

# Final Evaluation Findings

Narragansett Bay  
National Estuarine Research Reserve

June 2008 to June 2016

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## Summary of Findings

The Coastal Zone Management Act requires the National Oceanic and Atmospheric Administration's Office for Coastal Management to conduct periodic evaluations of the performance of state programs participating in the National Estuarine Research Reserve System. This evaluation examined the operation and management of the Narragansett Bay National Estuarine Research Reserve by the Rhode Island Department of Environmental Management, the designated lead agency, for the period from June 2008 to June 2016. The evaluation focused on three target areas: program administration, habitat resilience to climate change, and coastal development.

Final evaluation findings for the national estuarine research reserves highlight each reserve's accomplishments in the target areas and include recommendations, which are of two types:

**Necessary Actions** address programmatic requirements of implementing regulations of the Coastal Zone Management Act. These must be carried out by the dates specified. Failure to address necessary actions may result in a future finding of non-adherence and the invoking of interim sanctions, as specified in the Coastal Zone Management Act §312(c).

**Recommendations** are actions that the office believes would improve the program, but which are not mandatory. The state is expected to have considered the recommendations by the time of the next evaluation or dates specified.

The findings in this evaluation document will be considered by the NOAA Office for Coastal Management in making future financial award decisions concerning the reserve. The evaluation came to these conclusions:

**Accomplishment:** The Narragansett Bay National Estuarine Research Reserve made improvements to one of the cottages and constructed a classroom to create a holistic, functional campus that more fully supports education.

**Accomplishment:** The Narragansett Bay National Estuarine Research Reserve serves as a showcase site for the rest of the Rhode Island Department of Environmental Management with its use of renewable energy on site, and in employing community involvement in the development and implementation of the Prudence Island wildfire risk reduction plan.

**Accomplishment:** The reserve has been a leader in the National Estuarine Research Reserve System for sentinel site investment and protocol development. Many of the protocols developed and piloted at this reserve were adopted for the national network of sentinel sites. Additionally, the reserve initiated an analysis and synthesis of system-wide sentinel site data to make the data accessible and usable for coastal decision makers.

**Accomplishment:** The Narragansett Bay National Estuarine Research Reserve and its partners effectively advanced statewide comprehensive assessment of marshes. The reserve contributed research techniques and findings that, through collaborative work with state partners, leveraged a federal funding opportunity and resulted in state policy change.

**Accomplishment:** The Narragansett Bay National Estuarine Research Reserve has consistently fostered a relationship with the Prudence Island community and partners to preserve open space. During the evaluation period, the reserve acquired two of the last three major, undeveloped parcels on Prudence Island and incorporated them into the reserve, bringing the total protected land on Prudence Island to 85%.

**Necessary Action:** The Narragansett Bay National Estuarine Research Reserve must submit its final management plan for notice in the *Federal Register* to the Office for Coastal Management by August 31, 2018.

**Recommendation:** The Office for Coastal Management encourages the reserve to continue to work creatively to enhance public awareness and appreciation of the reserve and to communicate the value of its programs to a broader audience. This could include moving forward with establishing a presence on the mainland and building on the existing annual report document.

**Recommendation:** The Office for Coastal Management strongly encourages the Narragansett Bay National Estuarine Research Reserve to use the opportunity of the management plan update to intentionally integrate reserve sector expertise and efforts to address priority issues.

**Recommendation:** The Office for Coastal Management strongly encourages the Department of Environmental Management to work more closely with the Reserve and the Coastal Resources Management Council to advance shared priorities in the state and elevate the visibility of the Reserve and its contributions to science and policy in Rhode Island.

**Recommendation:** The Office for Coastal Management applauds the reserve's success in acquiring two of the last three major, undeveloped parcels on Prudence Island and encourages the reserve to ensure the wise management of these new parcels by taking into account current and future resources available for habitat management as they finalize stewardship plans for these parcels. The stewardship plans should be referenced in the updated management plan.

This evaluation concludes that the Rhode Island Department of Environmental Management is adhering to the requirements of section 312(a) of the Coastal Zone Management Act, 16 U.S.C. § 1458(a), in the operation of the Narragansett Bay National Estuarine Research Reserve.

## Program Review Procedures

The NOAA Office for Coastal Management evaluated the Narragansett Bay National Estuarine Research Reserve in fiscal year 2016. The evaluation team consisted of Pam Kylstra, evaluation team lead; Alison Krepp, site liaison; Betsy Nicholson, Northeast regional director; Donna McCaskill, communications; and Adrienne Harrison, regional specialist—all with the NOAA Office for Coastal Management; and Erik Smith, research coordinator, North Inlet-Winyah Bay National Estuarine Research Reserve. The support of the reserve staff was crucial in conducting the evaluation, and we most gratefully acknowledge this support.

