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New York District

US Army Corps of Engineers
New York Department of Environmental Conservation

PUBLIC INFORMATION MEETING

East Rockaway to Rockaway Inlet and Jamaica Bay Reformulation Study

PROBLEM: Addressing Coastal Storm Risk Management

MEETING PURPOSE: Set Scope of Environmental Review & Identify Alternatives

7:00 – 7:30	Welcome and Poster Board Viewing
7:30 – 8:00	US Army Corps of Engineers Presentation
8:00 – 9:00	Poster Board Session and Information Exchange

Sediment Modeling Results

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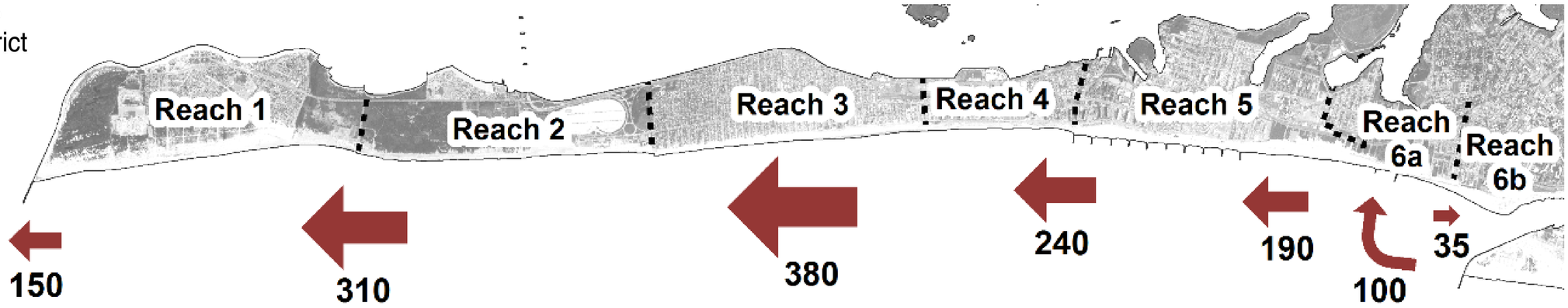
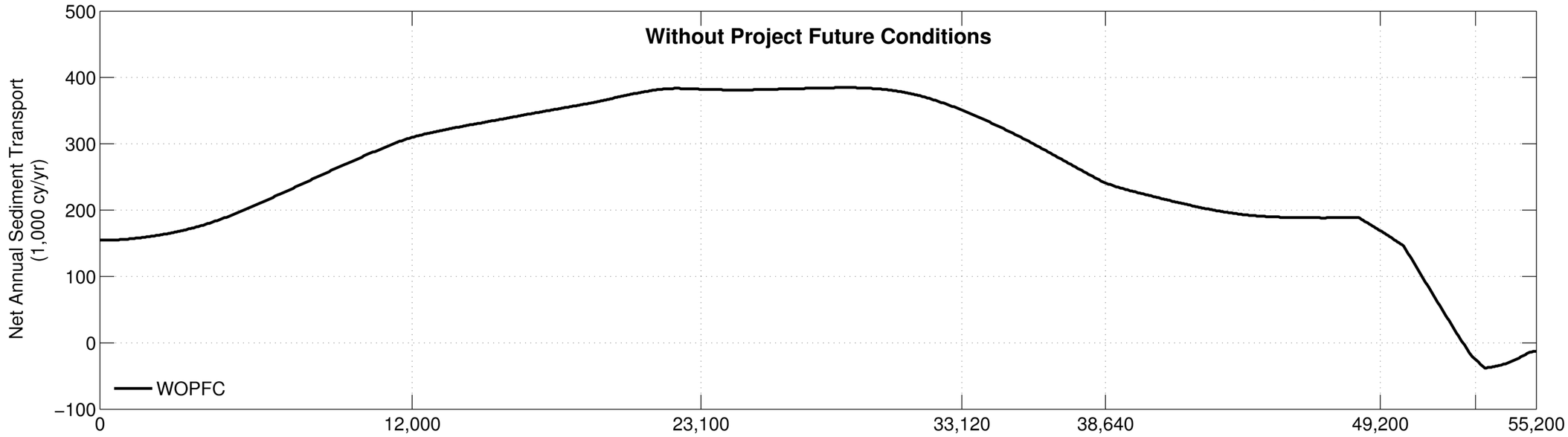
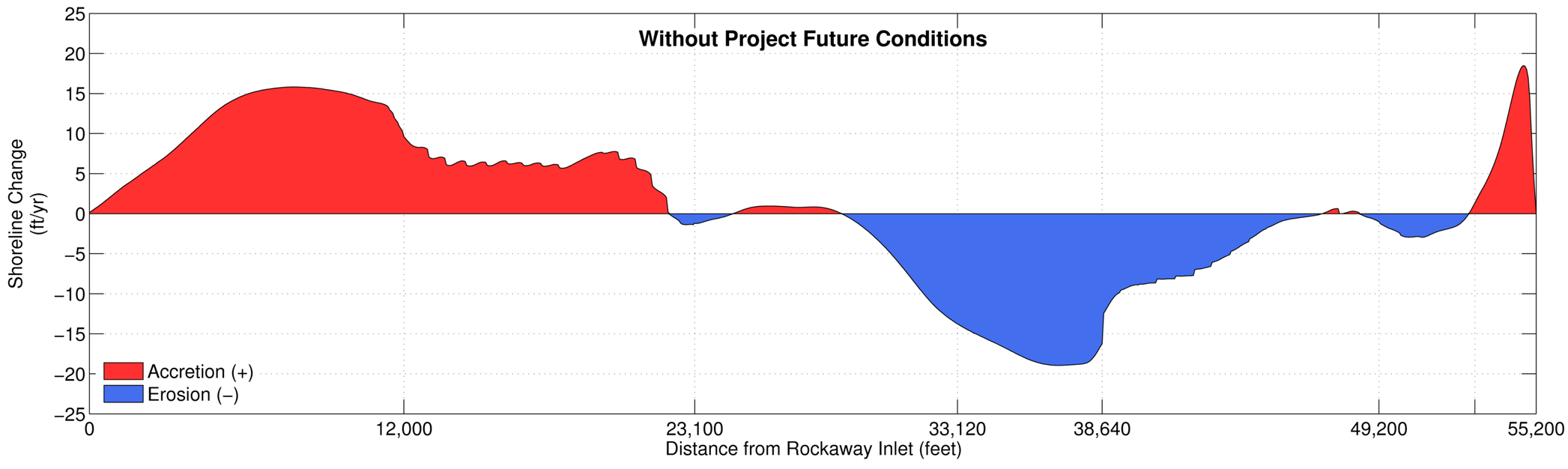


