# National Coastal Mapping Program

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Regional Sediment Management IPR and Engineering with Nature Workshop
Portland, OR, 29 August 2012

Outline

- USACE National Coastal Mapping Program
- Standard products
- New product developments
- Opportunities for RSM and EWN

US Army Corps of Engineers
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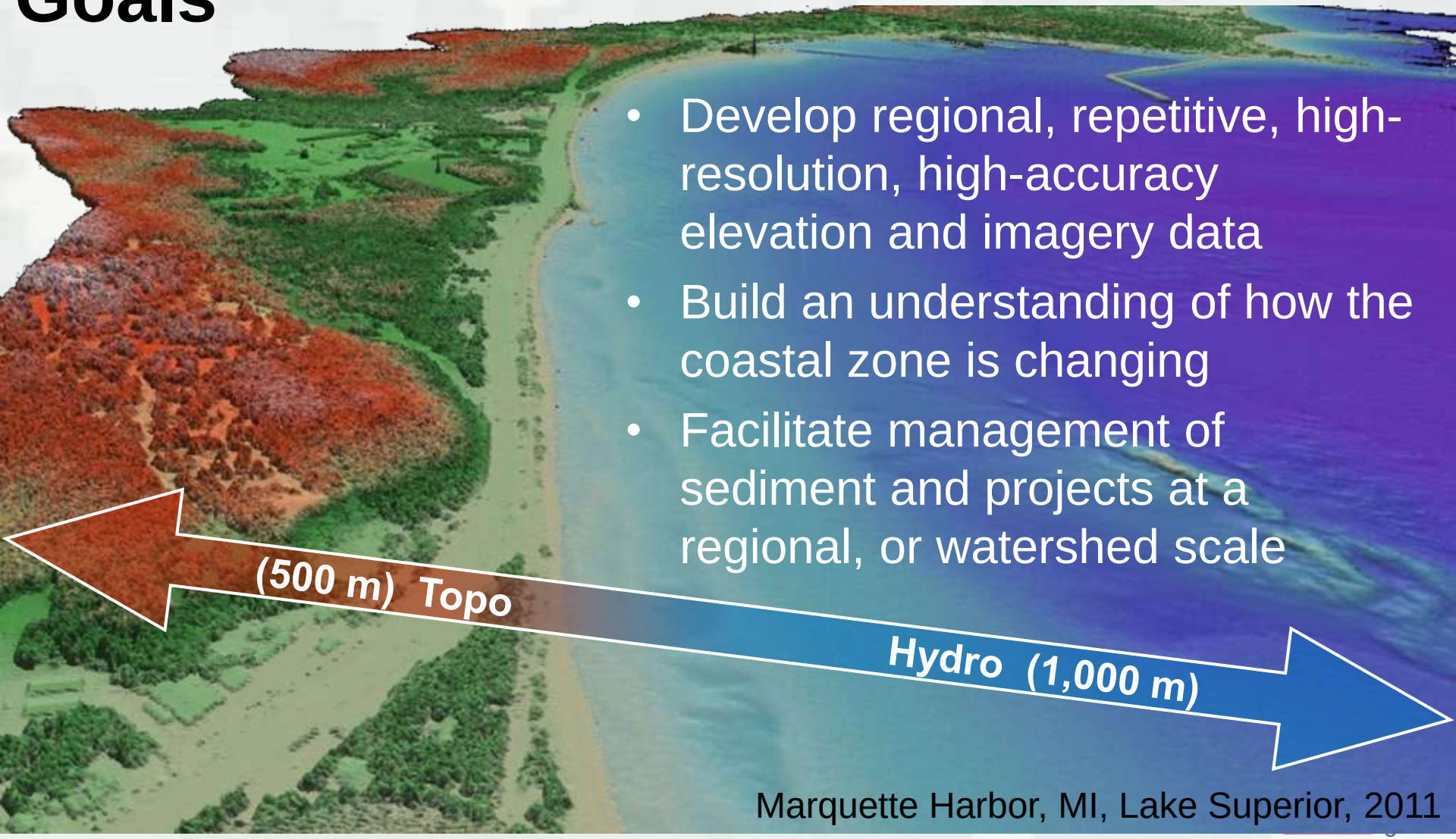
Joint Airborne Lidar Bathymetry
Technical Center of Expertise

