

# Rhode Island South Shore Regional Sediment Management

## 2010 ASBPA's National Coastal Conference

**Irene Watts**

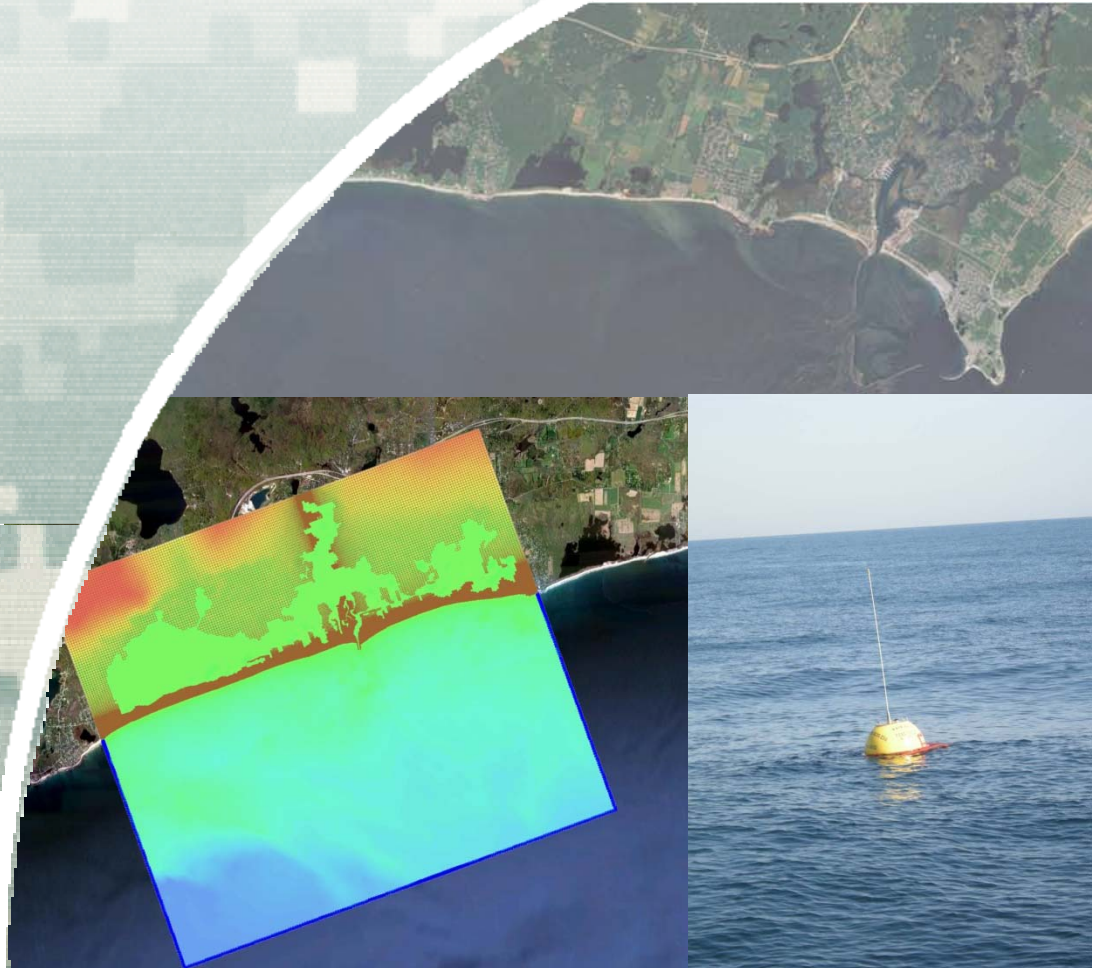
Coastal Engineer  
New England District  
14 October 2010



