NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Habitat Restoration in the Research Reserve

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Hudson River National Estuarine Research Reserve

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Advancing Restoration Science

LIST OF RESERVES

Great Lakes
1. Lake Superior, Wisconsin
2. Old Woman Creek, Ohio

Northeast
3. Wells, Maine
4. Great Bay, New Hampshire
5. Waquoit Bay, Massachusetts
6. Narragansett Bay, Rhode Island

Mid-Atlantic
7. Hudson River, New York
8. Jacques Cousteau, New Jersey
9. Delaware
10. Chesapeake Bay, Maryland
11. Chesapeake Bay, Virginia

Southeast
12. North Carolina
13. North Inlet-Winyah Bay, South Carolina
14. ACE Basin, South Carolina
15. Sapelo Island, Georgia
16. Guana Tolomato Matanzas, Florida

Gulf of Mexico
17. Rookery Bay, Florida
18. Apalachicola, Florida
19. Weeks Bay, Alabama
20. Grand Bay, Mississippi
21. Mission-Aransas, Texas

West
22. Tijuana River, California
23. Elkhorn Slough, California
24. San Francisco Bay, California
25. South Slough, Oregon
26. Padilla Bay, Washington
27. Kachemak Bay, Alaska

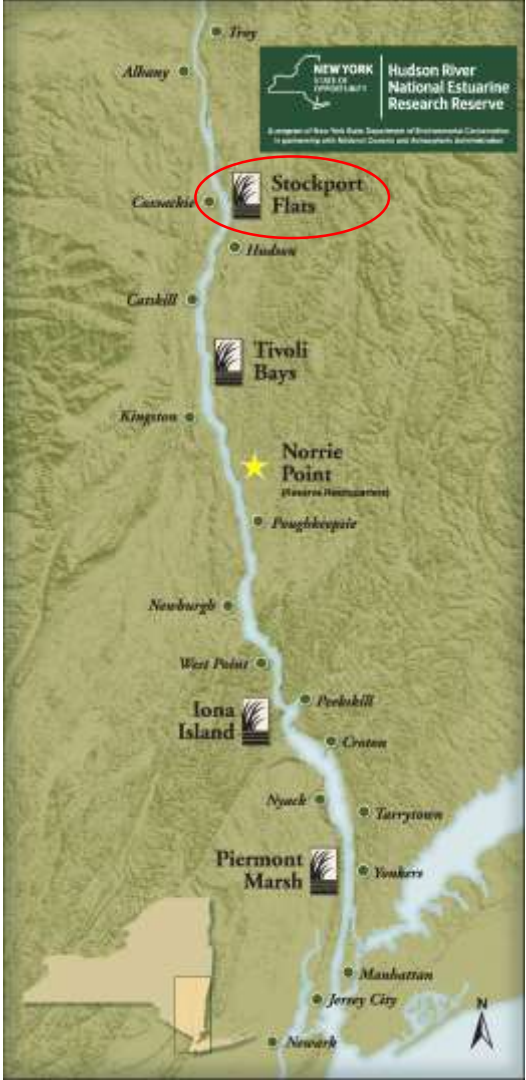
Pacific
28. He'eia, Hawai'i

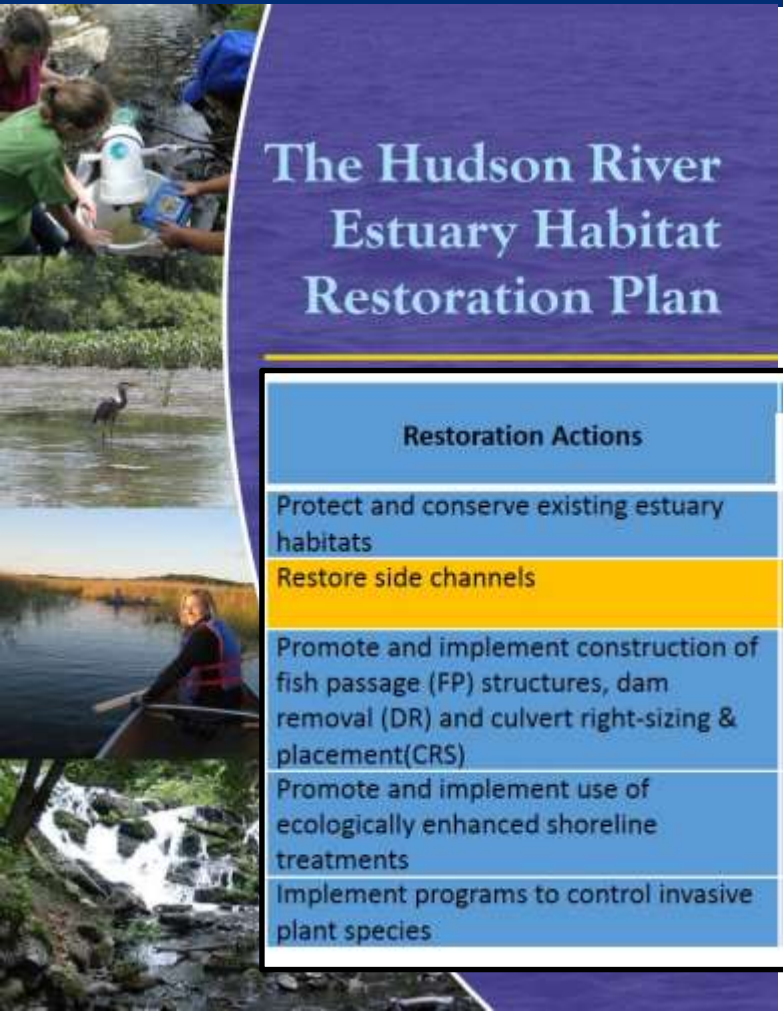
Caribbean
29. Jobos Bay, Puerto Rico


Photo by Andrew Hendry

Side Channel Restoration

Stockport Flats





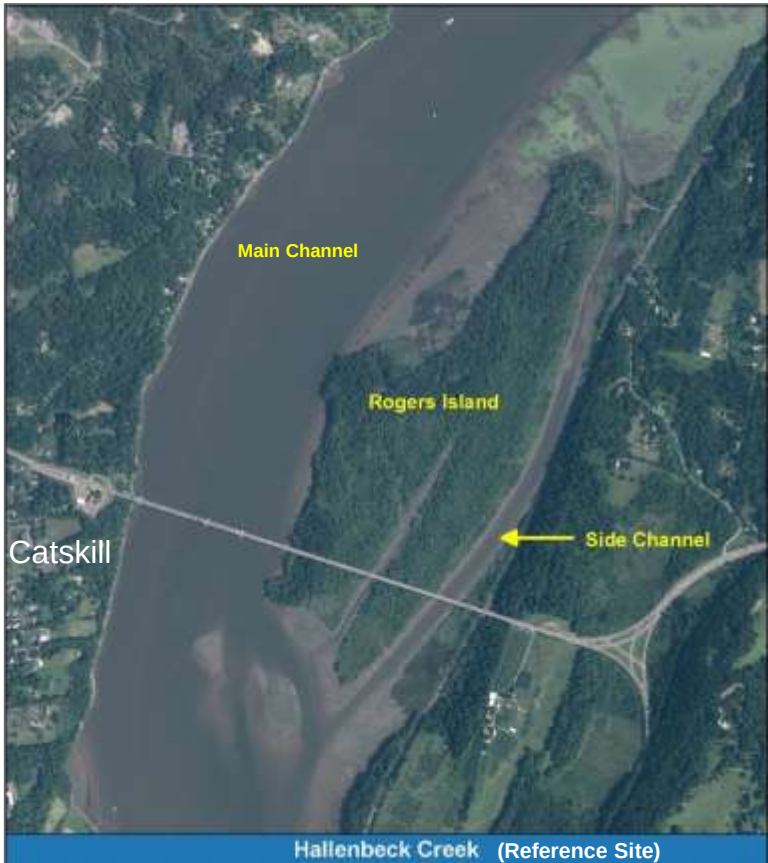
The Hudson River Estuary Habitat Restoration Plan

Miller, Daniel E., 2013. *Hudson River Estuary Habitat Restoration Plan*. New York State Department of Environmental Conservation, Hudson River Estuary Program.

