Goals & Recovery functions

Community Vision, Goals, & Assets

Issues & Needs

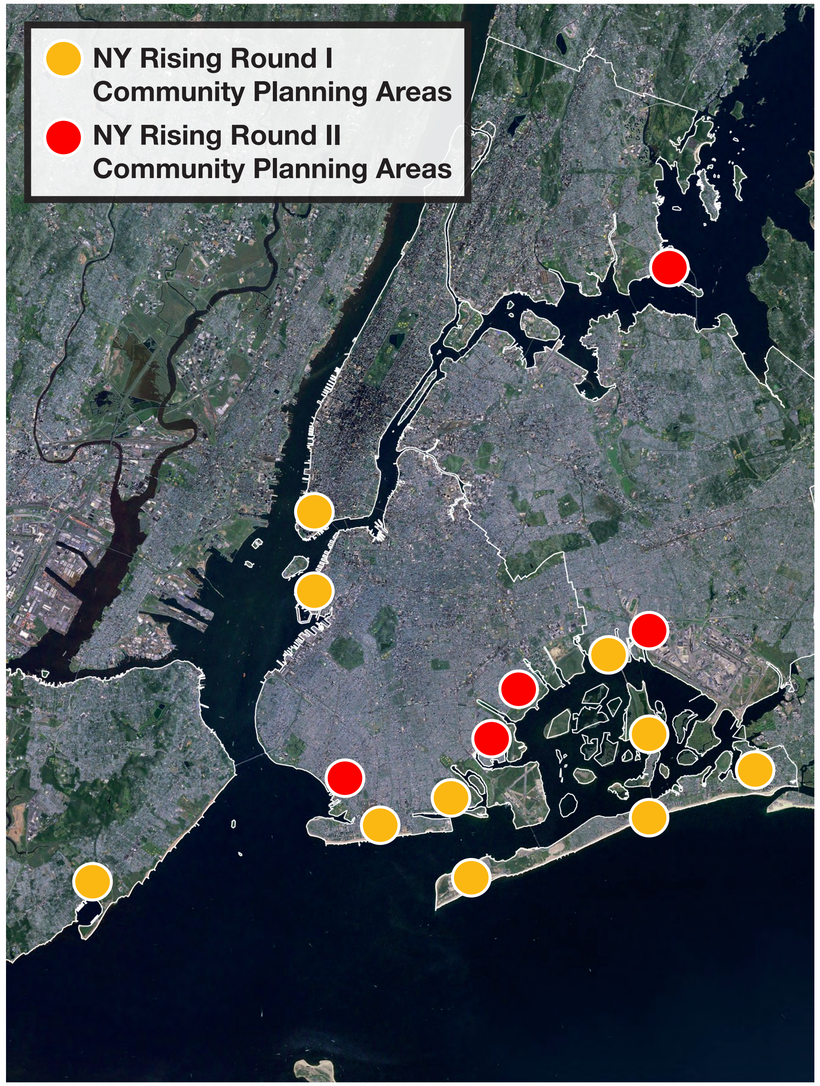
→ **Community Reconstruction Plan**

Implementable projects across six recovery functions

The NY Rising Community Reconstruction Program is helping communities impacted by Hurricane Irene, Tropical Storm Lee, and Superstorm Sandy to rebuild and become more resilient through community-driven plans that consider current damage, future threats to community assets, and the community's economic future. Residents are here today to participate in a public meeting to learn more about the program and share their input on strategies and projects to help shape the planning process.

Join the conversation!
#NYRising
@NYStormRecovery
NYStormRecovery

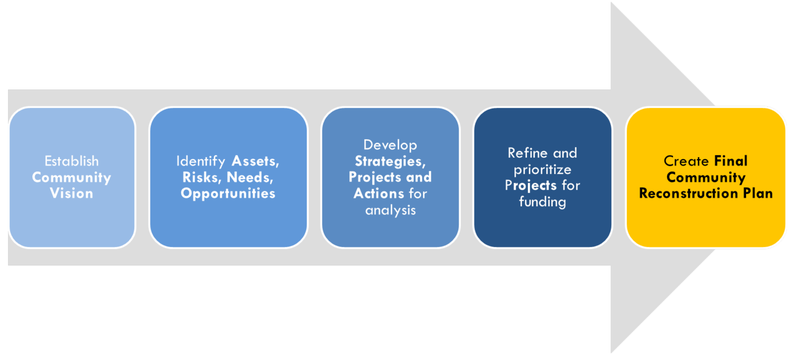
Map of Communities in NYC



There are fifteen NY Rising Communities in New York City. The Round 1 Committees, which concluded the planning process in April 2014, included ten community areas. The Round 2 Committees, which kicked off this summer, includes five community areas.

Planning Process & Work Schedule

Planning Process



Work Schedule

Deliverables	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.
Work Plan	June 13							
Vision, Issues, & Storm Damage	1 2 1	August 1						
Risk, Assets, Needs, & Opportunities		3	August 22					
List of Strategies			2	September 19				
List of Priority & Featured Projects				4	October 3			
Final Reconstruction Plan					5	6 7 3 8	9	4

For more information, please contact:

info@stormrecovery.ny.gov

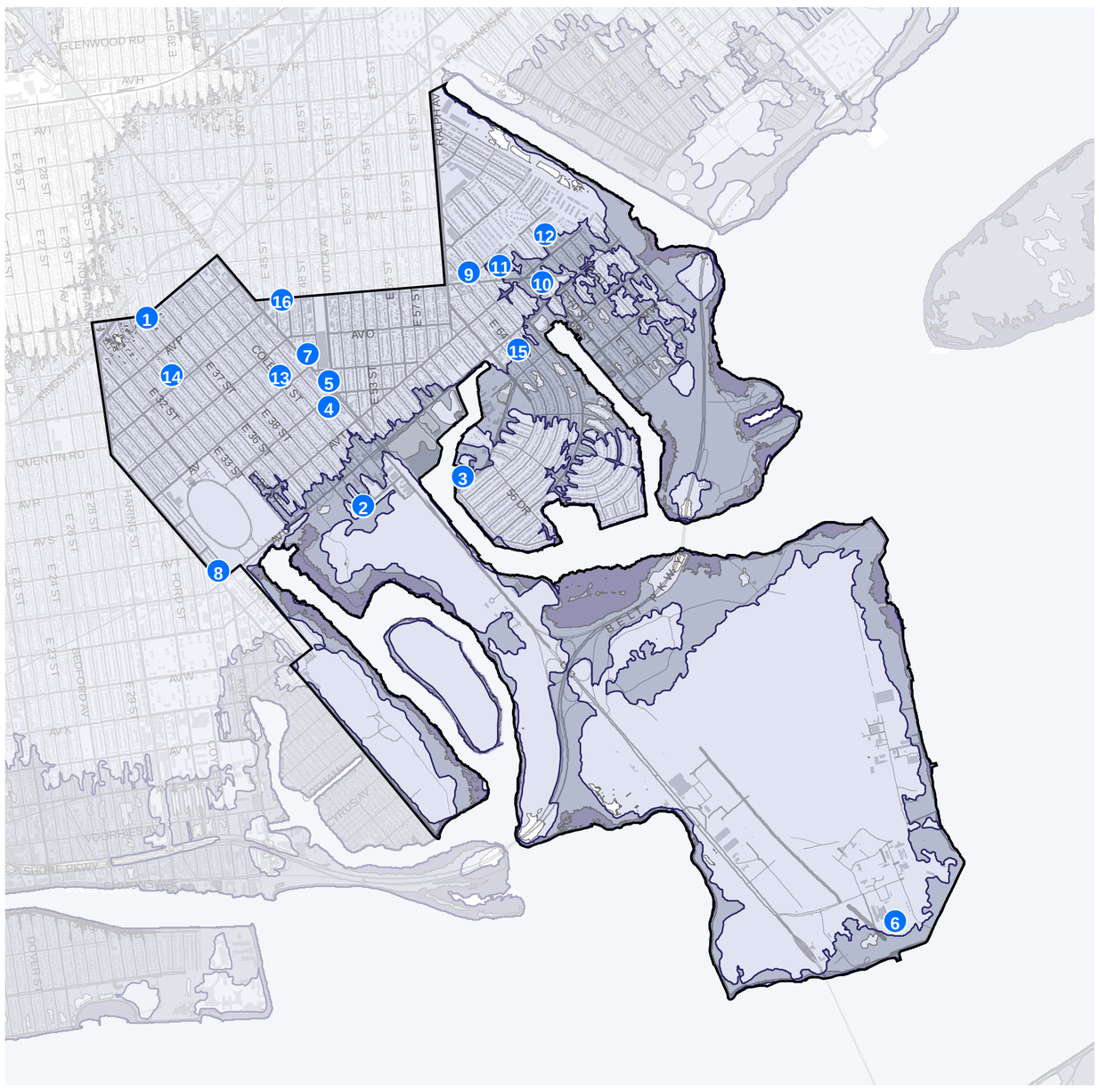
www.stormrecovery.ny.gov

Program Information
NY Rising Community Reconstruction Program

Assets

Assets include a variety of at-risk places and resources critical to a Community's resilience or recovery. They may facilitate economic or social activities in a Community, or refer to critical infrastructure required to support those activities. Assets may be part of the built or natural environment.

The following maps show key assets identified by the Planning Committee and public.



NY Rising Community Reconstruction Program
Southeast Brooklyn Waterfront Planning Area

Planning Area

Extent of High & Extreme Risk Zones

Health and Social Service Assets

Health,Social Service, and Emergency Response Assets

NYSDOS Risk Areas

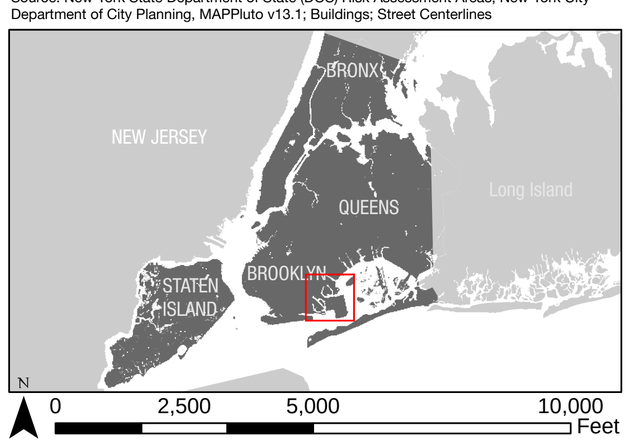
- Moderate
- High
- Extreme

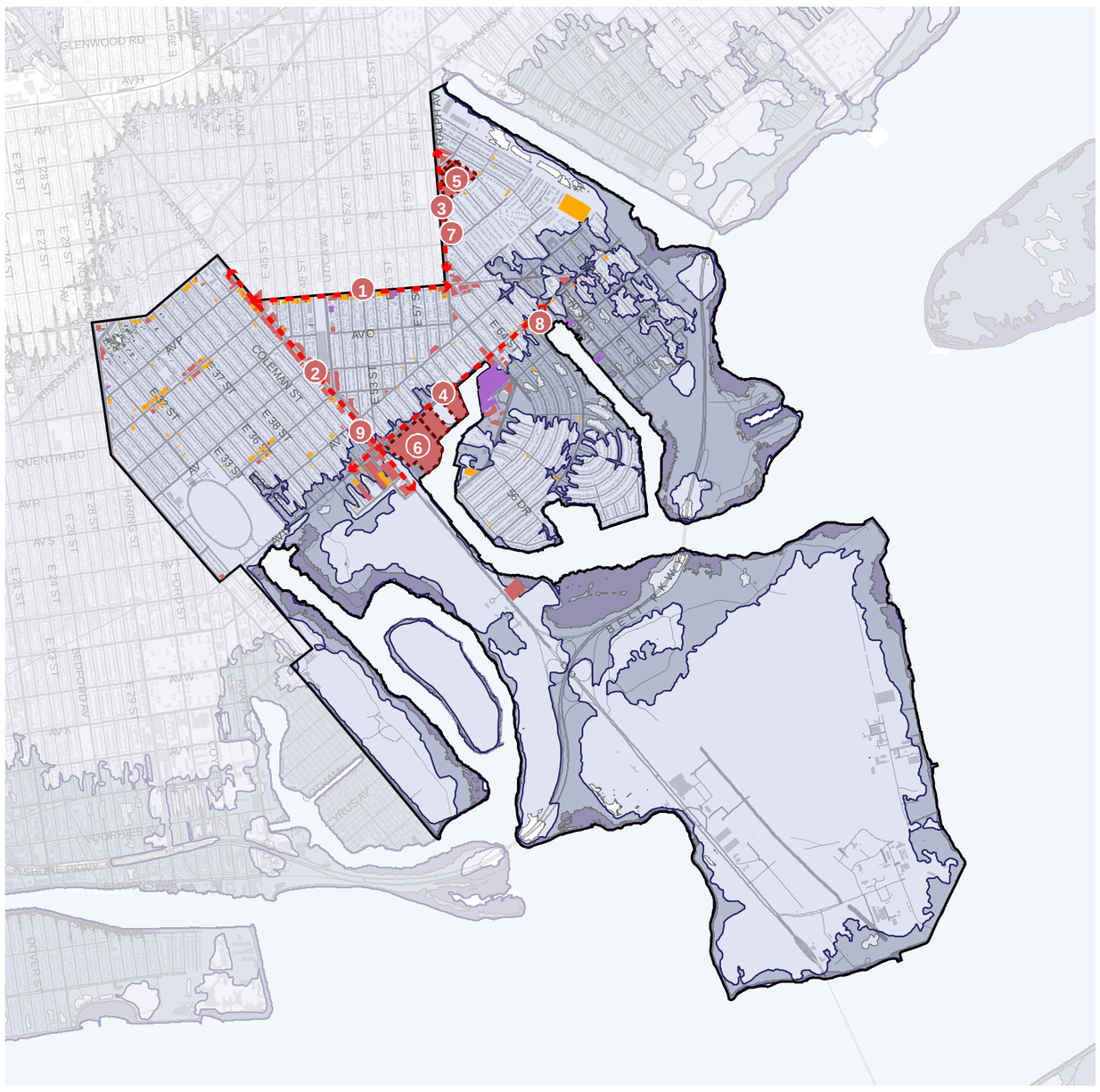
1	PHYSICARE FAMILY HEALTH CENTER
2	SOUTH BROOKLYN NEPHROLOGY (DIALYSIS) CENTER
3	SUNRISE SENIOR LIVING CENTER
4	RITE AID PHARMACY
5	WALGREENS PHARMACY
6	ARMED FORCES RESERVE CENTER
7	FDNY ENGINE 309, LADDER 159
8	FDNY ENGINE 321
9	FDNY ENGINE 323
10	SAINT BERNARD SCHOOL
11	JUNIOR HIGH SCHOOL 78 ROY H MANN
12	PUBLIC SCHOOL 312 (BERGEN BEACH)
13	PUBLIC SCHOOL 207 ELIZABETH G LEARY
14	PUBLIC SCHOOL 222 KATHERINE R SNYDER
15	PUBLIC SCHOOL 236 (MILL BASIN)
16	FLATLANDS VOLUNTEER AMBULANCE CORPS

