

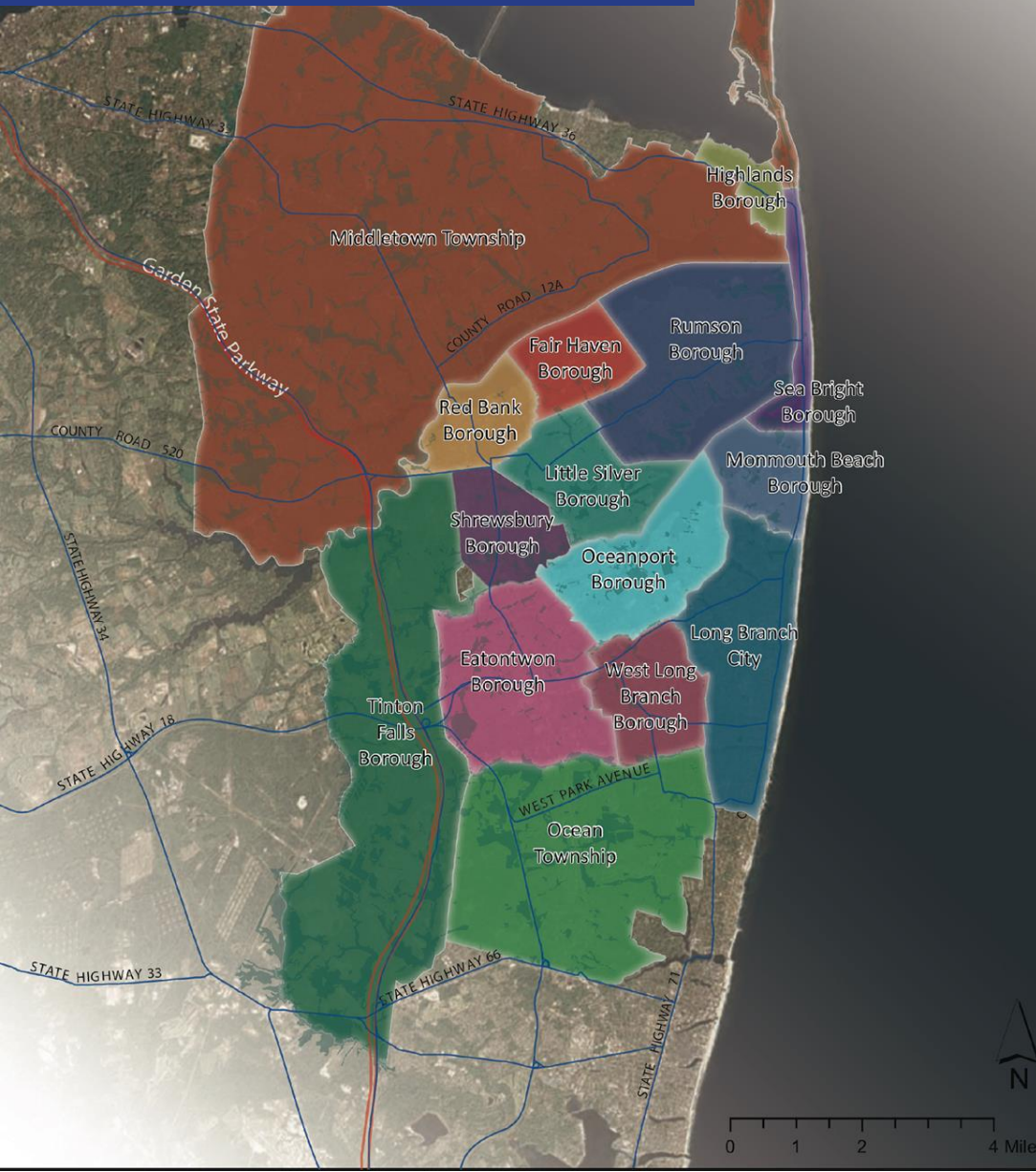
# **Project Overview**

**NJ FRAMES: Two Rivers, One Future**  
**Steering Committee, Technical and Constituency Advisory Groups**  
**Workshop**  
**January 9, 2019**  
**Tatum Park, Middletown, NJ**



# NJFRAMES

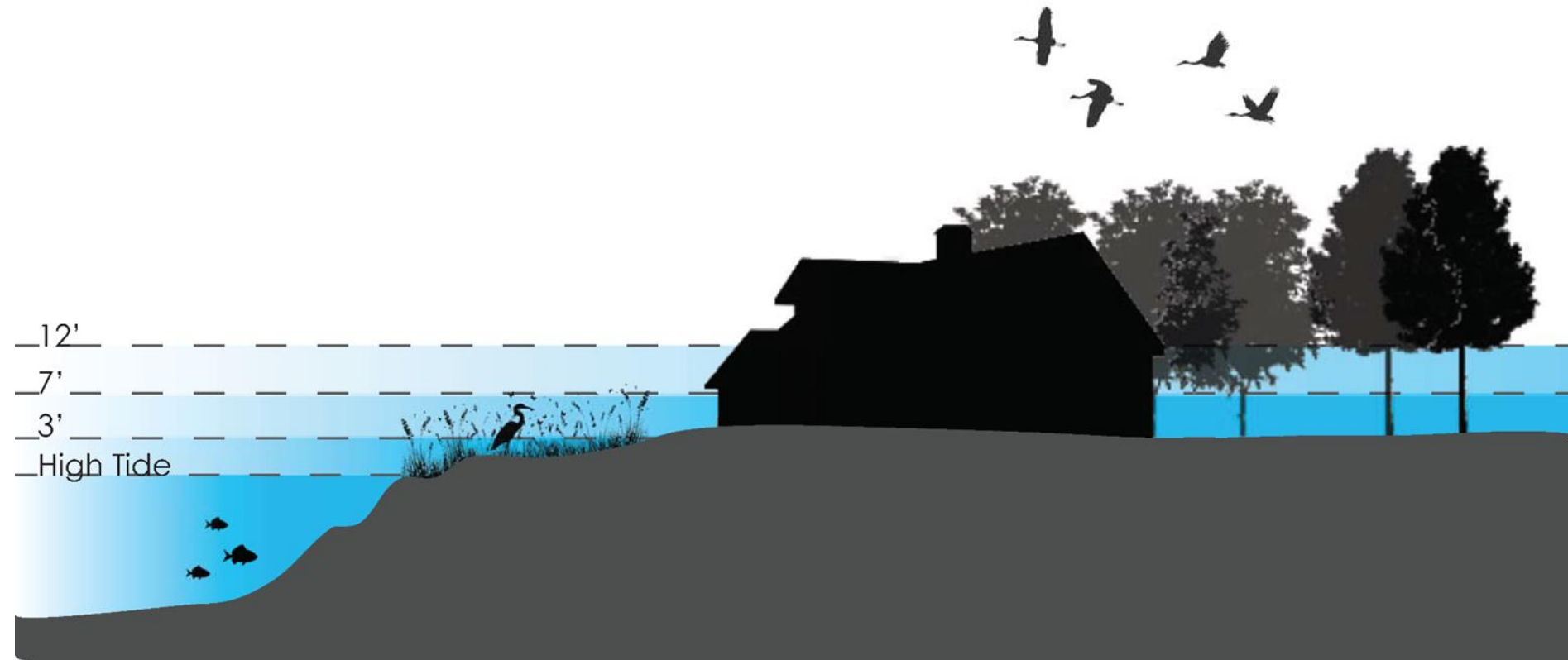
2 of 48



**Louis Berger**

**RUTGERS**  
Climate Institute

# What Are We Planning For?





# Project Goal





# Who Is Involved?

## Municipalities

	Municipal Meeting <u>OR</u> Getting-to-Resilience	Public Event(s)	Steering Committee Participation
Eatontown			
Fair Haven	✓	✓	✓
Highlands	✓	✓	✓
Little Silver	✓	✓	✓
Long Branch		✓	
Middletown	✓	✓	✓
Monmouth Beach	✓	✓	✓
Oceanport	✓		
Ocean Township	✓		✓
Red Bank	✓	✓	✓
Rumson	✓		✓
Sea Bright	✓	✓	
Shrewsbury	✓		✓
Tinton Falls			
West Long Branch			

# Constituents

## Society and Health

- Hackensack Meridian Health - Riverview Medical Center
- Monmouth County Regional Health Commission
- Monmouth Arts

## Ecology and Habitat

- American Littoral Society
- Clean Ocean Action
- Monmouth Conservation Foundation
- NY/NJ Baykeeper

## Hazard Response

- Monmouth County Volunteer Organizations Active in Disaster (VOAD)
- SBP, Inc.

## Infrastructure

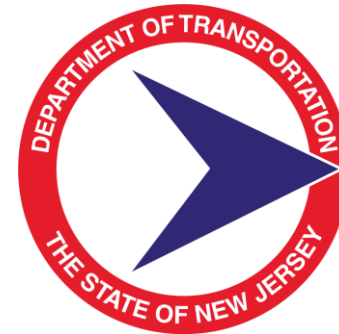
- Monmouth University
- Naval Weapons Station Earle
- NJAFM

## Economic Development

- EMACC - Eastern Monmouth Chamber of Commerce
- Fair Haven Yacht Works / Marine Trades Association NJ



# Agencies



FEMA



# Engagement & Outreach

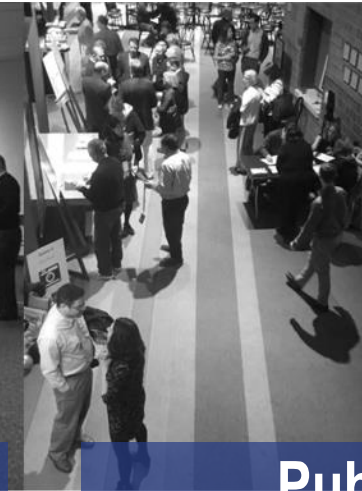
Nov. 2016 - Present



Kick Off



Agencies



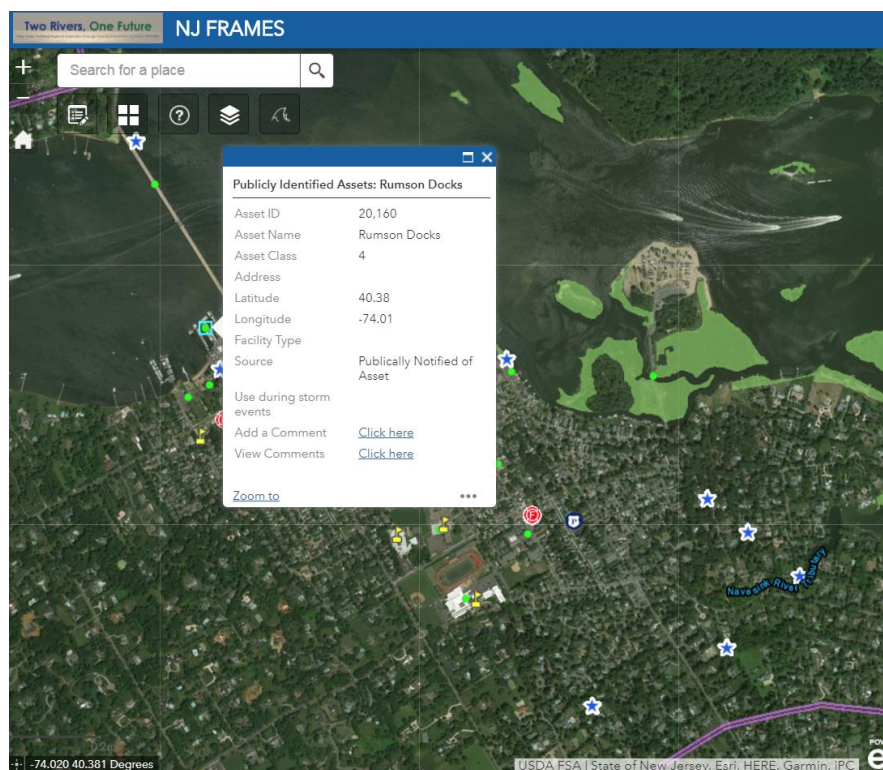
Public Events



Steering Committee and Advisory Group Meetings



# Asset Mapping



## Two Rivers, One Future

New Jersey Fostering Regional Adaptation through Municipal Economic Scenarios (FRAMES)

**#MapWhatMatters** to you in the Two Rivers region

**Help us to map out the most important places in your community and help protect them from floodwaters.**

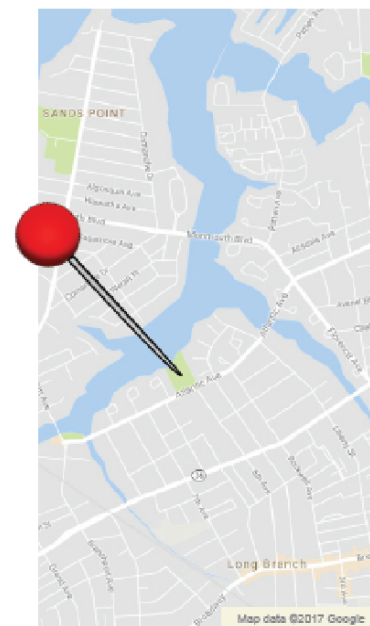
What places are most important to you? Do you value your town's library, outdoor concert venue, or a nearby hospital? Let us know!

The information you provide will help us make the Two Rivers region more resilient against flooding!

