CMS Applications in New England District

CIRP Technology Transfer Workshop
New Orleans District

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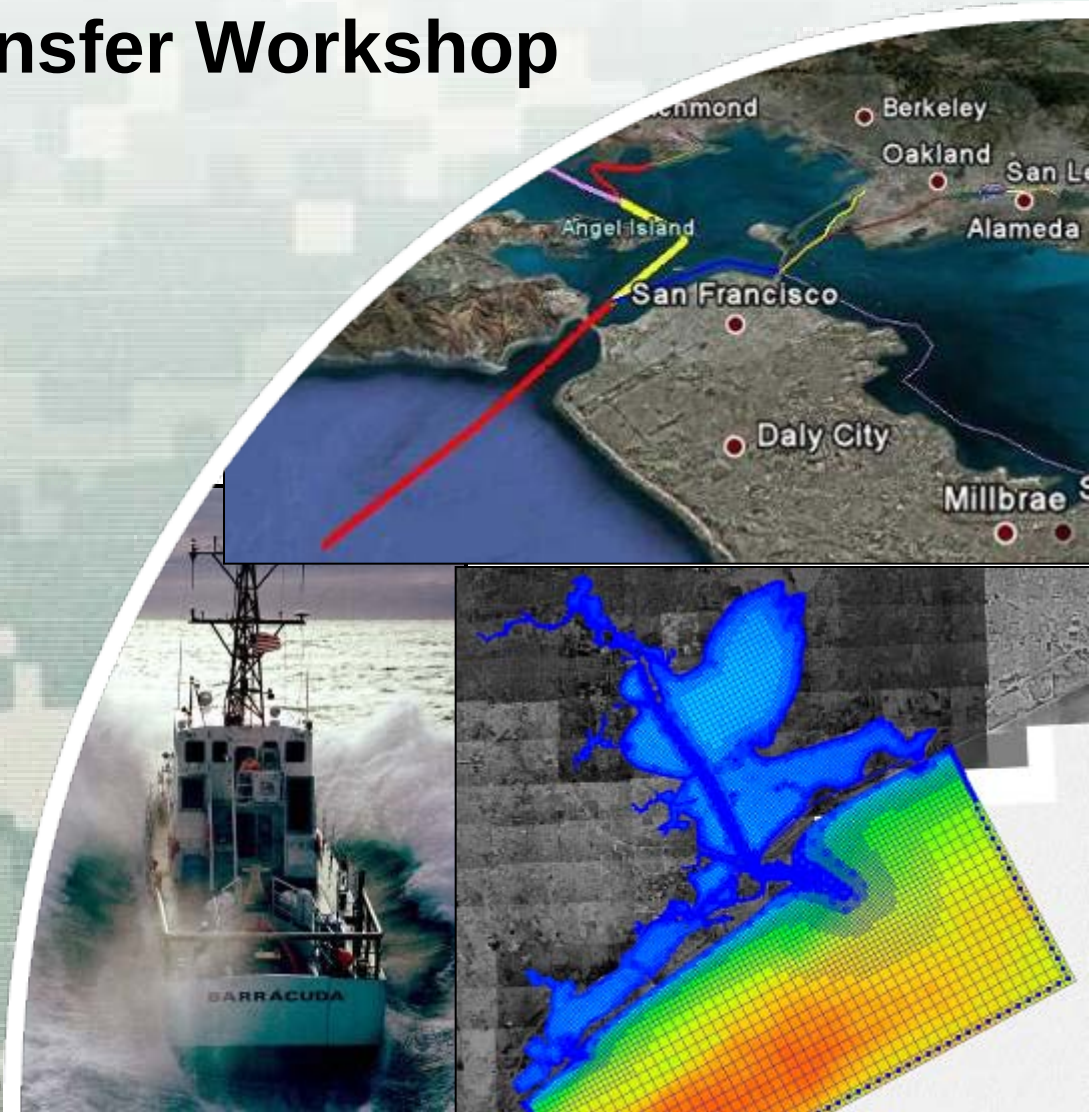
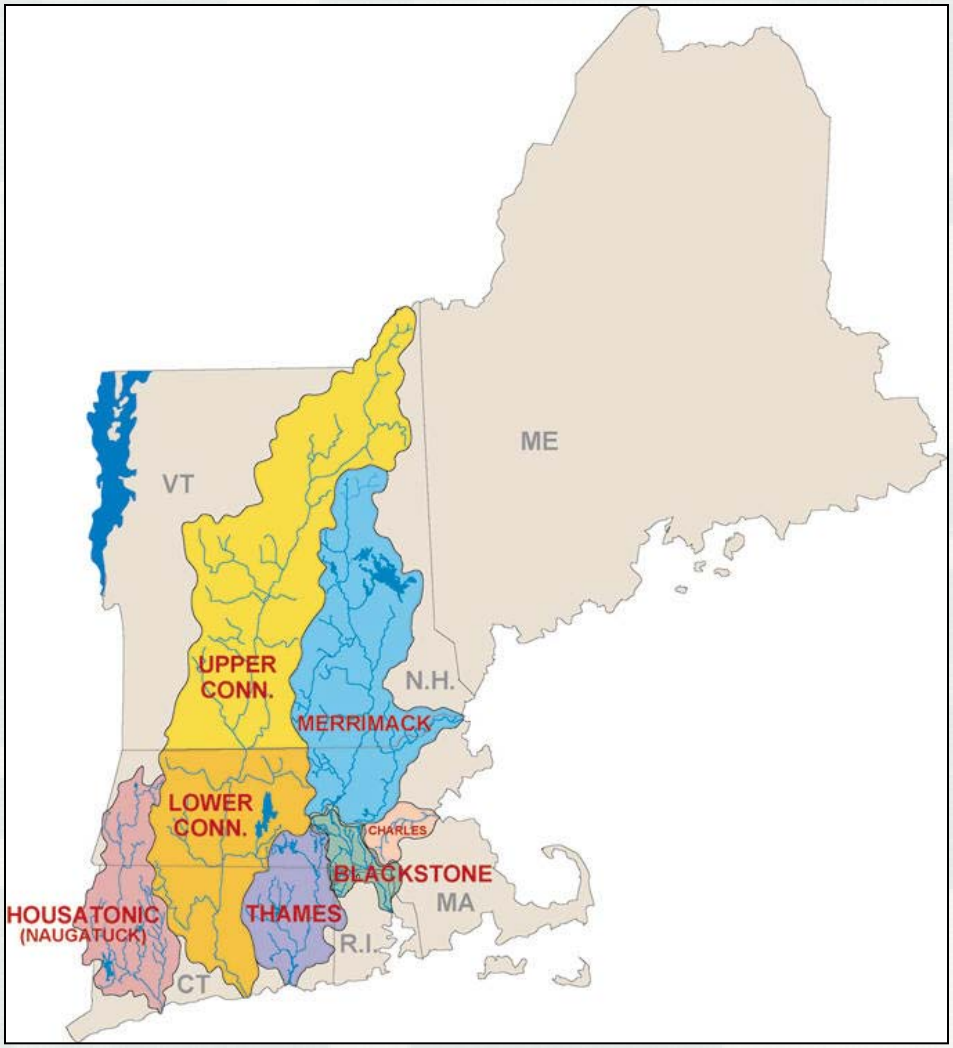


