



# STATE OF OUR COAST

Photo: Above Summit

A DATA-DRIVEN LOOK AT THE COASTAL  
HEALTH OF MASSACHUSETTS' NORTH SHORE



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# Coastal Strategy

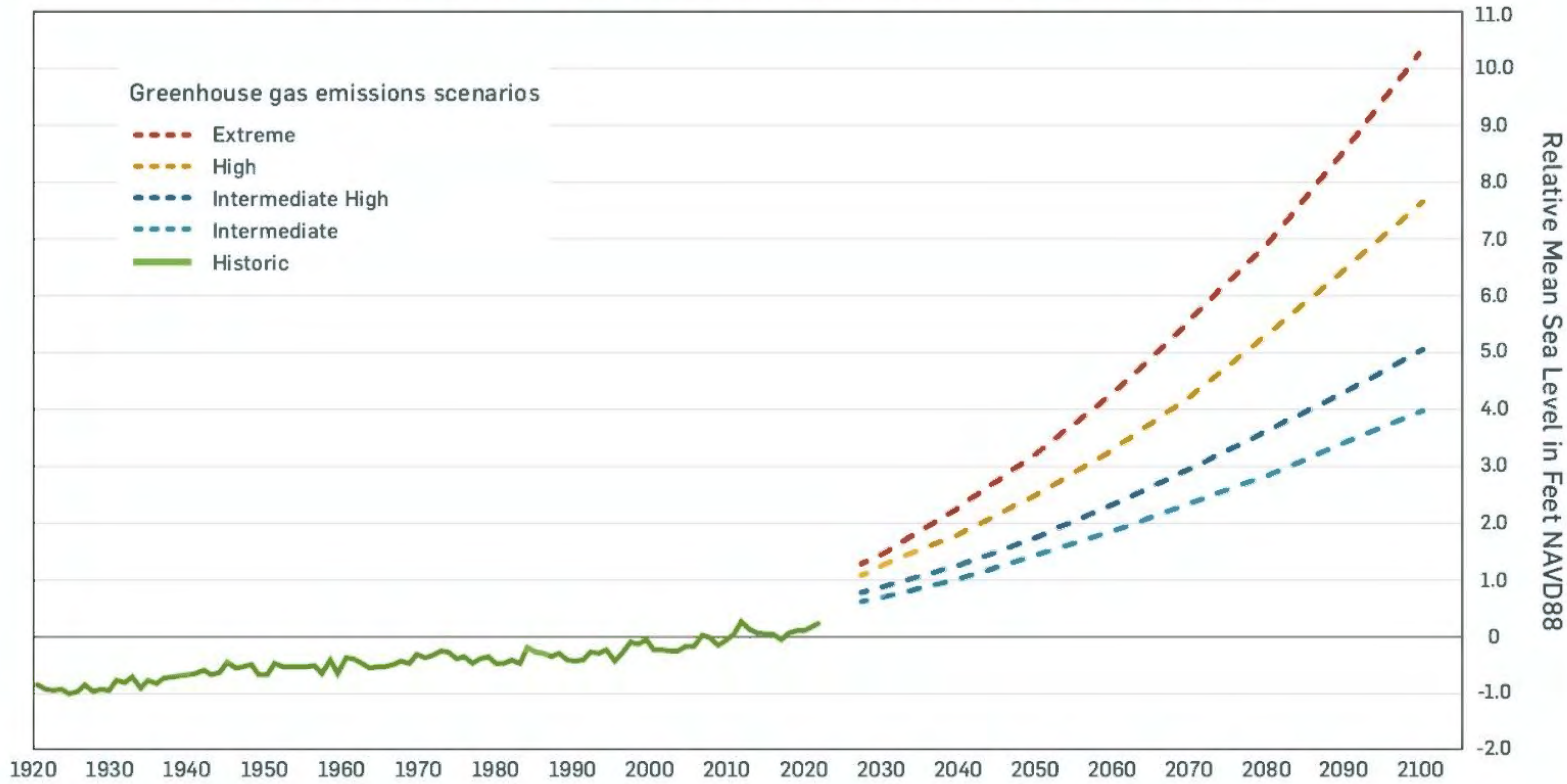
1. Protect & Advocate
  2. Inspire Love of Coast
  3. Focus on Most Vulnerable Places
- Create a framework for conversation and action

## RESPOND TO A CHANGING COAST

We will effectively respond to our changing coast. The Massachusetts coast needs our voice. Second only to the federal government in land holdings, now is the time to leverage and invest in one of our most visible and visited assets—our 120 miles of protected coastline across 35 properties. Here we welcome more than a half-million visitors each year. Over the next five years, we will uplift our coastal systems through targeted conservation, broad advocacy, cutting-edge land management, and robust stewardship. In short, we seek to be the coastal conservation leader for Massachusetts.

