

MONITORING LIVING SHORELINE PROJECTS IN MAINE



 UNIVERSITY OF
SOUTHERN MAINE

Cutler Institute



New England Tides

Tidal Ranges of NOAA Tide Stations



3

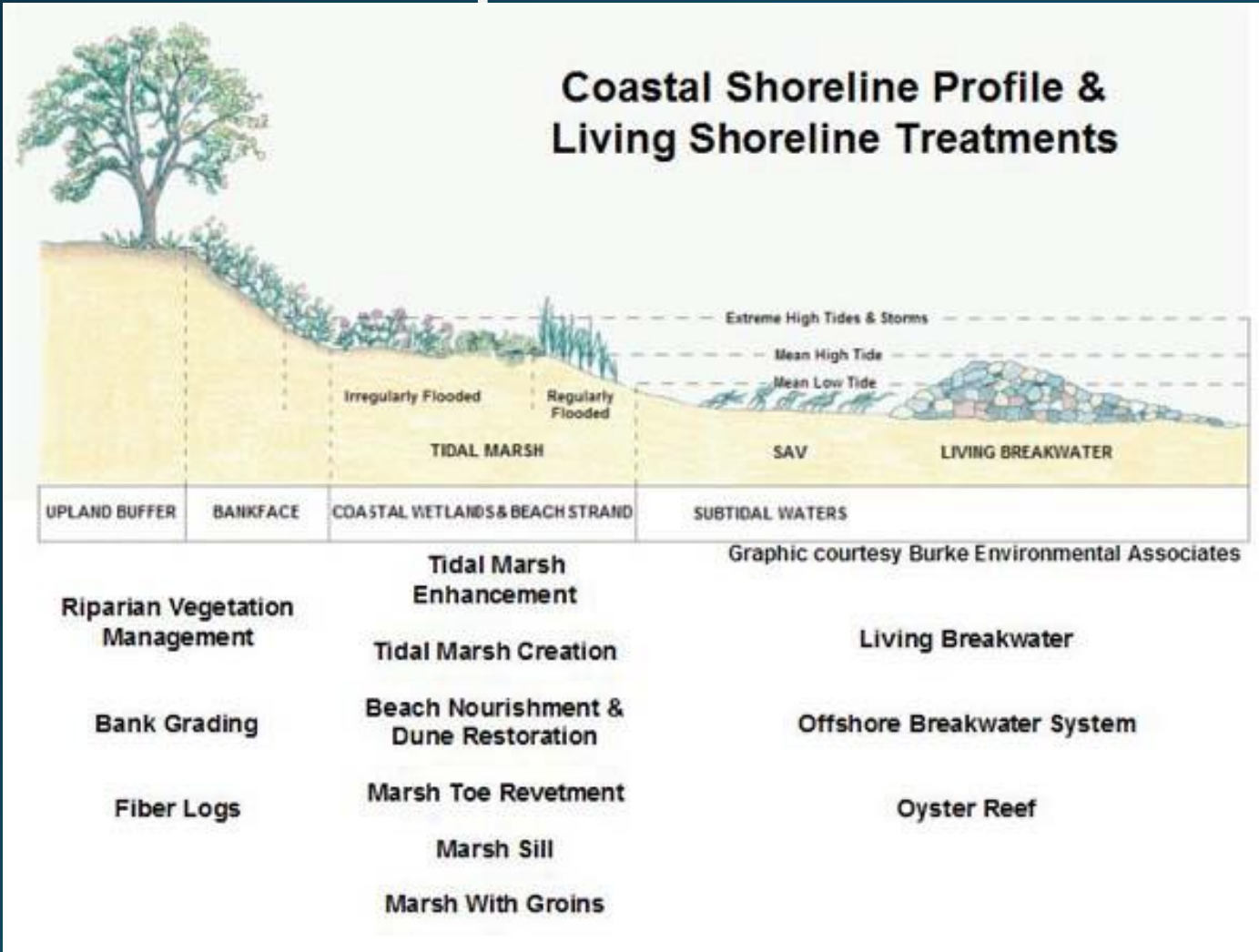
2

1

0

Log₂(Tidal Range (ft.))

