



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF OCEAN AND COASTAL RESOURCE MANAGEMENT
Silver Spring, Maryland 20910

SEP 27 2012

Collin O'Mara, Secretary
Delaware Department of Natural Resources
and Environmental Control
89 Kings Highway
Dover, Delaware 19901

Dear Secretary O'Mara:

Enclosed are the final evaluation findings for the Delaware National Estuarine Research Reserve (Reserve) for the period from January 2006 through September 2011.

The fundamental conclusion of this evaluation is that Delaware is adhering to the programmatic requirements of the NERR system in its operation of the approved Delaware Reserve. This document contains three recommendations, one of which is mandatory. In response to the State's comments on the NOAA draft evaluation findings, we have made all factual corrections.

We appreciate your cooperation and assistance and that of the Reserve staff during the accomplishment of this evaluation.

Sincerely,

Margaret A. Davidson
Acting Director

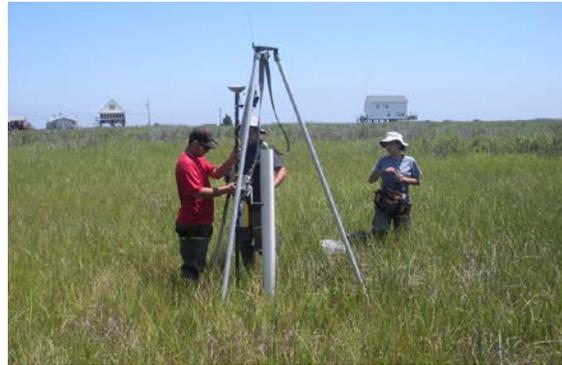
Enclosure

cc: Sarah Cooksey, Department of Natural Resources and Environmental Control
Kim Cole, Department of Natural Resources and Environmental Control
Michael Migliori, Estuarine Reserves Division, OCRM
Dr. William Reay, Chesapeake Bay-Virginia National Estuarine Research Reserve



FINAL EVALUATION FINDINGS
DELAWARE NATIONAL ESTUARINE RESEARCH RESERVE
January 2006 through September 2011

September 2012



All photos courtesy Delaware National Estuarine Research Reserve



Office of Ocean and Coastal Resource Management
National Ocean Service
National Oceanic and Atmospheric Administration
U.S. Department of Commerce

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I. EXECUTIVE SUMMARY

The Coastal Zone Management Act (CZMA) of 1972, as amended, established the National Estuarine Research Reserve System (NERRS). Sections 312 and 315 of the CZMA require the National Oceanic and Atmospheric Administration (NOAA) to conduct periodic performance reviews or evaluations of all federally approved National Estuarine Research Reserves (NERRs). The review described in this document examines the operation and management of the Delaware National Estuarine Research Reserve (DNERR or Reserve) during the period from January 2006 through September 2011. The Reserve is administered by the Delaware Department of Natural Resources and Environmental Control (DNREC).

This document describes the evaluation findings of the Director of NOAA's Office of Ocean and Coastal Resource Management (OCRM) with respect to the Delaware NERR during the review period. These evaluation findings include discussions of major accomplishments as well as recommendations for program improvement. The fundamental conclusion of the findings is that the State of Delaware is successfully implementing its federally approved NERR.

The evaluation team documented a number of Delaware Reserve accomplishments during this review period. The Blackbird Creek Reserve Stewardship Center has been completed, and the St. Jones Reserve Coastal Training Center has been enhanced to make the structure more energy-efficient. The Blackbird Creek Master Ecological Restoration Plan was completed and is being implemented. Staff has contributed to leadership and expertise at a national level and collects quality data which is shared with and used by numerous students and researchers. The Reserve has established numerous partnerships and has conducted research in cooperation with or in support of those partners to address coastal management needs. Of special note are the Delaware Sea Level Rise Initiative, the Marsh Vulnerability Index, the Town of Bowers Beach Community Resilience Adaptation Plan, and efforts to assist Kitts Hummock residents and the Bombay Hook and Prime Hook National Wildlife Refuges.

The Reserve also takes great advantage of partnering to increase educational and outreach capacity. It has applied reserve science to education through incorporation of horseshoe crab research and water quality monitoring into educational programs. The Coastal Training Program has received approval and a full-time CTP Coordinator has been hired.

The evaluation team also identified areas where the Reserve and its programming could be strengthened. This includes: 1) Updates to the Reserve's management plan are overdue and must be completed. 2) During the site visit, DNREC staff discussed the need for a single location and list of sources of funding that come to DNREC, require non-federal or state match, and potential match. OCRM suggests that this be done so that it is easier to locate sources of non-federal match for the Reserve's cooperative agreements. 3) The DNREC and the Reserve should also continue to look for ways to begin shifting some portion of the education or research coordinators' salaries to state funding to free up funding for projects.

II. PROGRAM REVIEW PROCEDURES

A. OVERVIEW

The National Oceanic and Atmospheric Administration (NOAA) began its review of the Delaware Reserve in June 2011. The §312 evaluation process involves four distinct components:

- An initial document review and identification of specific issues of particular concern;
- A site visit to Delaware, including interviews and a public meeting;
- Development of draft evaluation findings; and
- Preparation of the final evaluation findings, partly based on comments from the state regarding the content and timetables of recommendations specified in the draft document.

The recommendations made by this evaluation appear in boxes and bold type and follow the findings section where facts relevant to the recommendation are discussed. The recommendations may be of two types:

Necessary Actions address programmatic requirements of the CZMA's implementing regulations and of the Delaware Reserve approved by NOAA. These must be carried out by the date(s) specified;

Program Suggestions denote actions that NOAA's Office of Ocean and Coastal Resource Management (OCRM) believes would improve the program, but which are not mandatory at this time. If no dates are indicated, the state is expected to have considered these Program Suggestions by the time of the next CZMA §312 evaluation.

A complete summary of accomplishments and recommendations is outlined in Appendix A.

Failure to address Necessary Actions may result in a future finding of non-adherence and the invoking of interim sanctions, as specified in CZMA §312(c). Program Suggestions that are reiterated in consecutive evaluations to address continuing problems may be elevated to Necessary Actions. The findings in this evaluation document will be considered by NOAA in making future financial award decisions relative to the Delaware Reserve.

B. DOCUMENT REVIEW AND ISSUES DEVELOPMENT

The evaluation team reviewed a wide variety of documents prior to the site visit, including: (1) Delaware Reserve §312 evaluation findings dated 2006; (2) federally approved Environmental Impact Statement and program documents; (3) financial assistance awards and work products; (4) semi-annual performance reports; (5) official correspondence; and (6) relevant publications and information on natural resource management issues in Delaware.

Based on this review and on discussions with OCRM, the evaluation team identified the following priority issues:

- major accomplishments during the review period;
- status of Reserve staffing and needs;
- facilities development and/or land acquisition efforts;
- status of general administration of the Reserve and management plan revisions;
- status of implementation of the Reserve's research, monitoring, and education programs;
- the manner in which the Reserve coordinates with other governmental and non-governmental organizations and programs in the state and region; and
- the manner in which the Reserve has addressed the recommendations contained in the §312 evaluation findings released in 2006. The Delaware Reserve's assessment of how it has responded to each of the recommendations in the evaluation findings dated 2006 is located in Appendix B.

