Coney Island Creek Resiliency Study

March 9, 2016
OneNYC: Our Four Visions
On April 22\textsuperscript{nd}, Mayor Bill de Blasio released a new long-term strategic plan to address our most pressing challenges and builds on prior efforts.

Our Growing, Thriving City

Our Just and Equitable City

Our Sustainable City

Our Resilient City
OneNYC: Our Resilient City

This plan builds on existing efforts and strengthens and expands the City’s commitment to a multilayered approach to resiliency.

<table>
<thead>
<tr>
<th>Neighborhoods</th>
<th>Every city neighborhood will be safer by strengthening community, social, and economic resiliency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buildings</td>
<td>The city’s buildings will be upgraded against changing climate impacts</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>Infrastructure systems across the region will adapt to enable continue services</td>
</tr>
<tr>
<td>Coastal Defense</td>
<td>New York City’s coastal defenses will be strengthened against flooding and sea level rise</td>
</tr>
</tbody>
</table>
Sea Level Rise and Storm Surge

The City’s 520 miles of coastline is vulnerable to flooding from coastal storms...

Projected floodplain for the 2020s, 2050s, 2080s, and 2100

<table>
<thead>
<tr>
<th>100-year Floodplain*</th>
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</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td>2013 PFIRMs</td>
</tr>
<tr>
<td>Residents</td>
</tr>
<tr>
<td>Jobs</td>
</tr>
<tr>
<td>Buildings</td>
</tr>
<tr>
<td>1-4 Family</td>
</tr>
<tr>
<td>Floor Area</td>
</tr>
<tr>
<td>(Sq Ft.)</td>
</tr>
</tbody>
</table>

* Numbers are rounded for clarity

Over 171,000 buildings and 1.2 million New Yorkers projected to live in the floodplain by 20100.
Current Resiliency Investments

There are over $2 Billion in resiliency initiatives underway in Coney Island

**CURRENT INITIATIVES**

**Critical Infrastructure**
- A. MTA Rail Yards Floodwall ($20M+)
- B. Coney Island Hospital ($923M)
- C. NYCHA ($720M)

**Stormwater Management**
- D. Amended Drainage Plan Implementation, ($240M)
- E. Water Quality Improvements ($210M)

**Neighborhood Investments**
- F. Small business recovery and resiliency
- G. Housing Recovery
- H. New York Aquarium ($62 Million+)

**Regional Resiliency**
- I. T-groins and Beach Renourishment ($25M)
- J. Jamaica Bay Reformulation Study
- K. Coney Island Creek Resiliency Study
- L. Beachside Resiliency Study
Coney Island Creek Resiliency Study

What is this study?

- A first step in a long-term strategy to protect the life, property, and livelihoods of Coney Island & Gravesend communities from the effects of storm surge and sea level rise.

- A shared City-community agenda for resiliency grounded in sound science and developed to USACE standards with a goal of FEMA certification.

- An opportunity to improve the ecology and water quality of the Creek while strengthening the potential for community resilience by enhancing public spaces.

- A critical component of a comprehensive regional solution for coastal flooding that extends from Jamaica Bay to the low-lying areas of Gravesend Bay to Manhattan Beach.
Coney Island Creek Resiliency Study

Specific Goals of the Study:

1. Test the feasibility of the flood mitigation concept presented in A Stronger More Resilient New York as Southern Brooklyn Initiative #5.

2. Consider community benefits in a comprehensive and coordinated approach.

3. Identify immediate action items to enhance resiliency in the near-term.

4. Define implementation strategy for long-term vision to inform City and United States Army Corps of Engineers (USACE).

5. Conduct robust community engagement, empowering and mobilizing community stakeholders around the topic of resiliency.
Community Preferences & Guiding Principles

Resiliency for Coney Creek means: A comprehensive ecologically resilient and reliable flood mitigation measures for the Coney Island Community.

- Improved water, sediment and soil quality
- Alternatives should equally protect the community
- A regional solution, and an understanding of tradeoffs
- Enhanced recreational spaces and educational opportunities
- An in-depth analysis of hazardous materials disposal
- Investigating the opportunity for dunes and other beachside resiliency measures
- A low-maintenance and reliable system
- A solution that builds off of existing parks programming and planned improvements
- A solution that does not preclude potential ferry service
- Workforce development opportunities and local job access
What are we solving for?

The Creek’s low-lying shoreline makes it vulnerable to flooding.

- Majority of the shoreline has a ground elevation between 6 and 9 feet
- Ground elevations below 6 feet are easy entryways for flood waters during low- and high-frequency storm events

Historic wetlands (Coney Creek 1891)

Topography of primary study area
What are we solving for?

Storm surge and sea level rise vulnerabilities

Flood Depths
(100-year)

Flood Depths
(100-year + 3 feet sea level rise)
What are we solving for?

The Creek runs alongside important community facilities, critical infrastructure, and vulnerable populations.
What we found.

Shoreline conditions vary by type and condition, with some areas of critical concern.
What we found.

Dozens of permitted and unpermitted sewer outfalls leads to significant stormwater drainage into the Creek.
What we found.

Tidal flushing is constrained by narrow and angular passages, reducing water quality.
What we found.

Remedial activities at sites along the Creek have improved soil quality, but additional testing would be required for a project to move forward.
What we found.