US Army Corps of Engineers
BUILDING STRONG®

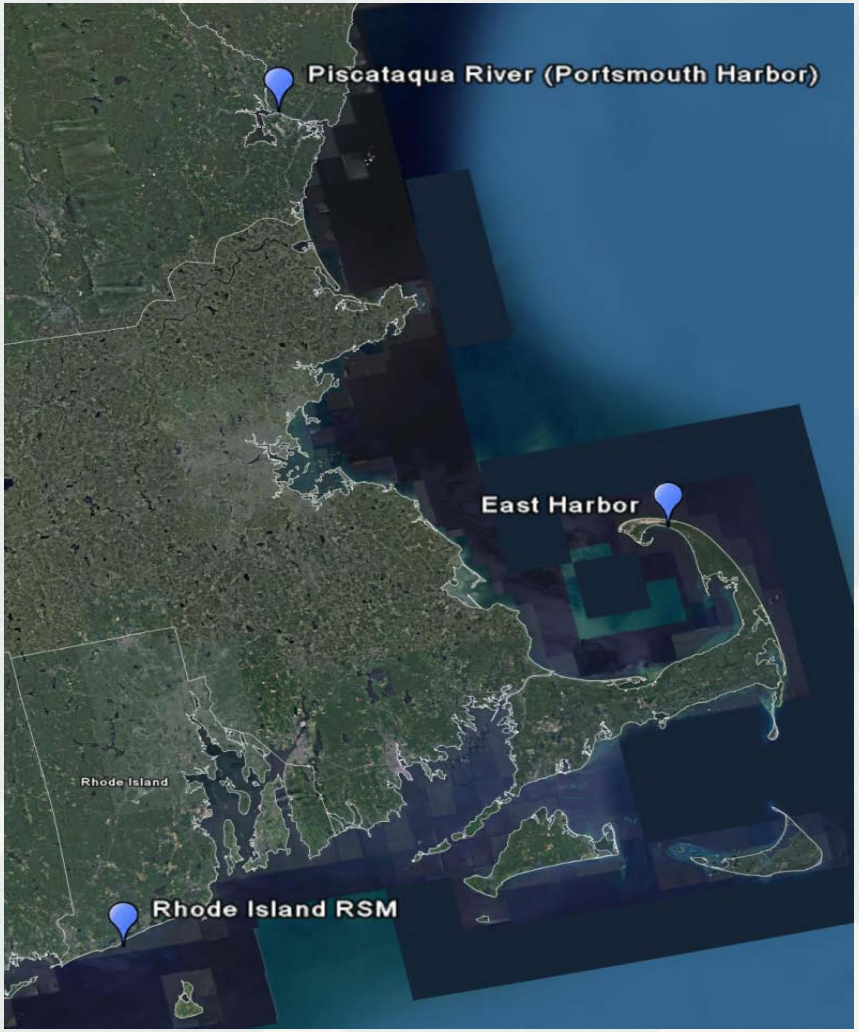
NAE Overview

- Encompasses 5 Coastal States
  - Maine
  - New Hampshire
  - Massachusetts
  - Rhode Island
  - Connecticut
- 6,100 miles of coastline
- 171 Harbors with Corps improvements
- 13 Deep draft commercial waterways
- 3 Hurricane Barriers



CMS Applications in NAE

- Turning Basin Design
  - Portsmouth Harbor (Piscataqua River)
  - Variable Grid
- Regional Sediment Management
  - Rhode Island South Shore
  - Nested Grids
- Habitat Restoration
  - East Harbor, Truro, MA
  - Telescoping Grid



