

Coastal Restoration – Example Partnering Efforts (Past, Present, & Future) Within Jamaica Bay

Urban Resilience in an Era of Climate Change: Global Input for Local Solutions

USACE - New York District
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US Army Corps of Engineers
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Topics

- **Recent Successes and Key Partnerships**
- **Coordination of Studies**
 - ▶ Hudson Raritan Estuary Feasibility Study
 - ▶ North Atlantic Coast Comprehensive Study (NACCS)
 - New York Bay, Its Tributaries and Jamaica Bay Focus Area
 - ▶ Jamaica Bay, Marine Park, Plumb Beach Feasibility Study
 - ▶ Atlantic Coast of NYC East Rockaway to Rockaway Inlet (Rockaway Beach), Jamaica Bay Reformulation Study



Vision of a World Class Harbor Estuary

Navigation/Port

Environment

Channel and berth Dredging
Dredged Material Management/
Beneficial Use
Drift/floatables Removal
NYC - Comprehensive
Waterfront Plan
Harbor Operations
Committee
Green Port Infrastructure
Improvements

HRE- Comprehensive Restoration
Plan
Ecosystem Restoration Projects
Regulatory Streamlining/Mitigation Planning
Water Quality – TMDL/CSO Abatement
PANY&NJ Acquisition Program
Oyster Restoration Partnership
CERCLA Remediation/Natural
Resource Damage Assessment
Urban Parks Initiative/
Public access
HEP - CCMP

Jamaica Bay
Science & Coastal
Resilience Center

NYC Vision 2020

Climate Change
Adaptation
Planning

Harbor
Operations

Storm Preparedness
Planning

Storm/Flood Risk
Reduction Projects

Safety/Security



Restoration Success Stories implemented under Continuing Authorities Program





Elders East 2006



Jamaica Bay

Marsh Islands Restoration

>1 million CY

Elders West 2010



2007



40 acres, \$17.2M



Elders East 2011

40 acres, \$15M



**Planting Effort at Black Wall and Rulers Bar (July 2013):
Jamaica Bay EcoWatchers, American Littoral Society, Jamaica Bay
Guardian and
Community Volunteers**



Plumb Beach- 2012/2013



127,000 cubic yards of sand
\$ 3.352M



Local Sponsor: NYCDP&R

Gerritsen Creek- Marine Park- 2010



**Restored 20 tidal marsh acres and 20 coastal grassland acres
Local Sponsor: NYCDP&R (\$8M)**

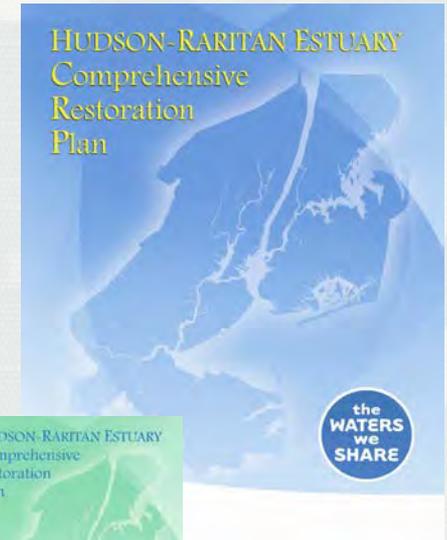


Coordination of Ongoing Studies and Restoration Efforts



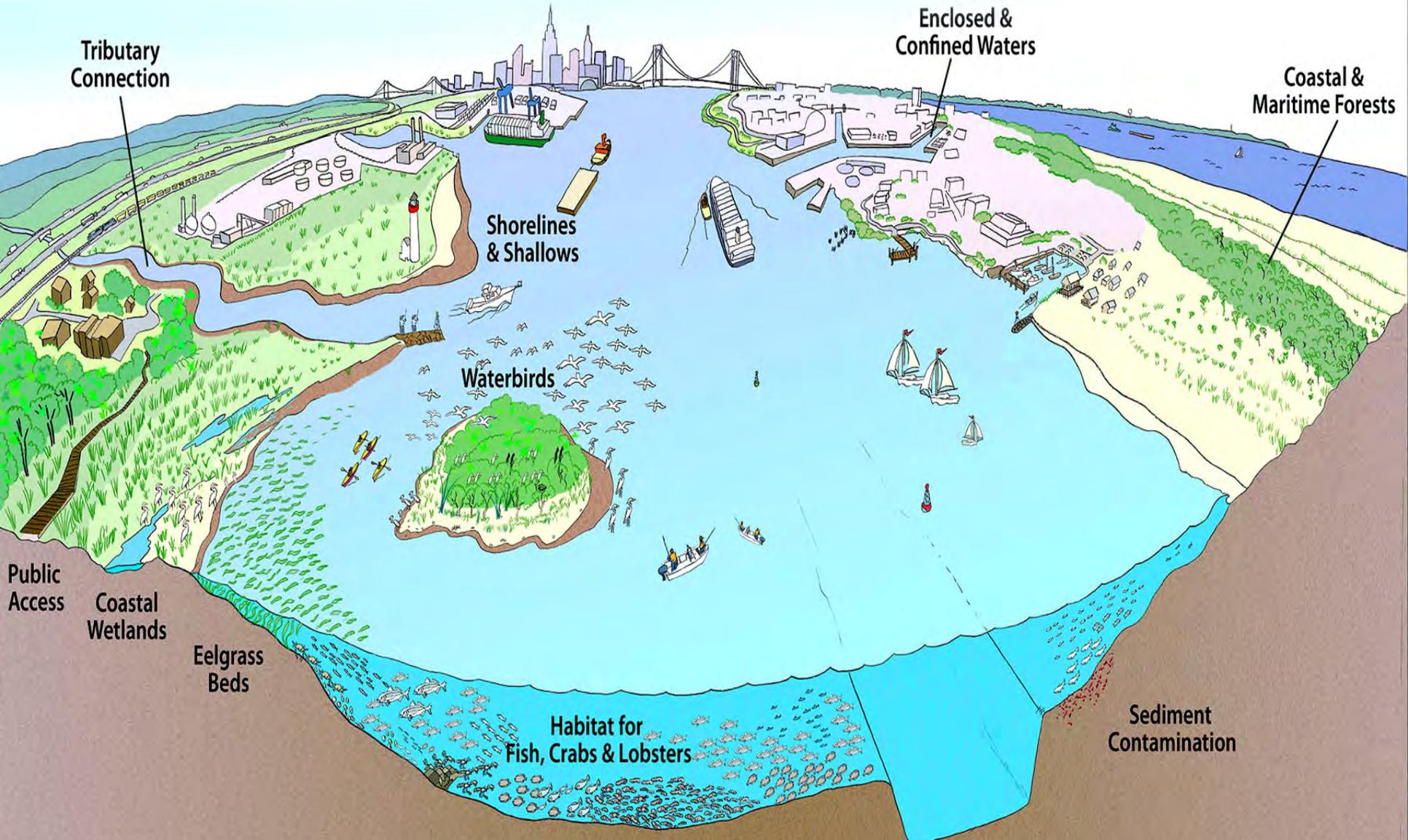
Hudson-Raritan Estuary (HRE) Ecosystem Restoration Program Comprehensive Restoration Plan

