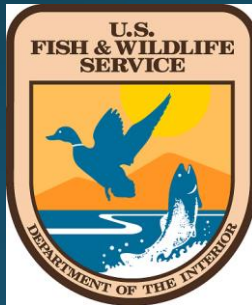


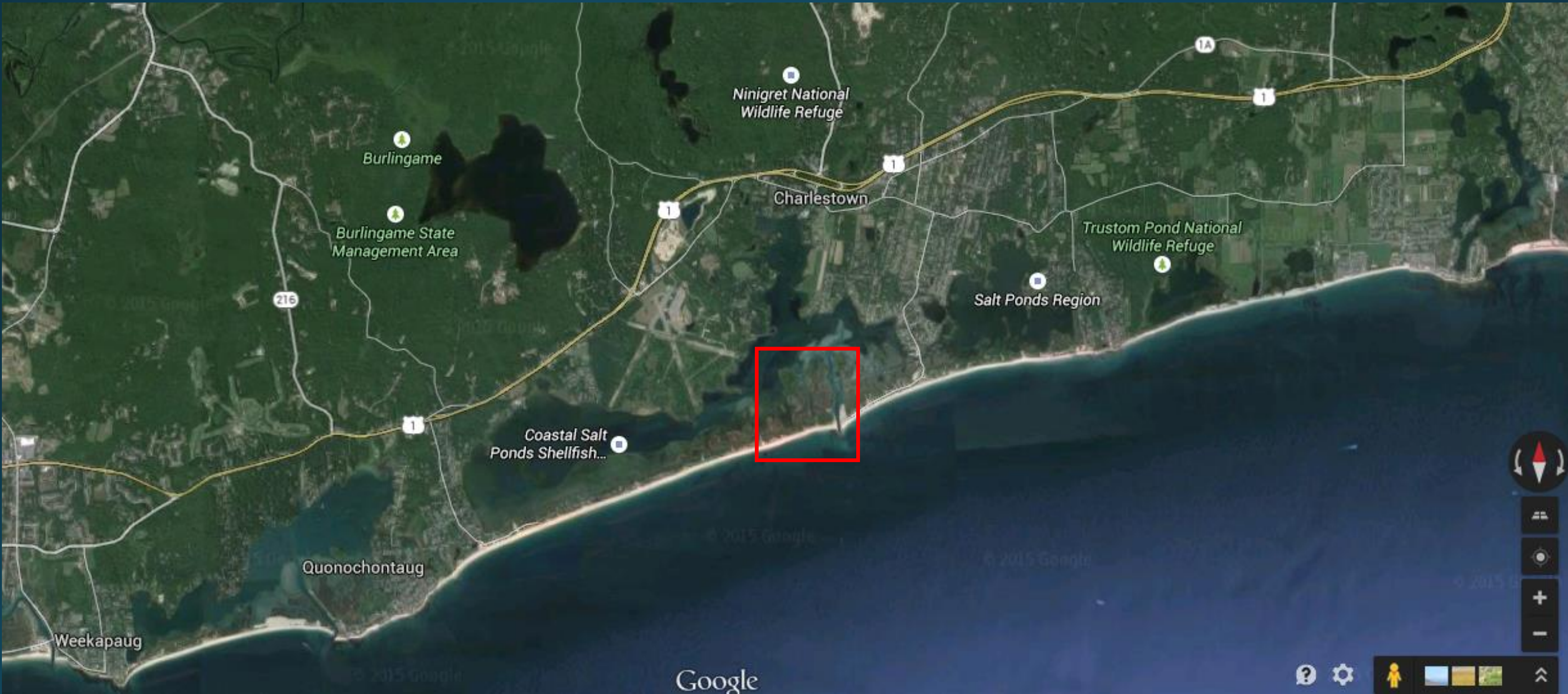
Beneficial Re-Use of Dredged Materials to Enhance Salt Marsh Resiliency in Ninigret Marsh, Charlestown, RI