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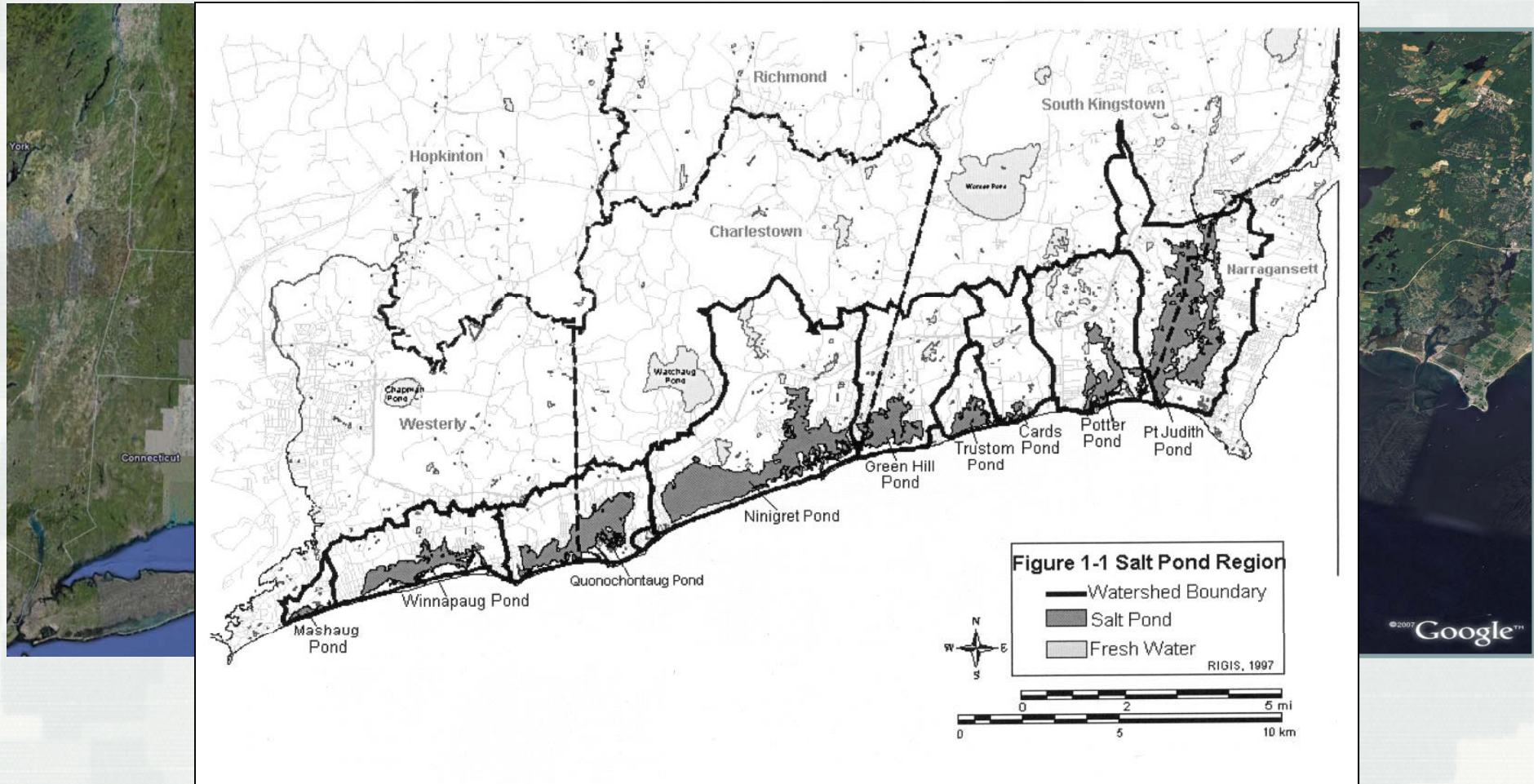


US Army Corps of Engineers  
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# Rhode Island South Shore Site Overview



South shore of Rhode Island (excerpted from Ernst et al. 1999)



# Rhode Island South Shore Overview



- Three federal navigation Projects
  - Point Judith Harbor of Refuge
  - Point Judith Navigation Channel
  - Little Narragansett Bay Navigation Channel
- Section 206 Habitat Restoration Completed:
  - Ninigret Pond
- Two proposed Section 206 projects
  - Quoni and Winnapaug
- Erosion along project extent with large losses in some areas
  - Impacting beach front structures & infrastructure
  - Threatening barrier beaches & critically important salt ponds
  - Barrier beaches provide protection to more highly developed areas
- Now must consider Sea Level Change





