

# Final Evaluation Findings

North Inlet-Winyah Bay  
National Estuarine Research Reserve

October 2010 to August 2019

Published November 2019



Office for Coastal Management  
National Ocean Service  
National Oceanic and Atmospheric Administration  
United States Department of Commerce

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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 North Inlet-Winyah Bay National Estuarine Research Reserve by the University of South Carolina Belle W. Baruch Institute for Marine and Coastal Sciences, the designated lead agency, for the period from October 2010 to August 2019. The evaluation focused on three target areas: program administration, fostering visibility of the reserve and community engagement, and improving coastal resilience.

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:

### Program Administration

**Accomplishment:** The North Inlet-Winyah Bay Research Reserve has had great success with securing National Estuarine Research Reserve System Science Collaborative grants, as well as external funding for numerous research and monitoring projects.

**Recommendation:** The Office for Coastal Management encourages the University of South Carolina to continue to seek ways to streamline the hiring process to minimize missed opportunities and negative impacts to the North Inlet-Winyah Bay Research Reserve's programs.

**Recommendation:** The Office for Coastal Management encourages the North Inlet-Winyah Bay Research Reserve and the University of South Carolina's Baruch Institute to continue to work in the near term with the foundation to find a solution that both allows easier access to the Hobcaw Barony property for those working on behalf of the reserve and addresses the foundation's concerns regarding resource protection and liability. For the longer term, the reserve is encouraged to explore the possibility of working with a partner organization to incorporate new land into the reserve boundary to enhance access.

**Recommendation:** The Office for Coastal Management strongly encourages the university and the reserve to explore options that minimize barriers to access and participation of families with children in reserve programming. This could include creating a transportation agreement with the Baruch Foundation, since nonprofit organizations are not required to comply with the same state safety regulations. Alternatively, the university and the reserve should consider purchasing a school bus that is compliant with state safety regulations for conveying families onto the reserve for public programming.

**Recommendation:** The NOAA Office for Coastal Management encourages the North Inlet-Winyah Bay Research Reserve to pursue the re-establishment of the advisory committee and use the group to support and further reserve goals and objectives. The reserve could benefit from using the committee to provide meaningful advice and feedback about reserve issues to aid with decision-making regarding the reserve's goals, priorities, initiatives, staffing, outreach, and visibility, not just feedback and review.

**Recommendation:** The Office for Coastal Management strongly encourages North Inlet-Winyah Bay Research Reserve to continue to work with the Baruch Foundation to identify opportunities for

collaboration and mutual benefit to enhance both programs. Some additional ideas for partnering include co-hosting special events, expanding visiting scientist programs, volunteer program recruitment and coordination, school group program coordination, and possible research program development for invasive species control.

**Recommendation:** As recommended in the previous evaluation findings, dated May 2011, the Office for Coastal Management continues to encourage the University of South Carolina's Baruch Institute for Marine and Coastal Sciences to revive the semiannual meetings attended by the leadership of the university's Baruch Institute and its field lab, Clemson's Baruch Institute of Coastal Ecology and Forest Science, the Baruch Foundation, and the reserve to increase synergies between them.

**Necessary Action:** The North Inlet-Winyah Bay Research Reserve must submit a full draft five-year management plan to NOAA by June 30, 2020.

### **Fostering Visibility of the Reserve and Community Engagement**

**Accomplishment:** The Winyah Master Naturalist course offered by the North Inlet- Winyah Bay Research Reserve has provided a great conduit for the reserve to reach new residents who may not be familiar with coastal ecosystems. It has also proved to be invaluable in producing a cadre of interested people to participate in citizen science projects, and potentially to serve as future reserve volunteers. Key leaders in the formation of the new reserve friends group (Inlet and Bay Stewards) also are graduates of the program. In addition, the program has the potential to benefit other reserve programs, such as the coastal training program, by virtue of the fact that several graduates moved into decision-making positions in the community and are equipped with understanding of and knowledge about the value of estuarine and coastal habitats for safety, quality of life, and the economy.

**Recommendation:** The North Inlet-Winyah Bay Research Reserve is encouraged to explore the use of different technologies to create new platforms to engage with young people, for example, virtual field trips for students who can't get out to the reserve for field trips. The reserve should also continue to focus on expanding education programming for students and training programs for educators to include students and educators engaged with subjects other than science, such as language arts or art, to build on its successful transition from the more standard STEM-focused curriculum to STEAM by incorporating art.

**Recommendation:** The North Inlet-Winyah Bay Research Reserve would benefit significantly from strengthening its profile with the University of South Carolina and, externally, with the broader coastal management community in the northern South Carolina coast, as well as with residents and visitors to the area. The NOAA Office for Coastal Management strongly encourages:

- The University of South Carolina to work with the Baruch Foundation and the reserve to continue to increase awareness among residents and visitors to the area of the reserve's presence and ongoing funding and support of the Discovery Center.
- The North Inlet-Winyah Bay Research Reserve to explore opportunities for furthering its relationship with the University of South Carolina's communications staff to augment the reserve's external outreach efforts and visibility within the university.
- The North Inlet-Winyah Bay Research Reserve to leverage the opportunity provided by the presence of new leadership within the university and the reserve to do additional inreach with the university to increase main campus recognition of the reserve's accomplishments and programs.

- The North Inlet-Winyah Bay Research Reserve to include in its draft management plan a communication and outreach plan to further the reserve's priority issues and increase community and partner awareness of the reserve's mission, accomplishments, and education, training, and recreational opportunities. The communication plan should identify target audiences, key messages, desired outcomes, and strategic communication opportunities, such as those suggested above, with a focus on short-term priorities in the next three to five years.

### **Improving Coastal Resilience**

**Accomplishment:** The North Inlet-Winyah Bay Research Reserve expanded monitoring into Winyah Bay and its value and use to researchers at the University of South Carolina, Clemson University, Coastal Carolina University, local and state regulatory agencies, and federal partners such as the National Weather Service's Southeast River Forecast Center, filling a critical data gap for downstream conditions within the greater Winyah Bay system.

**Accomplishment:** The North Inlet-Winyah Bay Research Reserve collaborated on the Stormwater Pond Conference in 2012, and subsequent partnering efforts led to securing a National Estuarine Research Reserve System Science Collaborative grant to develop a low-impact development manual that considers the environmental conditions of the South Carolina coast. This guide has become a valuable resource for coastal managers and design and development professionals in South Carolina, and a model for other reserves in the system.

**Accomplishment:** The North Inlet-Winyah Bay Research Reserve partnered with Coastal Carolina University and Georgetown County in the establishment of Georgetown RISE (resilience, innovation, sustainability, and education), which has provided a platform to engage elected officials, community members, educators, businesses, and youth within the county to promote science-based research and decision-making that benefits the community.

**Accomplishment:** The North Inlet-Winyah Bay Research Reserve staff recognized that there were no tools available for assessing the vulnerability of estuarine habitats. They collaborated to create CCVATCH (Climate Change Vulnerability Assessment Tool for Coastal Habitats) to fill that gap and to facilitate informed decision-making on marsh management. The National Estuarine Research Reserve System has plans to pilot it as a national tool.