Society of Wetland Scientists Annual Meeting
June 3, 2015

Caitlin Chaffee, RI Coastal Resources Management Council







The Site



South Coast Habitat Restoration Project

2002--2007

- USACE project (CRMC local sponsor)
- 40 acres of eelgrass habitat restored in Ninigret Pond
- Project maintenance plan established sediment basin to prevent future shoaling within restored eelgrass areas



Heather Island

Marshneck
Point

Ward Island

South Shore
Management Area

Charlestown Breachway

Current State of RI Marshes

- NBNERR Sentinel Site data
- RI Salt Marsh Assessment (RISMA) by Save The Bay
- EPA Research
- Statewide SLAMM modeling

Current State of RI Marshes

- Persistent flooding of marsh surface at low tide creating stagnant, shallow pools
- Vegetation die-back
- Transition of high marsh to low marsh communities
- Loss of high marsh communities







DOI Sandy Resiliency Funding

Proposed Project

- Restoration / enhancement of Ninigret Marsh using sediments dredged from approved basins
- Planning and design for similar projects in Quonochontaug and Winnapaug Ponds

DOI Sandy Resiliency Funding

Project Goals

- Increase marsh surface elevations to prevent surface ponding and allow vegetation to re-establish
- Create a mosaic of functional habitats
- Increase area of high marsh

