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

MAR 12 2012

John R. Griffin, Secretary
Maryland Department of Natural Resources
580 Taylor Avenue
Tawes State Office Building
Annapolis, Maryland 21401

Dear Secretary Griffin:

Enclosed are the final evaluation findings for the Chesapeake Bay National Estuarine Research Reserve in Maryland (CBNERR) for the period from December 2005 to January 2011.

The fundamental conclusion of this evaluation is that the Maryland Department of Natural Resources (DNR) is adhering to the programmatic requirements of the National Estuarine Research Reserve System in its operation of the federally approved CBNERR. This document contains a number of program accomplishments and a few recommendations, one of which is mandatory.

These findings reflect the administration and implementation of the Reserve at the time of the evaluation. We delayed the release of the final findings, however, upon learning that DNR had proposed and begun operating within a new structure that affected the CBNERR program. We greatly appreciated the invitation from Matt Fleming to discuss these developments. Representatives from my office's Estuarine Reserves, Coastal Programs, and National Policy and Evaluation Divisions, met with DNR staff in December to learn more about the proposal and discuss what it would mean for CBNERR staff to be distributed within the new Chesapeake and Coastal Service. While we look forward to the anticipated positive results of the reorganization, we have noted our initial concerns in the findings document. This text is new since your draft review in August, but there is no recommendation associated with it.

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

Sincerely,

Donna Wieting

Donna Wieting
Acting Director

Enclosure

cc: Elizabeth Ebersole, Manager, Chesapeake Bay NERR, Maryland DNR
Frank Dawson, Assistant Secretary for Water Resources, Maryland DNR
Matt Fleming, Director, Chesapeake and Coastal Service, Maryland DNR
Laurie McGilvray, Chief, Estuarine Reserves Division, OCRM

FINAL EVALUATION FINDINGS

CHESAPEAKE BAY NATIONAL ESTUARINE RESEARCH RESERVE MARYLAND

December 2005 – January 2011

March 2012

Office of Ocean and Coastal Resource Management
National Ocean Service
National Oceanic and Atmospheric Administration

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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 315 and 312 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 examined the operation and management of the Chesapeake Bay National Estuarine Research Reserve in Maryland during the period of December 2005 through January 2011. The Chesapeake Bay National Estuarine Research Reserve (CBNERR or Reserve) is administered by the Maryland Department of Natural Resources (DNR or Department).

This document describes the evaluation findings of the Director of NOAA's Office of Ocean and Coastal Resource Management (OCRM) with respect to CBNERR 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 Maryland Department of Natural Resources is successfully implementing and enforcing its federally approved NERR.

The evaluation team documented a number of CBNERR accomplishments during this review period. The Reserve greatly expanded and enhanced its research, education and stewardship programs during this evaluation period through new projects and programming. OCRM finds that CBNERR has been successful in promoting its capabilities and developing partnerships across DNR, and that the Department has been supportive in this regard. In addition, the Reserve demonstrated both skill and success in engaging a wide range of partners in collaborative efforts. Notable Reserve efforts during this evaluation period included: increased visibility for the Research and Monitoring program and a new project on monitoring marsh elevation dynamics in response to sea level change; the development of education initiatives including new K-12 programs and the teacher training "Data and the Estuary"; the implementation and successful programming of the Coastal Training Program; and the expansion and integration of stewardship efforts. CBNERR has also completed a substantial boundary expansion and enhance facilities at component sites.

In addition to these numerous accomplishments, the evaluation team identified a few areas where the Reserve and its programming could be strengthened. Two of the recommendations for CBNERR are in the form of Program Suggestions, which describe actions that NOAA believes DNR should take to improve the program but that are not currently mandatory. As mentioned above, CBNERR reach and programming have greatly matured during this review period. This expansion of the Reserve motivated evaluation recommendations regarding reserve administration, including oversight of administrative staff. The Reserve also has one Necessary Action, which must be addressed by the timeline provided. The Reserve must revise its Memorandum of Understanding with its partner at the Monie Bay component.

II. PROGRAM REVIEW PROCEDURES

A. Overview

NOAA began its review of CBNERR in November 2010. The §312 evaluation process involves four distinct components:

1. An initial document review and identification of specific issues of particular concern;
2. A site visit to Maryland including interviews and a public meeting;
3. Development of draft evaluation findings; and
4. 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 CBNERR approved by NOAA. These must be carried out by the date(s) specified;
>
> **Program Suggestions** denote actions that the 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 are outlined in Appendix A.

Failure to address Necessary Actions may result in 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 CBNERR.

B. Document Review and Issue Development

The evaluation team reviewed a wide variety of documents prior to the site visit, including (1) the federally approved 2008-2012 Management Plan and program documents; (2) financial assistance awards and work products; (3) semi-annual performance reports; (4) official correspondence; (5) previous evaluation findings; and (6) relevant publications on natural resource management issues in Maryland.

Based on this review and on discussions with OCRM's Estuarine Reserves Division, the evaluation team identified the following priority issues:

- The Reserve's general administration, including grants and fiscal management;
- Implementation of the Management Plan;
- Facilities development and operations planning;
- Implementation of the Reserve's research, stewardship, monitoring, coastal training, and education programs;
- Reserve staffing and needs;
- The manner in which the Reserve coordinates with other governmental and non-governmental organizations and programs in the state and region;
- Major accomplishments and challenges during the review period; and
- The state's response to the previous evaluation findings dated May 2006.

C. Site Visit to Maryland

Notification of the scheduled evaluation was sent to Maryland's DNR and CBNERR. In addition, a notice of NOAA's "Intent to Evaluate" was published in the *Federal Register* on November 12, 2010, and in *The Capital* weekly (Annapolis, Maryland) from December 12, 2010 to January 24, 2011.

The site visit to Maryland was conducted January 24-27, 2011. Kim Penn, Evaluation Team Leader, OCRM National Policy and Evaluation Division; Michael Migliori, CBNERR Program Specialist, OCRM Estuarine Reserves Division; and Kim Cole, Reserve Manager, Delaware NERR, Delaware formed the evaluation team.

During the site visit, the evaluation team interviewed CBNERR and Maryland DNR staff, federal partners, other state officials, and nongovernmental representatives. Appendix B lists persons and institutions contacted during this review.

As required by the CZMA, NOAA held an advertised public meeting during the evaluation on January 25, 2011, at 7 p.m., at the McCann Center at Jug Bay Wetlands Sanctuary, 1361 Wrighton Road, Lothian, Maryland. The public meeting is to give members of the general public the opportunity to express their opinions about the overall operation and management of CBNERR. Appendix C lists persons attending the public meeting.

The excellent support of CBNERR staff with the site visit's planning and logistics is gratefully acknowledged.

III. RESERVE PROGRAM DESCRIPTION

NOAA's Office of Ocean and Coastal Resource Management designated Maryland's Chesapeake Bay Estuarine Research Reserve (CBNERR or Reserve) in 1985. The state lead agency is the Department of Natural Resources (DNR). The Reserve was originally designated as a multi-component site composed of five subregions, however in 1988, DNR proposed a revised plan for a three-site system to NOAA. In January 1989, NOAA endorsed the three-site plan. Under this concept, the Reserve is now composed of the sites of Monie Bay (representing the Lower Middle Bay and designated in 1985); Otter Point Creek (representing tidal freshwater wetlands in the Upper Bay and designated in 1990); and Jug Bay (representing a tributary and designated in 1990).

The Reserve is administratively located in the Community and Local Government Services division within the Watershed Services Unit of the Office of Aquatic Resources at DNR. The Reserve manager is responsible for overall Reserve operations and management, the NERRS system-wide goals and objectives as well as the specific Reserve goals and objectives as defined in the management plan. Two of the three components (Otter Point Creek and Jug Bay) have site managers or coordinators who are not employees of DNR. DNR is responsible for oversight of the Monie Bay component.

The Chesapeake Bay is the largest estuary in the United States and is one of the most productive bodies of water in the world. It lies within the Atlantic Coastal Plain in the Chesapeake Bay Subregion of the Virginian Biogeographic Region, roughly half in the State of Maryland and half in the Commonwealth of Virginia. The multi-component Chesapeake Bay Reserve in Maryland reflects the diversity of estuarine habitats found within the Maryland portion of the Bay. In the Maryland portion of the Bay's watershed are a variety of habitats. The Maryland Reserve encompasses several of those habitats, and the locations of the three sites reflect the importance of tributaries to the overall health of the Bay ecosystem. The four site managers and their staff work with the Reserve manager and staff to conduct research, education, and stewardship activities.