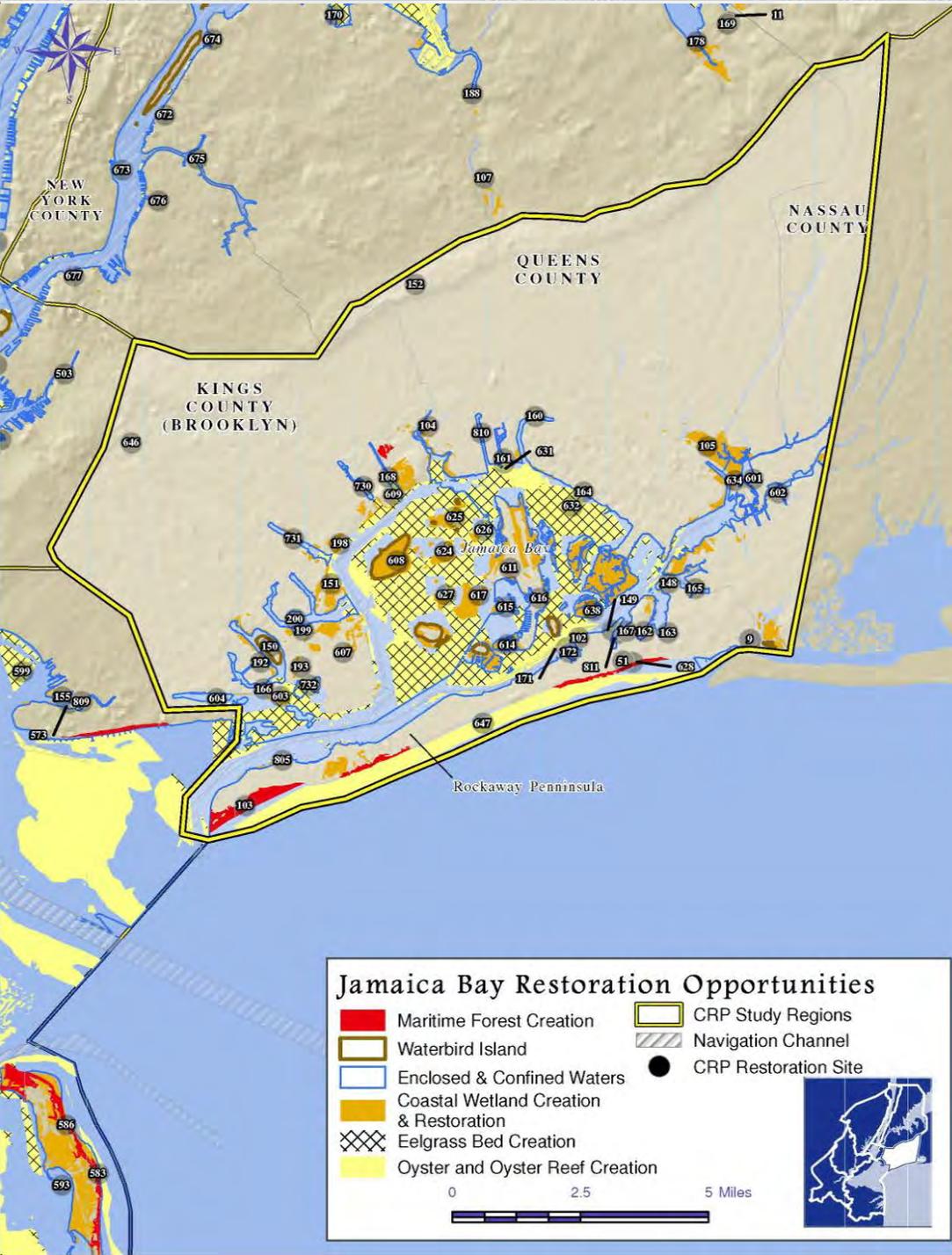
- Vision, Master Plan and Blueprint for a future restored estuary (Revision 2013).
- Collaboration among more than 80 organizations
- Adopted by the NY/NJ Harbor Estuary Program
- Established Priority Restoration Goals or Target Ecosystem Characteristics
- Restores wetlands, improves water quality, and quality of life for region
- Integration of Post-Sandy Recovery and Coastal Restoration
- ~280 Restoration Opportunities outlined in CRP can be integrated into ongoing studies