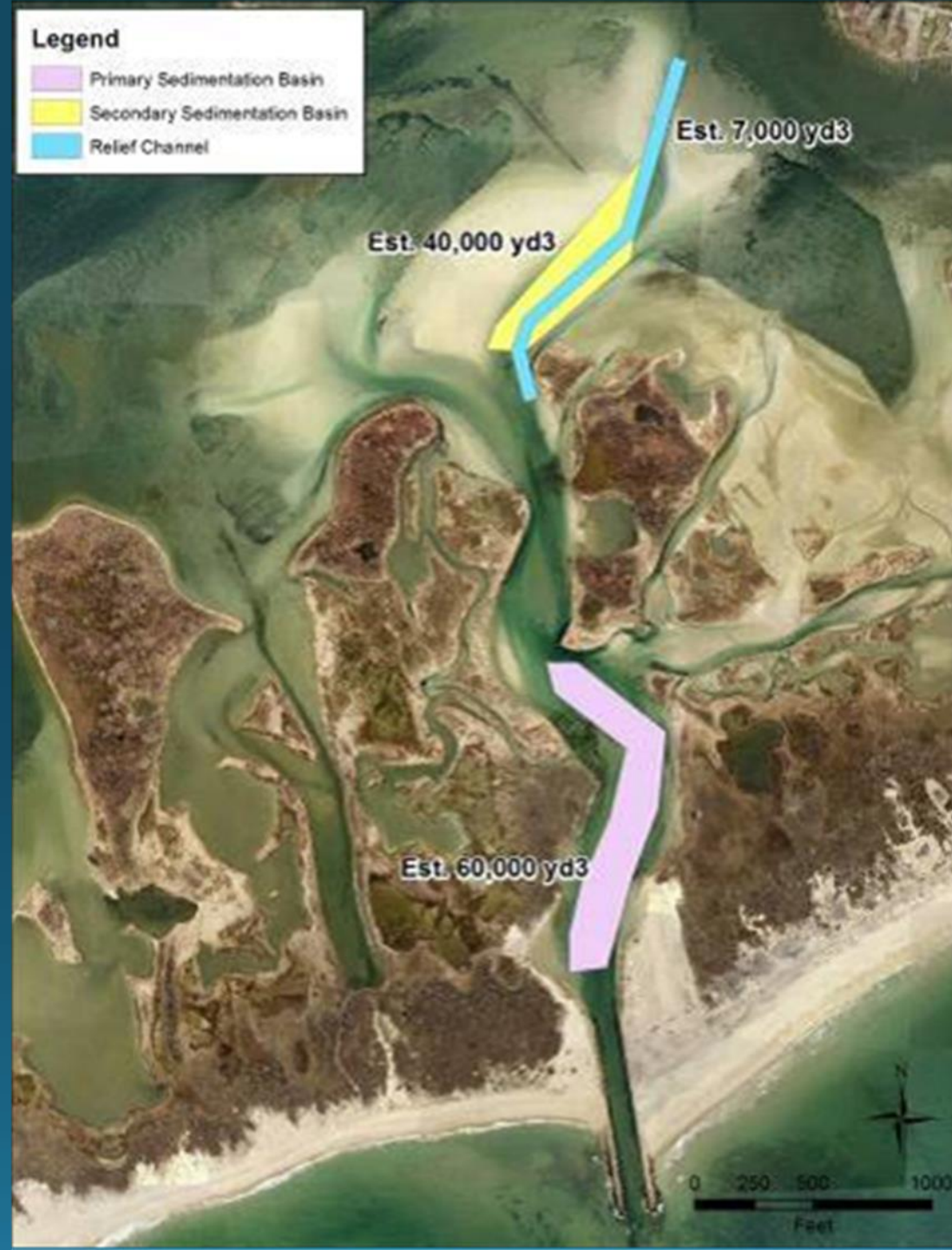
Co-Benefits

- Decrease rate of shoaling within restored eelgrass beds
- Improved recreational access to pond
- Restoration of state beach

