Vegetation Zone Dominance

A Tool For Discerning Relationships Between Marsh Topography and Plant Communities

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Balancing Progress & Protection – 10 Years of Science in Action

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Hierarchical Analysis
of coastal wetlands

1. Regional Prioritization

Elevation data not so accurate on marshes!

2. Remote Sensing Analyses

3. Site Characterization

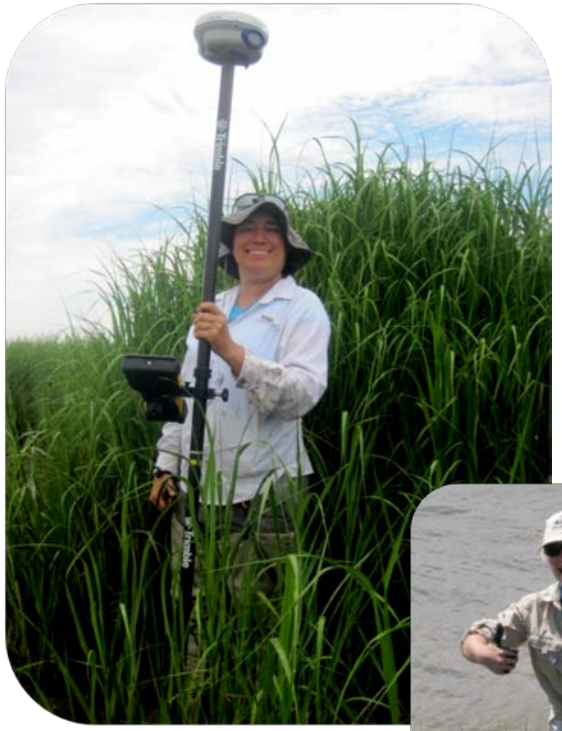
Vegetation Zone Dominance

4. Highly Detailed Analysis

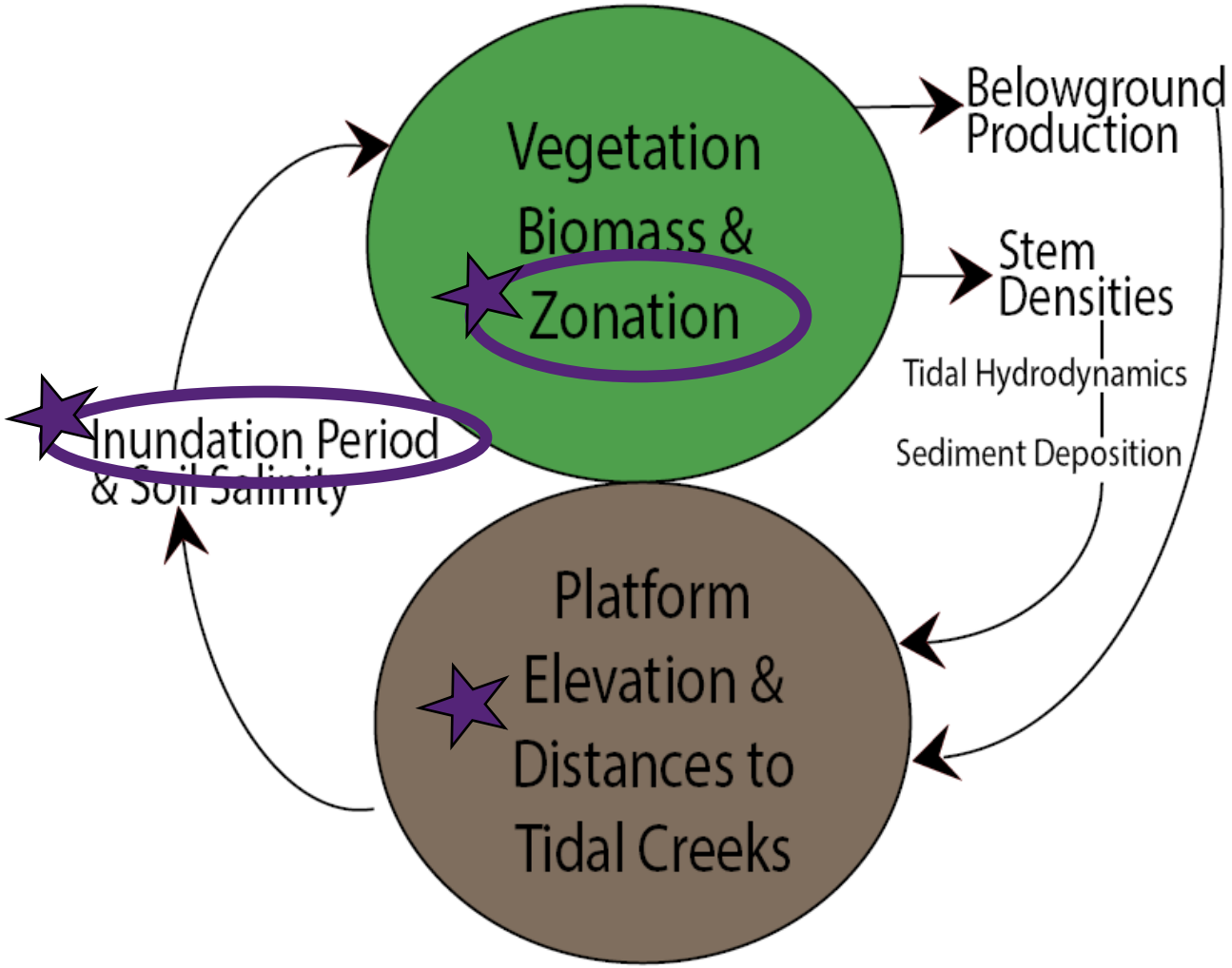
Adapted from J. Moody 2015

Currently…

We collect on the ground data through MidTRAM, but there are gaps in connecting accurate elevation data with plant distributions through on the ground methods.



We know plants, elevation, and flood frequency are intimately related…



Adapted from Fagherazzi *et al.* 2004 and 2012

Vegetation Zone Dominance

