CATHERINE CUTLER INSTITUTE

Casco Bay Estuary Partnership

UNIVERSITY OF SOUTHERN MAINE

Rapid Site Assessments for Long Term Tidal Marsh Monitoring

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“Sentinel” Monitoring

Long term monitoring of a representative site

Track changes through time

Use the information to understand changes in similar systems

Site Selection for 2022

Larger tidal wetlands

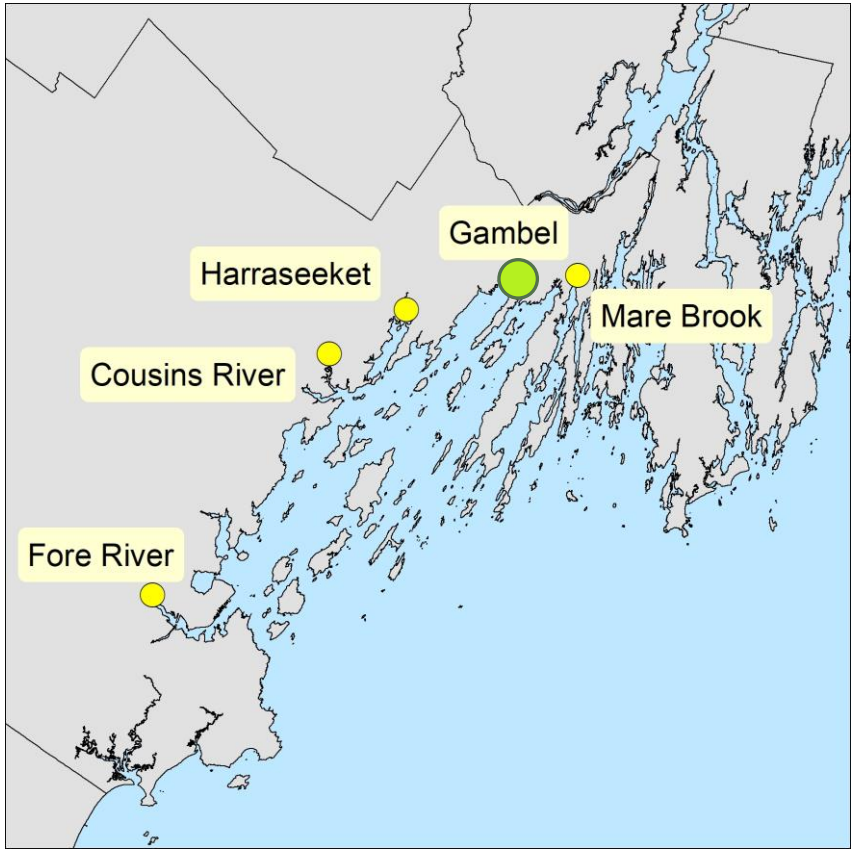
Public ownership or ownership by conservation organizations

