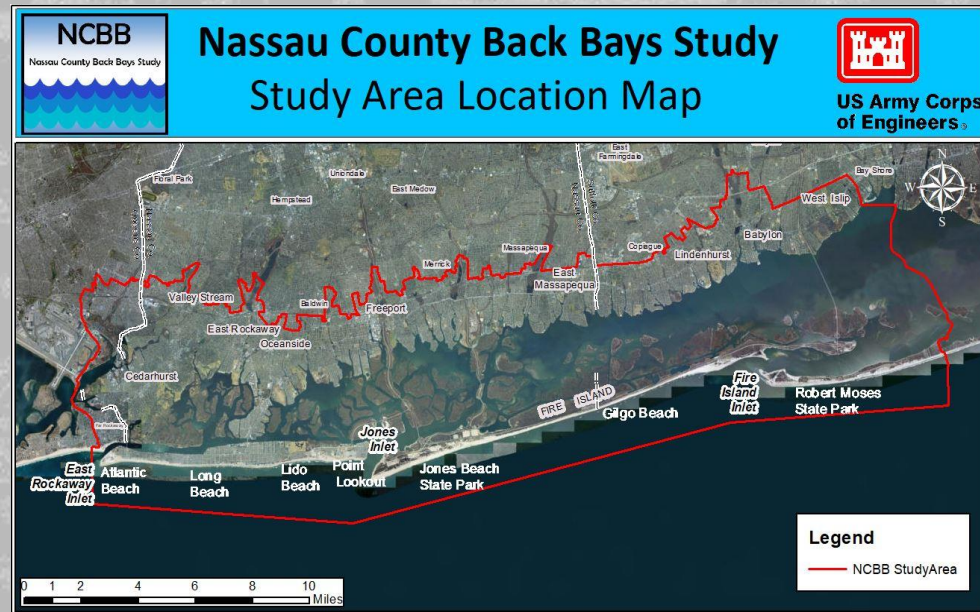


# NASSAU COUNTY BACK BAYS COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY



Scott Sanderson  
Project Manager  
North Atlantic Division/Philadelphia  
District/Coastal Planning  
Date: 27 June 2019



US Army Corps  
of Engineers®



# AGENDA



**Nautical Mile, Freeport, NY (2015)**

- Study Background
- Plan Formulation Summary
- Process Overview
- Status Report Highlights
- Questions & Answers
- Closing Comments



**Hurricane Sandy Damage, Oceanside, NY (2012)**



# OVERVIEW OF HURRICANE SANDY



- 22 October 2012 – Hurricane Sandy originated in the southwestern Caribbean
- Hurricane Sandy increased to a size of more than 1,000 nautical miles – largest diameter storm recorded in the Atlantic basin
- 29 October 2012 – Hurricane Sandy made landfall near Brigantine, NJ at about the same time as predicted high tide in the NY-NJ metropolitan area
- Total Damage Estimate - \$65 billion
  - Highest storm surge and greatest inundation on land occurred in New Jersey and New York, especially in and around New York City
  - Surge was accompanied by powerful damaging waves in these areas, including Nassau County
  - High-water mark of 4.6 feet above ground level observed in Freeport in the Town of Hempstead



# STUDY BACKGROUND



## STUDY AUTHORITY

- Public Law 71, Chapter 140 (June 1955)
- Public Law 113-2 (Disaster Relief Appropriations Act of 2013)

## NON-FEDERAL SPONSOR

- New York State Department of Environmental Conservation, in partnership with Nassau County
- Cost Sharing Agreement executed 30 September 2016

## STUDY PURPOSE

- Determine the feasibility of a project to manage coastal storm risk in the back bays of southern Nassau County
- Recommend a coastal storm risk management plan that will contribute to community and environmental resilience

## STUDY AREA: Extends ~ 30 miles east/west

- Nassau County: population of 1.3 million; 287 sq. miles land area; 166 miles of water
- Dense, low, elevation mixed-use development; highly developed shoreline
- Critical infrastructure
- Hundreds of miles of highways, roads (Some are evacuation routes)
- Area subject to tidal impacts and coastal storm inundation

