BACK

THE UPPER MANHATTAN PROJECT ∞ 2018

THE UPPER MANHATTAN PROJECT

AK PRESS

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 its 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 expanding the Waterfront Management Advisory Board and includes pledges to undertake feasibility studies for construction and restoration of flood-prone 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.

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 stakeholders. 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 revise "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.

Community Bank
Financial services should be provided by local institutions connected with the community. Locally-run 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 investments in 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 petro-chemical 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 farm stands, and supporting urban farms through the multiagency 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 mapping 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 essential to effectively address climate change issues, PB should be expanded to encompass more of the City's budget, green projects, and longer-term investments.

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 now 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 reinvesting in its infrastructure is a necessary first step, but we must also ensure that further price hikes do not happen and that 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 elderly. Between 2000 and 2011, 85% of those who died from heat in NYC died in their own homes.

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 infrastructure 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.

3333 Broadway *Drew Hamilton Houses* *Dyckman Houses* *Jackie Robinson Houses* *Wagner Houses* *Sugarhill Houses*

Research Institutions
Universities and government agencies can align their research capacities, 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, build awareness about climate emergencies such as weather predictions and sea level rise, while providing opportunities for students to build partnerships with the communities of New York City

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
A network of banks, foundations, creditors, and others, control the flow of capital for investments in infrastructure, philanthropic donations, and other measures for enhancing resiliency.

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.

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.

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 taking on a more public nature. For example, equipments should be manufactured locally.

Residents have communications systems, including digital and analog alternatives, to coordinate emergency response.

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.

The North River Sewage Treatment Plant is in the floodplain

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 activists 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.

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.

Storage of food, water, and medicine

Affordable Public Transport
In recent years, bicycle lanes, bus system facilities, and subway routes have been constructed in New York City. These services can provide important transportation options should other transportation resources be damaged in a storm. However, rising transportation costs are also increasingly limiting transportation access for low-income groups. Transportation options should be made more affordable, perhaps by means of more public investments, expansion of the bikeshare system, and reduced costs for subway and bus services. Transportation services should also be made free to low-income residents during emergency situations.

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.

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.

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.

Local Media Production *
Dedicated space for critical media outlets, training for citizen journalism, and cooperatively owned equipment for digital and hard copy media production.

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 communication 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 decades, the Marine Waste Transfer Station at 135th Street polluted 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 resilience center that can support local organizations, educational/cultural programs, freight movement, citizen science, and other climate-related efforts.

Indigenous Rights *
Pictured is the Lenape Wampum: the purple indicates the course of a Haudenosaunee canoe and a European ship, traveling parallel but never touching. The white stripes represent peace and friendship.

Environmental Justice Networks
Non-governmental organizations have forms coalitions to increase their organizing capacity and influence in policy making.

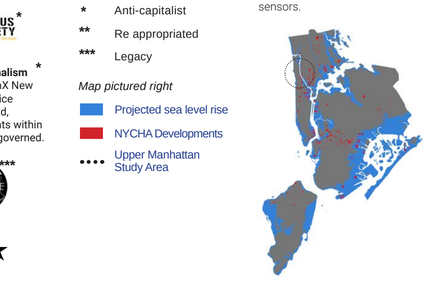
Black and Afro-Latin Nationalism *
For decades Black and LatinX New Yorkers have fought for justice by demanding access to land, reparations, and greater rights within how their communities are governed.

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 2014-2019. Research included interviews with residents and professionals, along with scientific data collection from satellites and sensors.



Created by: Aurash Khawarzad + Mateo Fernandez-Muro

A barrier erected in East Harlem to protect the subway from flooding during Superstorm Sandy. Photo by: Leonard Wiggins/MTA New York City Transit. October 22, 2013.

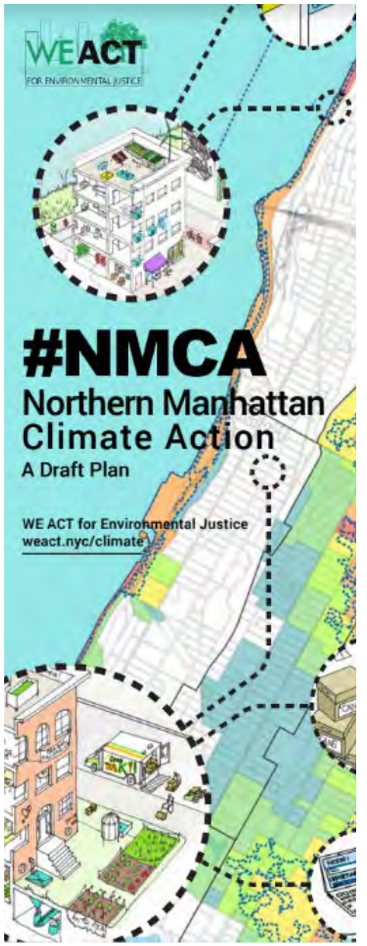
Contents

Community workshop in Washington Heights. April 4th, 2015.

1. Introduction

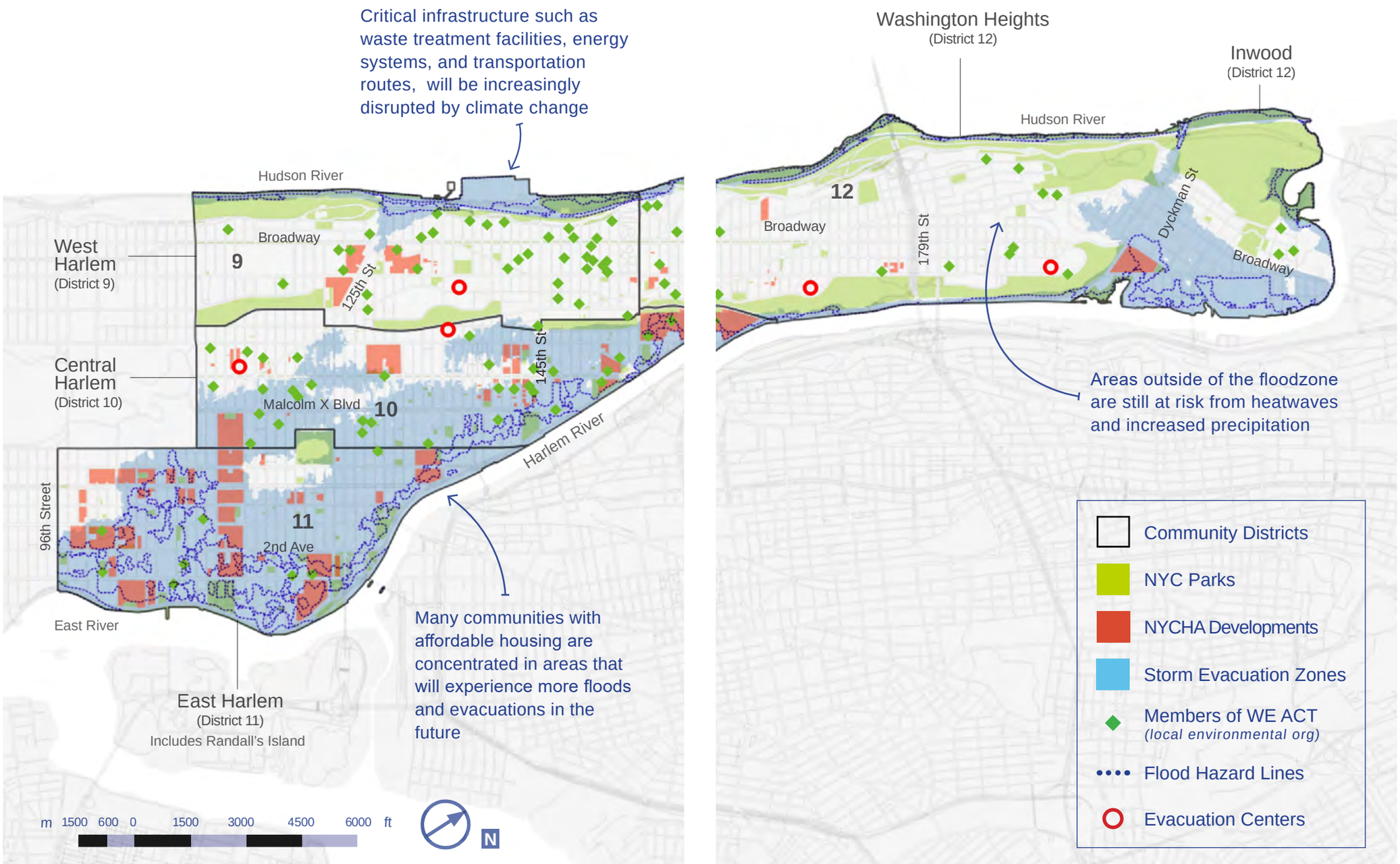
The Upper Manhattan Climate Action Manual is field guide for surviving the future of climate change in New York City, and specifically Upper Manhattan. The concepts in this manual are based on a planning process that began in 2015 and that includes input from local residents, environmental justice organizations, city agencies, academic research institutions, and hundreds of other sources with expertise on climate change. This is dedicated to their hard work in making New York City and the world a better place.

In the following pages the connection is made between our ability to prepare for climate change and our ability end extreme social inequality. Engaging in the actions listed here can create systems of environmental sustainability, community reinvestment, and political action, which could prepare New Yorkers from displacement by climate change or any other force.



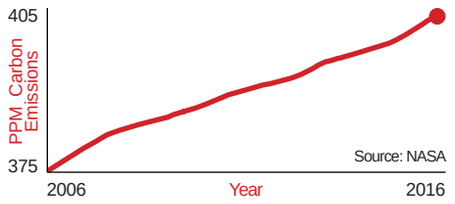
First climate resilience plan published in 2015

A. Upper Manhattan Map



B. Impacts of Climate Change

In 2016 the greenhouse gases: **CARBON DIOXIDE (CO2) METHANE (CH4) AND NITROUS OXIDE (N2O) REACHED 405 PARTS PER MILLION**



2016 WAS THE HOTTEST YEAR ON RECORD – 2.2°F ABOVE PREINDUSTRIAL LEVELS

THE EARTH COULD WARM 6 DEGREES FAHRENHEIT BY 2050 AND 8 DEGREES BY 2080

BETWEEN 2011 TO 2015 EXTREME WEATHER EVENTS INCREASED BY TEN TIMES

A STORM LIKE SANDY COULD HAPPEN ONCE EVERY 20 YEARS

HURRICANE SANDY CAUSED 233 DEATHS AND $60B DAMAGE ACROSS THE US AND CARIBBEAN

HEAT WAVES WILL TRIPLE BY 2080

HIMALAYAN GLACIERS COULD DISAPPEAR BY 2035

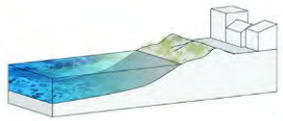
ARCTIC SEA ICE HAS DECLINED BY 10% IN THE PAST 30 YEARS

CLIMATE CHANGE THREATENS MORE THAN ONE QUARTER OF ALL SPECIES WITH EXTINCTION BY THE YEAR 2050

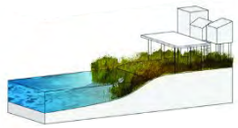
The City is building:

WALLS, GATES, DRAINAGE SYSTEMS, AND ST ELEVATIONS TO PREVENT FLOODING

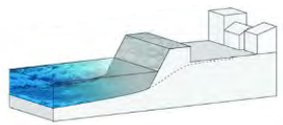
$45M Hunts Point **SOUTH BRONX**



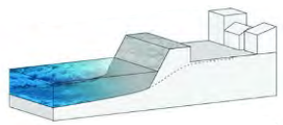
$100M Red Hook **BROOKLYN**



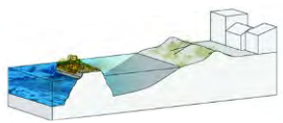
$108M Brooklyn Bridge to Battery Park City **LOWER MANHATTAN**



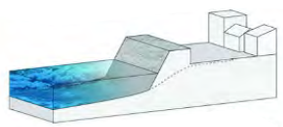
$203M Montgomery Street to Brooklyn Bridge **LOWER MANHATTAN**



$480M Rockaway **QUEENS**



$500M South Shore **STATEN ISLAND**



Funding is from the Department of Housing and Urban Development, Federal Emergency Management Agency, US Army Corp of Engineers, New York Sate and New York City.

C. Sea Level Rise

SEA LEVELS WERE 18 TO 27 FEET HIGHER 120,000 YEARS AGO

SEA LEVELS MAY RISE

2 feet by 2050

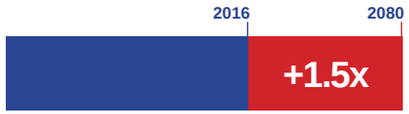
6 feet by 2100

MILLIONS OF NEW YORKERS COULD BE CLIMATE REFUGEES

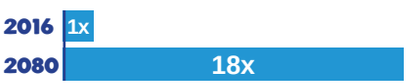
HUDSON RIVER and LONG ISLAND SOUND ECOSYSTEMS DISRUPTED

IN 2016 FIVE STATES HAD RAINFALL EXPECTED ONCE EVERY 500 YEARS

Extreme Precipitation Days
1.5x more frequent by 2080



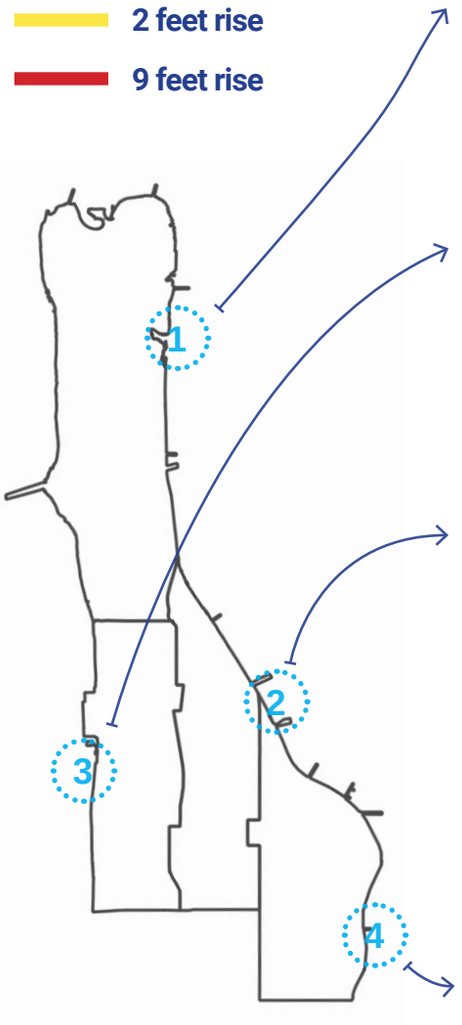
Coastal flooding frequency



Upper Manhattan
Sea level rise simulations

2 feet rise

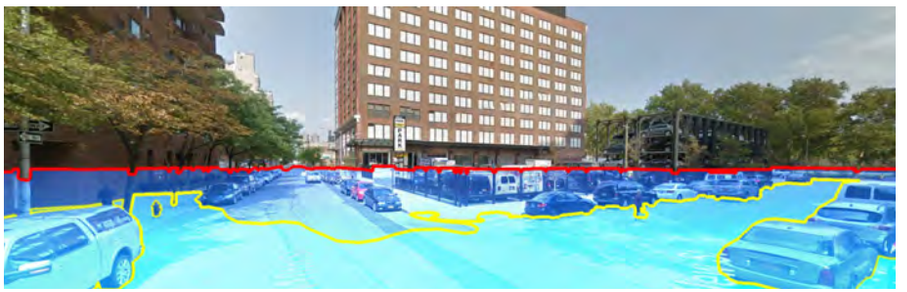
9 feet rise



West 206th Street and 9th Avenue // Elevation 3 feet

West 130th Street and 12th Avenue // Elevation 7 feet

138th Street and Harlem River Drive // Elevation 0 feet



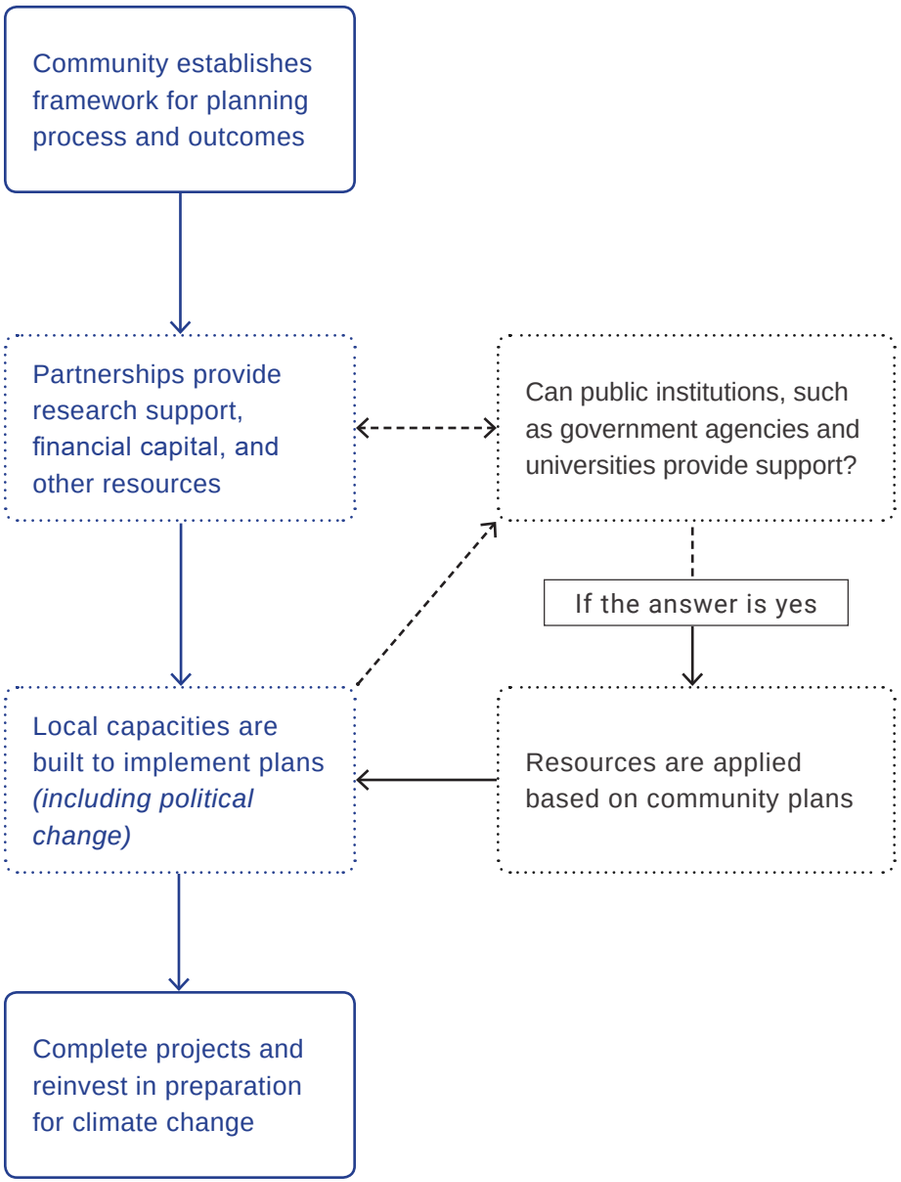
110th Street and FDR // Elevation 0 feet

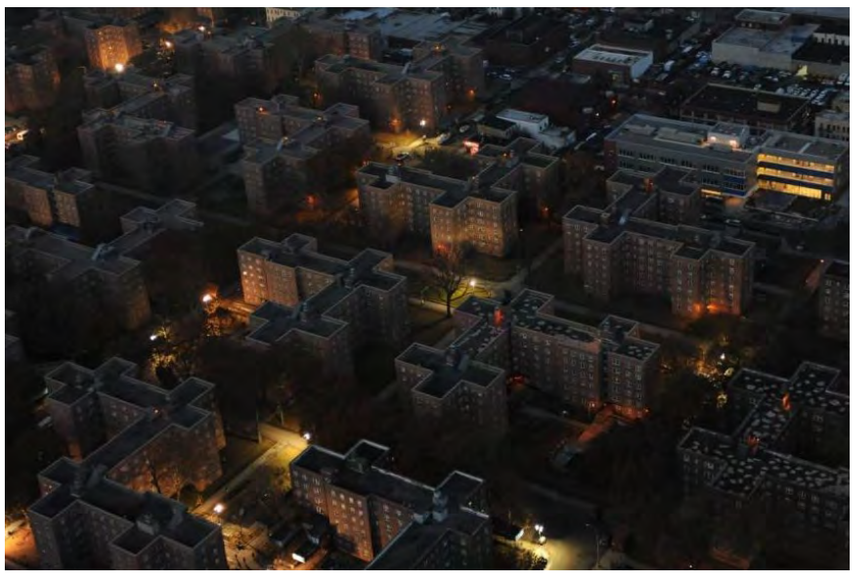
D. Community-based Planning

The New York City Panel on Climate Change (NPCC) defines resilience as "the ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a potentially hazardous event in a timely and efficient manner." Community-based planning for climate change combines this standard definition of environmental resilience with that of social resilience, which is the ability of groups or communities to cope with external stresses and disturbances as a result of political, economic, and other social changes.

For environmental justice communities, meeting this definition of resilience requires creating new systems that include their leadership and are based on fairness and equity. Without political change and greater access to financial capital, many communities will only become more impoverished as climate changes makes it more difficult to have safe housing, reliable transportation, healthy food, and stable employment, among other things.

The diagram on the right outlines a process in which communities lead a climate resilience process and retain the economic capital associated with its implementation. In this process communities control decision-making around environmental stewardship and start/manage the enterprises necessary to implement their resiliency plans. These community managed enterprises are one way of ensuring "ownership" over the environmental resources and economic opportunities that will be created in the city's response to climate change.

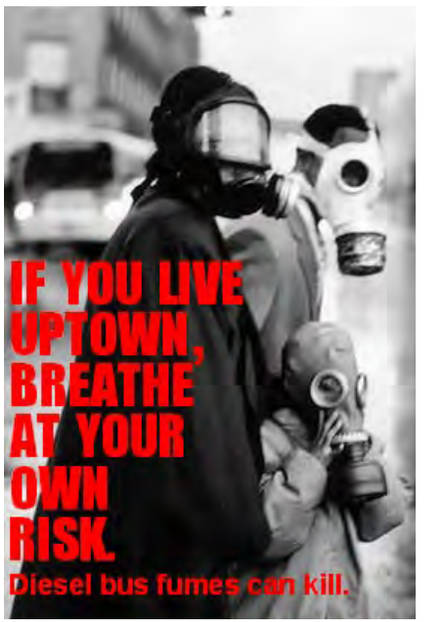




Public housing without power after Superstorm Sandy. Image by Mark Bonifacio/New York Daily News, published January 2016.

2. Climate Change and Social Inequality

Millions of New Yorkers are at risk of being harmed or displaced by climate change as a result of their income, race, gender, age, and/or some other form of social discrimination. The economic impacts alone of climate change will be devastating to places that are already on the precipice of being displaced due to exploitative costs of rent, healthcare education, food, and transportation, to name a few. According to the City of New York report, One NYC, 3.7 million New Yorkers live in poverty. Without directly linking any discussion about climate change to inequality and displacement, NYC may become more prepared for climate change, but those millions of people fighting displacement and poverty will have long been forced out. This section highlights the populations and geographic areas in Upper Manhattan that are especially vulnerable to climate change. When investing resources, building new infrastructure, or creating evacuation plans, these areas and their populations should be prioritized in order to avoid a humanitarian catastrophe and to ensure equity in our collective response to climate change.

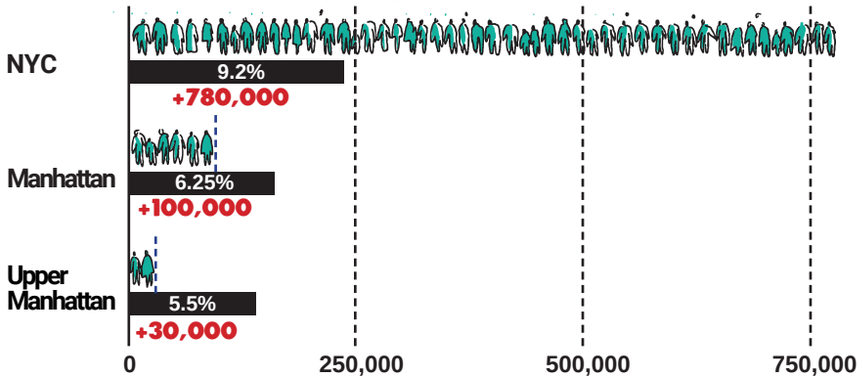


Poster from a 1990s environmental justice campaign in Upper Manahttan

A. Demographics

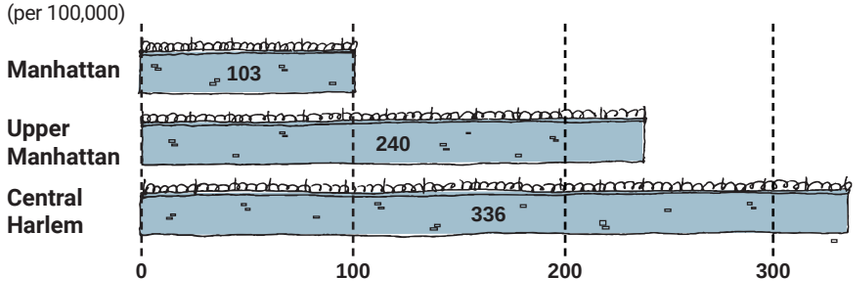
POPULATION GROWTH BY 2040

(absolute and relative as percentage)



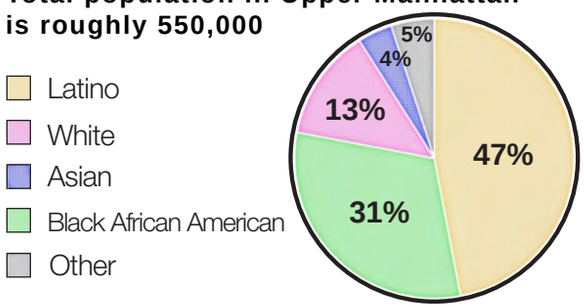
INCARCERATION RATE

(per 100,000)

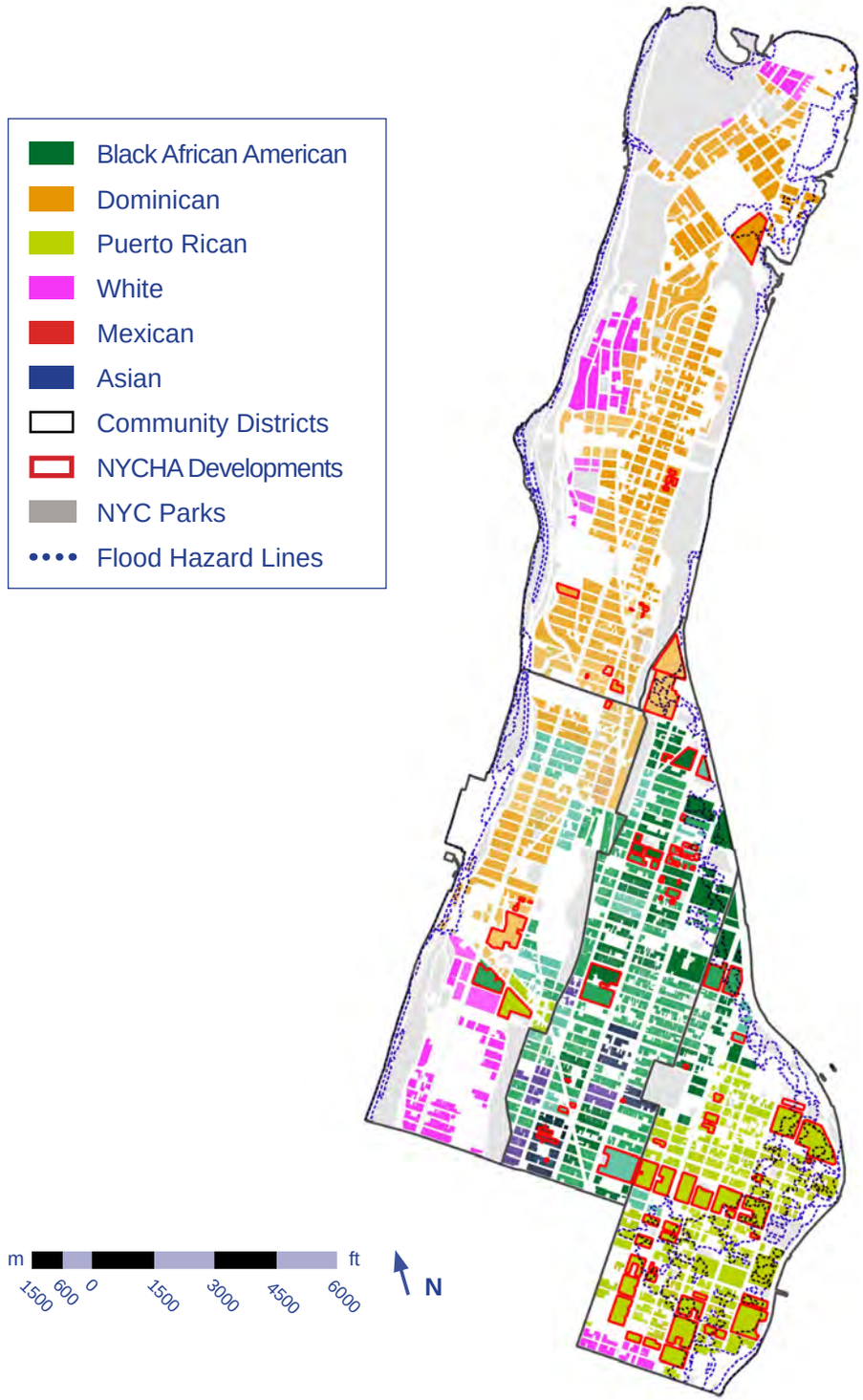


RACE AND ETHNICITY

Total population in Upper Manhattan is roughly 550,000



THE NUMBER OF PEOPLE WHO IDENTIFY AS BLACK HAS GONE DOWN 38% TO 30% IN SOME GENTRIFYING AREAS.

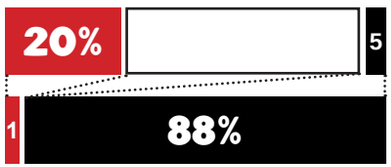


B. Economic Inequality

THE POVERTY RATE IN UPPER MANHATTAN IS OVER 30%

Source: NYU Furhman Center

In Manhattan the top 5% of households earned $850,000 per year, or 88 times as much as the poorest 20%.



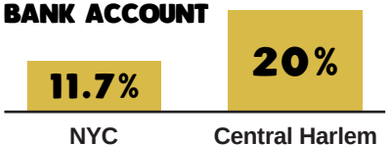
UNDERBANKED* HOUSEHOLDS

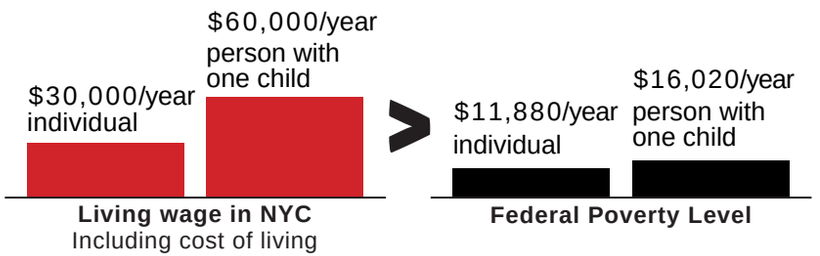
NYC — 25%

Washington Heights — 30%

*Households relying upon non-banks for crucial financial services such as cashing a check or purchasing a money order.

