

Monitoring National Wildlife Refuge Resiliency Projects



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Project Locations



- Parker River NWR
 - RI NWR Complex
 - Long Island NWR Complex
 - Chesapeake Marshlands
 - Forsythe
 - Cape May/ Supawna Meadows
 - Prime Hook
 - Chincoteague
-
- Region-wide Efforts



Types of Resiliency Projects

Individual Refuges

- Living Shoreline
 - Oyster/ bivalve restoration
 - Eelgrass restoration
 - Tidal flat restoration
- Sediment enrichment
- Dune/ Barrier Island restoration
- Marsh Hydrologic Improvements
 - Runnels
 - Tidal flow
 - Fish passage
 - Ditch Remediation
- Invasive Species
- Hydrology Modelling
- Black Duck Carrying Capacity

Region-wide

- SMI
 - Salt Marsh Integrity Assessments
 - Regional GNSS & Monumentation
- Shoreline Surveys
- Impoundment Analysis



Technique: Living Shoreline and Sub-tidal Habitats



CHER LITTLEFIELD, ENG

MD, RI, VA, MA



Technique: Sediment Enrichment/ Thin Layer Deposition



Technique: Dune & Barrier Island Restoration



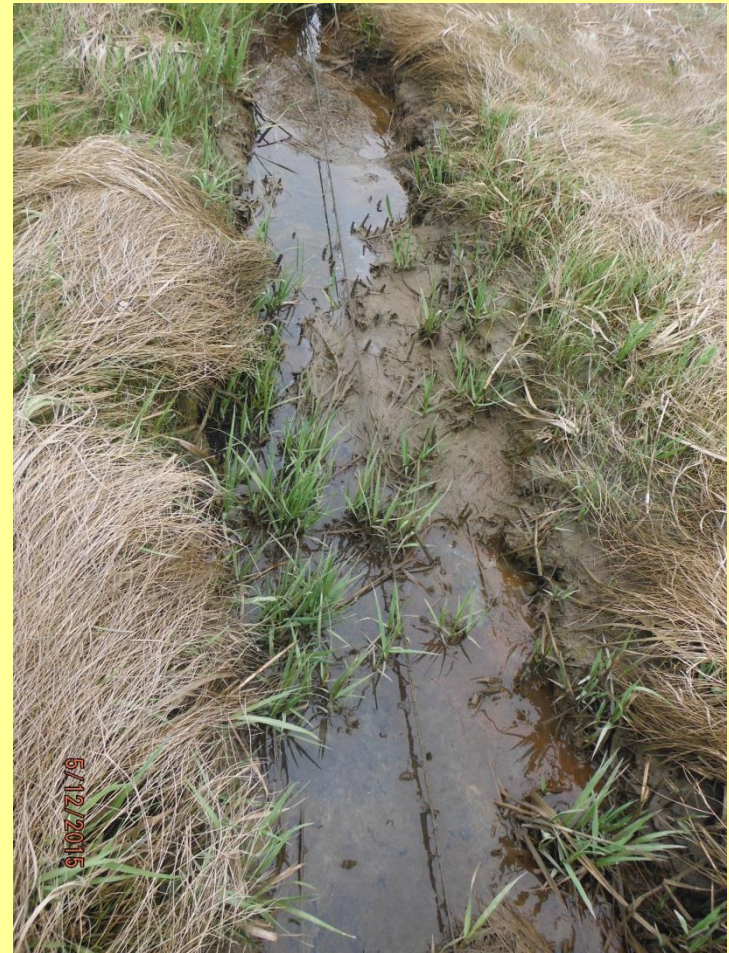
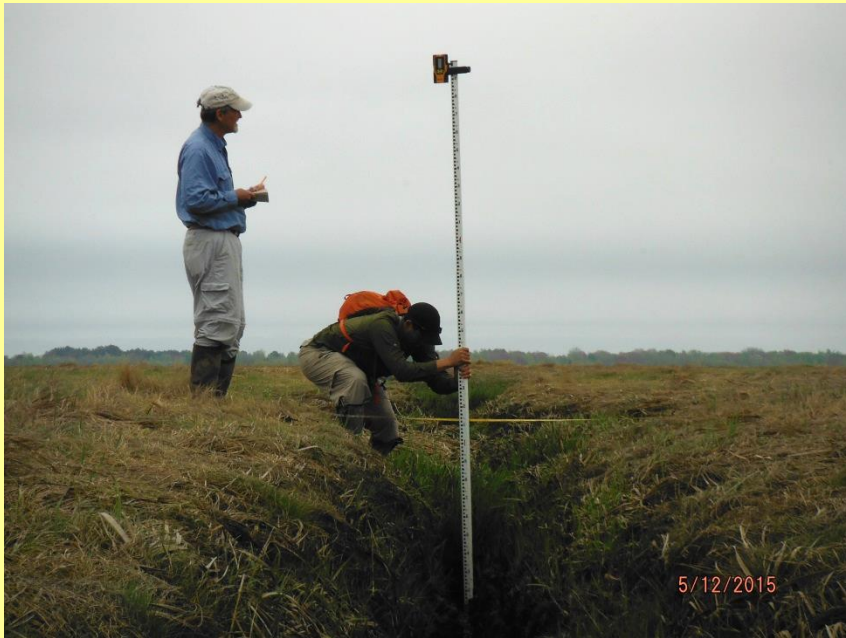
1998



