

New Jersey Back Bays Coastal Storm Risk Management Study Draft Feasibility Report and Environmental Impact Statement

Non Governmental Organization Virtual Meeting

12 May 2021

U.S. Army Corps of Engineers

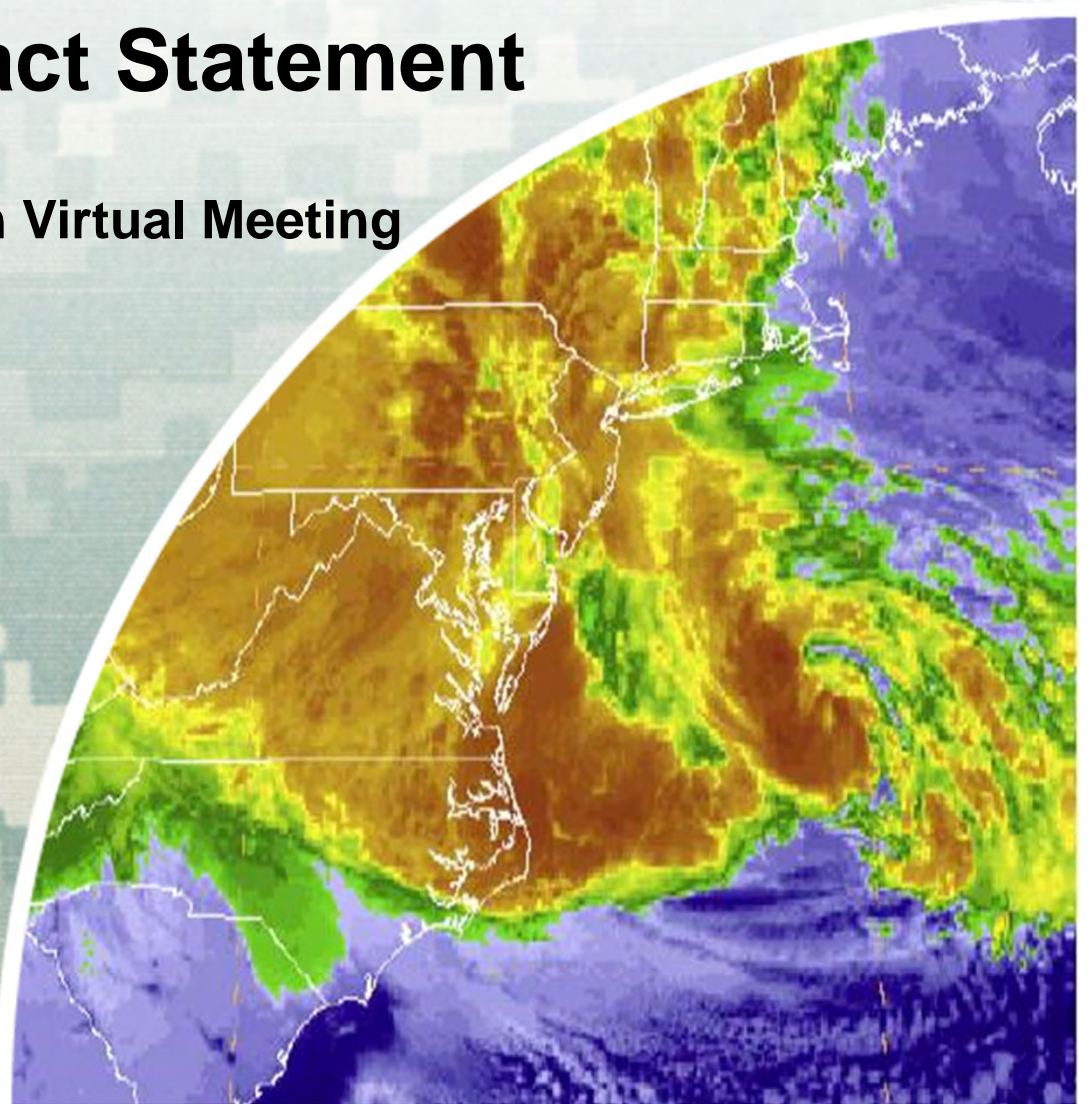
Philadelphia District



U.S. ARMY



US Army Corps of Engineers
BUILDING STRONG





AGENDA



- Introductions
- Study Overview and Tentatively Selected Plan
- Tiered NEPA Approach and Review Schedule
- Questions and Discussion



<http://www.nap.usace.army.mil/Missions/Civil-Works/New-Jersey-Back-Bays-Study/>

New Jersey Back Bays Coastal Storm Risk Management Study

STUDY BACKGROUND

[INTERIM REPORT \(MARCH 2019\)](#)

[STUDY STATUS](#)

[ENVIRONMENTAL COORDINATION](#)

Historic storms, including Hurricane Sandy, have severely impacted the back bay communities of coastal New Jersey. The New Jersey Back Bay Study developed out of the larger North Atlantic Coast Comprehensive Study which identified nine high-risk areas on the Atlantic Coast for further in-depth analysis. The study area is located behind the New Jersey barrier islands of Monmouth, Ocean, Burlington, Atlantic and Cape May Counties and includes the set of interconnected water bodies and coastal lakes that are separated from the Atlantic Ocean. The purpose of the study is to investigate Coastal Storm Risk Management strategies and solutions to reduce damages from 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 measures. Examples are highlighted in the below chart.

The study will consider past, current, and future coastal storm risk management and resilience planning initiatives and projects underway by the USACE and other Federal, State, and local agencies. Three overarching efforts will be performed:

- Assess the study area's problems, opportunities and future without project conditions;
- Assess the feasibility of implementing system-wide coastal storm risk management solutions such as policy/programmatic strategies, 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 structural, non-structural, and natural and nature-based features;
- Assess the impacts of back bay strategies and solutions on the Atlantic Coast Coastal Storm Risk Management Program towards developing recommendations within a systems context given likely future scenarios.

Submit Comments

Comments are accepted on an ongoing basis throughout the study process. Comments may be submitted via email or in writing:

By email: PDPA-NAP@usace.army.mil

In writing:

USACE Philadelphia District
Planning Division
100 Penn Square E.
Philadelphia, PA 19107

Links

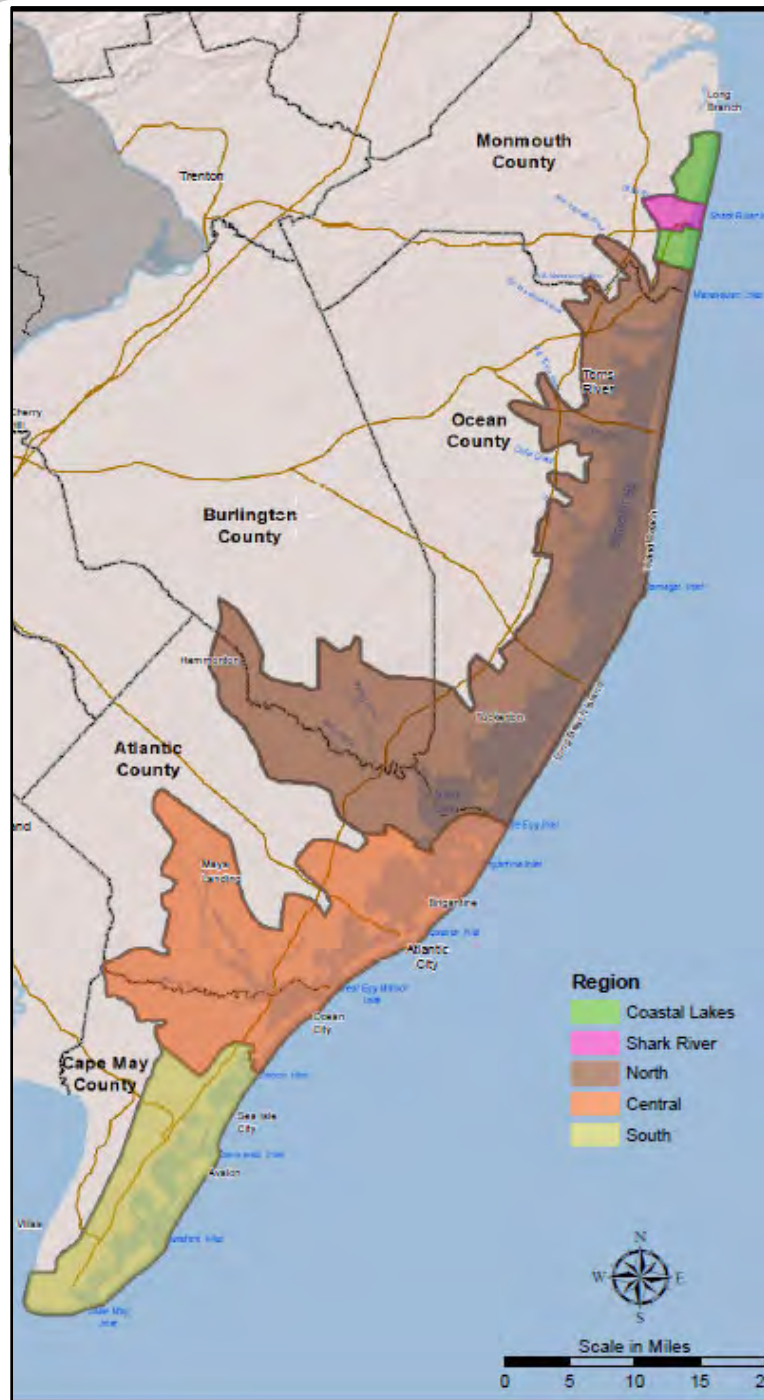
- [Study Area Map](#)
- [Public Mtg Presentation \(Sept 13, 2018\)](#)
- [Public Mtg Presentation \(Sept 12, 2018\)](#)
- [Public Comment Form \(Sept. 2018\)](#)
- [Meeting Welcome Form \(Sept. 2018\)](#)
- [Public Outreach Summary](#)
- [Study Fact Card](#)
- [Study Overview Factsheet](#)

Study Documents

- [Presentations](#)
- [Sept 2018 Public Meeting Posters](#)
- [Study Documents](#)



