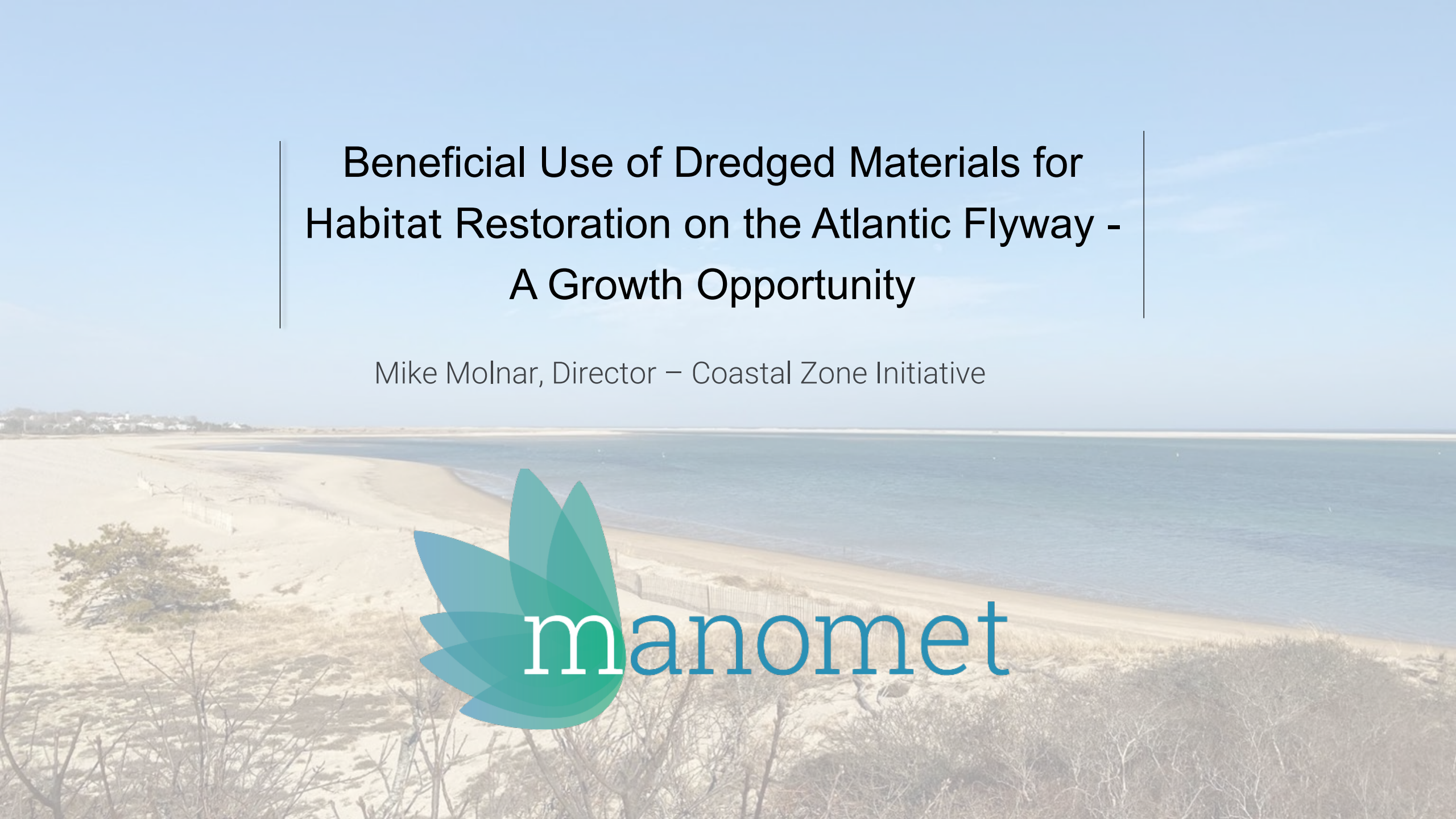
Beneficial Use of Dredged Materials for Habitat Restoration on the Atlantic Flyway - A Growth Opportunity

Mike Molnar, Director – Coastal Zone Initiative



rnithological Applications, 2023, 125, 1–14
ttps://doi.org/10.1093/ornithapp/duad003
dvance access publication 8 February 2023
esearch Article

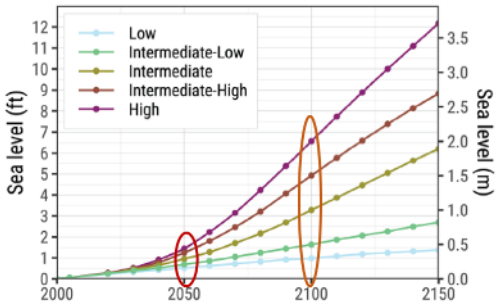
Ornithological Applications

OXFORD

Accelerating declines of North America's shorebirds signal the need for urgent conservation action

aul A. Smith,[1,*] Adam C. Smith,[2] Brad Andres,[3] Charles M. Francis,[2] Brian Harrington,[4] hristian Friis,[5] R. I. Guy Morrison,[1] Julie Paquet,[6] Brad Winn,[4] and Stephen Brown[4]

Vildlife Research Division, Environment and Climate Change Canada, Ottawa, Ontario, Canada
anadian Wildlife Service, Environment and Climate Change Canada, Ottawa, Ontario, Canada
Inited States Fish and Wildlife Service, Migratory Bird Program, Lakewood, Colorado, USA
Manomet Inc., Manomet, Massachusetts, USA
anadian Wildlife Service, Environment and Climate Change Canada, Toronto, Ontario, Canada
anadian Wildlife Service, Environment and Climate Change Canada, Sackville, New Brunswick, Canada
orresponding author: paulallen.smith@ec.gc.ca



Scenario	Year 2050	2100	2150
Low	0.5	1.0	1.4
Intermediate-Low	0.7	1.6	2.7
Intermediate	1.0	3.3	6.2
Intermediate-High	1.2	4.9	8.8
High	1.4	6.6	12.2

Units in feet relative to year 2000

Figure 1. *Global sea level rise scenarios from the 2022 Sea Level Rise Technical Report, including projected values for the years 2050, 2100, and 2150. All values are referenced to a year 2000 baseline.*

Challenges

Sea Level Rise, Sediment Disruption, Erosion, Habitat Loss

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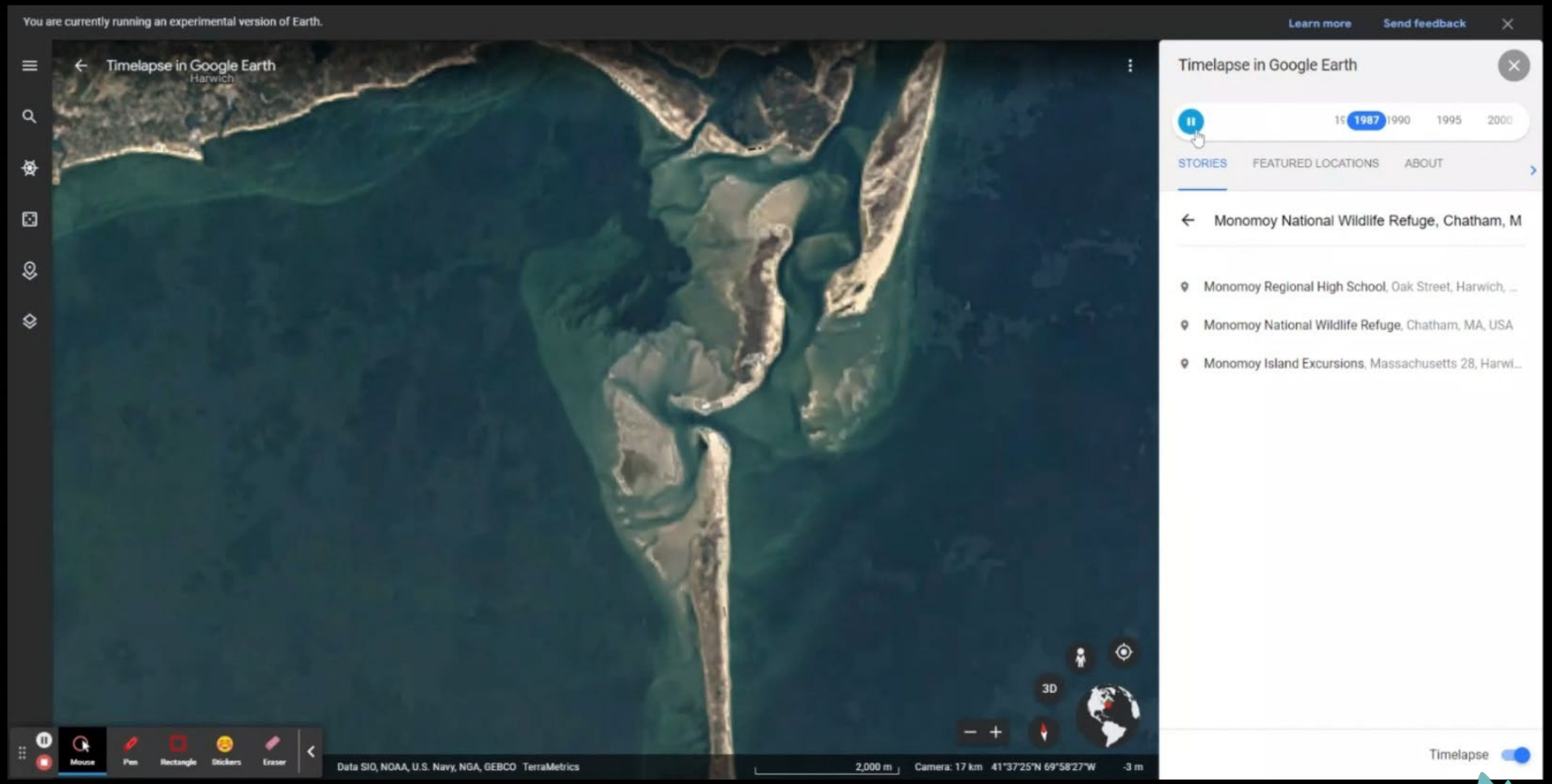
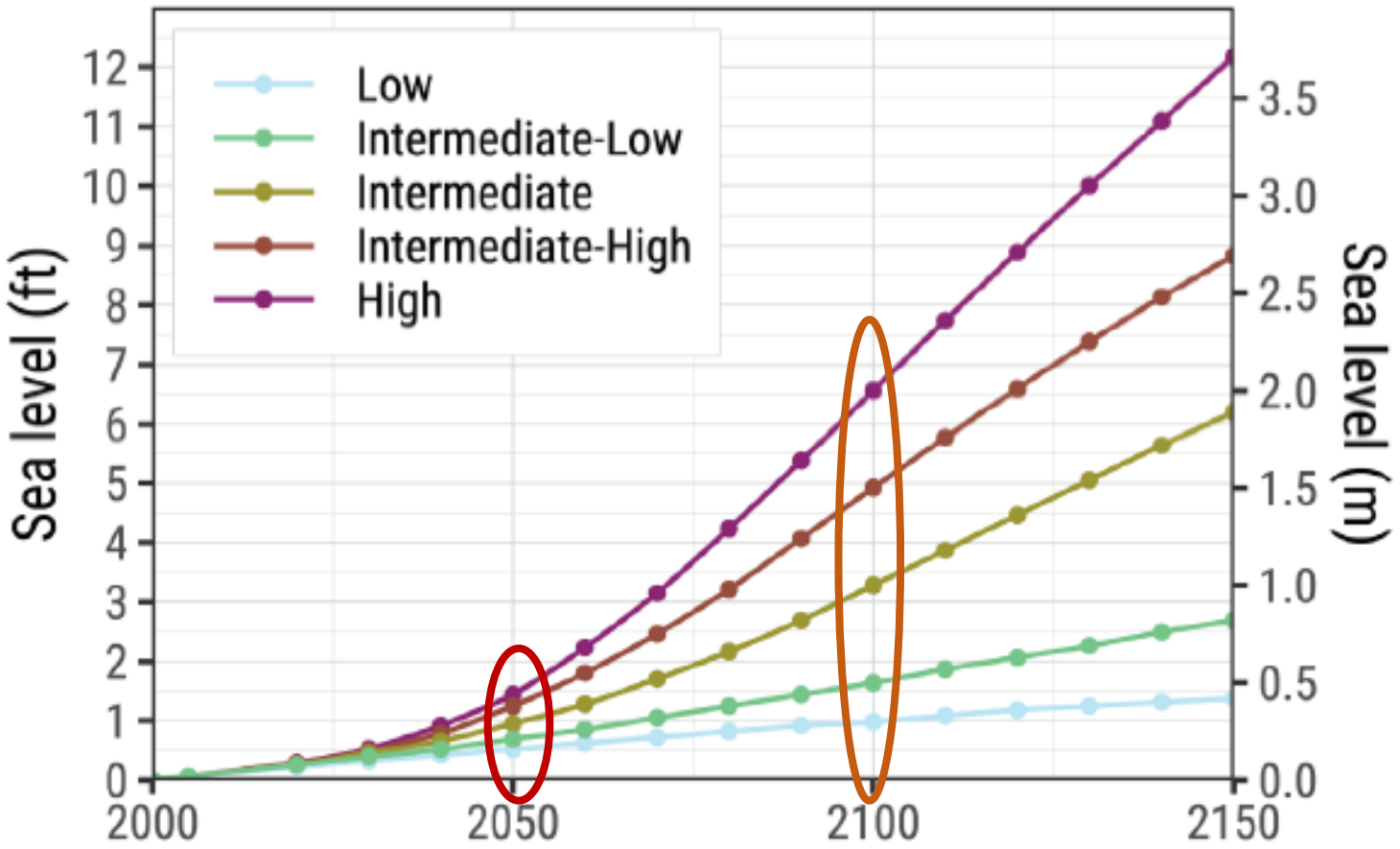