C. SITE VISIT TO THE DELAWARE NATIONAL ESTUARINE RESEARCH RESERVE

Notification of the scheduled evaluation was sent to the Delaware Department of Natural Resources and Environmental Control (DNREC) and regional newspapers. In addition, a notice of NOAA's "Intent to Evaluate" was published in the Federal Register on August 3, 2011.

The site visit to the Reserve was conducted concurrently with the site visit by a separate team evaluating the Delaware Coastal Management Program. Both the Reserve and Coastal Management Program are parts of the Delaware Coastal Programs within the DNREC Office of the Secretary. Both are well integrated with each other and partner with or provide support to many of the same state and local government agencies and non-governmental organizations. Therefore, for two days of the site visits, both evaluation teams met together with various partners, individuals, and groups.

The site visit to the Reserve was conducted from September 19 – 22, 2011. The Reserve evaluation team consisted of Ms. Chris McCay, Evaluation Team Leader, National Policy and Evaluation Division, OCRM; Mr. Michael Migliori, Program Specialist, Estuarine Reserves Division, OCRM; and Dr. William Reay, Manager, Chesapeake Bay-Virginia National Estuarine Research Reserve.

During the site visit, the evaluation team met with Reserve staff, the Secretary and senior staff from DNREC, other state agency staff, coastal researchers, educators, local government staff and officials, non-profit organizations, and community members. Appendix C lists people and institutions contacted during this review.

As required by the CZMA, NOAA held an advertised public meeting on Monday, September 19, 2011, at 6:00 p.m. at the Delaware Reserve's St. Jones Visitor Center, 818 Kitts Hummock Road, Dover, Delaware. This was a joint public meeting for the Delaware Reserve and the

Delaware Coastal Management Program. The public meeting gave members of the general public the opportunity to express their opinions about the overall operation and management of the Delaware Reserve and the coastal management program. Appendix D lists individuals who registered at the meeting. NOAA's responses to written comments submitted during this evaluation are summarized in Appendix E.

The Delaware Reserve staff members were crucial in setting up meetings and arranging logistics for the evaluation site visit. Their support is most gratefully acknowledged.

III. RESERVE PROGRAM DESCRIPTION

NOAA's Office of Ocean and Coastal Resource Management designated the Delaware National Estuarine Research Reserve (DNERR or the Reserve) in 1993. The lead agency is the Delaware Department of Natural Resources and Environmental Control (DNREC), and the Reserve is administratively located in the Office of the Secretary, Delaware Coastal Programs.

The Reserve consists of two components, the upper Blackbird Creek and lower St. Jones River sites, approximately 30 miles apart, comprising approximately 4,930 acres. The more landward Blackbird Creek Reserve component is located in southern New Castle County and is approximately 1,200 acres in size. The more seaward St. Jones Reserve component is located just about six miles south of Dover in Kent County.

The Blackbird Creek Reserve consists of freshwater tidal and non-tidal wetlands and brackish-water marshes. Saltmarsh cordgrass (*Spartina alterniflora*) and common reed are among the most common wetland plants. The upland fringe is a mixture of shrub and tree species, including both hardwoods and softwoods. The Blackbird Creek watershed drains a portion of southern New Castle County. This is a predominantly rural area, consisting of wetlands, forests and agricultural lands. Blackbird Creek flows into the Delaware River just upstream from Delaware Bay.

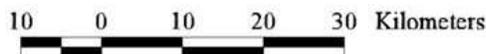
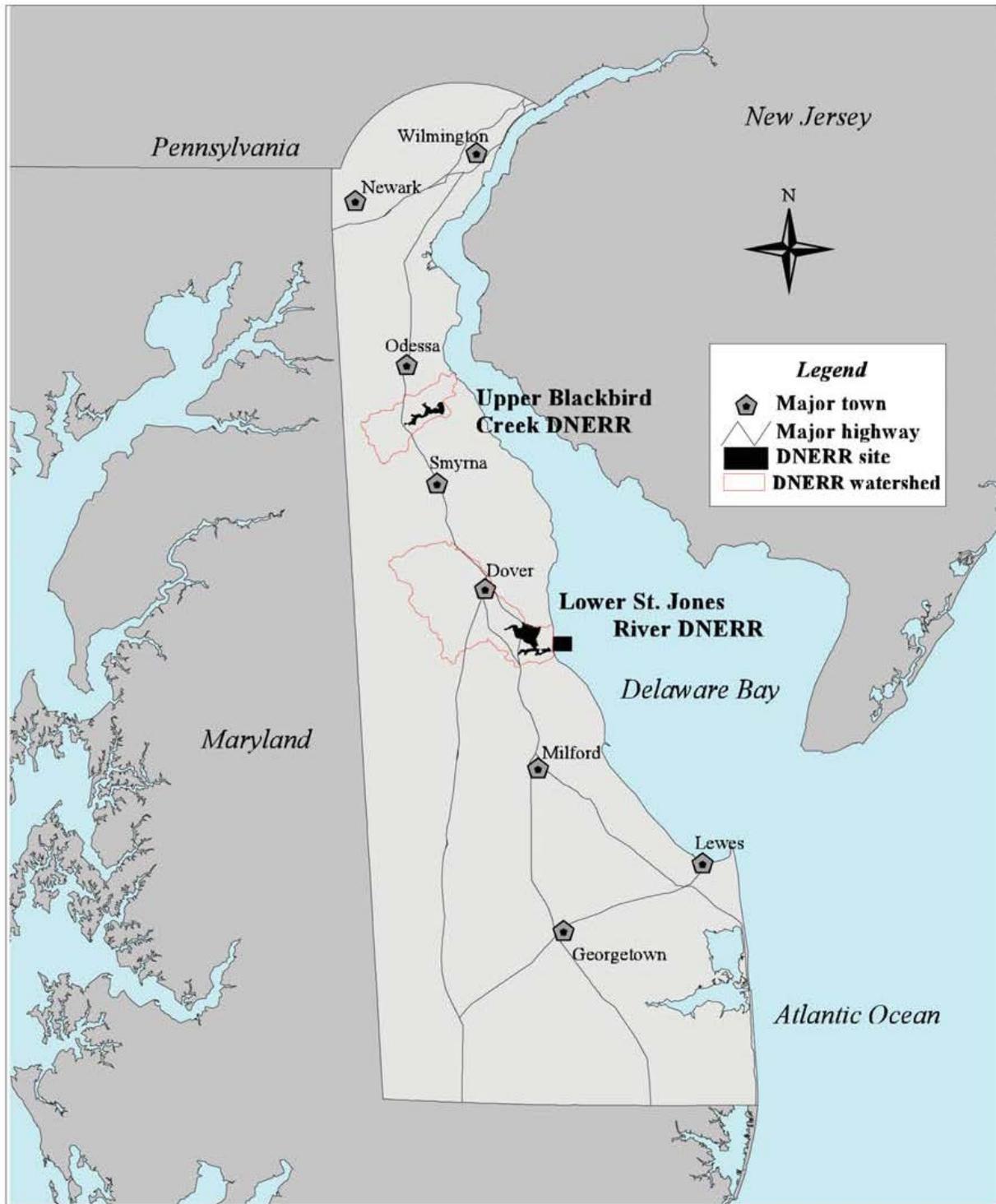
The Blackbird Creek Reserve is home to the Blackbird Creek Reserve Stewardship Center, which was created through renovation of an unusable existing structure and opened during this evaluation period. It includes lab space, office space, meeting rooms, and equipment storage.