Arrows represent yearly cubic yards of sand movement





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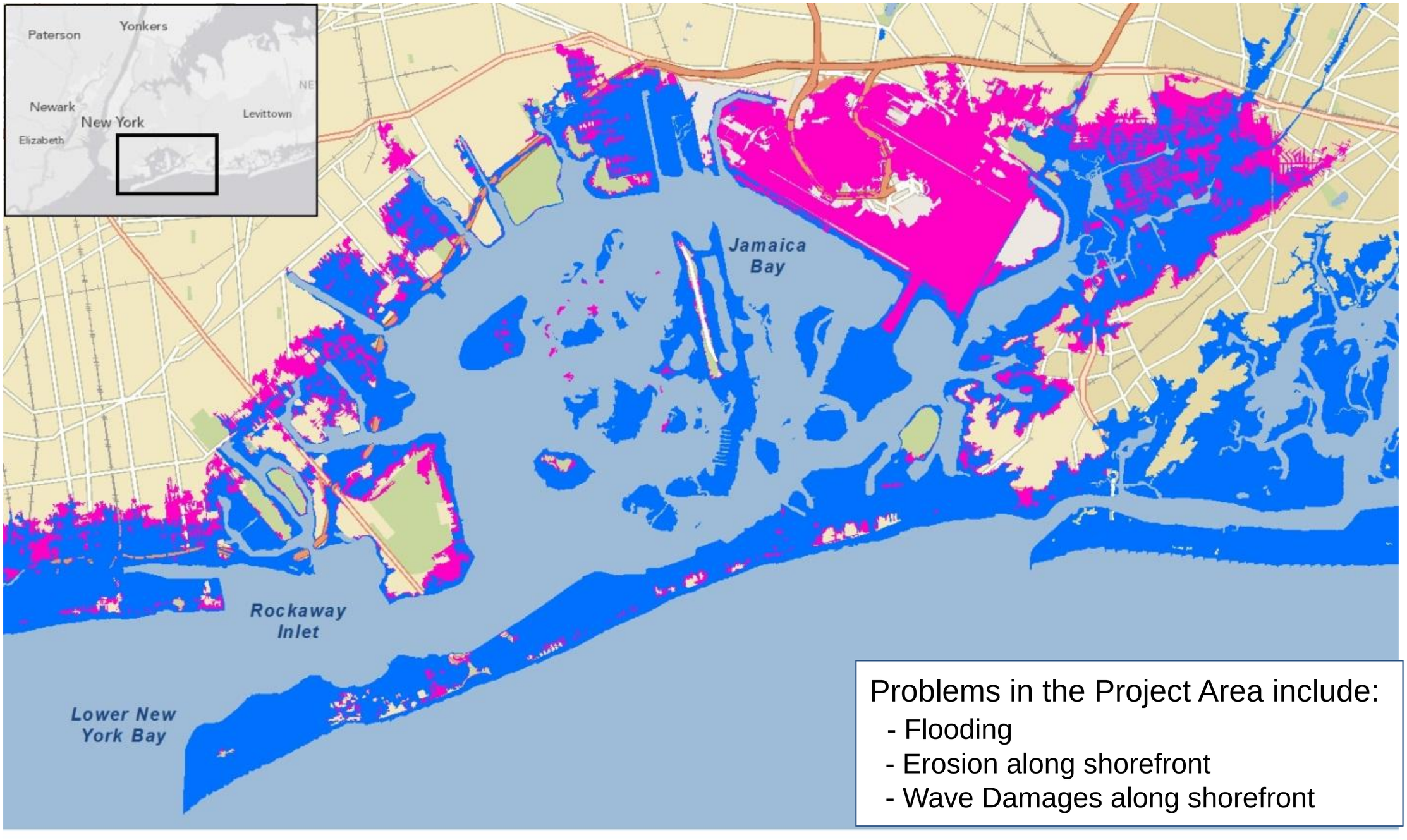
Project Area Problem Identification

