

State of New Jersey Shore Protection Program



**State of New Jersey
Philip Murphy, Governor**

**Department of Environmental Protection
Catherine McCabe, Acting Commissioner**

**Engineering & Construction
David Rosenblatt, Assistant Commissioner**

**Division of Coastal Engineering
William Dixon, Director**



Division of Coastal Engineering

Purpose...



To administer beach nourishment, shore protection and navigational dredging projects throughout the State to:

- ...Provide for protection of life and property along the coast
- ...Preserve New Jersey's vital coastal resources
- ...Maintain safe and navigable waterways



Shore Protection Fund is Dedicated...



“To protect existing development and infrastructure from storm surges, sea-level rise, and shoreline migration, through dune creation and maintenance, beach nourishment projects and construction and repair of shore protection structures.”

**\$25 million dedicated annually
Realty Transfer Tax (N.J.S.A. C. 13:19-16.1)**



How the money is divided...



DCE Overhead & Professional and Technical Services

- **Approximately \$5 million**

Steven's Institute of Technology
NJ

Richard Stockton College of

NJ Division of Fish and Wildlife

NJ Geological Survey

- **Remaining \$20 Million**

Federal Projects – NJDEP - local sponsor in these projects

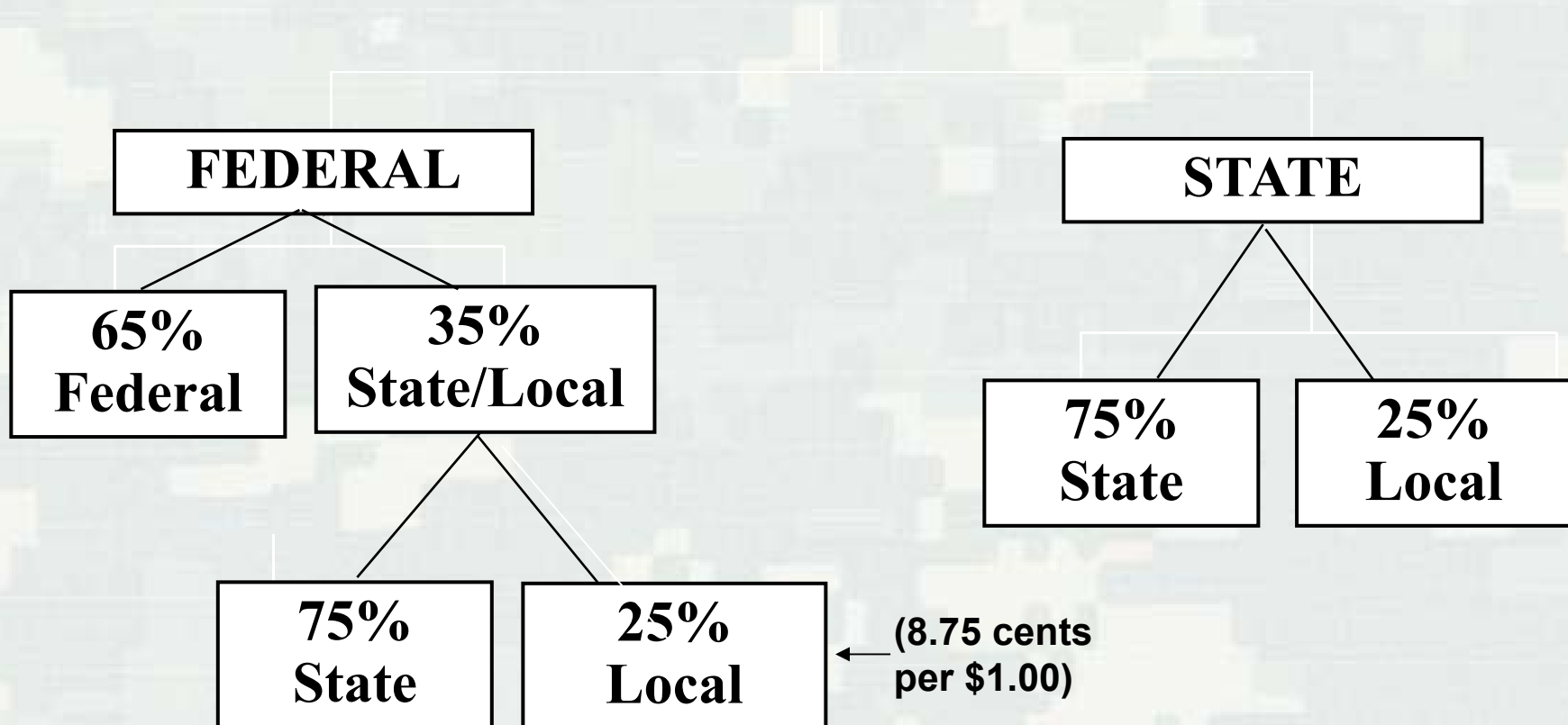
- ▶ **Studies**
- ▶ **Storm Damage Reduction/Shore Protection**
- ▶ **Environmental Restoration**

State Projects – Municipalities – local sponsor in these projects

- ▶ **Storm Damage Reduction/Shore Protection**



Typical Cost Share Breakdown: Shore Protection Projects



Meeting Purpose

NJBB Study purpose, outcomes and technical products

Shared vision for community coastal resilience in a regional, systems context

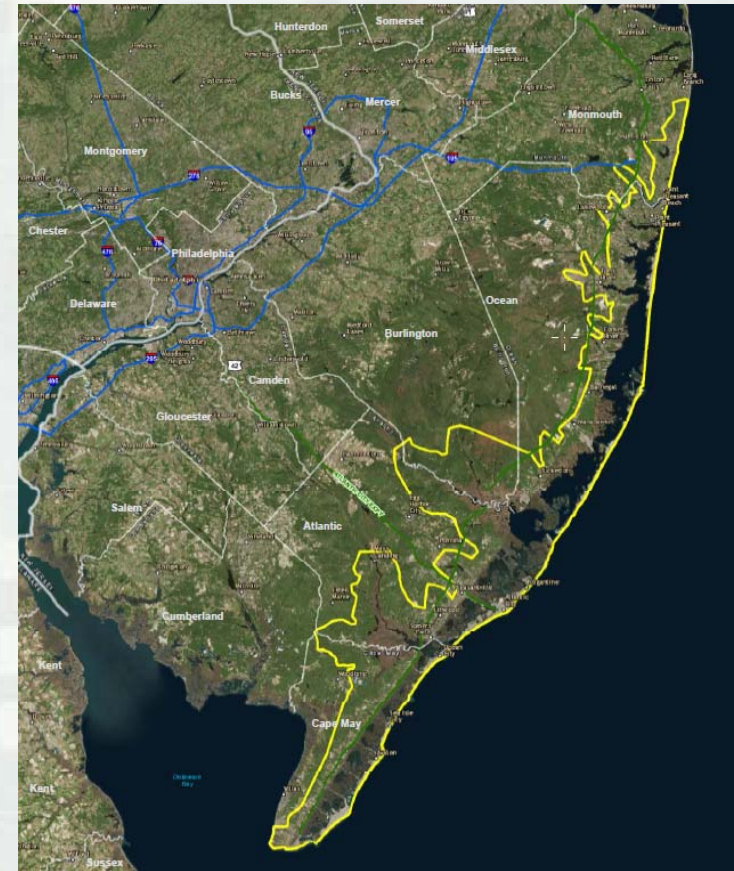
Local official's input

- Study analyses and products
- Study process and schedule
- Management measures
- Other pertinent information relevant to study



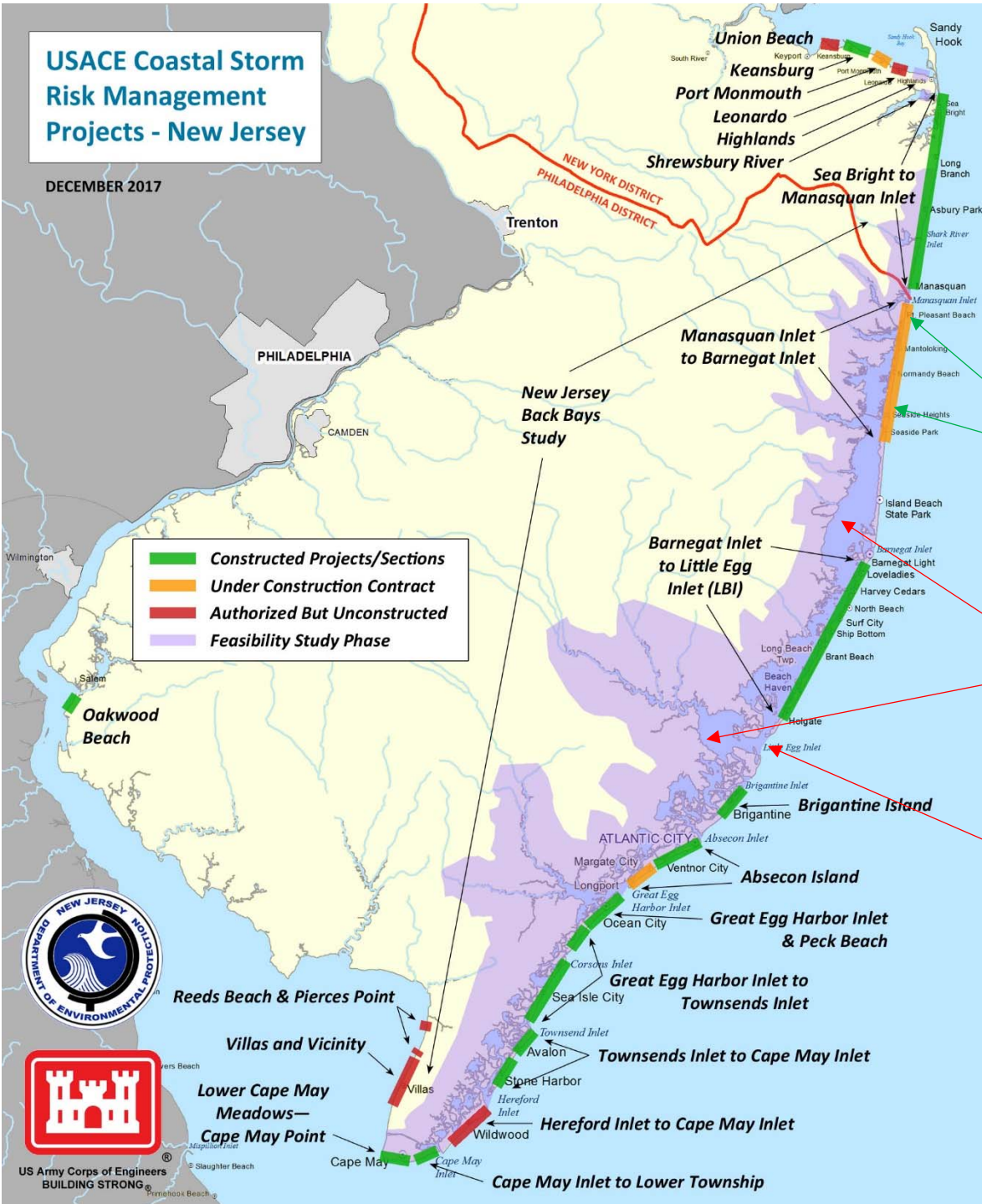
New Jersey Back Bays Coastal Storm Risk Management Feasibility Study

- Extensive area
- Coastal flooding and sea level rise risk management
- Reduce damages that affect population, critical infrastructure, critical facilities, property, and ecosystems.
- Implement system-wide structural, nonstructural, natural and nature-based solutions
- Three-year study to Tentative Plan (April 2019)
- Scaled and incrementally implementable design and construction opportunities