The St. Jones River component features tidal brackish-water and salt marshes dominated by saltmarsh cordgrass (*Spartina alterniflora*), salt hay (*Spartina patens*) and open water of creek, river and bay areas, buffered by freshwater wooded fringe, farmlands and meadows. The site also includes a portion of Delaware Bay.

The St. Jones River watershed drains a portion of the coastal plain in central Kent County, including the city of Dover, the surrounding suburbs, industrial areas, agricultural areas, and Dover Air Force Base. The upper St. Jones is impounded by a dam 10.5 miles upstream from the bay to form Silver Lake, a municipal recreation area. Some other headwater streams are also impounded. Much of the eastern portion (bayward) of the watershed consists of wetlands and forests, including lands and waters managed for waterfowl, wild turkey, deer and other wildlife.

The St. Jones Reserve is home to the DNERR St. Jones Center for Estuarine Studies, an education and research facility that includes Reserve offices, research and teaching laboratories, classroom space, dormitory rooms, a Coastal Training Center, and interpretive exhibits. The Coastal Training Center has two conference rooms that can be combined into a larger auditorium. A boardwalk for interpretive and research activities is constructed through part of the marsh and, along with the Center, is open to the public.

DELAWARE NATIONAL ESTUARINE RESEARCH RESERVE



This map was prepared by the Delaware Coastal Management Program for the Delaware National Estuarine Research Reserve Site Characterization. The information in this map is subject to change. The information provided is only an approximate graphical representation.



IV. REVIEW FINDINGS, ACCOMPLISHMENTS, AND RECOMMENDATIONS

A. OPERATIONS AND MANAGEMENT

1. Administration and Staffing

The Delaware NERR and the Delaware Coastal Management Program together are known as the Delaware Coastal Programs. They are administratively located in the Office of the Secretary of the Department of Natural Resources and Environmental Control (DNREC). This location in the Office of the Secretary is a change since the last evaluation, when the Delaware Coastal Programs were located in the DNREC Division of Soil and Water Conservation. After his appointment by the governor in 2009, the secretary initiated an agency-wide reorganization. During the reorganization he retained the co-location of the two programs within a single office, as they were in the Division of Soil and Water Conservation. This co-location in the Office of the Secretary means the Reserve and coastal management program are able to support each other and magnify the impact of the programs, leveraging the strengths and resources of each program. This program integration is discussed in later sections of these findings.

There were some aspects of the DNREC reorganization still not finalized at the time of the site visit. However, based upon input from several people with whom the evaluation team met and general observations by the team, it appears that the Reserve's location within the Office of the Secretary and its continued co-location with the coastal management program provide a higher profile for the Reserve and opportunities for greater integration, collaboration, and support for and from other programs within DNREC.

The staff members of the Delaware NERR are well respected, knowledgeable, and responsive to requests for assistance. They have built several significant partnerships that will be discussed elsewhere in these findings. Since the last evaluation the Reserve has been able to add a full-time state merit position for a Coastal Training Program Coordinator. This is discussed in greater detail in the section entitled "Coastal Training Program." Staff members have played roles in a variety of local, regional, and national efforts during the period covered by this evaluation:

- The Research Coordinator served as chair of the NERRS SWMP Data Management Committee and leads the Public Safety and Infrastructure Subcommittee of the Delaware Sea Level Rise Advisory Committee. The Environmental Scientist serves as the SWMP Technician Representative on the Data Management Committee and provides training at the Technician Training Workshop administered by the NERRS Central Data Management Office.
- The Education Coordinator serves on the Delaware Children in Nature Task Force and is the state of Delaware's coordinator for Project WET (Water Education for Teachers). The Estuarine Coordinator is a member of Delaware's Envirothon Planning Team and chairs the Aquatic Ecology Workgroup. The Education staff advised the formation of the Delaware Association for Environmental Education.

- The CTP Coordinator serves on the Education and Outreach Committee of the Delaware Invasive Species Council and is co-lead of Delaware’s Sea Level Rise Outreach Workgroup.

ACCOMPLISHMENT: The Delaware Reserve staff members provide leadership and share their knowledge and expertise at national, state, and local levels.

In light of the general economic downturn in Delaware, the Delaware NERR has sometimes struggled to identify non-federal or state match for cooperative agreement awards. Most non-federal match funding for the Reserve is currently provided by the Delaware Coastal Programs under the Office of the Secretary of DNREC. During the site visit there was some indication that, as part of the ongoing departmental reorganization, DNREC might attempt to identify in one place all the sources of funding that come to DNREC and its programs, what sources require match, and what sources could provide match. This could be a definite advantage for the Reserve in its attempts to identify additional eligible match funds that are allowable, allocable, and reasonable (as defined in OMB Circular A-87).

PROGRAM SUGGESTION: The Department of Natural Resources and Environmental Control (DNREC) is encouraged to identify a single location and list of sources of funding that come to DNREC and its programs, require non-federal or state match, and potential match.

The Reserve manager is state-funded, but the other Reserve core positions (education and research coordinators) are federally funded. It is OCRM’s expectation that, in general, Reserve core positions (manager, education coordinator, and research coordinator) will be funded by the state or commonwealth partner, while federal funds will be used to carry out the Reserve’s programs. Although OCRM recognizes that the economy in the state and the country affects these funding decisions, OCRM encourages DNREC and the Reserve to look for ways to begin shifting some portion of the education or research coordinators’ salaries to state monies. This could initially start with a percentage of one of these salaries, with a gradual increase in the percentage over time.

PROGRAM SUGGESTION: The DNREC is encouraged to look for ways by which to increase state financial support for Reserve operations and management. As part of that search, the DNREC and Reserve are encouraged to continue to look for ways to begin shifting some portion of the education or research coordinators’ salaries to state funding to make available more funds for projects.

2. Management Plan

Reserves are required by federal regulation to have a current NOAA-approved management plan (15 CFR 921.3). The plan should describe the Reserve’s goals, objectives, and management issues, as well as strategies for research, education and interpretation, public access,

construction, acquisition, and resource preservation. A management plan has four valuable functions: 1) to provide a vision and framework to guide Reserve activities during a five-year period; 2) to enable the Reserves and NOAA to track progress and realize opportunities for growth; 3) to present Reserve goals, objectives, and strategies for meeting the goals to constituents; and 4) to guide program evaluations. Regulations also require that a Reserve's management plan be updated every five years.

The Reserve's management plan is dated 2004-2009 and, as of the date of these findings, is out of compliance with the five-year plan revision requirement. An FY 10 cooperative agreement award task indicated that the revised management plan was due to OCRM at the end of March 2012. In the spring of 2011, however, the Reserve and OCRM established a set of milestones for completion of the revision by December 2011. This milestone was not met, nor was the March 2012 milestone in the FY 10 cooperative agreement award met. Following the site visit, a draft of the revised management plan was submitted to OCRM for review on May 23, 2012. The completed final management plan must be submitted to OCRM no later than December 31, 2012.

<p>NECESSARY ACTION: A revision of Delaware Reserve's management plan is overdue and is not in compliance with the five-year revision requirement. The Reserve must complete updated revisions to its management plan. The completed final plan must be submitted to OCRM no later than December 31, 2012.</p>

3. Facilities and Infrastructure

The evaluation findings dated November 2006 included a program suggestion for the Reserve to give consideration to the long-term use and development of Reserve facilities at both the St. Jones and Blackbird components. During this evaluation period, the Reserve has enhanced its facilities and infrastructure.