Blue illustrates current 1% annual chance of flooding

Purple illustrates 1.3 feet of Relative Sea Level Rise in 2070, (mid-range SLR) added to the 1% flooding



Rockaway's History of Coastal Projects

- State & City Projects constructed 1927 – 1975
  - Over 12 Million CY of sand placed
  - Several hundred groins built, stone and wood
- Joint Corps, State, City Project 1975 - 2012
  - Approximately 19 Million CY of sand placed
  - Terminal groin constructed (1979)

Before and After Initial Construction 1975

Corps Project (Authorized in 1965)

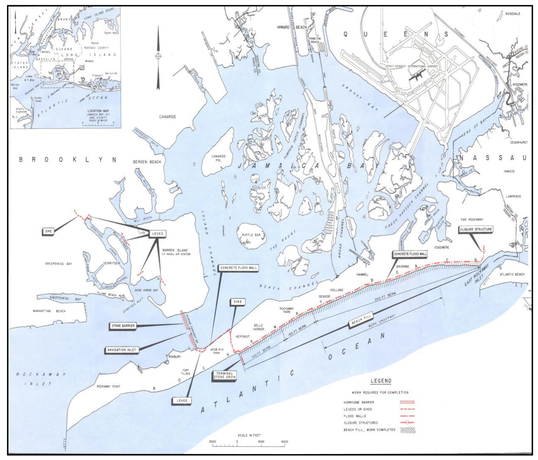
Beach Erosion Control and Hurricane Protection Project

Beach Erosion Control Features:

- Beach Berm at +10 ft MSL, up to 200 ft wide, length - 6 miles
- 5 M CY of sand placed for initial construction
- Renourished for a period of 10 years, each of 1M CY

Hurricane Protection Features:

- Hurricane Barrier w/ Navigation gate across Rockaway Inlet
- Floodwall at +18 ft MSL, for 7.7 miles along Rockaway



Authorized Project

Corps Construction

1974 Corps authorized separate construction of "beach erosion control" portion plus 10-years of renourishment

Constructed in 1975-1977

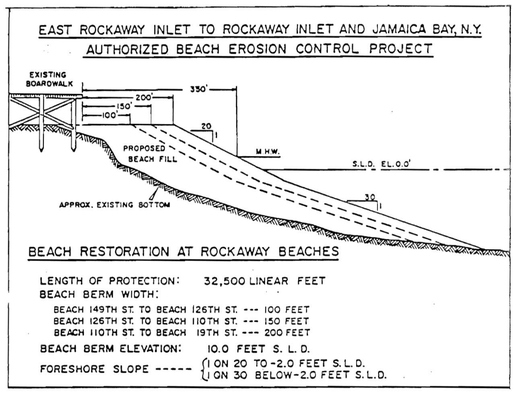
Terminal groin added at Beach 149th Street in 1979

Project Renourished through 1987

"Hurricane Protection Features" were de-authorized by Congress

In 1993, approved to extend renourishment

Renourishment undertaken in 1996, 2000, 2004



Constructed Project Cross-Section

Post-Sandy Projects

The Corps has worked with partners in New York City and New York State to build a robust coastal storm risk management project along the Atlantic Coast of Rockaway

- **3.5 million cubic yards of sand placed**
- More than 6 miles of beach widened and elevated
- City-funded betterment incorporated to elevate berm to provide additional risk reduction
- City's ongoing dune grass planting efforts will strengthen project further
- **More coastal storm risk management than has ever existed in Rockaway**

Crews pumping sand both widened and elevated the existing beach, greatly reducing coastal storm risks

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Short-Listed Alternatives

- Shoreline
  - Alt 0: No Action
  - Alt 1: Beach Restoration
  - Alt 2: Beach Restoration and Modified Erosion Control
  - Alt 3: Beach Restoration and Increased Erosion Control (Reinforced Dune is being evaluated for Alt 1, 2, and 3)
- Bay
  - Alt A: No Action
  - Alt B: Non-Structural (including house raising or flood proofing)
  - Alt C: Hurricane Barrier in Rockaway Inlet
  - Alt D: Perimeter Protection by T-wall and/or Living Shoreline where appropriate

Selected Plan will combine elements from shoreline and bay.