You are currently running an experimental version of Earth.
Learn more
Send feedback
Timelapse in Google Earth
Harwich
Timelapse in Google Earth
1987
1990
1995
2000
STORIES
FEATURED LOCATIONS
ABOUT
Monomoy National Wildlife Refuge, Chatham, M
Monomoy Regional High School, Oak Street, Harwich, ...
Monomoy National Wildlife Refuge, Chatham, MA, USA
Monomoy Island Excursions, Massachusetts 28, Harwi...
Timelapse
3D
Mouse
Pen
Rectangle
Stickers
Eraser
Data SIO, NOAA, U.S. Navy, NGA, GEBCO TerraMetrics
2,000 m
Camera: 17 km 41°37'25"N 69°58'27"W
-3 m



	Year		
Scenario	**2050**	**2100**	**2150**
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Units in feet relative to year 2000

Figure 1. *Global sea level rise scenarios from the 2022 Sea Level Rise Technical Report, including projected values for the years 2050, 2100, and 2150. All values are referenced to a year 2000 baseline.*

Sea level rise 11 inches since 1928

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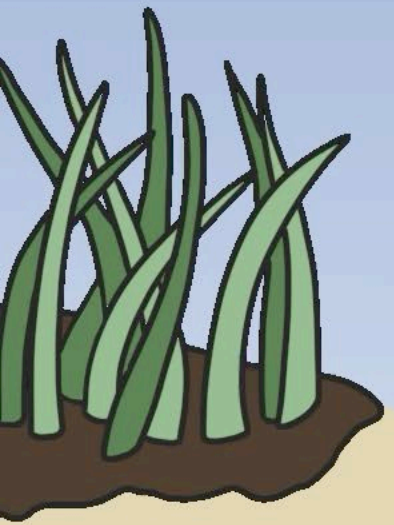
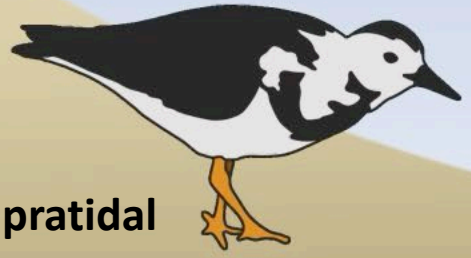


Salt Marsh



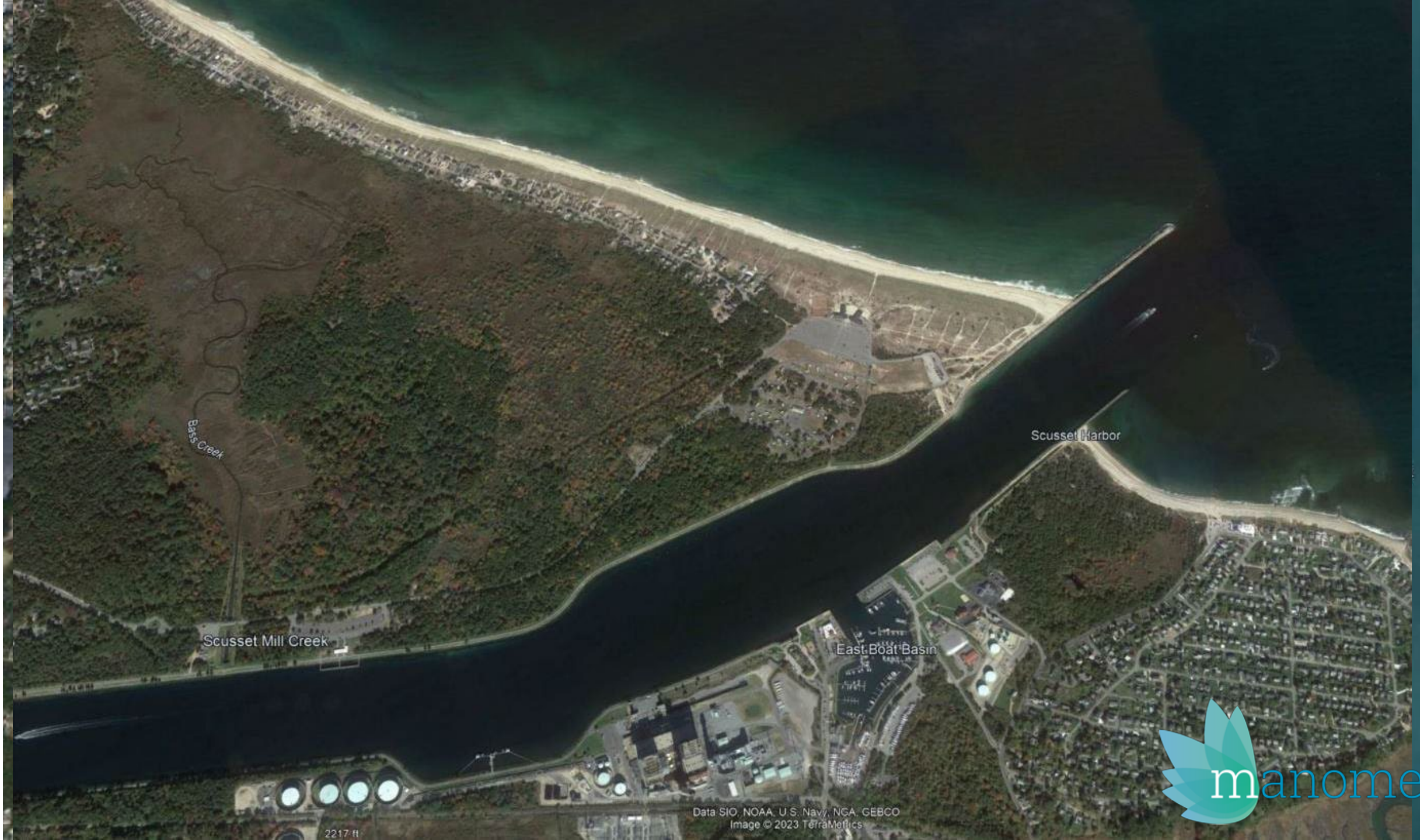
Supratidal

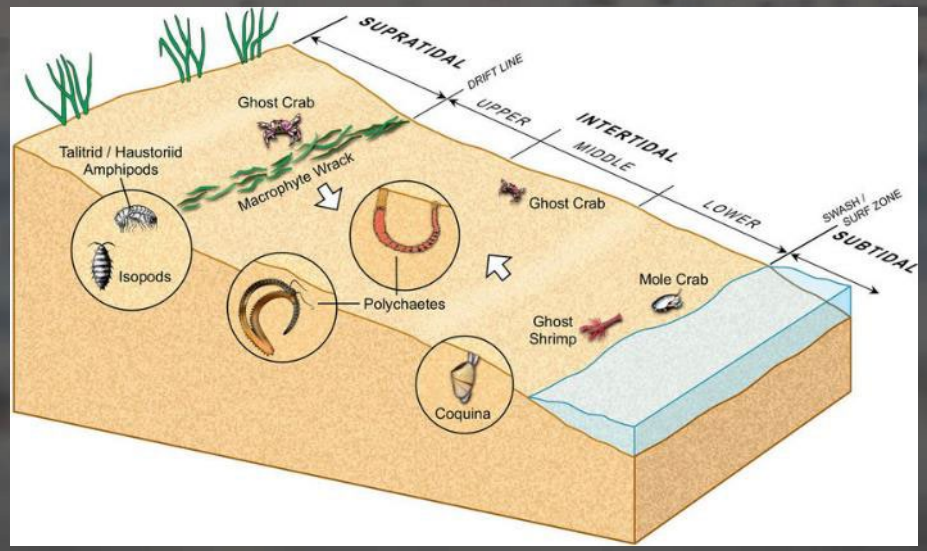
Intertidal

Credit: E. Renaud, Manomet

manomet

Credit: E. Renaud, Manomet


Bass Creek
Scusset Harbor
Scusset Mill Creek
East Boat Basin
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2023 TerraMetrics
2217 ft