Google Earth, 2007

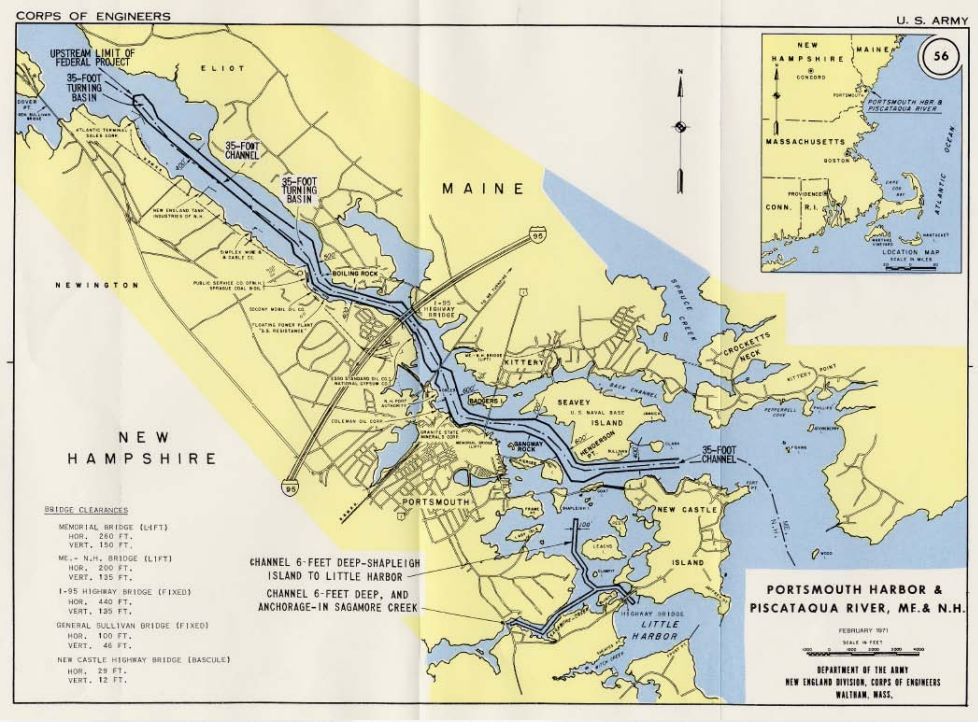
Turning Basin Design

Turning Basin Design

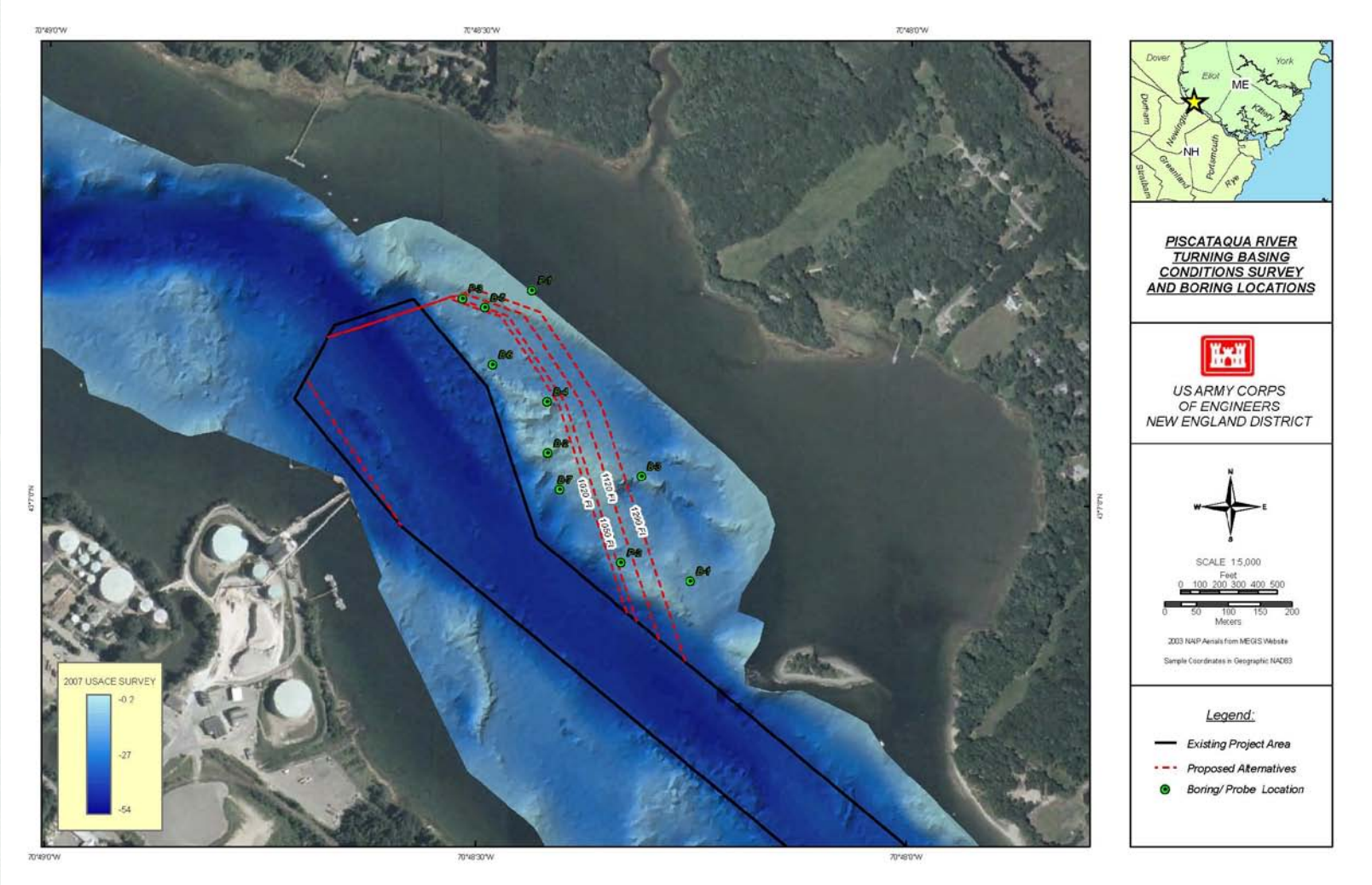
(NOAA, 13283)