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Atlantic Coast Alternative 1
(Beach Restoration)

Beach Restoration Alternative

- Includes construction of beach and dune
- Periodic renourishment of the beach (every 4 years)
- Greater volumes of sand placed in high erosion areas

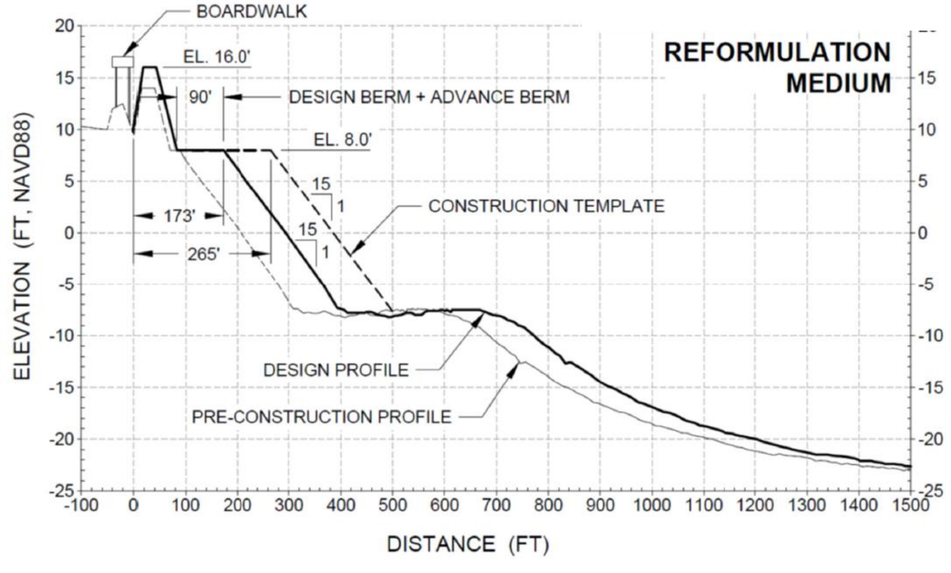
Dune heights being considered:

16 feet (shown) to 20 feet NAVD elevation

Design Berm being considered:

60 feet (shown) to 100 feet

Note: Actual constructed width with advance fill and width of beach including slope to the water line would be greater



Typical profile of beach berm and dune being considered for Alternatives 1, 2 and 3

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Atlantic Coast Alternative 2
(Beach Restoration and Modified Erosion Control)

- All beach berm and dune elements of Alternative 1
- Shortening of 10 existing groins between Beach 60th to Beach 86th
- Relocation of existing boardwalk from Beach 28th to Beach 39th

Boardwalk Relocation Detail

<u>Groin Shortening in Alt. 2</u>

60th Street - Shorten 100 ft
62nd Street - Shorten 100 ft
65th Street - Shorten 100 ft
68th Street - Shorten 100 ft
71st Street - Shorten 100 ft
74th Street - Shorten 100 ft
77th Street - Shorten 100 ft
80th Street - Shorten 100 ft
83rd Street - Shorten 100 ft
86th Street - Shorten 100 ft

