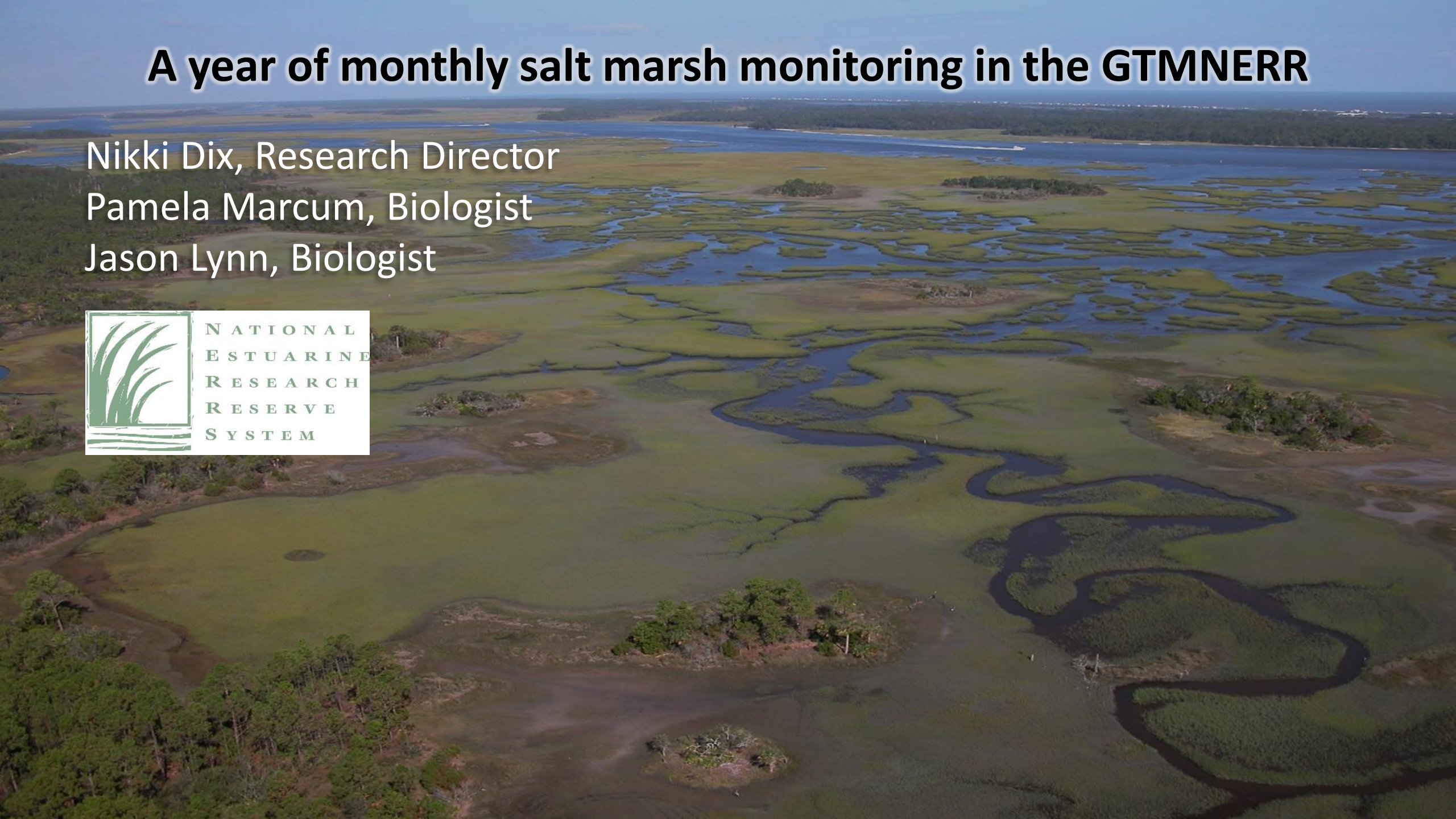
A year of monthly salt marsh monitoring in the GTMNERR

Nikki Dix, Research Director
Pamela Marcum, Biologist
Jason Lynn, Biologist

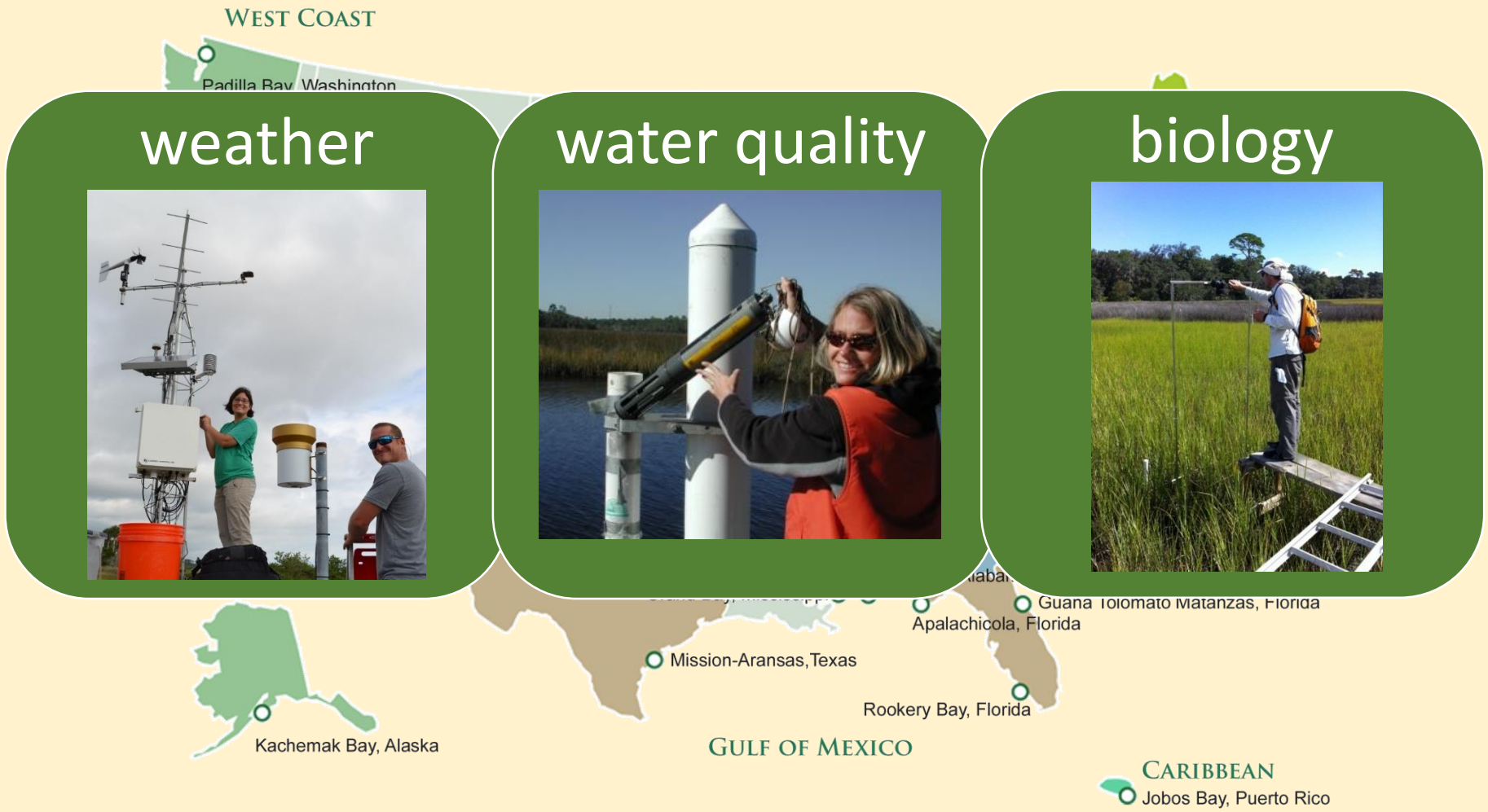


National Estuarine Research Reserve System

(NERRS)

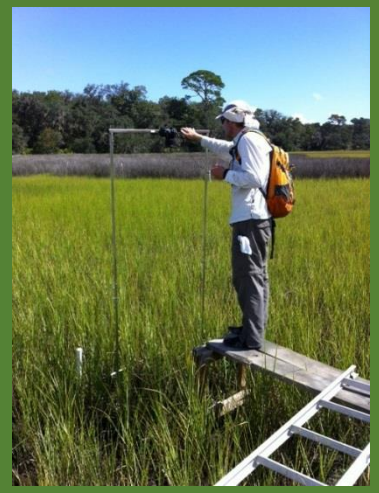
System-Wide Monitoring Program

(SWMP = “swamp”)



Biological Monitoring

biology



Potential changes due to:

- **Climate change**
- **Development**
- **Invasive species**
- **Storms**
- **Hydrologic alterations**

NERRS SWMP Vegetation Monitoring Protocol

Long-term Monitoring of Estuarine Vegetation Communities

National Estuarine Research Reserve System
Technical Report

Vegetation Monitoring Workgroup
Chair, Dr. Kenneth Moore, Research Coordinator
Chesapeake Bay National Estuarine Research Reserve System in Virginia
Gloucester Point, VA 23062

9/6/2013

Southeast Coast Network

National Park Service
Inventory & Monitoring Program

Standard Operating Procedure (SOP) #1.3.9

Photoplot-based Monitoring of Salt Marsh Vegetation

Please cite this as:

Curtis, A.C., J. Asper, S. Eastman, and L. C. Baron. 2013. Photoplot-based monitoring of salt marsh vegetation. Southeast Coast Network Standard Operating Procedure NPS/SECN/SOP-1.3.9