The Reserve has acquired additional property at the Blackbird Creek component. This component is farther from more concentrated, urbanized areas and has been somewhat less publicly accessible. The Reserve was able to renovate an unusable existing structure that now includes lab space, office space, meeting rooms and equipment storage. The structure is known as the Blackbird Creek Reserve Stewardship Center. Trails have been established, a canoe/kayak launch was constructed, and access to the state's internet was made available. Until the Stewardship Center was completed, the Blackbird Creek Reserve was used primarily for research, monitoring, and some training workshops. The physical presence of the Stewardship Center now makes it possible to use the Blackbird Creek component for more educational and outreach programs.

The St. Jones Reserve Center is the Reserve's public face and visitor center – an education and research facility that includes Reserve offices, research and teaching laboratories, classroom space, dormitory rooms, a Coastal Training Center, and interpretive exhibits. The Coastal Training Center has two conference rooms that can be combined into a larger auditorium. During this evaluation period, photovoltaic panels were added to the roof of the Coastal Training Center, and a new HVAC system and energy-saving computer controls were installed. The

native plant nursery was expanded, and a patio, demonstration rain gardens, and additional storage sheds were installed. When an historic barn was destroyed during a winter storm in 2009, the Reserve had the old beams and posts salvaged and made into benches.

ACCOMPLISHMENT: The Delaware Reserve has enhanced its facilities and infrastructure during this evaluation period. The completion of the Blackbird Creek Reserve Stewardship Center has provided increased public access and more opportunities for outreach and training. Enhancements at the St. Jones Reserve Coastal Training Center are making the structure more energy-efficient.

Facilities enhancements at both components and greater public accessibility and use at the Blackbird Creek component bring more responsibilities and need for additional maintenance and operation costs. The issue of staff presence at both components is also a concern the Reserve will need to address – how much, when, and by whom. This will be a challenge for the Reserve in the coming years as long as state and federal budgets are constrained.

4. Delaware Coastal Programs Integration and Partner Coordination and Collaboration

The Reserve appears to be well-served by being co-located with the Delaware Coastal Management Program. The two programs are highly integrated and support one another, leveraging the strengths and resources of each program. Such integration almost always creates a balancing act for both programs, but particularly for the Reserve, in retaining a unique identity, ensuring reserve-funded staff members devote sufficient time to reserve core programs, and preventing a blurring of the lines between the two programs. Both programs work with many of the same partners, and during this evaluation period they have contributed almost seamlessly to several initiatives in the state.

1) Sea Level Rise Initiative

In recent years, improved climatic and ocean observation systems have made it possible for scientists to better assess the potential for sea level rise and make some predictions about the future. Some predictions have shown that coastal areas, particularly in the mid-Atlantic states, will likely see an increased rate of sea level rise. This will have economic, social, and environmental effects throughout the state of Delaware.

To help assess, prepare for, and minimize the potential impacts of sea level rise, the Delaware Coastal Programs are leading a multi-year Sea Level Rise Initiative. To reduce Delaware's future vulnerability to the effects of sea level rise, the initiative will:

- provide scientific and technical support for decision-making
- implement on-the-ground projects in partnership with stakeholders
- provide educational and outreach opportunities for stakeholders and the public
- improve existing policies and management practices and/or develop new policies and management practices where necessary

As part of the goal of providing scientific and technical support for decision-making, Delaware

Coastal Programs scientists have partnered with the National Wildlife Refuge (NWR) System, the University of Delaware, local Estuary Programs, and other state agencies to fill gaps in knowledge about coastal storms, tide levels, and marsh sediment accretion. A cooperative agreement with the US Fish and Wildlife Service is in place and the Delaware Coastal Programs staff are assisting with and training for real-time water quality monitoring and with sediment elevations tables (SETs) in the salt marshes in the northern and southern units of Prime Hook NWR. The Coastal Programs staff is helping with shoreline monitoring using a National Park Service modeling scheme, although this is not part of the cooperative agreement.

The DNREC Division of Fish and Wildlife maintains impoundments for mosquito control or for marsh restoration, but many of these are no longer functioning very well. The Division is working with the Refuge and the Coastal Programs in the decision-making process for what impoundments to lose, which to maintain, and whether to create new impoundments to support waterfowl.

2) Coastal Hazards and Community Resilience

As part of the Sea Level Rise Initiative's goal of implementing on-the-ground projects in partnership with stakeholders, the Delaware Coastal Programs are working with local governments to help them improve their preparedness for coastal storms and future sea level rise. Using high resolution elevation data, a real-time flood monitoring system has been developed for Kent County that will improve flood response in coastal communities.

The Town of Bowers Beach, within Kent County just south of the St. Jones component of the Reserve, faces worsening flooding and coastal hazards. After several years of coordination, including Delaware NERR Coastal Training Program technical assistance and resilience planning workshops, Bowers Beach and the Delaware Coastal Programs have completed an initial flooding and coastal hazards vulnerability assessment and have begun to develop mitigation strategies. A final drainage report provided general recommendations and conceptual designs for the Town's three highest priority areas based on project steering committee input. The Town will now be working to develop a community coastal resilience adaptation plan. Representatives from the Town were pleased with the assistance and close working relationship the Town had with the Delaware Coastal Programs. They indicated that the Coastal Programs staff engendered a great deal of trust within the local community and that having a single staff person as the Town's point of contact is a very positive aspect of the project. The Reserve has partnered on other projects and with other agencies, and some of these are discussed in later sections of these findings. The research/monitoring, educational/CTP, and stewardship programs are integrated as well, and this, too, becomes evident in later sections of this document.

ACCOMPLISHMENT: The Delaware Reserve is well integrated with the Delaware Coastal Management Program and has established numerous partnerships that draw upon the Reserve's strengths while leveraging partner resources to the benefit of all involved. Of particular note are the Delaware Sea Level Rise Initiative and the Town of Bowers Beach Community Resiliency Adaptation Plan.

5. Volunteer Support

The Reserve has a corps of volunteers who assist in a range of activities, including tree planting as part of the restoration efforts at the Blackbird Creek Reserve, participation at Reserve outreach events, maintenance of a native plant nursery, and establishment of the new herbarium. One of the significant, ongoing volunteer efforts involves the horseshoe crab survey. The Delaware Bay region is home to the largest population of the American horseshoe crab. Since 2001, the Reserve has coordinated surveys on three beaches in Delaware Bay every spring during peak horseshoe crab spawning days. The data collected by volunteers during these surveys is important for scientists to monitor changes in numbers of spawning crabs in the Bay.

Volunteers support Reserve programs and activities and fill needs that would not be completely met without their efforts. More than one person with whom the evaluation team met mentioned that a volunteer coordinator at the Reserve is needed, not only to organize and maintain the efforts of current volunteers, but to actively recruit new volunteers from among the Dover Air Force Base population and retirees in the area. Unless a volunteer commits to serve as coordinator, this perceived need will remain unfulfilled. Given the current fiscal situation at all levels of government, it remains a lower priority in terms of Reserve staffing.

B. RESEARCH AND MONITORING

1. Research Activities

One of the research and monitoring efforts of greatest importance to the Reserve is the natural and anthropogenic impacts to habitat degradation, change, or loss. To that end, the evaluation team noted the breadth and depth of research conducted at the Reserve by Reserve staff, through partnerships, and by outside researchers.