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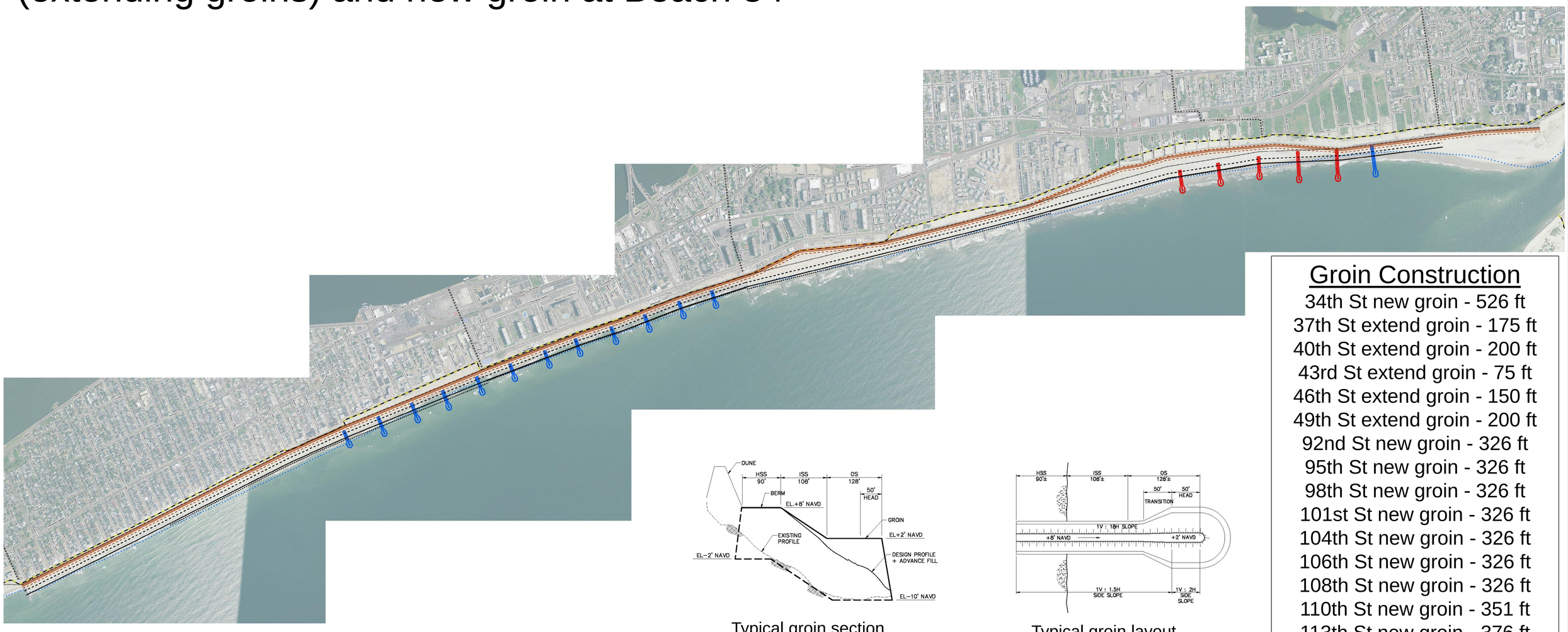
Map of Atlantic Coast Alternative 3
(Beach Restoration and Increased Erosion Control)

- All beach berm and dune elements of Alternative 1
- Construction of 12 new groins between Beach 90th to Beach 122nd
- Enhancement of existing groin field from Beach 36th to Beach 49th (extending groins) and new groin at Beach 34th

June 2018 Shoreline (Projected)
CEHA
Alternative_3
Dune Toe
Dune Crest
Berm Crest
Design Shoreline
Design Shoreline + Adv Fill
Project Baseline
Groin - New Construction
Groin - Extension
Groin - Shortening



Typical groin section

Typical groin layout

Groin Construction

34th St new groin - 526 ft
37th St extend groin - 175 ft
40th St extend groin - 200 ft
43rd St extend groin - 75 ft
46th St extend groin - 150 ft
49th St extend groin - 200 ft
92nd St new groin - 326 ft
95th St new groin - 326 ft
98th St new groin - 326 ft
101st St new groin - 326 ft
104th St new groin - 326 ft
106th St new groin - 326 ft
108th St new groin - 326 ft
110th St new groin - 351 ft
113th St new groin - 376 ft
115th St new groin - 376 ft
118th St new groin - 376 ft
121st St new groin - 326 ft

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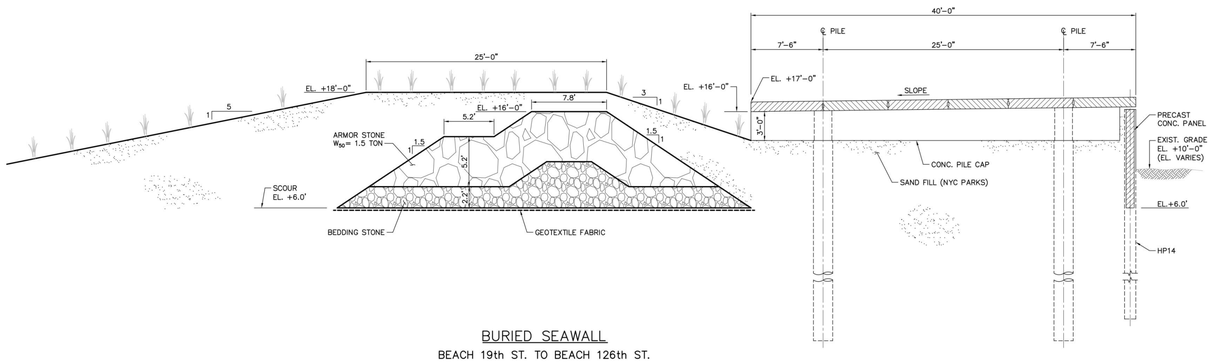
Dune Reinforcement