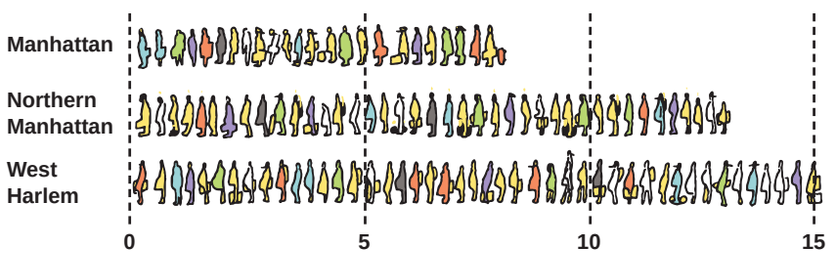
HOUSEHOLDS WITHOUT BANK ACCOUNT



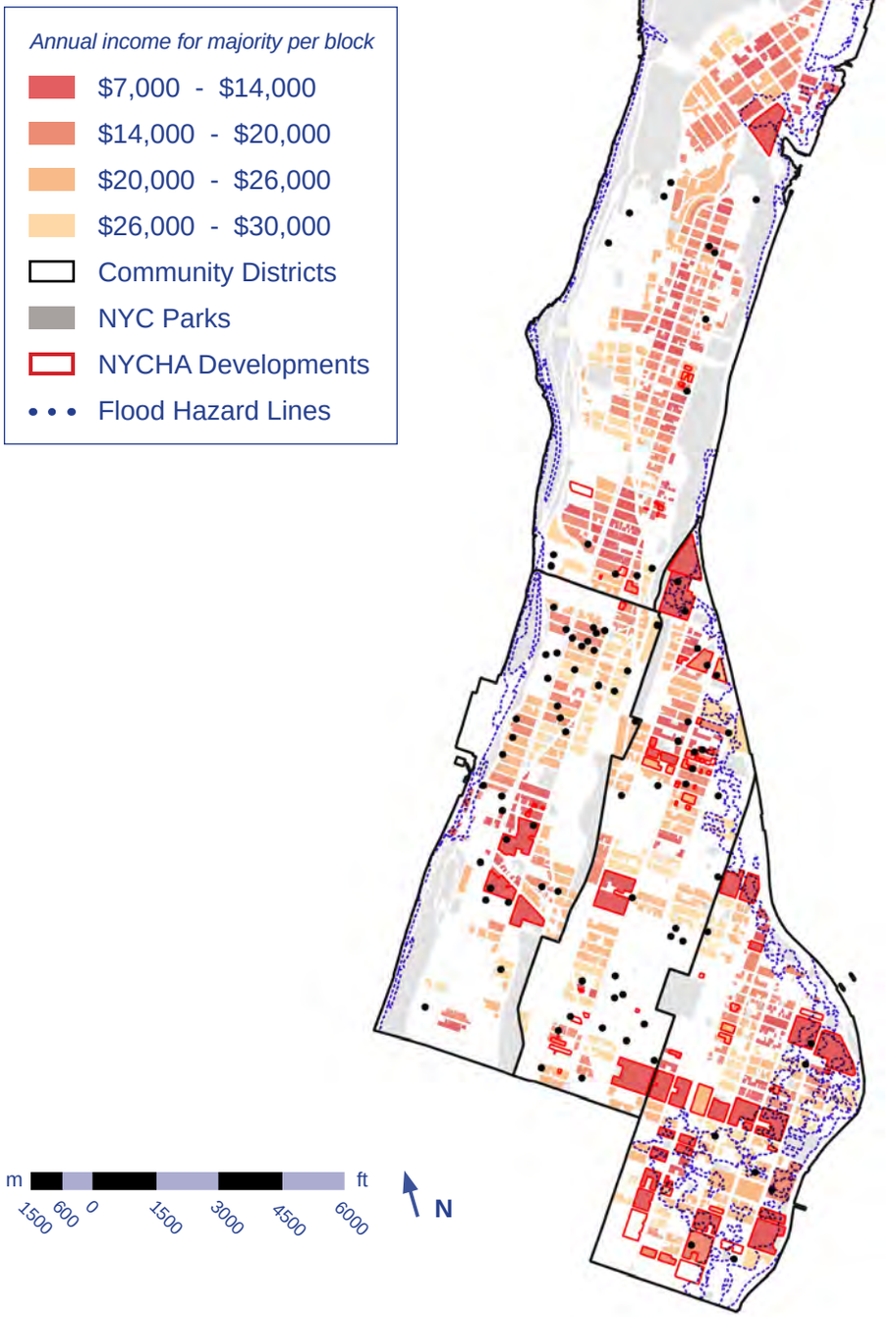


THE MEDIAN FAMILY INCOME IN EAST HARLEM IS $23,000 PER YEAR

% PEOPLE UNEMPLOYED

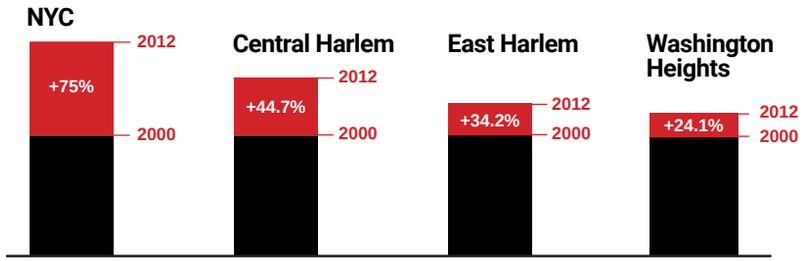


Average Income



C. Gentrification

AVERAGE RENT INCREASE FROM 2000-2012

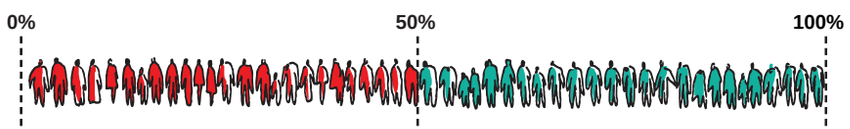


AVERAGE RENT INCREASE IN NYC FROM 1990 - 2012

MEDIAN RENT FOR ONE BEDROOM APARTMENT

	YEAR 2000	YEAR 2016
East Harlem	$1,600	$2,300
West Harlem	$1,500	$2,175
Central Harlem	$1,450	$2,100
Washington Heights	$1,300	$1,750

RENT BURDENED RESIDENTS IN UPPER MANHATTAN



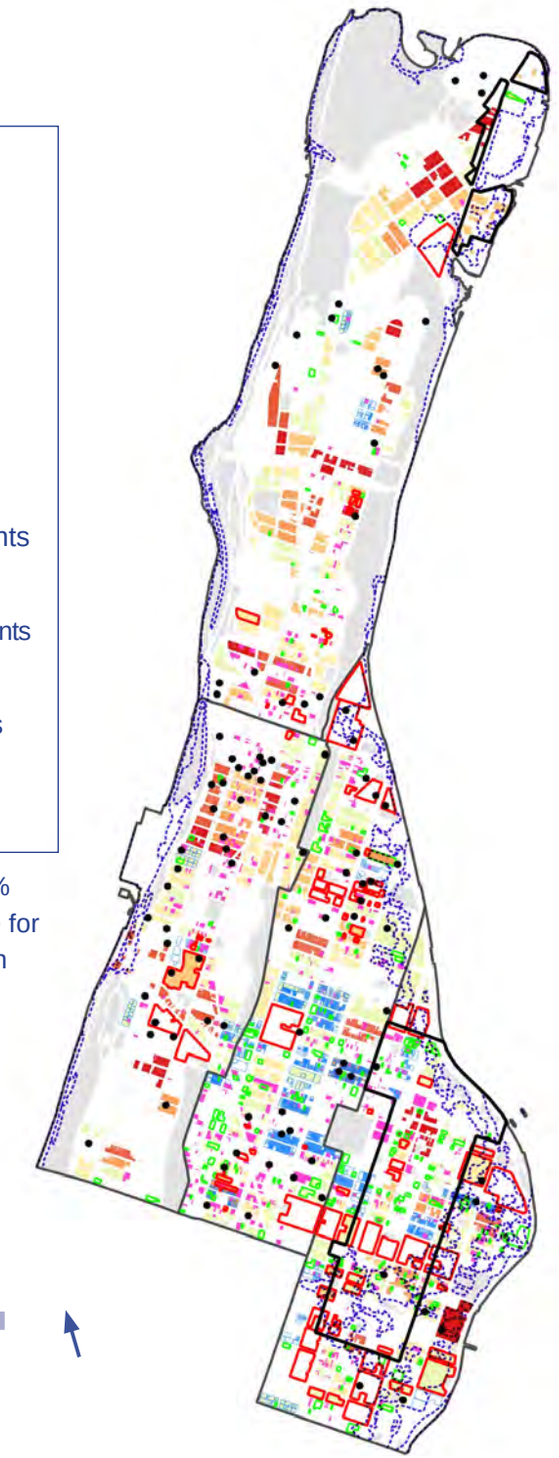
RENTS IN EAST HARLEM ROSE 5.5% FROM 2015 TO 2016

TO AFFORD A RENT OF $2,300 LANDLORDS CAN REQUIRE A TENANT TO EARN 40 TIMES THAT AMOUNT, WHICH IS $92,000 A YEAR

Rent Burden

- 30% - 33%
- 33% - 34%
- 34% - 37%
- 37% - 40%
- 45% - 50%
- 45% - 50%
- Community Districts
- NYC Parks
- NYCHA Developments
- HDFCs
- -12 yrs Old Developments
- +18% Vacant Units
- Proposed Rezonings
- Flood Hazard Lines
- Proposed Rezonings

Map includes gross rent as % of median household income for households earning less than $50,000



Climate change dramatically accelerates the process of gentrification and displacement by forcing the migration of people who can't afford the technology and resources necessary to deal with changing weather. In places like Miami, developers have begun buying land on higher elevations and causing the displacement of communities that have lived there for decades. In New Orleans, after Hurricane Katrina, black communities were displaced by white gentrifiers with access to more capital/ power. These changes in racial demographics in New Orleans have been reflected in an average income change in some areas of $37,455 before Hurricane Katrina to $57,279 afterwards.

After Superstorm Sandy, many resilience measures were proposed in NYC that would have had the perverse effect of increasing displacement. These redevelopments were presented as infrastructure solutions, and may have reduced carbon emissions and stopped severe flooding, but were dependent on attracting an affluent demographic that would have caused displacement by raising disparities in class and race and making some groups extremely vulnerable. Current tools for redevelopment such as rezonings, tax increment financing, and other methods of attracting speculative investors, are not reliable tools in preserving community as it is, let alone after a climate change disaster. For example, the major policy incentive for affordable housing in New York City, titled 421-a, is expected to cost the City $2.4 billion per year in lost tax revenue. That is revenue that could be invested in environmental protections and climate related services.

As opposed to facilitating displacement, climate justice solutions seek to build local wealth as a means of becoming resilient. By building new housing and retrofitting existing buildings to produce renewable energy, become energy efficient, and provide greater access to childcare, healthcare, education, and healthy food, among other things, we can prepare for a hotter and wetter world but also preserve local cultures and the communities that make them possible.

Top: A luxury housing development next to Marcus Garvey Park in Central Harlem where residents complained about a weekly drumming circle that happened in the park. Bottom: One of the few supermarkets in East Harlem. It will be closed and replaced with market rate housing in 2017.

D. Climate Justice

Climate justice is a framework for understanding climate change as an issue interdependent with social inequality, rather than being only environmental or physical in nature. Around the world climate change is causing extensive damage, much of it to indigenous communities and to poor and oppressed peoples everywhere. Entire islands, coastlines, and archipelagos are being lost, while entire regions inland are losing their ability to support native populations, not by any doing of their own but because of decisions made on a global scale by those in power. In this sense those that are least responsible for causing climate change are its biggest victims.

According to the Displacement Monitoring Centre, in 2014 more than 19 million people from 100 countries were forced to flee their homes because of natural disasters. Other reports put that number in the hundreds of millions. In many places, including New Orleans and New York City, these disasters displaced entire communities along the lines of class and race, People who do not have the means to protect their homes, rebuild, or peacefully settle elsewhere are uprooted and have to start somewhere entirely new, often with few economic prospects and little political power.

The number of people displaced is set to sky-rocket due to sea level rise and temperature changes. Within this century major cities like New York and Miami, and many more around the world, could be rendered significantly uninhabitable. Ensuring social equity in how people are supported during climate disasters requires fundamental changes in our process of governance. With new forms of political representation the Climate Justice Alliance envisions a world:

* In which everyone lives a good life by being in just and fair relationship with each other and within healthy, interdependent ecosystems.
* Is based on a culture of sharing rather than hoarding; localized democracies rather than globalized exploitation; the Web of Life rather than the Chain of the Market. Fairness, equity and ecological rootedness are core values.
* That celebrates and honors the beauty and diversity of life and the rights of people to realize their full potential as creative beings.

Residents of Houston escaping rainfall in April 2016 when the city received 15 inches of rain in 24 hours.

Residents of New Orleans walk amongst shuttered housing after Hurricane Katrina.

Protesters at the Dakota Access Pipeline on October 31st, 2016.

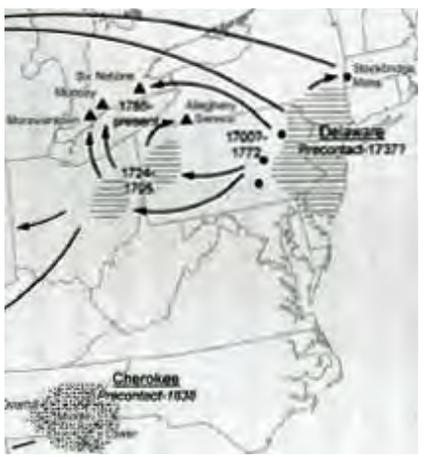
E. Indigenous Peoples Rights

The land that is now New York City was settled as early as 9,000 years ago. At the time of contact with Europeans, the area of Manhattan was inhabited by the Lenape tribe of indigenous peoples. Their tribe spanned the lands from what is now eastern Pennsylvania, New Jersey, southern New York, and eastern Delaware.

Lenni-Lenape (or Lenni-Lenapi) comes from their autonym, Lenni, which may mean "genuine, pure, real, original," and Lenape, meaning "man". The Lenape lived in numerous small towns along the rivers and streams that fed the waterways.

By the time of the arrival of Europeans, the Lenape were cultivating fields of vegetation through the slash and burn technique. They also harvested vast quantities of fish and shellfish from the bays of the area. Scholars have estimated that at the time of European settlement, there were at least 15,000 Lenape total in approximately 80 settlement sites around much of the New York City area, alone. In 1524 Lenape in canoes met Giovanni da Verrazzano as he sailed into the New York harbor.

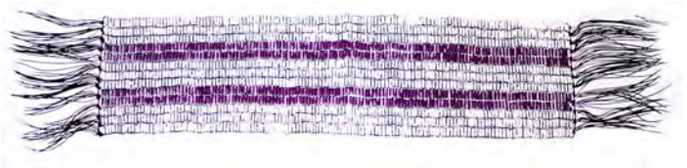
Upper Manhattan was settled by Dutch immigrants in the early and mid-seventeenth century. Resistance to Dutch settlement was led by the Munsee tribe living on the north end of the island. Warfare with and raids by the Munsees temporarily ended the northward expansion of the Dutch settlers in the 1650s. In 1664, New Amsterdam was transferred from the Dutch to the English and became New York.



Wampums

Wampum is a traditional shell bead used by the northeastern indigenous peoples as a form of gift exchange. According to the Onondaga Nation, the wampum is a living record and has many uses, including currency, records of meetings, invitations, and more.

Lenape wampum: The purple indicates the course of a Haudenosaunee canoe and a European ship, traveling parallel but never touching. The white stripes represent peace and friendship.



Wampum belt given by the Lenni Lenape tribe to William Penn for the “Treaty of Amity and Friendship” in 1683.

Hiawatha belt: The flag of the Haudenosaunee Confederacy, which included the Mohawk, Onondaga, Oneida, Cayuga, Seneca, and Tuscarora peoples.

F. Gender and Climate Change

Women and LGBTQ Rights

Climate change creates additional challenges in attaining social justice for women and members of the LGBTQ community. Studies have shown that women and girls are 14 times more likely to die than men during a disaster, and that those gender disparities are linked to economic and social rights. In the 1991 cyclone disasters which killed 140,000 in Bangladesh, for example, 90% of victims were women. During the 2006 tsunami, more women died than men, including in Indonesia and Sri Lanka where male survivors outnumbered female survivors by 3 to 1. Similar trends can be found in disasters in cities throughout the world.

Climate change will also cause long-term ramifications for women led industries. Women farmers account for 45-80 per cent of all food production in developing areas. Other industries ranging from healthcare to homeworkers will have to adapt to climate change. Addressing gender inequality can include a number of strategies:

* Engaging in discussions about gender specific needs in public policies and how we build our communities
* Connecting struggles for gender equity in climate change with broader struggles against hetero patriarchy, matriarchy, racism, and neo-colonialism.
* Ensuring adequate protections for women and LGBTQ evacuees
* Including gender (and gender identity) parity in planning and decision-making
* Providing resources, including training, for law enforcement to provide security for groups under duress

1. https://cmsdata.iucn.org

Recovery efforts in Puerto Rico after Hurricane Maria, 2017.

Equity in Decision-making

In climate related fields, including scientific research and governance, there are significant gender disparities. According to one study, globally women account for fewer than 30% of scientific journal publications. For every article with a female first author, there are nearly two articles first-authored by men (nature.com). Gender parity in climate change planning would be significant progress towards social justice. Discussions regarding gender and climate change, led by and inclusive of the communities that are being discussed, can outline key concerns and next steps forward. Immediate next steps can include an assessment of gender equity within climate planning organizations and efforts to be more gender inclusive in regard to public participation.

Top image: Mayor of San Juan, PR, Carmen Yulín Cruz. Bottom image: FEMA meeting.

Sexual Assault

After a disaster, people are more vulnerable to sexual victimization. The Women's Legal Defense and Education Fund points out that the trauma of sexual violence can be made worse by the added trauma of living through climate change and without housing, electricity, water, medical services, and other necessities. Victims may not be able to report because communication lines are down and because anti-violence personnel are struggling with their own emergencies. In addition, victims may be unable to physically reach critical services or resources, such as a hospitals and law enforcement, which may be focused on rescue efforts. The emergency shelters may not offer enough privacy to facilitate conversations about assault.

Protective measures can include:

* Providing privacy and safe lodging for residents and staff of emergency housing
* Ensuring the presence of adequate, trained shelter staff, volunteers, law enforcement and other security personnel, including designated individuals to look out for signs of sexual violence;
* Providing mandatory orientation sessions and written resources to educate shelter populations about sexual assault, safety measures, reporting options, and how to identify shelter security officials and locations, as well as safe places that have a constant security presence in place.

G. Differing Abilities

Physical Abilities

The Global Partnership for Disability and Development (GPDD) has stated that due to "existing inequities and disparities, people with disabilities will face a disproportionate impact due to climate change. People with disabilities and their families need adaptation and coping strategies and robust systems and mechanisms that can mitigate and minimize the harmful effects of climate change, and promote sustainable access to basic necessities, secure livelihoods, health care, and social and civic participation." The images to the right depict an evacuee stranded after Hurricane Harvey (Houston, 2017), and below that an image of an electrical installation placed on a rooftop in order to maintain critical services during a flood.

Cognitive Abilities

Climate change disasters can be have severe mental health impacts across the globe. The evacuation process, destruction to home and community, disruption of economies and access to basic goods and services, can play a role in deteriorating mental health. One article titled " Extreme Weather Events and Mental Health: Tackling the Psychosocial Challenge", between 25-50% of all people exposed to an extreme weather disaster may have some adverse mental health effects. The stress and confusion caused by climate change can necessitate additional mental health care and services, especially for people with pre-existing conditions and that may already be dependent on family/ friends or professionals for support.

Community meetings should be welcome of people with all abilities and different methods of contribution.

Language and Communications

Building inclusive, vibrant democracies depends on the active engagement of all citizens in public life. People with "disabilities" represent approximately 15% of the population. Through involvement in political activity, law and policy reform, disabled people and their organizations can influence improvements in the areas of health, rehabilitation, education, employment, and access to goods and services. The UN Convention on the Rights of Persons with Disabilities, Article 29 of the CRPD calls on nations to ensure persons with disabilities can effectively, fully participate in political and public life. Even in the most difficult elections situations, the rights of disabled citizens can be recognized. More at: http://www.miusa.org/

Architecture and Design

According to the National Disability Authority (NDA): Universal Design is the design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people regardless of their age, size, or ability. An environment (or any building, product, or service in that environment) should be designed to meet the needs of all people who wish to use it. If an environment is accessible, usable, convenient and a pleasure to use, everyone benefits. By considering the diverse needs and abilities of all throughout the design process, universal design creates products, services and environments that meet peoples' needs.

Images from top to bottom: 1) translation services being offered at a public meeting, 2) symbols for sign language and visually impaired services, 3) staircase with ramp for accessibility, 4) accessible bathroom facilities.

The aftermath of Superstorm Sandy in Lower Manhattan. Image by James Keivom, New York Daily News. January 19, 2016.

3. Upper Manhattan Climate Action Plans

- **A** Energy
- **B** Emergencies
- **C** Heat
- **D** Food and Waste
- **E** Social Hubs
- **F** Green Infrastructure
- **G** Governance
- **H** Housing
- **I** Waterfronts

3A Energy

A key element in climate resilience is transitioning our energy system from being based on fossil fuels and a centralized grid system to one based on renewable energy and distributed generation. Renewable energy systems can reduce carbon emissions, mitigating climate change, while also creating new industry that is managed communally.

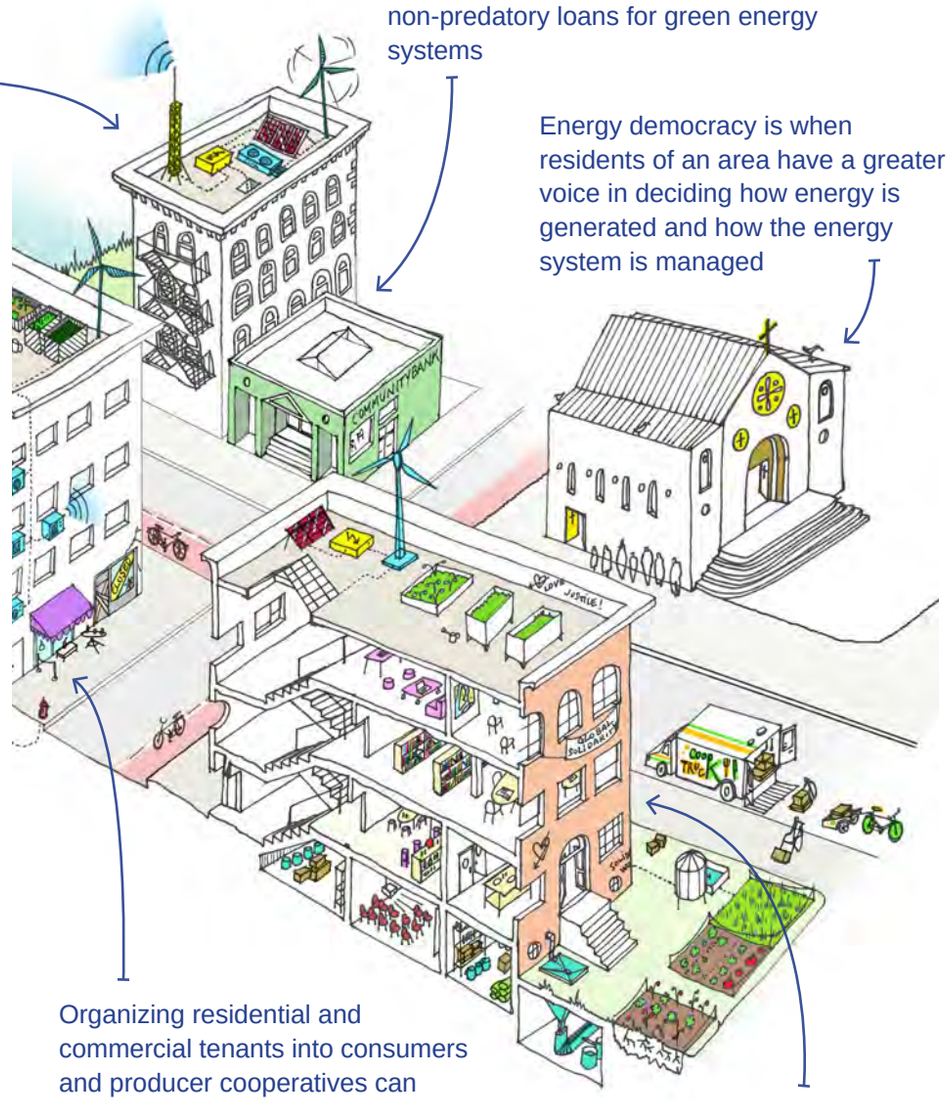
Over the next several decades, billions of dollars will be invested in designing, building, and maintaining new energy systems. These systems can double-down on the centralized grid, gas, oil, and nuclear systems that New York State is already dependent on, or they can be transitioned to sources of renewable energy that are not managed by large bureaucracies, but rather by community-based institutions that can reinvest resources back in the community, including in the form of access to financial capital, jobs, educational opportunities, and more.

Tenants of affordable housing will experience more of a cost burden for energy and a greater likelihood of blackouts as temperatures go up. Renewable energy can reduce energy costs, prevent blackouts, and create local jobs.

New York State is investing millions of dollars in creating microgrids where blackouts occurred during Superstorm Sandy. With greater community participation microgrids can be located in the right places to protect the people at the greatest risk of suffering.

Local financial institutions can provide non-predatory loans for green energy systems

Energy democracy is when residents of an area have a greater voice in deciding how energy is generated and how the energy system is managed

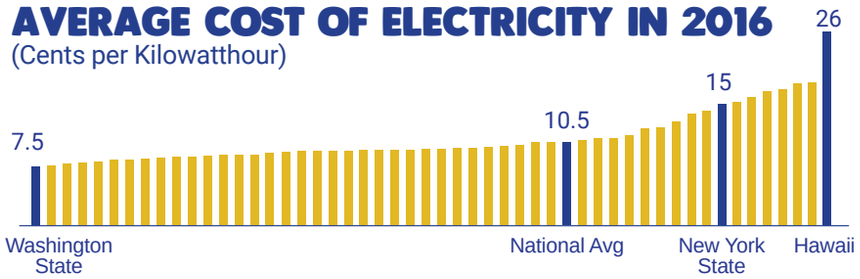


Organizing residential and commercial tenants into consumers and producer cooperatives can increase investments in energy, reduce costs, and provide needed ownership and employment within energy industries.

Social Hubs can support community members in organizing and installing a “shared solar” system.

Energy Democracy

AVERAGE COST OF ELECTRICITY IN 2016
(Cents per Kilowatthour)



CONEDISON IS SPENDING $1,000,000,000 UPGRADING SUBSTATIONS AND OTHER DISTRIBUTION EQUIPMENT AFTER DAMAGE FROM SANDY

THE NY-SUN INITIATIVE AIMS TO ADD 3 GIGAWATTS OF SMALL-SCALE SOLAR ACROSS THE STATE BY 2023

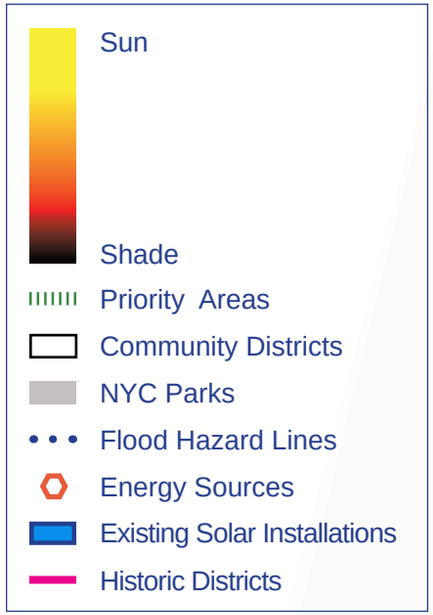
66% OF NYC'S BUILDINGS CAN SUPPORT SOLAR PANELS, MAKING 5,847 MEGAWATTS OF ENERGY. THAT AMOUNT CAN SUPPLY 50% OF PEAK DEMAND AND 14% OF THE CITY'S ANNUAL ELECTRICITY USE.

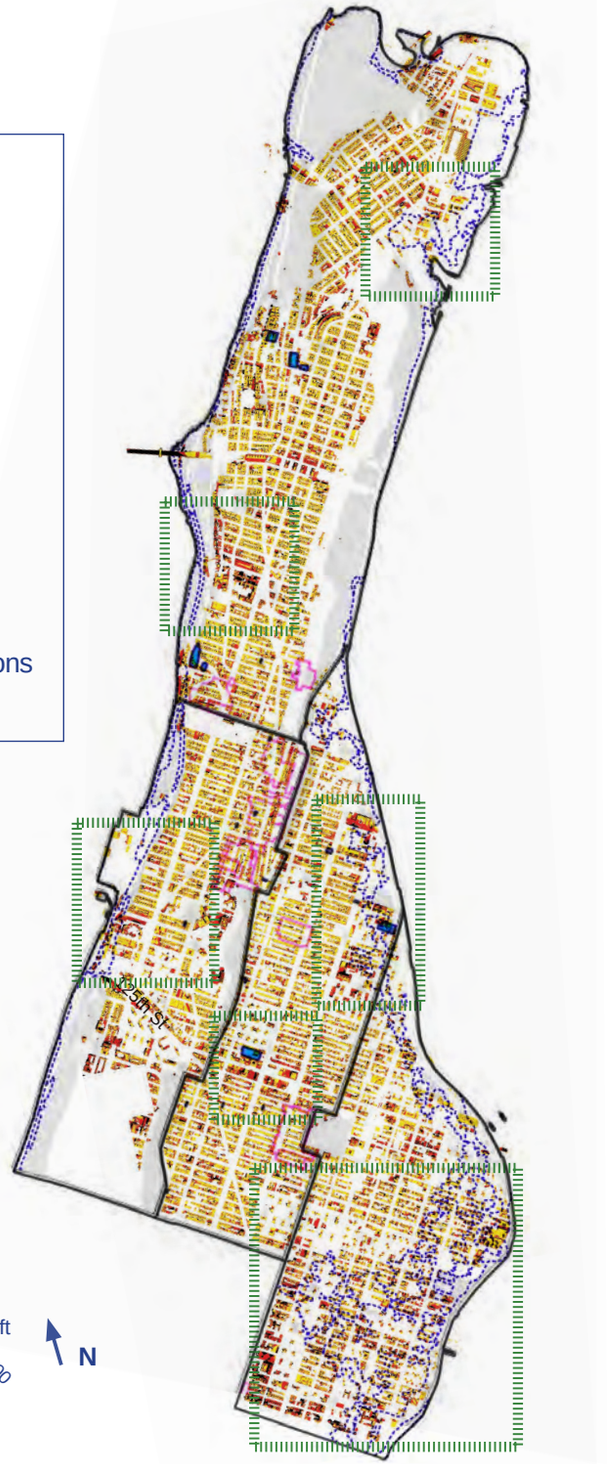
ONLY 26 SOLAR SYSTEMS HAVE BEEN BUILT IN UPPER MANHATTAN

LOW-INCOME NEW YORKERS PAY UP TO 13% OF THEIR INCOME ON ENERGY. THE AVERAGE FAMILY IN THE US PAYS 1.5%.

5 SOLAR INSTALLERS WERE OPERATING IN NYC IN 2005, BY 2015 THE NUMBER GREW TO 55 COMPANIES AND 2,700 WORKERS.

Rooftop Shade





City and State Policy

NYC 80 x 50: New York City plan to reduce carbon emissions by 80% by 2050. Includes interim target of 40% reductions by 2030. Requires significant reductions in emissions from the city's energy supply, buildings, transportation, and solid waste. http://www1.nyc.gov/site/sustainability/codes/80x50.page.

One City, Built to Last: A key element of the 80 x 50 plan, it focuses on reducing emissions by retrofitting every single City-owned building with significant energy use reductions by 2025. It includes installing 100 MW of solar power on schools and other public facilities. http://www.nyc.gov/html/builttolast/pages/home/home.shtml

New York State Energy Affordability Policy limits energy costs for low-income customers to no more than 6% of household income. Over 1.5 million will receive deductions. https:// www.nyserda.ny.gov/

New York State Climate and Community Protection Act (proposed): Financing options and laws to promote green building.

Zone Green: Zoning code amendments for window shades, solar electric and solar hot water panels to extend above height limit, removing penalties for thicker exterior walls, and other efficiency improvements. http://www.nyc.gov/html/gbee/html/codes/zone.shtml

Local Law 21: Amends the NYC Building Code to permit roof coating on existing and new buildings. Enables cool roofs as long as the coating covers 50% of the roof area. http://www.nyc.gov/html/gbee/html/initiatives/cool-roofs.shtml

Local Law 86: Requires that new construction or renovations to a building receiving $10 million or more in City funds must meet Leadership in Energy and Environmental Design (LEED) standards. http://www.nyc.gov/html/oec/html/ green/ll86_basics.shtml

Local Law 84: Requires all privately owned buildings over 50,000 sq. ft. to annually measure and report energy consumption figures. http://www.nyc.gov/html/planyc2030/downloads/pdf/ll84of2009_benchmarking.pdf

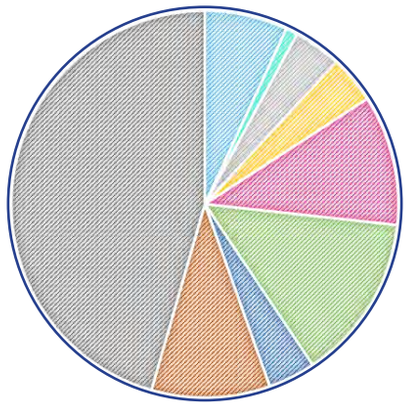
Local Law 85: Requires that any renovations to the building must be in compliance with energy code. http://www.nyc.gov/html/gbee/html/plan/ll85.shtml

Local Law 87: Mandates that buildings over 50,000 sq ft undergo periodic energy audit and retro-fitting. http://www.nyc.gov/ html/gbee/html/plan/ll87.shtml

Local Law 88: Requires City buildings, commercial and mixed-use buildings to upgrade all lighting fixtures to meet energy code standards by 2025. http://www. nyc.gov/html/gbee/html/plan/ll88.shtml

NYS A00101: Provides a green roof installation income tax credit of 55% for green roof installation costs. http://assembly.state.ny.us/leg/?bn=A00101&term=2015

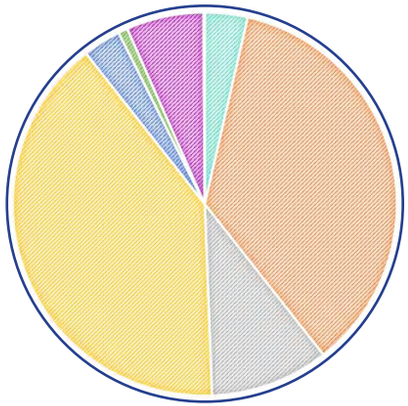
CURRENT ENERGY CONSUMPTION FOR NY STATE



Gas & Oil	46%
Nuclear	14%
Hydro	11%
Gas	10%
Oil	7%
Hydro Pumped Storage	4%
Coal	4%
Wind	4%
Other Renewable	1%

Source: NY State Energy and Research Development Agency

TRANSITION TO 100% RENEWABLES FOR NY STATE



Offshore Wind	40%
Solar Plants	36%
Onshore Wind	10%
Hydroelectric	7%
Residential Rooftop Solar	3%
Commercial Rooftop Solar	3%
Wave and Tide Devices	1%

Source: The Solutions Project

Rooftop Solar

Solar is one of the most abundant, and underutilized, sources of energy in NYC. Solar could provide 14% of the city's annual use and as much as 50% during peak demand periods, but currently provides less than 1% of the city's energy. Furthermore, only 200 of the 10,000 Con Edison customers who generate their own solar qualify as being low-income. City government has identified solar as a key strategy for meeting emissions reductions targets, reducing the cost of energy for New Yorkers, and reducing the load on the grid as to prevent blackouts from occurring, yet there are only a handful of solar installations in the entire city.