NOAA sent a notification of the scheduled evaluation to the director of the Rhode Island Department of Environmental Management, as well as published a notice of “Intent to Evaluate” in the *Federal Register* on April 11, 2016. NOAA also notified members of Rhode Island’s congressional delegation. The reserve posted a notice of the public meeting and opportunity to comment in the *Providence Journal* on May 13, 2016.

The evaluation process included a review of relevant documents and a survey of stakeholders, which helped identify three target areas for the evaluation: program administration, habitat restoration, and climate resilience. A site visit was also conducted and the evaluation team held meetings with staff members and group discussions with stakeholders and program staff members about the target areas. In addition, a public meeting was held on Tuesday, June 28, at 6:00 p.m. at the Audubon Society of Rhode Island, Environmental Education Center, 1401 Hope Street, Bristol, Rhode Island, to provide an opportunity for members of the public to express their opinions about the implementation of the reserve. Stakeholders and members of the public were given the opportunity to provide written comment via email or U.S. mail through Friday, July 15, 2016. No written comments were received. The Office for Coastal Management then developed draft evaluation findings, which were provided to the Rhode Island Department of Environmental Management and the reserve for review, and their comments were considered in drafting the final evaluation findings.

Final evaluation findings for the national estuarine research reserves highlight each reserve’s accomplishments in the target areas and include recommendations, which are of two types:

**Necessary Actions** address programmatic requirements of implementing regulations of the Coastal Zone Management Act. These must be carried out by the dates specified. Failure to address necessary actions may result in a future finding of non-adherence and the invoking of interim sanctions, as specified in the Coastal Zone Management Act § 312(c).

**Recommendations** are actions that the office believes would improve the program, but which are not mandatory. The state is expected to have considered the recommendations by the time of the next evaluation or dates specified.

## Evaluation Findings

The evaluation findings highlight that the Narragansett Bay National Estuarine Reserve's research, stewardship, education, and coastal training program are highly valued and are making a positive impact in the state and local community. The reserve has been a leader nationally in sentinel site development and at the state level by showcasing renewable energy use and routinely incorporating community involvement into management approaches. The reserve provides integral services and products to the community with staff roles that are well integrated across all the key components of the reserve. All indications suggest that the community is highly supportive of the reserve. The reserve also has challenges because it is small in size, situated on an island that is only reachable by boat, and located within a small state with multiple organizations with similar missions to protect the environment.

### Program Administration

#### *Facilities and Infrastructure*

During the evaluation period, reserve facilities were upgraded and are now more functional for the reserve's mission. The reserve has worked with the state and successfully acquired National Estuarine Research Reserve System Procurement, Acquisition, and Construction (PAC) funding to complete projects that have increased the reserve's functionality. For example, the reserve repurposed one of its cottages and can now house informal groups, such as homeschoolers and Girl Scouts, for overnights in one cottage, and accommodate those who need longer-term housing, such as interns and researchers, in the other cottage. Additionally, the reserve constructed a classroom adjacent to the main building that is used for a number of activities integral to the education program. It is used to host Teachers on the Estuary workshops, homeschool classes, and other education programs. State government audiences have also expressed interest in using it for daylong retreats. The reserve also installed pole mounted solar panels next to the headquarters building on Prudence Island as well as on the building's roof. Not only is this bringing a return on investment through utility savings, but it also helps the Rhode Island Department of Environmental Management to determine whether it would be of benefit to install panels on other department buildings on the mainland. Additionally, it allows education programming to include the solar panels as a tangible example of the benefits of alternative energy sources. (See related accomplishment under "Findings for Habitat Resilience to Climate Change" below.)

The old Navy pier locally known as "T-wharf" is currently used for recreational fishing and is also the site of a System-wide Monitoring Program data logger. At the entrance to the pier is a structure called "the Ed Shed" that is used for educational programming. During the evaluation period, Procurement, Acquisition, and Construction funding was used to expand it and equip it with newly designed exhibits, a seasonal flow-through seawater system with aquariums, and a touch tank. As the pier continues into a state of disrepair, safety concerns increase. The reserve and state consider that the long-term plan for the site would be to replace the T-wharf with a smaller fixed pier structure that could be used for fishing and by smaller boats. The new

structure would potentially include a smaller set of floating piers that would more safely and effectively meet the needs of day use visitors. The Office for Coastal Management encourages the Department to pursue a safe and effective resolution that better meets the needs of the reserve and other users.