# Description and Goals



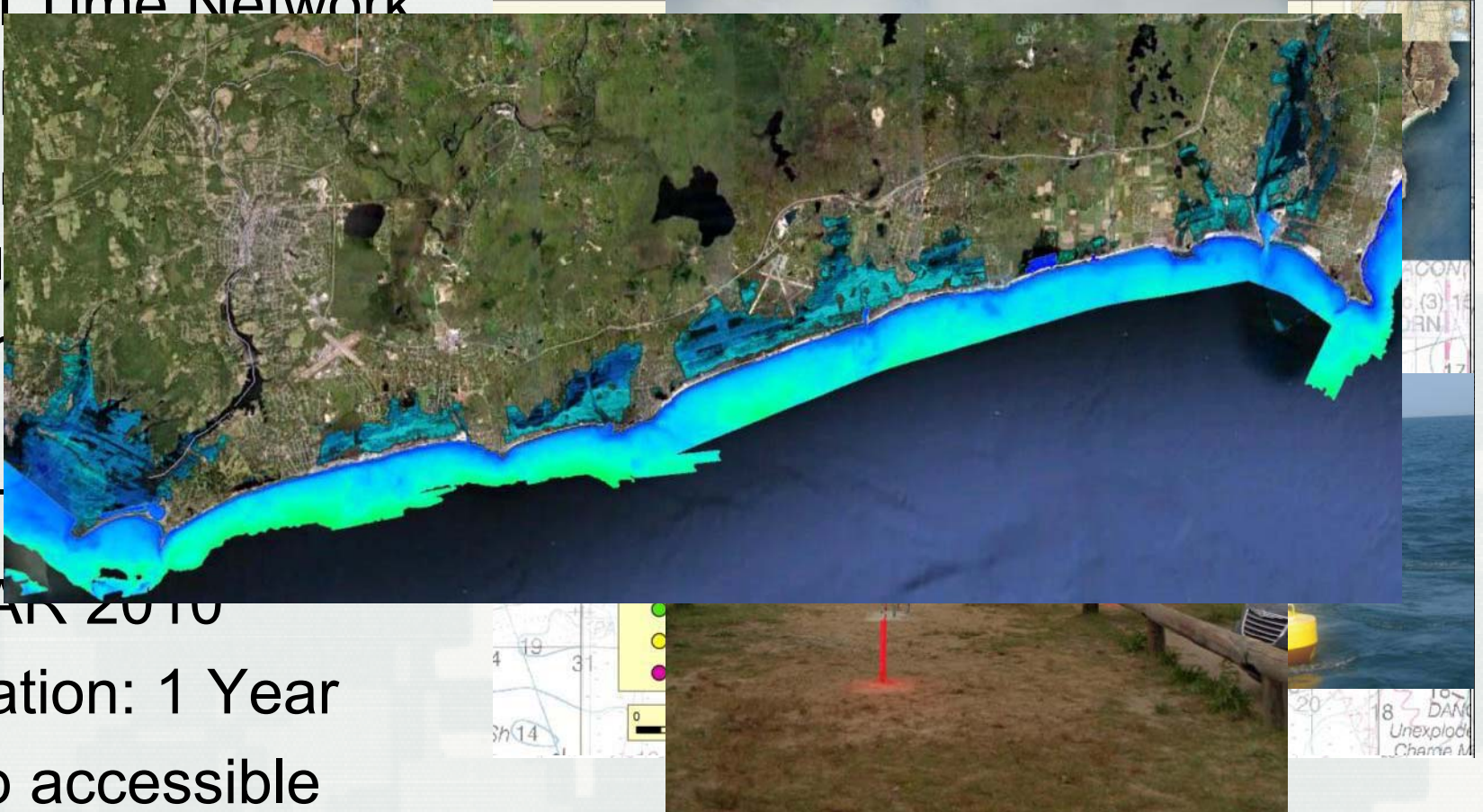
- Regional and Localized Sediment Budgets
  - Quantification and interpretation of past shoreline change
  - Locating and quantifying sediment sources and sinks
  - Determining long shore sediment transport rates
  - Sediment transport numerical modeling
- Enhanced operational practices at federal navigation projects and develop a Regional Sediment Management Plan
- Establishing and testing of techniques for assessing shoreline response to natural forces and human activities on local and regional bases
- Develop stronger partnership with stake holders
- Develop a means of information dissemination from the study to all interested parties



# Field Data Collection



- Real Time Network
- Offshore
- Nearshore
- Inter
- Gau
- MET
- LIDAR 2010
- Duration: 1 Year
- Web accessible

