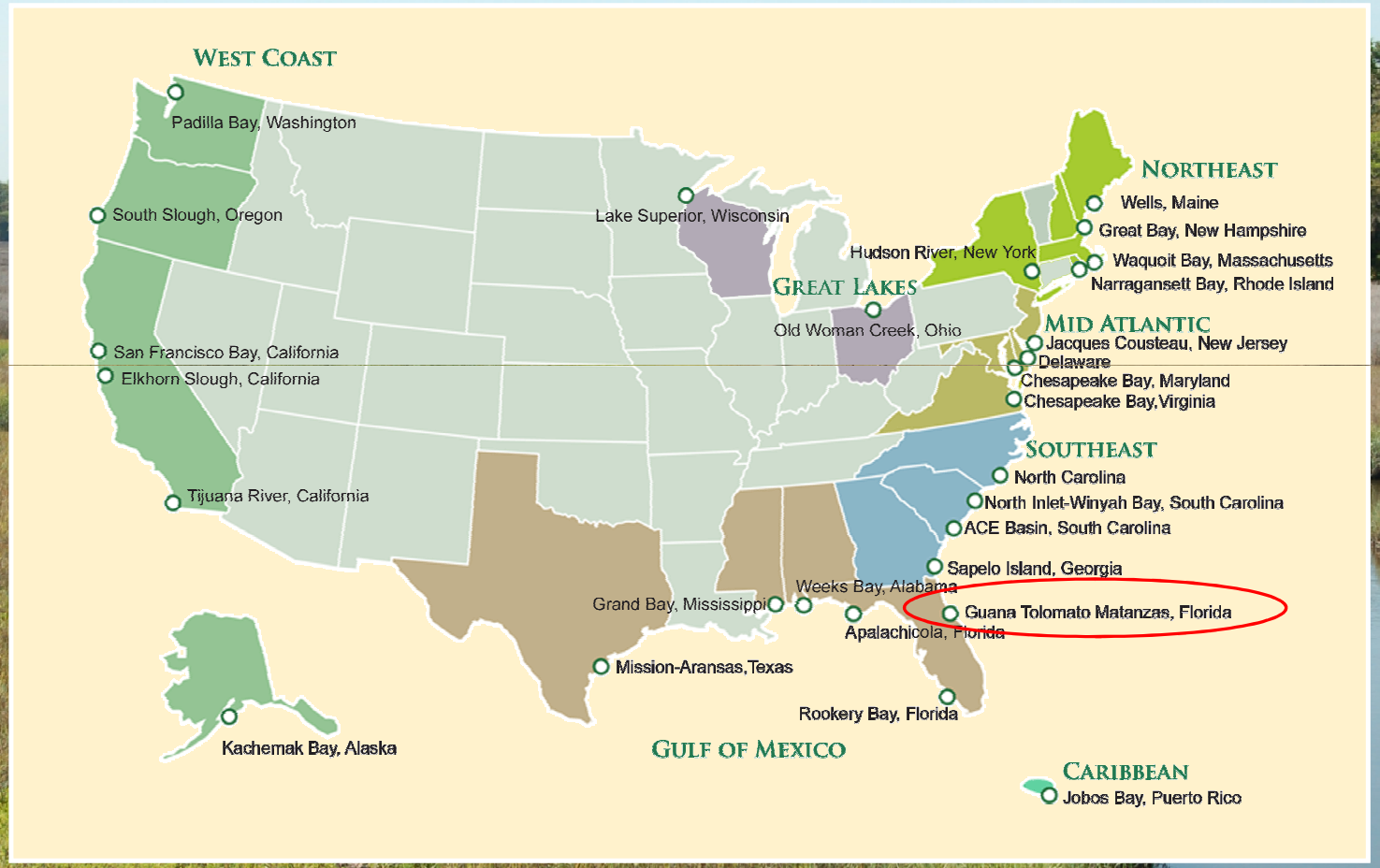
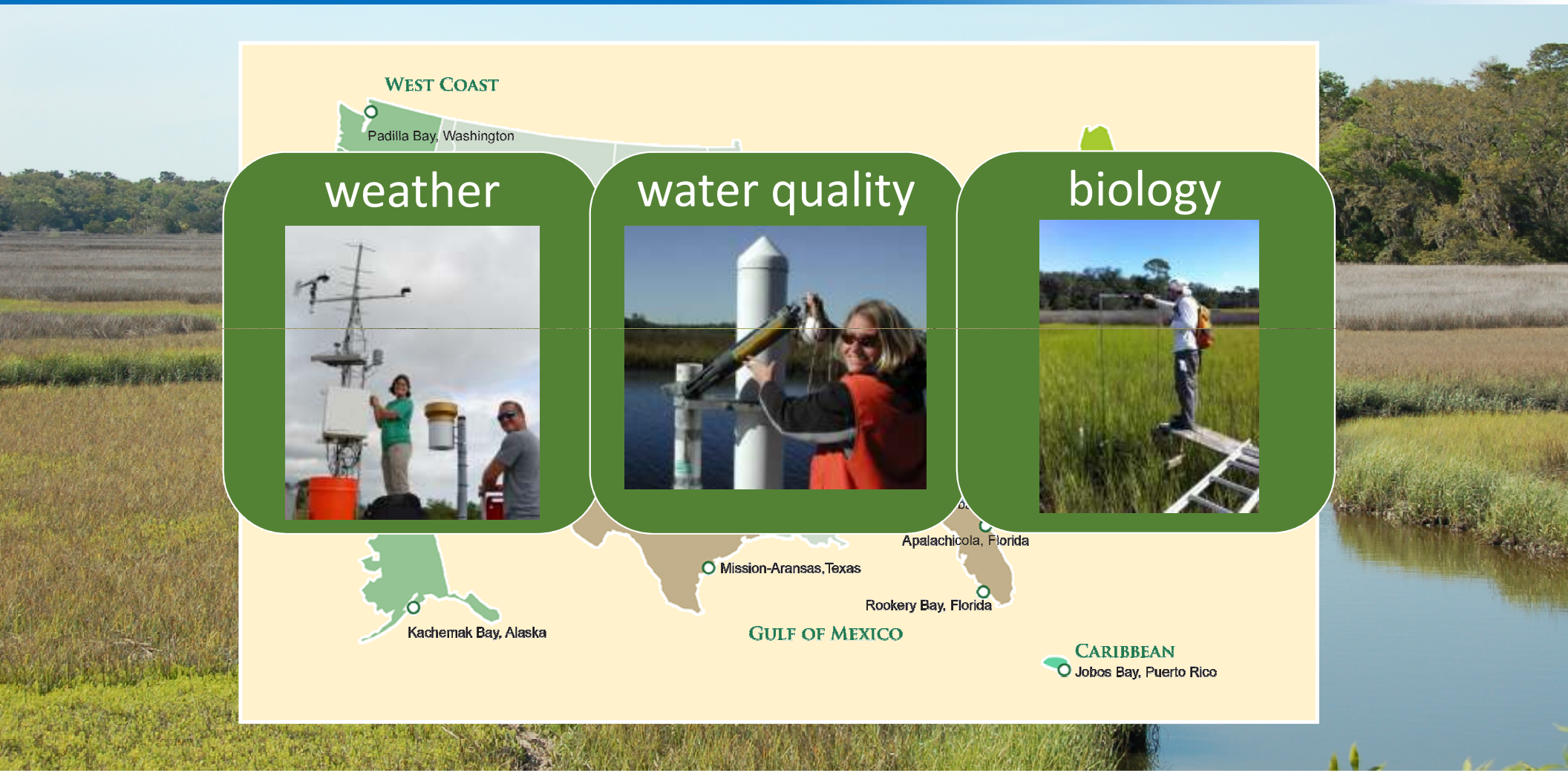
Intertidal Vegetation Monitoring and the Development of a Sentinel Site within the Guana Tolomato Matanzas National Estuarine Research Reserve