2015



Technique: Marsh Hydrologic Improvements: Ditch Remediation



Technique piloted by Adamowicz and G. Wilson 2011

Technique: Marsh Hydrologic Improvements: Runnels



Wenley Ferguson of Save The Bay. Photo Credit: Westerly Sun



Technique: Marsh Hydrologic Improvements: Tidal Flow



Sachuest NWR

Technique: Marsh Hydrologic Improvements: Fish Passage



Acushnet Photo Credit: J Turek

Technique: Invasive Species Management



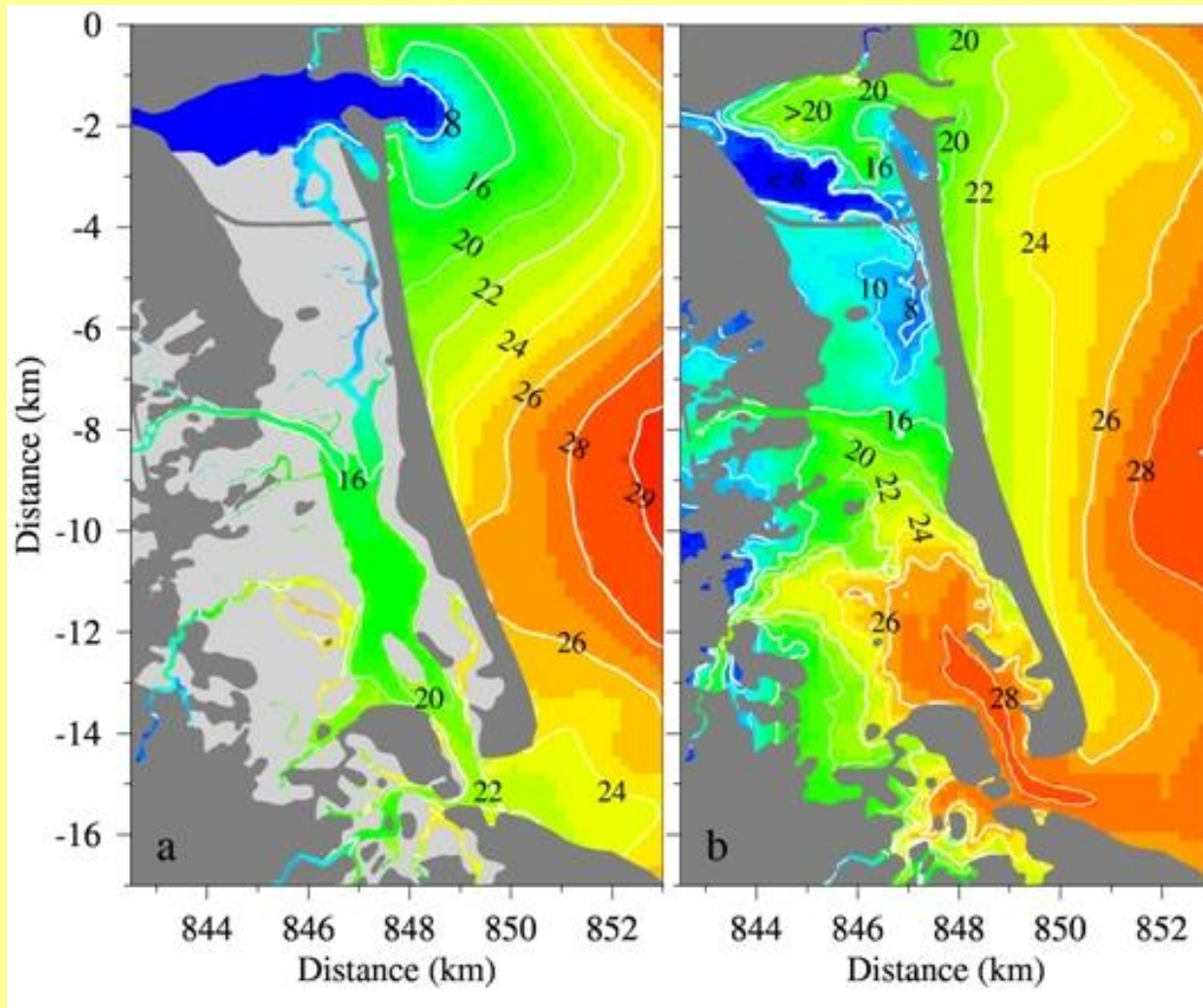
Traditional and Innovative Phragmites Control