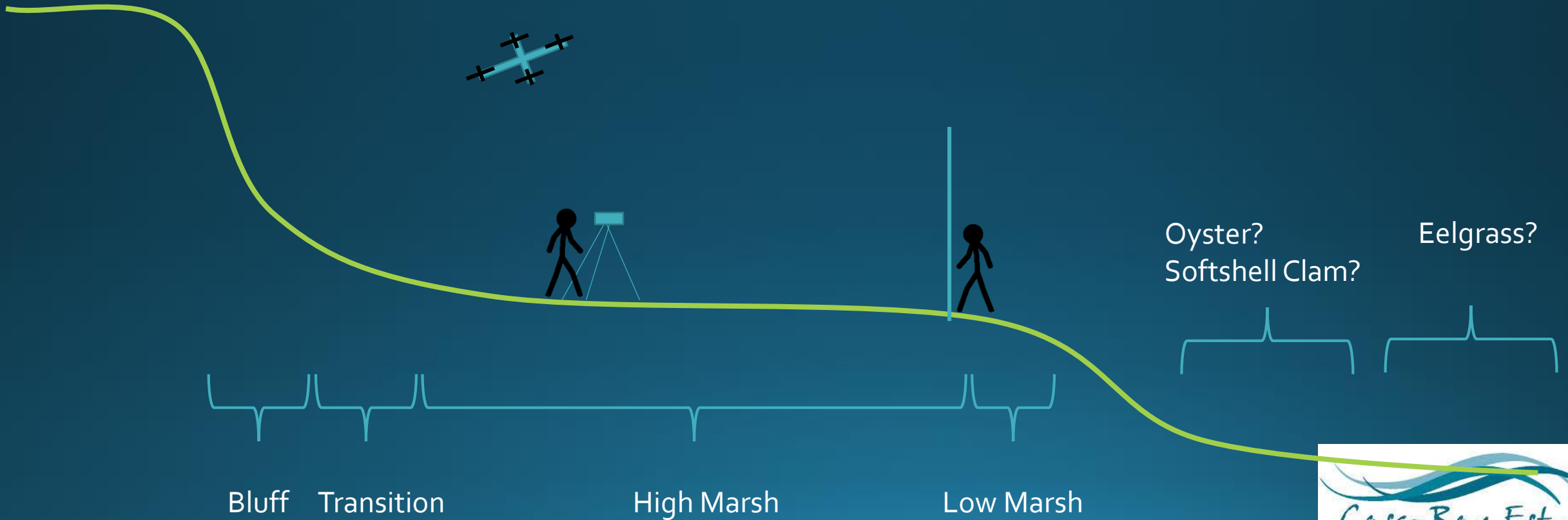
Conceptual Framework



- National models based on multilayered systems
- Proposed designs in Maine somewhat simpler
- Monitoring should reflect that

Conceptual Shoreline Cross Section

Upland



Bluff Transition

High Marsh

Low Marsh

Oyster?
Softshell Clam?

Eelgrass?

Considerations

- Monitoring framework that works across states and sites
 - NOT identical, but comparable
- How will information be used?
 - Target audience? D
- Discussion with other states:
 - What questions need to be answered?
 - Are there core METRICS that apply everywhere?
- Controlling costs and level of effort

Case Studies

- Few sites in each of the New England States
- Focus on performance at each site
- Generalization to future projects is based on
 - (1) Sites representative of future projects (“Case Studies”)
 - (2) A generalized exposure gradient
 - (3) “Post stratifying” sites based on site-level characteristics