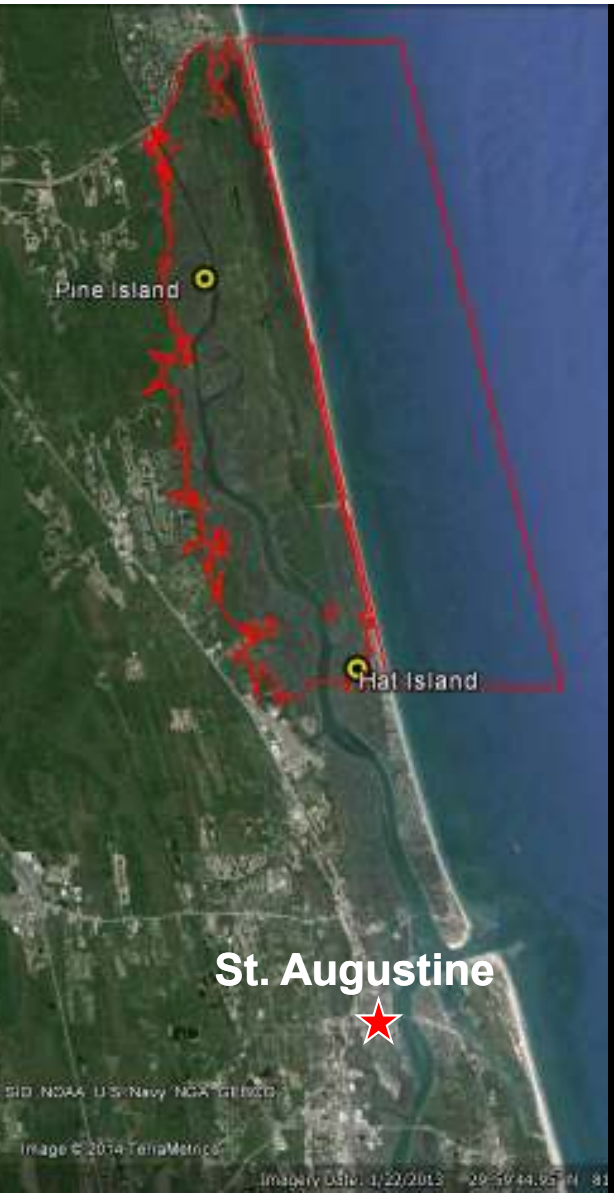
Nikki Dix
Pamela Marcum
Jason Lynn
Andrea Small