Monie Bay, the 3,426 acre southernmost component, is located on the Deal Island Peninsula in northwest Somerset County on the eastern shore of the Lower Middle Bay. Monie Bay is a tributary of Tangier Sound and ultimately the Chesapeake Bay. The component is comprised of wetland creeks and rivers, salt marshes, scrub-shrub wetlands, forested wetlands, forested uplands and coastal grasslands. The land is owned by the State and managed by DNR's Wildlife and Heritage Service as part of the much larger 13,000-acre Deal Island Wildlife Management Area.

Otter Point Creek (approximately 736 acres) is the northernmost Reserve component and is located in Harford County on the western shore of the Upper Bay. The creek flows into the Bush River, which drains into the Chesapeake Bay. The component is comprised of open water, tidal marshes, forested wetlands and upland hardwood forests, which are surrounded by highways, homes and commercial development. One of the last remaining freshwater tidal marshes in the upper Chesapeake Bay is found in the Otter Point Creek component. Landowners include

Harford County and the Izaak Walton League.

The Jug Bay component is situated along both sides of the Patuxent River in Anne Arundel and Prince George's counties. Jug Bay is a shallow embayment of the Patuxent River, which is a tributary of the Chesapeake Bay. Habitats of the Jug Bay component include creeks and rivers, freshwater tidal marshes, scrub-shrub wetlands, forested wetlands, forested uplands and fields. The Anne Arundel County Department of Recreation and Parks manages its county-owned property as the Jug Bay Wetlands Sanctuary on the east side of the Patuxent River. The Maryland-National Capital Park and Planning Commission and Prince George's County own and manage the Jug Bay Natural Area portion of the larger Patuxent River Park on the west side of the river. Portions of both county acreages are designated as the 2,087 acre Jug Bay component of the Reserve.

IV. REVIEW FINDINGS, ACCOMPLISHMENTS, AND RECOMMENDATIONS

A. Operations and Management

1. Reserve Administration and Staffing

According to the Management Plan (2008) for the Chesapeake Bay NERR in Maryland (CBNERR or Reserve), the Reserve's mission is "to improve coastal resource management by increasing scientific understanding of estuarine systems and making estuarine research relevant, meaningful, and accessible to managers and stakeholders." As part of the Maryland Department of Natural Resources (DNR or Department), the Reserve also helps to achieve the Department's mission "to preserve, protect, enhance and restore Maryland's natural resources for the wise use and enjoyment of all citizens."

Throughout the site visit, the evaluation team observed many ways in which CBNERR and DNR support and complement each other's operations and missions. It was evident to the evaluation team that DNR acknowledges the value of the Reserve and its initiatives. For example, CBNERR was described as an "integrating unit" within the Department's Watershed Services Unit (WSU) by providing the skills and services to integrate science and research into coastal management, stewardship and education, and by helping WSU to partner with other programs across the Department. The Reserve has greatly developed this function and these partnerships, which were noted as "invaluable and critical in this climate." Staff interviewed throughout the site visit noted that the Reserve expertise, information, and products are relied upon by the Department. OCRM commends the Reserve and the DNR on their efforts over the evaluation period to promote and better integrate CBNERR, its capabilities, and capacity across the Department.

The widespread success of CBNERR programs is attributable to experienced Reserve leadership and the talented and energetic staff. The Reserve Manager works to strengthen the Reserve's overall impact and is an effective and supportive leader, encouraging staff initiatives and fostering an environment of camaraderie and cooperation. The evaluation team found staff to be knowledgeable, dedicated, and highly regarded in their fields. They are also trusted partners in the research, education and resource stewardship communities. Staff work well together to advance Reserve goals and implement programmatic initiatives, which will be described throughout this document. The evaluation team noted that now with more mature programs, CBNERR could be more strategic in integrating efforts across sectors. For example, there appears to be support and excitement about opportunities for the Research and Coastal Training Programs to collaborate. OCRM encourages the Reserve to consider how to integrate across research, education and stewardship efforts where appropriate.

A number of Program Suggestions and one Necessary Action from the last evaluation focused on staffing deficiencies and state support. At around the time of the beginning of this evaluation period, there were no core Reserve staff at DNR. At the time of the site visit, all core positions were filled. In addition, during this evaluation period, the Department has supported the

reclassification (elevation) of staff positions including those for the Research, CTP and Stewardship Coordinators. The Reserve is one of the only Programs in DNR that has grown, with the addition of a fulltime Research Assistant, a seasonal Education Assistant, a fulltime CTP Aide, a seasonal Volunteer Coordinator at Monie Bay, and three seasonal contractual Research Interns. These changes have helped the Reserve to attract and retain highly qualified people, an issue during the last evaluation period. Reserve staff are successfully implementing the programmatic initiatives pursued by CBNERR, as will be described throughout this document. OCRM is pleased with the level of support provided to CBNERR by DNR, and commends the State for fostering this relationship.

Accomplishment: CBNERR has been successful in promoting its capabilities and developing partnerships across DNR. In addition, DNR's Watershed Services Unit has demonstrated its commitment to the partnership by prioritizing Reserve staff positions.

DNR also provides the Reserve with some administrative support. At the time of the site visit, Federal funds allocated through CZMA Section 315 operations support an office secretary (50%) and fiscal officer (50%). Though partially supported by CBNERR, the Reserve Manager has no responsibility for, or oversight of, these positions. OCRM acknowledges and understands state budget issues and the need to identify opportunities for efficiencies such as sharing administrative staff among programs. That said, the evaluation team noted that Reserve staff would likely be better supported if the Reserve Manager was also engaged in developing and tracking the performance of administrative staff. OCRM encourages DNR to allow the Reserve Manager more management authority with regard to the hiring, tasking, and performance evaluation of administrative staff funded by the NOAA grant.

Program Suggestion: OCRM strongly encourages DNR to afford the Reserve Manager joint oversight responsibility for the office secretary and fiscal officer who are supported in part via the NERR grant.

At the time of the site visit, the Reserve was located in the Community and Local Government Services division within the Watershed Services Unit (WSU) of Aquatic Resources in DNR. Community and Local Government Services was at the same level in the WSU organizational structure as the Chesapeake and Coastal Program and four other divisions. Though the Reserve Manager was responsible for a relatively large program with 12 DNR staff and formal partnerships with three county governments and another division within DNR, she was not present when WSU decisions were made that could impact the Reserve, nor was the Reserve Manager always consulted when her expertise could be brought to bear on efforts undertaken by the Unit.

As noted here, and will be supported further throughout this document, the Reserve has grown its staff, programming and partnerships substantially during this evaluation period. The Reserve works closely with divisions of WSU to develop and implement programs that address coastal management research and training needs across the Department and at various scales within the coastal zone. The Reserve provides science and services to partners that extend beyond communities and local governments. The evaluation team heard from various DNR staff across

Watershed Services regarding the importance of the Reserve to DNR. For example, the WSU Director noted how the Reserve is a microcosm of the Unit and provides an important link between Watershed Services and the Research and Assessment Services Unit. Another upper-level DNR manager noted the Reserve Manager has done a good job integrating the Reserve into the Department, but feels that there are opportunities to better integrate and broaden the base of people who are aware of the resources, issues and programming that the Reserve addresses.

The Reserve has increased the visibility of both the DNR and NERRS by providing critical services to DNR, at component sites, and throughout Maryland's coastal zone. Given the proven strengths of the Reserve and expanded scope of its programming, OCRM encourages DNR to evaluate where and at what level within the organizational structure the Reserve program ought to sit in order to be the most effective for both NERRS goals and those of the Department. Reserve placement could be better aligned with the breadth and strength of its science, programs and services, which would continue to enhance visibility of these tremendous assets.

Program Suggestion: OCRM encourages DNR to consider optimal organizational placement for the Reserve within the Watershed Service Unit that would promote further integration of CBNERR's expertise and capabilities across the Unit and Department.

Note: Subsequent to the site visit and State review of these draft findings, DNR has put forth a proposal for, and begun to implement, a reorganization of the Watershed Services Unit. The proposal aims to elevate the framework of the CZMA within DNR and to better align national, state and local objectives of the federally and specially funded programs for coastal and Chesapeake Bay watershed management activities. DNR is currently operating within this structure, where CBNERR staff are fully integrated into the new Chesapeake and Coastal Service. This means that Reserve staff members are located in different divisions within the Unit in order to align expertise and capabilities within a structure of services provided (e.g., Coastal and Marine Assessment, Conservation Education and Stewardship).