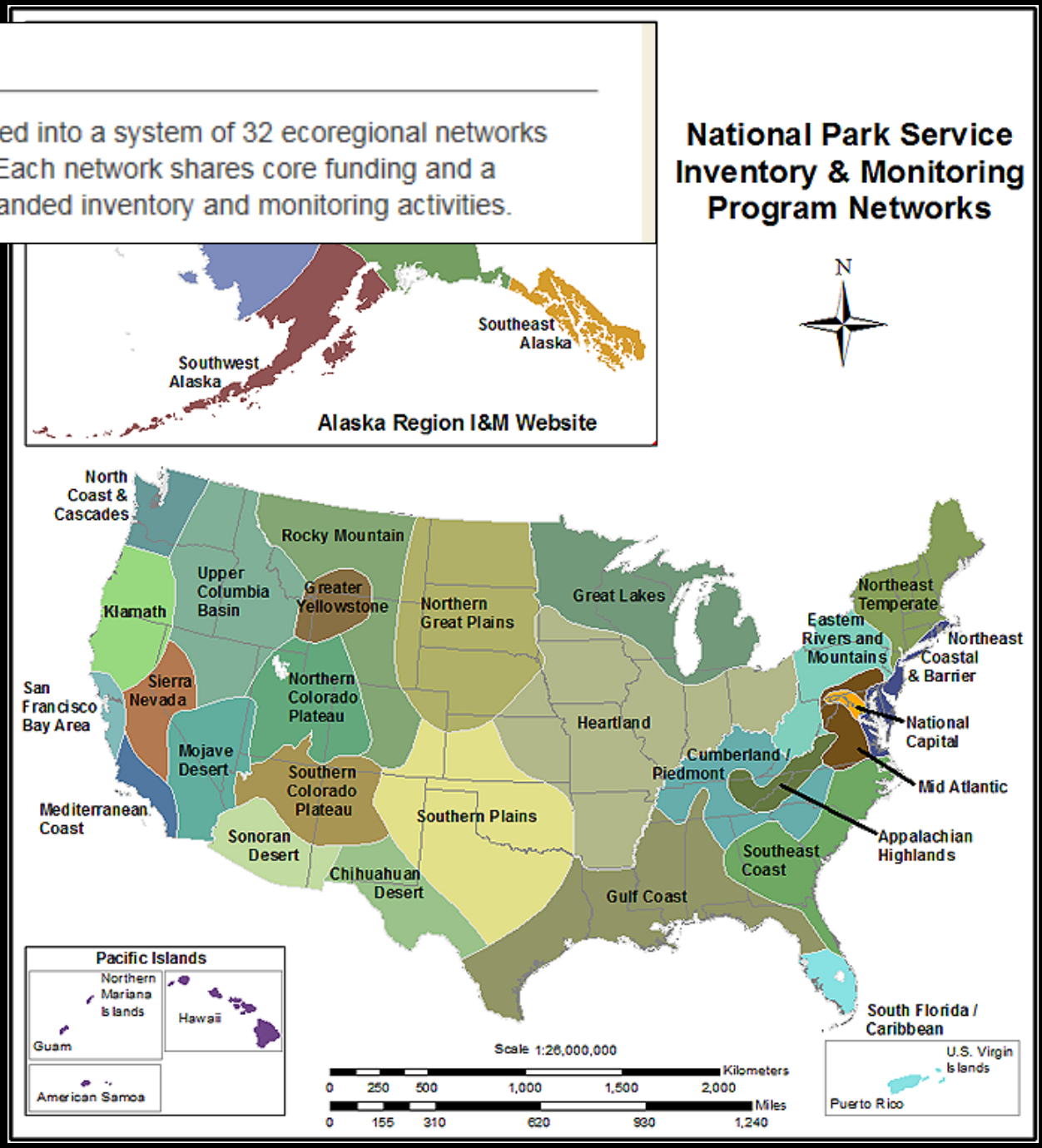
Summary

The following Standard Operating Procedure (SOP) is for assessing salt marsh vegetation composition and abundance on an annual basis using the total vegetation cover and average height of the dominant plant species. The following procedures for salt marsh vegetation monitoring are adapted from a number of sources, including: NERRS SWMP Bio-Monitoring Protocol, Long-term Monitoring of Estuarine Submersed and Emergent Vegetation Communities (Moore 2009); Louisiana Department of Natural Resources Coastal Resource Division protocol (Folse and West 2004); and, Monitoring Salt Marsh Vegetation, A Protocol for the Long-term Coastal Ecosystem Monitoring Program at Cape Cod National Seashore (Roman et al. 2001).

Background

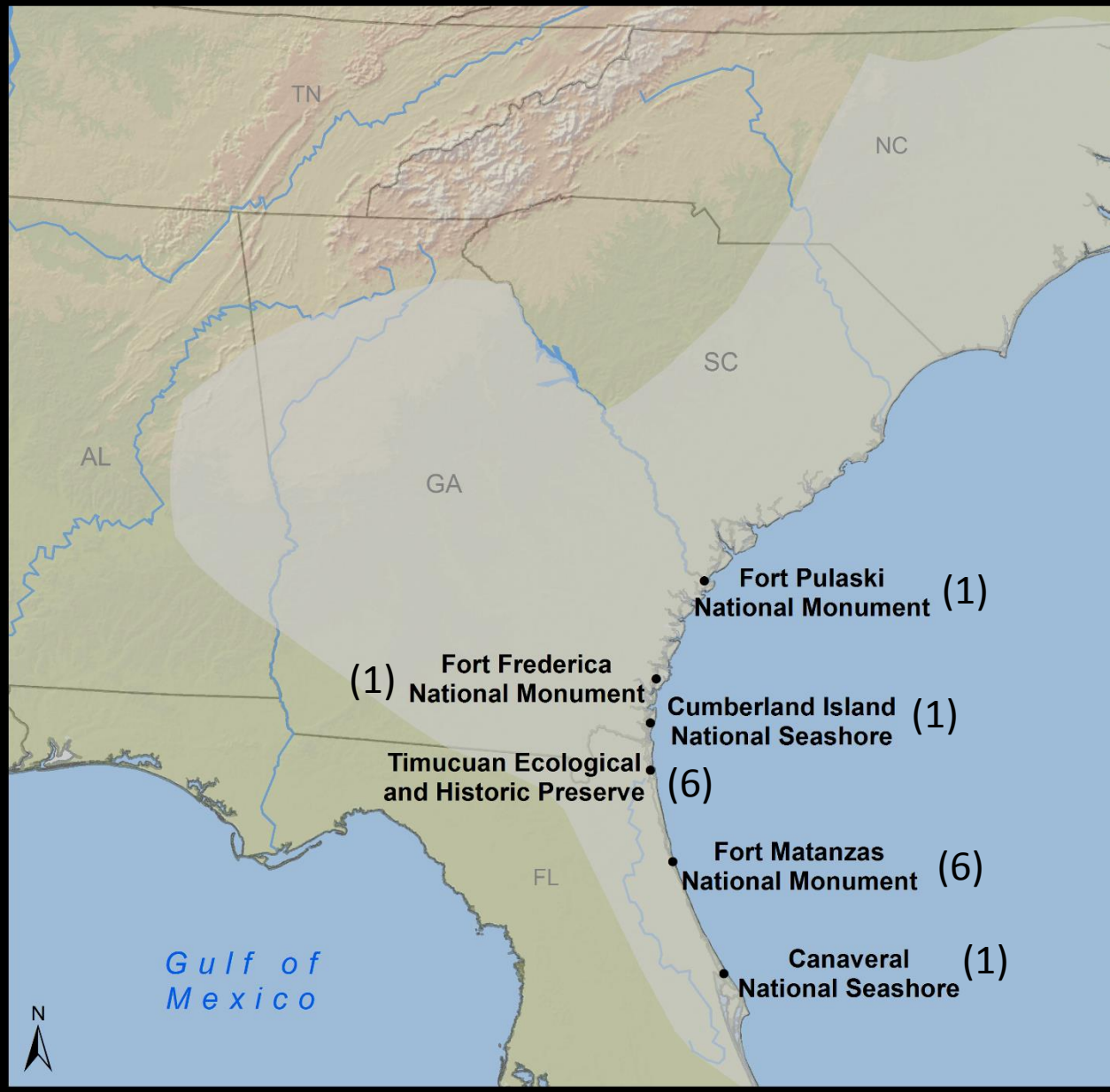
More than 270 parks with significant natural resources are organized into a system of 32 ecoregional networks linked by similar geographic and natural resource characteristics. Each network shares core funding and a professional staff to provide an efficient means of carrying out expanded inventory and monitoring activities.

http://science.nature.nps.gov/im/networks.cfm



Southeast Coast Network
Salt Marsh Monitoring

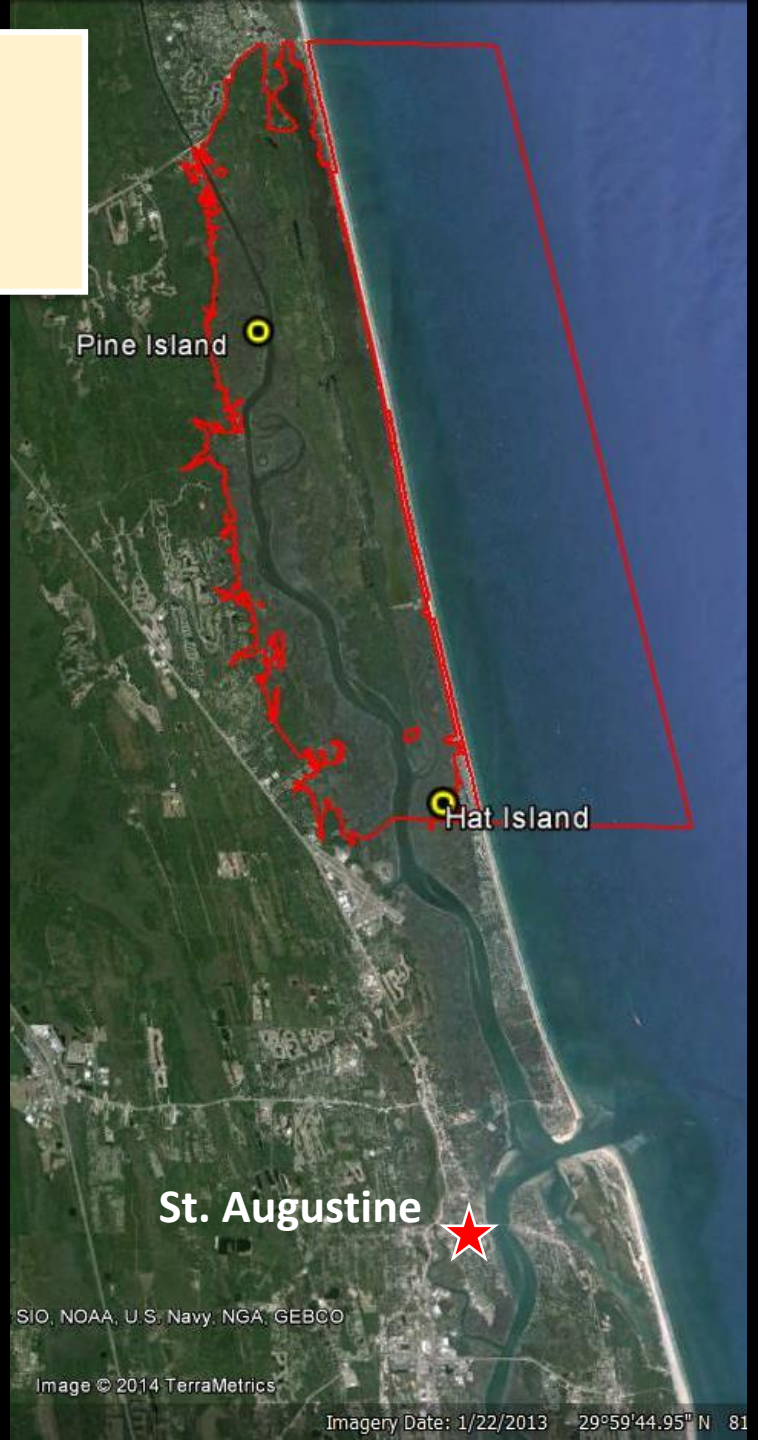
Southeast Coast Network
National Park Service
U.S. Department of the Interior