The Study Team is assessing the feasibility of reinforcing the dune (in Alternatives 1, 2 and 3)

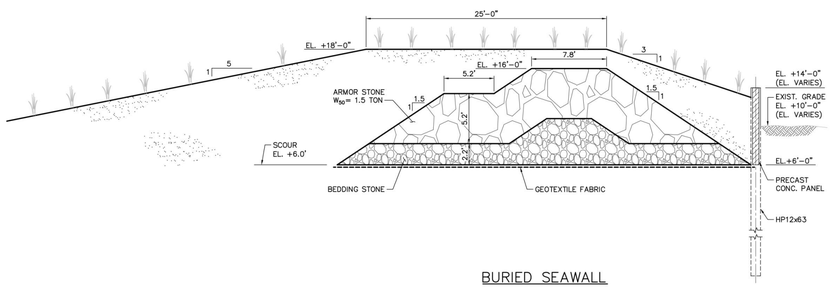
Two buried seawall alternatives are being analyzed.

These are being considered for the entire length of shoreline, or only in certain segments.

Buried Seawall A



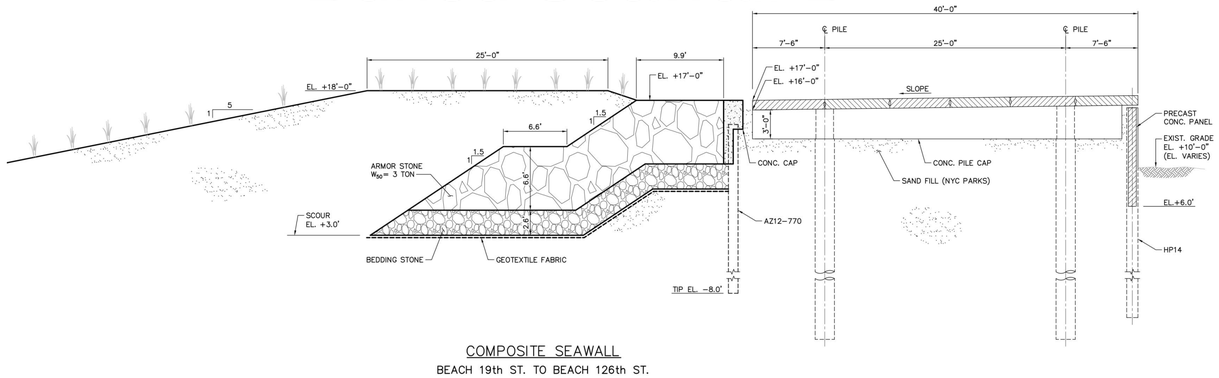
BURIED SEAWALL
BEACH 19th ST. TO BEACH 126th ST.
0 8' 16'
SCALE: 1/8"=1'-0"



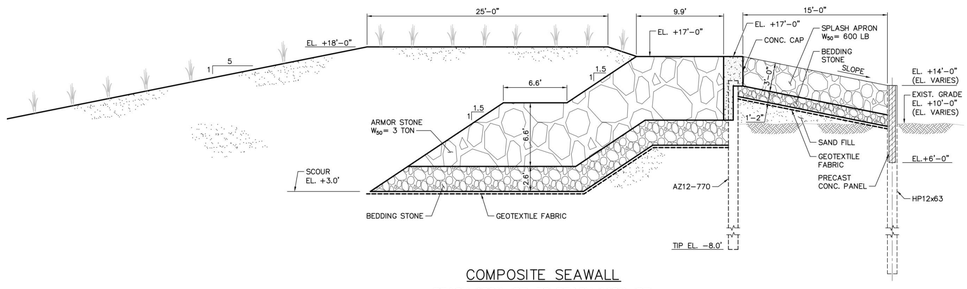
BURIED SEAWALL
BEACH 126th ST. TO BEACH 149th ST.
0 8' 16'
SCALE: 1/8"=1'-0"

- Designed to reduce wave impact
- Can be built in segments
- Smaller rock size; unobtrusive (fully buried)
- Estimated 100 year level of protection with beach berm

Buried Seawall B



COMPOSITE SEAWALL
BEACH 19th ST. TO BEACH 126th ST.
0 8' 16'
SCALE: 1/8"=1'-0"



COMPOSITE SEAWALL
BEACH 126th ST. TO BEACH 149th ST.
0 8' 16'
SCALE: 1/8"=1'-0"

- Designed to reduce wave impact and inundation
- Incorporates steel sheet pile and larger stone size
- Should be contiguous for entire project
- Estimated 150 year level of protection with beach berm