Perennial Pepperweed



Technique: Hydrology Modeling



http://eco37.mbl.edu/FVCOM/Salinity_HighLowTide.jpg



Technique: Black Duck Carrying Capacity



https://www.allaboutbirds.org/guide/American_Black_Duck/id



Regional Efforts Stronger Coast (DOI #30): Salt Marsh Integrity Assessments



Static GPS Occupations at rSETs



Ditch Net Nekton Sampling



Regional Efforts Stronger Coast (DOI #30): Elevation Monumentation

10 Refuges

Chincoteague/VA

Back Bay/VA

Supawna Meadows/ NJ

Stewart B. McKinney/ CT

RI NWR Complex

Parker River NWR/ MA

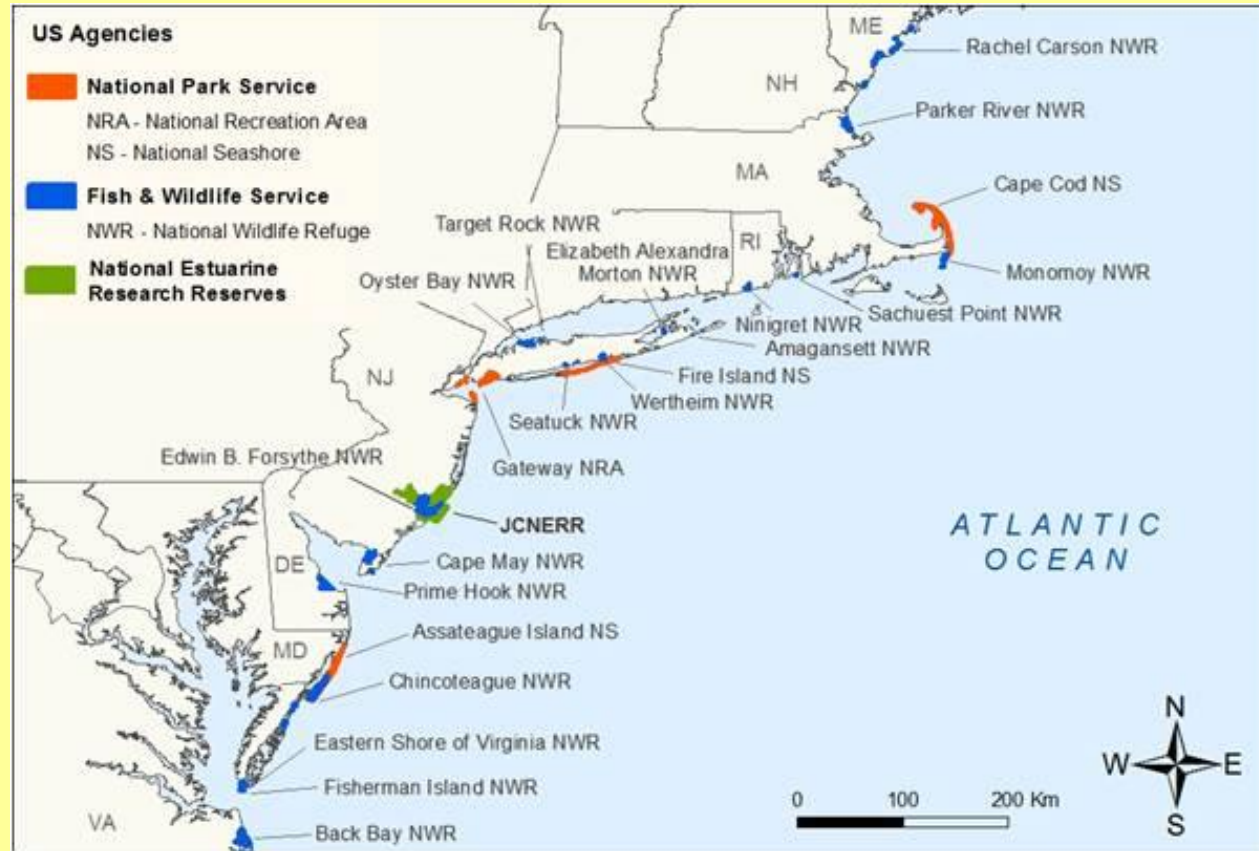
Monomoy NWR/MA

+3 NRWs in Maine

BM within 2 miles of each
salt marsh unit