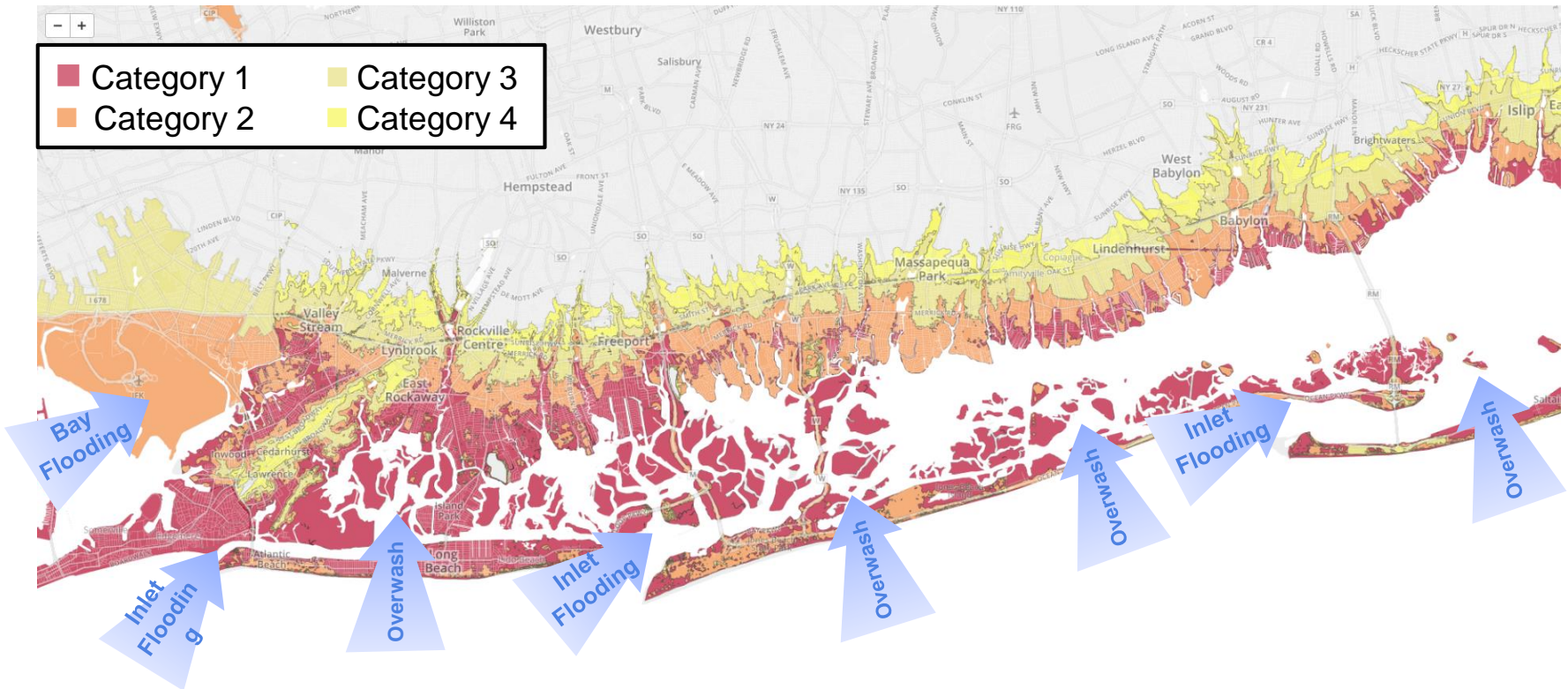


## PROBLEMS

- Frequent flooding from high tides, spring tides, sunny day flooding, and coastal storms
- High risk of coastal storm flooding and threat to life safety
- Ecosystem degradation in the back bays
- Relative Sea Level Change

## OPPORTUNITIES

- Manage coastal storm flood risk
- Better communicate coastal storm risk
- Improve recreation and restore natural systems in ways that may provide coastal storm risk management benefits
- Contribute to community rebuilding and resilience