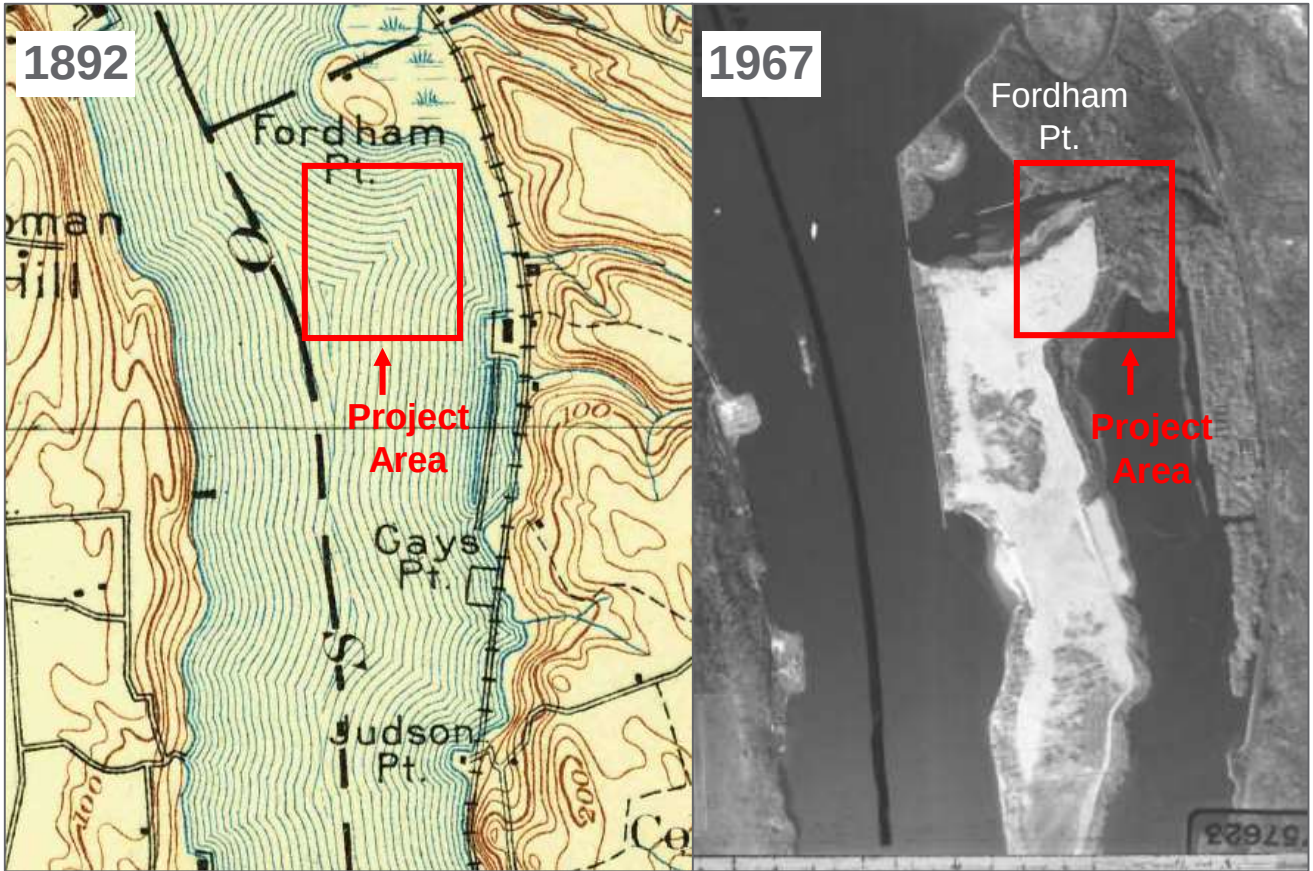
Restoration Actions	Priority Habitats for Restoration			
	Intertidal Habitats	Shallow Habitats	Shorelines	Tributary Habitats
Protect and conserve existing estuary habitats	X	X	X	X
Restore side channels	X	X	X	
Promote and implement construction of fish passage (FP) structures, dam removal (DR) and culvert right-sizing & placement(CRS)	DR, CRS	DR		DR, FP, CRS
Promote and implement use of ecologically enhanced shoreline treatments	X	X	X	
Implement programs to control invasive plant species	X	X	X	

Historic Losses of Habitat

- River channel straightened and deepened
- Loss of >4,000 acres of shallow water and intertidal habitats
- Near complete elimination of side channels in upper third of estuary