OCRM understands that the benefits of the reorganization may include better coordination and leveraging of resources for integrated coastal management, developing new partnerships, and increasing capacity across the Unit. As described throughout this document, Reserve staff capabilities are highly regarded throughout the Department, and clearly their expertise will benefit the Unit as a whole. However, there is also concern that this new structure could weaken the inter-disciplinary work, effectiveness, and identity of the Reserve as a unique program with its own clearly articulated goals. The Reserve team that has been assembled to implement the mission of CBNERR in specific, and the NERRS in general – research, education and stewardship – are now dispersed throughout the Unit. This distributed organization could prove challenging to the Reserve manager who no longer has direct oversight of her core staff to ensure program success. The multi-component nature of the Reserve, in which partner staff are also physically located at geographically different sites, will provide an addition layer of complexity to the management structure and program implementation. CBNERR is the first program to be integrated this way across a larger division, and as such, OCRM will closely monitor the Reserve's implementation in accordance with the CZMA, implementing regulations, and CBNERR Management Plan.

At the time these findings were signed, the reorganization had been approved by the Secretary of DNR, but was still undergoing final review at the Department of Budget and Management. DNR should keep OCRM apprised as the situation changes. Also note that the remainder of this document is drafted with references to the DNR organization as it was at the time of the site visit.

CBNERR component sites are managed cooperatively, led by DNR's Watershed Services Unit but involving critical local partners including: DNR's Wildlife and Heritage Service (WHS), Harford County Parks and Recreation, Harford County Chapter of the Izaak Walton League of America, Maryland-National Capital Park and Planning Commission (MNCPPC), and Anne Arundel County Recreation and Parks. Memoranda of Understanding (MOUs) are in effect with partners that further define management roles within the Reserve. One of the objectives articulated in CBNERR's Management Plan (2008) is that "Reserve operations will be improved by ensuring adequate State support, maintaining local support capabilities, and fostering good internal communication."

Multi-component reserves are often challenged by the coordination and communication necessary to administer the program as an integrated whole. Travel to component sites is time consuming, sites will have unique priorities and needs, staff and shared equipment must be coordinated, and partners will likely have different protocols and procedures for program operations. That said, OCRM finds that CBNERR is doing an excellent job overall working with its site-specific partners to advance Reserve programming, and the multi-component nature of the Reserve contributes to its success in informing coastal management in the State. The Reserve is fortunate to have strong partners, and Reserve staff make a concerted effort to integrate initiatives where possible, while still addressing the myriad of site-specific management, research and education needs.

At Otter Point Creek, the site property is owned by Harford County and the Izaak Walton League of America (IWLA, Harford County Chapter). Harford County's Parks and Recreation Department provide an on-site manager and staff at Leight Park and the Anita C. Leight Estuary Center, a facility that serves as a visitor and education center. Research, monitoring, education, and stewardship programs and projects are conducted, and the component is well-served by a volunteer friends' group the Otter Point Creek Alliance. At Jug Bay, the component property is owned and managed by the MNCPPC on the west site of the Patuxent River as Patuxent River Park, and Anne Arundel County on the east side of the river as the Jug Bay Wetlands Sanctuary. There are on-site managers and staffs located in two separate facilities, responsible for the Jug Bay portion of the Reserve located in their respective counties. The partnership at the Jug Bay component on both sides of the river provides a mix of strengths and activities, from passive recreation to interpretive programs, research and monitoring to stewardship. Jug Bay is also strongly supported by an active regional volunteer friends' group, the Friends of Jug Bay. CBNERR also provides small grants to partners at Otter Point Creek and Jug Bay to supplement projects, purchase supplies and support interns. CBNERR is fortunate in that components at Otter Point Creek and Jug Bay have engaged on-site managers, dedicated staff, visitor facilities and active volunteer groups. OCRM finds that these components are being administered in accordance with their MOUs.

The Reserve's Monie Bay component is cooperatively managed with WHS. The current MOU was signed between DNR's Forest, Parks and Wildlife Service and the Tidewater Administration in 1985 to formalize this relationship. It has not been updated since, but was reviewed by both parties (the current offices: Wildlife and Heritage Service and Watershed Services Unit) in 2007-2008 during the Management Plan revision process. According to the MOU, WHS staff are responsible for implementing the Reserve Management Plan at the component, and supporting the CBNERR in long-term research and educational programming, including the improvement of access and development of additional facilities as necessary. Currently, some research and monitoring efforts are conducted at Monie Bay, in addition to limited educational programs in the region.

The evaluation team noted that regional and local WHS staff are supportive of, and engaged in, the established partnership at Monie Bay. Reserve staff have use of WHS facilities for equipment storage, meeting and office space, and receive assistance with limited programming. CBNERR has also worked to expand programming at the site during this evaluation period. However, it appears that there is not a clear understanding of, nor operational commitment to, the CBNERR partnership by WHS as outlined in the MOU dated 1985. For example, WHS recently eliminated the Monie Bay site manager position without involving the Reserve Manager in the decision, or subsequently notifying her. Understandably, the mission of the WHS is not the same as that of the NERRS, but the current MOU articulates that the Reserve's Management Plan should augment the management activities at Deal Island Wildlife Management Area. WHS was given the opportunity to review the revised Management Plan for the Monie Bay component in 2008 and did not provide comments.

This partnership is critical to the long-term management of the Reserve component at Monie Bay. OCRM would like to see WHS demonstrate their continued commitment to the management of the site in support of the Reserve's mission by developing a revised, updated MOU that clearly articulates this commitment.

Necessary Action: OCRM requires that DNR develop a revised Memorandum of Understanding between the Watershed Services Unit and the Wildlife and Heritage Service detailing the partnership responsibilities for the management of the Reserve's Monie Bay component. A draft MOU should be submitted to OCRM for review, by the Estuarine Reserves Division and National Ocean Service's General Council, by June 30, 2012.

2. Financial Assistance Awards

OCRM awarded the State of Maryland federal financial assistance for the programs, operations and management of the CBNERR as well as competitive funding for several construction projects during the evaluation period. OCRM requires CBNERR to submit semi-annual performance reports that provide information about accomplishments related to each financial assistance award.

There have been some issues with grant management during this evaluation period. This is due in part to staff turnover. A number of extended staff vacancies in CBNERR resulted in unexpended Federal funds and requests to OCRM for award extensions and reprogramming. In 2006, DNR returned over $60,000 to NOAA, and in both 2007 and 2008 over $20,000 of the Federal grant had to be returned. Accounting errors resulted in insufficient funds available to complete tasks within FY2006 operations awards. The scope of work for these incomplete tasks was completed under subsequent award with FY2007 funding. In addition, DNR had four different fiscal officers working with the Reserve during this time. In February 2009, the OCRM program specialist for CBNERR traveled to Annapolis to meet with the Reserve Manager, senior leadership at Watershed Services, and fiscal officers to discuss concerns over grants management. Since that time, the Reserve and Watershed Services have met milestones to correct mistakes to and to prevent similar issues in the future. Currently the Reserve Manager meets monthly with her fiscal officer to track expenditures and estimates for planned purchases. The evaluation team heard that the Reserve and Chesapeake and Coastal Programs have been working to ensure that grants and contracts are managed consistently, and OCRM would strongly encourage that this continues.

3. Partnerships

CBNERR staff continue to build and strengthen partnerships to further Reserve goals and address key issues. Reserve partnerships are diverse, and include those with counties and municipalities, state and federal agencies, universities, and school districts. The evaluation team noticed a great rapport between Reserve staff and program partners, which has resulted in many successful initiatives including applied research projects, coastal training workshops, and demonstration projects. Partners seem enthusiastic about collaborating with Reserve, and do so at local, state and regional levels. The evaluation team spoke with many of these partners during the site visit, all of whom described a noticeable positive difference in CBNERR over the evaluation period. These collaborations help CBNERR to accomplish much more than would be possible on its own. OCRM commends the Reserve staff for fostering such an extensive breadth of partnerships.

While these partnerships are essential to the success of Reserve programs, describing them all in detail is outside the scope of this document. Two examples of particular relevance to Reserve management are included here.

NOAA Partnership Programs: Chesapeake and Coastal Program and Sea Grant
One of the primary goals of the NERR System is to help address priority coastal management issues through scientific research conducted at reserves. Attaining this goal requires two-way communication and collaboration with the coastal management community. CBNERR is organizationally located within the same DNR unit as Maryland's Chesapeake and Coastal Program. Maryland's Chesapeake and Coastal Program (CCP) is a networked program, implemented through partnerships with local, regional and state agencies. Priorities include helping communities prepare for climate change and coastal hazards, protecting habitats, and encouraging citizen stewardship of coastal resources. While most efforts are informal, it appears that collaboration between the two programs has increased during this evaluation period through

activities including land acquisition planning and addressing climate change impacts to Maryland's coastal communities.