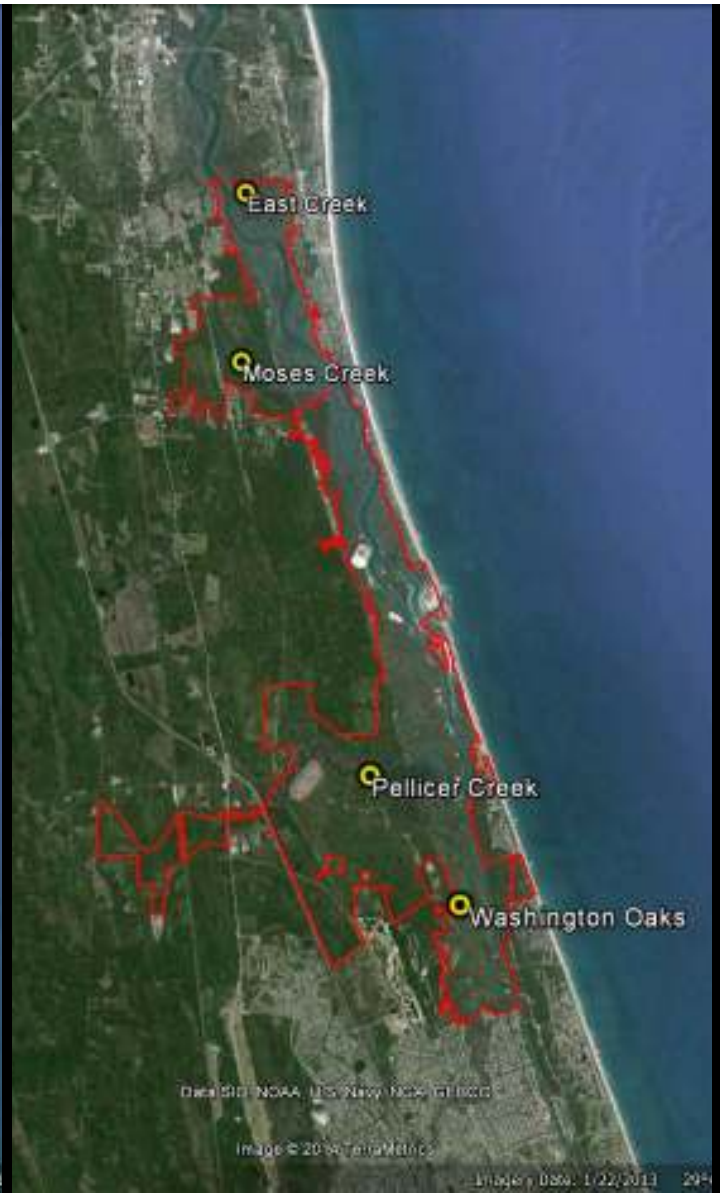
National Estuarine Research Reserve System (NERRS)

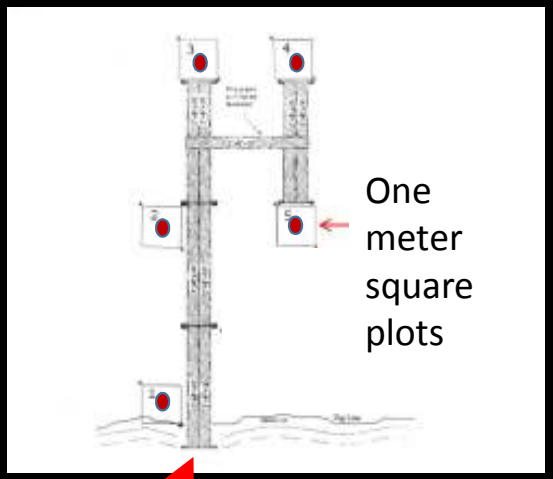


System-Wide Monitoring Program (SWMP)