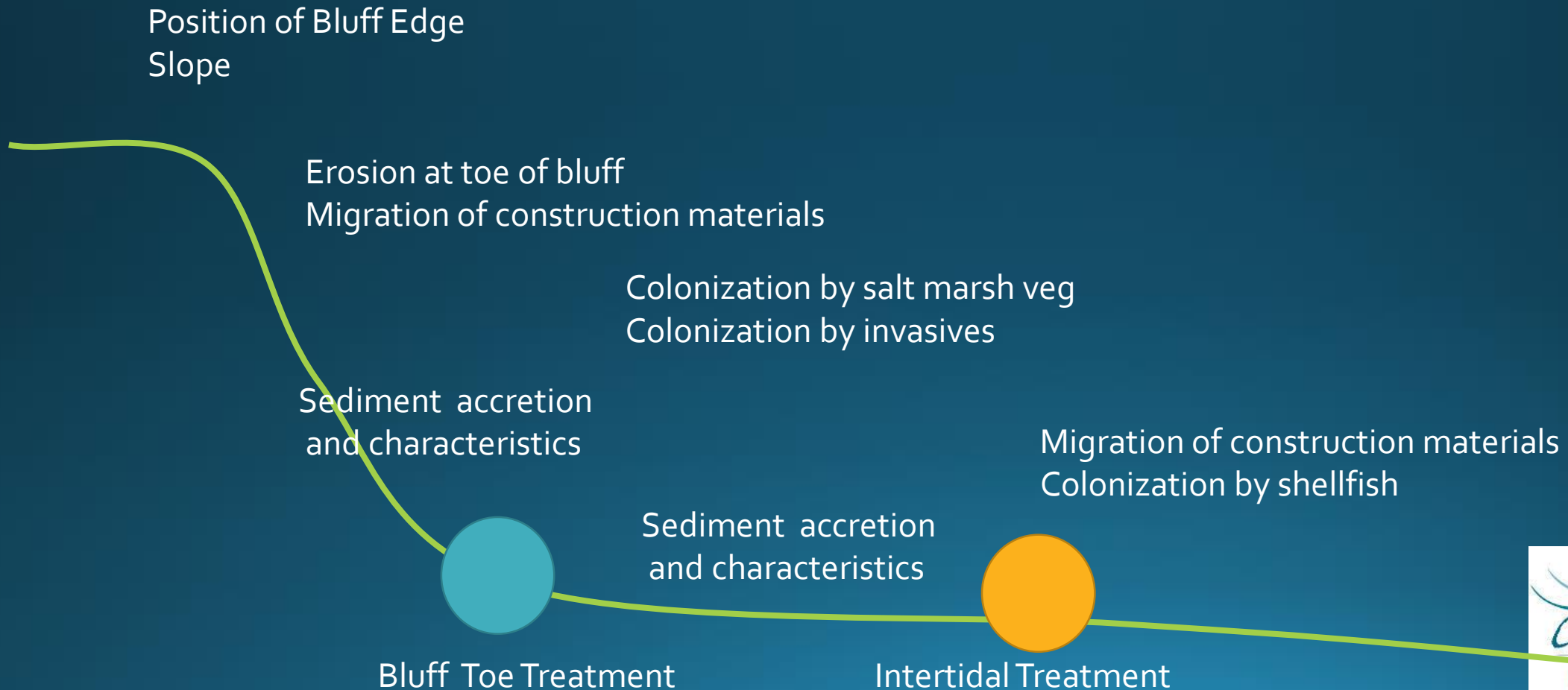
Monitoring Themes and Questions

- Context
 - What are the surroundings like and how might that affect project performance?
- Do LS / GI technologies “work”?
 - Stable structures
 - Reduced shoreline erosion
 - Sediment accumulation
 - Marsh persistence
- Do they have positive ecosystem benefits?
 - Shellfish
 - Salt marsh vegetation
 - Use by fish, birds, wildlife
- Do they have negative impacts?
 - Scour
 - Non-native species

