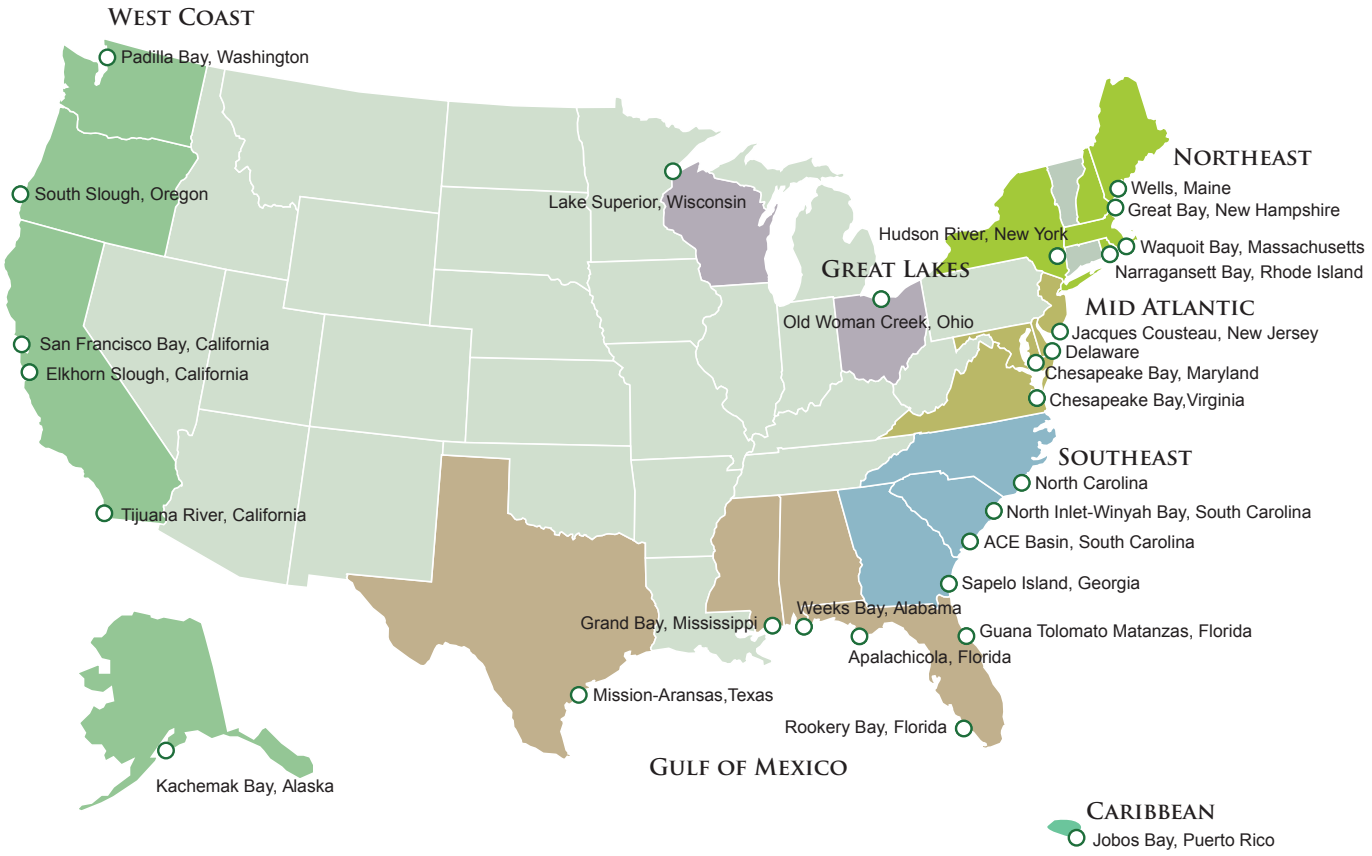
NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM

2011-2016

National Estuarine Research Reserve System

STRATEGIC PLAN

National Estuarine Research Reserve System



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INTRODUCTION

Estuaries, where rivers meet the sea, are among the nation's most biologically rich and economically important ecosystems. They are also one of the most vulnerable – situated on the front lines of natural and human-induced change. The interconnection between the health of estuaries and society's economic and recreational well-being is increasingly evident, and coastal conservation is being driven by both ecological and societal needs. The National Estuarine Research Reserve System, a network of 28 protected areas along America's coasts, responds to these needs by providing platforms for learning and teaching, applying research to management, and practicing coastal stewardship. Each reserve in the national system serves as a place-based living laboratory and classroom where program development, research techniques, and management approaches can be piloted and applied to issues of local, regional, and national importance.