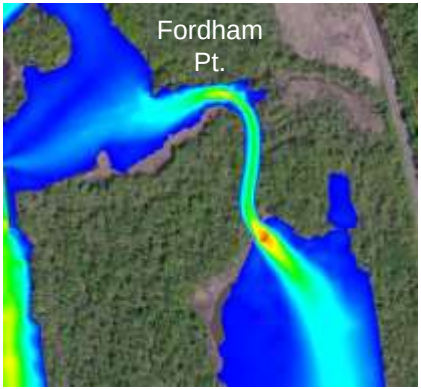
Stockport Flats

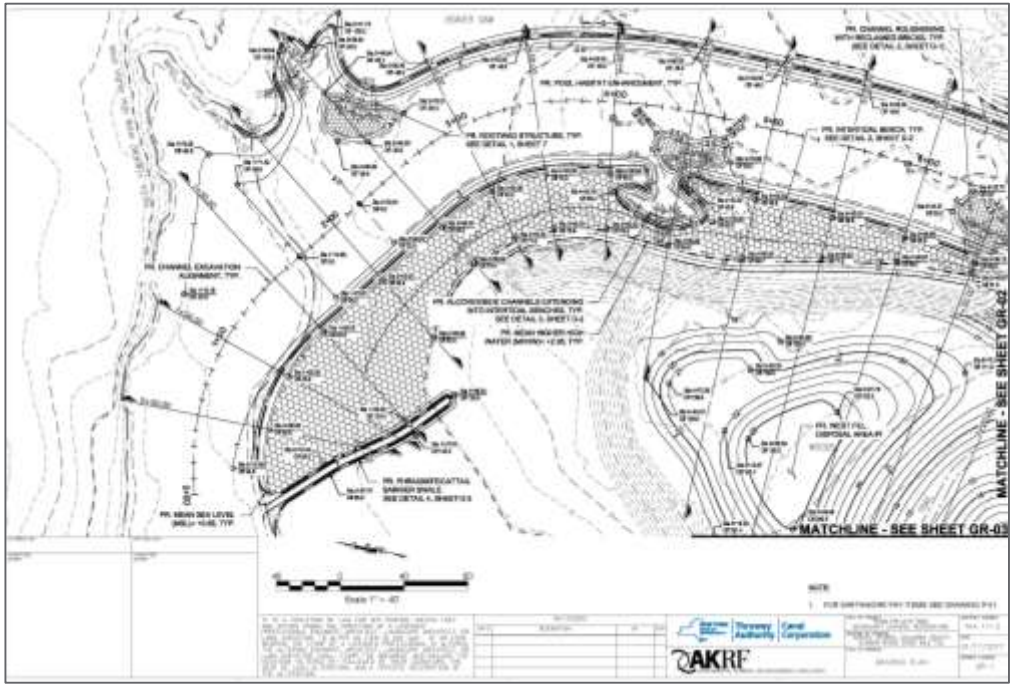


Design

- Intertidal benches
- Deep pools
- Alcoves
- Rootwads

Informed by reference site





Side Channel Construction

Photo by Brian DeGasperis, NYSDEC

Photo by Ken Murray, NYSTA

Photo by Ken Murray, NYSTA

Channel completed in 2017

- ~ 1,200’ L x 100’ W
- ~ -2’ MLLW

Monitoring

- Current velocity
- Shoreline & channel morphology
- Sediment characteristics
- Water quality
- Intertidal plant community
- Benthic invertebrate community
- Fish community


Photo by AKRF, Inc.


Photo by Warren Bautista, NYSDEC


Photo by Brian DeGasperis, NYSDEC


Photo by Brian DeGasperis, NYSDEC

Information Gaps

- Abundance & condition of larval fishes
- SAV habitat model


Photo by Brian DeGasperis, NYSDEC


Photo by NYSDEC

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Photo by Steve Stanne, NYSDEC