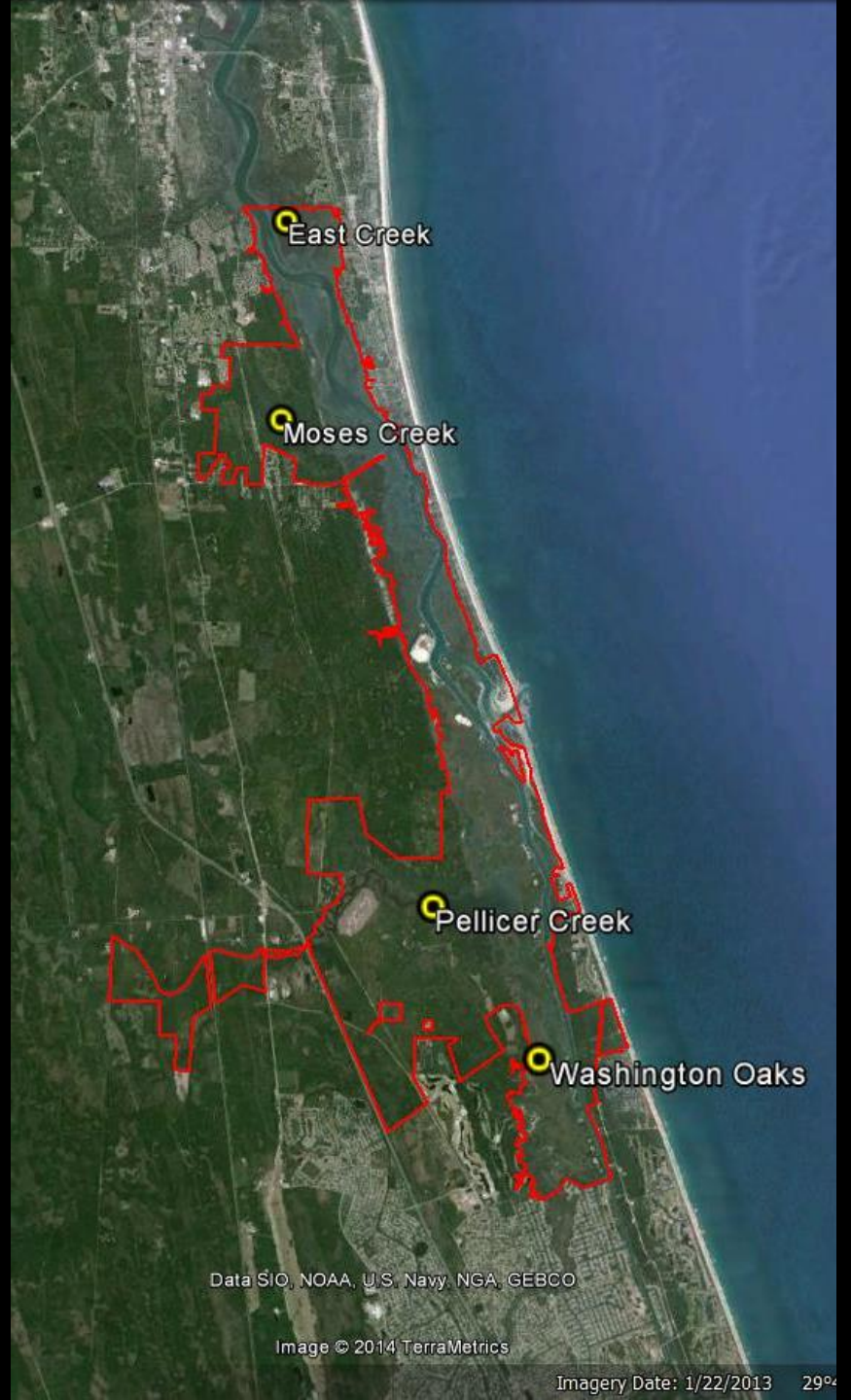


Lisa Cowart Baron, Coastal Ecologist
National Park Service
Southeast Coast Inventory & Monitoring Network
135 Phoenix Road
Athens, GA 30605
706.424.2390 (cell)
706.425.2096 (office)*no voicemail*
Lisa_Baron@nps.gov

For more information about the Southeast Coast Network, please check out our web page at http://science.nature.nps.gov/im/units/secn/index.cfm or follow us on Twitter @SECoastNetwkNPS.

> 8,000 acres saltmarsh

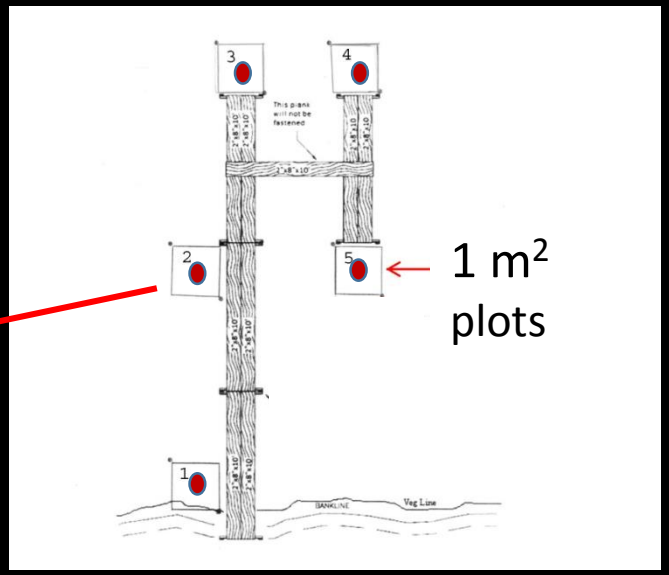





Vegetation Plot 3
Vegetation Plot 4
Accretion Plot
Accretion Plot
Soil Pore Water Plot
RSET
Accretion Plot
Vegetation Plot 2
Vegetation Plot 5
1 meter square plot
BOARDWALK
1 ½" PVC markers
**Not to Scale
1 Vegetation Plot
BANKLINE

Methods

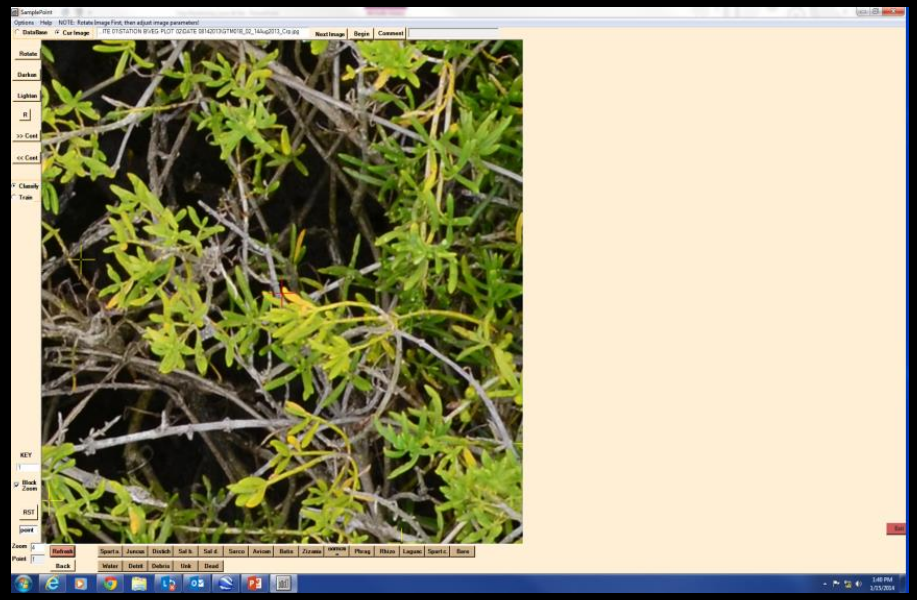
- Images
- Percent Cover
- Canopy Height