Target Areas

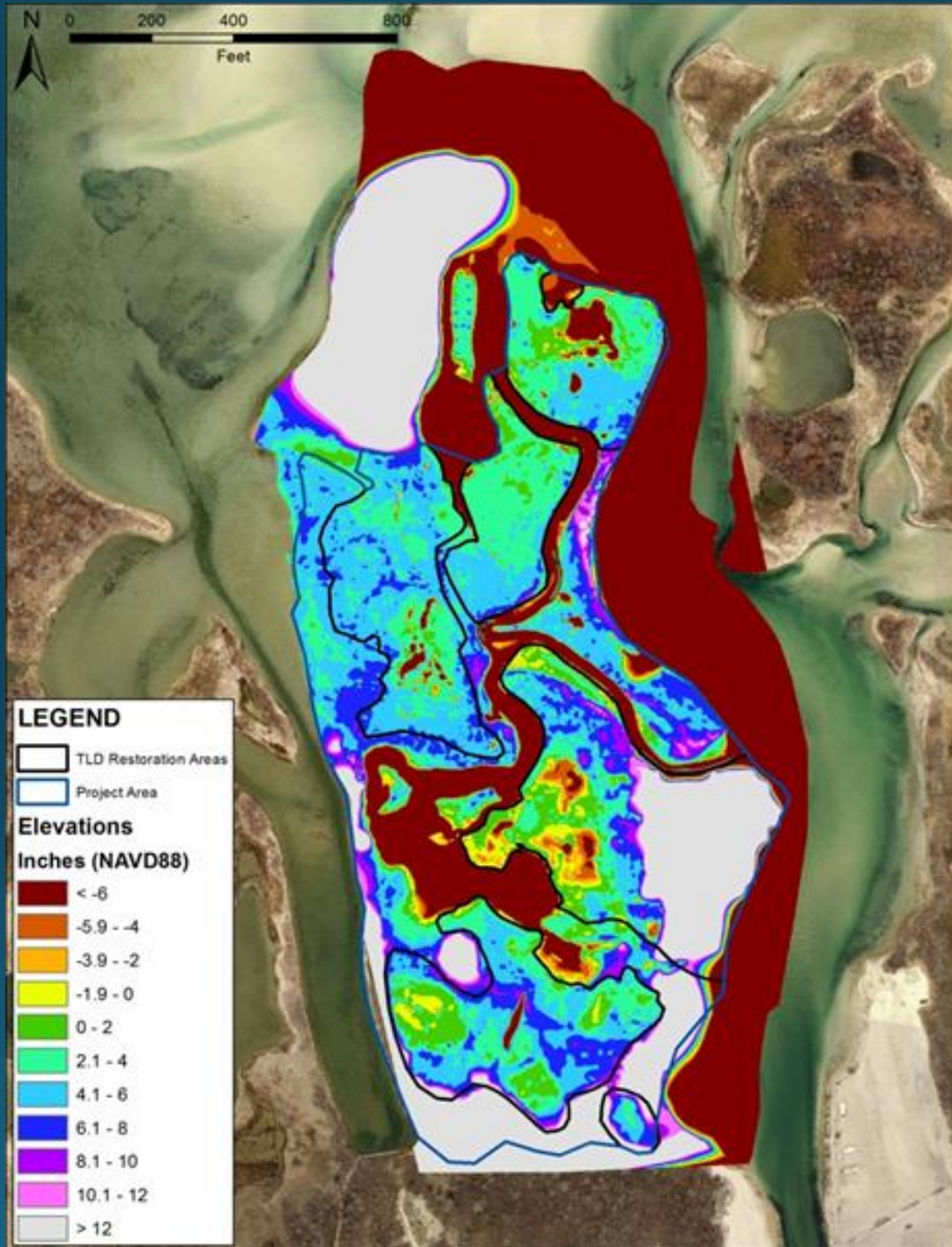


Target Areas



Site Data Collection

- RTK Elevation Data
