

Pathways to Resilience

A Guide to Collaborative Tidal Wetland Migration Pathway Protection

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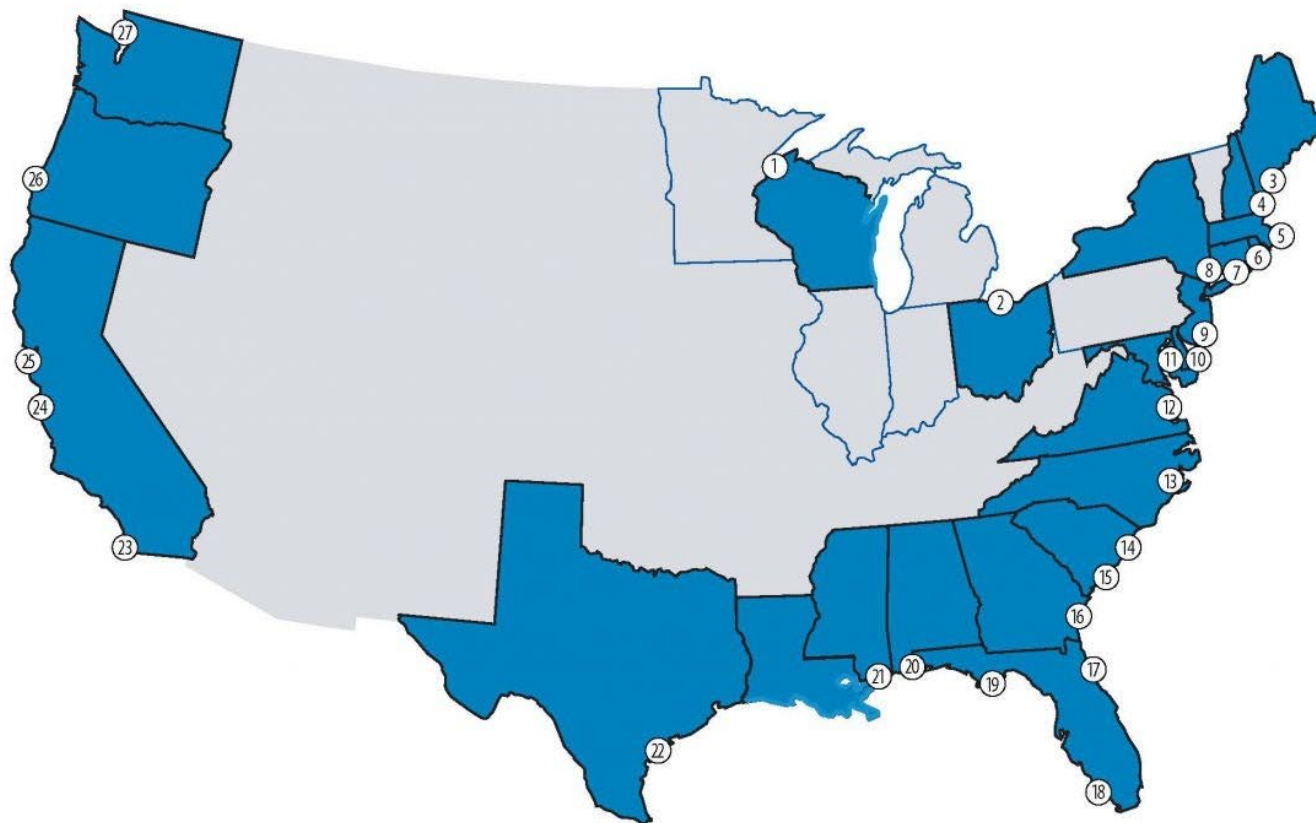
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**Narragansett Bay
Research Reserve**



NATIONAL ESTUARINE RESEARCH 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
7. Connecticut

Mid-Atlantic

8. Hudson River, New York
9. Jacques Cousteau, New Jersey
10. Delaware
11. Chesapeake Bay, Maryland
12. Chesapeake Bay, Virginia