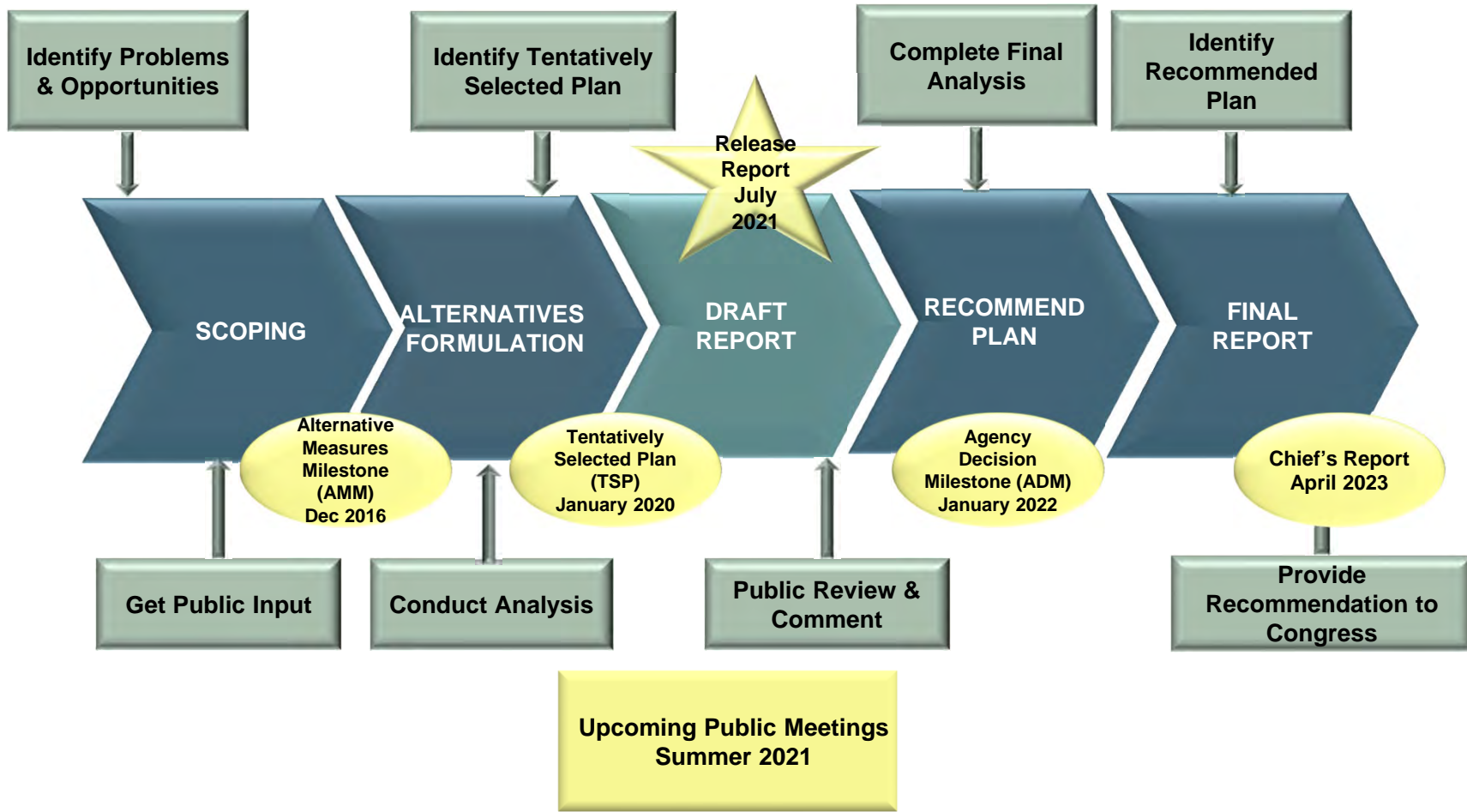
NJBB STUDY STATUS



- Extensive area
- Coastal flooding and sea level rise risk management
- Reduce damages that affect population, critical infrastructure and facilities, property and ecosystems
- Reduce risk to human life from coastal flooding and storms
- Funding uncertainty and study extension approval since January 2020 Tentatively Selected Plan

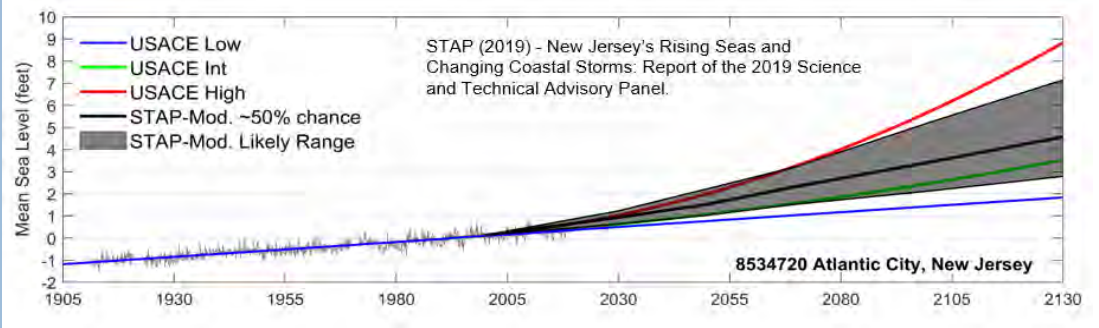
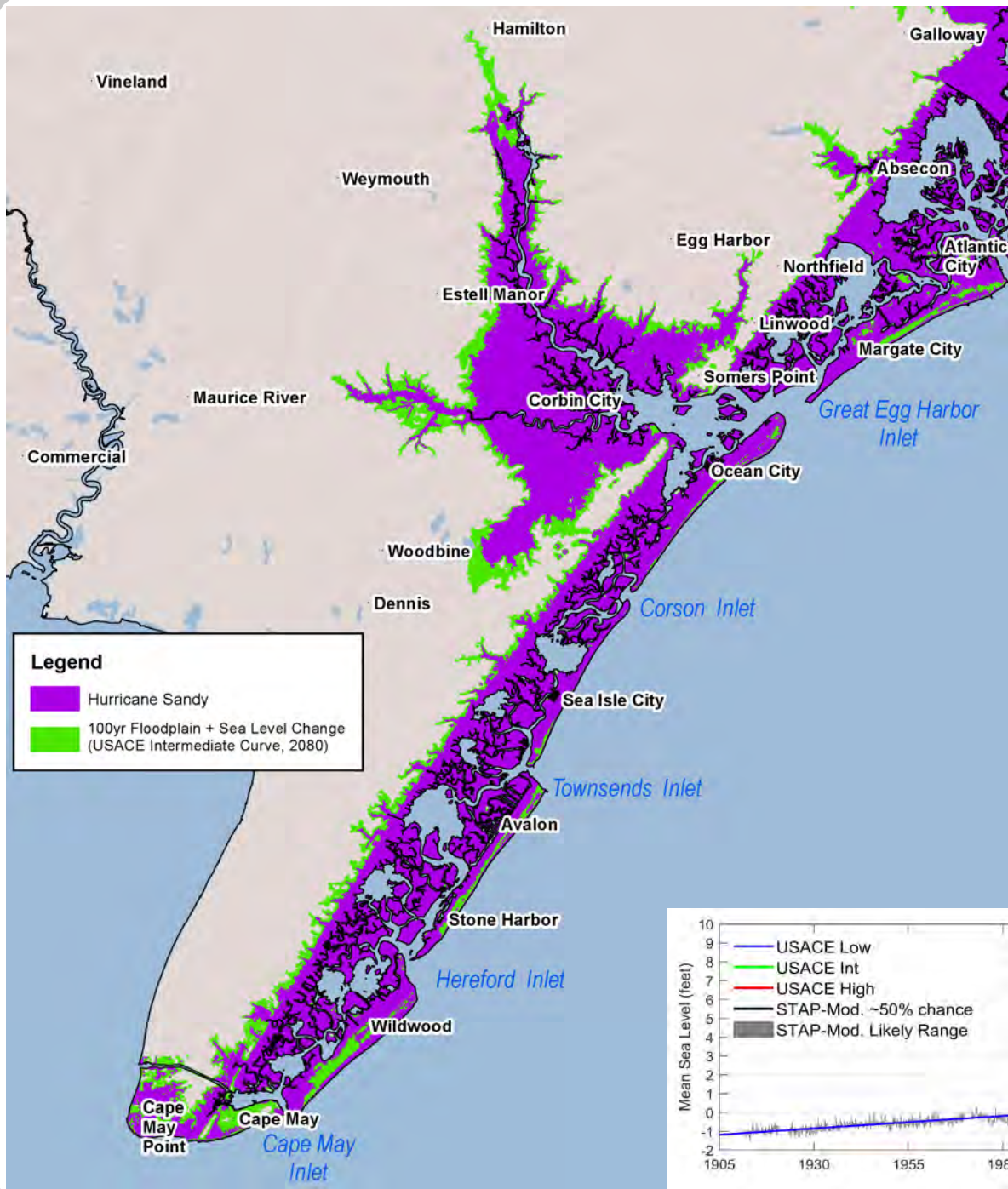


STUDY MILESTONES





Southern Study Area Inundation Map with Sea Level Rise

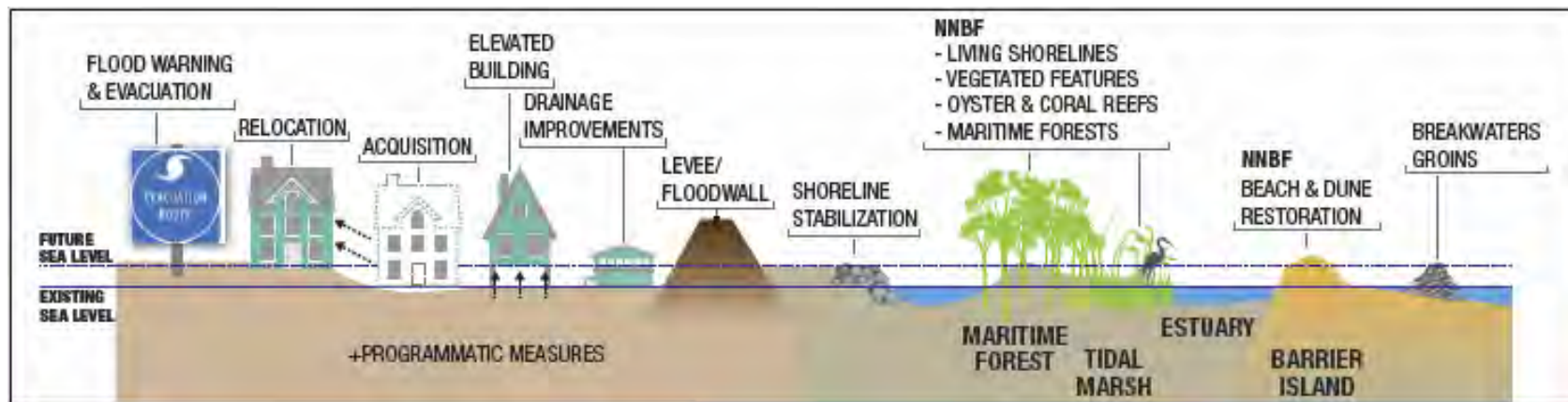
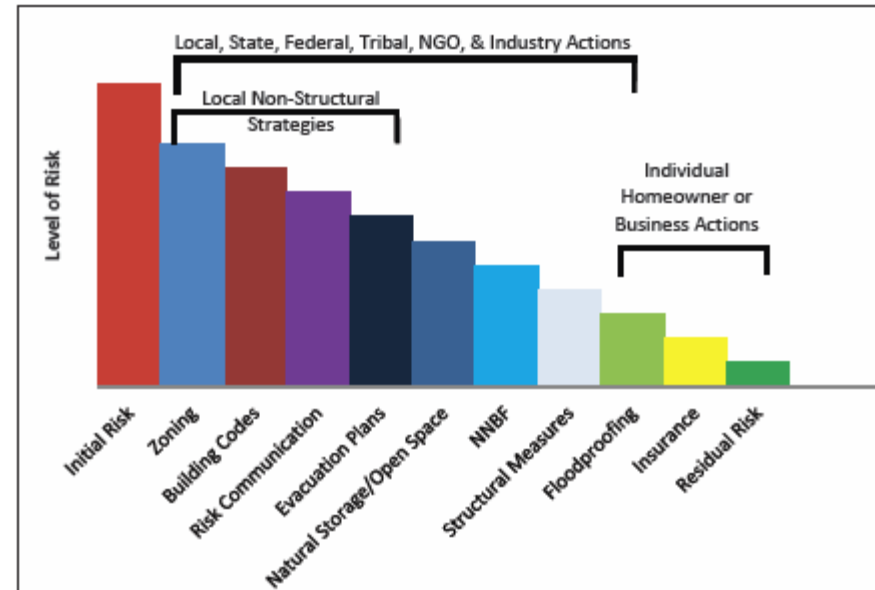