OUTSIDE OF THE PLANNING AREA:

17	CVS PHARMACY
18	BROOKLYN COLLEGE EVACUATION CENTER
19	MADISON HIGH SCHOOL
20	PUBLIC SCHOOL 203
21	PUBLIC SCHOOL 251
22	SOUTH SHORE EDUCATIONAL COMPLEX

Source: New York State Department of State (DOS) Risk Assessment Areas; New York City Department of City Planning, MAPPluto v13.1; Buildings; Street Centerlines





NY Rising Community Reconstruction Program
Southeast Brooklyn Waterfront Planning Area

Planning Area

Extent of High & Extreme Risk Areas

Economic Assets

Economic Assets

Commercial Corridors (Flatbush Avenue, Avenue N, Avenue U, Ralph Avenue)

Shopping Centers

NYSDOS Risk Areas

- Moderate
- High
- Extreme

Economic Use

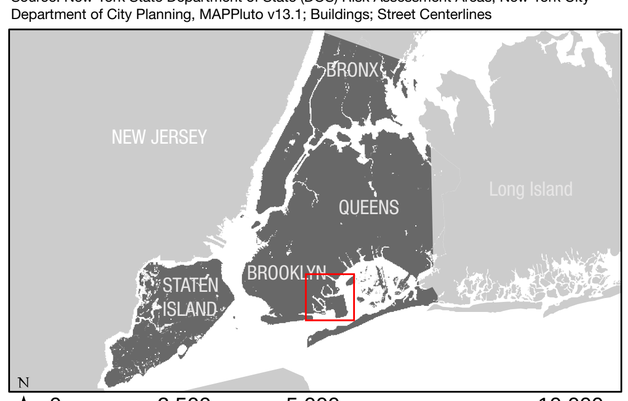
- Mixed Residential & Commercial
- Commercial & Office Buildings
- Industrial & Manufacturing

1	AVE N COMMERCIAL CORRIDOR
2	FLATBUSH AVE COMMERCIAL CORRIDOR
3	RALPH AVE COMMERCIAL CORRIDOR
4	AVE U COMMERCIAL CORRIDOR
5	GEORGETOWN SHOPPING CENTER
6	KINGS PLAZA SHOPPING CENTER
7	RALPH AVE SHOPPING CENTER
8	KEY FOODS
9	WALDBAUMS GROCERY

OUTSIDE OF THE PLANNING AREA:

10	KEY FOODS GROCERY

Source: New York State Department of State (DOS) Risk Assessment Areas; New York City Department of City Planning, MAPPluto v13.1; Buildings; Street Centerlines



Southeast Brooklyn Waterfront NY Rising Community Reconstruction Plan

Assets

NY Rising Community Reconstruction Program
Southeast Brooklyn Waterfront Planning Area

Planning Area

Extent of High & Extreme Risk Areas

Housing Assets

One and Two Family Residences in High and Extreme Risk Zones

Multi-Family Walk-Up Buildings in High and Extreme Risk Zones

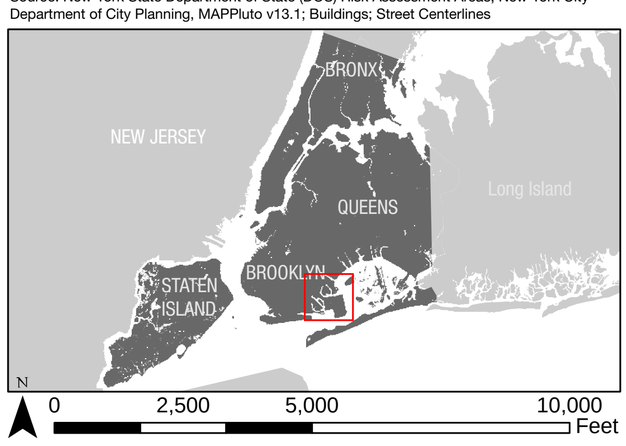
NYSDOS Risk Areas

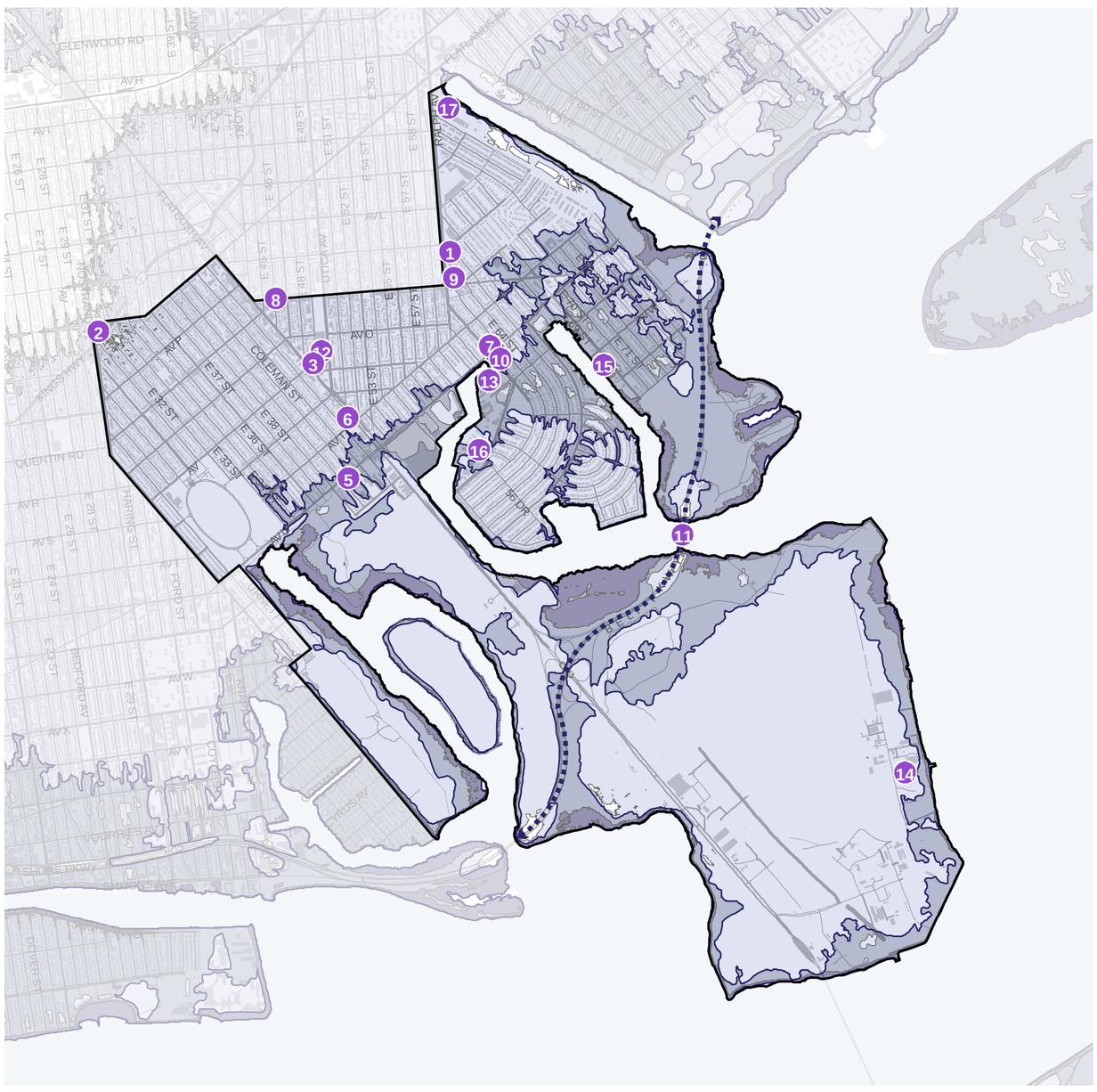
Moderate

High

Extreme

Source: New York State Department of State (DOS) Risk Assessment Areas; New York City Department of City Planning, MAPPluto v13.1; Buildings; Street Centerlines





NY Rising Community Reconstruction Program
Southeast Brooklyn Waterfront Planning Area

Planning Area

Extent of High & Extreme Risk Areas

Infrastructure Assets

Infrastructure Systems Assets

Belt Parkway

NYSDOS Risk Areas

Moderate

High

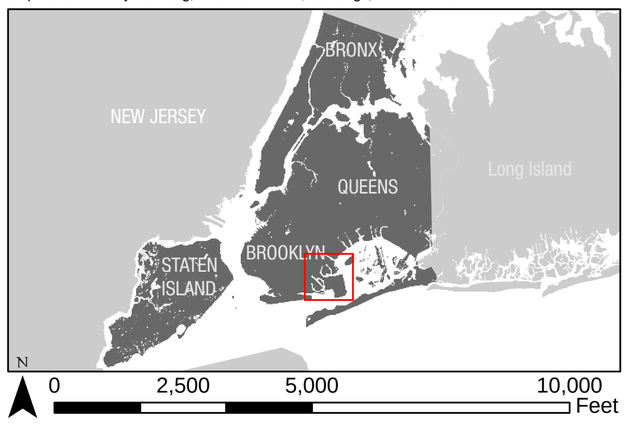
Extreme

1	GAS STATION	
2	GAS STATION	
3	GAS STATION	
4	GAS STATION	
5	GAS STATION	
6	GAS STATION	
7	GAS STATION	
8	CON EDISON SUBSTATION	
9	CON EDISON SUBSTATION	
10	CON EDISON SUBSTATION	
11	BELT PARKWAY	
12	FLATBUSH AVE BUS DEPOT (MTA)	
13	MILL AVE SCHOOL BUS DEPOT	
14	NYPD AIR OPERATIONS (FLOYD BENNETT FIELD)	
15	PRIVATE BUS DEPOT (AMBOY)	
16	STRICKLAND AVE SCHOOL DEPOT LOT	
17	PAERDEGAT BASIN COMBINED SEWER OVERFLOW RETENTION CENTER	

OUTSIDE OF THE PLANNING AREA:

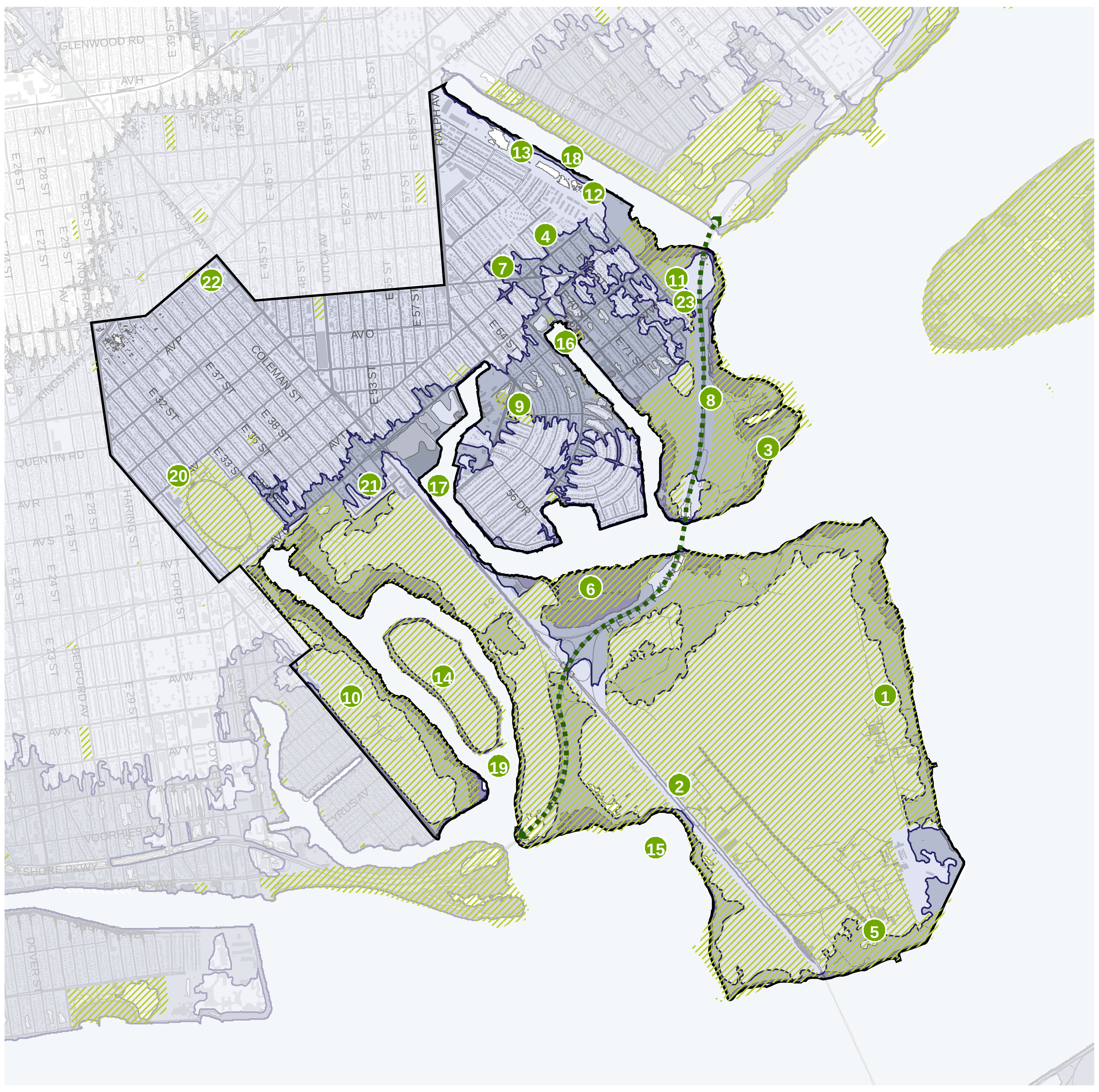
18	GAS STATION (2773 NOSTRAND AVE)
19	GAS STATION (2402 KNAPP ST)

Source: New York State Department of State (DOS) Risk Assessment Areas; New York City Department of City Planning, MAPPluto v13.1; Buildings; Street Centerlines



Southeast Brooklyn Waterfront
NY Rising Community Reconstruction Plan

Assets



NY Rising Community Reconstruction Program
Southeast Brooklyn Waterfront Planning Area