Turning Basin Design

- One of the highest current velocities for a federal channel
- Site is located at the head of a 6.5 mile federal channel
- Authorized Dimensions:
  - 200 ft wide
  - 35 ft depth MLLW
- Turning Constraints:
  - Turn only daylight hours on slack
  - Turning 747 ft ship in a 800 ft wide turning basin
- 350 – 700 cy of sediment to be removed



Turning Basin Design



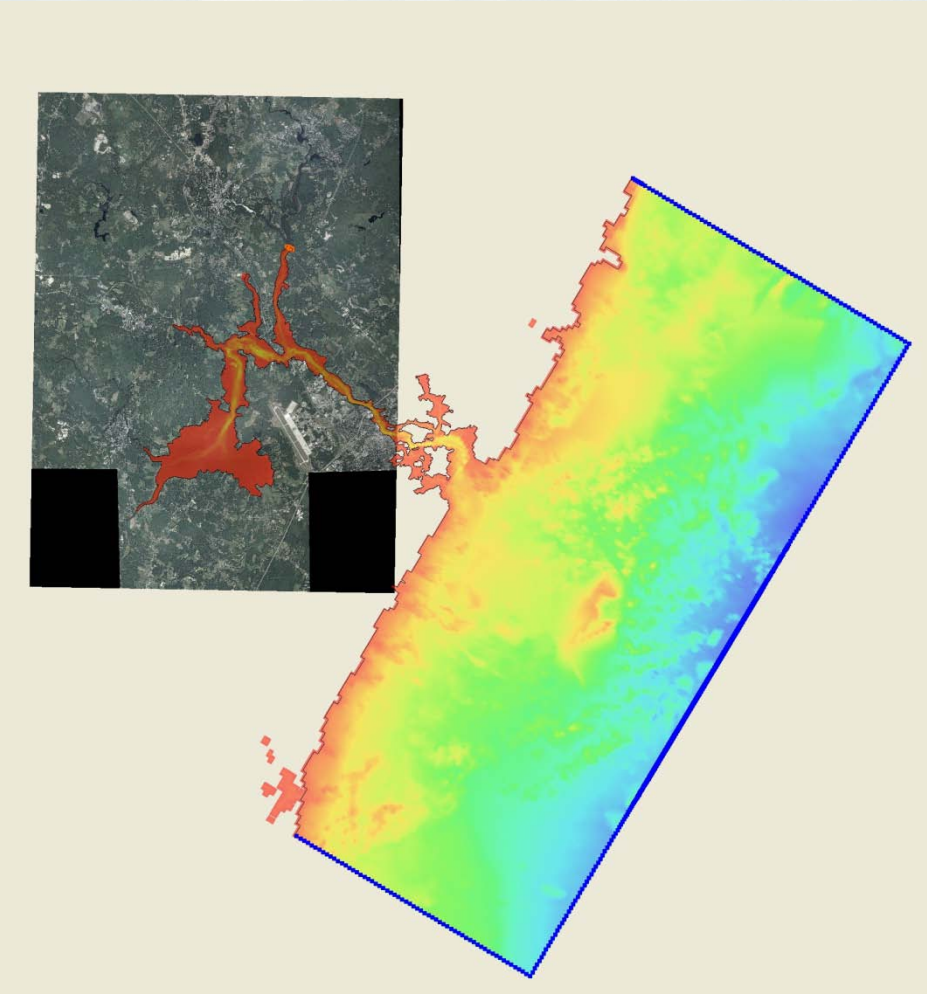
Turning Basin Design

- Project Goal: Determine (if any) change in current speeds over different turning basin configurations
- Main Concern: Current Magnitude
- Tide Range: Mean 2.6 m (8.63 ft); Diurnal 2.9 m (9.42 ft) Fort Point, NH

(Woods Hole Group, 2009)