SETTING REALISTIC EXPECTATIONS: ADAPTATION PLANNING CATEGORIES



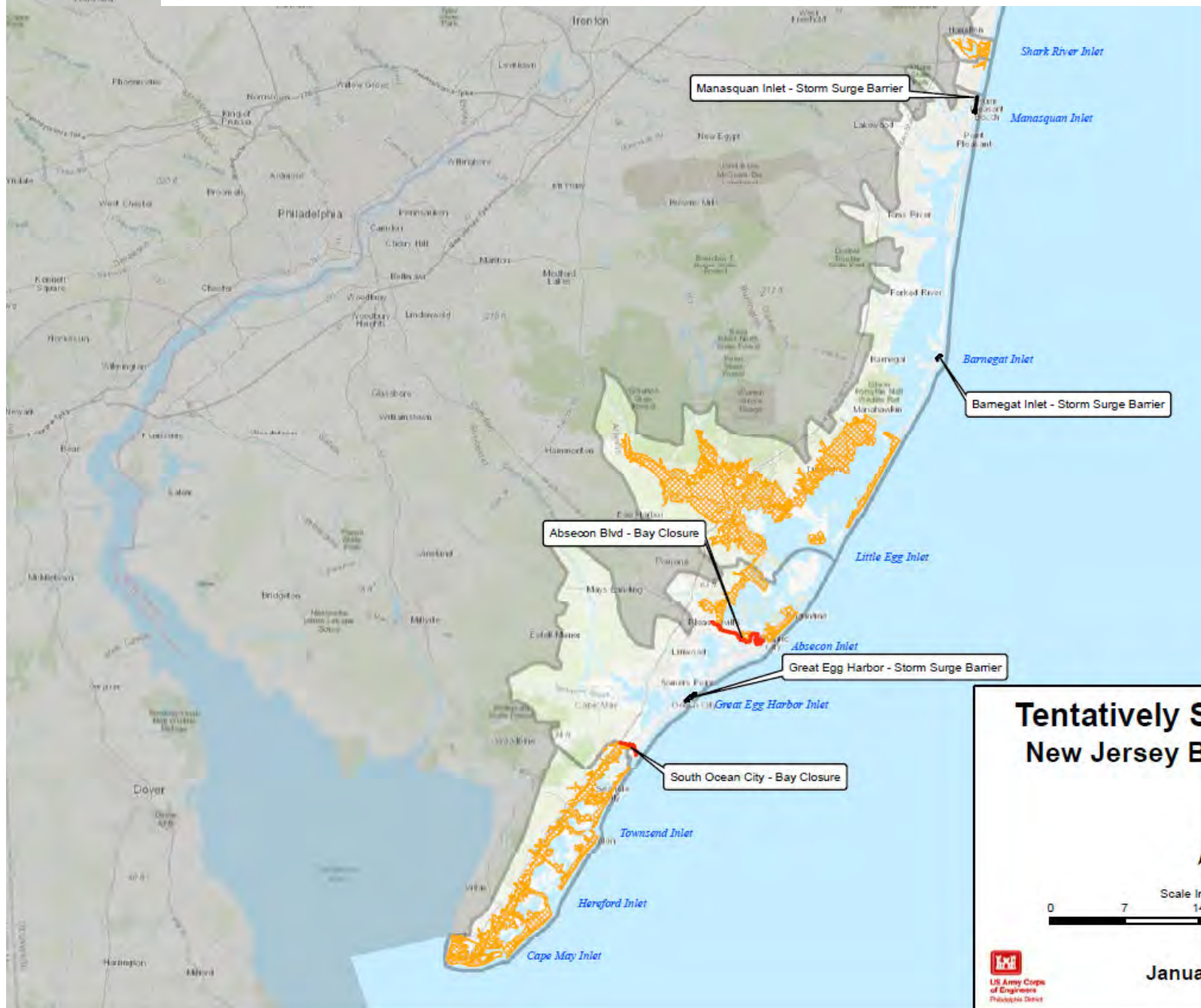
- **Preserve**
 - Includes low regret measures to address current and future vulnerability
- **Accommodate**
 - Adaptive capacity of the system
- **Avoid**
 - Strategic retreat



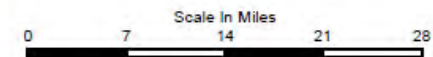
THE TENTATIVELY SELECTED PLAN

Measures

-  Non-Structural
-  Perimeter Plan
-  Inlet Closure
-  Bay Closure



Tentatively Selected Plan New Jersey Back Bays Study



January 2020

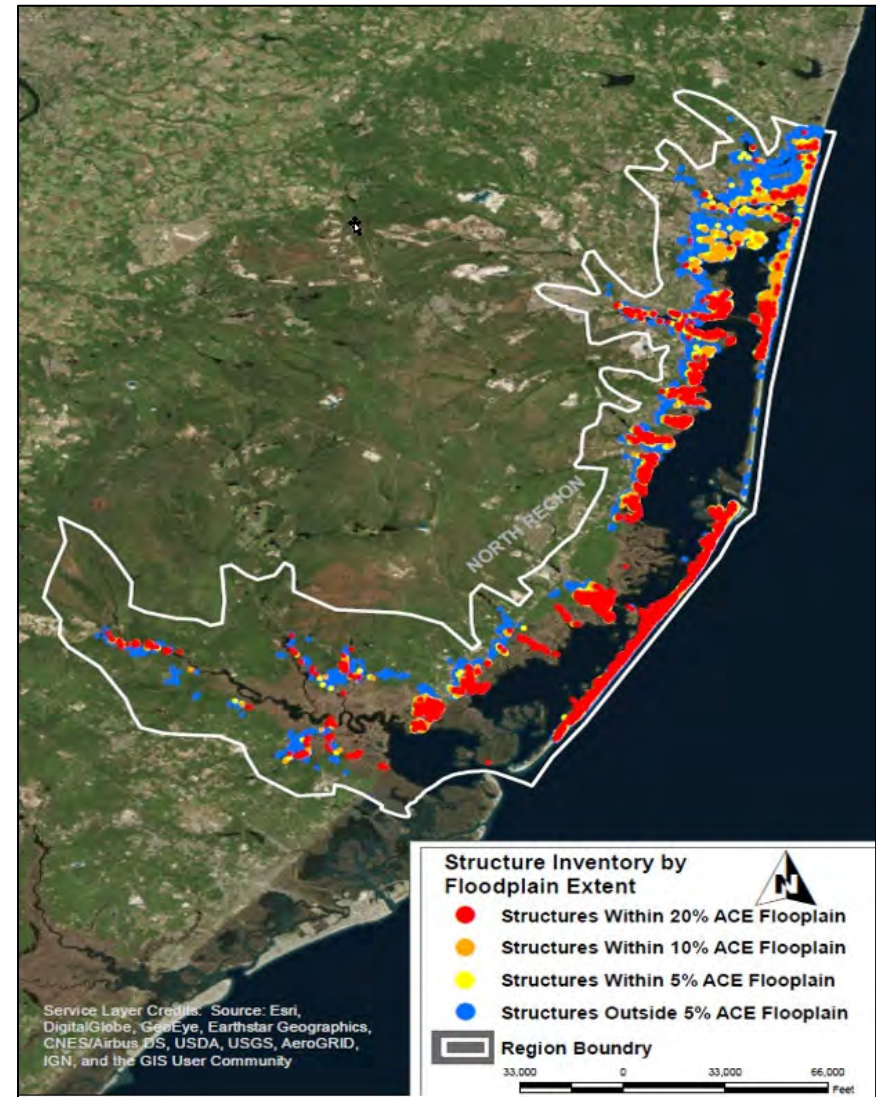
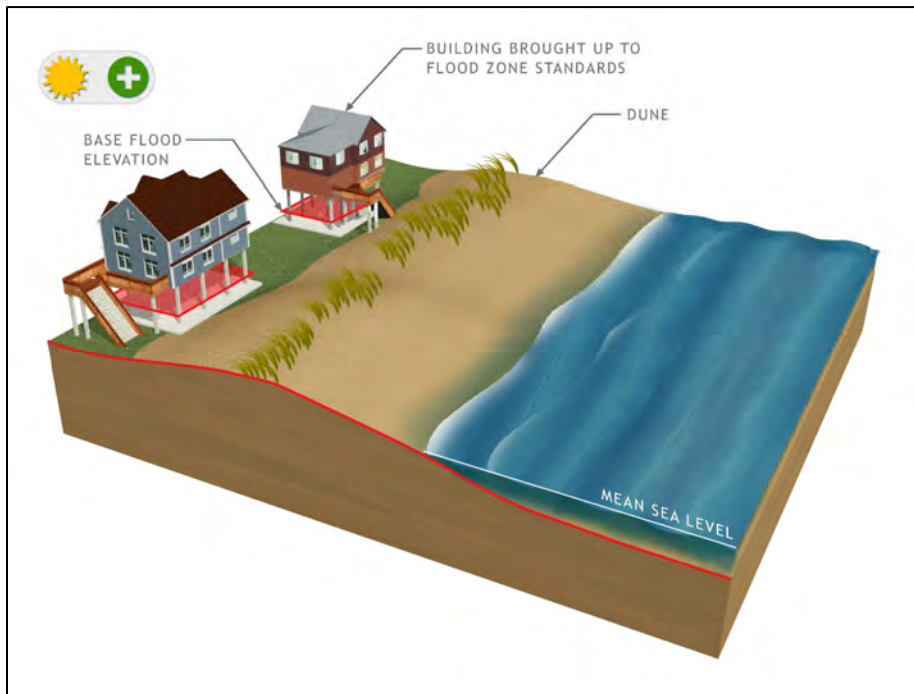




NONSTRUCTURAL MEASURES – BUILDING ELEVATION



- **Primary Nonstructural measures**
 - Building elevation
 - Acquisition and relocation later
- **Recommended in combination with structural measures to formulate economically justified hybrid plans**