One state policy to increase solar in renter dominated NYC is the Community Shared Solar Act. Shared solar allows any residential or commercial tenants to receive their energy from solar panels that are installed remotely. This allows tenants who do not own or have access to their rooftops to receive solar energy, and for buildings with greater energy demands than what their roof can provide to still get energy from solar. Through "remote net metering," subscribers receive a credit on their energy bill for excess energy they produce.

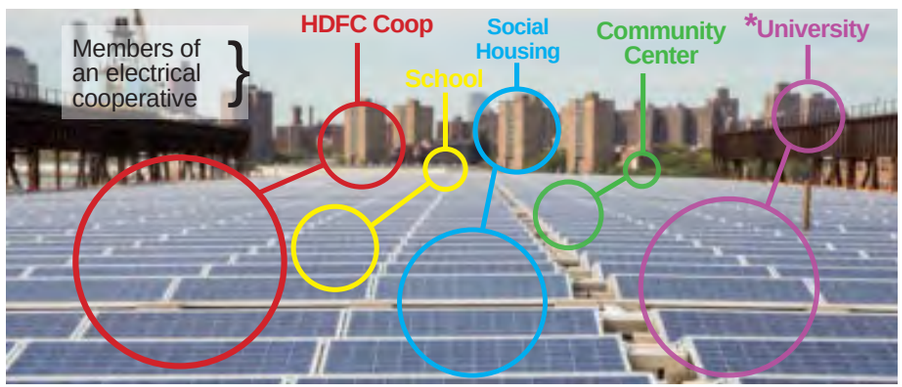
Members of a shared solar project must be in the same utility zone (NYC is in the same zone) and each project must have a sponsor who owns or operates the project. Sponsors must work with partners to organize the membership and work with the utility in connecting to the grid. The sponsor may be a building owner, a coop board, the project developer, a private company, or other entity. Each project must have at least 10 members (subscribers), and each member must be allocated at least 1,000kWh per year. A baseline of ten members prevents many smaller buildings in NY from participating in shared solar and should be changed, at least for residents of NYC. The terms of membership, including payment structure and provisions for exiting membership, are set by the agreement between the member and sponsor.

In Upper Manhattan there are hundreds of HDFC Coop buildings, public housing developments, universities, hospitals, and other buildings that could collaborate in developing a shared solar installation. These efforts can also sync with microgrid projects.

New York City plans to build 24 solar installations on public schools at a cost of $28 million. The 6.25 MW of solar produced by these installations will reduce more than 2,800 metric tons of greenhouse gas emissions a year. Schools in Upper Manhattan that are being considered are PS 92 (222 West 134th St), PS 242 (134 West 122nd St), and IS 201/Arthur Schomburg High School (2005 Madison Ave).

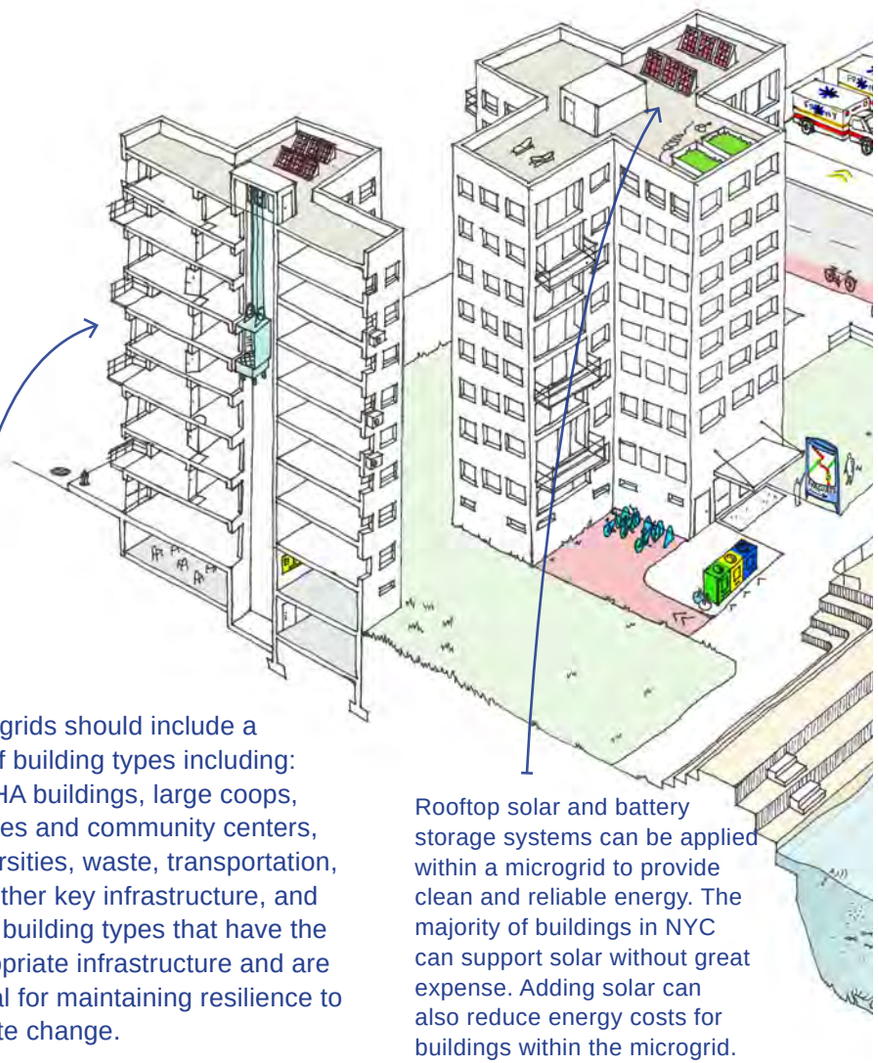
Adding battery storage to a solar installation allows tenants to store energy produced by solar panels during the day for consumption at night. Batteries also provide a backup option in case of an energy blackout, The annual capacity of solar battery storage systems is expected to grow from 60MW to 14GW between 2014 and 2023.

Image on opposite page: Solar canopy installation in Brooklyn that maximizes roofspace for energy production while maintaining access to ventilation and other infrastructure. Below: diagram of potential subscribers for a shared solar installation.



Microgrids

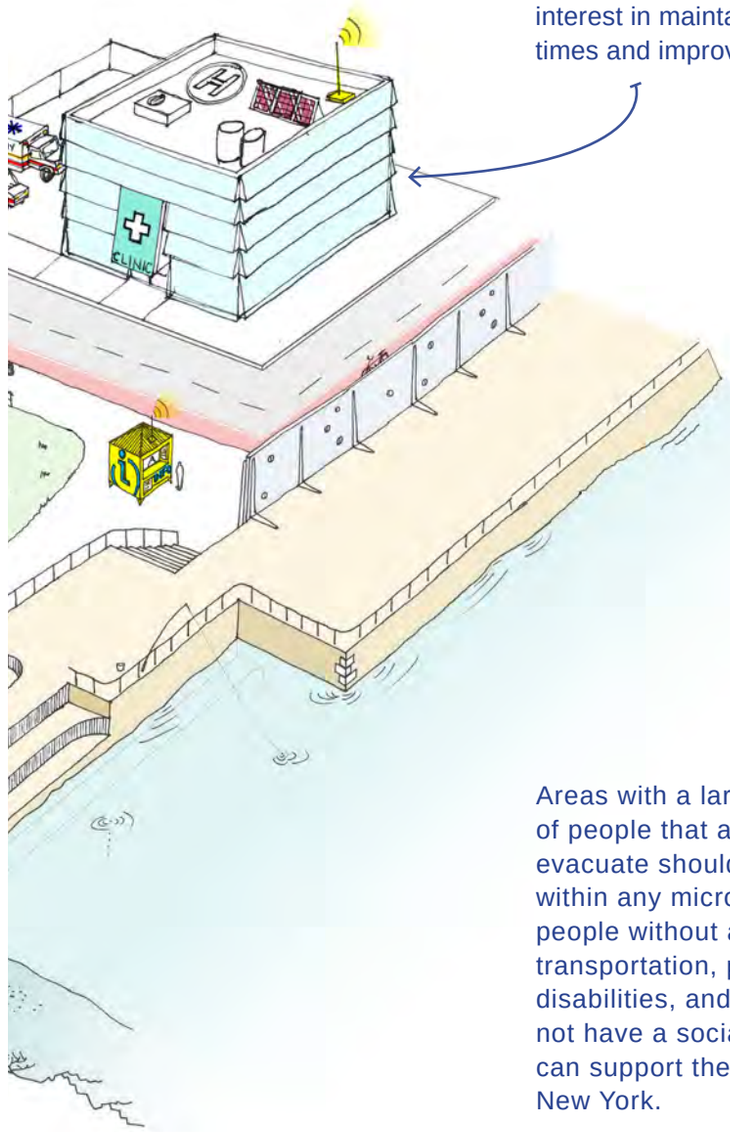
A microgrid is a group of buildings within a neighborhood that are connected with each other via distributed energy generation systems. This arrangement allows the microgrid to detach from the main grid should their be risk of a blackout. In NYC many people that lost power after Sandy are now developing microgrids so they won't lose power again during similar events in the future.



Microgrids should include a mix of building types including: NYCHA buildings, large coops, libraries and community centers, universities, waste, transportation, and other key infrastructure, and other building types that have the appropriate infrastructure and are critical for maintaining resilience to climate change.

Rooftop solar and battery storage systems can be applied within a microgrid to provide clean and reliable energy. The majority of buildings in NYC can support solar without great expense. Adding solar can also reduce energy costs for buildings within the microgrid.

Healthcare facilities are key partners in microgrid projects. They usually have access to a large amount of roofspace and an interest in maintaining power at all times and improving public health.



Areas with a large number of people that are unable to evacuate should be prioritized within any microgrid. Including people without access to transportation, people with disabilities, and people who do not have a social networks that can support them outside of New York.

Green Buildings

Energy democracy

Energy democracy is a process of empowering local communities to make decisions about their energy production and consumption. Democratizing energy can support development of small-scale solar and other renewables according to local needs. It can also support a local green economy by reducing energy costs and creating employment in high skilled jobs in a rapidly growing industry.

Building Materials

Materials that have high thermal resistance, such as brick and wood, are efficient due to their ability to block the absorption of heat, and insulate from extreme weather. New advances in concrete and artificial materials will lead to building designs that have light ecological footprints but can also withstand increasing environmental threats.

Combined Heat and Power

Combined heat and power (CHP) systems refers to the simultaneous generation of electricity and building heat from the combustion of a fuel or a solar heat collector. It is a highly efficient system of energy production due to its dual use and applicability in high density developments. Pictured: Future Hallets Point development.

Sustainable Interiors

Sustainable interiors utilize materials that have a low carbon footprint. These materials are often gathered from local sources and/or are repurposed. They often emit low levels of volatile organic compounds and can include carpets, wood flooring, wall and ceiling materials, furniture, and more. Paint, coatings and hinge sealants with low VOC are also important. Air quality in unhealthy interiors can be up to 100 times) more polluted than outside.

Passive Solar

Orienting a building along the lines of available sunlight allows the use of shading techniques, ventilation design, and the Sun's natural energy for heating and cooling. These buildings often consume less energy and are less dependent on automated HVAC systems. Passive solar designs can be codified into building standards and incentivised with fiscal policy.

Terraforming

Emerging technology allows for buildings in the future to integrate nature into their designs. Utilizing the natural properties of plant and animal life can eliminate our dependency on polluting systems of infrastructure, such as fossil fuels, and to create a new safe and happier environment using biomimicry. This image was presented as a vision for Paris in 2050.

Case Study: Coop Power

Co-Op Power is a consortium of community-owned clean energy and energy efficiency cooperatives in New England and upstate New York. The business seeks to create structures of ownership for energy consumers. The company states that by empowering people to collectively own local energy businesses, “investments in clean energy directly benefit local residents through green jobs, capital, and energy savings.” Using cooperative methods they have raised “more than $320,000 in Member Equity, $840,000 in member loans, and $850,000 in local investment to support the development of community-scale clean energy projects.” According to their website “75% of member equity is reinvested back into community energy resources.”

Becoming a member of an electrical cooperative allows for:

- The potential of saving (based on your purchases) thousands of dollars on energy
- After five years, more significant member discounts and dividends as a result of increased buying power, service offerings, and investments maturity
- Making a member loan to a community owned renewable energy business

According to the International Cooperative Alliance, cooperatives are based on:

- Membership open to anyone willing to accept responsibilities, regardless of race, religion, gender, or economic circumstances
- Democratic Member Control: organizations controlled by their members, who actively participate in setting policies and making decisions.
- Members’ Economic Participation: Members contribute equitably to, and democratically control, the capital of their cooperative
- Autonomy and Independence: self-help organizations controlled by their members
- Education, Training, and Information: employees contribute to the development of their cooperatives.
- Concern for Community: work for the sustainable development of local communities through policies supported by the membership

More at: http://www.cooppower.coop/

The community outreach and planning process for solar development, engineering and manufacturing solar panels, and installing and maintaining solar systems, are all disciplines within an emerging solar industry that can support local economic development and climate resilience.

3B Emergencies

Global warming means that we will experience severe storms more frequently. The impacts of which will be flooding from more precipitation and storm surges, damage from violent wind, more frequent heatwaves, drought, and more. When these events happen they can disrupt our lives for years, if not wipe out entire communities completely. In the aftermath of a weather emergency entire neighborhoods can be cut off from reliable transportation, food supplies, healthcare, education, and other vital services.

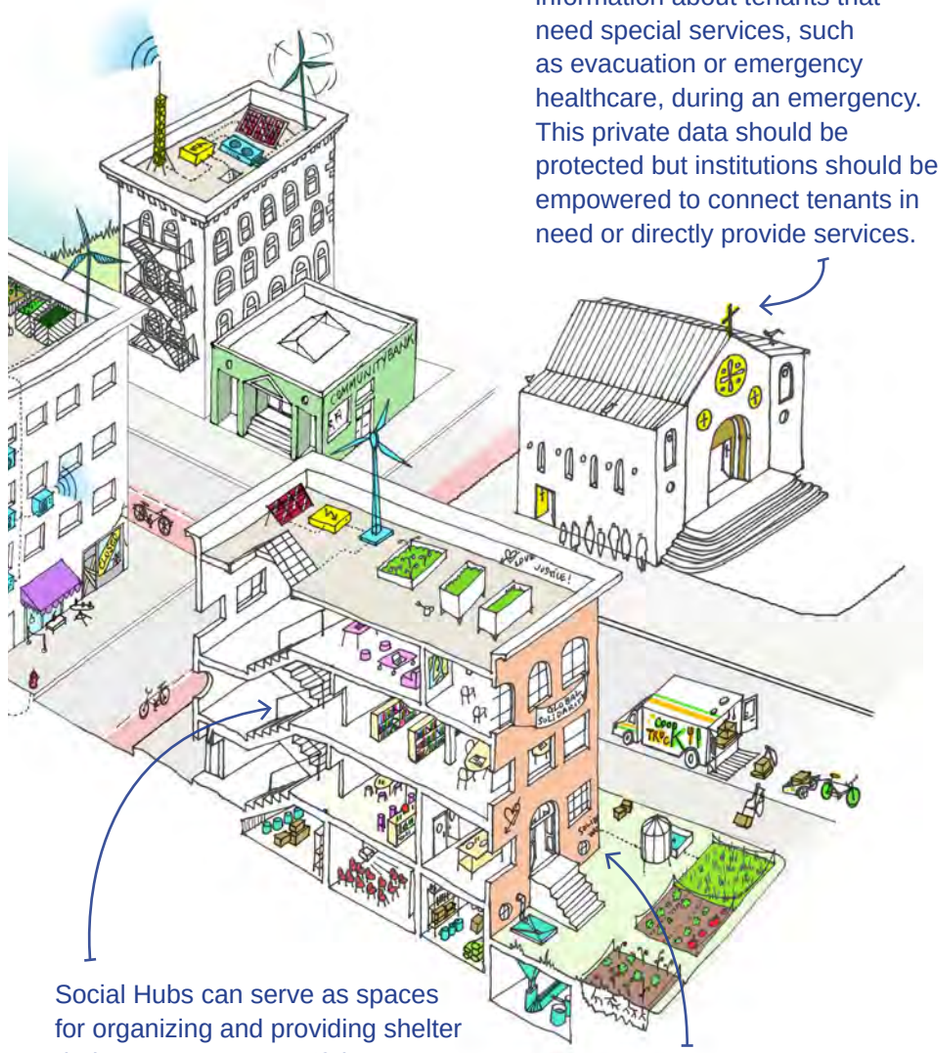
To be prepared for emergencies, the NMCA advocates to:

1. Train local residents in emergency preparedness techniques such as evacuation, shelter in place, and how to monitor the weather among other things.
2. Create a local communications system that allows neighbors to have reliable communications even when electricity and cell service are out.
3. Create an information kiosk that serves as a hub for preparedness training, receive emergency communications, and provide key services during an emergency event.

Manhattan has some of the oldest electrical infrastructure in the country, leaving it susceptible to blackouts as the demand for energy grows

Connecting tenants with each other, and with organizations that can provide support, is critical to surviving an emergency. In areas with high social cohesion, vulnerable populations can be identified and receive evacuation and medical support. In places with low social cohesion people risk not receiving the services they need because they can't communicate and service providers don't know where/how to find them.

Community institutions have information about tenants that need special services, such as evacuation or emergency healthcare, during an emergency. This private data should be protected but institutions should be empowered to connect tenants in need or directly provide services.



Social Hubs can serve as spaces for organizing and providing shelter during an emergency. If they are included within a microgrid they will also be safe from blackouts.

Community centers can support peer to peer communication that allows for quick action during an emergency.

Emergency Evacuations

On September 11, 2001:
500,000 PEOPLE WERE EVACUATED OUT OF MANHATTAN IN 9 HOURS BY HUNDREDS OF BOATS

3 MILLION PEOPLE MAY BE WALKING DURING A LARGE SCALE EVACUATION

23 RECEPTION CENTERS & SHELTERS ARE AVAILABLE IN AN EMERGENCY

THE CITY HAS PLANS TO MOVE 400,000 TO 2,000,000 PEOPLE FROM THE PATH OF A HURRICANE

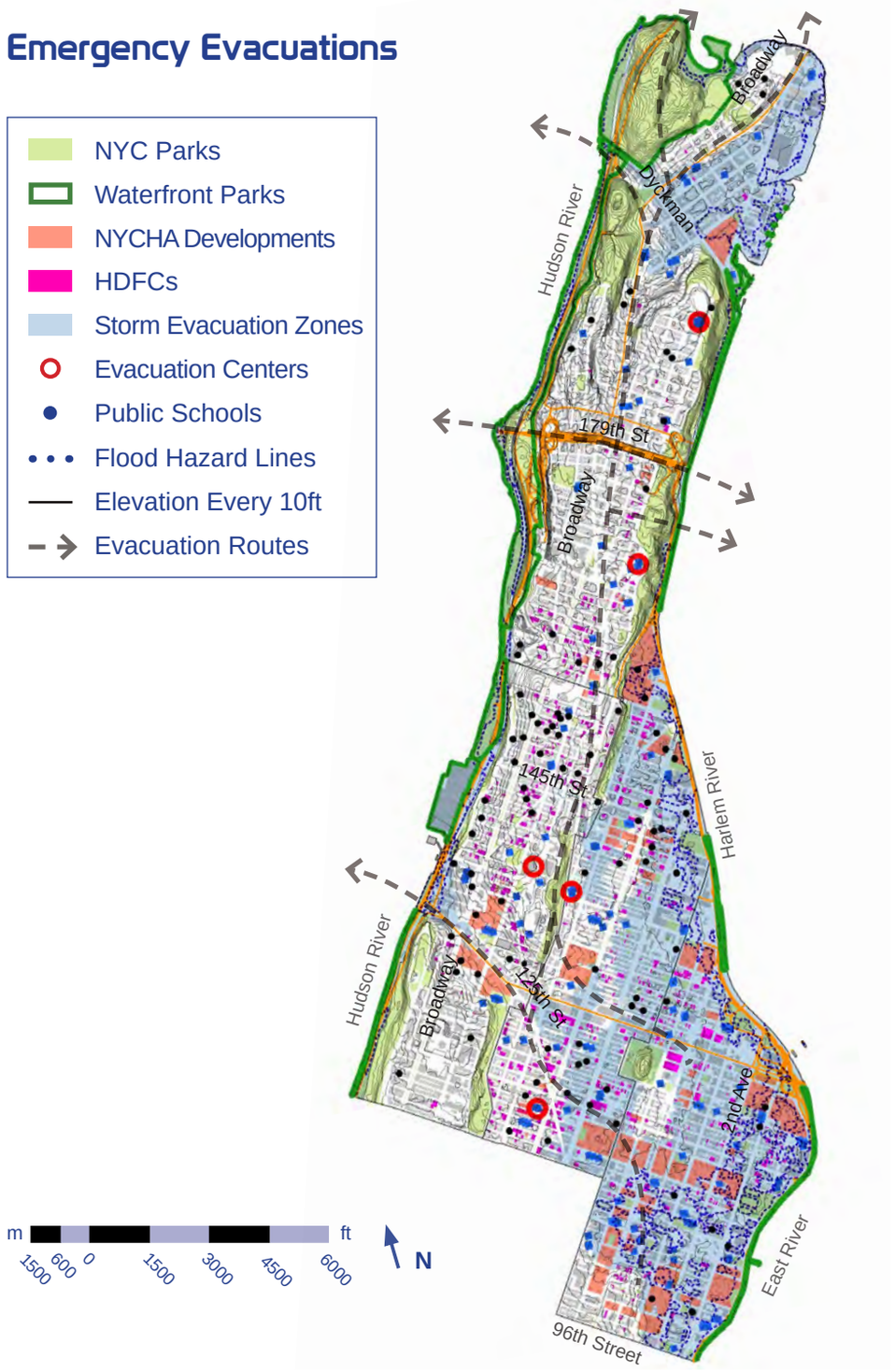
One report stated that:
1 MILLION PEOPLE COULD BE EVACUATED FROM DANGER ZONES WITHIN 1 HOUR

20% OF NEW YORKERS LOST ELECTRICITY AFTER SUPERSTORM SANDY

SEPTEMBER 2005:
3 MILLION EVACUATE TEXAS AND LOUISIANA BEFORE HURRICANE RITA. THIS IS THE THIRD LARGEST PEACETIME EVACUATION IN HISTORY.

OCTOBER 2016:
2.5 MILLION EVACUATE FLORIDA, GEORGIA AND S. CAROLINA BEFORE HURRICANE MATTHEW. THIS IS THE SECOND LARGEST EVACUATION IN U.S. HISTORY.

Emergency Evacuations



Evacuation Procedures

During an emergency situation take the following precautions:

- ☐ **Decide where your family will reunite after a disaster. Pick a place outside your home and a backup library/ community center**
- ☐ **Pre-pack a bag with essential items and have it easily accessible, known as a "Go Bag"** (more at http://www1.nyc.gov/)
- ☐ **Identify all exit routes from your home and neighborhood.**
- ☐ **Plan for everybody's needs, especially seniors, people with disabilities, children, non-English speakers, and pets.**
- ☐ **Close and lock windows, doors, and unplug appliances. Listen for instructions to shut off utilities.**
- ☐ **Do NOT use an elevator during a fire or emergency**
- ☐ **Go to the nearest safe place or shelter**
- ☐ **If you are directed to evacuate stay with people outside of New York City.**
- ☐ **For evacuees with no alternative shelter, schools, municipal buildings, and places of worship will serve as evacuation centers. Bring your Go Bag.**

To shelter in place:

- ☐ **Get your Go Bag**
- ☐ **Go to a room with few doors or windows**
- ☐ **Lock doors, close windows, and air vents**
- ☐ **Turn off fans, air conditioning or heating**
- ☐ **Seal all windows, doors, vents with plastic sheeting/ duct tape**
- ☐ **Keep in communication via radio or phone**

Become an Evacuation Center

Your place of work or community hub can become an evacuation center if it meets the following criteria:

- ☐ **15 to 20 square feet per person**
- ☐ **Availability any time of year**
- ☐ **Fire extinguishers, functional fire alarms (with sprinklers preferable)**
- ☐ **Emergency generator (facilities without generator can also be listed as evacuation centers)**
- ☐ **Heating and/or cooling system**
- ☐ **Food preparation, Cooking capacities, and Eating areas**
- ☐ **Telephone line**
- ☐ **Accessibility for people with disabilities**
- ☐ **Accessible restrooms**
- ☐ **Showers (one shower for every 40 residents)**
- ☐ **Toilets (one restroom for 40 people)**
- ☐ **Sink (one sink for every two toilets)**
- ☐ **Water**
- ☐ **Coats and blankets**

More at: https://www.health.ny.gov/environmental/emergency/flood/

Community Emergency Preparedness Systems

Emergency Preparedness Information Kiosk (EPIK)

In order to prepare for an emergency community residents in West Harlem are developing an installation that can support emergency preparedness trainings, education about climate change, and key services, including reliable communications. Equipment includes two-way radios, solar power and battery storage, rain water collection, miscellaneous storage space, and other infrastructure that can be utilized by community organizations, tenant associations, and other local groups to help each other plan for safety and navigate moments of crisis. The installation can be replicated in other places to support hyper-local action.

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.

Climate Refugees

Right of Return

The right of return is a principle drawn from the Universal Declaration of Human Rights and the International Covenant on Civil and Political Rights. It states that refugees wishing to return to their homes and live at peace with their neighbors should be permitted to do so at the earliest practicable date, and that compensation should be paid for the property of those choosing not to return.

Sanctuary City

Sanctuary Cities can support the housing of climate refugeesn by providing housing and limiting official cooperation with the national effort to enforce immigration law. These cities provide immigrants access to health and social services, public schools, to drive legally, and carry out other societal functions without fear of detainment or deportation. Other policies include include prohibiting police or city employees from questioning people about their immigration status and refusing requests by federal immigration authorities to detain people in certain circumstances. Studies have shown that sanctuary policies have no effect on crime or that crime rates were even lower than non-sanctuary cities. Source: Washingtonpost.com

Protected Migration

Article 13 of the Universal Declaration of Human Rights asserts that: a citizen of a state in which that citizen is present has the liberty to travel, reside in, and/or work in any part of the state where one pleases within the limits of respect for the liberty and rights of others, and that a citizen also has the right to leave any country, including his or her own, and to return to his or her country at any time. The right includes not only visiting places, but changing the place where the individual resides or works. Mitigating climate change includes guaranteeing safe passage and settlement for the millions of people who are and will be displaced by changes in climate. Allocations of land and transportation resources may be required once some coastal areas become inhabitable. Source: http://www.un.org/en/documents/udhr/

Refugees Status

Climate change refugees are people who are forced to leave their home region due to sudden an/or gradual long-term changes to their environment. Such changes could include increased droughts, desertification, sea level rise, or other changes to weather. The term climate exiles has been used to refer to those climate migrants who may be in danger of becoming stateless. Storms in NY have and will displace many that will not be able to afford other residences within the city limits or region. More at: https://www.rsc.ox.ac.uk/

Case Study: Red Hook Initiative (RHI)

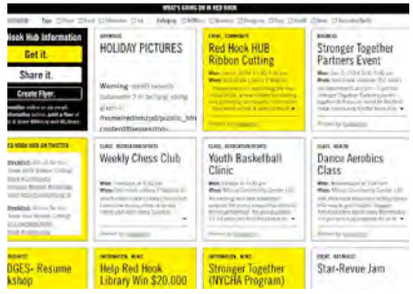
The Red Hook Initiative has been pioneering a combination of community programming and physical infrastructure to prepare Red Hook, Brooklyn, for their next emergency.

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.

Case Study: Cuban Community Response Systems

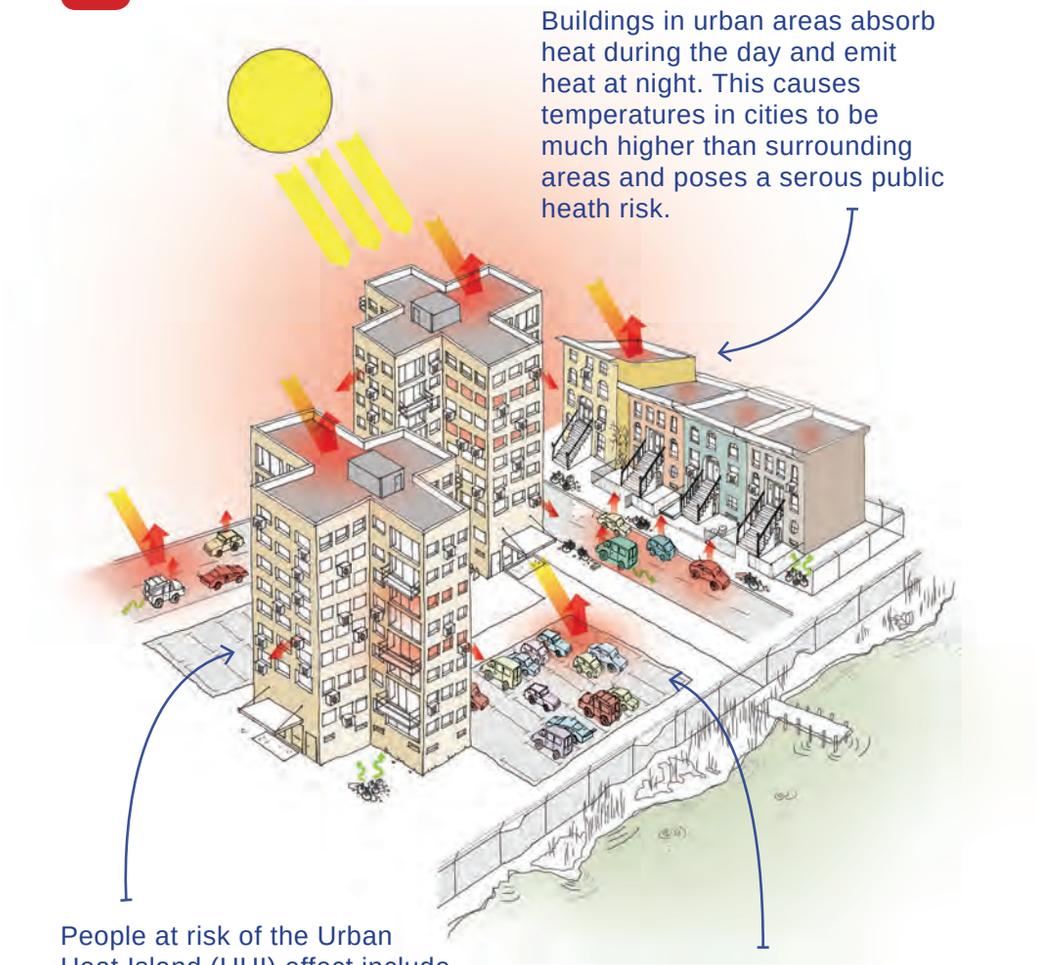
The Cuban response system has been recognized around the world as one of the most successful systems at predicting emergencies and providing immediate relief in their aftermath.

The response system has 4 stages:
- Stage I: Civil Defense is placed on an alert 72 hours before storm makes landfall and the media begins broadcasting warnings of the impending storm.
- Stage II: 48 hours before the storm, the National Civil Defense in each zone begins to organize preparation efforts, such as sending students home from schools. Shelters are inspected and supplied, and evacuations begin.
- Stage III: Media continues to provide coverage of the hurricane,and the DCN attempts to maintain lines of communication.
- Stage IV: People return to their homes, after they have been certified as sound by the DCN. Rescue operations and tallies of damages begin.

The system depends heavily on coordination from a “conscientious and prepared network of volunteers, disaster responders, and public health officials who all work together.” This group, along with public agencies, work to:
- Educate the population about hurricanes and the Simpson-Safir scale
- Provide constant information of threat and the measures that have to be taken
- Give natural disaster control the highest possible importance through the use of television, radio and community organizations
- Use national political leaders and specialists to communicate with the people and you put the very leaders of the government in the middle of the hurricane, to be with the people so that they should not be considered forgotten
- Practice the evacuation plans at times when there is no hurricane season
- Evacuate 24 hours prior to the hurricane striking the mainland
- Evacuate according the specific national, regional or local plan.
- Neighborhood physicians accompany evacuees so they will know their patients’ medical history and need
- Points where the evacuees are taken are known beforehand and are set up with water, food, and cots.
- Electric and gas services are cut off before the hurricane hits

Cuba’s weather forecast service, its emergency preparedness notification system, and its aid delivery system are among the best in the world in part due to their ability to engage community leaders in the process.