- Vegetation Data
- Tide Data
- Soils Data

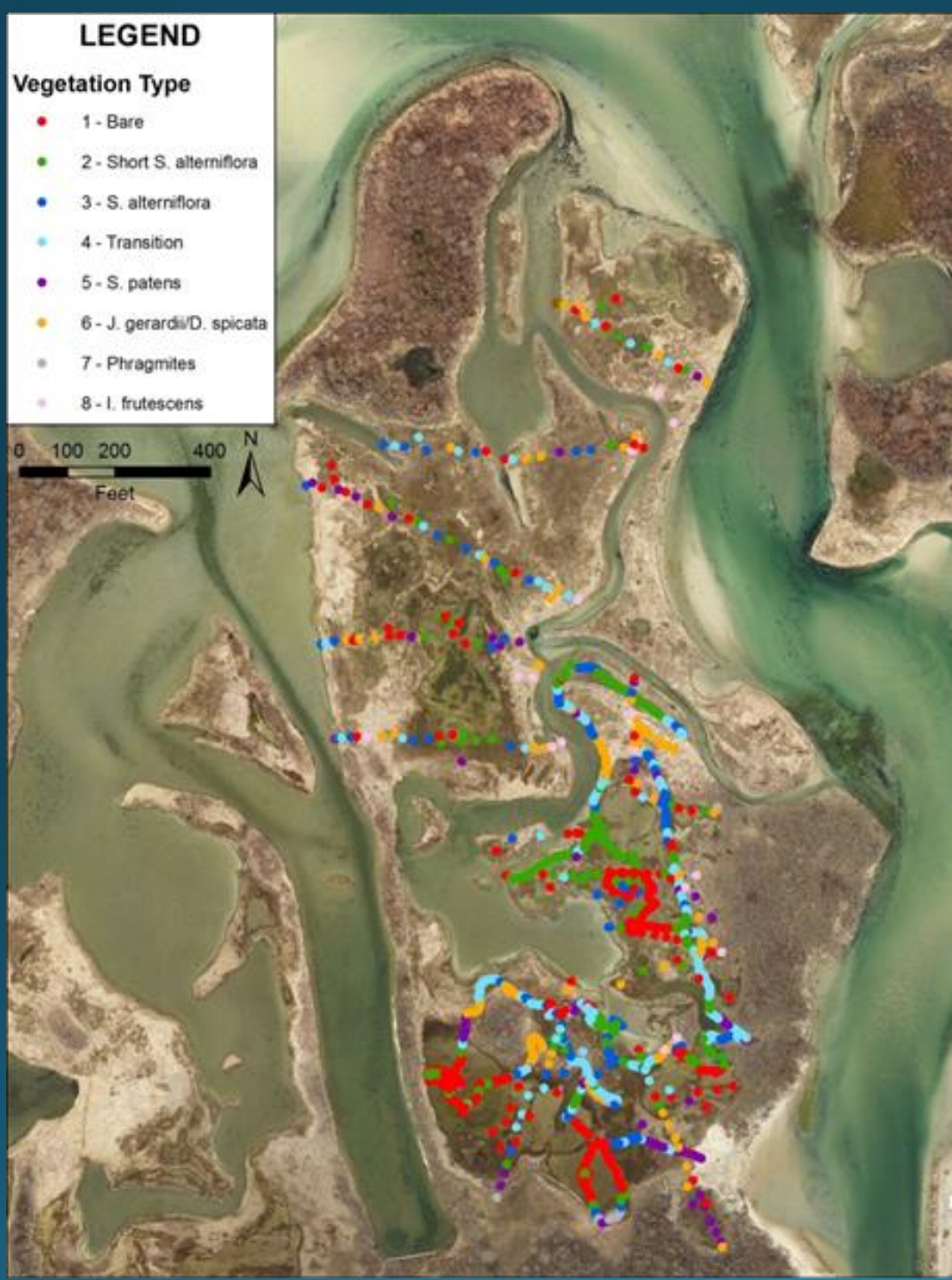
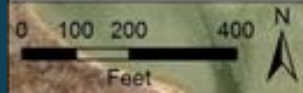