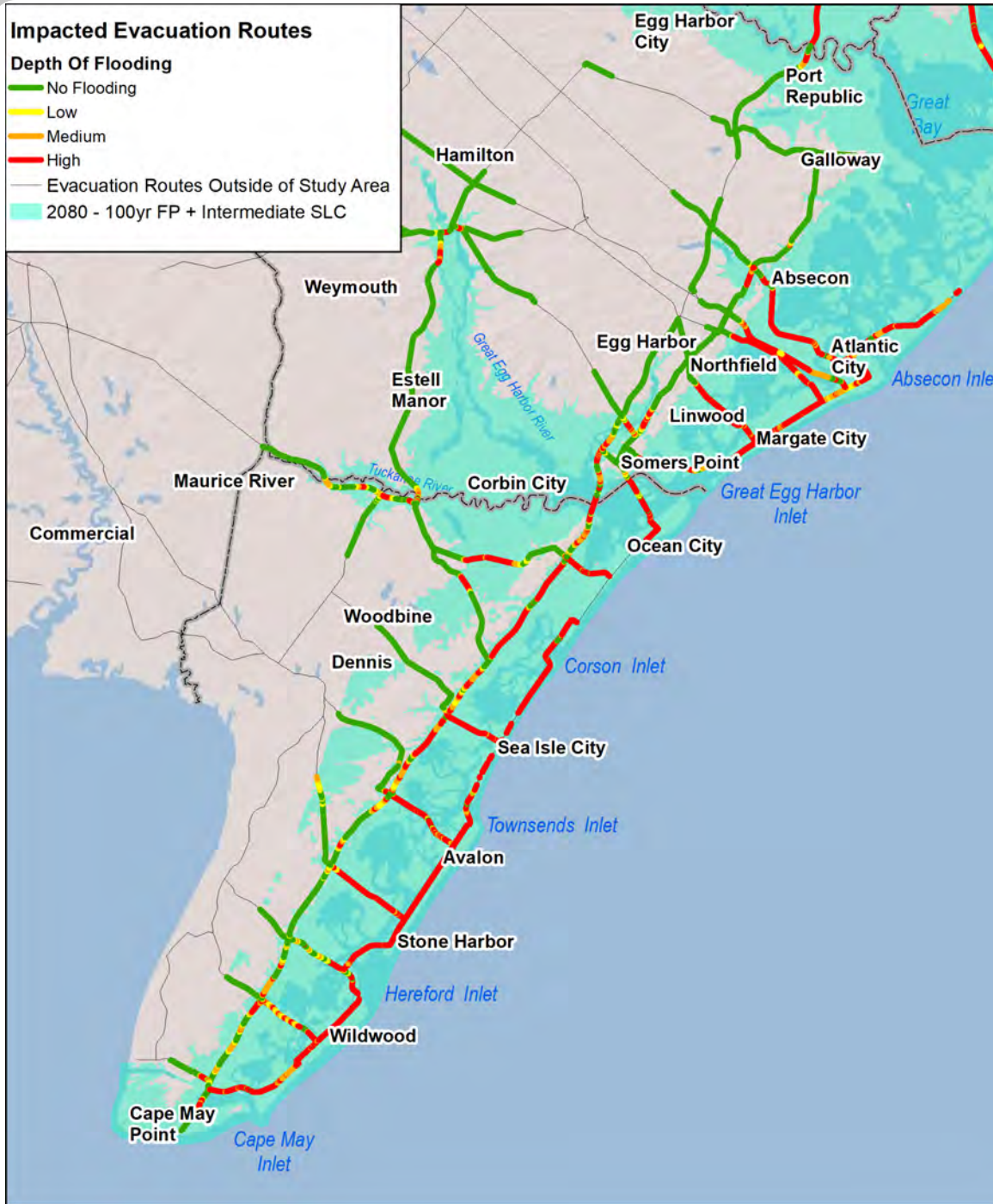




Impacted Evacuation Routes

Depth Of Flooding

- No Flooding
- Low
- Medium
- High
- Evacuation Routes Outside of Study Area
- 2080 - 100yr FP + Intermediate SLC