**Here's how you can participate:**

Visit [TwoRiversOneFuture.nj.gov](http://TwoRiversOneFuture.nj.gov) to learn more and start mapping.

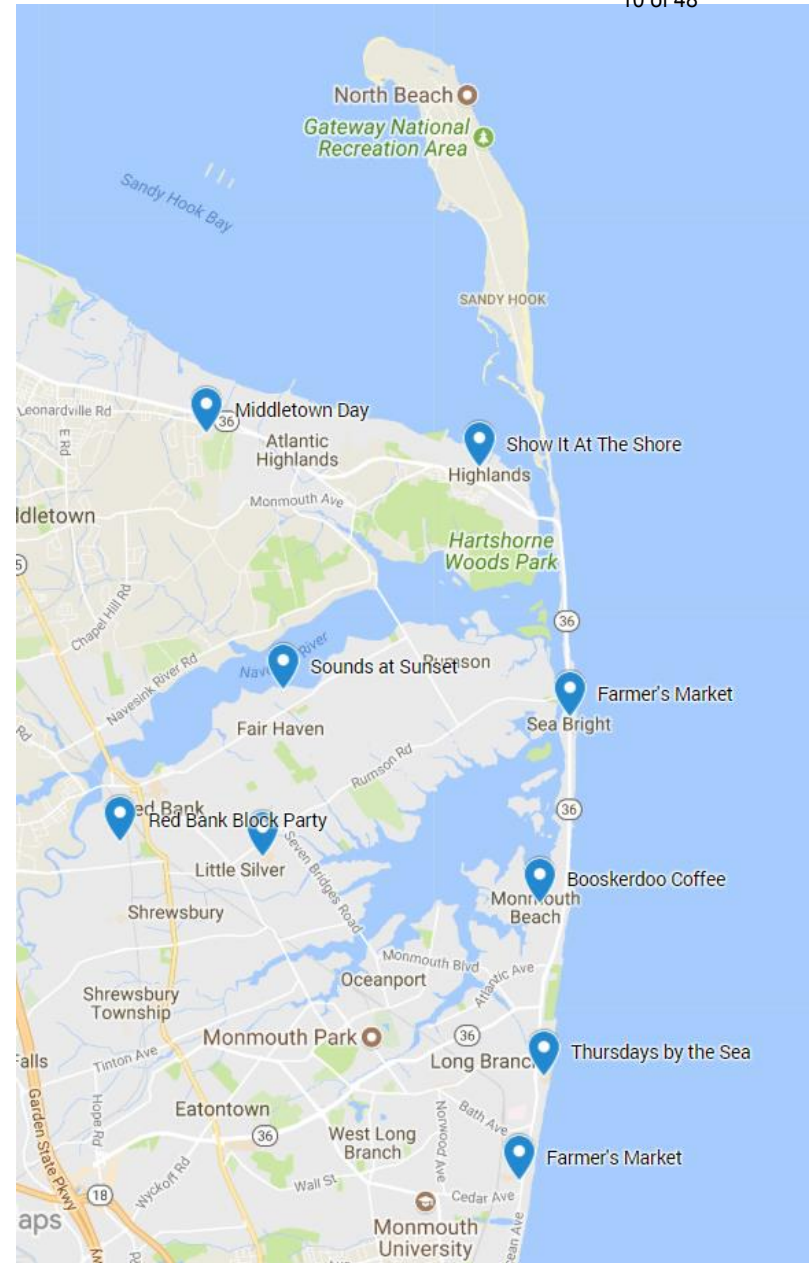
Or, use **#MapWhatMatters** and **#TwoRiversOneFuture** with images and info to tweet about your favorite places.



## Interviews

### Social Service Organizations

- Parker Health Clinic
- Monmouth Conservation Foundation
- Coastal Communities Family Success Center
- St. Anthony of Padua Church
- Lunch Break
- Oasis
- Family Promise
- Affordable Housing Alliance





# Municipal Meetings



## Two Rivers, One Future

New Jersey Fostering Regional Adaptation through Municipal Economic Scenarios (FRAMES)

### Two Rivers Regional Getting to Resilience Recommendations



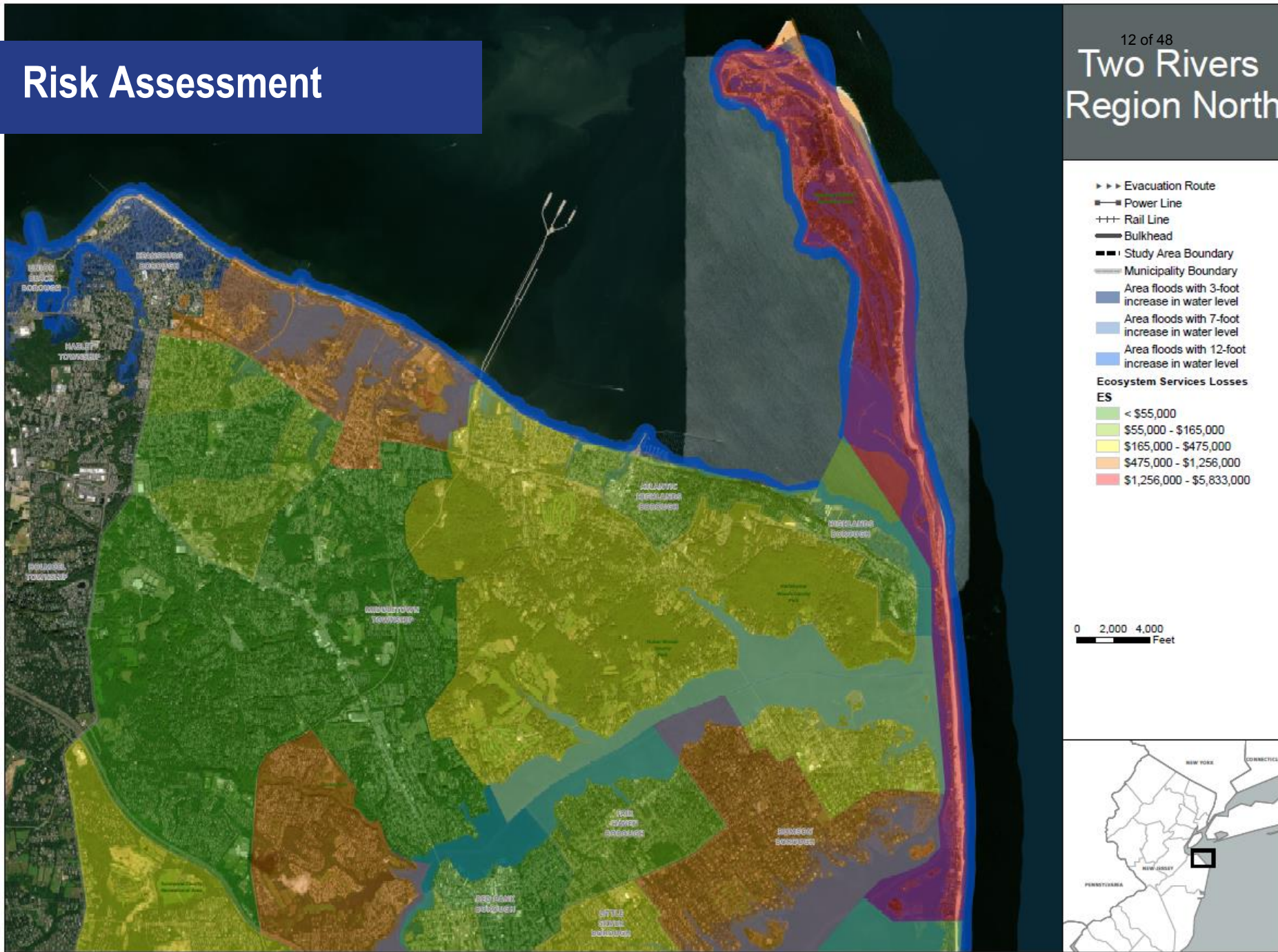
Photo credit: United State Army Corps of Engineers

Financial assistance for this work was provided by the National Oceanic and Atmospheric Administration's Coastal Resilience Grants program under grant award number NA18NCS4730004. These environmental data and related items of information have not been formally disseminated by NOAA and do not represent and should not be construed to represent any agency determination, view, or policy.

# Risk Assessment

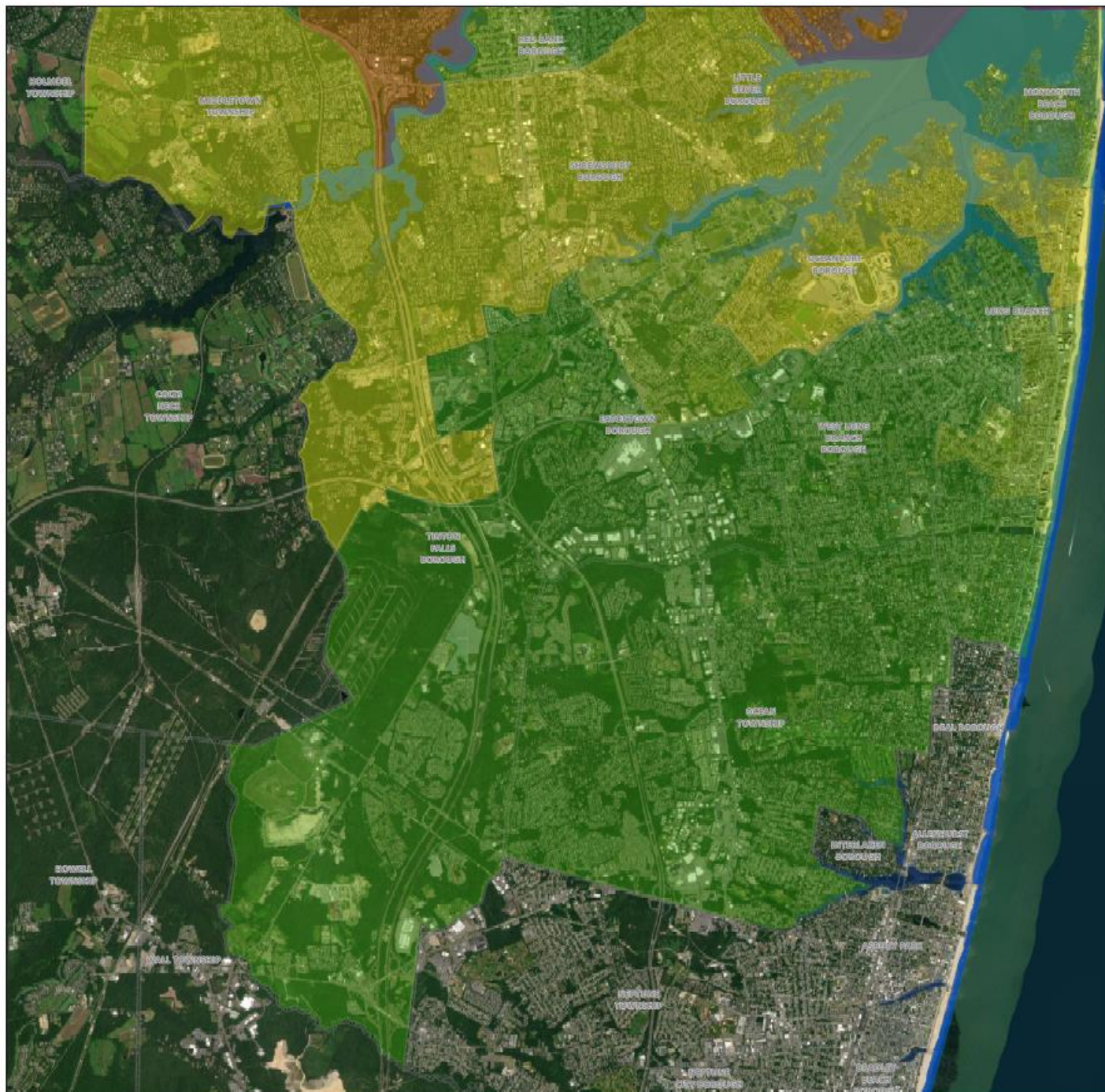
12 of 48

## Two Rivers Region North





# Two Rivers Region South



- ▶ ▶ ▶ Evacuation Route
- Power Line
- +++ Rail Line
- Bulkhead
- Study Area Boundary
- Municipality Boundary
- Area floods with 3-foot increase in water level
- Area floods with 7-foot increase in water level
- Area floods with 12-foot increase in water level

## Ecosystem Services Losses ES

- < \$55,000
- \$55,000 - \$165,000
- \$165,000 - \$475,000
- \$475,000 - \$1,256,000
- \$1,256,000 - \$5,833,000