Planning Area

Natural and Cultural Resource Assets

- Natural and Cultural Resource Assets
- Jamaica Bay Greenway
- Parks and Open Space

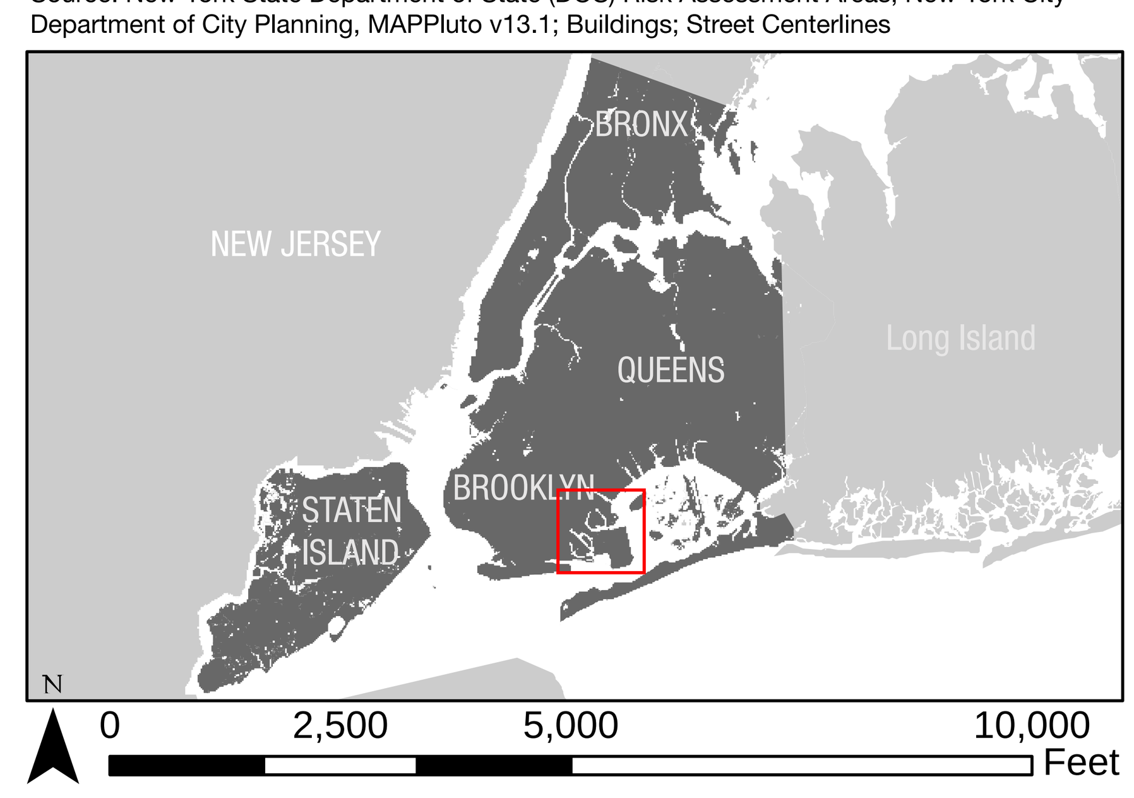
Extent of High & Extreme Risk Zones

NYSDOS Risk Areas

- Moderate
- High
- Extreme

1	HISTORIC AIRCRAFT RESTORATION PROJECT
2	AVIATOR SPORTS
3	BERGEN BEACH (GATEWAY NATIONAL RECREATION AREA, NATIONAL PARKS SERVICE)
4	BERGEN BEACH PLAYGROUND
5	FLOYD BENNETT FIELD (GATEWAY NATIONAL RECREATION AREA, NATIONAL PARKS SERVICE)
6	FOUR SPARROW MARSH
7	HICKMAN PLAYGROUND (NYC PARKS)
8	JAMAICA BAY GREENWAY
9	LINDOWER PARK (NYC PARKS)
10	MARINE PARK (NYC PARKS)
11	MCGUIRE FIELDS (NYC PARKS)
12	PAERDEGAT BASIN ECOLOGICAL PARK (UNDER CONSTRUCTION, NYC PARKS)
13	PAERDEGAT BASIN PARK (NYC PARKS)
14	WHITE ISLAND
15	DEAD HORSE BAY
16	EAST MILL BASIN
17	MILL BASIN
18	PAERDEGAT BASIN
19	MARINE PARK CREEK AND MILL CREEK
20	CARMINE CARRO COMMUNITY CENTER
21	ST. COLUMBA CHURCH
22	CHURCH OF ST. THOMAS AQUINAS
23	JOHN MALLONE COMMUNITY CENTER

Source: New York State Department of State (DOS) Risk Assessment Areas; New York City Department of City Planning, MAPPluto v13.1; Buildings; Street Centerlines



Community Vision, Needs, and Opportunities

The Southeast Brooklyn Waterfront Planning Committee and public have crafted the following vision statement and identified the needs and opportunities that follow. These elements informed the strategies and project ideas that are the focus of today's meeting.

"Through the NY Rising Community Reconstruction Program, the Southeast Brooklyn Waterfront Community aims to increase preparedness around severe weather-related events and climate change through education, planning, infrastructure development, and leveraging the ties that bind the community together."

Needs

- Improved drainage and stormwater management
- Resilient power supply
- Coastal edge strengthening and protection
- Tree cleaning and maintenance
- Emergency preparedness and response planning
- Residential resiliency technical assistance and education
- Improved access to food and supplies

Opportunities

- Large facilities with green spaces
- Concentration of recreational assets
- Access to shoreline
- Strong civic network
- Residents with strategic professional skills and resources
- Resilient existing communications networks

Community members gathered at Public Engagement Event #1, where they shared their thoughts on Community needs, opportunities, and vision.

Emergency Preparedness and Response

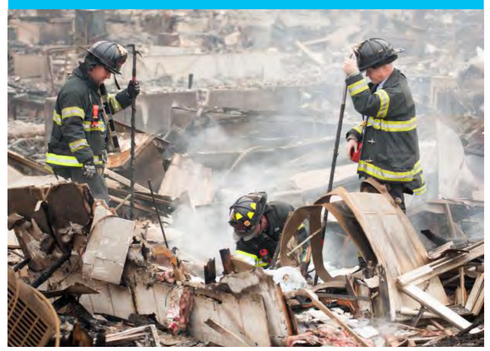
Strategies: Enhance emergency preparedness and response through **reliable communications, centralized spaces, transportation coordination, and strengthened capacity of existing organizations/programs**

Ensure access to **food and critical supplies**

Critical Emergency Functions

Capacity, Coordination, Communication

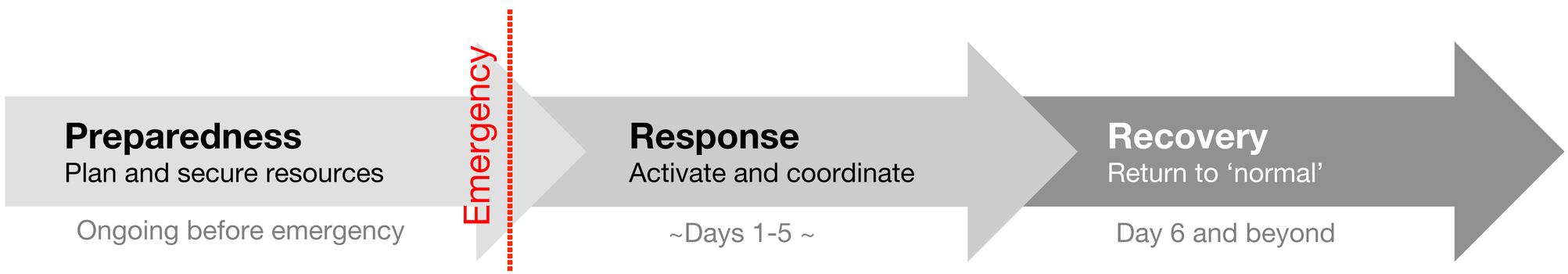
First Response and Safety



Emergency Mobility

Shelter and Supplies

Preparedness, Response, and Recovery Process



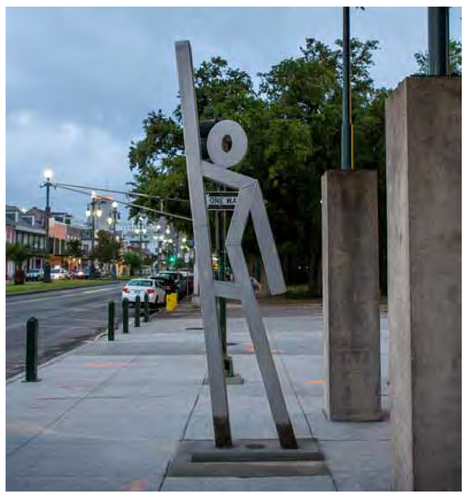
Emergency Preparedness and Response

Capacity, Coordination, Communication

Occupy Sandy Online Information Sharing - New York City, NY and New Jersey

Occupy Sandy, supported by thousands of volunteers,leveraged a wide variety of tools for information sharing and response:

- Tracked requests for assistance and for disaster relief supplies
- Used social media to gather and distribute information
- Created a centralized website and an online map to provide information, connect individuals with resources, collect donations, and register volunteers (in New Jersey, Coney Island, Greenpoint, the Rockaways, and Staten Island)



Evacuteer.org EvacuSpot Signage - New Orleans, LA

Evacuteer.org proposed public art pieces to serve as memorable markers of evacuation pick-up spots.

City Assisted Evacuation (CAE) is a citywide plan developed after Katrina to accommodate the over 30,000 residents who lack the ability to evacuate. It identified 17 EvacuSpots -- evacuation pick-up points throughout the city.

Public art was seen by the community as a crucial tool for raising citizen awareness.

Broadmoor CERT Training and Evacuation Assistance - New Orleans, LA

After Katrina, the Broadmoor Improvement Association (BIA) used FEMA's Community Emergency Response Team (CERT) program to train 20 residents in basic disaster response skills.

The Broadmoor CERT maintains a list of residents who might need evacuation assistance, contacts them in an emergency, and coordinates rides by neighbors to evacuation pick-up points.

The BIA maintains a toll-free check-in number and online community forum that allows residents to report themselves as "safe and sound."

Emergency Preparedness and Response

Emergency Mobility

Operation Brother's Keeper - New Orleans, LA

Operation Brother's Keeper is an initiative to provide transportation for residents without cars in New Orleans. It was started by local churches and community organizations, in partnership with local, state, and federal officials, and the Red Cross, who match those who have room in their cars to city residents who lack cars or are unable to drive.

During Hurricane Katrina, Operation Brothers Keeper evacuated 60% of the non-car owning population of the Jefferson's Parish neighborhood in NOLA. This relieved pressure on the area's Citywide Assisted Evacuation Plan as well as on public transportation.

Shelter and Supplies

St. Bernard of Clairvaux Parish and School – Brooklyn, NY

Located in Bergen Beach, St. Bernard Parish is home to a school with a large indoor gymnasium.

After Sandy, St. Bernard School opened their facility to the public and distributed a wide variety of food, clothing, and supplies to community members. Additionally, the school welcomed students from the Rockaways and other hard-hit areas whose schools had closed due to the storm, thereby enabling those students to avoid missed school days.

Fuel NY - New York State

A new New York State law requires gas stations located within a 1/2 mile of highway exits or hurricane evacuation routes to have a generator transfer switch and to deploy backup power within 24 hours of losing power during an emergency. Through the Fuel NY Initiative, the State additionally plans to provide grants of up to $13,000 per station toward purchase and installation of generators and transfer switches.

Emergency Preparedness and Response

Questions	Initial project or recommendation ideas?
What were the major emergency preparedness shortcomings in your neighborhood during and after Superstorm Sandy? Were you able to access the resources and help you needed in a timely manner? Was there good communication about where to get supplies? What were your specific needs during and post-Superstorm Sandy? What training or programs would help the Southeast Brooklyn Waterfront Community to better and more effectively respond to a future event?	**Example:** Convert existing community centers into hardened relief centers, where residents can access information, food, supplies, and power.

Housing

Strategy: Improve residential resiliency through education, technical assistance, and funding

Financial Assistance for Homeowners

A Stronger, More Resilient New York – New York City, NY

"Even if every structure destroyed or damaged by Sandy were rebuilt to the highest resiliency standards, this would still leave tens of thousands of existing structures in the 100-year floodplain vulnerable—with more becoming vulnerable as the climate changes. Subject to available funding, the City, therefore, will launch a: $1.2 billion program to provide incentives to owners of existing buildings in the 100-year floodplain to encourage them to make resiliency investments in those buildings. Of the up to $1.2 billion available through the program, the City will reserve up to $100 million for 1- to 3-family homes, up to $500 million for share of vulnerable buildings, citywide, up to $90 million for small businesses, and $100 million for affordable housing developments."

Technical Assistance for Homeowners

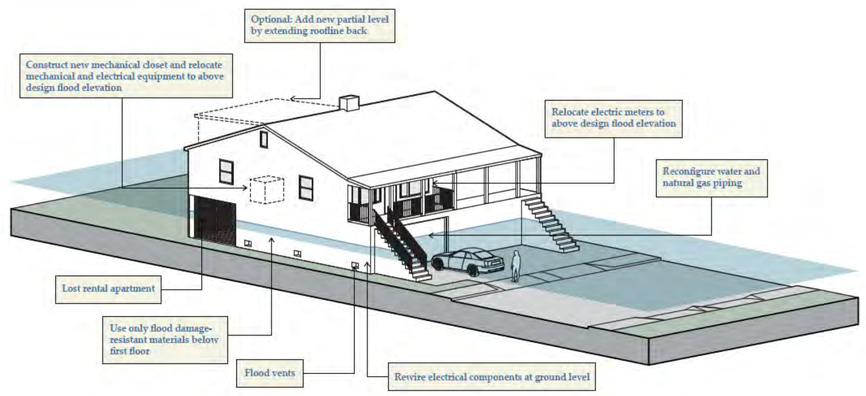
cnycn
CENTER FOR NEW YORK CITY NEIGHBORHOODS

Neighborhood Recovery Fund, Center for New York City Neighborhoods – New York City, NY

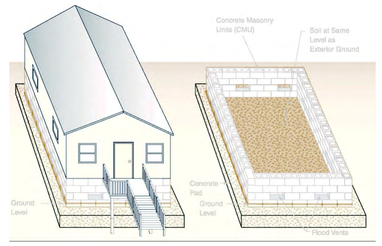
Wading through the details of a changing landscape of regulations and housing programs is not easy for even people acquainted with the programs. As a part of the Neighborhood Recovery Fund, the Center for New York City Neighborhoods will be running workshops that help homeowners to navigate these programs. In addition to this, CNYCN's emergency fund helped to assist residents with Sandy-related expenses that exceeded the assistance homeowners received from their insurance or FEMA.