Target Ecosystem Characteristics

[What] [Where] [How Much] [By When]





- # HRE Feasibility Study
- Mosaic of Habitats
 - Opportunities for many TECs: coastal wetland creation, oyster reefs, eelgrass beds, maritime forests, islands for waterbirds
 - 42 Restoration Opportunities
 - New Authorization - Recommending First Phase Construction and Future Studies



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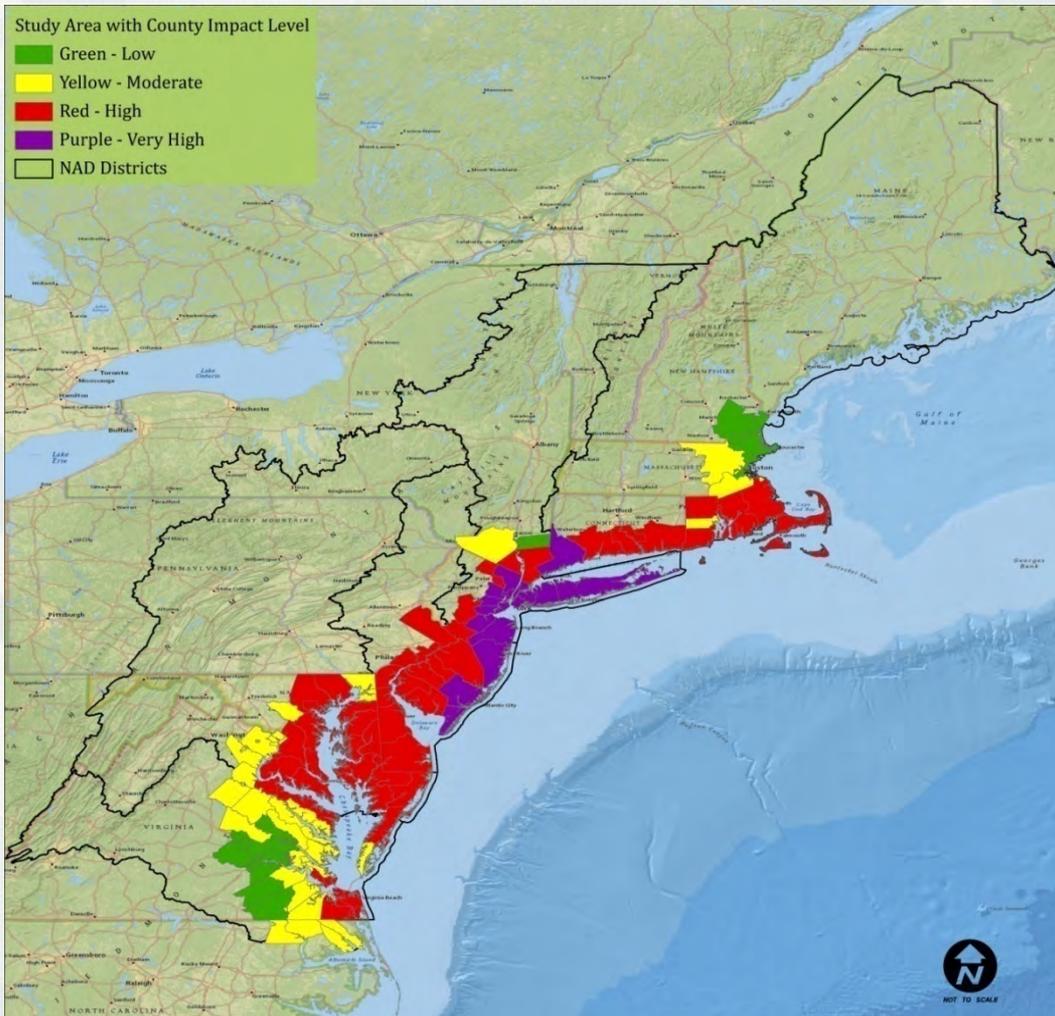
Disaster Relief Appropriations Act – 2013

Public Law (PL)113-2



North Atlantic Coast Comprehensive Study

- Up to \$20,000,000 (\$19M after Sequestration)
- Address the flood risks of **vulnerable coastal populations** within North Atlantic Division Boundaries
- Areas affected by erosion, precipitation, winds, surge, etc.



Goals:

- Provide a Risk Reduction Framework, consistent with USACE-NOAA Rebuilding Principles
- Promote Resilient Coastal Communities with sustainable and robust coastal landscape systems, considering future sea level rise and climate change scenarios, to reduce risk to vulnerable population, property, ecosystems, and infrastructure.



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Nature-Based/Green Engineering

- Natural landscapes or engineered ecosystems, and blended solutions
- Intrinsically dynamic, adaptive, and potentially more resilient than built systems



The Comprehensive Study will:

- Evaluate the performance of nature-based features during Sandy
- Identify features that were especially resilient to storms
- Develop tools for evaluation of benefits
- Consider the use of nature-based features to reduce the impacts of coastal storm flooding, erosion, etc. at a larger scale and as a system
- Work towards building a Federally-shared perspective on nature-based features, and its benefits