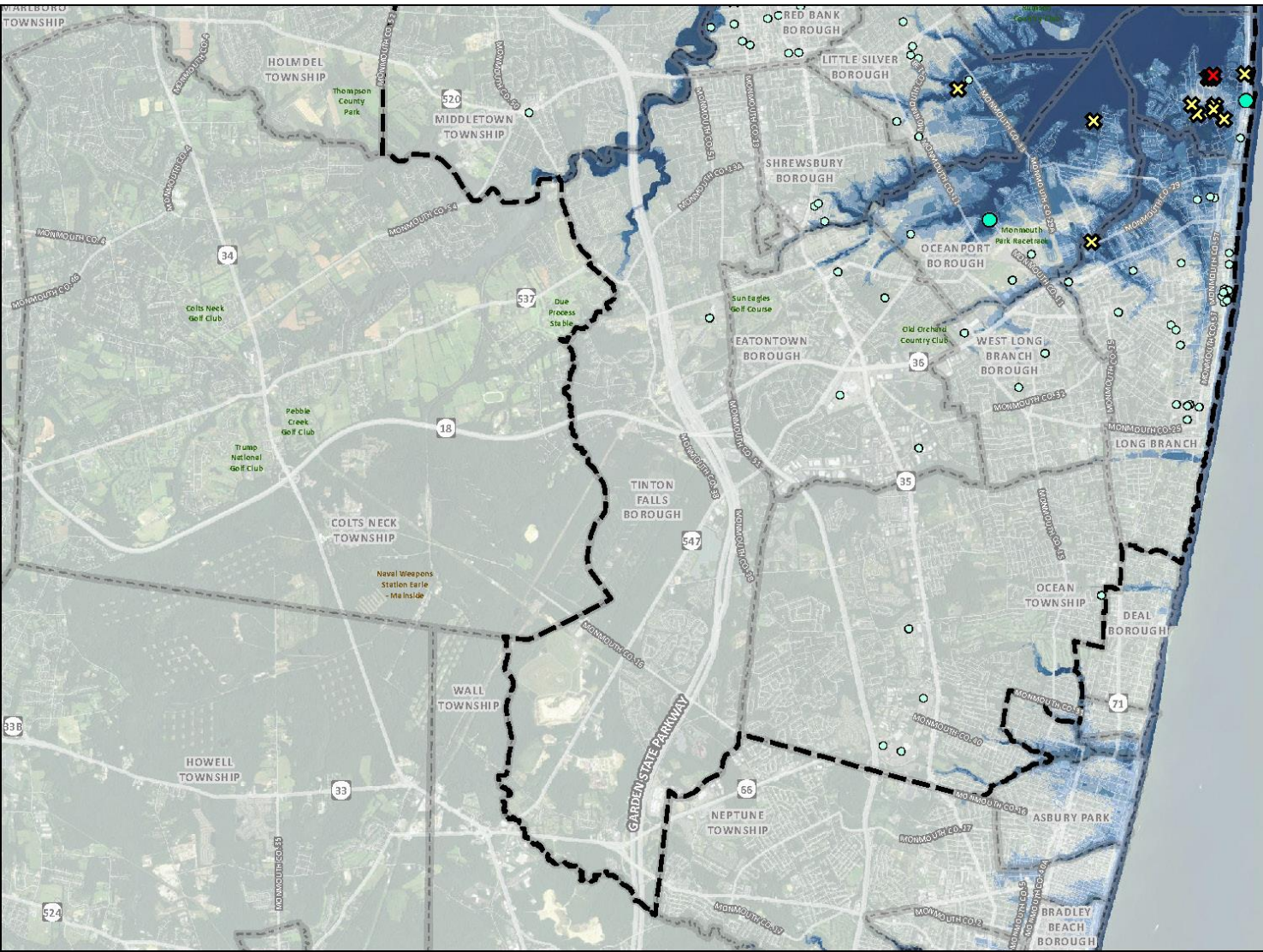
0 2,000 4,000  
Feet











## Two Rivers Region South

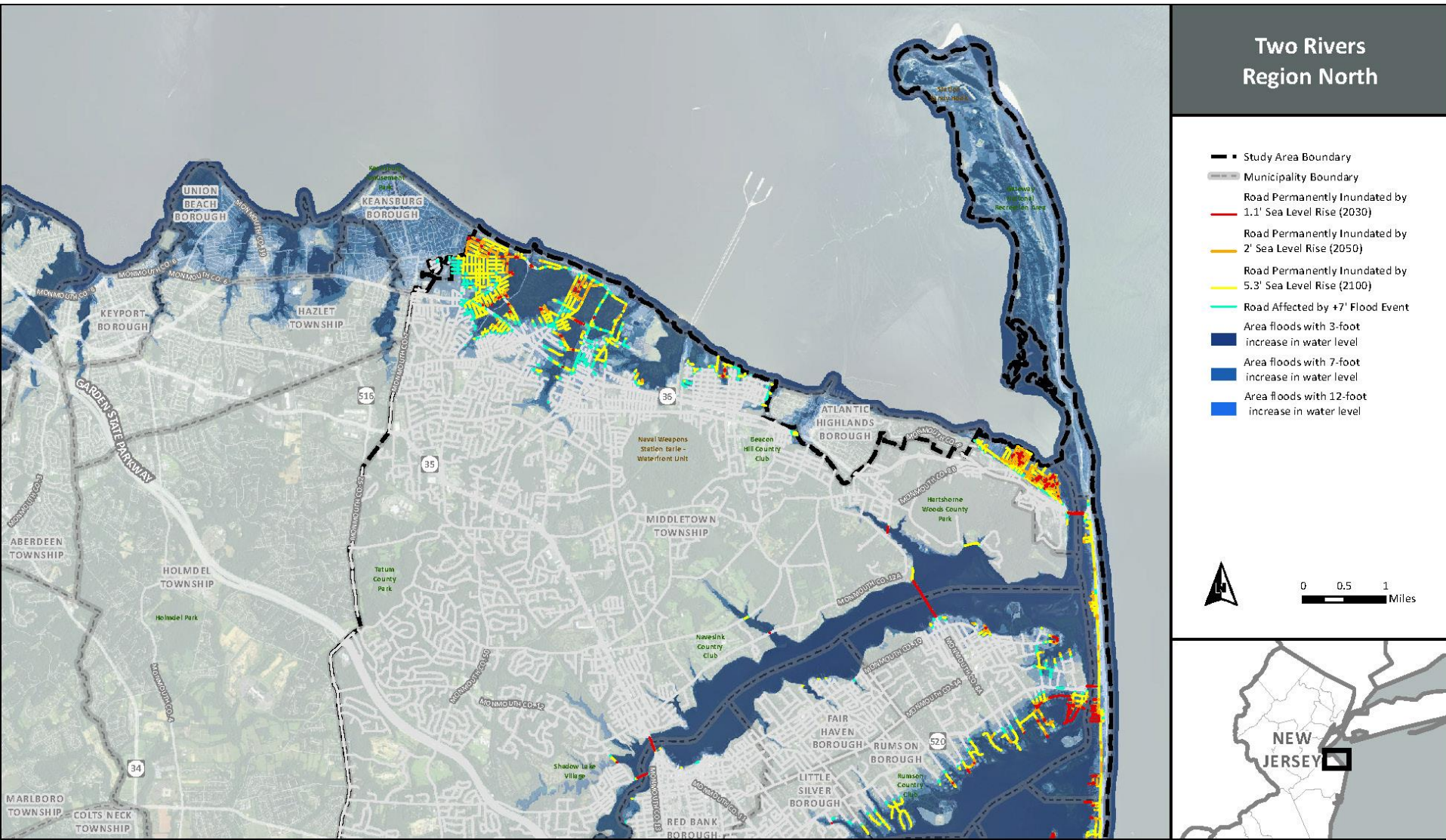
- Study Area Boundary
- Municipality Boundary
- Permanently Inundated by 1.1' Sea Level Rise (2030)
- Permanently Inundated by 2' Sea Level Rise (2050)
- Permanently Inundated by 5.3' Sea Level Rise (2100)
- Resource Affected by +7' Flood Event
- Resource Not Affected by +7' Flood Event
- Area floods with 3-foot increase in water level
- Area floods with 7-foot increase in water level
- Area floods with 12-foot increase in water level