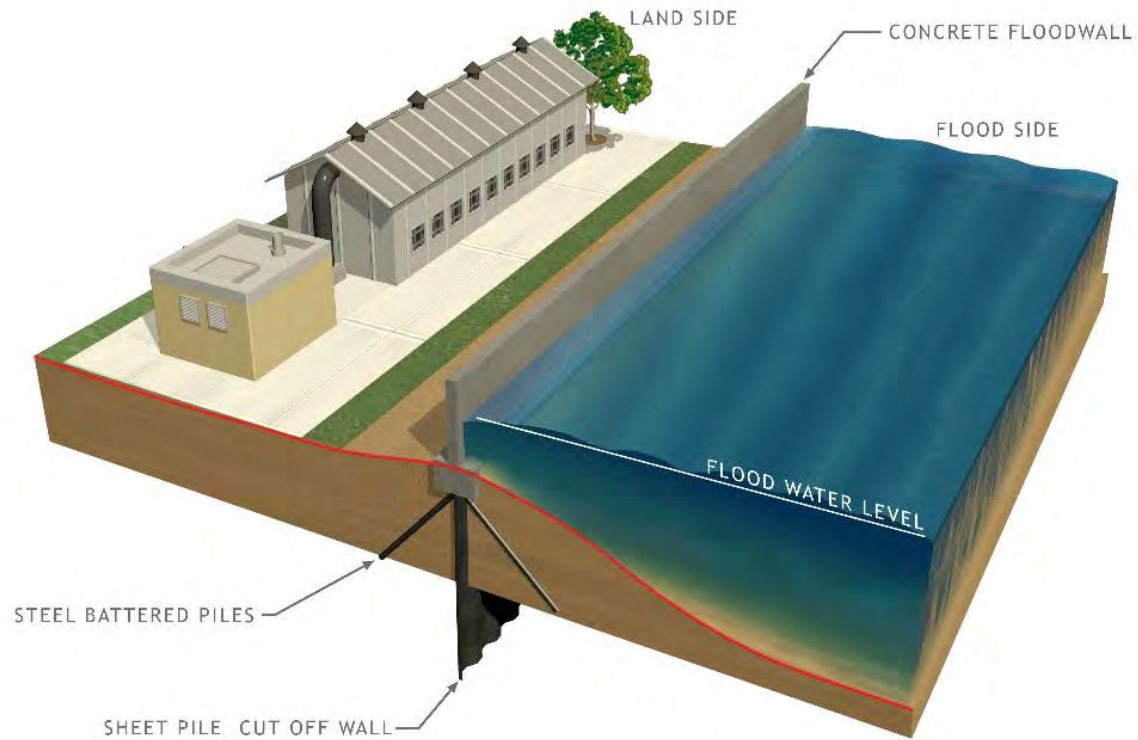
SOUTHERN STUDY AREA

NONSTRUCTURAL MEASURES – EVACUATION ROUTES

2080 – 100-YEAR FLOODPLAIN + INTERMEDIATE SLR



STRUCTURAL MEASURE – FLOODWALLS & LEVEES



Visual Impacts

Existing

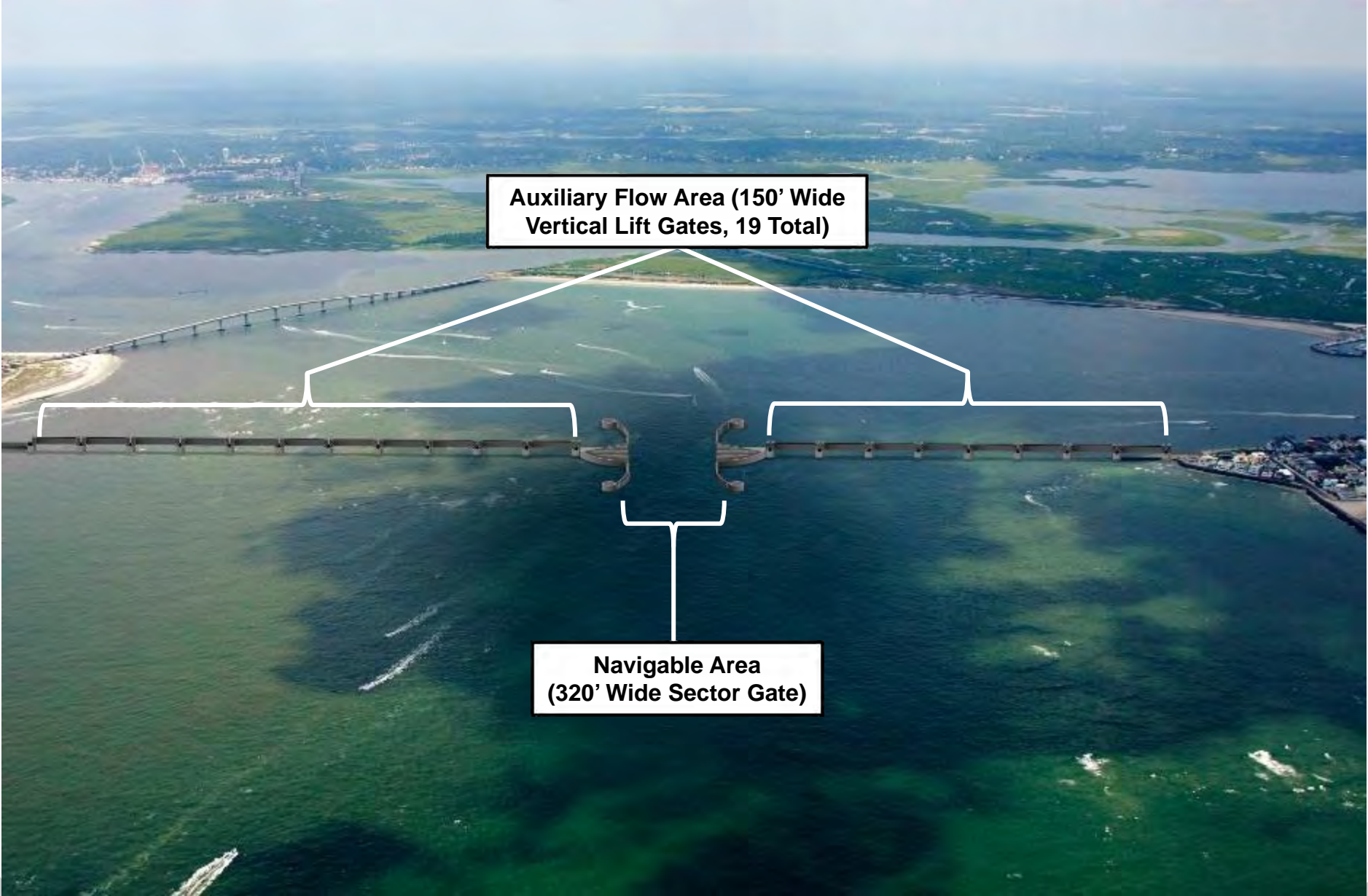


With Floodwall





GREAT EGG HARBOR INLET – PRELIMINARY STORM SURGE BARRIER DESIGN



**Auxiliary Flow Area (150' Wide
Vertical Lift Gates, 19 Total)**

**Navigable Area
(320' Wide Sector Gate)**

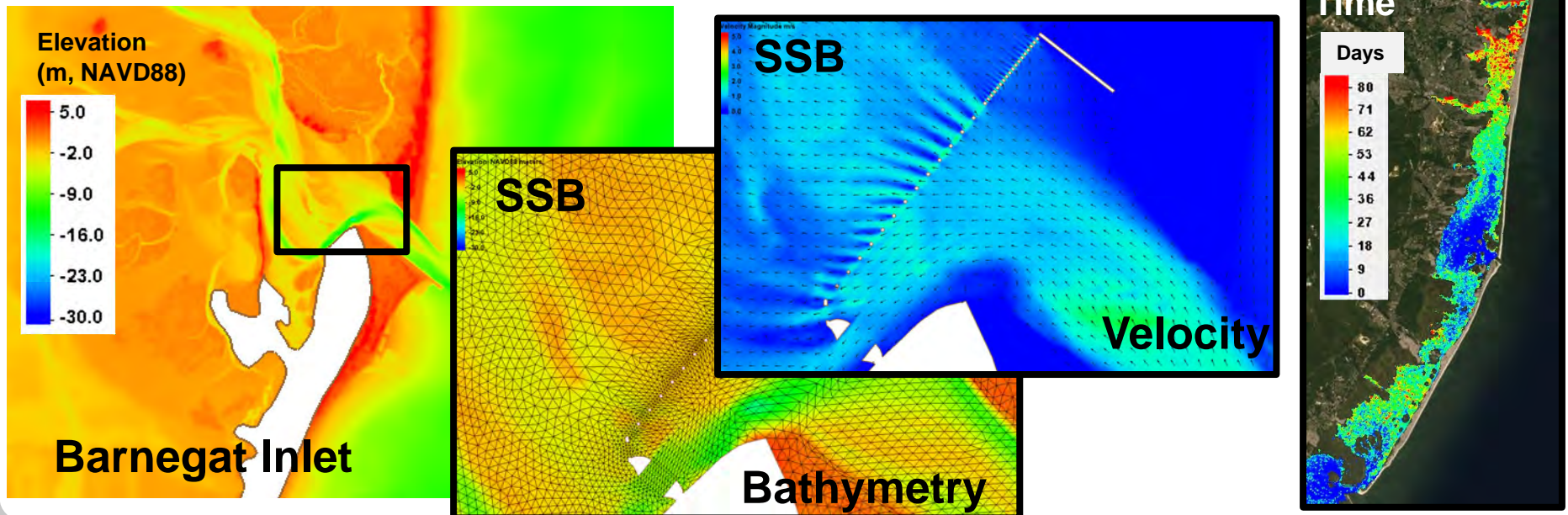


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ADH MODELING – STORM SURGE BARRIER INDIRECT IMPACTS

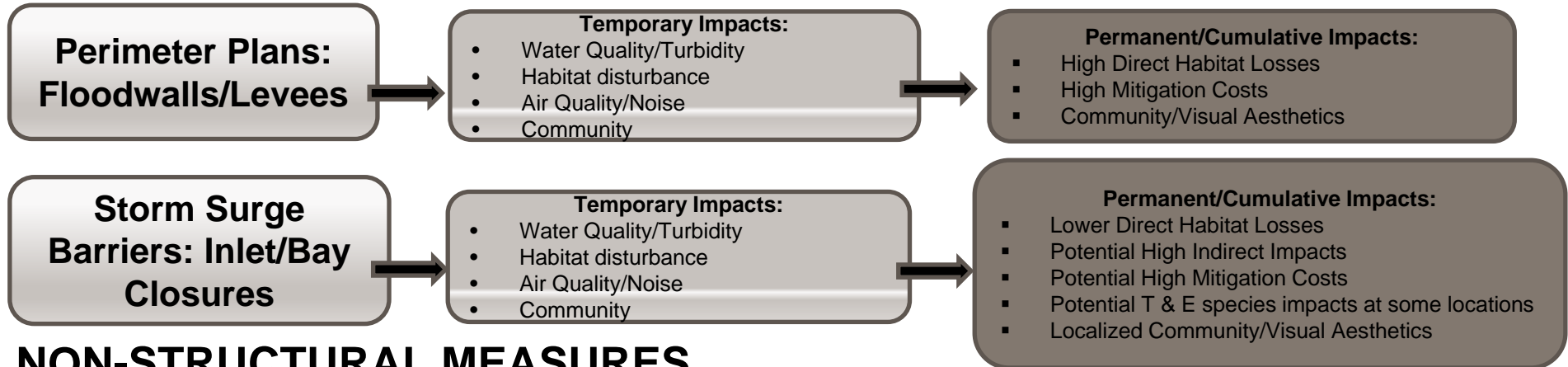


- USACE Engineering Research & Development Center Coastal Hydraulics Lab developed AdH model to evaluate indirect impacts of storm surge barriers:
 - TSP - tides, velocities, salinity, and residence time
 - Final Report – navigation, sediment transport, water quality.
- Calibrated to 2019 ADCP field data collected at 3 inlets and long-term tide/salinity stations.
- Investigate sensitivity to storm surge barrier design: alignment, sill elevation, sector gate size, number of vertical lift gates.
- **Preliminary Model Results:**
 - Tidal Prism - decreases 2% to 6% in Barnegat Bay, 3% to 9% in Great Egg Harbor
 - Velocities – far-field changes < 0.02 ft/s, larger changes at inlets
 - Salinity - reductions in mean salinity < 0.5 ppt
 - Residence Time - increases 2% to 10% in Barnegat Bay and Great Egg Harbor

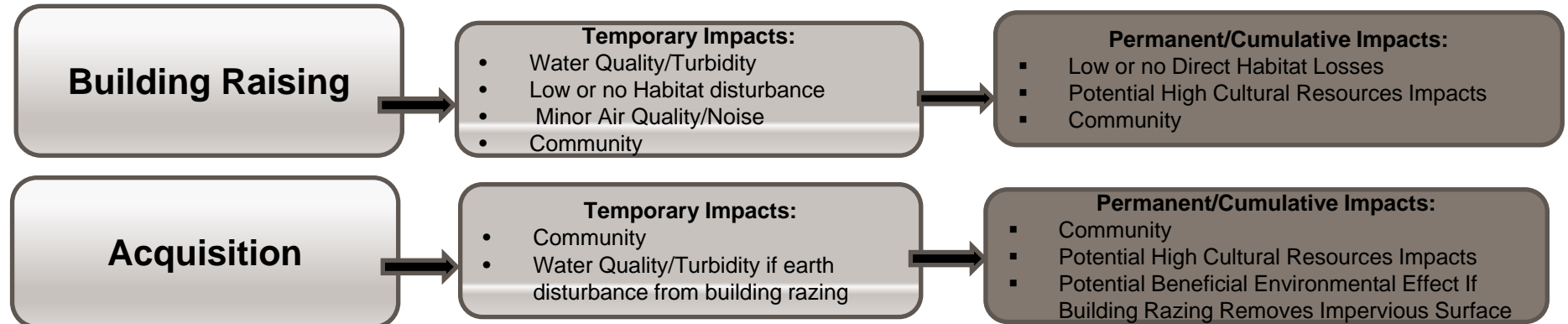


Environmental Considerations of the Focused Array of Alternatives

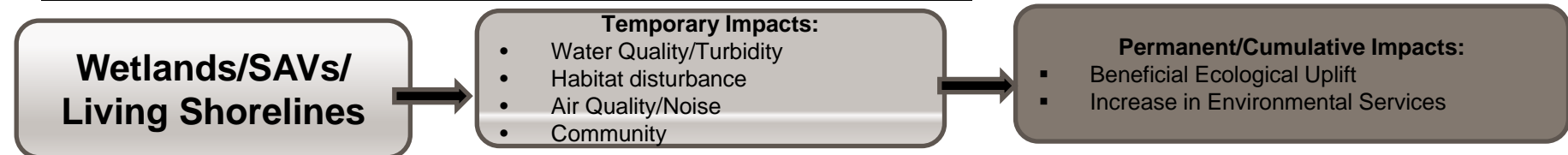
STRUCTURAL MEASURES



NON-STRUCTURAL MEASURES



Natural and Nature Based Features (NNBF)



SYSTEM OF ECONOMIC ACCOUNTS

National Economic Development (NED)

- The National Economic Development criteria examines the return per dollar spent and optimizes the balance between construction and implementation cost and coastal storm damages reduced.

Regional Economic Development (RED)

- Regional Economic Development considers the changes in regional economic activity that result from each alternative plan.
- Regional income and regional employment are two factors that are included in regional economic development

Environmental Quality (EQ)

- Environmental Quality criteria includes both beneficial and adverse changes in the ecological, aesthetic, and cultural attributes of natural and cultural resources

Other Social Effects

- Other social effects include urban and community impacts; life, health, and safety factors; displacement; long-term productivity; and energy requirements and energy conservation.
- Other criteria can be added to this category based on feedback from stakeholders.



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First Phase: Identify possible sites for NNBF

Compare mapped infrastructure and structure inventory to maps of wetlands and aquatic habitats to identify areas where NNBF is possible

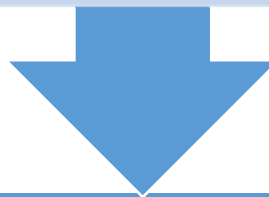
Identify marsh areas that are at risk for future loss from sea level rise, and could benefit from restoration using Sea Level Rise Affecting Marshes Model output

Integrate with perimeter plan alignment to determine where NNBF can augment perimeter plan



Second Phase: Identify appropriate NNBF measures at possible NNBF sites.

Use data from The Nature Conservancy's "Restoration Mapper" which integrates spatial mapping of different physical parameters with implementation guidance from the Stevens Institute of Technology's "Living Shoreline Engineering Guidelines" manual

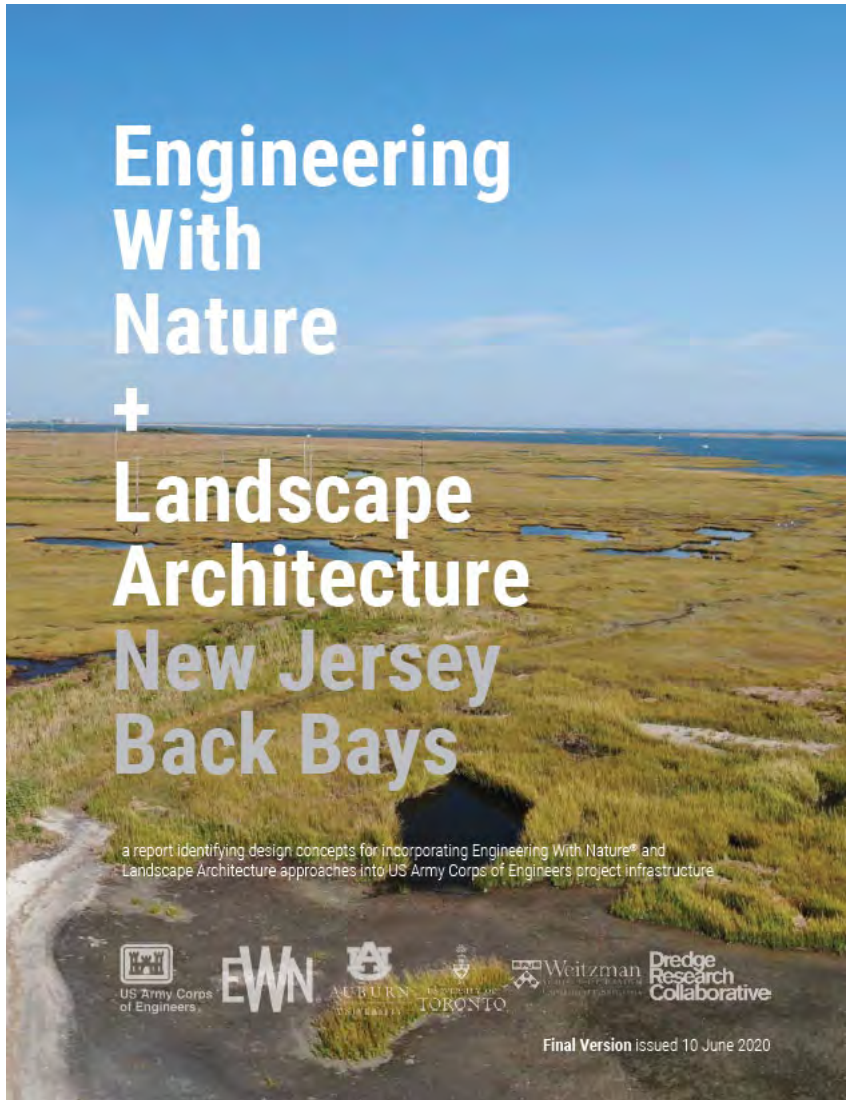


Third Phase: applying a Cost/Benefit metric to screen out NNBF sites with unfavorable BCRs

Rutgers University and NOAA are completing a study which compared NFIP data to wetland coverage. This study will provide insight and framework on assessing the flood/coastal storm risk reductions that can be attributable to NNBF.