# PLAN FORMULATION SUMMARY



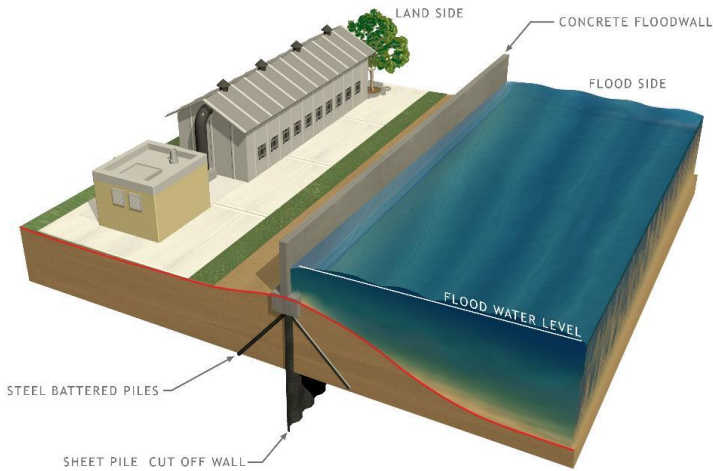
## PLANNING OBJECTIVES

- Reduce the risk of coastal storm damage to communities, public infrastructure, important societal resources, and the environment in southern Nassau County
- Contribute to the long-term sustainability and resilience of coastal communities and back bay environment in southern Nassau County

## PLANNING CONSTRAINTS

- Avoid impact to Federal navigation channels
- Avoid impact to constructed and planned resilience projects
- Avoid induced flooding in adjacent communities, and flooding from rainfall or overwhelming of existing interior drainage systems
- Avoid impacts to critical infrastructure
- Minimize or avoid impacts to the environment and public access

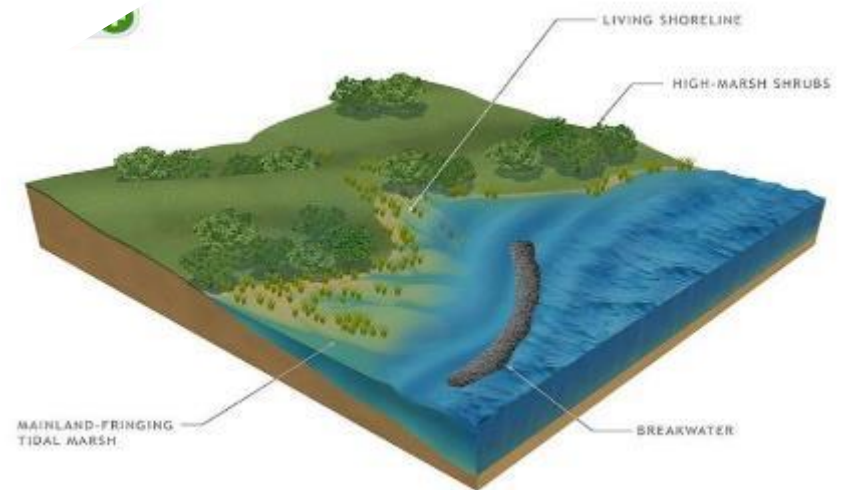
## Levees & Floodwalls



## Storm Surge Barriers



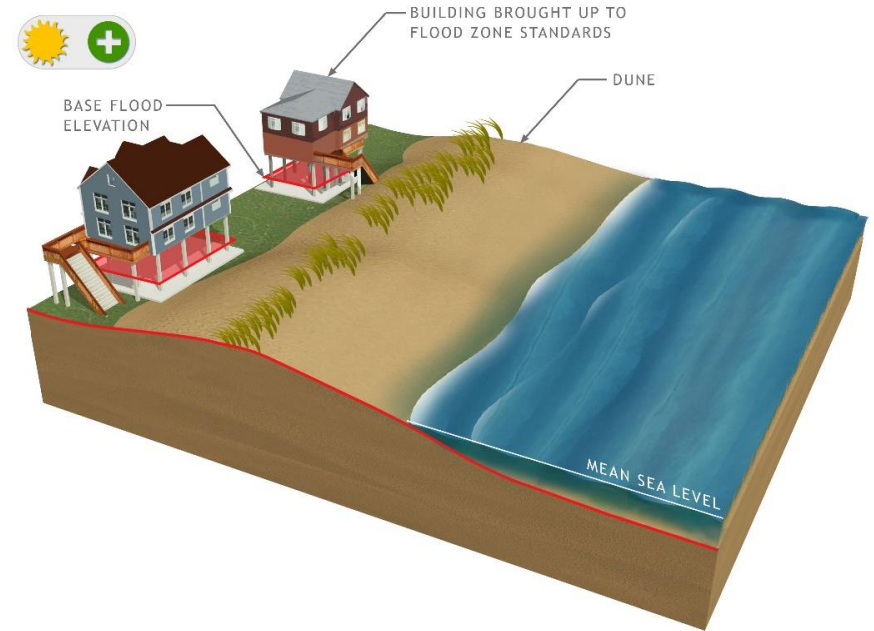
## Natural & Nature-Based Features (NNBF)