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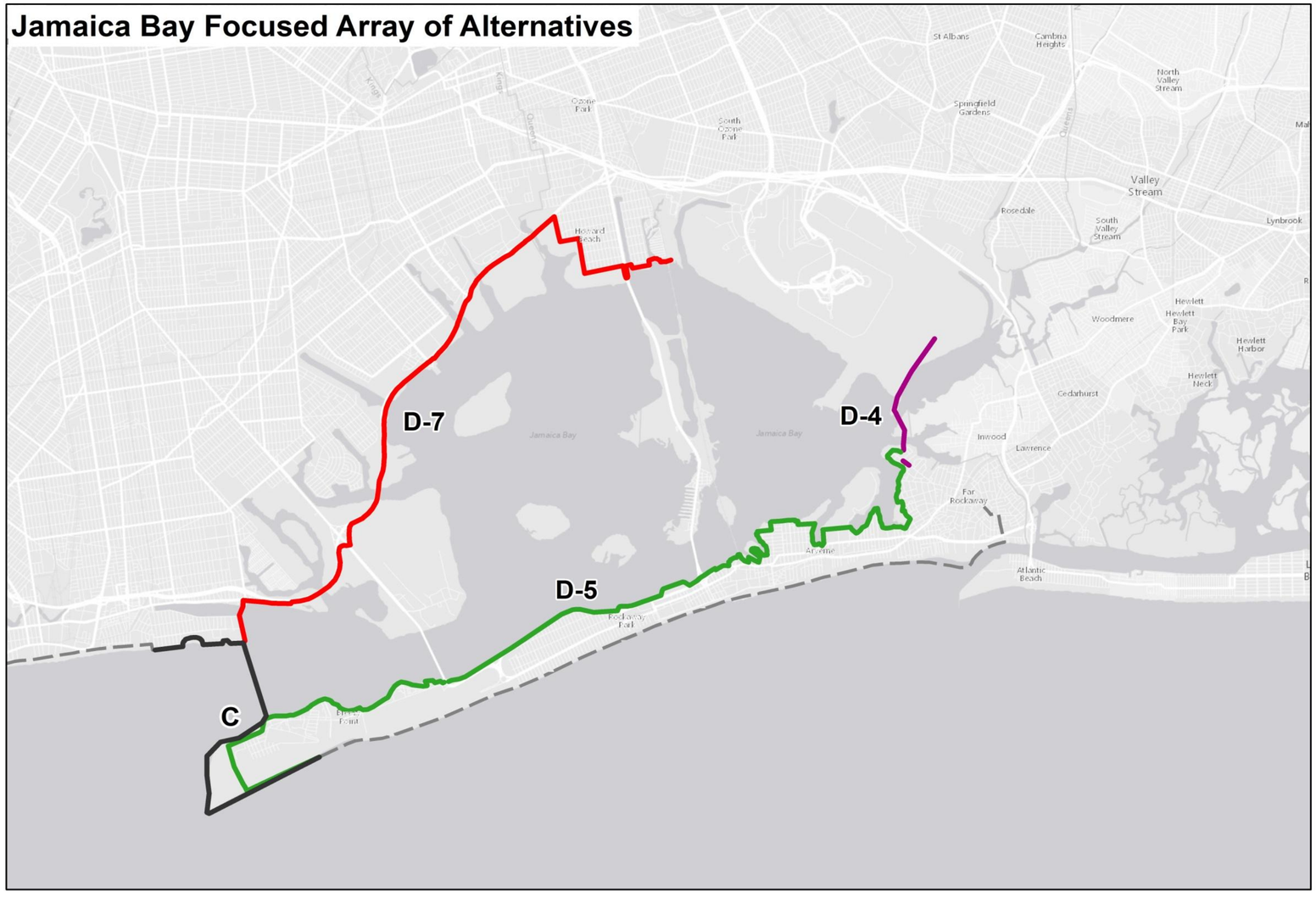
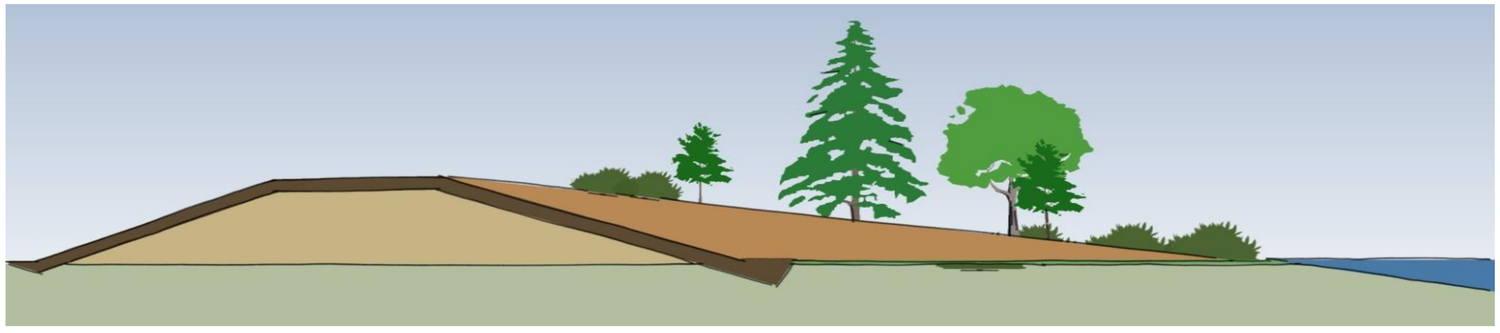
Jamaica Bay Structural Alternatives