**Recommendation:** The North Inlet-Winyah Bay Research Reserve is encouraged to revisit and update the information about reserve stakeholders that guides education and coastal training programming decisions to better translate relevant research results to primary audiences to enhance community and ecological resilience. The NOAA Office for Coastal Management strongly encourages the North Inlet-Winyah Bay Research Reserve to:

- Conduct a new market analysis and needs assessment for the education program to identify potential new programs, improved ways to reach current and new education program stakeholders, and the frequency of outreach efforts appropriate for those stakeholders.
- Consider conducting a new needs assessment of coastal training program audiences.

This evaluation concludes that the University of South Carolina Belle W. Baruch Institute for Marine and Coastal Sciences is adhering to the programmatic requirements of the National Estuarine Research Reserve System in the operation of the North Inlet-Winyah Bay National Estuarine Research Reserve.

## Program Review Procedures

The NOAA Office for Coastal Management evaluated the North Inlet-Winyah Bay National Estuarine Research Reserve in fiscal year 2019. The evaluation team consisted of Pam Kylstra, evaluation team lead, Stephanie Robinson, regional specialist, and Becky Allee, fisheries biologist, all with the NOAA Office for Coastal Management; and Jace Tunnell, manager, Mission-Aransas National Estuarine Research Reserve. The support of the reserve staff was crucial in conducting the evaluation, and this support is most gratefully acknowledged.

NOAA sent a notification of the scheduled evaluation to the director of the University of South Carolina Belle W. Baruch Institute for Marine and Coastal Sciences and published a notice of “Intent to Evaluate” in the *Federal Register* on June 27, 2019. NOAA also notified members of South Carolina’s congressional delegation. On June 13, 2019, the reserve posted a notice in the *Coastal Observer* about the public meeting and the opportunity to comment.

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
- Fostering Visibility within the Community and Engagement
- Improving Coastal Resilience

A site visit was also conducted, and the evaluation team held meetings with staff members and group discussions with stakeholders, partners, and program staff members about the target areas. In addition, a public meeting was held on Tuesday, August 6, 2019, at 5:30 p.m. at the Kimbel Lodge on Hobcaw Barony, 22 Hobcaw Road, Georgetown, SC, 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 comments via email or U.S. mail through Friday, August 16, 2019. A summary of the comments received, and the NOAA Office for Coastal Management’s responses, are included in Appendix A. The Office for Coastal Management then developed draft evaluation findings, which were provided to the University of South Carolina Belle W. Baruch Institute for Marine and Coastal Sciences and to 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 University of South Carolina Belle W. Baruch Institute for Marine and Coastal Sciences continues to successfully implement the federally approved North Inlet-Winyah Bay National Estuarine Research Reserve.

### Program Administration

North Inlet-Winyah Bay National Estuarine Research Reserve staff members are respected in the region and community as experts. The evaluation team heard from stakeholders and partners during the site visit meetings, in written comments, and in the responses to the survey that staff members are recognized as being highly dedicated, knowledgeable, and an important part of the community, providing critical information and expertise for decision-making that benefits their community, region, and the national system. Reserve staff members routinely contribute time and expertise to the national reserve system.

### *Staffing Changes*

Recently, new leadership was established within the University of South Carolina School of the Earth, Ocean, and Environment, the Belle W. Baruch Institute for Marine and Coastal Sciences, the Baruch Marine Field Laboratory, and the reserve. University and institute leadership, as well as the reserve manager and staff members, and Hobcaw Barony partners are all to be applauded for recognizing the opportunities this presents for developing new approaches in working together. The reserve is also encouraged to continue to leverage these opportunities to increase main campus recognition of the reserve's accomplishments and programs.

Within the National Estuarine Research Reserve System, the North Inlet-Winyah Bay Research Reserve has among the fewest number of staff members to execute the mission even when they're fully staffed. Coupled with staff size, the turnover creates concerns about the reserve's capacity to ensure the continuity of core programs, and the impact of staff retention as current staff members cover additional work created for them by turnover. Although the staff is well known for its dedication and expertise, the fact that it is so small may lead to missed opportunities for program delivery, expansion, and partnerships. The university is encouraged to continue to seek ways to streamline the hiring process to minimize these missed opportunities and negative impacts to programs.

### *Partnerships on Hobcaw Barony*

The property the reserve occupies is owned by the Belle W. Baruch Foundation that was established for the "purposes of teaching and/or research in forestry, marine biology, and the care and propagation of wildlife, flora and fauna in connection with colleges and/or universities in the state of South Carolina." The foundation achieves its mission through agreements with the reserve's lead organization, University of South Carolina's Baruch Institute for Marine and Coastal Sciences, as well as other institutions of higher learning in the state. The foundation relies on its university partners to conduct research.

The reserve and foundation are successfully collaborating on education programs, with both organizations recognizing the mutual benefits of being able to work together to host larger school groups. This collaboration is important to the success of their complementary education programs, because it expands the capacity of each organization's staff and facilities. The reserve is encouraged to

continue building relationships with the Baruch Foundation so that both programs can leverage staff, volunteers, and resources to reach multiple audiences. Additional ideas for collaboration include co-hosting special events such as Earth Day, expanding visiting scientist programs, volunteer program recruitment and coordination, school group program coordination, and possible research program development for invasive species control.

The evaluation team also observed that better communication and coordination among all of the entities that occupy the Hobcaw Barony property, including the foundation and other institutes, would benefit all concerned, since they have many common interests and concerns and are engaged in many similar activities. Additionally, in the findings for the last evaluation period, it was noted that in the past, directors and managers of those organizations had semi-annual meetings to better coordinate, prioritize, and collaborate, and that those meetings no longer occurred. Especially with new directors of the institute, field lab, and reserve, the recommendation from that evaluation period is reemphasized in this one: the University of South Carolina's Baruch Institute is encouraged to pursue reviving the semi-annual meetings.

### ***Access to the Hobcaw Barony Property***

The evaluation team heard frustration from a number of stakeholders about the challenges in accessing the reserve to carry out activities in support of the reserve's mission, including volunteer research and monitoring programs. To gain easier access to the marsh and to alternative boat launch areas, a possible long-term goal of the reserve might be to incorporate new land into the reserve boundary. This can be accomplished through a partner organization that is near the current reserve boundary or in the same watershed. The land might include area currently owned by city and county parks, private landowners, partner organizations, or federal or state agencies. The partner could benefit from facility improvements, while the reserve would benefit from enhanced ease of access. In the near term, the reserve is encouraged to continue to work with the foundation to find a solution that both allows easier access to those working on behalf of the reserve and addresses the foundation's concerns regarding resource protection and liability.

The reserve is interested in getting a better understanding about the existing level and types of public use of reserve waters and access points from the water. This can be a challenge to assess. To aid in this effort, the reserve could review existing boater surveys available with methodologies for getting at public use of the waters. One example is the [New York State Citizens Statewide Lake Assessment Program Boater Survey](#), which looks at non-motorized and motorized boat use within a specific area. This might be an option to perform several surveys throughout the year to get a better handle on public use of reserve waters. A GIS mapping exercise could help determine all accessible points of entry into the reserve waters by land. Another option is to poll other reserves around the country to see if they have conducted similar surveys within their reserve boundaries.