Housing Resiliency Options

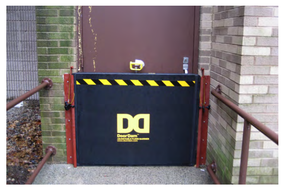
Menu of potential strategies (small attached home)



Some common strategies



Filling in basement



Dry floodproofing: installing barriers to prevent the entry of water

Installing in-home check valves to mitigate sewer back-up

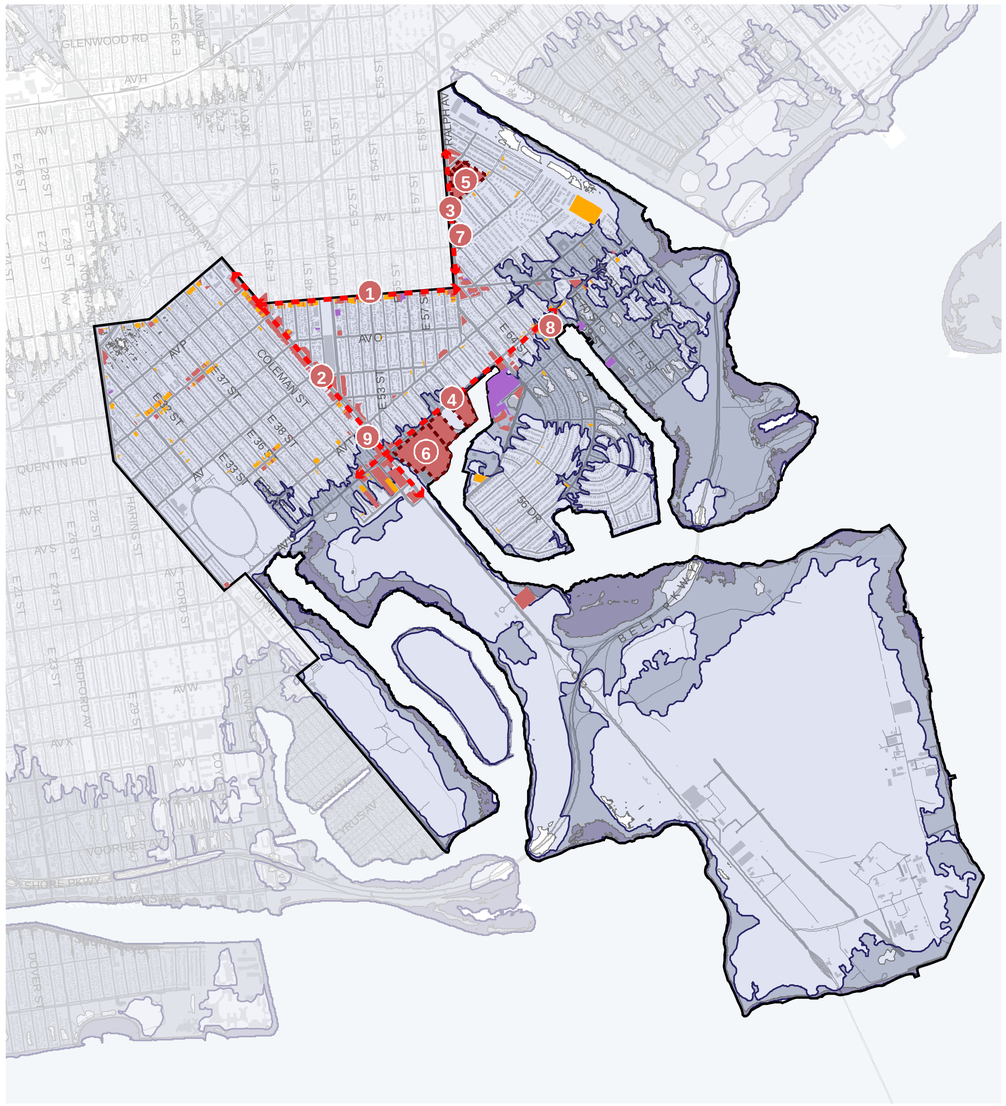
Housing

Questions	Initial project or recommendation ideas?
Would you benefit from homeowner technical assistance and education (e.g., certified assistance in assessing your home resiliency needs, learning more about flood insurance, or finding other flood insurance options)?	**Example:** Create an education and technical assistance program to help homeowners assess housing resiliency needs and repairs, flood insurance rates, and available funding options. **Example:** Establish a grant or low-cost loan program to help residents make resiliency upgrades to their homes.

Economic Development

Strategy: Improve resiliency of commercial corridors

Existing Commercial Corridors



NY Rising Community Reconstruction Program
Southeast Brooklyn Waterfront Planning Area

- Planning Area
- Extent of High & Extreme Risk Areas

Economic Assets

- # Economic Assets
- Commercial Corridors (Flatbush Avenue, Avenue N, Avenue U, Ralph Avenue)
- Shopping Centers

NYSDOS Risk Areas

- Moderate
- High
- Extreme

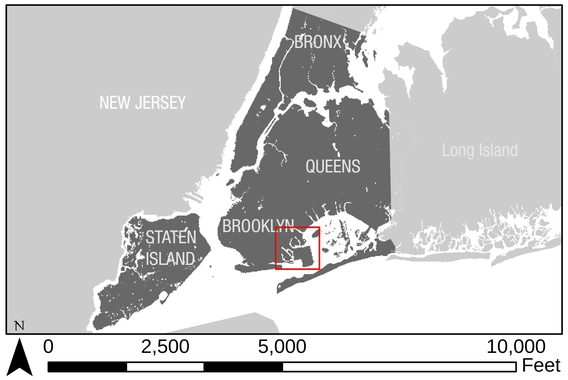
Economic Use

- Mixed Residential & Commercial
- Commercial & Office Buildings
- Industrial & Manufacturing

1 AVE N COMMERCIAL CORRIDOR
2 FLATBUSH AVE COMMERCIAL CORRIDOR
3 RALPH AVE COMMERCIAL CORRIDOR
4 AVE U COMMERCIAL CORRIDOR
5 GEORGETOWN SHOPPING CENTER
6 KINGS PLAZA SHOPPING CENTER
7 RALPH AVE SHOPPING CENTER
8 KEY FOODS
9 WALDBAUMS GROCERY

OUTSIDE OF THE PLANNING AREA:
10 KEY FOODS GROCERY

Source: New York State Department of State (DOS) Risk Assessment Areas; New York City Department of City Planning, MAPPluto v13.1; Buildings; Street Centerlines



Commercial Resiliency Options

Store-Level

Elevation of inventory

Backup power

Corridor-Level

Resilient street lighting

Resilient services

Flood protection barriers

Streetscaping to absorb stormwater and reduce flooding

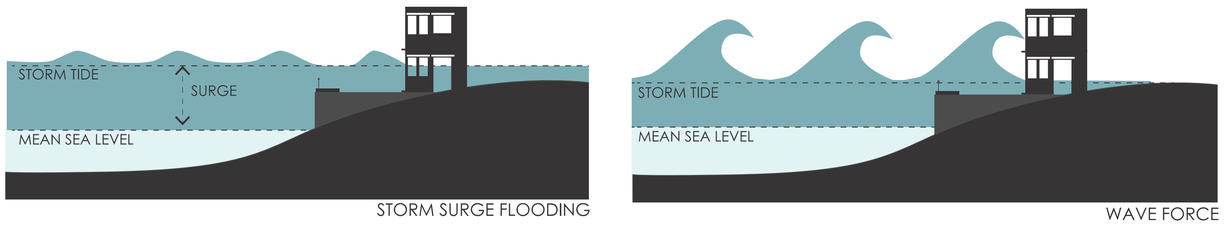
Economic Development

Questions	Initial project or recommendation ideas?
Which retail corridor provides the most vital services? What are its major strengths? What kinds of improvements are needed along this retail corridor? What is needed to support businesses throughout the Community?	**Example**: Implement an Avenue U pilot project, incorporating solar-powered cellphone charging stations, landscaping to enhance stormwater capture, flood protection mechanism and backup generators for stores.

Coastal Protection

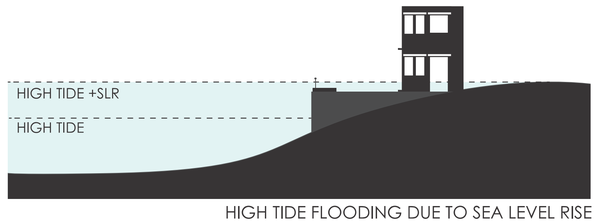
Strategy: Leverage existing assets and plans to stabilize the coastal edge and reduce flooding

Event-Based Hazards: Surge and Waves

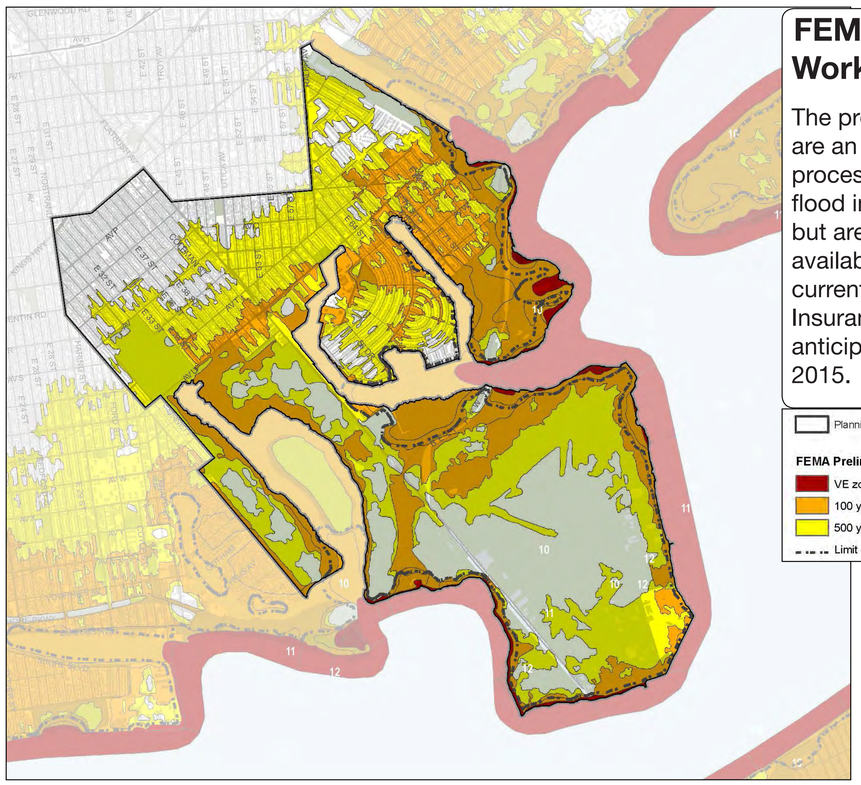


Source: NYC Department of CIty Planning, “Urban Waterfront Adaptive Strategies”

Gradual Hazards: Sea Level Rise



Source: NYC Department of City Planning, “Urban Waterfront Adaptive Strategies”



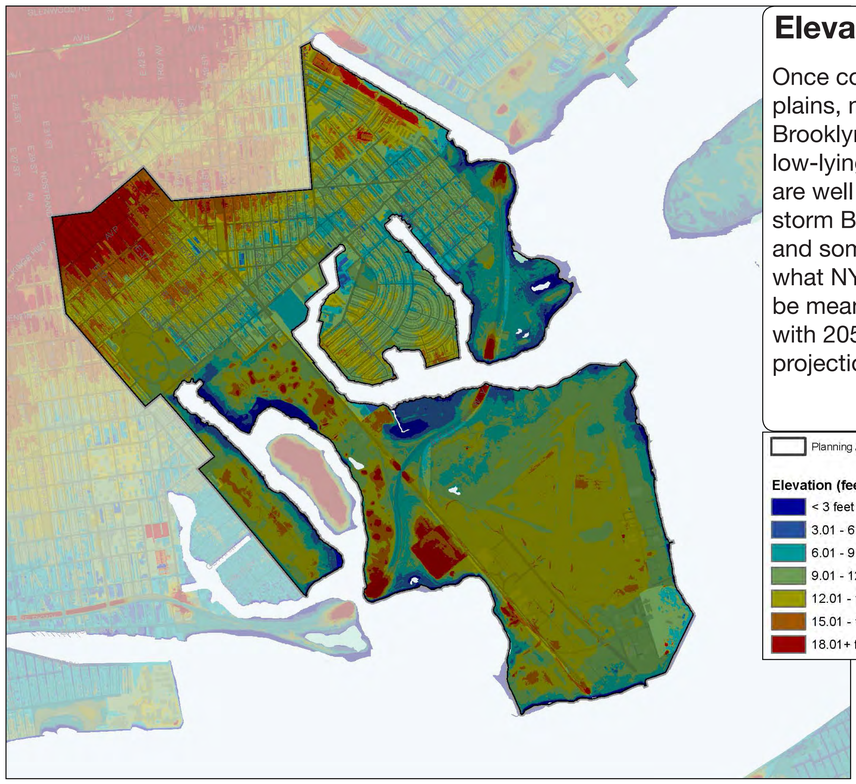
FEMA Preliminary Work Maps

The preliminary work maps are an interim step in FEMA’s process of developing final flood insurance rate maps, but are currently the best available information on current flood risk. Final Flood Insurance Rate Maps are anticipated to be release in 2015.

Planning Area

FEMA Preliminary FIRM Flood Zone

- VE zone (waves > 3')
- 100 year floodplain (1% annual chance of flooding)
- 500 year floodplain (0.2% annual chance of flooding)
- Limit of moderate wave action (1'-3' waves)



Elevation

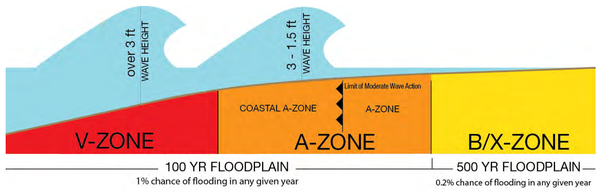
Once coastal wetlands and plains, much of Southeast Brooklyn Waterfront is a very low-lying area. Many areas are well below the 100 year storm Base Flood Elevation, and some areas are below what NYC estimates will be mean high water (MHW) with 2050 sea level rise projections.