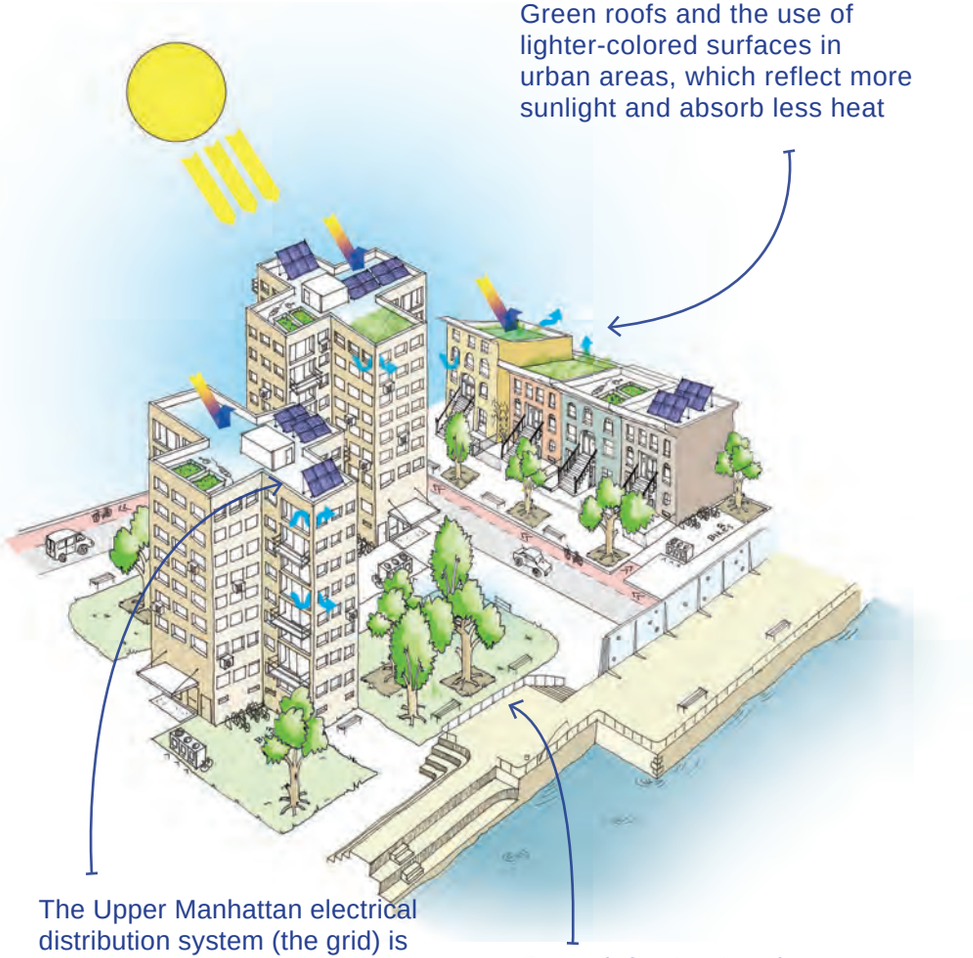
3C Heat



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.

Urban Heat Islands

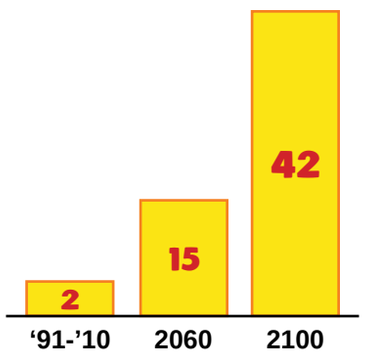
EXTREME HEAT EVENTS ARE WHEN IT IS 100°F OR HIGHER FOR ONE OR MORE DAYS OR 95°F OR HIGHER FOR TWO OR MORE DAYS

JULY 2016 WAS THE HOTTEST MONTH ON RECORD

2016 HAD 21 DAYS THAT REACHED OVER 90 DEGREES

ANNUAL NUMBER OF DAYS OVER 95° F

Based on projections by the World Climate Research Programme



HEAT WAVES ARE THE 2ND LEADING CAUSE OF DEATH AMONG WEATHER RELATED EVENTS

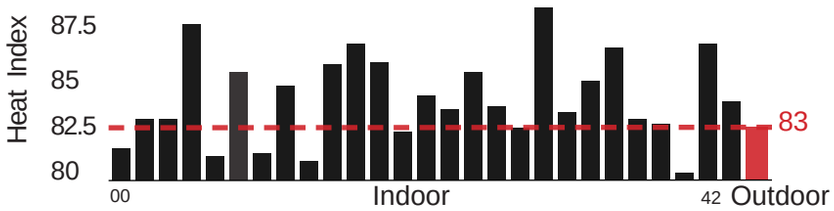
200%-800% INCREASE IN DEATHS DURING NEW YORK'S 2003 BLACKOUT

RESIDENTS IN NYCHA HOUSING PAY $120 PER YEAR FOR EACH AIR CONDITIONER.

DURING JULY OF 2016 OVER 1,000 RESIDENTS OF CENTRAL HARLEM LOST POWER. THE TEMPERATURE WAS 96 DEGREES.

AVERAGE HEAT INDEX

Nearly 2/3rd of the sampled spaces registered higher heat index compared to ambient conditions (Source: Harlem Heat)



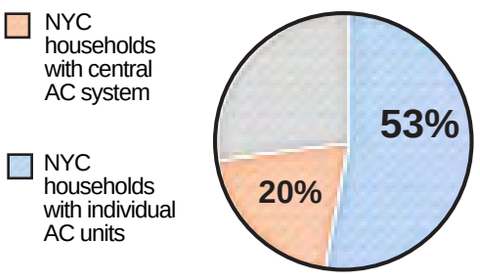
800 NEW YORKERS VISIT THE HOSPITAL EACH YEAR FOR HEAT-RELATED ILLNESS

140 DIED FROM HEAT EXCESS IN 2013

HARLEM RESIDENTS ARE TWICE AS LIKELY TO VISIT THE EMERGENCY ROOM FOR HEAT STRESS COMPARED TO THE REST OF NEW YORK.

OVER 50% OF PEOPLE IN UPPER MANHATTAN SAY THEY EXPERIENCED DIZZINESS, NAUSEA, AND OTHER IMPACTS OF OVERHEATING.

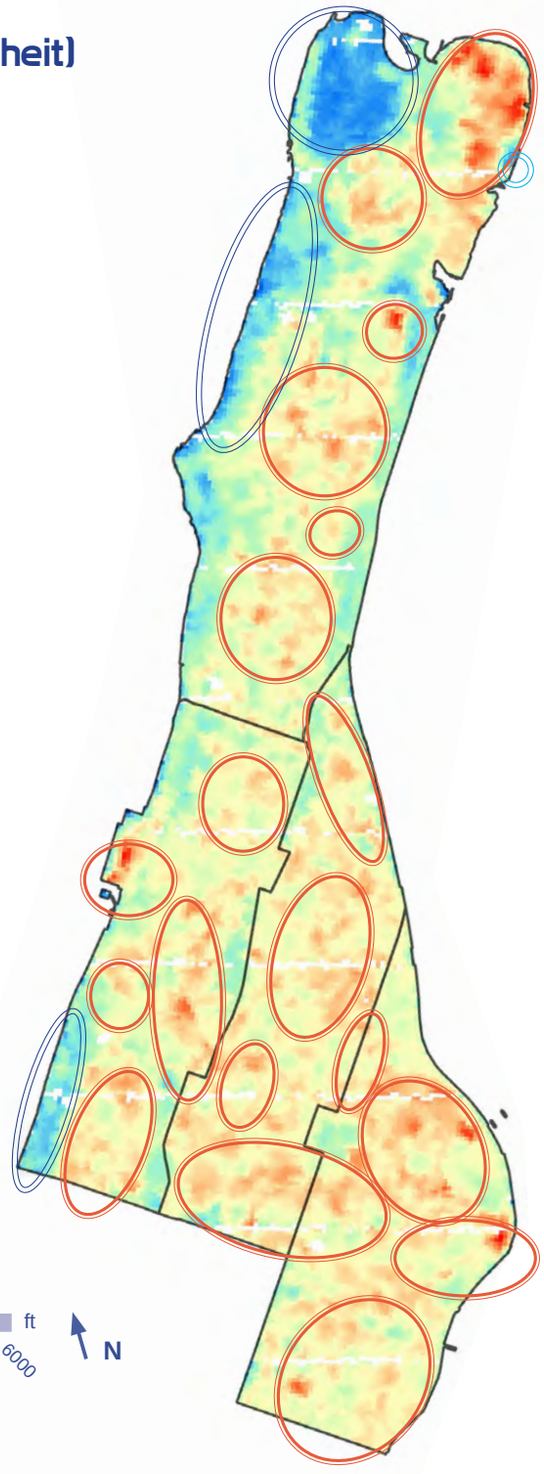
11533 MEGAWATTS was the **RECORD HEAT** for a weekend set at 3 p.m. on July 23, 2011



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

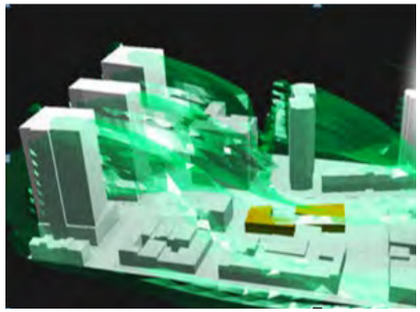
m 1500 600 0 1500 3000 4500 6000 ft

N

Urban Cooling Techniques

Urban Design

Designing streets so they align with wind patterns can improve air circulation and reduce daytime temperatures. Open spaces and certain architectural features can also improve circulation. This allows maximum penetration of winds, which carry off heat and lower ambient air temperatures.

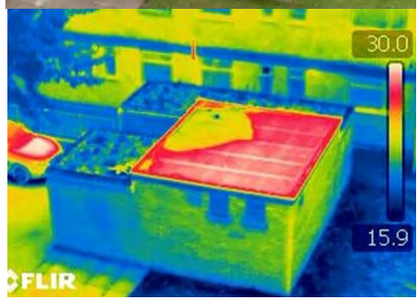


White Roof

Coating a roof with white reflects sun back into the atmosphere. This reduces building temperatures and energy use. This type of albedo modification can make a white roof up to 10°C cooler than an asphalt roof, and reduces ambient air temperatures by at least 1°C.

Green Roof

A green roof or living roof is partially or completely covered with vegetation and a growing medium that is planted over a waterproofing membrane. It may also include additional layers such as a root barrier and drainage and irrigation systems. Green roofs combat the urban heat island by cooling the atmosphere and reducing the heat transmitted into the building. Around a green roof the heat evaporates the water in the roots of the plants which emits cool air. Using infrared technology the image below shows over a 15°C heat difference between a standard asphalt roof and a green roof.

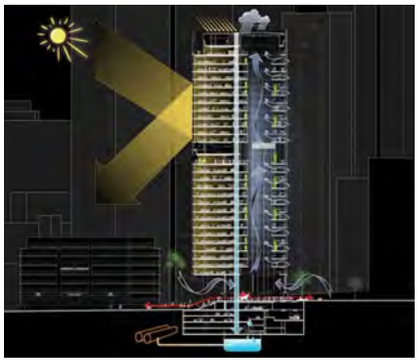


Walls and Insulation

Modern materials exist that can cool buildings by increasing ventilation, preventing air leaks and blocking the interior of a building from extreme temperatures. An example is this new brick design posted at archdaily.com.

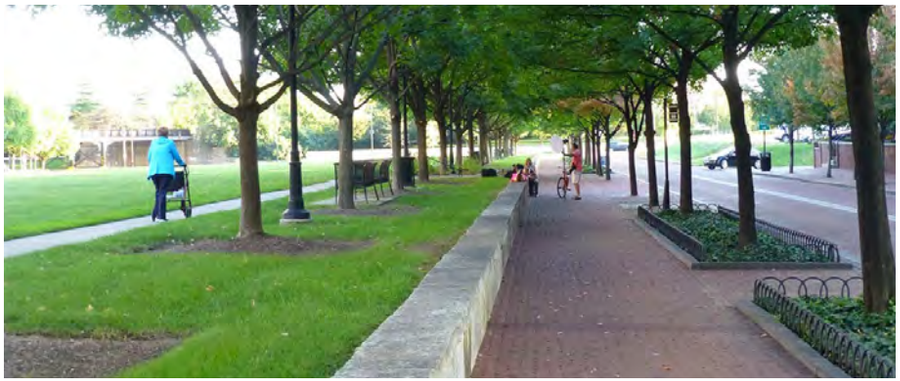
Ventilation

Proper ventilation is necessary for healthy indoor air quality and energy conservation. Window openings that are large and oriented to the direction of the wind capture the most air. Air ducts should be sealed to prevent leaks, and HVAC system cleaned regularly so bacteria isn't spread throughout the building.



Street Trees/Plantings

Trees and vegetation lower surface and air temperatures by providing shade and evapotranspiration. Shaded surfaces can be 20–45°F (11–25°C) cooler than the peak temperatures of unshaded areas. Green surfaces can reduce peak summer temperatures by 2–9°F (1–5°C). Trees and vegetation should be planted in strategically according to which communities are most at risk, including working class neighborhoods, areas prone to blackouts and flooding, and places where homes may have high energy bills and/or a lack of air conditioning. Image: Columbus, Ohio.



Case Study: Singapore Urban Greening

The dense city-state of Singapore has become a leader in responding to the urban heat island effect. The city's 5 million people are crowded into only 269 square miles, but the city still manages a high percentage of tree cover and integration of plants into the built environment.

Beginning in the 1950s the city launched an ambitious program to create a "City in a Garden" by covering half the city in green. Projects were undertaken to:

* Create a haven for aquatic and terrestrial wildlife such as otters, pythons, monitor lizards, pangolins and hornbills;
* Gardens with 100 different species of birds and 500,000 plant species and supertrees
* Adding greening to important community facilities such as hospitals.
* Five coastal parks; some have artificial beaches, but one features 6 ha of preserved mangrove forest.
* Physical distribution of vegetation in the urban fabric to create a perception of pervasive greenery;
* Space for healthy activities
* URA survey reported that 43% of respondents took part regularly in jogging/strolling/brisk walking and these are likely to be undertaken in parks and green spaces;
* Two thirds of the city – rooftops, parks, medians, sidewalks, roadways – capture rainwater and convey it or pump it via microprocessor controlled channels or tunnels to 18 reservoirs
* Eventually, the city has plans to turn ninety percent of its surface area into rainfall catchment.
* Buildings in the city focus on cross-ventilation, creating a passive climate-controlled environment. Continuous, open corridors allow air to cool homes and provide plenty of natural sunlight for residents. This architecture "is a genuine precursor to the zero-energy mass housing that will be essential for the continued growth of Asia's cities."

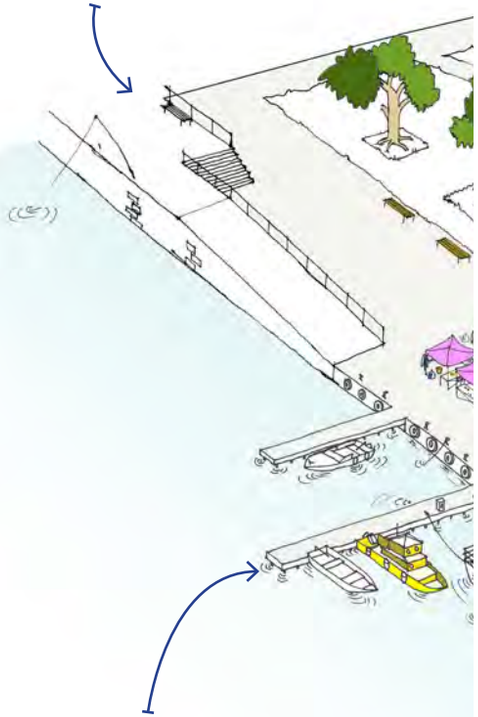
Top: Hospitals in Singapore include interior green space to promote physical health and mental well-being for patients, visitors and staff (Pictured Khoo Teck Puat Hospital). Bottom: Green corridors and natural areas built into the urban fabric.

3D Food and Waste

Food sovereignty means that people have the ability to define and control the type of food available to them, and ensure it's culturally appropriate and grown through sound ecological and sustainable means. This is especially important in areas, where access to fresh, affordable, nutritious food can be limited. Access to good food, while not an end-all solution, is vital to improving community health, especially in neighborhoods afflicted by high morbidity, which is often linked to obesity and issues such as diabetes, liver and heart disease.

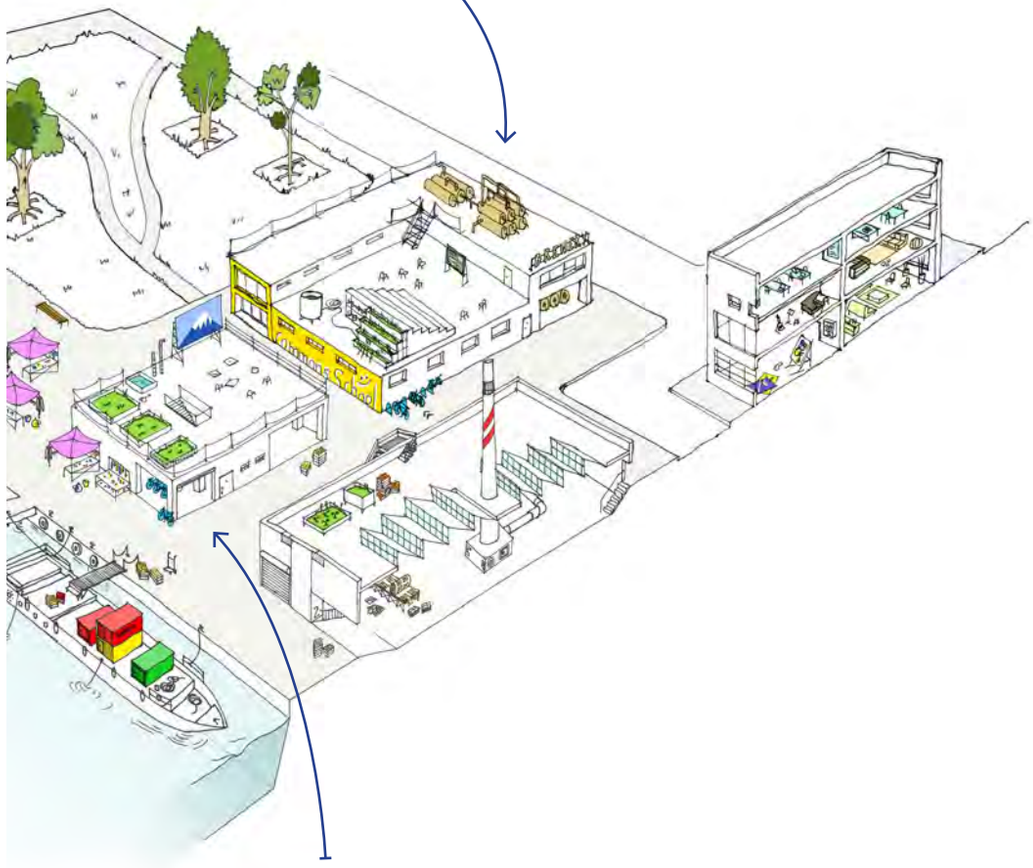
In terms of waste, more than 80% of the City's trash was trucked, stored, and then bundled for interstate transport in just four out of 59 community districts. The South Bronx, where just 6.5% of the city's population resides, was home to 15 waste transfer stations and handled over 31% of the city's solid waste. Not coincidentally, the South Bronx had one of the highest asthma rates in the world.

Flood protection infrastructure can protect food and waste resources including urban farms, shipping ports, markets, and waste management facilities, among others.



New docking infrastructure would allow farmers from Upstate NYC to bring their produce to New York City via the Hudson River.This would cut down on truck traffic and the use of fossil fuels, along with making our neighborhoods safer and cleaner.

Industrial facilities and business incubators can support a local food economy while reducing the carbon footprint of the food consumed in NYC.



Local markets on the waterfront can support sustainable transportation and help program public spaces for public benefit.

Agricultural Impacts

THE U.S. FOOD SYSTEM CONTRIBUTES NEARLY 20% OF THE NATION'S CO2 EMISSIONS; ON A GLOBAL SCALE, LAND USE CONTRIBUTES 12% OF CO2 EMISSIONS.

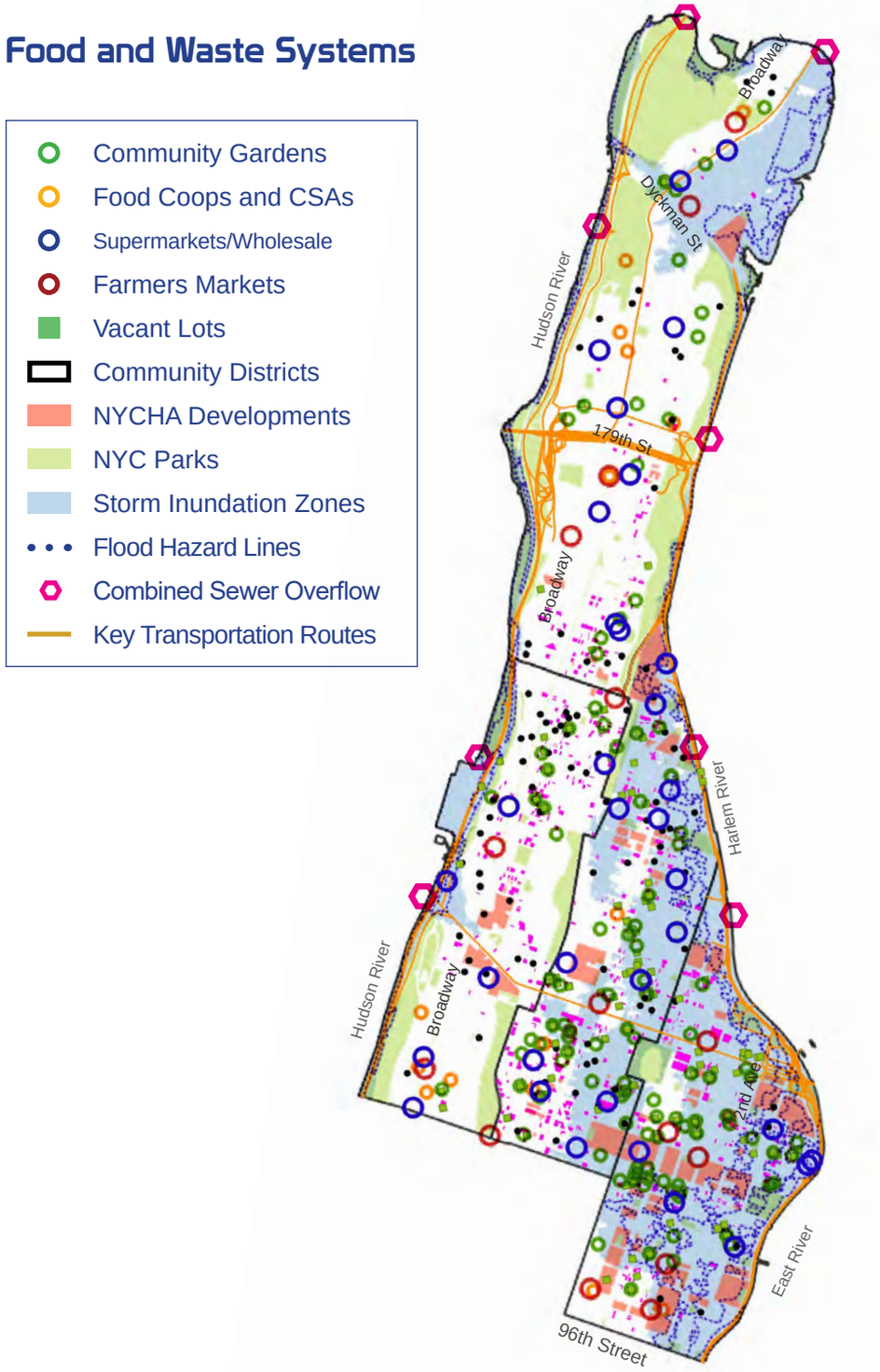
6M HECTARES (14.8M ACRES) OF NEW FARMLAND WILL BE NEEDED AROUND THE GLOBE EVERY YEAR TO KEEP UP WITH NEW DEMAND. AS OF NOW, 12M HECTARES A YEAR ARE LOST THROUGH SOIL DEGRADATION.

MANURE ACCOUNTS FOR ABOUT 14% OF TOTAL GREENHOUSE GAS EMISSIONS FROM THE US AGRICULTURE SECTOR. SMALLER SOURCES OF EMISSIONS INCLUDE RICE CULTIVATION, WHICH PRODUCES CH4, AND BURNING CROP RESIDUES, WHICH PRODUCE CH4 AND N2O.

NEW YORK STATE HAS:

* **7.2 MILLION ACRES OF FARMLAND, ALMOST ONE-QUARTER OF THE STATE'S TOTAL LAND AREA**
* **59% OF FARMLAND IS DEDICATED TO CROPS, 22% IS WOODLAND, 10% IS PASTURELAND, AND 9% IS FOR CONSERVATION AND OTHER USES**
* **MORE THAN 205,000 ACRES OF CERTIFIED ORGANIC FARMLAND**
* **THE AVERAGE SIZE OF A FARM IN NY IS 202 ACRES**
* **MORE THAN HALF OF NEW YORK'S FARMS ARE SMALLER THAN 100 ACRES**
* **$5.4 BILLION IN AGRICULTURAL COMMODITY SALES IN NY DURING 2012**
* **THE TOTAL ESTIMATED AGRICULTURAL IMPACT IN THE STATE WAS $37.6 BILLION IN 2011**
* **AS OF 2012 NY HAD MORE THAN 35,500 FARMS**

Food and Waste Systems



Case Study: Brook Park Garden

The South Bronx is among the most impoverished and polluted districts in the country. Almost 30% of the Bronx's 1.4 million residents live at or below the poverty line. The borough has over 9% unemployment, compared with 6% for the city as whole. The Bronx is also considered the least healthy of NY State's 62 counties. 26% of adults in The Bronx are in poor or fair shape, compared to 16% statewide. Many of these problems are exacerbated in the South Bronx.

In order to combat these deep rooted issues, local activists have been building community gardens. At Brook Park, the Friends of Brook Park, led by Ray Figueroa, organization's program director, have found a way to grow local produce that can help local health and provide economic opportunity. The garden produces hot peppers that are sold to a local company which produces the Bronx Greenmarket Hot Sauce. By doing so Figueora claims they are creating a new economic model for urban agriculture. The money they generate goes into stipends for people that work at the farms.

Furthermore, most of the gardeners are teenagers with criminal records who have been 'sent to work in the garden through a court order as an alternative to incarceration'. This system allows frontline communities, those that are most affected by poverty, poor food options, and lack of green space, to take the lead in reversing their conditions. The experience of gardening gives those in need access to green space, education in running a business, and of course healthy food. This way local resources are used to better the community instead of being owned and sold for profit by speculators that are not from The Bronx and who would not reinvest back into it were they to profit from its local produce.

The procedure of creating the garden included identifying abandoned land, determining its public or private ownership, and making a license agreement with the property owner to use the land for the purposes of a garden. This cycle repeated could give community members access to vacant land and amplify the model of Brook Park.

Website: http://www.friendsofbrookpark.org/

THE BRONX HOT SAUCE

Images of Brook Park, staff, and The Bronx Hot Sauce that it produces (Images from http://NYtimes.com) Bottom: Hunts Point Food Distribution Center in the South Bronx

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.

Case Study: BK ROT

BK ROT is a composting service that handles pick up, processing, and distribution of locally produced compost in Brooklyn. It is the largest bike-powered composting service in NYC.The model that BK ROT uses centers local youth of color, building economic strength, stopping environmental racism and gentrification, and creating a green community space for organics recycling.

BK ROT youth workers engage in a positive, skills-based environmental job training and leadership development program during their employment. The Institute for Local Self-Reliance calculates that a composting facility creates 21.4 jobs for every $10 million invested in it, while a landfill only creates 8.4 jobs for the same investment.

BK ROT workers collect organic waste from residents and small businesses by bike, and process the material at their 2500 square foot compost site, Know Waste Lands; a vacant lot which BK ROT helped secure and turn into a restorative wild garden and composting site. As of this date 95 residential households were being served, each of whom is paying $15/month to have bikers pick up their compost and process it. As the NYC Department of Sanitation rolls out its residential organics collection program, BK ROT plans to transition from serving residents to focusing on small businesses. Currently BK ROT collects and processes organic waste from 8 local businesses.

Since their inception in August 2013, the team has processed over 54,269.5 lbs of local organic waste; 19 tons in 2016; generated over $40,000 in youth stipends; created 8 part-time positions; and serves over 90 households. They are on track to process over 100,000 lbs this year and have a goal of doubling that by 2019. BK ROT demonstrates the potential of community composting to distribute the value of waste locally and to employ people equitably.

More at: www.bkrot.org

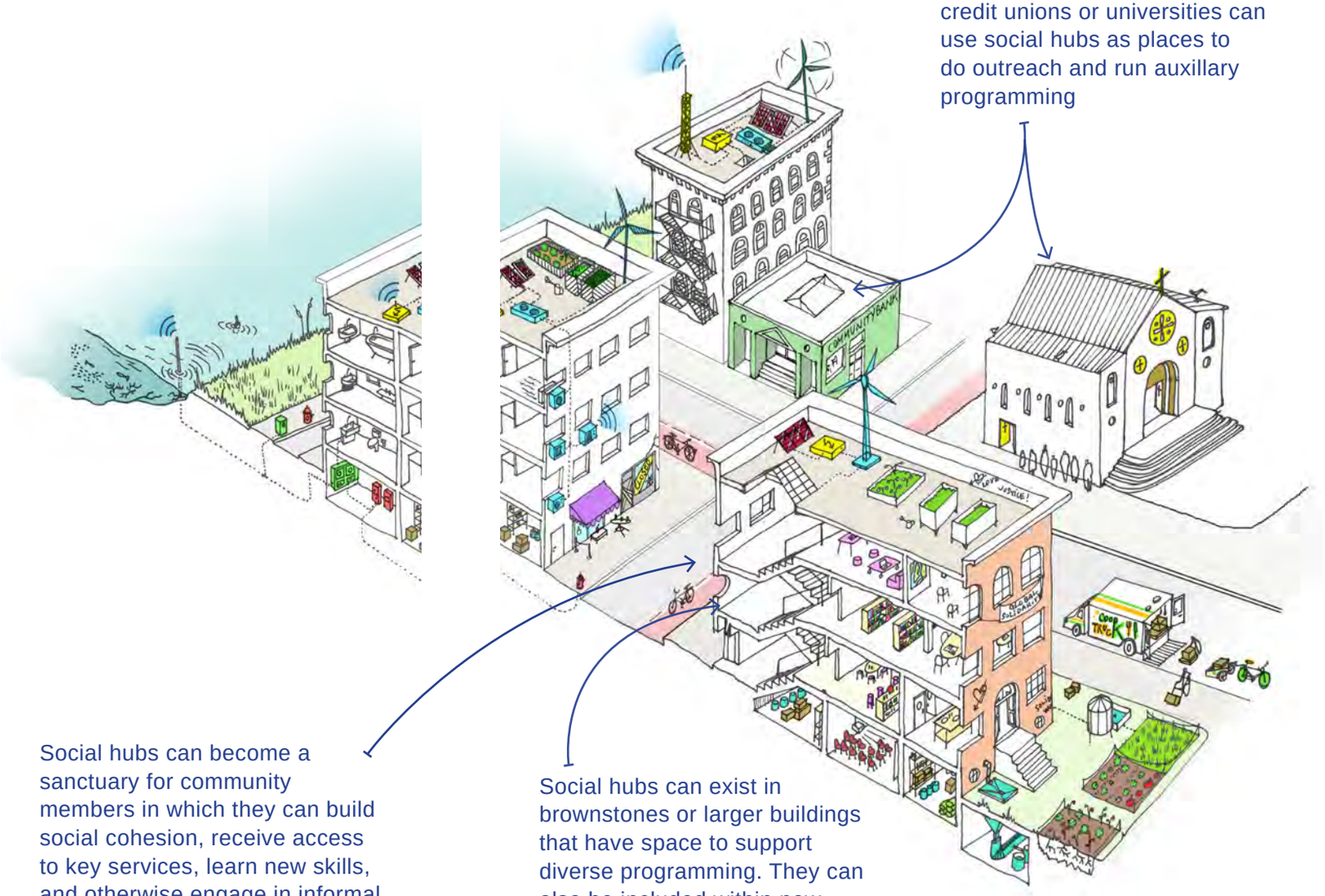
BK ROT composting operations are cleaning up pollution in Brooklyn while building an industry for local youth. Photos by Murray Cox.

3E Social Hubs

Social Hubs (or social centers) are community spaces that are used for a range of community organizing, educational, and cultural activities that are intended to facilitate action on important local issues.

These places support programs ranging from hosting community meetings, providing facilities for meetings of tenant organizations, housing a library, showing film screenings, providing public health programming like yoga and self-defense, provide incubator space for community organizations, and access to technology and tools for art-making, among other things. The goal is to have a flexible space that can be programed and managed by the community and therefore caters to
local needs.

Such spaces can bring diverse groups of together and reverberate larger movements for climate justice. Social hubs can be created in vacant buildings such as brownstones or even the abandoned 135th Street Marine Waste Transfer Station (on page 112). They can also be built in unused city property or as part of new developments happening in areas the city has targeted for rezonings.



Case Study: Mayday Space

Mayday Community Space is a social hub located in Bushwick, Brooklyn. Mayday provides "space for people of color, immigrants, women-led groups, LGBTQ, poor and working class communities, and their allies to organize for social justice, reflect on movement-building campaigns and strategies, share ideas, and cultivate solidarity among people fighting for a more equitable city." The social hub intends to foster collaboration among those most affected by oppression, which they believe is "instrumental to connecting organizing around climate change to other intersecting challenges and oppressions." By being inviting to individuals, formal and non formal groups, these centers provide a platform for connecting with other people and eliminating prejudice and stereotypes within our communities.

Mayday itself is housed in a former school building owned by a local church. The church has partnered with Mayday to equip and program the former school facilities as a social hub. As such Mayday Space has access to class rooms, performance venues, cooking and eating spaces, storage facilities, and other infrastructure to support a wide range of meetings.

On any given week programming at Mayday can include film screenings, poetry readings, tutorials on the production of materials for activism, panel discussions, and other planning activities in support of local campaigns for social justice. Advantages of being member driven including support from membership in programming and maintenance of the space, along with ensuring that programs are culturally appropriate and address local issues.

More recently Mayday has opened a restaurant near the social hub that will generate revenue to support staff and programming. The business enterprise allows Mayday to secure a steady stream of income that is independent from competitive grants. It also provides another outlet for doing outreach and programming.

More at: https://maydayspace.org/

MAY DAY

Images of Mayday Space including art making activities and community planning workshops.

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.