As a part of a state entity, the reserve is required to use vehicles that comply with state safety regulations when transporting people under the age of 18. While adults may be transported to programming locations within the Hobcaw Barony property in the reserve's 15-passenger van, the van does not satisfy the state safety regulations for conveying minors. This requirement, coupled with the concern many parents have with driving their personal cars on the property's dirt roads, limits the access to and, ultimately, the participation of families in reserve public education programming. The university and the reserve are strongly encouraged to explore options that minimize barriers to access and participation of families with children in reserve programming. This may include creating a



transportation agreement with the Baruch Foundation, since nonprofit organizations are not required to comply with the same state safety regulations. Alternatively, the university and the reserve should consider purchasing a school bus that is compliant with state safety regulations for conveying families onto the reserve for public programming.

### ***Advisory Group***

The reserve's advisory committee met roughly once or twice a year, with the most recent meetings occurring in November of 2016 and June of 2014. The reserve has plans in 2019 to reconstitute a committee and re-establish regular meetings. During the site visit, there was discussion about the role that the advisory committee had historically served. The group was analogous to a rubber stamp for decisions already made by the reserve staff and received report-outs from staff members about reserve activities. An advisory committee can likely better serve the reserve by being asked to provide meaningful advice and feedback about reserve issues that aids with decision-making about the reserve's goals, priorities, initiatives, staffing, and outreach. Additionally, since one of the key concerns expressed in the responses to the stakeholder survey, and from stakeholders and partners during the site visit, was the lack of visibility of the reserve, an advisory committee could also help communicate the value of the reserve to the University of South Carolina and external audiences in the region.

In addition to considerations about the role of an advisory committee, the composition is important to the reserve as well. Clearly, representation of the foundation would be critical as well as that of key partners and stakeholders.

An advisory group may serve to be especially helpful as the reserve completes the update of the management plan. The reserve could choose to use the advisory group and relevant partners to help define the reserve's niche in addressing emerging local and regional issues.

It is also recognized that re-establishing and fostering an effective advisory group takes work. In the evaluation of a different reserve in the Southeast, a partner organization noted that it devotes 25 percent of a full-time equivalent to the coordination and maintenance of its advisory board. The North Inlet-Winyah Bay Research Reserve does not have 25 percent of anyone's time to dedicate to this task. If the reserve determines that the advisory group is a priority, perhaps that could be a role provided by the emerging friends group, Inlet and Bay Stewards. More discussion of the Inlet and Bay Stewards will follow in the next section: "Fostering Visibility of the Reserve and Community Engagement."

### ***Funding***

The reserve successfully completed two procurement, acquisition, and construction awards from NOAA's Office for Coastal Management to construct an outdoor classroom, enhance and update Kimbel Lodge facilities, and repair boardwalk infrastructure that is necessary for accessing the reserve's sentinel site.

The 30 percent match requirement for the NOAA Operations Award to the reserve is covered by the University of South Carolina by waiving the university's indirect cost for the Operations Award, which covers the costs of utilities and operating and maintaining facilities. The waived indirect cost also covers university administrative services, including human resources, grants management, and purchasing, constituting a significant source of support for the reserve. The reserve does not have cash match to use to support reserve activities, which impacts its ability to hire additional staff members and conduct additional activities.

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

**Accomplishment:** The North Inlet-Winyah Bay Research Reserve has had great success with securing National Estuarine Research Reserve System Science Collaborative grants, as well as external funding for numerous research and monitoring projects.

**Recommendation:** The Office for Coastal Management encourages the University of South Carolina to continue to seek ways to streamline the hiring process to minimize missed opportunities and negative impacts to the North Inlet-Winyah Bay Research Reserve's programs.

**Recommendation:** The Office for Coastal Management encourages the North Inlet-Winyah Bay Research Reserve and the University of South Carolina's Baruch Institute to continue to work in the near term with the foundation to find a solution that both allows easier access to the Hobcaw Barony property for those working on behalf of the reserve and addresses the foundation's concerns regarding resource protection and liability. For the longer term, the reserve is encouraged to explore the possibility of working with a partner organization to incorporate new land into the reserve boundary to enhance access.

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**Recommendation:** The Office for Coastal Management strongly encourages North Inlet-Winyah Bay Research Reserve to continue to work with the Baruch Foundation to identify opportunities for collaboration and mutual benefit to enhance both programs. Some additional ideas for partnering include co-hosting special events, expanding visiting scientist programs, volunteer program recruitment and coordination, school group program coordination, and possible research program development for invasive species control.

**Recommendation:** As recommended in the previous evaluation findings, dated May 2011, the Office for Coastal Management continues to encourage the University of South Carolina's Baruch Institute for Marine and Coastal Sciences to revive the semiannual meetings among the leadership of the university's Baruch Institute and its field lab, Clemson's Baruch Institute of Coastal Ecology and Forest Science, the Baruch Foundation, and the reserve to increase synergies between them.

**Necessary Action:** The North Inlet-Winyah Bay Research Reserve must submit a complete draft management plan to NOAA for review by June 30, 2020.

## **Fostering Visibility of the Reserve and Community Engagement**

Many of the comments made by stakeholders in the stakeholder survey and during the site visit meetings were concerned with increasing the visibility of the reserve within the University of South Carolina, among potential partners, and within the regional community. This section is focused on the reserve's efforts that broaden its reach and communicate the value of the reserve both internally within the university and externally to the surrounding community, as well as the relationship-building interactions that develop from those efforts. Although educational programs are one mechanism by which the reserve can enhance its visibility and engage with community members, the target area did not focus on the quality of educational programming, but rather on whether key potential stakeholder groups and partners are aware of the reserve and its programs.

### ***Examples of Key Efforts***

Reserve staff members are known as trusted sources of scientific information. They are recognized for their dedication and willingness to respond to requests for information. The ability to effectively communicate scientific information to diverse audiences can be challenging, but a number of stakeholders noted that reserve staff members do it adeptly.

The Master Naturalist program has provided a great conduit for the reserve to reach new residents who may not be familiar with coastal ecosystems. It has also proved to be invaluable in producing a cadre of interested people to participate in citizen science projects, and potentially to serve as future reserve volunteers, and key leaders in the formation of the new reserve friends group, Inlet and Bay Stewards, also are graduates of the program. In addition, the program has the potential to build inroads for other reserve programs, such as the coastal training program, by virtue of the fact that several graduates moved into decision-making positions in the community and are equipped with understanding and knowledge about the value of estuarine and coastal habitats for safety, quality of life, and the economy. Among the stakeholders the evaluation team met with, there was great support for the program. It was noted that to both reach more people and to increase the accessibility of the program, the reserve might consider offering it more than once annually and establishing a scholarship to benefit those who cannot afford the program.