Planning Area

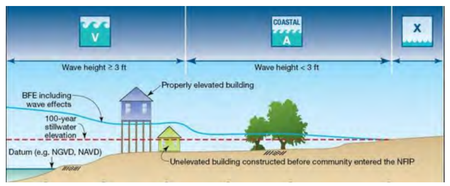
Elevation (feet from NAVD88)

- < 3 feet
- 3.01 - 6 feet
- 6.01 - 9 feet
- 9.01 - 12 feet
- 12.01 - 15 feet
- 15.01 - 18 feet
- 18.01+ feet

Understanding FEMA Flood Risk Information



The **FEMA Flood Risk Zones** and how they are defined are illustrated above. The V and A zones together comprise the area with a 1% or greater chance of flooding each year. To put it in perspective, this is about 5 times as likely as getting a flush in 5 card poker. The V zone is also subject to waves over 3’ high.



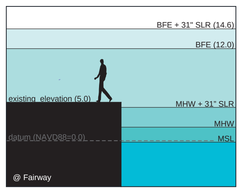
Source:

FEMA Region II Coastal Mapping Basics

http://www.region-2coastal.com/coastal-mapping-basics

The **Base Flood Elevation (BFE)** is the elevation to which floodwater is anticipated to rise during the base flood (in this case the 100 year storm). The BFE is the federal regulatory requirement for the elevation or floodproofing of structures. The relationship between the BFE and a structure’s elevation determines the flood insurance premium. In NYC, the Building Code and Zoning Code may require additional floodproofing or elevation.

Considering Future Change



FEMA flood risk maps reflect risk if a storm were to happen today. They do not take into account potential future change such as rising sea levels.

Sea level rise Baseline (2000-2004) 0 inches	Low-estimate (10th percentile)	Middle range (25th to 75th percentile)	High-estimate (90th percentile)
2020s	2 inches	4 to 8 inches	11 inches
2050s	7 inches	11 to 24 inches	31 inches

Based on 35 GCMs (24 for sea level rise) and two Representative Concentration Pathways. Baseline data are from the National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center (NCDC) United States Historical Climatology Network (USHCN), Version 2 (Menne et al., 2009). Sfewm are the 10th percentile, 25th percentile, 75th percentile, and 90th percentile 30-year mean values from model-based outcomes.Temperature values are rounded to the nearest 0.5°F, perciptation values are rounded to the nearest 5 percent, and sea level rise values rounded to the nearest inch.

Source: New York City Panel on Climate Change, “Climate Risk Information 2013”

http://www.nyc.gov/html/planyc2030/downloads/pdf/npcc_climate_risk_information_2013_report.pdf

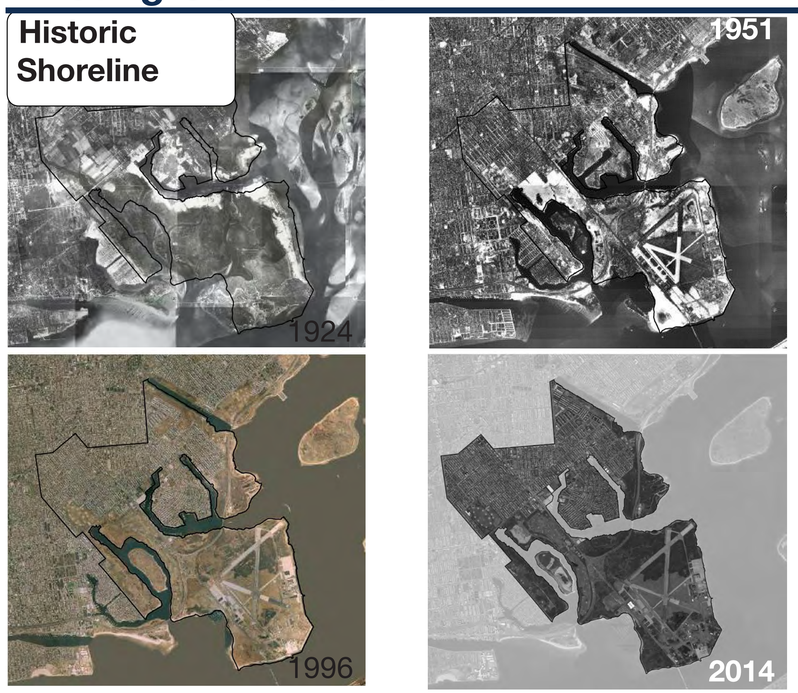
The New York City Panel on Climate Change estimates that there will be between 7 and 31 inches of sea level rise by 2050.

Southeast Brooklyn Waterfront
NY Rising Community Reconstruction Plan

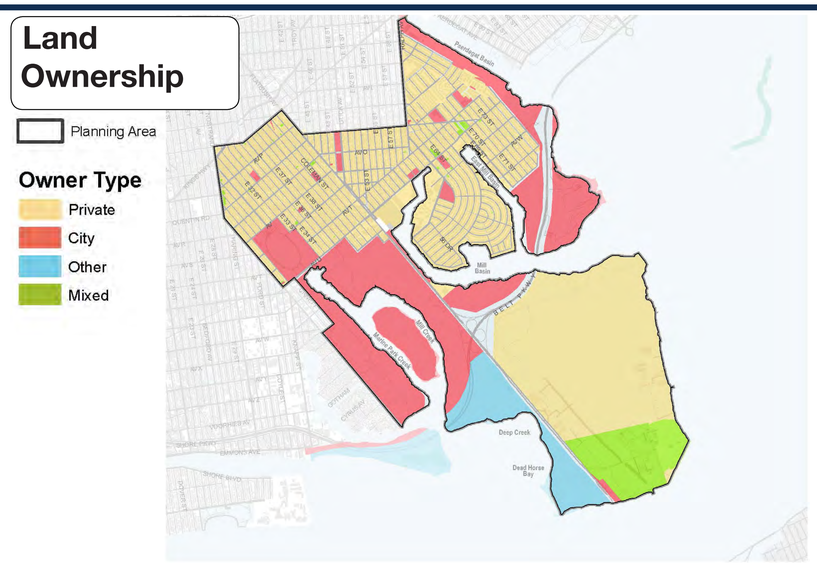
Coastal Protection

Strategy: Leverage existing assets and plans to stabilize the coastal edge and reduce flooding

Existing Conditions



As historical maps indicate, filled wetlands comprise a large amount of the Southeast Brooklyn Waterfront Planning Area. These filled areas correspond in large part to the flood plains and low-lying areas of the neighborhood.



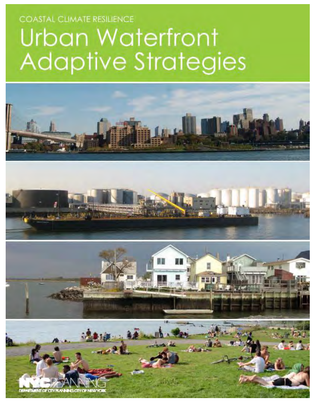
Data Source: NYC DCP MapPLUTO

Varied ownership indicates that multiple types of land owners would need to be engaged to provide coastal protection to the Community. In addition, public funding for shoreline protection on private property can be difficult and involve requirements for the property owner.

Data Source: NYC DCP

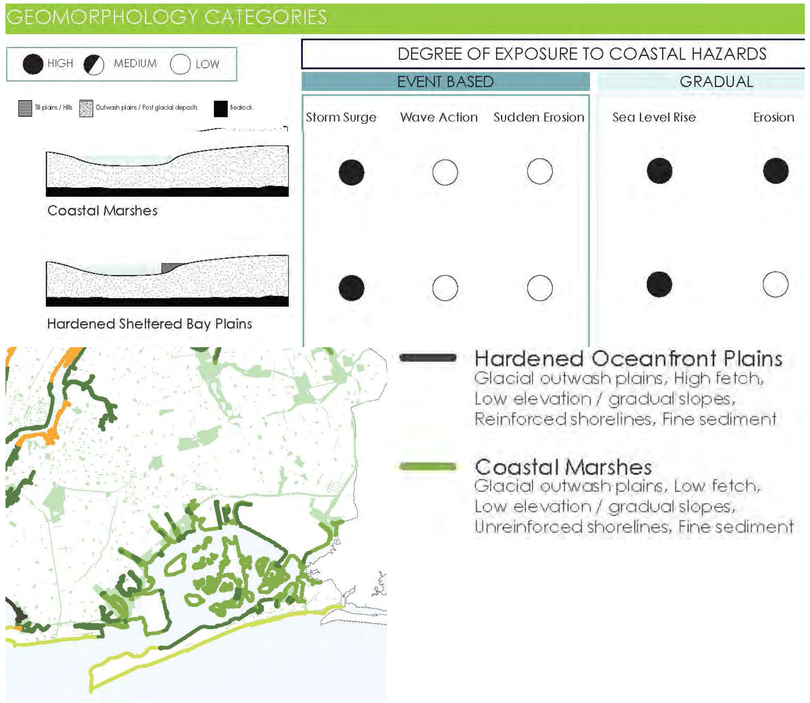
In Southeast Brooklyn Waterfront, the shoreline is varied and often inaccessible. Accommodating waterfront access and activity should be an important part of any proposed coastal protection measures.

Understanding the Edge



In June of 2013, The New York City Department of City Planning released "**Urban Waterfront Adaptive Strategies.**" This report is intended to be a guide for identifying and evaluating potential strategies for increasing the resilience of waterfront communities to coastal flooding and sea level rise. The report examined coastal conditions - the geomorphology as well as land use and density - and proposed adaptive strategies appropriate to different neighborhoods across the city.

Source: NYC Department of CIty Planning, "Urban Waterfront Adaptive Strategies"



Source: NYC Department of City Planning, "Urban Waterfront Adaptive Strategies"

Coastal Protection

Strategy: Leverage existing assets and plans to stabilize the coastal edge and reduce flooding

Potential Approaches

Protect Against Storm Surge

Berms/Levees

Berms/levees are earthen embankments located at the shoreline that provide protection from flooding. Berms are commonly used throughout the country along riverbanks to direct the flow of the river and protect communities. In New York City, there is a berm at Brooklyn Bridge Park that serves multiple purposes.

Tide Gates

Tide Gates are large scale infrastructure interventions that span the width of waterways. Tide gates allow water flow freely when the tide sets in one direction and automatically close and prevents water from flowing in the other direction. Tide gates must tie into high ground on both sides of the shoreline.

Floodwalls/Seawalls

Floodwalls/seawalls are permanent or deployable vertical walls used at the shoreline or upland to prevent flooding. Floodwalls are anchored into the ground and are designed to withstand flooding from either rivers or storm surge. Floodwalls sometimes have gates to allow access for a roadway or other right-of-way, which can be closed in advance of a flood event.

Attenuate Waves / Reduce Shoreline Erosion

Wetlands

Wetlands are a bank stabilization technique that uses plants, sand/soil, and limited use of hard structures to provide shoreline protection and maintain valuable habitat. These are an alternative to bulkheads or revetments that provide for a stable shoreline, resistant to erosion while also providing for intertidal habitat and coastal vegetation. Restored wetlands currently exist along Paerdegat Basin.

Living Shorelines

Living shorelines are submerged, or partially submerged, reef structures made of rock, concrete, or other materials, that are designed to provide marine habitat for plants, invertebrates, fish, and birds, while also attenuating waves. They are a product of recent research exploring the use of artificial reefs as a type of off-shore "living breakwater" that mimic naturally occurring oyster reefs.

Protect Against High Tides and Sea Level Rise

Raise Bulkheads

Bulkheads are vertical retaining walls intended to hold soil in place and allow for a stable shoreline. Approximately 25 percent of the New York City shoreline has a bulkhead. This includes the city's waterfront industrial areas as well as built-up commercial and residential areas and parkland.

Revetments

Revetments (also called "rip-rap") are shoreline structures typically made of stone rubble or concrete blocks placed on a sloped surface to protect the underlying soil from erosion and reduce the forces of wave action. Revetments are used commonly throughout New York City as an alternative to bulkheads, as they tend to be relatively low cost and environmentally more sensitive than a hard, vertical wall.

Thinking Holistically

When we discuss coastal protection, we have to consider the different types of threats and levels of risk we are protecting against. The most effective coastal protection will likely come from a **combination of layered strategies** that incrementally step down risk. Shoreline strategies will also be most effective when considered in concert with site- and building-level flood protection and adaptation strategies. Such combinations of strategies may also generate co-benefits and create opportunities to increase resiliency across multiple recovery functions.

Time-frame is also important. Many approaches to coastal protection take a long time to implement due to a variety of factors including cost, permitting, and the level of coordination required among agencies, communities and land owners. It is important to think about what you want to do in the short, medium and long term to reduce risk.

Coastal Protection

Strategy: Leverage existing assets and plans to stabilize the coastal edge and reduce flooding

Potential Strategies

1. Targeted coastal protection measures at vulnerable, floodprone locations

2. Comprehensive measures that “tie into” either one another or nearby high ground

3. Leveraging of existing coastal protection projects within Jamaica Bay

On the map to the right, write your ideas for how to protect Southeast Brooklyn Waterfront from storm surge and sea level rise.

Some key questions to consider are:

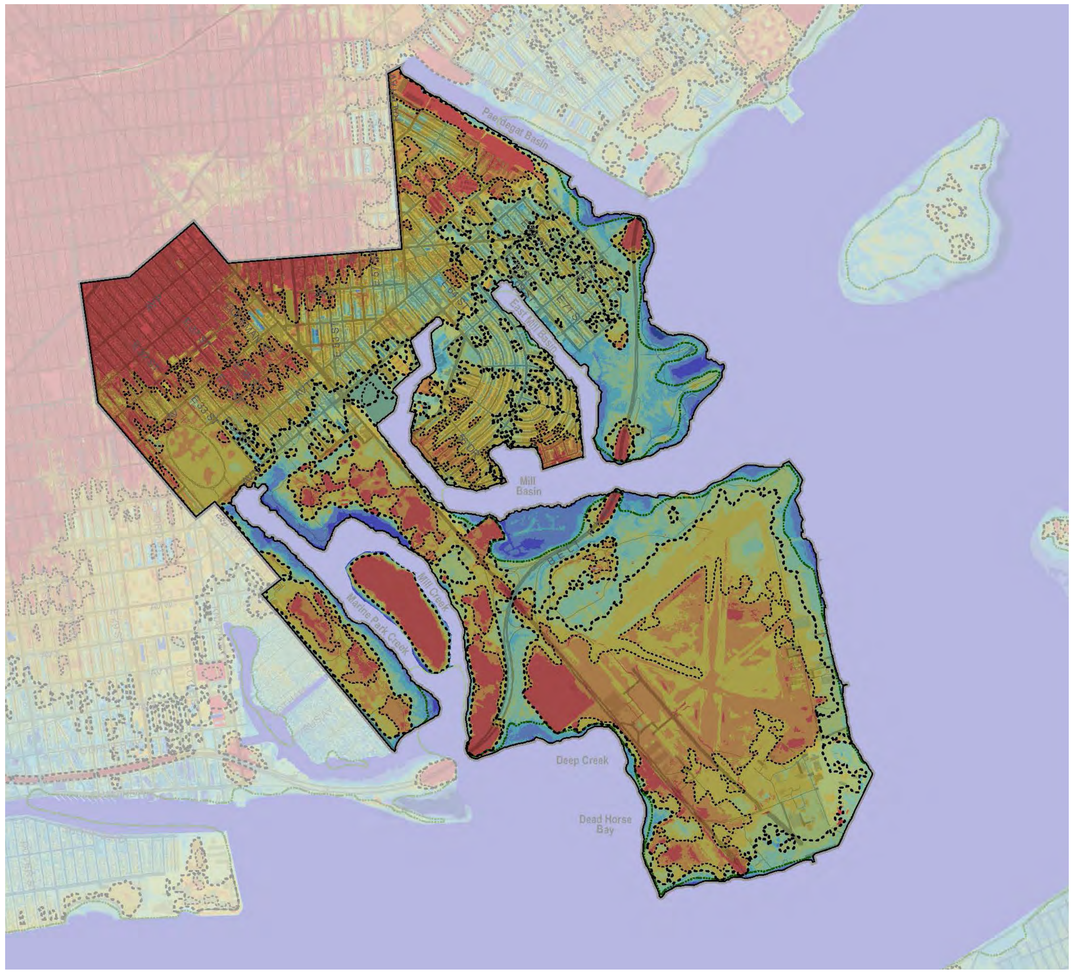
1. What areas are particularly vulnerable to coastal flooding and sea level rise?