WHO WE ARE

Established by the Coastal Zone Management Act of 1972, as amended, the National Estuarine Research Reserve System is a state-federal partnership between the National Oceanic and Atmospheric Administration (NOAA) and the coastal states. It is administered by NOAA's Estuarine Reserves Division in the Office of Ocean and Coastal Resource Management. NOAA provides funding, coordination, national guidance for program implementation, and technical assistance. Coastal states are responsible for managing reserve resources and staff, providing matching funds, and implementing programs locally. Through this partnership, the Reserve System addresses local, regional, and national priorities and connects NOAA with on-the-ground projects, needs, and emerging issues.

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HOW WE WORK

The Reserve System was founded on the principle that long-term protection of representative estuaries provides stable platforms for research and education and the application of management practices that will benefit the Nation's estuaries and coasts. Individual reserves serve as living laboratories for the study of estuaries and natural and man-made changes. Reserves employ place-based approaches to connect science to people, whether they are teachers, students, decision makers, or coastal residents. Reserves serve as demonstration sites where new ideas are tested. Through the implementation of System-wide programs in monitoring, training, and education, reserves also have regional and national impact. It is the integration of locally relevant reserve programs with System-wide approaches that fosters innovation and allows comparison of estuarine conditions across the country. Trusted long-term relationships with local communities, state and federal agencies, and other non-governmental entities form partnerships that amplify the impact of individual reserves and the Reserve System. The influence of reserve programs and products are felt well beyond the boundaries of individual sites. By working locally, regionally, and nationally, the Reserve System is more efficient and effective in addressing the key issues faced by coastal managers and communities today. In the next five years, the Reserve System will strengthen opportunities for place-based innovation that is transferable to other reserves and coastal management programs, while continuing the commitment to implementing robust System-wide programs in monitoring, training, and education.

The Reserve System is guided by several principles:

- Engage local communities and citizens to improve stewardship of coastal resources
- Create strong partnerships to enhance the success of Reserve programs
- Integrate research, education, and stewardship to address complex coastal problems
- Implement best management practices at reserves to lead by example
- Seek regional collaborations to extend the influence of reserve programs and products.

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WHAT WE WORK ON

The Reserve System has identified climate change, water quality, and habitat protection as strategic areas of focus and investment over the next five years. These are the most significant issues for estuaries nationally and require local and regional responses. The Reserve System, as a place-based network of protected areas, is uniquely positioned to address these issues. While individual reserves will have other issues that are important locally, the Reserve System will focus on programs and projects that address climate change, water quality, and habitat protection.

A Graduate Research Fellow investigates how estuaries respond to nutrient load in the Guana-Tolomato-Matanzas (GTM) National Estuarine Research Reserve, Florida. Photo credit: Nikki Dix

Climate Change

Climate change will have significant impacts on estuaries and coasts by exacerbating existing stressors such as sea level/lake level change, inundation and flooding from storms, drought, and changes to freshwater inflows. Additional impacts such as ocean acidification and species shifts also will affect estuaries. These impacts are expected to vary regionally and increasingly affect coastal communities and economies (USGCRP 2009). Reserves are well positioned to monitor and study the impacts of climate change on estuaries and to work with communities to plan and adapt to these changes. Reserves can design and implement mitigation and adaptation practices in the construction of facilities and through stewardship projects. Reserve training and education programs can help communities understand and adapt to anticipated local and regional climate change impacts.

Habitat Protection

Coastal wetlands are being lost at a rate of approximately 60,000 acres per year, largely due to coastal development and

Marsh at Goodwin Islands, Chesapeake Bay Virginia National Estuarine Research Reserve Photo credit: George Cathcart

inundation (Stedman and Dahl 2008). The biologically rich habitats of estuaries and coastal watersheds provide essential functions such as nurseries for many commercially important fish and shellfish as well as protection for human communities from storm surge, storm water run-off, and flooding. Current stressors on coastal habitats will be amplified by climate change causing greater habitat loss and alteration. Reserves are well suited to map, monitor, and investigate habitat changes and develop, test, and implement methods for habitat protection and restoration. Reserves also transfer these best management practices through coastal training and community education programs.

