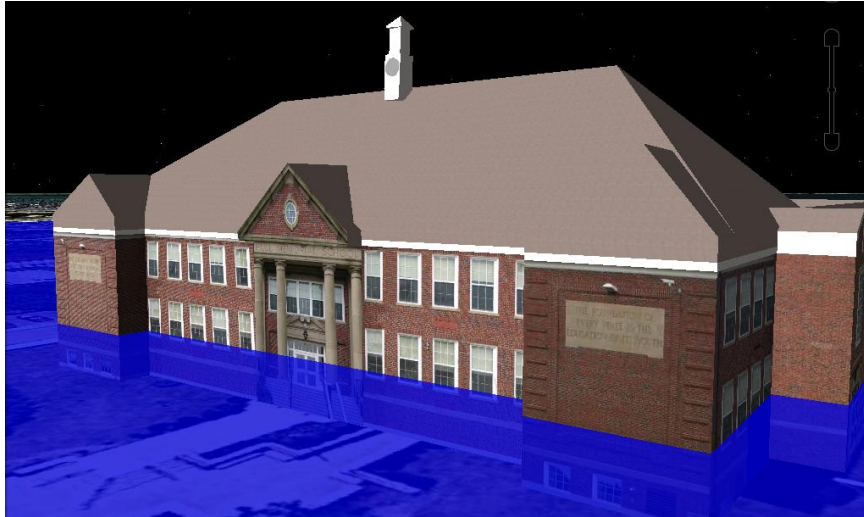
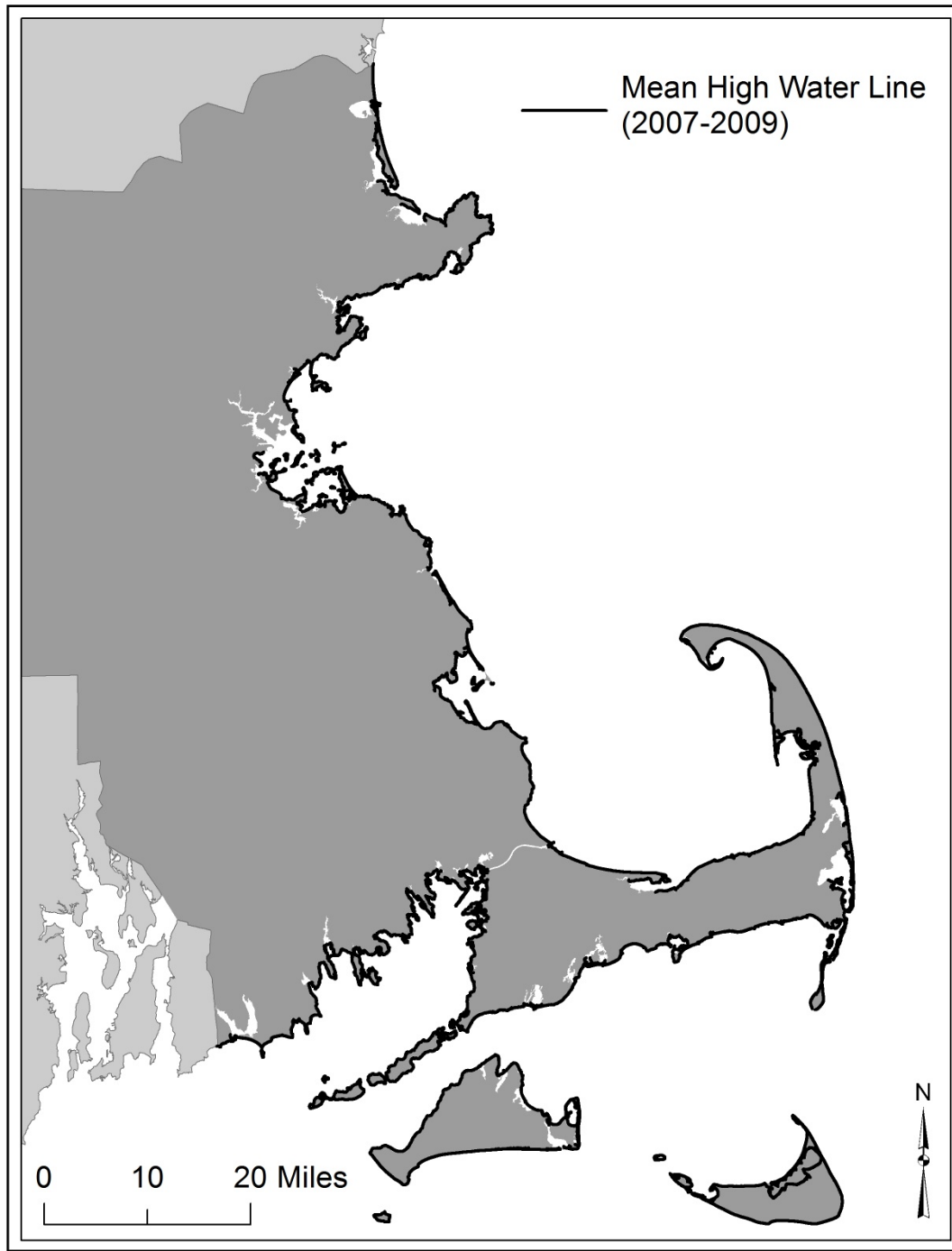


