

strategic PLAN

2005 - 2010



National Estuarine Research Reserve System



research

stewardship

education

The National Estuarine Research Reserve System is administered by NOAA's National Ocean Service, Office of Ocean and Coastal Resource Management, Estuarine Reserves Division. For more information, visit us online at www.nerrs.noaa.gov or contact us at: 1305 East West Highway N/ORM5, Silver Spring, Maryland 20910. Phone number: 301-713-3155

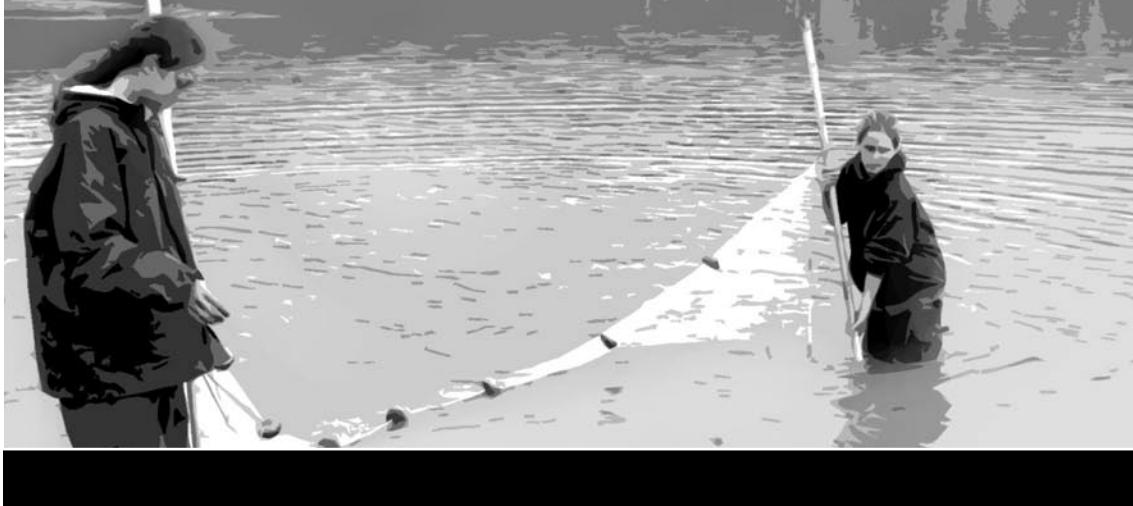
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vision | Healthy estuaries and coastal watersheds where coastal communities and ecosystems thrive.



mission | To practice and promote coastal and estuarine stewardship through innovative research and education, using a system of protected areas.



goals

1. Strengthen the protection and management of representative estuarine ecosystems to advance estuarine conservation, research and education.
2. Increase the use of reserve science and sites to address priority coastal management issues.
3. Enhance peoples' ability and willingness to make informed decisions and take responsible actions that affect coastal communities and ecosystems.

Introduction

For thousands of years, coastal and estuarine environments have provided people with food, safe harbors, transportation access, flood control, and a place to play and relax. The pressures on the nation's coast are enormous and the impacts on economies and ecosystems are becoming increasingly evident. Severe storms, climate change, pollution, habitat alteration and rapid population growth threaten the ecological functions that have supported coastal communities throughout history. As a network of 27 protected areas established for long-term research, education and stewardship, the National Estuarine Research Reserve System (NERRS) has a unique role to play in keeping coastal ecosystems healthy and productive.

The reserve system is a partnership program between the National Oceanic and Atmospheric Administration and coastal states that has protected more than one million acres of coastal and estuarine habitat since the program was established by the Coastal Zone Management Act in 1972. NOAA provides funding, national guidance and technical assistance. Each reserve is managed on a daily basis by a lead state agency, non-profit organization or university with input from local partners. Through careful stewardship, innovative science and education, and relevant training programs, the reserves encourage

careful management and protection of local estuarine and coastal resources.

The Coastal Zone Management Act created the reserve system to protect estuarine areas, provide educational opportunities, promote and conduct estuarine research and monitoring, and transfer relevant information to coastal managers. For the next five years, core reserve programs will focus on four priority topics: impacts of land use and population growth, habitat loss and alteration, water quality degradation, and changes in biological communities. The National Estuarine Research Reserve System's 2005-2010 Strategic Plan articulates how the strengths of the reserve system will be applied to address the major challenges of coastal management.

A Local Approach to National Priorities

Land use and population growth, water quality degradation, habitat loss and alteration, and changes in biological communities are not the only topics that reserves work on, but these four have risen to the top as deserving of adequate and strategic investment for the national system. These four topics are high priority science and training needs for coastal managers.³ Reserve scientists, educators and land managers have identified these topics as locally and nationally important and appro-

priate to the mission of the National Estuarine Research Reserve System. Increased understanding about these topics will improve the reserve system's ability to protect and restore coastal watersheds and estuaries and empower individuals to make informed decisions. The nation's coasts and estuaries need to be managed, understood and appreciated at multiple scales. Through a network of locally oriented programs around the country, the reserve system provides insight into common information and management needs as well as

data for use by local, regional and federal scientists and decision makers. Working at both the site level and as a national system, reserves have a greater impact than could be achieved through community efforts alone.