Several researchers discussed with the evaluation team the reasons why they appreciate being able to conduct research at the Reserve. They indicated that all staff members are very supportive and that Reserve facilities are open at all times for researchers. The ability to conduct research over the long term at a single location and to show student researchers how their research will be used by coastal managers were other reasons noted. Many researchers use the Reserve's System-wide Monitoring Program (SWMP) data for background or to incorporate into their long-term projects, including horseshoe crab spawning studies, sediment transport modeling, and sediment accretion studies. The Reserve has been instrumental in introducing reserve-based issues to university researchers – both faculty and students.

The Reserve has been engaged in cooperative as well as supportive research during this evaluation period. Examples of such research include, but are not limited to:

- ongoing development of a statewide marsh vulnerability index (MVI) based on the elevation of the marsh surface in the tidal regime. By analyzing several biological parameters and elevation data from each location, the optimum growth range of the species is being determined for various locations. With an MVI, highly susceptible

- marshes can be identified and targeted for conservation action;
- several hydrology, water quality bio-monitoring, and accretion studies in conjunction with staff from the Bombay Hook and Prime Hook National Wildlife Refuges to focus on the changes occurring in the two refuges and to assist in the conservation of refuge resources by using Reserve expertise in SWMP monitoring and in using the Reserve components as reference sites to the work conducted in the refuges;
- hydrology study with placement of several water level and flow devices to determine the avenues of coastal flooding and subsequent drainage issues of Kitts Hummock after 2008 severe coastal storm.

ACCOMPLISHMENT: Research conducted by the Delaware Reserve and in cooperation with or in support of others is driven by coastal management needs and is being used to resolve existing problems or provide for conservation or restoration actions. Of special note are elements of the Sea Level Rise Initiative and the efforts to assist Kitts Hummock residents and the Bombay Hook and Prime Hook National Wildlife Refuges.

2. Monitoring

The Reserve’s System-wide Monitoring Program (SWMP) exceeds minimum NERR SWMP requirements of four water quality and one meteorological station by having three water quality stations and one meteorological station at each of the two components of the Reserve. The Reserve has achieved acceptance rates of 97% for water quality and over 99% for meteorological data submitted to the NERR Central Data Management Office, which performs QA/QC on all data submitted by each Reserve. Reserve staff members have assumed leadership roles at the national level, as noted in the earlier discussion under “Administration and Staffing.” Researchers cited the Reserve’s long-term monitoring data as an important aspect in determining the location of their study sites. The Reserve, in turn, makes its data readily available to researchers and students.

Four sediment elevation tables (SETs) have been installed in each of the Reserve’s two components. Elevation data is collected quarterly from the SETs to determine accretion and subsidence rates in different habitats. The data is informing the development of the Reserve’s Marsh Vulnerability Index.

ACCOMPLISHMENT: The Delaware Reserve has contributed to monitoring leadership and expertise at a national level and collects quality data as recognized by the NERRS CDMO and others.

3. Graduate Research Fellows

The Reserve has supported eight NERRS Graduate Research Fellows (GRFs) during this evaluation period. The Research Coordinator has built strong working relationships with graduate institutions, so that the Reserve receives many more applicants than available fellowships, ensuring that the fellowship is competitive and the most merit-worthy research is

funded. The Reserve has provided them with boat and operator time and field support. In addition, the GRFs were furnished with significant amounts of information from SWMP, topography, habitats, and hydrology, as well as other data sets. GRF research has been incorporated into restoration efforts in the Blackbird Creek component, accretion/erosion rates relating to sea level rise, and marsh health modeling research. The GRF program in the Delaware Reserve has been used as a research program/fellowship as well as a workforce development tool. Several Delaware GRFs have gone on to work within DNREC, including the Delaware Coastal Programs, so the GRF program has not only provided important research to coastal management but has served as a STEM (science, technology, engineering, and mathematics) educational tool.

C. EDUCATION AND OUTREACH

1. Education and Outreach Programs

The Reserve continues to maintain strong partnerships with numerous educators and organizations and offers a variety of programs for K-12 and undergraduate students and teachers. All of the educators with whom the evaluation team met (and a number of educators who provided written comments as part of the Reserve's evaluation) are very pleased with the Reserve's educational programs. The Reserve's education program is multi-faceted, targeting statewide audiences, with K-12 field trips and outreach into classrooms, teacher professional development, public and community education programs, and outreach events for the public. During this evaluation period, the education staff conducted a Market Analysis and Needs Assessment (MA/NA), targeting the K-12 education community. The information from that analysis and assessment is being utilized in strategic planning for the Reserve's education program. NOAA's Office of Ocean and Coastal Resource Management encourages the NERR to consider findings of the MA/NA and how the Reserve will contribute to and support new and developing statewide education initiatives, such as Delaware's *Children in Nature* and *Maryland and Delaware Climate Change Education, Assessment and Research (MADE CLEAR)*, and continue to incorporate NERRS directed research and monitoring programs and results into education programs. *MADE CLEAR* should align well with the climate change education priorities of the NERRS and compliment the sea level rise work done by other sectors within the Reserve.

The Reserve's K-12 education program provides students and teachers with rich, educational experiences that enable them to develop the four strands of scientific proficiency:

- Know, use, and interpret scientific explanations of the natural world
- Generate and evaluate scientific evidence and explanations
- Understand the nature and development of scientific knowledge; and
- Participate productively in scientific practices and discourses.

Delaware NERR's leadership in K-12 education demonstrates its commitment to keep students in the science, technology, engineering, or mathematics (STEM) pipeline and to produce a strong workforce that will contribute to fields in ocean, coastal, atmospheric, and climate sciences.

The Reserve offers nine onsite educational programs, whose content can be tailored to meet the

needs of any grade level, and three outreach educational programs that Reserve staff members bring to the classroom. Educational programming has been expanded, and new partnerships have been developed that increase the capacity of all the partners during this evaluation period. This has included:

- The Reserve hosted the *Delaware Envirothon*, a statewide environmental education competition for students, at the St. Jones component in 2006 and at the Blackbird Creek component in 2011.
- The Reserve hosted the first *Make a Splash* water festival and estuary celebration in 2007 in partnership with the state Division of Historical and Cultural Affairs. It is now an annual event held at the St. Jones Reserve and nearby John Dickinson Plantation. *Make a Splash* is a cooperative event of the DNREC, the Reserve, John Dickinson Plantation, Project WET USA, Tidewater Utilities and others. It is designed for 4th graders and the 4th grade Land and Water and Delaware History state education units, and annual participation has been between 400 – 800 students annually.
- *Green Eggs & Sand* is an innovative workshop experience and set of curriculum modules designed to explore the Atlantic Coast horseshoe crab/shorebird phenomenon and management issues. The 10th anniversary of the award-winning curriculum was celebrated at the Reserve in the spring of 2010 in conjunction with the Delaware Division of Fish and Wildlife, the Maryland Department of Natural Resources, and the New Jersey Department of Environmental Protection. From 2009-2011 the curriculum was revised and updated and then piloted in the spring of 2011. At the time of the site visit, it was scheduled to be finalized by spring 2012.