2. Which coastal protection strategies would you like to see employed in your community?

3. What kinds of water-based activities are important to your community?

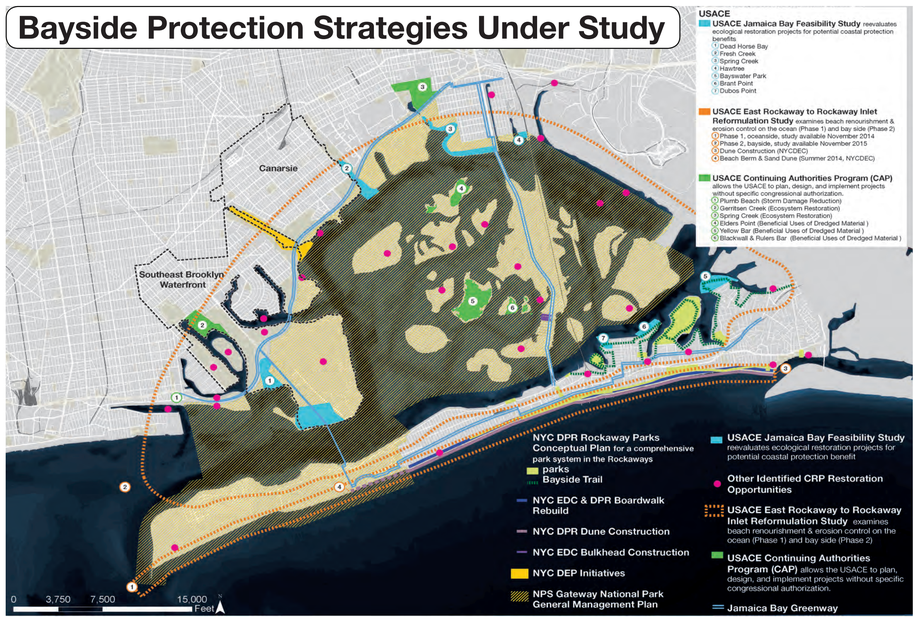
4. What kinds of shoreline-based activitities are important to your community?

Community Ideas



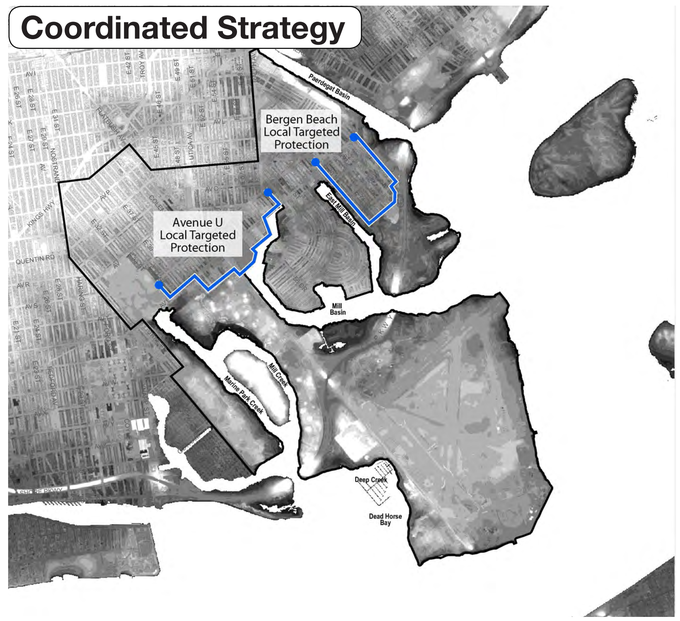
Source: NYC DCP MapPLUTO, FEMA Preliminary FIRM

Bayside Protection Strategies Under Study



Local Targeted Strategy

Coordinated Strategy

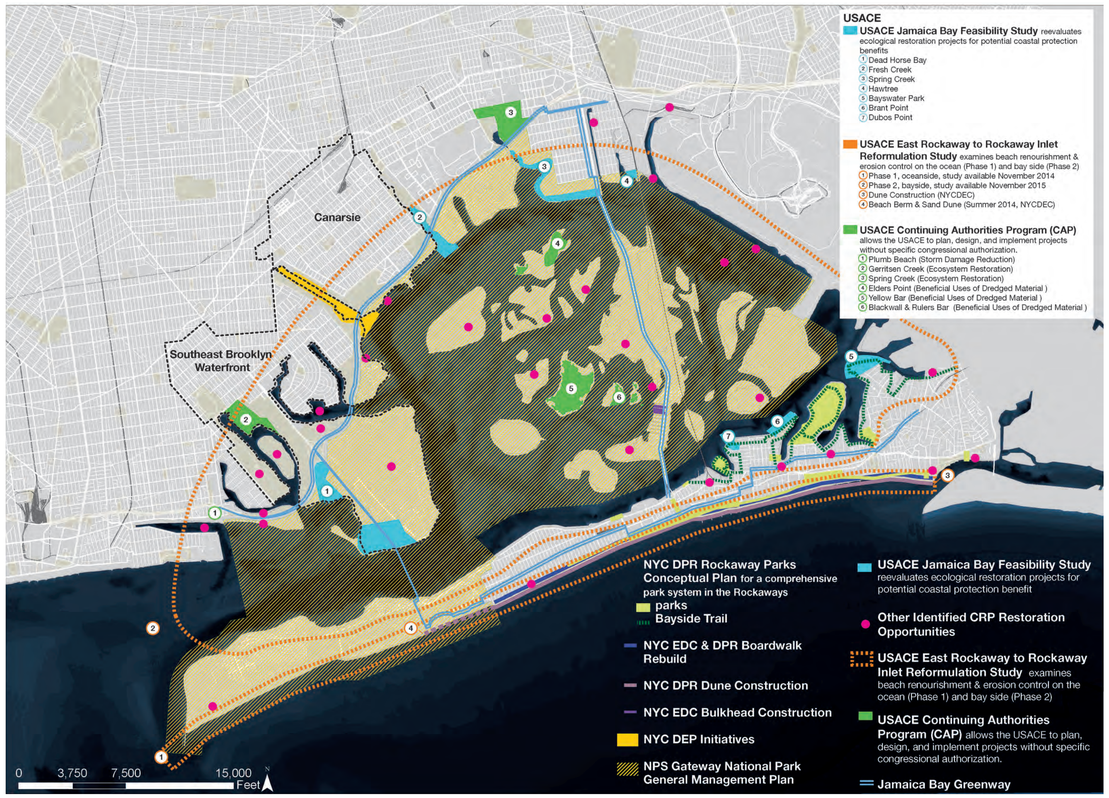


Southeast Brooklyn Waterfront
NY Rising Community Reconstruction Plan

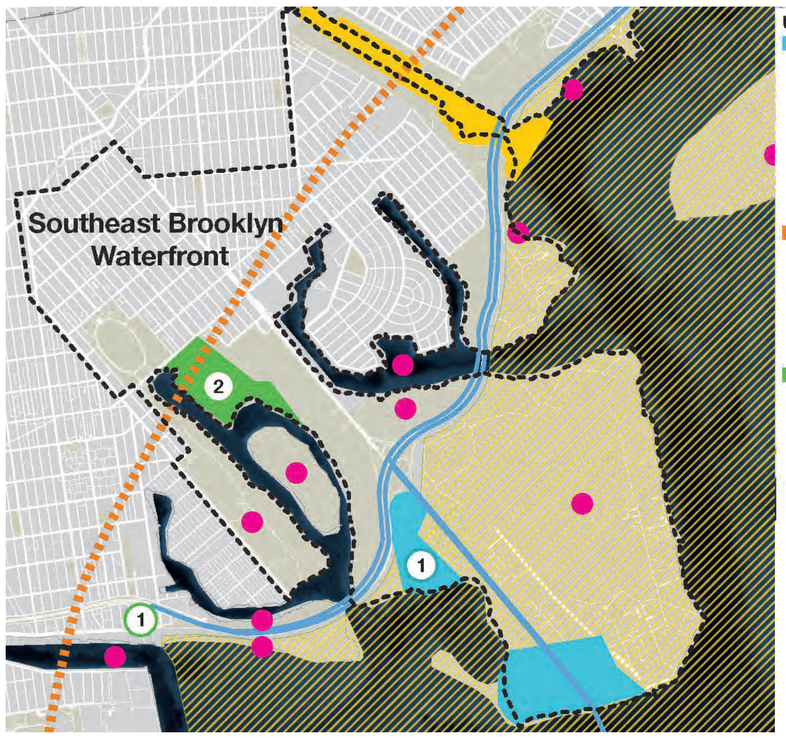
Jamaica Bay Plans and Projects

Understanding ongoing plans and projects within Jamaica Bay

Existing Plans and Projects



Detail of Southeast Brooklyn Waterfront



USACE

USACE Jamaica Bay Feasibility Study reevaluates ecological restoration projects for potential coastal protection benefits
1. Dead Horse Bay
2. Fresh Creek
3. Spring Creek
4. Hawtree
5. Bayswater Park
6. Brant Point
7. Dubos Point

USACE East Rockaway to Rockaway Inlet Reformulation Study examines beach renourishment & erosion control on the ocean (Phase 1) and bay side (Phase 2)
1. Phase 1, oceanside, study available November 2014
2. Phase 2, bayside, study available November 2015
3. Dune Construction (NYCDEC)
4. Beach Berm & Sand Dune (Summer 2014, NYCDEC)

USACE Continuing Authorities Program (CAP) allows the USACE to plan, design, and implement projects without specific congressional authorization.
1. Plumb Beach (Storm Damage Reduction)
2. Gerritsen Creek (Ecosystem Restoration)
3. Spring Creek (Ecosystem Restoration)
4. Elders Point (Beneficial Uses of Dredged Material)
5. Yellow Bar (Beneficial Uses of Dredged Material)
6. Blackwall & Rulers Bar (Beneficial Uses of Dredged Material)

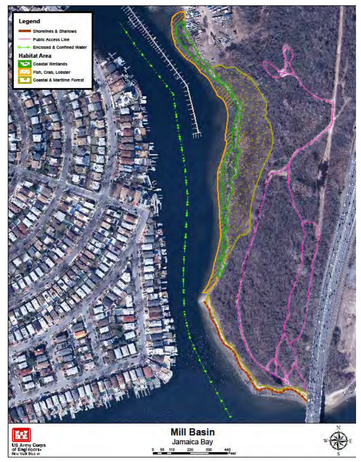
HRE CRP

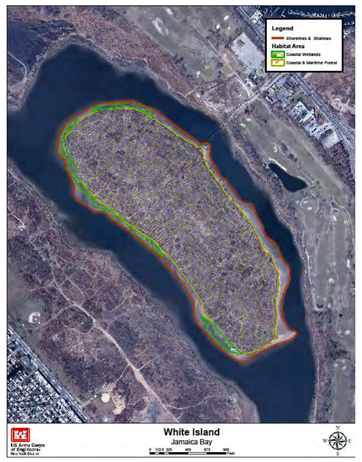
Ecosystem Opportunity Areas

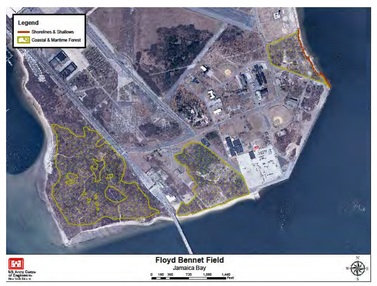
The Hudson Raritan Estuary Comprehensive Restoration Plan (HRE CRP), developed by the U.S Army Corps of Engineers (USACE) in partnership with the Port Authority of New York and New Jersey, is a master plan to guide ecosystem restoration efforts throughout the Jamaica Bay estuary. The HRE CRP identifies unfunded potential projects throughout the Bay. Originally released in 2009, the HRE CRP is a living document that is USACE is developing in conjunction with the Reformulation Study.

