

Changes in the Marsh: How the Past is Influencing the Present

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Overview – NaMaSTe

- Working as part of the National Marsh Synthesis Team (NaMaSTe) an NSC project
- Overall project goal is to analyze long-term salt marsh monitoring data on a site, reserve, regional and national level
- Working on developing a new vegetation metric to determine salt marsh response to sea level rise by looking at how different regions are responding

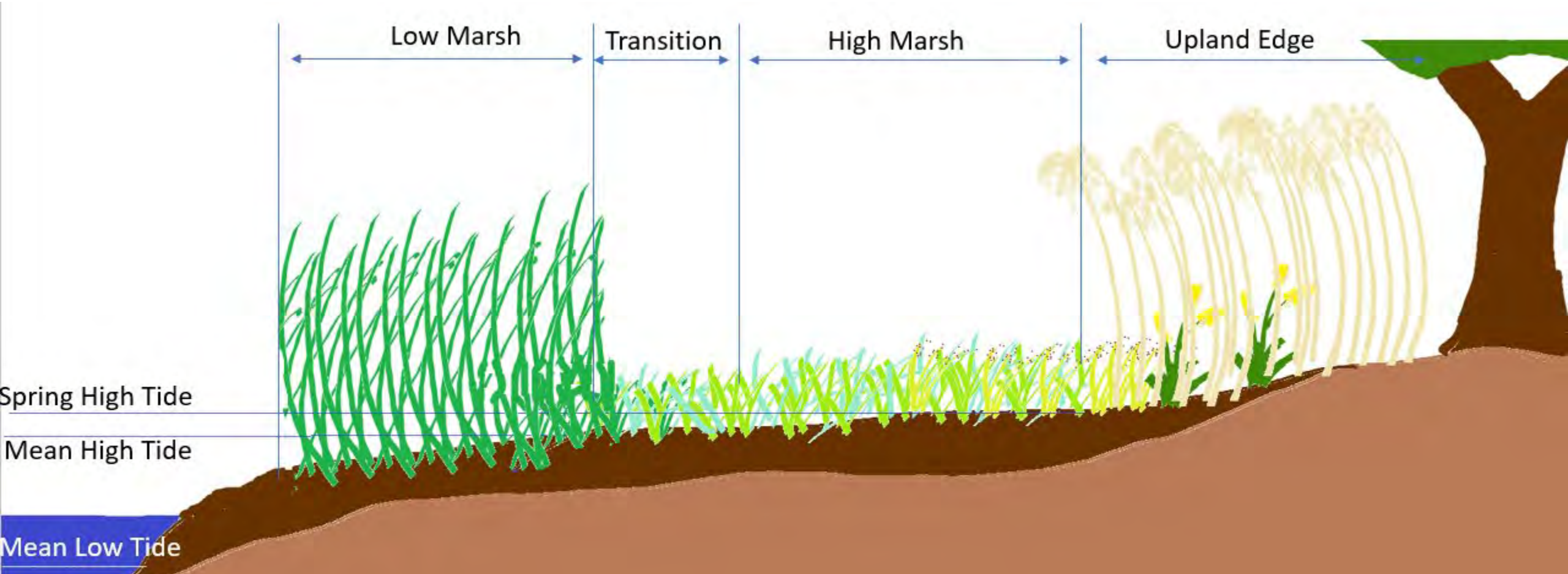
NaMaSTe – Metadata Management

- Meeting 1-on-1 with each reserve to determine methods and reserve-specific conditions
- Determining what data is available and cataloging the available data
- Evaluating what metrics were measured at all reserves with similar enough methods, frequently enough to be analyzed together



NaMaSTe – Key Factors Moving Forward

- After pilot testing analyses it became clear that designating marsh zone for each plot is crucial to determining a change in the marsh vegetation
- Analyses must start at individual sites within reserves and work upwards