USACE ENGINEERING WITH NATURE REPORTING



Enhanced Modeling in Support of Recommended EWN/NNBF Measures and Efficacy in Providing Flood/Storm Risk Reduction

C.D. Piercy, J.K. King, M.A. Bryant, C.C. Camillo, M.A. Cialone, S.C. Dillon, and G. Slusarczyk

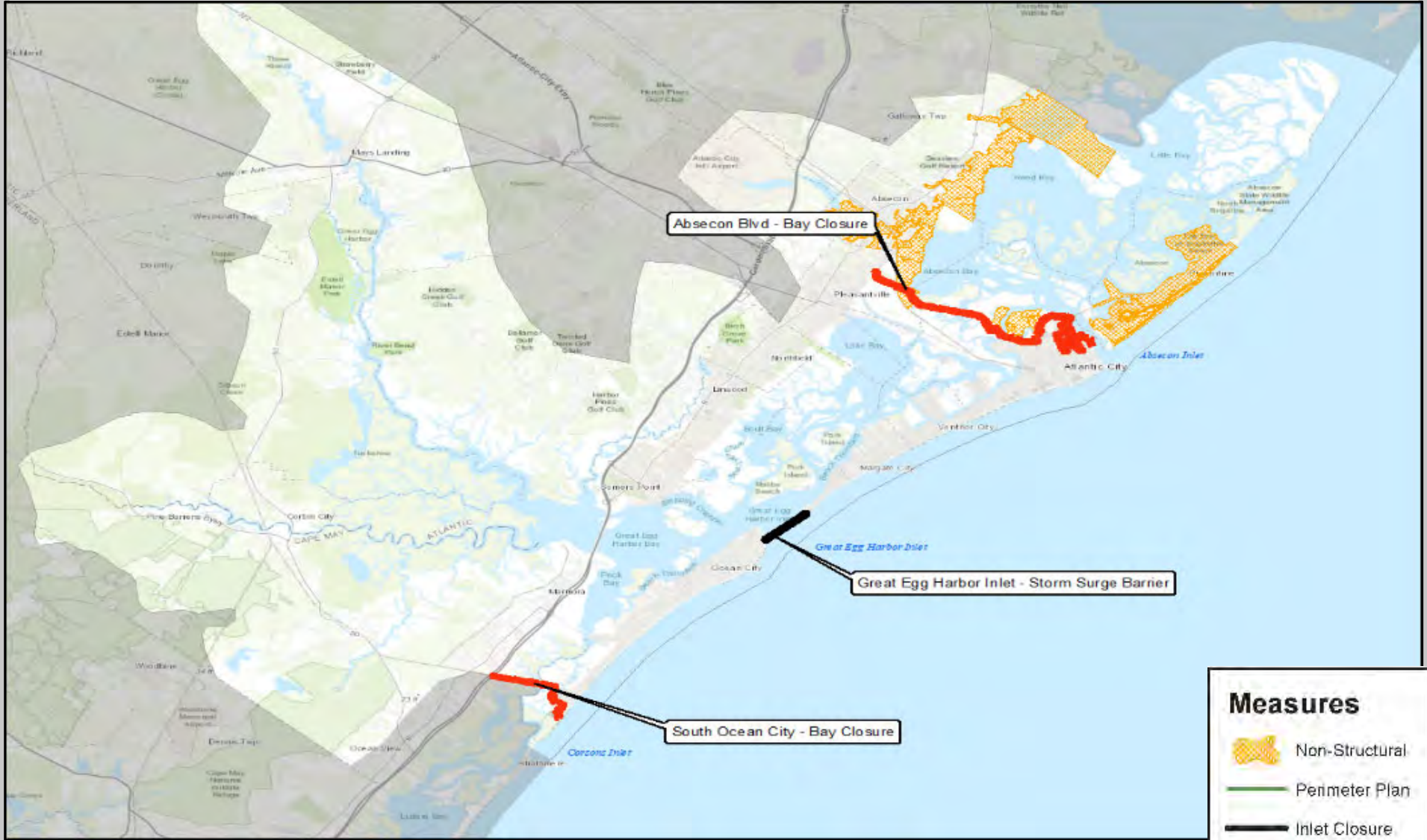
*U.S. Army Engineer Research and Development Center
3909 Halls Ferry Road
Vicksburg, MS 39180*

June 2020





Prepared for **USACE Philadelphia District
100 E Penn Square East
Philadelphia, PA 19107**



CENTRAL REGION TSP

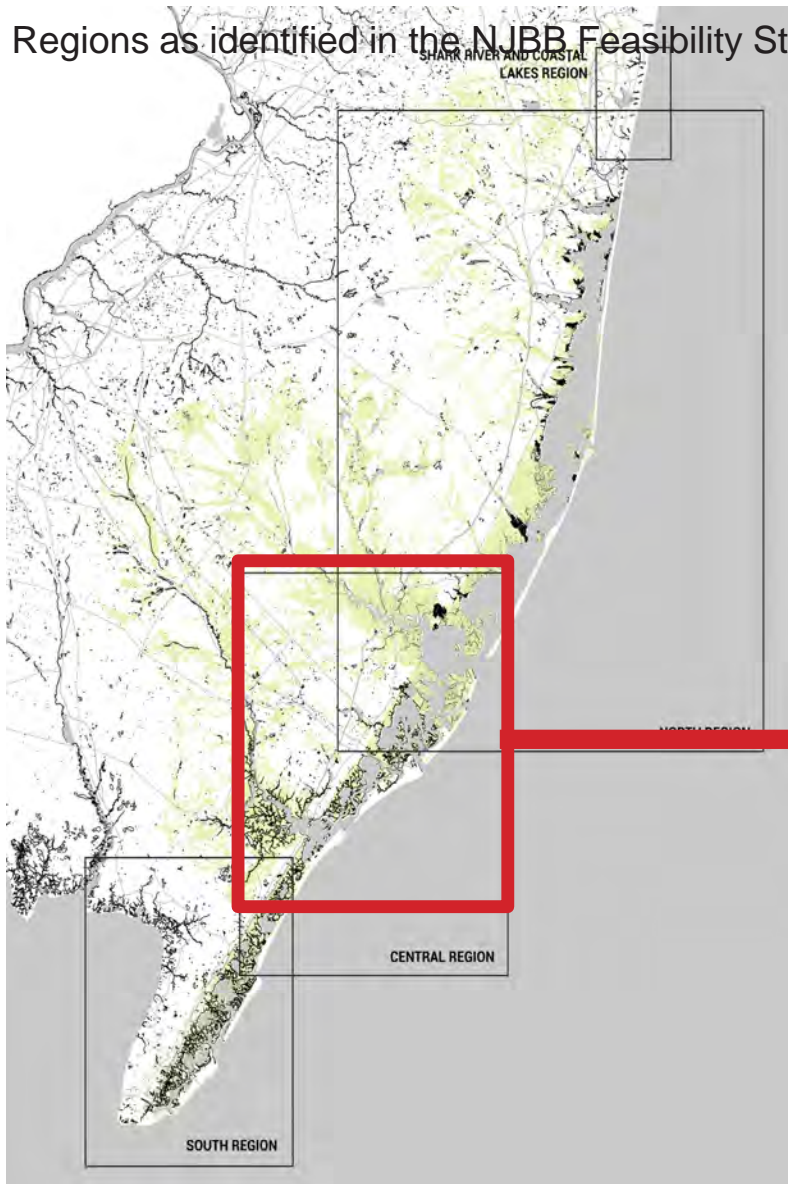


Measures

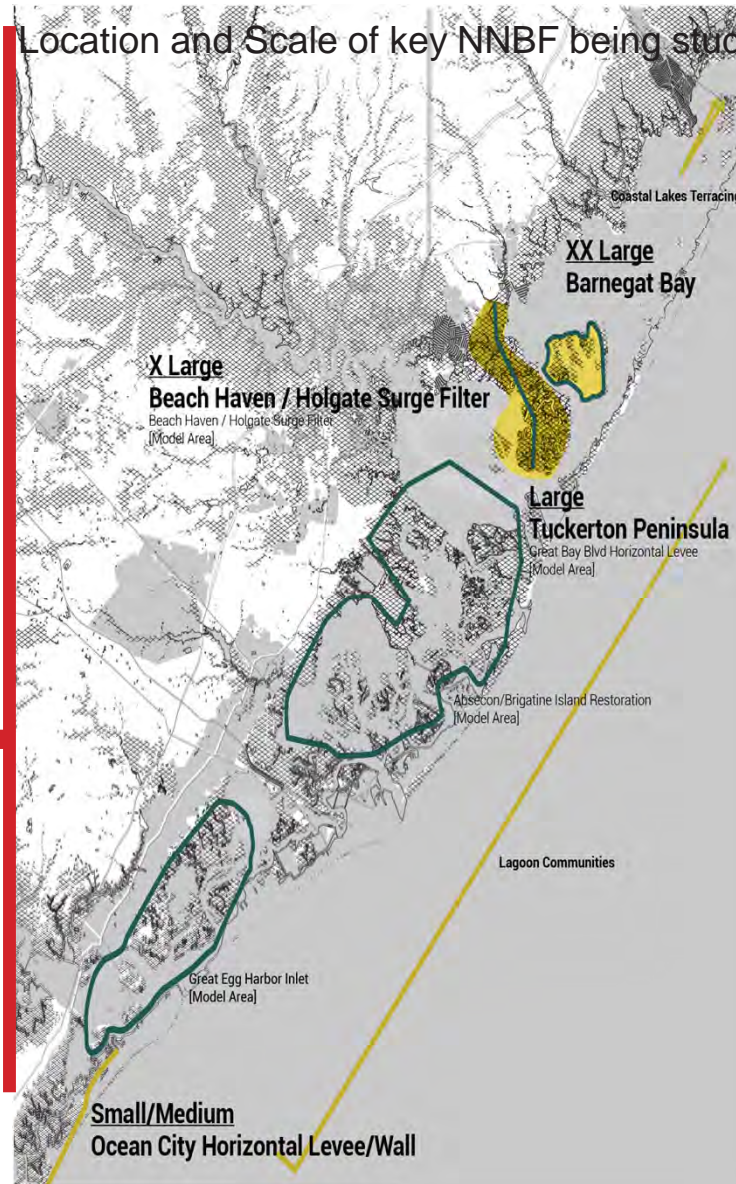
-  Non-Structural
-  Perimeter Plan
-  Inlet Closure
-  Bay Closure