Methods

- Calculated

  percent cover

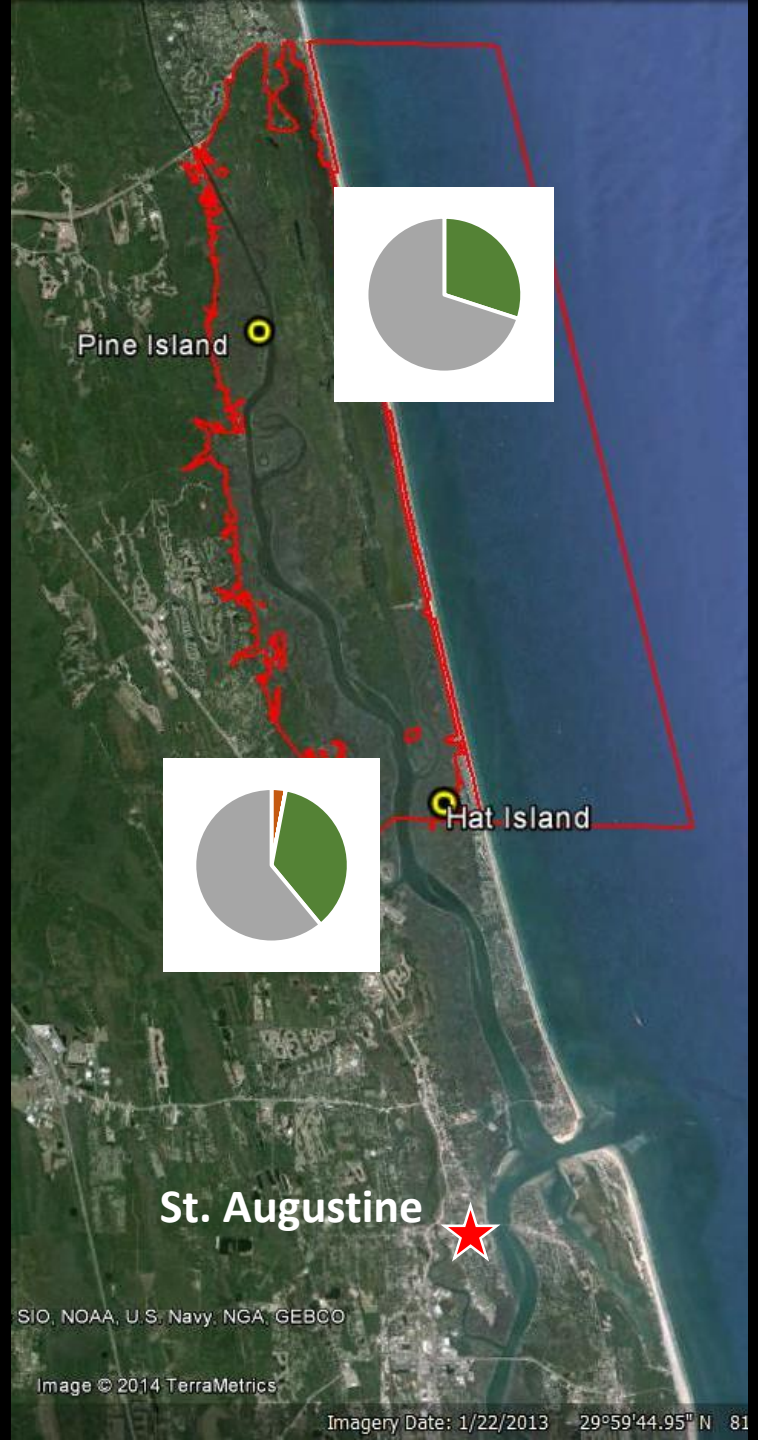


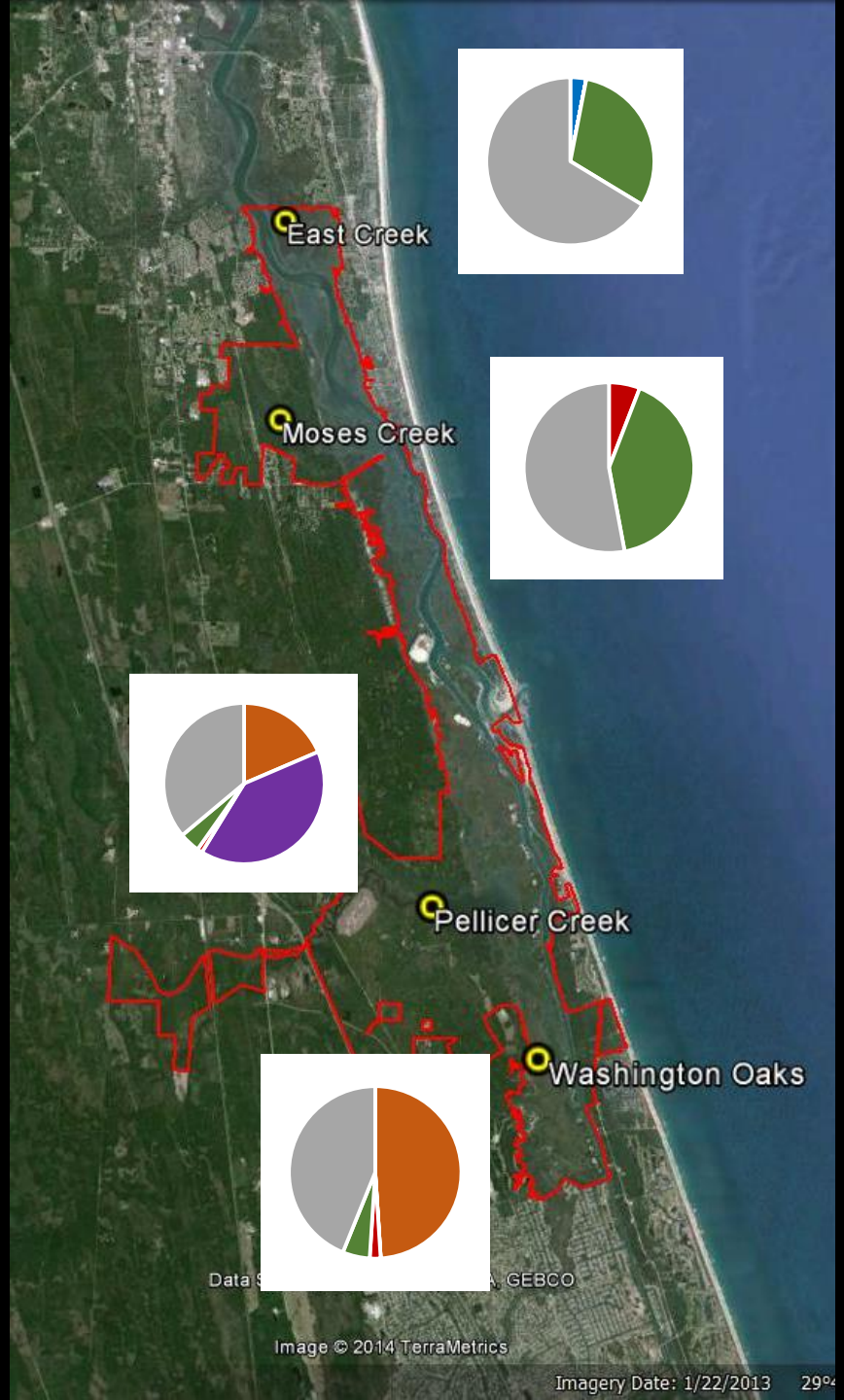
images cropped for SamplePoint

Spartina alterniflora

Batis maritima

Juncus roemerianus



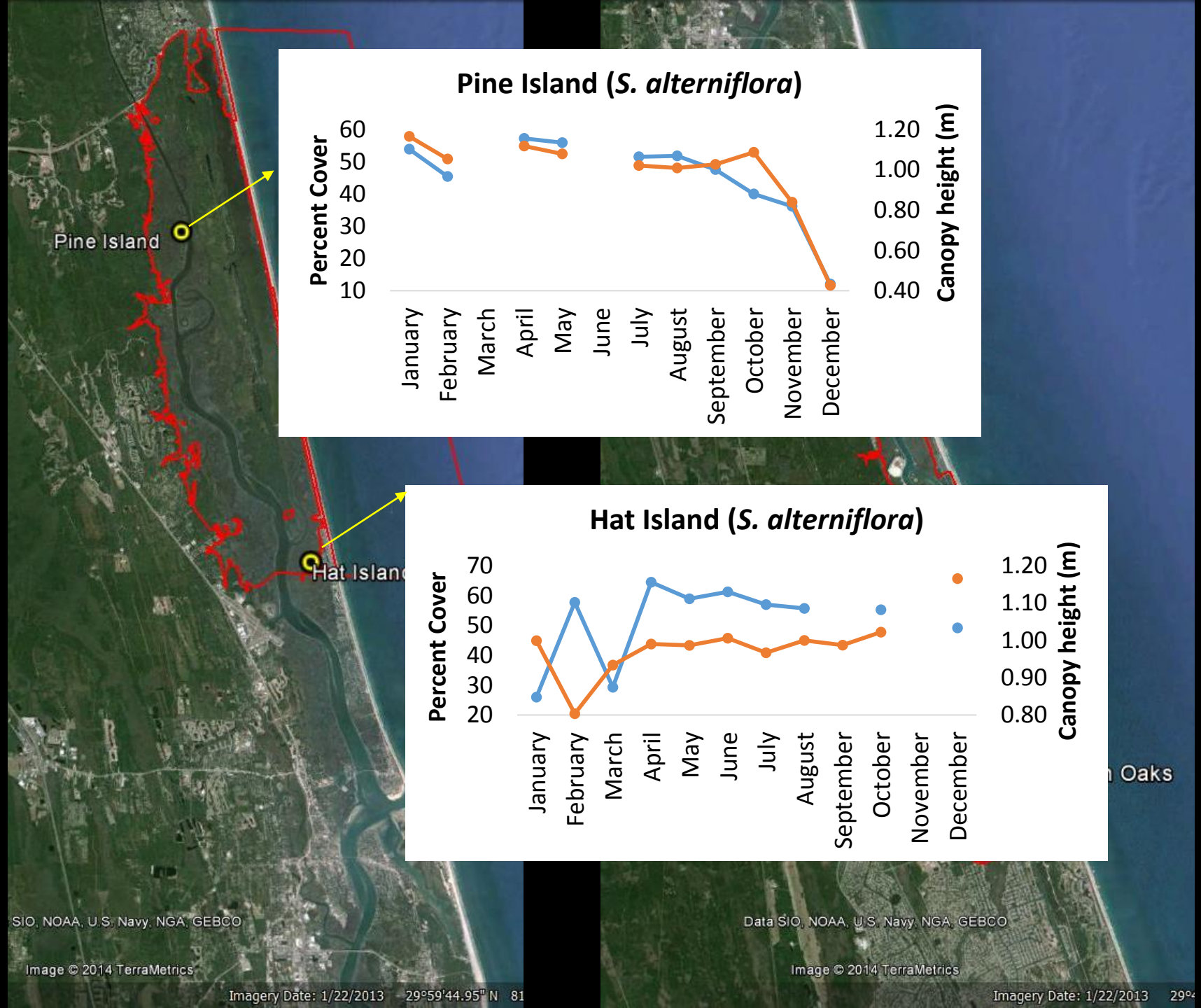


2014 Species Distribution

- Mud
- Smooth Cordgrass *(Spartina alterniflora)*
- Saltwort/Sea Pickles *(Batis maritima)*
- Glasswort *(Sarcocornia perennis)*
- Black Needlerush *(Juncus roemerianus)*
- Black Mangrove *(Avicennia germinans)*