The Creek is an ecologically diverse habitat for a variety of species.
Additional Key Study Findings

What did we learn during the study?

1. Regional Resiliency planning is critical and results in an estimated project benefit of $4.8B in avoided damages.

2. A FEMA certified flood protection system is feasible.

3. Stormwater drainage and surface water mitigation must be an integral part of all flood protection strategies.

4. An barrier with a wide-opening, that remains open, is required to avoid negative impacts on water quality.

5. To reduce maintenance and increase reliability, fewer parts that need to be deployed or operated is preferred.

6. Community and stakeholder involvement is a critical element in furthering a long-term flood protection strategy.

7. There are several significant cost drivers leading to large cost uncertainties depending on alternative.
Flood Mitigation – Kit of Parts

Components of a flood mitigation system:

- Floodwall
- Bulkhead
- Levee
- Floodgate / Tidal Barrier
- Living Shoreline
- Stone Armor
- Groin
- Wetlands
- Deployable Solutions
Alternatives for Flood Mitigation System
Areas within the red line “line of protection” is behind the flood mitigation system.*

<table>
<thead>
<tr>
<th>GOALS</th>
<th>Calvert Vaux Alignment</th>
<th>Six Diamonds Alignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flood risk reduction and reliability</td>
<td>- Entire study area protected</td>
<td>- Entire study area protected</td>
</tr>
<tr>
<td></td>
<td>- Operable gates required maintenance</td>
<td>- Fewer operable gates required for increased reliability</td>
</tr>
<tr>
<td>Ecological Considerations</td>
<td>- Wide opening / Always open</td>
<td>- Wide opening / Always open</td>
</tr>
<tr>
<td></td>
<td>- More pristine environment impacted</td>
<td>- Less ecology disturbed</td>
</tr>
<tr>
<td>Community Benefits</td>
<td>- Potential for additional means of egress</td>
<td>- Potential for additional means of egress</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Lower height required, better public safety and accessibility</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Opportunity to enhance parks</td>
</tr>
<tr>
<td>Cost Considerations</td>
<td>- High Cost $$$</td>
<td>- Lower Cost $$</td>
</tr>
<tr>
<td>Implementability</td>
<td>- Permitting challenges</td>
<td>- Reduced permitting challenges</td>
</tr>
</tbody>
</table>

*Additional alignments considered
Flood Mitigation

Resiliency investments can also enhance public spaces.
Flood Mitigation

A comprehensive system to protect the entire peninsula will have to incorporate a variety of strategies.
Flood Mitigation

Resiliency investments can also enhance public spaces.
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Resiliency investments can also enhance public spaces.
### Creek Study Phase 1 Implementation

#### Resiliency Initiatives for 2016

<table>
<thead>
<tr>
<th>Implementation Funding</th>
<th>Beachside Resiliency</th>
<th>Pumping Station</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Implementation Funding" /></td>
<td><img src="image2.png" alt="Beachside Resiliency" /></td>
<td><img src="image3.png" alt="Pumping Station" /></td>
</tr>
<tr>
<td>Status: City has allocated $32 M for Coney Island shoreline protection</td>
<td>Status: EDC/Parks planning in progress</td>
<td>Status: EDC/DCAS planning in progress</td>
</tr>
<tr>
<td>Next Step: The City will issue a request for proposal (RFP) in Spring 2016</td>
<td>Next step: Investigate alternatives and cost estimates</td>
<td>Next step: Test structural useful life; identify activation opportunities</td>
</tr>
</tbody>
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<tr>
<th>Stormwater Management</th>
<th>Resiliency Education</th>
<th>Small Business &amp; Resident Support</th>
<th>Coney Tie-In for Jamaica Bay</th>
</tr>
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<tbody>
<tr>
<td><img src="image4.png" alt="Stormwater Management" /></td>
<td><img src="image5.png" alt="Resiliency Education" /></td>
<td><img src="image6.png" alt="Small Business &amp; Resident Support" /></td>
<td><img src="image7.png" alt="Coney Tie-In for Jamaica Bay" /></td>
</tr>
<tr>
<td>Status: NYCHA application for funding complete</td>
<td>Status: Coordination with educators</td>
<td>Status: Program in development by SBS and Center for NYC Neighborhoods</td>
<td>Status: Coordination with Army Corps ongoing</td>
</tr>
<tr>
<td>Next step: NYCHA obtain FEMA Phase I approval</td>
<td>Next step: Support curriculum on resiliency, ecology, and history</td>
<td>Next step: Launch assistance to 100 businesses &amp; residents</td>
<td>Next step: Include new “Coney Tie-In” in Jamaica Bay planning</td>
</tr>
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Key Next Steps

Ongoing coordination with federal, state, and local partners remains a City priority.

- The city will release the *Coney Island Creek Resiliency Study – Public Report* in the Spring 2016 and use it as a tool to secure additional funding for Coney Island resiliency measures.

  ➢ **For example:** The City will continue to strongly advocating alongside our federal, state and local elected officials for USACE to include Coney Island in their Rockaway Reformulation Study.

- The City will continue to work with our partners to advance *New York/New Jersey Harbor & Tributaries Feasibility Study*.

- The City will continue working with elected officials and community groups on planning for future Coney Island resiliency initiatives.

- The City will issue a request for proposal (RFP) to implement near-term shoreline protection measures in Spring 2016.