Presentation Agenda

• Overview

• Regional Resiliency

• Long-term Flood Protection Recommendations
  – Creek Side Alignment
  – Floodgate Typologies
  – Water Quality and Ecology

• Outreach and Next Steps
Current Study Status
Overview

Purpose of feasibility study: *Develop long-term strategy to protect Coney Island & Gravesend from effects of storm surge and sea level rise*

- Conduct robust technical analysis of large-scale tidal barrier & wetlands concept presented in SIRR report
- Identify specific measures to provide near-term flood protection
- Recommend comprehensive flood protection plan and define implementation steps

**Coordinated interagency effort:**

- Managed by NYCEDC on behalf of ORR
- Close partnership with DEP, Parks, City Planning
- State and Federal agencies (e.g., DEC, Army Corps) also involved

**Funding:** 100% from first tranche of Sandy CDGB funds
Questions to be answered:

1. Is the tidal barrier & wetlands concept **technically feasible**? What are the environmental, engineering, and regulatory challenges, and how could they be overcome?

2. Is this a **cost-effective** way of addressing the threats severe weather and sea level rise pose to Coney Island and Gravesend?

3. What measures can be advanced to provide **near-term flood protection**?

4. Are there opportunities to provide other **community benefits**, such as improved access to waterfront recreation, without compromising the primary goal of flood protection?

5. What do community stakeholders think about the Creek proposal and how it could **best address their needs**?
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Shoreline is primarily low-lying
  - Majority of the shoreline between 6 and 9 feet NAVD88
  - Regions below 6 feet NAVD88 are easy entryways for flood waters during low- and high-frequency storm events

Low-lying areas are often adjacent to important community facilities, including public schools, NYCHA, senior housing developments, and community clinics
Rapid Waterfront Inspection Assessment

Shoreline Condition

- Rapid Waterfront Inspection Assessment was
- Some engineered shorelines in “serious” condition along the Creek
Shoreline configurations include:

- Engineered structures:
  - Bulkhead
  - Revetment
- Non-engineered shorelines
  - Debris-strewn embankments
  - “Homemade” bulkheads
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Study Milestones

- **OCT 2014**
  - Pre-Kickoff Community Meeting at Coney Island YMCA

- **JAN-FEB 2015**
  - "Deep Dive" into existing conditions

- **APR-MAY 2015**
  - Community Meeting at Liberation H.S. and Creek Committee Kickoff

- **MAR-JUL 2015**
  - Long-term Flood Protection Recommendations
    - Including exploring regional resiliency context

- **JUL-AUG 2015**
  - Quantifying Benefits associated with project

- **SEP-OCT 2015**
  - Project Findings including implementation and phasing strategies

- **APR-MAY 2015**
  - Pre-Kickoff Community Meeting at Coney Island YMCA

- **OCT 2014**
  - Continued collaboration with Agencies & Community

- **MAY-JUL 2015**
  - Quantifying Benefits associated with project

- **JUL-AUG 2015**
  - Open Space and Community Infrastructure Planning
    - Including identifying opportunities for recreation and community infrastructure

- **AUG 2015**
  - Community Meeting #3
Regional Resiliency Efforts
A Regional View

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Regional Resiliency Efforts
Long-term Flood Protection Recommendations
Elevation (ft NAVD88) in Coney Island
Creek Side Opportunities
Providing Integrated Solutions for a Resilient Coney Island Creek
West Barrier Alignment

- 1,700- foot width
- 100-year flood risk reduction + SLR = 22 ft NAVD88
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Flood Protection Strategies and Considerations

Feasibility Considerations:

• Flood Risk Reduction
• Ecological Enhancement
• Drainage
• Community Infrastructure
  • Recreation
  • Connectivity
  • Economic Opportunities
• Implementability / Feasibility

West Barrier
West Barrage + Wetlands
East Barrier
East Barrage + Wetlands
Perimeter Flood Protection
All Wetlands
## Flood Protection Strategies Comparison

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East Barrier Alignment

- 500-foot width
- 100-year flood risk reduction + SLR = 17 ft NAVD88
Regional Resiliency Context
(100-Year Design Elevation 2050 SLR [NAVD88])