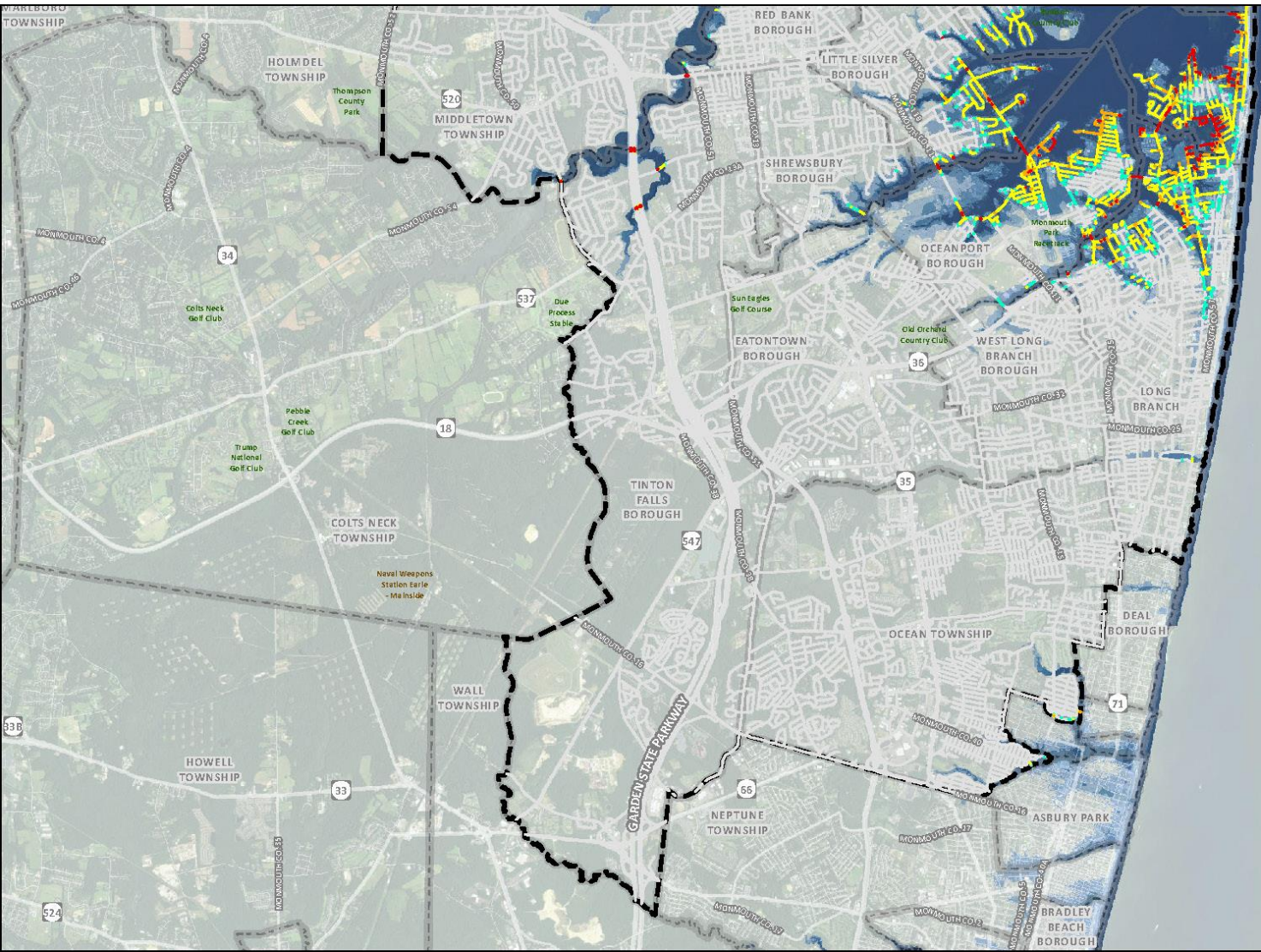
0 0.5 1 Miles











## Two Rivers Region South

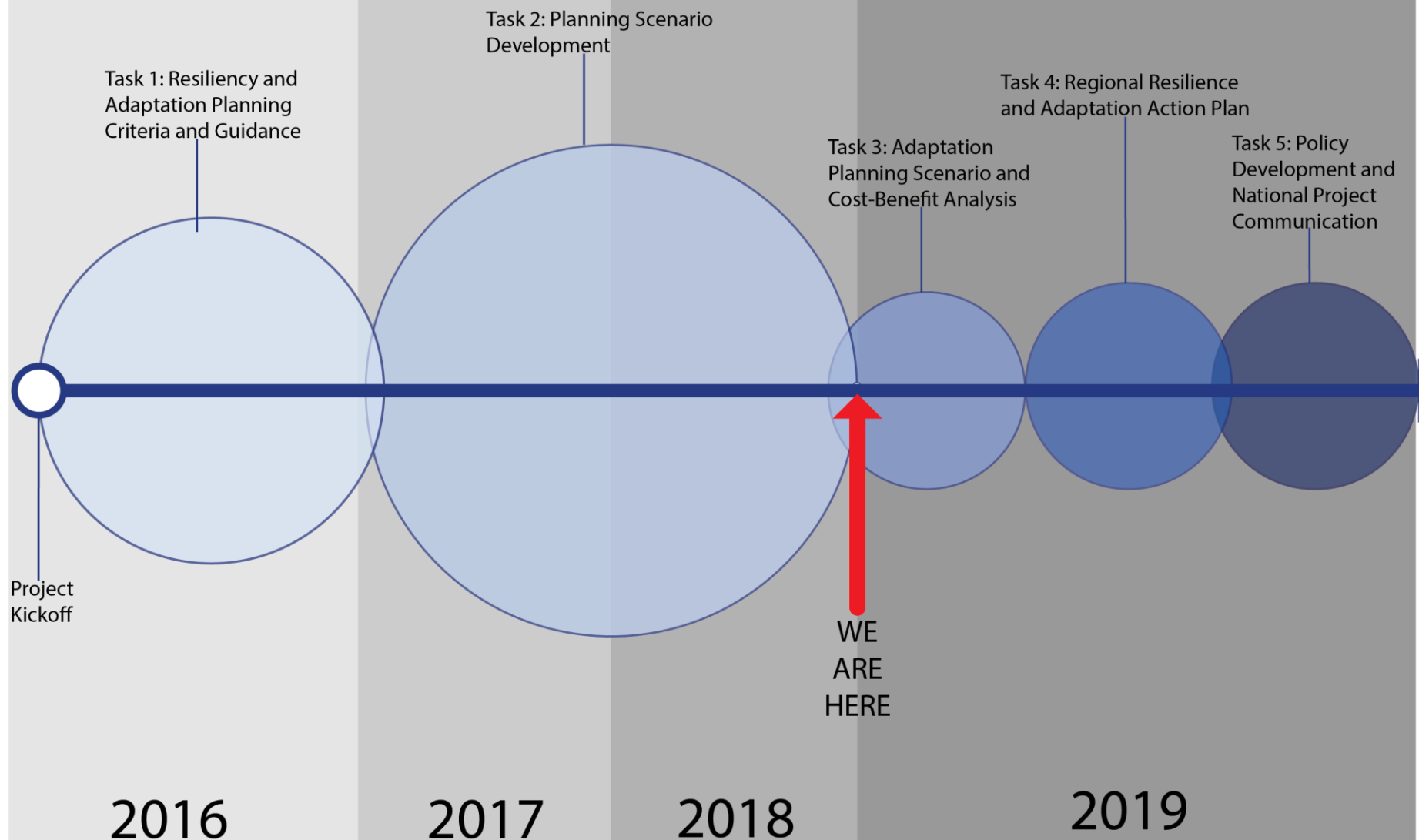
- Study Area Boundary
- Municipality Boundary
- Road Permanently Inundated by 1.1' Sea Level Rise (2030)
- Road Permanently Inundated by 2' Sea Level Rise (2050)
- Road Permanently Inundated by 5.3' Sea Level Rise (2100)
- Road Affected by +7' Flood Event
- Area floods with 3-foot increase in water level
- Area floods with 7-foot increase in water level
- Area floods with 12-foot increase in water level



0 0.5 1 Miles




# Next Steps & Timeline






# Stay Informed



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

Governor Phil Murphy • Lt. Governor Sheila Oliver  
[NJ Home](#) | [Services A to Z](#) | [Departments/Agencies](#) | [FAQs](#)  
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[Coastal Management Program Home](#)

**About the Program**

[CMP History](#)

[Coastal Nonpoint Pollution Control Program](#)

[Coastal Land Use Regulation](#)

[Coastal Enforcement](#)

[Enforceable Policies](#)

[Federal Consistency](#)

[Coastal Hazards of NJ](#)

[NJ Coastal Data](#)

[309 Assessment & Strategy](#)

[Public Access](#)

[Hudson River Waterfront Walkway](#)

[Historic Fact Sheets](#)

[Coastal Atlas](#)

[NJ Clean Marina Program](#)

[Contact CMP](#)

[Links](#)

[Photo Gallery](#)

[Land Use Management](#)

## Two Rivers, One Future


New Jersey Fostering Regional Adaptation Through Municipal Economic Scenarios (FRAMES)

[Home](#)
[Project Area](#)
[Community Engagement](#)
[Project Documents](#)


The NJ FRAMES project is a regional and collaborative effort in coastal Monmouth County, NJ that seeks to understand and begin to address our future flood vulnerability. The end result will be a long-term Regional Resilience and Adaptation Action Plan that will identify ways our communities can reduce risks and impacts together.

**What's New**


- ▶ [NJ FRAMES Update Summer 2018](#) (pdf)
- ▶ [Find a Way to Get Involved!](#)
- ▶ [Upcoming Public Events](#)
- ▶ [Check out the #MapWhatMatters results!](#)
- ▶ [NJFRAMES Technical Memo Summary](#) (pdf)
- ▶ [NJFRAMES Technical Memo](#) (pdf)



[Project Area](#)



[Stakeholders and Community Engagement](#)



[Project Documents](#)

<http://www.tworiversonefuture.nj.gov>



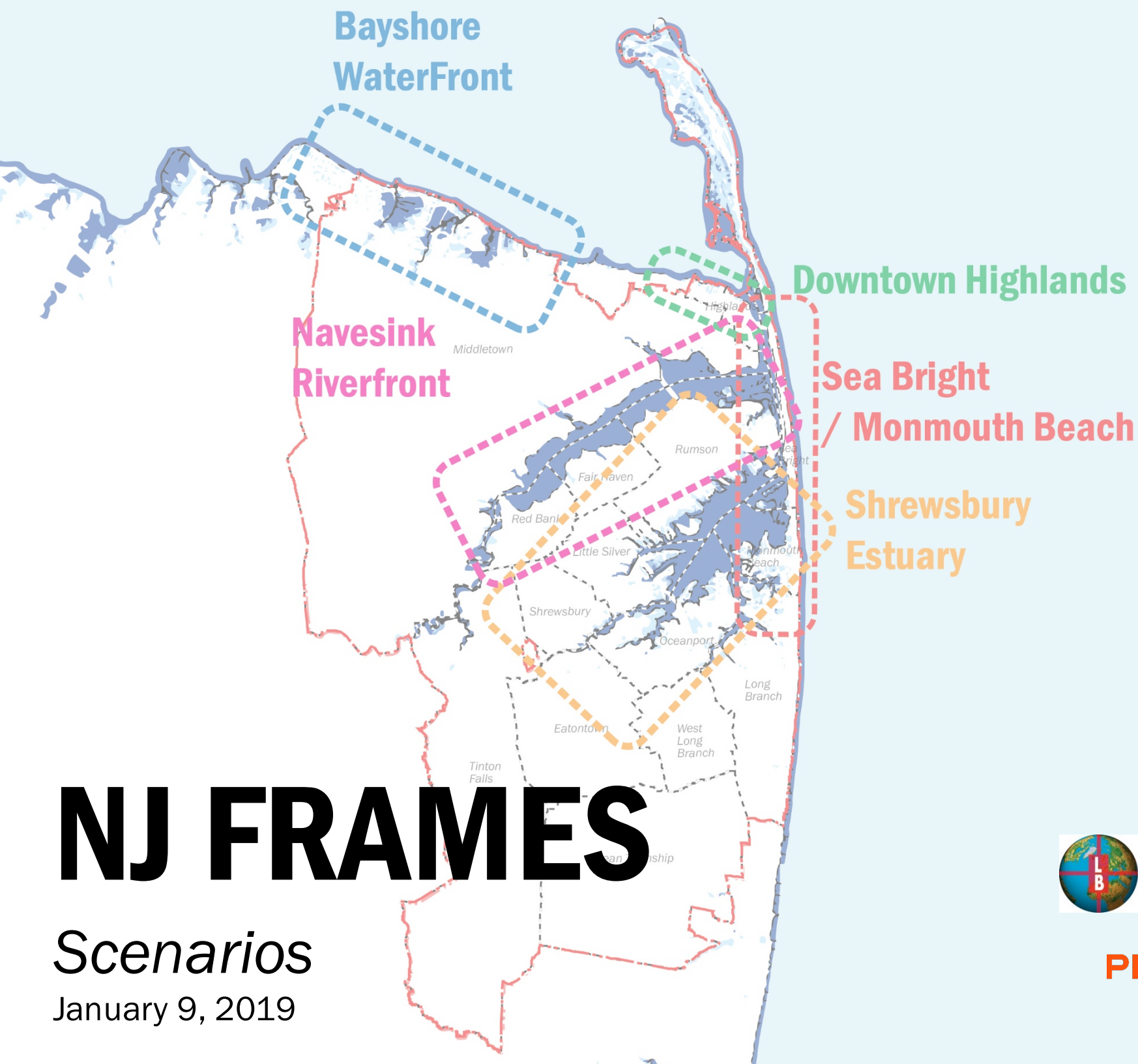
[njframes@dep.nj.gov](mailto:njframes@dep.nj.gov)



[#TwoRiversOneFuture](#)



[@NJCoastalManagement](#)



# NJ FRAMES

*Scenarios*

January 9, 2019



Louis Berger

**PERKINS —  
EASTMAN**

# PROJECT OBJECTIVES



- Create a more consistent and sustainable response to coastal hazards in New Jersey
- Develop a ***Regional Resilience*** and ***Adaptation Action Plan*** based on their Preferred Planning Scenario



# SCENARIOS GOALS

- Serve as a *means* for assisting stakeholders in clarifying their thinking on the key challenges
- Frame discussion on critical high-level choices involved in establishing the Plan
- The solutions identified in the At Risk Areas will inform the Regional Resilience Plan for the Two River Region





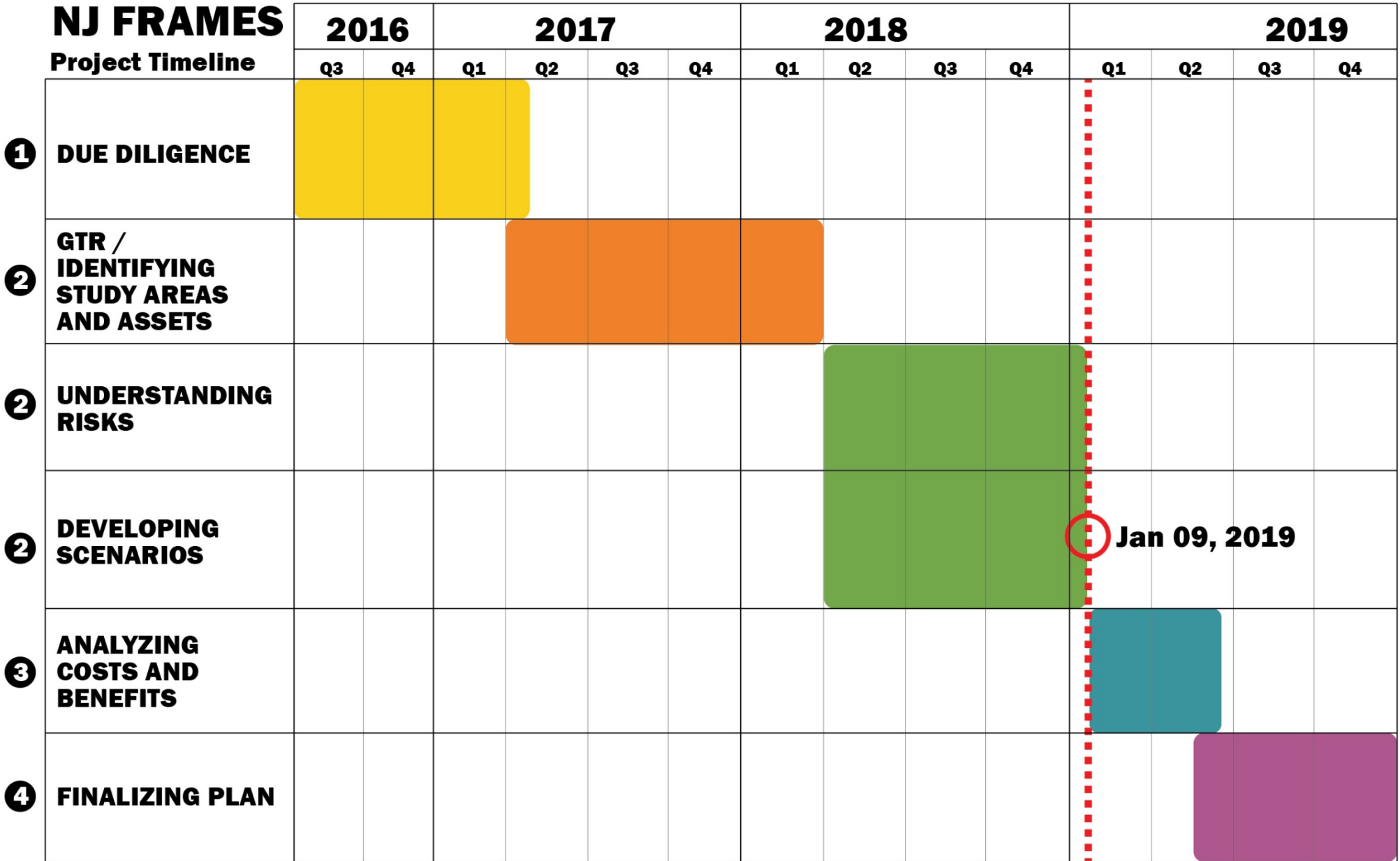
# SCENARIOS PRINCIPLES

- Each should offer a distinct approach
- Each should be developed at a geographic scale at which stakeholders can understand inundation impacts
- Each should be capable of organizing a set of actions at the chosen geographic scale for the “At Risk Areas”
- Each should be easy to understand