SUPRATIDAL
DRIFT LINE
UPPER
INTERTIDAL
MIDDLE
LOWER
SWASH / SURF ZONE
SUBTIDAL
Ghost Crab
Talitrid / Haustoriid Amphipods
Macrophyte Wrack
Ghost Crab
Isopods
Polychaetes
Mole Crab
Ghost Shrimp
Coquina

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Research Article

AOS AMERICAN ORNITHOLOGICAL SOCIETY

Ornithological Applications

OXFORD

Accelerating declines of North America's shorebirds signal the need for urgent conservation action

Paul A. Smith,[1,*] Adam C. Smith,[2] Brad Andres,[3] Charles M. Francis,[2] Brian Harrington,[4] Christian Friis,[5] R. I. Guy Morrison,[1] Julie Paquet,[6] Brad Winn,[4] and Stephen Brown[4]

[1]Wildlife Research Division, Environment and Climate Change Canada, Ottawa, Ontario, Canada
[2]Canadian Wildlife Service, Environment and Climate Change Canada, Ottawa, Ontario, Canada
[3]United States Fish and Wildlife Service, Migratory Bird Program, Lakewood, Colorado, USA
[4]Manomet Inc., Manomet, Massachusetts, USA
[5]Canadian Wildlife Service, Environment and Climate Change Canada, Toronto, Ontario, Canada
[6]Canadian Wildlife Service, Environment and Climate Change Canada, Sackville, New Brunswick, Canada

*Corresponding author: paulallen.smith@ec.gc.ca

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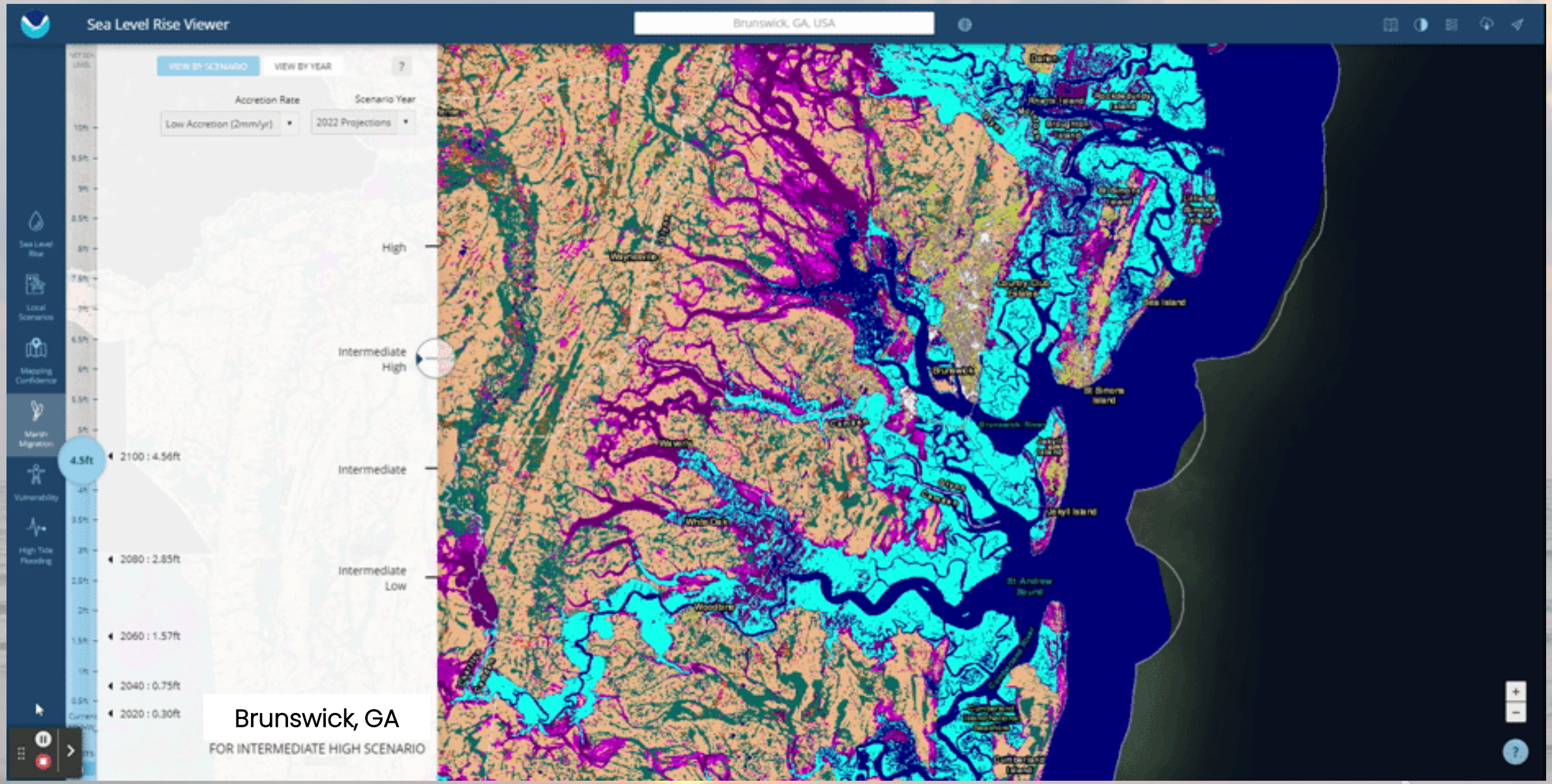
Sea Level Rise Viewer
Brunswick, GA, USA
VIEW BY SCENARIO
VIEW BY YEAR
Accretion Rate
Low Accretion (2mm/yr)
Scenario Year
2022 Projections
High
Intermediate High
Intermediate
Intermediate Low
4.5ft
2100 : 4.56ft
2080 : 2.85ft
2060 : 1.57ft
2040 : 0.75ft
2020 : 0.30ft
Brunswick, GA
FOR INTERMEDIATE HIGH SCENARIO

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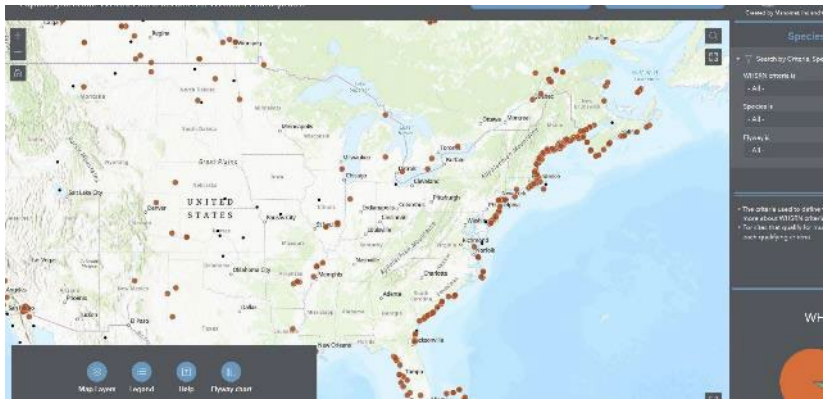
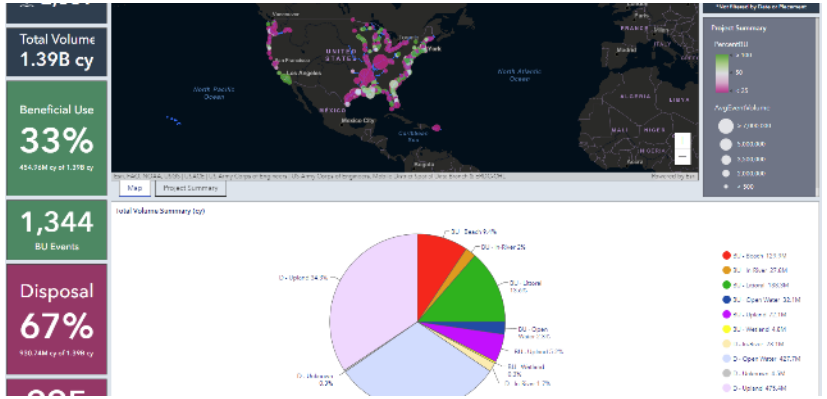
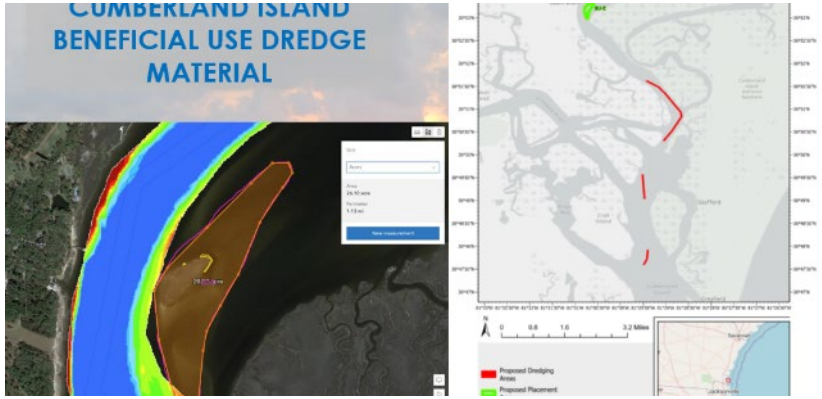




	ME	MA	NJ	DE	VA	NC	SC	GA
Site 1								
Site 2								
Site 3								
Site 4								
Site 5								



SECTION 125 OF WRDA 2020

Renews the Congressional commitment to beneficial use (BU) of dredged material by:

(a) establishing a national policy to maximize the beneficial use of material obtained from Corps projects; requiring the Corps to calculate the economic and environmental benefits of the beneficial use of dredged material when calculating the Federal Standard AND amending section 204(d) of WRDA 1992 to direct that other-than-least-cost placements of dredged material for certain purposes be **funded using appropriations available for construction or operation and maintenance** of the water resources development project producing the dredged material

(b) increasing the number of beneficial use of dredged material demonstration projects to 35 projects (added more Section 1122 projects),

(c) directing the Corps to develop **five-year regional dredged material management plans**, and

(d) emphasizing greater coordination across the Corps' dredging contracts (extended regionalization to inland projects).