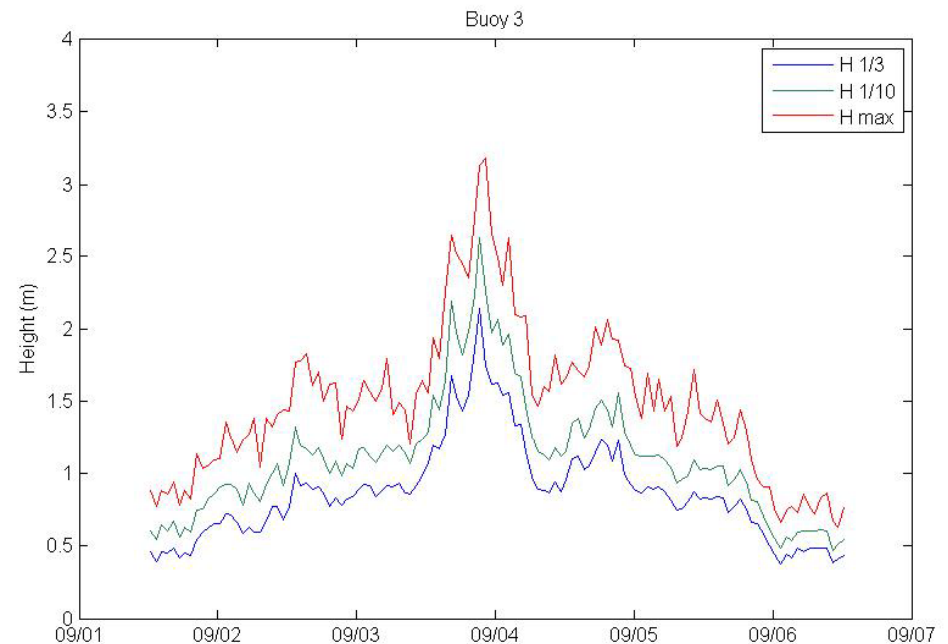




# Field Data Collection



- Hurricane Earl
  - ▶ Buoy: Max  $H_s$  = 6 m
  - ▶ ADCP: Max  $H_s$  = 3 m
- Observed clear reduction in wave height

