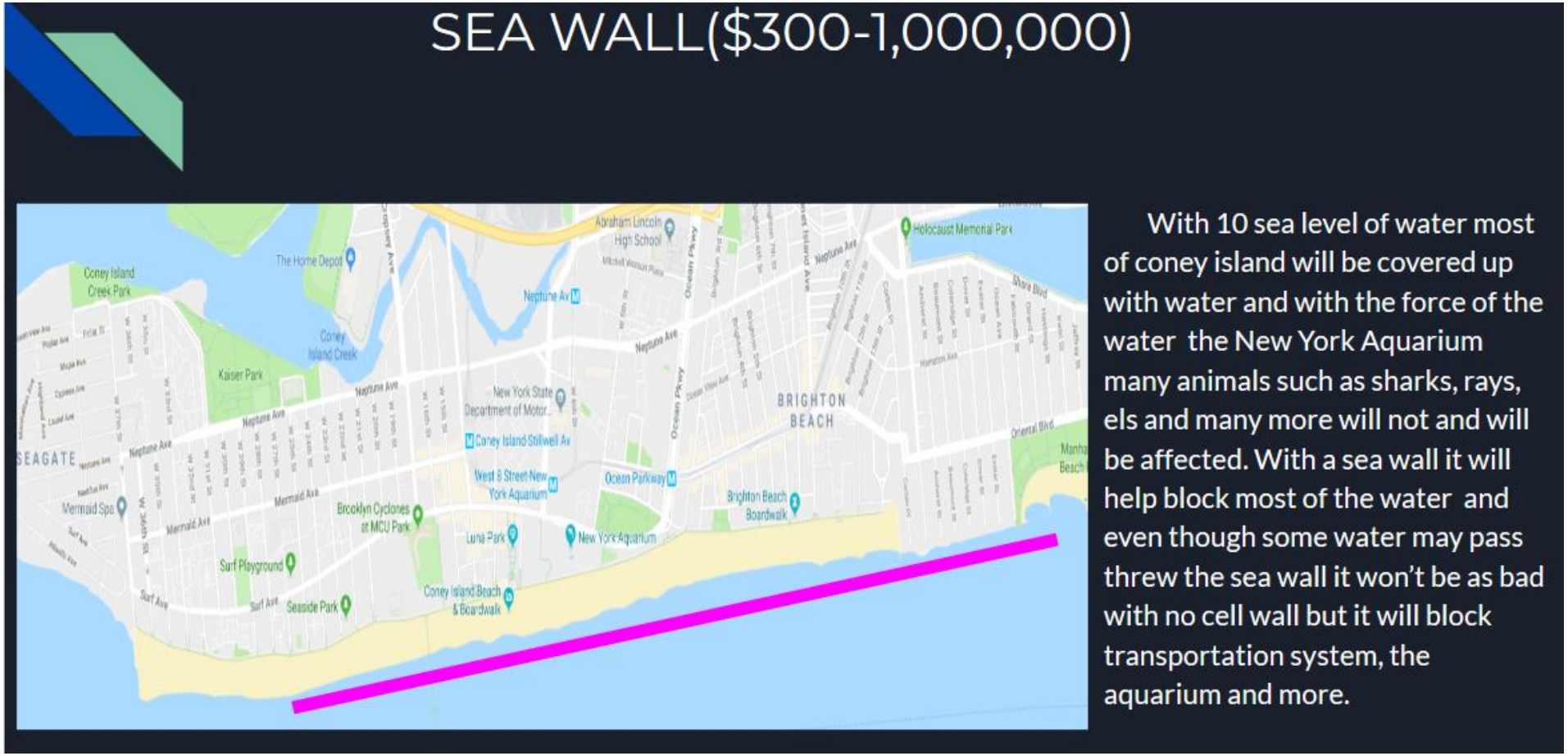


This is the sea level in Coney Island at 8ft and it shows almost all of Coney Island being is in danger and here are some ways we can help

Student Work Example

This is a screenshot from a student's presentation on how to prepare the Coney Island neighborhood for flooding.

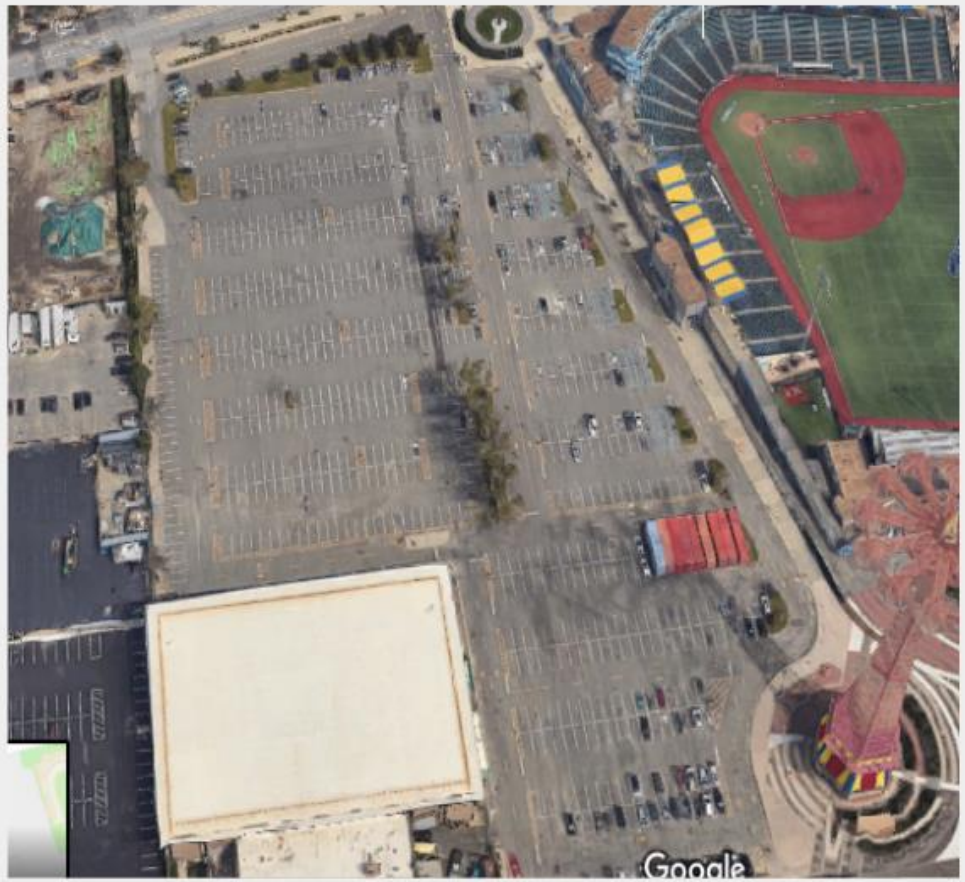
(The $$$ number comes form a fictitious budget that students were given to develop their pans)