NaMaSTe – Wells NERR

Indicator Species Analysis 2011

- Low Marsh Indicator Species:
 - *Spartina alterniflora*
 - *Spartina patens*
 - *Suaeda linearis*
- High Marsh Indicator Species
 - *Plantago*
 - *Juncus gerardii*
 - Bare Ground
- Upland Edge Indicator Species
 - *Solidago sempervirens*
 - *Distichlis spicata*
 - *Schoenoplectus americanus*

Indicator Species Analysis 2017

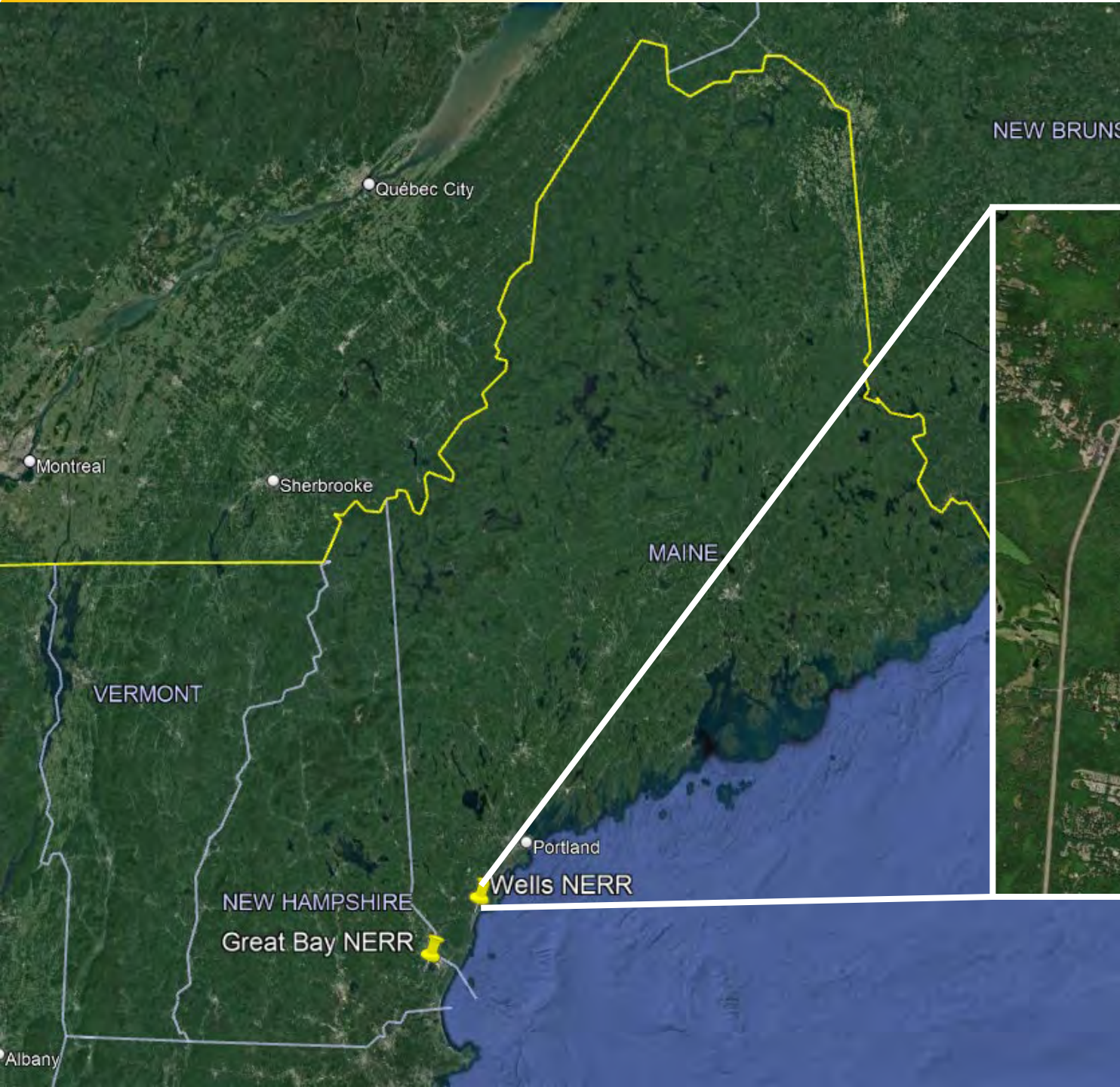
- Low Marsh Indicator Species
 - *Suaeda linearis*
 - *Salicornia depressa*
 - *Atriplex patula*
- High Marsh Indicator Species
 - *Spartina alterniflora*
 - Bare ground
- Upland Edge Indicator Species
 - *Spartina patens*
 - *Juncus gerardii*
 - *Solidago sempervirens*