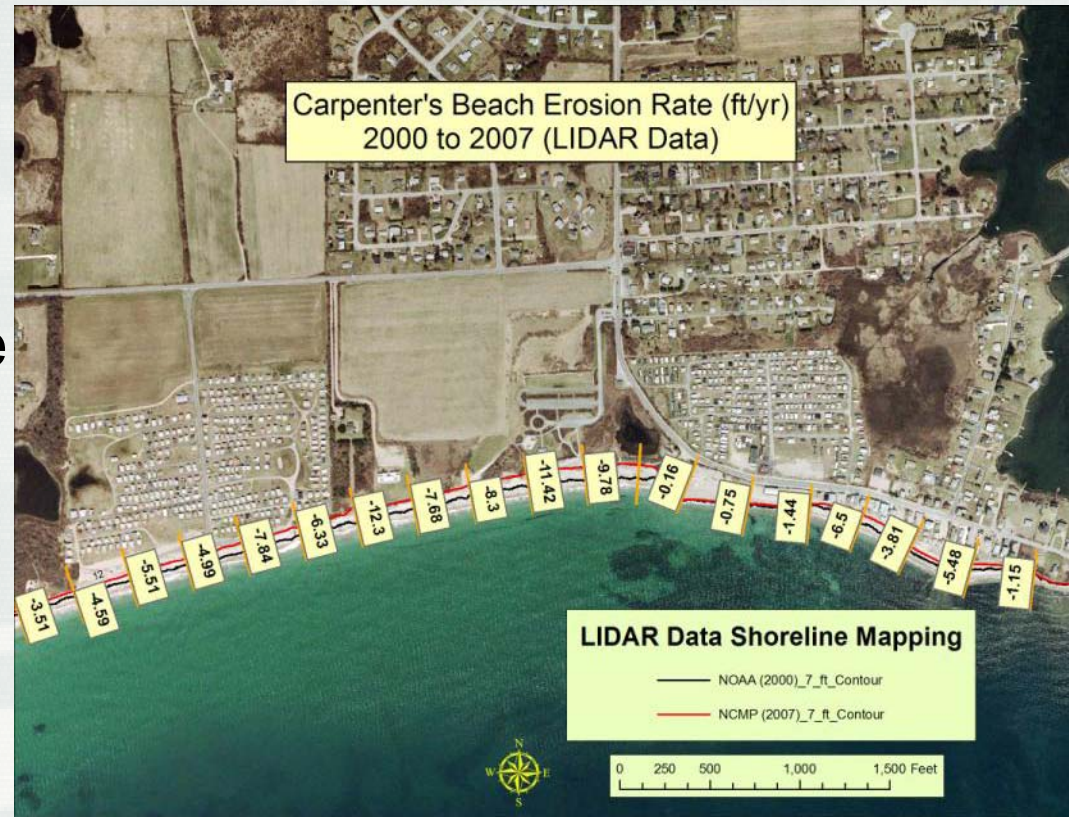




# Beach Morphology Data



- Historical Profiles
- New Profiles
- Historical Shoreline Position
- Recent LIDAR shoreline position
- Beach Profile analysis:
  - RMAP
  - GIS/SMS