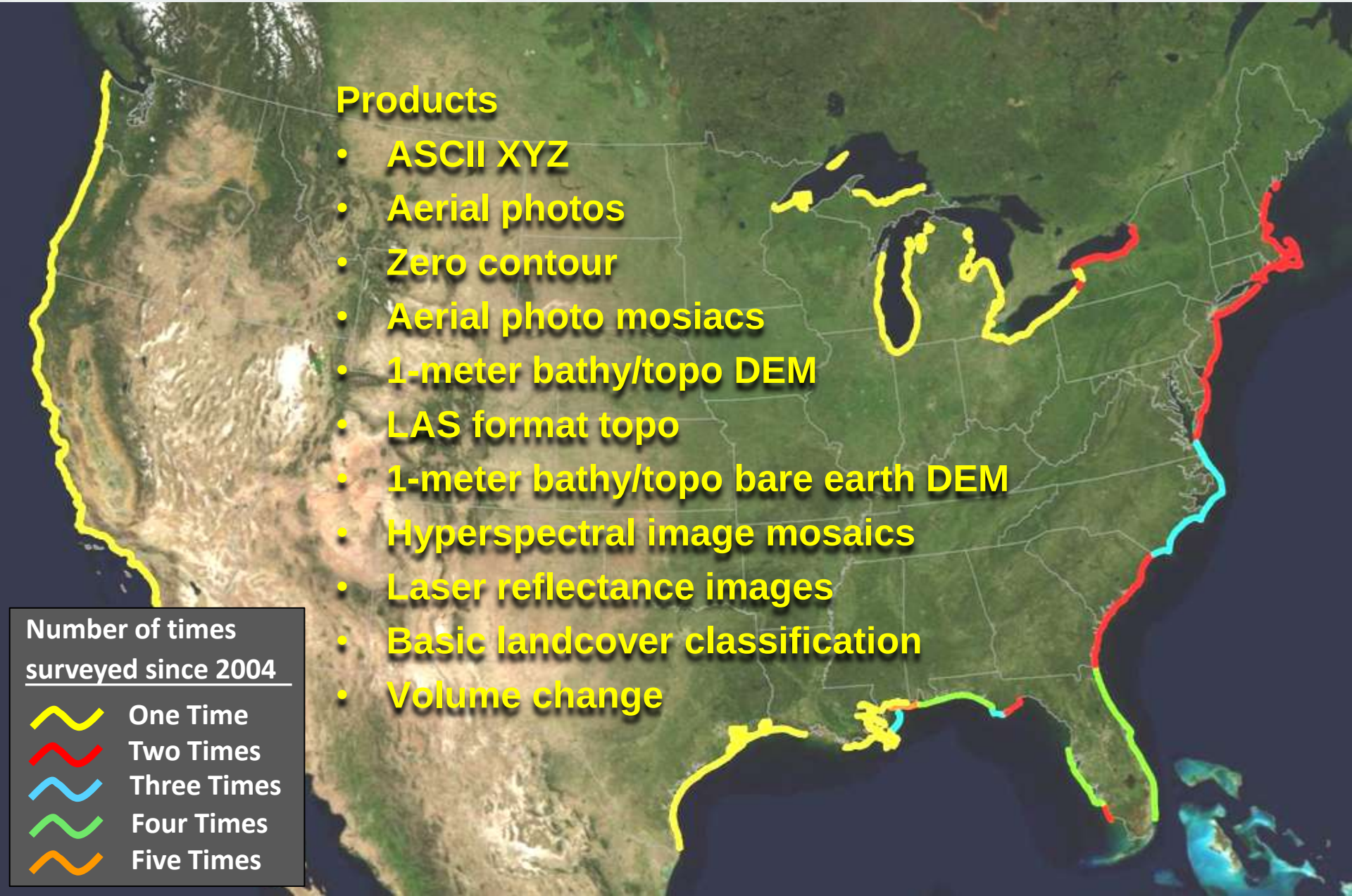
# National Coastal Mapping Program Goals