- Since elevations, tidal flooding, and plant distributions are so related, we could develop a tool that combines these factors *numerically*
- The VZD tool describes what dominant plant species occur in specific tidal flood zones
- **VZD is highly simplified way to report complex community composition data**

Vegetation Zone Dominance

- VZD is a starter tool for studying plant distributions
  - Can be used for one time surveys, or long term monitoring plans
  - It is ideal for tracking changes in distributions due to increases in tidal flooding (SLR) and approximating the marsh platform's elevations within the tidal prism

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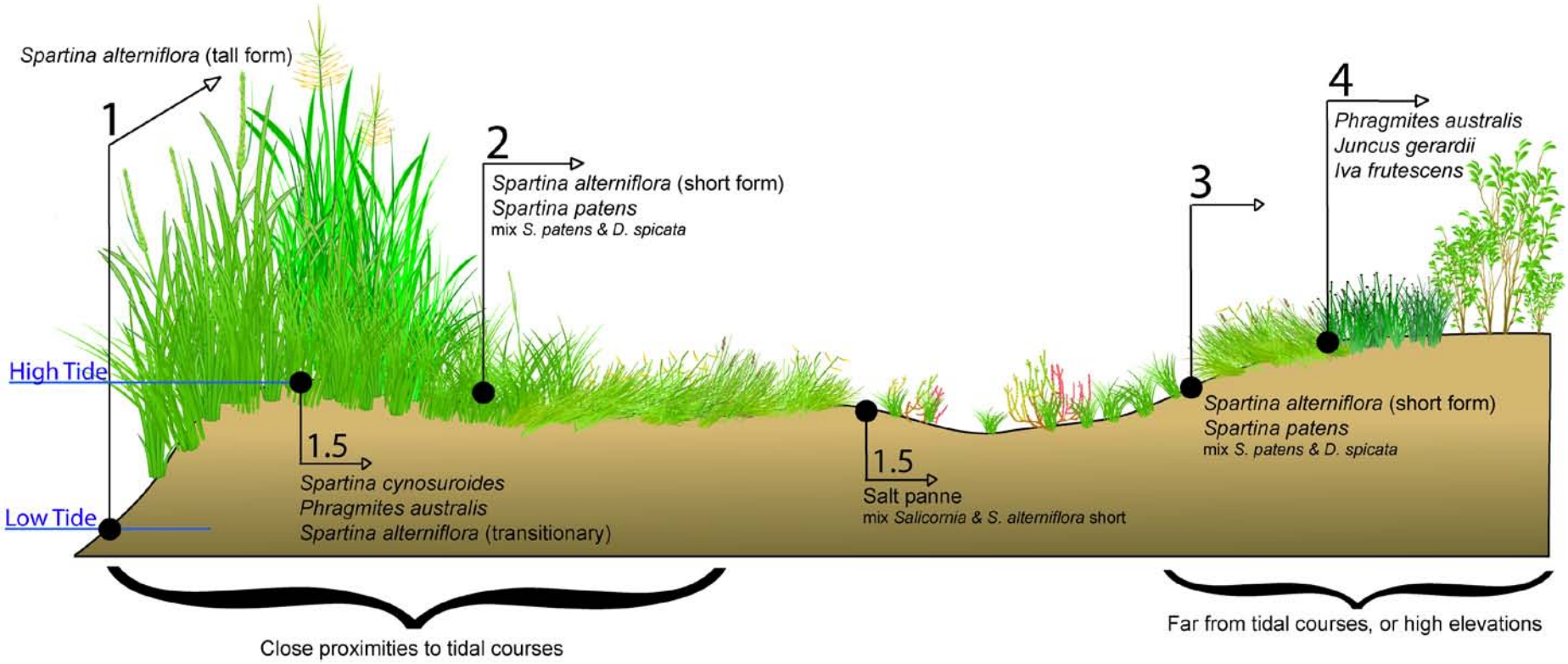
- This year, we collected over 10,000 RTK GPS points. These data were used to analyze patterns in plant distribution, which were converted into "zones".
- VZD takes into account elevations and distances to tidal creeks