Local Adaptation Efforts Along the Massachusetts Coast



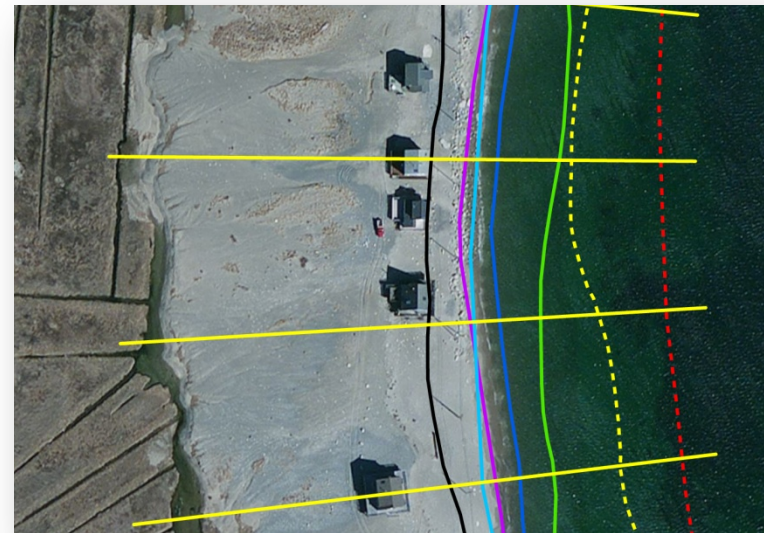
Julia Knisel
Coastal Shoreline &
Floodplain Manager