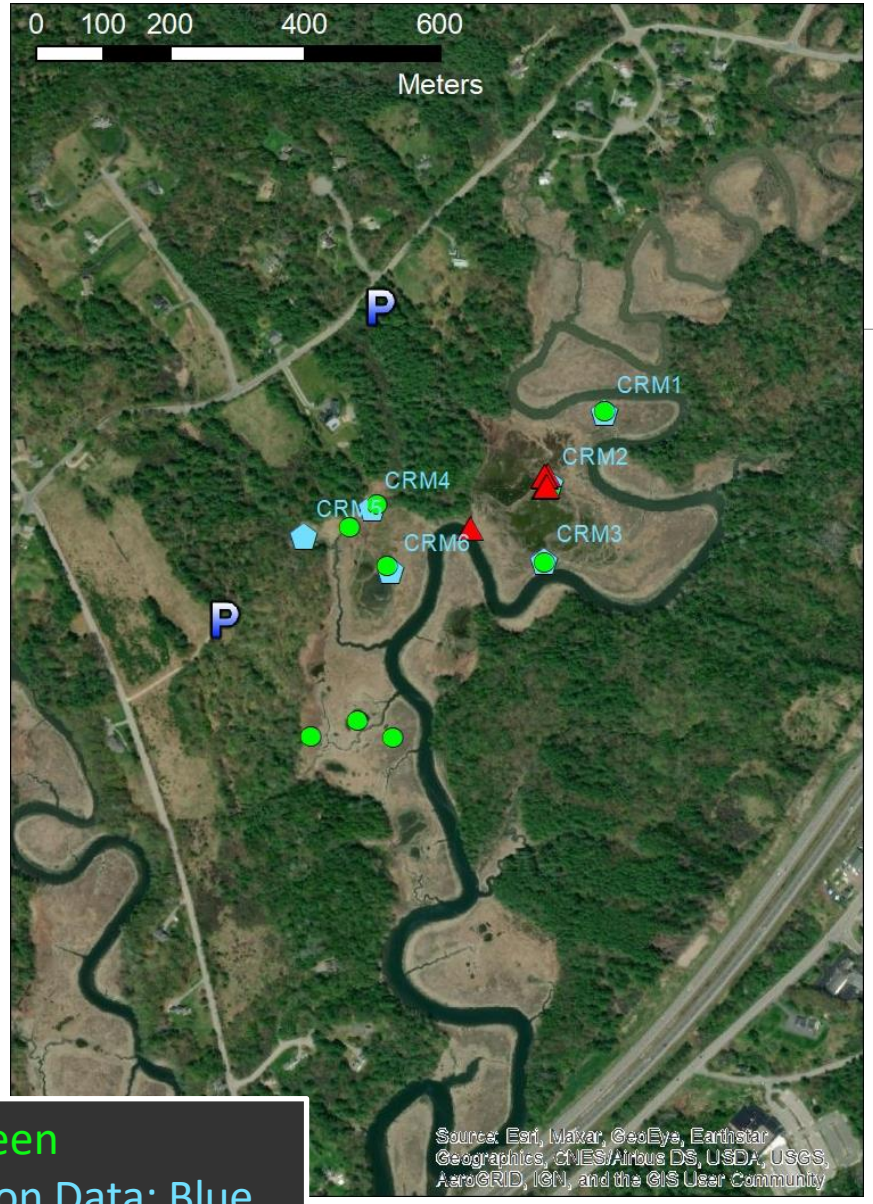
Good access,

- Surveying equipment

Limited downstream tidal restrictions

Existing rSETs





Plan: Green
Vegetation Data: Blue
Photos: Red Triangles

Cousins River Marsh 2022

Rapid Assessment Site Visits

Pre-visit planning
- One tide
- Planned route
- Eight to ten pre-planned locations

Site walk
- Vegetation characteristics
  - Dominant species and relative cover
    - Planned locations
    - Other locations that look interesting
- Photo documentation

Brief report:
- Written narrative
- Maps
- Vegetation data
- Photographs

What is a “reference” site? Does it matter?

Cousins River Marsh

- Tree roots suggest freshwater history

Fore River Marsh

- Linear ditch

Kate Furbish Preserve

- Agricultural (?) roadbed

Harraseeket Marshes

- Berm along tidal channel

Extensive shallow pools, often associated with berms

Regional effort to enhance “resilience” of tidal wetlands to rising seas

Shallow pools often seen as a symptom

Should we track “sentinel” sites where we may implement “resilience” projects?

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“Ghost forest” at Kate Furbish Preserve

Substantial die-back of low-lying trees

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“Ghost forest” at Kate Furbish Preserve

Substantial die-back of low-lying trees

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Next steps

Select criteria for choosing “sentinel” site(s)

Select “best” site(s)

Coordinate with landowner(s) and others

Finalize protocols

Part of a spreadsheet reviewing protocols from other sentinel monitoring efforts

Group	Parameter / Indicator	Climate impact?	Salt marsh relevant?	SWMP	Great Bay	Waquoit Bay	NBNERR	Wells	ISMN	LIS (SMCCP)
Weather										
	Air temperature	✓	H	✓	✓	✓	✓	✓		
	Wind speed	✓	M	✓	✓	✓	✓	✓		
	Wind direction	?	By site	✓	✓	✓	✓	✓		
	Relative humidity	✓	L	✓	✓	✓	✓	✓		
	Barometric pressure			✓	✓	✓	✓	✓		
	Photosynthetic active radiation	?	M	✓	✓	✓	✓	✓		
	Precipitation	✓	H	✓	✓	✓	✓	✓		
Water Quality										
	Temperature	✓	H	✓	✓	✓	✓	✓	✓	✓
	pH (acidity)	✓	M	✓	✓	✓	✓	✓		✓
	Suspended particles (Secchi or turbidity)	✓	H	✓	✓	✓	✓	✓	✓	✓
	Salinity	✓	H	✓	✓	✓	✓	✓	✓	✓
	Dissolved oxygen	✓	?	✓	✓	✓	✓	✓	✓	✓
	Hypoxia (duration, affected area, severity, wind speed and direction)	✓	H						✓	✓
Nutrients										
	Ammonium	?	H	✓	✓	✓	✓	✓		
	Nitrate	?	H	✓	✓	✓	✓	✓		
	Nitrite	?	H	✓	✓	✓	✓	✓		
	Ortho-phosphate	?	?	✓	✓	✓	✓	✓		
	Chlorophyll a	?		✓	✓	✓	✓	✓	✓	
	HAB (cell count w species id, algal toxins)(blue mussels 2 weeks period)	✓								✓
Biological Systems										
	Community composition	✓	H	✓	✓	✓	✓	✓	✓	✓
	Species abundance	✓	H	✓	✓	✓	✓	✓	✓	✓
	Species distribution	✓	H	✓	✓	✓	✓	✓	✓	
(Flora)										
	Emergent vegetation	✓	H			✓		✓		
	Invasive plant species	✓	M							✓
	Changes in timing of plant blooms	✓	?							
	SAV	?	H			✓	✓		✓	✓
	macroalgae	?	L		✓	✓	✓			

Thank You

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