The establishment of CBNERR's Coastal Training Program (CTP) has clearly strengthened the partnership. The CTP works closely with the CCP to develop and deliver trainings for coastal decision-makers. One of CCP's strengths is developing technical guidance and tools for coastal managers, and the Reserve has become an ideal partner to help disseminate information and providing training opportunities. In addition to working together on workshop development, the CTP and CCP have been working to foster stronger relationships among of NOAA-supported programs in the state. In 2010, the CCP, CBNERR and Sea Grant formed a partnership to better align their programs to provide assistance to local communities in planning for and addressing climate change impacts such as sea level rise. The partnership should help the programs identify and leverage each other's strengths and resources. The goal is to "prepare local communities to adapt to and confront the impacts of climate change." As such, they are planning to conduct a needs assessment for local governments on climate change impacts and adaptation.

OCRM commends CBNERR on these efforts, and encourages the Reserve to continue to strengthen partnerships with CCP and Sea Grant with regard to addressing other coastal management issues. For example, the Reserve's Research and Monitoring Program and Sea Grant could work with the CCP to identify and begin to address critical research priorities.

As will be discussed through these findings, CBNERR has made great progress in strengthening partnerships within DNR, with the coastal management community, and with reserve components to guide and support coastal management across the state. One opportunity for the Reserve to engage at a regional scale is the implementation plan for the Executive Order on the Chesapeake Bay. In particular, the enhanced research and monitoring infrastructure of the sentinel site initiative (discussed further later in these findings) and potential climate change education initiative present excellent opportunities to connect with the Executive Order. OCRM encourages CBNERR to collaborate with the CCP, Virginia's coastal program and NERR, and NOAA's Chesapeake Bay office to support activities of the Chesapeake Bay Executive Order.

Somerset Intermediate School

Program development at Monie Bay has always been a challenge given the site's distance from Reserve headquarters, the lack of local Reserve staff and a public facility, and limited access for staff, researchers, and the general public. The evaluation team also heard from WHS staff that in the culture of Maryland's lower eastern shore, building relationships is important, so consistency and face time with Reserve staff matter greatly. For CBNERR to be able to increase opportunities at Monie Bay, finding strong partners and developing these relationships will be critical. During this evaluation period, the Reserve has successfully developed new relationships with staff from Somerset Intermediate School and Somerset County Planning Department. The Reserve also hired a part-time volunteer coordinator for the component, who has helped to foster these partnerships as well as relationships with local groups such as senior organizations. These efforts have lead to increased visibility on the in the region and successful initiatives including a new ocean/estuarine literacy program in Somerset County and a marsh clean-up event for local 6th grade students.

During the site visit, the evaluation team was able to meet some of the Reserve's partners at SIS and in the Planning Department. Somerset Intermediate School (SIS) is a Maryland Green School, with a focus on promoting environmental literacy and leadership, and community stewardship. They are an ideal partner for CBNERR on the lower eastern shore. The Reserve worked closely with SIS to develop a project proposal for an education pavilion on Annemessex Creek on the school property, which was submitted to NOAA for funding consideration. The pavilion, which would provide a venue for environmental education programming, as well as estuarine science and restoration projects, had the strong support of the County's Recreation Department and Planning Department. This level of excitement and engagement illustrates the value that the local community places on CBNERR and its programs. The project was deemed ineligible for NERRS acquisition and construction funding, however, due to the requirement of "adequate state control," as the pavilion would be on County-owned land, outside the Reserve boundary and the State-owned lands of the Monie Bay component. OCRM commends CBNERR for developing relationships that will be critical to the enhancement of support and programming at Monie Bay, and encourages staff to continue to think strategically and creatively with regard to how to continue to grow these partnerships. One option for the project that was discussed during the site visit was the potential for SIS or Somerset County to apply for funding through the CCP and CZMA Section 306A. OCRM encourages the Reserve to work with CCP and Somerset County to further explore this and other options.

Accomplishment: CBNERR has built strong relationships with new partners in Somerset County, which have enhanced programming opportunities at the Monie Bay component.

4. Management Plan and Boundary Expansion

Reserves are required by Federal regulation to have a current NOAA-approved management plan (15 C.F.R. sec. 921.13). The plans describe the reserves' goals, objectives, and management issues, as well as strategies for research, education and interpretation, public access, construction, acquisition, and resource preservation, and, if applicable, restoration and habitat manipulation. 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 reserve and NOAA to track progress and realize opportunities for growth; (3) to present reserve goals, objectives, and strategies to constituents; and (4) to guide program evaluations. Regulations also require that a reserve's plan be updated every five years.

The Reserve's latest management plan was completed in 2008, successfully addressing a necessary action in the previous evaluation that the Reserve must complete an updated management plan. The 2008-2012 Management Plan is thoughtful and integrated across programs; OCRM commends CBNERR on this effort.

The Management Plan also included boundary expansions at both Otter Point Creek and Jug Bay. At Otter Point Creek, the total uplands and wetlands area increased from 443 acres to 475 acres with the incorporation of an additional 32 acres at Leight Park owned by Harford County.

In addition, the IWLA donated the conservation easements for the Bosely Conservancy to the State. At Jug Bay, on the Anne Arundel side, the Reserve boundary now includes a total of 1,230 acres of upland and wetland habitat with the addition of additional lands already within JBWS, the Glendening Nature Preserve, and River Farm. The Reserve boundary within Prince Georges County was also expanded, and now includes additional land owned by the MNCPPC at Patuxent River Park/Jug Bay Natural Area, to a total of 606 acres of upland and wetlands.

The expansion of a Reserve's boundary is a comprehensive process that requires extensive effort and coordination with NOAA. In the case of CBNERR, the complexity was increased by the number of State partners involved, and combined, the Reserve over doubled its uplands and wetlands areas at the Otter Point Creek and Jug Bay sites (increased the total Reserve area by almost 30%). OCRM commends the Reserve for successfully expanding its boundary, enabling the Reserve to better address resource management of, and expand reserve programming at, the component sites.

Accomplishment: CBNERR expanded its boundary to include upland areas critical to the long-term protection of the Otter Point Creek and Jug Bay components.

5. Facilities Enhancement

Multi-component reserves are often challenged by the need for staff and facilities at more than one location. The Reserve's facilities are essential for meeting the mission of the Reserve. The 2008-2012 Management Plan includes a strategy of "maintain and build appropriate facilities, infrastructure, and interpretive displays" to enhance and maintain the utility of the Reserve for conducting research, education and coastal training programs.

OCRM finds that CBNERR has worked to improve Reserve facilities during this evaluation period, particularly at the Jug Bay component, for which the Reserve was awarded NERRS acquisition and construction funds in 2010 for two public access projects. At the Jug Bay Natural Area/Patuxent River Park, MNCPPC will construct a handicap accessible observation tower. The Jug Bay Wetland Sanctuary NERRS funds were awarded to construct a boardwalk and observation platform at the Glendening Preserve. This project will greatly enhance public access to the Anne Arundel County portion of the Jug Bay component, as the Glendening Preserve is the only area that is open seven days a week and currently there is no access to the marsh except by water (canoe/kayak). The project is currently awaiting NOAA review of potential environment impacts as part of requirements under the National Environmental Policy Act. While neither of these projects are complete, it is clear that they will greatly enhance the public's experience at the Reserve.

The most notable enhancement during this evaluation period was the renovation of the Plummer House on the Glendening Preserve of the Jug Bay Wetlands Sanctuary. The Reserve was awarded $85,000 in NERRS construction funds that were matched with over $100,000 in local funding (from the Friends of Jug Bay, Jug Bay Wetlands Sanctuary volunteers, and Anne Arundel County) to remodel a farmhouse on the Preserve, and convert it into a public contact building and offices for CBNERR staff and volunteers. One Jug Bay Wetlands Sanctuary

volunteer deserve special recognition – Mickey Taylor served as the construction manager for the project, spending hundreds of hours directing and conducting the renovation. This effort exemplifies collaboration across Federal, state, and local entities, leveraging of technical and financial resources, and hundreds of volunteer hours. In addition, CBNERR worked across sectors to teach community members about Bayscaping through a CTP workshop and engage the participants in landscaping the grounds around the house to include a rain garden, pervious paving stones on the front walkway, and rain barrels. Volunteers from the Friends of Jug Bay helped develop a butterfly garden with funding assistance from CBNERR. The Reserve also provided a grant to install solar panels to provide electricity for Plummer House. The Plummer House was dedicated April 2008, and has become an excellent demonstration project for 'going green.' OCRM commends the Reserve on this effort.

Accomplishment: The renovation of the Plummer House at Jug Bay has not only provided increased public access and office space for CBNERR, but also excellent opportunities for public engagement and outreach through demonstration Bayscaping, a rain garden, and the installation of solar panels.