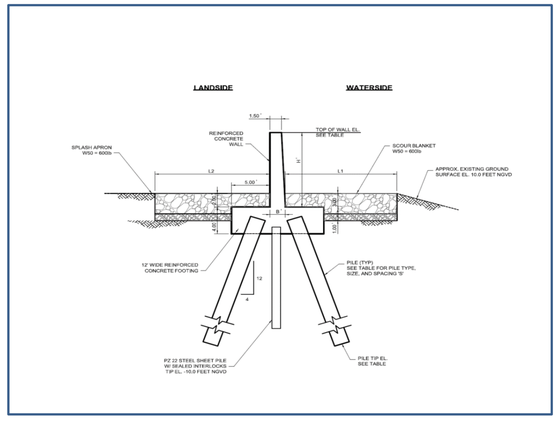
Living shoreline

C- Inlet Barrier

- Operated under storm conditions
- Provides risk reduction to entire project area
- Cannot be constructed in smaller increments
- Requires tie-in to high ground protection

D- Perimeter Plan

- Includes walls, smaller gates and nature based features constructed around the perimeter of Jamaica Bay
- Each section would reduce risks to specific communities within Jamaica Bay once completed
- Each Reach is subject to individual cost/benefit analysis
- Requires tie-in to high ground protection



Typical wall section (T- Wall)

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Screening of Measures

Along the Atlantic Ocean Shoreline and within Jamaica Bay there are a range of existing conditions and specific problems associated with coastal storms.

A wide-range of measures were considered and evaluated to arrive at the short-listed alternatives.

The following is a list of measures considered for the Project Area.

Bayside Measures

Nonstructural
Acquisition
Floodplain zoning
Floodproofing
Flood warning system

Structural
Tide gate
Hurricane barrier
Levee
Floodwall
Bulkhead/Seawall
Breakwater

NNBF *(Natural and Nature-Based Features)*
Living shoreline
Coastal wetland
Maritime and coastal forest
Reef
Dune and Beach
Swale/Channel

Other
Bay shallowing
Stormwater improvement
Wastewater treatment
Park access and recreation
Evacuation routes

Oceanside Measures

Structural
Dune and berm construction
Dune reinforcement
Groin
- Lengthen or shorten existing
- New Groins
- T-Groins
- Groin removal

Nonstructural
Acquisition
Boardwalk relocation
Floodplain zoning
Floodproofing

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Identifying What Impacts to Assess

NEPA Scoping: The Corps of Engineers and the New York State Department of Environmental Conservation are conducting NEPA scoping

- This provides the public with the opportunity to present any potential environmental concerns they may have with any alternatives being evaluated
- Concerns brought up during this process will be addressed in the Environmental Impact Statement that will be prepared
- To compare the feasible alternatives identified in the previous posters in terms of their potential to affect the environment, each of their impacts on the following resources will be assessed, as well as cumulative impacts

Topography and Soils
Water Resources:
- *Groundwater*
- *Surface Water*
- *Water Quality*

Land Use and Zoning
Vegetation
Fish and Wildlife
- *Fish*
- *Benthics*
- *Mammals*
- *Birds*
- *Amphibians and reptiles*

Threatened and Endangered Species
Essential Fish Habitat

Socioeconomics
- *Population*
- *Housing*
- *Environmental Justice*
- *Economy/Income*

Aesthetics and Scenic Resources
Recreation
Transportation
Cultural Resources
Coastal Zone Management
Hazardous, Toxic, and Radioactive Waste
Air Quality
Noise
Cumulative Impacts (nearby ongoing/proposed projects)

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Next Steps

Assessing Public Support of Alternatives:
Now

Tentatively Selected Plan: **September 2015**

Draft Feasibility Report and Environmental Impact Statement released for review:
December 2015

Before finalization, any report must be extensively reviewed and approved both internally within USACE and externally, including local, state and other Federal oversight

Construction start will depend on length of required reviews and approvals, and relative complexity of design

Comment cards are available at the entrance.
Comments can be provided through **June 30, 2015** to:

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New York, NY 10278

Electronic Version of Posters Available at:
www.nan.usace.army.mil/Rockaway

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