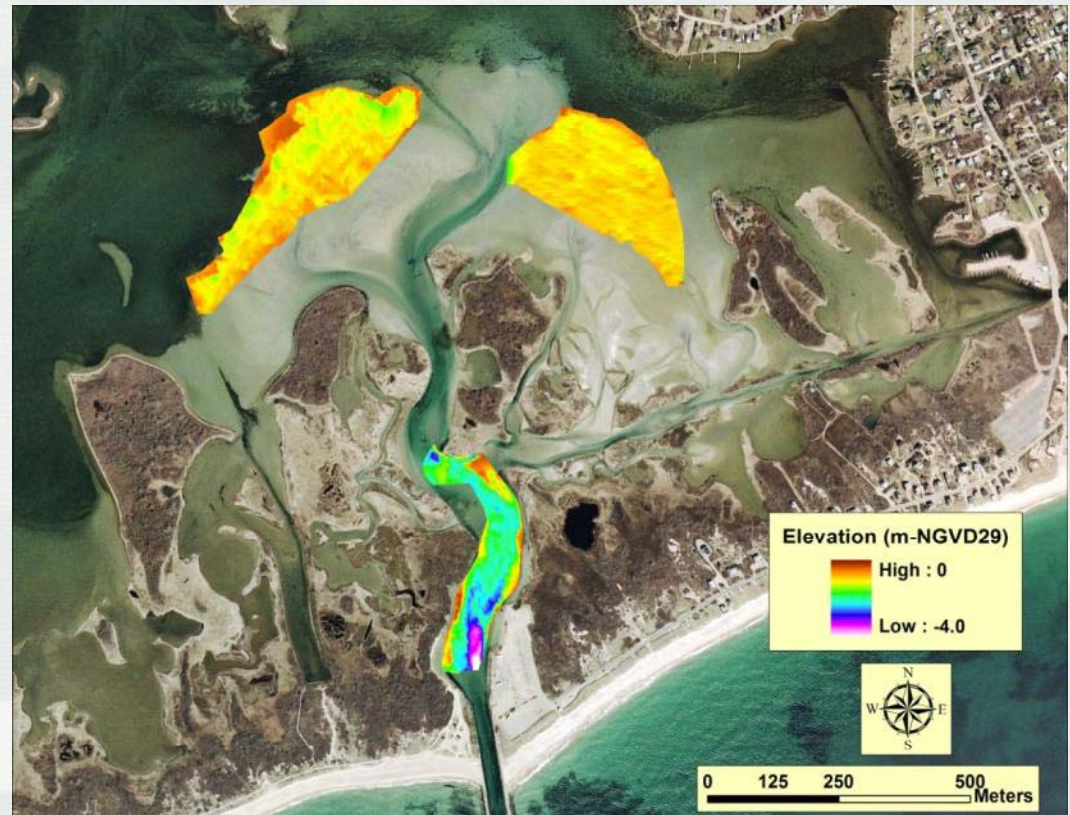




# Inlet Morphology Data



- Historical Photo Mapping
- Volume Estimation
- Survey Data Comparison



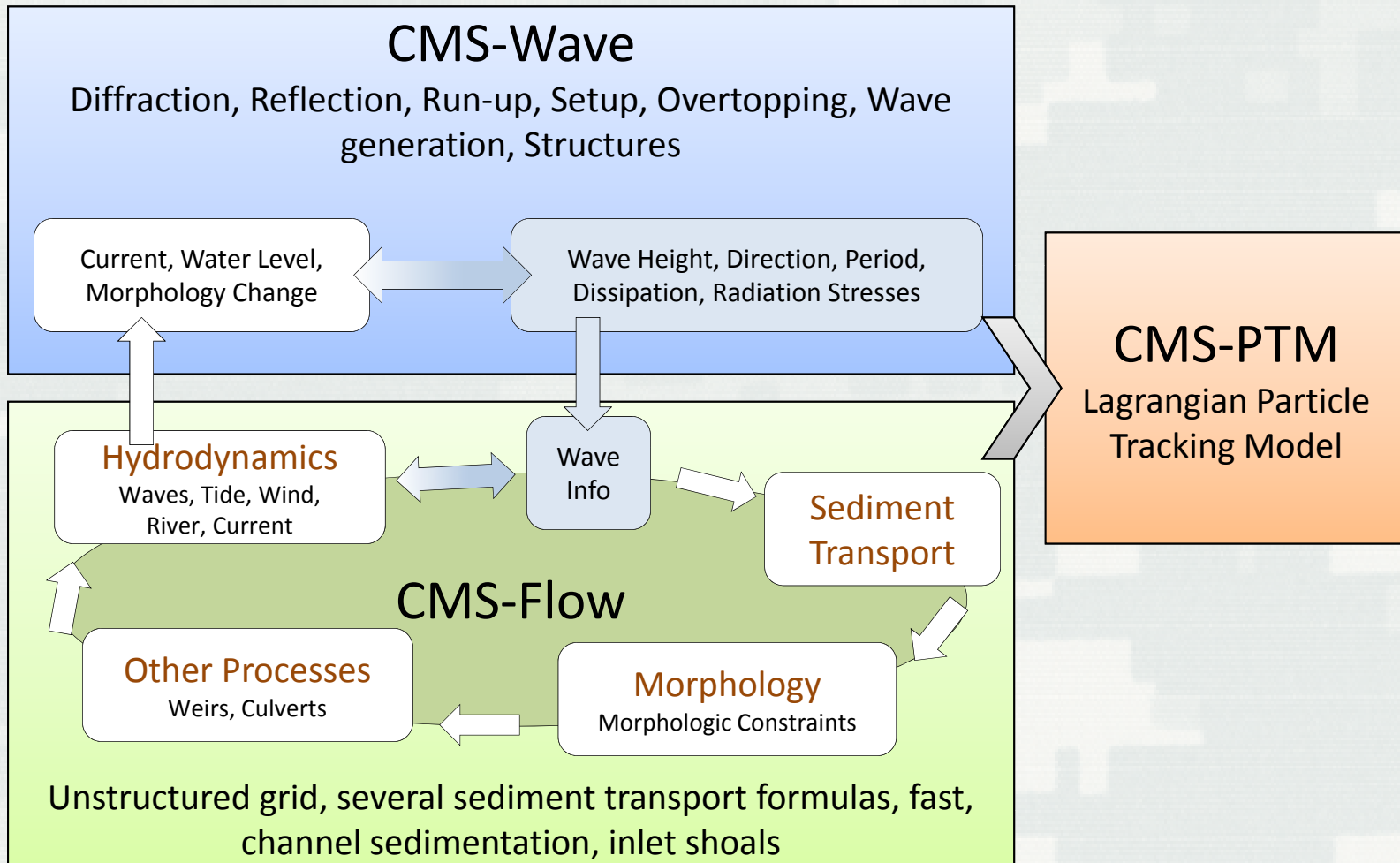




# Coastal Modeling System (CMS)



Integrated wave, current, and morphology change model

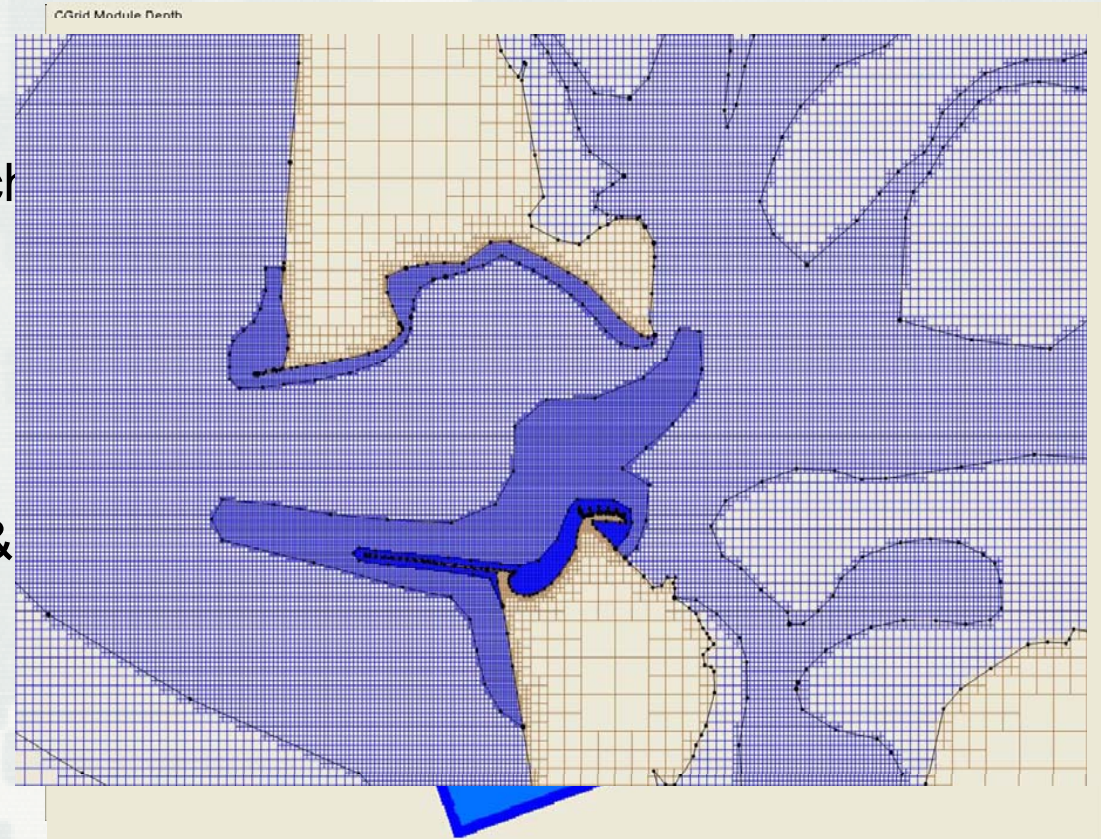




# CMS Modeling and Other Tools



- Modeling Approach:
  - Large Regional Grid
  - Nested child grids for each pond
- Telescoping (Quad tree):
  - ▶ Optimizes refinement and computational time
- Modeling performed at NAE & CHL



(Lin, et al 2010 CHETN – IV – 76)



## District, Agency & Stakeholder Coordination



- Local Sponsor: CRMC
- TAG Team
  - ▶ NRCS, USGS, NOAA, EPA, USFWS, FEMA
  - ▶ Narragansett Tribe, RI DEM, University of RI, The Nature Conservancy, Save the Bay, Salt Ponds Coalition, Surf Riders Association, Audubon Society, Pawcatuck and Wood River Watershed Association, City of Westerly, Town of Charlestown, Town of South Kingstown, and the Town of Narragansett
- CDIP SCRIPPS
- University of Rhode Island & Graduate School of Oceanography
  - ▶ Historic Beach Profile Data
- NERACOOS



# Additional Projects



- Projects:
  - ▶ Point Judith Harbor of Refuge
    - O&M Navigation Study
    - Wave modeling to be used in repair design
  - ▶ Little Narragansett Bay Channel
    - Potential channel relocation due to encroachment of barrier island