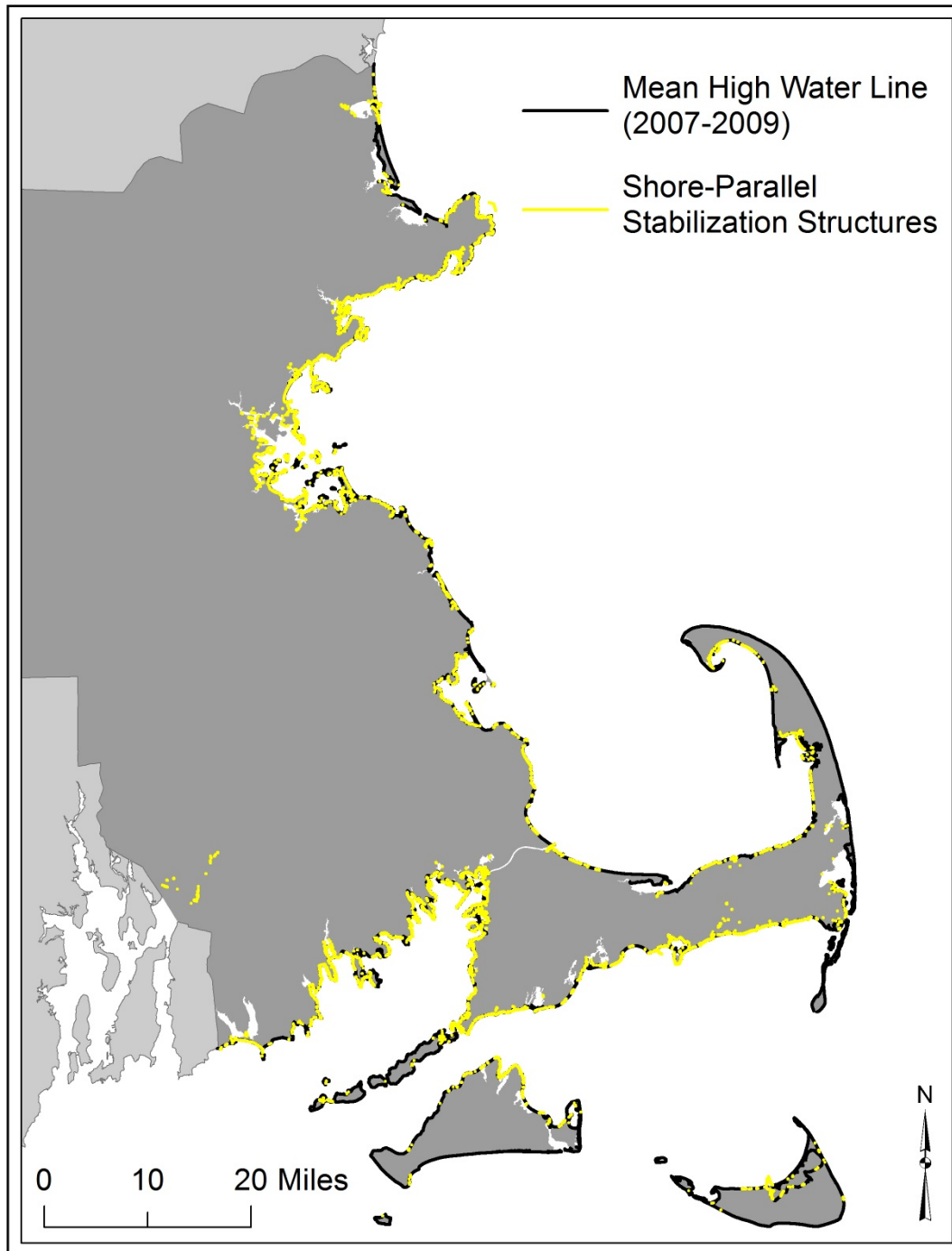




Natural Buffers Limited

- ~ 1,100 shoreline miles mapped & evaluated

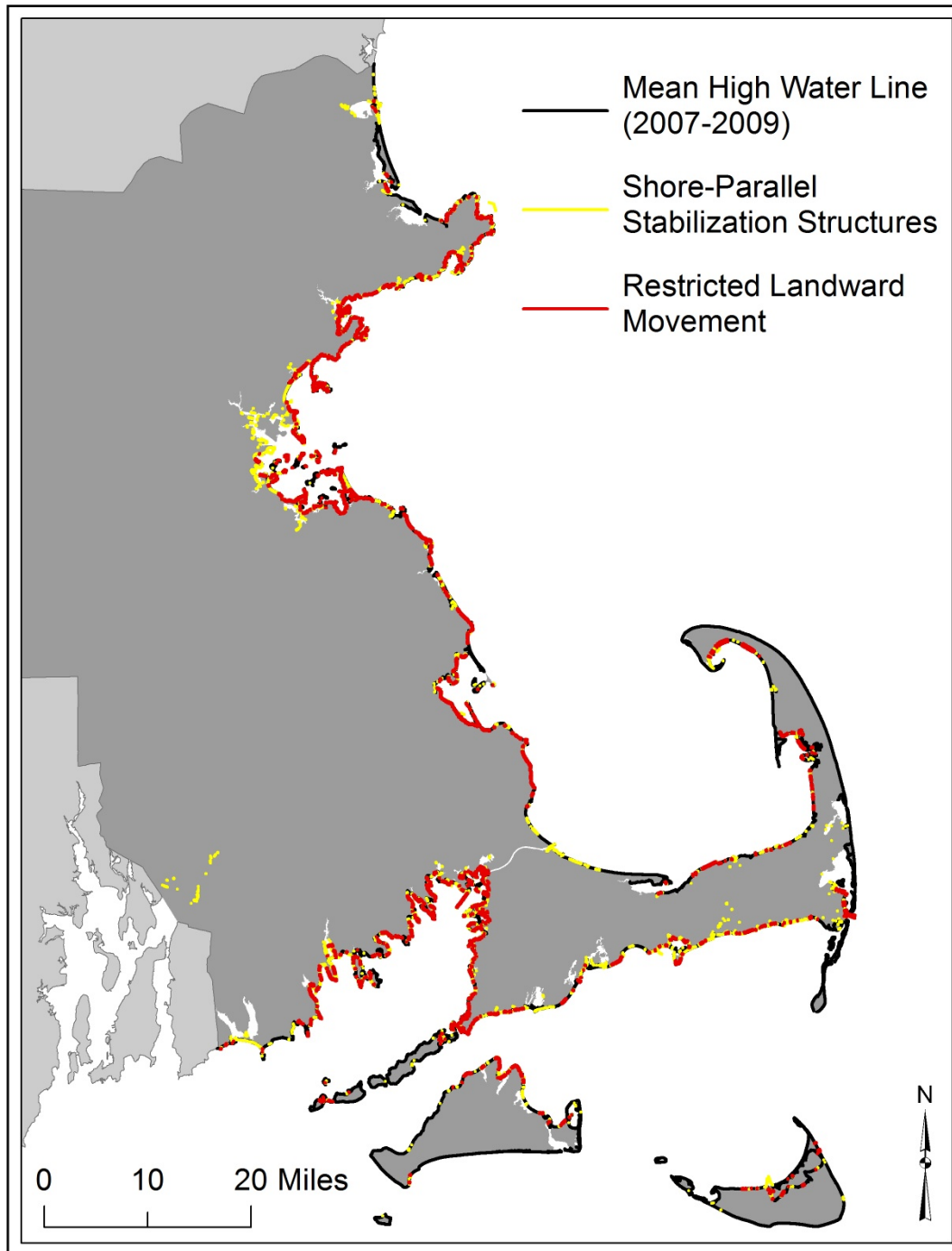




Natural Buffers Limited

- ~ 1,100 shoreline miles mapped & evaluated
- ~ 27 % armored with seawalls, bulkheads & revetments