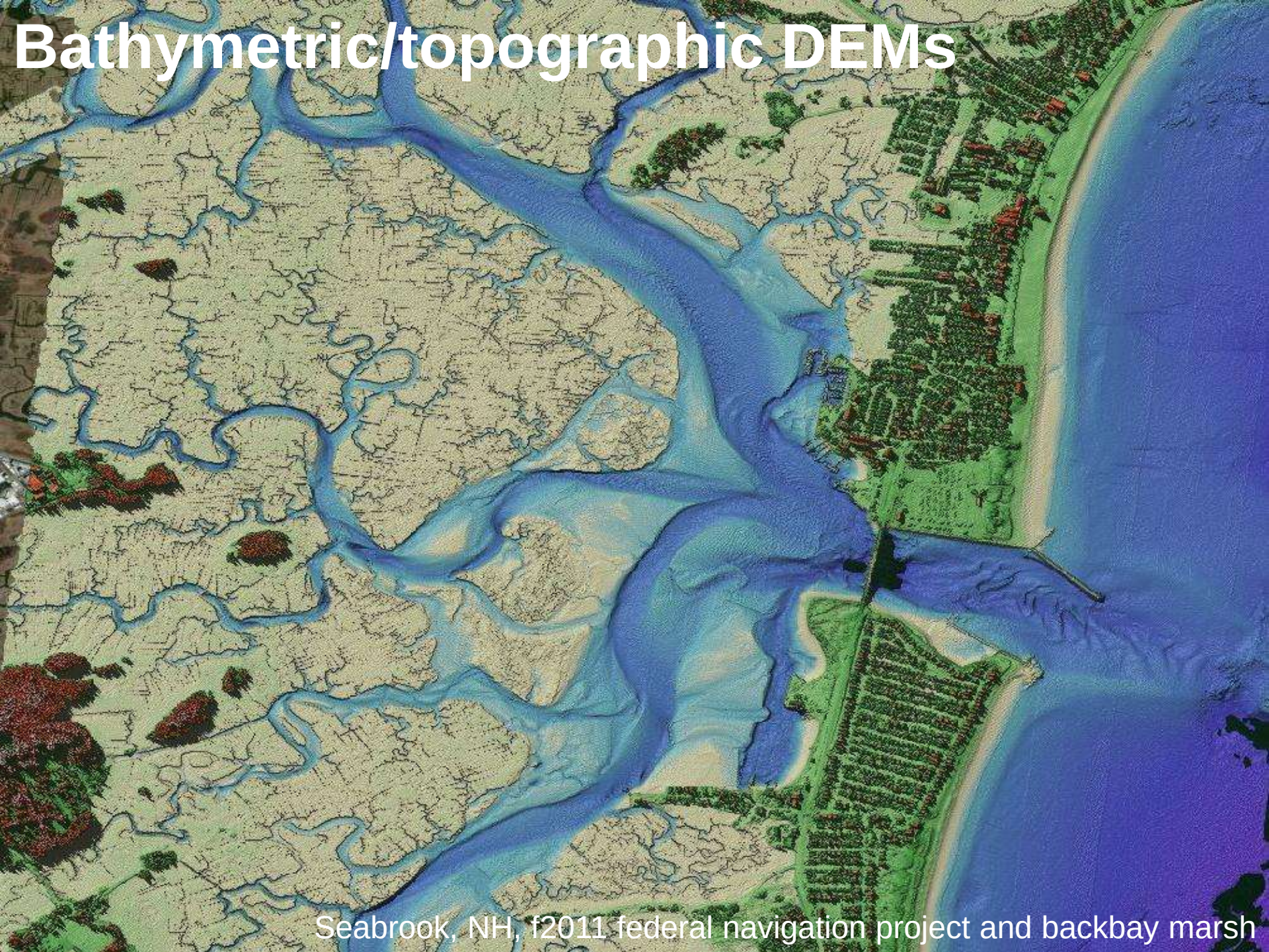

- Develop regional, repetitive, high-resolution, high-accuracy elevation and imagery data
- Build an understanding of how the coastal zone is changing
- Facilitate management of sediment and projects at a regional, or watershed scale

Marquette Harbor, MI, Lake Superior, 2011

# National Coastal Mapping Progress



# Bathymetric/topographic DEMs



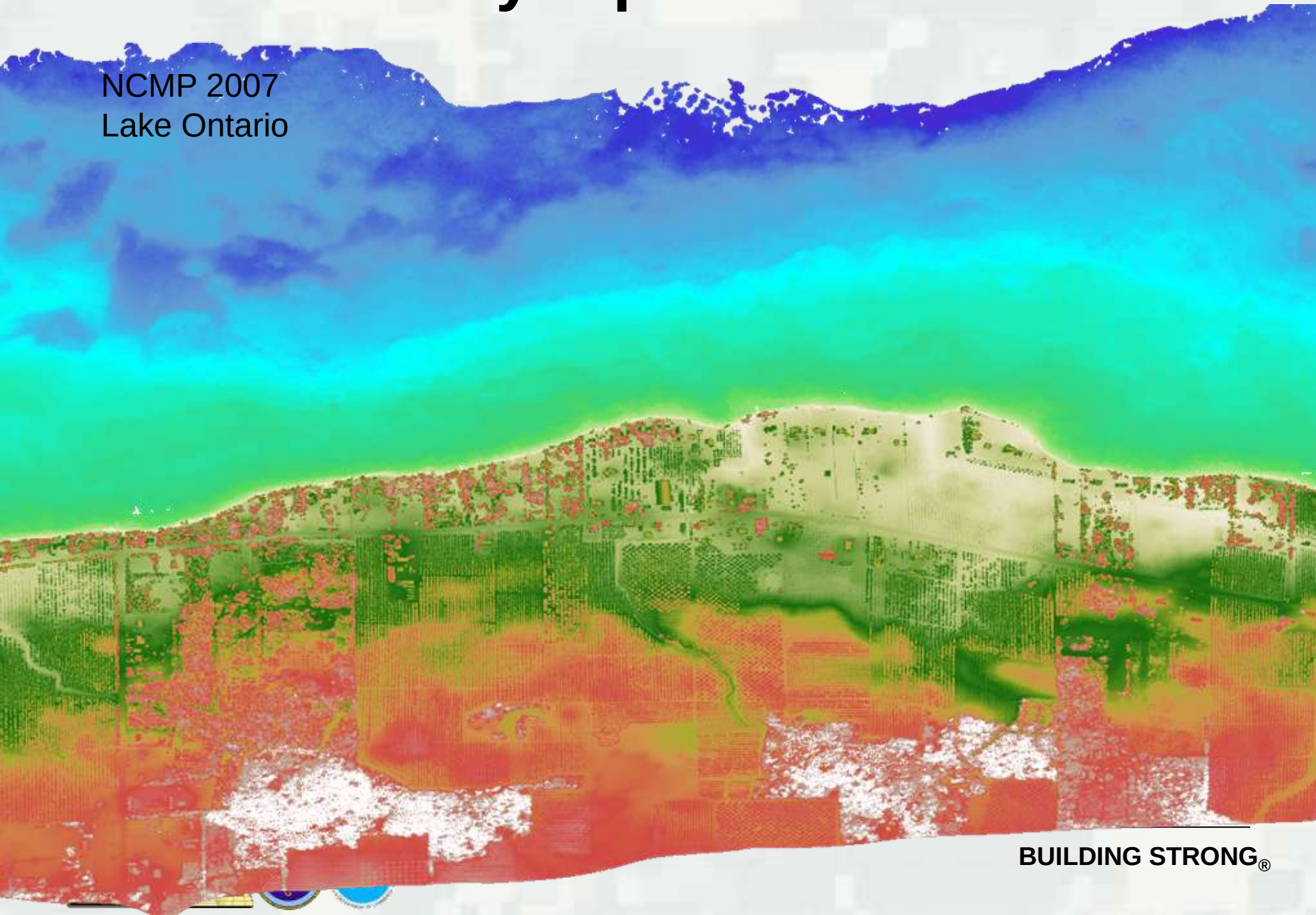
Seabrook, NH, f2011 federal navigation project and backbay marsh