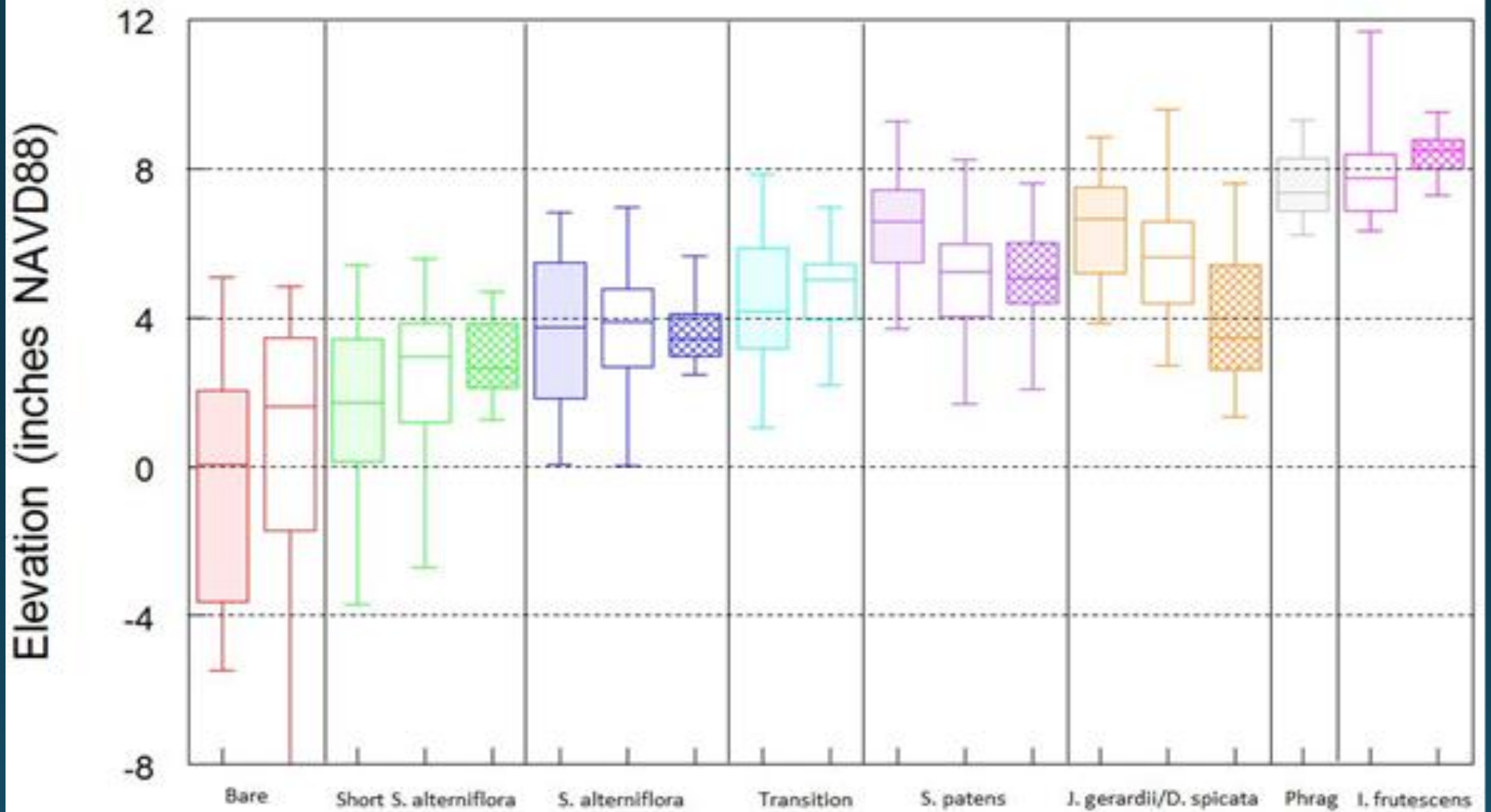
LEGEND

Vegetation Type

- 1 - Bare
- 2 - Short *S. alterniflora*
- 3 - *S. alterniflora*
- 4 - Transition
- 5 - *S. patens*
- 6 - *J. gerardii*/*D. spicata*
- 7 - *Ptfragmites*
- 8 - *I. frutescens*