Natural Buffers Limited

- ~ 1,100 shoreline miles mapped & evaluated
- ~ 27 % armored with seawalls, bulkheads & revetments
- ~ 21 % restricted from shifting landward by coastal structures



Building Elevation – Massachusetts Building Code (2008)

(G) Flood-Resistant Construction & Construction in Coastal Dunes

✓ Open pilings

✓ 2' freeboard



Building Elevation – Hull Freeboard *Incentive* (2009)

- Hull Board of Selectman voted to advance:
 - ✓ protection of health & safety of citizens
 - ✓ prevention of property damage
 - ✓ reduction of costly emergency services
- Elevate buildings 2' above current highest requirement = \$500 rebate of building department permit fees



- May 2011, passed 4' height allowance in zoning bylaw (ZBA special permit required)

Building Elevation – Hull Freeboard *Incentive* (2009)

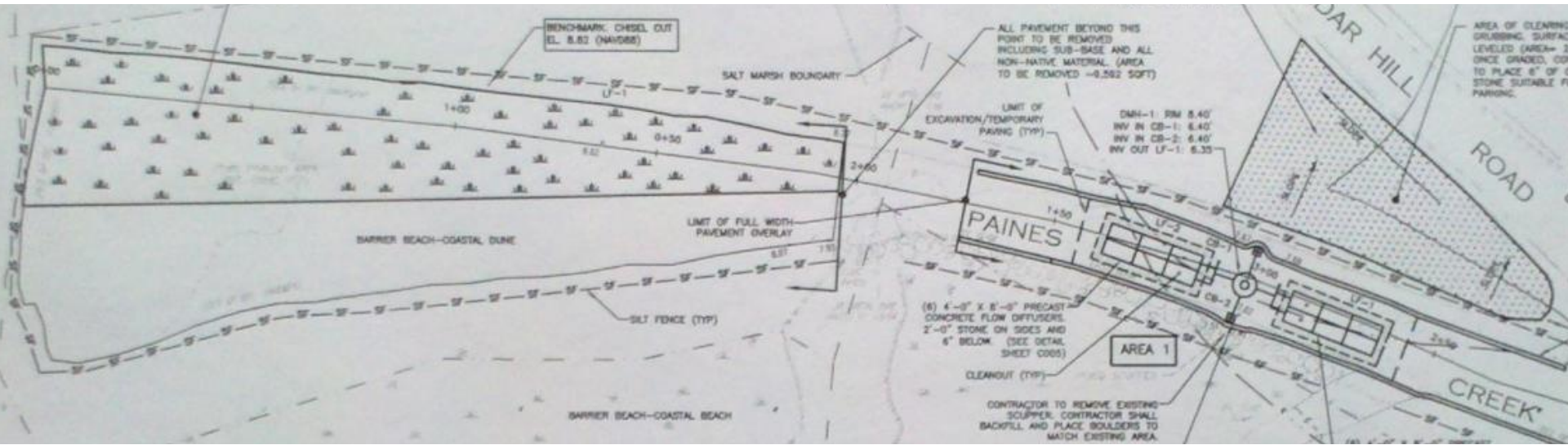
- 2009-2012, 20 of 24 eligible permit requests included 2' or more of freeboard for new & existing construction in Hull
- FEMA Community Rating System credit for incentive program



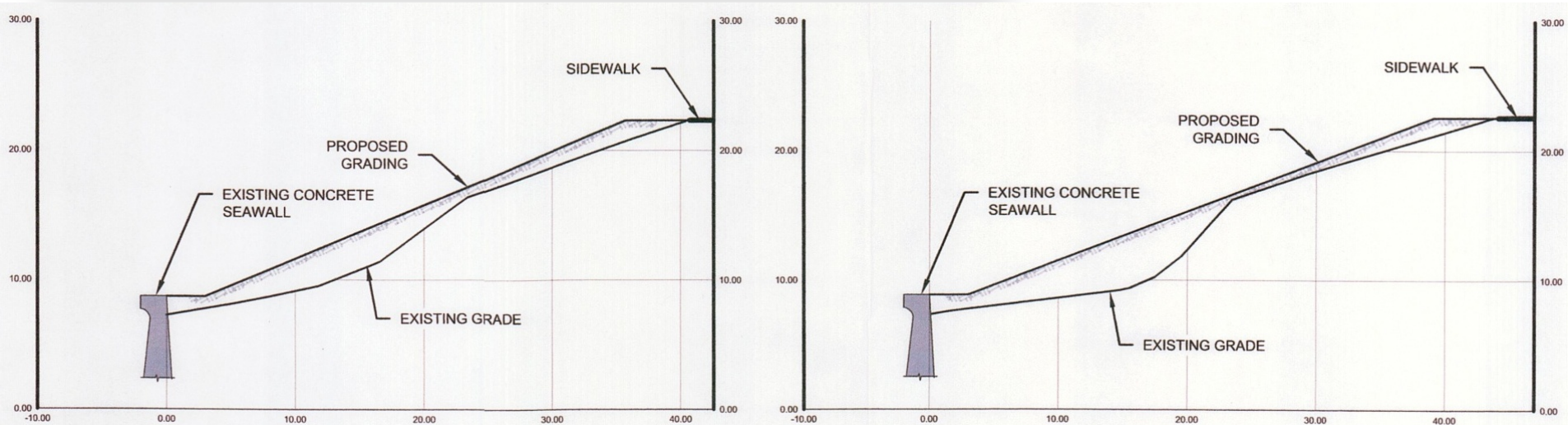
Relocation & Restoration – Brewster Parking Area (2011)