Opportunities

Information Sharing, Coordination, Planning

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Goal

Foster long-term beneficial management actions on the US Atlantic to improve conditions for overall coastal habitat and North American shorebird/seabird populations

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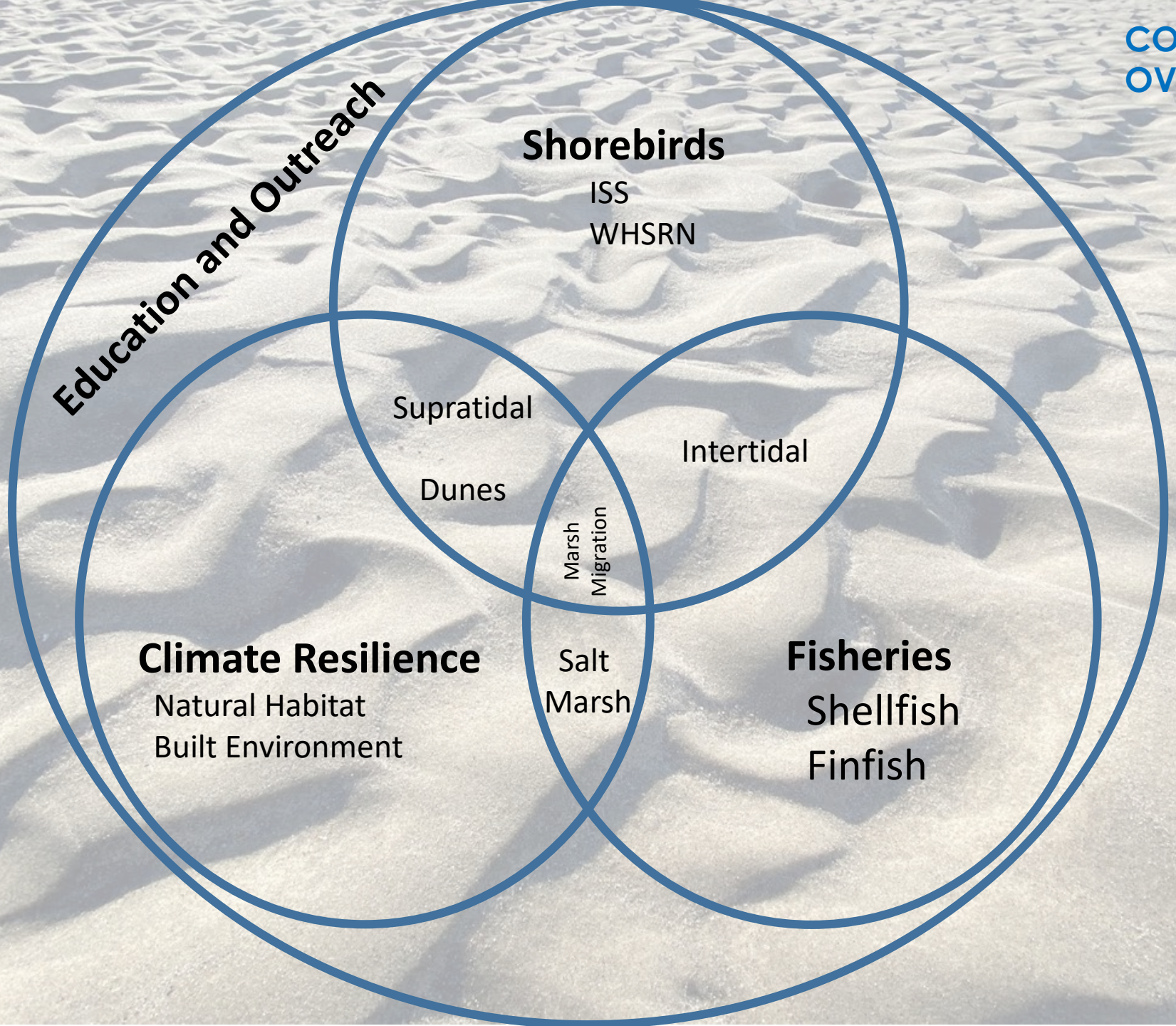
COASTAL ZONE INITIATIVE OVERLAP



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NORTH ATLANTIC DIVISION & SOUTH ATLANTIC DIVISION

Dredge Events
2,339

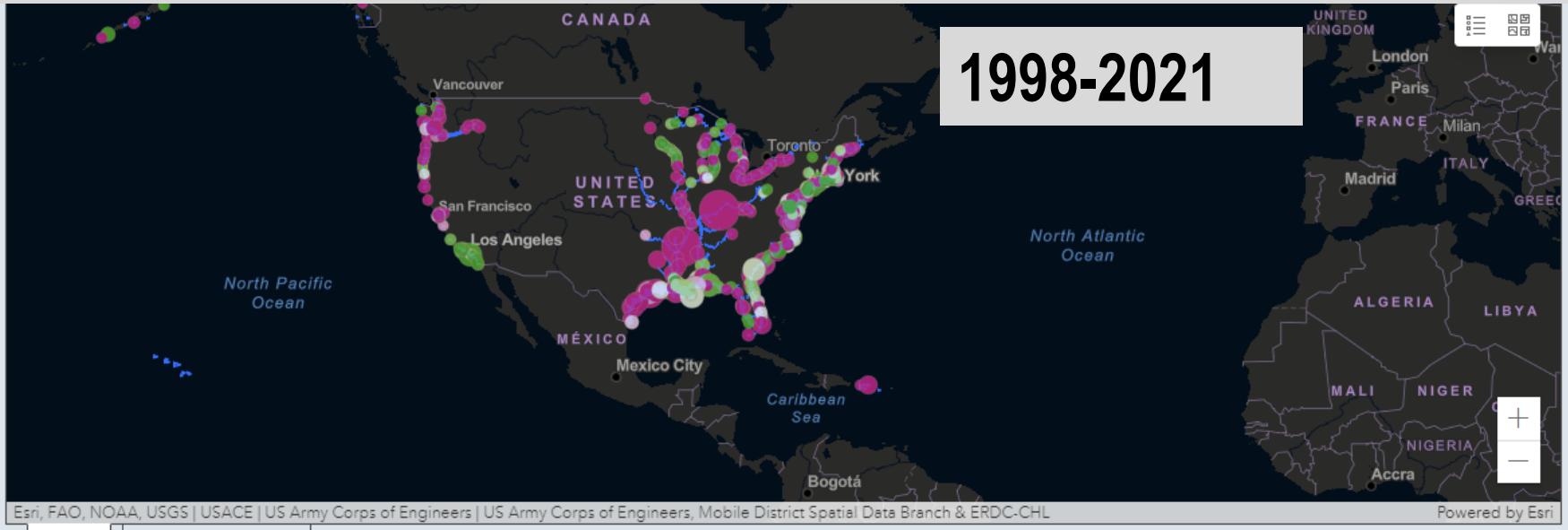
Total Volume
1.39B cy

Beneficial Use
33%
454.96M cy of 1.39B cy

1,344
BU Events

Disposal
67%
930.74M cy of 1.39B cy

995
Disposal Events



Map | Project Summary

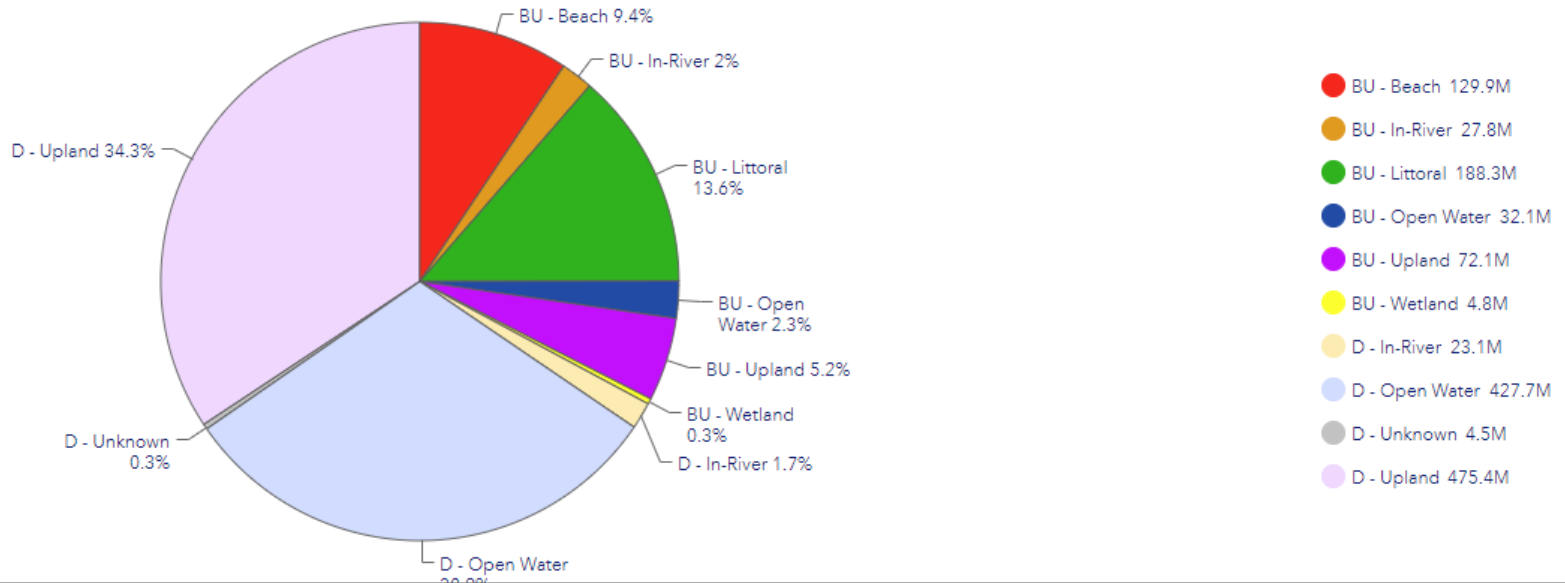
O&M Projects*
244
*Not filtered by Date or Placement