Vegetation Elevation Ranges



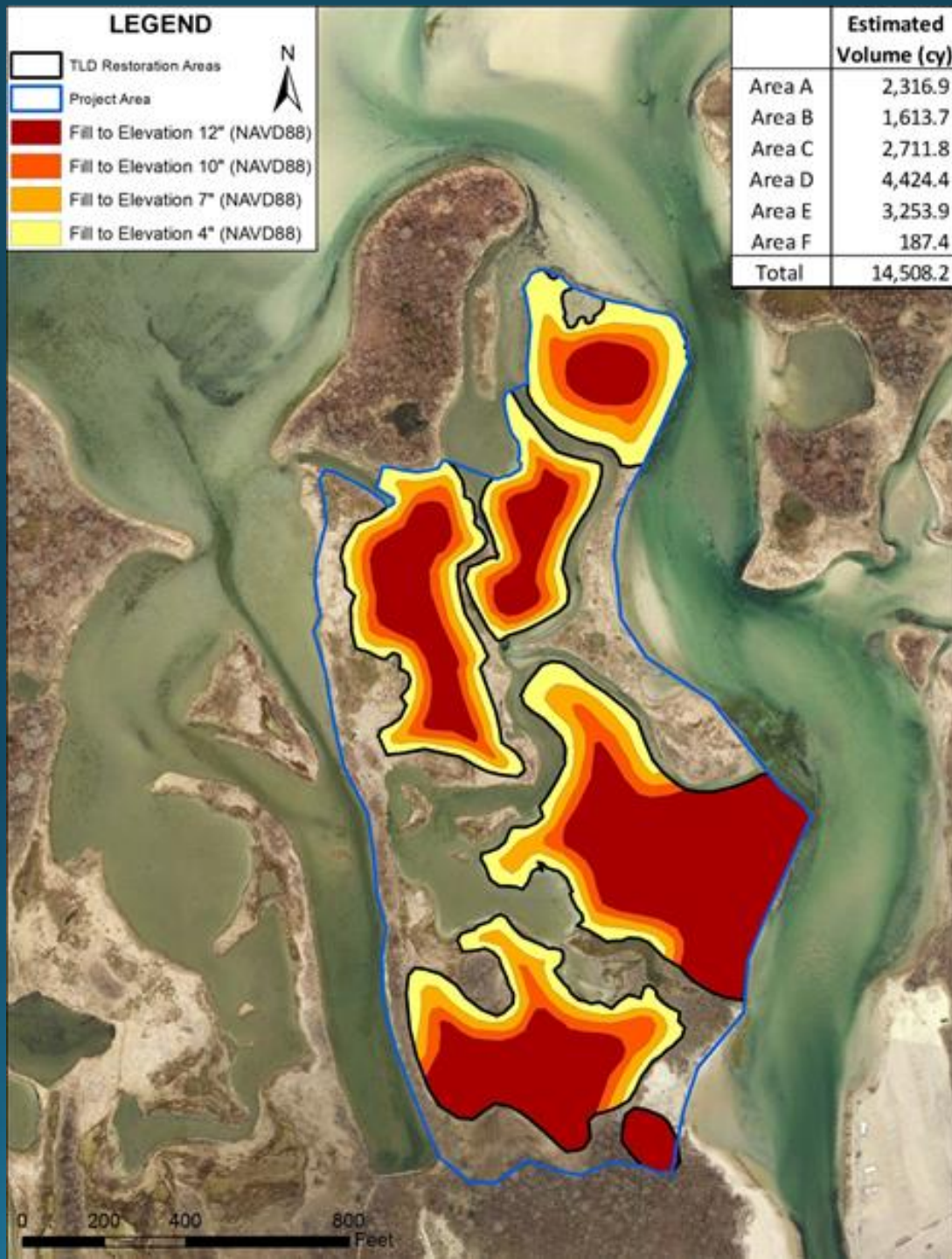
Note: Shaded boxes represent 2014 data
Unshaded boxes represent 2015 data (points)
Cross-hatched boxes represent 2015 data (polygons)

Target Elevations

Elev. 7 - 10 (inches, NAVD88) for *S. patens*, *J. gerardii*, and *D. spicata*, and

Elev. 10 - 12 (inches, NAVD88) for *Iva frutescens*.

Estimated Depths and Volumes



Monitoring Plan

(developed by STB, EPA and NBNERR)

Monitoring parameter	Method	Protocol
<i>Vegetation</i>		
Species composition & abundance*	Point intercept	Roman et al. 2001
Plant height (<i>dominant vegetation</i>)	Measurement of plants	Roman et al. 2001
Photos of veg plots*	Digital photography	K. Raposa, pers. comm.
Stem density per species	Stem counts	Roman et al. 2001
Above ground production	Clip plots	Morris and Haskin 1990, modified
Belowground macro-organic matter	Soils core analysis	Twohig and Stolt 2011
Photo points	Digital photography	K. Raposa, pers. comm.

Monitoring Plan (cont.)

Monitoring Parameter	Method	Protocol
Hydrology		
Water level*	Water level loggers	Turner 2011
Avian		
Species composition & abundance**	Point counts	Saltmarsh Habitat and Avian Research Program protocols (www.tidalmarshbirds.org)
Nekton		
Species composition & abundance*	Throw traps	Raposa and Roman, 2001
Crab density	Burrow counts	K. Raposa, unpublished data
Sediment Elevation & Accretion		
Elevation surveys*	RTK	Messaros et al. 2012
Surface elevation & accretion*	SETs and marker horizons	Cahoon et al. 2006
Subsidence and sediment accretion	6" ceramic tiles	Neubauer et al. 2002, modified
Soil Characteristics		
Shear strength	Shear vane	Turner 2011

Control Site



100 50 0 100 Meters

Impact Site



100 50 0 100 200 300 400 Meters

Thanks!

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