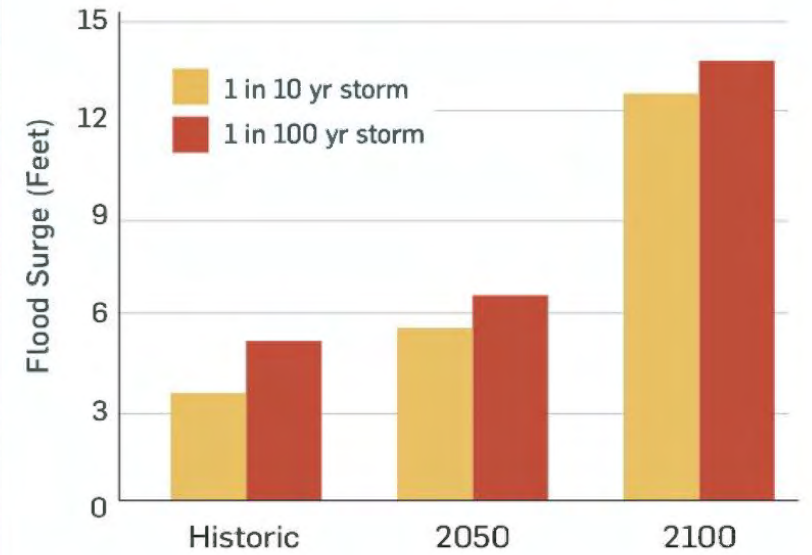
# What We're Facing

## Relative Annual Mean Sea Level and Future Scenarios: Boston, MA



SOURCES: Annual Mean Sea Level from NOAA's Historical Sea Level Trend data from Boston Tide Gate Station  
Future SLR projections from the Northeast Climate Adaptation Science Center,  
[www.resilientma.org/resources/resource::2152/massachusetts-climate-change-projections-statewide-and-for-major-drainage-basins](http://www.resilientma.org/resources/resource::2152/massachusetts-climate-change-projections-statewide-and-for-major-drainage-basins)

## Flood Surge Levels from Stronger Storms





# The Challenges

# Shorelines

## SHORELINE CHARACTERIZATION ASSESSMENT



### OCEAN-FACING SHORELINE (15.2 MILES) [CIT. 4]

*Shoreline types below can overlap, not cumulative*

Coastal Beach (2 MI)

Coastal Bank (11.4 MI)