Methods

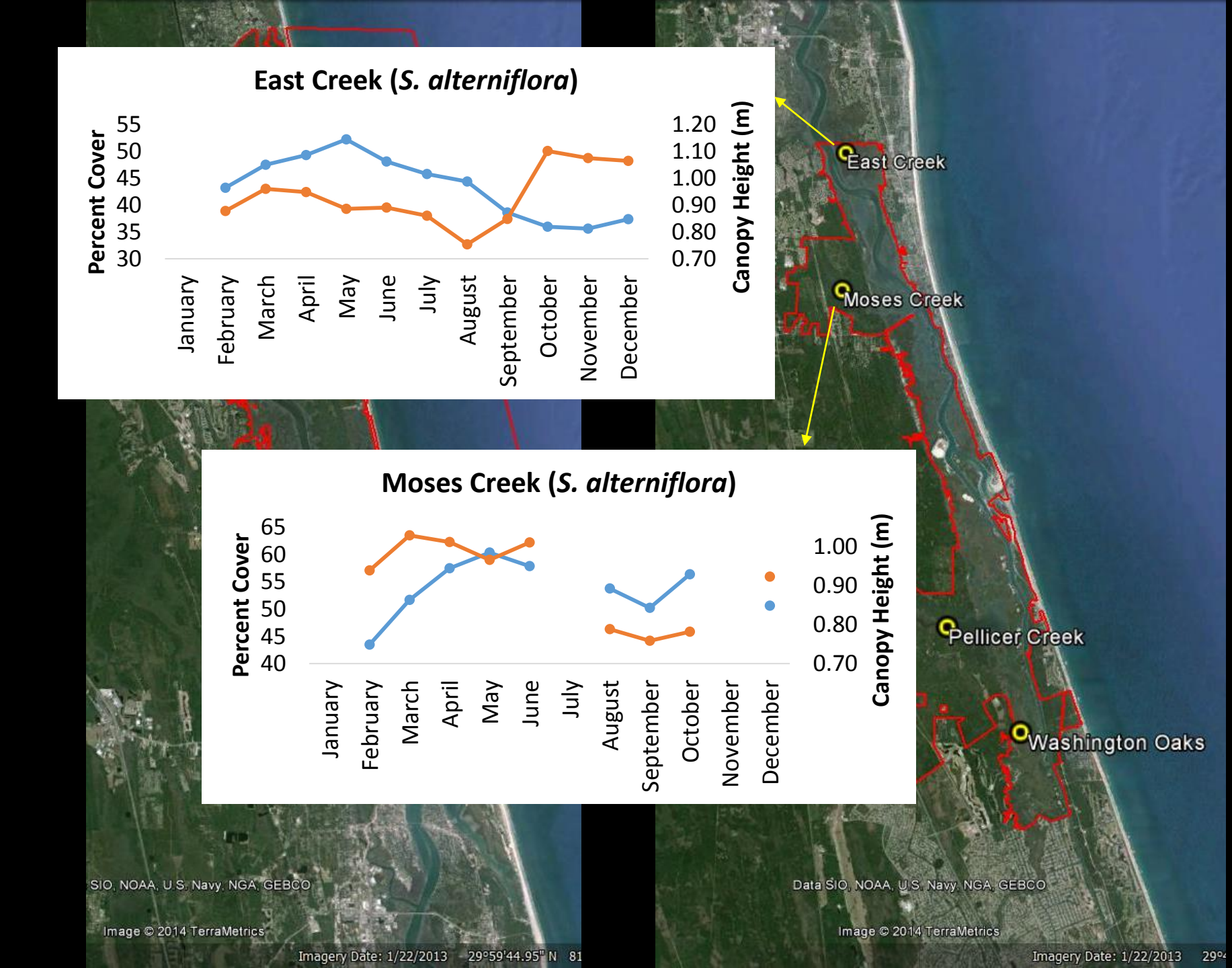
- Sample during peak biomass



2014 Intra-annual Patterns

Percent cover

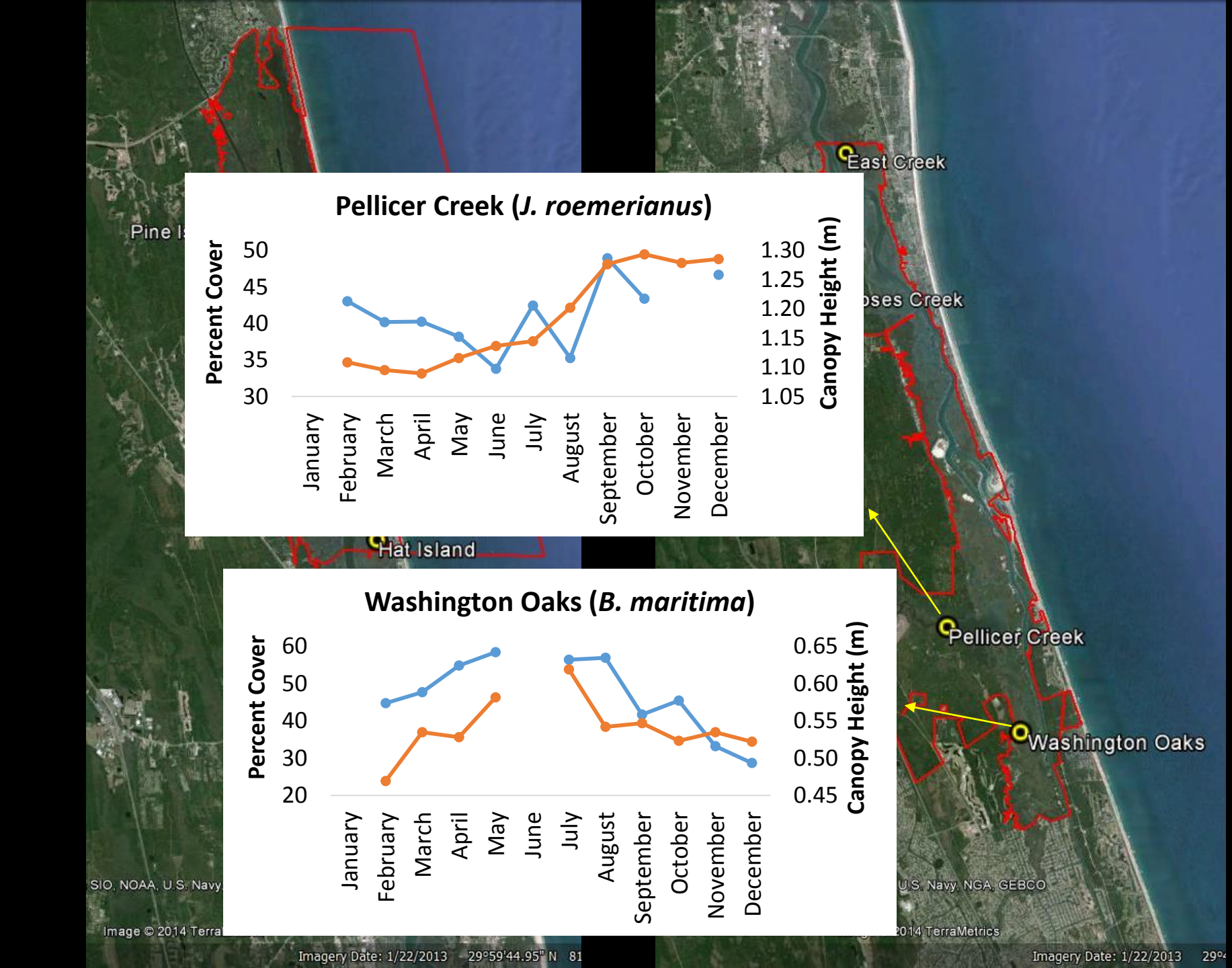
Canopy height (m)



2014 Intra-annual Patterns

Percent cover

Canopy height (m)