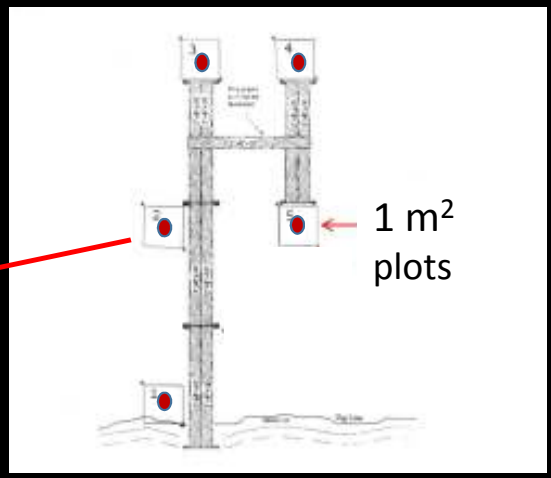

Pine Island
Hat Island
St. Augustine


East Creek
Moses Creek
Pellicer Creek
Washington Oaks


One
meter
square
plots

Methods

- Images
- Percent Cover
- Canopy Height



METHODS

- CALCULATED

  PERCENT COVER

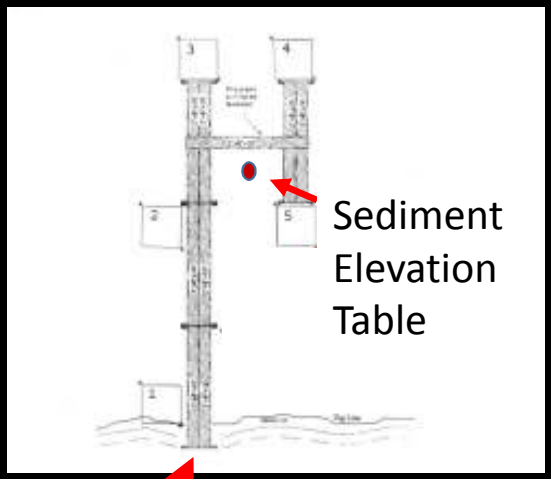
images cropped for SamplePoint

Spartina alterniflora

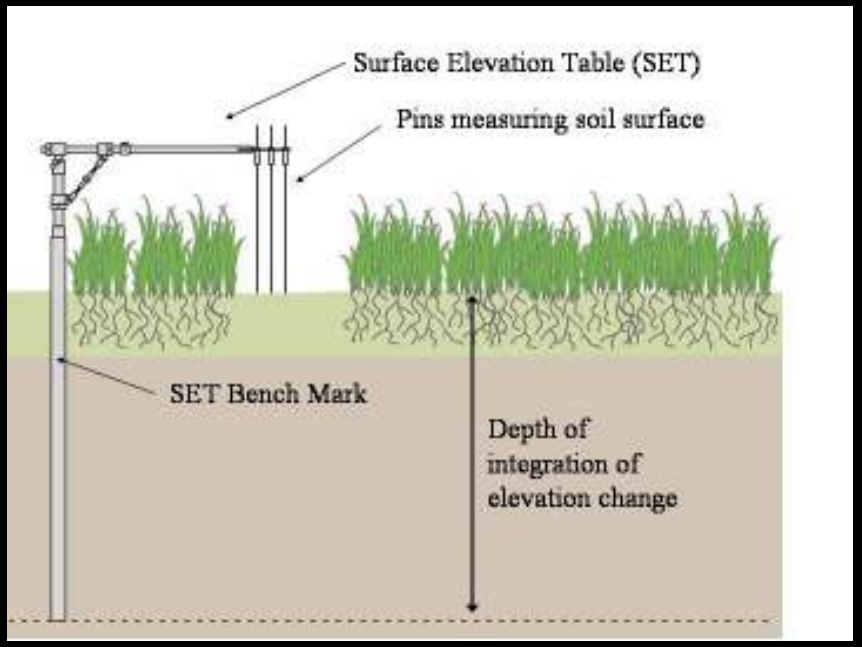
Batis maritima

Juncus roemerianus

Deep Rod Surface Elevation Tables (SETs)

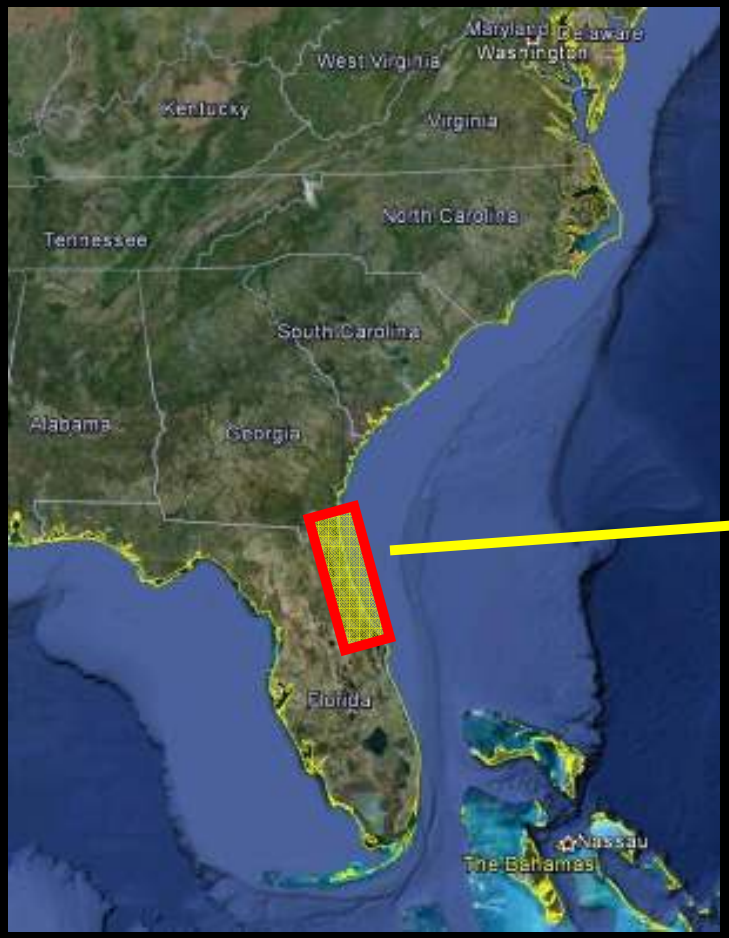


Deep Rod Surface Elevation Tables (SETs)



From: Elevations Overview for NERRS

Salt Marsh – Mangrove Ecotone



SALT MARSH – MANGROVE ECOTONE

PNAS

Poleward expansion of mangroves is a threshold response to decreased frequency of extreme cold events