Overview – Historic Agricultural Embankments Impact on Salt Marsh Vegetation and Hydrology

- Embankments were used by farmers in order to farm different parts of the marsh at different salinity regimes.
- Looking to see what impact these embankments have on vegetation and hydrology
- Important step as we look towards salt marsh restoration

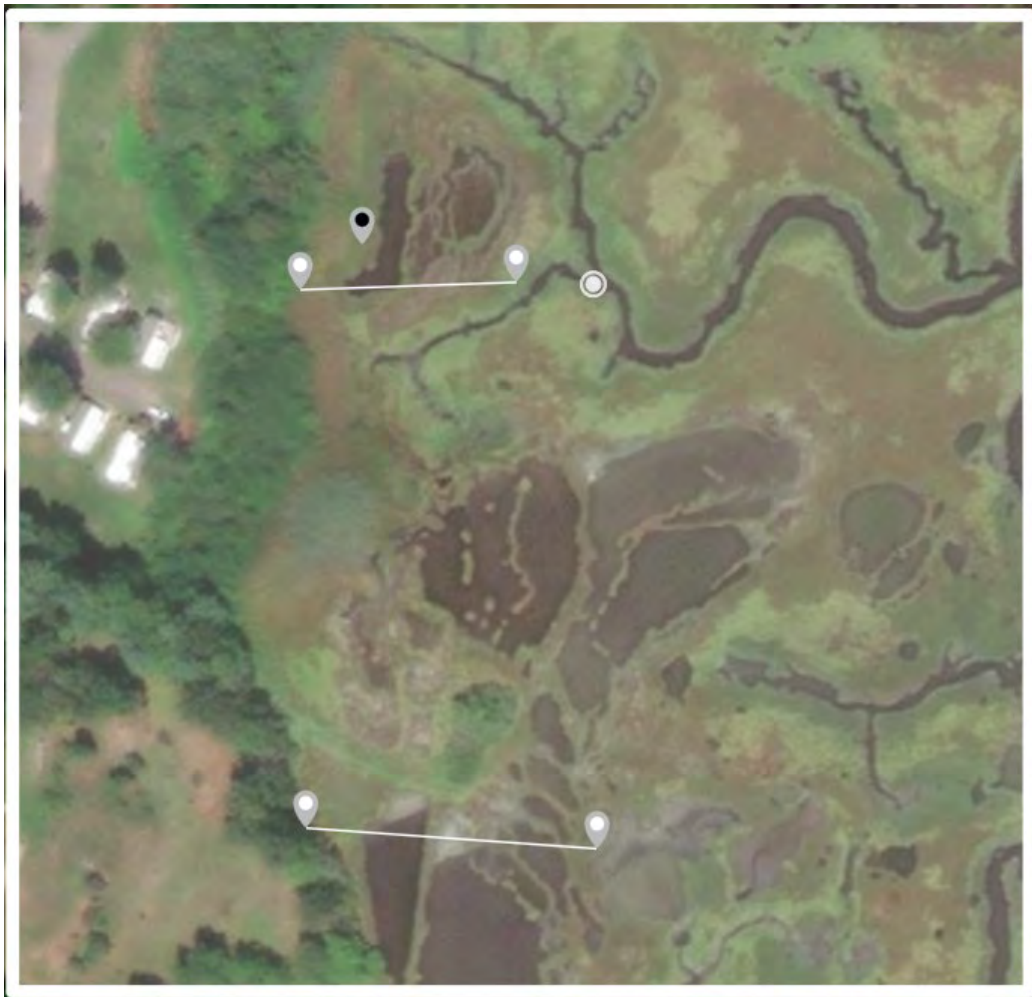


Wells, Maine



