

USING SEDIMENT TO INCREASE SALT MARSH RESILIENCE: TWO RHODE ISLAND CASE STUDIES

Resilient Coastal Wetlands and Communities: Multi-Regional Workshop

May 25, 2022

Caitlin Chaffee, Narragansett Bay National Estuarine Research Reserve

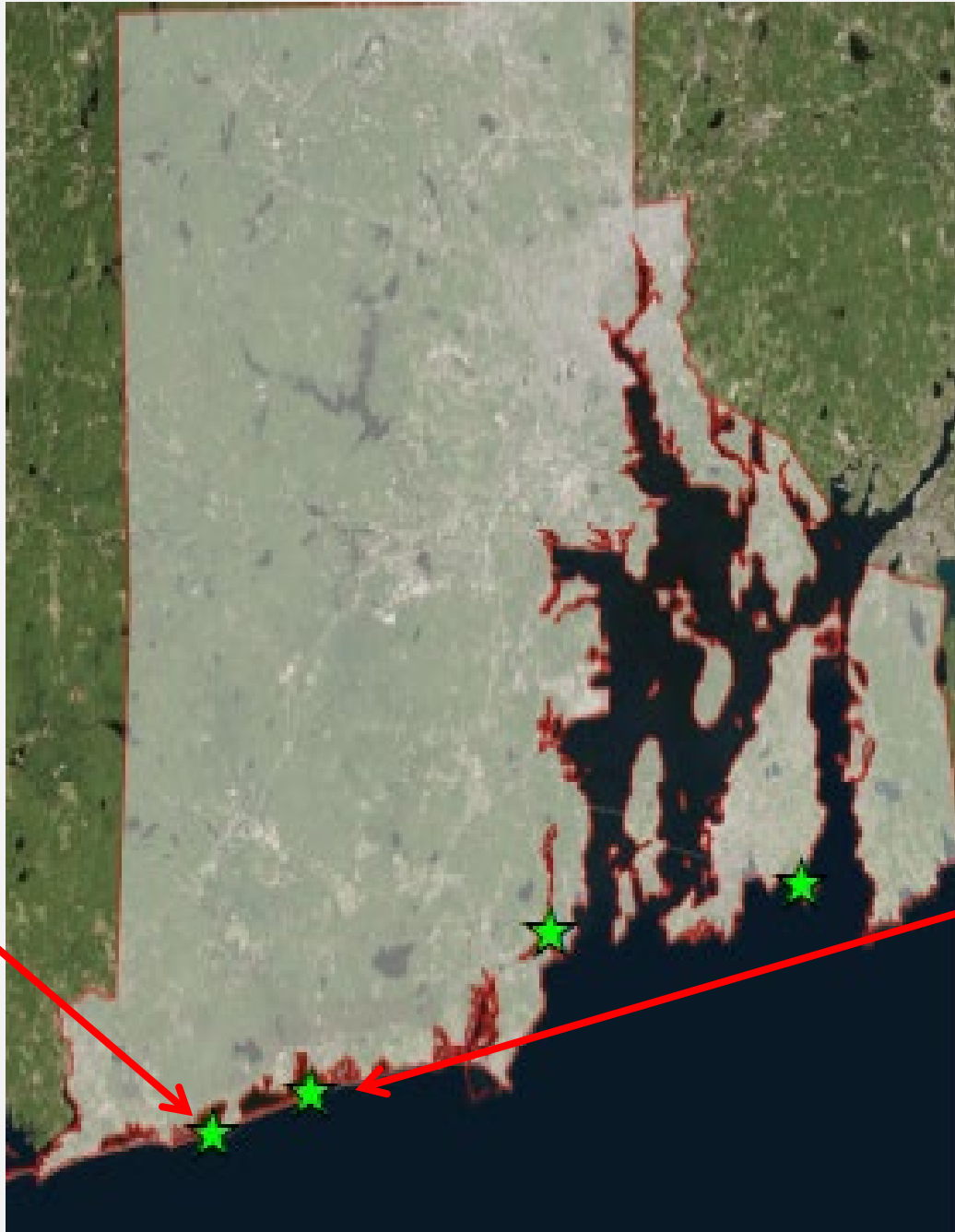
Wenley Ferguson, Save The Bay Narragansett Bay