Coastal Risk Reduction & Resilience Measures

Measure	Definition	Effect	Examples
Natural	Created through the action of biochemical and physical processes operating in nature	Shoreline erosion control, wave and surge attenuation, especially in low-energy environments; additional resilience benefits; performance difficult to quantify	<p>Barrier islands, dunes, reefs, wetlands, and riparian corridors</p> 
Nature-Based	Products of planning, engineering design, and construction incorporating natural processes that contribute to coastal risk reduction and resilience	Shoreline erosion control, wave and surge attenuation, especially in low-energy environments; performance difficult to quantify	
Non-Structural	Products of public policy, management and regulatory practices; may include pricing schemes, planning, engineering design, and construction	Modify or avoid the impacts of the hazard (vs. modifying the hazard); quantifiable performance	<p>Structure acquisitions or relocations, flood proofing of structures, implementing flood warning systems, flood preparedness planning, land use regulations, development restrictions within the greatest flood hazard areas, elevated development, managed retreat, evacuation, buyout and leaseback</p> 
Structural	Products of planning, engineering design, and construction	Shoreline erosion control, wave and surge attenuation, reduced flooding; quantifiable performance	<p>Levees, storm surge barrier gates, seawalls, groins, revetments, and near-shore breakwaters</p> 

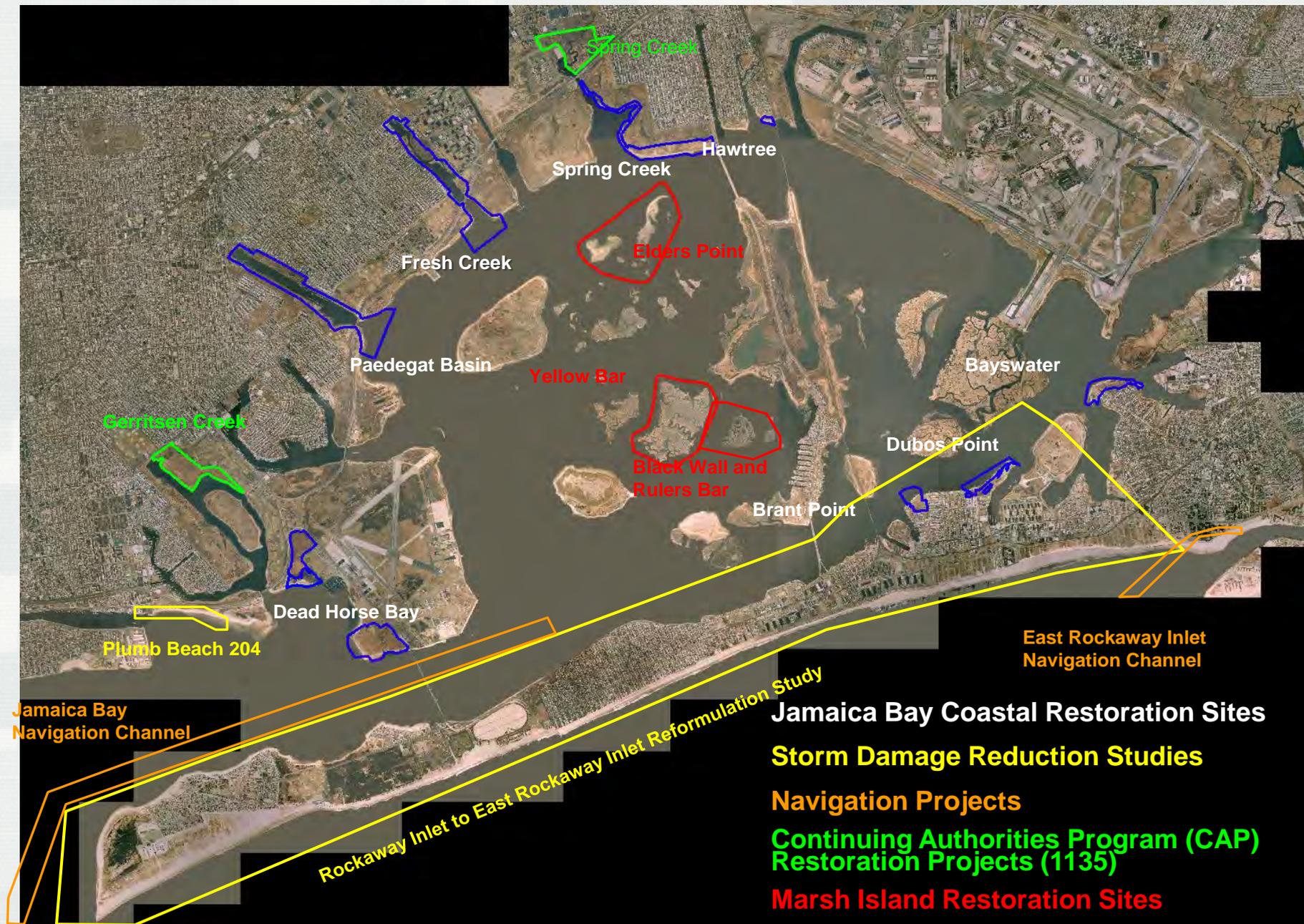
Bolded Examples already included in Jamaica Bay Feasibility Study

North Atlantic Coast Comprehensive Study

- July-Dec 2013: Webinar Collaboration Series
- Focused Area Analysis for
 - New York Bay, Its Tributaries and Jamaica Bay
 - Nassau County Back-bays
- Winter/Spring 2014: Interagency & International validation & collaboration
- Summer 2014: Begin finalizing report and routing for reviews
- January 2015: Final Report to Congress
- NACCS is **NOT** a traditional Feasibility Study that would result in construction recommendations