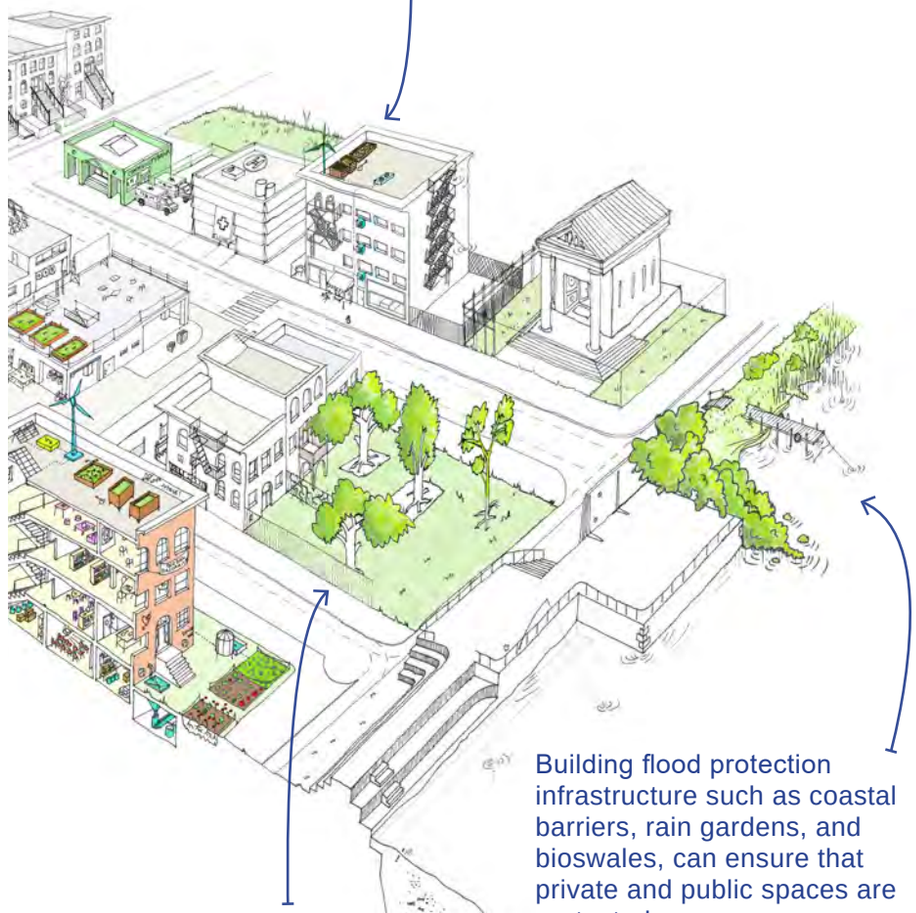
3F Green Infrastructure

Green infrastructure can be defined as a network of human-managed and natural ecosystems that together enhance ecosystem health and resilience, contribute to biodiversity, and benefit human population by improving air quality, conserving water resources, creating public spaces, among providing other benefits.

Manhattanville public housing in West Harlem has only 889 trees, which makes it the second poorest neighborhood in terms of trees in Manhattan

Green buildings can have green rooftops and water storage capacity systems that reduce indoor temperatures and conserve water.

The NYC Department of Environmental Protection has committed over $208 million to its Green Infrastructure Program.



Building flood protection infrastructure such as coastal barriers, rain gardens, and bioswales, can ensure that private and public spaces are protected.

Parks and open spaces are desperately needed in East Harlem to cool temperatures and handle flood waters

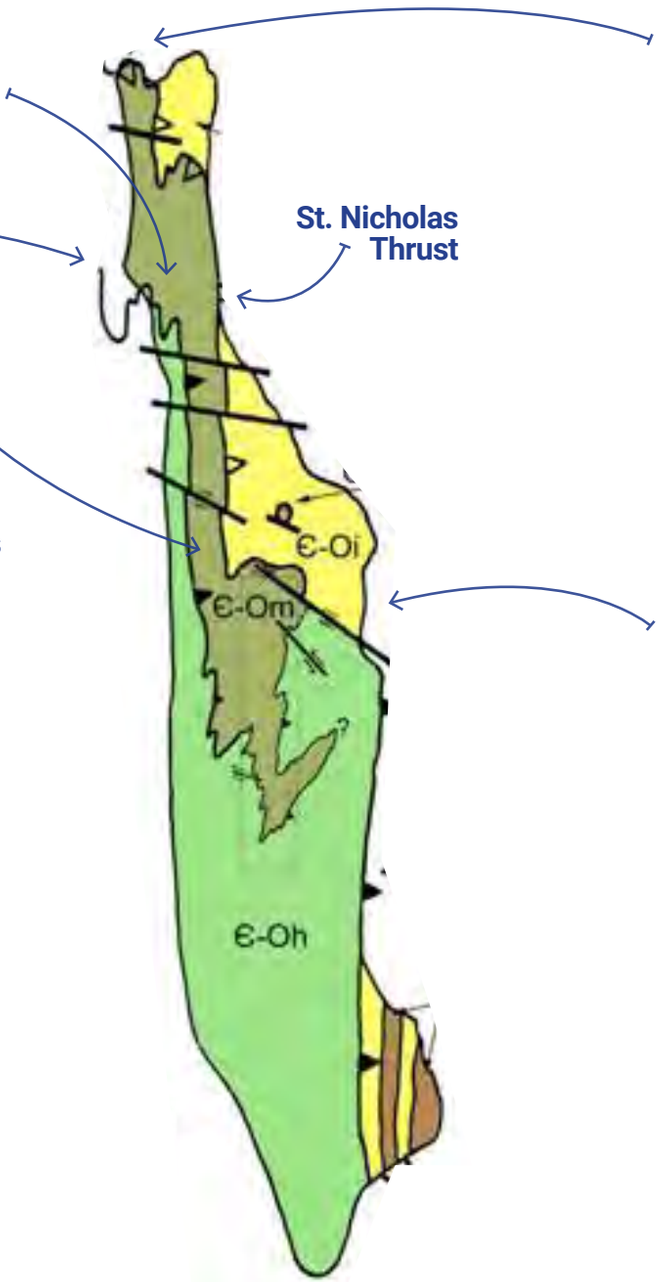
Geology of Manhattan

Pinehurst Avenue and West 183rd Street in Bennett Park, is the highest natural elevation in Manhattan at 265 ft

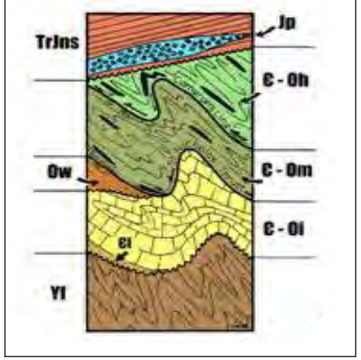
Cameron's Line

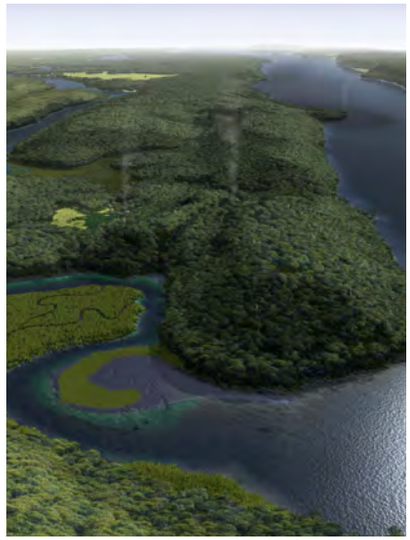
Running along 125th Street, through layers of schist, lies Manhattan's fault line. In 2001, it experienced a magnitude-2.4 tremor.

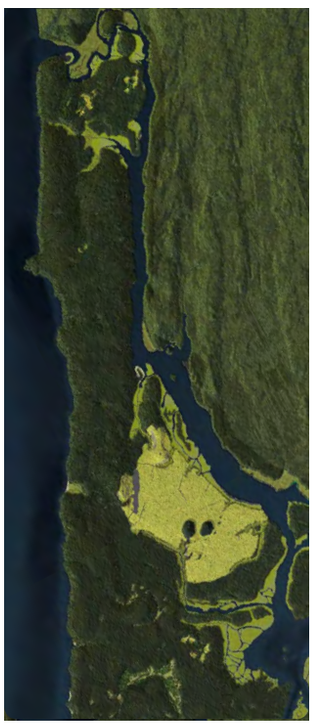
Schist is a medium-grade metamorphic rock with medium to large, flat, sheet-like grains. It has a consistency that presents challenges for water absorption and green infrastructure.



Є-Oh = Hartland Schist
Є-Om = Manhattan Schist
Ow = Walloomsac Schist
Є-Oi = Inwood Marble
Yf = Fordham Gneiss







Images of Manhattan before it was developed by European settlers. It was then known by indigenous peoples as Mannahatta, which means the land of many hills. In the images it is apparent that areas like East Harlem (above), Inwood (top), and West Harlem, are at low elevations and contain sensitive coastal environments. More at https://welikia.org.

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”

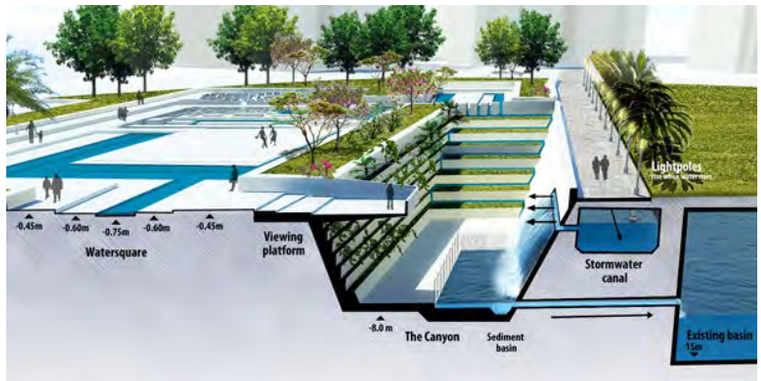
This public space is composed of three basins. During dry days they serve as a basketball court, skate park, and performance arts podium. On the rainy days, via stainless steel gutters, the square (basins) absorbs the rain water from the atmosphere as well as the rain water from roofs from the nearby 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.

Case Study: Swale NYC

New York City may have a limited amount of space on land for food production but the waters around the city are not limited in such a way. One project that is utilizing water to create “food forests” is the Swale project.

Swale has created a floating food forest on a floating barge that can be stationed or move anywhere around NYC’s coastline. This installation presents a model to exponentially increase the amount of food we produce and to do so in a way that is resilient the impacts of climate change. Barges can also provide some measure of coastal protection from flooding and storm surges.

According to Swale, these “Food forests are a way to diversify plant life through supportive planting; each plant building, supporting, and sustaining the next, each plant an important part of its created ecosystem. Food forests build soil fertility by intercropping, this locks carbon into the soil. Fertilizers aren’t necessary, which also reduces the need for fossil fuels.

Swale has been designed and tested in partnership with nautical engineers, landscape architects, gardeners, artists, educators, students, and the US Coast Guard. After a one year planning and building period, Swale is functioning as a floating island and is open to the public. The project seeks to end the city’s dependence on large-scale food supply chains with little accountability, to one that strives for community interdependence.

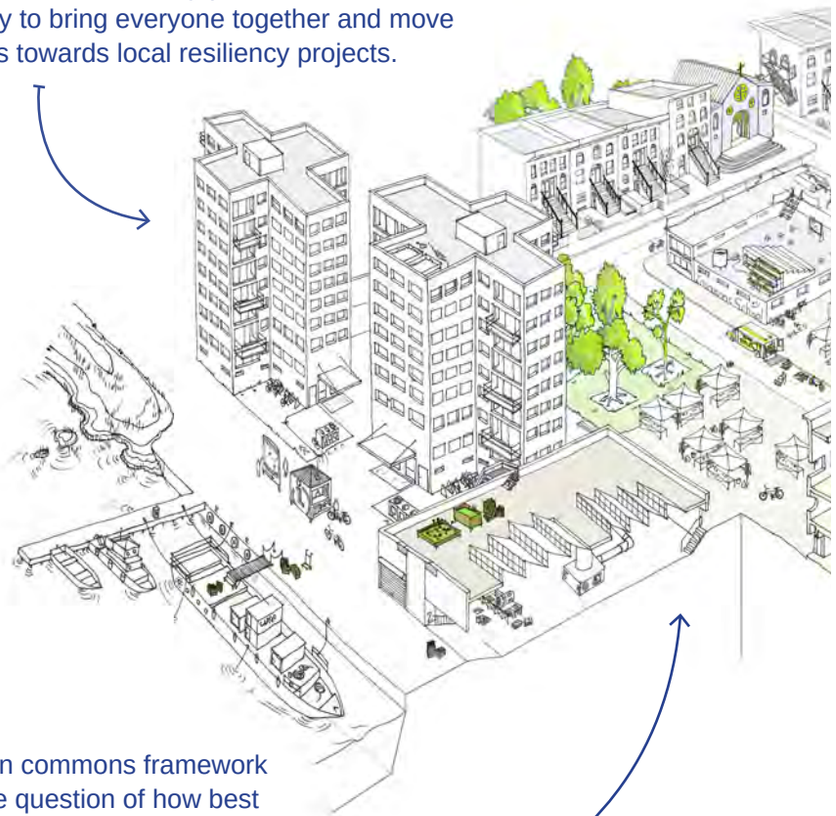
Utilizing the waterfront with floating architecture can create new sources of production, whether for food, housing, manufacturing, or something else. Swale is a model of how we can add to the city’s capacity without adding existing strain to our systems of transportation, energy, or waste.

More at: http://swaleny.org/

The Swale floating “food forest” docked at Brooklyn Bridge Park.

3G Governance

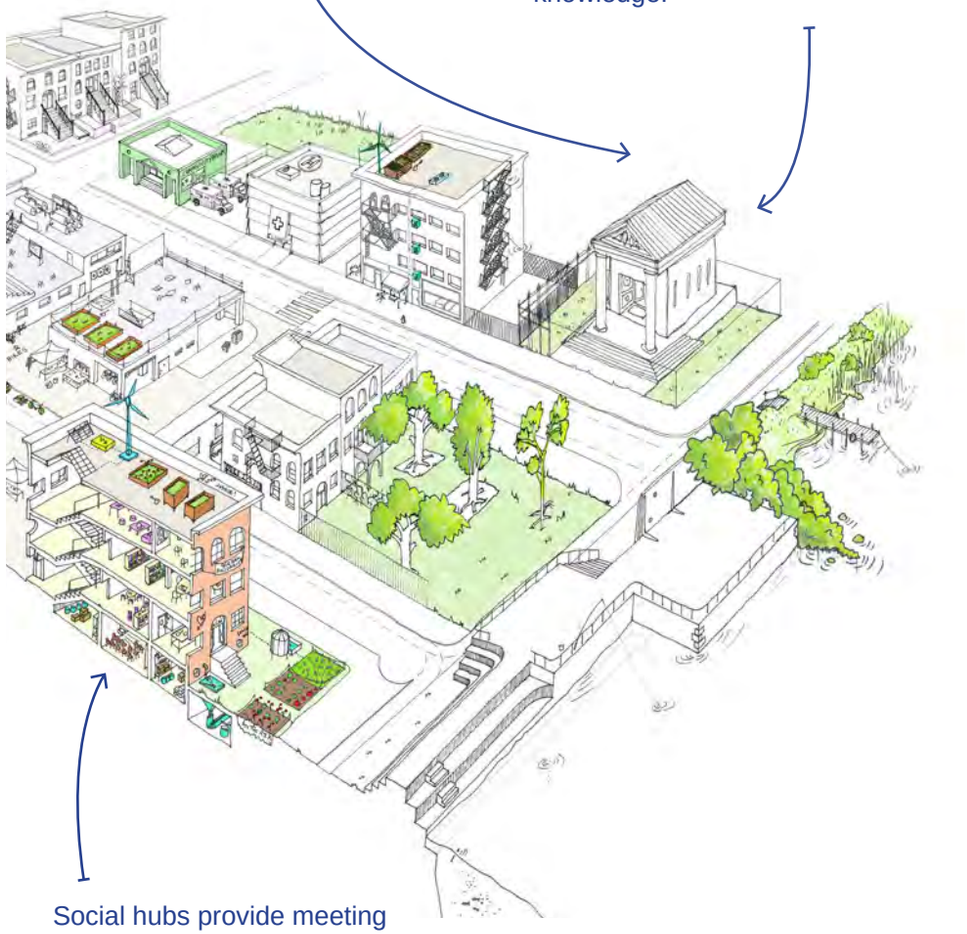
Tenant associations, coop boards, and similar networks can play a big role in resilience in terms of organizing for energy democracy, emergency preparedness, green infrastructure, and other resilience measures. They possess the information and ability to bring everyone together and move resources towards local resiliency projects.



The urban commons framework raises the question of how best to produce and consume shared resources like energy, land, and water. Collaborative governance strategies ensure that resource allocation is not only based on who has power but that resources are made available to everyone.

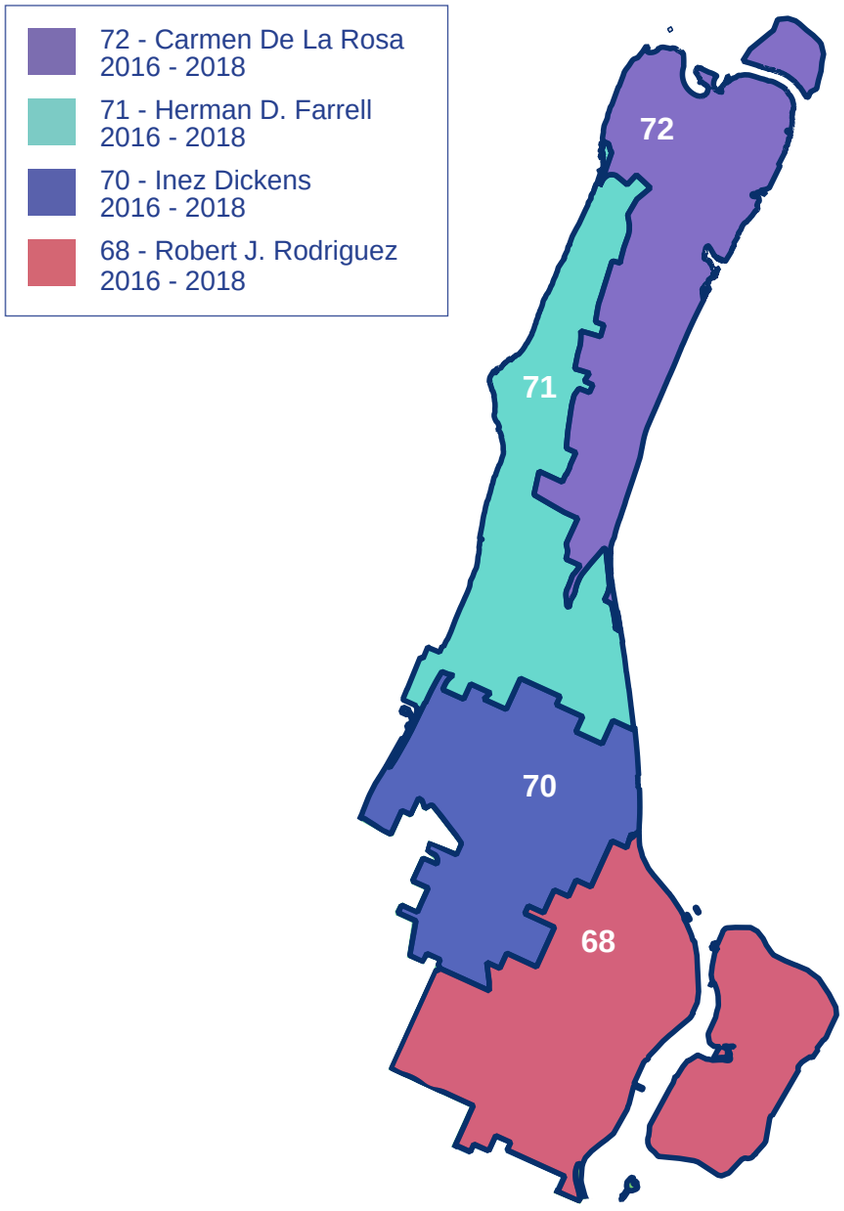
The climate change era requires decision-making authority by local communities to guide capital and other investments. This power can help community reinvestment and smart planning decisions.

Other cities have used a process of neighborhood assemblies for more inclusive governance. They provide a venue for open discussion with a process for decision-making that is collectively determined and values local knowledge.

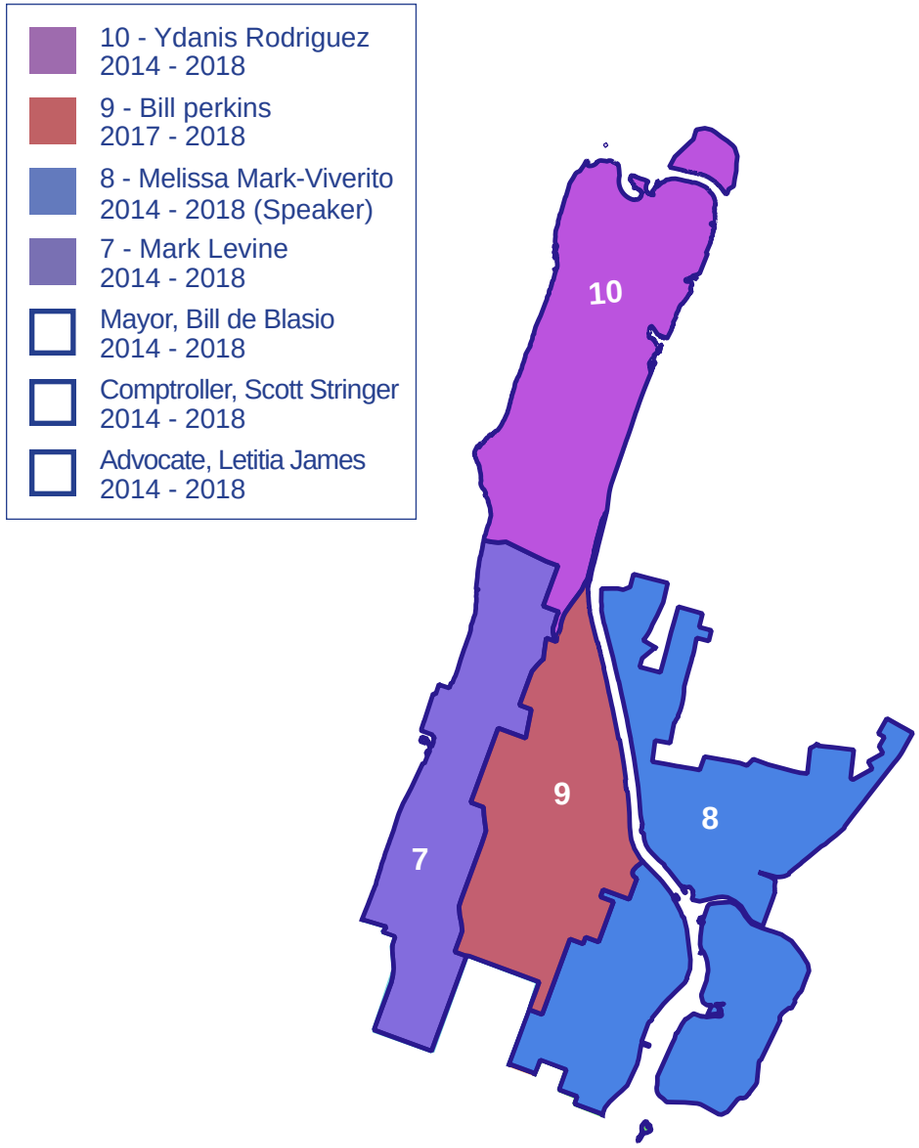


Social hubs provide meeting space, educational programs, access to tools for direct action, and other resources for advocacy campaigns.

NY State Assembly Districts

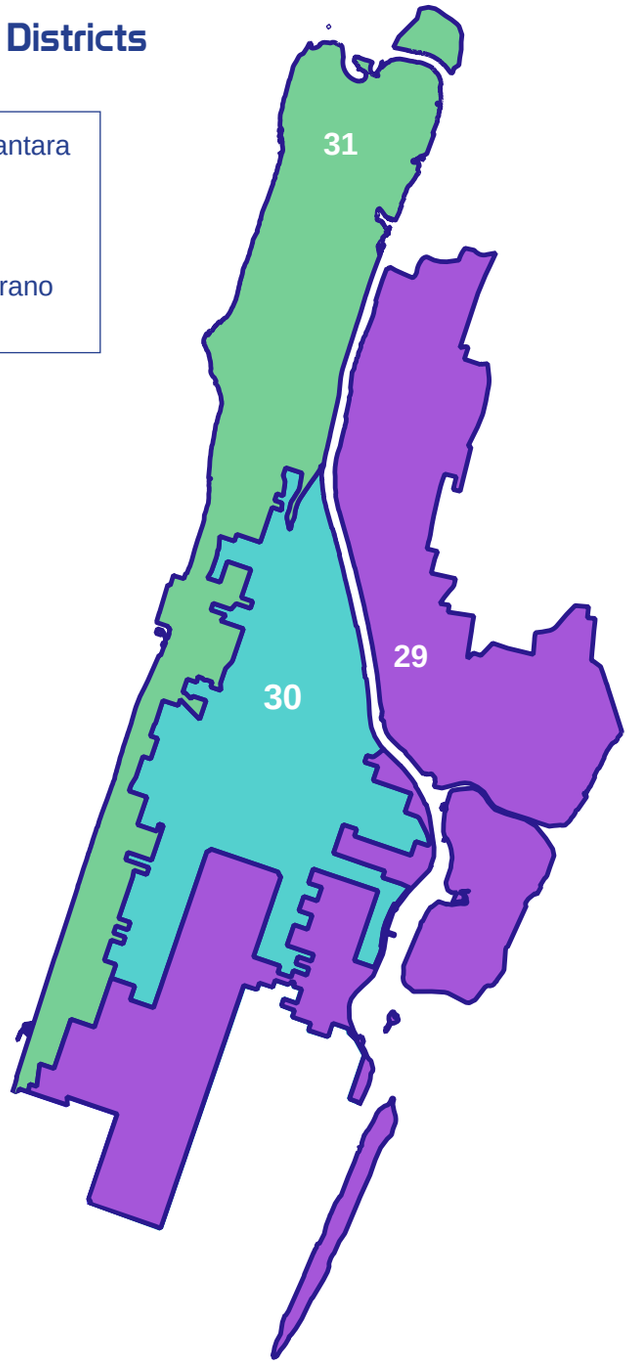


NY City Council Districts



NY State Senate Districts

- 31 - Marisol Alcantara 2017 - 2019
- 30 - Bill Perkins 2017 - 2019
- 29 - Jose M. Serrano 2017 - 2019

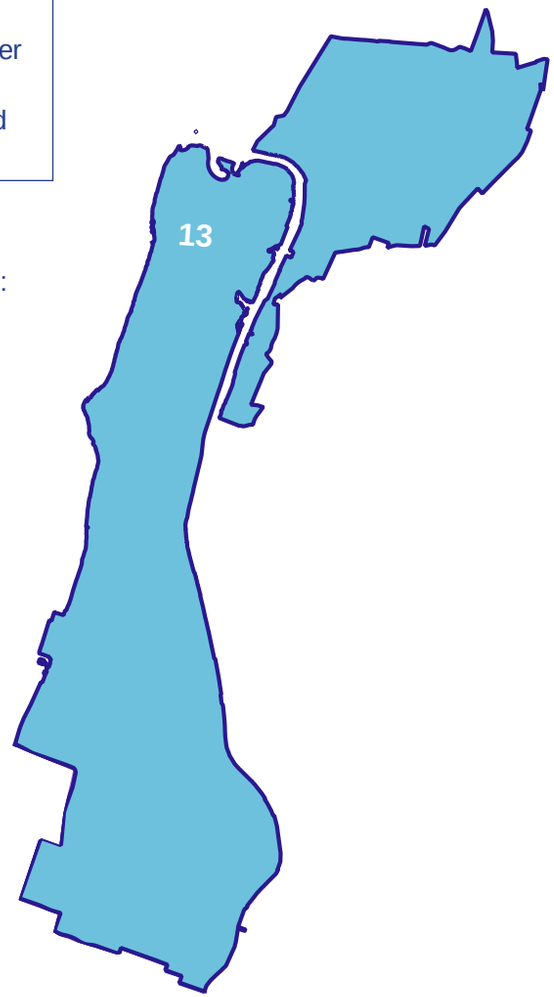


Congressional District

- 13 - Rep. Adriano Espaillat 2017 - 2019
- Senator Charles Schumer 2017 - 2023
- Senator Kirstin Gillibrand 2015 - 2021

Registered voters as of 2016:

Total: 357,113
Democrat: 282,108
Republican: 17,978
Other: 57,027



Participatory Budgeting

The NY City Council website describes participatory budgeting (PB) as "a democratic process in which community members directly decide how to spend part of a public budget."

Between September and April of a fiscal year, city councilors representing 25 districts work with their residents to spend $1 million of their district budget – for a total of approximately $25 million. In Upper Manhattan the only district that does not offer PB is 10, although that is subject to change with upcoming elections. The amount dedicated to participatory budgeting only represents .00035% of the city's total budget for fiscal year 2014. The total City budget for that year was $70,000,000,000.

The amount of money spent in the PB process falls far short of the resources we need to invest in climate related infrastructure and services, but PB is significant because it represents model for becoming climate resilient in a democratic fashion. Climate resilience planning is perfect for PB because of the local knowledge it requires and because of the co-benefits of climate change projects.

The City of Paris allocates the most money for the PB process, a total of 65 million Euros (roughly 70 million U.S. Dollars) this year. Between 2014 and 2020 the city will have allocated a total of 500 million Euros to projects chosen by the public. The city also uses an online vote with physical ballot boxes for traditional voting. During the last online vote the city received over 41,000 votes – 60% of which came through the Internet. The votes selected 9 of 15 projects put forward for a vote.

Participatory budgeting project fair in NYC, 2015.

The PB process in NYC includes the following steps:

1. Neighborhood Assemblies: September - October
2. Delegate Orientations: November
3. Delegate Meetings: November - February
4. Project Expos: February-March
5. Community Vote: March-April
6. Implementation & Monitoring: April and onwards

The NMCA calls for PB to be used for projects generated during community planning processes. NMCA working group members are specifically advocating for PB to be used for emergency preparedness projects including the EPIK kiosk (see section 3B), emergency communications equipment for at risk buildings, and distributed energy generation equipment for affordable housing and important community spaces.

Other countries are applying the ethos of democratic participation to other forms of government. Iceland's Pirate Party, the country's prominent ruling party, have led an initiative to crowd source the country's constitution. The process features extensive in-person engagement with randomly selected citizens and even more extensive engagement online with thousands of Icelanders using online tools like Facebook and Twitter. The final draft proposed reforms to the constitution that emphasized human rights, transparency, and environmental protection, among others. In Spain and other countries where there is political upheaval these methods are also being applied to empower citizen within their democracy.

Human Rights

Copwatch

A network of people that observe and document police activity while looking for signs of misconduct and police brutality. The goal is ensure accountability and reform in events where police committ harrasment, unlawful arrest, bodily harm, or other abuses of power. Copwatch member Ramsey Orta sparked a national debate on police brutality by filming the arrest and subsequent homicide of NYer Eric Garner. More at: justicecommittee.org

Encryption

Encryption enables the right to privacy by protecting communications from spying. It can help people share their opinion with others without reprisals, access information on the web and organize with others against injustice. This protection also enables the rights to freedom of expression, information and opinion, and also has an impact on the rights to freedom of peaceful assembly, association and other human rights. Source: www.eff.org

Direct Action

No social justice movement in history has been successful without the use of direct action. Many of the most successful actions against environmental polluters have been forms of direct action, most recently in NY against companies seeking approval for fracking. In terms of competing harms, it is our responsibility to take action to prevent severe climate change. More at: ruckus.org

Surveillance and Prosecution

Across the world activists are being surveilled and prosecuted for advocating to protect the environment. In 2016, Honduran activist Berta Cáceres was killed in her homeland of Honduras for organizing against environmentally destructive policies, including dam and mining projects. Cáceres organized a road blockade to prevent access to the dam sites. For over a year, the blockade withstood eviction attempts and violent attacks.

In the United States during the protests to stop the Dakota Access Pipeline's construction, the Federal Aviation Administration imposed a rare "temporary flight restriction," covering nearly 154 square miles of airspace above the pipeline resistance to stop drone documentation by activists.

Workers within government are also facing challenges from implementing policy on climate change. Staff at the US Department of Agriculture (USDA) have been told to avoid using the term climate change in their work, with the officials instructed to reference "weather extremes" instead. In Florida employees, contractors and volunteers, have been instructed not to use the terms "climate change" and "global warming" in official communications.

Case Study: Spain's Municipal Movement

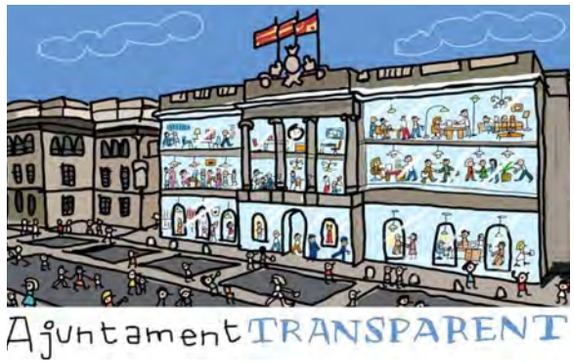
Beginning in 2014, a political movement known as Municipalism overtook Spain's largest cities, including Barcelona and Madrid. The movement is a reaction to decades of autocracy in the country that have contributed to the country's housing crisis and its high levels of inequality. The Municipal Movement is based on reforming government so it aligns with the needs of working class Spaniards and not the country's elite. They do this by changing policy to favor transparency, public participation, and by shifting public resources away from supporting commercial industries and towards preserving communities at risk of displacement.