### ***Identity, Public Awareness, and Outreach***

The reserve has identified a need for improved branding and building public awareness of the reserve's programs, resources, and expertise. Public awareness has been limited by the geographic location of the reserve on an island. Additionally, the reserve is situated in a small state among many organizations that have missions that the public does not distinguish between. This concerns reserve staff because the reserve is at a stage with its program maturity and research investments where it is having significant impacts that they would like the community and region to associate with the reserve. The reserve has taken steps to address this issue, for example, Coastal Training Program events and education programs are sometimes held at the Audubon Education Center and are advertised through Audubon. To mitigate for the misperception that the Coastal Training Program is part of Audubon or a part of the department separate from the Reserve, the Coastal Training Program coordinator includes introductory information about the reserve for participants in each workshop overview.

The Office for Coastal Management applauds the reserve staff's desire to achieve greater recognition with the interest of having a broader reach of the products and services they provide. However, during the review process, it became clear that although there is confusion with name and service recognition among members of the public, they have at least some knowledge of the services the reserve provides. While community-wide recognition is desired, reserve stakeholders and partners, including researchers, town planners, educators, Prudence Island residents, regulators and high-level state officials, did relay strong name recognition and an understanding of the reserve's mission and scope of work.

Reserve staff have a solid track record of listening to the reserve's stakeholders and partners, and responding appropriately. For instance, a town planner remarked that the programming offered by the Coastal Training Program reflected a clear understanding of what was needed even before the planning community realized the need was there. In another example, island residents supported stewardship efforts like cutting back trees, controlled burns, and invasive species work largely because staff members were active in the community and were trusted to make decisions that were in the best interest of the residents and the environmental health of the island. Several stakeholders at the state level mentioned that they depend on, and are confident in, the reserve's water quality data to support their program, and noted how timely and responsive staff members were to their requests.

The reserve is to be commended for its creativity and partnering in efforts to increase reserve awareness and attract more visitors to the island. For instance, the reserve hosted an annual block party in July for several years running, partnered with the department to participate in its Great Outdoors Pursuit event, and in 2014, hosted a 5k road race. These were popular events despite the limitations posed by the ferry schedule, which include making all events daylong

and imposing a *de facto* participation cap of roughly 100 individuals. Although these events did not bring the numbers of visitors to the island the reserve had hoped, they did demonstrate staff creativity in raising awareness about and engagement with the reserve.

An additional opportunity for increasing the public's awareness of the reserve, its programs, and resources may be to identify options to establish a stronger presence on the mainland, for instance, installing an interpretive sign at the ferry landing or increasing visibility through partners like the Audubon Environmental Education Center. The reserve may consider partnering with land management groups to develop interpretive materials that highlight research from the reserve. Additionally, there may be opportunities to increase the visibility of programming done with partner organizations, for example, work with Rhode Island Audubon to host a special series on reserve programs. The Office for Coastal Management encourages the reserve to continue to creatively explore ways to raise public awareness, and foster engagement and appreciation for the important work the reserve does to benefit the community and the region.

The Office for Coastal Management also recognizes that the reserve has gone above and beyond required reporting by producing an annual report. The goal of the annual report is to communicate the value of the reserve's programs and activities to state agencies, the Rhode Island legislature, the congressional delegation, and other key state and local entities. The report provides great value for its current purpose, and there may be opportunities to further refine or mine the content and design of this publication to reach additional audiences and support branding efforts.

### ***Management Plan and Sector Integration***

All national estuarine research reserves are required by the Coastal Zone Management Act to have five-year management plans. The current Narragansett Bay Reserve Management Plan 2010-2015 is out of date. The reserve must submit its final management plan for notice in the *Federal Register* by August 31, 2018, enabling NOAA to meet its obligations under 15 C. F. R 921.33. The reserve should ensure that its updated management plan includes clear objectives for the next five years and follows the *Reserve System Management Plan Guidelines and Resources* of 2013.

The management plan guidance strongly encourages reserves to integrate across sectors to address coastal issues. The reserve is already well positioned for this with communication and collaboration between staff embedded in the reserve's culture. For instance, the Coastal Training Program worked with the Rhode Island Coastal Program on a project designed to help local municipalities plan for climate adaptation. The project used data from the reserve's sentinel site program to aid in calibration of a model used to develop marsh migration maps for local municipalities. The Coastal Training Program's consistent use of the reserve's research and monitoring data enables staff members from both programs to stay up-to-date with the programs' respective projects. Additionally, the education, research, and stewardship programs have worked together to support the Teachers on the Estuary (TOTE) program each year. Although the education staff developed the TOTE workshops, it is truly a cross-sector effort.



The research staff provides overview presentations for the workshops, and the stewardship staff leads guided tours of the reserve that highlight the invasive species issues in the island. The curriculum for the TOTE program includes hands-on experience with the marsh research and monitoring on the island, includes experience with the water quality monitoring in the bay, and is updated regularly by the research and stewardship sectors to include current observations.