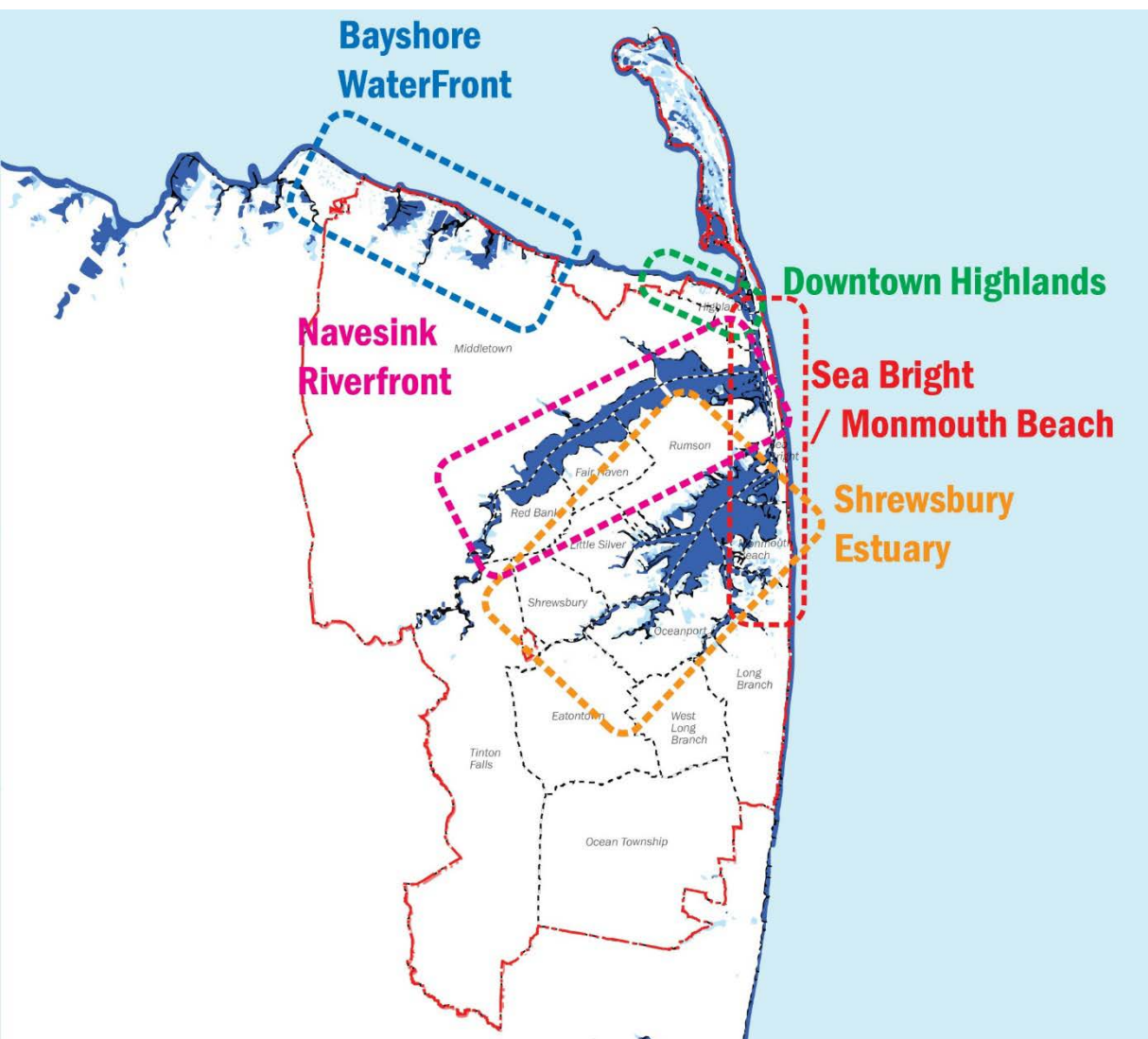
# NJ FRAMES

## Project Timeline





# FIVE PRIMARY AT-RISK AREAS



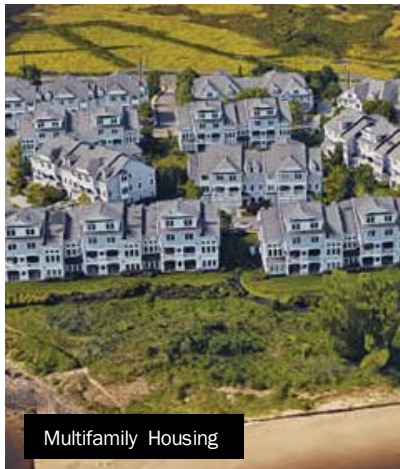
- Five types of vulnerable areas identified in the 2030, 2050, and 2100 Sea Level Rise
- Each has different types of topography, land use, and economic driver.

# THE REGION'S FOUR PRIMARY ASSET CATEGORIES 2 of 48

## Housing



Single Housing



Multifamily Housing

## Infrastructure



Sewage Treatment Plant



Train Station (Little Silver)



Route 36

## Natural Resources



Wetland



Beach

## Economic Development



Beach Club House



Ferry



Commercial Corridor



# ACTION SCENARIOS

## LIVING WITH THE WATER

### Approach

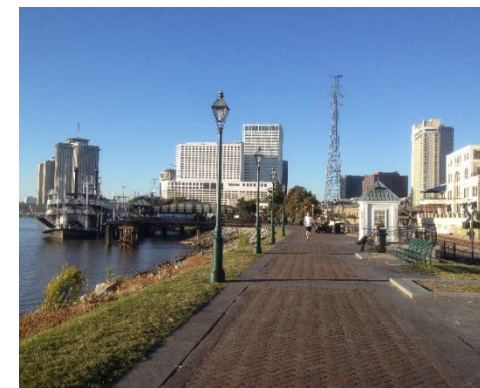
- Encourage individual property owners to modify their facilities and properties
- Modify/Enhance infrastructure
- Change land use policies to manage future growth to align with risks



## PROTECTING OUR COMMUNITIES FROM THE WATER

### Approach

- Construct coastal protection infrastructure at the waters edge



## MOVING AWAY FROM THE WATER

### Approach

- Retreat from areas projected to be inundated and surge zones at greatest risk
- Change land use policies to manage future growth to align with risks



# TYPES OF ACTIONS



Application for Blue Acres Acquisition						For G.A. Use Only
Return to: NJDEP Green Acres Program Mail Code 501 -01, P.O. Box 420 Trenton, NJ 08625-0420 Contact: (609) 984-0500 Fax: (609) 984-0608 Web: <a href="http://www.nj.gov/dep/greenacres">www.nj.gov/dep/greenacres</a>					Date Received: _____ Application Number: _____	
<b>A. Owner Information</b>						
Property Owner's Name: _____			Daytime Telephone: _____			
Full name						
Co-Owner's Name: _____			Daytime Telephone: _____			
Full name						
Property Owner's Mailing Address: _____						
City, State & Zip Code: _____						
Property Owner's E-mail Address: _____						
If applicable, check if the property is owned by a(n):      Estate _____ Partnership _____ Corporation _____						
If you wish to designate someone to act as your representative, please complete Section C.						
<b>B. Property Information</b>						
Municipality: _____			County: _____			
Please provide the following information, which is available from your most recent tax bill(s):						
Block #	Lot #	Assessed Value	Farmland Assessed?	Annual Property Taxes	Acres per Lot	
_____	_____	\$ _____	Yes / No	\$ _____	_____	
_____	_____	\$ _____	Yes / No	\$ _____	_____	
_____	_____	\$ _____	Yes / No	\$ _____	_____	
(Use back of application if more space needed.)					Total Acres: _____	
Property Address (e.g. 123 Main St): _____						
What is your asking price for this property (required)? _____						
*NOTE: While the asking price is a key element in the evaluation of this property, it is non-binding, and is not a commitment on the part of the State of New Jersey to pay this amount should this property be selected for acquisition.						
Date you acquired title to the property: _____			Date of last flood event: _____			
Were there any structures located on the property at the time of the last flood event?						Yes    No
If yes, what type of structure?		Single Family Residential: _____		Commercial (describe): _____		
(check all that apply)		Multi Family Residential: _____		Other (shed, garage, etc.) _____		
Was this structure someone's primary residence at time of last flood event?						Yes: _____ No: _____

Policy



# BAYSHORE WATERFRONT

## CHARACTERISTICS

- Low-lying coastal plain
- **Landscape:** salt marshes, maritime shrub lands, tidal creeks, dunes, public beaches
- **Land Use:** single family homes, and low density condos, marinas
- **Waterfront** largely made up of public beaches, with some privately-owned sections with bulkheads

Belford Harbor

### HOUSING

- Inundation houses adjacent to wetlands or on waterfront

### INFRASTRUCTURE

- Protection of Marinas and Ferry Terminals
- Inundation of Middletown Sewerage Authority
- Inundation of Route 36

### NATURAL RESOURCES

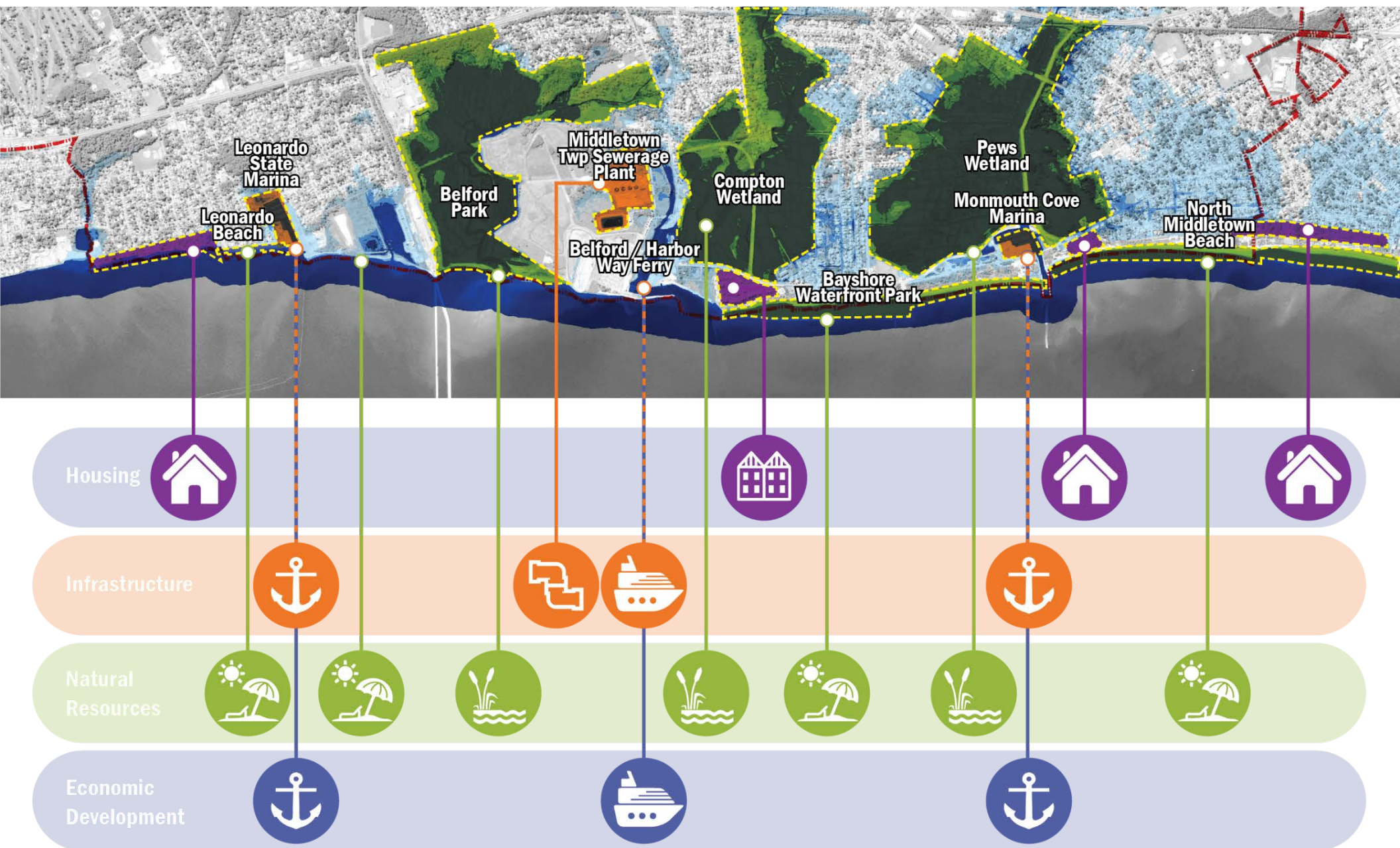
- Eroding beaches
- Impacted wetlands

### ECONOMIC DEVELOPMENT

- Protection of Marinas and Ferry Terminals



# BAYSHORE WATERFRONT : ASSET





# BAYSHORE: PROTECTING OUR COMMUNITIES FROM THE WATER



## HOUSING

- ① USACE plan-includes construction of floodwalls, tide gates, road closure gates, road regrading, levees, sea groins, and beach nourishment
- ② Connect to USACE plan in Leonardo community –raising bulkhead
- ③ Connect to USACE plan in Leonardo community –tide gates at Leonardo State Marina
- ④ Connect to USACE plan in Leonardo community –levee and berm
- ⑤ Building retrofits

## INFRASTRUCTURE

- ① Connect to USACE plan to includes construction of floodwalls, tide gates, road closure gates, road regrading, levees, sea groins, and beach nourishment
- ② Work with Middletown Sewage Authority to launch protection plan for SewageTreatment Plant
- ③ Raise bulkheads
- ④ Raise RT 36 in flood prone sections
- ⑤ Building retrofits

## NATURAL RESOURCES

- ① USACE plan- includes construction sea groins, sand dunes, and beach nourishment
- ② USACE plan- wetland restoration
- ③ Dune Management