Opportunities within the Southeast Brooklyn Waterfront Planning Area include:

- Dead Horse Bay (shown below)
- Floyd Bennett Field (shown below)
- Four Sparrow Marsh
- Mill Basin (shown below)
- Bergen Beach (shown below)
- White Island (shown below)
- Marine Park
- Gerritsen Inlet







Source: USACE, “Hudson-Raritan Estuary Comprehensive Restoration Plan”

Southeast Brooklyn Waterfront
NY Rising Community Reconstruction Plan

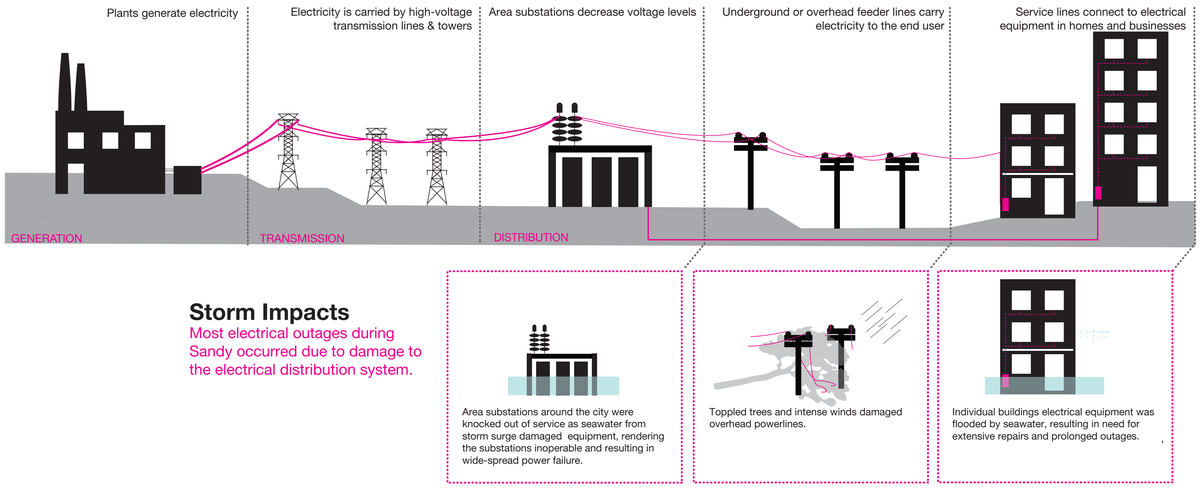
Coastal Protection

Questions	Initial project or recommendation ideas?
Where are vulnerable, low-lying locations in the Planning Area? Where are floodprone areas with large concentrations of housing, retail, and other assets that need to be protected?	**Example**: Produce a coastal protection study, considering approaches for providing comprehensive flood protection for the Planning Area.

Power

Strategy: Make the power supply more resilient and redundant

Existing Conditions



Storm Impacts
Most electrical outages during Sandy occurred due to damage to the electrical distribution system.

Area substations around the city were knocked out of service as seawater from storm surge damaged equipment, rendering the substations inoperable and resulting in wide-spread power failure.

Toppled trees and intense winds damaged overhead powerlines.

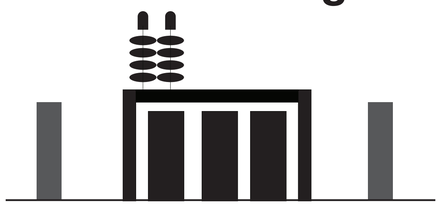
Individual buildings electrical equipment was flooded by seawater, resulting in need for extensive repairs and prolonged outages.

Community Ideas

Your Ideas Here

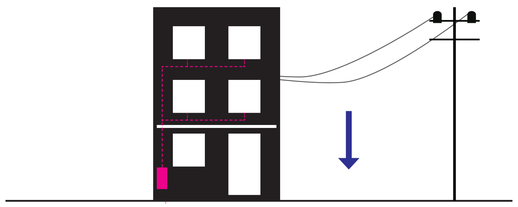
Potential Approaches

Protect the Existing Distribution System



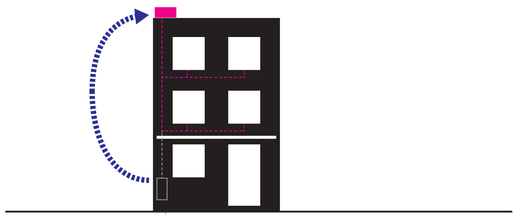
Substations

Substations can be protected from future flood damage in many ways: floodwalls or other measures can protect facility perimeters; equipment can be raised; back-up generators, flood sensors, and/or submersible equipment can be installed; and/or backup connections can be installed to be ready for temporary mobile substations.



Service Lines

The overhead distribution system can be protected from future damage by strengthening and relocating power lines, maintaining trees properly, or by relocating some or all of the system below ground. New smart-grid technologies can be installed on distribution systems, reducing the number of citizens affected when a powerline goes down.



Home Equipment

Home electrical equipment including switches, sockets, breakers, and wiring, can be raised to prevent future damage from floodwater, in addition to replacing it with submersible electrical equipment.

Alternative Energy Sources

Solar

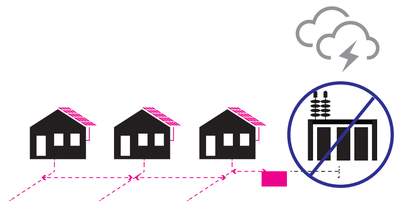
The roofs of large buildings as well as expansive parking lots are opportunity sites for large-scale solar generations. The top floor of buildings can be wired to use solar as off grid power during emergencies.

Wind

Wind power, when combined with an energy storage system, can feed into the existing grid while still functioning if the grid goes out.

Gas

Traditional gas-powered backup generators can still be an important source of power and can supplement other alternative energy sources.



Microgrids

A microgrid is a small portion of the larger electrical grid that can be disconnected from the rest of the grid during an emergency. The microgrid can therefore act as a self-sufficient unit when the larger grid is compromised. Potential microgrid locations include:

- Waterfront commercial connected to local residential

Power

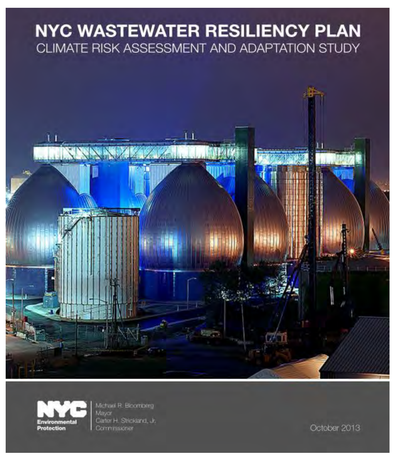
Questions	Initial project or recommendation ideas?
What were you most critical power needs post-Superstorm Sandy and during other power outages? Where does the Community need resilient lighting that will stay on even in the event of a power failure? Are there any critical facilities or community centers that should have back-up power? Where does the Community need extra lighting?	**Example**: Create a program to fund the purchase of fixed back-up generators at key community centers. **Example**: Install solar-powered lighting network on a critical street.

Drainage

Strategy: Improve drainage and reduce flooding from sewer back-up

Existing Plans: Citywide

NYC Wastewater Resiliency Plan (NYC DEP, 2013)



In response to the impacts of Superstorm Sandy, the NYC Department of Environmental Protection (NYC DEP) prepared this report to asses infrastructure risks and set forth a framework to implement protective measures for NYC's wastewater system. The report provides a facility by facility assessment of the risks and type and cost of measures to reduce flood damage to wastewater treatment plants (WWTP) and pump stations at risk from flooding.

State of the Sewers Report (NYC DEP, 2012 & 2013)

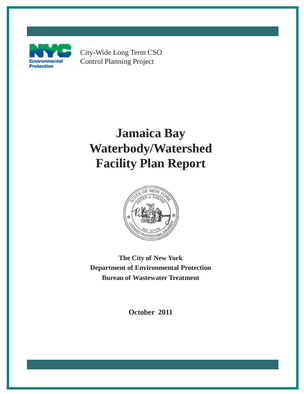
NYC DEP operates and maintains 7,500 miles of sewers that convey an average of 1.3 billion gallons of wastewater per day to 14 in-city wastewater treatment plants. In 2012, NYC DEP released the first State of the Sewers report to describe the innovative tools and strategies we use to operate the sewer system efficiently and effectively. Over the last year, NYC DEP has implemented new programs and continued to improve the way we operate and maintain the sewer system.

NYC Green Infrastructure Plan (NYC DEP,

In 2010, NYC DEP began implementing a citywide Green Infrastructure Program to manage stormwater runoff that would otherwise discharge into the combined sewer system and contribute to combined sewer overflows (CSOs). Green infrastructure is a cost-effective way to improve the quality of New York City's waterways while bringing multiple benefits to local communities, including improved air quality, increased shade, and cooler temperatures during the summer, enhanced neighborhood aesthetics and economic opportunities for green jobs. NYC DEP releases annual updates on the city's progress and projects each year.

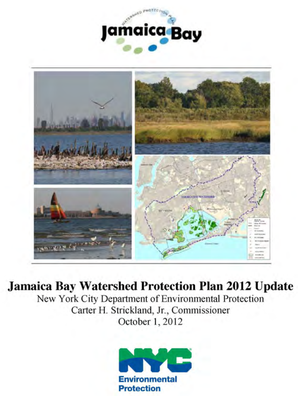
Existing Plans and Projects: Jamaica Bay and Southeast Brooklyn Waterfront

Jamaica Bay and CSO Tributaries Waterbody / Watershed Facility Plan (NYC DEP, 2011)



This plan was prepared in response to a "Combined Sewer Overflow Consent Order" from New York State Department of Environmental Conservation which requires NYC to develop plans to improve water quality in watersheds impacted by Combined Sewer Overflows (CSOs) in the City. It outlines strategies to improve water quality in Jamaica Bay and its tributaries. Strategies include a variety of initiatives to address CSO events in the 26th Ward Service area and Fresh Creek watershed.

Jamaica Bay Watershed Protection Plan (NYC DEP, 2007, updated 2010)



This plan outlines NYC's strategies and projects aimed at restoring and maintaining the water quality and ecological integrity of Jamaica Bay. Regular updates / progress reports on the plan, which provide updates on ongoing initiatives and specific projects, have been published in 2008, 2010, and 2012.

Paedergat Basin CSO Facility, Natural Area and Ecology Park (NYC DEP, recently completed)

The Paerdegat Basin Combined Sewer Overflow (CSO) Facility opened in 2011. The retention facility will prevent up to 50 million gallons of combined sewer overflows during heavy rain from being discharged into Paerdegat Basin. The stored wastewater will be retained in underground tanks at the facility until the wet weather subsides, when it will be pumped to the nearby Coney Island Wastewater Treatment Plant. A nature preserve and Ecology Park are also being constructed--and are near completion.

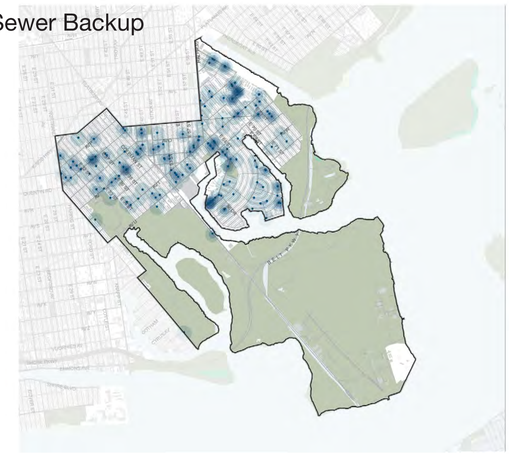
Drainage

Strategy: Improve wastewater and stormwater management

Issues: Drainage Complaints

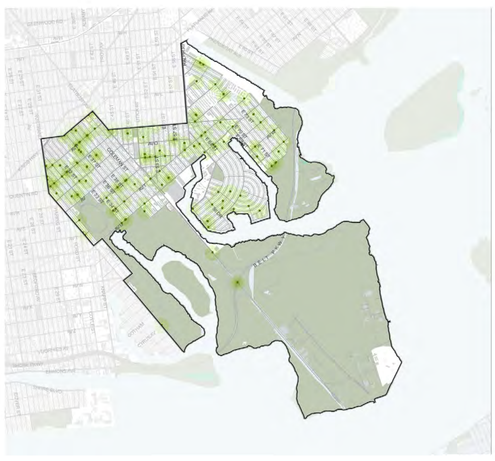
Drainage complaints to 311 for 1 year (July 2013 - June 2014).
Is this where you experience these drainage issues?

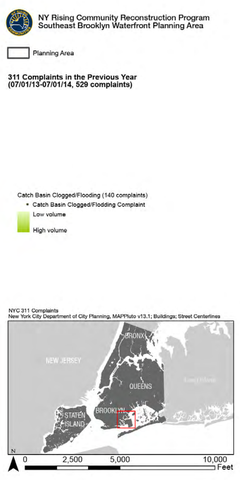
Sewer Backup



Street Flooding

Catch Basin Clogging/Flooding

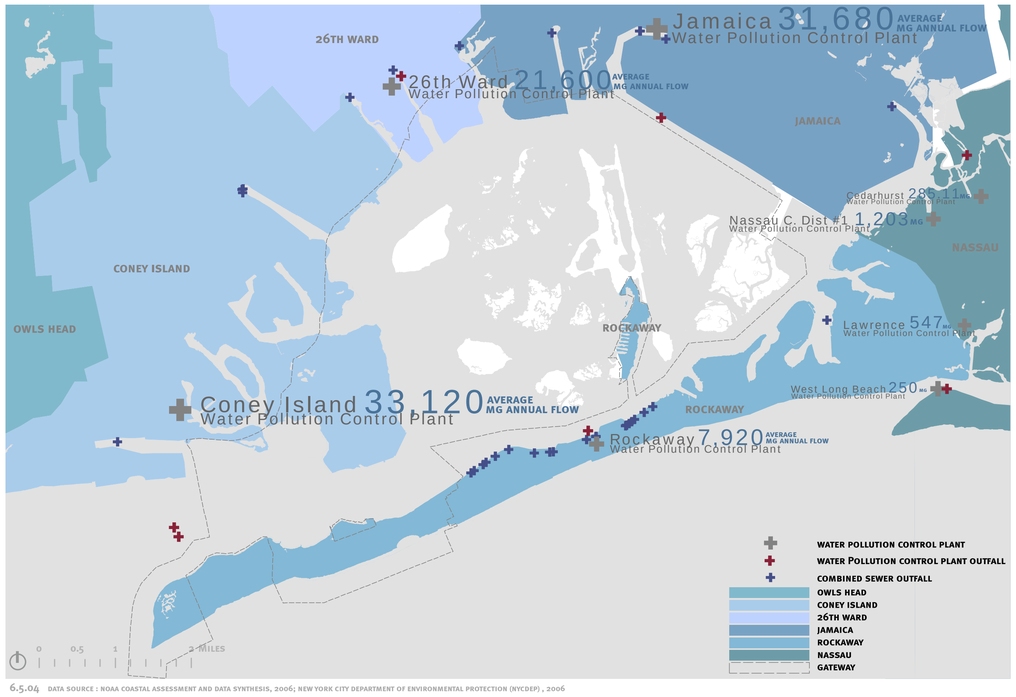




Existing Conditions: The Wastewater and Stormwater Systems

Wastewater Treatment Plants and Service Areas in Jamaica Bay

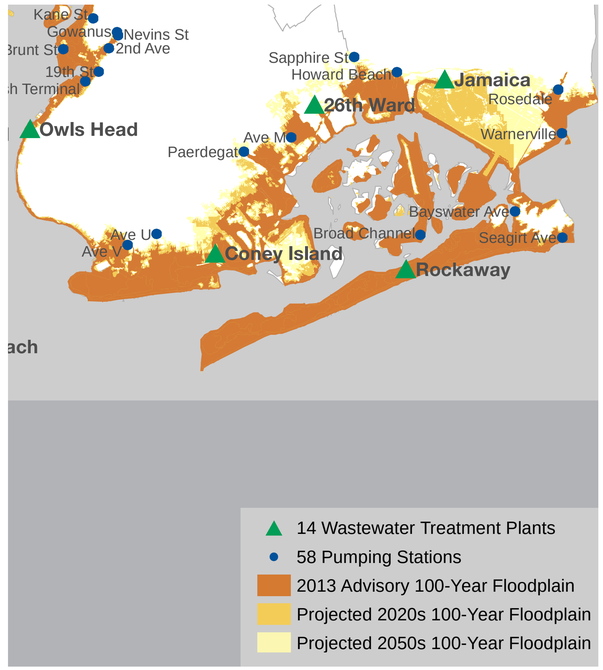
SOURCE: "Envisioning Gateway." Orff, Williams, et. al. Columbia University Graduate School of Architecture, Planning and Preservation