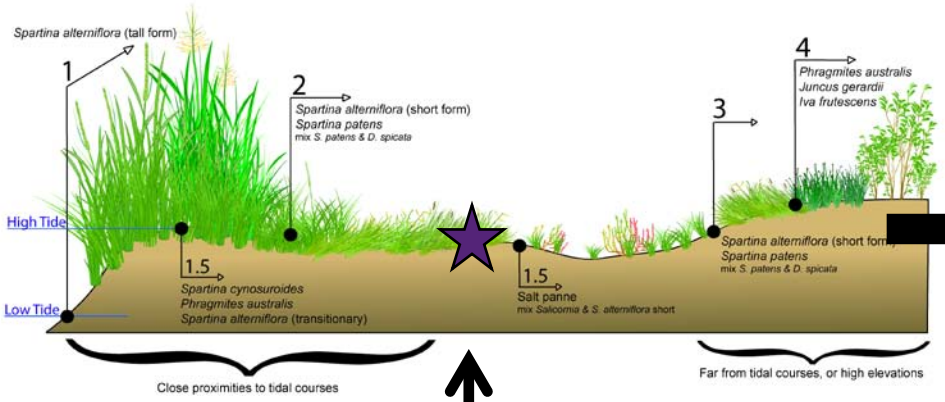


Calculating VZD

Spartina alterniflora – 5%

Spartina patens – 70%

~90 m from tidal creek



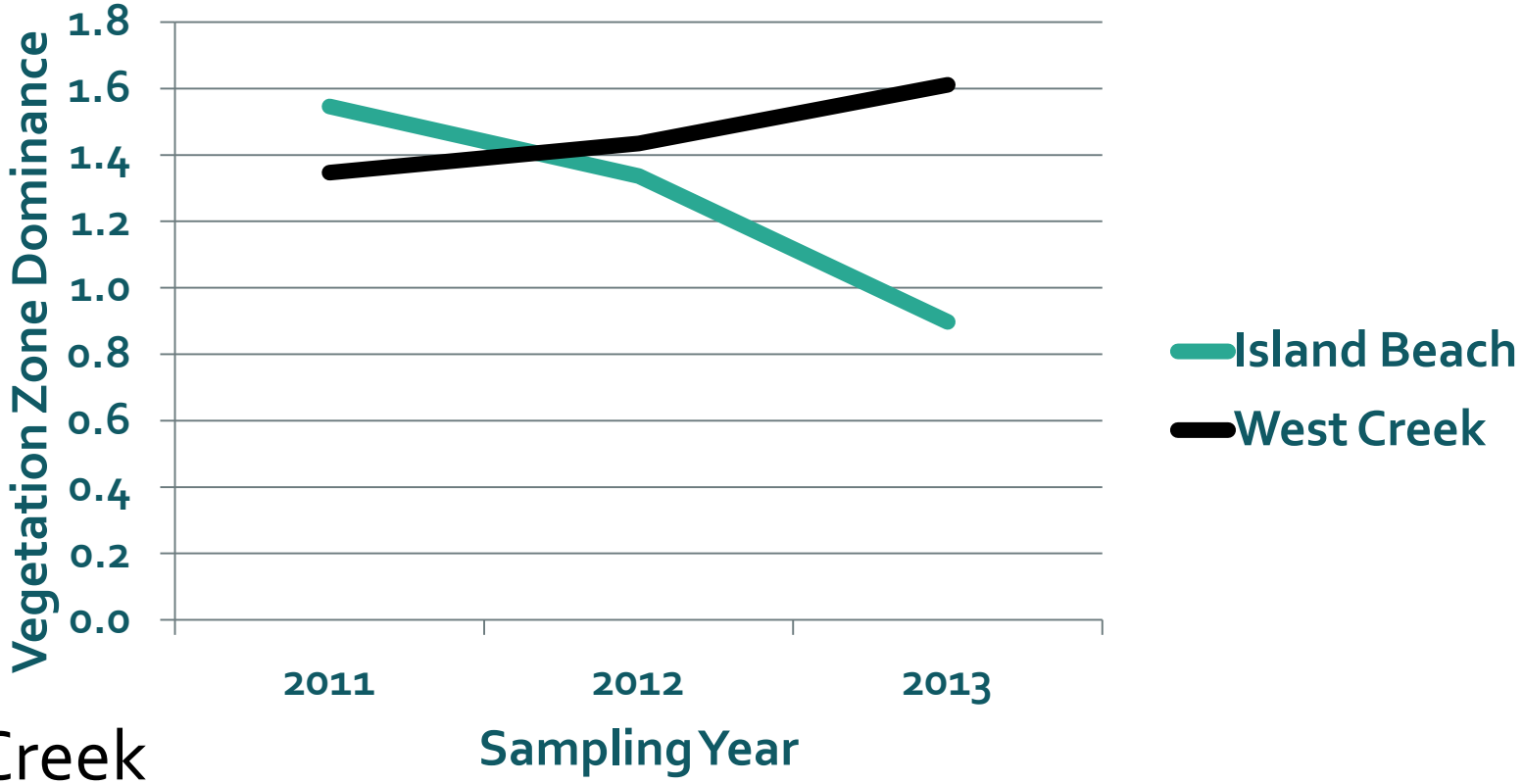
VZD= (0.05 * 2) + (0.70 * 3)

VZD = 2.4

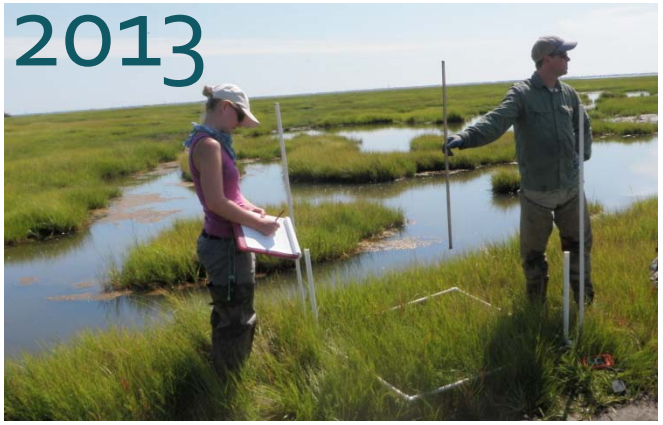
What we're using VZD for…

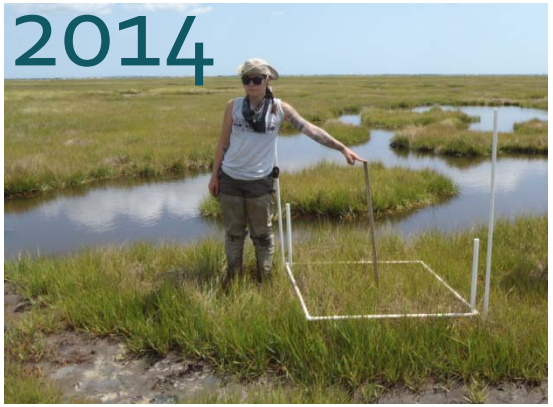
- Mid Atlantic Coastal Wetland Assessment (MACWA)
  - Site Specific Intensive Monitoring: long term data sets at specific locations; eventually couple SET-MH trends with VZD vegetation data trends
  - Marsh Futures: stream-lining vegetation surveying using assessment areas and RTK measurements
  - Rapid Assessment Methods (RAM): use VZD to interpret RAM data for SLR vulnerability