Water Quality

In the most recent assessment of estuaries by NOAA, the U.S. Environmental Protection Agency and the U.S. Department of Agriculture, a majority of estuaries showed signs of eutrophication and algal blooms, which were strongly influenced by population growth and land use practices (Bricker 2007). Understanding and monitoring water quality trends provides critical information needed to improve ecosystem health and mitigate adverse impacts such as harmful algal blooms and hypoxia. Of equal importance is promoting and implementing best management practices that address land-based sources of pollution. Reserves' ability to couple long-term monitoring data with management practices on reserve lands and in adjacent coastal watersheds provides an opportunity to study the effectiveness of different management practices. By implementing consistent protocols, reserves are also in a position to detect regional and national trends over time, particularly for larger scale drivers such as climate change.

National Estuarine Research Reserve System

VISION

Resilient estuaries and coastal watersheds where human and natural communities thrive

MISSION

To practice and promote stewardship of coasts and estuaries through innovative research, education, and training using a place-based system of protected areas

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GOALS AND OBJECTIVES

Protected Places

GOAL:

Estuaries and coastal watersheds are better protected and managed by implementing place-based approaches at Reserves.

OBJECTIVES:

1. Increase permanent protection and restoration of key areas in reserve watersheds to improve coastal habitat quantity, quality, and resiliency to climate change impacts.
2. Develop, demonstrate, and evaluate tools and practices at reserves that advance progress on habitat protection, water quality, and climate change impacts.
3. Expand biogeographic representation of the Nation's estuaries in the Reserve System by designating new reserves.

PRIORITY STRATEGIES:

1. Demonstrate best practices in land and estuarine stewardship and climate change adaptation at reserve properties and facilities.
2. Identify, prioritize, and implement land acquisition and habitat restoration projects taking into account climate change impacts.
3. Implement engagement programs to promote estuarine resource stewardship.
4. Designate new reserves in unrepresented biogeographic subregions and states as resources permit.

Science

GOAL:
NERRS scientific investigations improve understanding and inform decisions affecting estuaries and coastal watersheds.

OBJECTIVES:

1. Expand capacity to monitor changes in water quality and quantity, habitat, and biological indicators in response to land use and climate change drivers.
2. Improve understanding of the effects of climate change and coastal pollution on estuarine and coastal ecology, ecosystem processes, and habitat function.
3. Characterize coastal watersheds and estuary ecosystems and quantify ecosystem services to support ecosystem-based management of natural and built communities
4. Increase social science research and use of social information to foster coastal stewards that value and protect estuaries.

PRIORITY STRATEGIES:

1. Lead Reserve-based collaborative projects that connect scientists with intended users from problem definition through implementation.
2. Generate and disseminate periodic data syntheses and analyses of water quality and habitat change and the effects of climate change and other stressors at local and regional scales.
3. Implement monitoring and research projects that use reserves as sentinel sites for detecting and understanding the effects of sea level change and other climate change effects on estuaries.
4. Develop and implement strategies that build reserve capacity to conduct and use social science to address coastal management issues.

People

GOAL:

NERRS education and training increases participants' environmental literacy and ability to make science-based decisions related to estuaries and coastal watersheds.

OBJECTIVES:

1. Enhance the capacity and skills of teachers and students to understand and use NERRS data and information for inquiry-based learning.
2. Increase estuary literacy and promote active stewardship among public audiences through the development and delivery of tools and programs addressing climate change, habitat protection, and water quality.
3. Improve the capacity and skills of coastal decision makers to use and apply science-based information in decisions that affect estuaries and coastal watersheds.

PRIORITY STRATEGIES:

1. Provide place-based educational experiences that facilitate hands-on exploration of estuary environments.
2. Include relevant estuarine research and data in reserve professional training and education programs.
3. Implement teacher training programs using Estuary 101 curricula.
4. Expand training for coastal decision makers focused on climate change, habitat protection, and water quality issues.

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