Project Summary

PercentBU
> 100
50
< 25

AvgEventVolume
> 7,000,000
5,000,000
3,500,000
2,000,000
< 500

Total Volume Summary (cy)



Placement Summary | Volume/Year | % BU/D by Year | Placement by District

Source: https://www.arcgis.com/apps/dashboards/1d91fcfd05c14569be7d3e67c73e03bc

BENEFICIAL USE - PLACEMENT CONSIDERATIONS

		Material Composition							
		Fine			Mix				Sand
Location	High Marsh								
	Low Marsh								
	Marsh Edge								
	Island								
	Dune								
	Beach								
	Mudflat								
	Bar/Spit								
	Other								

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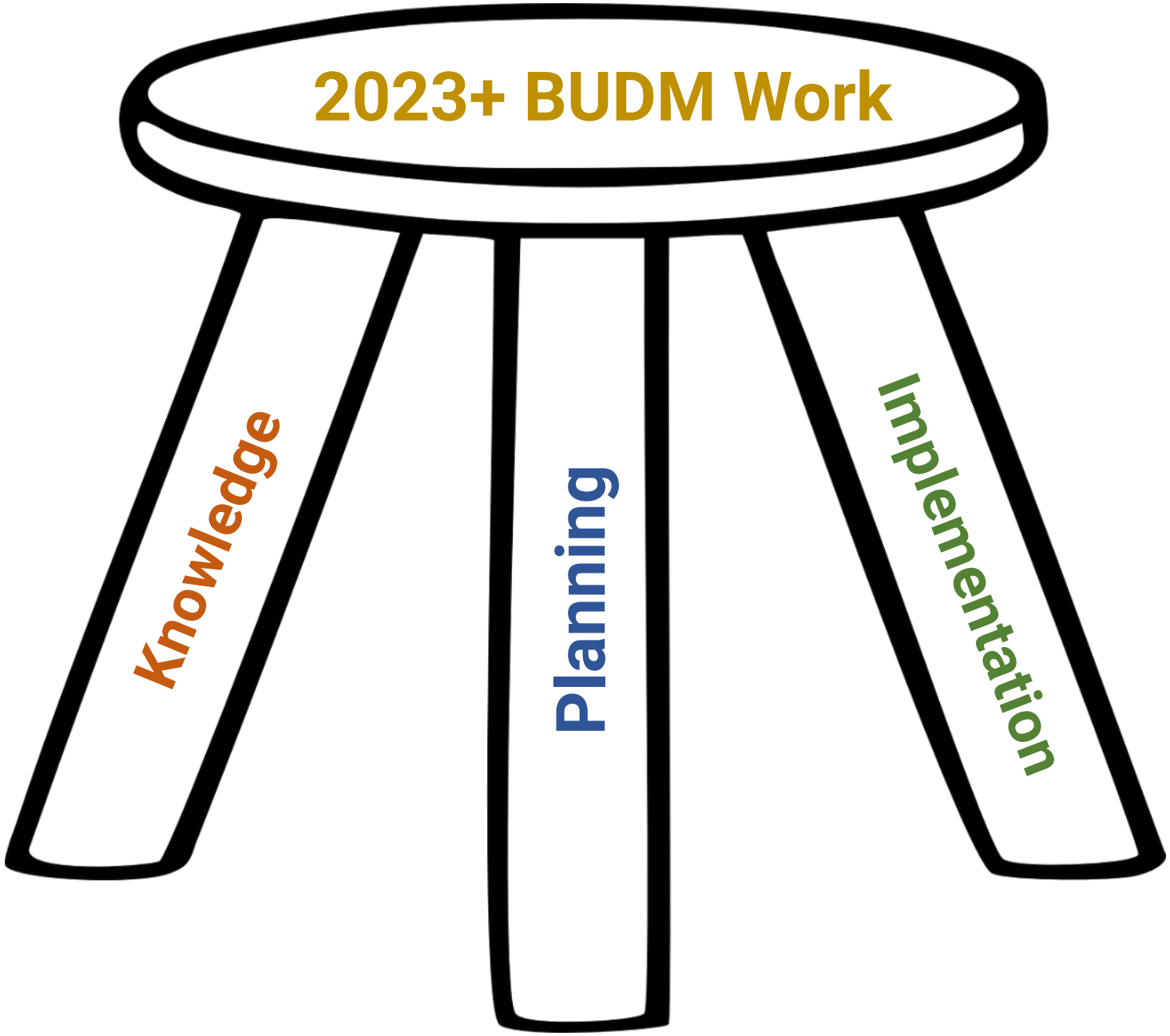
2023+ BUDM Work
Knowledge
Planning
Implementation

OUTCOMES

Webinar
Topic 1
Topic 2
Topic 3
Topic 4
Topic 5
Topic 6

	ME	MA	NJ	DE	VA	NC	SC	GA
Site 1								
Site 2								
Site 3								
Site 4								
Site 5								
Site 6								

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CASE STUDIES

Collector	Number	Notes
TNC – BULN	10	Place Based
AMOY WG	14	Place Based
CSO/ASBPA	13	Place Based and Process
Manomet/CSO	6+	Place Based

RSM RCX

CSO

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CASE STUDIES

Case Study Items:

Project Overview:

Project Goals:

Planning Elements:

Design Elements:

Permits/Regulatory:

Construction Elements:

Construction Costs:

Maintenance/Monitoring:

Restoration Outcomes:

Lessons Learned:

Photos & Maps

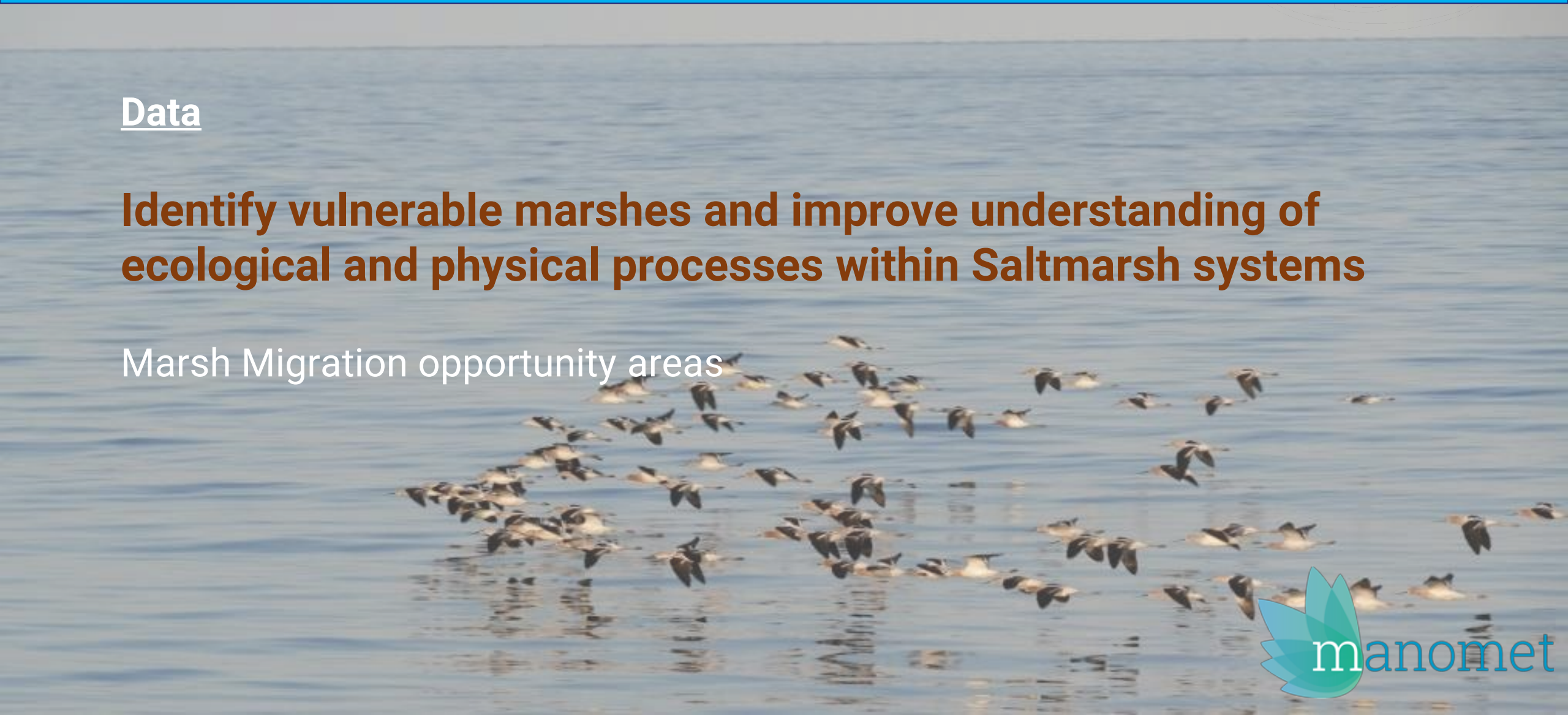
Needs Heard to Date

Coordination:

Regional Dredge Material Management Plan (RDMMPs) prep work

Continue building on existing efforts – USFWS ACJV SALS Maps, NJ TNC/DOT/TWI, etc.