## ECONOMIC DEVELOPMENT

- ① USACE plan- includes construction of floodwalls, tide gates, road closure gates, road regrading, levees, sea groins, and beach nourishment
- ② Building retrofits



# DOWNTOWN HIGHLANDS

## CHARACTERISTICS

- Denser community, the most impacted area by Sandy
- Identity of waterfront community VS US ASCE flood wall project (2017 / 2018)
- Waterfront– Private houses, beaches, marinas, ferry terminals, and parks

### HOUSING

- The waterfront is lined with single family houses with access to the water.
- Topography is relatively flat

### INFRASTRUCTURE

- Marinas and Seastreak Ferry terminal not protected
- Constant flooding of Navesink Ave bridge
- Roads to Route 36 inundated
- vulnerable sewer system & Sanitary pump stations

### NATURAL RESOURCES

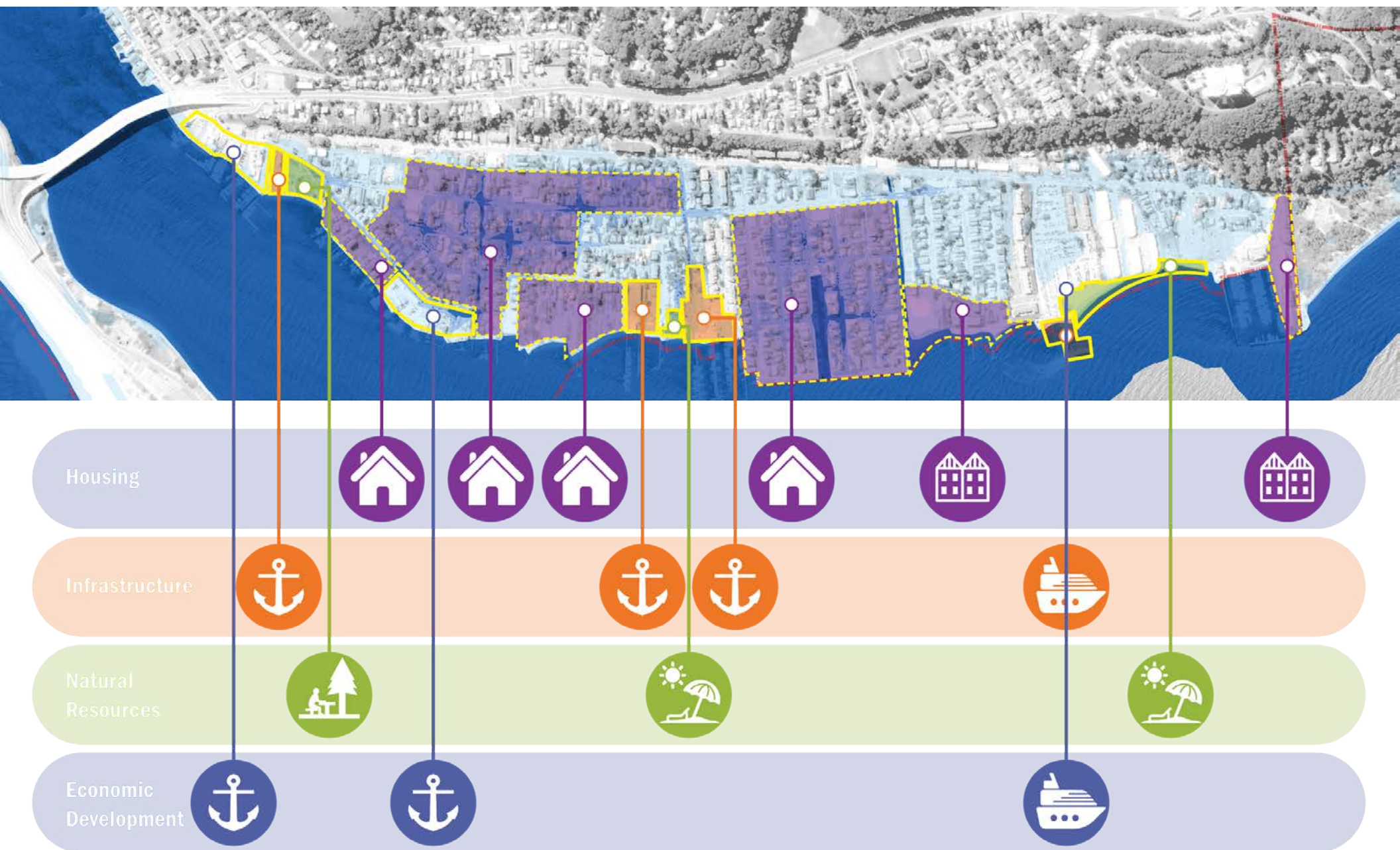
- Eroding beaches

### ECONOMIC DEVELOPMENT

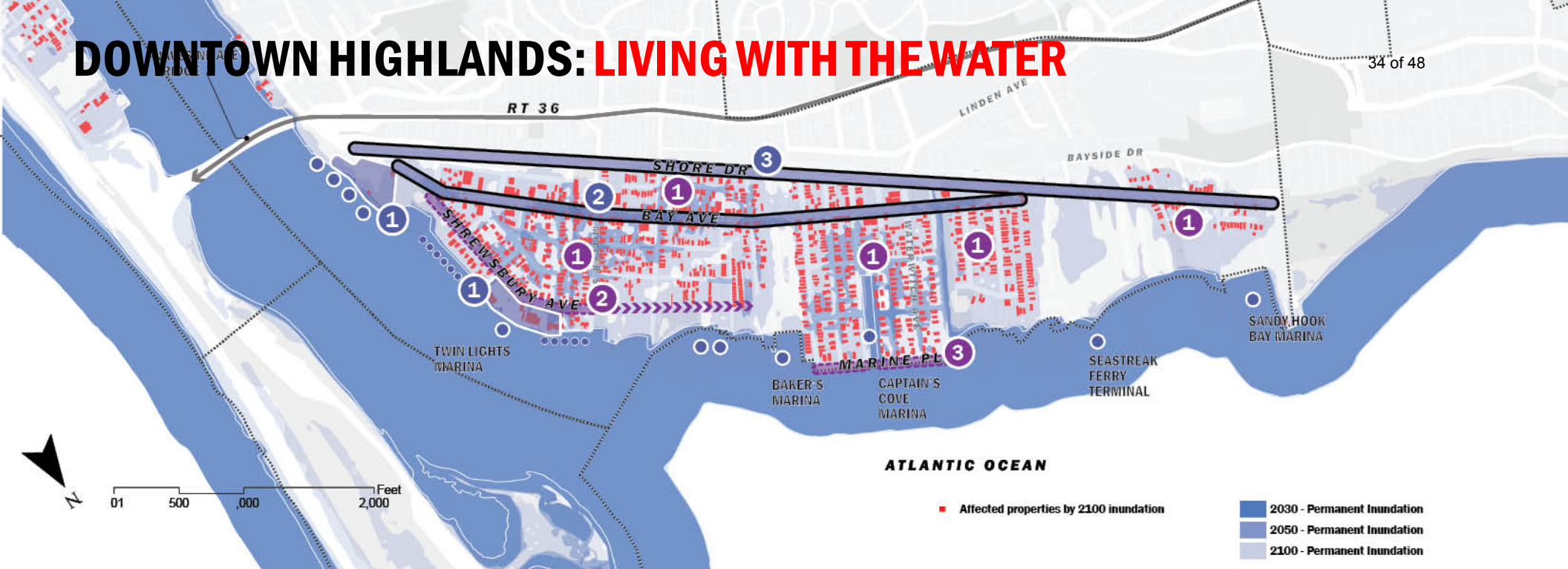
- Inundation of marinas, Seastreak ferry terminal, and local businesses on the waterfront. These are important economic assets to this community.



# DOWNTOWN HIGHLANDS : **ASSET**



# DOWNTOWN HIGHLANDS: **LIVING WITH THE WATER**



## HOUSING

- 1 Elevate homes
- 2 Elevate and extend Shrewsbury avenue
- 3 Elevate Marine PI Street
- 4 Landscaping and vegetation ordinance
- 5 Houses to be built 2' above base flood elevation. (GTR)
- 6 Flood Damage Prevention Ordinance

## INFRASTRUCTURE

- 1 New pump station in Center Ave (GTR)
- 2 Backflow preventers (GTR)
- 3 Extension of outfalls

## NATURAL RESOURCES

- 1 Shoreline replenishment
- 2 Landscaping and vegetation ordinance

## ECONOMIC DEVELOPMENT

- 1 Elevate Businesses
- 2 Elevate Bay Ave
- 3 Elevate Shore Dr to Ferry terminal
- 4 Businesses to be built 2' above base flood elevation.
- 5 Coastal Hazard Disclosure Policy

- 7 Coastal Hazard Disclosure Policy
- 8 Development Fees in Vulnerable Areas
- 9 Floodable development
- 10 Floor Area Ratio Ordinance

- 6 Development Fees in Vulnerable Areas
- 7 Flood Damage Prevention Ordinance
- 8 Floodable development
- 9 Floor Area Ratio Ordinance



# NAVESINK RIVERFRONT

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## CHARACTERISTICS

- Waterfront edge - primarily residential with wetlands
- Red Bank area – medical center and downtown
- Relatively higher elevations – no imminent risk except some bridges and roads

HOUSING	INFRASTRUCTURE	NATURAL RESOURCES	ECONOMIC DEVELOPMENT
<ul style="list-style-type: none"><li>• Red Bank</li><li>• Rumson northeast riverfront</li><li>• Barley Point Island</li><li>• Houses on Black Point Horseshoe St</li></ul>	<ul style="list-style-type: none"><li>• Navesink crossing</li><li>• Rte-35 (Red Bank)</li><li>• Marinas</li><li>• Barley Point Road</li><li>• Oceanic Bridge</li><li>• Black Point Horseshoe St</li><li>• Senator Kyrillos Bridge</li></ul>	<ul style="list-style-type: none"><li>• Eroding wetlands</li><li>• Exposed green edges</li></ul>	<ul style="list-style-type: none"><li>• Marinas</li></ul>

# NAVESINK RIVERFRONT : **ASSET**



Housing

Infrastructure

Natural  
Resources

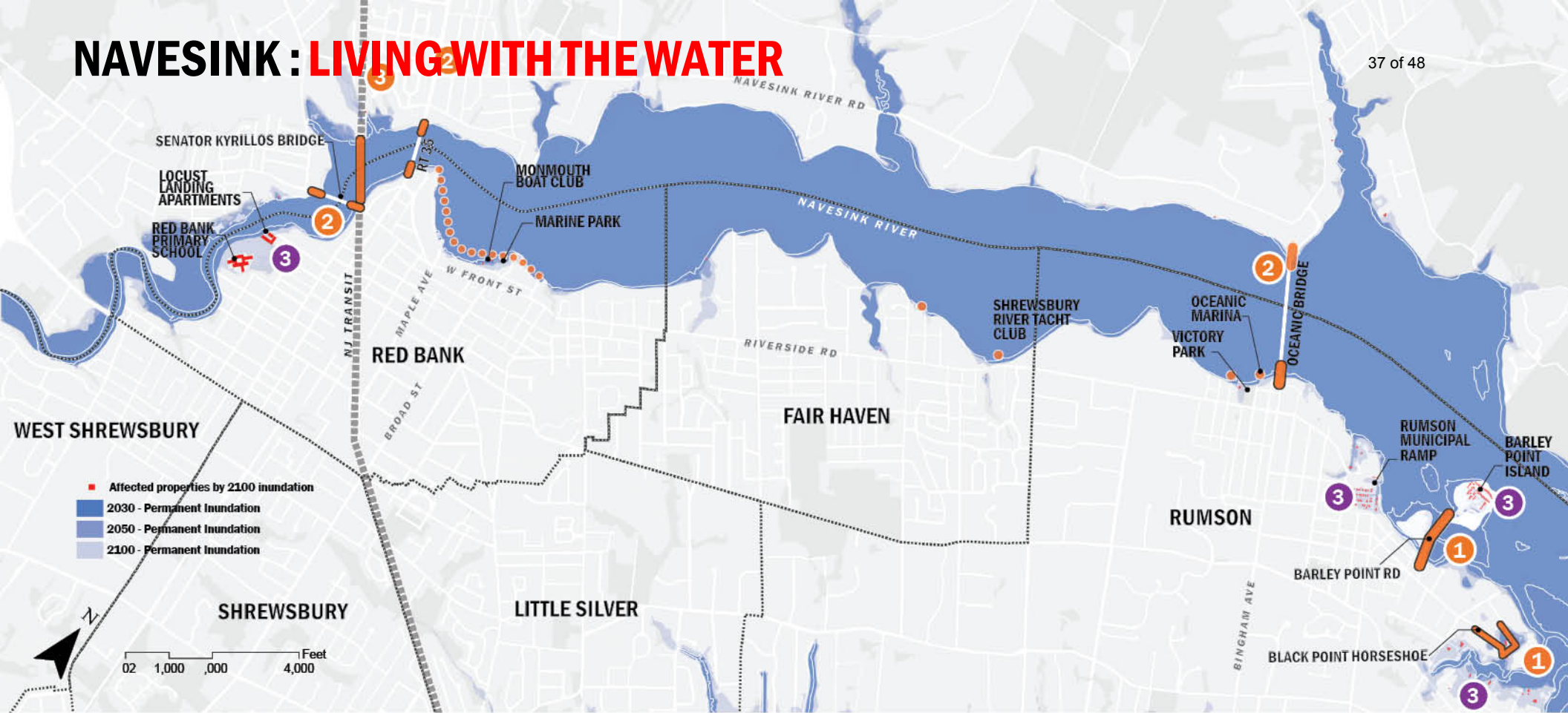
Economic  
Development





# NAVESINK: LIVING WITH THE WATER

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## HOUSING

## INFRASTRUCTURE

## NATURAL RESOURCES

## ECONOMIC DEVELOPMENT

- 2030**
- 1 Landscaping and vegetation ordinance
  - 2 Freeboard requirement 2.5'