Southeast

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

Gulf of Mexico

18. Rookery Bay, Florida
19. Apalachicola, Florida
20. Weeks Bay, Alabama
21. Grand Bay, Mississippi
22. Mission-Aransas, Texas

West

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

Pacific

29. He'eia, Hawai'i

Caribbean

30. Jobos Bay, Puerto Rico

PROPOSED

Bay of Green Bay, Wisconsin
Louisiana

NERRS Marsh Resilience Assessment

	US State	Marsh Name and National Estuarine Research Reserve	CATEGORIES OF MARSH RESILIENCE TO SEA LEVEL RISE					Overall Resilience
			Marsh Elevation	Elevation Change	Sediment Supply	Tidal Range	Sea Level Rise	
EAST COAST	NH	Great Bay Discovery Center, Great Bay						
	MA	Sage Lot Pond, Waquoit Bay						
	RI	Nag West, Narragansett Bay						
	NY	Outer Tivoli North, Hudson River						
	DE	St. Jones Reserve, Delaware						
	MD	Jug Bay, Chesapeake Bay						
	VA	Goodwin Island Reserve, Chesapeake Bay						
	NC	Masonboro Island, North Carolina						
	SC	Crabhaul Creek, North Inlet-Winyah Bay						
	SC	Big Bay Creek, ACE Basin						
GULF	MS	Grand Bay, Grand Bay						
WEST COAST	WA	Sullivan Minor, Padilla Bay						
	OR	Hidden Creek, South Slough						
	CA	China Camp State Park, San Francisco Bay						
	CA	Upper Slough Marshes, Elkhorn Slough						
	CA	Oneonta Slough, Tijuana River						

RESILIENCE TO SEA LEVEL RISE

Low

High

Protecting people and economies

- \$267 BILLION in U.S. storm damage is prevented by coastal wetlands every single year
- nearly 75% of commercially harvested fish and shellfish depend on tidal wetlands during key stages of their life cycles



An opportunity: coastal wetland migration



Coastal wetland migration pathway: area of upland habitat where coastal wetlands are projected to migrate under a given sea level rise scenario

Coastal wetland pathway protection: protecting wetland migration pathways through land acquisition, conservation easements, planning or zoning changes, or regulatory measures

Wetland Migration Guide

A Guide to Collaborative Tidal Wetland Migration Pathway Protection

Assess

Plan

Design

Implement

Pathways to Resilience Project

Find webinars, contact information, and other useful tools.

Open Menu ⋮

Translates real, on-the-ground project experiences from six Reserves along the East coast (NH, RI, NJ, NC, SC, FL)