USACE Coastal Storm Risk Management Projects - New Jersey

DECEMBER 2017



Comprehensive oceanfront projects

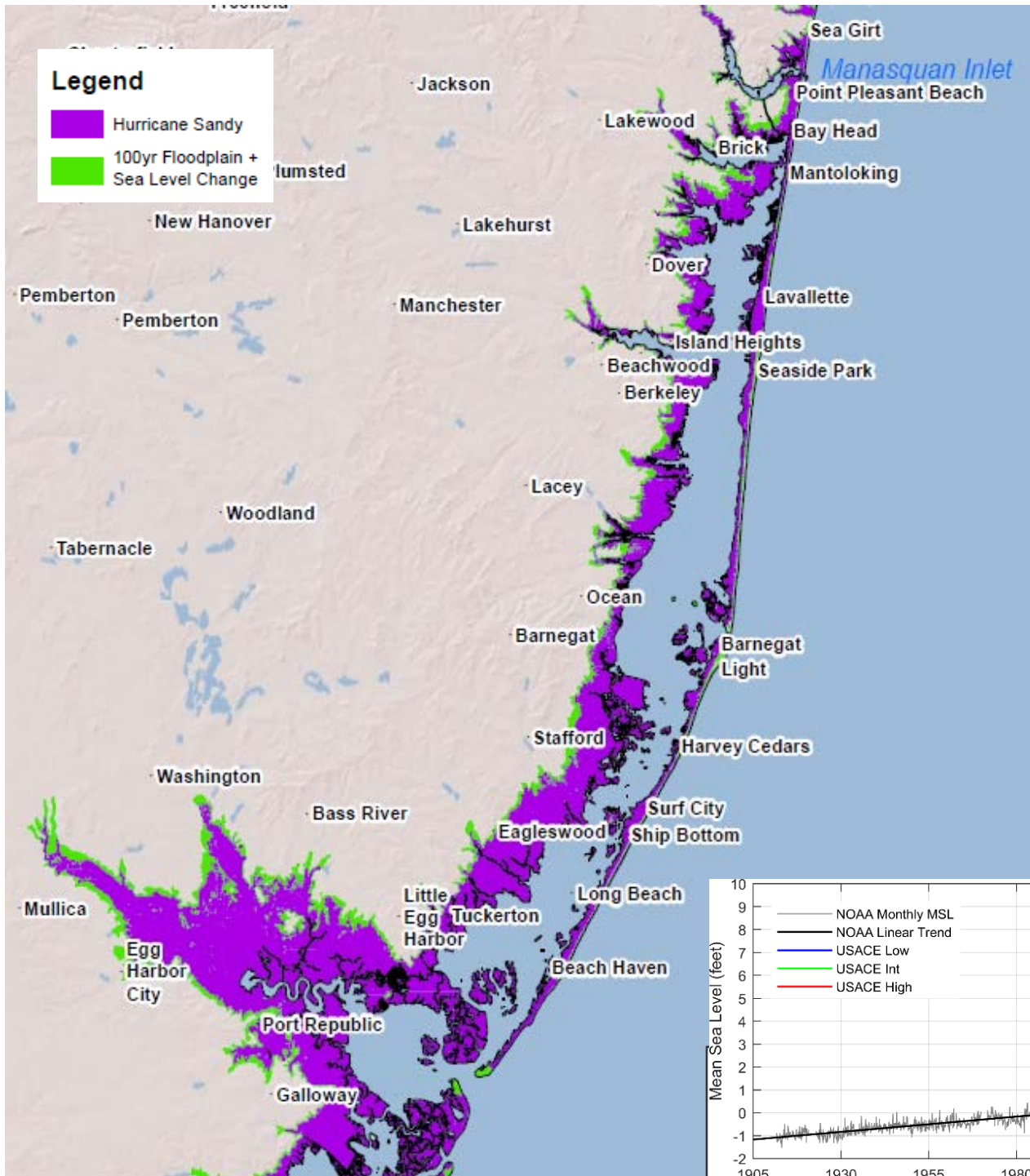
Limited project coverage at Back Bays

Twelve tidal Inlets

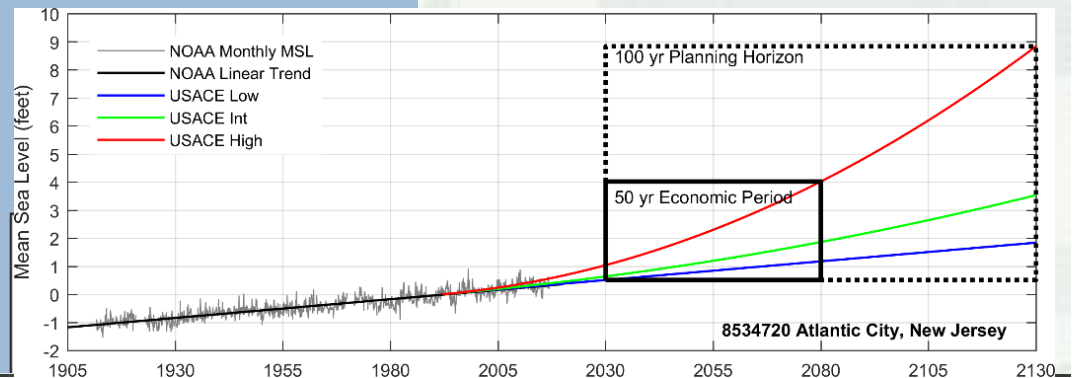




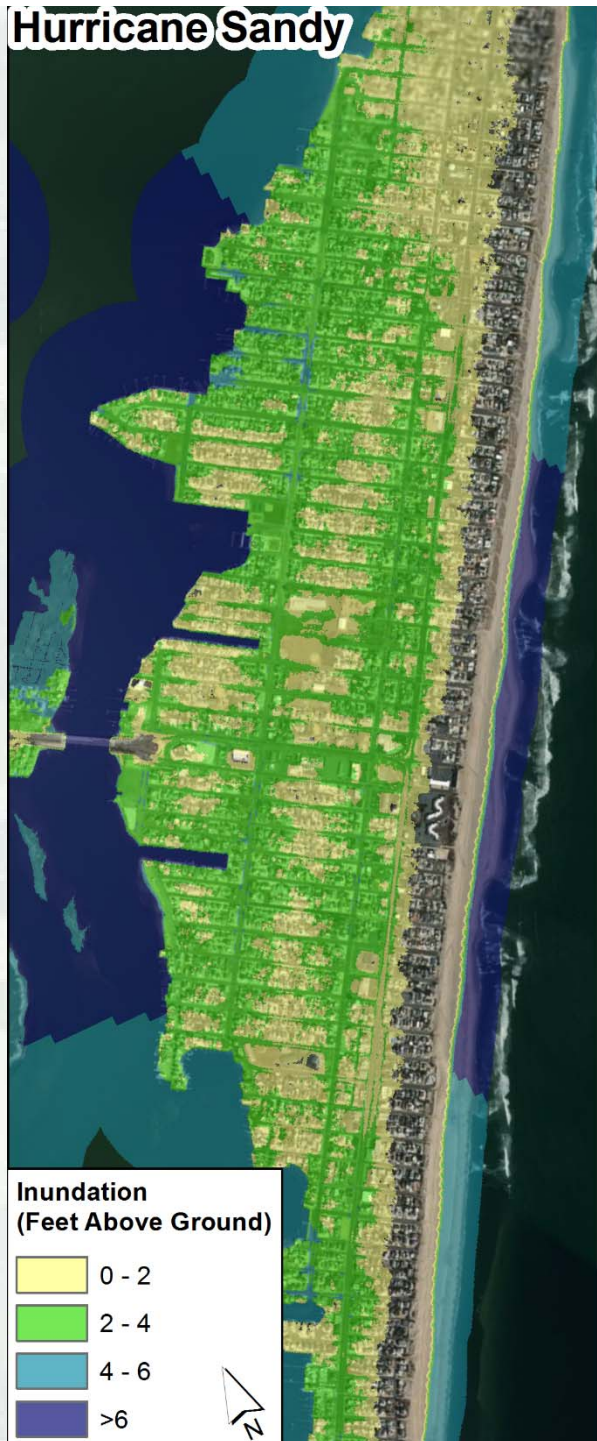
- **Hurricane Sandy (October 2012) Mantoloking, NJ**
- **USACE North Atlantic Coast Comprehensive Study**
- **Focus Area Studies**



Ocean County Inundation Map with Sea Level Rise



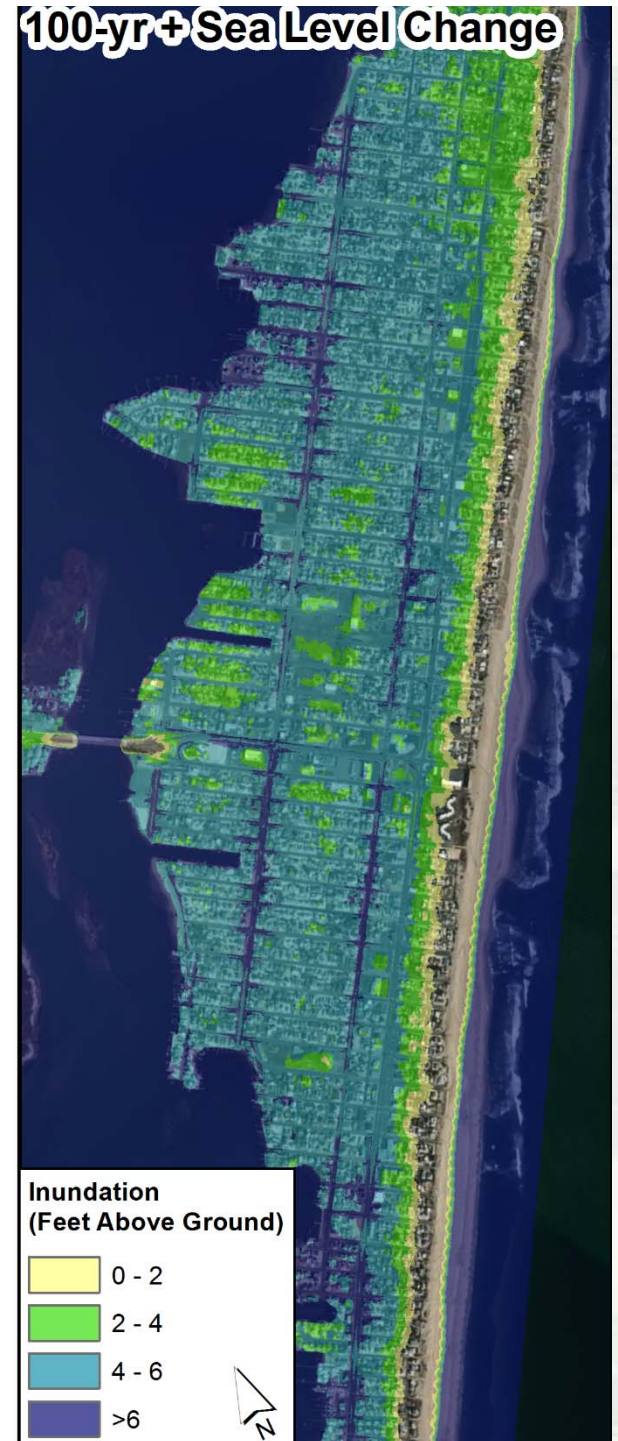
Hurricane Sandy



100-yr Floodplain



100-yr+ Sea Level Change



RESILIENCE means "the ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions."

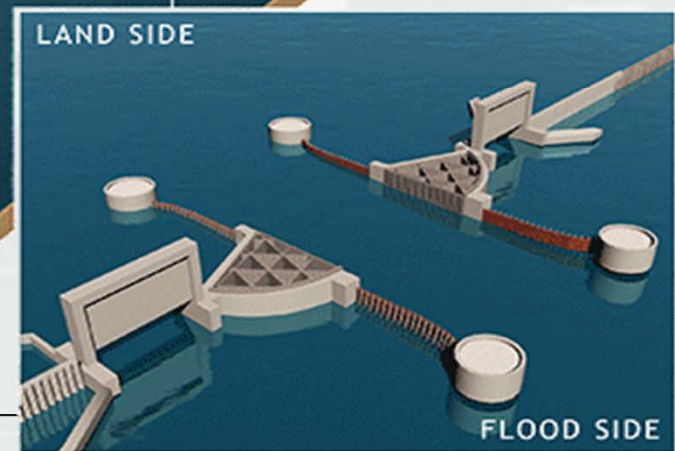
Presidential Executive Order 13653, Preparing the U.S. for Impacts of Climate Change (NOV 2013)