Embankments – Wells NERR Sites

Embankment Site



Reference Site



Embankments – Embankment Transects



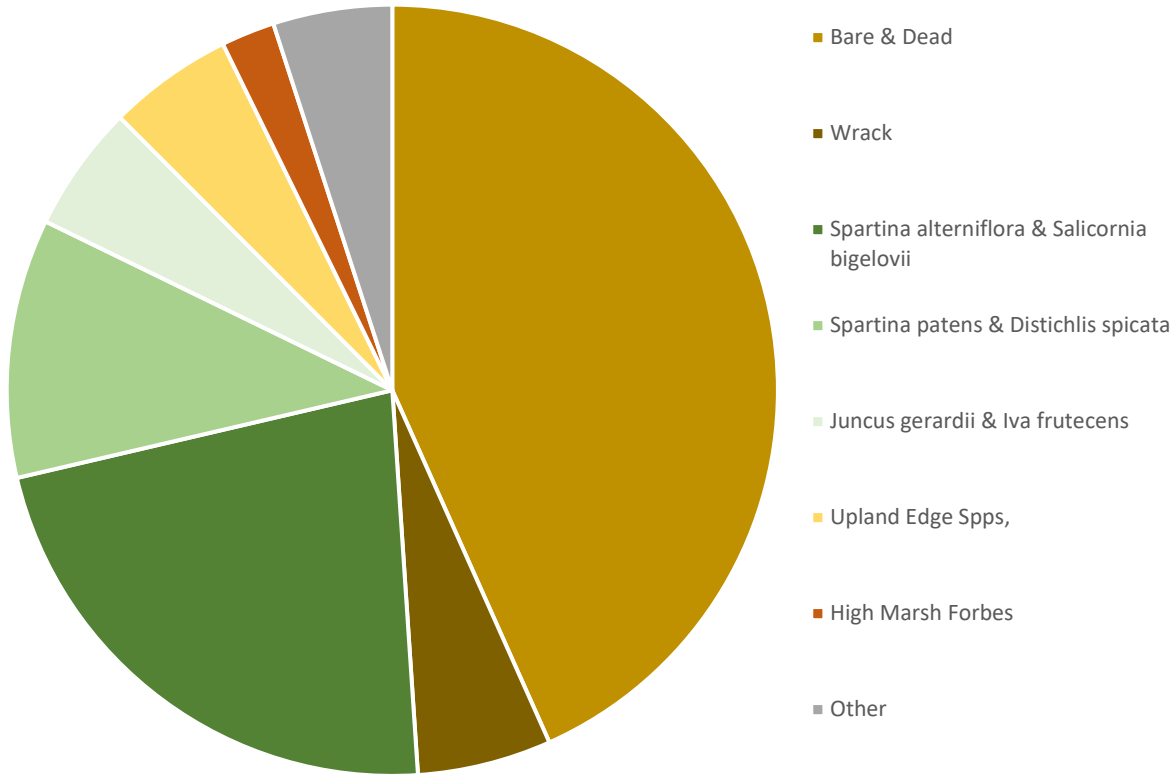
Embankments – Field work & Methods

- Aerial imagery was used to pick out reference and embankment sites
- Transects for vegetation composition and elevation were established
- Temporary monitoring wells and creek monitoring stakes were installed with Onset HOBO water level recorders