There is currently no on-site facility for the Reserve at the Monie Bay component, and thus access for both researchers and the general public continues to be limited. CBNERR's Management Plan states that providing facilities for programming at Monie Bay is currently the Reserve's highest facilities construction priority. OCRM agrees with this assessment, and encourages the Reserve and DNR to work to identify an appropriate location for upland access and facility development. The evaluation team discussed with Reserve staff the need for both facilities to support Reserve research and a visitor/nature center for public programming. Several external researchers mentioned that facilities (including overnight accommodations) would greatly increase the attractiveness of Monie Bay as a research site. A public visitor/nature center would serve to engage and educate the local community, as there is currently no such environmental center on the lower eastern shore. Land acquisition opportunities will likely dictate which of these types of facilities are prioritized, as the location and accessibility requirements of each might be different. OCRM encourages the Reserve to continue to work with the State and local partners to identify opportunities to develop facilities at Monie Bay.

B. Research and Monitoring Program

CBNERR's Research and Monitoring Program aims to improve coastal resource management by increasing the scientific understanding of estuarine systems. The current focus of the Program is to better understand the effects of land use changes and climate change on coastal and aquatic resources to inform resource management decisions. The Reserve's Management Plan articulates a number of objectives for the Research and Monitoring Program, including: more scientists will conduct research at the Reserve; scientists, resource managers, and the general public will have access to datasets and products generated by the Reserve; and, coastal decision-makers will use science-based information. OCRM finds that CBNERR has enhanced both

research and monitoring efforts during this evaluation period, and is successfully working towards these objectives.

Long-term monitoring and applied research projects are conducted at all three Reserve components. While there are Reserve-wide research priorities, such as land use and climate change impacts, each site also has unique research needs and varying capacity to address them. Multi-component sites also present challenges in balancing Reserve resources and coordinating staff and equipment. The evaluation team noted that the Research Coordinator is doing a good job of providing technical guidance and support to sites, for example the development of a 100 meter research grid at Otter Point Creek to inform research project development. In addition, the CBNERR has increased the number of research staff (the Research Coordinator, a Research Assistant and three seasonal Research Interns at the time of the site visit) who further support the Reserve's research and monitoring programs.

The evaluation team had the opportunity to meet with a number of Reserve research partners during the site visit. Researchers noted excellent experiences and productive partnerships. It is clear that the Research Coordinator is well-respected in her field and has worked during this evaluation period to elevate the status of program with the scientific community. In addition to working with site-specific staff, Reserve research partners include: Morgan State University, the University of Maryland, Salisbury University, Towson University, Aberdeen Proving Grounds, the US Department of Agriculture and NOAA.

Issues with the availability and translation of data and results from Reserve research, monitoring and stewardship efforts were mentioned a few times throughout the site visit. For example, partners at the component sites (both staff and volunteers) would like to receive information (in a timely fashion) in a form that they can use for management decisions and education. Reserve staff also expressed disappointment in how difficult it was to get information and data included on DNR websites. OCRM encourages DNR and CBNERR to work on these issues, as a critical objective of the Reserve is that scientists, coastal managers, and the general public have access to CBNERR data and products. Collaborating with the Coastal Training Program to disseminate research results would also be an excellent way to get information to coastal management partners.

1. Research Projects

CBNERR's research focus is on applied research project that increase understanding of the effects of land use changes and climate change on coastal and estuarine ecosystems. During this evaluation period, the Research and Monitoring Program has focused efforts on two new projects studying marsh surface elevation dynamics and habitat decline at the Deal Island Impoundment.

Marsh Elevation Dynamics
Many coastal areas are currently experiencing rapid sea level rise. This is particularly true in many low-lying coastal areas of Maryland. An emerging priority, both for the State of Maryland and for CBNERR's Research Program, is to examine the impacts of sea level change on marsh ecosystems. During this evaluation period, the Reserve began a study of marsh surface elevation

change and sedimentation dynamics at Jug Bay and Monie Bay. This included the re-measurement of previously established surface elevation tables (SETs) at Jug Bay (12), and the installation and measurement of new SETs at Jug Bay (12 SETs) and Monie Bay (12 SETs). The Reserve also established and measured marker horizon plots at each SET station.

The NERRS has recently launched a sentinel site initiative as part of its System-wide Monitoring Program (SWMP) "to track the status of key indicators of ecosystem integrity and uses these indicators to inform adaptation planning and management response to impacts." Although CBNERR is not currently receiving additional funding to develop sentinel site infrastructure and monitoring, the Research and Monitoring Program has taken great initiative with finding partners and resources (e.g., working with NGS to develop benchmarks), and making the investments necessary, to do so. The infrastructure in place from this research project will be an excellent resource for identifying and understanding sea level change and developing climate adaptation strategies not only for the Reserve, but also the State and larger Chesapeake Bay region. It is also a key preliminary step to engaging in the SWMP sentinel site initiative in the future.

OCRM commends CBNERR for taking the initiative to make the investments necessary to better understand the implications of sea level rise on Maryland's marshes and estuaries.

Accomplishment: CBNERR has demonstrated initiative in developing its capabilities and building the infrastructure necessary to become a sentinel site for sea level change. This capacity will be a great asset to the Reserve, the State, and the Chesapeake Bay region.

Deal Island Impoundment Study
The Research Program has also begun to collaborate with WHS at Monie Bay on a research project at the Deal Island Wildlife Management Area (DIWMA) Impoundment. WHS partners at DIWMA had observed poor water quality and declining health of salt marsh and submerged aquatic vegetation (SAV) at the aging tidal marsh impoundment. In response, CBNERR established research and monitoring projects to examine the status of water quality, marsh vegetation, and SAV. This project is just getting underway, but is a great example of management-inspired research. It could also be a great opportunity to work with the CTP to disseminate research results and any recommended management actions.

2. Monitoring

System-wide Monitoring Program
The goal of the NERR SWMP is to identify and track short-term variability and long-term changes in estuarine water quality, habitat, and land use in each reserve. The data gathered through SWMP provides standardized information about how estuaries function and change over time, enabling scientists to gain a better understanding of how human activities and natural events can change coastal ecosystems. CBNERR partners with DNR's Resource Assessment Services to implement SWMP. Data from SWMP contribute to DNR's overall Chesapeake Bay monitoring efforts, which includes over 80 long-term fixed monitoring stations and almost 40 continuous *in situ* monitoring stations (of which the Reserve's are five). Partners noted that the Reserves contributions to Bay-wide monitoring efforts and the new Chesapeake Bay TMDL

watershed implementation plans. Only tributaries with long-term monitoring data will be able to be delisted, as that will allow the State to objectively document changes over time.

Biomonitoring
CBNERR also established two new biomonitoring efforts at all components during this evaluation period: submerged aquatic vegetation and emergent marsh vegetation transect monitoring. The Reserve began the current submerged aquatic vegetation monitoring effort in 2007. There are six transects at Jug Bay, five at Otter Point Creek, and ten on the Monie Bay impoundment that will be monitored three times per year. Emergent marsh vegetation monitoring began in 2008, and transects will be measured once per year at peak biomass. There are fifteen transects at Jug Bay and Otter Point Creek, six at Monie Bay, and ten on the Monie Bay impoundment that will be monitored for species diversity, coverage, and maximum height. The Reserve also measured nine additional transects at Jug Bay, which were originally established in 1995, in order to determine spatial and temporal changes in species composition and distribution. Data collected from these efforts will help Reserve researchers and coastal resource managers to better understand the processes of estuarine ecosystems and the effects associated with human activity.

3. Site Profile

NERRS implementing regulations require each reserve to develop a comprehensive site profile. A site profile is designed to (1) compile scientific datasets relating to the reserve, (2) characterize the physical and biotic components of the environment, (3) synthesize the known ecological relationships within the reserve and its watershed, (4) trace the impact of natural and human disturbances, and (5) explore the need for future research, education, and management initiatives.

CBNERR was designated in 1985 with two components added in 1990, however, the site profile is still not complete. At the time of the site visit, the Research Coordinator and her staff had submitted drafts for all three components and an overall summary section. OCRM acknowledged the great effort CBNERR staff had made in developing site profiles for all three components, and commended the Reserve on these high quality draft products. CBNERR and ERD subsequently agreed upon a schedule for completion and approval of the documents. In accordance with that agreement, CBNERR has since completed, and ERD has approved, the site profiles.

4. Graduate and Undergraduate Research Fellowships

The Reserve continues to be actively engaged in the education and training of both undergraduate and graduate students. The NERRS GRF Program is a system-wide program that supports masters or doctoral students' management-related research projects that enhance scientific understanding of the reserve system, provide information needed by reserve managers and coastal decision-makers, and improve public awareness and understanding of estuarine ecosystems and management issues. During the evaluation period, CBNERR has sponsored five NERRS Graduate Research Fellows (GRFs). The research coordinator provides research support

to GRF students and also works with Reserve staff to integrate the fellows into Reserve activities.