The reserve secured a NOAA Marine Debris grant to install two marine debris sculptures; a white shrimp was installed in Georgetown adjacent to the East Bay Park boat landing, and a redfish was installed at the Hobcaw Barony Discovery Center. These exhibits are designed to be filled with locally collected marine debris. Interpretive signs provide information about the origins of marine debris, impacts on fish and shrimp, and actions viewers can take to minimize marine debris. Viewers are encouraged to select a pledge card and post their photo with it to social media using #trashfreeniw. Additionally, reserve staff members have given multiple presentations on marine debris and have co-sponsored litter clean-up events in Georgetown.

The newly formed friends group, Inlet and Bay Stewards, presents another opportunity for increasing the reserve's visibility with various stakeholder groups and the broader community. The reserve is encouraged to work with the Inlet and Bay Stewards board to develop any materials, provide training to members, and plan or prioritize strategic activities that the group can undertake specifically to increase awareness of the reserve and to support the reserve's priorities. Additionally, it would benefit both the reserve and the foundation to explore a way to employ a collaborative approach, similar to the education model mentioned in the "Program Administration" section, to create and implement a volunteer coordination plan that meets the liability requirements of both the foundation and the

university. To quantify the contribution of volunteers, including that of the Inlet and Bay Stewards, the reserve is encouraged to use [Independent Sector](#) to estimate financial value of volunteer hours.

### ***Inreach: Reserve's Value to the University of South Carolina and the Baruch Foundation***

The reserve is unique when compared to other programs within the University of South Carolina, and this could be beneficial to both. The reserve can provide hands-on research opportunities, beautiful photos and interesting facts, information, expertise, and recreational and educational experiences. These opportunities can add another dimension to the university's reputation and help it gain favor with and generate interest within a broader audience. To the reserve's benefit, the university's communication machine is well established and can raise and broaden the reserve's visibility within the university, with opinion leaders, and throughout the state.

As a part of the reserve's effort to continue to improve its website and social media presence, the evaluation team suggests that the reserve should also consider making it a priority to arrange time for the university's communication staff to visit the reserve, with the intent of helping to increase the reserve's value within the university. This would allow the university's communication staff to gain firsthand knowledge about the reserve and to aid in the development of creative ideas necessary to integrate the reserve's communication needs with the university's outreach activities as an additional outreach avenue for the reserve. During this visit, the reserve staff members could also learn about the different communication and outreach approaches used by the university and to collaboratively decide the best way for the reserve to contribute.

The new reserve manager has developed a good relationship with the new directors of the University of South Carolina Baruch Institute and field lab. They work closely together on all issues that involve the reserve's resources, operations, and activities. The reserve manager has also developed a sound relationship with the university's associate dean of its School of Earth, Oceans, and Environment. As previously mentioned, all of these people are relatively new to their positions, and are keenly interested in leveraging one another's fresh perspectives to the common advantage of the university, institute, lab, and reserve. This shared interest should be capitalized upon for the opportunities to enhance programs and increase the reserve's visibility.

### ***Outreach and Community Engagement: External Visibility***

The evaluation team observed that the stakeholders who are already aware of the reserve see clear benefit of the reserve to their organizations, communities, and themselves. The issue is that there is much of the community that either is confused by or does not distinguish between the various organizations represented on the Hobcaw Barony property. People may be familiar with and refer to them collectively as "Baruch" or "Hobcaw," but are not aware that there is a national estuarine research reserve in the area. Additionally, people tend to think of all the entities as whichever one with which they came into contact first. Another compounding factor is the limited space on the driveway signage, with only the upper level institutional partners listed. Creativity and prioritizing deliberate and targeted outreach are critical to creating awareness.

The foundational element of any outreach effort is having something worthwhile to communicate. As such, the reserve should continue to provide high-quality research, education, training, and conservation products and services. A talented, competent staff dedicated to its work and committed to sharing the results of its efforts is the most important component of any outreach effort.

Especially given the reserve's staffing limitations, for efficient and effective outreach, reserve staff members need to develop specific outreach goals along with target audiences, messages, and strategies for reaching these audiences. For example, if additional visiting researchers are desired, a target audience could be specific universities and departments within these universities, even specific people. Messages would contain information about what the reserve has to offer and what potential researchers have to do to participate. Through further assessment, reserve staff members would then identify the most effective ways to reach this audience, and assign tasks and deadlines to get the job done. This approach of focusing on a few strategic goals or approaches at a time, rather than random outreach efforts, and working down the list would help the staff remain motivated and make forward progress in achieving the reserve's outreach goals and ultimately in improving the reserve.

Other examples of potential outreach goals that are linked with reserve audiences include the following:

- By using reserve research and training, the reserve would help local government officials increase community resilience to coastal hazards.
- Targeting civic groups within the region to increase awareness and implementation of community resilience best practices.
- Emphasizing outreach to peer organizations to broaden the scope of reserve efforts.
- Continuing to message reserve activities and accomplishments to NOAA and the University of South Carolina to ensure relevance and continued funding.

As with any outreach effort, setting specific goals is a key first step. NOAA's Office for Coastal Management has various products and trainings that the reserve staff may use, including a simple outreach template that guides the user through the process for each target audience.

In summary, the reserve is strongly encouraged to continue to look for opportunities to better promote the reserve's identity and existence internally within the university and externally among potential partners and the broader community. Suggestions include the following:

- Build on opportunities with the Baruch Foundation and other partners to get the reserve's name out more.
  - For instance, the reserve is mentioned twice on the foundation's website: once on the Discovery Center page and once on the "For Teachers" marine science for grades 6-12 page. Those two instances could be hyperlinked to the reserve's website. The reserve could also create hyperlinks to the foundation's website on its own site.
- Leverage university resources more effectively, especially the university's communications capacity.
- Engage new and diverse audiences and deliver reserve programs or products more frequently. Find ways to incorporate elements of [universal design](#) into all reserve programming, allowing participation by all people regardless of their age, size, ability, or disability.
- Explore the use of different technologies to create new platforms to engage with young people; for example, videos for students who can't get out to the reserve for field trips should be explored. The reserve should also continue to focus on expanding education programming for students and training programs for educators to include students and educators engaged with subjects other than science, such as language arts or art, to build on its successful transition from the more standard STEM-focused curriculum to STEAM by incorporating art.
- Research the installation of tourism-oriented directional signage on Highway 17 to alert travelers of the reserve's location. During the site visit and in the survey results, partners and stakeholders remarked that people drive past Hobcaw Barony without any awareness that a

national estuarine research reserve is present on the property.

- Finally, the reserve should work to better communicate research findings to partners and the public.

### ***Findings for Fostering Visibility of the Reserve and Community Engagement***

**Accomplishment:** The Winyah Master Naturalist course offered by the North Inlet-Winyah Bay Research Reserve has provided a great conduit for the reserve to reach new residents who may not be familiar with coastal ecosystems. It has also proved to be invaluable in producing a cadre of interested people to participate in citizen science projects, and potentially to serve as future reserve volunteers. Key leaders in the formation of the new reserve friends group (Inlet and Bay Stewards) also are graduates of the program. In addition, the program has the potential to benefit other reserve programs, such as the coastal training program, by virtue of the fact that several graduates moved into decision-making positions in the community and are equipped with understanding and knowledge about the value of estuarine and coastal habitats for safety, quality of life, and the economy.