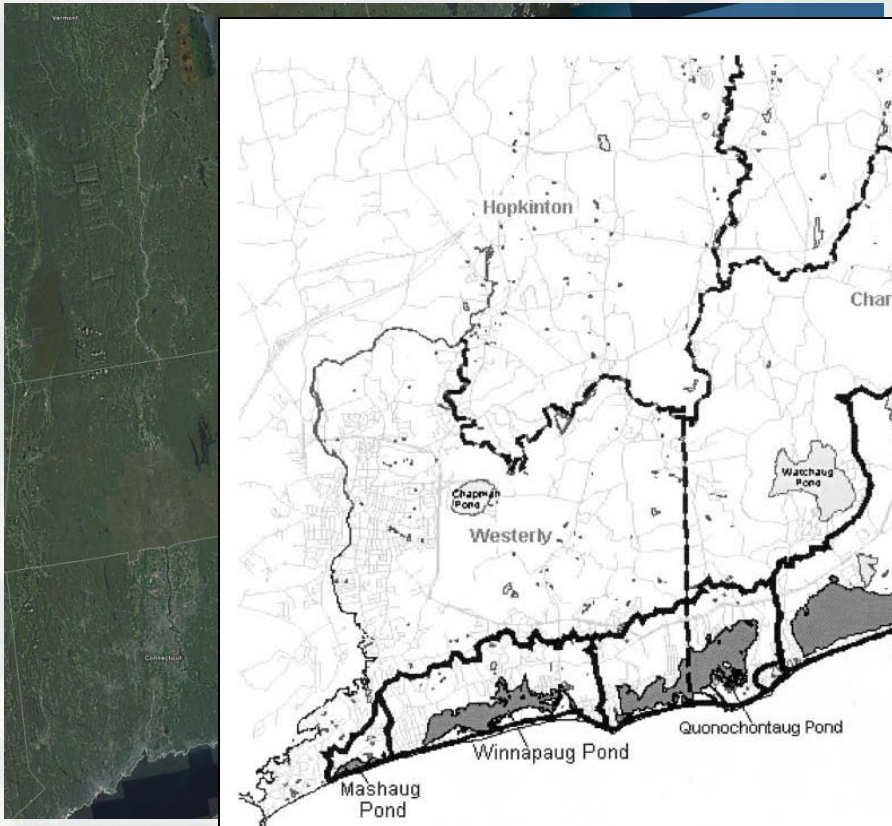
Turning Basin Design

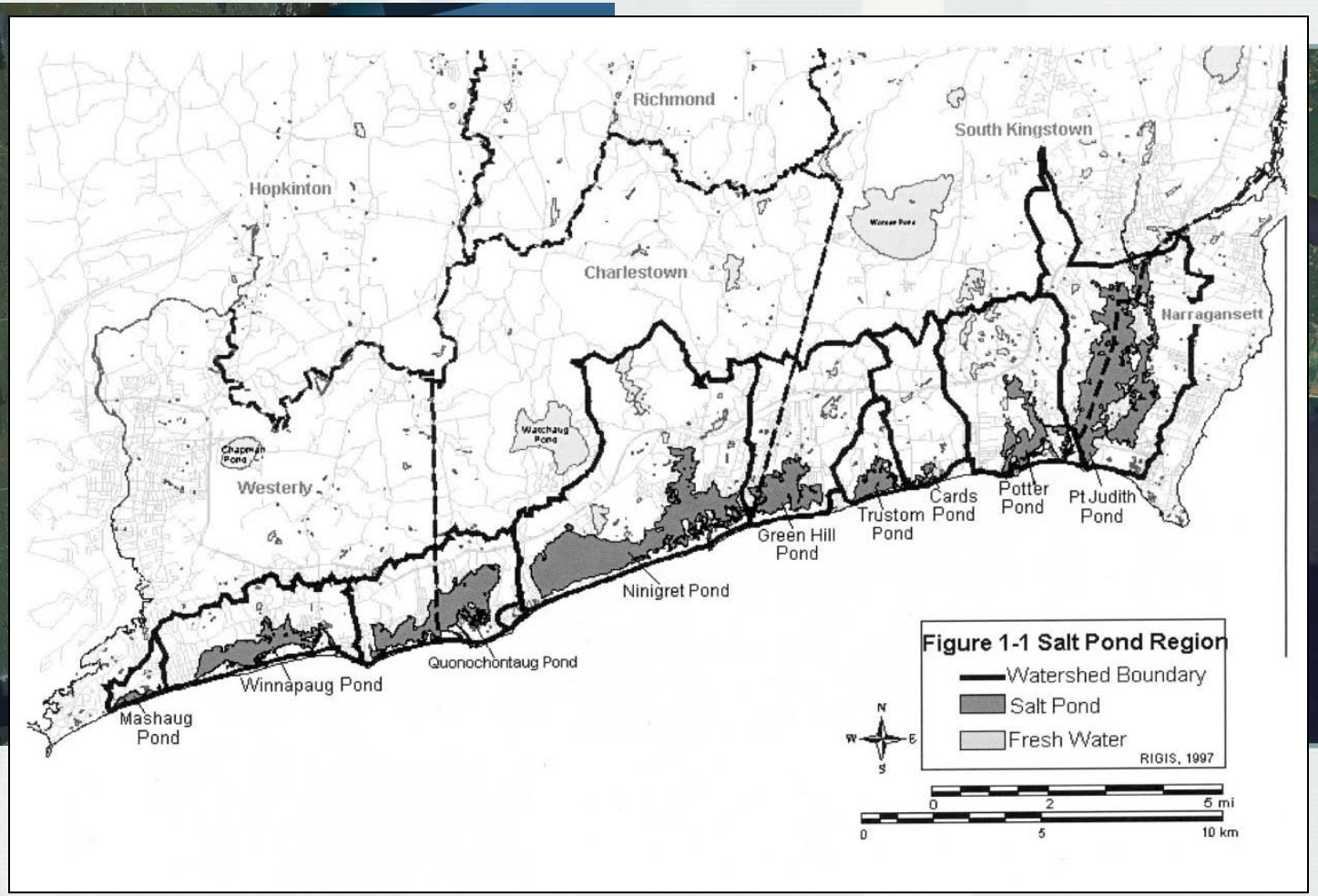
- Number of computational cells: 112,534
- Cell Size Range:
  - Min: (11,16)
  - Max: (250, 250)
- ADCP and Tide Measurements used for calibration