The goals, objectives and strategies outlined in this strategic plan will guide and support the National Estuarine Research Reserve System in its nation-wide efforts to improve coastal management, advance estuarine research, and educate current and future generations of coastal stewards.

Stewardship:

The responsible management of coastal resources using the best available information for the purpose of maintaining and restoring healthy, productive and resilient ecosystems.

Priority Coastal Management Issues

1. Land Use and Population Growth

The United States' exploding coastal population results in competing demands for clean water, beaches, recreational and commercial space, infrastructure and housing. In 2003, an estimated 153 million people lived in coastal counties, which is approximately 53% of the total US population. Pressure to develop land in coastal areas is escalating at more than twice the rate of population growth. Land use changes can significantly impact coastal and estuarine species and habitat. The Pew Ocean Commission reports that when more than 10% of a watershed is covered in impervious surface such as roads, roofs and parking lots, aquatic resources begin to degrade.¹

Coastal population and land use demands are not only increasing, they also are changing. Demographic and socio-economic trends show that the backgrounds and interests of people who are moving to the coast may be different from those of traditional fishing, commerce, or beach communities. The way people value and understand their relationship to the coast is reflected in the personal, political and professional choices they make. To make wise coastal resource management decisions, we need to understand the rela-



tionships among estuarine ecosystems and changing landscapes and attitudes. National Estuarine Research Reserves encourage the development and use of science based knowledge and tools in local land use planning, community development, and stewardship of public and private property.

2. Habitat Loss and Alteration

More than half of the nation's coastal wetlands have vanished since European settlement.² Estuarine and coastal environments continue to be altered and eliminated due to dredging, dams, recreational and commercial uses, flood and hazard mitigation, residential and infrastructure development, commercial port activities, and agriculture. Many of these activities disturb the physical, biological and chemical attributes of the estuary and therefore degrade

the plants and animals that depend on the habitat to survive. Seagrass beds, marshes, shellfish, bird and fish populations can be affected by sedimentation, erosion, and hydrological, chemical or physical alteration of the habitat. Estuarine ecosystems also are vulnerable to coastal storms and sensitive to changes in climate and sea level. Coastal managers want to know more about how their choices influence coastal habitat and the species that live there. Better information will ensure that alternatives are considered for permitting, as well as planning and implementing successful restoration and mitigation efforts.³

Reserve research and monitoring programs increase the fundamental understanding of estuarine dynamics and add new information about the causes and consequences of changes in habitat quantity and quality. Research and stewardship programs at the NERRs also develop, implement and evaluate new techniques

to restore and protect estuarine resources. Training programs and advisory services make this information available to professionals. Through education programs conducted at the reserves, students and citizens learn why these habitats are important and what they can do to keep them healthy.

3. Water Quality Degradation

Improving the condition of coastal water quality is a goal of the Coastal Zone Management Act and an ongoing struggle for all coastal regulatory agencies. Despite continuing local, state and federal investments, more than 20,000 beach closures were enforced in 2004⁴ and more than 60% of estuarine waters were classified by the EPA as having degraded water in 2005.⁵ Excess nutrients and chemical and biological contamination can cause human health problems and threaten aquatic life.



The Reserve System has been collecting water quality data for ten years to quantify short term variability and long term changes in estuarine waters. Through monitoring and studying changes in water quality, the reserves investigate how human activity, weather patterns, and estuarine characteristics contribute to changes in water quality that affect ecological processes and, consequently, human health. Reserves apply the knowledge generated through research and monitoring to improve water quality through habitat protection, restoration, and training and outreach programs.

4. Changes in Biological Communities

Biological communities are changing as a result of invasive species, over-harvest, climate changes, pollution, and habitat destruction. Invasive species out-compete or consume native organisms; habitat alteration and destruction displace some species and create opportunities for others; and changes in parameters such as temperature and salinity can shift the distribution of plants and animals. Chemical contamination and nutrient enrichment damage habitat and can alter the structure of floral and faunal communities. Over-harvesting biological resources also can change community structure and threaten valuable species. These problems impact natural interactions and linkages and lead to cascading indirect effects throughout the ecosystems.

Reserve research, stewardship, education, and training programs focus on understanding how changes in biological communities affect the way estuaries function. To minimize the negative impact of these changes, reserves investigate and communicate how to balance public needs with the protection of increasingly susceptible natural resources.