**Recommendation:** The North Inlet-Winyah Bay Research Reserve is encouraged to explore the use of different technologies to create new platforms to engage with young people, for example, virtual field trips for students who can't get out to the reserve for field trips. The reserve should also continue to focus on expanding education programming for students and training programs for educators to include students and educators engaged with subjects other than science, such as language arts or art, to build on its successful transition from the more standard STEM-focused curriculum to STEAM by incorporating art.

**Recommendation:** The North Inlet-Winyah Bay Research Reserve would benefit significantly from strengthening its profile with the University of South Carolina and, externally, with the broader coastal management community in the northern South Carolina coast, as well as with residents and visitors to the area. The NOAA Office for Coastal Management strongly encourages:

- The University of South Carolina to work with the Baruch Foundation and the reserve to continue to increase awareness among residents and visitors to the area of the reserve's presence and ongoing funding and support of the Discovery Center.
- The North Inlet-Winyah Bay Research Reserve to explore opportunities for furthering its relationship with the University of South Carolina's communications staff to augment the reserve's external outreach efforts and visibility within the university.
- The North Inlet-Winyah Bay Research Reserve to leverage the opportunity provided by the presence of new leadership within the university and the reserve to do additional inreach with the university to increase main campus recognition of the reserve's accomplishments and programs.
- The North Inlet-Winyah Bay Research Reserve to include in its draft management plan a communication and outreach plan to further the reserve's priority issues and increase community and partner awareness of the reserve's mission, accomplishments, and education, training, and recreational opportunities. The communication plan should identify target audiences, key messages, desired outcomes, and strategic communication opportunities, such as those suggested above, with a focus on short-term priorities in the next three to five years.

## Improving Coastal Resilience

Coastal resilience includes both community resilience and ecological resilience, that is, resilience of people and structures as well as natural systems, such as marshes, to threats that coastal South Carolina is experiencing, such as sea level rise, increased air and water temperatures, and extreme rainfall and other weather events. The reserve's role to date has been to increase understanding and to educate and communicate about how to make communities and ecosystems more able to bounce back from and adapt to these impacts. Notably, sea level rise is resulting in increased flooding and storm surge from hurricanes and extreme rain events, and is increasing coastal erosion and saltwater intrusion. In addition, the impacts of climate change are likely to increase the effects of other environmental stressors, like wildfire, and invasive species. The evaluation team heard from stakeholders that addressing climate change impacts such as sea level rise, extreme weather events, and increased frequency of severe storms was one of the biggest coastal management challenges in the region.

### *Examples of Key Efforts*

In May, 2016, the reserve expanded monitoring into Winyah Bay and its value and use to researchers at the University of South Carolina, Clemson University, and Coastal Carolina University, local and state regulatory agencies, and federal partners such as the National Weather Service's Southeast River Forecast Center. With funding, support, and collaboration from the Southeast Coastal Ocean Observing Regional Association and the Belle M. Baruch Marine Laboratory, a System-Wide Monitoring Program water quality platform was established in Winyah Bay, which brings the number of reserve stations to five.

This station fills a critical data gap for downstream conditions within the greater Winyah Bay system. The Winyah Bay station leverages the work of and collaborations with reserve research partners. For example, the National Weather Service's Southeast River Forecast Center is using water level data from this station in the development of a total water level forecasting system for its Coastal Flood Program. The data from the new station is also being used as a primary study site by the South Carolina Department of Health and Environmental Control's Bureau of Water in support of the development of a numeric nutrient criteria for estuarine waters. In another example, an acoustic receiver was mounted on the station to facilitate monitoring of acoustically tagged sharks to understand how physical conditions impact their presence and movement.

The reserve consistently exceeds system-wide monitoring program data collection and reporting requirements; for example, while a roughly 30-day collection interval is required, the reserve samples every 20 days. Additionally, the reserve collects several optional parameters beyond those required. The reserve has further enhanced its monitoring efforts by upgrading all of its outdated and unsupported data sondes to new, next-generation models at all primary and secondary System-Wide Monitoring Program stations, allowing the reserve to reduce maintenance effort and time. Based on experience and testing with these upgrades, the reserve developed recommendations for the System-Wide Monitoring Program at the national level.

The reserve collaborated with the South Carolina Sea Grant Consortium and other partners on the Stormwater Pond Conference in 2012. Subsequent partnering efforts with the ACE Basin National Estuarine Research Reserve, Center for Watershed Protection, and South Carolina Sea Grant Consortium led to securing a Reserve System Science Collaborative grant to develop a low-impact development manual that includes stormwater engineering specifications, land-use planning resources, and site-design practices specific to the environmental conditions of the South Carolina coast. This effort

represents integration across the research and monitoring program and the coastal training program, as well as effective collaboration between partners and other reserves. *Low Impact Development in Coastal South Carolina: a Planning and Design Guide* has become a valuable resource for coastal managers and design and development professionals in South Carolina, and a model for other reserves in the system.

The reserve engages teachers in training through the Teachers on The Estuary Program. Teacher training and workshops provide teachers with knowledge that they can share with their students to educate them about their surrounding environment and enhancing coastal resilience. For example, through these workshops, teachers learn about the importance of the marsh in filtering water and slowing storm surge. Teachers use that knowledge to educate students on the importance of protecting and conserving salt marsh and uplands. Teacher training transfers knowledge to 300-500 students per year. Upon request, the education coordinator will customize training to meet teachers' needs. Stakeholders again noted that there are many more teachers and schools that would benefit from participating in the reserve salt marsh programs than are aware of the reserve or its programs. It was suggested that the reserve education coordinator reconnect annually with school administrators to gain their support and involvement in ensuring that teachers are aware of the reserve and ways to get their students engaged in reserve programs. The reserve is encouraged to conduct a new market analysis and needs assessment to identify potential new programs, improved ways to reach current and new education program stakeholders, and the frequency of outreach efforts appropriate for those stakeholders. The results of the assessment would inform the reserve communications and outreach plan, and should be incorporated into the updated management plan.

The last coastal training program needs assessment was done in 2006 and, as discussed in the "Program Administration" section, there has been marked turnover in the program's coordinator position. The current coordinator may consider updating the coastal training program needs assessment to reassess coastal training program priorities, coastal decision-maker audiences, and ways to more directly bring relevant reserve research and monitoring to those audiences to enhance community and ecological resilience.

In 2014, the reserve joined the South Carolina Sea Grant Consortium's Seeds to Shoreline program and serves as a local source of *Sporobolus* for north coast teachers and works with three participating schools in Georgetown and Horry Counties. The program provides participating educators with estuary ecology background and knowledge, supplies, and support to raise native *Sporobolus* seedlings for transplanting in coastal areas in need of shoreline restoration.

The reserve initiated and led the development of CCVATCH (Climate Change Vulnerability Assessment Tool for Coastal Habitats) into a national products tool. Vulnerability assessment tools for terrestrial habitats existed, but the reserve stewardship staff recognized that there were no vulnerability tools for assessing estuarine habitats. The staff collaborated to create CCVATCH, which fills that habitat gap. Staff members have been expanding its use to influence decision-making for marsh management and have additional plans to pilot it as a national tool.