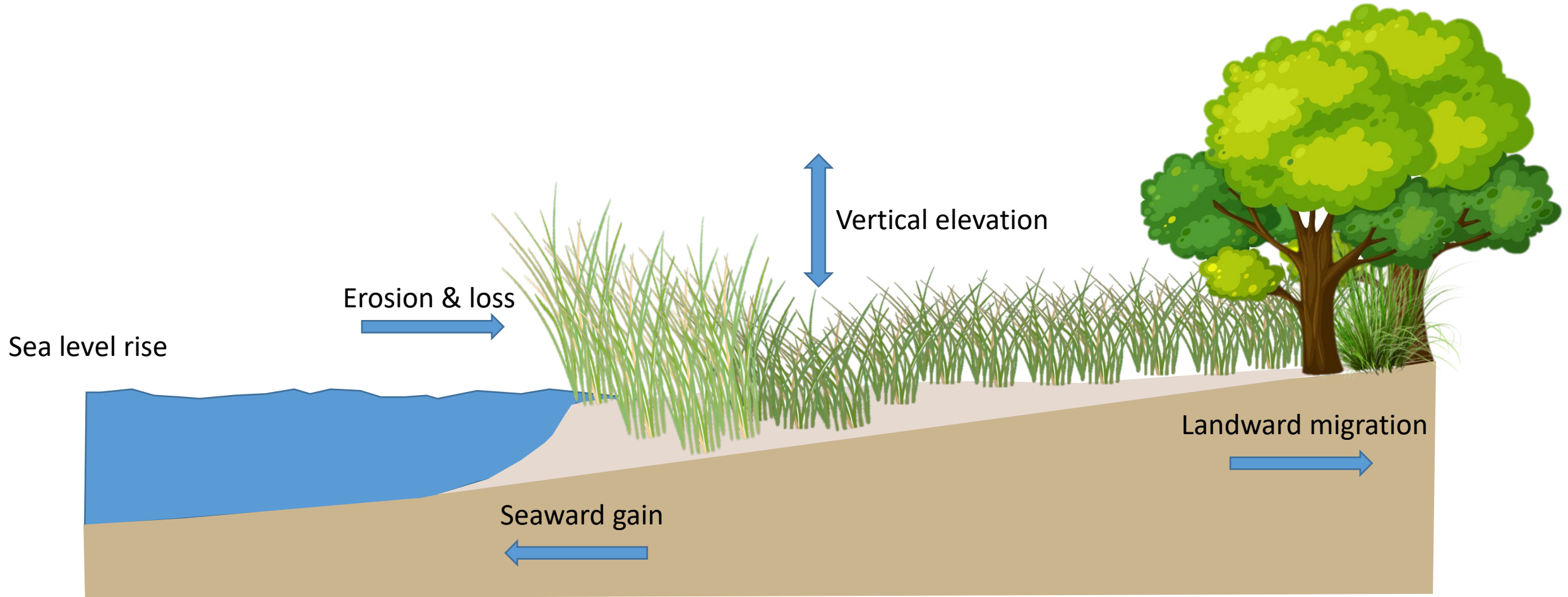


The term **tidal wetlands** encompasses salt, brackish, and fresh-tidal wetlands, mangroves, and vegetated shallows

Drivers of wetland migration

- Sea level rise and storm events
- Slope of adjacent upland
- Type of adjacent upland (physical barriers/land use, land type)
- Physical, chemical, biological properties of adjacent upland soil





Migration into lawn (Portsmouth, RI)

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Migration into coastal forest (Madison, CT)



As sea levels rise and storms grow stronger, tidal wetlands must move inland to persist- or disappear altogether.

Ensuring space for this migration, while balancing the needs of nearby communities, is a growing challenge along the East coast and around the United States.



Assess

- Who works with marsh migration in your region?
- Is migration corridor protection a good fit for your organization?
- What are your goals?



Plan

- Given your goals, who will you work with?
- Where will you focus your work?
- What information do you need to make progress toward your goals?
- How will you engage partners and stakeholders?



Design

- What opportunities exist for marsh migration in your focus area?
- How will you evaluate them?
- Which projects rise to the top, and why?





Implement

- Which of your priority projects are ready to move forward?
- What's needed to take action?
- How can you prepare to act quickly when opportunities arise?

Coastal wetland migration in context: Sapowet Marsh, Tiverton RI



- Agricultural field adjacent to salt marsh; leased by DEM for agriculture until 2017
- Signs of degraded marsh: impounded water, vegetation die off, changing to open water
- Secured funding for marsh migration facilitation and tidal hydrology restoration from 2018-2019



Action: seeded field with a mix of native grasses and forbes



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Action: removed artificial berms