## ■ Nonstructural measures

- Building elevation
  - Acquisition and relocation later
  - Flood warning and evacuation planning
  - Programmatic considerations
    - Land use
    - Floodplain management
    - Zoning
- 
- Potential to combine with structural measures







# POTENTIAL ALTERNATIVES

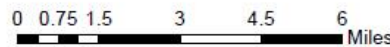


## Nassau County Back Bays Coastal Storm Risk Management Feasibility Study

Alternative 1a - Inlet Barriers

\* Nonstructural and Natural and Nature-Based Features - location TBD

-  Barrier
-  Oceanfront Alignment
-  County
-  Highway





# POTENTIAL ALTERNATIVES



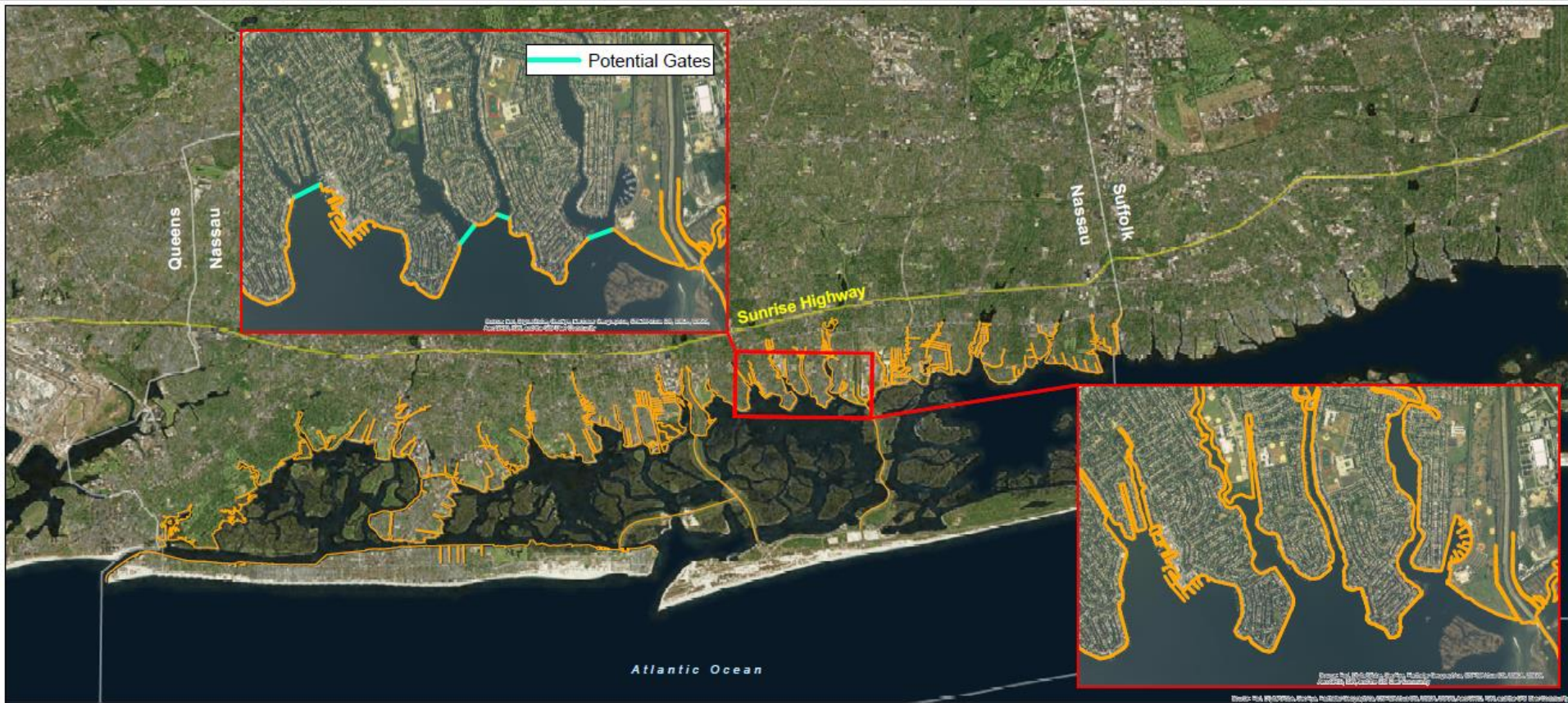
## Nassau County Back Bays Coastal Storm Risk Management Feasibility Study