In 2017, the reserve's coastal training program, Coastal Carolina University, and Georgetown County partnered to found Georgetown RISE (resilience, innovation, sustainability, and education), a United Nations Regional Center for Expertise on Education for Sustainable Development. It provides a platform to engage elected officials, community members, educators, businesses, and youth within the county to promote science-based research and decision-making that benefits the community. An example of the work of Georgetown RISE was the Georgetown Climate Adaptation Project, which transferred the



approach developed in the New England Climate Adaptation Project, a partnership between the Consensus Building Institute and the National Estuarine Research Reserve System. The reserve was awarded a NOAA Science Transfer Grant that allowed the coastal training program to support the 18-month project that developed and hosted community role-play simulations about climate adaptation. Through workshops and trainings, the project engaged over 200 participants from a wide range of backgrounds and affiliations.

### ***Findings for Improving Coastal Resilience***

**Accomplishment:** The North Inlet-Winyah Bay Research Reserve expanded monitoring into Winyah Bay and its value and use to researchers at the University of South Carolina, Clemson University, Coastal Carolina University, local and state regulatory agencies, and federal partners such as the National Weather Service's Southeast River Forecast Center, filling a critical data gap for downstream conditions within the greater Winyah Bay system.

**Accomplishment:** The North Inlet-Winyah Bay Research Reserve collaborated on the Stormwater Pond Conference in 2012, and subsequent partnering efforts led to securing a National Estuarine Research Reserve System Science Collaborative grant to develop a low-impact development manual that considers the environmental conditions of the South Carolina coast. This guide has become a valuable resource for coastal managers and design and development professionals in South Carolina, and a model for other reserves in the system.

**Accomplishment:** The North Inlet-Winyah Bay Research Reserve partnered with Coastal Carolina University and Georgetown County in the establishment of Georgetown RISE (resilience, innovation, sustainability, and education), which has provided a platform to engage elected officials, community members, educators, businesses, and youth within the county to promote science-based research and decision-making that benefits the community.

**Accomplishment:** North Inlet-Winyah Bay Research Reserve staff recognized that there were no tools available for assessing the vulnerability of estuarine habitats. They collaborated to create CCVATCH (Climate Change Vulnerability Assessment Tool for Coastal Habitats) to fill that gap and to facilitate informed decision-making on marsh management. The National Estuarine Research Reserve System has plans to pilot it as a national tool.

**Recommendation:** The North Inlet-Winyah Bay Research Reserve is encouraged to revisit and update the information about reserve stakeholders that guides education and coastal training programming decisions to better translate relevant research results to primary audiences to enhance community and ecological resilience. The NOAA Office for Coastal Management strongly encourages the North Inlet-Winyah Bay Research Reserve to:

- Conduct a new market analysis and needs assessment for the education program to identify potential new programs, improved ways to reach current and new education program stakeholders, and the frequency of outreach efforts appropriate for those stakeholders.
- Consider conducting a new needs assessment of coastal training program audiences.

## Evaluation Metrics, 2012-2017

Three performance measures and targets were selected by North Inlet-Winyah Bay National Estuarine Research Reserve staff to track during the five-year period of 2012-2017 as part of the NOAA 312 program evaluation process. These were selected from a draft list of 10 measures submitted for initial review by NOAA partners. One measure and an associated target were selected to address each of the three goals in the North Inlet-Winyah Bay Research Reserve Management Plan, 2011-2016. Performance measures and associated targets are listed under the appropriate goals, objectives, and strategies from the reserve's management plan. The reserve will likely track other measures as well to inform planning efforts.

### **Metric 1**

**Goal 1:** Understand and minimize the impacts of coastal growth on water and habitat quality and ecological communities.

**Objective 1.3:** The natural, cultural, and economic resources in the North Inlet and Winyah Bay watersheds are protected and valued.

**Strategy 1.3.2:** Provide education, outreach, and training programs and materials about watershed connectivity, the impacts of different types of land use on estuarine ecosystems and resources, and how community members can protect these resources.

The education and stewardship programs will take the lead in addressing this strategy with assistance provided by the coastal training program and research program. This strategy is highlighted in the reserve's education and stewardship plans in the management plan, pages 64-65 and 81, respectively.

**Performance Measure:** Number of community members for the 2012-2017 period that participate in reserve public education and outreach programs dealing with watersheds, impacts of land use on estuaries and their resources and how they can protect these resources.

**Target:** 2,000 community members for the 2012-2017 period participate in reserve public education and outreach programs dealing with watersheds, impacts of land use on estuaries and their resources, and how they can protect these resources.

| First-Year Results<br>(7/1/12-6/30/13) | Second-Year Results<br>(7/1/13-6/30/14) | Third-Year Results<br>(7/1/14-6/30/15) | Fourth-Year Results<br>(7/1/15-6/30/16) | Fifth-Year Results<br>(7/1/16-6/30/17) | Total |
|--|---|--|---|--|-------|
| 361                                    | 407                                     | 1381                                   | 581                                     | 381                                    | 3,111 |

**Discussion:** Results reflect community members' participation in reserve programs, including education kayak excursions in the reserve, marsh field trips, presentations to community groups, and a Master Naturalist course.

## Metric 2

**Goal 2:** Understand and communicate the impacts of naturally occurring short-term stochastic and long-term, large-scale climate events on coastal ecosystems and human communities.

**Objective 2.2:** The skills and abilities of local communities and coastal decision-makers to plan for, mitigate, and adapt to long-term and stochastic climatic events are increased.

**Strategy 2.2.1:** Increase the reserve's role in coastal training and community education pertaining to the effects of climate variability and change on estuarine resources and coastal hazards.

The coastal training program (CTP) will lead efforts, with assistance provided by education, research, and stewardship programs. Training events and technical assistance provided to local communities through the CTP will strategically build on past climate education efforts and expressed audience needs. Additional information related to this strategy is in the education section of the reserve's management plan, pages 74-75, and in the reserve's CTP Strategy Document.

**Performance Measure:** Over the five-year period, percent of coastal decision-makers who participated in reserve-sponsored training events related to climate and climate adaptation report an increase in their understanding and skills related to these topics, as determined by written surveys. (National Estuarine Research Reserve System CTP Short-Term Outcome 3)

**Target:** Over the five-year period, 90 percent of coastal decision-makers who participated in reserve-sponsored training events related to climate and climate adaptation report an increase in their understanding and skills related to these topics, as determined by written surveys.

| Year                                      | First-Year Results<br>(7/1/12-6/30/13) | Second -Year Results<br>(7/1/13-6/30/14) | Third-Year Results<br>(7/1/14-6/30/15) | Fourth-Year Results<br>(7/1/15-6/30/16) | Fifth-Year Results<br>(7/1/16-6/30/17) |
|---|--|--|--|---|--|
| Percent respondents who reported increase | NA                                     | 100%                                     | 94%                                    | 95%                                     | 94%                                    |

**Discussion:** Although there were five workshops held in fiscal year 2012, none of them were specific to climate and adaptation topics. Workshops delivered in the other four years include North Coast Resilience Summit; Coastal Flooding, Climate, and Community Decision-making; Floodplain Management: Resources and Tools. Coastal training program coordinators report percentage of *respondents* who report an increase in their understanding and skills, while the performance measure is based on the percentage of *participants* who report an increase. The coordinators are reporting as they should be; the issue is with the verbiage of the performance measure.