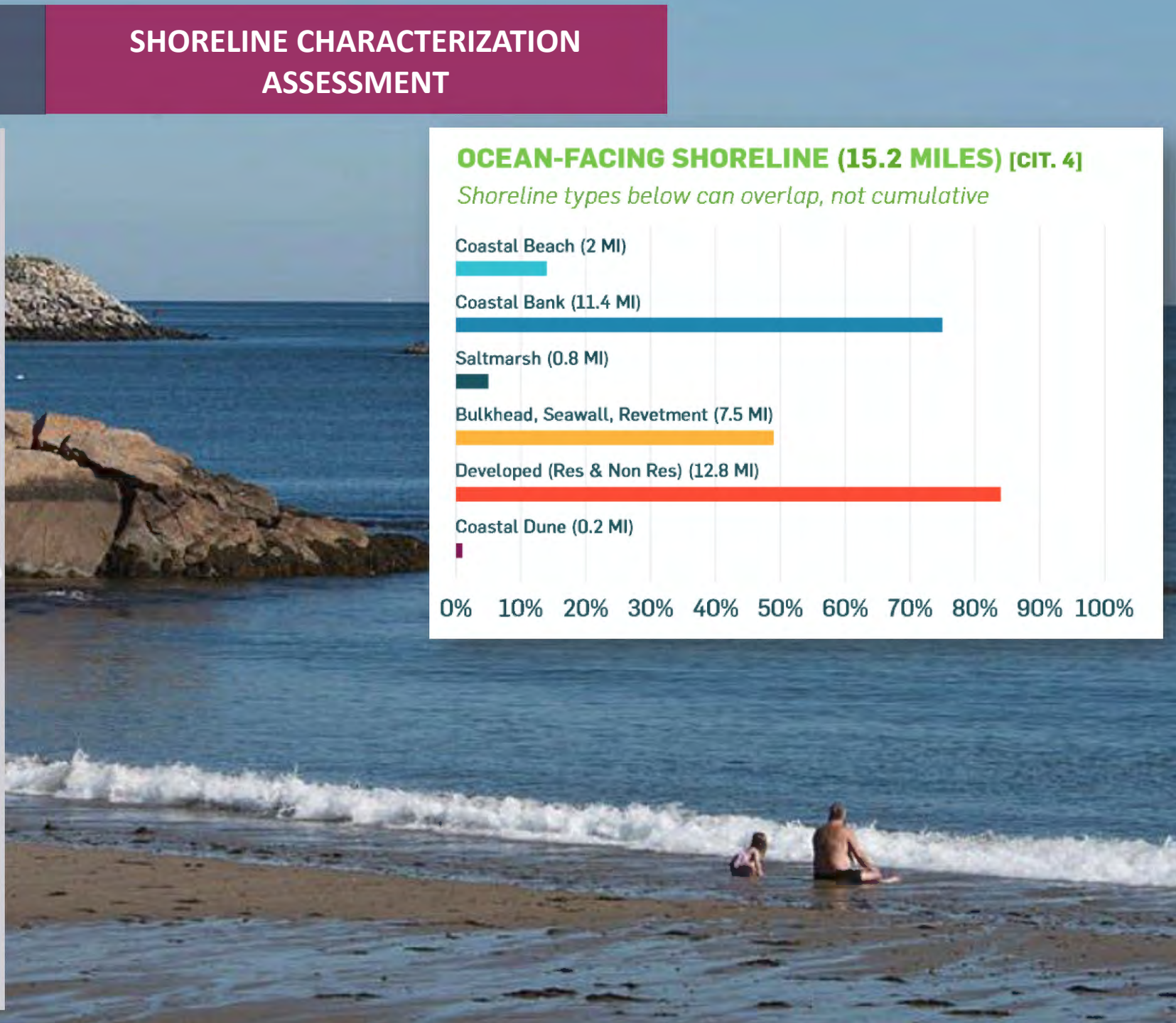
Saltmarsh (0.8 MI)

Bulkhead, Seawall, Revetment (7.5 MI)

Developed (Res & Non Res) (12.8 MI)

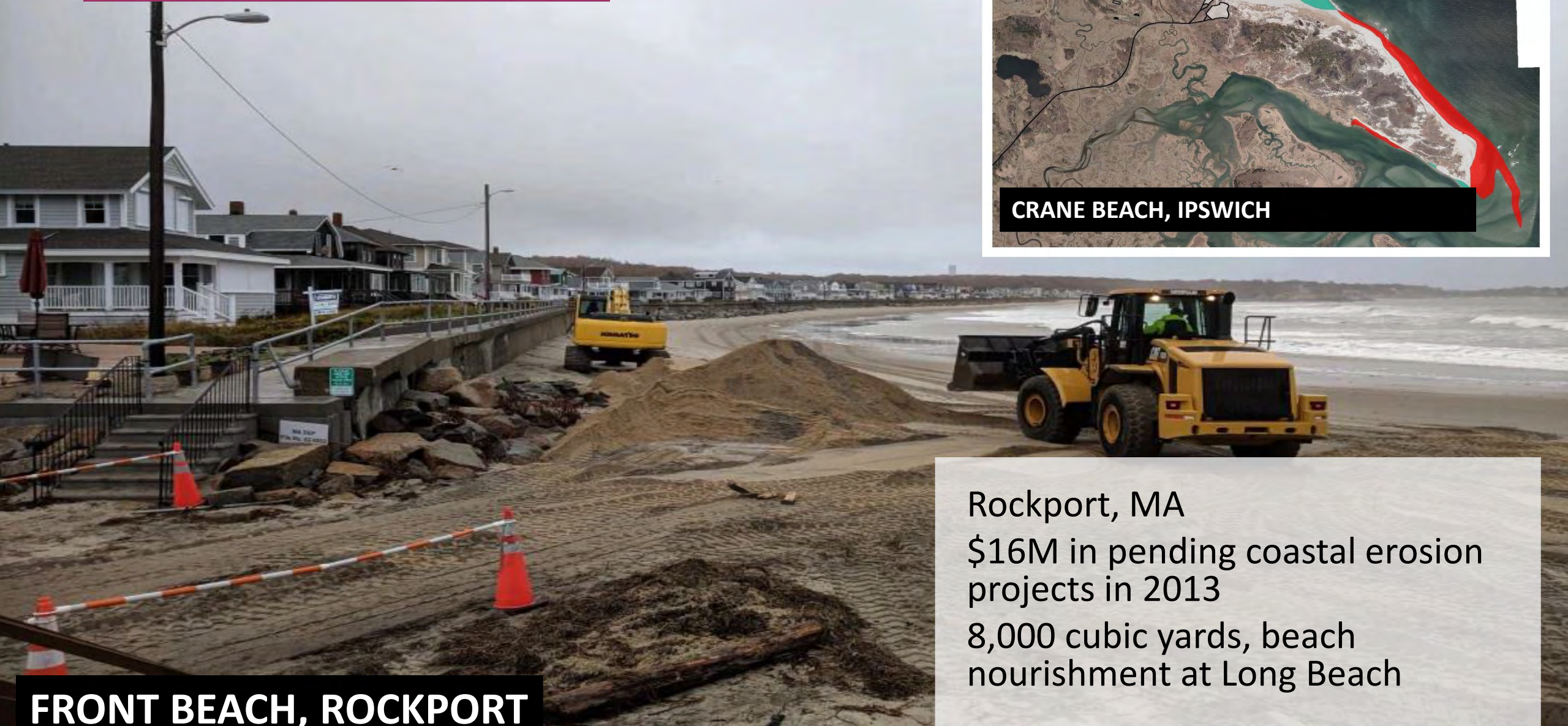
Coastal Dune (0.2 MI)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%