Oyster Habitat Restoration

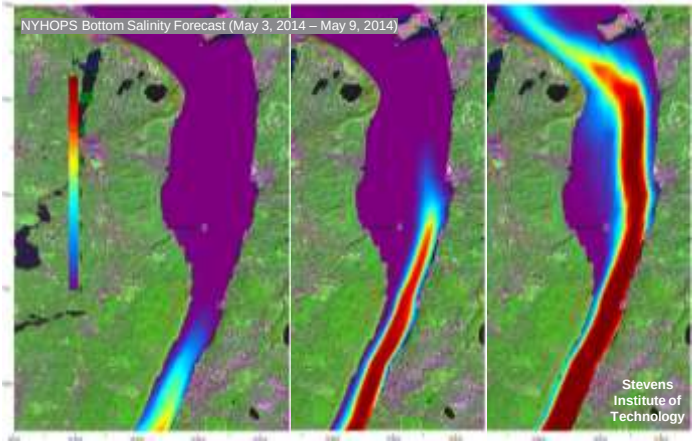
Tappan Zee

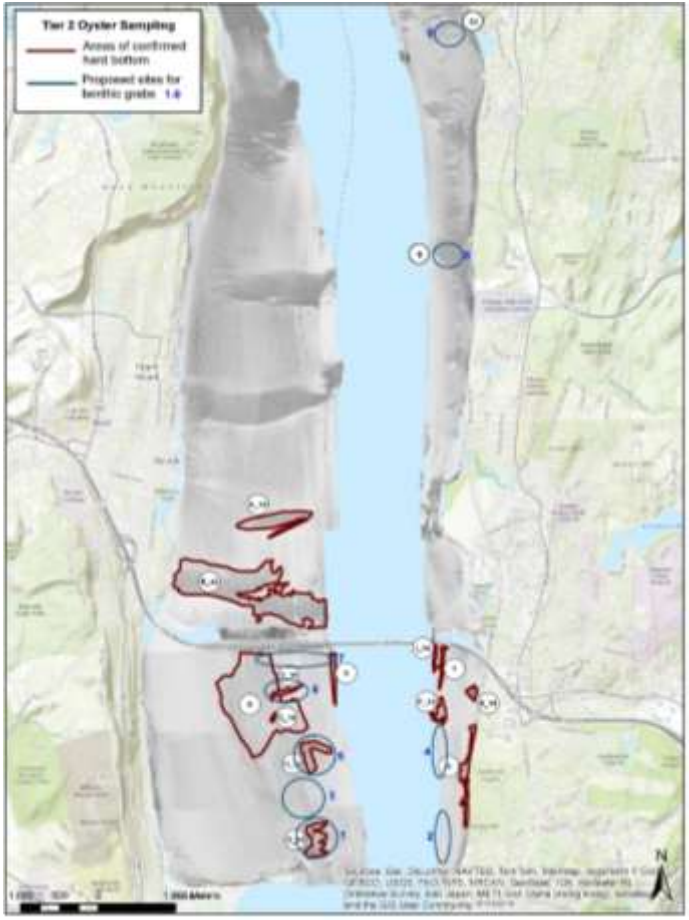
Photo by Brian DeGasperis, NYSDEC

Tappan Zee Oysters

Restoration in low salinity waters

- High annual recruitment
- Low disease pressure
- Potential for high mortality during heavy rainfall events
- Low growth rate



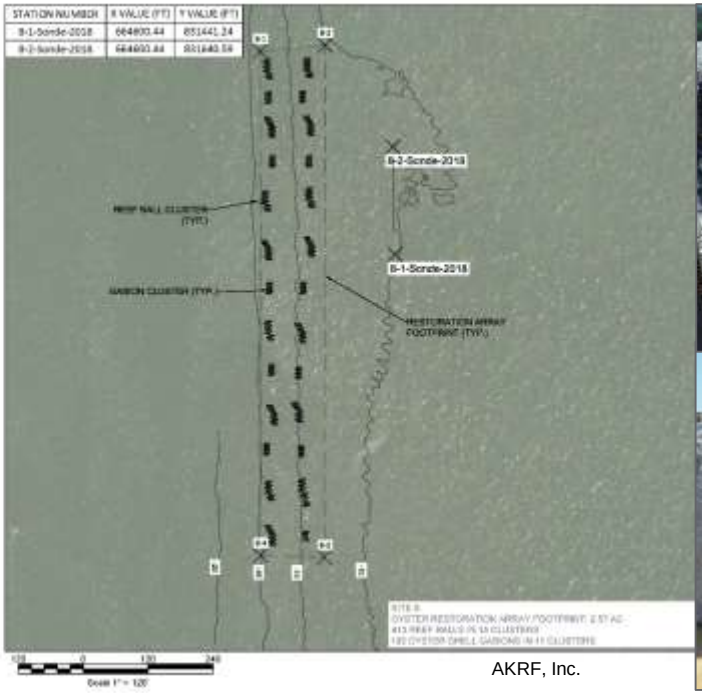


Design

- Two substrate types
- Array of clusters
- Three sites

LOCATION MAP

GPS POINT NUMBER	X VALUE (FT)	Y VALUE (FT)
B-1	664356.39	851838.70
B-2	664476.39	851829.32
B-3	664469.87	850881.66
B-4	664351.58	850888.06



AKRF, Inc.