The Delaware Reserve also places a strong emphasis on community education and outreach, and it partners with a range of entities to increase the capacity of all and reach a wider audience. During this evaluation period, the Reserve:

- Hosted the first Blackbird Creek Fall Festival in 2007 (now an annual event). The festival is designed to foster stewardship of coastal environments by celebrating the richness of estuaries, Delaware's cultural traditions and the Blackbird Creek site.
- Partnered with the Delaware Coastal Management Program, The Nature Conservancy, and the Partnership for the Delaware Estuary to launch the *Thank You Delaware Bay* campaign in 2008. The campaign is designed to raise awareness, instill a sense of personal connection, and encourage the public to take actions to help safeguard and protect Delaware Bay. A unique logo and slogan are used in print advertisements, posters, and public service announcements to promote bay stewardship and direct people to the *Thank You Delaware Bay* website.
- Held the first annual St. Jones Reserve Open House in the fall of 2009 in partnership with the Delaware Native Plant Society and in conjunction with its native plant sale. The Reserve offers guest speakers, videos, exhibit tours, and wetland hikes. Reserve staff indicated that this has been a successful effort in bringing new visitors to the Reserve.
- Hosted a national traveling exhibit, *Native Waters: Sharing the Source*, in the spring of 2008. The exhibit shares cultural and scientific ways of learning about the importance of water in people's lives. The Reserve worked closely with the Lenape Indian Tribe of Delaware and the Nanticoke Lenni-Lenape Tribe of New Jersey to develop a Delaware-

specific exhibit for display during the showing of the *Native Waters* exhibit.

Exhibits and communication tools are also a part of the Reserve's outreach efforts. Coastal and estuarine interpretive exhibits were installed in the Coastal Training Center in 2006, and plans for renovating exhibits at the St. Jones Reserve Visitors Center and the Blackbird Creek Reserve Stewardship Center were underway at the time of the site visit. The Reserve's website has been updated and the education staff have embraced social media as a communication tool, including Facebook, Twitter, and a weekly blog post.

ACCOMPLISHMENT: The Delaware Reserve takes great advantage of partnering with other organizations to increase the educational and outreach capacity of each without duplication. The Reserve has shown innovation, leadership, and the application of reserve science to education in incorporating horseshoe crab research and water quality monitoring into select education programs.

2. Coastal Training Program

At the beginning of this evaluation period, the Reserve did not have an approved Coastal Training Program (CTP). However, prior to its approval, 19 coastal decision-maker workshops were held, covering a range of priority coastal management issues. In 2008 the Reserve's CTP Market Analysis and Needs Assessment (MA/NA) was updated, and in 2009 the MA/NA and other planning documents were submitted to the OCRM Estuarine Reserves Division to implement the CTP in Delaware. The Reserve's CTP was officially approved in April 2009, and a CTP Coordinator was hired in July 2009. In May 2011 the CTP Coordinator position became a full-time position.

Since its approval, the CTP has held 22 workshops with more than 880 attendees. The workshops have covered a range of CTP priority issues, including sea level rise, sustainable habitat, and water quality. In 2010, the CTP partnered with DNREC's Watershed Assessment Section to host the biennial Delaware Wetlands Conference, designed to share resources, information, and programs that help preserve and protect wetlands and the services they provide with scientists, conservation organizations, land use planners, and decision makers.

The CTP also offers technical assistance and science translation. It assisted the Delaware Coastal Management Program with developing the *Survey of Delaware Residents' Opinions on Climate Change and Sea Level Rise* to examine thoughts and opinions on climate change and sea level rise in Delaware as well as opinions on management strategies and actions pertaining to these issues. The results of the study have informed numerous sea level rise outreach and education strategies of the CTP and other partners.

Staff of the CTP have assisted and continue to assist the Delaware Coastal Management Program with the facilitation of the Delaware Sea Level Rise Advisory Committee and its various subcommittees and working groups. The Delaware Sea Level Rise Advisory Committee will be an on-going CTP project for the next two years that will develop adaptation recommendations for the state. The CTP also serves on a separate statewide Sea Level Rise Outreach Workgroup

that has developed a strategy for decision-maker and public education and outreach for the state as well.

The Coastal Training Program has been very successful at reaching, working with, and training DNREC and other state employees. It recognizes that its challenges are now to increase its base of potential contacts and target audiences to participate in CTP workshops and trainings, to attract elected officials to attend CTP events, and to develop effective relationships with local communities and citizen groups. The evaluation team and NOAA's Office of Ocean and Coastal Resource Management concur and encourage the Reserve to focus in those areas.

ACCOMPLISHMENT: The Delaware Reserve's Coastal Training Program received full approval in April 2009 and is being implemented. A full-time CTP coordinator has been hired.

D. STEWARDSHIP AND RESOURCE MANAGEMENT

Within the NERR system, many Reserves conduct or accomplish programs or activities related to land acquisition, enforcement, restoration, restoration science, technical advice and support, and community education under the general rubric of stewardship and resource management. The Delaware Reserve does not have a dedicated stewardship coordinator. Other staff cover stewardship-related activities.

The Reserve has worked closely with the Coastal Management Program, Delaware Department of Agriculture, and others to conserve the Blackbird Creek watershed. This coordinated effort has created a constellation of protected areas that provide a buffer for the Reserve at the Blackbird Creek. Although no lands were acquired and incorporated into the Reserve boundary over the evaluation period, OCRM recognizes the Reserve's effort to partner with others to meet Reserve stewardship objectives.

The Reserve staff completed the Blackbird Creek Master Ecological Restoration Plan in 2007. The plan is now being implemented. This involves managing and controlling invasive species, such as kudzu, multiflora rose, autumn olive, Canada thistle, and phragmites. Over 18 acres of uplands and 11 acres of riparian buffer have been planted with trees. Stream restoration research and engineering design was in progress with the University of Delaware at the time of the site visit.

There are three demonstration sites that the Reserve has developed and maintains. The Alvin G. Wilson Conservation demonstration area continues to be maintained at the St. Jones Reserve. Also at the St. Jones Reserve, rain garden demonstration areas were installed in 2010 and 2011 as part of the *Rain Garden for the Bays* program. At Blackbird Creek Reserve, volunteers planted over 1,700 trees on six acres in 2009 as part of a hedgerow demonstration area.

ACCOMPLISHMENT: The Delaware Reserve completed the Blackbird Creek Master Ecological Restoration Plan and has begun implementation.

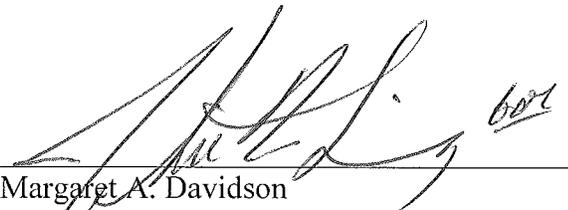
V. CONCLUSION

For the reasons stated herein, I find that the State of Delaware is adhering to the programmatic requirements of the Coastal Zone Management Act and the regulations of the National Estuarine Research Reserve System in the operation of its approved Delaware National Estuarine Research Reserve.

The Delaware Reserve has made notable progress in: Administration and Staffing; Facilities and Infrastructure; Coastal Programs Integration and Partner Coordination and Collaboration; Research Activities; Monitoring; Education and Outreach Programs; Coastal Training Program; and Stewardship.

These evaluation findings also contain three (3) recommendations: one (1) Necessary Action that is mandatory and two (1) Program Suggestions. The state must address the Necessary Action by the date indicated. The Program Suggestions should be addressed before the next regularly-scheduled program evaluation, but they are not mandatory at this time. Program Suggestions that must be repeated in subsequent evaluations may be elevated to Necessary Actions. Summary tables of program accomplishments and recommendations are provided in Section VI.

This is a programmatic evaluation of the Delaware 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.