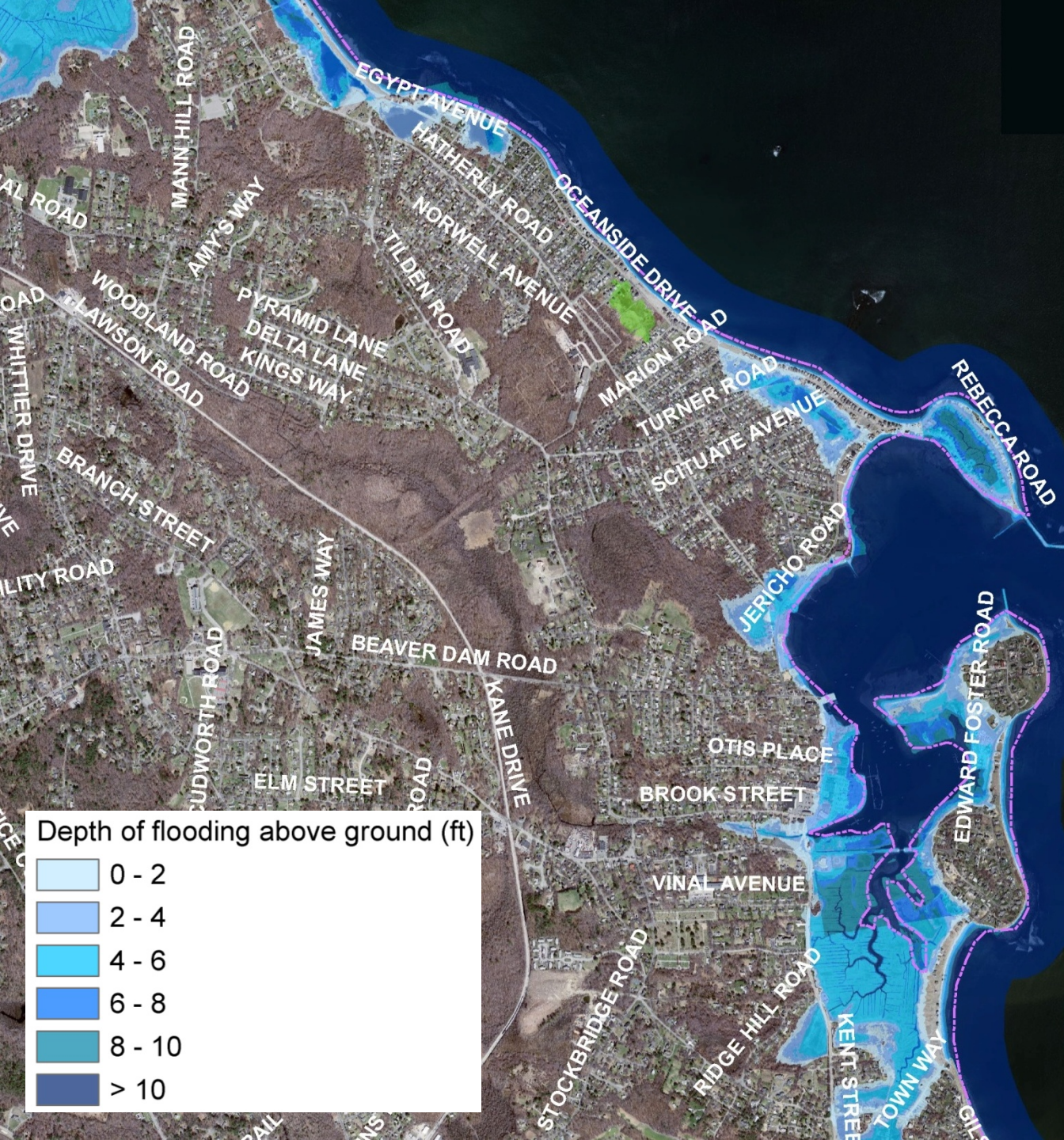
Relocation & Restoration – Brewster Parking Area (2011)