Photo by Brian DeGasperis, NYSDEC

Photo by Brian DeGasperis, NYSDEC

Reef Construction

- Reefs completed in 2018
- 881 reef balls, 422 gabions
- ~ 5 acres

Monitoring

- Oyster size and density
- Non-oyster epibenthos
- Water quality

Photo by the Hudson River Foundation

Photo by the Hudson River Foundation

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Information Gaps

- Oyster fecundity & population dynamics
- Use of artificial reefs by fishes, crabs and other nekton


Photo by the Hudson River Foundation


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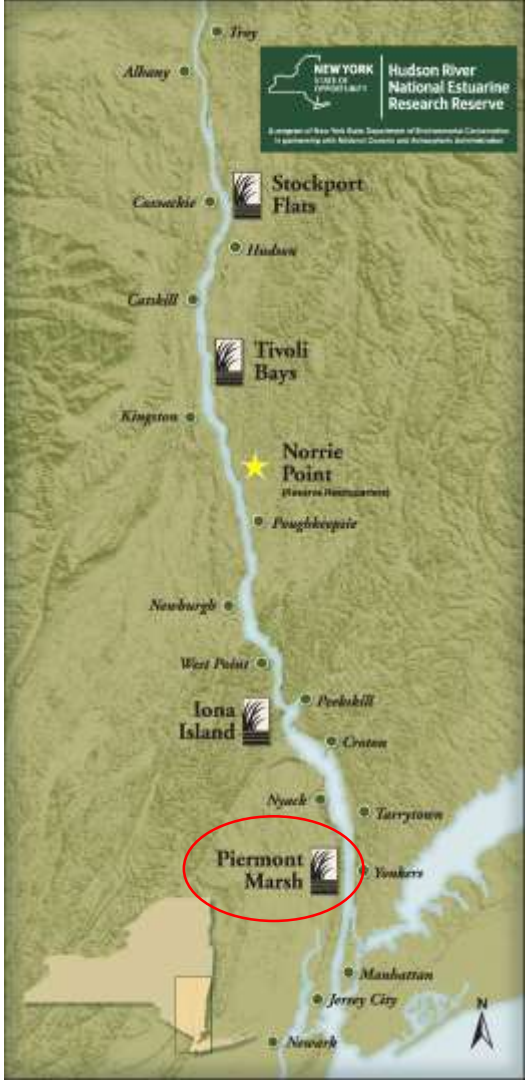
Marsh Edge Protection

Piermont Marsh

Photo by Brian DeGasperis, NYSDEC



Marsh Edge Erosion

- At least 50 feet of marsh has eroded since the 1920's
- Losing native Spartina fringe

Conceptual Planning 2020

Stabilization Techniques

Examples from marshes in South Carolina

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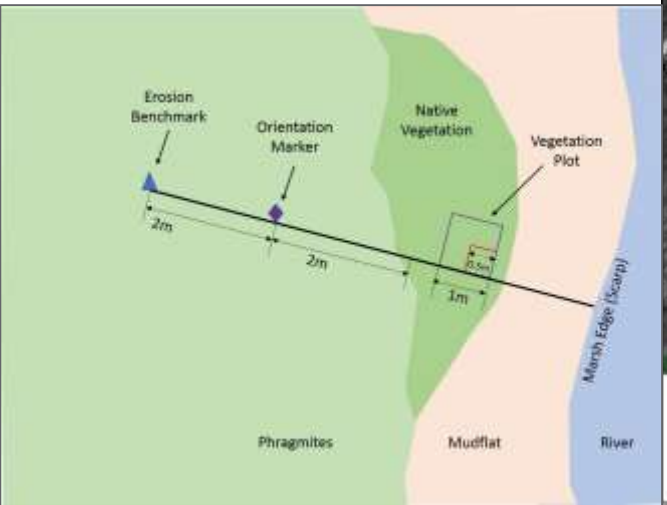
Monitoring

- Shoreline change
- Marsh elevation
- Wave energy
- Vegetation



Information Gaps

- Shoreline dynamics
- Impacts of goose grazing
- Causes and impacts of interior ponding

Thank You

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Photo by Robert Rodriguez, Jr.

Questions?

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