NEW JERSEY BACK BAYS: POTENTIAL NNBF LOCATIONS AND SCALES

Regions as identified in the NJBB Feasibility Study

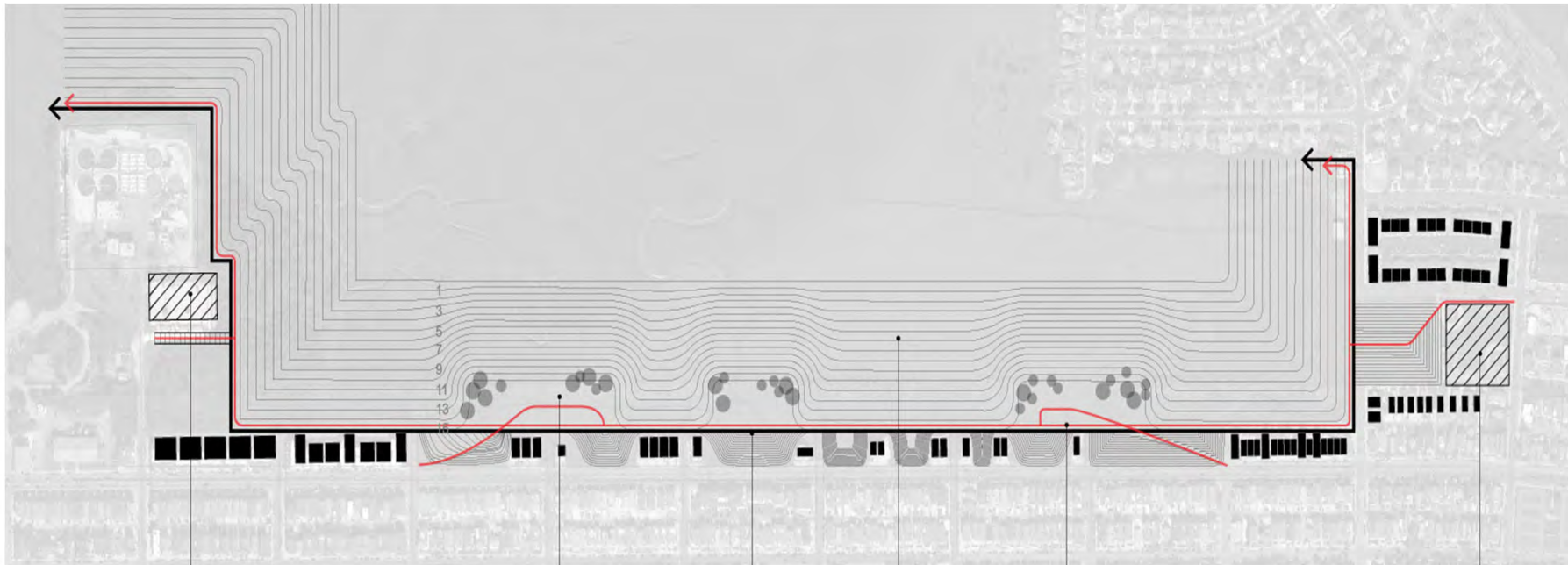


Location and Scale of key NNBF being studied further



OCEAN CITY HORIZONTAL LEVEE/WALL

Segment of Ocean City Floodwall converted to hybrid levee/wall for marsh restoration and public access



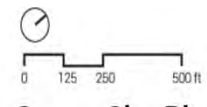
Ocean City Dog Park

Open Space

Flood Wall Horizontal Levee

Path

Baseball Complex



Existing Marsh

Future Low Marsh

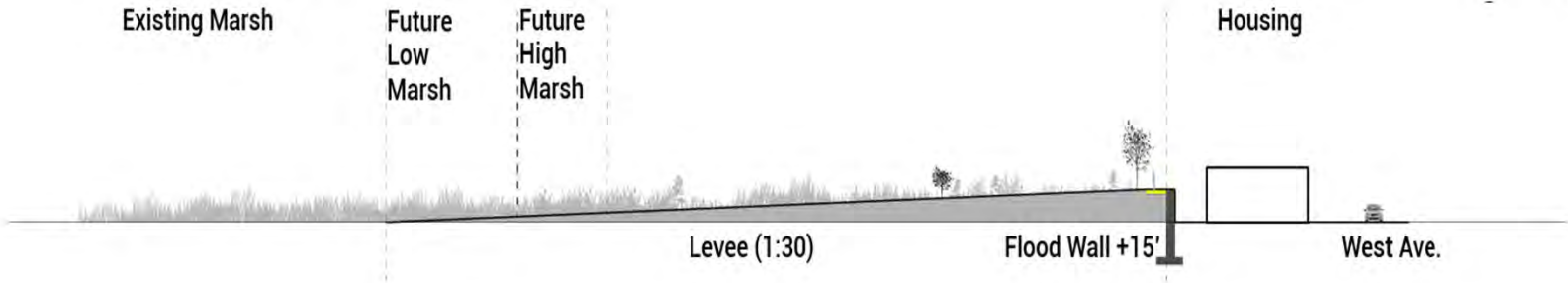
Future High Marsh

Housing

Levee (1:30)

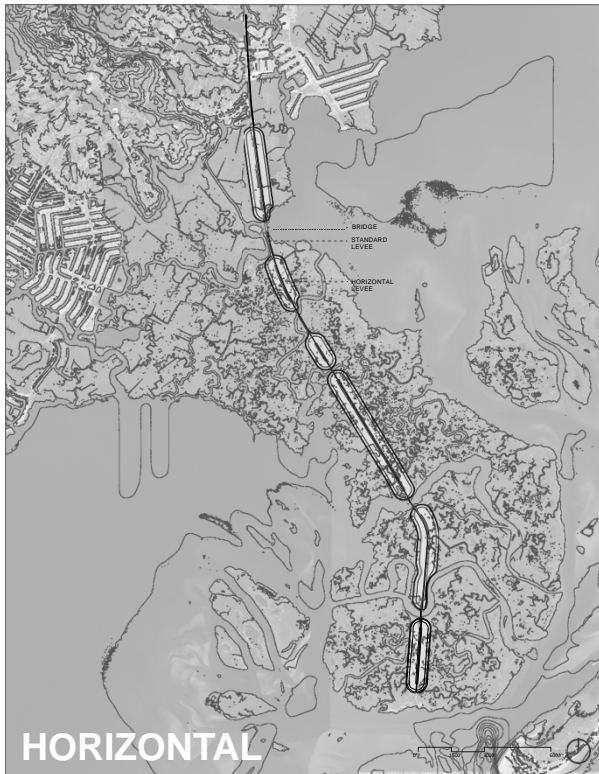
Flood Wall +15'

West Ave.



TUCKERTON PENINSULA VARIATIONS

Alternatives for CSR/M/NNBF features along Great Bay Blvd.



BEACH HAVEN SURGE FILTER



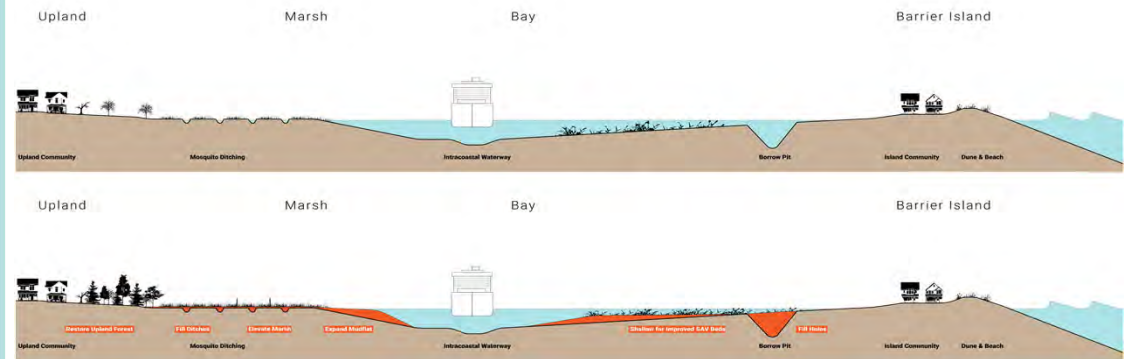
Surge Filter produced by Marsh Creation and Restoration over Existing Shoals and Shallows

BARNEGAT BAY BAY-WIDE NNBF STRATEGIES

Barnegat Bay Marsh Status



Wide-Application NNBF Strategies for Barnegat Bay



Lagoon/Canal Community Protection through Living Breakwaters

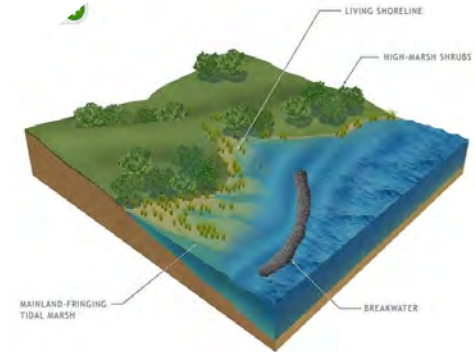




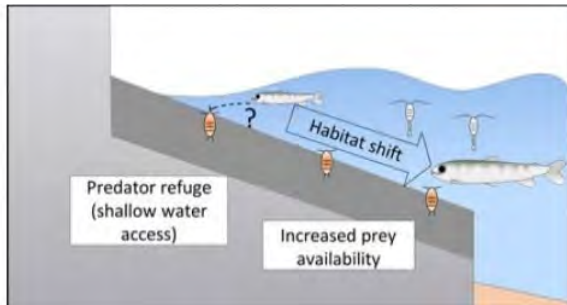
COMPLEMENTARY/HYBRID NNBFS



- **Primary NNBf measure under consideration is living shorelines. Current criteria for this measure include:**
 - Unarmored shorelines adjacent to infrastructure
 - Complementary to structural measures such as floodwalls and levees
- **NJBB study is also considering modifications that can be made to structural measures that can increase their habitat value:**
 - Habitat benches to restore more natural slope along shorelines
 - Textured concrete to support colonization of algae and invertebrates



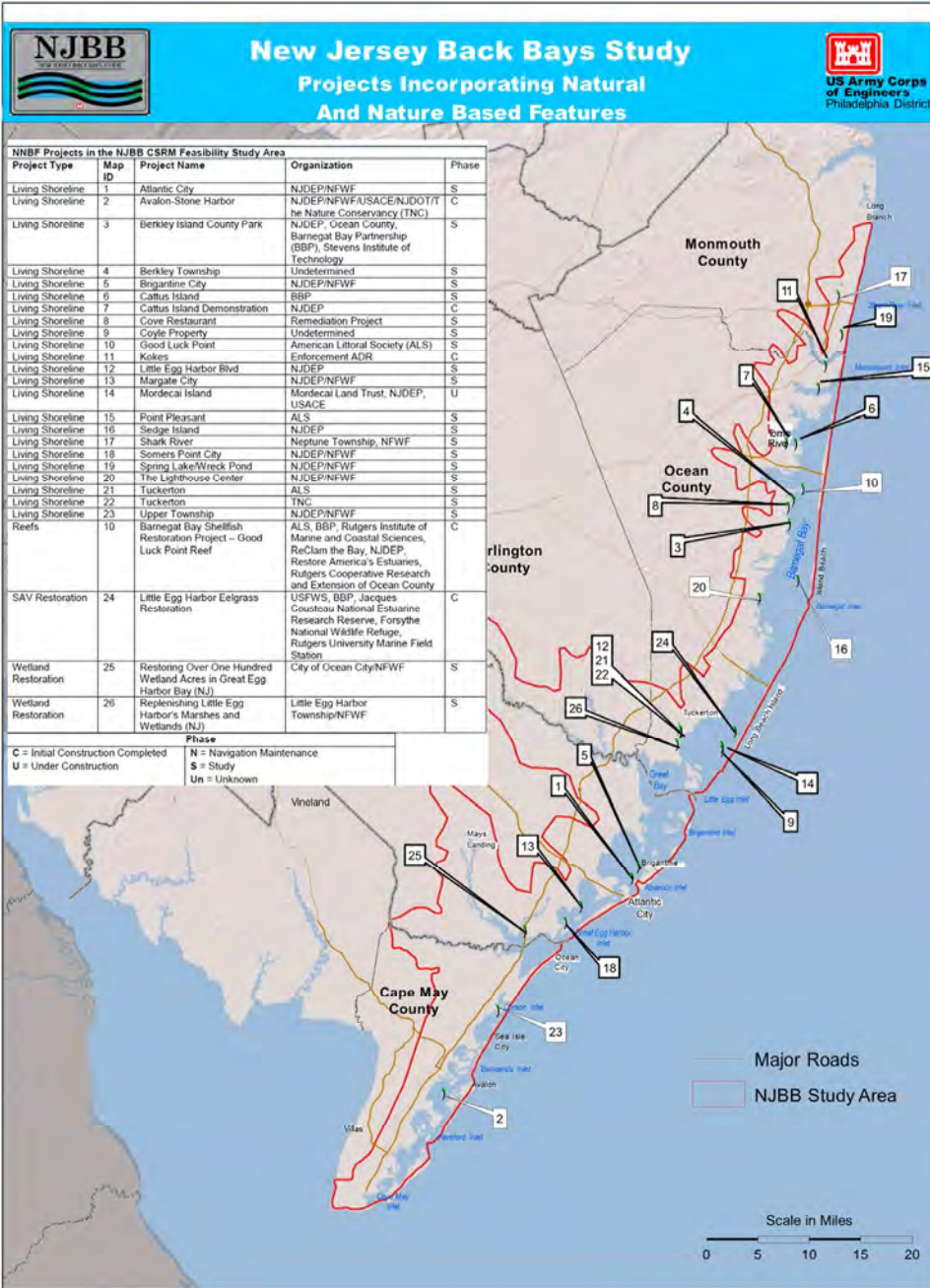
Construction of living shoreline in Camp Pecometh, MD