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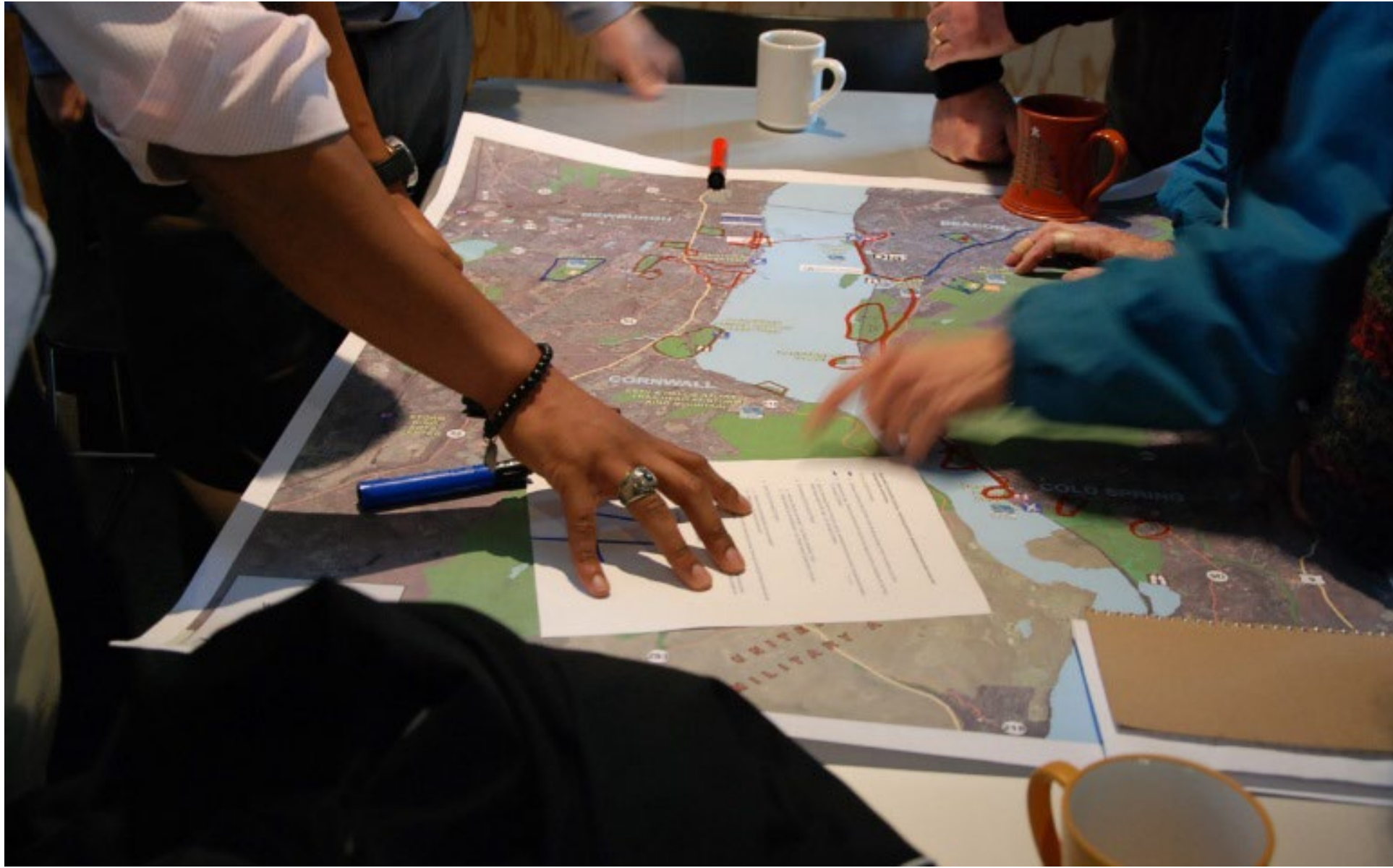


While there are management techniques that may help some existing wetlands...

... there is a vital need to protect pathways for wetlands to migrate upslope...



... by engaging those who make land protection
and regulatory decisions



Making way for wetlands

- Proactive planning today directly reduces future disaster costs and protects critical ecosystems
- Learn more at www.nerra.org/wetland-toolkit/wetland-migration-guide/

Thank you! Questions?