6.5.04 DATA SOURCE : NOAA COASTAL ASSESSMENT AND DATA SYNTHESIS, 2006; NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION (NYCDEP) , 2006

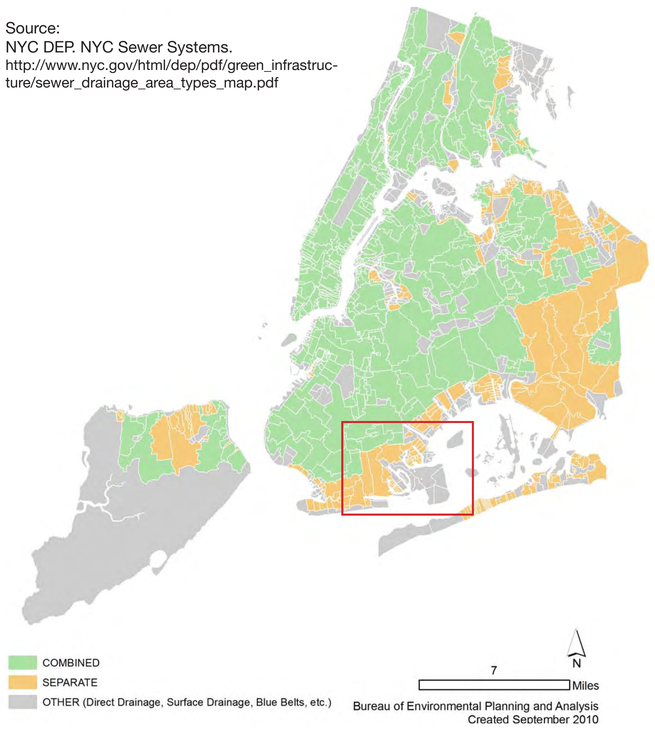
Wastewater facilities At-Risk of Storm Surge Inundation

SOURCE: NYC DEP, *Wastewater Resiliency Plan (2013)*



The Planning Area is on a Mostly Separated Sewer System

Source:
NYC DEP. NYC Sewer Systems.
http://www.nyc.gov/html/dep/pdf/green_infrastructure/sewer_drainage_area_types_map.pdf

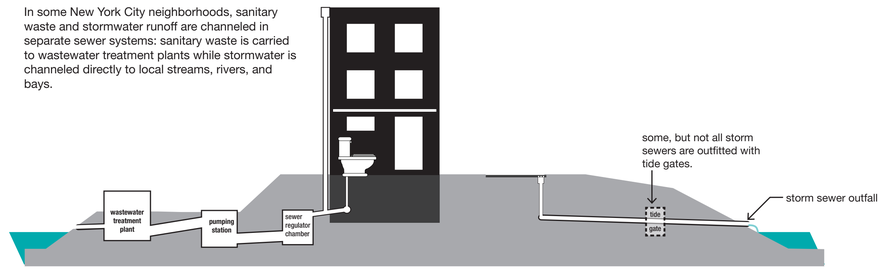


Bureau of Environmental Planning and Analysis
Created September 2010

Southeast Brooklyn Waterfront

(mostly) separated sewer areas

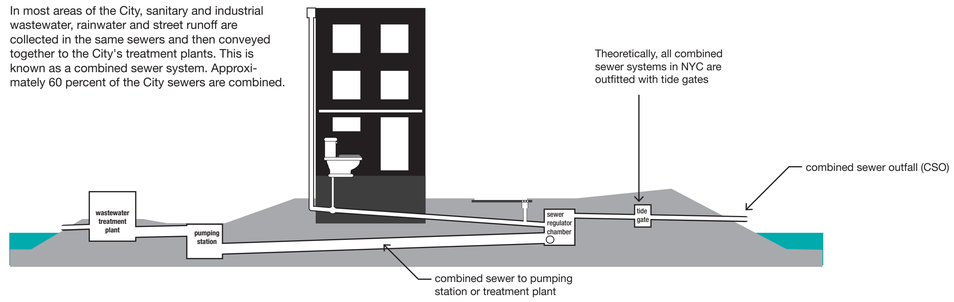
In some New York City neighborhoods, sanitary waste and stormwater runoff are channeled in separate sewer systems: sanitary waste is carried to wastewater treatment plants while stormwater is channeled directly to local streams, rivers, and bays.



Elsewhere in New York City

combined sewer areas

In most areas of the City, sanitary and industrial wastewater, rainwater and street runoff are collected in the same sewers and then conveyed together to the City's treatment plants. This is known as a combined sewer system. Approximately 60 percent of the City sewers are combined.

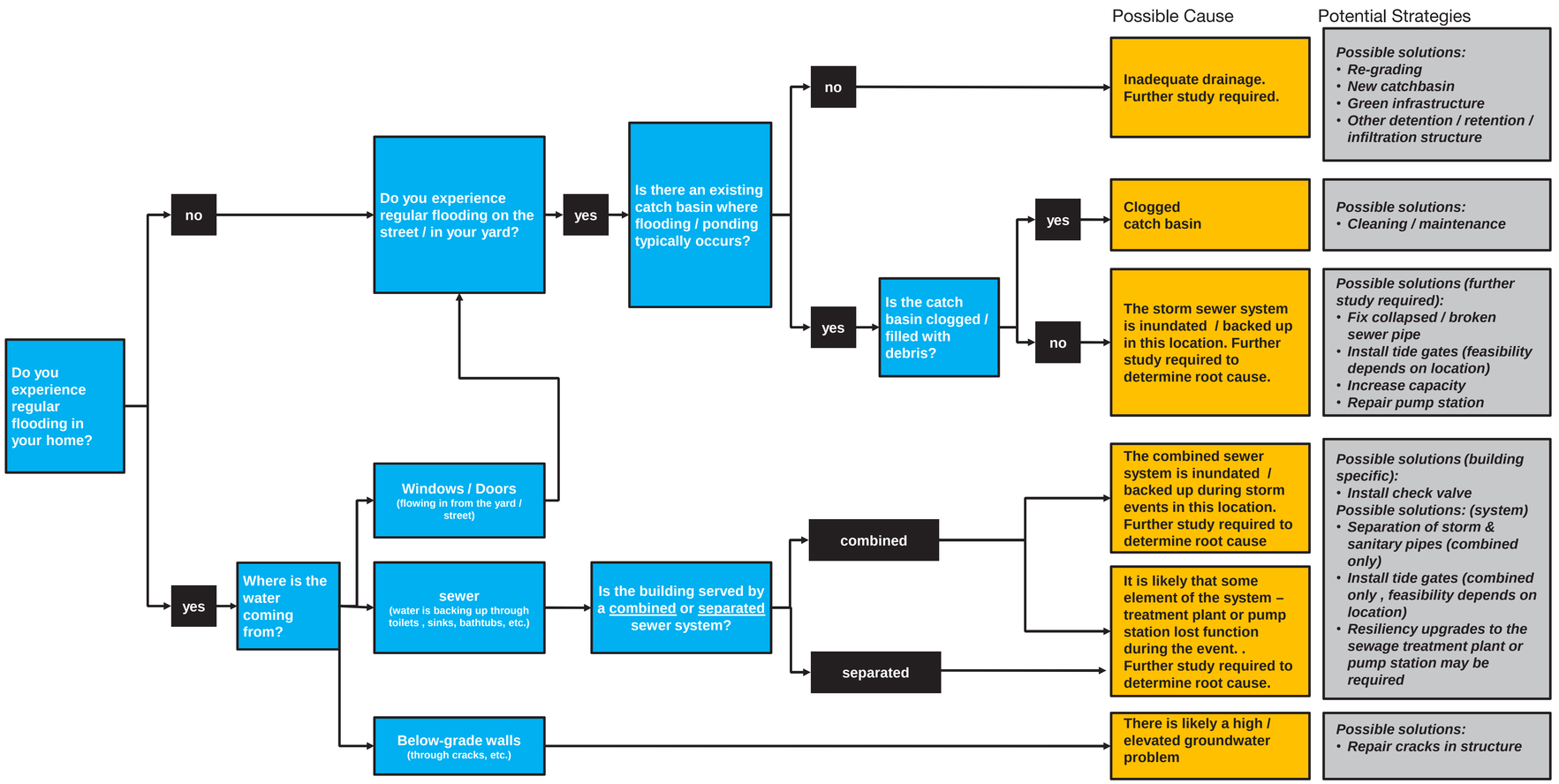


Southeast Brooklyn Waterfront
NY Rising Community Reconstruction Plan

Drainage

Strategy: Improve drainage and reduce flooding from sewer back-up

Diagnosing the Problem



NOTE: these are possible causes and potential solutions only; careful investigation of the specific issue and location would be required to diagnose the problem and recommend a solution.

Potential Approaches

Heavy rainfall events:

- **Improve maintenance of stormdrains:** regularly remove sediment, garbage etc. which clog drains and reduces capacity of system
- **Repair / upgrade system:** Identify pinch points in the system – locations where pipes are under capacity, or damaged – and target these locations for upgrades
- **Increase on-site stormwater detention and retention**: Measures such as green roofs, blue roofs, bioswales, and rain gardens can reduce runoff within the watershed and provide additional capacity, reducing the amount of stormwater that flows to low points and into the drainage system

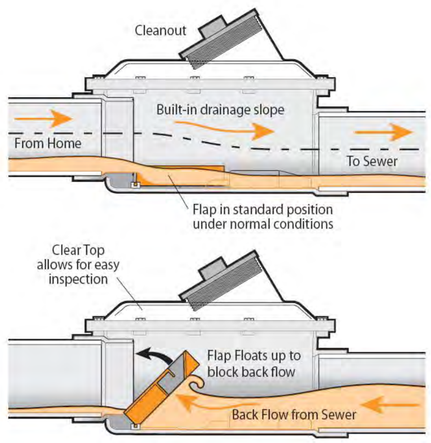
High tide events:

- **If tide gates are feasible/effective, ensure functionality of tide gates:** ongoing maintenance to ensure that tide gates work properly during high tides and storm events

Surge events:

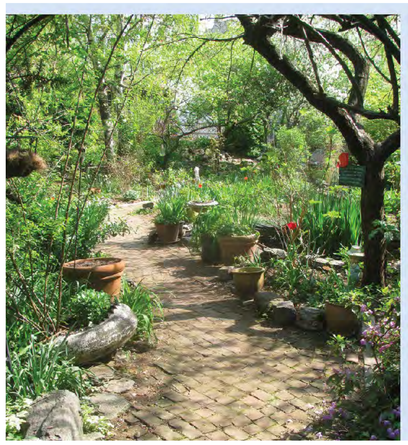
- **Protect pump stations and wastewater treatment plants**: protecting wastewater treatment plants and pump stations can ensure the sewer system is back up and running immediately after the storm event
- **Install check valves in homes and buildings**

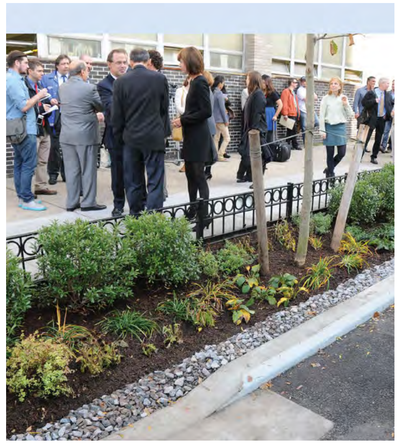
Example Projects and Recommendations



Install sewer connection cut-off valves (check valves) at individual properties

SOURCE: NY Rising Community Reconstruction Plan for Gerritsen Beach and Sheepshead Bay





Create bioswales and raingardens to capture stormwater

SOURCE: NYC DEP

install storage tanks and rainbarrels to retain stormwater during heavy rain events

SOURCE: CULTEC, NYC DEP

Drainage

Strategy: Improve wastewater and stormwater management

Where should stormwater management projects be located? Place your ideas on this elevation map.

NY Rising Community Reconstruction Program
Southeast Brooklyn Waterfront Planning Area

Planning Area

Buildings

Elevation (NAVD88)
0
10
20

Limit of floodplains
100 year floodplain
(1% annual chance of flooding)
500 year floodplain
(.2% annual chance of flooding)

SEBW Community is serviced by
Coney Island Wastewater Treatment Plant

Pumping Stations (in the 100 year floodplain)

Combined Sewer Outfalls (CSOs)

CSO detention Facilities

Drainage

Questions	Initial project or recommendation ideas?
Do you feel there is adequate knowledge and education among community members around backup issues and mitigation? Do you experience major stormwater runoff from your roof during regular rain events and in the aftermath of Superstorm Sandy?	**Example:** Create a residential resiliency technical assistance and funding program, including education around backup management and funding toward the purchase of in-home check valves. **Example**: Implement stormwater capture measures, including bioswales and permeable paving, along major thoroughfares, to reduce flooding.

Innovation Station

Got a big (or small) idea that does not fit anywhere else? Place your ideas here!

Strategies

What should NY Rising in Southeast Brooklyn Waterfront focus on? Vote for your 3 most important strategies.

1. **Improve stormwater and wastewater management to prevent flooding and backup**
2. **Leverage existing assets (including wetlands, plants/ vegetation) to stabilize coastal edge and reduce flooding**
3. **Make power supply more resilient and redundant**
4. **Enhance emergency preparedness and response through reliable communications, centralized spaces, transportation coordination, and strengthened capacity of existing organizations/ programs**
5. **Improve residential resiliency through education, technical assistance, and funding**
6. **Discourage development at at-risk undeveloped locations**
7. **Avoid, minimize, and mitigate any potential negative impacts from new projects**
8. **Improve resiliency of commercial corridors**
9. **Ensure access to food and critical supplies**