Overview of Jamaica Bay USACE Efforts

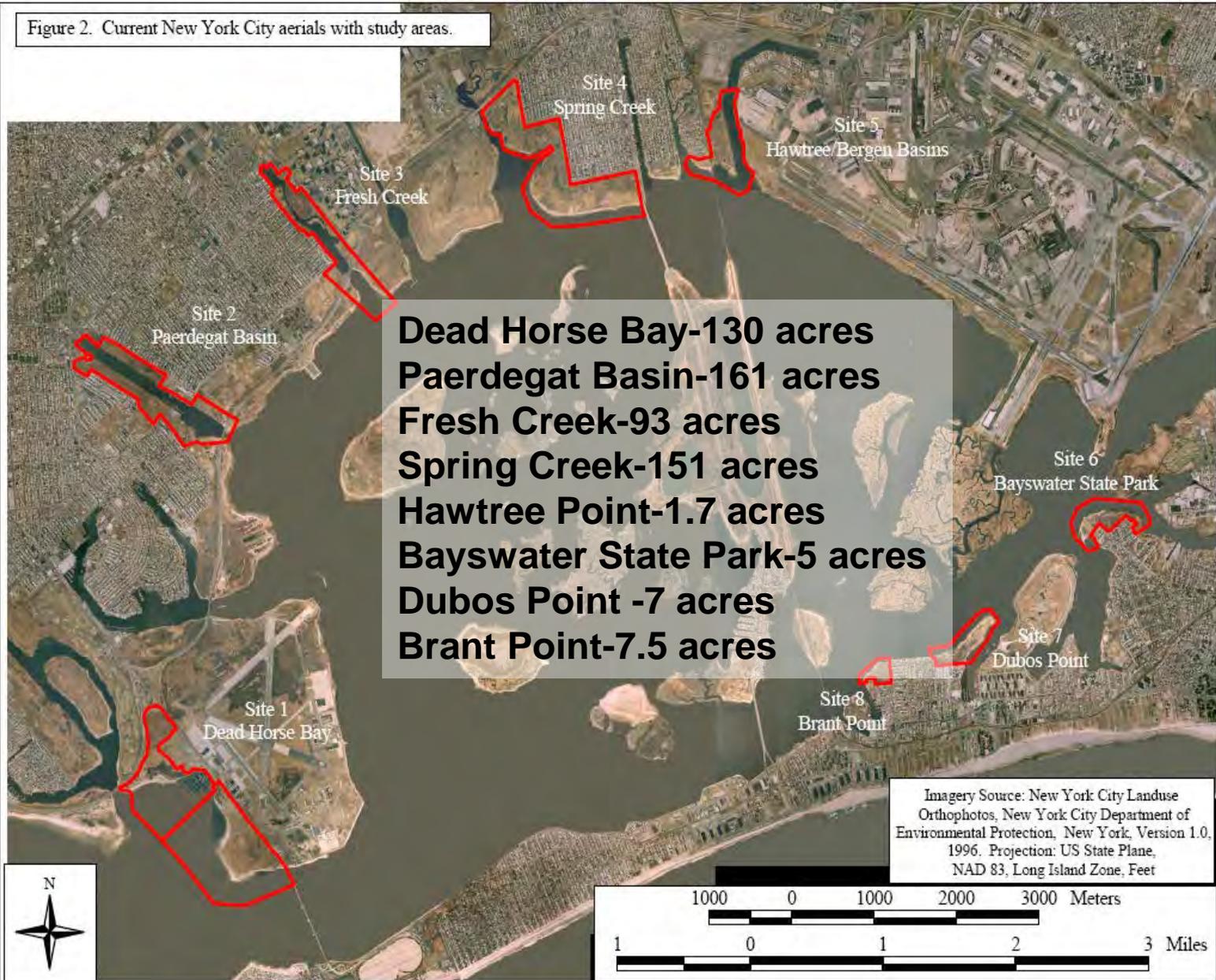


Jamaica Bay, Marine Park, Plumb Beach Feasibility Study

- 1996 Feasibility Study (\$5 million) with NYCDEP
- Preliminary Interim Draft Feasibility Study Report recommended 8 restoration sites – 550 acres of restoration
- 2012 revisions per HQUSACE comments
- June 2013: Second Interim Report to Congress – Disaster Relief Appropriations Act
- Reevaluation of 8 recommended restoration sites for Coastal Storm Risk Management (CSRM)