Margaret A. Davidson
Acting Director, Office of Ocean and Coastal
Resource Management


Date

VI. APPENDICES

Appendix A. Summary of Accomplishments and Recommendations

The evaluation team documented a number of the Delaware Department of Natural Resources and Environmental Control and Reserve’s accomplishments during the review period. These include:

Issue Area	Accomplishment
Administration and Staffing	The Delaware Reserve staff members provide leadership and share their knowledge and expertise at national and state levels.
Facilities and Infrastructure	The Delaware Reserve has enhanced its facilities and infrastructure during this evaluation period. The completion of the Blackbird Creek Reserve Stewardship Center has provided increased public access and more opportunities for outreach and training. Enhancements at the St. Jones Reserve Coastal Training Center are making the structure more energy-efficient.
Delaware Coastal Programs Integration and Partner Coordination and Collaboration	The Delaware Reserve is well integrated with the Delaware Coastal Management Program and has established numerous partnerships that draw upon the Reserve’s strengths while leveraging partner resources to the benefit of all involved. Of particular note are the Delaware Sea Level Rise Initiative and the Town of Bowers Beach Community Resiliency Adaptation Plan.
Research Activities	Research conducted by the Delaware Reserve and in cooperation with or in support of others is driven by coastal management needs and is being used to resolve existing problems or provide for conservation or restoration actions. Of special note elements of the Sea Level Rise Initiative and the efforts to assist Kitts Hummock residents and the Bombay Hook and Prime Hook National Wildlife Refuges.
Monitoring	The Delaware Reserve has contributed to monitoring leadership and expertise at a national level and collects quality data as recognized by the NERRS CDMO and others.

Education and Outreach Programs	The Delaware Reserve takes great advantage of partnering with other organizations to increase the educational and outreach capacity of each without duplication. The Reserve has shown innovation, leadership, and the application of reserve science to education in incorporating horseshoe crab research and water quality monitoring into select education programs.
Coastal Training Program	The Delaware Reserve's Coastal Training Program received full approval in April 2009 and is being implemented. A full-time CTP coordinator has been hired.
Stewardship	The Delaware Reserve completed the Blackbird Creek Master Ecological Restoration Plan and has begun implementation.

In addition to the accomplishments listed above, the evaluation team identified two areas where the program could be strengthened. Recommendations are in the forms of Program Suggestions and Necessary Actions. Areas for improvement include:

Issue Area	Recommendation
Administration and Staffing	PROGRAM SUGGESTION: The Department of Natural Resources and Environmental Control (DNREC) is encouraged to identify a single location and list of sources of funding that come to DNREC and its programs, require non-federal or state match, and potential match.
Administration and Staffing	PROGRAM SUGGESTION: The DNREC is encouraged to look for ways by which to increase state financial support for Reserve operations and management. As part of that search, the DNREC and Reserve are encouraged to continue to look for ways to begin shifting some portion of the education or research coordinators' salaries to state funding to make available more funds for projects.
Management Plan	NECESSARY ACTION: A revision of Delaware Reserve's management plan is overdue and is not in compliance with the five-year revision requirement. The Reserve must complete updated revisions to its management plan. The completed final plan must be submitted to OCRM no later than December 31, 2012.

Appendix B. State's Response to Previous (2006) Evaluation Findings

Program Suggestion: OCRM encourages Delaware Coastal Programs to develop a strategy to disseminate information obtained from benthic mapping project to coastal managers and decision makers so that it can be used for coastal management applications, as well as policy updates.

Response: The Delaware Coastal Programs exports the data into a file package that is updated with the new data each season. This information is then transferred to anyone that requests it. As we near the completion of the mapping of the entire Bay, efforts are underway to have the final product distributed through the NOAA CSC digital coast data viewer. It will also be added to DNREC GIS drives, and offered to the Delaware Datamil for distribution.

Program Suggestion: OCRM strongly encourages DNREC to explore means by which to increase state financial support for DNERR operations and management.

Response: The DNERR continues to seek State funding support and has been able to obtain state funding for specific projects, equipment and supplies. This money has come from penalty funds and minor capital improvement (MCI) funds for items including: installation of a photovoltaic system; patio; zero-turn lawnmower; and lumber to repair the St Jones Reserve boardwalk.

Program Suggestion: DNERR should consider reinstating an Advisory Committee that could support program development and identify opportunities for collaboration.

Response: The DNERR utilizes ad hoc committees for specific topics or issues. There are two standing Advisory Committees for the DNERR, the Education Advisory Committee and the Coastal Training Advisory Committee.

Program Suggestion: OCRM encourages DNERR to think critically about the long-term use and development of Reserve facilities at both the St. Jones and Blackbird components. The Reserve should consider how facilities will best support expanding programs and public use, while balancing the inevitable increase in site maintenance.

Response: The DNERR has increased its land holdings and public access at the Blackbird Creek Reserve including a canoe/kayak launch, and renovating an existing building for office space, lab space, meeting space and equipment storage. Staffing resources is currently a limitation to expanding programs at the St Jones Reserve and Blackbird Creek Reserve facilities.

Program Suggestion: OCRM encourages DNERR to develop a plan for the translation and dissemination of research findings to best inform and engage coastal managers and decision makers.

Response: The DNERR now has a fully implemented Coastal Training Program.

Program Suggestion: OCRM strongly encourages DNERR to proceed with the development and implementation of their Coastal Training Program.

Response: The DNERR updated the original 2002 market analysis and needs assessment for a Coastal Training Program in 2008, reformed the Advisory Committee and completed the Program Strategy and Marketing Plan in 2009. Delaware received approval of its Coastal Training Program on April 29, 2009. A part-time seasonal Coastal Training Program Coordinator was hired June 29, 2009 to implement the Program. A full time Coastal Training Program Coordinator state merit position was reclassified, approved and hired May 9, 2011. The Coastal Training Program in Delaware is fully implemented.

Program Suggestion: DNERR should consider the stewardship program's current and future direction and needs and work with DNREC to identify how best to address them, such as through the hiring of a stewardship coordinator.

Response: The DNERR has integrated the activities of the stewardship program across all Reserve staff positions.

Appendix C. Persons and Institutions Contacted

Delaware Department of Natural Resources and Environmental Control (DNREC)

Collin O'Mara, Secretary
Sarah Cooksey, Administrator, Delaware Coastal Programs
Dave Carter, Manager, Delaware Coastal Programs
Tricia Arndt, Delaware Coastal Programs
Bonnie Arvay, Delaware Coastal Programs
Pat Hoffman, Delaware Coastal Programs
Brian Kelly, Delaware Coastal Programs
John Kennel, Delaware Coastal Programs
Susan Love, Delaware Coastal Programs
Drexel Siok, Delaware Coastal Programs
Kenny Smith, Delaware Coastal Programs
Mark Wolanski, Delaware Coastal Programs
Bartholomew Wilson, Delaware Coastal Programs
Carl Yetter, Delaware Coastal Programs
Laura Herr, Division of Water
Stewart Michels, Division of Fish and Wildlife
Dan Brower, Division of Watershed Stewardship
Lara Allison, Division of Watershed Stewardship
Sara Wozniak, Division of Watershed Stewardship
Rebecca Rothweiler, Division of Watershed Stewardship
Matt DiBona, Division of Fish and Wildlife
Gary Kreamer, Division of Fish and Wildlife
Craig Rhoads, Division of Fish and Wildlife
Wayne Lehman, Division of Fish and Wildlife
Ray Bivens, Division of Parks and Recreation
Brian Leahy, Office of the Secretary, Financial Services
Rebecca Zink, Office of the Secretary, Financial Services
Brenda DeLong, Office of the Secretary, Financial Services