Although a small staff naturally encourages increased communication and cross-sector assistance as needed, the reserve would benefit from using the management plan update to strengthen intentional cross-sector integration to address priority coastal issues. In the update, the reserve is encouraged to identify one or two high-priority coastal management issues toward which every sector would contribute their expertise. The issues should be used to focus staff effort and increase collaboration across sectors. The reserve staff members should work together to design a deliberate cross-sector approach to address the priority issues and meet regularly to discuss progress, brainstorm solutions to challenges, identify funding opportunities and discuss budgets, and identify additional opportunities to work across sectors. The reserve should also strategically consider what partnerships will need to be strengthened or developed and the level of engagement that will most effectively and efficiently achieve the reserve's priority issues.

### ***Education and Access***

On-site education is a hallmark activity for the reserve system. Visiting the reserve and working with the reserve staff members and scientists provides visitors potentially life-changing experiences. The reserve is hampered by limited, boat-only access. Getting people to come out for classes and experiences that are short in duration is not realistic. The education coordinator has therefore focused on providing educational experiences that last a day or longer. The education program has expanded to include providing full-day programming for homeschool groups, overnights for Girl Scouts, and, through a partnership with University of Rhode Island's W. Alton Jones summer camp program, multi-day experiential learning opportunities. Although the reserve's participation numbers are not as high as those of some other, more accessible reserves in the national system, the reserve is providing impactful educational programming that fits the constraints of this reserve.

### ***Findings for Program Administration***

**Accomplishment:** The Narragansett Bay National Estuarine Research Reserve made improvements to one of the cottages and constructed a classroom to create a holistic, functional campus that more fully supports education.

**Accomplishment:** The Narragansett Bay National Estuarine Research Reserve serves as a showcase site for the rest of the Rhode Island Department of Environmental Management with its use of renewable energy on site, and in employing community involvement in the development and implementation of the Prudence Island wildfire risk reduction plan.

**Necessary Action:** The Narragansett Bay National Estuarine Research Reserve must submit its

final management plan for notice in the *Federal Register* to the Office for Coastal Management by August 31, 2018.

**Recommendation:** The Office for Coastal Management encourages the reserve to continue to work creatively to enhance public awareness and appreciation of the reserve and to communicate the value of its programs to a broader audience. This could include moving forward with establishing a presence on the mainland and building on the existing annual report document.

**Recommendation:** The Office for Coastal Management strongly encourages the Narragansett Bay National Estuarine Research Reserve to use the opportunity of the management plan update to intentionally integrate reserve sector expertise and efforts to address priority issues.

### **Habitat Resilience to Climate Change**

The reserve's research is being used by coastal decision makers to better manage coastal areas in the region and beyond. Additionally, this research also enables state entities, such as the Coastal Resources Management Council to make and defend coastal management decisions. As described in the examples below, the reserve has produced groundbreaking research protocols, research and monitoring results, and community-involved management approaches that are being used by many beyond the reserve. To better promote an understanding and utility of the reserve's strengths, the Office for Coastal Management strongly encourages the Department of Environmental Management to pursue and support opportunities to better integrate the reserve's capabilities into the department's responsibilities for management of the state's coast. This can be accomplished through increased communication and coordination across the department and the Coastal Resources Management Council leadership, and between staff at different organizational levels, to better align strategic planning and implementation of shared priorities, better position the reserve to serve Rhode Island, and improve the visibility of the reserve's role in providing the scientific basis for coastal management decisions by the state.

### ***Sentinel Sites and Tidal Marsh Resilience to Sea Level Rise Indices (MARS)***

The reserve's sentinel site efforts are among the most advanced in the reserve system. Several stakeholders noted that the leading-edge work the reserve has done has shifted the conversation about sentinel sites and salt marshes from use as reference sites for gauging condition to mechanisms for understanding change and vulnerability. The reserve has taken a leadership role in marsh monitoring by undertaking a system-wide data synthesis and analysis of existing sentinel site data to develop a tool for assessing marsh resilience relative to sea-level rise. This tool combines multiple factors that contribute to marsh resilience to sea level rise and allows comparisons to be made locally, within regions, and across the country. This tool was used to conduct a nationwide assessment of marsh resilience and it found that, overall, marshes are adequately resilient. However, the assessment also revealed that the least resilient marshes are in Southern New England, which includes Rhode Island. The indices give coastal managers a new approach for considering adaptation strategies to best manage marshes in the context of sea level rise. Additionally, a paper on the work was submitted for publication in

June 2016 and accepted in October 2016 in the journal *Biological Conservation*; the reserve's research coordinator is first author on the publication.