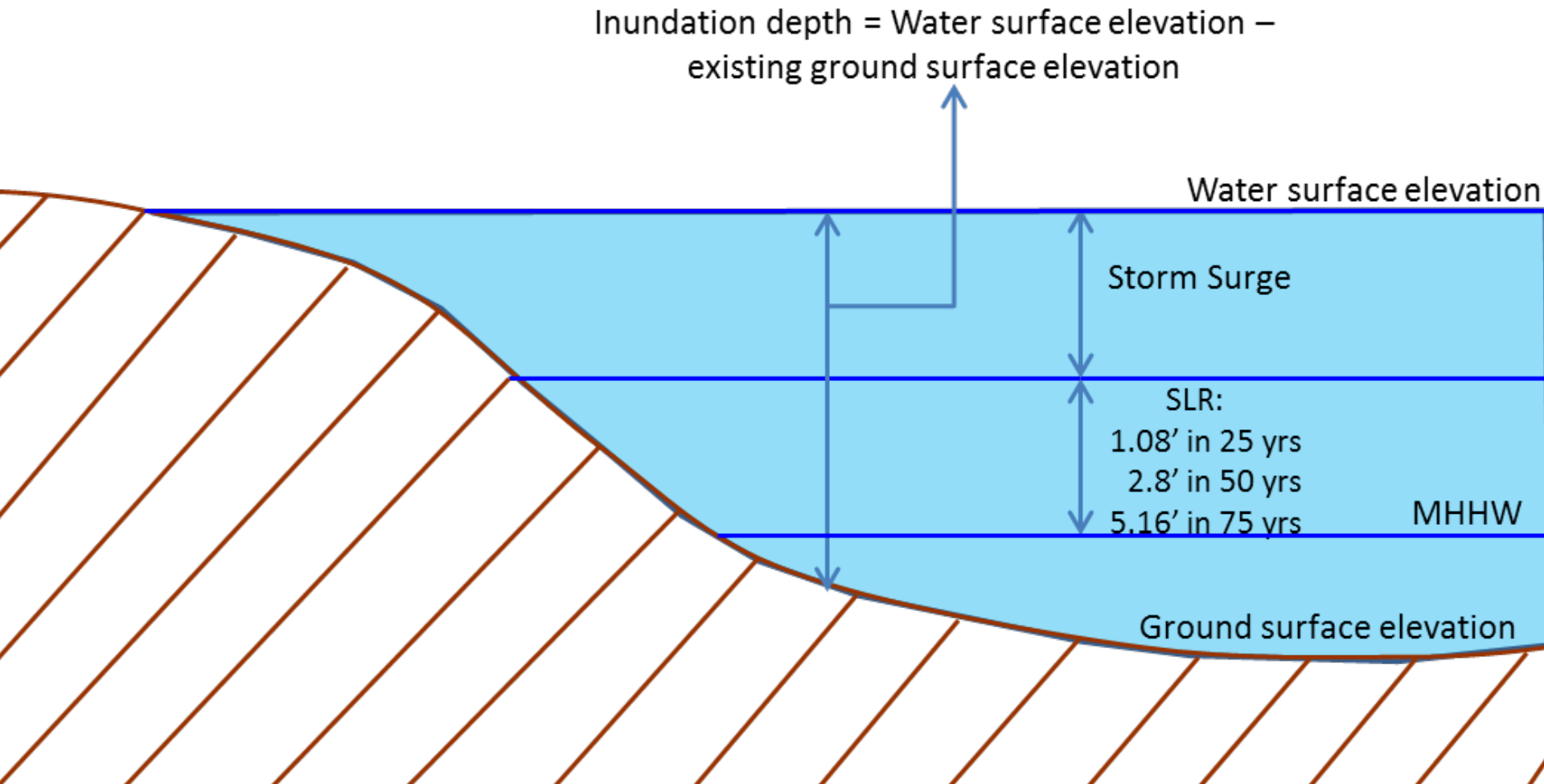
Reconstruction of Coastal Structures – Oak Bluffs Seawall (2014)