USACE's Principles of Resilience



MANAGEMENT MEASURES

STRUCTURAL – STORM SURGE BARRIERS



New Orleans, LA: Inner Harbor Navigation Canal – Lake Borgne Storm Surge Barrier

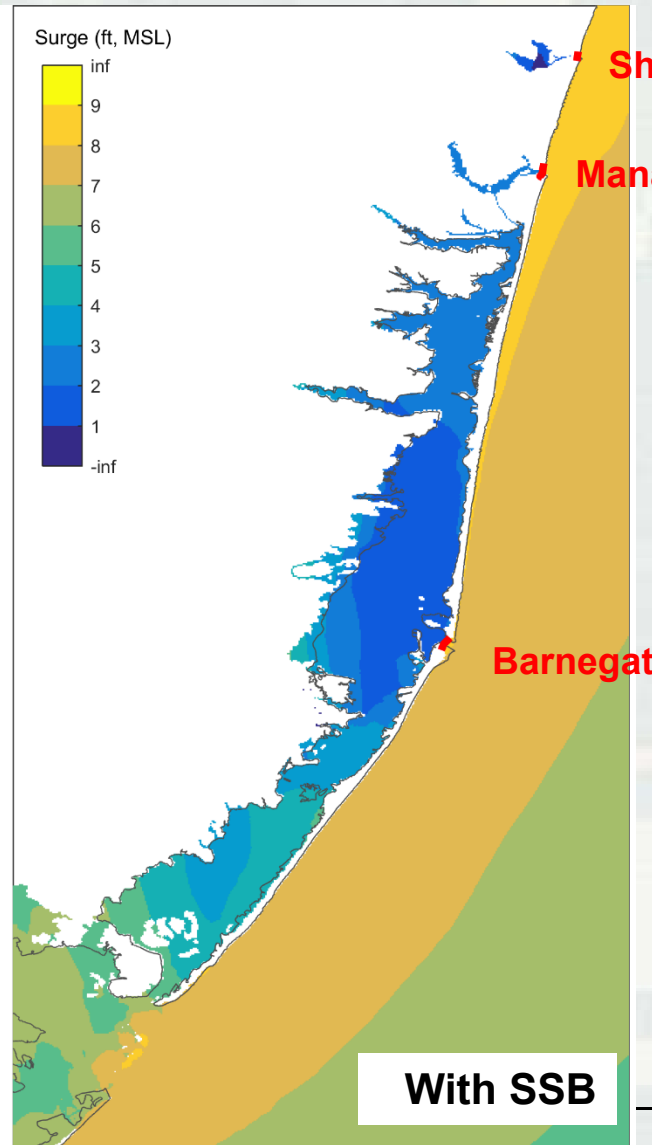
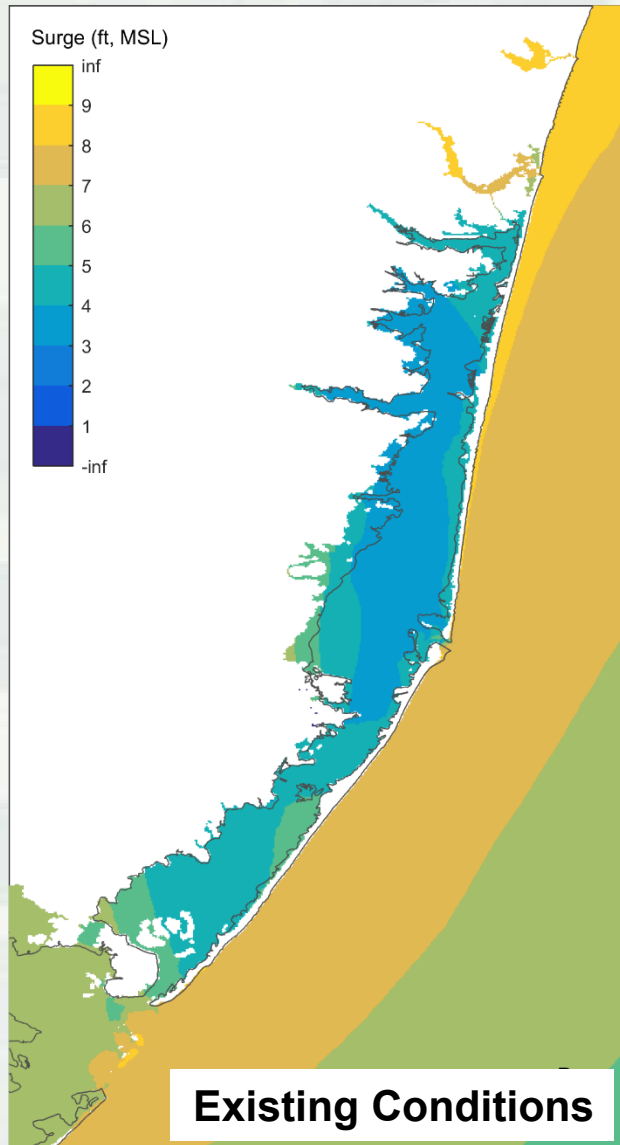