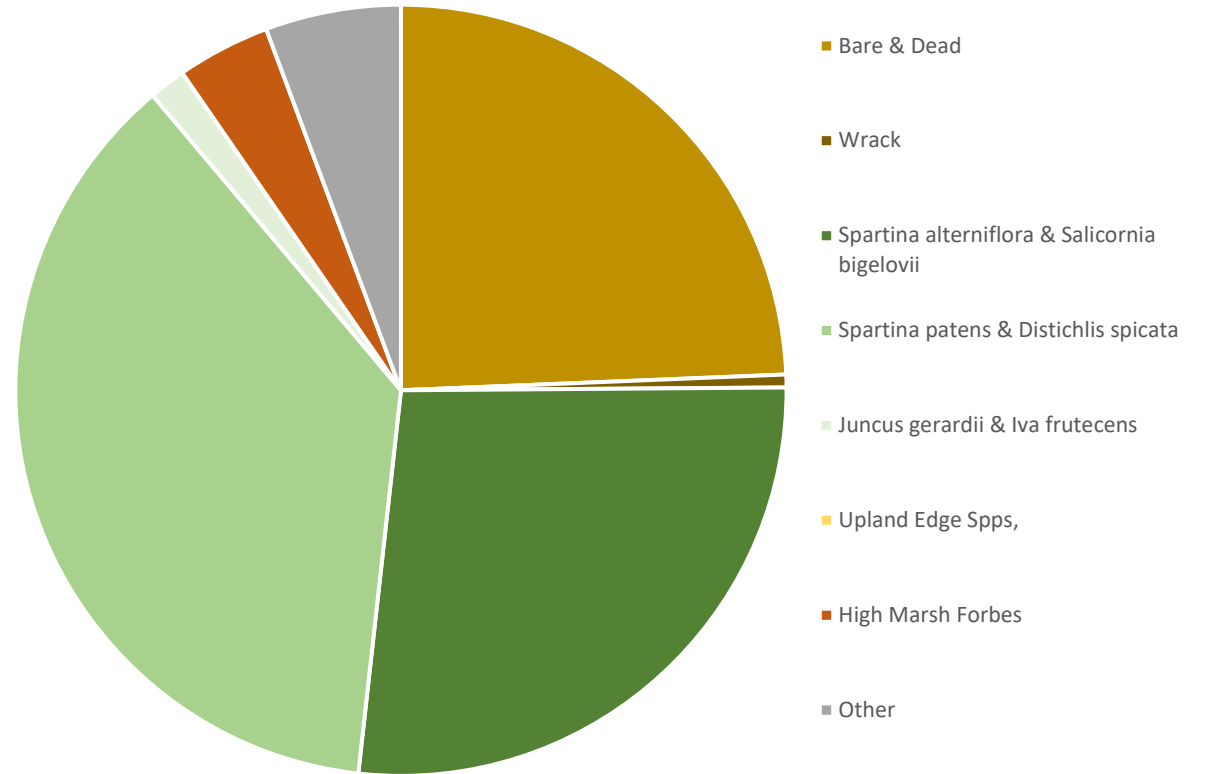


Embankments – Vegetation Results

Wells Embankment

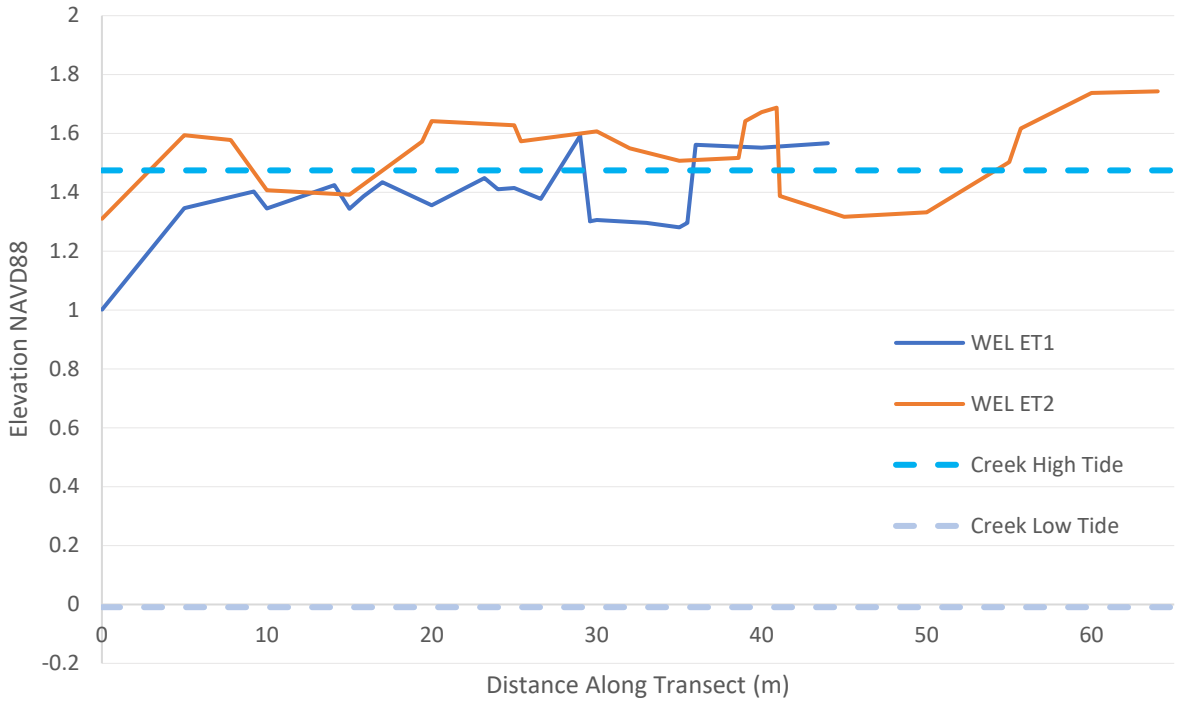


Wells Reference

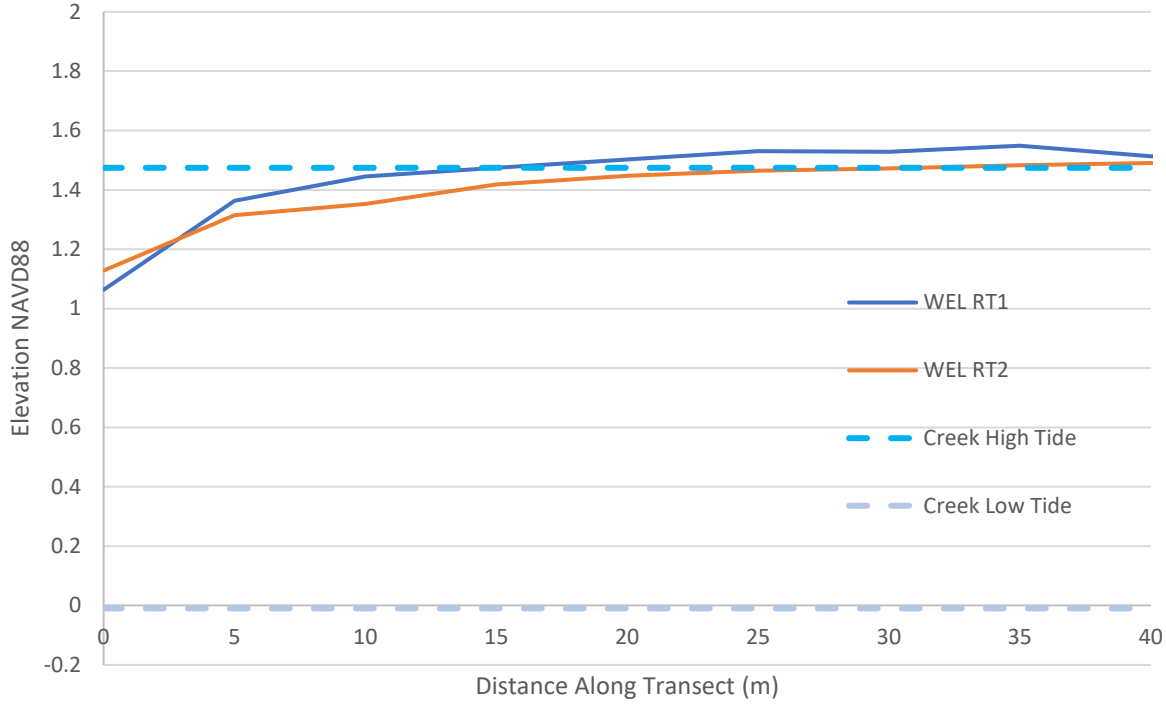


Embankments – Hydrology Results

Wells Embankment Transects Elevation Profiles