Student Work Example

This is a screenshot from a student's presentation on how to prepare the Coney Island neighborhood for flooding.

This is an example of the parking lot and it would be used as permeable pavement we will be using 10 parking lots like this one to just hold water this will cost $100,000 because it will take time to build it within the parking lot.



Fieldwork Projects

An important part of the course involves fieldwork projects where students do hands on projects

- **Dune grass planting and street tree care with the Parks Dept**
- **Learning how to build portable network kits with The Point in the Bronx**
- **Air Quality Monitoring with Cleanup North Brooklyn**

HSES students planting dune grass in Coney Island with the NYC Parks Dept on April, 4th 2019

Student Action Projects

The course will culminate with students completing projects designed to mitigate or address a specific issue associated with the local impacts of climate change.

The image on the right is from our initial proposal for the course.

F SECTION 3: DESIGN + IMPLEMENT

A: Designing solutions for resilience

- Collaborating with students on brainstorming ideas for making NYC resilient to climate change
- Produce draft concepts and share in class

Resilience design game

B: Rapid prototyping

- Create a prototype of your concept by utilizing maker facilities, design software, and other mediums
- Share and test prototype with other students, incorporate feedback

3-d printers

C: Stage 1 deployment

- Deploy resilience idea in the study area
- Engage with students and other stakeholders to test idea and collect results

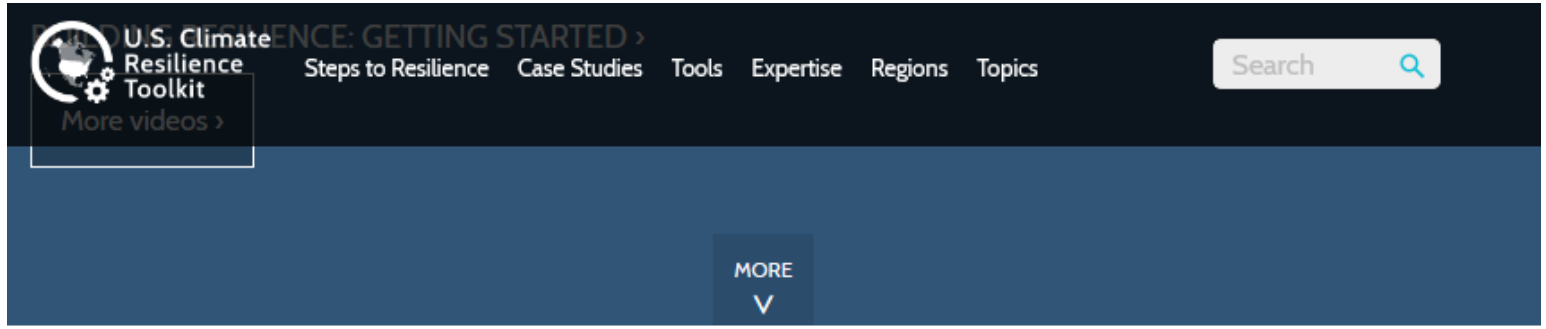
Air purifier concept

D: Presentation and analysis

- Present concept in a community meeting/ setting
- Receive feedback and incorporate into rapid prototyping process

Group discussion/analysis

Reflecting on our Framework



STEPS TO RESILIENCE

Use this framework to discover and document climate hazards, then develop workable solutions to lower climate-related risks. Watch the overview video or click any step to learn more.

1. Explore Hazards
2. Assess Vulnerability & Risks
3. Investigate Options
4. Prioritize & Plan
5. Take Action

Next steps

In the 2019-2020 school year Preparing NYC for Climate Change will become a full year, 5 day a week course at the High School for Environmental Studies.

Feel free to stay in touch with Sean at sabbottk@envirostudies.org.

Since the city and state do not provide schools with money specifically designated for environmental education this project has been supported by the Friends of the High School for Environmental Studies. Check them out at www.friendsofhses.org and feel free to support!

Questions

- **Please submit questions via the Q&A section (not Chat)**
- **Select to All Panelists.**
- **If we are not able to get to your question today, we will try to address it after the webinar in our general follow up email or you may hear directly from the presenters.**

Thank You

Please take the time to fill out the short evaluation for this webinar so we can continue to bring you topics that are most useful for you. An evaluation link has already been emailed to you.

This concludes our 2018-19 webinar series.
Watch for our next series of webinars, which will begin in Fall 2019.

The 2018-19 Webinar Series is generously sponsored by:

Town Creek Foundation

The High Meadows Fund