VZD Example

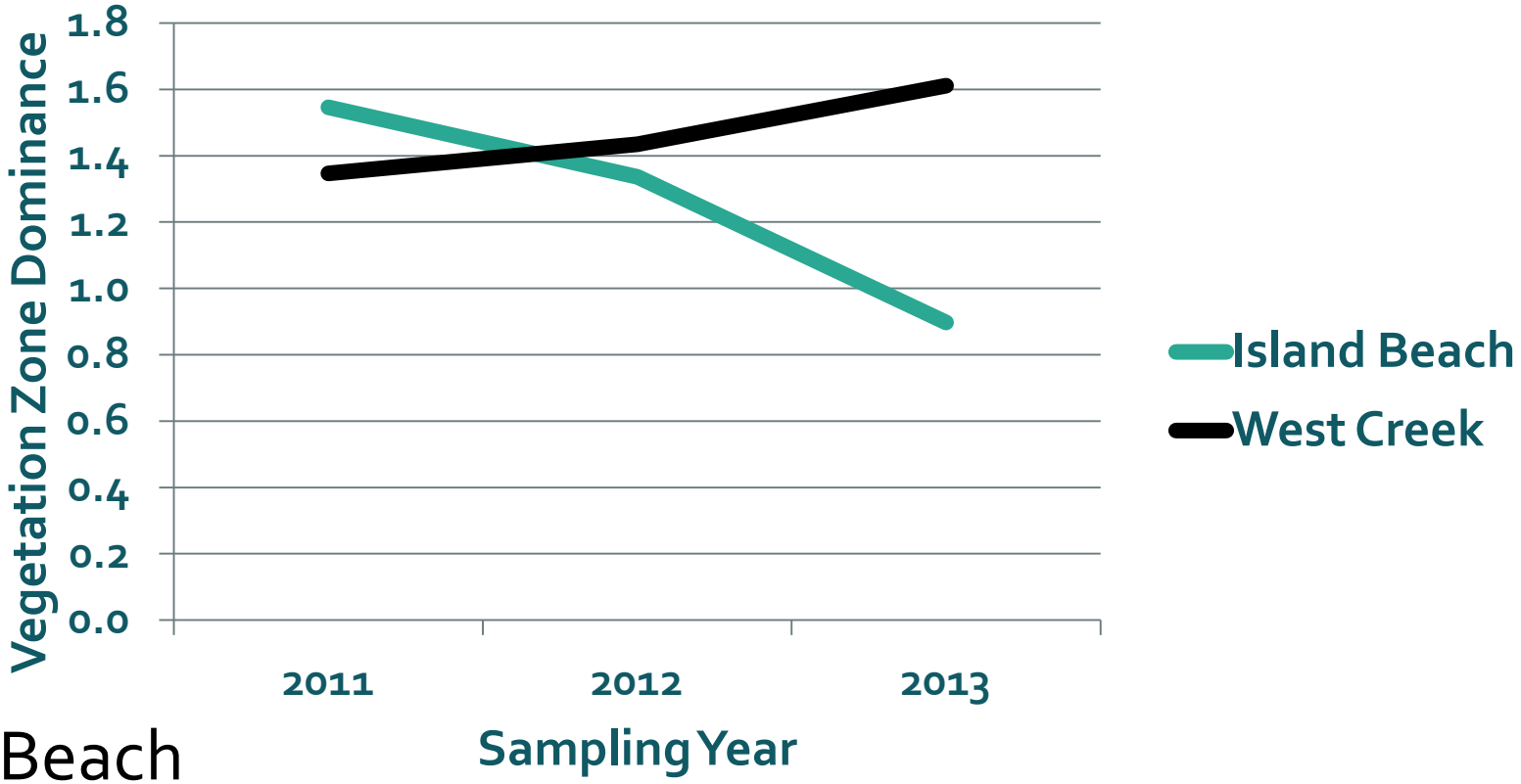


West Creek





VZD Example



Island Beach

Next Steps

- Study VZD **with more precision**
  - Find what factors drive variation
- **Encourage others to use VZD!**
  - Corroborate other survey techniques (like those using LiDAR)
  - Investigate other marsh types (freshwater)
  - Apply to BACI designs and other long term monitoring
    - Test restoration effects/efficiencies

Thank you!

Acknowledgements

- Quirk, Cahoon, Morris, Fagherazzi , & Mudd for conceptual inspiration