CBNERR GRF research projects included:

Year	Fellow	Project Title
2005	J. Testa	*Water quality and nutrient cycling in the Patuxent River estuary: Assessing the role of tidal marshes*
2006	B. Fertig	*Developing the eastern oyster, Crassostrea virginica, as a biological indicator of nitrogen sources*
	L. McChesney	*Effects of sediment grain size on competitive abilities of Hydrilla verticillata and Vallisneria americana at Otter Point*
2007	M. Castellano (2 yrs)	*Using Soil Properties as a Framework for Understanding Nutrient Transport and Transformation at the Terrestrial-Aquatic Estuarine Interface*
	B. Fertig	*Establishing a link between d15N in Crassostrea virginica tissues to land use: spatial analysis and modeling approaches*
2008	B. Fertig	*Connecting monitoring, long-term, and broad-scale water quality datasets through an estuarine biological indicator of nitrogen source: Delta-15 N in Crassotrea virginica tissues*
2009	E. Seldomridge	*Geomorphic Framework for the Measurement and Prediction of Nitrogen Loss in Tidal Wetlands, Jug Bay, Maryland*
	M. Castellano	*Using Soil Properties as a Framework for Understanding Nutrient Transport and Transformation at the Terrestrial-Aquatic Estuarine Interface*
2010	E. Seldomridge	*Measurement of Hydraulic and Geomorphic Influences on Nitrate Retention in Freshwater Tidal Marshes, Patuxent River, Maryland*

The evaluation team had the opportunity to speak with past and current GRFs during the site visit. GRFs described positive experiences with the Reserve and appreciation for the guidance, support, and opportunities afforded to them. The Research Coordinator has been proactive in recruitment to local universities, and plans to do additional seminars and information sessions to increase both the quantity and quality of research projects proposed. OCRM encourages the Reserve to continue to strengthen GRF recruitment.

C. Education Program

National Estuarine Research Reserves are federally designated "to enhance public awareness and understanding of estuarine areas, and provide suitable opportunities for public education and interpretation." The reserve system provides a range of formal and non-formal education programming for key audiences depending on watershed and community needs and the specific

capacity of each reserve. CBNERR's Management Plan describes a number of objectives for the Education Program, one of which is that "students and teachers have an increased estuarine and environmental literacy." As such education programs are "designed to enhance participant's awareness and understanding of estuaries and emphasize the interrelationships of coastal habitats and human activities." The Reserve uses its diverse components to conduct field programs that introduce participants to habitats ranging from shallow water to wetlands and salt marsh, and might include the collection of water quality data or estuarine invertebrates. CBNERR's Education Program emphasizes the incorporation of "authentic" data into programming, a strength and niche of the NERRS. In this respect, the diversity of ecosystems and research efforts at CBNERR components proves to be a great asset for integrating data from a variety of coastal habitats into educational programming.

The evaluation team was impressed by the variety of education and outreach opportunities offered by CBNERR. In addition to NERRS-initiated and Reserve-wide efforts, the Education Coordinator provides direct assistance with regard to the development and implementation of site-specific education programs. Site-specific initiatives included: a Zooplankton Lab Program at Patuxent River Park; the Otter Point Creek Environmental Survey; and, field programming at Monie Bay for the Ocean/Estuarine Literacy Program in Somerset County. Community interaction and involvement is high, and partner support for Reserve programming is evident. OCRM finds that CBNERR is addressing Reserve goals through the implementation of a Program that engages its target audiences through a range of opportunities, including K-12 education, teacher trainings and public outreach.

CBNERR is one of many environmental education programs in the Chesapeake Bay region. Three of the four counties (not Somerset) where Reserve components are located also have environmental education centers associated with the school systems. As such, the Reserve plans to do a market analysis and needs assessment to identify partnership opportunities and plan future Reserve programming to fill existing gaps in environmental education. An Education Advisory Committee was established in 2010 to initiate the assessment, but an extended vacancy in the Education Coordinator position limited the Reserve's ability to begin. CBNERR anticipates that it will be completed in the coming year. As the Education Program moves forward with the market analysis/needs assessment, OCRM encourages staff to also consider how the Reserve collaborates with the WSU Aquatic Resource Education Program, the DNR Education Matrix team, the Maryland Association for Environmental and Outdoor Education, county school system environmental centers (e.g., Arlington Echo, Harford Glen, the Schmidt Center) and the State of Maryland Children in Nature Initiative. The Education Coordinator participates in the education workgroup at DNR, which is currently working to develop a statewide environmental literacy standard. The evaluation team heard from DNR education partners that they greatly appreciate the ability to access Reserve science, to use Reserve components for trainings, and to share staff and equipment when possible. Joint planning between the programs would allow for more effective leveraging of strengths and resources across DNR.

The Reserve's Education Program is staffed by a full-time Education Coordinator, who works closely with on-site staff at Otter Point Creek, Jug Bay, and to a lesser extent Monie Bay. The

position of Education Coordinator was vacant from May 2010 to January 2011. During this time ongoing programs at Reserve sites continued to be implemented but larger initiatives, such as the market analysis and needs assessment were put on hold.

1. K-12 Education

The NERRS has developed a K-12 Estuarine Education Program (KEEP) to help students learn about essential coastal and estuarine concepts, develop data literacy skills, and strengthen problem solving skills. The program combines experiential education, teacher education, and technology and web-base education. During this evaluation period, CBNERR has been working to implement KEEP throughout its programming. Reserve staff also contributed to the development, piloting and revision of the national Estuaries 101 curriculum and the Chesapeake Bay module 102.

CBNERR conducts over 300 K-12 education programs annually in collaboration with county partners. These include interactive classroom programs, field programs, special events, and summer camps. The Reserve also supports initiatives that contribute to the enhancement of environmental education statewide. Three new and notable K-12 education efforts are highlighted here:

Patuxent Teen Paddle Leadership Program
As a complement to school-year programs, CBNERR, in collaboration with staff at Jug Bay, developed a more intensive educational experience through the multi-day Patuxent Teen Paddle Leadership Program. This five-day program gives teens a chance to develop leadership and teamwork skills as they canoe and camp along the Patuxent River while learning about and conducting estuarine science. The week culminates in participant presentations to an audience of parents and park staff. The program was initiated in 2008 and has become an annual offering with excellent reviews and growing demand. OCRM commends the Reserve on this innovative addition to its K-12 education program.

Ocean/Estuarine Literacy Program in Somerset County
As part of CBNERR's growing partnership with Somerset County, the Education Program helped to develop and implement an Ocean/Estuarine Literacy Program in Washington and Crisfield High Schools. CBNERR also delivered field programming at Monie Bay in support of the curricula. The Reserve has also continued to support the successful Wetlands and Wildlife Field Day at the Monie Bay component. Annual participation of 4th grade students averaged 300 during the evaluation period. That said, education programming at and around the Monie Bay component is limited by the lack of facilities and dedicated Reserve staff at the site.

Maryland Green Schools Program
During this evaluation period, CBNERR developed a strong relationship with the Maryland Association for Environmental and Outdoor Education (MAEOE). In 2006, the Reserve began supporting the MAEOE's Green Schools and Centers Program through an annual grant. (The relationship between MAEOE and the Reserve was brand new in the previous evaluation period, and was identified in the findings as a potential future partner for the education program.) The

Green Schools Award Program recognizes K-12 schools that provide "a holistic, integrated approach to authentic learning that incorporates local environmental issue investigation and professional development with environmental best management practices and community stewardship." This funding ($10,000) has helped MAEOE to grow the program.

2. Teacher Trainings

In addition to providing students with a range of environmental education opportunities, CBNERR has focused effort on developing trainings for teachers. To this end, the Reserve provides professional teacher development opportunities during the summer break as well as curricula and materials to support estuarine education. CBNERR has worked collaboratively with site staff and NOAA's Chesapeake Bay Office to develop and deliver teacher trainings. The evaluation team heard excellent feedback from teachers who have participated in trainings. While a number of professional development opportunities were offered during the evaluation period, two trainings deserving special mention include: "Data in the Estuary" and a regional training for Estuaries 101.

CBNERR in collaboration with staff at Jug Bay and Otter Point Creek, developed a new profession development opportunity, "Data and the Estuary," to apply scientific data collected within the Chesapeake Bay, and in other estuaries throughout the nation, to teach science in middle and high school classes. "Data and the Estuary" is intended to help teachers increase their ability to: use Estuaries 101, FieldScope, and associated curricula; access tools and curricula that support STEM programming; design and implement authentic student-driven investigations; implement investigations; analyze collected information; and develop action projects to manage and address the results of investigations. Unique modules for Chesapeake Bay's eastern and western shores have also been developed. Teachers are introduced to researchers and environmental educators, local resources for field trips, and online resources such as lesson plans on estuaries.gov and NERRS monitoring data. Initial trainings on the prototype of "Data and the Estuary" occurred in 2007 and 2008, and beginning in 2009, the Reserve has delivered two trainings annually. "Data and the Estuary" is considered a Continuing Profession Development experience, and so upon completion, teachers are also able to get Maryland State Department of Education (MSDE) credits. One teacher noted that her experience with this training has "set the stage for a continuing outdoor experience for science students" at her high school.