In Barcelona, the new governing party, Barcelona en Comú, has crowdsourced its code of political ethics and presented a platform titled 'Governing by Obeying'. Its aim is to ensure the party "changes the rules of the game", rather than just perpetuating ineffective government. The code includes salary and term limits, as well as transparency commitments and measures to put an end to the revolving door between public office and industry. The Barcelona en Comú electoral program was drawn up by over 5000 people, with contributions made in open assemblies and online, and the strategic and political decisions of the platform are made by the 'plenary' assembly, held twice a month. The platform includes stopping the privatization of health services, tackling high utility bills, controlling mass tourism, creating a renewable energy system, and improving municipal democracy, with a portion of the city budget allocation decided directly by citizens. Preventing evictions is at the top of both Barcelona en Comú and the new governing party in Madrid's, Ahora Madrid, electoral lists. The Mayor of Barcelona, Ada Colau, is a founder of the Mortgage Victims' Platform (or PAH), one of Spain's strongest social movements, created in the wake of the economic crisis to resist a wave of housing evictions.

ahora MADRID

Barcelona En Comú

PODEMOS



Top: M15 protest held in Sol Plaza in Madrid. Middle: Tenants demanding housing reforms at a protest organized by PAH. Bottom: Campaign materials from Barcelona en Comu.

Case Study: Cooperation Jackson

Cooperation Jackson is building a cooperative network in Jackson, Mississippi that will consist of four interconnected and interdependent institutions: an emerging federation of local worker cooperatives, a developing cooperative incubator, a cooperative education and training center (the Lumumba Center for Economic Democracy and Development), and a cooperative bank or financial institution. Cooperation Jackson's basic theory of change is centered on the position that organizing and empowering the structurally under and unemployed sectors of the working class, particularly from Black and Latino communities, to build worker organized and owned cooperatives will be a catalyst for the democratization of our economy and society overall. Cooperation Jackson believes they can replace the current socio-economic system of exploitation, exclusion and the destruction of the environment with a proven democratic alternative. An alternative built on equity, cooperation, worker democracy, and environmental sustainability to provide meaningful living wage jobs, reduce racial inequities, and build community wealth.

Their goals are articulated in the Jackson-Kush Plan, which include the following:

- an institutional vehicle to promote broad public understanding of economic democracy, the foundations of solidarity economics and the principles of cooperatives and how cooperative and worker owned and self-managed enterprises work to benefit workers, their families and their communities.
- A institutional vehicle to educate and train working people in Jackson, Mississippi to successfully start, finance, own, democratically operate and self-manage a sustainable cooperative enterprise.
- A model that will encourage and enable workers in other cities and municipalities in Mississippi, the South and throughout the United States to implement their own initiatives to promote economic democracy, solidarity economics and cooperative development.
- Coop Jackson is now developing 3 cooperatives including Freedom Farms, an urban farming cooperative; Nubia's Place Café and Catering Cooperative; and, Mississippi Waste Alternative, a recycling and composting cooperative.

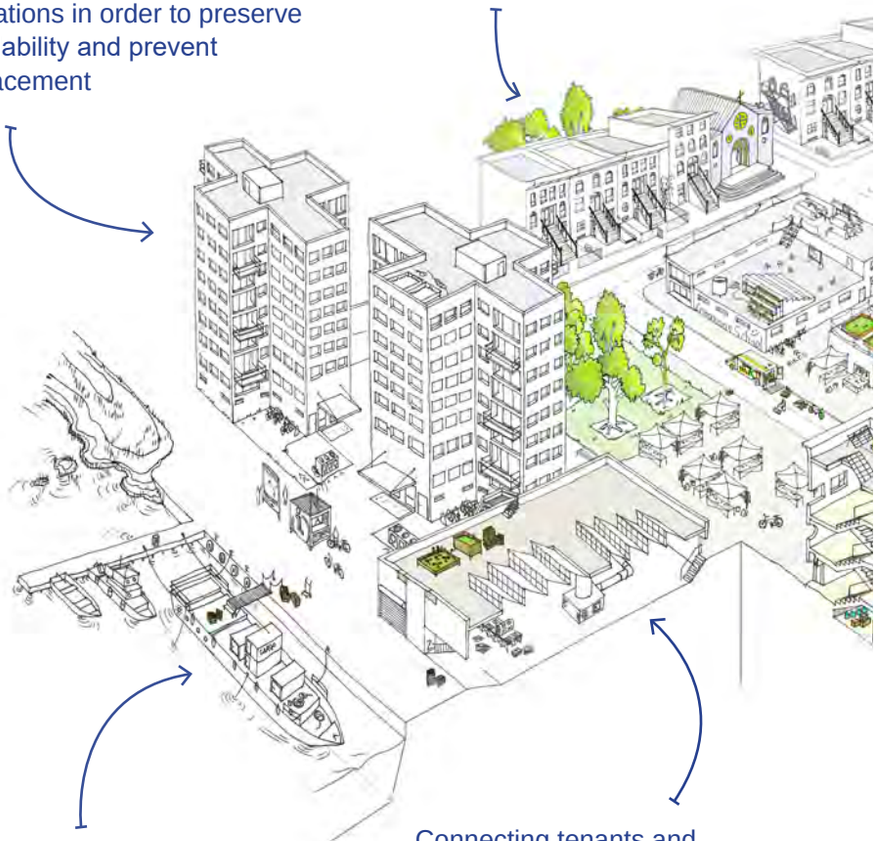
Source: cooperationjackson.org

Top: Lumumba Center in Jackson Mississippi
Middle: Chokwe Lumumba and members of Cooperation Jackson/CJA
Bottom: Logo of the Federation of Southern Cooperatives/Land Assistance Fund

3H Housing

Affordable housing in flood prone areas need infrastructure improvements and better enforcement of housing code regulations in order to preserve affordability and prevent displacement

Housing on elevated land is currently undervalued and will become more valuable as flooding becomes more frequent

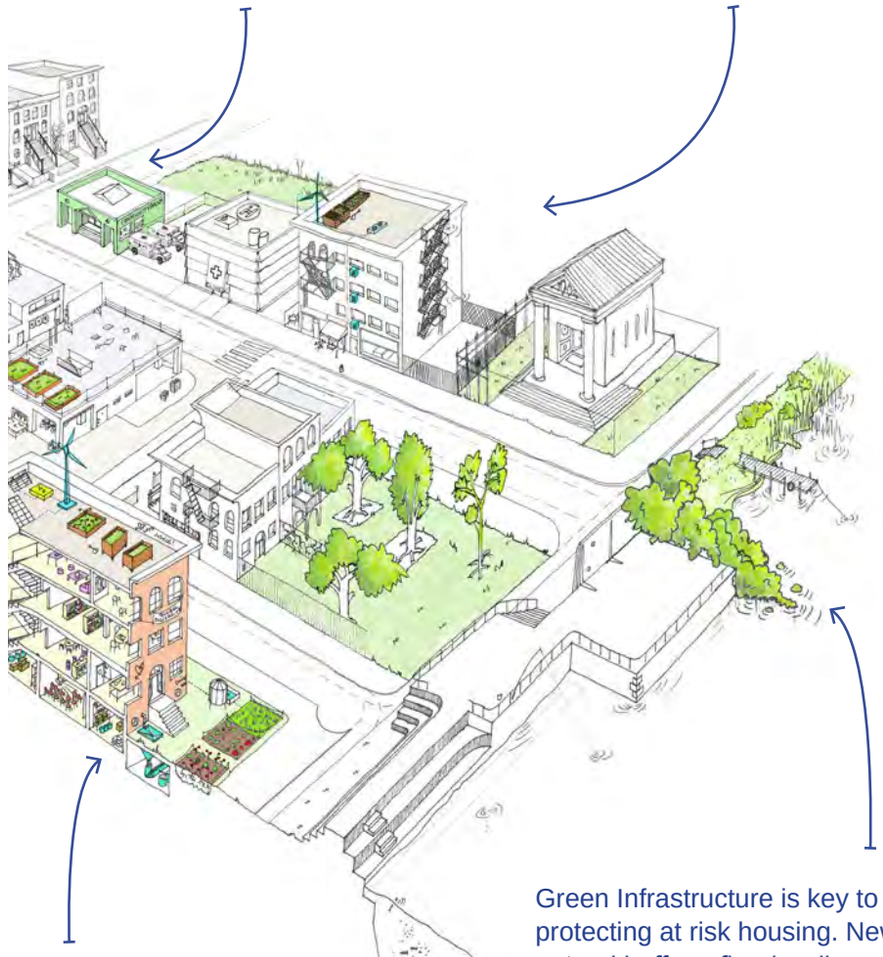


Housing that is connected to waterfront transportation can reduce CO2 emissions from fossil fuels, ease traffic congestion, and provide a quick evacuation route during a disaster

Connecting tenants and housing organizations with local educational programs and incubator spaces can help residents develop a local economy that provide sufficient revenue to deal with housing costs.

Community financial institutions can fund housing developments that will meet the community's standards of affordability, not the measure of affordability set by the federal government.

Private real estate developers and their partner financial institutions will seek to capitalize on climate change by charging more properties that have resilience measures in place.



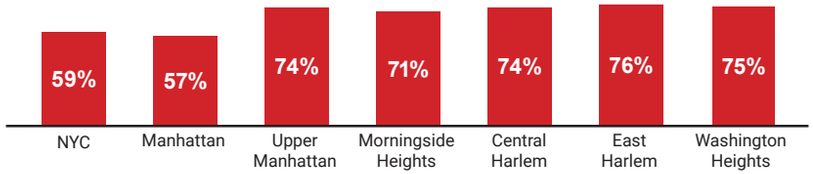
Social hubs can provide temporary shelter, access to information about housing resources, and networks that can organize to stop unfair housing policies and practices

Green Infrastructure is key to protecting at risk housing. New natural buffers, flood walls, and other measures can stop flooding, cool temperatures, absorb stormwater, and support natural ecosystems.

Housing Quality

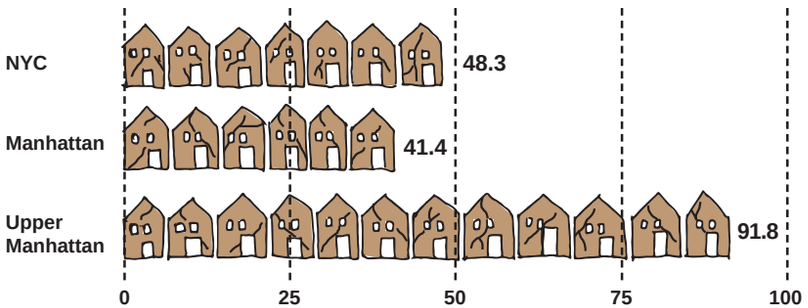
LOW HOUSING QUALITY

(percent of renter-occupied homes with at least one maintenance defect)



HOUSING CODE VIOLATIONS

(per 1,000 privately owned rental units)



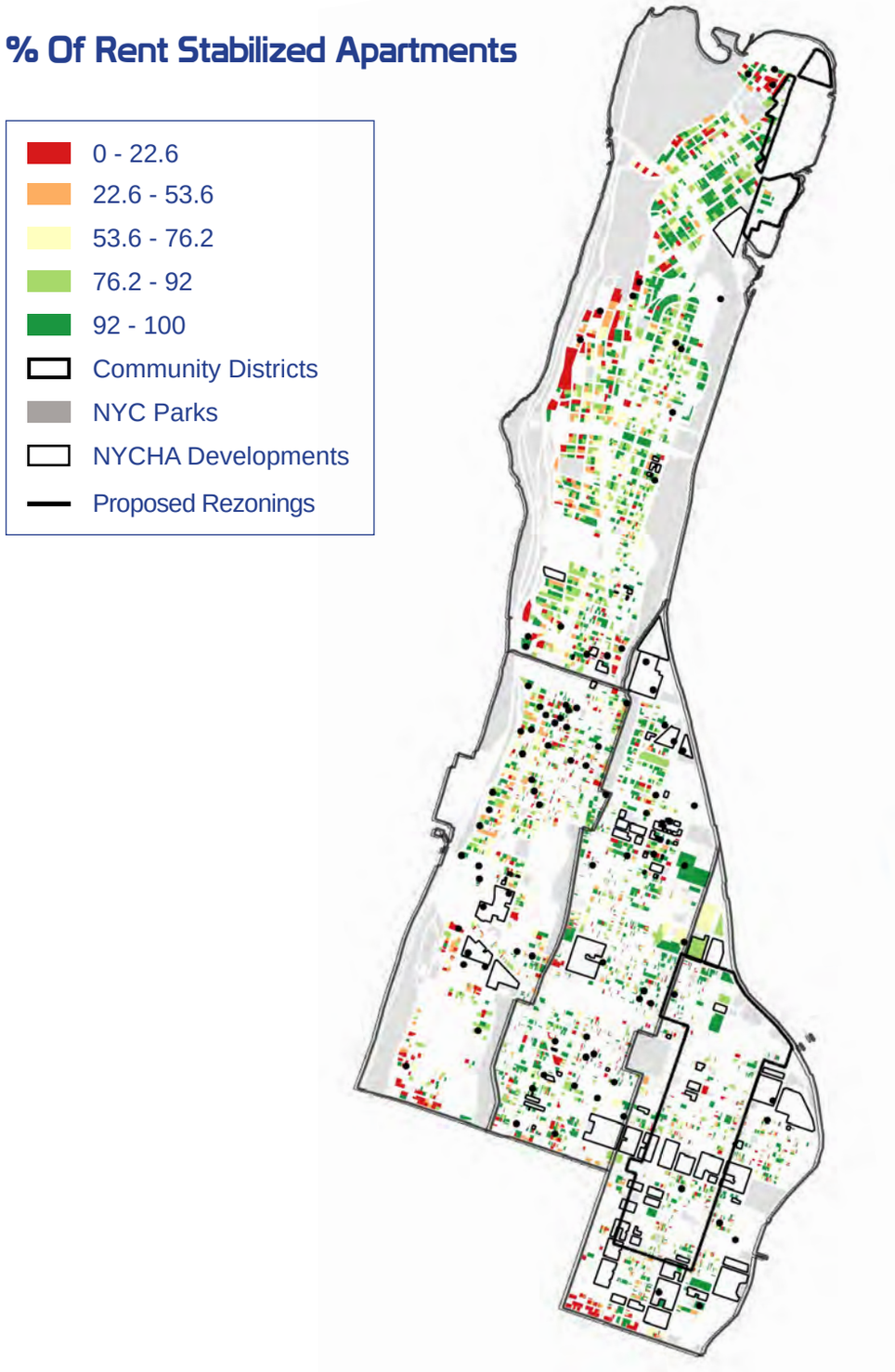
EAST HARLEM COULD LOSE 200 – 500 AFFORDABLE HOUSING UNITS EACH YEAR

IN A RECENT SURVEY OVER 38% OF MANHATTANITES SAID THE CITY WAS TOO EXPENSIVE FOR THEM TO LIVE HERE.

1/3RD OF THE HOUSING ADDED IN NYC FROM 2000 – 2010 WERE ADDED IN 15 GENTRIFYING AREAS WITH ONLY 26% OF THE CITY'S POPULATION

THERE ARE 1,200 HDFC BUILDINGS WITH OVER 30,000 UNITS IN THE CITY.

% Of Rent Stabilized Apartments



New York City Housing Authority (NYCHA)

NYCHA HAS 330 DEVELOPMENTS AND $18 BILLION DEFICIT FOR CAPITAL PROJECTS

Upper Manhattan has:

- **54 NYCHA COMPLEXES**
- **336 BUILDINGS**
- **30,000 APTS / 65,000 RESIDENTS**
- **12,460,592 SQ FT OF BUILDINGS**
- **2 ACRES OF OPEN SPACE**
- **AVG RENT OF $433 PER MONTH**

$3 BILLION IN FEDERAL FUNDING FOR SANDY PROJECTS HAS BEEN ALLOCATED TO 33 NYCHA COMPLEXES. 3 IN UPPER MANHATTAN ARE ISAACS, RANGEL, AND METRO NORTH HOUSING COMPLEXES.

WORK BEING DONE INCLUDES:

* Roof replacement
* Repair and restoration of doors, frames & hardware of common areas damaged by flooding
* Replacement of underground conduits & site lighting
* Restoration of playground surface areas and play structures
* Site Restoration (sidewalks, asphalt resurfacing, fencing)
* Installation of stand-by generators to provide full back-up power
* New building to house boiler equipment
* New electrical annex
* Restoration of mechanical, electrical and plumbing systems
* Abate & restore building crawl spaces
* CCTV and Layered Access Systems
* Flood proofing of damaged areas

NYCHA IS WORKING THROUGH A BACKLOG OF 330,000 REPAIR REQUESTS

IN 2015 A PLUMBING JOB TOOK AN AVERAGE OF 49 DAYS TO FIX. A PAINT JOB TOOK 53 DAYS. A PLASTER JOB TOOK 63 DAYS.

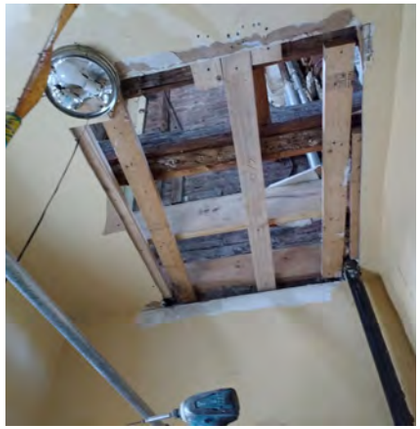
NYCHA IS LEASING GREEN SPACE FOR MARKET-RATE DEVLOPMENT. "INFILL" PROJECTS ARE HAPPENING AT WYCKOFF GARDEN, HOLMES TOWERS, MANHATTANVILLE, AND OTHERS. THE DEVELOPMENTS WILL INCLUDE SOME "AFFORDABLE" HOUSING AND REVENUE FOR NYCHA BUT NOT ENOUGH TO PREVENT DISPLACEMENT OF CERTAIN TENANTS.

NEW DEVELOPMENTS ON NYCHA PROPERTY ARE SUBJECT TO PROJECT LABOR AGREEMENT WITH THE BUILDING AND CONSTRUCTION TRADES COUNCIL (BCTC) OF GREATER NEW YORK – PROVIDING SOME ACCESS TO UNION MEMBERSHIP AND TRAINING.

Tenants Rights

Anti-Harassment

In NYC landlords are required to maintain the physical quality of housing according to Housing Maintenance Code, which the dept of Housing Preservation and Development (HPD) enforces. There are other state and national laws that carry severe penalties if landlords raise rents excessively, do construction that creates health hazards for tenants, or otherwise exploit their tenants financially or cause physical harm. More at: http://metcouncilonhousing.org/



Housing Court

Tenants can file an HP action against their landlord when the landlord will not make repairs or provide required services. The action asks the court to order the landlord to make repairs or provide services. An HP action can be filed by just one tenant or a group of tenants in a building and can be for individual dwelling units or in the public areas of a building. To file an HP action you must first send a letter by certified mail to the landlord listing the repairs and services you need. More at: http://cwtfhc.org/

Tenants Unions

Tenants unions are networks of tenants that span across buildings, usually within one neighborhood, that facilitate collective bargaining for rent reductions, building improvements, and other tenant needs. The Crown Heights Tenants Union, for examplke, includes over 40 buildings working to maintain affordability and stop gentrification.

GOOD OLD LOWER EAST SIDE GOLES
Keeping People in their Homes + Community

CHTU CROWN HEIGHTS TENANT UNION

Building Tenant Power in Brooklyn and Beyond! Flatbush Tenant Coalition

Right to the City

The right to the city is a philosophy that states the residents of a city have the right to make and remake the city after their own image. This is in contrast to current systems where non-representative governmental institutions and private companies have enourmas influence in how cities are developed and what services are provided, among other things. Moreover, the right to the city is a common rather than an individual right since this transformation inevitably depends upon the exercise of a collective power to reshape the processes of urbanization. In New York City many organizations, like the Young Lords (pictured right), Occupy Wall Street, Right to the City Alliance, and countless others have worked tirelessly to shape policy and create a process for this right to be exercised.

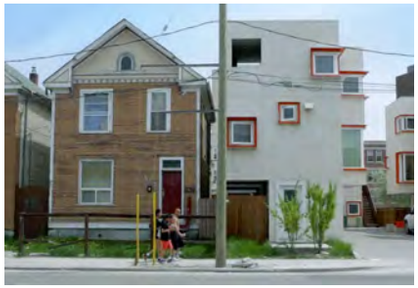
Squatters Rights

When a person takes “adverse possession” of a home, they obtain what are known as “squatter’s rights.” In the state of New York, a person has to live on the property openly and without permission of the owner for a period of at least 10 uninterrupted years to be able to claim “adverse possession.” In New York City, however, grants squatter’s rights after just 30 days. According to the law, after 30 the owner must go through the process of legal eviction to regain possession. More at: buildium.com

Social Housing Developments

Permanent Affordability

Thousands of 'affordable' housing units in NY that exist or that will be developed will become market rate over the next few decades. Permanently affordable housing units are not developed based on investor speculation but are mandated to be below market for their entire duration.



Open Space and Recreation

Community land trusts and housing coops can support development of shared open space facilities. By collectivizing some housing resources like cooking and transportation facilities, additional space can be freed to create parks, gardens, and other open areas.

HDFC Co-ops

HDFC stands for Housing Development Finance Corporation. They are social purpose corporations (SPC) committed to the conservation of affordable housing. HDFCs are legal entities that own or more residential buildings. They are membership based with membership granted a share purchase in the cooperative. Each shareholder is granted the right to occupy one unit. Co-ops allow members to pool their resources so that their buying power is leveraged, thus lowering the cost per member in all the services and products associated with home ownership, including building solar energy and other resilience measures. There are 3,000 HDFC coops in NYC.

Community Garden

Given that cooperatives emphasize providing services for all of their members and the shared use of space, they comport well with community gardens that rely on similar features. Coops may already have member information and access to space, which are two key steps to building and managing a garden.

Childcare

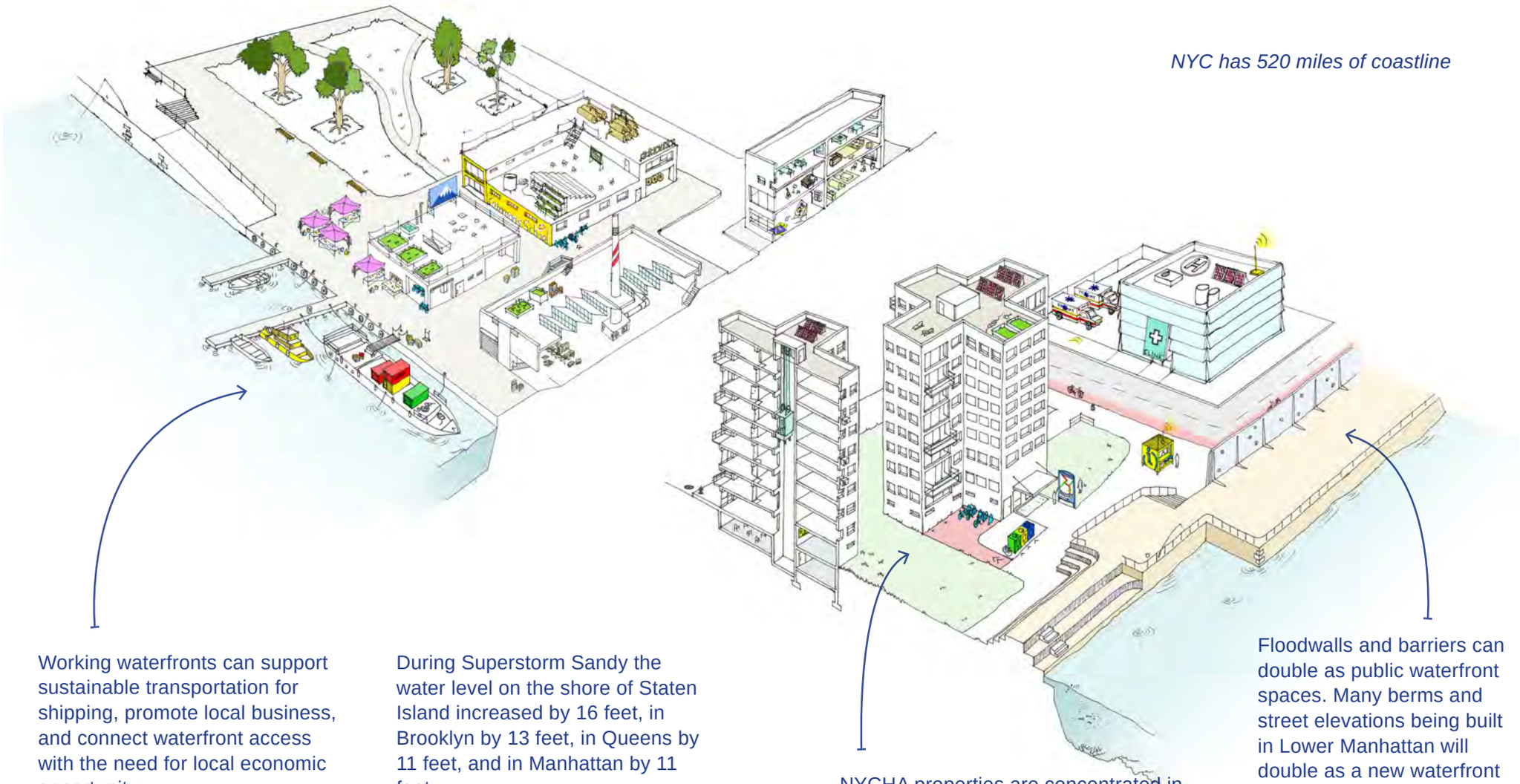
Many social housing developments have childcare included within their building. Childcare services are provided under existing healthcare provisions or can be procured separately by members that want to pool their resources for shared childcare. Shared spaces in the building, like a nursery or community center, can also be used.

Accessible Transportation

Sharing bicycles, cars, and other modes of transport has become a popular model allowing city-dwellers to forgo the large upfront capital costs of owning a vehicle, while still giving them access to one when they need it most. Transportation cooperatives reduce the costs of car and bicycle ownership while allowing people who already own those resources to be compensated for sharing them with the larger community. When these systems are partnered with social housing developments they can significantly reduce the cost of living.

31 Waterfronts

NYC has 520 miles of coastline



Working waterfronts can support sustainable transportation for shipping, promote local business, and connect waterfront access with the need for local economic opportunity.

During Superstorm Sandy the water level on the shore of Staten Island increased by 16 feet, in Brooklyn by 13 feet, in Queens by 11 feet, and in Manhattan by 11 feet.

NYCHA properties are concentrated in waterfront areas. Being on the waterfront can cool the buildings, which suffer from the urban heat island, but their location makes them more susceptible to flooding and strong winds.

Floodwalls and barriers can double as public waterfront spaces. Many berms and street elevations being built in Lower Manhattan will double as a new waterfront esplanade.

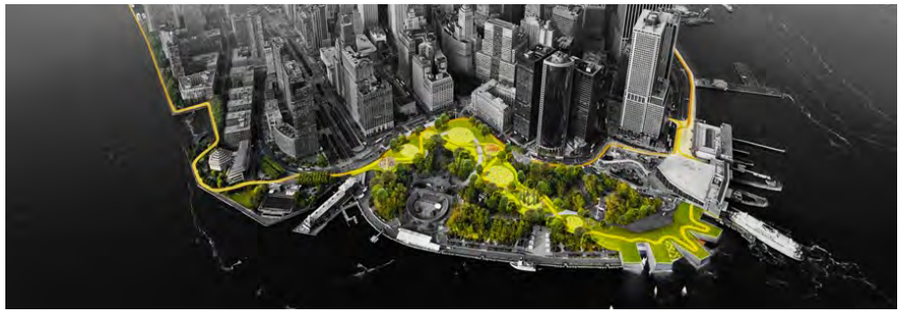
Coastal Protection

Waterfront Barriers

Hard infrastructure will have to be built along coastlines to protect from rising sea levels. This example of a waterfront park in Annapolis, Maryland, demonstrates how hard infrastructure can be multipurpose by also creating public space, exhibiting art, and supporting transportation.

Integrated Buffer Systems

The City government, with support from New York State and federal agencies, are spending billions on a range of micro and site specific flood damage solutions for Lower Manhattan and other areas hard hit by Sandy. Some of the solutions are permanent with others being deployed during storms. They include raising streets, making buildings more resilient, improving drainage and pumping facilities, raising streets along the waterfront, and deploying temporary flood walls when necessary.



Aquatic Ecosystems

Coastal ecosystems, including those underwater, can create a buffer to storm surges. Creating oyster beds, mussels, and eelgrass tidal marshes, for example, attenuates waves and cleans millions of gallons of harbor water by harnessing the biotic filtration process. These projects can also stimulate biodiversity and help revise NY's marine economy.

Natural Buffers

Wetlands can serve as buffer areas to protect against storm surge by being a transitional zone between dry lands and areas dominated by rivers or estuaries. When natural buffers are eroded, as was the case in New Orleans before Hurricane Katrina, urban areas feel the full brunt of a hurricane's winds and storm surge.

Floating Architecture

With floating architecture, local coastlines become an asset in the face of climate change instead of a vulnerability. Buildings that have flotation systems, or buildings that are considered "permanently moored" and not usable in navigation, can serve as a barrier to coastal flooding, while also providing critical resources like housing, urban farms, open areas, industrial facilities, and more. Floating buildings are usually towed into location by another ship.

Water as a Human Right

Water Pollution

Water pollution is the contamination of water lakes, rivers, oceans, aquifers and groundwater. This form of environmental degradation is at risk of increasing due to several pipeline projects within North America, increased coastal development, and the global nature of waste management. The combination of increased pollution and the move to privatized forms of infrastructure makes the future very dangerous for communities living off the land and/or dependent on public services for water. Flint, Michigan, pictured middle-right opposite page is an example.

Collective Management

Water can be sustainably managed as a common resource where it provides sufficiently for communities and is preserved for future generations. Common resources are managed by ensuring that those that are dependent on resources can participate fairly in its management. This means ensuring the rule-making rights of community members are respected by outside authorities, using a peer system for monitoring resource consumption, having methods of accountability for group members, and building responsibility for governing common resources from the community to the state level. More at: onthecommons.org

Privatization

When private corporations buy or operate public water utilities and/ or natural water resources, leaving communities with higher rates and lower water quality, among other things. Many believe the privatization of water is a violation of water as a human right. One source claims that globally 909 million consumers of water were served by “private players” in 2011, up from 681 million people in 2007. For the typical household, privately owned water utility service costs 59% more than public water service. And investor owned utilities charge 63% more for sewer service than public utilities. In Flint, Michigan, where the water was found to have high levels of lead, the municipality changed water supplies for local residents to a polluted source to save costs, while still providing private business with higher qaulity water. More at: foodandwaterwatch.org

Water Protectors

Activists around North America, known as Water Protectors, have been engaging in direct action to prevent the privatization of water and extraction of fossil fuels where water is at risk of being polluted. This includes protesting pipeline construction and drilling. Water protectors also promote alternative forms of governance and design for the conservation and equitable distribution of water. Such direct action to protect ater will be more important in the future as climate change adds stress to water supplies by contributing to droughts and otherwise damaging ecosystems. More at: nodapl.life

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

Case Study: Venice Flood Management

Venice, Italy, for obvious reasons, has one of the most advanced flood management systems in the world. The nuisance flooding they deal with regularly will become more common place around the world as sea levels rise.

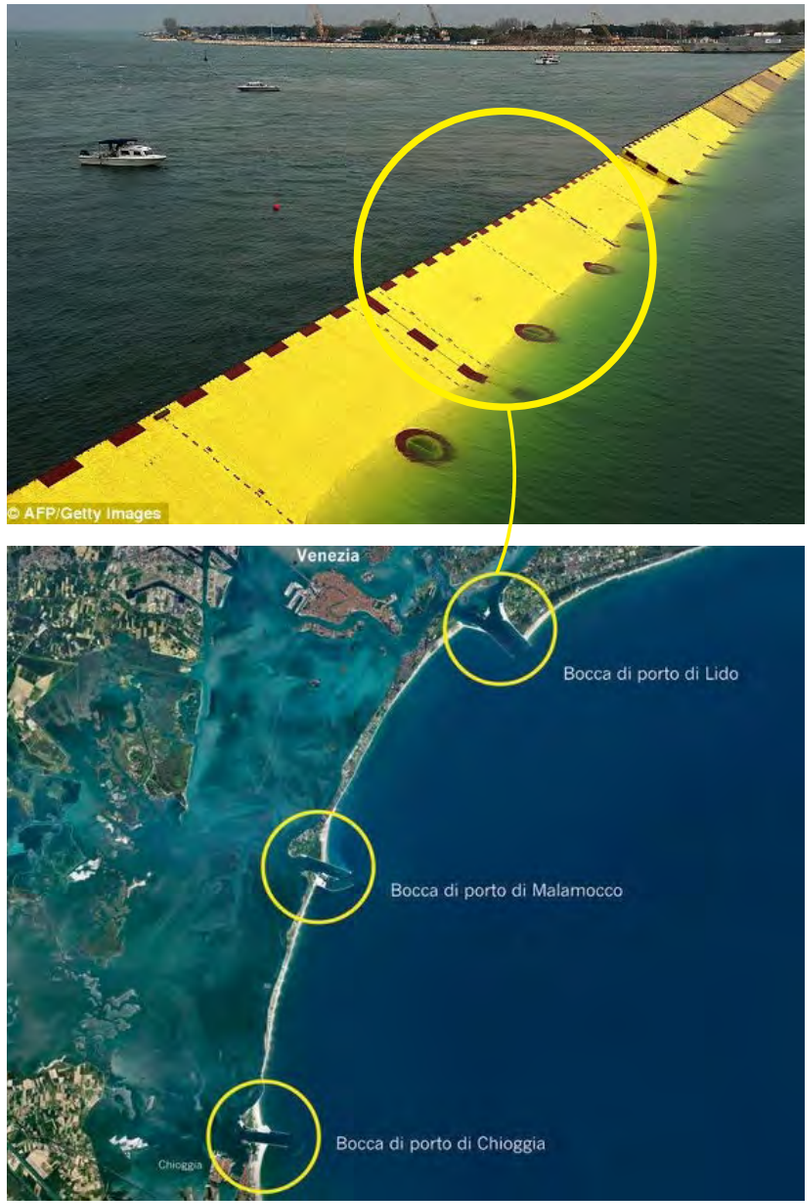
Flooding in Venice, known as Acqua alta, occurs regularly during the winter months. “For anyone who is not Venetian, it is always amazing to see how residents in the city take the phenomenon of the high tides and exceptional water levels in their stride,” says Paolo Canestrelli, director of the city’s tide monitoring and forecast center. Measures in place to protect against flooding include sirens that warn the city when a high tide is forecast; information is provided in real time via the web and mobile telephones; temporary elevated platforms are set up in the parts of the city with heavier pedestrian traffic, while some public water transport lines are diverted to all-weather routes.