Needs Heard to Date



Data

Identify vulnerable marshes and improve understanding of ecological and physical processes within Saltmarsh systems

Marsh Migration opportunity areas

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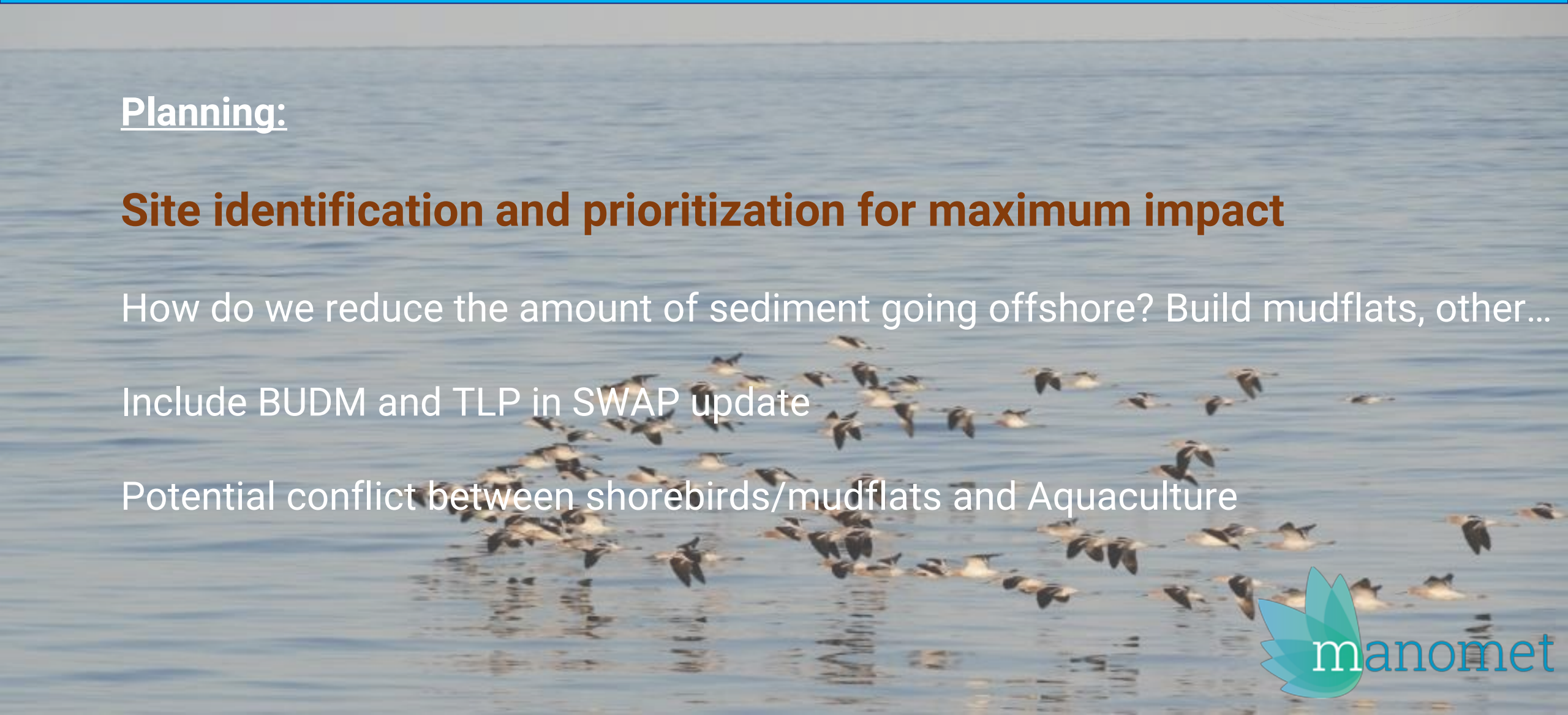
Needs Heard to Date



Planning:

Site identification and prioritization for maximum impact

How do we reduce the amount of sediment going offshore? Build mudflats, other…

Include BUDM and TLP in SWAP update

Potential conflict between shorebirds/mudflats and Aquaculture

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Needs Heard to Date

Policy

Improve standing of Thin Layer Placement and BUDM to enhance marsh platforms

Some States require BUDM. How do we work through regulatory challenges?

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Needs Heard to Date

Education:

Value of restoring/enhancing marshes prior to SLR impacts

Need better E&O to communities and other partners on value of salt marshes and how to restore…

- Toolkits for communities – needed
- Increasing awareness – public education

Post project Monitoring and ongoing maintenance – project webinar – Management A- Z. Include long term monitoring and ongoing maintenance. Dog walk, shorebird importance, beach closures.

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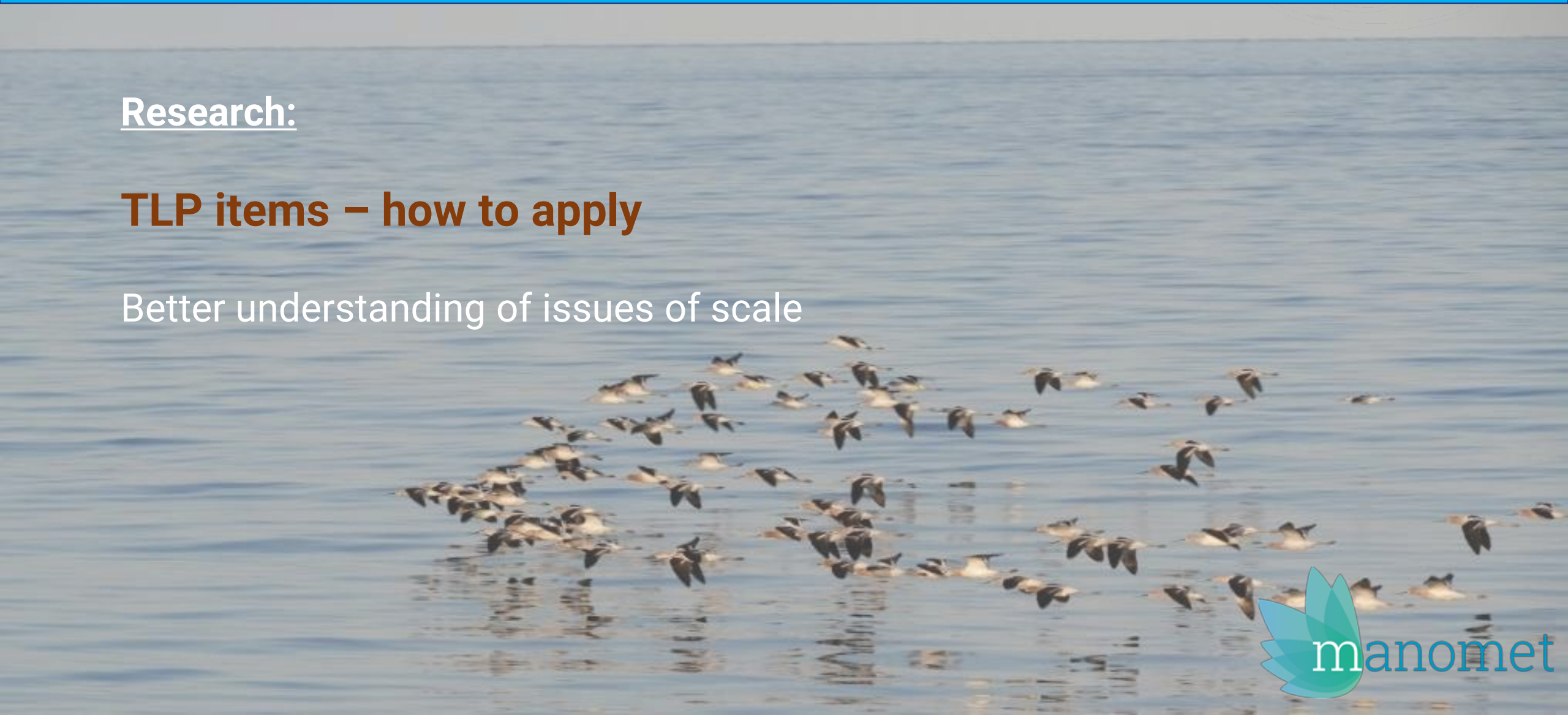
Needs Heard to Date



Research:

TLP items – how to apply

Better understanding of issues of scale

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Needs Heard to Date

Restoration:

Huge restoration need, limited capacity

BUDM not currently allowed in some states.