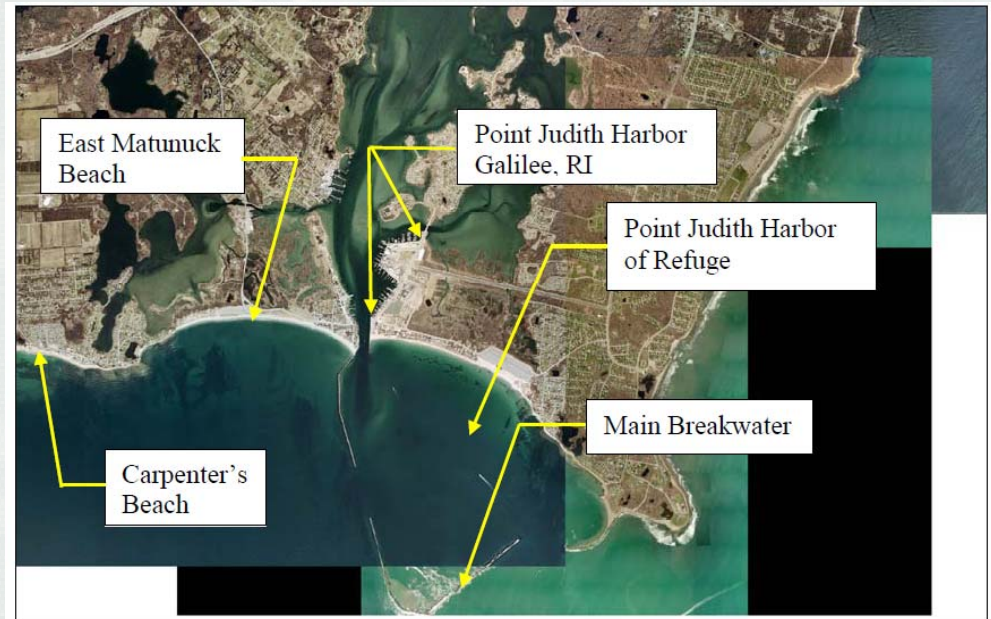
Pt. Judith Breakwater Harbor of Refuge



## Benefits to O&M



- 3 Federal Navigation Projects:
  - ▶ Navigation Channels
    - Pt Judith
    - Little Narragansett Bay
  - ▶ Harbor of Refuge
    - Pt Judith Harbor of Refuge
- Section 206 Habitat Restoration Completed:
  - Ninigret Pond
- Two proposed Section 206
  - Quoni and Winnapaug
- Breakwater Repair

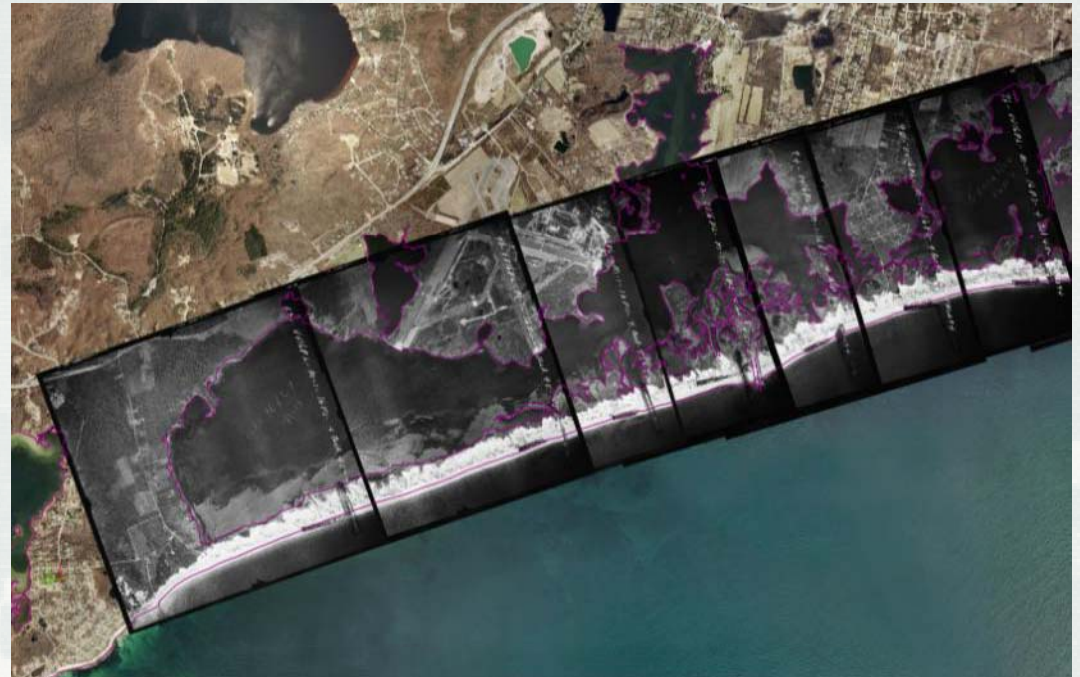




## RSM Lessons Learned (so far)



- Advantages of Real Time Data
- Engage Partners Early
  - ▶ Data Sharing and Coordination
- Buying vs Rental of Gauges





# Discussion