Kyle C. Cavanaugh[a,b,1], James R. Kellner[b], Alexander J. Forde[c], Daniel S. Gruner[d], John D. Parker[a], Wilfrid Rodriguez[a], and Ilka C. Feller[a]

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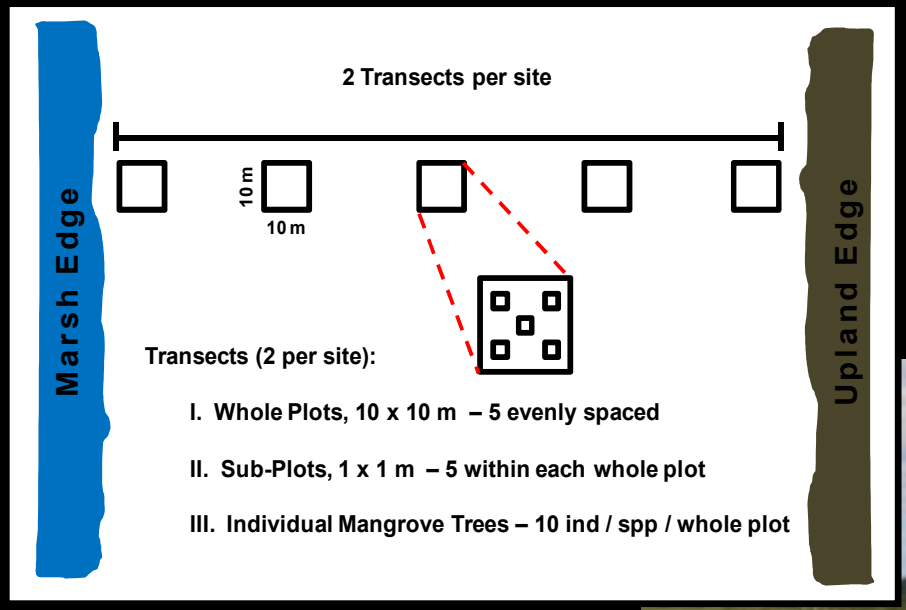
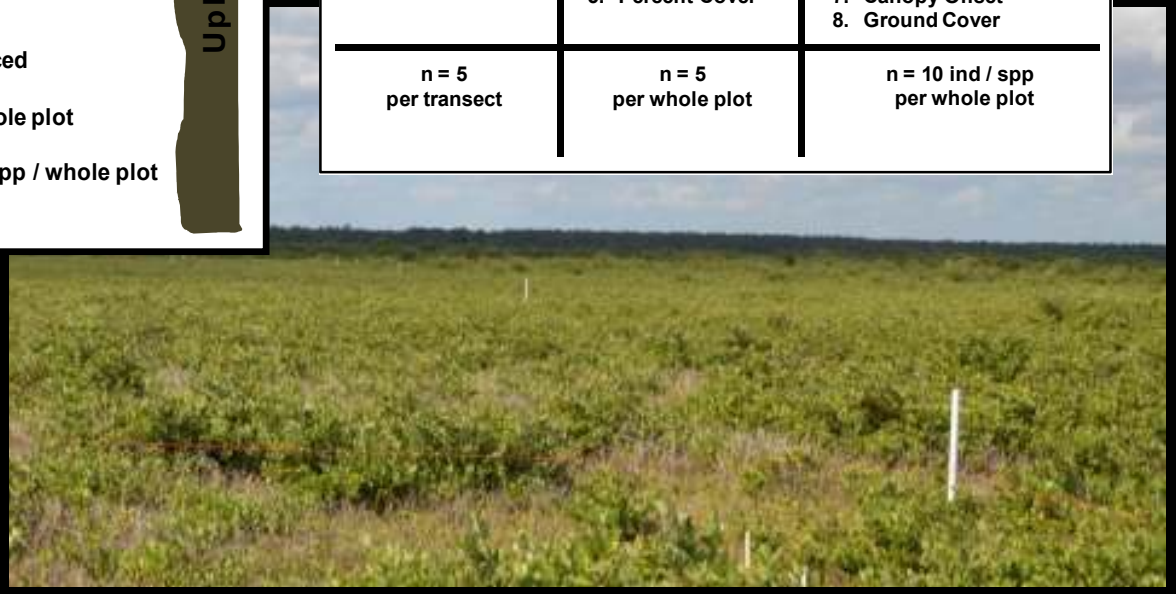
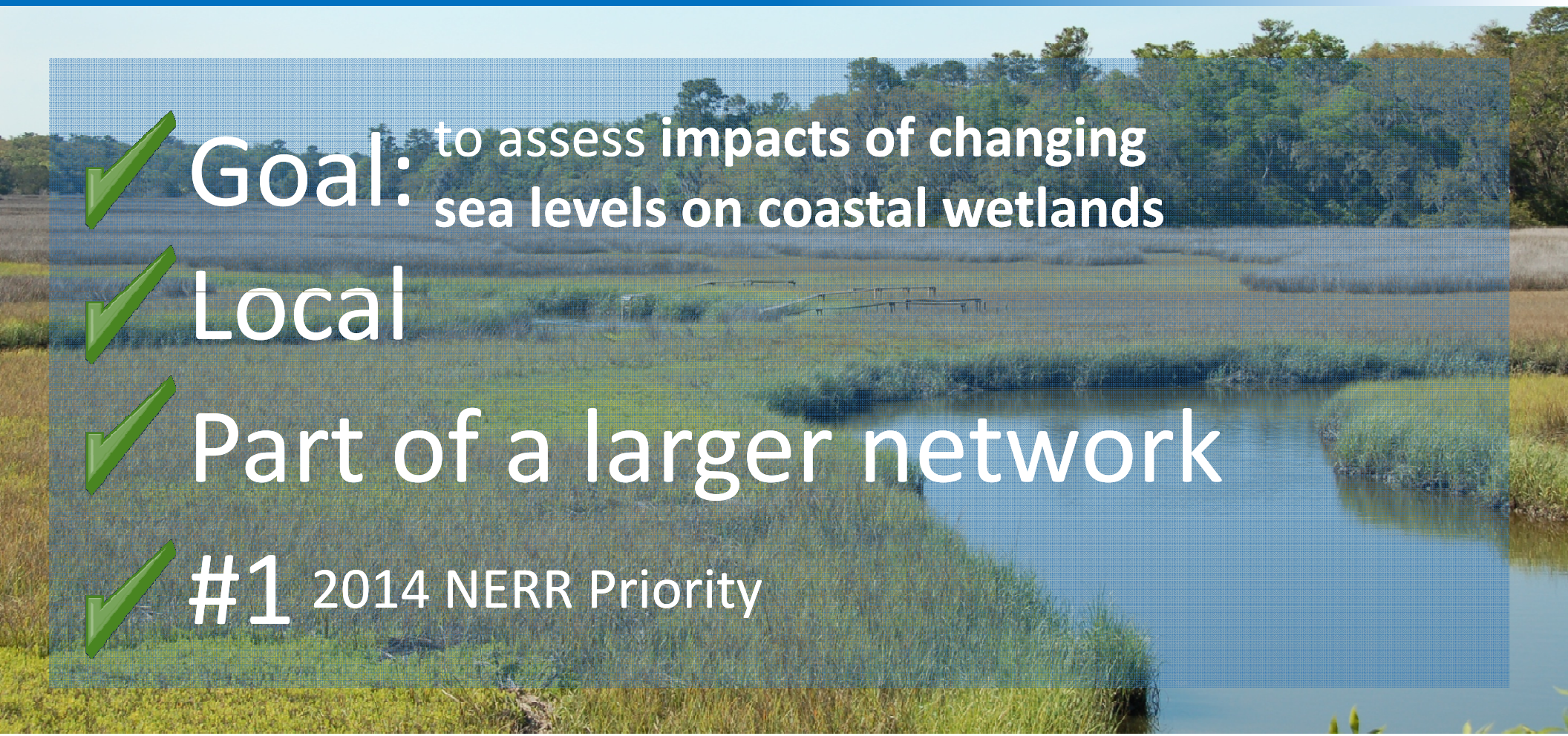
Monitoring Methods