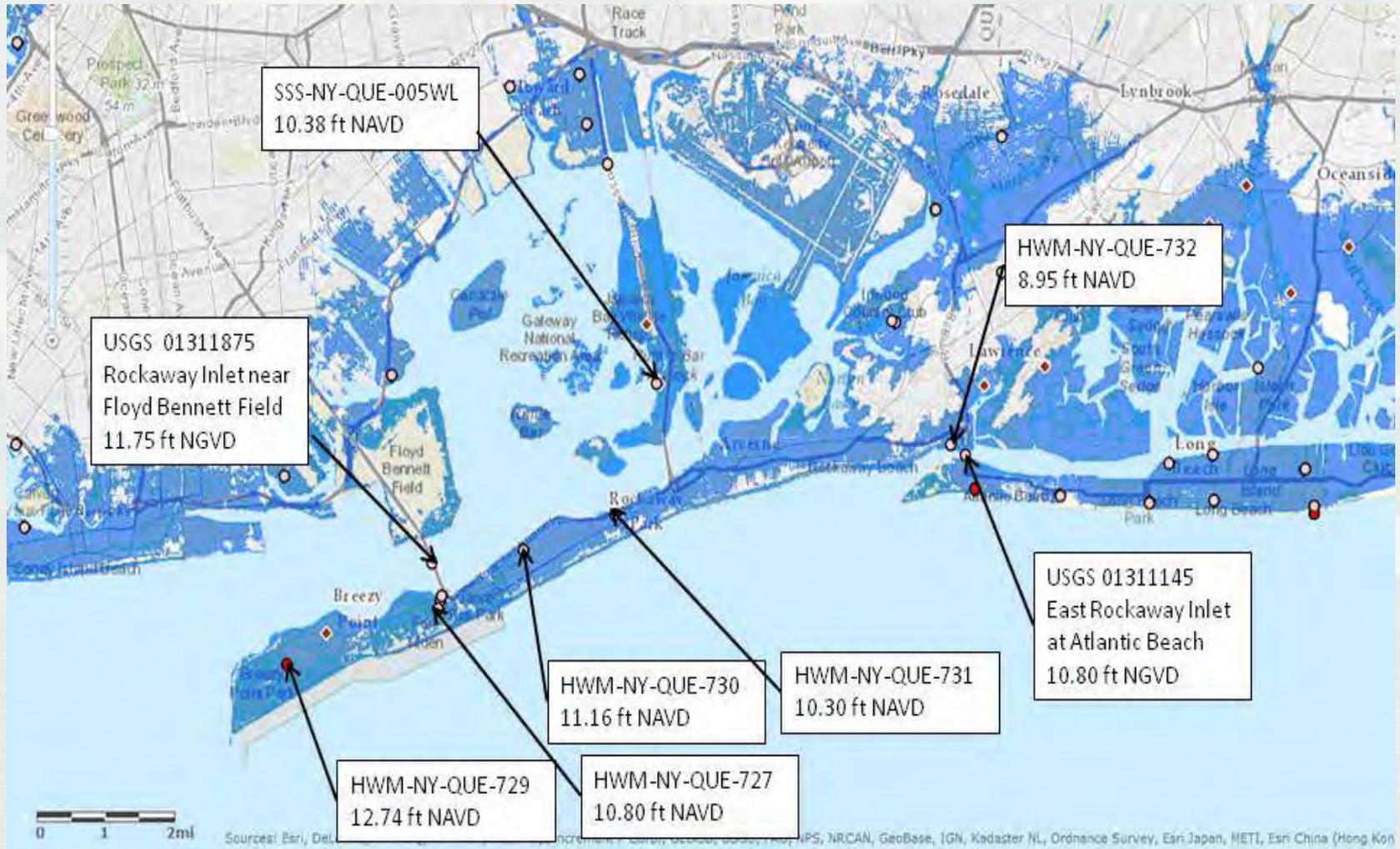
Figure 2. Current New York City aerals with study areas.



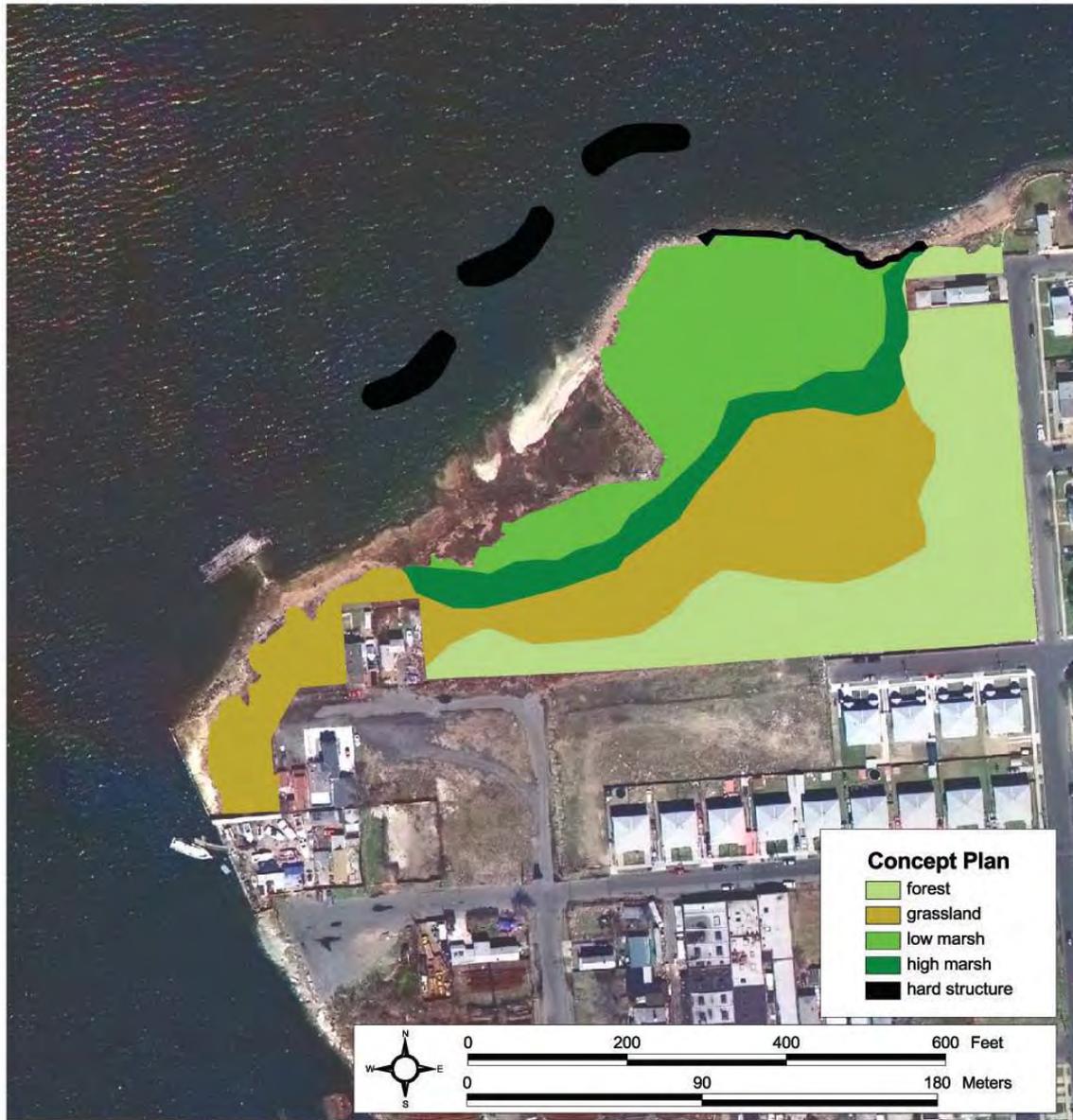
Impacts of Sandy

- At Rockaway-at least a “250 year storm”
- NDBC Station 44065 (New York Harbor Entrance) recorded an offshore wave height of 32.5 ft, the highest ever observed wave height for the station
- Rockaway was inundated with up to 5.4 ft of water above ground level