# Laser reflectance image

NCMP 2010
Northampton, New Hampshire

5-m resolution

# Bare earth bathy/topo DEM

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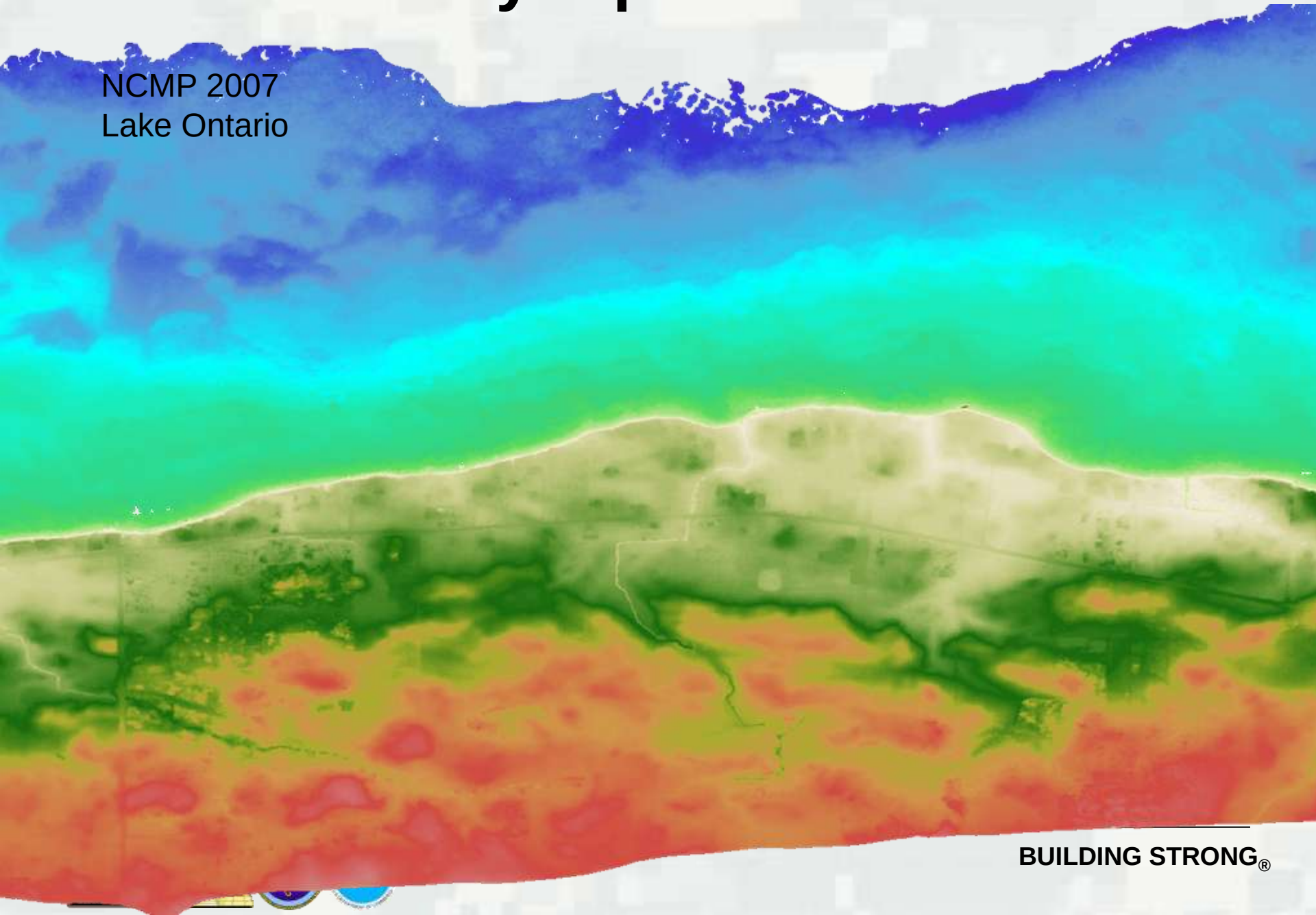
# Bare earth bathy/topo DEM