- 2050**
- 3 Elevate Houses
  - 4 Coastal Hazard Disclosure Policy
  - 5 Flood Damage Prevention Ordinance

- 2100**
- 6 Floodable development
  - 7 Floor Area Ratio Ordinance
  - 8 Coastal Hazard Disclosure Policy
  - 9 Flood Damage Protection Ordinance

- 1 Elevate identified roads
- 2 Elevate identified bridges
- 3 Elevate NJ Transit

REGION WIDE SOLUTION

- 1 Wetland restoration
- 2 Open Space and Recreation Plan
- 3 Landscaping and Vegetation Ordinance

- 4 Living shorelines
- 5 Coastal Habitat Conservation

- 1 Elevate businesses

# SHREWSBURY ESTUARY

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## CHARACTERISTICS

- Waterfront edge - primarily residential with wetlands
- Fort Monmouth – significant economic development asset
- Vulnerable roads and rails

### HOUSING

- Privately-owned single family houses dominate the shorefront

### INFRASTRUCTURE

- Roads connecting to evacuation routes will be partially inundated in a 3' flood event
- Vulnerability of railroad tracks at Parkers Creek and Oceanport Creek crossings

### NATURAL RESOURCES

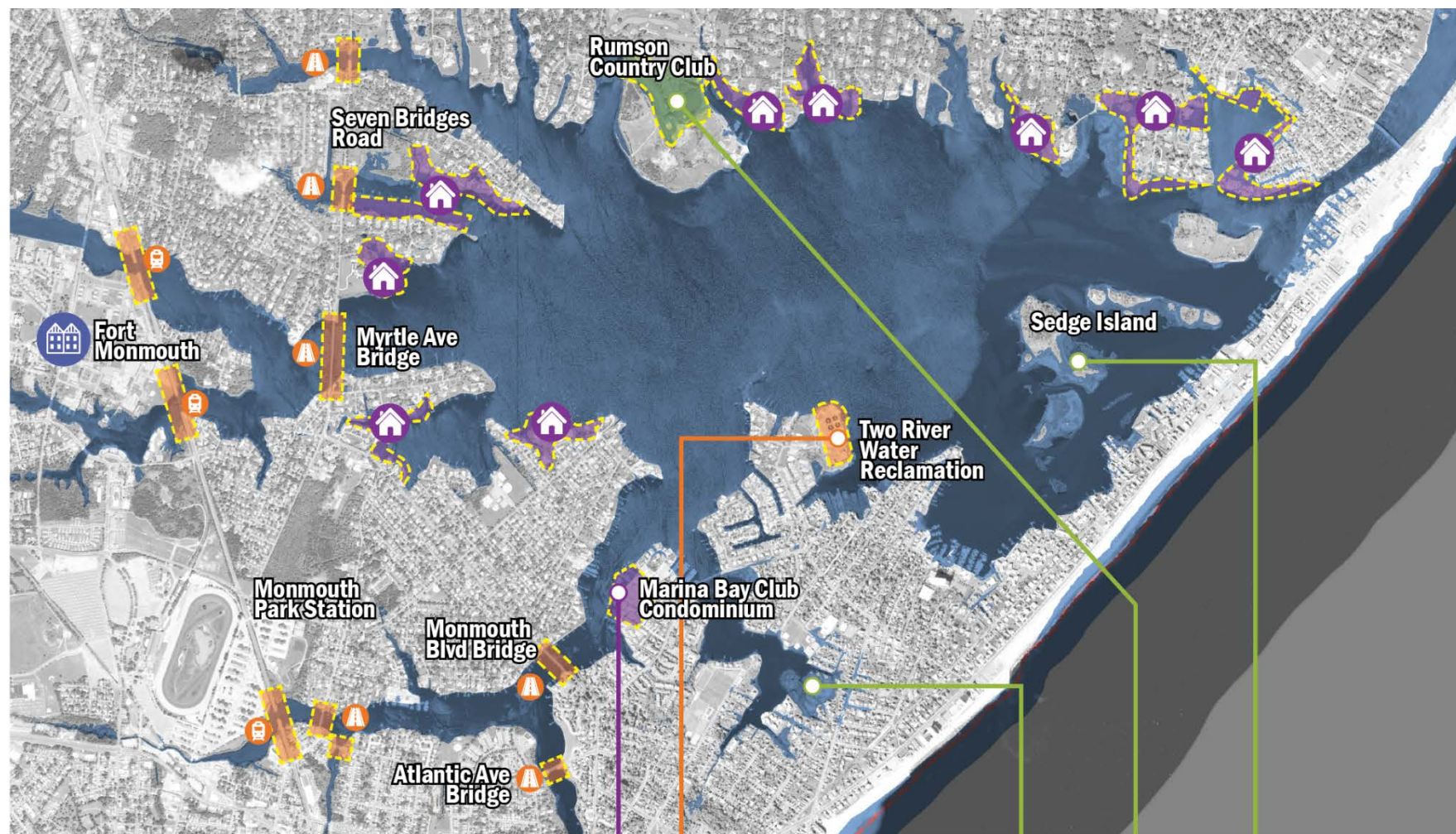
- Eroding wetlands
- Exposed green edges

### ECONOMIC DEVELOPMENT

- Fort Monmouth and Monmouth Park Racetrack are important economic developments



# SHREWSBURY ESTUARY : **ASSET**



Housing



Natural  
Resources



Infrastructure

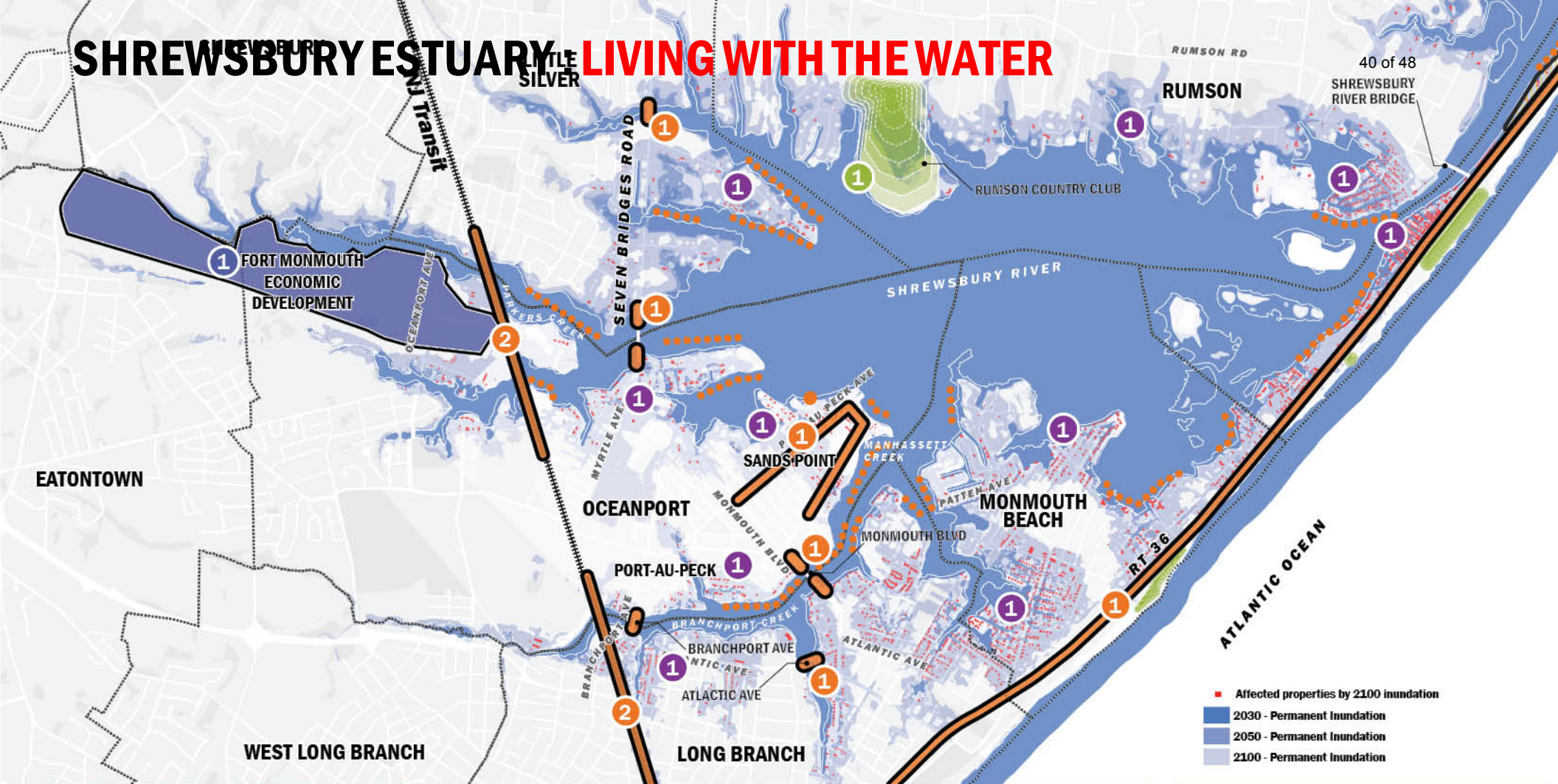


Economic  
Development





# SHREWSBURY ESTUARY LIVING WITH THE WATER



## HOUSING

- 1 Elevate Houses
- 2 Freeboard requirement 2.5'
- 3 Flood Damage Prevention Ordinance
- 4 Landscaping and vegetation ordinance

- 5 Floodable development
- 6 Coastal Hazard Disclosure Policy
- 7 Development Fees in Vulnerable Areas

REGION WIDE SOLUTION

## INFRASTRUCTURE

- 1 Elevate identified roads and bridges
- 2 Elevate railroad tracks

## NATURAL RESOURCES

- 1 Open Space and Recreation Plan
- 2 Green infrastructure plan
- 3 Coastal Habitat Conservation

## ECONOMIC DEVELOPMENT

- 1 Floodproof Development of Fort Monmouth
- 2 Freeboard requirement 2.5'
- 3 Flood Damage Prevention Ordinance
- 4 Landscaping and vegetation ordinance
- 5 Floodable development
- 6 Floor Area Ratio Ordinance
- 7 Coastal Hazard Disclosure Policy
- 8 Development Fees in Vulnerable Areas



# SEA BRIGHT / MONMOUTH BEACH

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## CHARACTERISTICS

- Waterfront edge - primarily residential with wetlands
- Fort Monmouth – significant economic development asset
- Vulnerable roads and rails

### HOUSING

- The riverfront (east) is lined with single family houses with access to the water.
- Challenge to implement mitigation strategies in private properties. Borough is looking into new ordinances and codes to make elevation of bulkhead continuous.
- Over wash of sea wall during storm events and gap in the system

### INFRASTRUCTURE

- Flooding of low lying streets due to coastal flooding and poor drainage during rain events
- Two River Waste Reclamation Authority will be completely inundated in a 7' flood event
- Bridges are important lifelines that connect these communities with less vulnerable areas. Constant flooding of Navesink Ave bridge on Rumson side.