Delaware National Estuarine Research Reserve

Kimberley Cole, Manager
Jennifer Holmes, Education Coordinator
Dr. Bob Scarborough, Research Coordinator
Kelly Valencik, Coastal Training Program Coordinator
Charles Bishop, Conservation Technician
Wes Conley, Conservation Technician
Kate Marvel, Estuarine Educator
Mike Mensinger, Environmental Scientist
Christina Pinkerton, Environmental Scientist
Brandon Boyd, NERRS Graduate Research Fellow
Ramona Stammerman, NERRS Graduate Research Fellow

State and Federal Agency Representatives

Michael Kirkpatrick, Delaware Department of Transportation
Kurt Reuther, Delaware Department of Safety and Homeland Security
Marcia Fox, Delaware Department of Agriculture, Forestry Service, Delaware Invasive Species Council
Cathy Martin, Delaware Invasive Species Council
Syd Swann, Delaware Government Information Center
Dr. Tom McKenna, Delaware Geological Survey
Gloria Henry, Delaware Department of State
Michael Stroeh, US Fish and Wildlife Service
Susan Guiteras, US Fish and Wildlife Service

Local Government Representatives

Karl Kalbacher, New Castle County
Ron Hunsicker, Mayor, Town of Bowers Beach

Academic/Educational Representatives

Dr. Nancy Targett, University of Delaware, Delaware Sea Grant
Kevin Brinson, University of Delaware
Dr. John Madsen, University of Delaware
Dr. Michael O'Neal, University of Delaware
Stephanie Stotts, University of Delaware
Dr. Mingxin Guo, Delaware State University
Dr. Gulnihal Ozbay, Delaware State University
Dr. Richard Chapas, University of Delaware, Experimental Program to Stimulate Competitive Research (EPSCoR)
Amy Broadhurst, EPSCoR
Jeanette Miller, EPSCoR
Dr. Christopher Sommerfield, University of Delaware, School of Marine Science and Policy
Dr. Richard Seyler, Wilmington University
Marlys Jean-Natonick, St. John's Lutheran School

Other Organizations and Individuals

Bill Swiatek, Wilmington Area Planning Council
Dennis Coker, Lenapi Tribe of Delaware
Rich Collins, Positive Growth Alliance
Dr. Chad Tolman, Delaware League of Women Voters
Peggy Schultz, Delaware League of Women Voters
John Taylor, Delaware Chamber of Commerce
Jennifer Adkins, Partnership for the Delaware Estuary
Dr. Danielle Kreeger, Partnership for the Delaware Estuary
Lisa Wool, Partnership for the Delaware Estuary
Ed Lewandowski, Center for the Inland Bays
Sally Boswell, Center for the Inland Bays
Jim Martin, Town of Bowers Beach
Valladaras Family

Other Organizations and Individuals (continued)

Pete and Mary Ann Varanko

Dr. Richard Weber

Appendix D. Persons Attending the Public Meeting

The public meeting was held on Monday, September 19, 2011, at 6:00 p.m. at the Delaware Reserve's St. Jones Visitor Center, 818 Kitts Hummock Road, Dover, Delaware. This was a joint public meeting for the Delaware Reserve and the Delaware Coastal Management Program. The following people signed in at the meeting:

Jim Bailey, Broadkill Beach Preservation Association
Mary Burke, Kitts Hummock resident
Barbara Cooney, Kitts Hummock resident
Carol Costello, Kitts Hummock resident
Michael Costello, Kitts Hummock resident
James Keating, Kitts Hummock resident
Jim Kirkbride, Pickering Beach property owner
Nancy Lawson, Pickering Beach property owner
Cheryl Lord, Kitts Hummock resident
Frank Lord, Kitts Hummock resident
Jim Martin, Bowers Beach property owner
James Sullivan, DNREC, Division of Watershed Stewardship
Dorothy Welliver, Pickering Beach property owner

Appendix E. NOAA's Response to Written Comments

NOAA received written comments regarding the management or administration of the Delaware National Estuarine Research Reserve. Each of the letters is part of the official record of the evaluation and is briefly summarized here, followed by OCRM's response.

Chuck Sanders

McVey Elementary School, Newark, Delaware

Comment: Mr. Sanders and his fifth graders are very pleased with the Reserve education staff and the St. Jones Reserve.

OCRM's Response: The evaluation team thanks Mr. Sanders and his students for their comments.

Sharon Tucker, Ph.D.

University of Delaware Associate in Arts Program

Comment: Dr. Tucker brings Ecology students to the Reserve for a field trip each semester. She is very impressed with the Reserve, the staff, and the education programs that are offered. A lot of information and experiences are provided in a two-hour trip, and her students consistently rate the trip as their first or second favorite class activity.

OCRM's Response: The evaluation team thanks Dr. Tucker for her comments.

Joyce Nauman

Cape Henlopen High School, Lewes, Delaware

Comment: Ms. Nauman has used the St. Jones Reserve educational programs many times and has always found them to be exceptional on many levels.

OCRM's Response: The evaluation team thanks Ms. Nauman for her comments.

Jim Sullivan, Planner

DNREC, Division of Watership Stewardship

Comment: Mr. Sullivan expresses his appreciation for the Coastal Training Program. The CTP training programs enhances his skills, and having the trainings at the Reserve allows more DNREC staff to participate in tight fiscal times.

OCRM's Response: The evaluation team thanks Mr. Sullivan for his comments.

Christina Wirtz, Outreach Ombudsman

DNREC, Division of Waste and Hazardous Substances

Comment: Ms. Wirtz has taken CTP classes and appreciates the concise and comprehensive training, the opportunities for skill-building, and that the information and technologies regarding

climate change and sea level rise are the most recent. She also noted that when her son was in grade school, he (and many other children) the Reserve provided field activities and workshops that were a wonderful opportunity.

OCRM's Response: The evaluation team thanks Ms. Wirtz for her comments.

**Dorothy Abbott, Extension Agent
University of Delaware Cooperative Extension**

Comment: Ms. Abbott noted that the facilities at the St. Jones River and Blackbird Creek reserves are excellent facilities that serve as community demonstration sites and that staff members are very knowledgeable and helpful. She indicated that she is pleased to see the Reserve staff engage in other environmental education activities coordinated through federal, state, higher education, and local entities as partners.

She would like to see the historical perspective of the St. Jones River and the Blackbird Creek enhanced in Reserve programming, because the two rivers were a major part of the surrounding urban and rural communities and played a significant part in Delaware's history.

OCRM's Response: The evaluation team thanks Ms. Abbott for her comments and will share those comments with the Reserve staff as they relate to enhanced programming.

**Kathy Harvey, Mayor
Town of Odessa**

Comment: Mayor Harvey noted that the Town of Odessa participated in the Coastal Heritage Driving Tour in the spring of 2011, was very pleased to host the Reserve in this effort, and looks forward to working with the Reserve again in the future. Mayor Harvey was very complimentary toward staff members.

OCRM's Response: The evaluation team thanks Mayor Harvey for her comments.

**Kit Carson
Kitts Hummock property owner**

Comment: Kit Carson wrote that Kitts Hummock is a historic beachfront community and not a poorly thought-out new development. He hopes it will be treated fairly in terms of sand replenishment and protection from sea level changes.

OCRM's Comment: The evaluation team thanks Kit Carson for the comments. However, the Delaware National Estuarine Research Reserve plays no part in sand replenishment as protection from sea level changes.