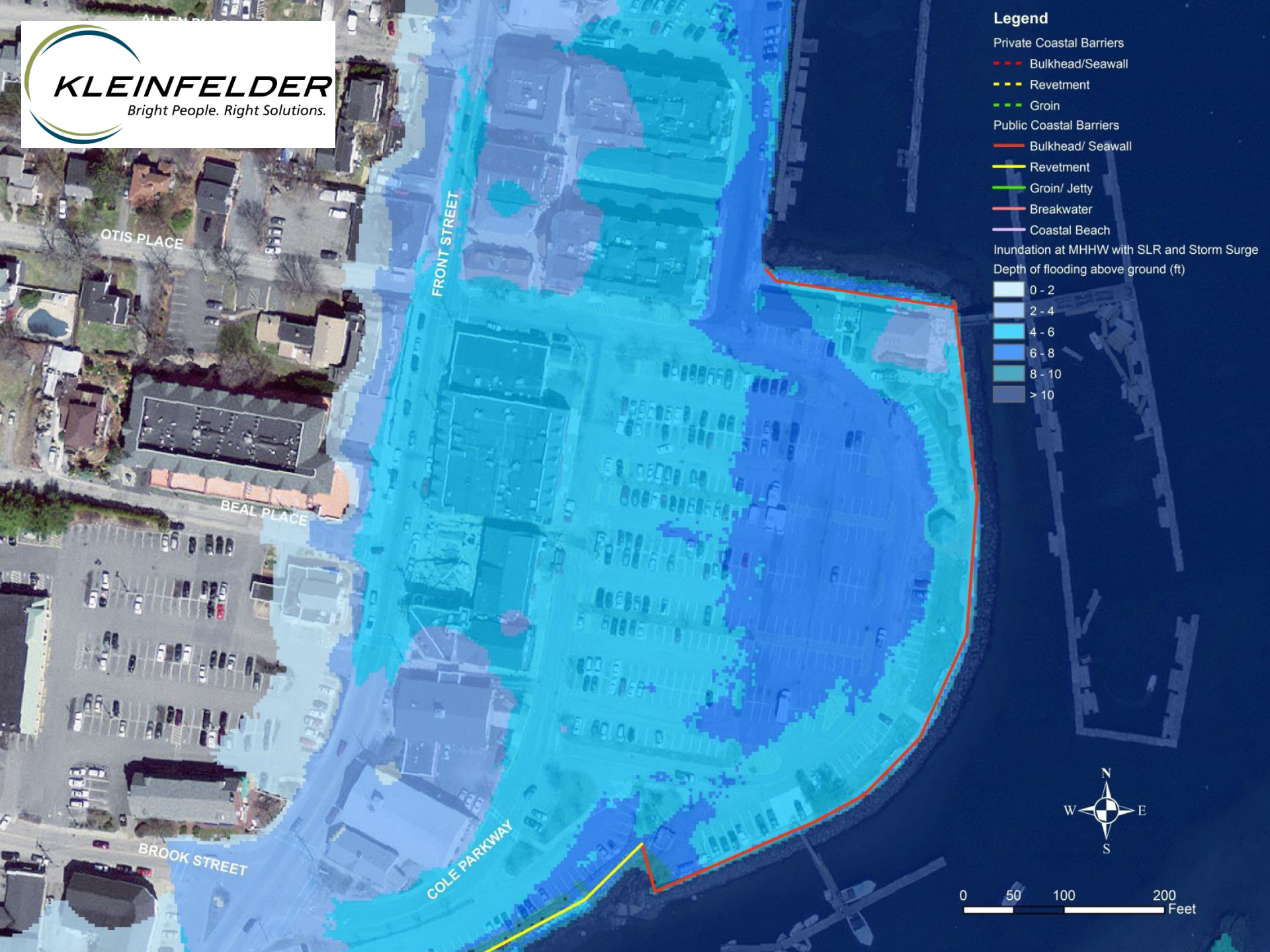


Dynamic Vulnerability Assessments – South Shore Potential Nor'easter Impacts with 5' Sea Level Rise (2013)