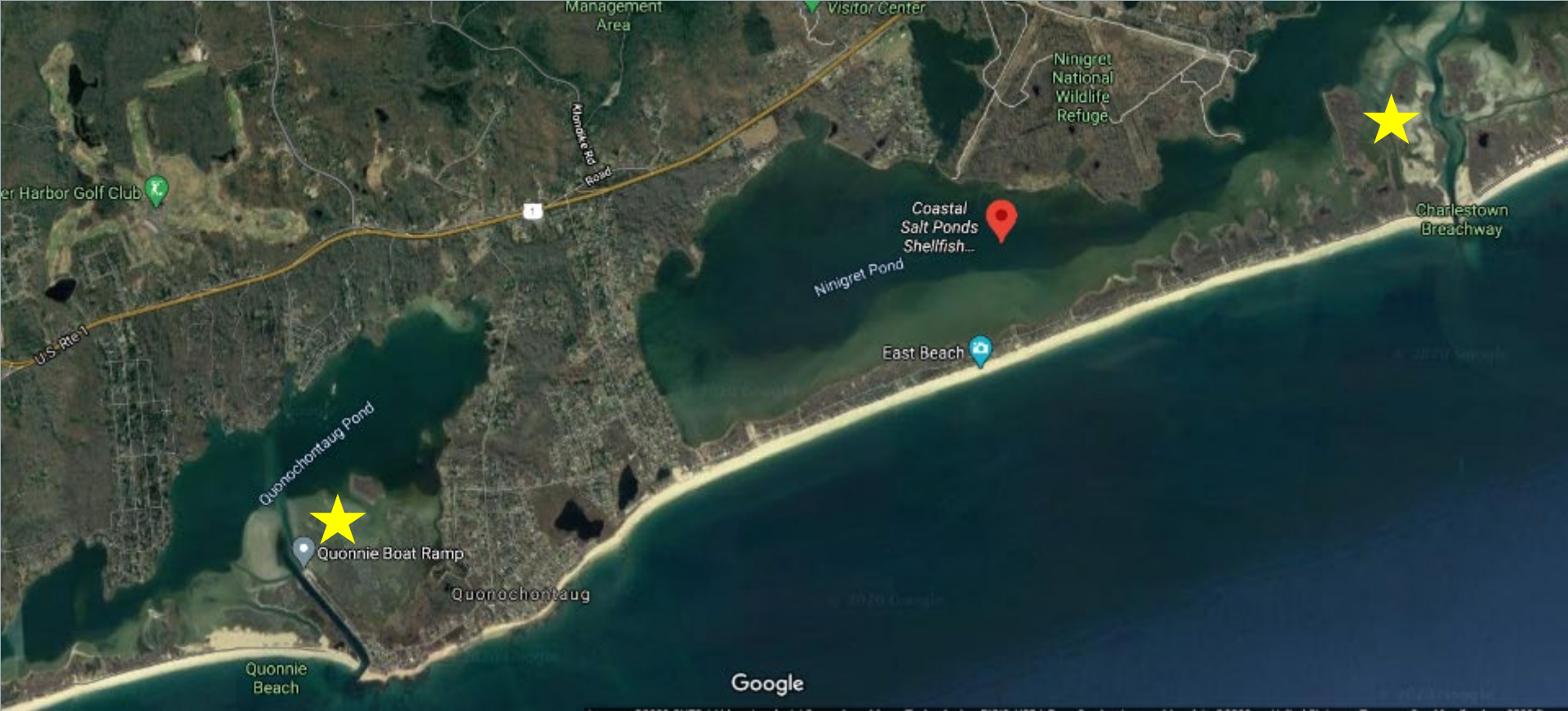
OVERVIEW

- Case Study 1: Ninigret Pond
- Case Study 2: Quonochontaug
- Key Lessons Learned

Quonochontaug Marsh
Restoration
Charlestown, RI

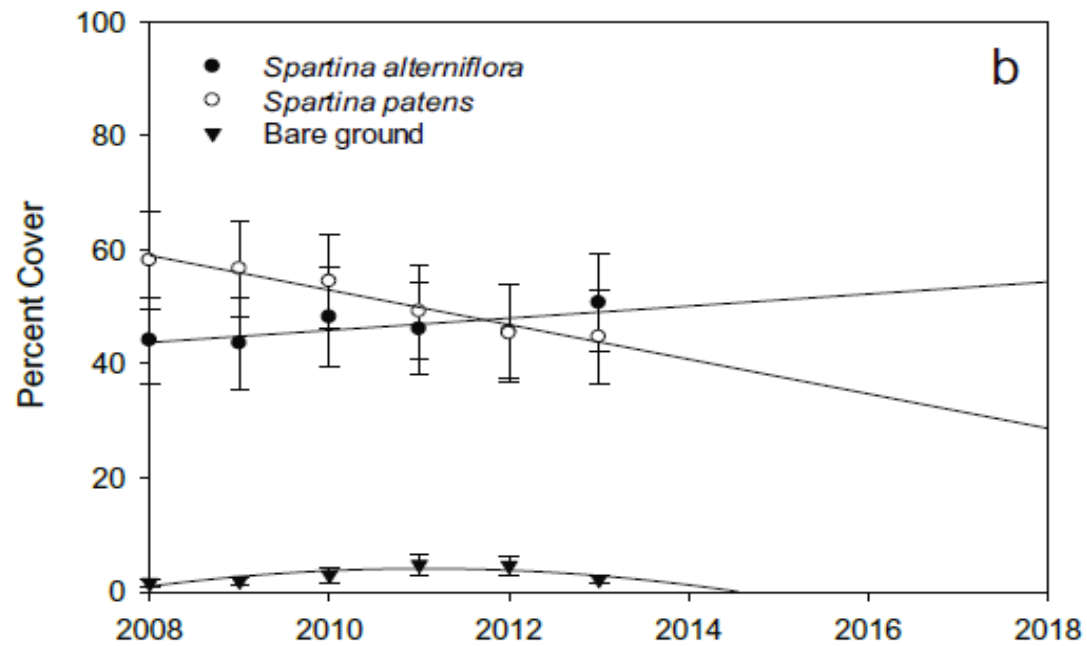
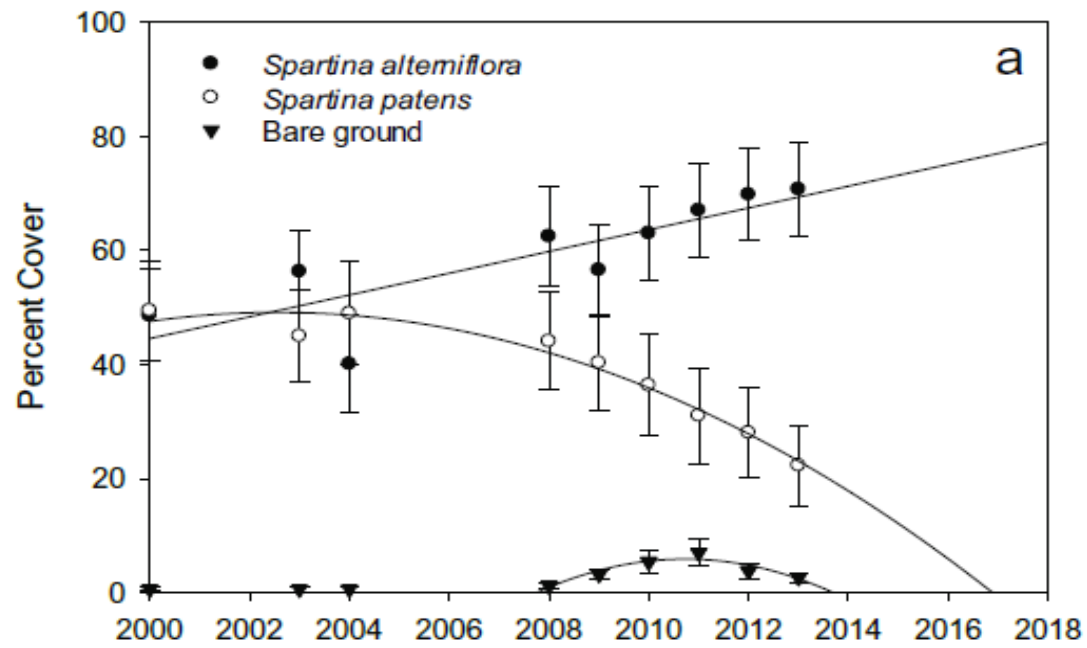