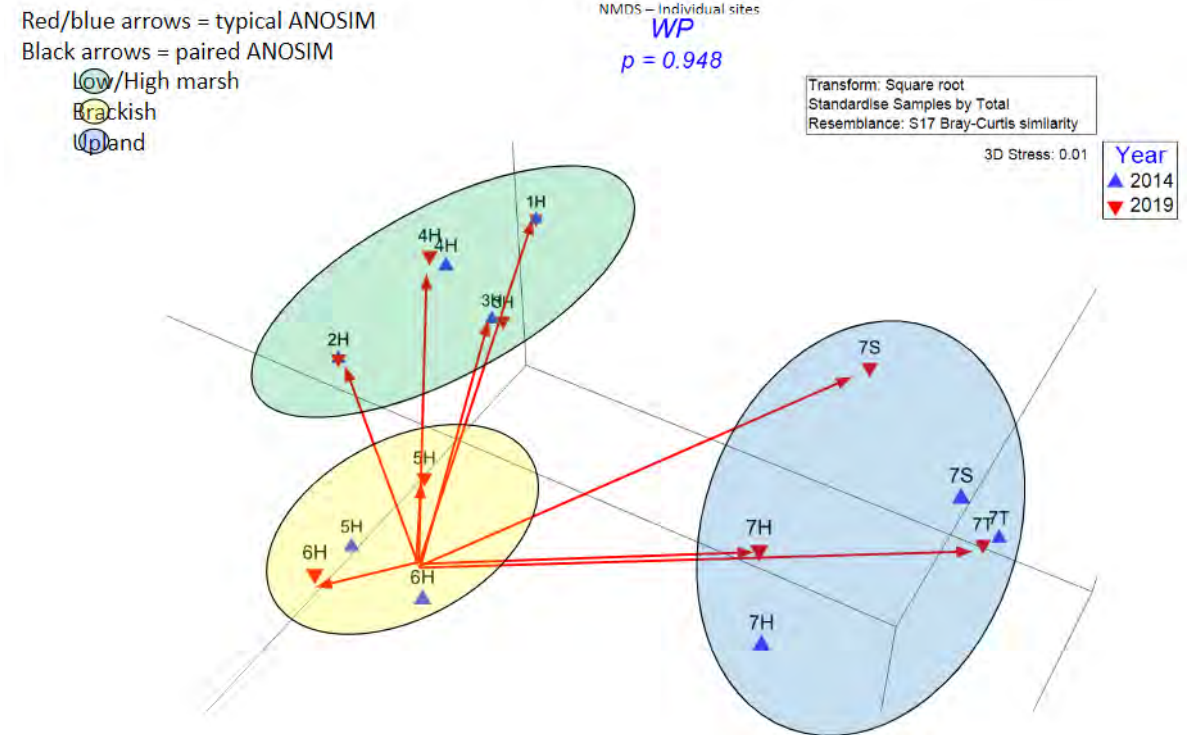


Wells Reference Transects Elevation Profiles



Next Steps - NaMaSTe

- Begin working with data in NaMaSTe format to create R-code
- Focus on transition zones and changes within plots that are on the edge of zones
- Develop vegetation metric for each region

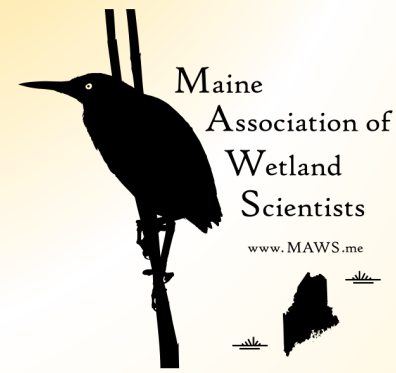


Next Steps - Embankments

- Multivariate analyses of vegetation data and incorporating elevation data into vegetation analyses
- Incorporate salinity data into hydrological analyses



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