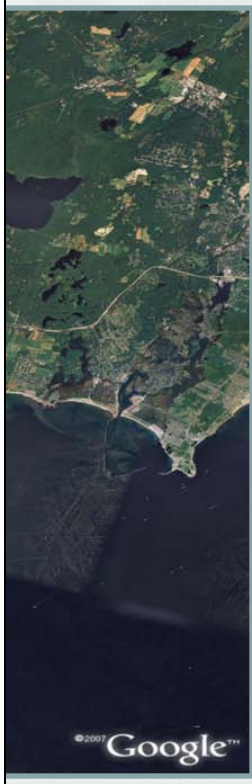


Regional Sediment Management

Regional Sediment Management







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

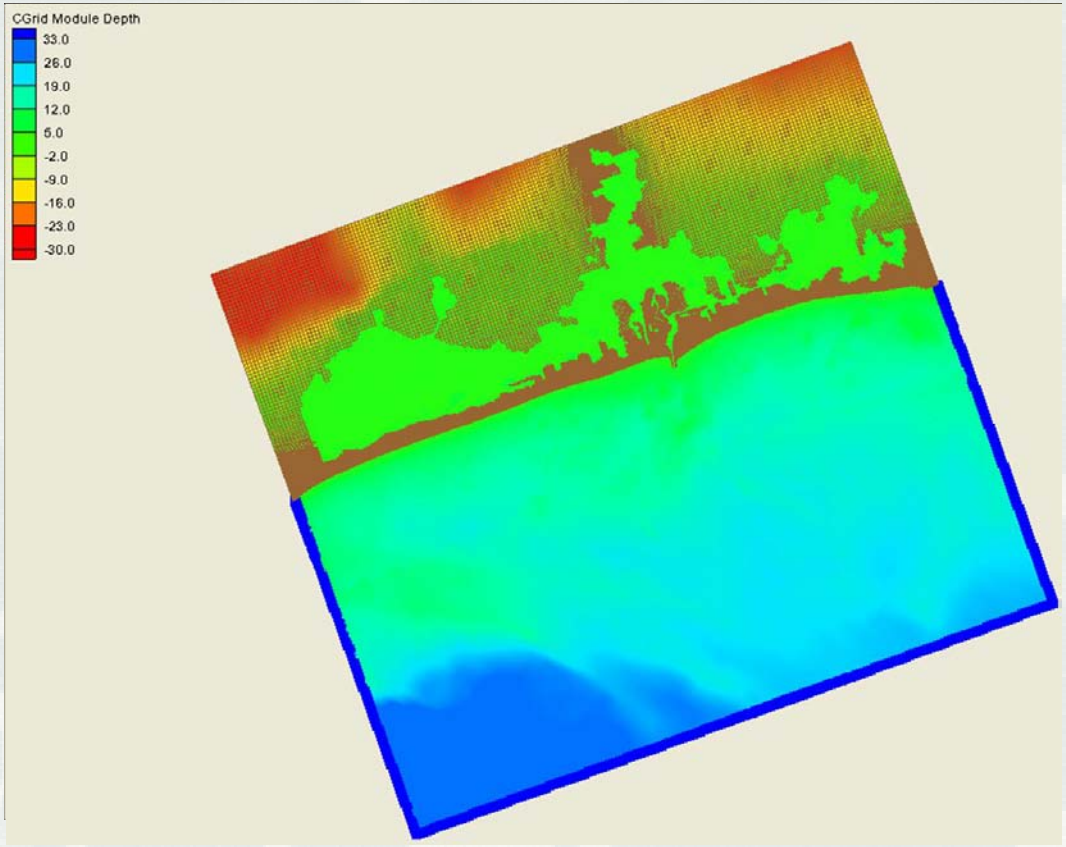
Regional Sediment Management

- Two federal navigation channels
- Section 206 Habitat Restoration Completed:
  - Ninigret Pond
- Two proposed Section 206
  - Quoni and Winnapaug
- Identify sediment pathways in the system to further understanding for better management of material
- Comprehensive regional approach has never been attempted

(Ninigret Pond, Truslow, 2005)