### ***Salt Marsh Mapping***

Working in partnership with NOAA Office for Coastal Management and the State of Rhode Island, the reserve is producing high resolution saltmarsh maps that depict high, low, and transition marsh across the state. This statewide baseline information about salt marsh vegetation community types will help coastal decision makers determine long-term restoration priorities and inform coastal resilience planning since it has potential to be used to gauge change over time when compared to past and future data. Rhode Island Sea Grant and the Coastal Resources Management Council used a Sea Level Affecting Marshes Model (SLAMM) to develop state-wide marsh migration maps. The reserve's salt marsh monitoring work highlights the trends the maps depict serving as a valuable complement to the them. In Rhode Island, through the combined outreach efforts of the Coastal Training Program and partners like Save the Bay, The Nature Conservancy, and Sea Grant, 21 coastal counties have started using the marsh migration maps to guide their resilience and adaptation efforts.

During the site visit, multiple stakeholders noted that the collaborative culture of the reserve, while having always been a part of the character of the reserve to some degree, has expanded considerably over the last few years. The facilitation services offered to partners as a part of the outreach mentioned in the above paragraph was considered critical for engaging counties and assisting them with using the salt marsh maps to inform planning. Reserve staff members managed and contributed to the collaboration of scientists, restoration practitioners, and resource managers to bring the most current salt marsh science to a broader community and resulted in the development of the statewide saltmarsh strategy.

### ***Climate Change Vulnerability Assessment Tool for Coastal Habitats***

Agencies like the Department of the Interior and the U.S. Forest Service have vulnerability assessment tools designed for upland habitat; however, up until recently, there was no vulnerability assessment tool focused on coastal habitat. The reserve used Science Collaborative Transfer Grant funding to lead the New England region in the development of a new tool, the Climate Change Vulnerability Assessment Tool for Coastal Habitats (CCVATCH), to help land managers, decision makers, and researchers develop conservation, management, and restoration plans for coastal habitats. This assessment tool assists users with prioritizing coastal habitat management actions by identifying which habitats are likely to be most affected by expected changes in climate and primary sources of habitat vulnerability. As part of this project, four estuarine reserves in New England will conduct assessments of their areas, demonstrating the utility of the tool to support adaptive management in response to climate change.

### ***Crab Monitoring***

The reserve has also been a regional leader for research on invasive green crab impacts on salt marsh habitat. Staff members responded to growing concern about crab population increases and the potential negative impacts of crab burrowing activity on salt marsh habitat by looking

at density and distribution of crabs, burrows, and other factors across nine marshes in Rhode Island. Although results are forthcoming, the preliminary findings show that green crab population increases are due to vegetation changes and weakened soils, both related to sea level rise. The new green crab rapid assessment monitoring protocol created by reserve staff members, in collaboration with other federal and state personnel, provides the region with a way to quantify the impact of green crab feeding behavior on salt marsh vegetation. The reserve, along with project partners, is already looking at potential actions to minimize the negative impact of the green crabs on marsh systems.

### ***Habitat Management: Community Wildfire Protection and Volunteer Stewards***

The reserve is a valued training ground for prescribed burning. Being able to do this safely, consistently, and successfully on Prudence Island meets management needs and can serve as a model for prescribed fire implementation across the state. However, the reserve staff capacity alone is not sufficient to manage the prescribed burn activity on the island. In the past, the reserve partnered with Rhode Island Bureau of Natural Resource's Division of Fish and Wildlife and its Forest Environment Program for expertise, equipment, operator support, and fire crew assistance; however, the division has had significant reductions in staff that made it difficult to meet the reserve's needs for assistance with habitat management. This reduction in staffing in agencies statewide has highlighted the need for greater collaboration. As such, there has been a renewed collaboration with the division that has resulted in a multi-partner grant award to create the community wildfire protection plan for the local community on Prudence Island that will include some additional allowances for habitat management and prescribed fire across the island. This community wildfire protection plan will be the first of its kind in Rhode Island and depends heavily on the expertise of and support by the reserve staff for success.

This creative approach to meet the island's forest management needs that has been employed by the reserve staff blends the renewed collaboration with the division and the engagement of island residents through the formalization of the reserve's long-standing Woodcutting Stewards Program for trail maintenance and restoration activities, including invasive species removal, management of rare habitats, and re-establishment of native forest. The 2010 technical report on the woodcutting program included three years of the evaluation period from 2008 to 2010. In that three-year period, program volunteers removed 400 trees, averaging 135 trees annually, and contributed a total of 1,200 hours of their time, averaging 400 hours annually. Community involvement is critical for implementation of the stewards program and benefits the reserve by providing additional labor, providing significant volunteer match for federal funds, and expanding the reserve's education outreach potential. The program volunteers have a source for winter fuelwood.