In 2008, CBNERR (Maryland) collaborated with the Chesapeake Bay NERR in Virginia and the Delaware NERR to support a multi-day professional development course on Estuaries 101 for teachers from the Chesapeake Bay region. OCRM encourages NERRs to collaborate at a regional scale on efforts such as this to leverage resources and provide a venue for professional sharing.

3. Public Outreach

CBNERR continues to provide a variety of public education and outreach opportunities. Much of this programming is offered in collaboration with site staff and includes drop-in opportunities

at Jug Bay and Otter Point Creek facilities, special events both at sites and throughout the Chesapeake Bay region, and public workshops such as the Green Living series.

During the evaluation period, CBNERR was also called upon to host several NOAA special events. CBNERR and partners helped to organize and successfully hosted two NOAA Restoration Days (at Jug Bay in 2007 and Otter Point Creek in 2009) and an Earth Day celebration at Jug Bay, in 2009, with the NOAA Administrator Dr. Jane Lubchenco. Additionally, the Reserve has hosted several NOAA Sea Grant Fellow visit, a trip for Office of Management and Budget examiners, and various NOAA staff retreats (ERD, OCRM Business Management Division, and NERRS Strategic Committee). These opportunities have not only provided education on coastal and estuarine systems, but also greatly raised the visibility of CBNERR. The events have also helped strengthen support for the National System, as they served to showcase the natural assets and successful education, research and stewardship initiatives of NERRS to important partners. NOAA, OCRM, and ERD are greatly appreciative of the efforts put forth by the Reserve for these events.

Accomplishment: CBNERR successfully hosted a number of high visibility special events for NOAA, including NOAA Restoration Days and Earth Day with Dr. Lubchenco, that served to highlight Reserve resources and contributions to coastal research, education and stewardship.

In addition to these hands-on-experiences and expanded reserve programming in all sectors, CBNERR has greatly increased its visibility through the development of a number of new public outreach materials. The Reserve created a traveling exhibit and a tri-fold brochure, designed a simpler CBNERR logo, and established an annual accomplishments flyer. In addition, the Reserve worked with DNR to revamp the CBNERR webpage.

D. Coastal Training Program

The Coastal Training Program (CTP) is designed to inform coastal decision-making, improve coastal stewardship at local and regional levels through the application of science-based knowledge, and increase dialogue and collaboration among decision-makers. Planning for the program includes establishing a training advisory committee, conducting a market survey of training providers and an audience needs assessment, developing a program strategy that outlines priority coastal issues to be addressed, prioritizing target audiences, and creating a marketing plan.

CBNERR began development of its CTP with the hiring of a coordinator in 2006 and completed all required planning documents by early 2008. The CTP was designated operational by NOAA and eligible for full funding in February 2008. CTP efforts primarily support two CBNERR goals (CBNERR Final Management Plan, 2008): Goal 2) Increase the use of science and Reserve sites to address management issues, and Goal 3) Enhance peoples' ability and willingness to make informed decisions and take responsible actions that affect Maryland's coastal communities and ecosystems. The Program provides skill-based trainings and materials under

two main themes: managing the effect of development on the shoreline, and watershed management and sustainability. Its target audiences include local government staff, state agency staff, and non-profit organizations. The challenge for the CTP, as with all of the Reserve sectors, is that the three component sites are in different geographic areas, with some overlapping but also different training needs.

The CTP has rapidly become a key asset to the Reserve and its reputation in the Chesapeake Bay region. Between October 2007 and September 2010, the CTP offered over 30 different training programs totaling almost 9,000 contact hours, and reaching 500 individuals. CTP workshops have been well received and attended. The evaluation team met with a number of CTP partners and clients who praised the Reserve and noted the value of the program. Examples of CTP workshops held during this evaluation period include:

- Bay Smart Basics: Critical Area Planning for Municipalities
- Critical Area Buffer Workshops
- Communicating the Climate Change Message
- Planning for Sea Level Rise
- Bayscaping for Homeowners and Community Organizations

The evaluation team was impressed with the CTP's partnerships—both the diversity of those with whom the Program works and the Reserve's attention to avoid duplicating efforts. In addition to other offices within DNR, active partners include Maryland Sea Grant and Maryland Department of Housing and Community Development. The evaluation team was able to meet with a number of these, all of whom were extremely supportive of the management and operation of the Program.

According to CBNERR partners and clients, the CTP has been integral in raising the profile of the Reserve program, particularly within DNR. During this evaluation period, one of the CTP's primary clients has been DNR staff – both as a partner for workshop development and delivery, and an audience. For example, the CTP worked with DNR's Critical Area Commission to develop and deliver workshops on the substantive changes to regulations under the Critical Area Law, and included hands-on exercises. The workshops targeted local governmental staff, officials and consultants involved in implementation of the Critical Area Program. The CTP also collaborated with the CCP on a series of living shoreline workshops and a sea level rise workshop. The evaluation team spoke to planners in Somerset County who noted that their participation in the latter workshop has lead to the incorporation of sea level rise information into new comprehensive planning efforts. A future opportunity noted during the site visit is that with the Office for a Sustainable Future to develop trainings for Maryland's recently released climate adaptation strategies. The CTP has also provided trainings that address the professional development needs of DNR staff, such as those on "communicating conservation" and "facilitation skills for scientists." It is evident that CBNERR's CTP is fulfilling a training gap within DNR, which has helped the Reserve to develop strong and productive partnerships across the agency.

OCRM commends CBNERR on the establishment and impressive growth of the CTP during this evaluation period. OCRM finds that the CTP successfully supports the Reserve mission, as well as many other needs in DNR. The CTP has also raised the visibility of the Reserve in DNR and across the state.

Accomplishment: CBNERR has established a Coastal Training Program that is successful in providing critical trainings for site partners, DNR colleagues, and the larger coastal community, and that has raised the visibility of the Reserve.

An excellent example of new and successful partnerships during this evaluation period is that which has been developed among CBNERR, DNR's Office for a Sustainable Future, and the Department of Housing and Community Development to launch "Going Green Downtown" in Maryland. This effort resulted in a Green Guide, website, and series of workshops, which provide information and instruction on best practices, and a website on best practices for sustainable planning and revitalization activities in Maryland's communities. This has made a significant impact on Maryland's Main Streets programs, as each designated community is now required to designate a committee responsible for developing a plan for becoming "Clean, Safe and Green." Partners in this effort noted that the CTP was critical to the effort, for example, by make the Green Guide "digestible" to communities. OCRM commends CBNERR for developing new partnerships to increase the reach of the CTP program.

Beginning in 2010, the CBNERR has been working to restructure the CTP to include a course-based approach for some portion of its annual training offerings. This will allow CBNERR to become more efficient in providing key professional development opportunities on a reoccurring basis, while still remaining flexible to address emerging issues. The Reserve plans to focus on trainings that help local governments plan for and respond to 1) population growth and development; and 2) climate change impacts, subsidence and inundation. As mentioned previously, the CTP is also working with the CCP and SG to conduct a new needs assessment. It should also help guide the Reserve in balancing the needs of DNR staff, the Reserve sites, and other target audiences. Thoughtful evaluation and refinement in these ways will help the CTP to stay relevant and effective. OCRM encourages the Reserve to complete its 5-year program update within the next six months using this current audience assessment data and input from its advisory committee, and considering CBNERR goals and objectives. This will enable the CTP to continue building upon its success and address relevant coastal management issues.

There are a number of organizations in the Chesapeake Bay region that provide education, training and technical assistance opportunities targeted at natural resource decision-makers. In order to better coordinate and collaborate these efforts, CBNERR worked with partners to launch the "Chesapeake Coastal and Watershed Outreach Exchange" in 2008. The Outreach Exchange brought together agencies, organizations and universities that provide outreach, training, and technical assistance on land use, natural resource conservation and water resource issues to local governments, watershed organizations and other local level decision makers in Maryland communities. The initial workshop provided a venue to share information, develop collaborative opportunities, and identify gaps. In order to encourage ongoing networking, CBNERR and Maryland Sea Grant developed a website for the group. The website continues to provide a

valuable online resource for upcoming education and training events in the Chesapeake Bay region. However, it was noted that it continues to be a challenge to partners actively engaged in ongoing coordination. OCRM commends the CTP on this effort, and encourages the Reserve to consider how to best use this venue to continue to coordinate with partners, and further develop the CTP's unique training niche. There are many constituent needs, as well as a diverse suite of partners and other education and training programs with which to coordinate.