A more significant flood measure the city is taking is known as MOSE (Modulo Sperimentale Elettromeccanico, Experimental Electromechanical Module). It is a large moveable floodwall off of the coast. It is an integrated system consisting of rows of mobile gates installed at the Lido, Malamocco and Chioggia inlets that are able to temporarily isolate the Venetian Lagoon from the Adriatic Sea during high tides. Together with other measures such as coastal reinforcement, the raising of quaysides, and the paving and improvement of the lagoon, MOSE is designed to protect Venice and the lagoon from tides of up to 3 meters (9.8 ft).

Construction began in 2003 at all three lagoon inlets. As of June 2013, more than 85% of the project has been completed. The project has:

* 1 mile of mobile barriers
* 78 gates
* One lock for large shipping
* Three small locks to allow the transit of smaller vessels
* There are 156 hinges
* 30 minutes is required to raise the gates

The project is estimated to cost $5.5 billion, up $1.5 billion from initial cost projections. It should be fully operational in 2018. For more information visit mosevenezia.eu.



MOSE flood walls under construction to protect Venice, Italy from high tide flooding and rising sea levels.

4. Reference Information

A. Glossary

Alternating Current (AC) - mA current that flows alternately in one direction and then in the reverse direction. In North America, the standard for alternating current is 60 complete cycles each second. Such electricity is said to have a frequency of 60 hertz. Alternating current is used in power systems because it can be transmitted and distributed more economically than direct current.

Anthropocene - Is a proposed epoch dating from when human activities started to have a significant global impact on Earth's geology and ecosystems. The Anthropocence concept thus includes, but also transcends, the idea of anthropogenic climate change.

Anthropogenic Climate Change - A change or disturbance in the climate caused by humans

Base Load - The minimum continuous load over a given period of time. Base load generating stations operate essentially at full output whenever possible.

Capacity - In the electric power industry, capacity has two meanings: 1. System Capacity: The maximum power capability of a system. For example, a utility system might have a rated capacity of 5000 megawatts, or might sell 50 megawatts of capacity. 2. Equipment Capacity: The maximum power capability of piece of equipment. For example, a generating unit might have a rated capacity of 50 megawatts.

Capital Project - A Capital Project is a project that helps maintain or improve a City asset, often called infrastructure. To be included in the Capital Budget, a project must meet ONE of the following requirements (criteria): It is a new construction, expansion, renovation, or replacement project for an existing facility or facilities.

Carbon Footprint - The amount of carbon dioxide and other carbon compounds emitted due to the consumption of fossil fuels by a particular person, group, etc.

Climate Change Adaptation - A process of adapting of ecosystem to the new circumstances caused by the climate changes and implementing activities for limiting the future effects

Climate Change Mitigation - Process of reducing the impact of the climate change (in focus – limiting the level of green gas emissions) by various tools such as installing new eco friendly technologies, raising awareness among citizens for rational use of energy or via green urban planning.

Climate Justice - Recognition of climate change's disproportionate impacts on historically marginalized communities, who benefit the least from fossil fuels consumption both locally and around the world. Climate justice work aims to level these impacts and foster comprehensive solutions outlined by affected groups.

Climate Resilience - A constant process of recognizing and highlighting the implications of the climate change over the biodiversity, adapting to the new circumstances and providing/ implementing activities for mitigation of the climate change.

Cogeneration - The simultaneous production of power and thermal energy. Such systems have great potential in industry, where a significant requirement for electricity is coupled with a large demand for process steam

Community Solar - A solar–electric system which is shared by several members of a respective community, installed on a collective residential building.

Combined Sewer Overflow - In periods of rainfall or snowmelt, total wastewater flows can exceed the capacity of the sewer collection systems and/or treatment facilities. When this occurs, the combined sewer system is designed to overflow directly to nearby streams, lakes, and harbors, discharging untreated sewage and stormwater.

Combined Heat and Power - Trigeneration or combined cooling, heat and power(CCHP) refers to the simultaneous generation of electricity and useful heating and cooling from the combustion of a fuel or a solar heat collector. Cogeneration is a thermodynamically efficient use of fuel.

Common Resource - a resource, such as water or open land, that provides users with tangible benefits. A major concern with common resources is overuse, especially when there is discmination by powerful forces and land/people are exploited.

Community Choice Aggregation (CCA) - a system allowing municipalities to aggregate the buying power of individual customers to secure alternative energy supply contracts on a community-wide basis. CCAs now serve nearly 5% of Americans in over 1300 municipalities as of 2014.

Composting - A mixture of decayed or decaying organic matter used to fertilize soil. Compost is usually made by gathering plant material, such as leaves, grass clippings, and vegetable peels, into a pile or bin and letting it decompose as a result of the action of aerobic bacteria, fungi, and other organisms.

Consumer Cooperative - enterprises owned by consumers and managed democratically which aim at fulfilling the needs and aspirations of their members. They operate within the market system, independently of the state, as a form of mutual aid, oriented toward service rather than pecuniary profit. There are many types of consumers' cooperative. There are health care, insurance, and housing cooperatives as well as credit unions, agricultural and utility cooperatives. The major difference between consumers' cooperatives and other forms of business is that the purpose of a consumers' cooperative association is to provide quality goods and services at the lowest cost to the consumer/owners rather than to sell goods and services at the highest price above cost that the consumer is willing to pay.

Conference of Parties (COP) - Supreme decision-making body of the Convention on Climate Change which reviews the implementation of the Convention and takes decisions necessary to promote the effective implementation of the Convention, including institutional and administrative arrangements.

Demand Response (DR) - Demand Response is a resource for controlling electricity consumption at times of peak demand. Consumers reduce or shift their electricity usage during peak periods in response to price signals and financial incentives.

Democratic socialism - A political ideology that advocates political democracy alongside social ownership of the means of production, often with an emphasis on democratic management of enterprises within a socialist economic system.

Direct Current (DC) - Current that flows continuously in the same direction (as opposed to alternating current). The current supplied from a battery is direct current

Disaster Capitalism - The practice (by a government, regime, etc) of taking advantage of a major disaster to adopt liberal economic policies that the population would be less likely to accept under normal circumstances

Electrical Energy - The quantity of electricity delivered over a period of time. The commonly used unit of electrical energy is the kilowatt-hour (kWh).

Electrical Power - The rate of delivery of electrical energy and the most frequently used measure of capacity. The basic unit is the kilowatt (kW).

Electrical Cooperative - A cooperative owned by community members which distributes electricity to the respective community. In case the cooperative makes margin profit, the amount is reinvested for infrastructure maintenance or renovation; in some cases even dividenda is shared among the members.

Environmental Democracy - To give individuals and communities meaningful decision-making power over how this transition is carried out and how it affect us.

Environmental Resiliency - The ability of ecosystems to respond to periodic disruptions and adapt to gradual change.

Energy Efficiency (EE) **-** Energy efficiency, or efficient energy use, is a way of managing and restraining growth in energy consumption. Its goal is to reduce and/or maximize the amount of energy required to deliver services. managing and restraining the consumption of energy. It can be achieved by installing energy efficiency measures such as outer wall insulation or by using energy efficient home appliances labeled with “energy star”.

Energy Poverty - Lack of meeting the daily basic needs such as cooking, heating or/and personal hygiene as a result to limited access to energy. It also stands for phenomena in which people as a result of sufficient income, use dirty or polluting fuels.

Environmental Justice - Recognition of the increased likelihood for low-income communities of color to live with greater environmental risks than other communities, especially in high-density urban contexts. Environmental justice work engages these communities to define problems and solutions for flattening this disparity.

Evapotranspiration - The process by which water is transferred from the land to the atmosphere by evaporation from the soil and other surfaces and by transpiration from plants.

Floodplain - A flat area which is close to a river or other water stream and is under risked of being flooded during heavy rain falls.

Fossil Fuels - A natural fuel such as coal or gas, formed in the geological past from the remains of living organisms.

Food Sovereignty - Idea/mission which strives for people to have full engagement and control over the food production chain (planting, gardening, collecting and distributing) in order to promote and protect people’s right to healthy wood and healthy environment.

Gender Rights - The struggle for justice in the treatment of women and members of the LGBTQ community. This includes a more respectful discourse in our culture about gender roles and systems (i.e. patriarchy and matriarchy, among other things), and changes in how power is exercised in society from the family level to the highest levels of power.

Gentrification - The process of urban redevelopment that is implemented by partnerships between government and business, and that creates demographic changes by displacing low-income communities of color for the benefit of affluent communities that have more economic and political capital than the community they are displacing.

Gigawatt (GW) - One billion watts. (see Watt)

Green Economy - It is an economy does not cause any consequences to the environment and the nature, but at the same time is sustainable and produces growth and employment prospects.

Green Infrastructure - Process of preserving the ecosystems by increasing the amount and number of greenery in a respective area. Most usually, the green infrastructure is related to treating and managing storm water by installing environmental features, usually trees and plants. Green roof tops and reed beds are some of the examples for green infrastructure. They absorb the storm water and positively affect the capacity of the sewage collection system during heavy rain falls.

Grid - A network of electric power lines and connections.

HDFC Coops - It stands for Housing Development Fund Corporation cooperatives. This is NYC’s affordable housing measure by which renters or buyers receive tax breaks and subsidies under specific rules and conditions mainly focusing on their income and financial capability.

Hard Infrastructure - Hard infrastructure encompasses networks necessary for the functioning of a modern industrial nation. This article delineates both the fixed assets, and the control systems, software required to operate, manage and monitor the systems, as well as any accessory buildings, plants, or vehicles that are an essential part of the system. Also included are fleets of vehicles operating according to schedules such as public transit buses and garbage collection, as well as basic energy or communications facilities that are not usually part of a physical network, such as oil refineries, radio, and television broadcasting facilities.

Heatwave - A heat wave is a prolonged period of excessively hot weather, which may be accompanied by high humidity, especially in oceanic climate countries. While definitions vary, a heat wave is measured relative to the usual weather in the area and relative to normal temperatures for the season.

Hertz (Hz) - The unit of frequency for alternating current. Formerly called cycles per second. The standard frequency for power supply in North America is 60 Hz.

Hurricane evacuation zone - New York City’s hurricane contingency plans are based on six evacuation zones. Hurricane evacuation zones are areas of the city that may be inundated by storm surge or isolated by storm surge waters. There are six zones, ranked by the risk of storm surge impact, with Zone 1 being the most likely to flood. In the event of a hurricane or

tropical storm, residents in these zones may be ordered to evacuate.

Just Transition - a framework that has been developed by the trade union movement to encompass a range of social interventions needed to secure workers' jobs and livelihoods when economies are shifting to sustainable production, including avoiding climate change, protecting biodiversity, among other challenges.

Kilowatt hour (kWh) - The commercial unit of electric energy; 1000 watt hours. A kilowatt hour can best be visualized as the amount of electricity consumed by ten 100-watt light bulbs burning for an hour. One kilowatt hour is equal to 3.6 million joules.

Load - The total amount of electricity required to meet customer demand at any moment. The load equation fluctuates depending on electricity use throughout any given day.

Microgrids - Local energy sources which distribute energy. They are connected to the central grid, but can operate and distribute energy independently from it. Microgrids have own power resources, generations and loads and can be used as a back –up option in case of blackouts.

Neoliberalism - A policy model of social studies and economics that transfers control of economic factors to the private sector from the public sector. It takes from the basic principles of neoclassical economics, suggesting that governments must limit subsidies, make reforms to tax law in order to expand the tax base, reduce deficit spending, limit protectionism, and open markets up to trade. It also seeks to abolish fixed exchange rates, back deregulation, permit private property, and privatize businesses run by the state.

Net-metering - A system in which solar panels or other renewable energy generators are connected to a public-utility power grid and surplus power is transferred onto the grid, allowing customers to offset the cost of power drawn from the utility.

New York Independent System Operator (NYISO) - Operates competitive wholesale markets to manage the flow of electricity across New York—from the power producers who generate it to the local utilities that deliver it to residents and businesses.

Non-profit Industrial Complex - The non-profit industrial complex (or the NPIC) is a system of relationships between, the State (or local and federal governments), the owning classes, foundations, and non-profit/NGO social service & social justice organizations that results in the surveillance, control, derailment, and everyday management of political movements.

The prison industrial complex (PIC) - Is a term we use to describe the overlapping interests of government and industry that use surveillance, policing, and imprisonment as solutions to economic, social and political problems.

Renewable Energy - Energy from a source that is not depleted when used, such as wind or solar power.

Remote net-metering - Remote net metering rules allow for solar power to be installed anywhere and sold onto the grid in order to foster clean energy development.

Social Cohesion - The measure by which a society fosters social inclusion and mobility, and resists marginalization of any members. A society with strong social cohesion is collectively more capable of adapting to changing social and environmental conditions.

Social Housing - Social housing is affordable housing. A key function of social housing is to provide accommodation that is affordable to people on low incomes. Limits to rent increases set by law mean that rents are kept affordable.

Social Justice - Equal access to liberties, opportunities, and rights for all people in a society; protection and support for its members according to need; and celebration of diversity among its members

Social Movement - Social movements are a type of group action. They are large, sometimes informal, groupings of individuals or organizations which focus on specific political or social issues. They resist and/or carry out a social change based on a set of values and ideologies held within and across communities and seek to be revolutionary in outcome. Social movements have been ciritcal to many if not all contemporary instances of vast improvements in civil and human rights.

Soft Infrastructure - Refers to all the institutions which are required to maintain the economic, health, and cultural and social standards of a country, such as the financial system, the education system, the health care system, the system of government, and law enforcement, as well as emergency services Soft infrastructure includes both physical assets such as highly specialised buildings and equipment, as well as non-physical assets such as the body of rules and regulations governing the various systems, the financing of these systems, as well as the systems and organizations by which highly skilled and specialized professionals are trained, advance in their careers by acquiring experience, and are disciplined if required by professional associations.

Socio-economic inequality - Uneven distribution of resources and wealth among different groups in a society. This is tied to histories of mitigated access including redlining, discriminatory hiring practices, and unfairly written laws

Sustainable development - Economic development with concerns for equitable distribution of benefits among people both presently and intergenerationally.

Transmission - The process of transporting electric energy in bulk on high voltage lines from the generating facility to the local distribution company for delivery to retail customers.

Urban Heat Island - A metropolitan area which is way warmer compared to the rest of the areas in the city or to the rural regions. The local heat is produced due to the concentration of buildings, cars, streets and people as well as a result of lack of greenery.

Worker Cooperative - Worker-owned cooperatives are business enterprises that are owned and governed by their employees. All worker cooperatives have two common characteristics: 1) member-owners invest in and own the business together, and share the enterprise's profits, and 2) decision-making is democratic, with each member having one vote. Currently, there are over 300 worker-owned cooperatives in the U.S. operating in a diverse range of industries. While the majority are small businesses, with fewer than 50 workers, there are also notable larger enterprises.

100-year floodplain - The geographical area with a 1 percent or greater chance of flooding in any given year

500-year floodplain - The geographical area with a 0.2 percent chance of flooding in any given year

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26. Page 57 Middle: ecorenovator.org
27. Page 57 Bottom: Cameron Blaylock, Urban Omnibus
28. Page 58 Top: alamy.com
29. Page 58 Middle: radioalumbra.com
30. Page 58 Bottom: umc.org
31. Page 59 Top: express.co.uk
32. Page 59 Middle and bottom: dailyherald.com
33. Page 61 Top: Red Hook Initiative
34. Page 61 Middle-right: Red Hook Initiative
35. Page 61 Bottom: archpaper.com
36. Page 63 Top-right: New York Times
37. Page 63 Top-left: http://www.met.inf.cu
38. Page 63 Bottom: Florian Plaucheur, AFP. October 2, 2014
39. Page 70 Top: architosh.com
40. Page 70 Middle: homesbysuncrest.com
41. Page 70 Bottom: turas-cities.org
42. Page 71 Top: archdaily.com
43. Page 71 Middle: inhabitat.com
44. Page 71 Bottom: doggerel.arup.com
45. Page 73 Top: greenroofs.com
46. Page 73 Bottom: newatlas.com
47. Page 79: The New York Times
48. Page 81 Top: corbinhill-foodproject.org
49. Page 81 Bottom: corbinhill-foodproject.org
50. Page 83: bkrot.org
51. Page 87: Maydayspace.org
52. Page 89: Top and Bottom: The New York Times
53. Page 92: geocaching.com
54. Page 94: Top: youtube.com/channel/UC2198s23hKfoXAkMESYR4hw
55. Page 94: Middle-top: phillywatersheds.org
56. Page 94: Middle-bottom: nassauswcd.org
57. Page 94: Bottom: nassauswcd.org
58. Page 95: Top: usda.gov
59. Page 95: Middle-top: wri.cals.cornell.edu
60. Page 95: Middle-bottom: urbanomnibus.net
61. Page 95 Bottom: archdaily.com
62. Page 97 Top: c40.org
63. Page 97 Middle: rdcrotterdam.com
64. Page 97 Bottom: urbanisten.nl
65. Page 99: swaleny.org
66. Page 106: pbnyc.org
67. Page 108 Top: Ramsey Orta
68. Page 108 Bottom: peoplesworld.org
69. Page 109 Middle: thunderbirdamericanindiandancers.wordpress.com
70. Page 109 Bottom: malcolm-x.org
71. Page 111 Top: telesurtv.net
72. Page 111 Middle: cronica21.org
73. Page 111 Bottom: blog.democracyos.org
74. Page 113 Middle and bottom: cooperationjackson.org
75. Page 119 Top: NYDailynews.com
76. Page 120 Top: dnainfo.org
77. Page 120 Middle: wnyc.org
78. Page 121 Top: righttothecity.org
79. Page 121 Middle: bronxmuseum.org
80. Page 121 Bottom: takebacktheland.org
81. Page 122 Top: theguardian.com
82. Page 122 Middle: archdaily.com
83. Page 122 Bottom: openbuildings.com
84. Page 123 Top: blogs.usda.gov
85. Page 123 Middle-top: itdp.org
86. Page 123 Middle-bottom: mobilicities.com
87. Page 123 Bottom: 4allsentientbeings.files.wordpress.com
88. Page 125 Top: climate.gov
89. Page 125 Bottom: rebuildbydesign.org
90. Page 126 Top: wur.nl
91. Page 126 Middle: spxdaily.com
92. Page 126 Bottom: toledoblade.com
93. Page 128 Top and bottom: elcolombiano.com, CoastalCare.org
94. Page 128 Bottom: wmf.org
95. Page 129 Bottom: dailykos.com
96. Page 130: Aurash Khawarzad
97. Page 131 Top: enyacompetitions.org
98. Page 131 Middle: Pratt Institute
99. Page 131 Bottom: enyacompetitions.org
100. Page 132: unisdr.org
101. Page 133 Top: mosevenezia.eu
102. Page 133 Bottom: theguardian.com

D: Principles for Organizing

Principles of Environmental Justice

Delegates at the First National People of Color Environmental Leadership Summit held on October 24-27, 1991, in Washington DC, drafted and adopted these 17 principles of Environmental Justice.

WE, THE PEOPLE OF COLOR, gathered together at this multinational People of Color Environmental Leadership Summit, to begin to build a national and international movement of all peoples of color to fight the destruction and taking of our lands and communities, do hereby re-establish our spiritual interdependence to the sacredness of our Mother Earth; to respect and celebrate each of our cultures, languages and beliefs about the natural world and our roles in healing ourselves; to ensure environmental justice; to promote economic alternatives which would contribute to the development of environmentally safe livelihoods; and, to secure our political, economic and cultural liberation that has been denied for over 500 years of colonization and oppression, resulting in the poisoning of our communities and land and the genocide of our peoples, do affirm and adopt these Principles of Environmental Justice:

1) Environmental Justice affirms the sacredness of Mother Earth, ecological unity and the interdependence of all species, and the right to be free from ecological destruction.
2) Environmental Justice demands that public policy be based on mutual respect and justice for all peoples, free from any form of discrimination or bias.
3) Environmental Justice mandates the right to ethical, balanced and responsible uses of land and renewable resources in the interest of a sustainable planet for humans and other living things.
4) Environmental Justice calls for universal protection from nuclear testing, extraction, production and disposal of toxic/hazardous wastes and poisons and nuclear testing that threaten the fundamental right to clean air, land, water, and food.
5) Environmental Justice affirms the fundamental right to political, economic, cultural and environmental selfdetermination of all peoples.
6) Environmental Justice demands the cessation of the production of all toxins, hazardous wastes, and radioactive materials, and that all past and current producers be held strictly accountable to the people for detoxification and the containment at the point of production.
7) Environmental Justice demands the right to participate as equal partners at every level of decisionmaking, including needs assessment, planning, implementation, enforcement and evaluation.
8) Environmental Justice affirms the right of all workers to a safe and healthy work environment without being forced to choose between an unsafe livelihood and unemployment. It also affirms the right of those who work at home to be free from environmental hazards.
9) Environmental Justice protects the right of victims of environmental injustice to receive full compensation and reparations for damages as well as quality health care.
10) Environmental Justice considers governmental acts of environmental injustice a violation of international law, the Universal Declaration On Human Rights, and the United Nations Convention on Genocide.
11) Environmental Justice must recognize a special legal and natural relationship of Native Peoples to the U.S. government through treaties, agreements, compacts, and covenants affirming sovereignty and self-determination.
12) Environmental Justice affirms the need for urban and rural ecological policies to clean up and rebuild our
cities and rural areas in balance with nature, honoring the cultural integrity of all our communities, and provided fair access for all to the full range of resources.
13) Environmental Justice calls for the strict enforcement of principles of informed consent, and a halt to the testing of experimental reproductive and medical procedures and vaccinations on people of color.
14) Environmental Justice opposes the destructive operations of multi-national corporations.
15) Environmental Justice opposes military occupation, repression and exploitation of lands, peoples and cultures, and other life forms.
16) Environmental Justice calls for the education of present and future generations which emphasizes social and environmental issues, based on our experience and an appreciation of our diverse cultural perspectives.
17) Environmental Justice requires that we, as individuals, make personal and consumer choices to consume as little of Mother Earth's resources and to produce as little waste as possible; and make the conscious decision to challenge and reprioritize our lifestyles to ensure the health of the natural world for present and future generations.

Jemez Principles for Democratic Organizing

#1 Be Inclusive - If we hope to achieve just societies that include all people in decision-making and assure that all people have an equitable share of the wealth and the work of this world, then we must work to build that kind of inclusiveness into our own movement in order to develop alternative policies and institutions to the treaties policies under neoliberalism. This requires more than tokenism, it cannot be achieved without diversity at the planning table, in staffing, and in coordination. It may delay achievement of other important goals, it will require discussion, hard work, patience, and advance planning. It may involve conflict, but through this conflict, we can learn better ways of working together. It's about building alternative institutions, movement building, and not compromising out in order to be accepted into the anti-globalization club.

#2 Emphasis on Bottom-Up Organizing - To succeed, it is important to reach out into new constituencies, and to reach within all levels of leadership and membership base of the organizations that are alreadyinvolved in our networks. We must be continually building and strengthening a base which provides our credibility, ourstrategies, mobilizations, leadership development, and the energy for the work we must do daily.

#3 Let People Speak for Themselves
We must be sure that relevant voices of people directly affected are heard. Ways must be provided for spokespersons to represent and be responsible to the affected constituencies. It is important for organizations to clarify their roles, and who they represent, and to assure accountability within our structures.

#4 Work Together In Solidarity and Mutuality - Groups working on similar issues with compatible visions should consciously act in solidarity, mutuality and support each other's work. In the long run, a more significant step is to incorporate the goals and values of other groups with your own work, in order to build strong relationships. For instance, in the long run, it is more important that labor unions and community economic development projects include the issue of environmental sustainability in their own strategies, rather than just lending support to theenvironmental organizations. So communications, strategies and resource sharing is critical, to help us see our connections and build on these.

#5 Build Just Relationships Among Ourselves We need to treat each other with justice and respect, both on an individual and an organizational level, in this country and across borders. Defining and developing "just relationships" will be a process that won't happen overnight. It must include clarity about decision-making, sharing strategies, and resource distribution. There are clearly many skills necessary to succeed, and we need to determine the ways for those with different skills to coordinate and be accountable to one another.

#6 Commitment to Self-Transformation - As we change societies, we must change from operating on the mode of individualism to community-centeredness. We must "walk our talk." We must be the values that we say we're struggling for and we must be justice, be peace, be community.

E. Emergency Communications

Emergency Notification Systems

http://www.Accuweather.com/alerts
Provides free email forecast and severe weather alerts.

http://www.alertfm.com/
ALERT FM is an aggregator of State and Local emergency information with multiple contact paths for mass notification. Emergency information is delivered via the data subcarrier of existing FM radio stations, SMS (text) and email. This personal alert and messaging system allows emergency management officials to create and send digital alerts and messages to recipients such as first responders, school officials, businesses, and citizens based on geographic or organizational groupings. Such alerts and messages might include NOAA weather warnings, evacuation instructions, homeland security notices, Amber Alerts, or school closings.

http://anythingweatherstore.com/
AnythingWeather provides severe weather alerting services, via email or mobile phone, of severe thunderstorms, tornadoes, flash floods, lightning, winter storms, and even specific weather variables like extreme heat or cold or maximum wind gusts. Alerts are based on NWS issued watches and warnings etc..as well as Real-Time lightning notifications.

http://www.boatus.com/hurricanes/signup.asp
Receive Public Advisories from the National Hurricane Center as they are issued, PLUS detailed maps of the forecast track, wind bands and wind field for each named storm. Choose to receive alerts from one or more of 5 regions in the Atlantic or Gulf of Mexico.

http://www.callloop.com/
Call Loop makes it easy for schools, organizations, and local government agencies to send emergency alerts via mass text messages and audio voice broadcasts. Lets users sign up to receive local weather alerts and updates sent directly to their mobile phone. Weather Alerts - Just text in WEATHER to 38470. Source of data--NWS.

Deaf & Hard of Hearing Weather Radio Systems
http://weatherradios.com/special-needs
WeatherRadios.com focuses on weather radio products and specializes in weather alert accessories for deaf and hard-of-hearing individuals including wireless transmitters/ receivers, pillow vibrators and strobe lights.

http://www.DialMyCalls.com
DialMyCalls is a completely web-based system that sends emergency weather alerts via phone call, text message, and email. Weather data is pulled from the NWS & DialMyCalls is also is an integration partner with IPAWS/ FEMA warning system. Account can also be accessed from any computer with internet access. Also offers iPhone/Android apps as well as a toll-free number to dial into to send broadcasts in times where power may be out, or are on the road.

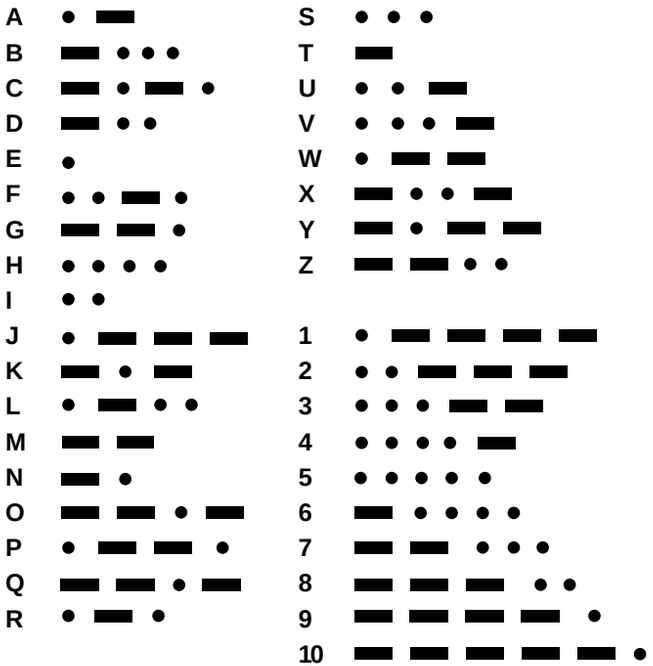
http://weather.noaa.gov/pub/fax/ftpmail.txt
This National Weather Service (NWS) FTPMAIL server is intended to allow Internet access for users who do not have direct access to the World Wide Web but who are equipped with an e-mail system. The service is free and no signup is required. Using FTPMAIL, users can request files from NWS and have them automatically e-mailed back to them. Note: This service does not provide automated alerts--user request is required to receive products.

http://www.saildocs.com/
Saildocs is an email-based document-retrieval system for the delivery of text-based Internet documents either on request or by subscription. Saildocs can deliver web pages (including text weather forecasts, and provides subscriptions for automatic delivery. Saildocs offers text-based document retrieval and subscription services for offshore sailors, adventurers, missionaries and others who must somehow live their lives without 56k-baud modems or DSL connections. There are currently two services offered, a document retrieval service which will return documents from the Internet or our own files, and a subscription service which will send Internet documents (for example weather reports) at scheduled intervals.

SMS Tsunami Warning - http://www.sms-tsunami-warning.com/
Free email and SMS alerts

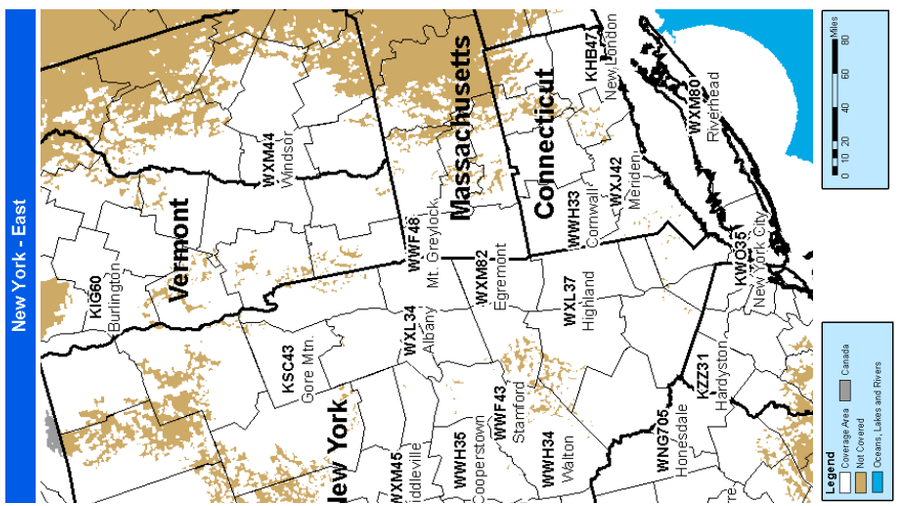
https://www.stormwaterforecast.com/
Stormwater Forecast - Site-specific forecasts for stormwater professionals. This service provides automated notification of US National Weather Service forecasts supporting rain event action plans, flow monitoring and stormwater sampling schedules, staffing decisions, construction management and asset protection. Automated email alerts are provided.