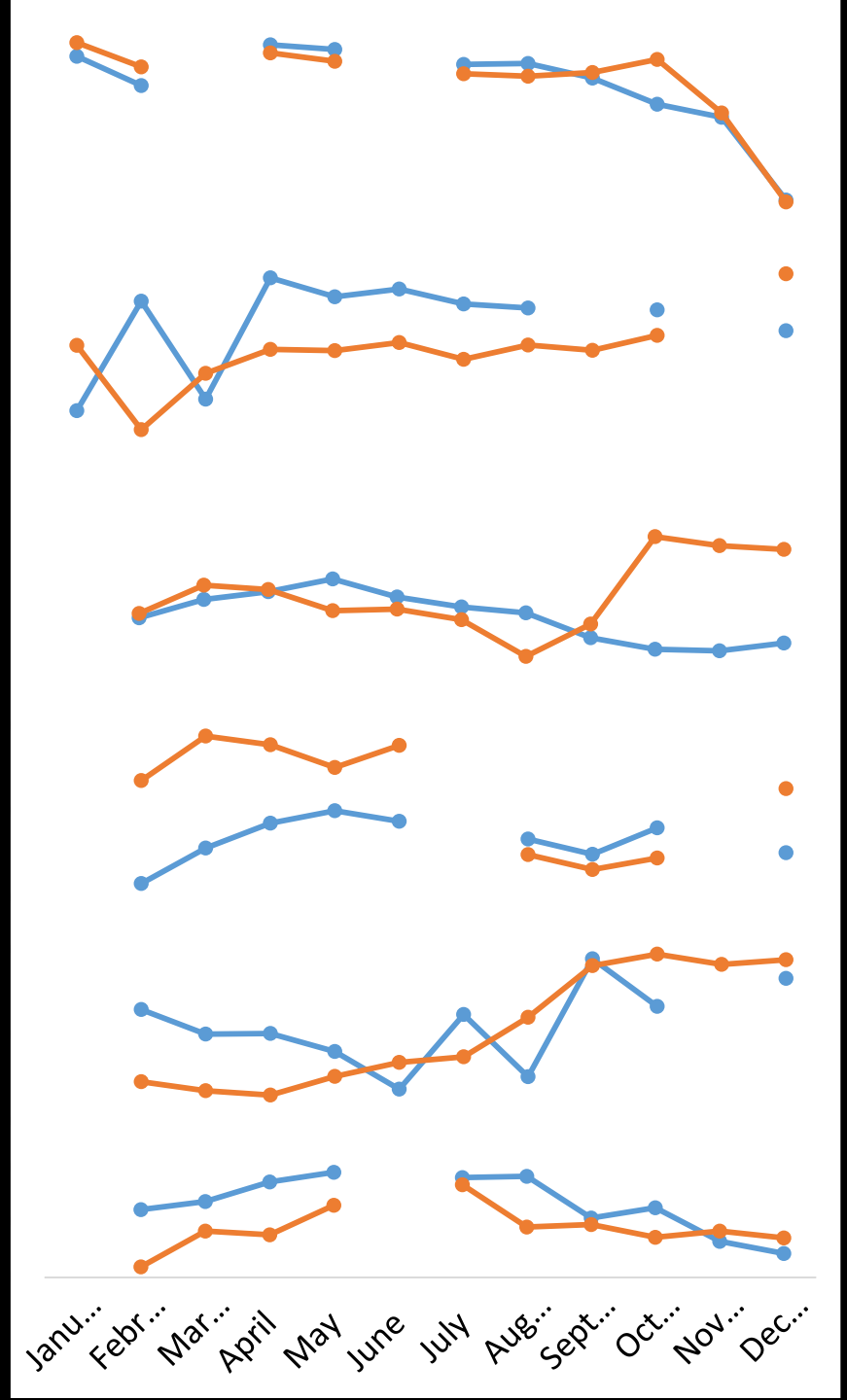
2014 Intra-annual Patterns

Percent cover

Canopy height (m)

When is peak biomass?

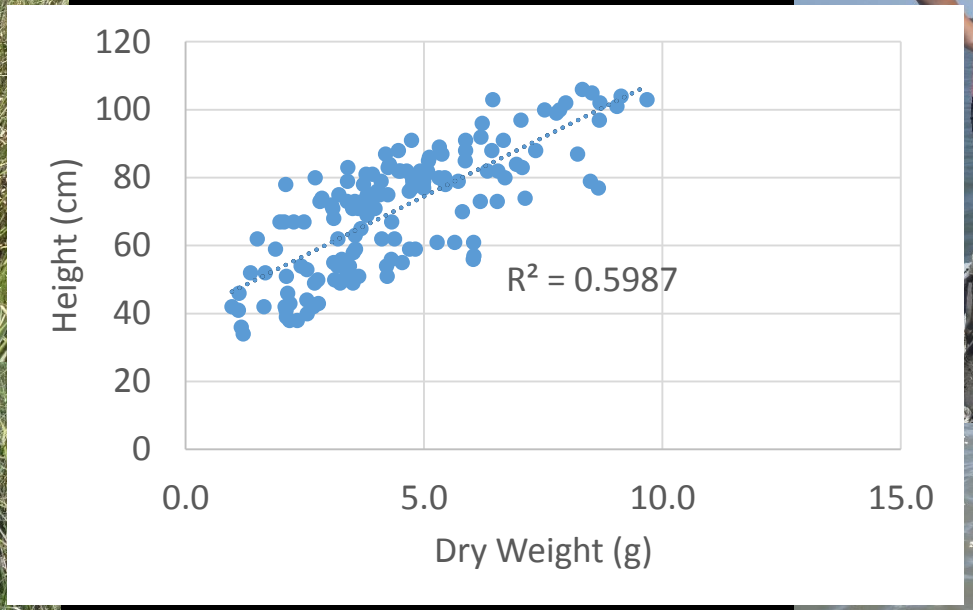
Future Monitoring:
May
Sept

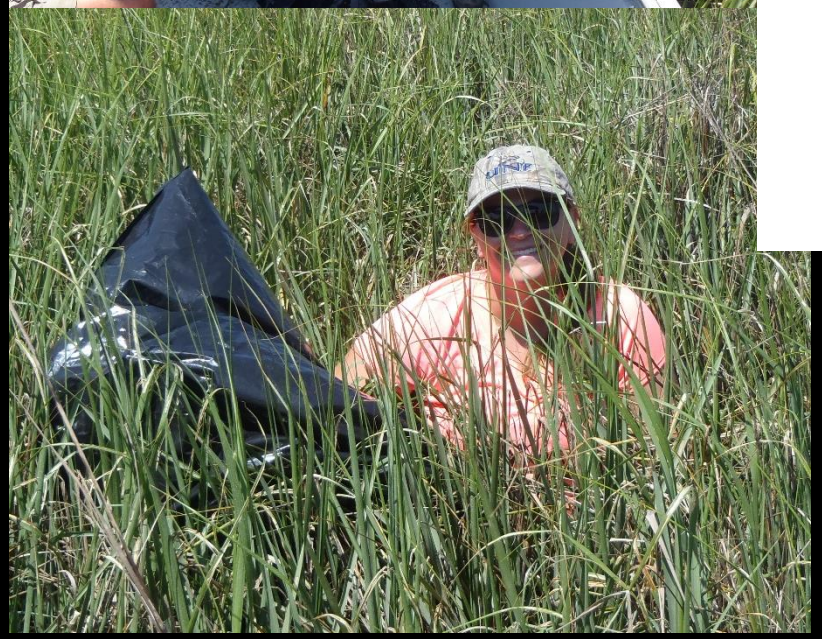


Percent cover

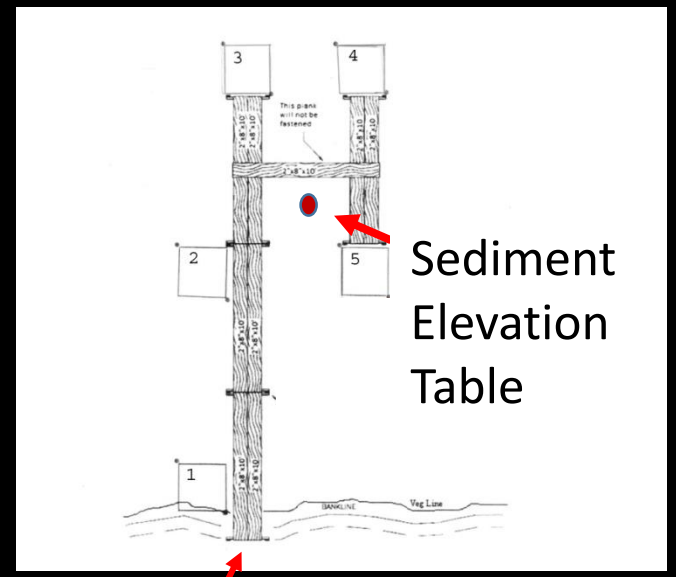
Canopy height (m)

How do non-destructive methods relate to biomass?



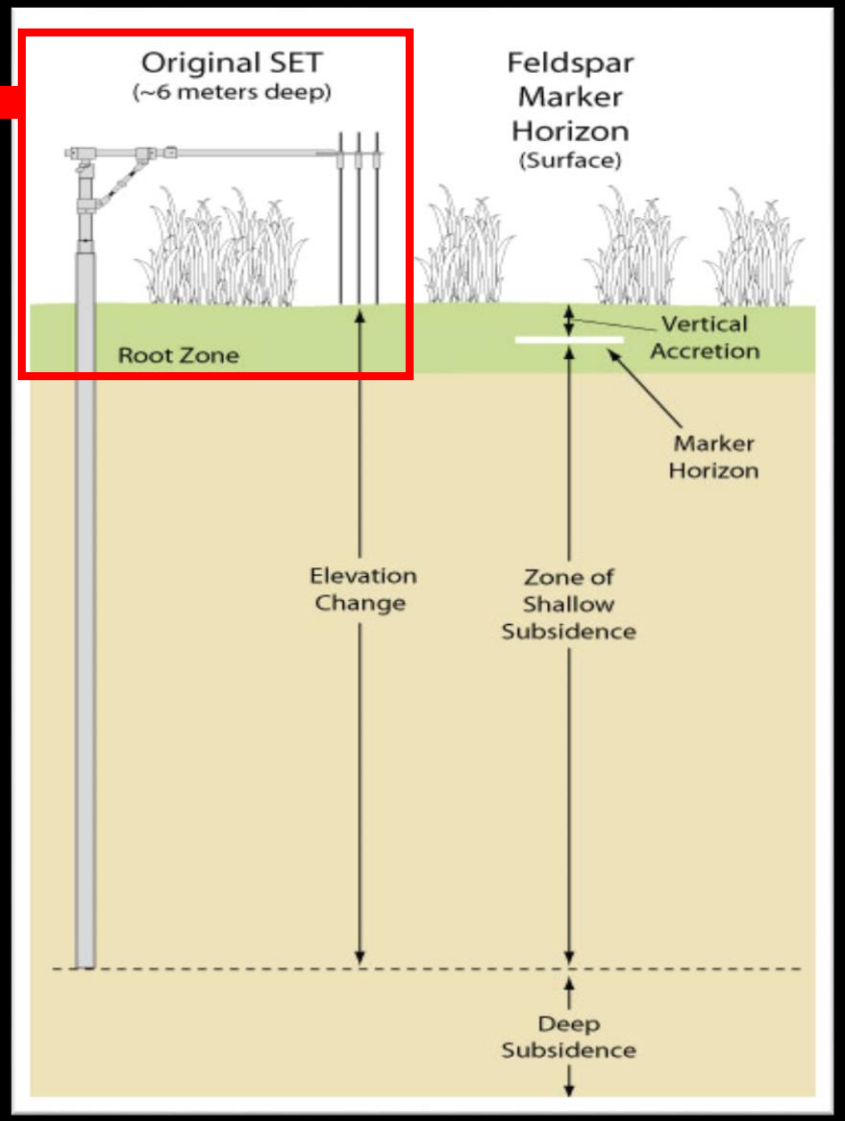


Deep Rod Surface Elevation Tables (SETs)