It was also noted during the site visit that the stewardship coordinator, as a contract employee, due to insurance limitations is not permitted to operate state equipment. This restriction creates significant logistical challenges in meeting the fire and habitat management needs of the island. While the reserve has made efforts to address the need by prioritizing work schedules of reserve-employed state employees responsible for heavy equipment, assistance from additional state heavy equipment personnel is necessary. The Office for Coastal

Management commends the reserve for the work on habitat management including implementation of the community wildfire protection plan, and encourages the department to provide the additional support necessary.

### ***Findings for Habitat Resilience to Climate Change***

**Accomplishment:** The reserve has been a leader in the National Estuarine Research Reserve System for sentinel site investment and protocol development. Many of the protocols that were developed and piloted at this reserve were adopted for the national network of sentinel sites. Additionally, the reserve initiated an analysis and synthesis of system-wide sentinel site data to make the data accessible and usable for coastal decision makers.

**Accomplishment:** The Narragansett Bay National Estuarine Research Reserve and its partners effectively advanced statewide comprehensive assessment of marshes. The reserve contributed research techniques and findings that, through collaborative work with state partners, leveraged a federal funding opportunity and resulted in state policy change.

**Accomplishment:** The Narragansett Bay National Estuarine Research Reserve is serving as a showcase site for the rest of the Rhode Island Department of Environmental Management for the use of renewable energy on site and in employing community involvement in the development and implementation of the wildfire risk reduction plan employed on Prudence Island.

**Recommendation:** The Office for Coastal Management strongly encourages the Department of Environmental Management to work more closely with the Reserve and the Coastal Resources Management Council to advance their shared priorities in the state and elevate the visibility of the Reserve and its contributions to science and policy in Rhode Island.

## **Coastal Development**

During the evaluation period, the Coastal Training Program has cultivated a dedicated following and reputation for listening to constituent needs and delivering relevant trainings. The program has continued to refine its niche as a primary provider to rural, inland municipalities. Although stakeholders have multiple options for obtaining information and training on content areas specific to planning, they recognize the reserve's programs as the only good source they have to address their gap in process and communication skills. Stakeholders from planning offices reported that these trainings have been critical to increasing their effectiveness internally with their offices as well as to increasing support from their public. An example is the role the reserve played in helping Rhode Island municipalities use the *Conservation Development Guidance Manual*. A decade ago, a need for conservation development to preserve open space was recognized, yet efforts to bring community members on board were unsuccessful because the original subject matter expert lacked the capability necessary to address community members' concerns and foster change. The topic was not prioritized for ten years until the reserve became involved and expanded the project to a larger audience by providing training in

all eligible municipalities (28 of 39 in the state) on how to use the guide and offered technical assistance with implementing the process. As a result, the approach has been successfully accepted, with 17 Rhode Island towns having adopted the ordinances and 8 having draft ordinances awaiting approval. The reserve is respected as a reliable, professional source of relevant, top-notch training, information, and technical assistance.

### ***Coastal Training Program Advisory Council***

In the last evaluation findings, it was recommended that the reserve reexamine the role of the Coastal Training Program Advisory Committee and consider how it could best contribute to the success of the Coastal Training Program. During the site visit for this evaluation, there was a desire expressed for additional ideas about how to continue to improve the arrangement of the Coastal Training Program Advisory Committee to better serve the program coordinator and the program. Rhode Island may consider a model similar to that of the New Hampshire Coastal Adaptation Workgroup Outreach Committee. This committee brings together the roughly ten training, outreach, and extension organizations that serve the communities within New Hampshire's coastal watershed. This coordinated network is able to strategically discuss needs, opportunities, and partnerships for coastal training and outreach. This is not a formal advisory group; however, they have committed to goals of leveraging resources, not overwhelming communities in the coastal watershed, consistent messaging on coastal topics, and working together to accomplish individual program goals.

Another example that may be valuable to the Coastal Training Program is the structure of the advisory council at Waquoit Bay National Estuarine Research Reserve. Much like the Narragansett Bay Reserve, the Waquoit Bay Reserve is one of many similar organizations in its region. The work of the Waquoit Bay's advisory council is arranged around issues and priorities that are within the mission of the reserve and have been identified as both target audience priorities and gaps that need to be addressed in the region. For instance, even though stormwater management is a priority issue among the reserve's target audiences, it is addressed by other organizations. However, through a gap analysis, it was discovered that wastewater within stormwater management was not being sufficiently covered by other organizations. This became one of the reserve's focus areas and minimizes duplication with other organizations.