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DEVELOPING A SCREENING AND SEARCH FUNCTION

Geographic Search function

COMPOSITE RISK INDICES

SALT MARSH RESILIENCY

MIGRATORY BIRDS

NFWF CREST TOOL

Credit L. Reichold, USACE

Scrub and rerun

Important Shorebird Sites in the Americas

Explore potential WHSRN sites across the Western Hemisphere

Export Site Data | Suggest a Site

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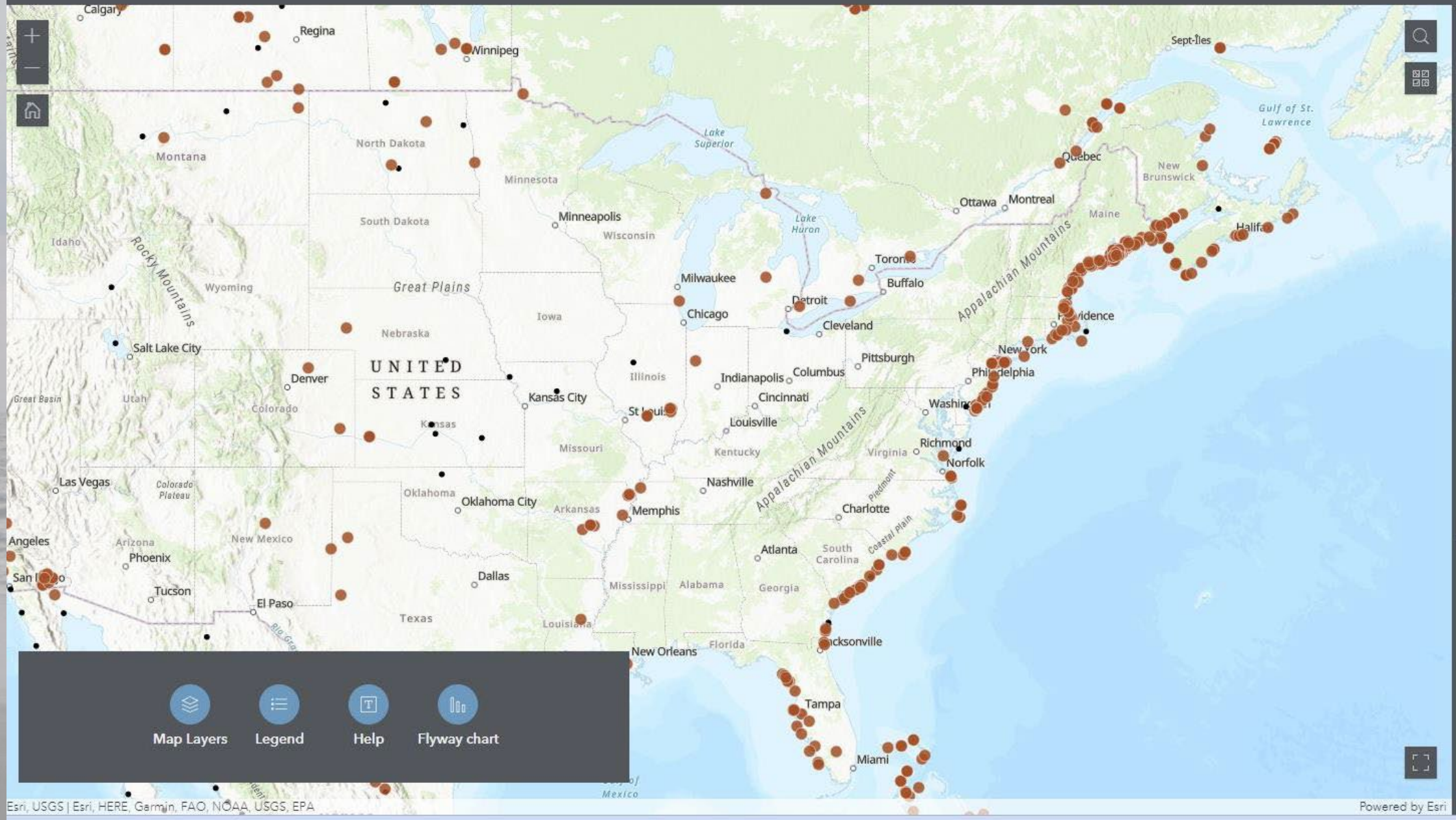
Created by Manomet, Inc and



Map Layers | Legend | Help | Flyway chart

Esri, USGS | Esri, HERE, Garmin, FAO, NOAA, USGS, EPA

Powered by Esri

Species

Search by Criteria, Spe

WHSRN criteria is

- All -

Species is

- All -

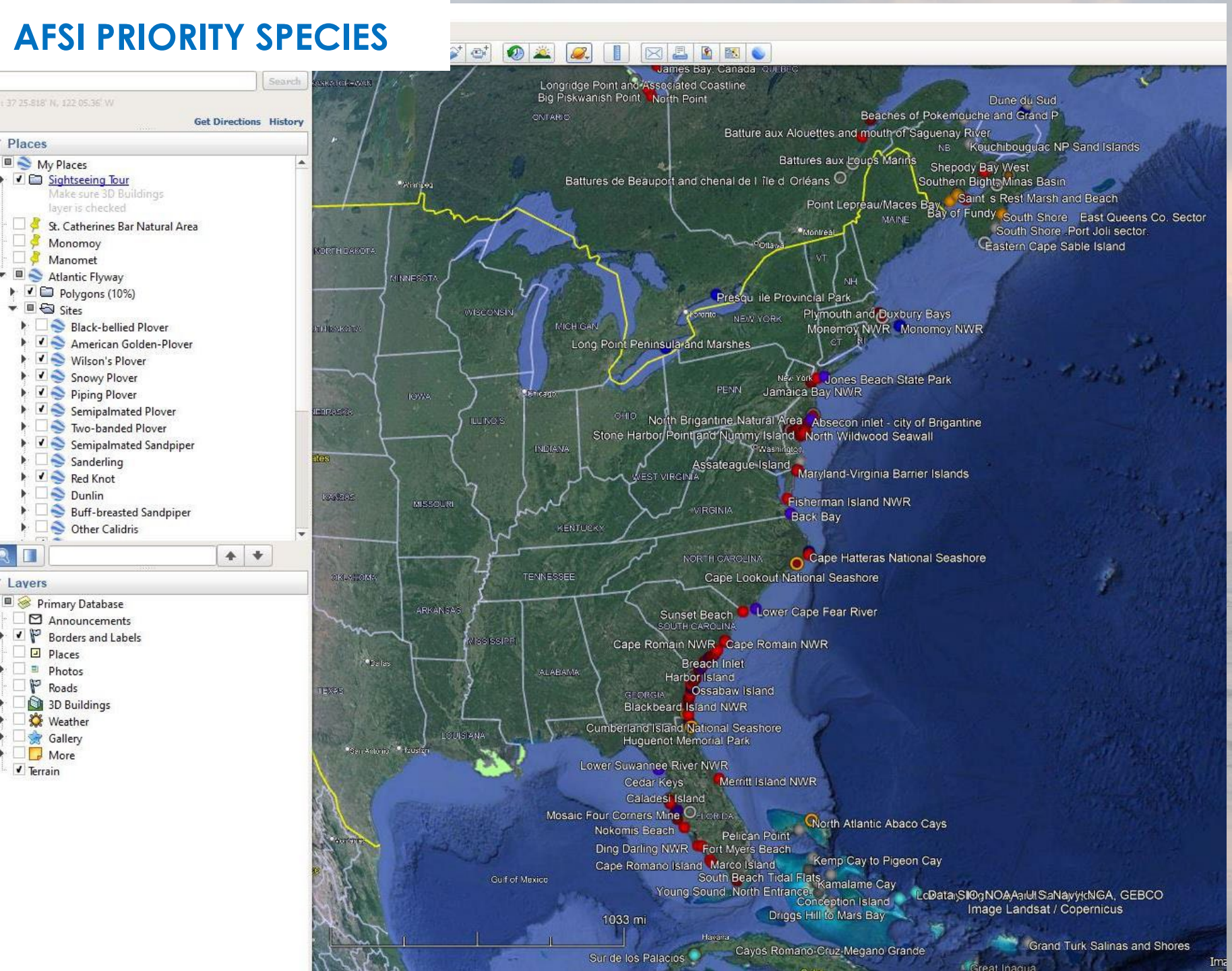
Flyway is

- All -

- The criteria used to define
more about WHSRN criteri
- For sites that qualify for mu
each qualifying criteria.

WH

AFSI PRIORITY SPECIES



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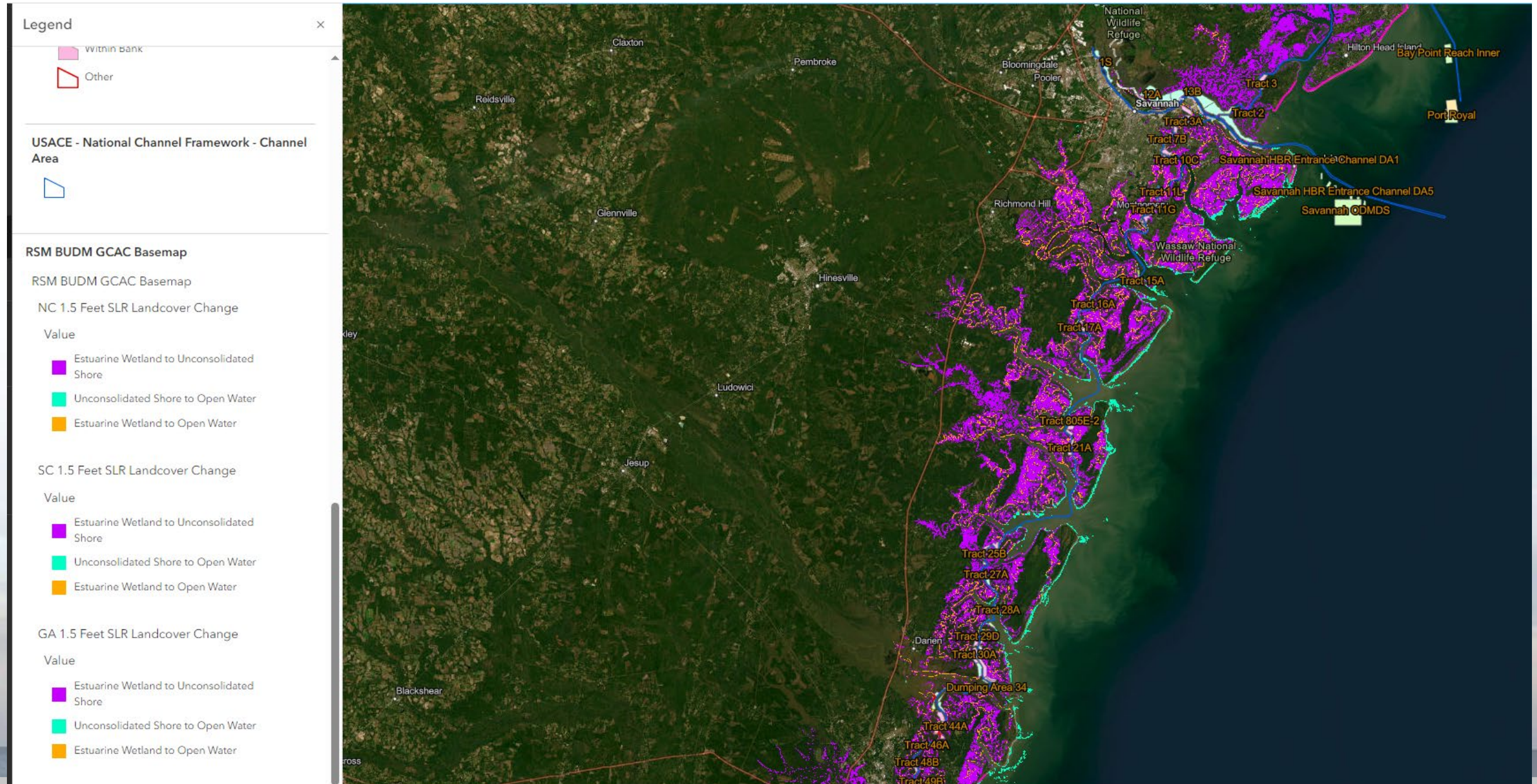
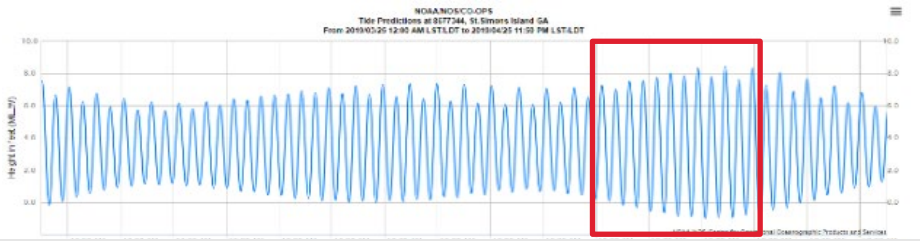
BASE MAP DEVELOPMENT