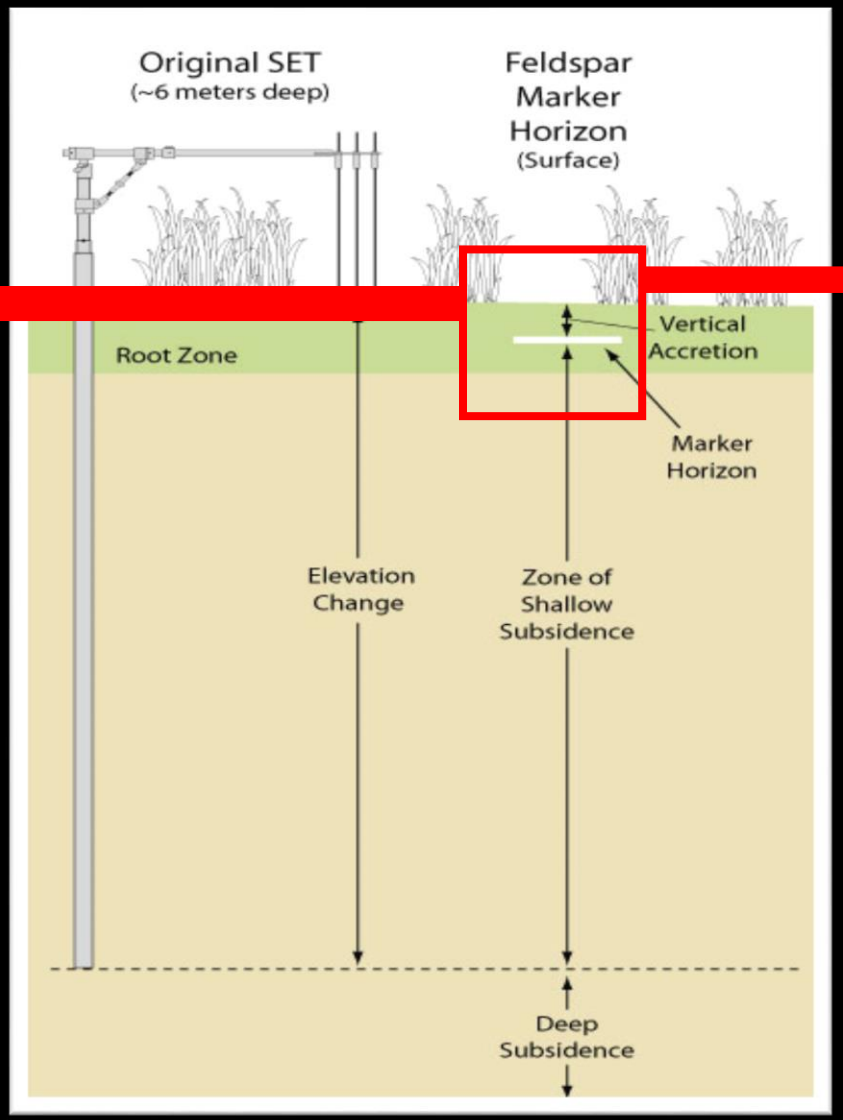


Sediment Elevation Monitoring

Deep Rod
Surface Elevation Tables (RSETs)