Regional Sediment Management

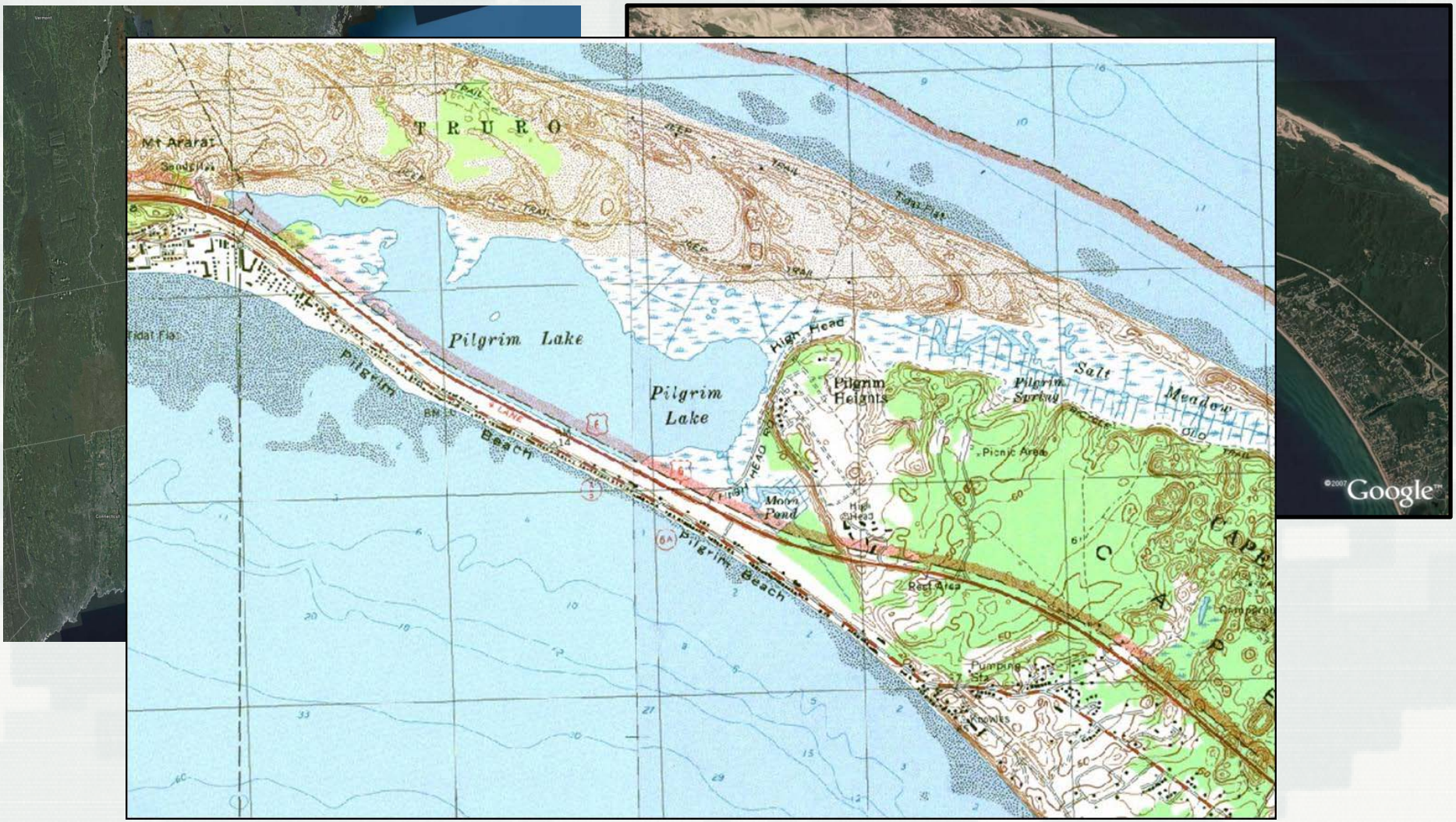
- Large Data Collection Effort
- Modeling Approach:
  - Large Regional Grid
  - Nested child grids for each pond