Alternative 1b - Inlet and Back Bay Barriers



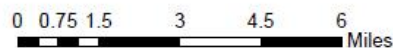
\* Nonstructural and Natural and Nature-Based Features - location TBD

-  Barrier
-  Oceanfront Alignment
-  County
-  Highway



## Nassau County Back Bays Coastal Storm Risk Management Feasibility Study

Alternative 2 - Structural



\* Nonstructural and Natural and Nature-Based Features - location TBD

- Reinforced shoreline
- County
- Highway





# POTENTIAL ALTERNATIVES



## Nassau County Back Bays Coastal Storm Risk Management Feasibility Study

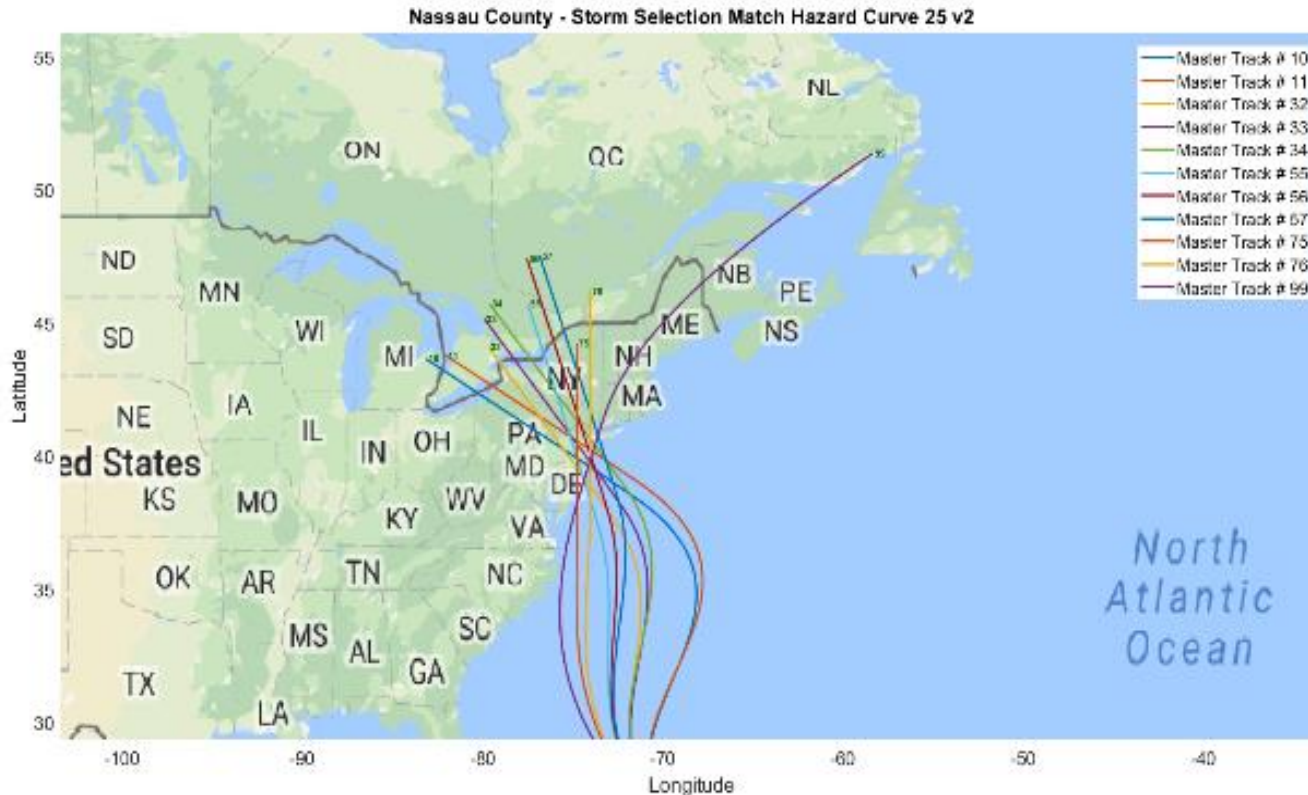
Alternative 3 - Nonstructural



**US Army Corps  
of Engineers**  
New York District

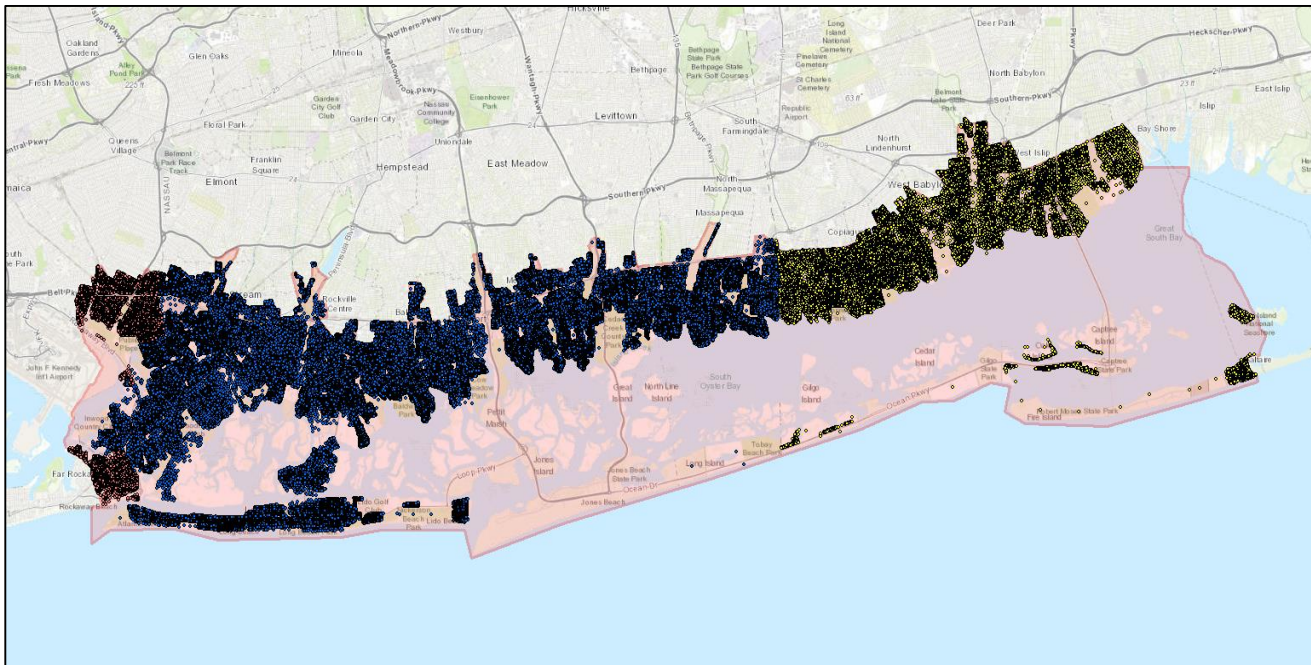
# SUMMARY OF HYDRODYNAMIC MODELING

- Hydrodynamic model results show three principle processes for storm surge entering the bay:
  - Storm surge propagation through the three tidal inlets
  - Local wind-driven storm surge along the bay axis
  - Overwash across the barrier islands



# SUMMARY OF ECONOMIC ANALYSIS

- Total study area extends across 3 counties (Nassau, Queens and Suffolk)
  - Detailed structure inventory assessments are currently only available for Nassau County
  - Further investigation on the structure inventory in Queens County and Suffolk County is ongoing and will be implemented when calculating total storm-induced damage estimates
  - Nassau County structures and contents account for over \$55 billion in total value with an additional \$2 billion in value from assessed vehicles
  - With further refinement of the Queens Cty. and Suffolk Cty. inventories, the total study area inventory is expected to approach 150,000 total structures with over \$100 billion in total damageable assets