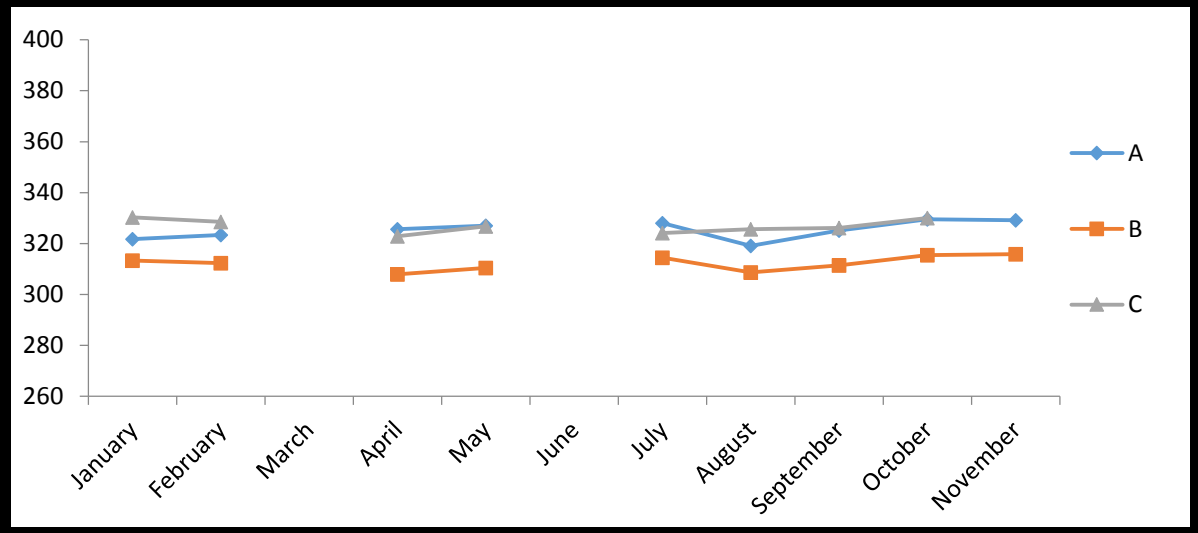
Sediment Elevation Monitoring

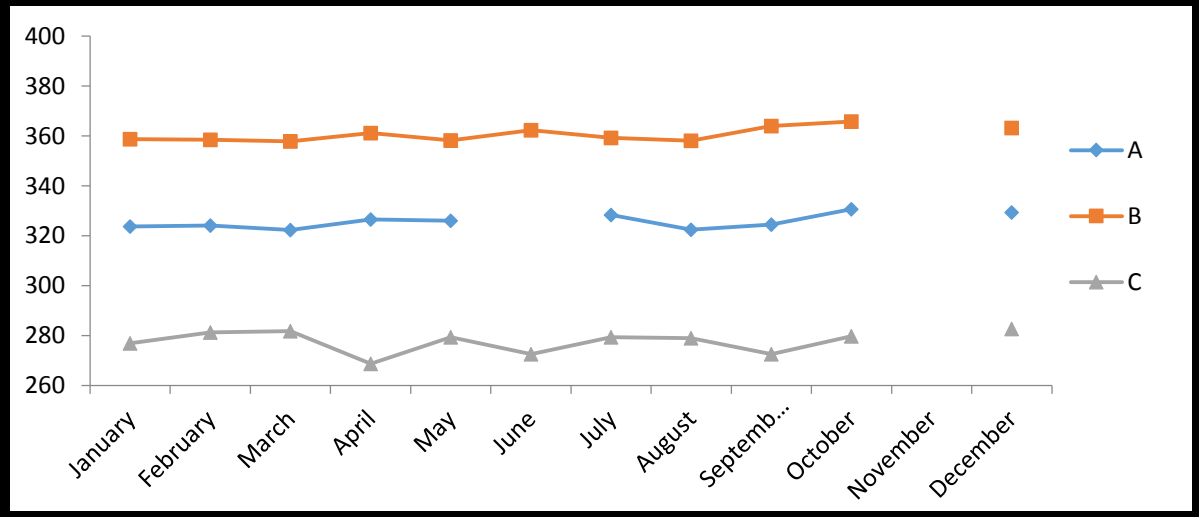


Accretion Plots

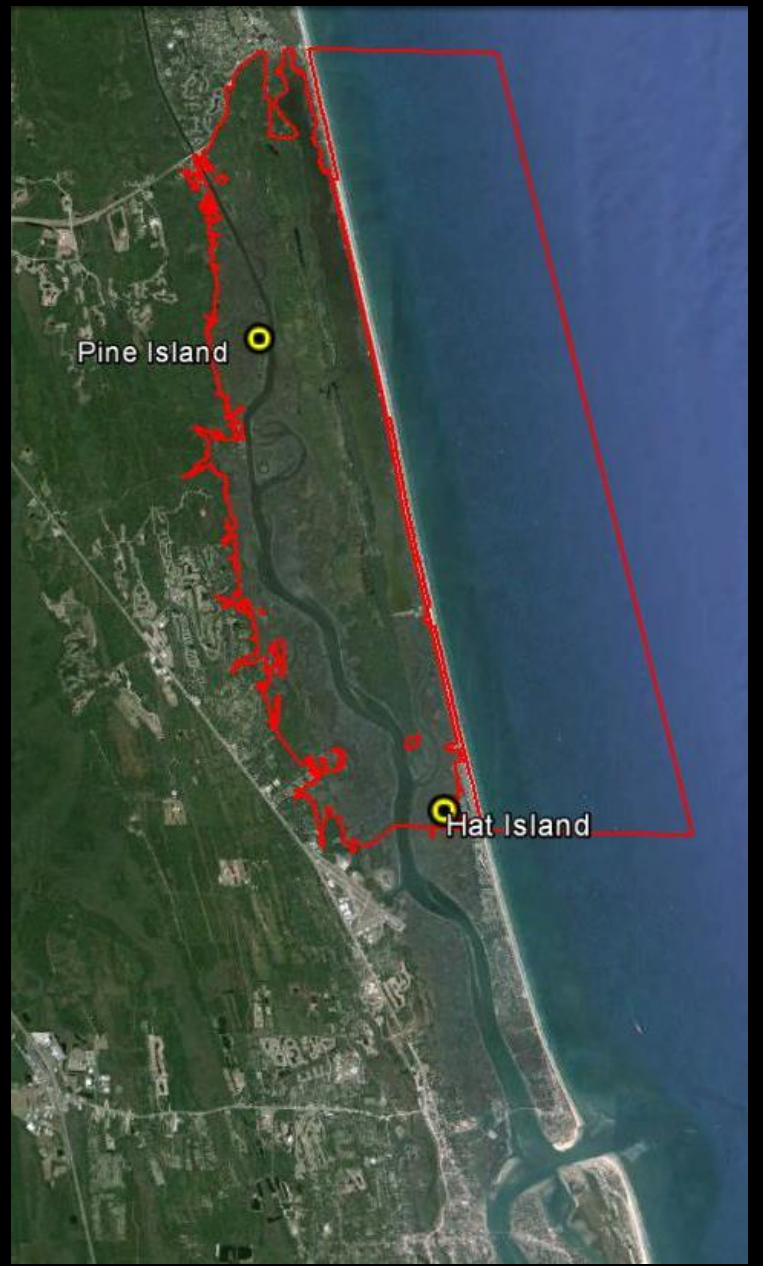
2014 Sediment Elevation

RSET



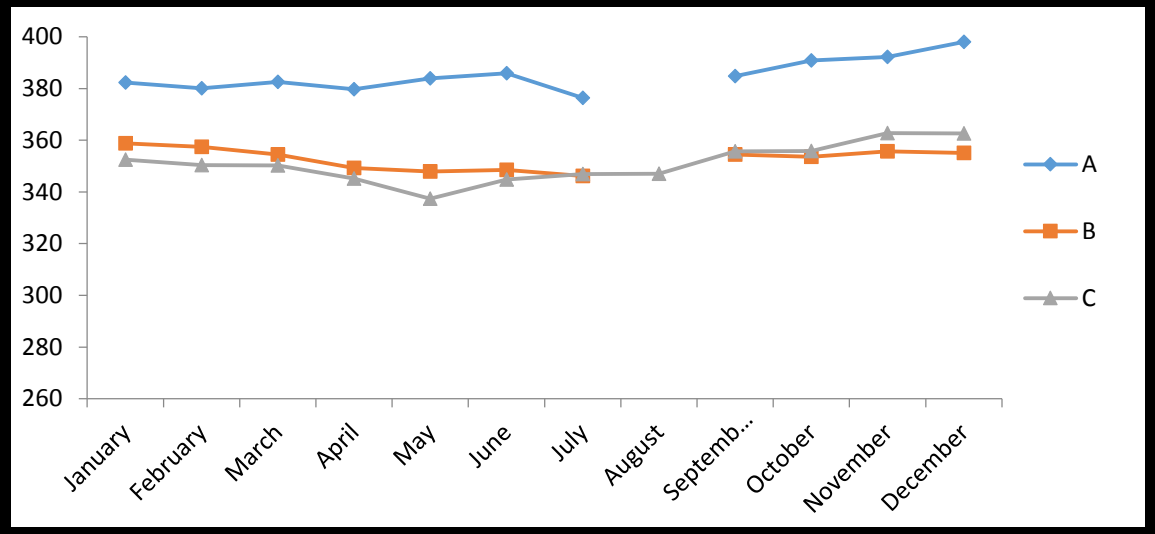


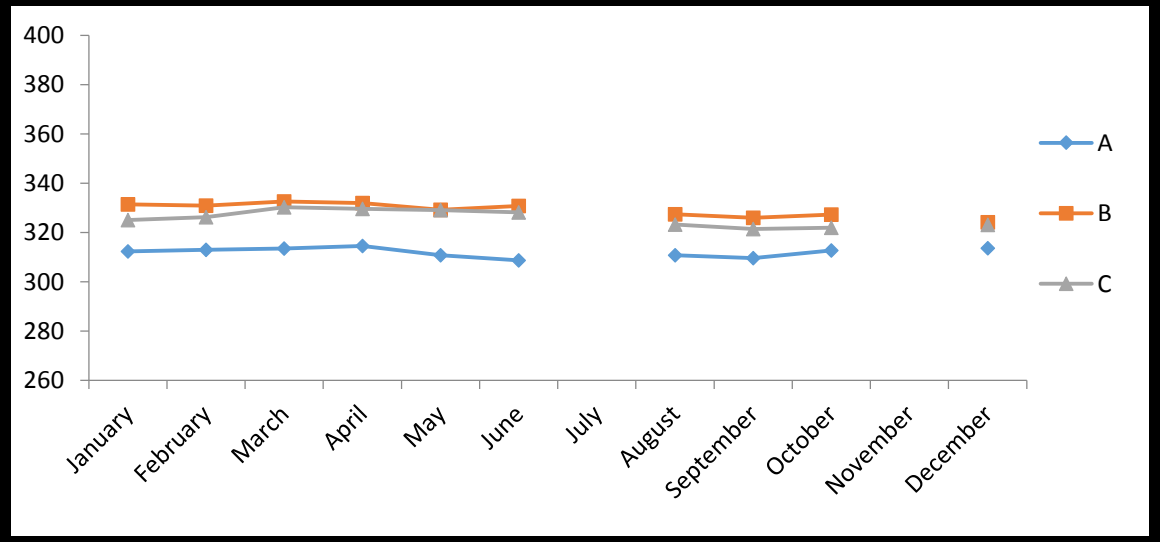
Elevation Change (mm)	Accretion Plots
+4	
+3	
+0	13.7 mm (n=3*)
+6	
+4	NOT SAMPLED
+6	



2014 Sediment Elevation

RSET

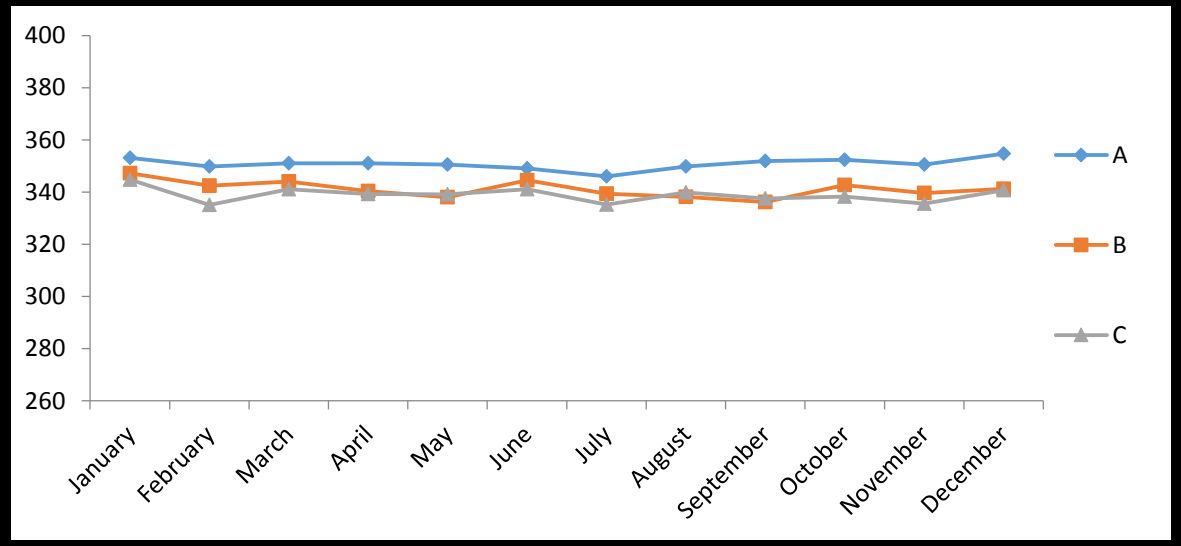


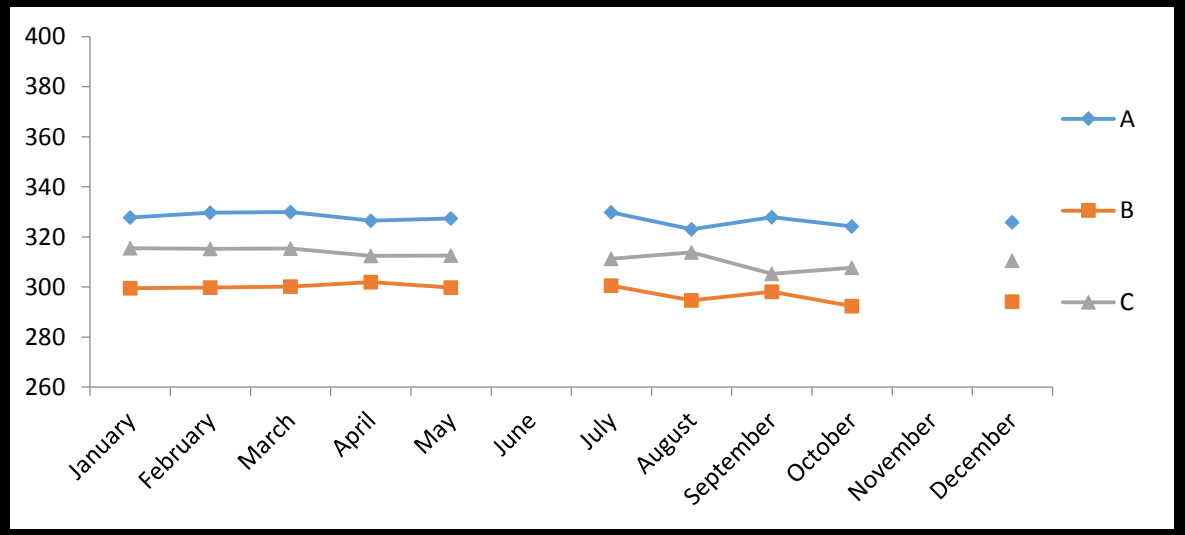


Elevation Change (mm)	Accretion Plots
+16	NC (n=3)
- 4	
+10	
+1	NOT SAMPLED
-7	
-2	

2014 Sediment Elevation

RSET





Elevation Change (mm)	Accretion Plots
+2	10.8 mm (n=3*)
- 6	16.4 mm (n=3*)
- 4	NC (n=3)
-2	
-5	15.0 mm (n=3**)
-5	13.9 mm (n=2*)

Questions/Comments?