Lin, et al 2010 CHETN *To be announced*

Habitat Restoration of Salt Marsh

Habitat Restoration

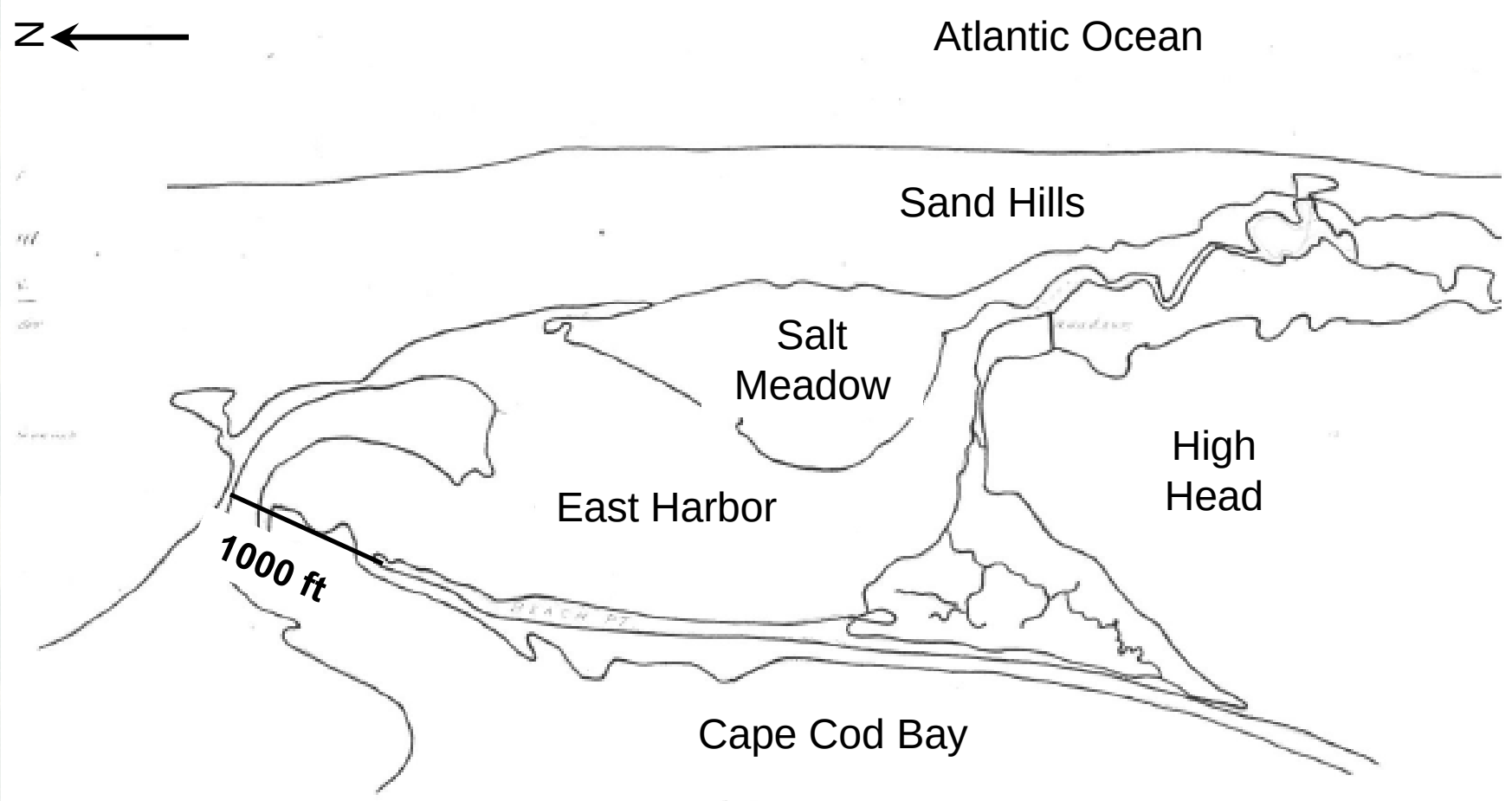


Habitat Restoration

- Restore natural tidal exchange
- Design inlet to allow tidal exchange and minimize silting
- Design Constraint: Up to 75 ft wide
- Considerable amount of infrastructure

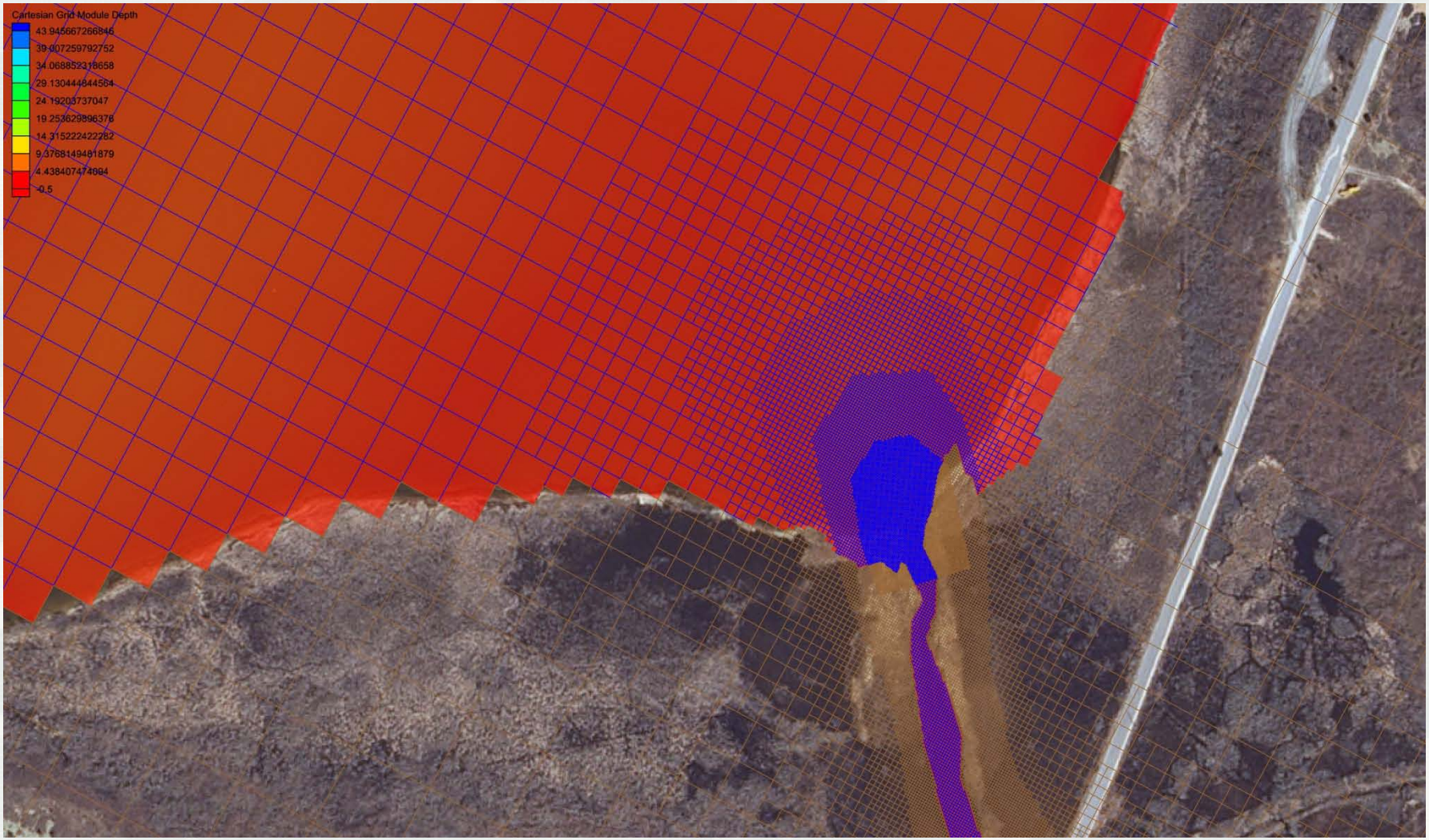
MA GIS, Color Ortho Imagery, 2005

Development History



Truro, 1868

Habitat Restoration



Discussion