Guiding Principles

- Strong partnerships between NOAA, state agencies and universities, and other local partners are critical to the success of the reserve system.
- The reserve system integrates science, education and stewardship on relevant topics to maximize the benefits to coastal management.
- Reserves serve as a catalyst and a focal point for demonstrating and facilitating objective problem solving and best management practices.
- Reserves engage local communities and citizens to improve stewardship of coastal areas.
- Reserves implement an ecosystem-based management approach.

Goal One:

Strengthen the protection and management of representative estuarine ecosystems to advance estuarine conservation, research and education.

Objectives:

1. Biogeographically and typologically representative estuarine ecosystems are protected through the designation of new reserves.
 2. Biological, chemical, physical, and community conditions of reserves are characterized and monitored to describe reference conditions and to quantify change.
 3. Reserve ecosystems are conserved through land acquisition, natural resource management and restoration.
- Collect baseline information about the biological, physical, chemical, and socio-economic parameters of reserve biological and human communities.
 - Integrate NERRS monitoring, data management, education and training capabilities in regional ocean observing systems.
 - Implement land acquisition plans to enhance the long term integrity and diversity of reserve habitats.
 - Restore and actively manage reserves' natural resources to meet local habitat and human use goals.

Strategies:

- Identify and designate new reserves consistent with system-wide policy and available resources.
- Collect system-wide measurements of the short-term variability and long-term changes in the water quality, biotic communities and diversity, land-use and land cover characteristics of estuarine ecosystems to support effective coastal zone management.
- Work collaboratively with other programs to evaluate and apply advanced technologies and tools to support effective coastal management.
- Provide facilities and support to manage the natural resources within reserve boundaries.

Goal Two:

Increase the use of reserve science and sites to address priority coastal management issues.

Objectives:

1. Scientists conduct estuarine research at reserves that is relevant to coastal management needs.
 2. Scientists have access to NERRS datasets, science products and results.
 3. The scientific community uses data, tools and techniques generated at the NERRS.
- Disseminate reserve science through publications, outreach and technology transfer.
 - Generate time-series data and empirical studies to describe the ecological condition of reserve habitats.
 - Promote reserve science products through web sites, communication materials, and other avenues to meet the needs of diverse stakeholders.

Strategies:

- Understand coastal decision maker science and training needs through needs assessments, coastal management science needs surveys, etc.
- Work collaboratively with other programs to conduct research on priority management issues in the reserves.
- Offer Graduate Research Fellowships to master's and doctoral students to conduct science that is relevant to coastal management and to train students in estuarine science.
- Deliver monitoring and observation data to the scientific community.
- Increase visibility and reinforce the credibility of NERRS science through communication efforts about NERRS research and monitoring.
- Attract scientists and practitioners to use reserves as reference sites.
- Conduct and facilitate relevant research in reserve watersheds.
- Synthesize reserve data into information for use in decision making.
- Conduct and facilitate research into education effectiveness and behavior change.
- Ensure that reserves have facilities and research support to meet the needs of visiting scientists and staff.

Scientist:

A person who uses principles and procedures for the systematic pursuit of knowledge involving the recognition and formulation of a problem, the collection of data through observation and experiment, and the formulation and testing of hypotheses.

Goal Three:

Enhance people's ability and willingness to make informed decisions and take responsible actions that affect coastal communities and ecosystems.

Objectives:

1. People are aware of the ecological, economic, historical, and cultural importance of estuarine resources.
2. People understand how human choices and natural disturbances impact social, economic, and estuarine ecological systems.
3. People apply science-based information when making decisions that could impact coastal and estuarine resources.