# Aerial photography

NCMP 2010
The Five Sisters, near Boston, MA

RGB imagery
20 cm

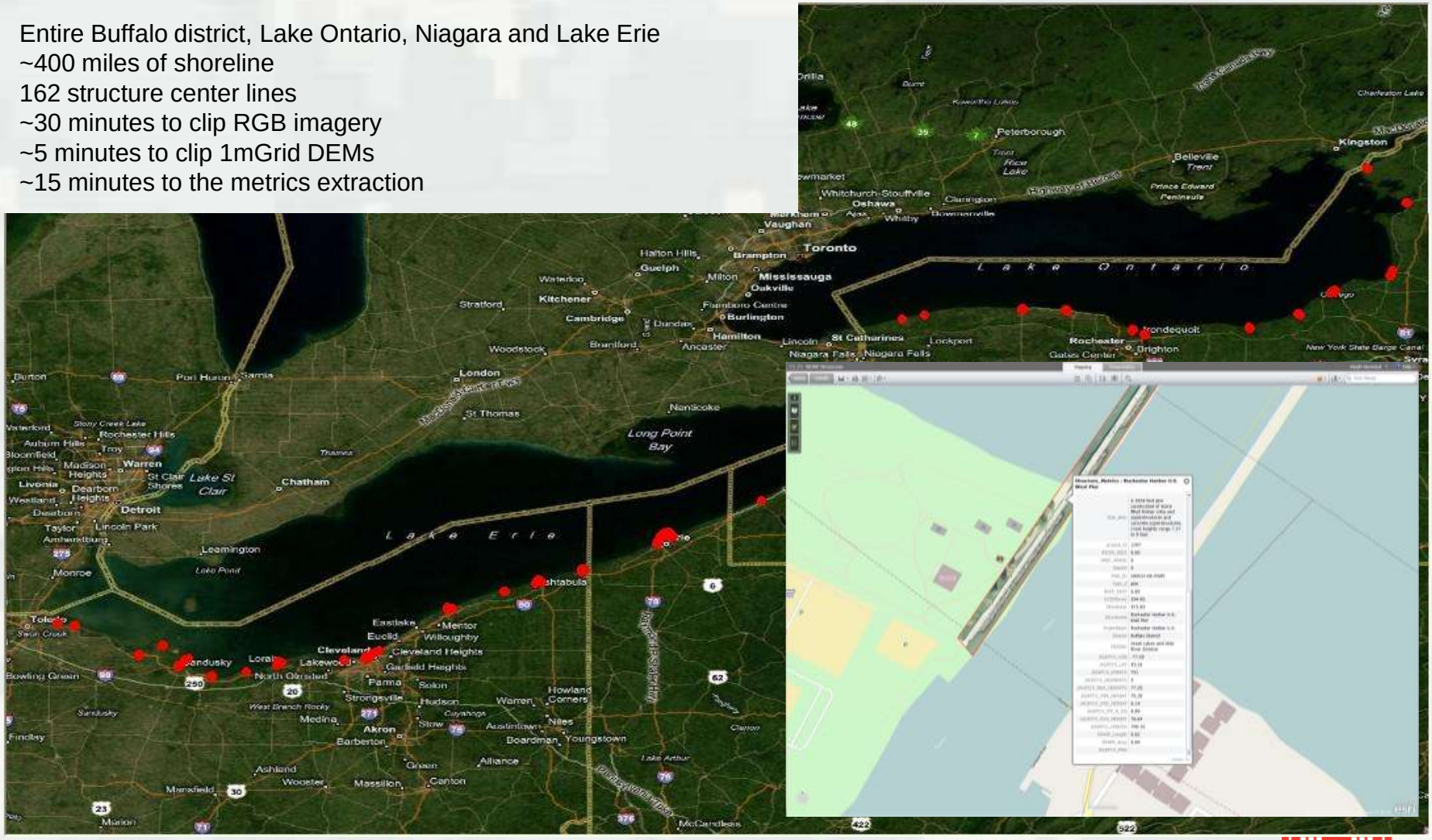
# Hyperspectral imagery

1 m pixel resolution
36 spectral bands
375-1050 nm

Seabrook, New Hampshire, 2005

# NCMP Structures

Entire Buffalo district, Lake Ontario, Niagara and Lake Erie
~400 miles of shoreline
162 structure center lines
~30 minutes to clip RGB imagery
~5 minutes to clip 1mGrid DEMs
~15 minutes to the metrics extraction




http://explorer.arcgis.com - Search NCMP; NCMP Structures Map

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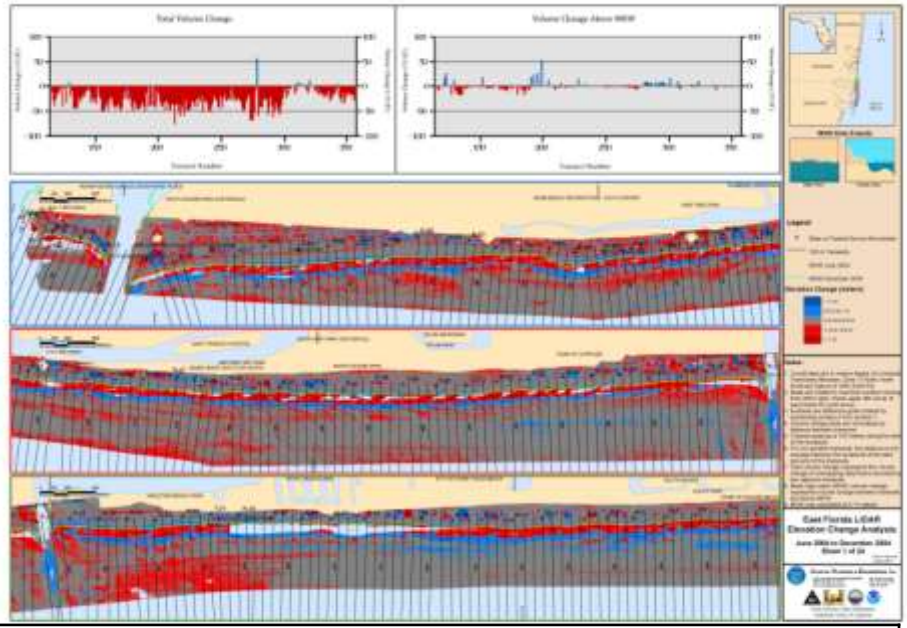
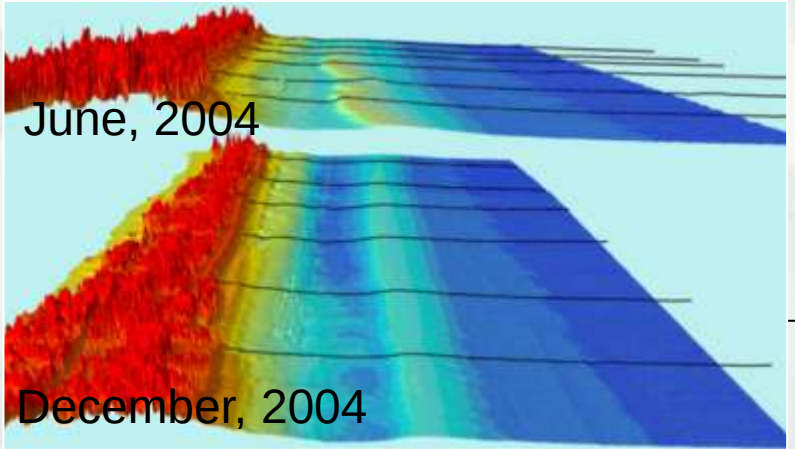
# Volume change and sediment budgets