Barge Gate and Sector Gate at the Gulf Intracoastal Waterway



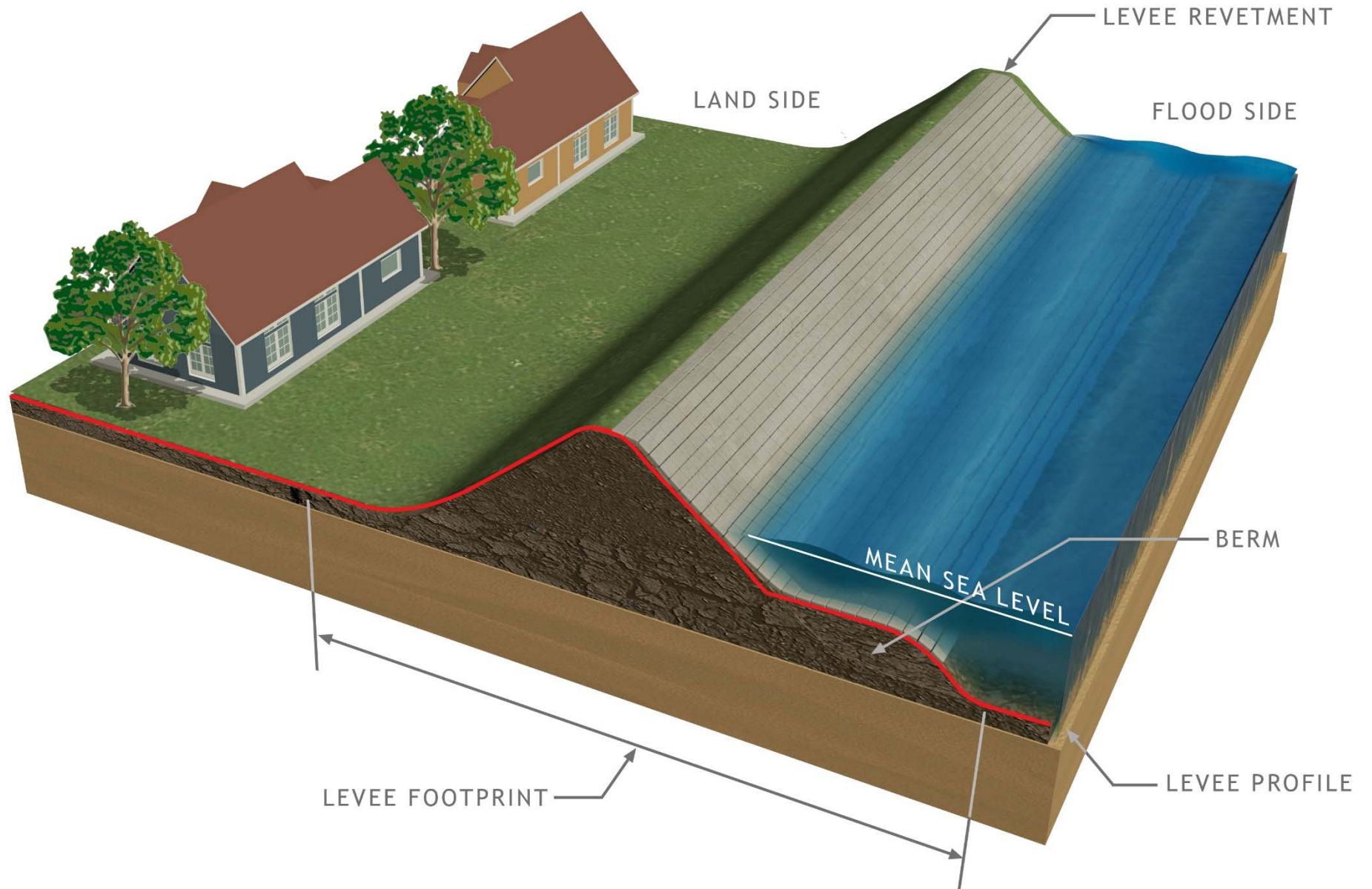
Vertical Lift Gate at Bayou Bienvenue

ERDC – Storm Surge Barriers



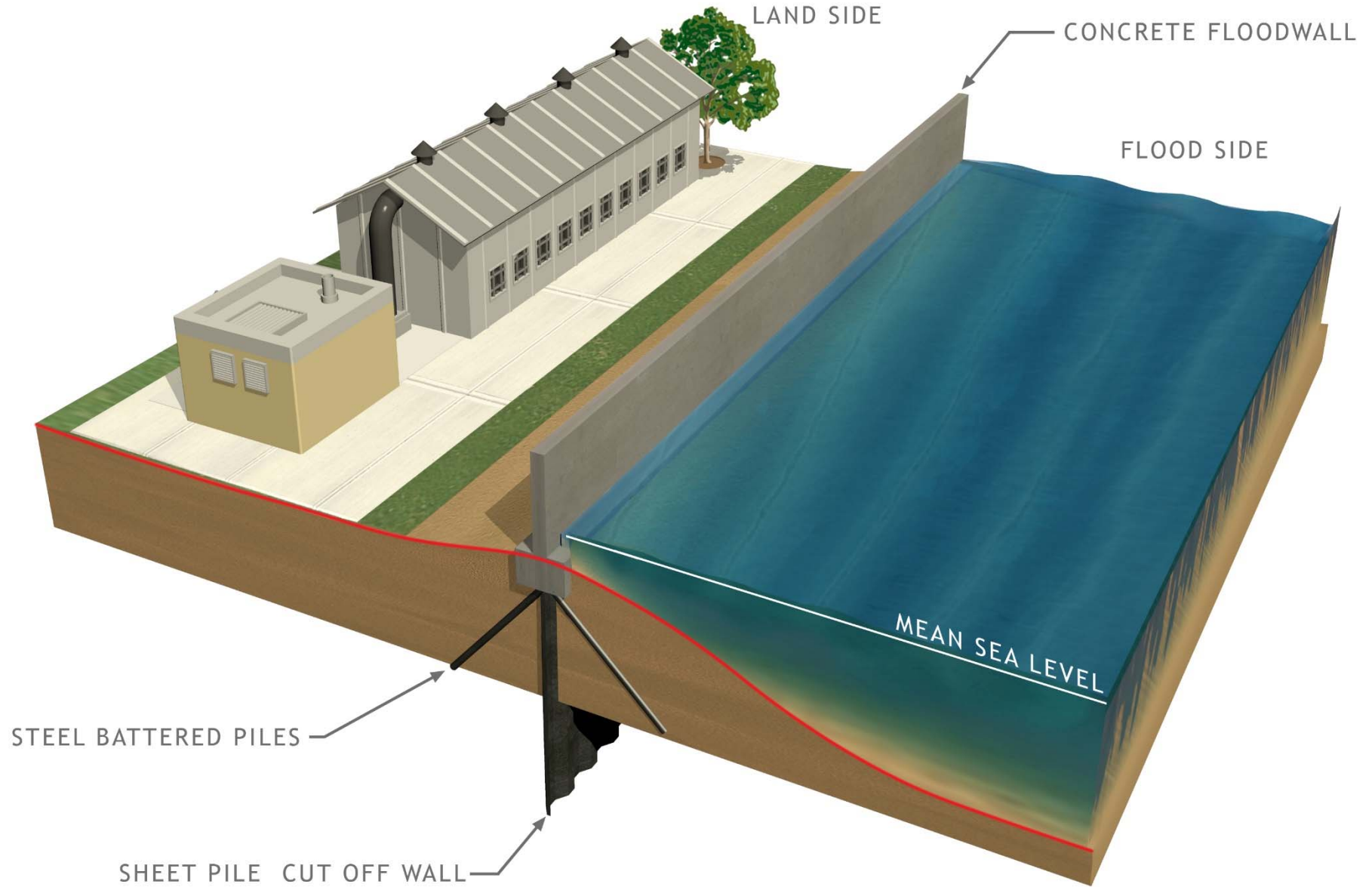
MANAGEMENT MEASURES

STRUCTURAL - LEVEE



MANAGEMENT MEASURES

STRUCTURAL - FLOODWALL



Green Brook Floodwall, NJ



Floodwall

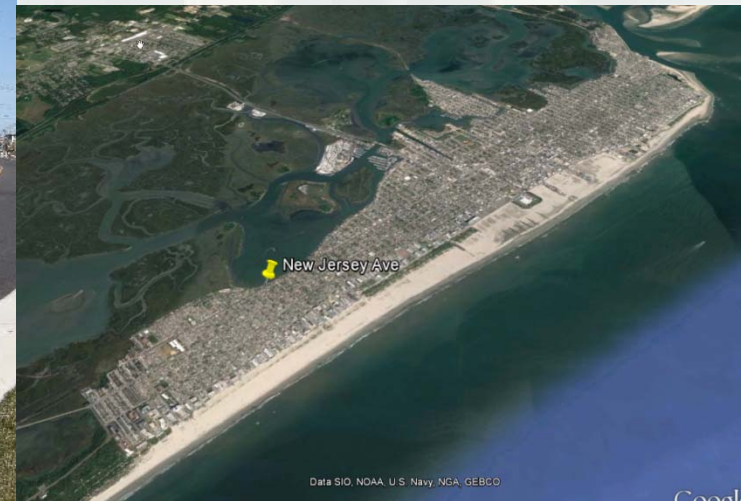


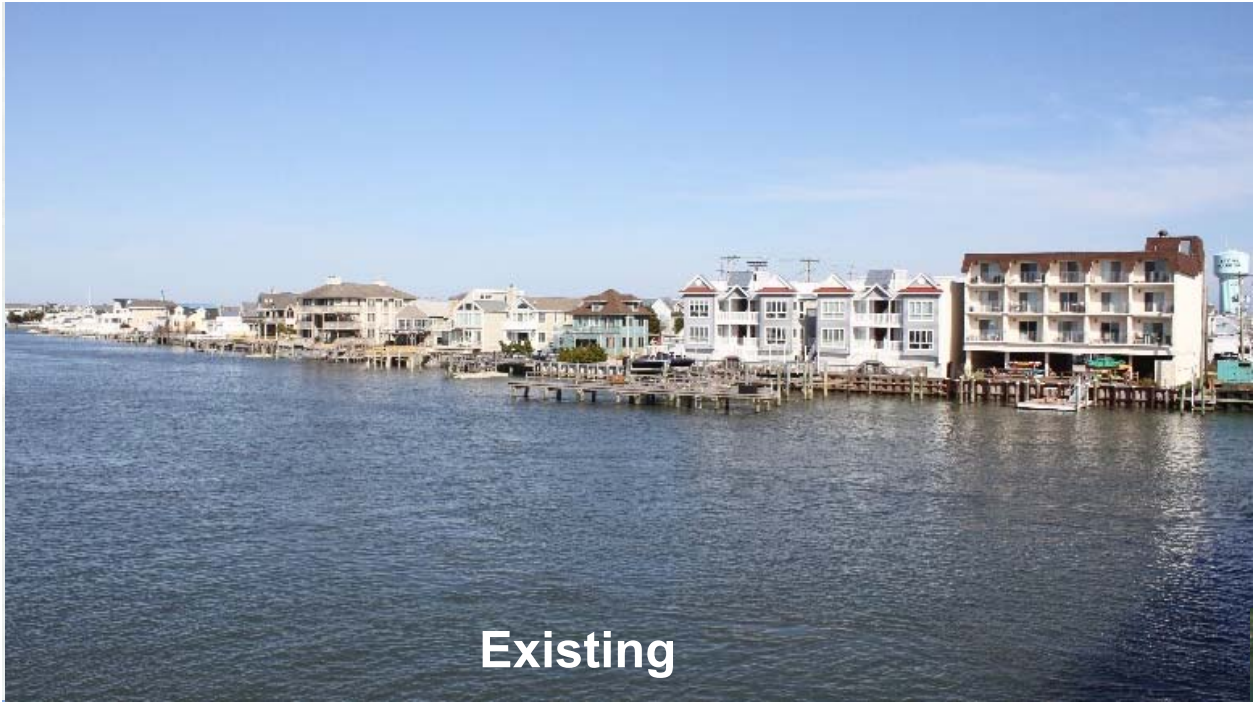
Flood Gate



Under Construction

New Jersey Avenue Levee, Wildwood Crest, NJ



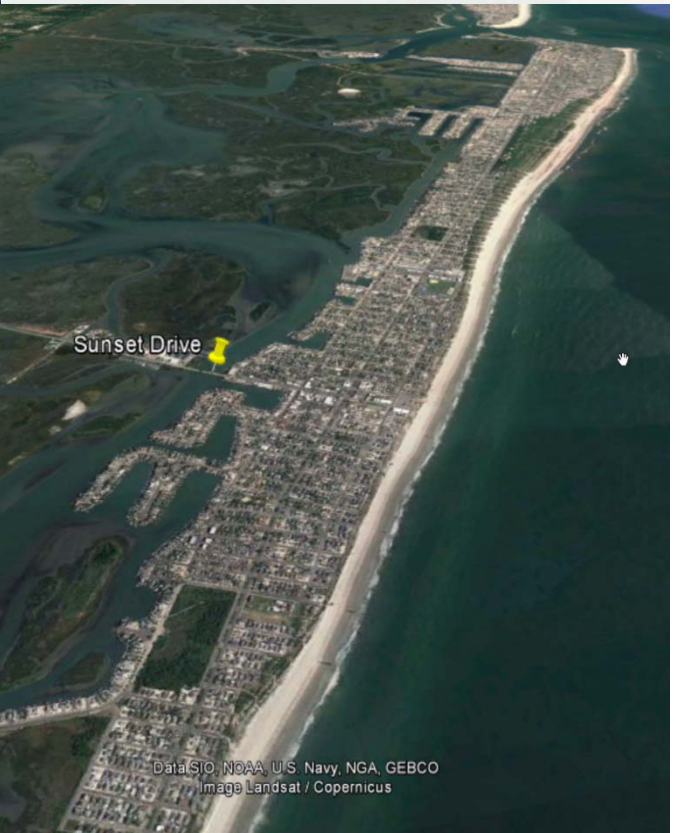


Existing



With project

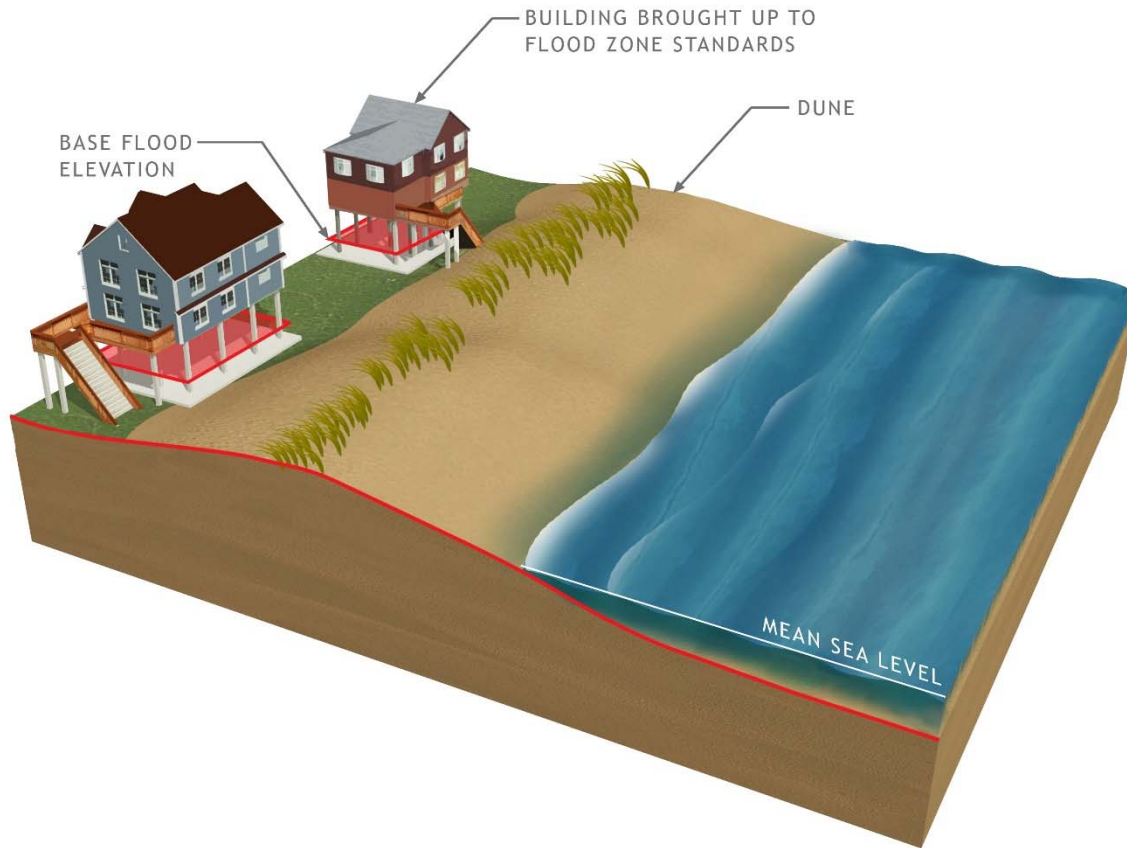
Sunset Drive Floodwall, Stone Harbor, NJ



Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus

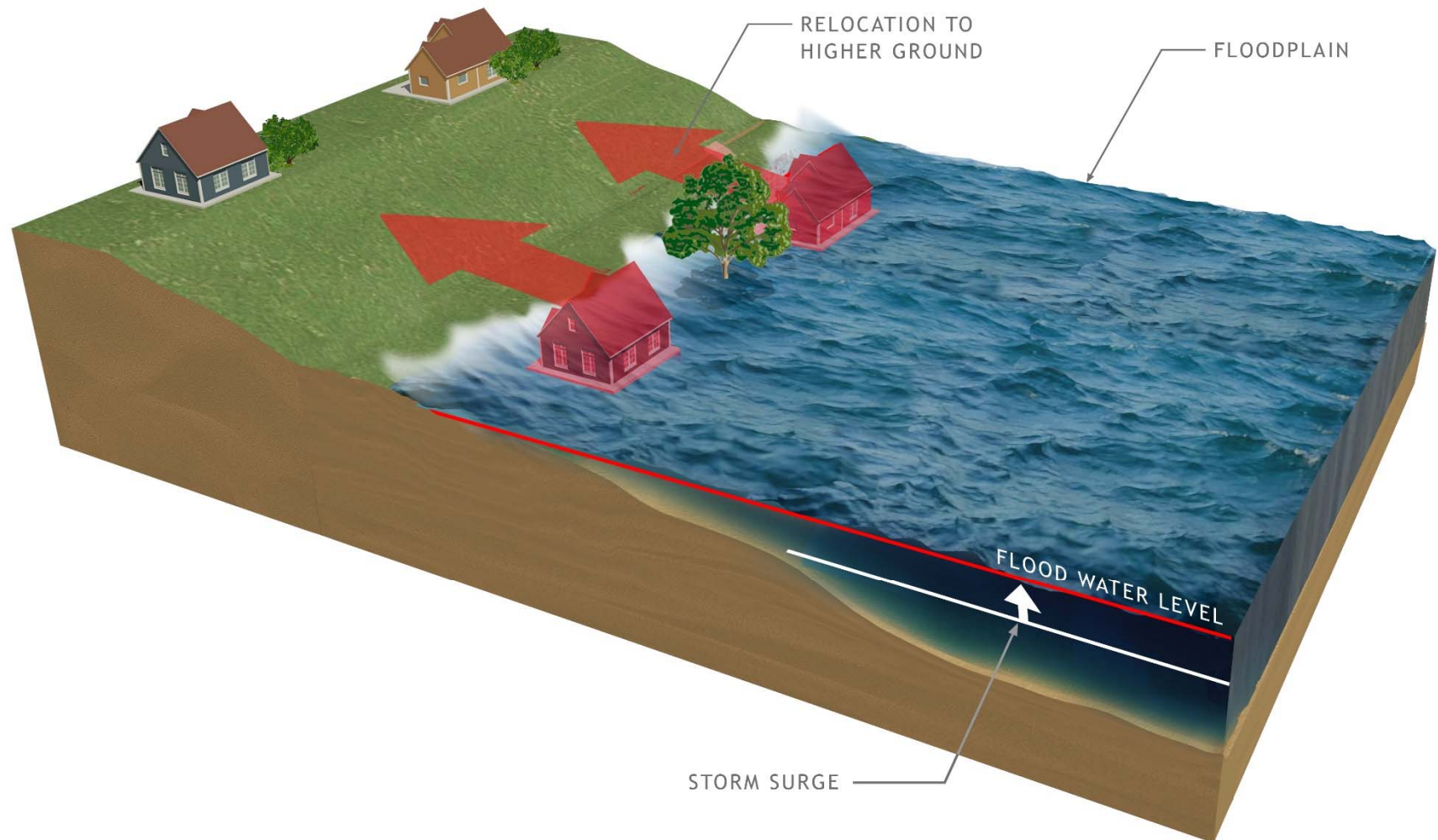
MANAGEMENT MEASURES

NON-STRUCTURAL - ELEVATION



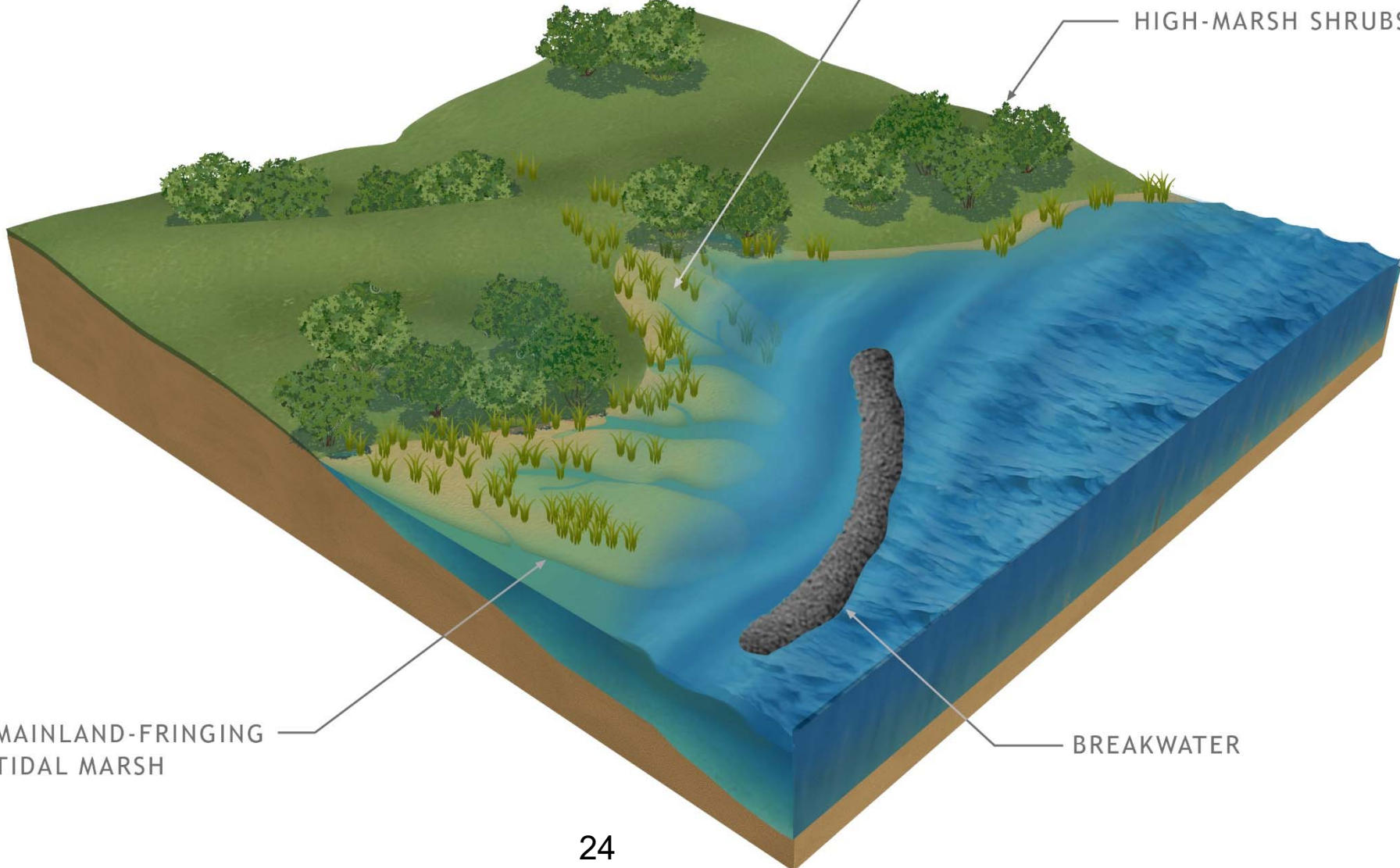
MANAGEMENT MEASURES

NON-STRUCTURAL - ACQUISITION & RELOCATION



NATURAL AND NATURE-BASED FEATURES

LIVING SHORELINES — LIVING SHORELINE

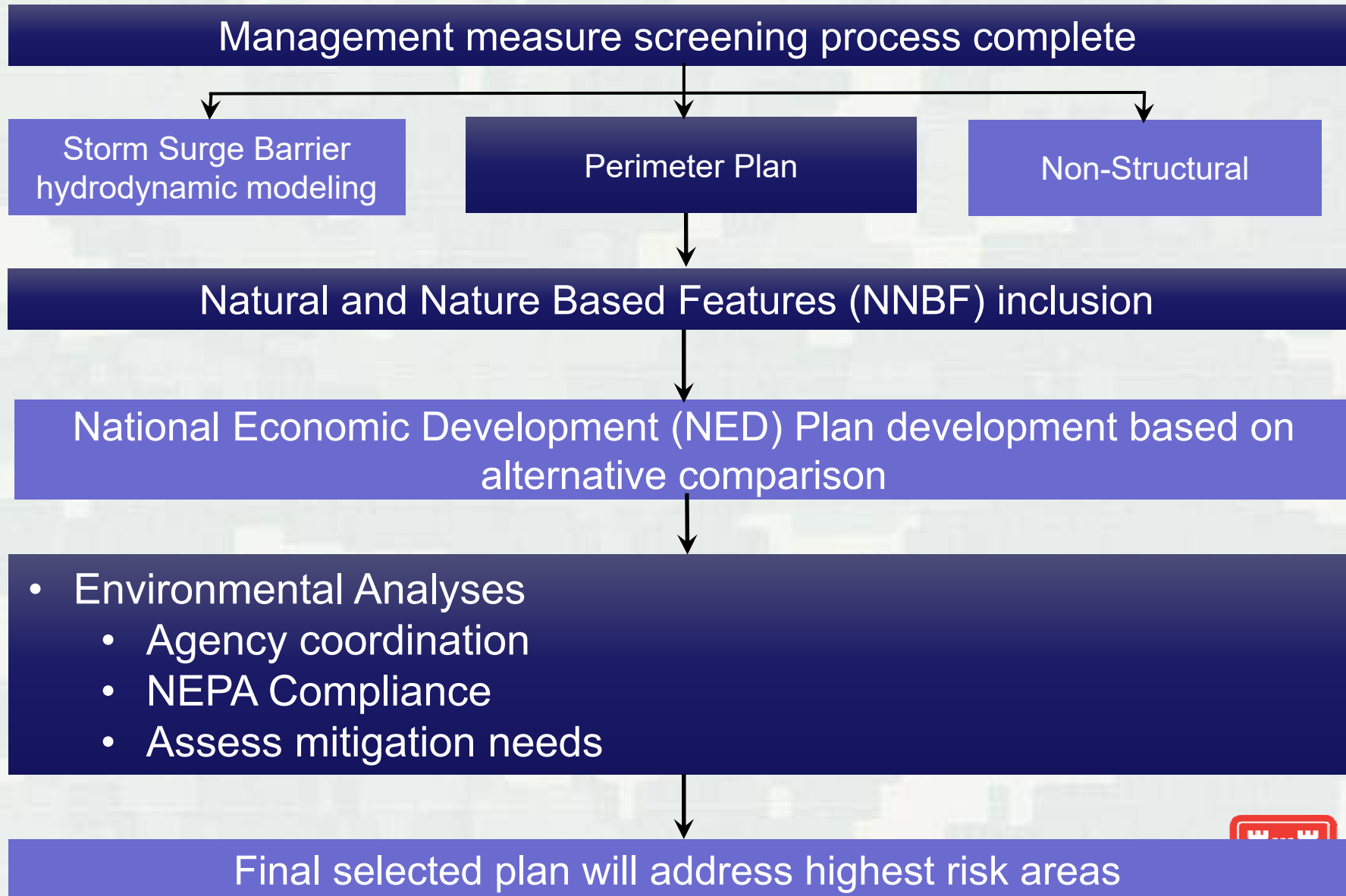


HIGH-MARSH SHRUBS

MAINLAND-FRINGING
TIDAL MARSH

BREAKWATER

Overall Study Strategy



OCEAN COUNTY INVENTORY

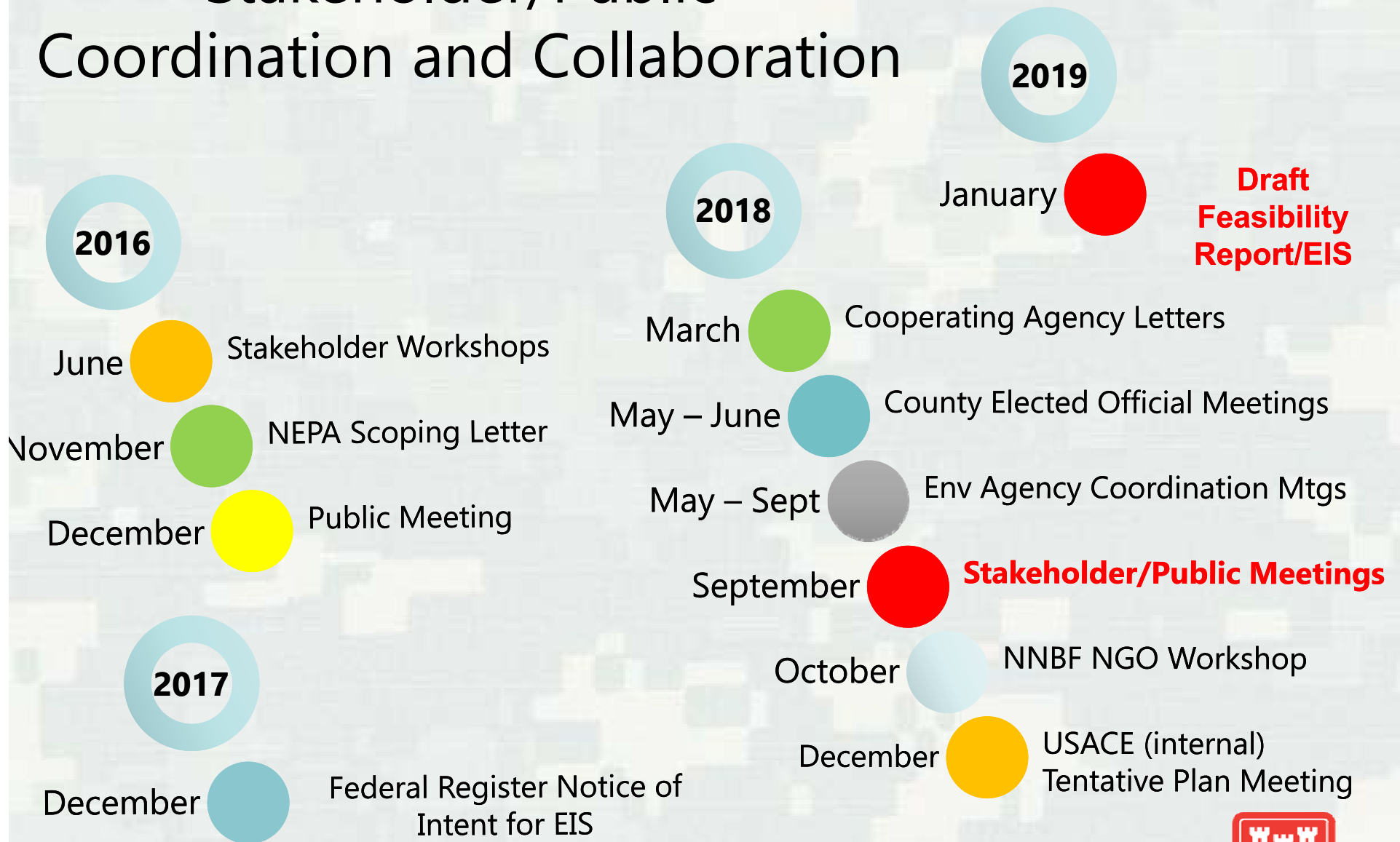
MUNICIPALITIES	STRUCTURES	RESIDENTIAL	NON-RES	TOTAL VALUE
Barnegat Light	1,189	1,131	58	\$474,850,307
Barnegat	755	732	23	\$129,895,811
Bay Head	1,014	952	62	\$632,790,146
Beach Haven	2,384	2,241	143	\$621,156,548
Beachwood	57	54	3	\$13,856,277
Berkeley	4,374	4,289	85	\$909,776,438
Brick	9,772	9,516	256	\$2,519,164,192
Eagleswood	305	284	21	\$50,014,990
Harvey Cedars	1,182	1,143	39	\$518,709,319
Island Heights	716	682	34	\$160,023,183
Lacey	4,772	4,673	99	\$988,717,917
Lakewood	5	2	3	\$3,082,282
Lavallette	2,551	2,477	74	\$627,787,048
Little Egg harbor	4,964	4,870	94	\$766,996,344
Long Beach	8,217	8,031	186	\$2,849,755,869