The Waquoit Bay Reserve's Coastal Training Program advisory council is composed of 12 members who represent the reserve's target audiences, researchers whose areas of study align with Waquoit Bay Reserve's priority issues, Sea Grant staff members, Massachusetts Coastal Zone Management Program personnel, planning commission members, and staff members from municipalities and nonprofit organizations. Initially, they met three times during the Coastal Training Program coordinator's first year to assist with development of a five-year strategy for the program; now they meet as a group annually. In between meetings, members of the advisory council are engaged either individually or in subgroups as their expertise or advice is needed. This combination of an annual in-person meeting and contact with smaller groups or individuals throughout the year allows for both synergistic interaction and efficiency. The tenure on the advisory council is limited to a three-year term, permitting the coordinator to

shift council composition periodically to better align expertise with reserve priorities and to prevent members from feeling locked into lifetime membership.

The Office for Coastal Management encourages the Narragansett Bay Reserve to continue to explore opportunities for maximizing training resources across the region and consider whether modifications to its Coastal Training Program advisory council could benefit the Coastal Training Program.

### ***Water Quality and System-wide Monitoring Program***

The reserve is a partner in the Narragansett Bay Water Quality Monitoring Network and, since 1999, has been collecting data used by the department as part of the state's broader monitoring requirements. The surface- and bottom-level water quality data collected by the reserve at T-wharf is included in the department's annual integrated report that lists impaired waters and surface water quality assessments. One example of the data collected by the reserve is the Secchi disk measurements, which are relevant to current discussions of improvements in bay-wide water clarity and have contributed to a finding of a 50 percent reduction in nutrient loading over the last 10 years. During the site visit, it was noted by stakeholders that to them the reserve also serves as an unofficial extension of the department's Office of Water, and that the collaboration between the Office of Water and the reserve is institutionalized to the degree that it is considered the standard approach. The culture of collaboration extends throughout the network. For example, the reserve's water quality data are also used by the Narragansett Bay Estuary Program to inform its *State of Our Watershed* report.

### ***Acquisition***

During the evaluation period, the strategic use of funds from the department, The Nature Conservancy, the Town of Portsmouth, Prudence Island Conservancy, and NOAA led to the reserve's acquisition of two significant, undeveloped parcels on the island. The most recent land acquisition of 93 acres, finalized in December 2015, brought the total area of protected land on Prudence Island to 85 percent. This was done through cooperation and partnership among several organizations and individuals who recognize the value of ensuring the permanent protection of important ecological, historical, recreational, and cultural resources on the property.

The opportunity for habitat protection through acquisition does not necessarily come with an influx of resources to oversee the stewardship of the newly acquired parcel or parcels. With this in mind, the reserve is encouraged to take into account current and future resources available for habitat management as they finalize the stewardship plans for these parcels. These stewardship plans should be referenced in the updated management plan.

### ***Findings for Coastal Development***

**Accomplishment:** The Narragansett Bay National Estuarine Research Reserve has consistently fostered a relationship with the Prudence Island community and partners to preserve open

space. During the evaluation period, the reserve acquired two of the last three major, undeveloped parcels on Prudence Island and incorporated them into the reserve, bringing the total protected land on Prudence Island to 85%.

**Recommendation:** The Office for Coastal Management applauds the reserve's success in acquiring two of the last three major, undeveloped parcels on Prudence Island and encourages the reserve to ensure the wise management of these new parcels by taking into account current and future resources available for habitat management as they finalize stewardship plans for these parcels. The stewardship plans should be referenced in the updated management plan.

## Evaluation Metrics

Beginning in 2012, national estuarine research reserves began tracking their success in addressing three evaluation metrics specific to their programs. The evaluation metrics include a five-year target and provide a quantitative reference for each program about how well it is meeting the goals and objectives it has identified as important to the program.

The goals and objectives are from the Narragansett Bay National Estuarine Research Reserve 2010-2015 Management Plan.

### METRIC 1

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

**Objective:** Increase the use of high quality NBNERR and National Estuarine Research Reserve System (NERRS) estuary, water quality data, and climate change education products by formal (and informal educators) in the Narragansett Bay watershed.

**Strategy:** Provide formal educators with professional development opportunities that include both technical training and background in technology-driven educational tools that enhance NBNERR and NERRS education programs such as Google Earth and the new System-Wide Monitoring Program (SWMP) interface as well as hands-on field opportunities. These trainings will follow the Teachers on the Estuary (TOTE) model that has been used with great success at NBNERR over the last few years. These multi-day workshops utilize the reserve's habitats and current research as a base for introducing teachers to coastal issues and real-world science that they can then incorporate into their classroom studies. While the reserve has worked hard to reduce costs, these trainings still depend on adequate funding. Reduced operations funding over the next few years could limit the number of trainings possible as well as the total number of contact hours for each educator. More information can be found in the Narragansett Bay Management Plan 2010-2015, pages 42-43.