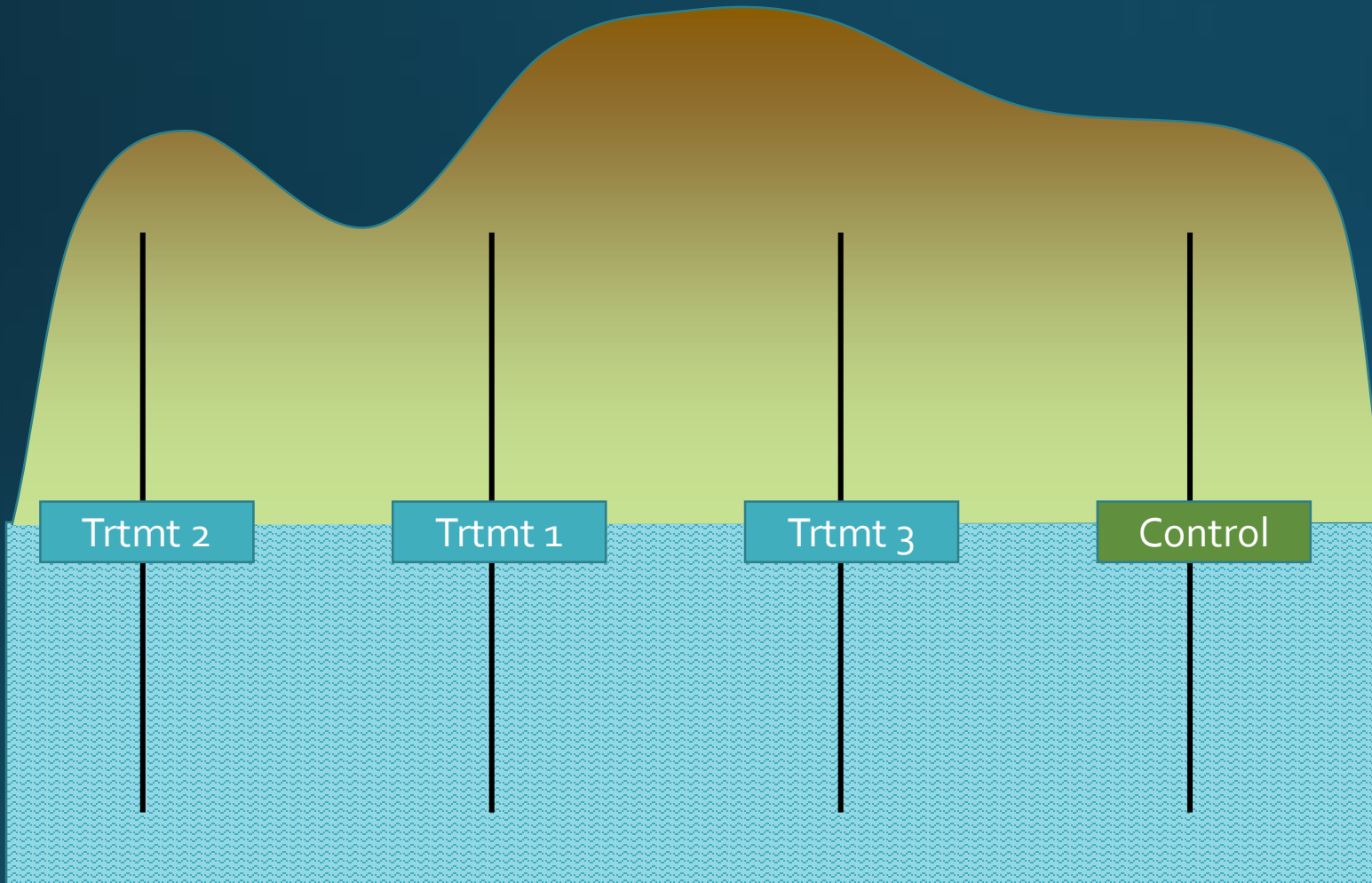
Monitoring Phases

- Pre-project data
 - Site characterization
 - Examples: fetch; tidal elevations; proximity of infrastructure
 - Pre-project topography and cross sections
 - Living resources assessment
- As built documentation
 - Baseline for site evolution and change
- Performance monitoring
- End of study intensive data collection (?)

