Communicating Results from the Tidal Marsh Resilience Synthesis to the Research Reserves, National Partners, and Coastal Managers

Project Contact

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Project Duration

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Project Partners

- ACE Basin National Estuarine Research Reserve
- Chesapeake Bay National Estuarine Research Reserve, Maryland
- Chesapeake Bay National Estuarine Research Reserve, Virginia
- Delaware National Estuarine Research Reserve
- Elkhorn Slough National Estuarine Research Reserve
- Grand Bay National Estuarine Research Reserve
- Great Bay National Estuarine Research Reserve
- Hudson River National Estuarine Research Reserve
- Narragansett Bay National Estuarine Research Reserve
- North Carolina National Estuarine Research Reserve
- North Inlet-Winyah Bay National Estuarine Research Reserve
- Padilla Bay National Estuarine Research Reserve
- Roca Communications+
- San Francisco Bay National Estuarine Research Reserve
- South Slough National Estuarine Research Reserve
- Tijuana River National Estuarine Research Reserve
- Waquoit Bay National Estuarine Research Reserve

Overview

Globally, scientific leaders and coastal managers have identified the need for a broad geographic assessment of coastal wetlands resilience to inform management strategies and priorities in the face of sea level rise. Although numeric models are often used to guide management decisions, they are typically applied at local scales, and their calculations are not easily understandable to coastal managers or the public. Multi-metric indices designed directly for coastal managers, such as those used for aquatic invertebrate and fish data, present a promising alternative approach. However, they have never been developed for coastal wetlands.

The goal of the National Estuarine Research Reserve's System-Wide Monitoring Program is to conduct such data syntheses that could inform coastal management and contribute to estuarine science. However, relatively few monitoring program syntheses have been completed, and there are no syntheses for the program's sentinel site marsh data, despite substantial investment in data collection and management.

A multi-reserve effort developed the first multi-metric, integrative indices of marsh resilience to sea-level rise and applied them to marshes in 16 reserves across the United States. The goal of this transfer project is to translate the results of the syntheses to a broader community of end-users, both within and outside of the reserve system, and to create a comprehensive tool that allows coastal managers to make more informed decisions about coastal wetland management.

Benefits

The project team's synthesis of System-Wide Monitoring Program sentinel site data resulted in a new approach for assessing coastal marsh resilience: the Marsh Resilience to Sea-Level Rise indices. This new tool resulted in the following positive outcomes:

- By using this novel multi-metric index for tidal marshes, reserve staff and partners are better able to understand the risks to marshes from accelerated sea level rise, can determine the relative resilience of individual marshes, and can identify factors influencing the level of resilience.

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- The project team raised the profile of monitoring in the reserve system and demonstrated the value of the monitoring program to congress, NOAA, and estuarine scientists by sharing the Marsh Resilience to Sea-Level Rise indices with a wide range of end users. These end users included reserve staff; national organizations such as the U.S. Geological Survey and National Park Service; local and regional coastal management organizations; and the public.
- The project team linked marsh index scores to appropriate management strategies that coastal managers can use in their regions.

Approach

A project team led by scientists from the Elkhorn Slough, Narragansett Bay, Chesapeake Bay in Virginia, and North Inlet-Winyah Bay Reserves conducted the sentinel site synthesis and translated the results by completing the following three key tasks:

- **Scientific Publication** – The project team completed a scientific publication on marsh resilience across the reserve system, describing the first multi-metric index created for tidal marshes.
- **Tool and Manual Creation** – The team developed an Excel-based tool and user's manual to allow national organizations collecting marsh data to apply the new marsh resilience indices to their sites.
- **Dissemination to End Users** – Working with a communications consultant, the team developed and disseminated a summary brochure about the project. Additionally, the team shared their synthesis of marsh resilience across the reserve system with a variety of audiences through more than 20 oral and poster presentations, including a NOAAOne seminar and presentations at Coastal and Estuarine Research Federation and Society of Wetland Sciences conferences.

What's Next

The reserves will re-evaluate resilience to sea level rise across marshes at least every 10 years by applying the newly developed tools. New reserves can be included in the future, as more reserves fully implement the sentinel site monitoring needed to apply the tools, and the tool can be updated and modified to include new parameters. The tool development leads are also currently collaborating with scientists at the U.S. Geological Survey to compare and potentially combine metrics of marsh resilience developed independently by the two organizations.

Products

- User-friendly tool and manual for the application of the Marsh Resilience to Sea-level Rise indices in global marshes
- Written summary of marsh resilience across the National Estuarine Research Reserve System
- PowerPoint presentations about the Marsh Resilience to Sea-Level Rise indices tailored for technical and non-technical audiences
- Scientific publication detailing the Marsh Resilience to Sea-Level Rise indices and their application to 16 reserves

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