Conceptual diagram of habitat bench

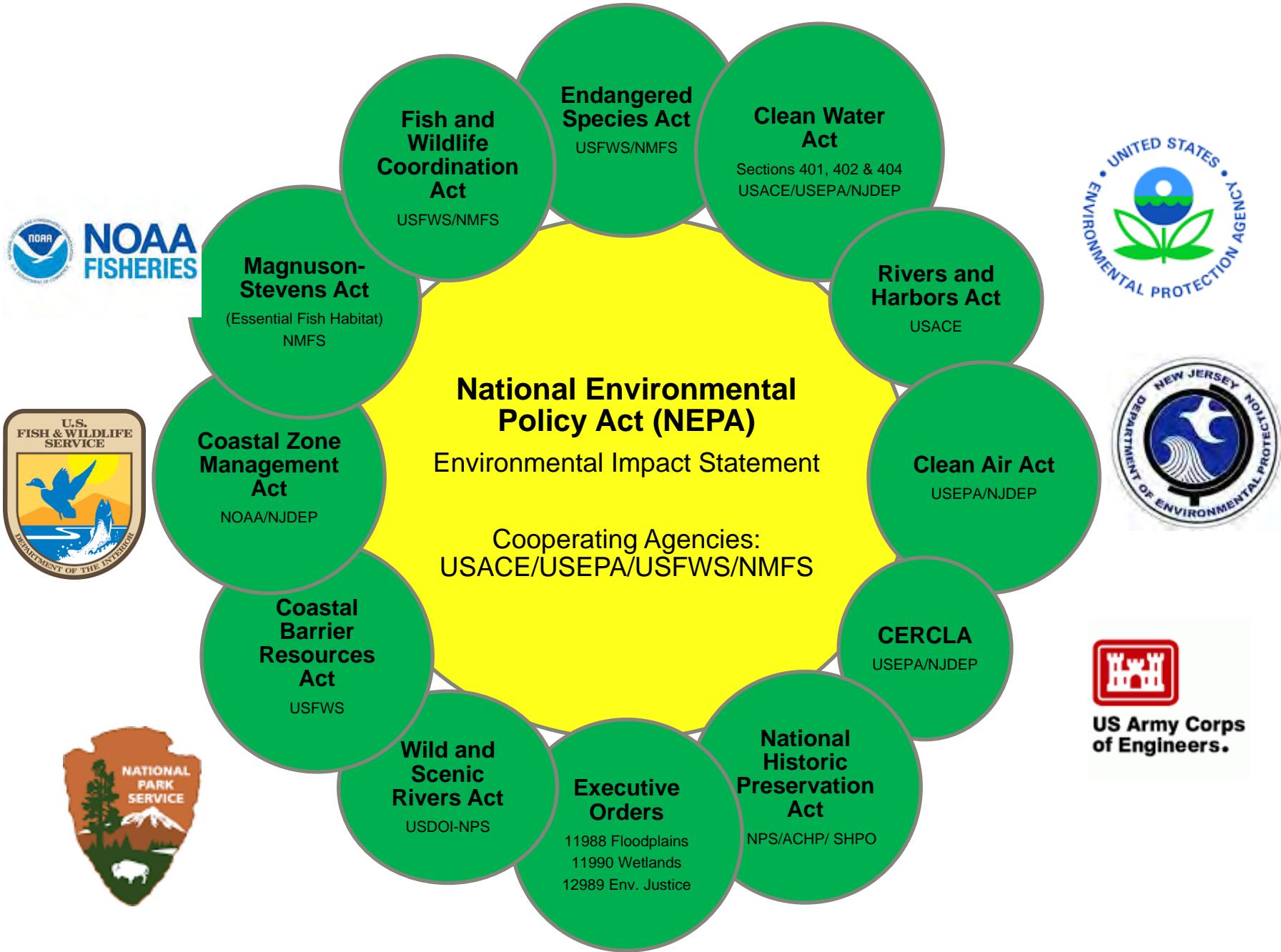


Textured concrete

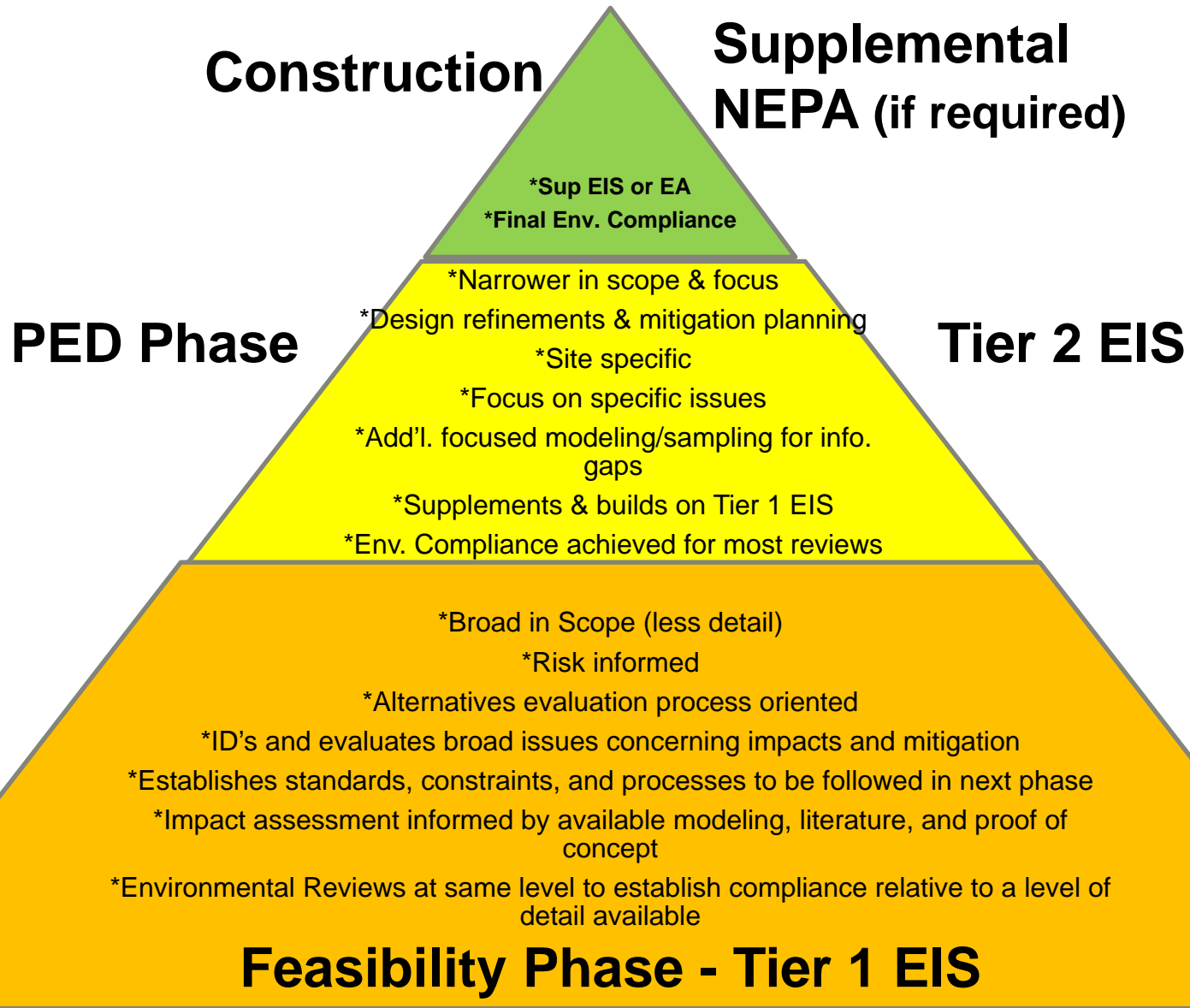


PROJECTS INCORPORATING NNBF

AGENCY COORDINATION AND COMPLIANCE



NJBB TIERED NEPA APPROACH





ENVIRONMENTAL REVIEW SCHEDULE



DRAFT NEW JERSEY BACK BAYS TIER 1 DEIS REVIEW SCHEDULE

AGENCY	REVIEW	ACTION	2021													
			June	July	August	September	October	November	December	January						
General Review	Tier 1 Level NEPA (DEIS)	Agency and Public NEPA Review of DEIS		7-Jul		15-Aug (45 days duration)										
NOAA/NMFS	Tier 1 ESA	Initiate Consultation to designate complete BA		7-Jul		15-Aug (60 days duration)										
		Conclusion of ESA Consultation					1-Sep								15-Jan (135 days duration)	
NOAA/NMFS	Tier 1 MSA	Initiate Consultation - designate complete EFH Assessment		7-Jul		15-Aug (60 days duration)										
		NOAA Response - EFH Conservation Recommendations					1-Sep									
DOI/USFWS	Tier 1 ESA	Initiate Consultation to designate complete BA		7-Jul		15-Aug (60 days duration)										
		Conclusion of ESA Consultation					1-Sep								15-Jan (135 days duration)	
DOI/USFWS	Tier 1 FWCA	Provide Draft FWCA 2(b) Report		7-Jul		30 days (duration)										
		Provide FWCA 2(b) Report					1-Sep									
NJDEP	Tier 1 Federal Consistency Review	Submit and designate complete FEDCON package		7-Jul		30 days (duration)										
		Conditional Federal Consistency					1-Sep								15-Jan (60 days duration)	
	Section 106 NHPA Review	Execute Prog. Agreement (PA)														(Duration in accordance with...)

COMMENTS & QUESTIONS

- **USACE NJBB Web Portal:**
<http://www.nap.usace.army.mil/>
- **Reporting, videos of meetings, regular updates**
- **Detailed comments can be submitted by comment form, email or in writing**
 - ▶ PDPA-NAP@usace.army.mil
 - ▶ **U.S. Army Corps of Engineers, Planning Division, 100 Penn Square East, Philadelphia, PA 19107**

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USACE NJBB Webpage



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Questions & Answers