MUNICIPALITIES	STRUCTURES	RESIDENTIAL	NON-RES	TOTAL VALUE
TOTAL	81,262	78,402	2,860	\$20,027,094,798

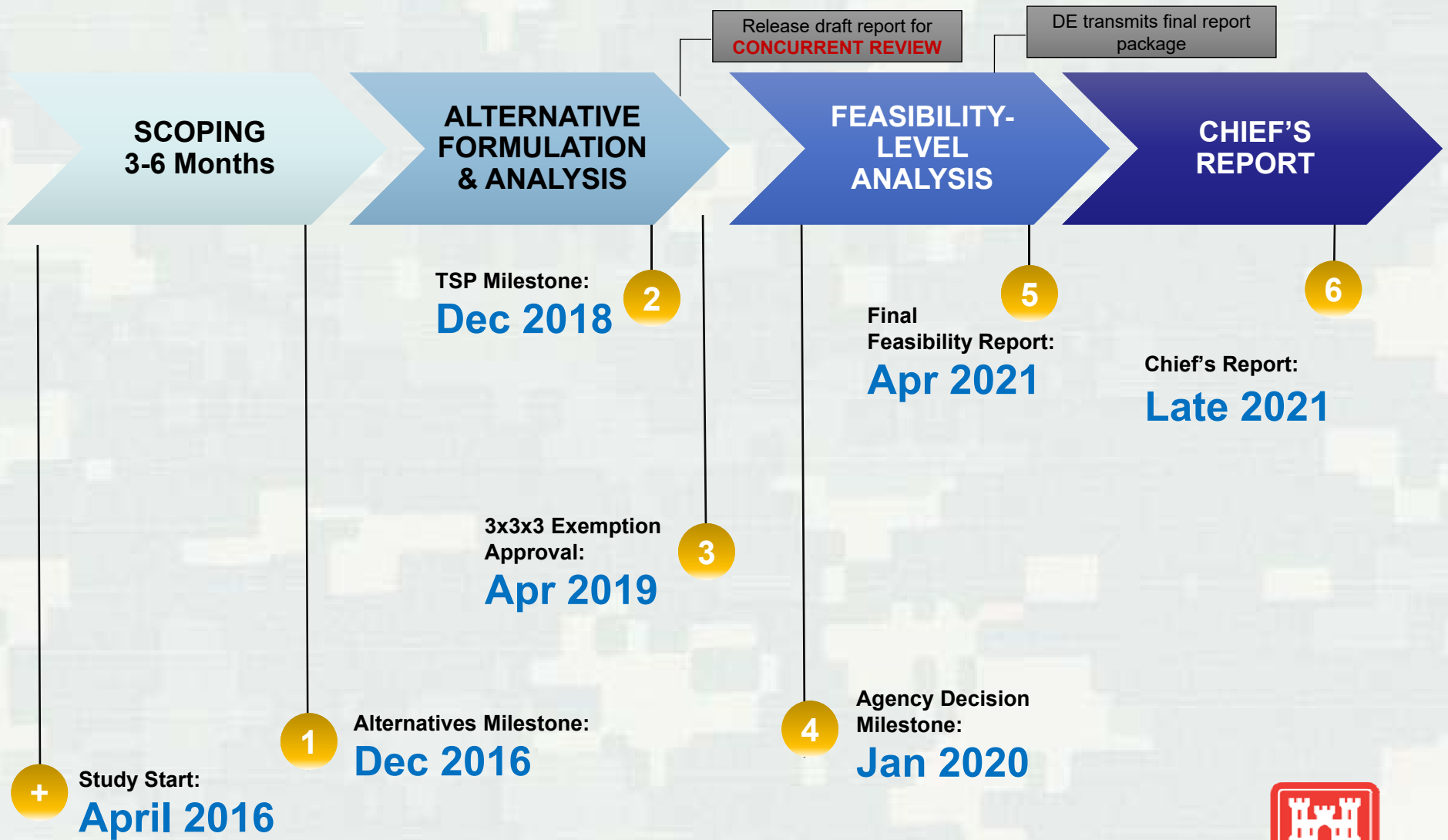
MUNICIPALITIES	STRUCTURES	RESIDENTIAL	NON-RES	TOTAL VALUE
Mantoloking	479	471	8	\$574,013,922
Ocean Gate	1,075	1,045	30	\$166,711,894
Ocean	1,849	1,807	42	\$313,789,211
Pine Beach	99	95	4	\$22,548,752
Point Pleasant	4,818	4,583	235	\$1,190,957,705
Point Pleasant Beach	2,869	2,622	247	\$721,032,608
Seaside Heights	1,958	1,727	231	\$393,352,145
Seaside Park	2,020	1,927	93	\$412,115,557
Ship Bottom	1,883	1,724	159	\$542,612,492
South Toms River	93	56	37	\$28,474,832
Stafford	4,864	4,801	63	\$773,516,958
Surf City	2,248	2,131	117	\$720,895,696
Toms River	13,689	13,327	362	\$2,717,757,431
Tuckerton	1,061	1,009	52	\$182,738,924



Stakeholder/Public Coordination and Collaboration



SMART Feasibility Study Process: NJBB FRM Study





Questions/ Discussion



William Dixon
New Jersey Department of Environmental Protection
Engineering and Construction
Division of Coastal Engineering, Director

William.Dixon@dep.state.nj.us

732-255-0890

J. Bailey Smith
US Army Corps of Engineers
Philadelphia District

J.B.Smith@usace.army.mil

215 656 6579

**Mark Your Calendars
for the September
Public Meetings!!!**



Office of Coastal & Land Use Planning

- Administers NJ's Coastal Management Program
- Development and implementation of planning activities
- Sustainable and resilient coastal community planning
- Ecological project development
- Ocean resource planning
- State Plan support
- Municipal public access planning



Resilience & Adaptation Planning

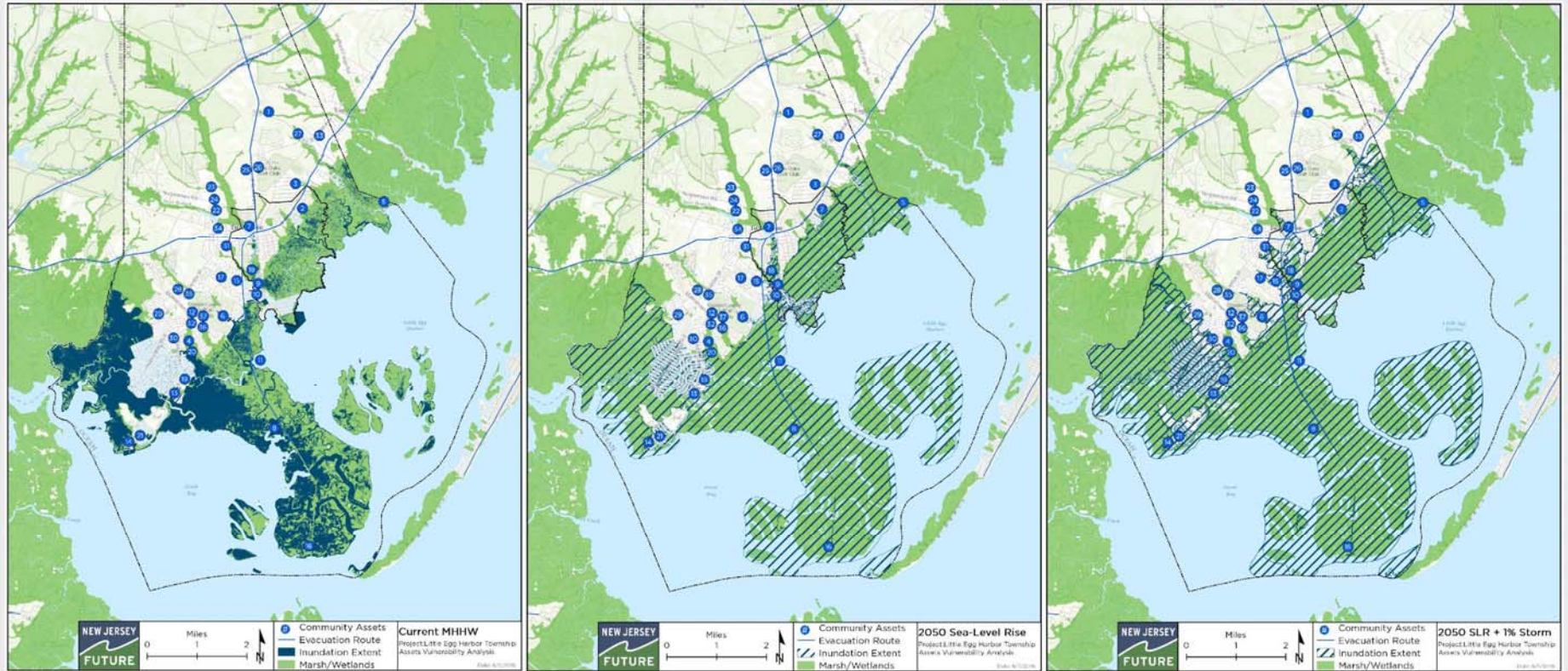
- Planning and technical support to 239 communities
- Community planning + ecological projects
- Coordination with coastal partners
- Implementation of award-winning projects

Coastal Partners



Vulnerability Assessment

LITTLE EGG HARBOR TOWNSHIP COMMUNITY ASSETS VULNERABILITY ASSESSMENT May 2016



WHAT THE MAPS SHOW

The Little Egg Harbor Strategic Recovery Planning Report (SRPR), issued in February 2015, evaluated the community's potential flood and inundation risk based on projections of rising sea levels by 2050. This analysis revealed that current nuisance flooding that occurs in township coastal areas during the highest-tide events will become regular occurrences under 2050 sea level rise projections. This flooding would inundate as much as 31 percent (9,100 acres) of total area of the Township (29,411 acres), flooding 8 percent (1,032) of the community's 13,234 parcels.

If a 1-percent storm, the rough equivalent of

Hurricane Sandy when it made landfall, was added to 2050 sea-level rise, 34 percent (9,100 acres) of the total area of the township would be inundated, flooding 36 percent (4,711) of the total number of parcels in the community.

The maps above show the locations of critical community assets and juxtapose those locations against the three inundation scenarios. The township's wetlands and marshes, which buffer storm and wave action, are likely to be inundated permanently and potentially lost as sea levels rise, exposing critical community facilities to flood damage. Many of the township's commercial

marinas and docks (**Assets 5, 8, 9, 10, 11, 20, 21**) will suffer regular inundation. The Rutgers Marine Field Station (**Asset #16**), at the tip of the Tuckerton peninsula, will no longer be accessible; Great Bay Boulevard and Radio Road will be compromised as evacuation routes. The township community center (**Asset #30**) and religious facilities (**Assets #18 and #19**) that might otherwise be used for shelter during storm events will experience regular flood damage. In addition, by 2050 a 1-percent storm event would entirely inundate residential neighborhoods on Osborn Island and Mystic Island.

COMMUNITY ASSETS

- 1 Little Egg Harbor Public Works
- 2 GlobeNet Complex
- 3 AT&T Complex
- 4 County MUA Pumping Station
- 5 Parkertown Dock
- 6 County Golf Course at Atlantis
- 7 Seaman County Park
- 8 Cape Horn Marina
- 9 Schimpf's Marina
- 10 Total Marina
- 11 Captain Mike's Marina
- 12 Senior Center
- 13 Osborn Bridge

- 14 Clam Beds
- 15 AC Electric-Motts Fam
- 16 Rutgers Marine Field Station
- 17 St. Theresa's Church
- 18 Jersey Shore Baptist Chapel
- 19 Living Waters Christian Church Center
- 20 Munro's Marina
- 21 Great Bay Marina
- 22 Pinelands Regional School District
- 23 Pinelands Regional Jr. High School
- 24 Pinelands Regional High School
- 25 RCW Early Education Center
- 26 George Mitchell Elementary School