# ISSUE AREAS

## BEACH EROSION



**FRONT BEACH, ROCKPORT**



Rockport, MA

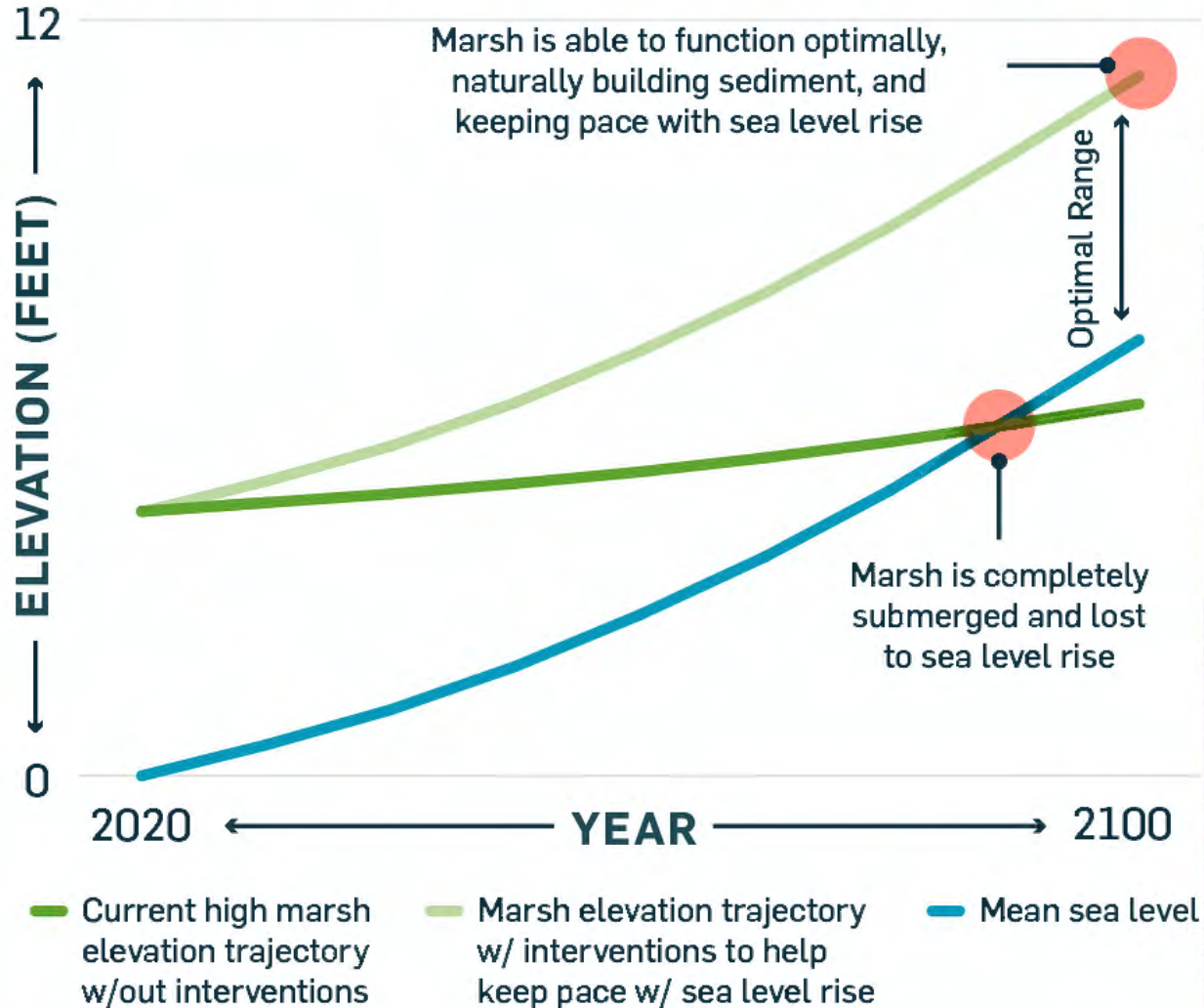
\$16M in pending coastal erosion projects in 2013