- The environmental effort to date has focused on documenting existing conditions in the study area
  - Land use, geology, soils, topography, water resources, water quality, wildlife, vegetation, infrastructure, hazardous, toxic, and radioactive waste, cultural and recreational resources, noise, and aesthetics.
- As alternatives are further refined, impacts to environmental resources will be assessed
- Based on current formulation, environmental resources likely to be impacted include:
  - Coastal Barrier Improvement Act (CBIA) of 1990 / Coastal Barrier Resource System
  - Estuarine Ecosystems – Wetlands, Submerged Aquatic Vegetation, tidal flats, etc.
  - Wildlife – Avian and aquatic (marine finfish, shellfish, and other wildlife)
  - Threatened & Endangered Species (Birds, mammals, reptiles, and fish)
  - Essential Fish Habitat
  - Recreational Resources (beaches, and national, state, and county parks)
  - Aesthetics

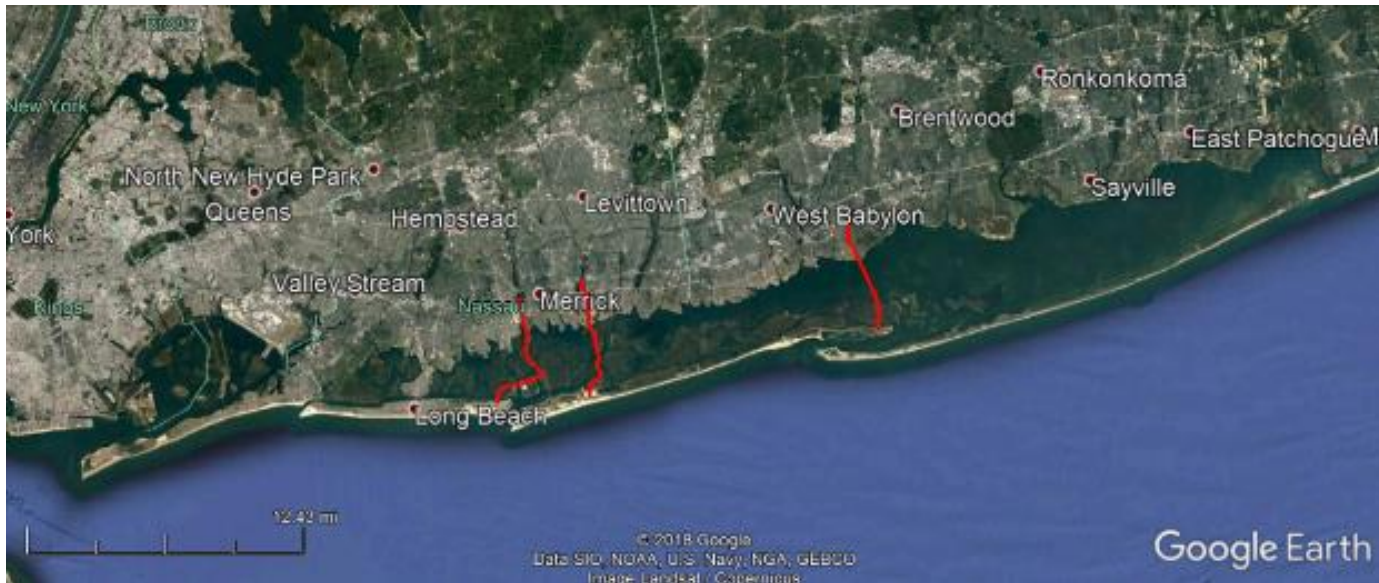




# POST-STATUS REPORT UPDATE



- Coastal Engineering Modeling
  - Hydrodynamic modeling of 2 additional cross-bay closure alignments:
    - Loop & Meadowbrook State Parkway
    - Robert Moses Causeway
- Economic Analysis
  - Structure Inventory Update
  - Without Project Conditions Update







# PROPOSED SCHEDULE

<b>Milestone</b>	<b>Date</b>
Cost-Sharing Agreement Signed	30 September 2016 (Actual)
Alternative Milestone	16 August 2017 (Actual)
Status Report	30 April 2019 (Actual)
Tentatively Selected Plan Milestone	May 2020
Draft Feasibility Report/Env. Impact Statement	June 2020
Agency Decision Milestone	January 2021
Final Feasibility Report/Env. Impact Statement	January 2022
Chief of Engineers Report	April 2022

**Note: Schedule is dependent on approval of 3x3x3 Exemption by the Assistant Secretary of the Army for Civil Works (ASA – CW)**



# QUESTIONS & ANSWERS