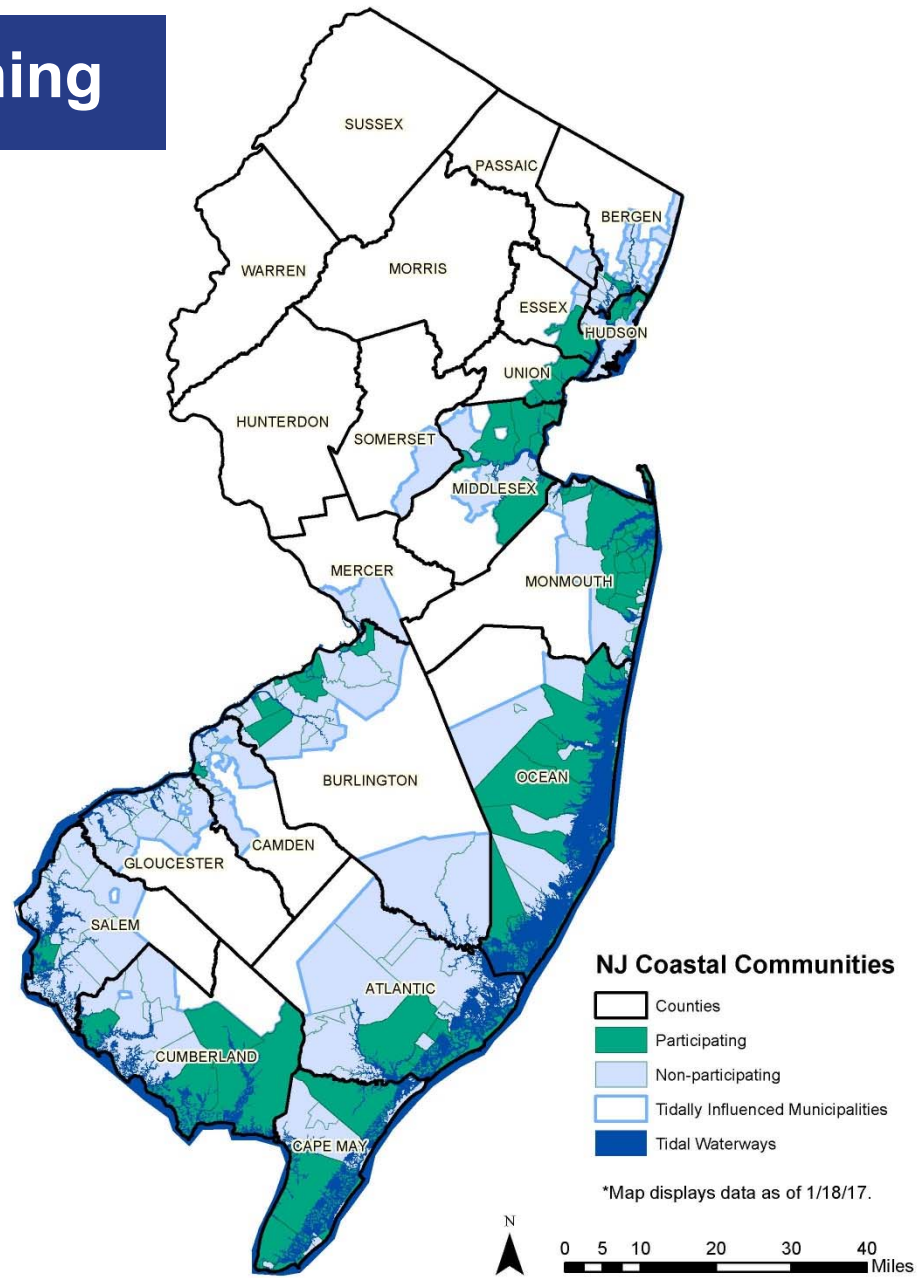
- 27 Frog Pond Elementary School
- 28 County Branch Library
- 29 Seacrest Village
- 30 Community Center
- 31 Great Bay Reg. Volunteer EMS
- 32 Mystic Island Fire Department
- 33 Parkertown Fire Department
- 34 West Tuckerton Fire Department
- 35 U.S. Post Office
- 36 Little Egg Harbor Police Department
- 37 Little Egg Harbor Township Hall

High Potential for Inundation
 Low Potential for Inundation

Getting To Resilience



Resilience Planning

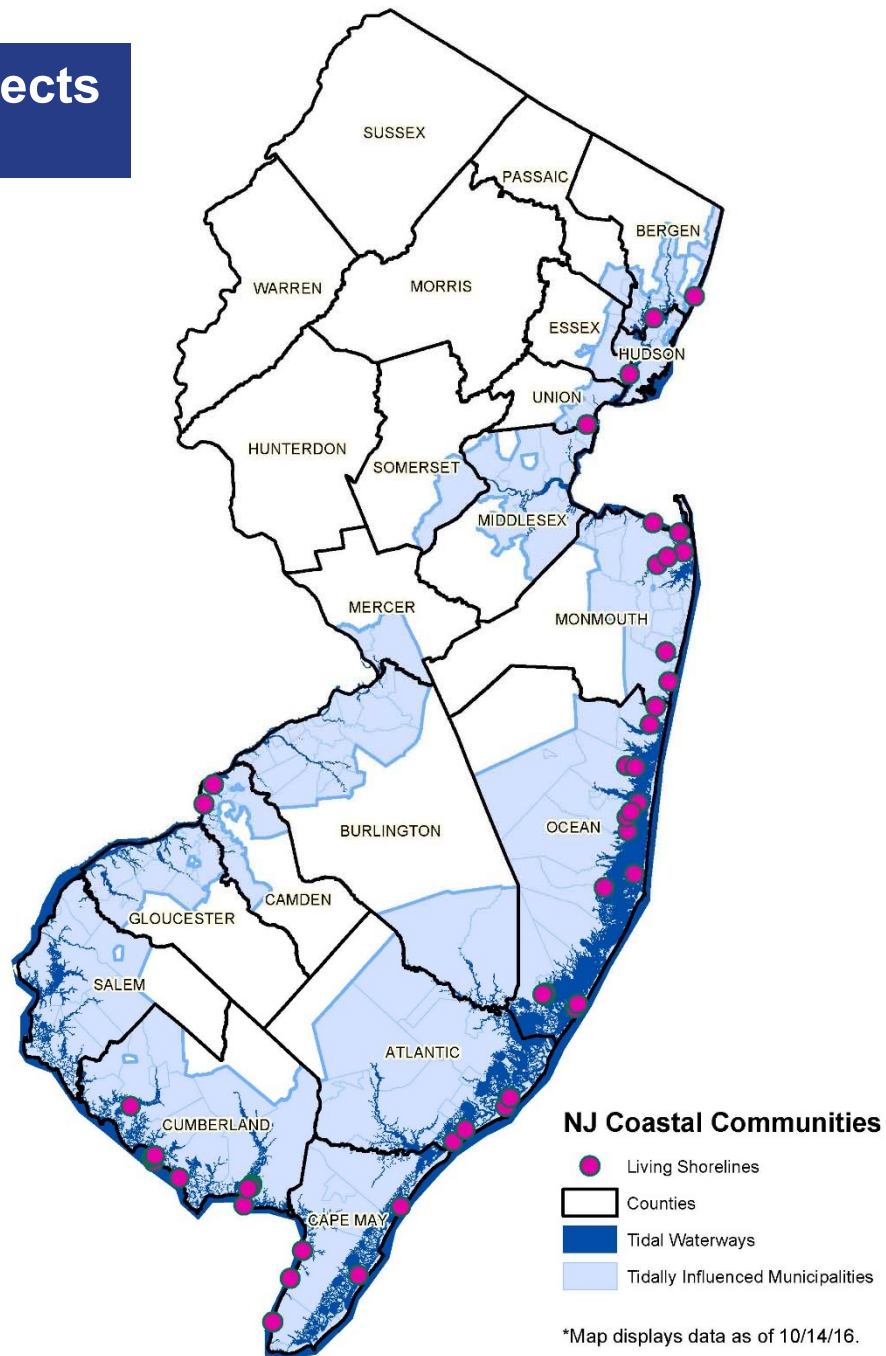


Building
to Ecological Solutions
Coastal Community
Hazards

A Guide for New Jersey
Coastal Communities



Living Shorelines Projects



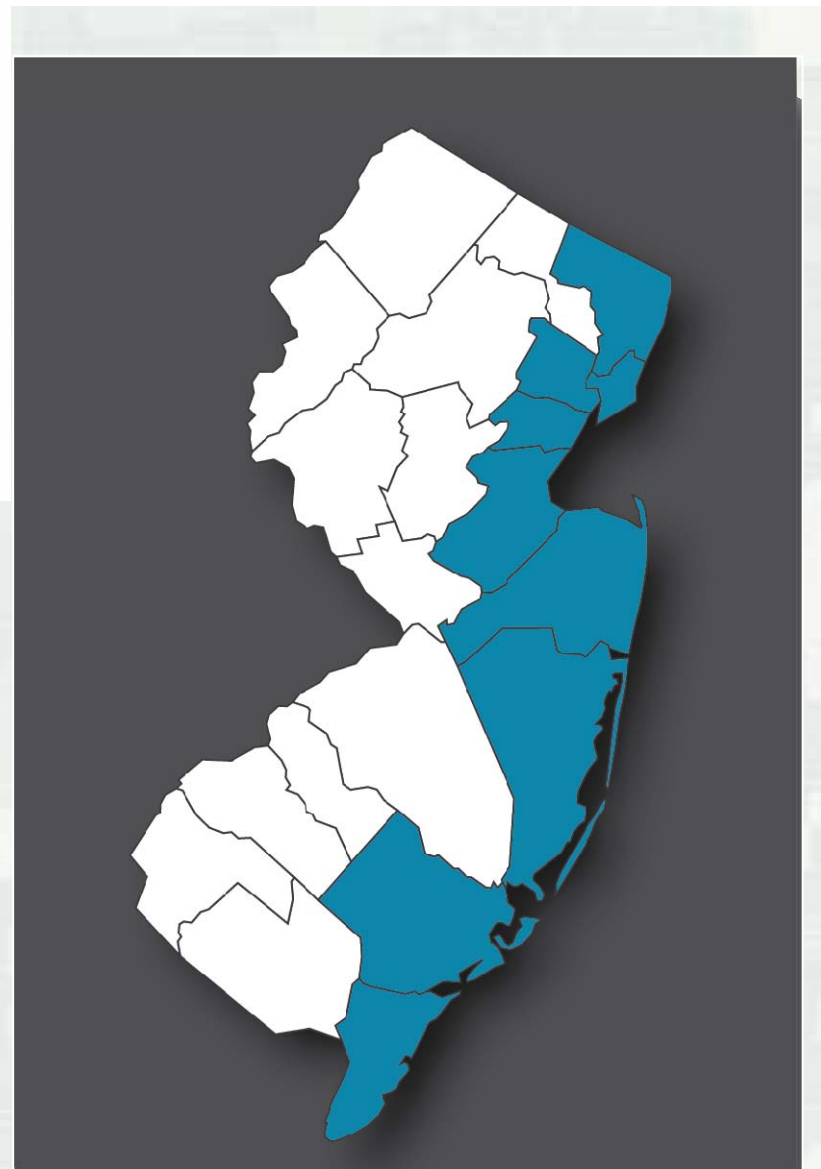
Resilient NJ

Regional Planning
for a Stronger New Jersey

The Program will fund the development and implementation of up to 5 regional resilience and adaptation action plans

Who Qualifies?

- 9 HUD-identified MID counties
- Groups of 3+ municipalities in those counties with a shared boundary
- Utility authorities



<http://www.nj.gov/dep/oclip/resi>





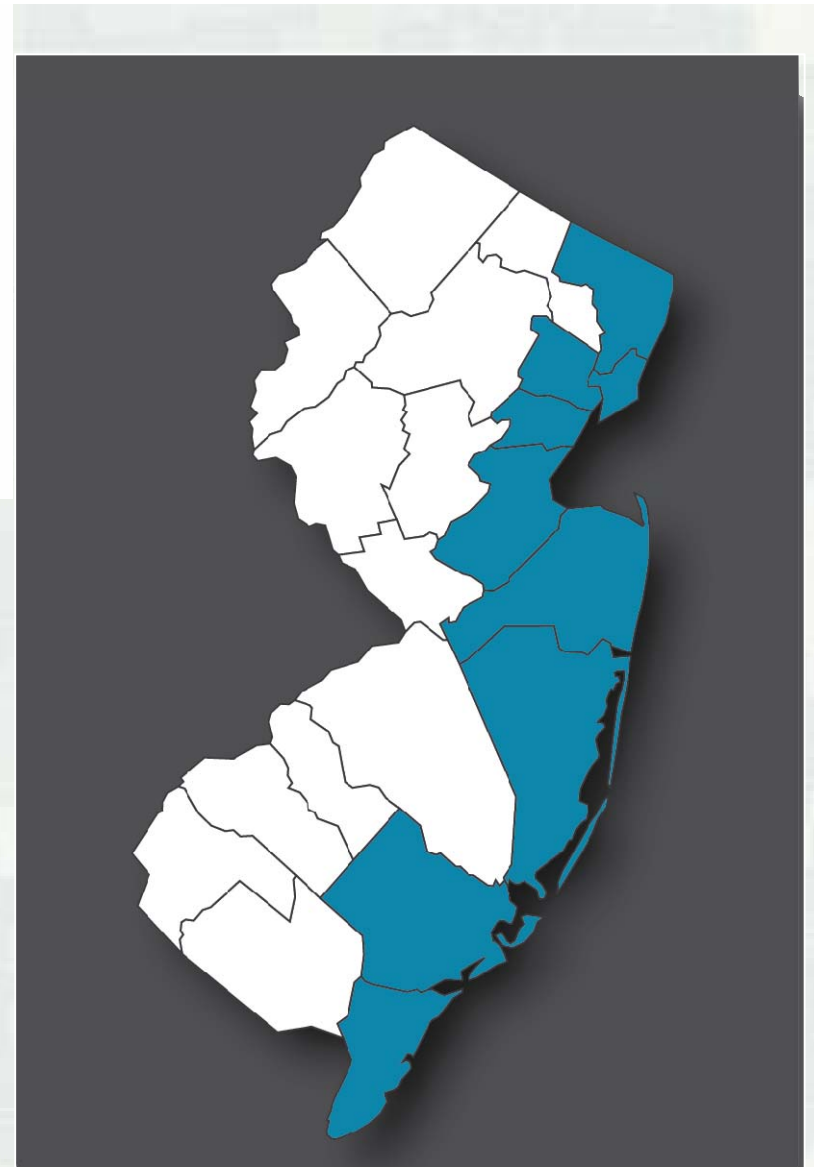
Funding awarded on a competitive basis

Notice of Funding Availability

- **Regions** (counties/municipalities, authorities, community-based organizations)
- **NGOs (technical assistance)**

Request for Proposals

- **Consultant teams (planners, engineers, landscape architects, etc.)**



<http://www.nj.gov/dep/oclip/resi>



Thank you!