WHOLE PLOTS (10 x 10 m)	SUB-PLOTS (1 x 1 m)	TREE ARCHITECTURE (Individual Trees)
1. Percent Cover 2. Temperature (Soil Porewater) 3. Salinity (Soil Porewater)	1. Total Count - Mangrove Spp 2. Form (shoot vs. tree) 3. Trunk Diameter 4. Canopy Height 5. Percent Cover	1. Canopy Height 2. Trunk Formation 3. Trunk Diameter 4. Clear Height 5. Canopy – Wide Axis 6. Canopy – Narrow Axis 7. Canopy Offset 8. Ground Cover
n = 5 per transect	n = 5 per whole plot	n = 10 ind / spp per whole plot



NERRS Sentinel Site Program



- Goal: to assess **impacts of changing sea levels on coastal wetlands**
- Local
- Part of a larger network
- #1 2014 NERR Priority

NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

National Ocean Service

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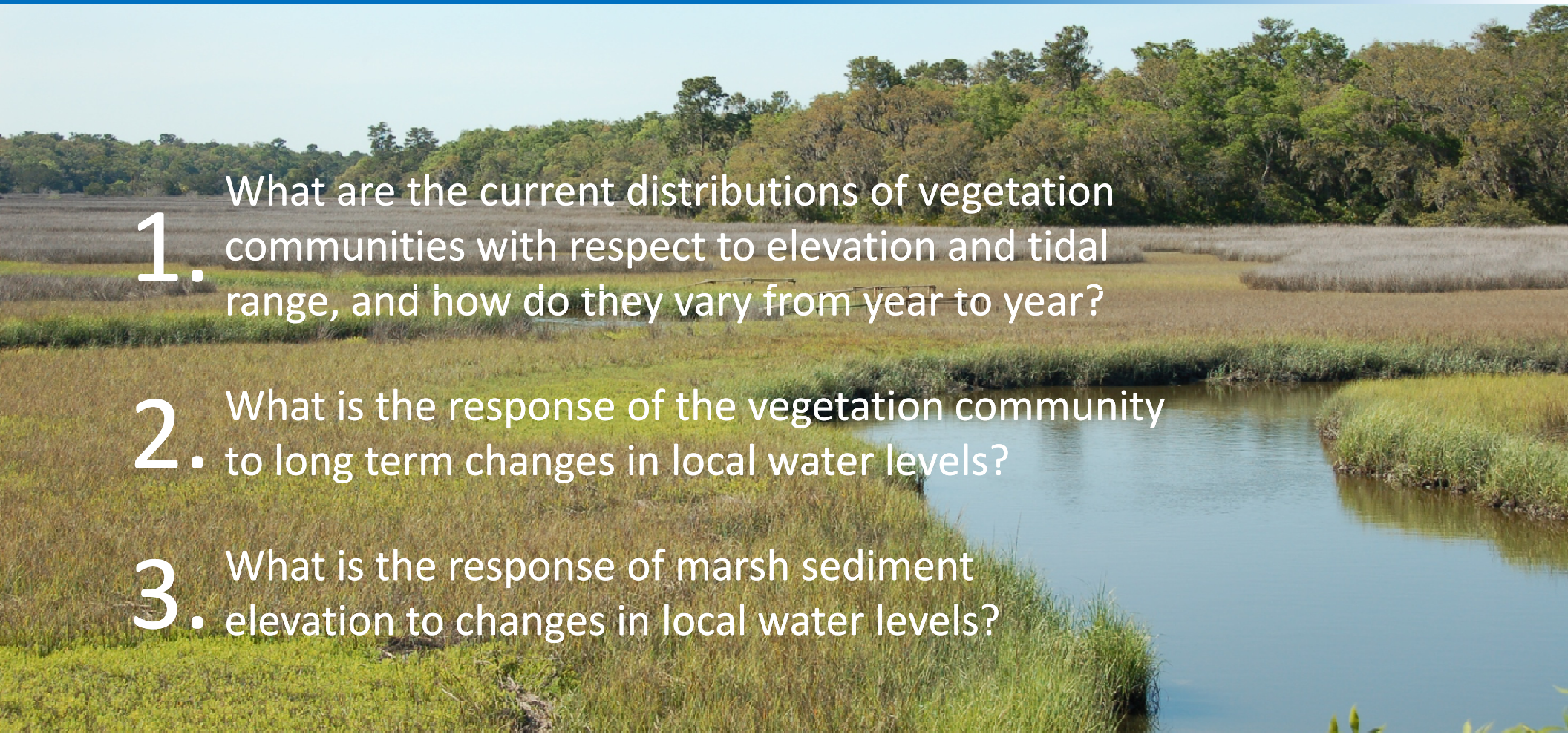
NOAA Sentinel Site Program

Sentinel Site **'Cooperatives'** Corral Resources to Tackle **Coastal Problems**.


NOAA
NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM
WEST COAST
Padilla Bay, Washington
South Slough, Oregon
San Francisco Bay, California
Elkhorn Slough, California
Tijuana River, California
Kachemak Bay, Alaska
Lake Superior, Wisconsin
GREAT LAKES
Old Woman Creek, Ohio
NORTHEAST
Wells, Maine
Great Bay, New Hampshire
Hudson River, New York
Waquoit Bay, Massachusetts
Narragansett Bay, Rhode Island
MID ATLANTIC
Jacques Cousteau, New Jersey
Delaware
Chesapeake Bay, Maryland
Chesapeake Bay,Virginia
SOUTHEAST
North Carolina
North Inlet-Winyah Bay, South Carolina
ACE Basin, South Carolina
Sapelo Island, Georgia
Weeks Bay, Alabama
Grand Bay, Mississippi
Guana Tolomato Matanzas, Florida
Apalachicola, Florida
Mission-Aransas,Texas
Rookery Bay, Florida
GULF OF MEXICO
CARIBBEAN
Jobos Bay, Puerto Rico
9

NERR Framing Questions



1. What are the current distributions of vegetation communities with respect to elevation and tidal range, and how do they vary from year to year?
2. What is the response of the vegetation community to long term changes in local water levels?
3. What is the response of marsh sediment elevation to changes in local water levels?