Conceptual Cross Section: Bluff

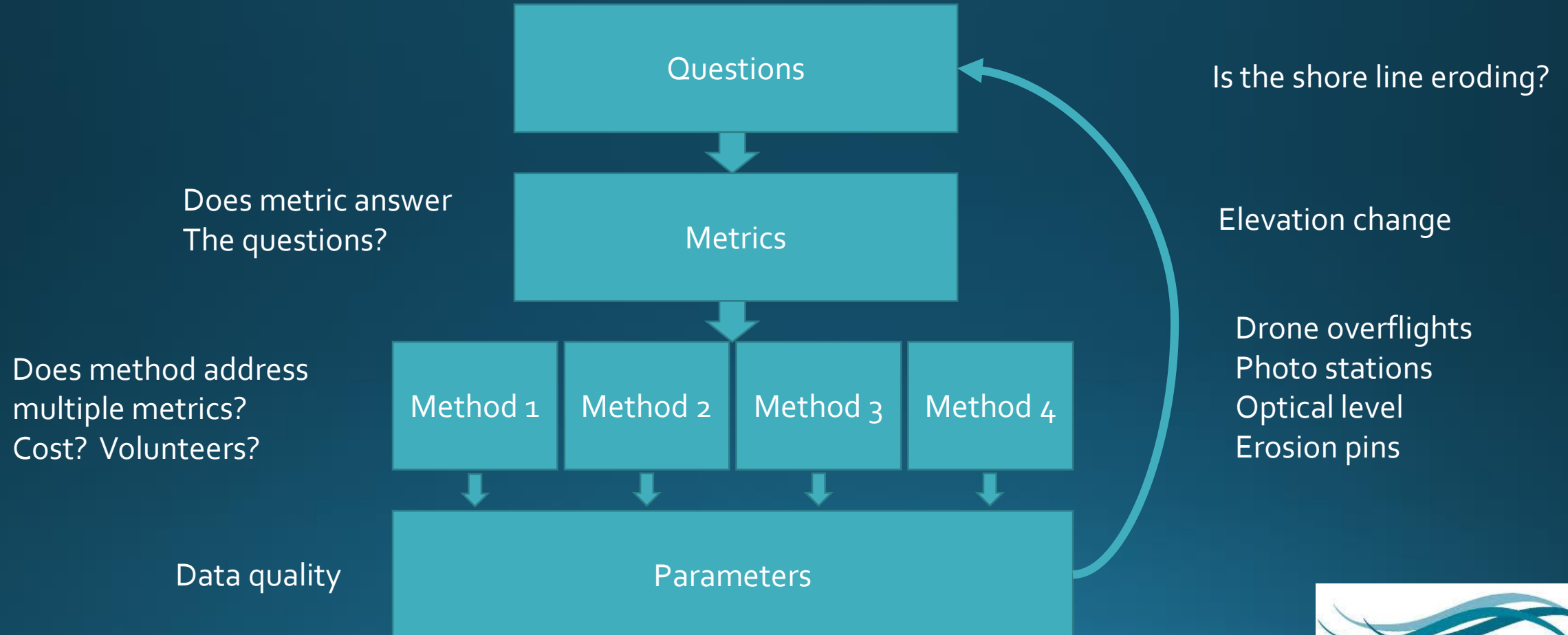


Monitoring Concept



- Monitoring at two levels:
 - Site
 - Wave energy
 - Fetch
 - Living resources
 - Bathymetry
 - Treatment
 - Erosion and deposition
 - Soil/sediment characteristics
 - Living resources

Method Selection



Questions

- What questions or information will be most important to regulatory agencies to support future permitting decisions?
- What kind of data quality objectives need to be met to make resulting data of value to regulatory agencies?

Not many Regional Examples....



- How's Maine different?
 - Meso to macrotidal
 - Winter ice

From <https://www.habitatblueprint.noaa.gov/storymap/lis/index.html>