Michael Kolber
Office of Coastal and Land Use Planning
Michael.Kolber@dep.nj.gov
(609)-984-0058

<http://www.nj.gov/dep/oclup/>



@NJCoastalManagement



NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION · OFFICE OF COASTAL AND LAND USE PLANNING

References



Congress of the United States
Washington, DC 20515

May 15, 2017

The Honorable Douglas W. Lamont
Acting Assistant Secretary of the Army (Civil Works)
108 Army Pentagon
Washington, D.C. 20310-0108

Dear Acting Assistant Secretary Lamont:

We are writing to express our support for the New Jersey Back Bays (NJBB) coastal flood risk management study, being conducted by the Philadelphia District in partnership with the New Jersey Department of Environmental Protection (NJDEP). While Hurricane Sandy in 2012 demonstrated the effectiveness of the Corps' coastal projects, it also showed that the people, property, and infrastructure adjacent to the back bays remain completely vulnerable to storm damage. This study developed out of the larger North Atlantic Coast Comprehensive Study (NACCS) which identified nine high-risk areas on the Atlantic Coast for further in-depth analysis.

Undertaking a comprehensive study of this large and heavily populated area will certainly require a waiver to the standard 3 years, \$3 million limit prescribed by the USACE 3x3x3 planning process. Therefore, we urge your office, the Corps and NJDEP to quickly complete the waiver package and identify the appropriate schedule, scope and cost estimate needed to deliver specific recommendations that can be implemented at the Federal or non-federal levels to reduce risks associated with coastal storm flooding in the back bay areas.

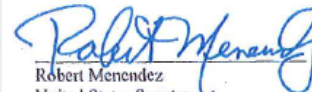
The study area extends along 110 miles of the New Jersey coast and encompasses 950 square miles of land, wetlands, open water, and coastal lakes across parts of five counties and 90 municipalities. There are approximately 235,000 structures and a permanent population of about 700,000 within the study area. Seasonal tourism and recreation drive the population of the study area significantly above that measured by the US Census statistics. These areas will remain completely vulnerable to storm damage, as all other Corps efforts underway or completed were limited to the ocean side of the coastline.


Twelve inlets provide hydraulic connections between the Atlantic Ocean and the back bays, making all of the back bays susceptible to flooding from the ocean. During coastal storms, elevated ocean water levels propagate through the inlets into the back bays, causing flood damage proportional to the geographic extent, duration, and height of the ocean storm surge. Most of the study area infrastructure at risk from coastal flooding is residential, with important commercial and critical public infrastructure components. This infrastructure exists where it is because of the attraction of living, recreating, or working on or near tidewater with easy access to the ocean and bays, and it provides a significant contribution to the \$40 billion New Jersey coastal economy.


Congressional Support

Thank you for your past support of efforts to protect New Jersey's coasts. We appreciate your full consideration to waiver request on this important study.


Sincerely,


Robert Menendez
United States Senator


Cory A. Booker
United States Senator


Frank Pallone, Jr.
Member of Congress


Frank A. LoBiondo
Member of Congress


Tom MacArthur
Member of Congress


Christopher H. Smith
Member of Congress

CC: Theodore (Tab) Brown, Chief, Planning and Policy Division
Lieutenant Colonel Michael A. Bliss, Commander, USACE Philadelphia District



Existing Literature

➤ NACCS

- Main Report
- New Jersey State Appendix
- Full Array of Measures Report
- New Jersey Focus Area Report



➤ State of New Jersey Academic Studies for Barnegat Bay

➤ HUD, FEMA, NOAA, DOI, Rockefeller Foundation etc.



Relevant USACE Community Documents



**NACCS Coastal
Program Guide**

NACCS Coastal Program Guide

New Jersey

Planning Grants

Planning Assistance to States and Continuing Authorities Program, **USACE**
<http://www.lwr.usace.army.mil/Missions/FloodRiskManagement/FloodRiskManagementProgram.aspx>

Flood Mitigation Assistance and Pre-Disaster Mitigation Grant Program, **FEMA**
<https://www.fema.gov/hazard-mitigation-assistance>

- Contact the local coordinator for your state:
New Jersey Office of Emergency Management State Ha First Class Michael K. Gallagher, LPP5698@gw.nisp.or

Agricultural Conservation Easement Program, **NRCS**
<http://www.nrcs.usda.gov/wps/portal/nrcs/main/nati>

- Find a U.S. Department of Agriculture Service Center ne <http://offices.sc.egov.usda.gov/locator/app>

Recovery Grants

Hazard Mitigation Grant Program, **FEMA** (<https://www.program>)

- Contact the local coordinator for your state:
New Jersey Office of Emergency Management State Ha First Class Michael K. Gallagher, LPP5698@gw.nisp.or

Community Development Block Grant – Disaster Rec (<https://www.hudexchange.info/cdbg-dr/>)

- Contact the local coordinator for your state:
HUD Regional Field Office - Newark, (973) 776-7288, [A](#)

Public Assistance, **FEMA** (<http://www.fema.gov/public-non-profit>)

USACE Emergency Response Program
<http://www.usace.army.mil/Missions/EmergencyOpe>

Small Business Administration Mitigation Loan, **SBA**
<https://www.sba.gov/category/navigation-structure/loans/disaster-loans>

Increased Cost of Compliance, **NFIP** (<https://www.fen-program-2/increased-cost-compliance-coverage>)

Information current as of Jan

**New Jersey Coastal
Program Guide**



New Jersey Back Bays Coastal Storm Risk Management Study

Summary of Public Outreach

U.S. Army Corps of Engineers
Philadelphia District

Updated December 2016



Public Outreach Summary

U.S. Army Corps of Engineers New Jersey Back Bays Flood Risk Management Planning Workshop Coastal Risk Management Strategy Profile

CONTACT INFORMATION (Name, Affiliation, Email, Phone):

PROFILE TITLE:

LOCATION (Describe the precise location of the problem; provide a map if possible):

PROBLEM (Define the problem and its general location)

•Discuss if any work been done on analysis, repairs, advocacy for this problem:

•Provide any specific elevation information of existing management measures:

Community Profile

NORTH ATLANTIC DIVISION

US Army Corps of Engineers

ABOUT BUSINESS WITH US MISSIONS LOCATIONS CAREERS MEDIA LIBRARY CONTACT

North Atlantic Coast Comprehensive Study Report

NACCS Main Report
Appendix A - Engineering
Appendix B - Economic and Social Analyses
Appendix C - Planning Analyses
Appendix D - State and District of Columbia Study Synopsis, January 2015

A full listing of NACCS files can be found in Documents and

Risk Management Strategies



This map shows various coastal storm damage risk management strategies communities can use. Specific communities should consider a range of all possible solutions based on site-specific conditions. A text-only version of this information is available at the bottom of the page.

In the News

NACCS lead selected as Project Manager of the Year
Army Corps of Engineers releases NACCS
NACCS advances into Phase 3
The Comprehensive Study transitions to Phase 2
U.S. Army Corps of Engineers collaborates on study of North Atlantic coast after Hurricane Sandy

About the N

The U.S. Army Corps of Engineers recently completed a report detailing the results of a year study to address coastal storm and flood vulnerable populations, property, ecosystem infrastructure affected by Hurricane Sandy in the United States' North Atlantic region.
This, the North Atlantic Coast Comprehensive Study, is designed to help local communities understand changing flood risks associated with climate change and to provide tools to the

Comprehensive Study

PHILADELPHIA DISTRICT - MARINE DESIGN CENTER

US Army Corps of Engineers

ABOUT BUSINESS WITH US MISSIONS LOCATIONS CAREERS MEDIA LIBRARY CONTACT

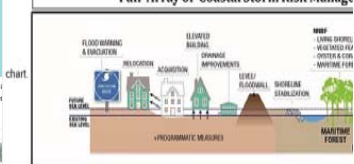
New Jersey Back Bays Coastal Storm Risk Management

Contact
Philadelphia District Marine Design Center

Study Background

Historic storms, including Hurricane Sandy, have severely impacted the back bay community Back Bay (NJBB) Study developed out of the larger North Atlantic Coast Comprehensive Study areas on the Atlantic Coast for further in-depth analysis. The NJBB study area is located between Monmouth, Ocean, Burlington, Atlantic and Cape May Counties and includes the set of intertidal areas separated from the Atlantic Ocean.
The purpose of the study is to investigate Coastal Storm Risk Management (CSRM) strategies coastal flooding affecting population, critical infrastructure, critical facilities, property, and ecosystems.
The Study will consider the full array of structural, non-structural, and natural and nature-based solutions.

Full Array of Coastal Storm Risk Management



Study Process

- The study will consider past, current, and future coastal storm risk management and resilience by the USACE and other Federal, State, and local agencies. Three overarching efforts will be:
- Assess the study area's problems, opportunities and future without project conditions;
 - Assess the feasibility of implementing systems-wide coastal storms risk management solutions such as storm surge barriers at selected inlet entrances, or tidal gates at selected lagoon entrances;
 - Assess the feasibility of implementing site-specific perimeter solutions such as a combination of natural and nature-based features;
 - Assess the impacts of back bay strategies and solutions on the Atlantic Coast CSRM Plan within a systems context given likely future scenarios.

NJBB Web Portal

US Army Corps of Engineers

ABOUT BUSINESS WITH US MISSIONS LOCATIONS CAREERS MEDIA LIBRARY CONTACT

Welcome to the Corps' Building Resilience website!

Resilience Initiative Roadmap
Emphasizing Community Resilience
The Corps' Resilience Initiative
What are building codes?
Why are they important?
How do building codes increase resilience?
How will resilience influence building codes and design standards in the future?
Presidential Proclamation

USACE's Principles of Resilience

Climate Preparedness and Resilience
Coastal Risk Reduction and Resilience

BUILDING STRONG

Site Sustainability, Site Security, Community Resilience, Buildings, Natural Hazards & Adaptation, Contact Us

Coastal Risk Reduction and Resilience: Using the Full Array of Measures

Coastal areas are especially vulnerable to hazards, now and in the future, posed by waves and surges associated with sea level change and coastal storms. There are a variety of approaches that can be used to reduce the risks of these hazards to coastal areas, including natural or nature-based features (e.g., wetlands and dunes), nonstructural interventions (e.g., policies, building codes and emergency response such as early warning and evacuation plans), and structural interventions (e.g., seawalls and breakwaters). This topic is the subject of intense interest following Hurricane Sandy.

Coastal Risk Reduction and Resilience: Using the Full Array of Measures

This report was prepared by a multidisciplinary team at the direction of the Directorate of Civil Works to clarify language used by the USACE to describe the full array of coastal risk reduction measures. This will help improve transparency and communications with our partners and stakeholders as we work together to address the increasing challenges posed by coastal storms and changing sea levels combined with aging infrastructure and a dynamic socioeconomic environment, "and the USACE approach to coastal risk reduction measures considers the engineering attributes of the various measures (how do these help reduce vulnerabilities) and dependencies among features of each measure.

USACE Building Resilience

For more information about specific sections of the report, please click on the thumbnail images below:

Natural and Nature-Based Features

Natural features are created and evolve over time through the actions of physical, biological, geologic, and chemical processes operating in nature.
Nature-based features are those that may mimic characteristics of natural features but are created by human design, engineering, and construction to provide specific services such as coastal risk reduction.
Nature-based features are acted on by the same physical, biological, geologic, and chemical processes operating in nature, and as a result, they generally must be maintained in order to reliably provide the intended level of services.
Natural and nature-based features (Table 1 from the report) can enhance the resilience of coastal areas challenged by sea level rise (Borjesson et al. 2011) and coastal storms (e.g., Gedan et al. 2011, Lopez 2009).

Relevant USACE Web Portals

Climate Preparedness and Resilience

Climate Change Adaptation
Coastal Risk Reduction and Resilience

Coastal Risk Reduction and Resilience: Using the Full Array of Measures

Coastal Risk Reduction and Resilience: Using the Full Array of Measures

Natural and Nature-Based Features

Natural and Nature-Based Features

USACE Climate Preparedness and Resilience