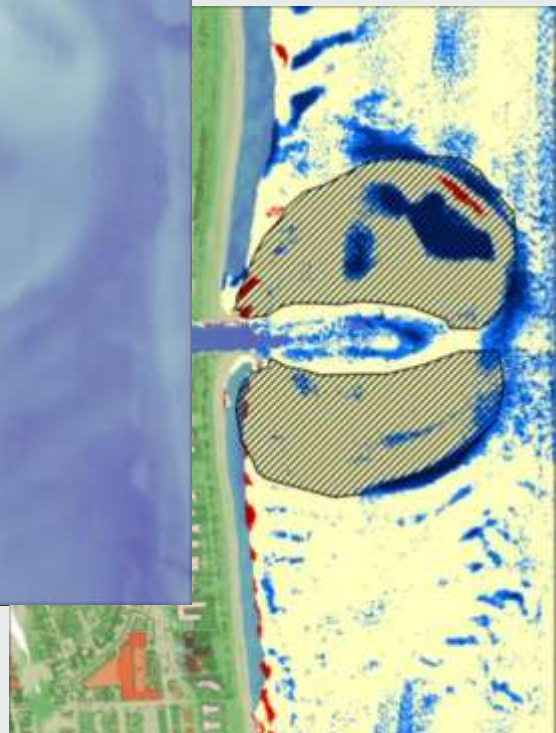


| Volume Change (CY/lf) | | | |
|---|---|---|---|
| Total | Average | Erosion | Accretion |
| -6,400 | -30 | -6,500 | 125 |

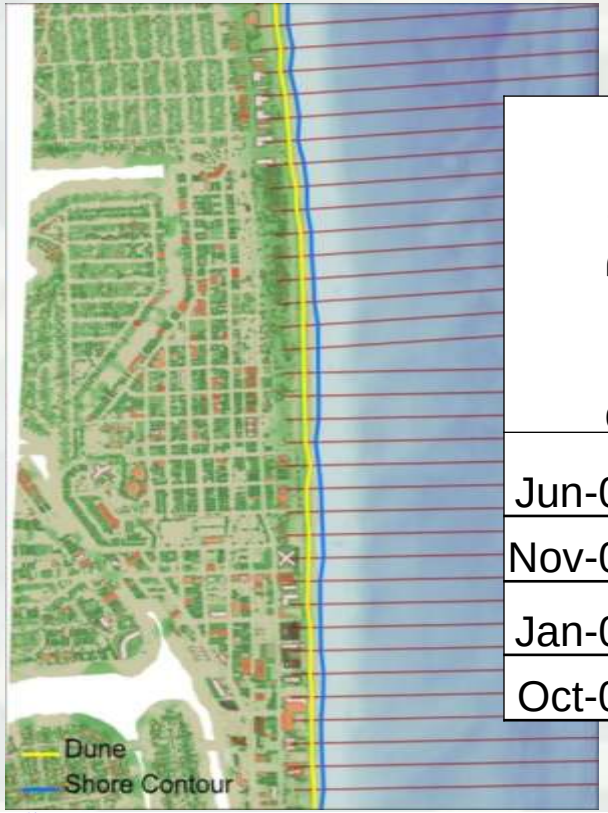
Volume Change (CY)

| Survey | North Shoal | South Shoal | Total |
|---|---|---|---|
| 10/2009--6/2004 | 266,158 | 174,736 | 440,894 |
| 10/2009--1/2006 | 232,284 | 150,703 | 382,987 |
| 1/2006--11/2004 | 106,561 | 21,548 | 128,109 |
| 11/2004--6/2004 | -81,090 | -64,643 | -145,733 |