Regional Efforts Stronger Coast (DOI #30): Shoreline Position Survey



Regional Efforts: Stronger Coast (DOI #30): Impoundment Study

- Reached out to refuges for priority impoundments “under threats” from SLR
- First cut assessment of breaching threats via LiDAR
- Modeling interior bathymetry and topography of adjacent marsh
- Conducting RTK surveys on the ground to verify/correct LiDAR



Photo credit: FWS



Technique: Regional Efforts

In-house Global Navigation Satellite System (GNSS)



RTK SwATH Sensors



LiDAR Correction

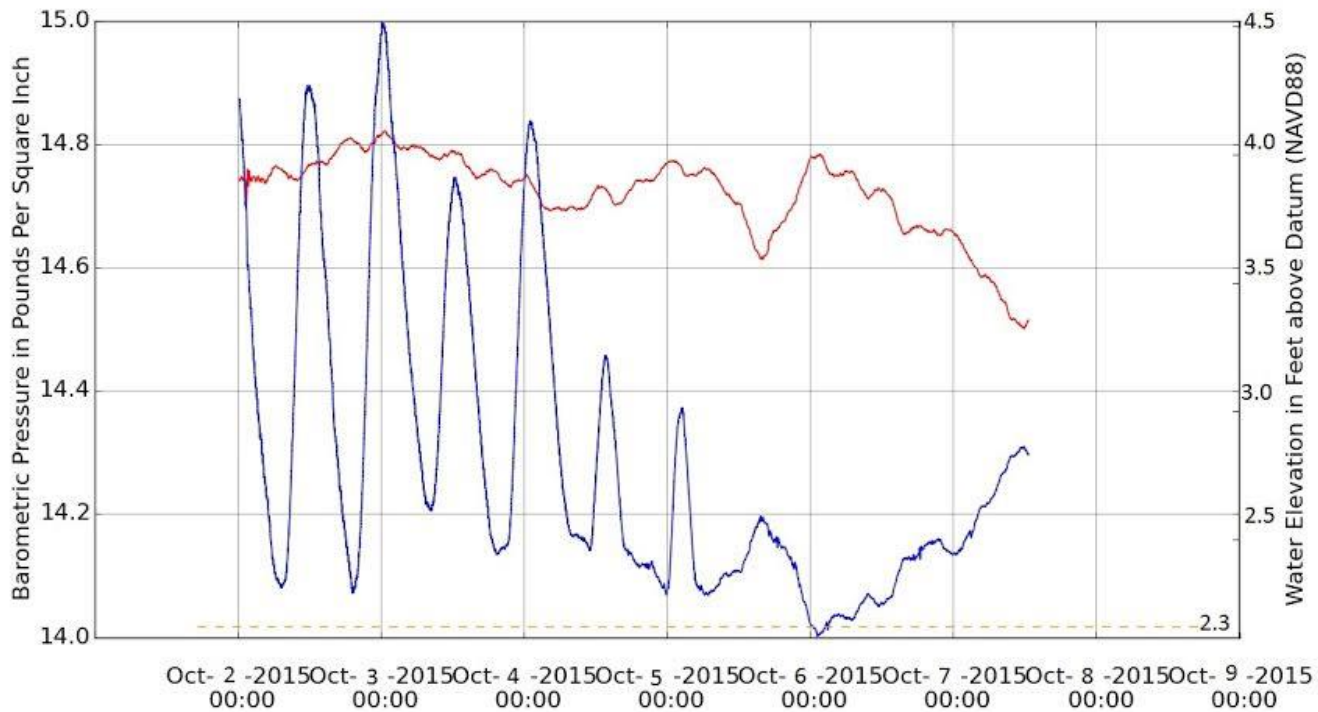


**Contractor
Performance**



Current Meter Correction

SwATH



Thank You

- Thanks to
- NWRs
- Region 5 DNR
- B. Forslind
- T. Mikula
- Questions?