**Performance Measure:** Number of professional development contact hours for formal educators.

**Target:** By 2017, 700 professional development contact hours for formal educators.

First Year Results	Second Year Results	Third Year Results	Fourth Year Results
No data submitted	112 contact hours	188 contact hours	243 contact hours

**Discussion:** The reserve conducts technical training and provides background in technology-driven educational tools that introduce teachers to coastal issues and real world science that they can then incorporate into their classroom studies. The target for the evaluation period was to provide 700 professional development contact hours for formal educators; the total contact hours reported is 543, or 75 percent of the goal.

## METRIC 2

**Goal:** Increase the use of reserve science and sites to address priority coastal management issues within Narragansett Bay and its watershed.

**Objective:** Contribute to status and trends assessments and forecasting of environmental quality by tracking short-term variability and long-term changes in abiotic and biological parameters at the reserve and within Narragansett Bay.

**Strategy:** The reserve will work with partners to continue developing and expanding the number of key parameters and sites that are monitored annually in submerged aquatic vegetation and salt marsh habitats to better understand complex ecosystem changes over time to better quantify short- and long-term changes in biological and physical conditions in Narragansett Bay. The metric is defined not only by the number of ecological parameters measured, but also by the number of locations those measurements are taken at. For example, one ecological parameter will be salt marsh vegetation composition, another soil-bearing capacity, and another could be nekton composition. The metric will be the sum of those ecological parameters, multiplied by the number of discrete measurement locations in salt marsh or submerged aquatic vegetation beds. This is important because it includes a spatial component to variation in data. Additional ecological parameters will be included if they can provide significant data to help understand the variation in these complex ecosystems. Thus, the addition of a new ecological parameter measured at 10 locations would increase the metric by 10.

This expansion will be accomplished in part with new funding that the reserve secured with Save the Bay from the Rhode Island Habitat Trust Fund. In addition, existing staff time will be refocused to accomplish this task.

More information can be found in the Narragansett Bay Management Plan 2010-2015, pages 30-34.

**Performance Measure:** Sum of each ecological parameter multiplied by the number of new sites at which the ecological parameter is measured.

**Target:** By 2017, 52 is the sum of each ecological parameter multiplied by the number of new sites at which the ecological parameter is measured.

First Year Results	Second Year Results	Third Year Results	Fourth Year Results
No data submitted	33	33	44

**Discussion:** The total for the evaluation period of the sum of each ecological parameter multiplied by the number of new sites at which the ecological parameter is measured exceeds the goal by 58. This is indicative of the leadership the reserve provides in collection, synthesis, and evaluation of status and trends data so that coastal stakeholders can make science-grounded decisions.

### METRIC 3

**Goal:** Increase the use of reserve science and sites to address priority coastal management issues within Narragansett Bay and its watershed.

**Objective:** Continue to provide coastal resource managers, the scientific community, and general education practitioners with appropriate scientific and technical information to foster informed decision-making.

**Strategy:** The reserve will continue to create and distribute new technical communication products to a wide range of stakeholders. Technical communication products are technical reports, fact sheets, and peer review manuscripts that include significant reserve staff contributions. The technical communication products may be generated by any sector. The reserve makes technical communication products available through online downloads from the reserve's website, direct email distribution, and limited print publication. More information can be found in the Narragansett Bay Management Plan 2010-2015, pages 30-34. The reserve currently has 28 technical communication products that are available to stakeholders and will make an additional 22 available by 2017.

**Performance Measure:** Number of new technical communication products made available to stakeholders.

**Target:** By 2017, 22 new technical communication products made available to stakeholders.

<b>First Year Results</b>	<b>Second Year Results</b>	<b>Third Year Results</b>	<b>Fourth Year Results</b>
No data submitted	36 products	6 products	7 products

**Discussion:** The total number exceeds the goal by 27 products.

## Conclusion

For the reasons stated herein, I find that the Rhode Island Department of Environmental Management is adhering to the programmatic requirements of the Coastal Zone Management Act and its implementing regulations in the operation of its approved Narragansett Bay National Estuarine Research Reserve.

These evaluation findings contain one necessary action to be completed by August 31, 2018, and four recommendations that must be considered before the next regularly scheduled program evaluation. Program recommendations that must be repeated in subsequent evaluations may be elevated to necessary actions.

This is a programmatic evaluation of the Narragansett Bay National Estuarine Research Reserve that may have implications regarding the state's financial assistance awards. However, it does not make any judgment about or replace any financial audits.

signed Dr. Jeffrey Payne  
Jeffrey L. Payne, Ph.D.  
Director, Office for Coastal Management

July 10, 2017  
Date

## **Appendix A: NOAA Office for Coastal Management's Response to Written Comments**

The NOAA Office for Coastal Management received no written comments regarding the Narragansett Bay National Estuarine Research Reserve.