8,000 cubic yards, beach nourishment at Long Beach

# ISSUE AREAS

## SALT MARSH – KEEPING PACE WITH SLR

### Can the Marsh Keep Pace with Sea Level Rise?

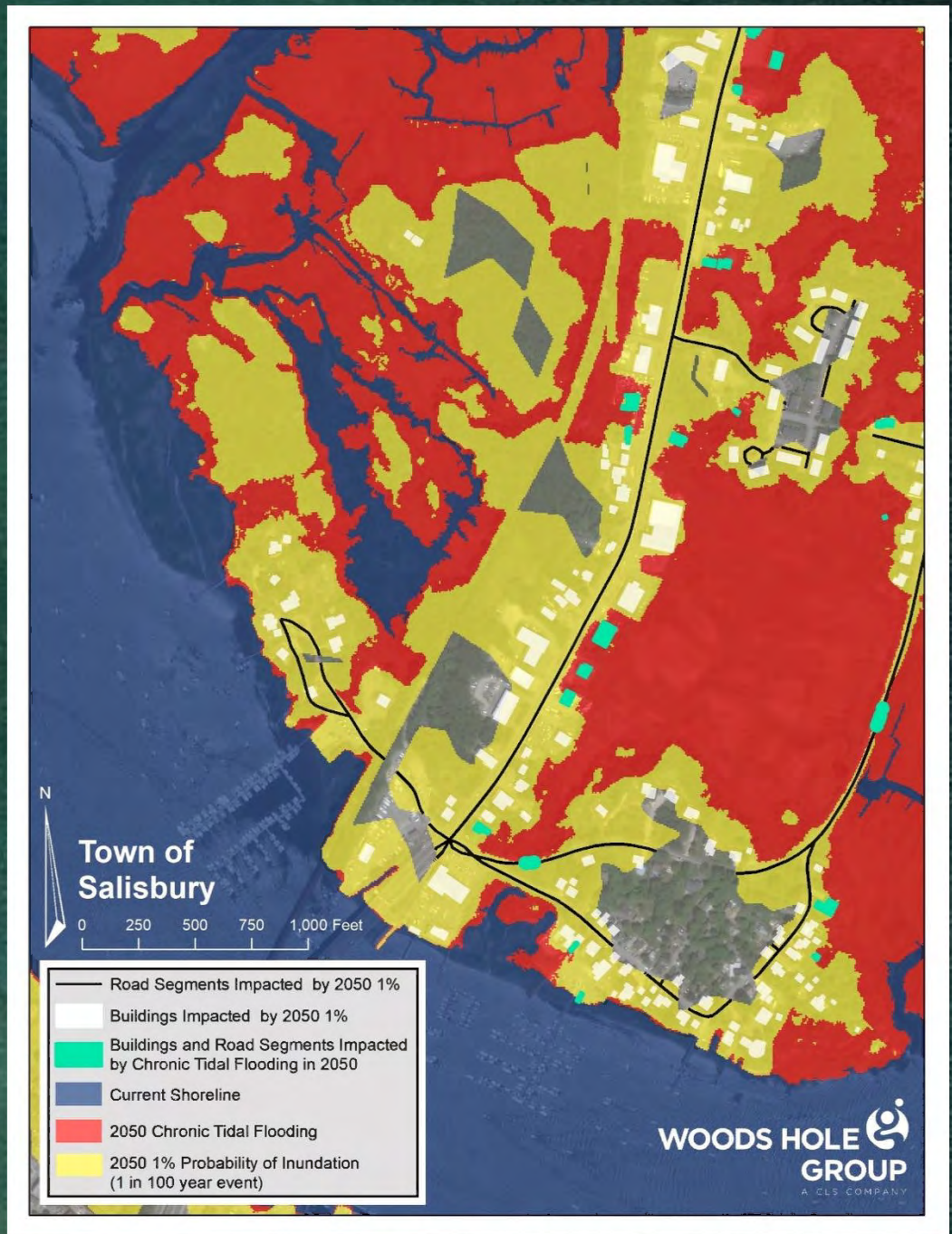
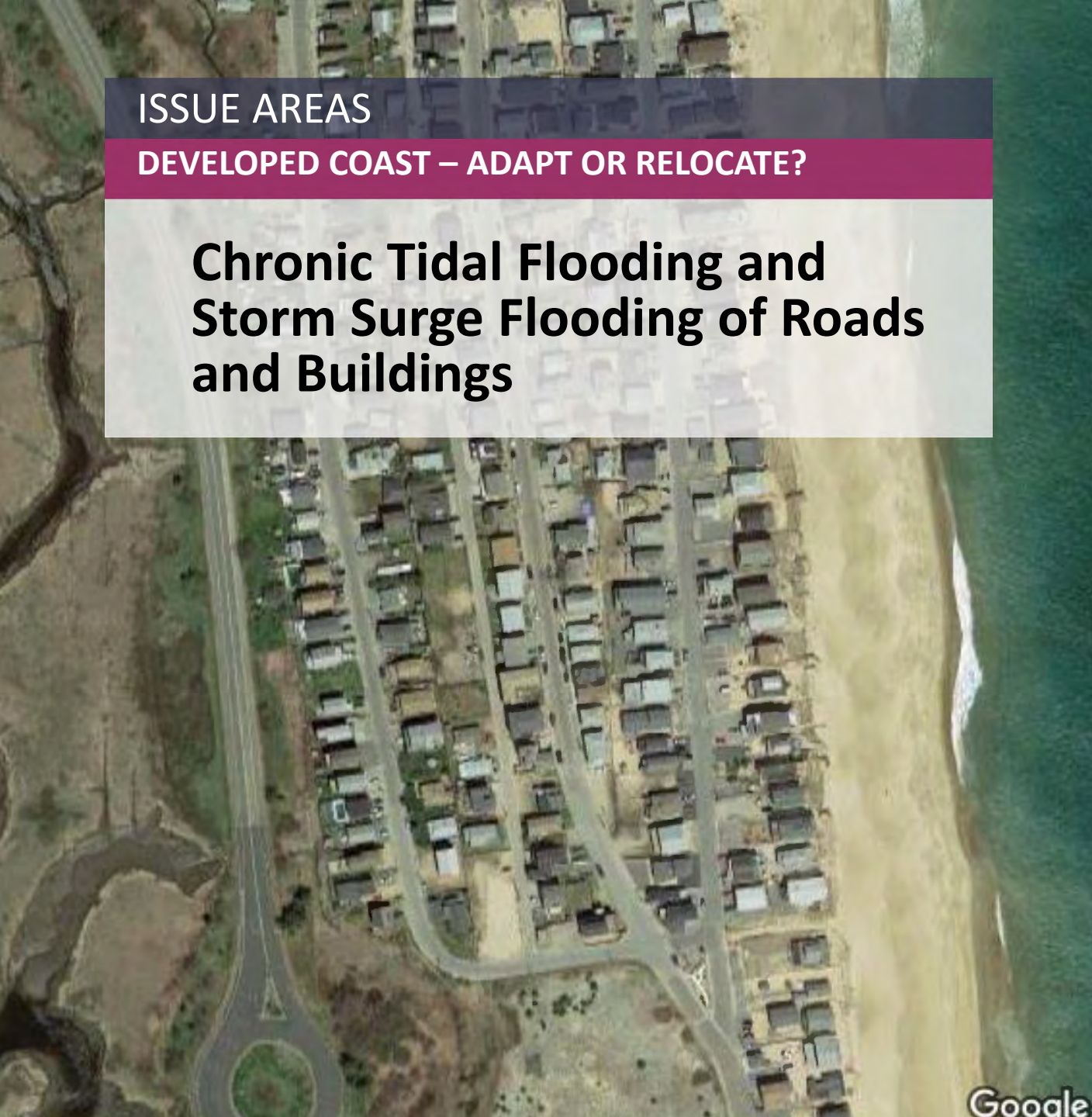


Coastal wetlands saved NY / NJ \$625M in property damage during Hurricane Sandy in 2012