Ninigret Marsh Restoration
Charlestown, RI



CASE STUDY I: NINIGRET POND

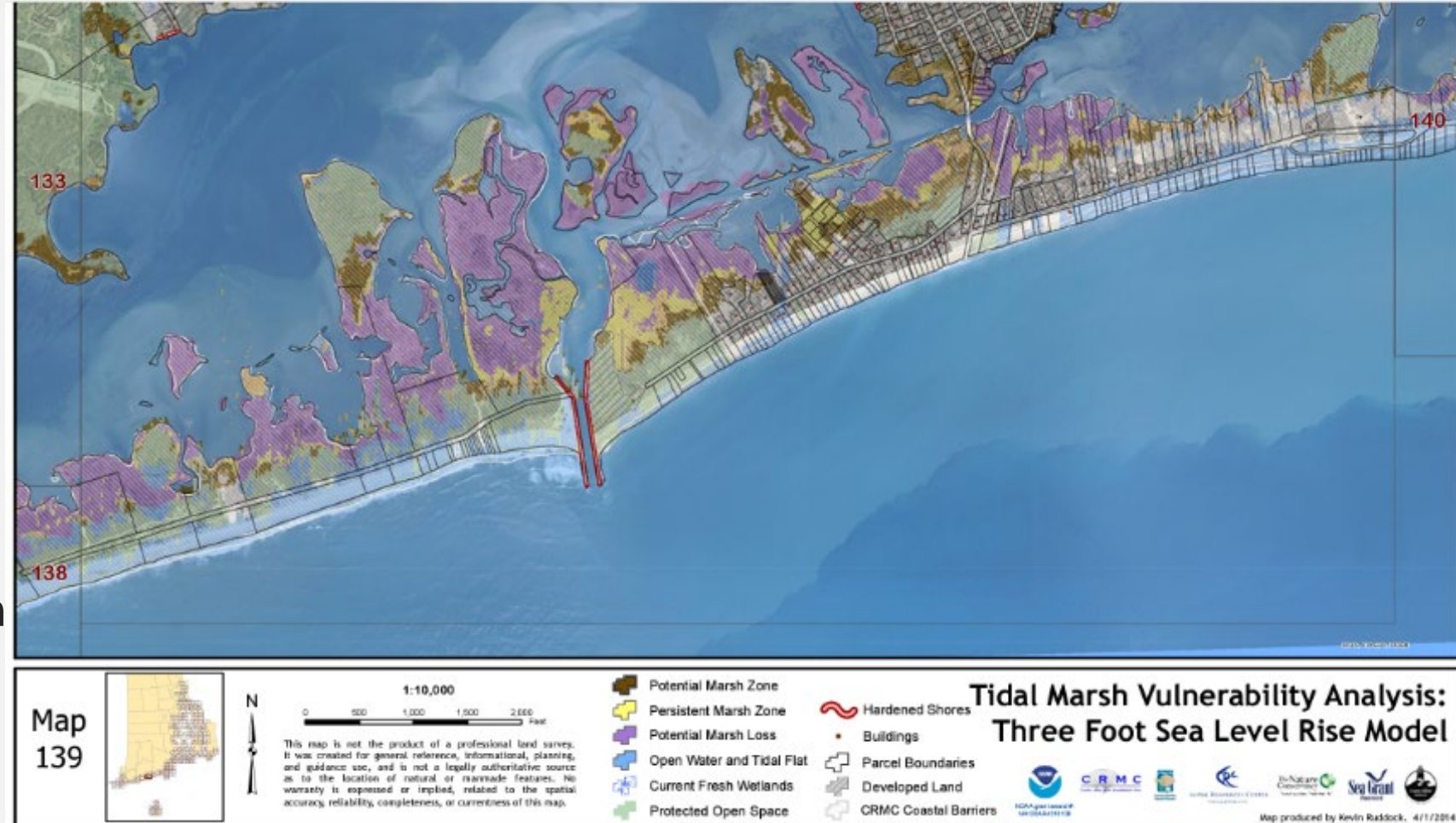
- **Completed:** 2017
- **Type:** Hydraulic dredging and direct sediment discharge
- **Sediments:** >90% sand
- **Funding Source:** NFWF Hurricane Sandy Resilience Grant (DOI)
- **Cost:** \$1.6M
- **Acres:** 20
- **Lead:** RI Coastal Resources Management Council
- **Contractor:** JF Brennan
- **Partners:** Town of Charlestown, Save The Bay, USFWS, EPA, NBNERR, URI EDC, RINHS