Morse Code and Phonetic Alphabet

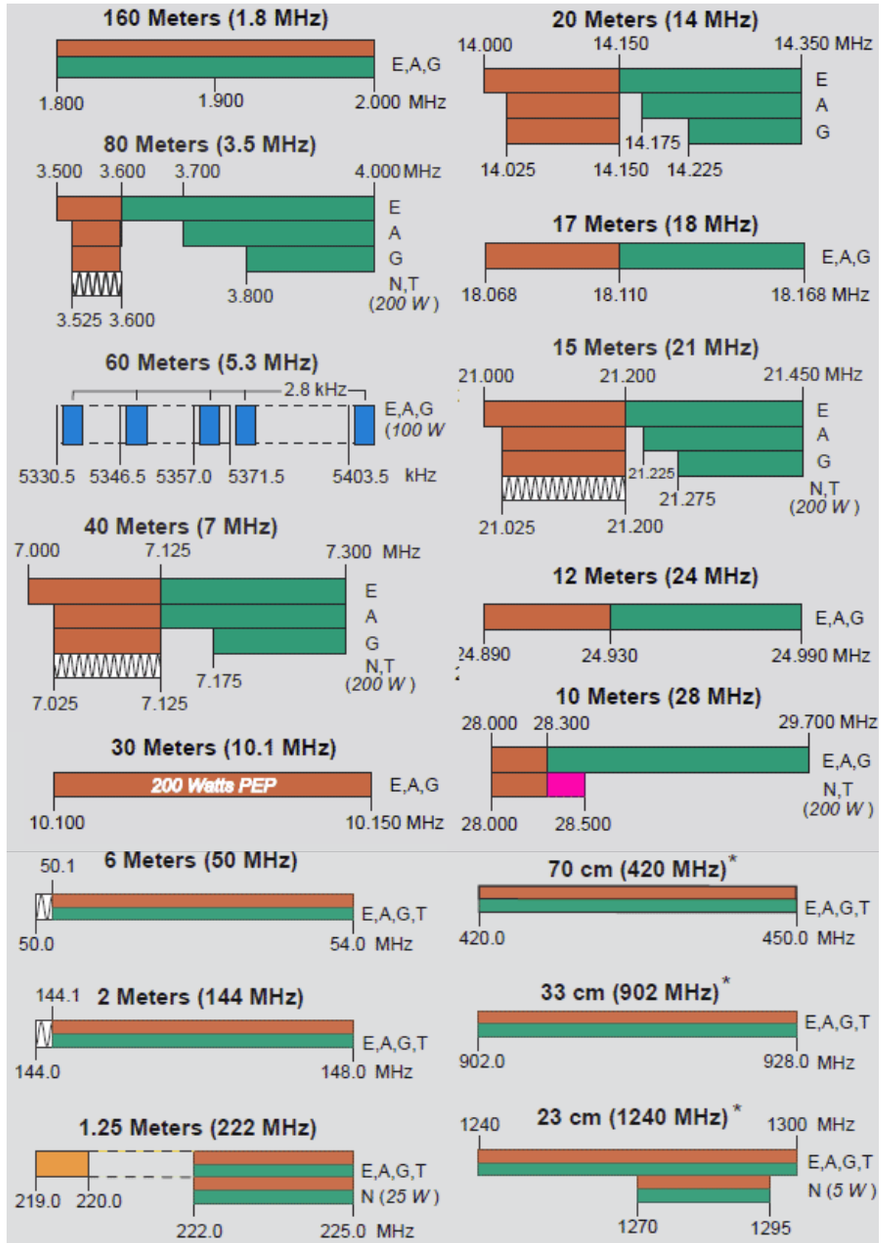


A - Alpha
B - Bravo
C - Charlie
D - Delta
E - Echo
F - Foxtrot
G - Golf
H - Hotel
I - India
J - Juliet
K - Kilo
L - Lima
M - Mike
N - November
O - Oscar
P - Papa
Q - Quebec
R - Romeo
S - Sierra
T - Tango
U - Uniform
V - Victor
W - Whiskey
X - X-ray
Y - Yankee
Z - Zulu

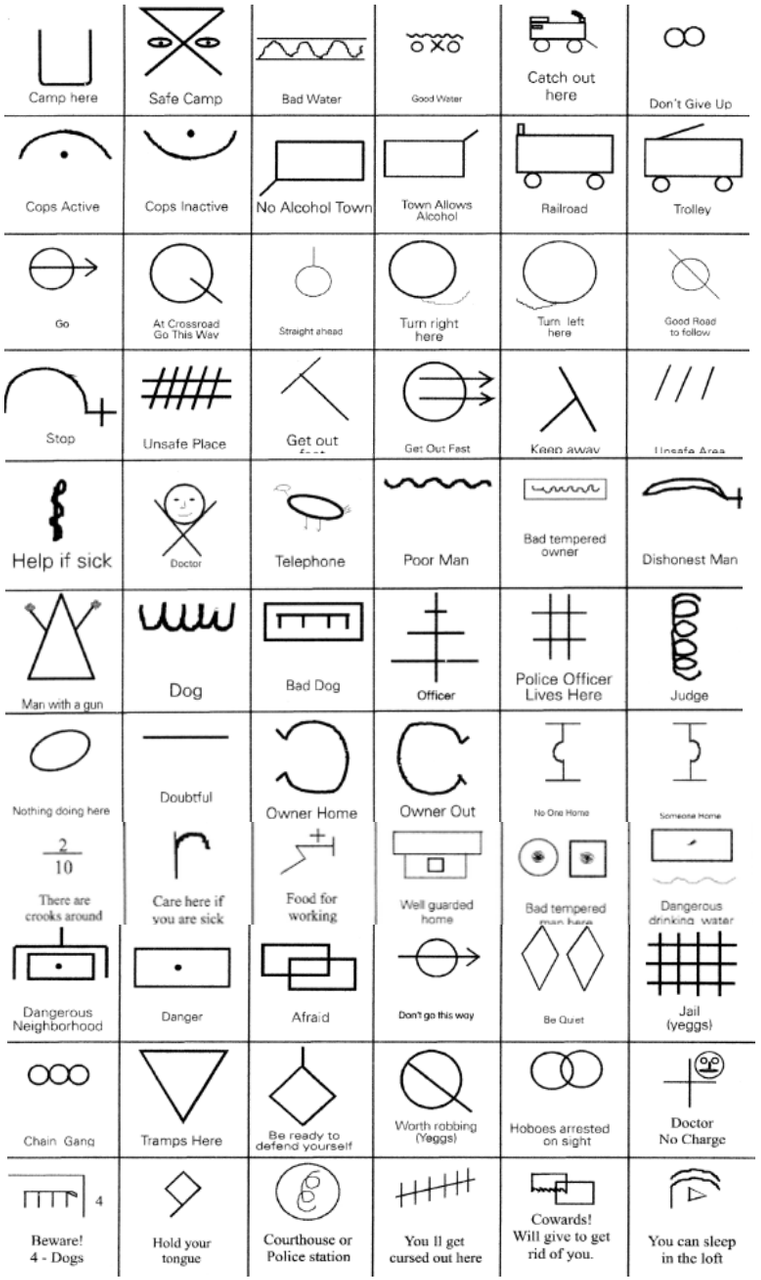
NOAA Emergency Radio Stations

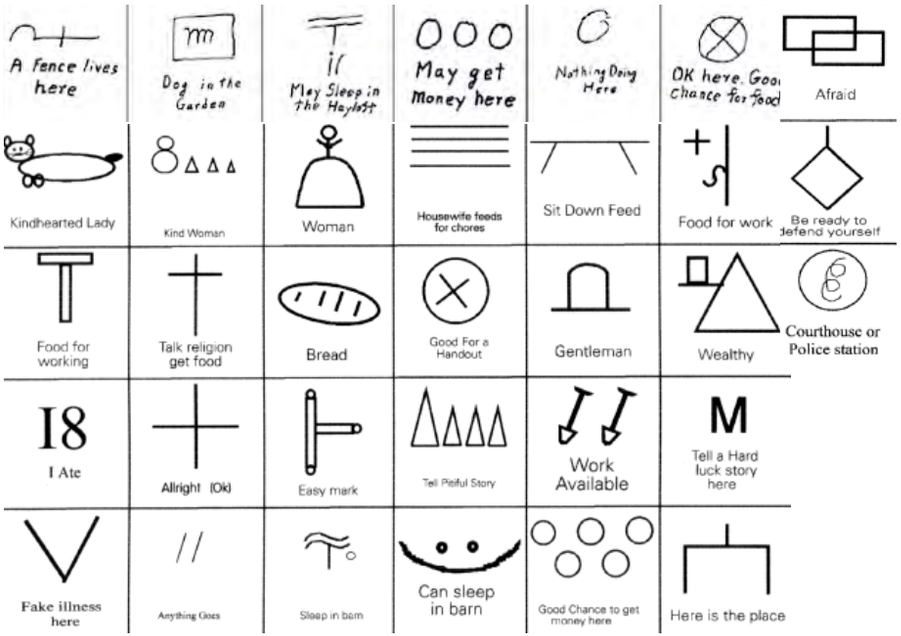


UF Bands, VHF, UHF Bands for Shortwave Radio

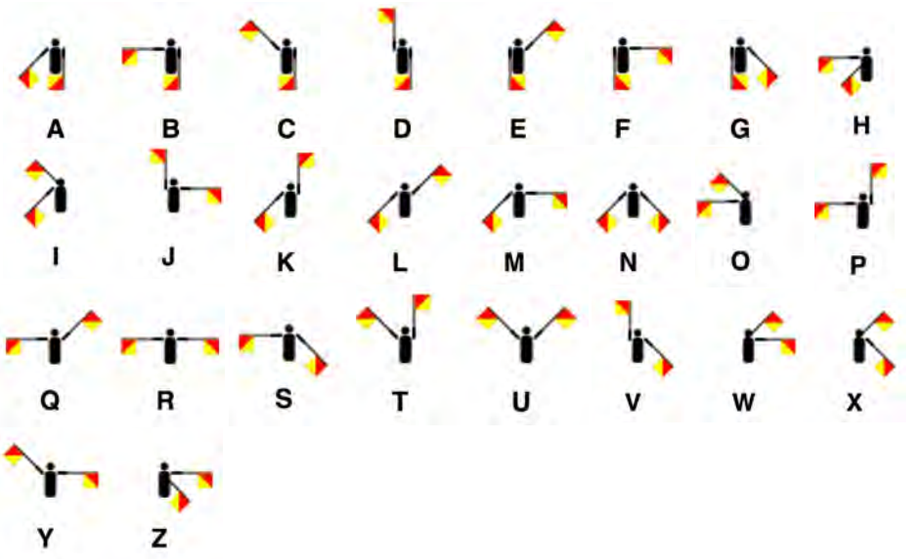


Hobo Symbols





Flag Semaphore



READY NEW YORK EMERGENCY REFERENCE CARD

Name:	1	2	3	4
Date of Birth:				
Work/School/Other Number:				
Mobile Number:				
Work/School/Other Address:				
Doctor's Name:				
Doctor's Phone Number:				
Prescriptions:				
Allergies/Special Medical Needs:				
Insurance Carrier/Policy Number:				

READY NEW YORK EMERGENCY REFERENCE CARD

Name:	1	2	3	4
Date of Birth:				
Work/School/Other Number:				
Mobile Number:				
Work/School/Other Address:				
Doctor's Name:				
Doctor's Phone Number:				
Prescriptions:				
Allergies/Special Medical Needs:				
Insurance Carrier/Policy Number:				

4F. Weather Forecasting

Reading Nature

Detect the direction of the wind. Wind is caused when air moves from a high pressure area to a low pressure area. Since weather moves in from the west, westerly winds indicate good weather because they suggest the bad weather is already to your east. Easterly winds suggest that the bad weather is coming toward you.

Watch smoke from a fire. The air pressure determines what direction the smoke will go. In high pressure, the smoke will go directly up into the air. If the pressure is low, it will spiral back down around the fire. If you see the smoke spiraling back down, bad weather is likely on the way. When smoke spirals downwards, it means that bad weather is very close. The low pressure system is already in place over your area.

Watch for calm conditions. Before a storm, the low pressure system can push out the area's normal wind patterns. This creates a temporary calm before the storm begins. You'll notice a lack of wind, which creates a stillness over the area. If you're near water, it will be calm and still, as well. This calm indicates a coming storm.

Check for humidity. High humidity often precedes a storm, so watch for signs of high humidity, such as frizzy hair, curling leaves, and swollen wood. These signs can tell you that a storm is on the way. Pine cones can also tell you if it's humid because they will stay closed if the humidity is high but will open if the air is dry.

If you're near the ocean, look for ocean swells. These swells can be caused by winds that are blowing a storm system from out over the sea. This could mean that rain is on the way.

Look at the shape of the clouds. In general, clouds that are white and high indicate good weather, and clouds that are dark and low mean rain or storms are on the way. White, wispy clouds usually mean that the weather will be clear. Flat clouds mean that the air is stable, while fluffy clouds mean that it is unstable. Smaller puffy clouds may look calm, but they often build over the course of the day. If you see these clouds, it could mean a storm is brewing.

Observe the position of the clouds. Clouds that look high usually mean that they are farther away but could become a weather threat up to six hours later. Lower clouds mean that bad weather is closer. As the weather threat approaches, you will see the clouds move lower in the sky. Black clouds mean that there is a coming storm that does not have strong winds. Brown clouds mean that there is a coming storm that does have strong winds. White clouds usually mean good weather, though a storm could be on its way later in the day.

Check for a red sky in the morning. Weather moves from west to east, while the sun rises in the east and sets in the west. If you see a red sky in the morning, then it means that there is clear weather in the east where the sun is rising, but bad weather in the west, making the sky look red. The bad weather from the west will be moving toward you, as that is how weather patterns work.

Stare at the moon. Look to see how visible the moon is. If the moon is easy to see in a clear sky, then it could mean that the weather is cooling. If the moon is visible, look for a wide halo that spreads out from the moon. A halo suggests coming rain. Remember the old saying, "Ring around the moon? Rain real soon." A ring around the moon means a warm front is coming, which usually brings rain. The ring is caused by ice crystals that are passing over the moon. A double halo around the moon could signal strong winds in the coming storm.

Look for high ant mounds. Before a storm, ants will build up their mounds and create steep sides. If you see raised ant beds, especially if they were lower before, then there may be a storm coming.

Watch for low-flying or roosting birds. When the air pressure falls before a storm, birds feel discomfort in their ears. This causes them to fly lower toward the ground or to perch on lower tree branches or power lines. You may also observe the birds eating ground insects. This behavior suggests that a storm is coming. If the birds are flying high in the sky, then there will likely be fair weather. Birds also become quiet before a storm. Singing and chirping birds could indicate good weather. Look for bird migrations. Birds can sense air pressure and will time their migrations to good weather. If you see flocks of birds migrating in the sky, then the weather will likely be good that day.

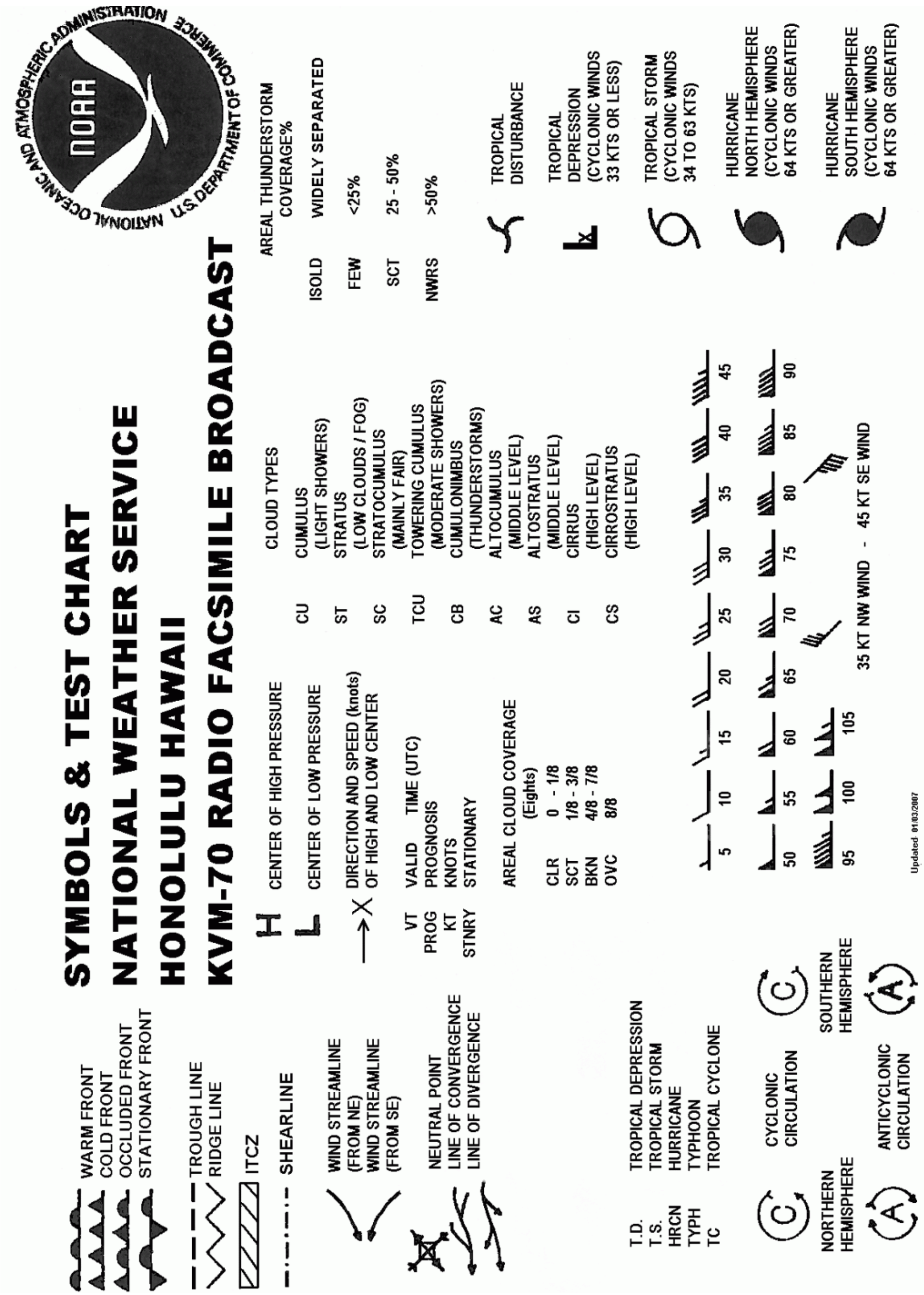
Look for snakes. Snakes will leave their nests before bad weather, even if it's in the middle of winter time. Seeing snakes in unexpected places or at time when the snake would normally be in its nest can be a sign of bad weather.

Watch turtles if they are nearby. Turtles will seek higher ground before a storm, so look for movement to higher locations. You may see them in the road one to two days before a rain.

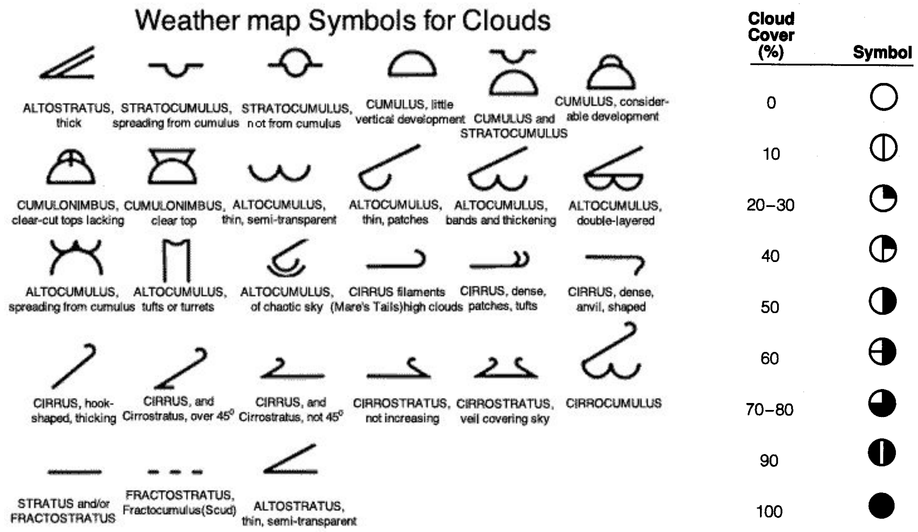
Weather Symbols

00 Cloud development NOT observed during past hour (not plotted)	01 Clouds generally becoming less developed (not plotted)	02 State of sky on the whole unchanged during past hour (not plotted)	03 Clouds generally forming or developing during past hour (not plotted)	04 Visibility reduced by smoke
10 Mist	11 Patches of shallow fog at station, NOT deeper than 6 feet on land	12 More or less continuous shallow fog at station, NOT deeper than 6 feet	13 Lightning visible, no thunder heard	14 Precipitation within sight, but NOT reaching the ground
20 Drizzle (not freezing) or snow grains, not as shower(s), has ended	21 Rain (not freezing) not falling as shower(s), ended in the past hour	22 Snow not falling as shower(s) ended in the past hour	23 Rain and snow or ice pellets, not as shower(s) ended in the past hour	24 Freezing drizzle or freezing rain, not as shower(s) ended in the past hour
30 Slight or moderate dust storm or sandstorm (has decreased in past hour)	31 Slight or moderate dust storm/sandstorm (no change during past hour)	32 Slight or moderate dust storm or sandstorm (has begun or increased)	33 Severe dust storm or sandstorm, decreased during the past hour	34 Severe dust storm or sandstorm, has no change during past hour
40 Fog at a distance, but not at the station during the preceding hour	41 Fog in patches	42 Fog, sky visible (has become thinner during preceding hour)	43 Fog, sky obscured (has become thinner during preceding hour)	44 Fog, sky visible (no appreciable change during the past hour)
50 Drizzle, not freezing, intermittent (slight at time of observation)	51 Drizzle, not freezing, continuous (slight at time of observation)	52 Drizzle, not freezing, intermittent (moderate at time of observation)	53 Drizzle, not freezing, continuous (moderate at time of observation)	54 Drizzle, not freezing, intermittent (heavy at time of observation)
60 Rain, not freezing, intermittent (slight at time of observation)	61 Rain, not freezing, continuous (slight at time of observation)	62 Rain, not freezing, intermittent (moderate at time of observation)	63 Rain, not freezing, continuous (moderate at time of observation)	64 Rain, not freezing, intermittent (heavy at time of observation)
70 Intermittent fall of snowflakes (slight at time of observation)	71 Continuous fall of snowflakes (slight at time of observation)	72 Intermittent fall of snowflakes (moderate at time of observation)	73 Continuous fall of snowflakes (moderate at time of observation)	74 Intermittent fall of snowflakes (heavy at time of observation)
80 Rain shower(s), slight	81 Rain shower(s), moderate or heavy	82 Rain shower(s), violent	83 Shower(s) of rain and snow mixed, slight	84 Shower(s) of rain and snow mixed, moderate or heavy
90 Shower(s) of hail, w/ or w/o rain or rain/snow, no thunder, mod. or heavy	91 Thunderstorm during past hour w/ slight rain at time of observation	92 Thunderstorm during past hour w/ current moderate/ heavy rain	93 Thunderstorm ended w/ current slight snow, rain/ snow mixed, or hail	94 Thunderstorm ended w/ current moderate/heavy snow, rain/snow, or hail

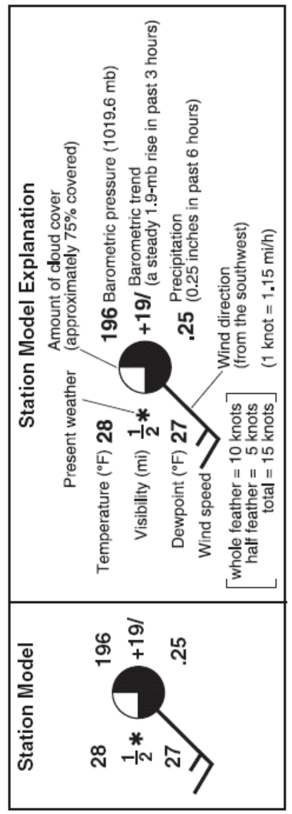
05 Haze	06 Widespread dust in the air, not raised by wind at or near station	07 Dust or sand due to wind at or near the station but no dust whirl/sandstorm	08 Well developed dust whirl and/or sand whirl but no dust storm/sandstorm	09 Dust storm or sandstorm within sight or at the station during past hour
15 Precipitation within sight, reaching the surface, but more than 3 miles away	16 Precipitation within sight, reaching the surface within 3 miles	17 Thunder heard, but no precipitation at the station	18 Squall(s) within sight during past hour	19 Funnel cloud(s) and/or Tornado(es) during the preceding hour
25 Shower(s) of rain ended in the past hour	26 Shower(s) of snow, or of rain and snow ended in the past hour	27 Shower(s) of hail, or of rain and hail ended in the past hour	28 Fog or ice fog ended in the past hour	29 Thunderstorm (with or without precipitation) ended in the past hour
35 Severe dust storm or sandstorm has begun or increased	36 Slight or moderate drifting snow (generally below eye level)	37 Heavy drifting snow (generally below eye level)	38 Slight or moderate blowing snow (generally above eye level)	39 Heavy blowing snow (generally above eye level)
45 Fog, sky obscured (no appreciable change during the past hour)	46 Fog, sky visible (has begun or has become thicker during past hour)	47 Fog, sky obscured (has begun or has become thicker during past hour)	48 Fog, depositing rime Ice, sky visible	49 Fog, depositing rime Ice, or Ice fog, sky obscured
55 Drizzle, not freezing, continuous (heavy at time of observation)	56 Drizzle, freezing, slight	57 Drizzle, freezing, moderate or heavy	58 Drizzle and rain, slight	59 Drizzle and rain, moderate or heavy
65 Rain, not freezing, continuous (heavy at time of observation)	66 Rain, freezing, slight	67 Rain, freezing, moderate or heavy	68 Rain or drizzle and snow, slight	69 Rain or drizzle and snow, moderate or heavy
75 Continuous fall of snowflakes (heavy at time of observation)	76 Ice needles (with or without fog)	77 Snow grains (with or without fog)	78 Isolated star-like snow crystals (with or without fog)	79 Ice pellets (sleet)
85 Snow shower(s), slight	86 Snow shower(s), moderate or heavy	87 Shower(s) of snow pellets or small hail, slight with or without rain or rain/snow	88 Shower(s) of snow pellets or small hail, moderate or heavy w/ or w/o rain/snow	89 Shower(s) of hail, slight, w/ or w/o rain or rain/ snow mixed, no thunder
95 Thunderstorm, slight or moderate, w/o hail but w/ rain and/or snow	96 Thunderstorm, slight or moderate, with hail at time of observation	97 Thunderstorm, heavy, w/o hail but with rain and/or snow	98 Thunderstorm combined with dust storm or sandstorm	99 Thunderstorm, heavy, with hail at time of observation



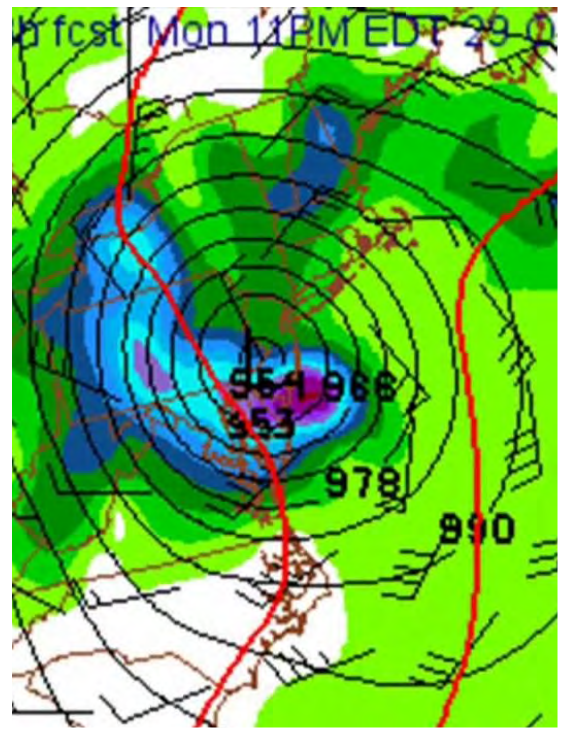
SYMBOLS & TEST CHART
NATIONAL WEATHER SERVICE
HONOLULU HAWAII
KVM-70 RADIO FACSIMILE BROADCAST
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE
NOAA
WARM FRONT
COLD FRONT
OCCLUDED FRONT
STATIONARY FRONT
TROUGH LINE
RIDGE LINE
ITCZ
SHEARLINE
WIND STREAMLINE (FROM NE)
WIND STREAMLINE (FROM SE)
NEUTRAL POINT
LINE OF CONVERGENCE
LINE OF DIVERGENCE
T.D. TROPICAL DEPRESSION
T.S. TROPICAL STORM
HRCN HURRICANE
TYPH TYPHOON
TC TROPICAL CYCLONE
CYCLONIC CIRCULATION
ANTICYCLONIC CIRCULATION
NORTHERN HEMISPHERE
SOUTHERN HEMISPHERE
CENTER OF HIGH PRESSURE
CENTER OF LOW PRESSURE
DIRECTION AND SPEED (knots) OF HIGH AND LOW CENTER
VT VALID TIME (UTC)
PROG PROGNOSIS
KT KNOTS
STNRY STATIONARY
AREAL CLOUD COVERAGE (Eighths)
CLR 0 - 1/8
SCT 1/8 - 3/8
BKN 4/8 - 7/8
OVC 8/8
CLOUD TYPES
CU CUMULUS (LIGHT SHOWERS)
ST STRATUS (LOW CLOUDS / FOG)
SC STRATOCUMULUS (MAINLY FAIR)
TCU TOWERING CUMULUS (MODERATE SHOWERS)
CB CUMULONIMBUS (THUNDERSTORMS)
AC ALTOCUMULUS (MIDDLE LEVEL)
AS ALTOSTRATUS (MIDDLE LEVEL)
CI CIRRUS (HIGH LEVEL)
CS CIRROSTRATUS (HIGH LEVEL)
AREAL THUNDERSTORM COVERAGE%
ISOLD WIDELY SEPARATED
FEW <25%
SCT 25 - 50%
NWRS >50%
TROPICAL DISTURBANCE
TROPICAL DEPRESSION (CYCLONIC WINDS 33 KTS OR LESS)
TROPICAL STORM (CYCLONIC WINDS 34 TO 63 KTS)
HURRICANE NORTH HEMISPHERE (CYCLONIC WINDS 64 KTS OR GREATER)
HURRICANE SOUTH HEMISPHERE (CYCLONIC WINDS 64 KTS OR GREATER)
5 10 15 20 25 30 35 40 45
50 55 60 65 70 75 80 85 90
95 100 105
35 KT NW WIND - 45 KT SE WIND



Weather map Symbols for Clouds
ALTOSTRATUS, thick
STRATOCUMULUS, spreading from cumulus
STRATOCUMULUS, not from cumulus
CUMULUS, little vertical development
CUMULUS and STRATOCUMULUS
CUMULUS, considerable development
CUMULONIMBUS, clear-cut tops lacking
CUMULONIMBUS, clear top
ALTOCUMULUS, thin, semi-transparent
ALTOCUMULUS, thin, patches
ALTOCUMULUS, bands and thickening
ALTOCUMULUS, double-layered
ALTOCUMULUS, spreading from cumulus
ALTOCUMULUS, tufts or turrets
ALTOCUMULUS, of chaotic sky
CIRRUS filaments (Mare's Tails)high clouds
CIRRUS, dense, patches, tufts
CIRRUS, dense, anvil, shaped
CIRRUS, hook-shaped, thicking
CIRRUS, and Cirrostratus, over 45°
CIRRUS, and Cirrostratus, not 45°
CIRROSTRATUS, not increasing
CIRROSTRATUS, veil covering sky
CIRROCUMULUS
STRATUS and/or FRACTOSTRATUS
FRACTOSTRATUS, Fractocumulus(Scud)
ALTOSTRATUS, thin, semi-transparent
Cloud Cover (%)
Symbol
0
10
20–30
40
50
60
70–80
90
100



Station Model
28
196
+19/
.25
27
Station Model Explanation
Present weather
Temperature (°F) 28
Visibility (mi)
Dewpoint (°F) 27
Wind speed
whole feather = 10 knots
half feather = 5 knots
total = 15 knots
Amount of cloud cover (approximately 75% covered)
196 Barometric pressure (1019.6 mb)
+19/ Barometric trend (a steady 1.9-mb rise in past 3 hours)
.25 Precipitation (0.25 inches in past 6 hours)
Wind direction (from the southwest)
(1 knot = 1.15 mi/h)



Mon 11PM EDT
978
990

4G. 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

WE ACT FOR ENVIRONMENTAL JUSTICE
COMMUNITY VOICES HEARD
Fifth Avenue Committee
MAY DAY
The Brotherhood SisterSol
RED HOOK INITIATIVE
M GM
WORD UP
THE POINT
CORBIN HILL FOOD PROJECT
The Laundromat Project

City and State

NYC Office of the Mayor
NEW YORK CITY DOI
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
myserda Energy. Innovation. Solutions.
NYC PLANNING DEPARTMENT OF CITY PLANNING CITY OF NEW YORK

Intermediary

NRDC
New Economy Project
SOLARone
ALIGN
Csi
596 ACRES
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
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
COMMUNITY DEVELOPMENT
ICTURE 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 federal credit union
Enterprise
BlocPower

Development/Manufacturing/Workforce

GREEN CITY FORCE
GRID ALTERNATIVES
conEdison
SolarCity
AECOM
MADE IN NYC
ROSA LUXEMBURG FOUNDATION
32BJ SEIU
SKANSKA
Statoil
Williams

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Future Technology

Geoengineering

Manipulating land and our environment has always been a feature of human history. Scientists have found evidence of a sustained and deliberate burning of rain forests as far as 140,000 years ago. While previous methods of environmental management/ manipulation were practiced sustainably, current methods of climate change related geogengineering (GE) are on a much vaster scale and their impacts are largely unknown. These methods include reflecting sunlight from space, adding huge quantities of lime or iron to oceans, pumping deep cold nutrient-rich waters to the surface of oceans and irrigating vast swaths of desert to grow trees, all of which would theoretically deflect heat, or absorb carbon emissions. According to one monitoring organization, there are over 75 active GE projects around the world. A map can be seen here: https://map.geoengineeringmonitor.org.

Robotics

According to some the robotics field is at the beginning of a process which will "transform how we live and work over the next two decades. The confluence of robotics, artificial intelligence, social network systems and knowledge sharing is driving a huge, new revolution." Examples of changes we may see are people being able to regain their ability to walk, such as with the exoskeleton pictured to the right. Concerns include who will have access to advanced technology, weaponization, and the potential for mass unemployment and social alienation due to automation of the workplace.

Top image: Ancient practices of land management include forest burning for crop control, among other things. Middle image: Modern "cloud seeding" geoengineering project. Bottom image: Prototype exoskeleton that can assist with movement

Molecular Biology

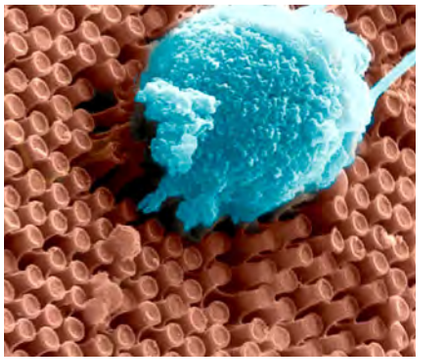
Molecular biology, along with biochemistry and other genetic studies, have the ability to protect human life and other organisms from increased disease and other predicted health impacts from climate change. Concerns exist about the equitable distribution of gene technology, such as those that protect crops from eradication and humans from contagion, and the unknown long-term impacts deliberately altering the building blocks of life on earth.

Autonomous Vehicles

The Intelligent Transportation Society of America projects that autonomous vehicles could achieve a 2-4% reduction in oil consumption and vehicle greenhouse gas emissions over a 10 year period. Such vehicles can also support dangerous aid work. For example, in New Orleans during a hurricane buses collect residents who can't otherwise evacuate at designated "evacuspots". A job that autonomous vehicles could support by running more regularly and without putting human drivers in danger.

Artificial Intelligence

The technological singularity is the hypothesis that the invention of artificial superintelligence will cause a runaway technological growth, resulting in unpredictable changes to human civilization. Artificial intelligence will enter a "runaway reaction" of self-improvement, resulting in a powerful superintelligence that would surpass all human intelligence.



Images from top to bottom: 1) Molecular engineering designed to protect human cells from attack, 2) Autonomous ground vehicle, 3) Autonomous aerial vehicle, 4) Artist depiction of the singularity

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