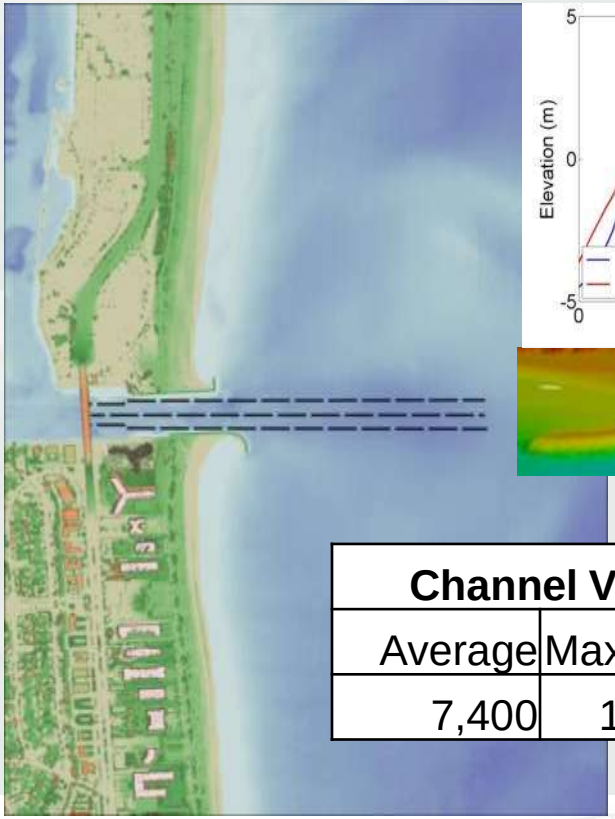


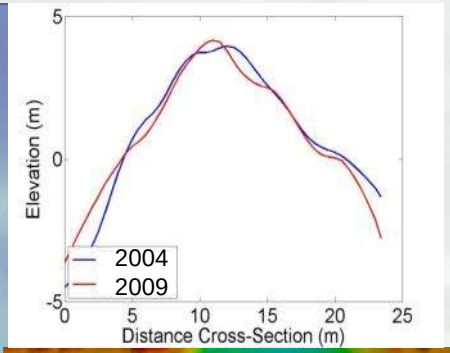


# Coastal zone and navigation monitoring

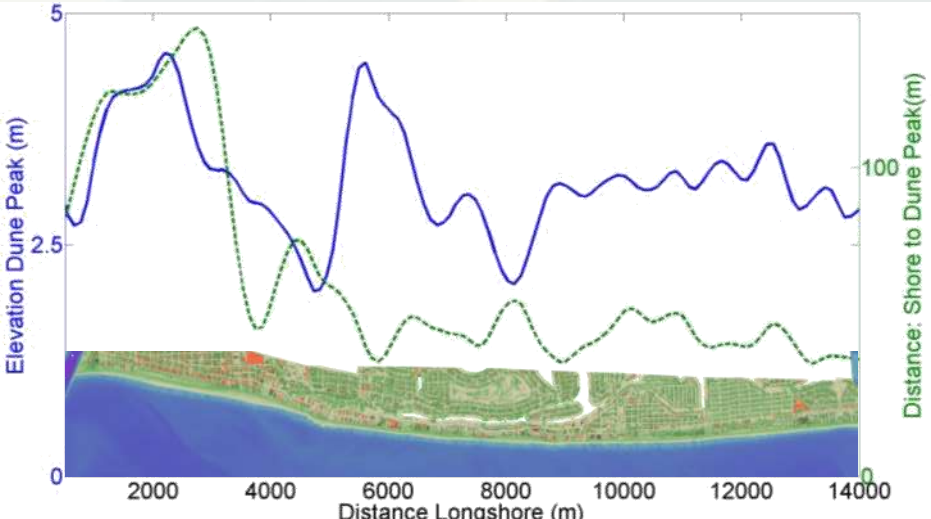


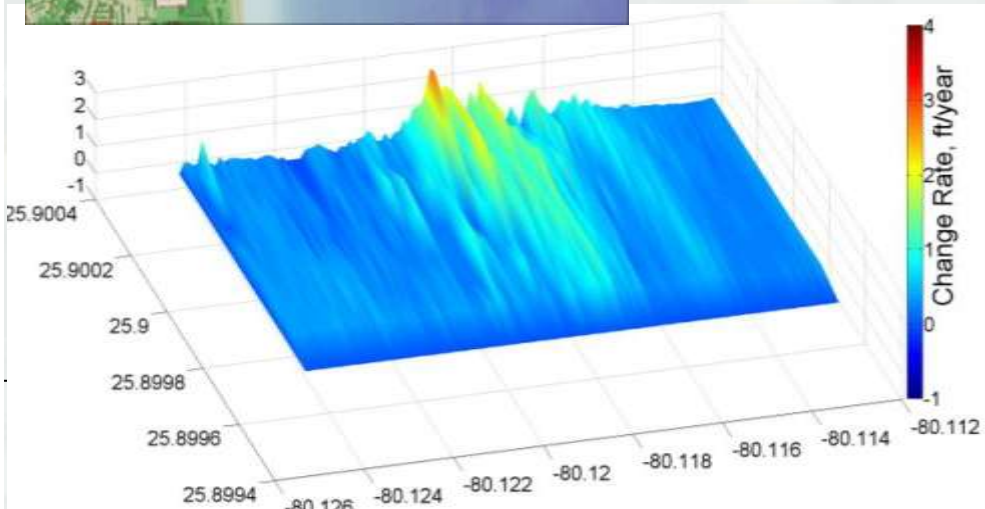

| Survey Date | Average Dune Peak (m) | Average Distance (m) |
|---|---|---|
| Jun-04 | 2.8 | 56.1 |
| Nov-04 | 2.7 | 43.1 |
| Jan-06 | 2.9 | 52.8 |
| Oct-09 | 3.3 | 63.2 |



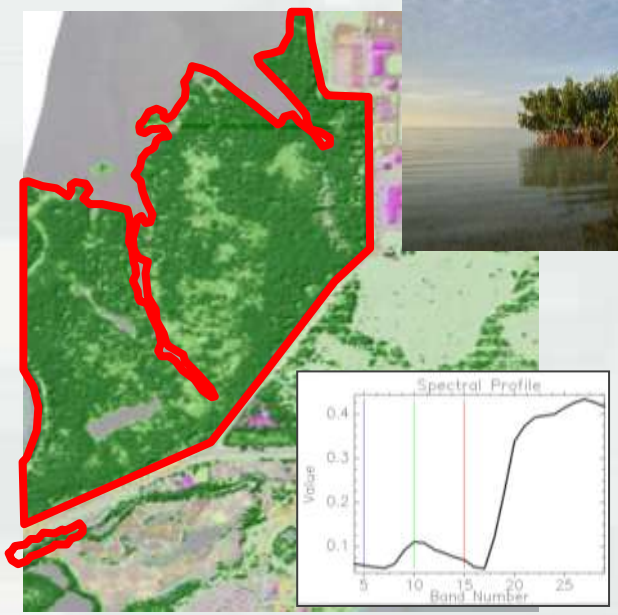



| Channel Volume CY/yr | | |
|---|---|---|
| Average | Maximum | Minimum |
| 7,400 | 12,900 | 3,900 |



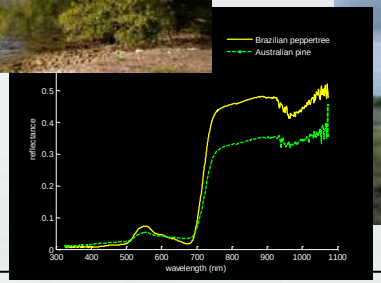



# Critical species detection



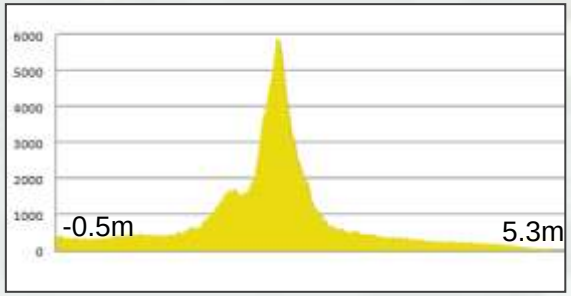
Wetland Type:
*Mangrove Swamp*
Mangrove Area:
*1.25km²*
Total Land Area:
*15km²*
Invasives Present:
*Yes*
Type:
*Australian Pine*
*Brazilian Pepper*