- Northern Tie-in
  - Design El. >17-20 feet

- Sea Gate Community
  - Design El. >22-27 feet

- USACE Jamaica Bay Study
  - 100-year Flood Protection

- Current USACE Beach Nourishment Project
  - Design El. 12 feet
Tidal Barrier Alignments
Level of Protection for in-water measures

**Plan View**

- **West Barrier:**
  - 1,700-foot width
  - 100-year + SLR = 22 ft NAVD88

- **East Barrier:**
  - 500-foot width
  - 100-year + SLR = 17 ft NAVD88

**Bird’s Eye View**

- **East Barrier:**
  - 500-foot width
  - 100-year + SLR = 17 ft NAVD88

- **West Barrier:**
  - 1,700-foot width
  - 100-year + SLR = 22 ft NAVD88
Flood Protection Precedents

Rhode Island, USA
Tainter Gates

Venice, Italy
Flip Up (Spillway) Gates

Marina Bay, Singapore
Barrage

Thames River, UK
Rotating Gates

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Long-Term Flood Protection

Opening Size

No Opening
- Passive Flood Protection is most reliable
- Most cost-effective
- Connection across Creek
- Minimal O&M
- Pumps needed for WQ

Narrow Opening
- Combination of passive and mechanical parts
- Cost-effective
- Connection across Creek is feasible with non-nav.
- O&M required to maintain and operate mechanical components
- Pumps needed for WQ

Wide Opening
- Most mechanical parts; least reliable
- Most expensive option
- Connection across Creek is feasible with non-nav.
- Most O&M required
- Least impact on WQ and aquatic habitat

FOR BOTH “WEST” AND “EAST” ALIGNMENTS
Ecological Considerations for Barrier

- Minimize impacts based on **opening size, footprint, alignment**
- East Alignment preferred:
  - **Decreases** substrate and habitat disturbance
  - **Avoids** existing aquatic habitat value
  - **Lessens** impact on water flow throughout Creek
  - Provides more opportunities for **restoration**
Ecological Opportunities for Programming
Beach Side Opportunities
100-Year Flood Risk Reduction

Design Elevations

Elevation (ft NAVD88)

- 0.1 - 4
- 4.1 - 5
- 5.1 - 6
- 6.1 - 7
- 7.1 - 8
- 8.1 - 9
- 9.1 - 10
- 10.1 - 11
- 11.1 - 12
- 12.1 - 13
- 13.1 +

22-27 feet NAVD88

15-17 feet NAVD88

17-20 feet NAVD88
100-Year Flood Risk Reduction

Design Heights

Approx. 3-5 feet

Approx. 8-10 feet

Approx. 15-20 feet

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Design Precedents

Coastal Promenade, The Netherlands

Deployable Floodwalls, The Netherlands

Vegetated Dunes, Ocean City, MD

Inflatable Dams, New Orleans, LA

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Outreach and Next Steps
Outreach Next Steps

- **April - Community Meeting #1:** *Existing Conditions; Community Needs & Vision*

- **May – Coney Creek Committee:** *Shoreline Conditions Assessments; Water Quality modeling; Barrier Options; Outreach Planning*

- **Summer – Ongoing community events, presentations, and access to experts*

- **July 23rd – Coney Creek Committee:** *Preliminary Findings; Outreach and Next Steps for Study; Community Meeting Planning*

- **August 6th - Community Meeting #2:** *Technical Analysis & Preliminary Recommendations; Trade-Off Considerations; Confirm Concept Options*

- **Fall – Coney Creek Committee & Community meeting #3:** *Present Community Vision; Refine Vision & Implementation Strategies*
Study Next Steps

→ Advance short-term recommendations

→ Continue evaluation and case-making for long-term flood protection strategies

→ Coordinate study findings and recommendations with key City Agencies, other stakeholders, and on-going coordination with Community Board

→ Refine ecological analyses in coordination with DEP and DEC

→ Advance Creek study in context of regional resiliency planning for City in coordination with Army Corps
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