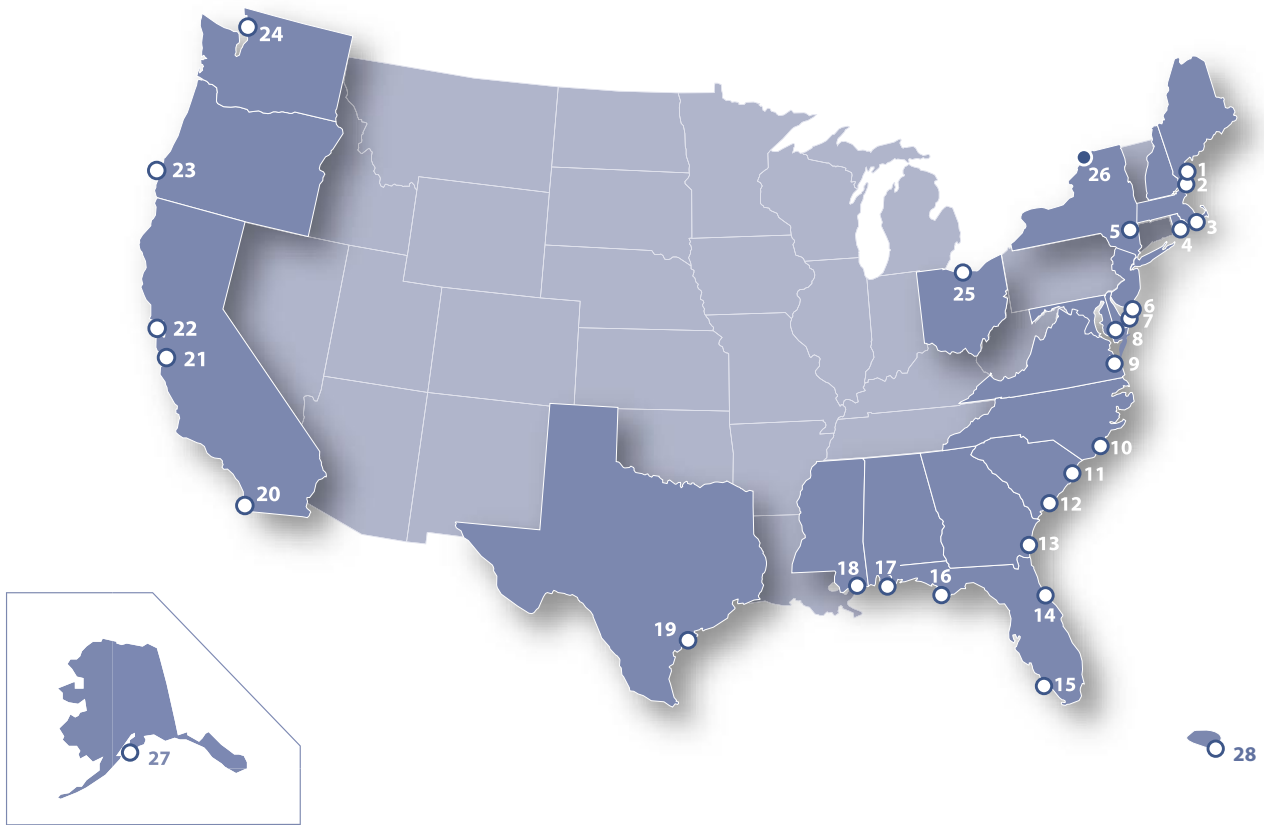
Strategies:

- Provide educational opportunities that increase students' understanding of estuarine science and technology.
- Implement and participate in public programs and events to raise awareness and understanding about estuaries and the NERRS.
- Produce and distribute educational materials and web-based products that raise public awareness about estuaries, the NERRS, and NERRS education products.

- Train teachers to educate students about coastal watersheds and estuaries.
- Deliver monitoring and observing data to diverse user groups in a useful format.
- Improve the willingness and ability of communities to restore and protect coastal ecosystems.
- Provide science-based information and training to individuals and organizations.
- Assist restoration practitioners in developing and applying effective restoration techniques.
- Implement volunteer programs to engage local citizens in advancing the goals of the reserves.
- Conduct programs to encourage people to make personal choices that reduce their impact on coastal resources.
- Evaluate programs to determine how people apply information and knowledge.
- Build and maintain educational facilities and interpretive displays.

Sources

- ¹ Pew Ocean Commission Report
- ² United States Commission on Ocean Policy Report
- ³ NERRS Coastal Training Program Trends Analysis Report, Improving Links Between Science and Coastal Management
- ⁴ National Resource Council website
- ⁵ EPA Coastal Conditions Report



● designated ○ proposed

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| 1. Wells Reserve, Maine | 15. Rookery Bay Reserve, Florida |
| 2. Great Bay Reserve, New Hampshire | 16. Apalachicola Reserve, Florida |
| 3. Waquoit Bay Reserve, Massachusetts | 17. Weeks Bay Reserve, Alabama |
| 4. Narragansett Bay Reserve, Rhode Island | 18. Grand Bay Reserve, Mississippi |
| 5. Hudson River Reserve, New York | 19. Mission-Aransas, Texas |
| 6. Jacques Cousteau Reserve, New Jersey | 20. Tijuana River Reserve, California |
| 7. Delaware Reserve | 21. Elkhorn Slough Reserve, California |
| 8. Chesapeake Bay Reserve, Maryland | 22. San Francisco Bay, California |
| 9. Chesapeake Bay Reserve, Virginia | 23. South Slough Reserve, Oregon |
| 10. North Carolina Reserve | 24. Padilla Bay Reserve, Washington |
| 11. North Inlet-Winyah Bay Reserve, South Carolina | 25. Old Woman Creek, Ohio |
| 12. ACE Basin Reserve, South Carolina | 26. Proposed Reserve—St. Lawrence River |
| 13. Sapelo Island, Georgia | 27. Kachemak Bay Reserve, Alaska |
| 14. Guana Tolomato Matanzas Reserve, Florida | 28. Jobs Bay Reserve, Puerto Rico |