Reevaluate each Site for Coastal Storm Risk Management: Brant Point Example



- 7.5 acres \$ 5.2 M Fed
 - 2.6 acres marsh
 - 2.5 acres salt meadow
 - 2.4 acres maritime forest
- More Natural Diversity
- Improved habitat Quality
- Improved Water Quality
- Improved Aesthetics
- Enhanced Recreation



Brant Point



WSE = 0 feet
NAVD88



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WSE = 1 feet
NAVD88



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WSE = 2 feet
NAVD88



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WSE = 3 feet
NAVD88



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Brant Point



WSE = 4 feet
NAVD88



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Brant Point



WSE = 5 feet
NAVD88



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Brant Point



WSE = 6 feet
NAVD88



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Brant Point



WSE = 7 feet
NAVD88



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Brant Point



WSE = 8 feet
NAVD88



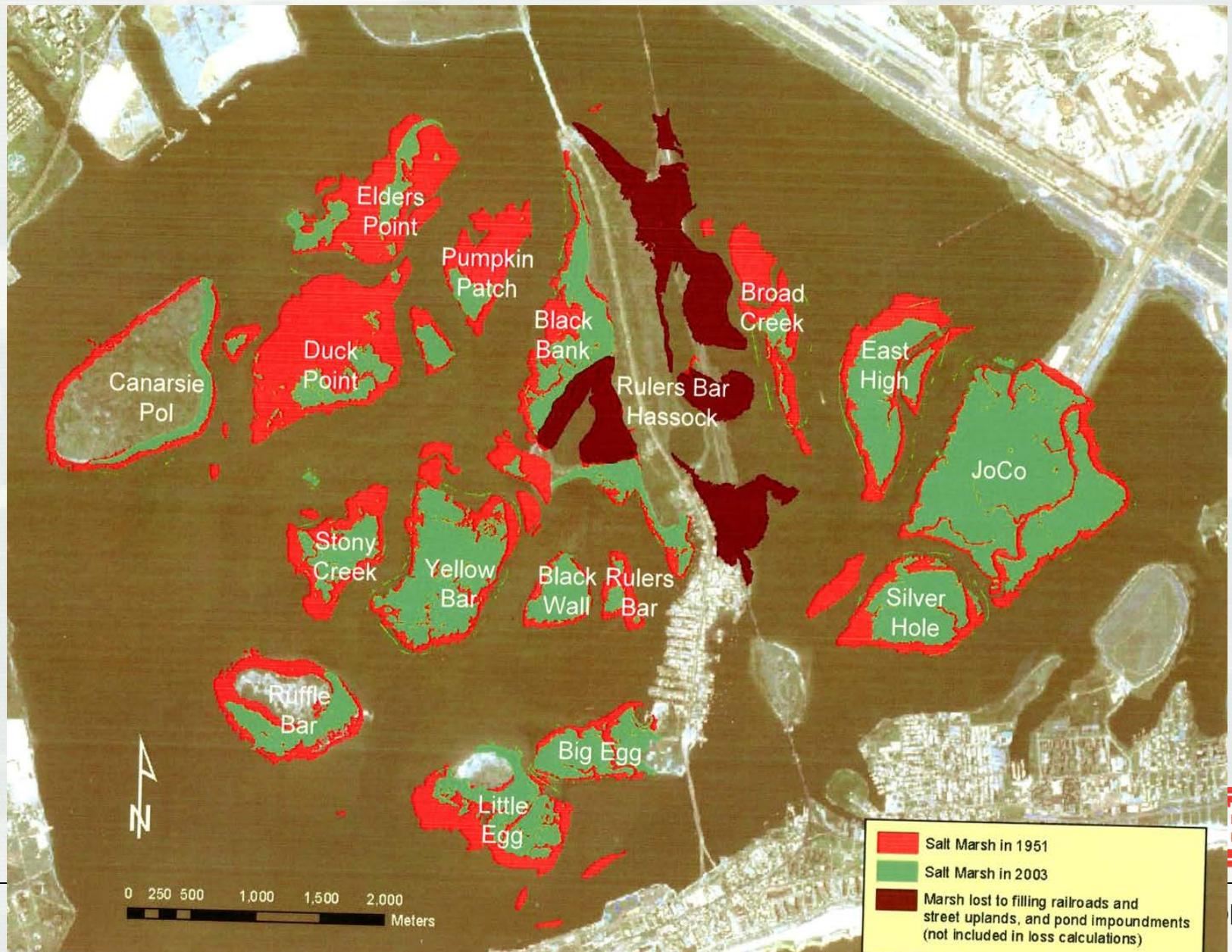
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General Considerations Coastal Storm Risk Management Measures