**Metric 3**

**Goal 3:** Understand and reduce the impacts of invasive species and habitat loss on biodiversity.

**Objective 3.1:** Native species are conserved and their habitats are protected and restored in the North Inlet and Winyah Bay watersheds.

**Strategy 3.1.1:** Facilitate the implementation of inventory programs for threatened, Endangered, and key species in the North Inlet-Winyah Bay Research Reserve.

**Strategy 3.2.1:** Implement invasive species monitoring strategies for species that currently threaten or could be a future threat to reserve resources.

The stewardship, research, and education programs will foster the use of volunteers in research, monitoring, restoration, and education programs that protect biodiversity through species and habitat conservation and invasive species control. Volunteers will be trained and involved in long-term stewardship projects in the reserve and local community as well as short-term participation projects, such as beach and marsh sweeps. These projects represent a subset of total volunteer hours that the reserve currently reports on as part of the Reserve System’s Performance Measurement System. Total volunteer hours have averaged around 200 annually, with about half of these hours contributed to the types of projects described above. Plans are to roughly double the volunteer base that serves the reserve’s habitat protection and invasive species monitoring and control objectives over the next five years. Additional information related to these strategies is in the stewardship section of the reserve’s management plan, pages 79-82.

**Performance Measure:** Number of hours of service contributed by volunteers in a year to reserve stewardship, research, and education projects that address native species and habitat monitoring and conservation, restoration, or invasive species detection and removal.

**Target:** By the year 2017, volunteers will contribute a total of 200 hours of service in a year to reserve stewardship, research, and/or education projects that address native species and habitat monitoring and conservation, restoration, or invasive species detection and removal.

| First-Year Results (7/1/12-6/30/13) | Second-Year Results (7/1/13-6/30/14) | Third-Year Results (7/1/14-6/30/15) | Fourth-Year Results (7/1/15-6/30/16) | Fifth-Year Results (7/1/16-6/30/17) | Total |
|-------------------------------------|--------------------------------------|-------------------------------------|--------------------------------------|-------------------------------------|-------|
| 72                                  | 379                                  | 443                                 | 468                                  | 215                                 | 1,577 |

**Discussion:** Reserve monitoring and stewardship efforts to which volunteers contributed included biweekly sampling for plankton and nekton, clean-up events, marine debris assessment, and a citizen science project to monitor painted buntings.

## Evaluation Metrics, 2017-2022

Approved April 4, 2018

Background: At the time of drafting these new evaluation metrics, the North Inlet-Winyah Bay Reserve was in the process of revising its management plan, which includes a revised strategic plan. As a result, it chose to tie the new draft measures to goals and objectives in the National Estuarine Research Reserve System Strategic Plan 2017-2022, recognizing that these goals and objectives are very consistent with those currently outlined in their draft site-specific strategic plan.

### **Metric 1**

**Reserve System Goal:** Improve the scientific understanding of estuaries and their watersheds through the development and application of reserve research, data, and tools.

**Reserve System Objective 1:** The reserve system will maintain and expand monitoring of relevant and emerging biophysical and socioeconomic parameters, increasing the capacity to track the effects of changes in land use, coastal development, and climate.

**Reserve System Objective 2:** Reserves and coastal researchers will increase their collaborative research to address the needs of decision-makers and stakeholders.

**Strategy:** The North Inlet-Winyah Bay Research Reserve is committed to continuing to collaborate with others to improve understanding of how coastal development and climate change impact coastal waters and habitats as well as coastal communities. The reserve plans to work with partners to facilitate and conduct targeted research that increases understanding on these topics and informs best management practices and climate adaptation strategies. Efforts will also be made to engage graduate students in projects focused on these priority areas for research.

As of April 2018, the reserve only lists projects in the research database in which the reserve has an active role either as a lead or in facilitating or providing support. Examples of types of facilitation provided are a researcher making use of the system-wide monitoring program data or reserve staff helping investigators in the field. It is noted that the reserve’s research sector is in the process of further defining what should be included in the research database.

**Performance Measure:** From 2017 to 2022, number of research projects initiated and conducted or facilitated by the reserve that address coastal development or climate change impacts on water quality or coastal resources.

**Target:** Between 2017 and 2022, two research projects will be initiated and conducted or facilitated by the reserve that address coastal development or climate change impacts on water quality or coastal resources.

| First-Year Results<br>(7/1/17-6/30/18) | Second-Year Results<br>(7/1/18-6/30/19) | Third-Year Results<br>(7/1/19-6/30/20) | Fourth-Year Results<br>(7/1/20-6/30/21) | Fifth-Year Results<br>(7/1/21-6/30/22) |
|--|---|--|---|--|
| 1                                      | 1                                       | TBD                                    | TBD                                     | TBD                                    |

**Discussion:** Given the reserve’s strong performance, a more ambitious target should be set in the future. In the first year, the reserve and Clemson together initiated research to improve the understanding of marsh sensitivity to environmental variability and change. In year two, the reserve and the South Carolina Sea Grant Consortium have collaborated to start research to develop a predictive understanding of how land-use and specific stormwater management conveyances and structural control structures impact variations in the magnitude of nonpoint source biochemical oxygen demand. The results will contribute to both improved stormwater management and total maximum daily load development for coastal water impacted by low dissolved oxygen.

**Metric 2**

**Reserve System Goal:** Advance environmental appreciation and scientific literacy, allowing for science-based decisions that positively affect estuaries, watersheds, and coastal communities.

**Reserve System Objective 1:** Coastal residents and visitors will increase their awareness and ability to improve stewardship of estuaries, coastal watersheds, and their communities.

**Strategy:** The reserve will continue to provide educational programs for public audiences that focus on estuaries, watersheds, and actions people can take to improve stewardship of estuaries, watersheds, and their communities. A variety of different programs will be offered to inform and engage community members, including field experiences in the reserve, classes, public presentations, exhibits at community venues, and marine debris clean-up events.

**Performance Measure:** From 2017 to 2022, the number of people reached through public outreach activities.

**Target:** Between 2017 and 2022, 3,000 people will be reached through public outreach activities.

| First-Year Results<br>(7/1/17-6/30/18) | Second-Year Results<br>(7/1/18-6/30/19) | Third-Year Results<br>(7/1/19-6/30/20) | Fourth-Year Results<br>(7/1/20-6/30/21) | Fifth--Year Results<br>(7/1/21-6/30/22) |
|--|---|--|---|---|
| 826                                    | 637                                     | TBD                                    | TBD                                     | TBD                                     |

**Discussion:** These results reflect contact the reserve has with visitors to the Discovery Center and people engaged through reserve programs on site and in the community.