South Shore Coastal Inundation Depth Scenarios





Legend

Private Coastal Barriers

--- Bulkhead/Seawall

--- Revetment

--- Groin

Public Coastal Barriers

--- Bulkhead/ Seawall

--- Revetment

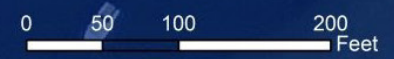
--- Groin/ Jetty

--- Breakwater

--- Coastal Beach

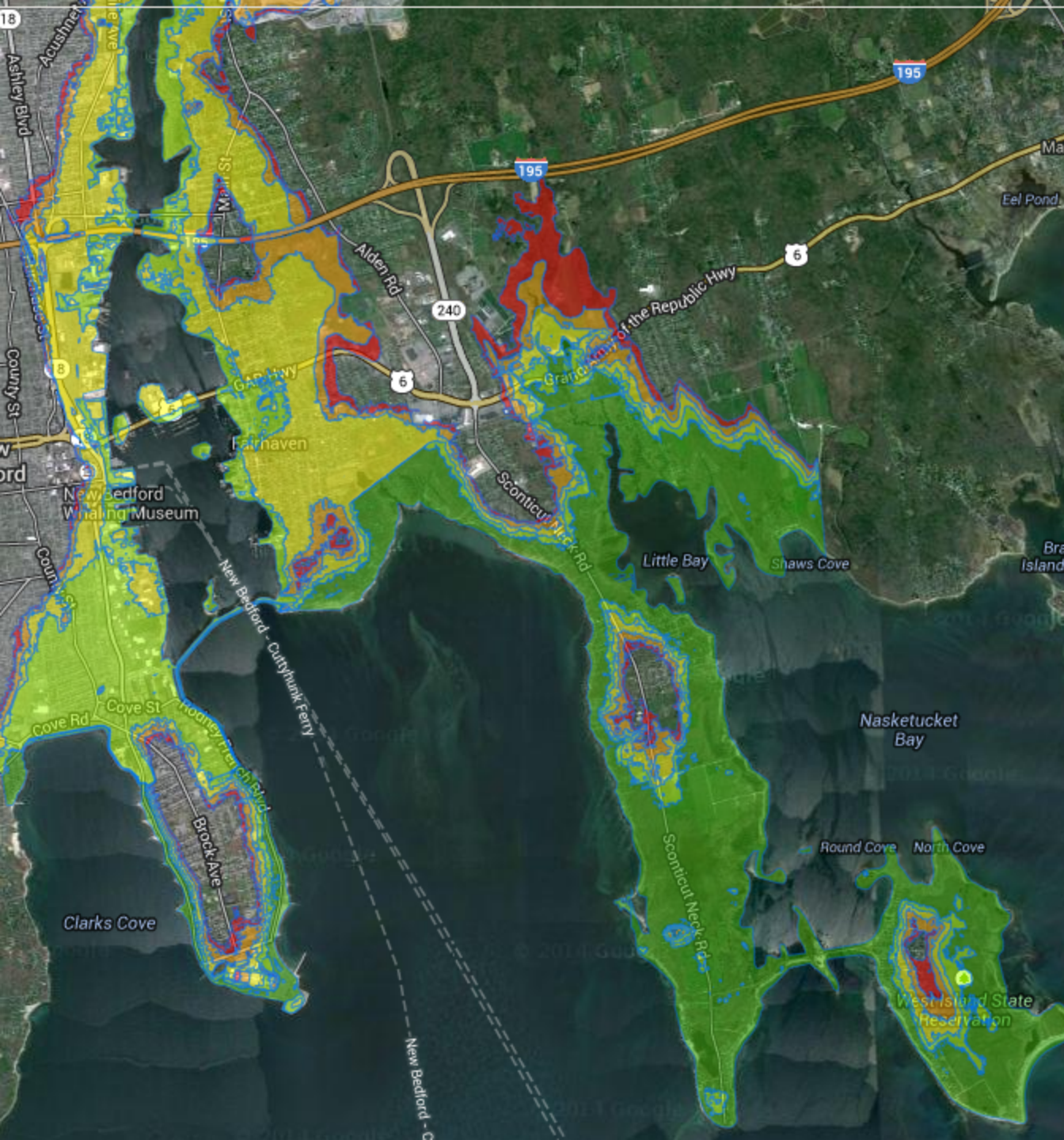
Inundation at MHHW with SLR and Storm Surge

Depth of flooding above ground (ft)

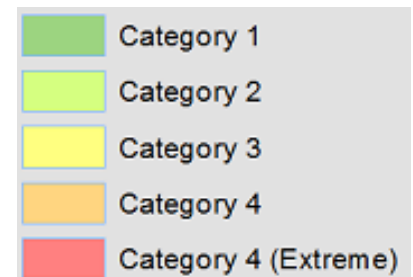


3D Coastal Inundation Depth (with 5' of Sea Level Rise & Nor'easter Storm Surge)





Dynamic Vulnerability Assessments – Buzzards Bay Potential Hurricane Impacts with 4' Sea Level Rise (2014)



Local Grants – Coastal Community Resilience

- CZM grant program provides financial (\$1 million) & technical resources to advance new & innovative local efforts to increase awareness of climate impacts, identify vulnerabilities & implement measures to increase community resilience
- 19 applications for ~ \$2.1 million
- Review criteria included current adaptation efforts, climate issues, StormSmart climate adaptation actions & sea level rise scenarios
- **10 projects selected for FY14-15:**
 - Evaluations of sea level rise impacts
 - Plans to relocate, redesign & adapt vulnerable infrastructure & buildings
 - Restoration of beaches & dunes
 - Community outreach to raise awareness, gain input & alter behavior

Local Grants – Green Infrastructure for Coastal Resilience

- CZM grant program provides financial (\$1.3 million) & technical resources to advance the understanding & implementation of natural approaches to mitigating coastal erosion & flooding problems
- 13 applications for ~ \$2.8 million
- Review criteria included potential threats to coastal infrastructure/ natural resources & consideration of sea level rise scenarios
- **Projects being recommended for FY14-15:**
 - Design & construction of beach & dune nourishment
 - Cultivation & planting of beach grass
 - Demonstration of living shoreline technology



For More Information – mass.gov/czm/stormsmart