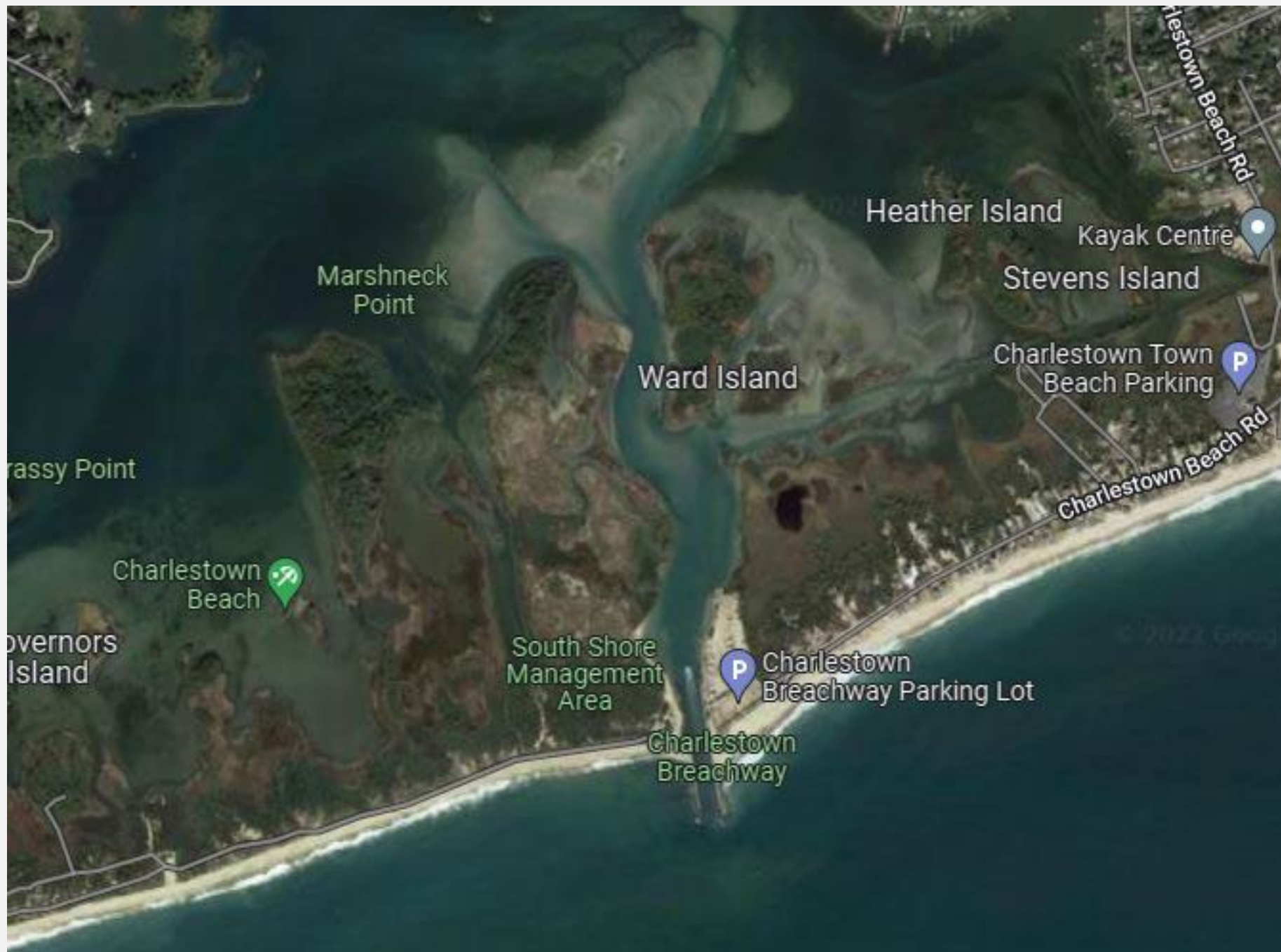
PROJECT PLANNING

- Vulnerability Assessments
- Information Gathering
 - SLR / marsh migration maps
 - Elevation and vegetation surveys
 - Information transfer from completed projects
- Consultation with dredging experts