### NATURAL RESOURCES

- Eroding wetlands in Monmouth Beach
- Beach erosion

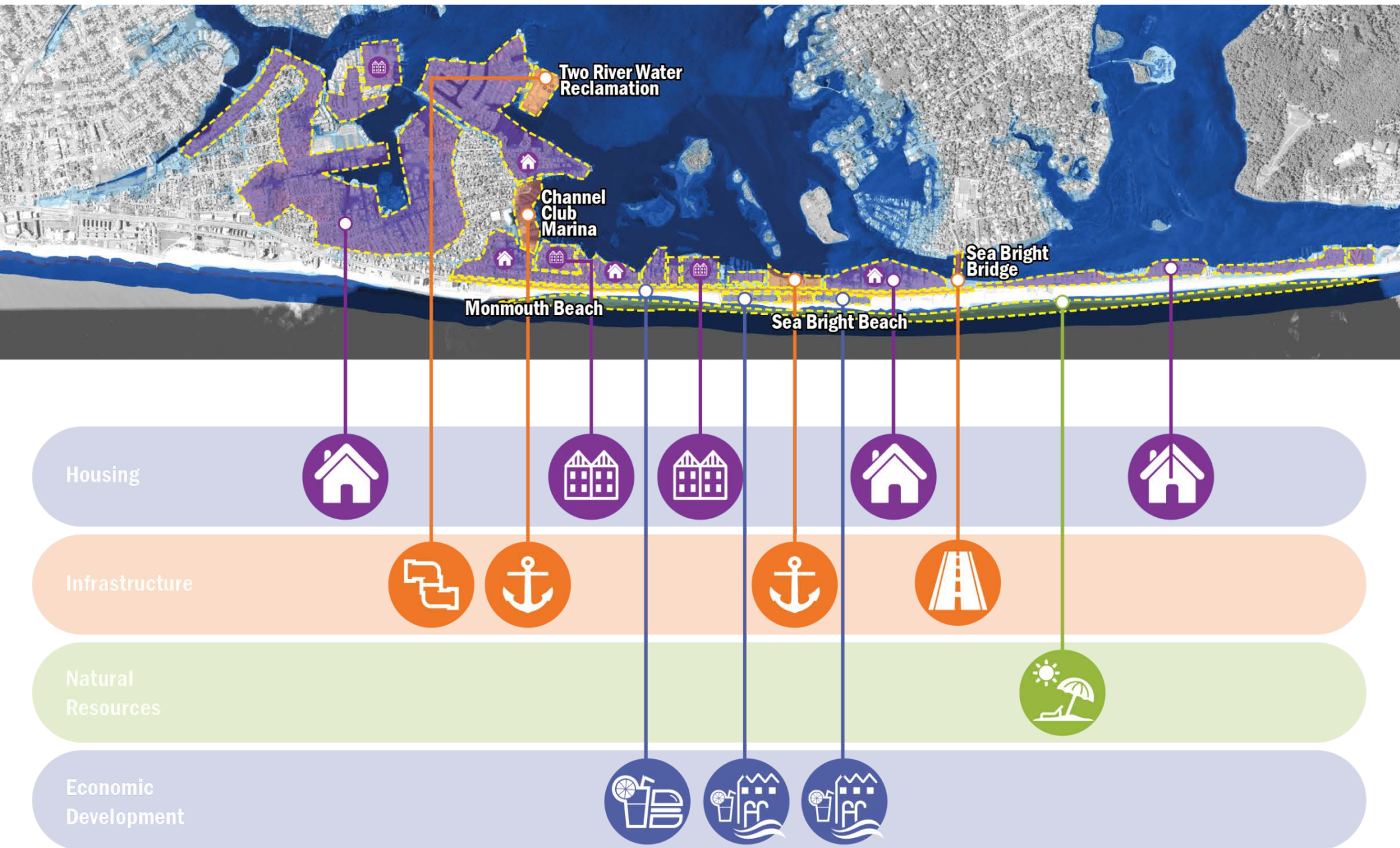
### ECONOMIC DEVELOPMENT

- Beach clubs are vital economic assets to the community and are minimally protected



# SEA BRIGHT/MONMOUTH BEACH : **ASSET**

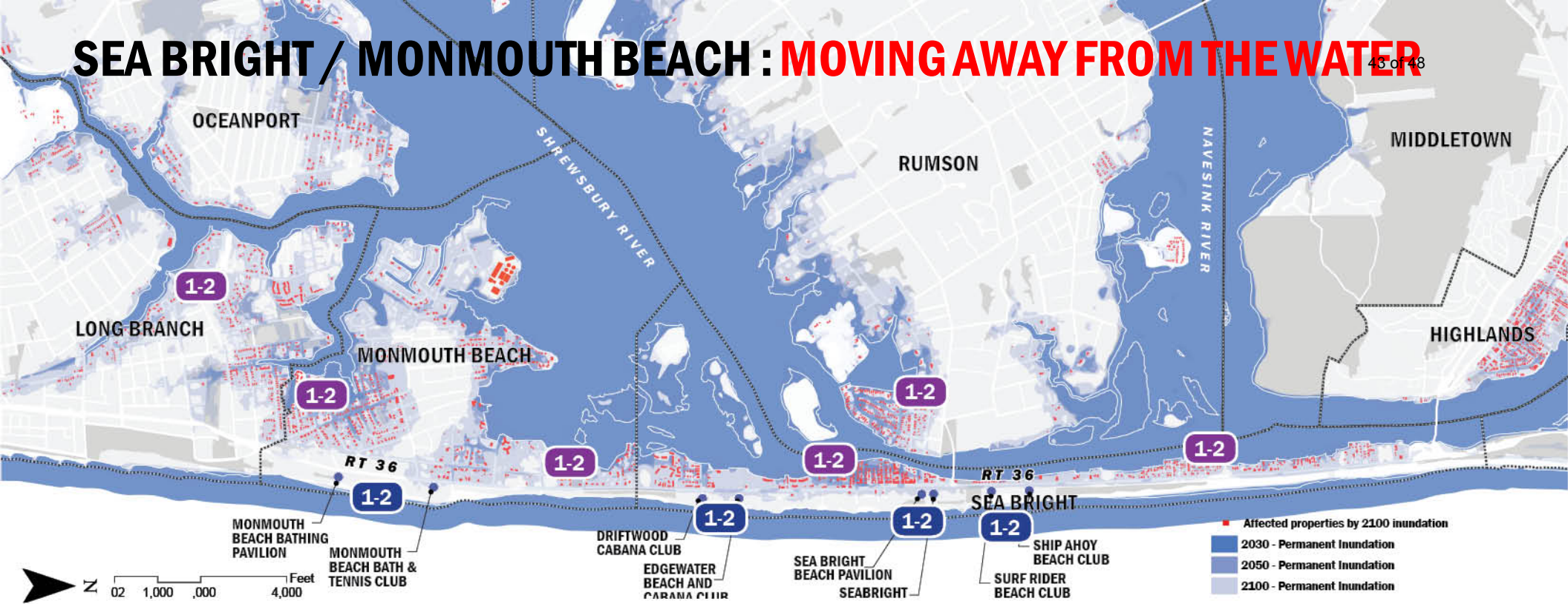
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# SEA BRIGHT / MONMOUTH BEACH : MOVING AWAY FROM THE WATER

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## HOUSING

## INFRASTRUCTURE

## NATURAL RESOURCES

## ECONOMIC DEVELOPMENT

- 2030**
- 1 Lot size averaging ordinance
  - 2 Conservation Overlay Ordinance

- 2050**
- 1 Gradually decrease rebuilding of frequently flooded roads

- 2100**
- 1 Conservation Overlay Ordinance

- 2030**
- 1 Lot size averaging ordinance
  - 2 Conservation Overlay Ordinance

- 2050**
- 3 Rolling Easement
  - 4 Transfer of Development Rights

- 2100**
- 2 Rolling Easement

- 2050**
- 3 Rolling Easement
  - 4 Transfer of Development Rights

**2100**

REGION WIDE SOLUTION

# DEVELOPING THE REGIONAL PLAN

- how to prioritize how the region addresses short v. long term actions;
- deciding where to commit resources within the region,
- understanding the role different communities within the Two-Rivers Study Area can potentially play in building long term coastal resiliency, etc.)

## The Steering Committee's Regional Resilience Goals

*"The Regional Resilience Adaptation Action Plan will..."*

### ENVIRONMENTAL / PHYSICAL

- ☐ Balance Grey and Green Infrastructure – 0.9
- ☐ Prioritize the Use of Nature-based Solutions -0.7
- ☐ Protect Habitats - 0.9
- ☐ Expand Natural Areas/Open Space -0.9
- ☐ Protect Residential Areas – 0.7
- ☐ Improve Stormwater
  - Infrastructure – 0.8
  - Management – 0.8
- ☐ Minimize Erosion - 0.8
- ☐ Improve "Lifeline" Infrastructure Reliability
  - Power – 0.8
  - Water – 0.7
  - Transportation -0.7
  - Healthcare -0.5
  - Wastewater
- ☐ Reduce vulnerabilities of existing facilities and potentially contaminating sites - NEW Wording
- ☐ Increase Sheltering and Evacuation Infrastructure -0.6
- ☐ Ensure Adequate Sheltering and Evacuation Processes – 0.7

### SOCIAL

- ☐ Maintain Social and Community Connectivity – 0.6
- ☐ Preserve Regional Character -0.7
- ☐ Increase Communication to the Residents Regarding Flood Risks - 1
- ☐ Ensure Use of Resilience Strategies that are Inclusive – NEW Wording

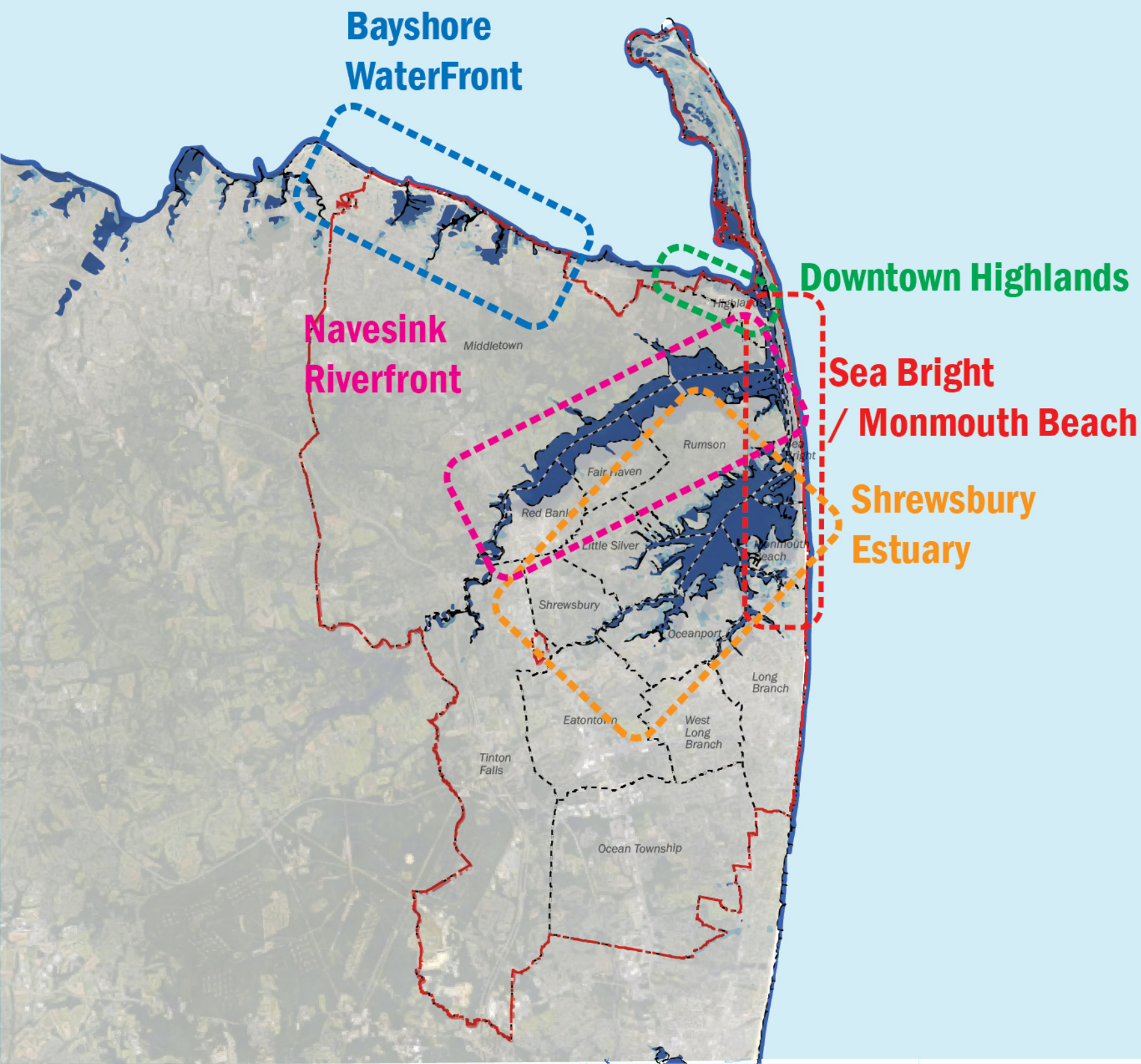
### ECONOMIC

- ☐ Facilitate Sustainable Economic Development Strategies –0.8
- ☐ Preserve Ocean / Water Dependent Businesses -0.6
- ☐ Utilize Creative Municipal Financing Opportunities - 0.6
- ☐ Connect to Incentive-based Programs (CRS, Sustainable Jersey, etc.) -0.8
- ☐ Maximize the Benefit Cost Ratio -0.7

### REGIONAL PARTNERSHIPS

- ☐ Increase Communication Among Agencies and Organizations
  - Federal -0.9
  - State -1.0
  - County – 0.8
  - Regional - 0.9
  - Local -0.9
  - NGOs
- ☐ Increase Utilization of Shared Services - 0.6









## NEXT STEPS

Nov 16	Team meeting/call - discuss draft Adaptation Planning Scenarios and 11/29 Engagement meeting draft presentation
Nov 29	Engagement meeting – Get input on Adaptation Planning Scenarios
Nov 30 - Dec 14	Develop preferred adaptation Scenarios based on engagement feedback
Dec 15 - Jan 20	Identify mitigation of flooding impacts (analyze/calculate risk reduction benefits)
Jan 21 – Apr 20	Benefit cost analysis on scenarios

# Thank you!

**Your Advisory Group leader will be in touch about next steps and future meetings.**

**Kelly Pflicke**  
[Kelly.Pflicke@dep.nj.gov](mailto:Kelly.Pflicke@dep.nj.gov)

**Lisa Auermuller**  
[auermull@marine.rutgers.edu](mailto:auermull@marine.rutgers.edu)

**Bethany Bearmore**  
[bbearmore@louisberger.com](mailto:bbearmore@louisberger.com)

**Matt Campo**  
[mcampo@ejb.rutgers.edu](mailto:mcampo@ejb.rutgers.edu)