Benefits of a Sentinel Site

Improved understanding of local coastal wetlands – structure & function

Ecosystem Services

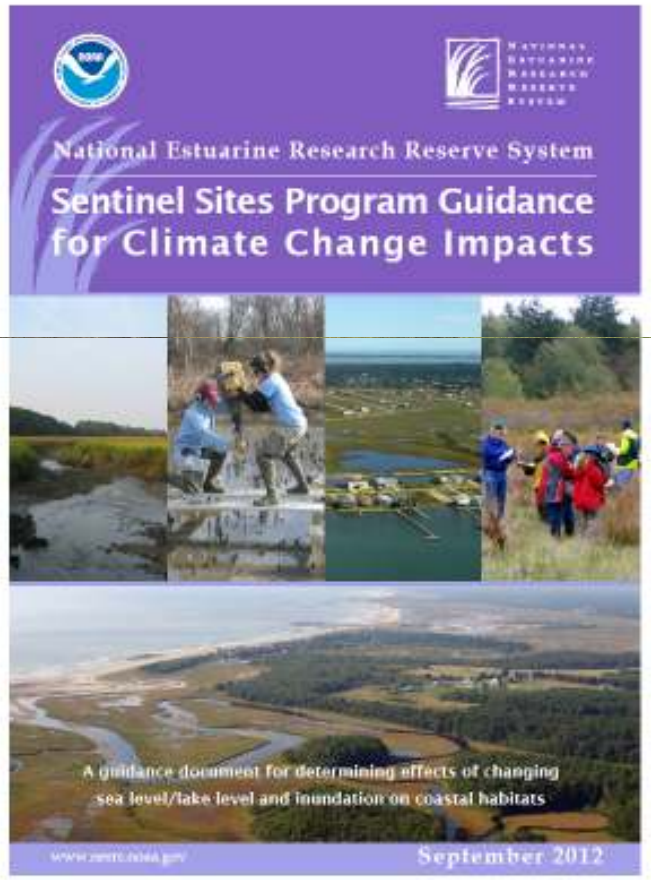
Benefits of a Sentinel Site

Early detection of sea level rise impacts

Informing habitat restoration

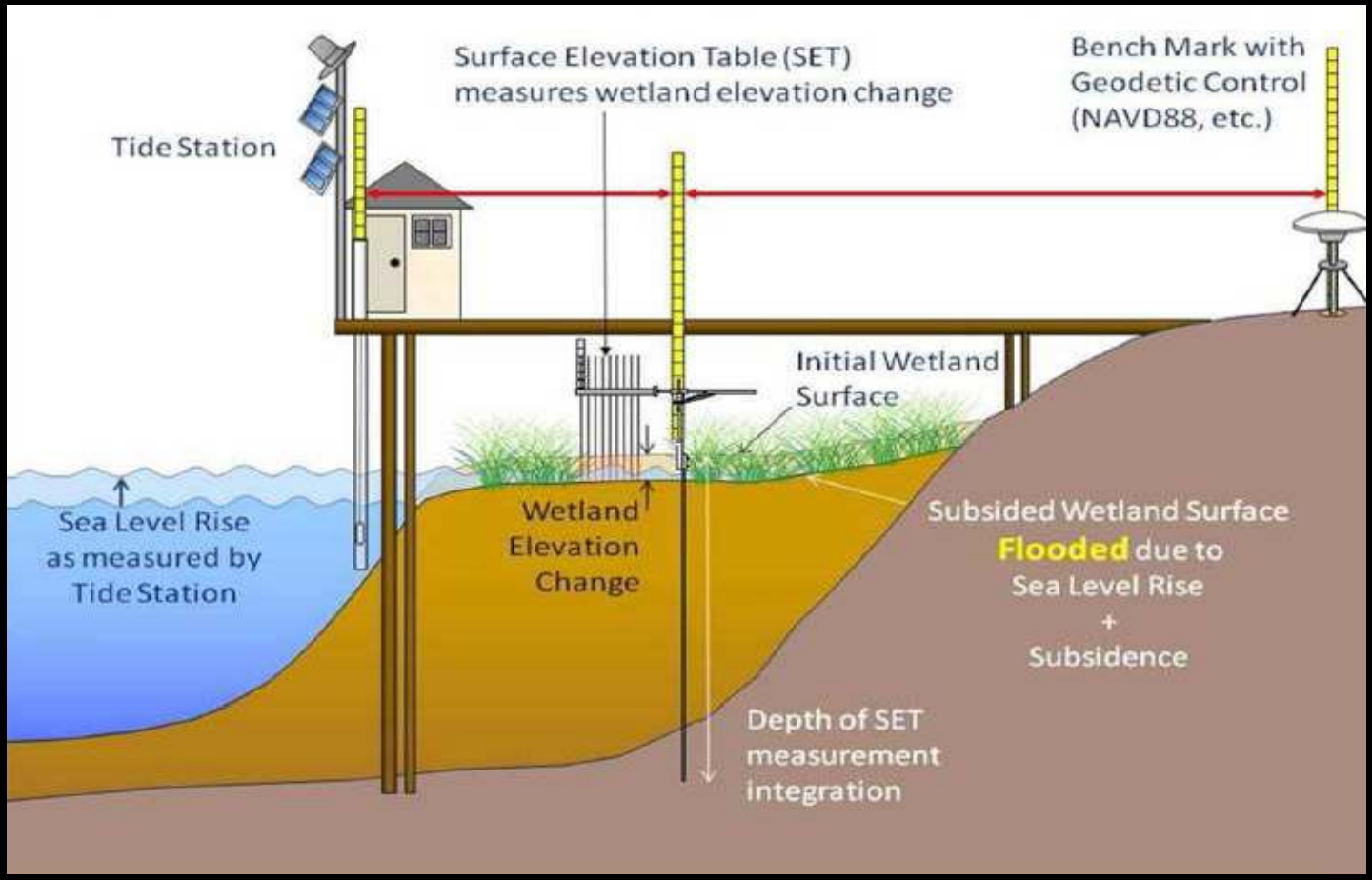
- Sediment dynamics
- Variability in marsh elevation
- Which marshes are most sensitive to water level changes?
- Where are restoration projects needed?
- Where will restoration be effective?

NERRS Sentinel Site Requirements



- ❑ Marsh and Mangrove Monitoring
- ❑ Sediment Elevation Monitoring
- ❑ Water Quality and Weather Monitoring (near transects)
- ❑ Water Level Measurements
- ❑ Vertical Reference System

Vertical Control and Water Level



Vegetation Transects

QUESTIONS?

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