**Metric 3**

**Reserve System Goal:** Advance environmental appreciation and scientific literacy, allowing for science-based decisions that positively affect estuaries, watersheds, and coastal communities.

**Reserve System Objective 3:** Coastal decision-makers and environmental professionals will understand and effectively apply science-based tools, information, and planning approaches that support resilient estuaries and coastal communities.

**Strategy:** The reserve’s draft revised CTP Strategy Document, 2017-2022, identified three key issues to focus on over the next five years: water quality protection, coastal hazards and climate change, and

habitat conservation and restoration. Training events and technical assistance will be focused on these priority issues over the next five years. Other topics will also be addressed, based on the evolving interests and needs of decision-maker audiences.

**Performance Measure:** From 2017 to 2022, the number of training events delivered by the coastal training program that address water quality protection, coastal hazards and climate change, or habitat conservation.

**Target:** Between 2017 and 2022, 15 training events will be delivered by the coastal training program that address water quality protection, coastal hazards and climate change, or habitat conservation.

| Year   | First-Year Results (7/1/17-6/30/18) | Second-Year Results (7/1/18-6/30/19) | Third-Year Results (7/1/19-6/30/20) | Fourth-Year Results (7/1/20-6/30/21) | Fifth-Year Results (7/1/21-6/30/22) |
|--|-------------------------------------|--------------------------------------|-------------------------------------|--------------------------------------|-------------------------------------|
| Number of events that meet the target criteria | 1                                   | 5                                    | TBD                                 | TBD                                  | TBD                                 |
| Total number of events                         | 8                                   | 9                                    |                                     |                                      |                                     |

**Discussion:** In fiscal year 2017, the reserve hosted the Communicating Climate Change: A Research-based Approach workshop. In fiscal year 2018, the events included four Role Play Simulations on Community Planning for Climate Adaptation as a part of the Georgetown RISE partnership. The reserve also hosted the Adaptation Planning for Climate Change workshop attended by 22 participants.

## Conclusion

For the reasons stated herein, I find that the University of South Carolina School for the Earth, Ocean and Environment is adhering to the programmatic requirements of the Coastal Zone Management Act and its implementing regulations in the operation of its approved North Inlet-Winyah Bay National Estuarine Research Reserve.

These evaluation findings contain one necessary action and nine recommendations that must be considered before the next regularly scheduled program evaluation. The necessary action is mandatory and must be completed by June 30, 2020. Program recommendations that must be repeated in subsequent evaluations may be elevated to necessary actions.

This is a programmatic evaluation of the North Inlet-Winyah 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 by Jeffrey Payne*  
Jeffrey L. Payne, Ph.D.  
Director  
Office for Coastal Management

*dated December 10, 2019*  
Date



## Appendix: Response to Written Comments

### **Christine Ellis, Executive Director, Winyah Rivers Alliance**

Christine participated in a stakeholder meeting during the site visit and sent follow up comments to the evaluation team. In her comments, Ms. Ellis shared additional issues of concern that impact the Winyah Bay watershed. One of the challenges she identified is marine debris, specifically abandoned boats. Due to a combination of current laws and regulations, funding, and liability the abandoned boats remain in the waterways. Another issue she raised is accessibility of climate science research and communication of that information for community planning and to the non-scientific community. Her last comment regarding the turnover rate of the coastal training program coordinator position suggested that low salary is a cause.

**NOAA Office for Coastal Management's Response:** The NOAA Office for Coastal Management thanks Ms. Ellis for her comments. The office acknowledges that abandoned boats are an issue throughout the Southeast as each state faces similar challenges with removal linked to gaps in regulations and the cost of removal. A member of the evaluation team sent Ms. Ellis a link to NOAA's Marine Debris Program funding opportunities available to state and local governments and suggested that it could provide an opportunity for a future partnership between the Winyah Rivers Alliance and local government in watershed.

The office is supportive of reserves providing information, training, and tools to better equip elected officials and other stakeholders and partners with skills for decisions to benefit their communities. The office acknowledges that the communication of climate science is an area that the office and the entire National Estuarine Research Reserve System is working on. Synthesizing it into locally relevant reports is a challenge, and the office is in the process of developing templates as a tool that can help. The coastal training program plays a significant role in communication of science for decision-making as well.

In the Southeast, reserve staff salaries are often somewhat low compared to some other regions, and this results in staff turnover. The office recognizes that this can affect program continuity, as well as other issues for the reserve.

### **Sheila Sullivan, Head of Children-Youth Services, Georgetown County Library System**

Ms. Sullivan shared the value the reserve's education programs provide to Georgetown County children and parents who participate in the library system's summer programs. She shared that the reserve's education staff members are great community partners to the library system. The reserve education staff provide informative, hands-on programs that are appealing to the children and parents and foster participation. Ms. Sullivan expressed that the reserve's programs have enhanced the lives of many Georgetown County children and that the library system has been fortunate in its working relationship with the Hobcaw Barony Discovery Center and the reserve.

**NOAA Office for Coastal Management's Response:** The NOAA Office for Coastal Management thanks Ms. Sullivan for her comments. The office is supportive of the reserve's efforts to engage parents and children within the Georgetown County area in learning about the estuary through strong partnerships like the one with the Georgetown County Library System.

**Duane Draper, Board Member, Inlet and Bay Stewards**

Mr. Draper participated in a stakeholder meeting during the evaluation site visit and sent follow up comments to the team. In his written comments, he reiterated his concern about ease access to the Hobcaw Barony property. With the interest of the nascent friends group becoming an advocacy mechanism for the reserve, he expressed the desire of the group to be involved with the reserve's research projects in addition to friends group members sitting in on public programming and events. He also acknowledged the need for the group to explore best practices of successful friends groups.

**NOAA Office for Coastal Management's Response:** The NOAA Office for Coastal Management appreciates the time Mr. Draper took to both participate in a stakeholder meeting and provide written comments. The evaluation team heard from a number of people who shared concern about volunteers' access to the Hobcaw Barony property and has addressed it in the findings. The Office for Coastal Management has provided Mr. Draper with insight about the operations and practices of friends groups associated with other reserves in the Southeast.

**Dr. Thomas O'Halleran, Assistant Professor, Clemson University, Baruch Institute of Coastal Ecology and Forest Science**

Dr. O'Halleran wished to convey the value of the research collaboration with the reserve brings to his work. The sentinel site infrastructure and data sets facilitated and enhanced the impact of a new study by allowing the installation of an eddy flux tower. He elaborated that in just two years, the data set he is collecting has attracted collaborators, spun off multiple research proposals, and lead to invited presentations. Additionally, the undergraduate and graduate students involved in the project have benefitted from specialized training in instrumentation and coastal ecology methods. Dr. O'Halleran expressed his appreciation for the efforts and quality work of the reserve and looks forward to continuing to collaborate with the reserve in the future.

**NOAA Office for Coastal Management's Response:** The NOAA Office for Coastal Management thanks Dr. O'Halleran for the thoughtfulness of his comments and deeply appreciates the work he does with the reserve to contribute to training students and to expanding the body of knowledge available.