PRE-PROJECT CONDITIONS





PROJECT TEAM

- Funding Proposal Development
- Design and Implementation
- Monitoring

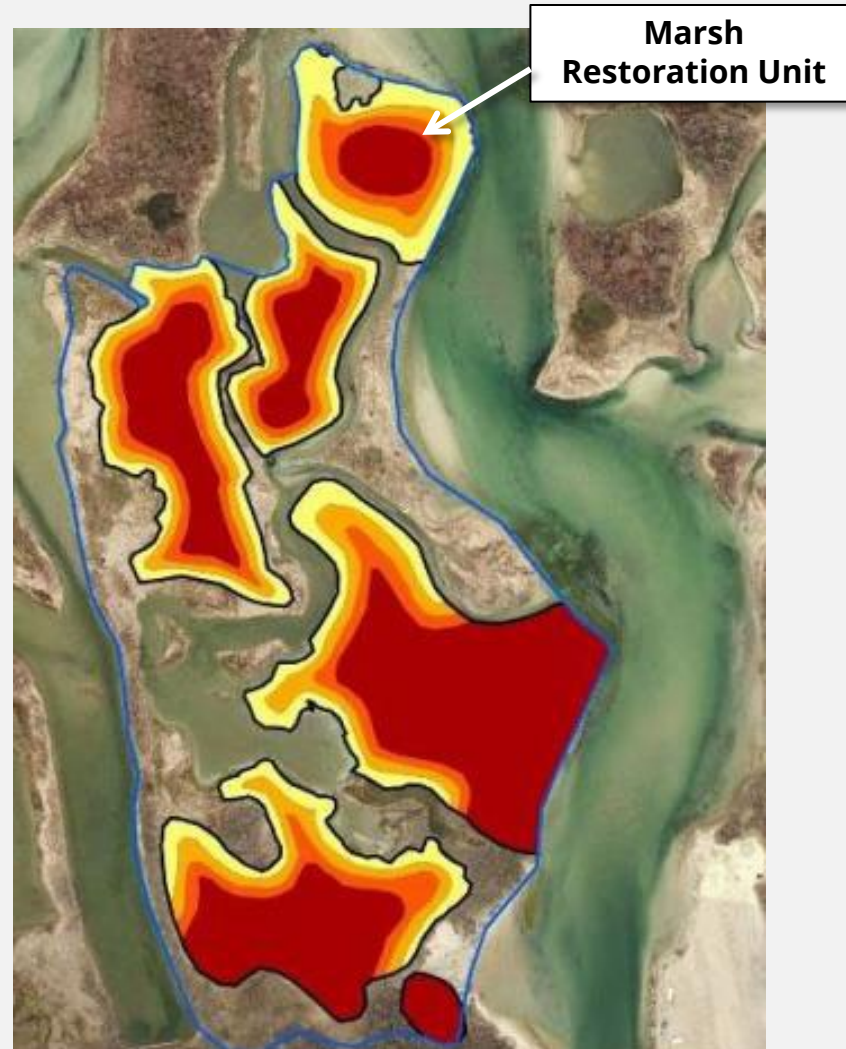


COLLABORATIVE DESIGN CHALLENGES

- Establishing project goals and objectives
- Balancing objectives with permit and funding requirements
- Dealing with uncertainty
 - Design
 - Budget / Construction Bid Solicitation

DESIGN: FILL ELEVATIONS AND GRADING

- Max target elevation: 1.2 ft NAVD88
- Historic creeks and pools to remain
- Preserved 5 ft perimeter buffer as sediment control