DEVELOP DESIGN GUIDANCE

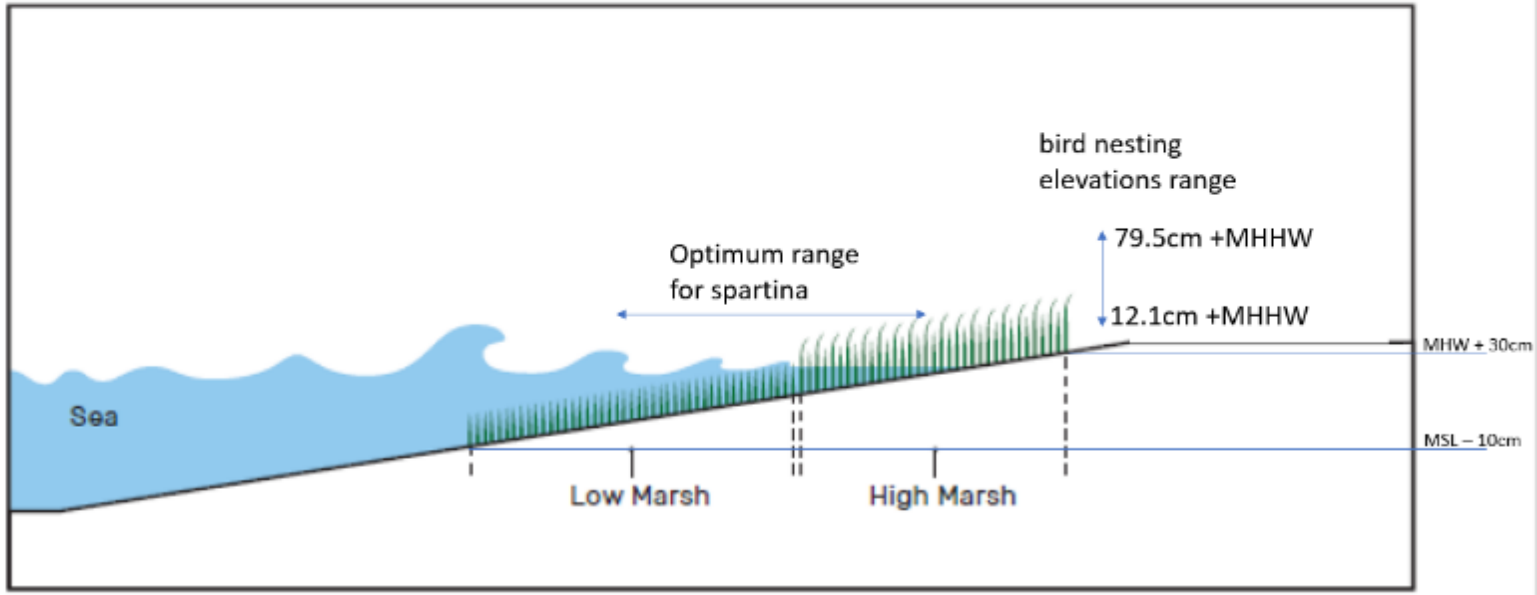
- Design Guidelines (target elevations, species and diversity, Geotech considerations for elevation/grade)
- Success Criteria (performance specs, monitoring etc.)
- Permitting and Regulation Evaluations guidance (404, EFH, etc.)



- Review of past projects (lessons learned)
- Field measurements (to be defined)
- Methods to keep costs low for design and implementation.

Credit L. Reichold, USACE

- Dominant salt marsh species (spartina alterniflora) has vertical distribution within the Tidal zone -10cm below MSL to 30 cm above MHW. Optimum range (Morris et. al., 2013) is mid way btwn the upper and lower limits.
- At the Jekyll Creek site, MSL = 0.06m NAVD 88 and MHW = 1.07m NAVD 88
- Observed 2019 bird nesting elevations from Coastal GA ranged 1.027 to 1.896m NAVD88; which referenced to local MHHW is 12.1cm +MHHW to 79.5cm +MHHW.



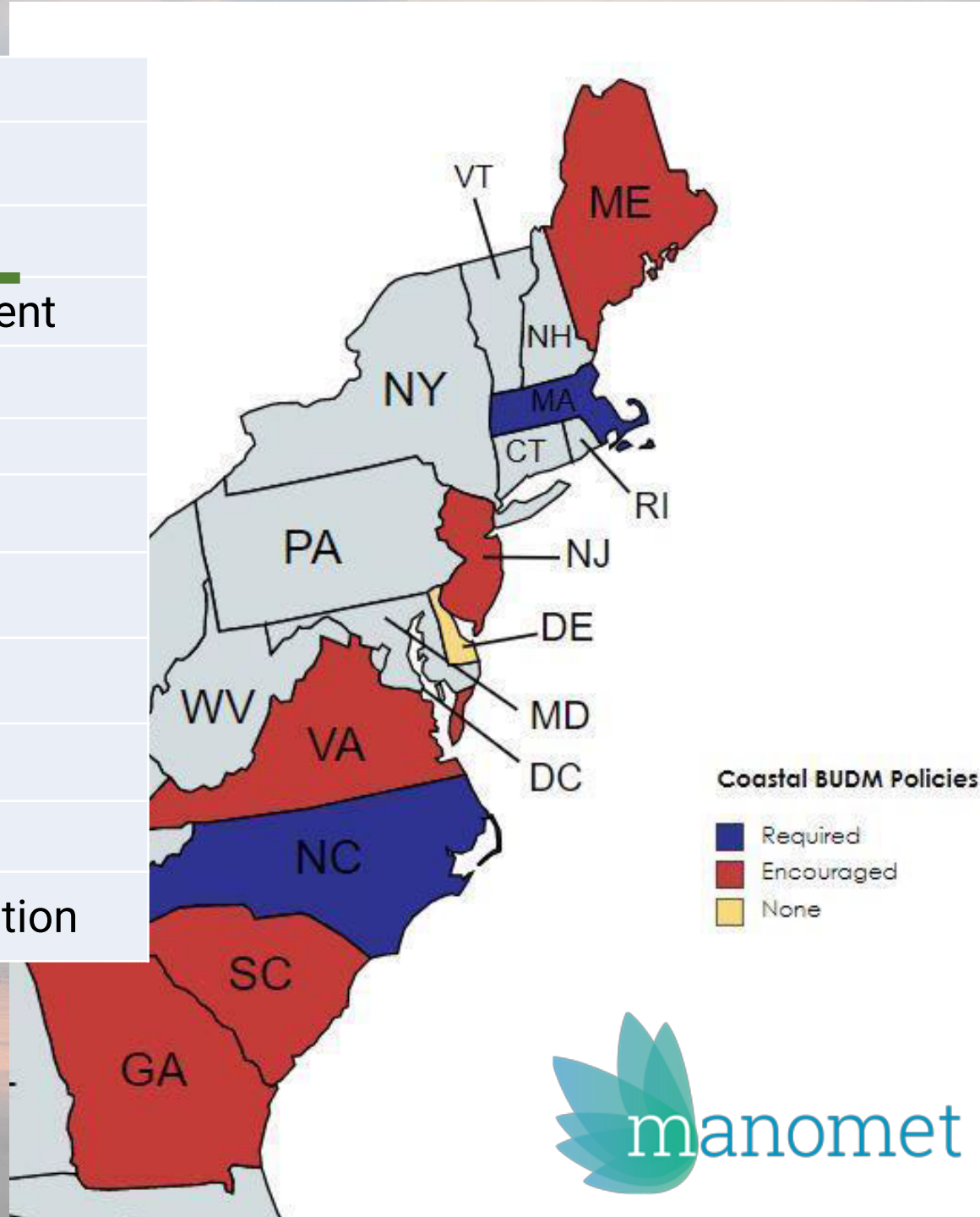
USACE REGIONAL DMMPS

Credit L. Reichold, USACE

- WRDA 2020 Section 125 – 5yr DMMP requirement
- Forecasting of dredging priorities and project schedules
- Incorporation of true lifecycle costs for placement alternatives
- Quantification of direct, indirect, and comprehensive benefits (ex. cross business line savings, local or regional economic benefits, environmental benefits, climate resiliency, etc.).
- Increased collaboration opportunities and alignment of funding needs above Federal Standard with local, State, and Federal partners.
- Annual Update of DMMPs
- Formal Engagement and Coordination Plan

HABITAT AND BUDM TIMELINE

March 2019	Workshops Round 1
Summer / Fall 2021	Workshops Round 2
January - March 2023	Planning and Needs Assessment
May - December 2023	Case Studies
July - August 2023	Introductory Webinars
December 2023	South Workshops
Dec 2023 – Dec 2024	Informational Webinars / CoP
February - September 2024	North Workshops
December 2024	WCS Funding Year 1 Ends
January 2025*	NFWF Funding Year 1 Ends
2024 and Beyond	E&D / Restoration Implementation



With Generous Support From:

R. Howard Dobbs, Jr. FOUNDATION

WCS

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NEXT STEPS

- Project Pipeline
- Funding Proposals…
  - Engineering and Design
  - Implementation
  - Monitoring
  - Education and Outreach

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QUESTIONS???