## ISSUE AREAS

### DEVELOPED COAST – ADAPT OR RELOCATE?

# Chronic Tidal Flooding and Storm Surge Flooding of Roads and Buildings

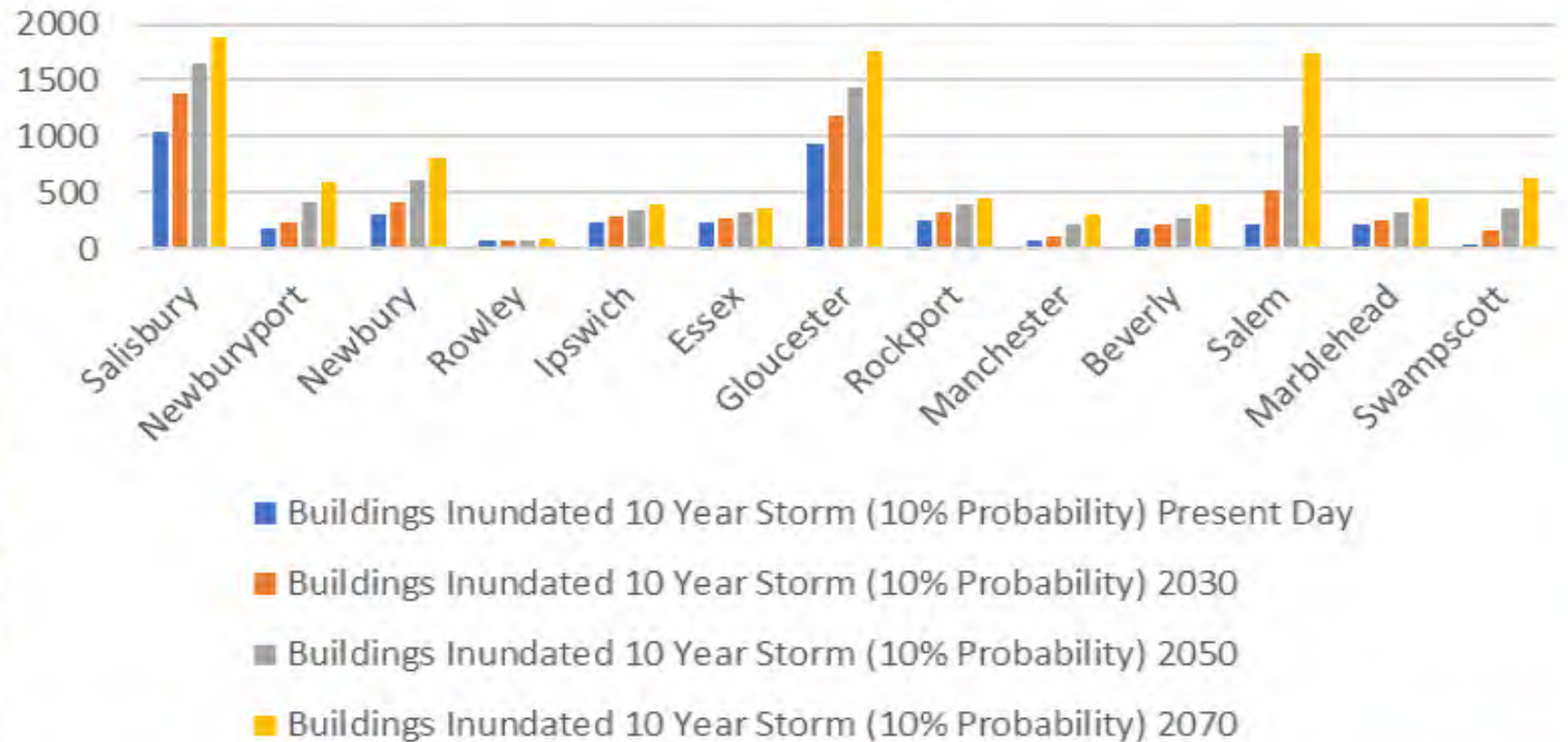




## ISSUE AREAS

### DEVELOPED COAST

### Buildings Inundated by 10-Year Storms



## ISSUE AREAS

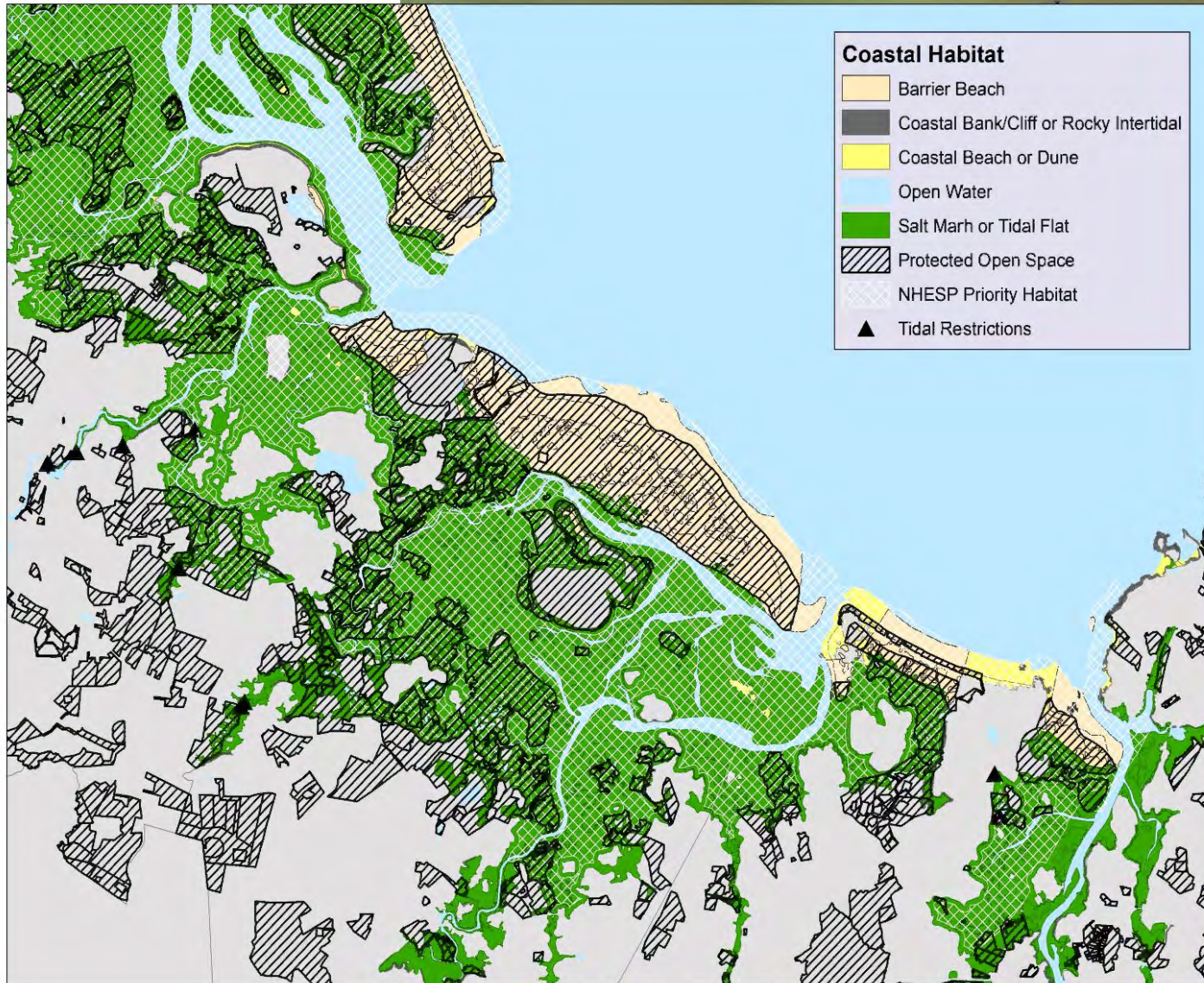
### ARMORED SHORELINE AND BUILT WATERFRONTS

- Alternatives to Armored Shoreline?
- Not designed for climate change
- Overtopping flood risks
- Environmental impacts
- Significant renewal costs



# Issue Areas

## COASTAL HABITAT – FUTURE DEVELOPMENT



25% of natural coastal habitat areas are conserved as open space

# COMMUNITY ACTIONS



Great Marsh Towns	Action Spotlight
Essex	Conomo Point Seawall
Gloucester	High School, Water Treatment, Blue Economy Incubator
Newburyport	Wastewater Treatment plant
Newbury	Dune Nourishment, Living Shoreline
Rowley	MVP Plan
Ipswich	Adaptive Building and Road Design
Salisbury	Raising Ring Island Roads
Rockport	Long Beach Nourishment
Manchester-by-the-Sea	Restoring Sawmill Brook
Beverly	Considering portable flood walls
Salem	Restoring fringe salt marsh, Climate Action Plan
Marblehead	Oyster restoration project
Swampscott	Protective living reefs

# Funding Resilience

Commonwealth of MA, Executive Office of Energy and Environmental Affairs

\$4.5M+ in funding for 50 North Shore projects focused on coastal resilience, pollution remediation, healthy estuaries, and climate planning and action over the last 5 years.

Other funding and incentive mechanisms – emissions trading systems, green/blue resiliency bonds, climate funds and derivatives, insurance policies, capital budgets?





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