IMPLEMENTATION CHALLENGES

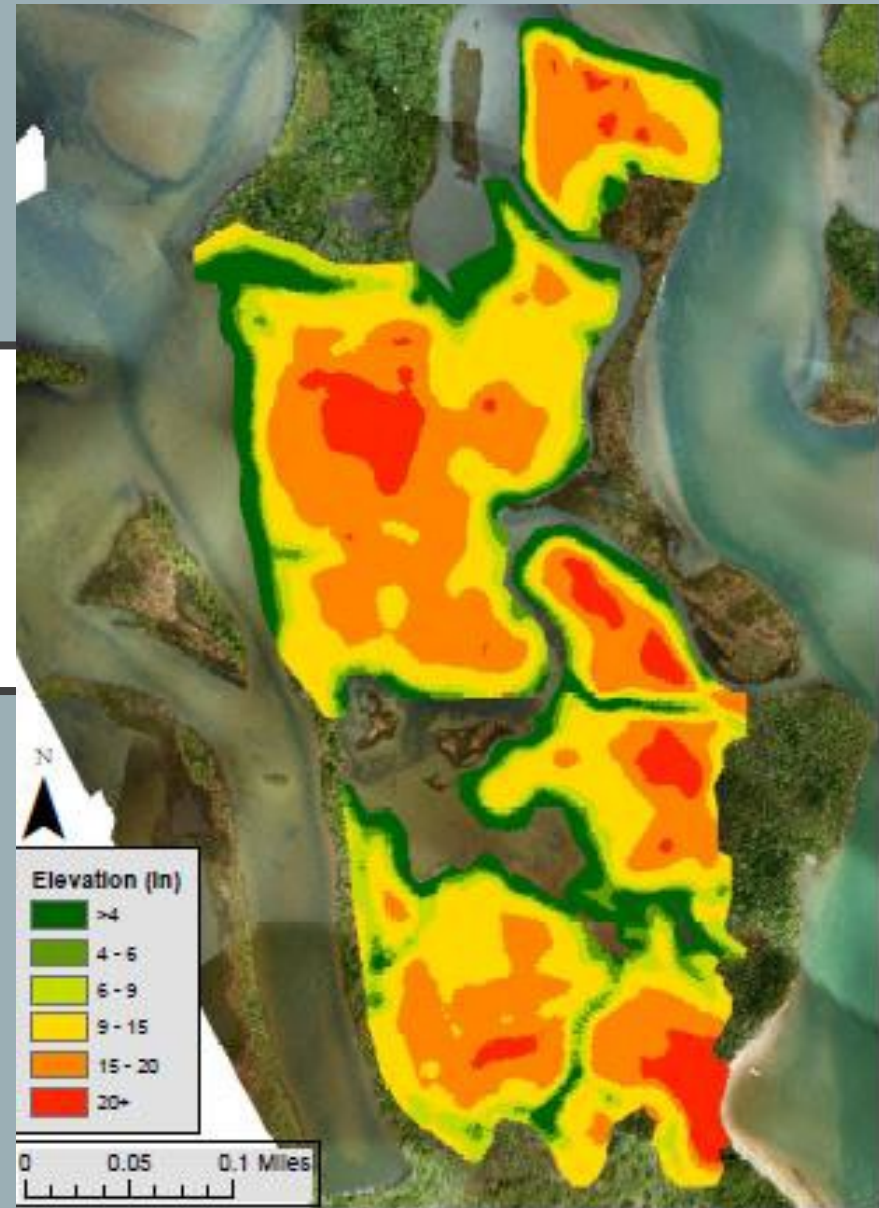
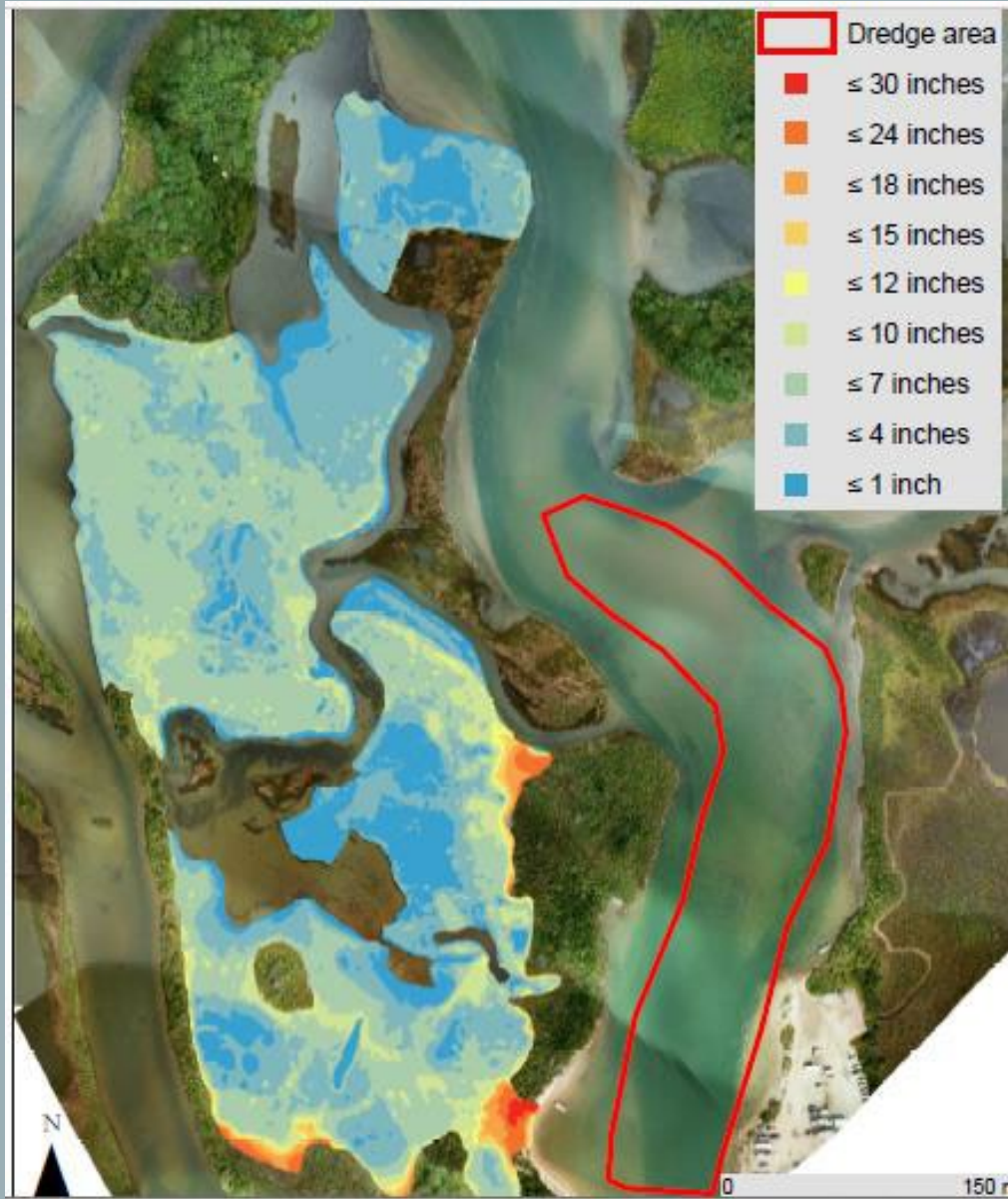
- Time of Year Restrictions
- Elevation Controls
- Construction Oversight
- Water Management
- Sand Management