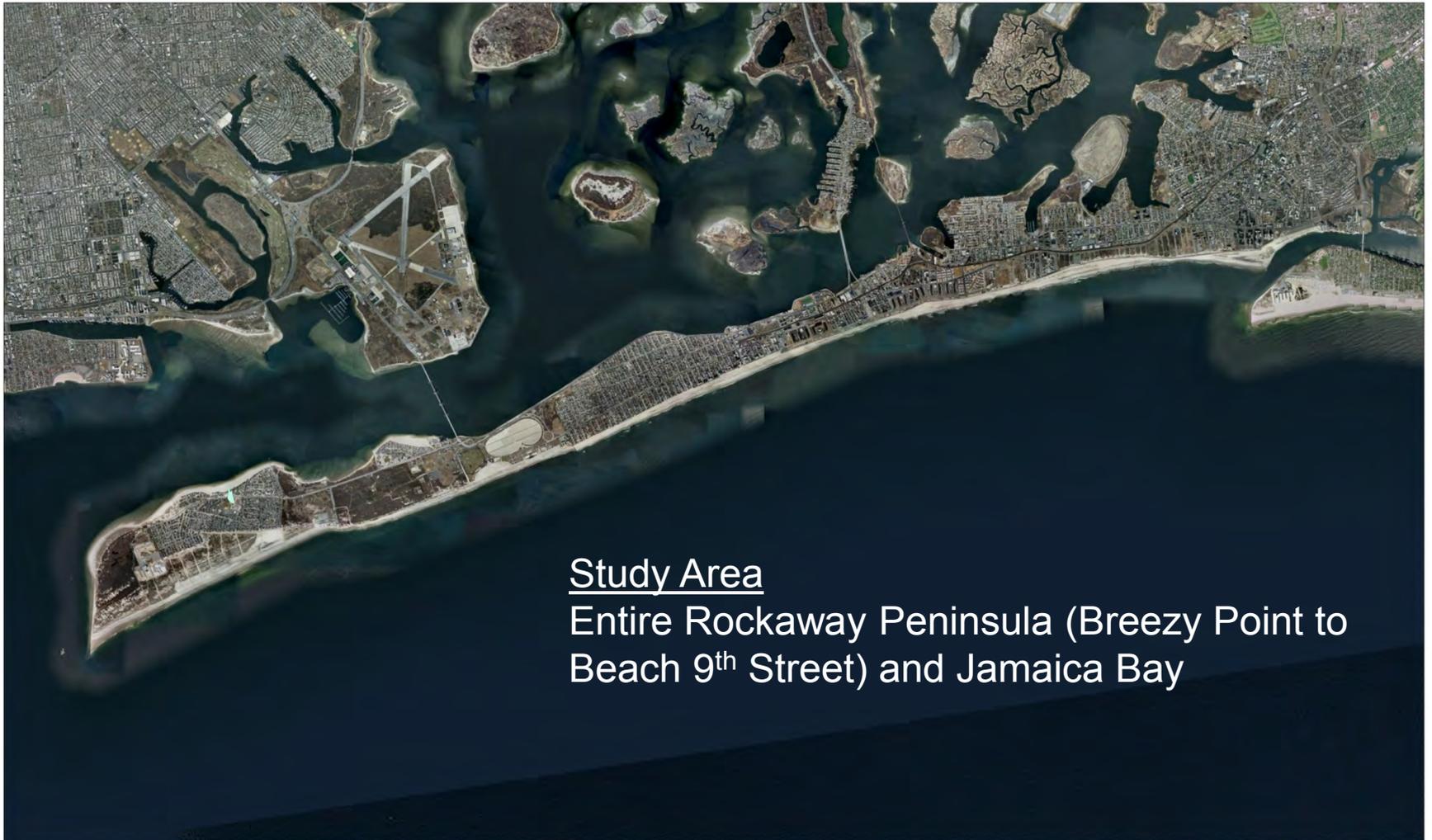
- Reconsider erosion control measures
- Reinvestigate “Living Shorelines” approach
- Oyster Reef possibilities
- Increase maritime forest elevation
- Placement of dunes, berms
- Breakwaters



Inclusion of Marsh Islands



Atlantic Coast of NYC East Rockaway to Rockaway Inlet (Rockaway Beach), Jamaica Bay Reformulation Study



Study Area

Entire Rockaway Peninsula (Breezy Point to
Beach 9th Street) and Jamaica Bay

Background/Historical Overview

- Project originally authorized by the Flood Control Act of 1965 and WRDA 1974
 - ✓ Initial beach replenishment completed in 1977
 - ✓ Periodic nourishment for 10-years.
- After last authorized nourishments in 1988, several storms seriously eroded the shoreline.
- Section 934 of WRDA 1986 allowed for nourishments from 1995-2004.



Hurricane Sandy Repair/Restore



- Phase 1A: Creation of a berm between B86-B149
 - ✓ 600,000 Cubic Yards
 - ✓ 1A Sand Pumping: August 11 – September 9, 2013
- Phase 1B: Adding 200 feet of beach width from B19-B149
 - ✓ 2,900,000 Cubic Yards
 - ✓ Projected Schedule: January 15- May 24, 2014



Reformulation Study (Atlantic Coast and Bay)

Alternatives Considered

Beach

- Non-Structural Plans
- Beach Restoration
- Beach Restoration w/ Structures
- Removal / Modification of Groins
- Groins

Bay

- Levees and Floodwalls
- Storm Closure Gates
- Nature/Natural Based Features
- Inlet Management / Sand Bypassing
- Seawalls
- Breakwaters



Coordination with Partner Efforts

- Jamaica Bay Science and Resilience Institute
- NYC Special Initiative for Rebuilding and Resiliency (SIRR) Plan
- Urban Waterfront Adaptive Strategies
- NYS2100 Commission Report
- ERDC Studies
- Hurricane Sandy Rebuilding Task Force
- DATA SHARING: ADCIRC Modeling...



Questions?

[For More Information](#)

<http://www.nan.usace.army.mil/Home.aspx>
www.watersweshare.org

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