**Wetlands and invasive species**

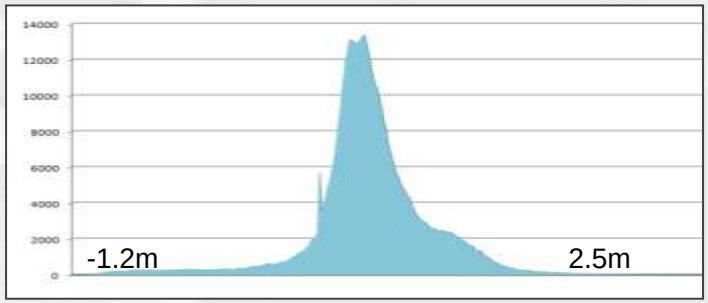


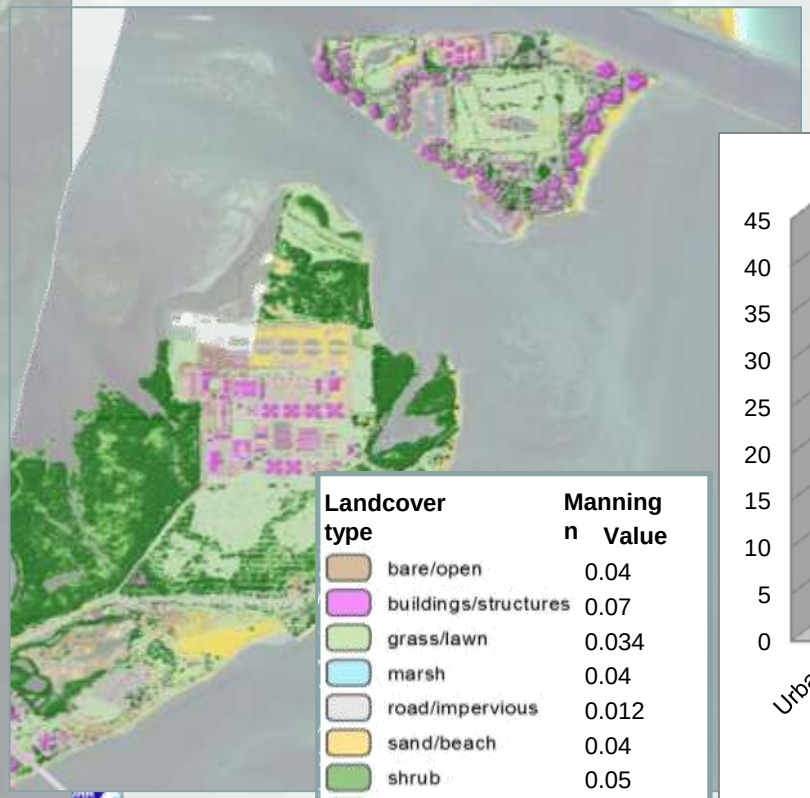
# Coastal land cover classification

Beach Elevation Distribution

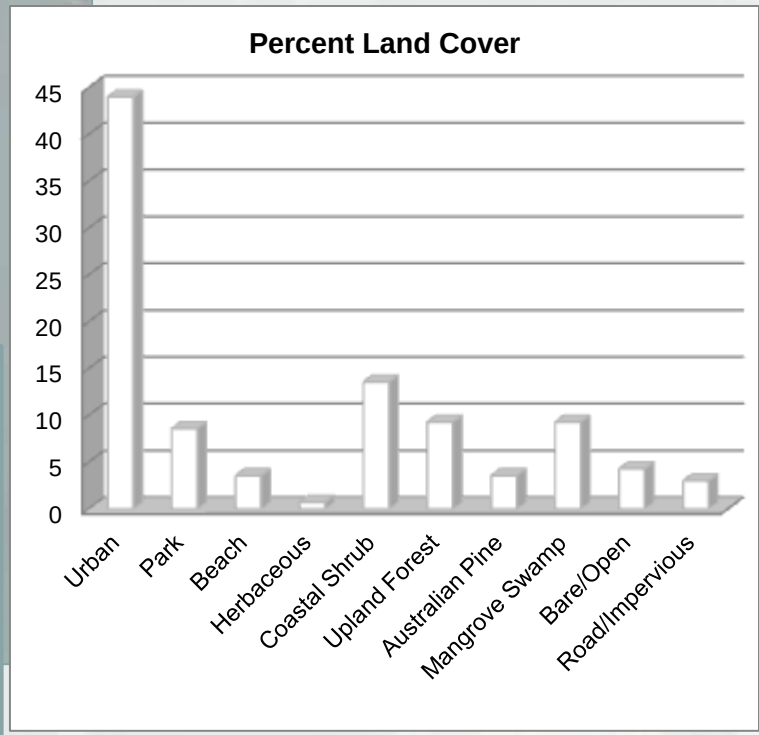



Wetland Elevation Distribution



| Landcover type | Manning n Value |
|---|---|
| bare/open | 0.04 |
| buildings/structures | 0.07 |
| grass/lawn | 0.034 |
| marsh | 0.04 |
| road/impervious | 0.012 |
| sand/beach | 0.04 |
| shrub | 0.05 |
| trees/forested | 0.12 |
| water | 0.02 |



# Questions?

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