Pre/post elevations





Stabilize sediment/sand



Vegetated buffers used for sediment control of sand



Planted beach grass as temporary sand stabilization



Used brush and dune fencing for sand stabilization



Salt marsh planting: Ninigret

186 volunteers/ 750 hours/46,850 plants



Distichlis August 2017



Distichlis August 2018



July 2019



Re-establish Hydrology



2018



Tie into existing elevations



Impounded water along edge of sediment placement



Regrading sediment to tie into existing elevations









CASE STUDY 2: QUONOCHONTAUG MARSH

- **Completed:** 2019
- **Type:** Hydraulic dredging and direct sediment discharge
- **Sediments:** >90% sand
- **Funding Source:** NOAA Coastal Resilience Grant, Town of Charlestown, Weekapaug Foundation
- **Cost:** \$2.2M
- **Acres:** 30
- **Lead:** RI Coastal Resources Management Council
- **Contractor:** JF Brennan
- **Partners:** Town of Charlestown, NOAA, Save The Bay, Salt Ponds Coalition, Shelter Harbor Conservancy, USFWS, EPA, NBNERR, URI EDC, RINHS, Charlestown Land Trust



Google

PRE-PROJECT CONDITIONS

- Permanent ponding
- Vegetation die-off
- Bare areas
- Crab burrows throughout marsh platform



COMMUNITY SUPPORT

- Land protection
- Support for municipal funding
- Fundraising

DESIGN AND CONSTRUCTION LESSONS LEARNED FROM NINIGRET

- More effective tie-in to upland elevations
- Use of RTK-enabled equipment
- Sand management using fencing and beach grass
- Planting great for community engagement but not necessary for restoration goals
- Set realistic expectations and objectives

Quonnie sediment placement: winter 2018-19





URI - EDC UAS Imagery April 17, 2019

Drone imagery prior to first growing season



Sand stabilization



Dune 27' wide, 4' high

Quonnie: Grading and restoring hydrology



Enhanced Public Access



Salt marsh planting



September 2018

Quonochontaug West



January 2019



August 2020



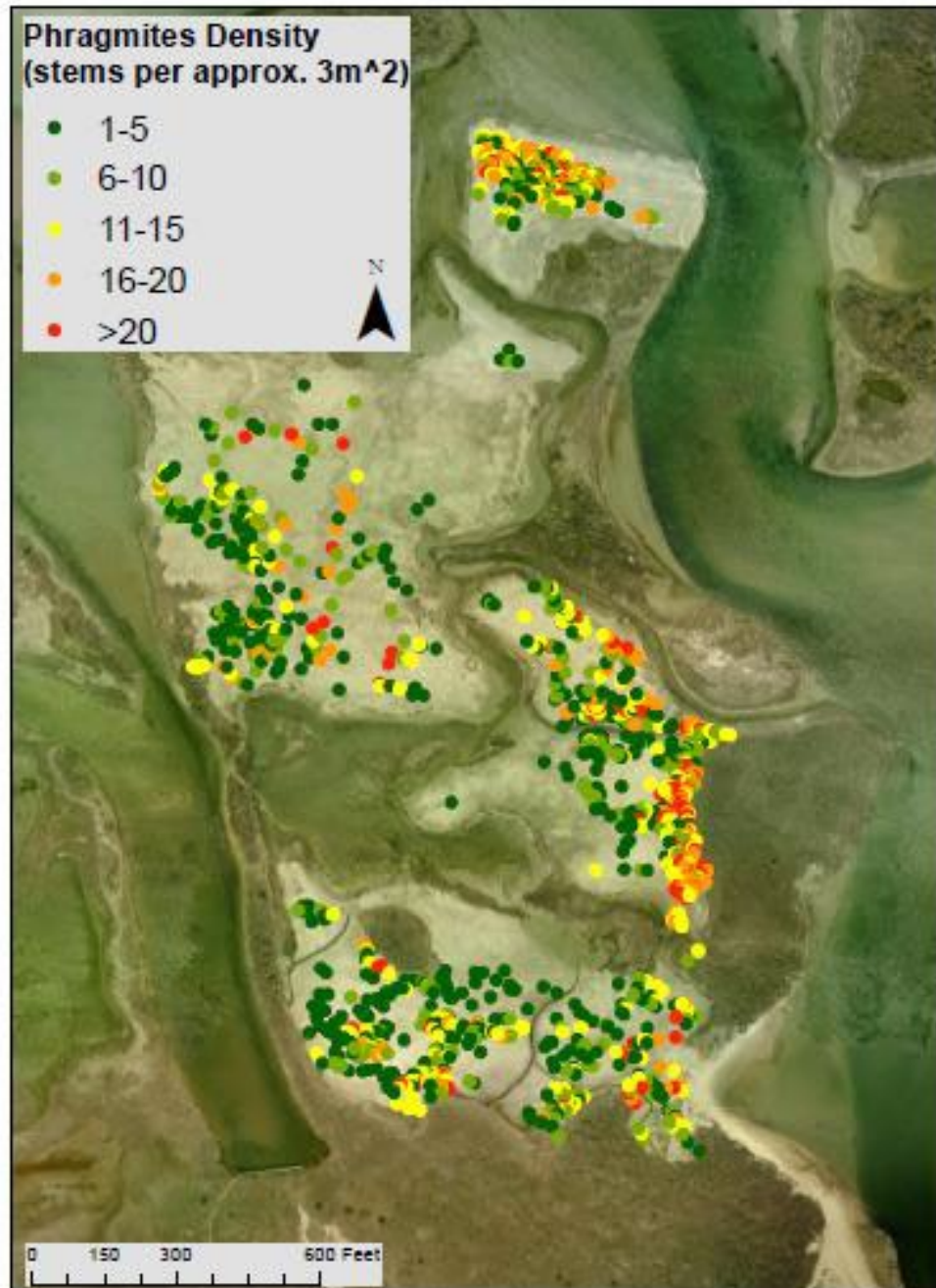
August 2021



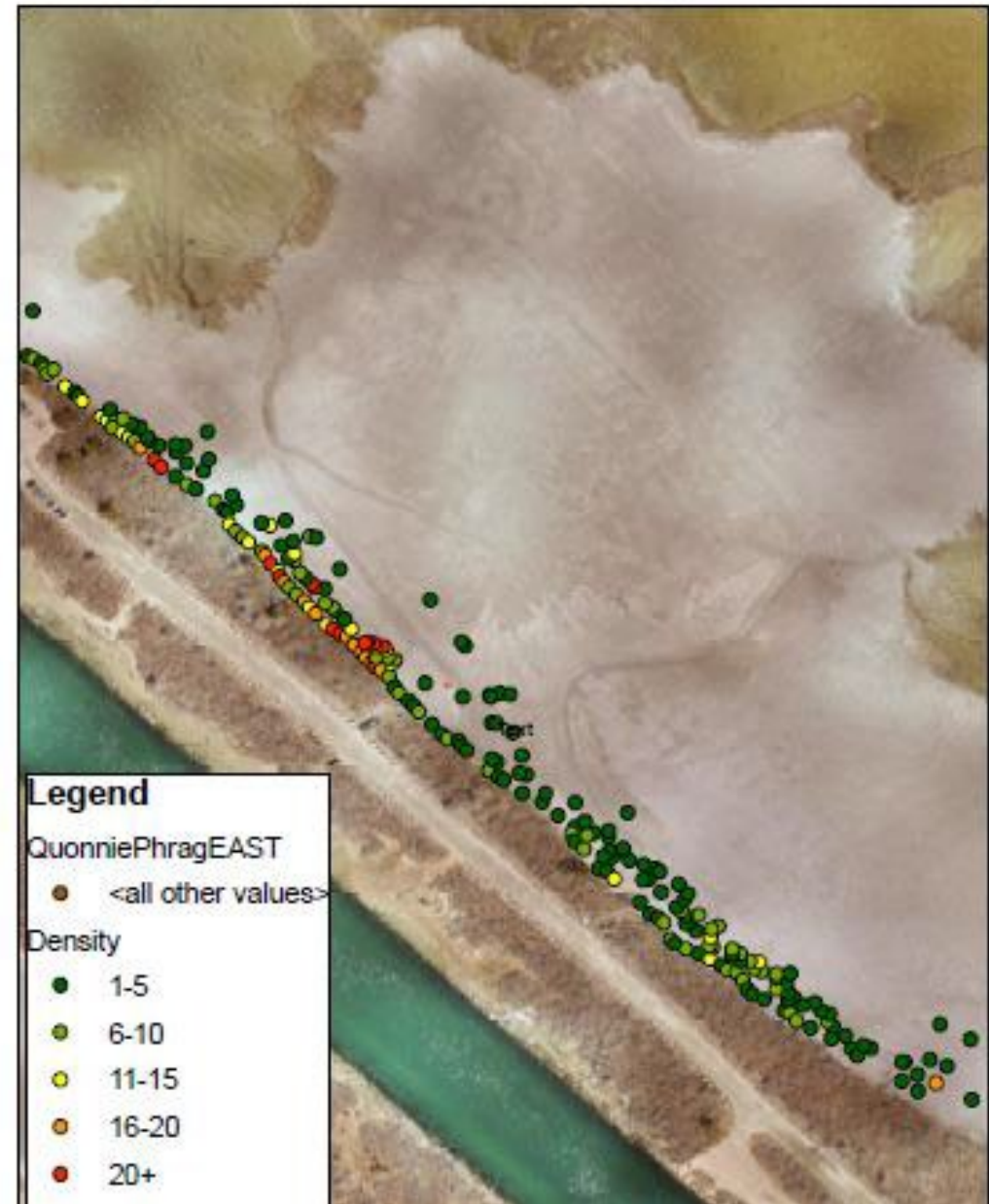
KEY LESSONS LEARNED

- Create a strong team
- Consider multiple objectives and benefits
- Set realistic goals and expectations based on limitations of equipment and personnel capacity
- Be open to feedback from contractors
- Plan for adaptive management after initial construction phase

2018 Ninigret Phragmites Coverage



August 2019 Quonnie Phrag Locations









THANKS!

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- Wenley Ferguson, Save The Bay wferguson@savebay.org