D. Stewardship Program

Stewardship is a functional role at each reserve, often integrating aspects of research, monitoring, education, and implementation of resource management actions. Stewardship Programs provide long-term management and protection of natural resources within the system, and serve to model responsible resource management practices to coastal communities. CBNERR's stewardship and management actions aim to help protect and restore sustainable fish, wildlife and plant populations and communities, important terrestrial and aquatic habitats, and water quality.

CBNERR's Stewardship Program has grown a great deal during this evaluation period. Current efforts in support of Reserve goals include: land acquisition, land management activities, monitoring, and engaging volunteers in activities. As such, the Stewardship Coordinator's responsibilities include: land acquisition, land management, GIS product development, and volunteer coordinator. Due to CBNERR being a multi-component site, the Reserve's Stewardship Coordinator provides leadership, and does actually "coordinate" stewardship activities, as much of the on-the-ground effort must be undertaken by staff at the individual sites. Coordinating stewardship activities at multiple sites, with priorities, staff and volunteers, is challenging. OCRM commends the Reserve on the enhancements made to the Stewardship Program.

1. Land Acquisition

CBNERR works with a variety of partners to accomplish land acquisition priorities. These include: the CCP through the Coastal and Estuarine Land Conservation Program (CELCP), DNR's Program Open Space, the Hartford Land Trust, Conservation Fund, Lower Shore Land Trust, and the M-NCPPC.

CBNERR has been successful during this evaluation period in working with partners to identify and acquire critical lands at Reserve sites. Properties acquired by partners during include:

Component	Property	Acreage	Year
Otter Point Creek	Walton's Retreat	7	2006
Jug Bay	Dorr	7	2008
	Shepherd	31	2008
	Krause	4.5	2009
Monie Bay	McCain	181	2009

These properties will be recommended for inclusion into the Reserve during the next boundary expansion.

CBNERR has worked collaboratively with the CCP during this evaluation period to incorporate the Reserve's land conservation priorities into the state CELCP plan, which was submitted for final approval in January 2011. During the evaluation period, Maryland did receive funds through CELCP to acquire a parcel that would have expanded the Jug Bay component in Anne Arundel County, however the project fell through due to a change in land value. OCRM commends CBNERR and CCP for working together to identify priorities for Maryland coastal conservation, and encourages the CBNERR to continue to work with CCP to identify and prioritize CELCP proposals in the future. For example, as noted in the Reserve's Management Plan, identifying and acquiring land that provides upland access at Monie Bay should be a priority in the near future.

2. Land Management

The Reserve's land management activities include restoration, prescribed burning, and invasive species removal. The Reserve is also beginning to think about land management at more of a landscape scale, and with regard to coastal priorities, such as sea level rise and marsh migration. During this evaluation period there have been a number of accomplishments demonstrating enhancement of CBNERR's land management activities. Two projects in particular are highlighted here not only for their value to Reserve resources and coastal resource managers, but also for their integrated nature and success in engaging and leveraging partnerships.

Wild Rice Restoration

Restoration of wild rice at Jug Bay has been occurring over the past decade. Wild rice in tidal freshwater marshes at Jug Bay began to show signs of decline in the 1990s. Once it was determined via exclusion studies that the primary cause of the decline was grazing by resident Canada geese, the Reserve and partners at Jug Bay begin a significant restoration effort. The project included: installation of fencing around stands of native wild rice; seed collection; seedling plantings; and, the implementation of a summer hunting season to manage populations of Canada geese. The Stewardship and Research Programs have worked together with state and county partners to implement this restoration program, with much of the on-the-ground work done through volunteers. The Reserve's CTP has also developed workshops and trainings on the wild rice restoration effort in order to facilitate the transferability of the successful technique to other parts of Maryland and to a larger regional audience.

This long-term project has culminated in an analysis of changes in wild rice density in Jug Bay, which has demonstrated the success of the restoration project. The Reserve contracted with the Towson University Center for GIS to conduct a delineation of wild rice in Jug Bay over different time periods using aerial photography. A habitat change analysis was then completed to determine results. According to this, wild rice coverage has nearly returned to pre-restoration levels, at over 1M square meters. The CBNERR and their partners are now gradually removing fencing, and are moving towards management of the resource. OCRM commends the Reserve on this effort, an excellent example of management need driving science, which in turn informed

management, the integration of reserve sectors, community involvement, and the transferability of restoration techniques developed.

Accomplishment: CBNERR and partners at Jug Bay have been working to restore native wild rice for over a decade, and a recently completed habitat change analysis quantified and confirmed restoration success.

Bush River Partnership, Wheel Creek Watershed Restoration
Otter Point Creek is a tributary at the headwaters of the Bush River. Due to recent and anticipated development pressures, increased impacts from urbanization are anticipated within the watershed, Harford County together with DNR developed a Bush River Watershed Restoration Action Strategy (WRAS) and subsequent Bush River Watershed Management Plan. Upon completion of these, in 2007, CBNERR initiated the Bush River Partnership which brought together partners at county, state and federal levels, and volunteer groups interested in addressing actions in the WRAS. Since the initial meeting, the Reserve has facilitated the mission of Bush River Partnership through both technical expertise and financial support. For example, CBNERR has helped prepare grant applications, water quality monitoring, and funds to purchase equipment. Working with Harford County Department of Public Works, the Reserve has helped the county secure funding through the 2010 Trust Fund Local Implementation Grant for stormwater retrofits and watershed restoration (433 acres) at Wheel Creek, a tributary within the Bush River Basin. The Reserve has also assisted with workshops and demonstrations projects, such as a rain garden, as part of the outreach component for the project. The Bush River Partnership is an excellent example of how Reserve expertise and support has leveraged partnerships and funding to advance watershed management and community stewardship.

3. Natural Resource Monitoring

The Reserve continues to support numerous site-specific monitoring efforts that help site managers to track trends, provide researchers with baseline data, and provide an important education experience for volunteers. These efforts, discussed in detail in the previous evaluation findings, include: larval yellow perch and juvenile fish monitoring at OPC, herpetology monitoring at Otter Point Creek and Jug Bay, secretive marsh bird monitoring, and invasive species mapping. Secretive marsh bird monitoring is the only monitoring, excluding SWMP, that is conducted at all three Reserve components. DNR staff, community volunteers and researchers participate in these efforts.

4. Geographic Information Systems

The Reserve works with DNR's Geographic Information Systems (GIS) Division to produce the GIS products required of the NERRS. During this evaluation period, CBNERR and the Division have worked together to produce GIS layers of the Reserve boundaries, land cover layer for component watersheds, and land acquisition target areas. The Division also provides CBNERR staff technical support and training. With the hire of the current Stewardship Coordinator, CBNERR increased its in-house capacity to develop products and analyze information, which has benefited Reserve efforts.

5. Volunteers

Fundamental to inspiring a sense of resource stewardship within the coastal community is providing opportunities for the public to experience and learn about the Chesapeake Bay. One way that the community can be active stewards of the resource is by volunteering. CBNERR has active volunteer groups at both the Jug Bay and Otter Point Creek components. During this evaluation period, the Reserve hired a seasonal volunteer coordinator at Monie Bay, who has been important to building relationships in that area. In addition, CBNERR works with the Maryland Conservation Corps stationed at Merkle Wildlife Sanctuary. Volunteers support Reserve operations by assisting with on-site research and ecological monitoring activities, restoration, education and public events, maintenance and administrative tasks. CBNERR provides support to the volunteer groups in the form of guidance and training, and annual financial support. The Reserve also holds annual volunteer appreciation events.

The evaluation team had the opportunity to meet with a number of volunteers throughout the site visit. They were excited about their role working with CBNERR, and the growth they have observed in Reserve operations over this evaluation period. Volunteers at Otter Point Creek and Jug Bay, particularly enjoyed engaging in "citizen science," and mentioned that they would appreciate seeing the results of their efforts, for example in annual status and trends reports, or copies of research papers that used data collected. This is an excellent way to keep volunteers interested and excited about their work, and OCRM encourages the Reserve to consider how best to respond to the request. Partners at Monie Bay noted the important role that the volunteer coordinator is playing in the region – networking within the community, engaging new volunteers in Reserve efforts, and supporting special events. Monie Bay's location and lack of facilities make it challenging not only for the Reserve to provide structured and reoccurring programs at the site, but also for staff to recruit and keep engaged a volunteer base. OCRM commends CBNERR for identifying this position as critical to efforts at Monie Bay, and encourages the Reserve to continue supporting it.

V. CONCLUSIONS

For the reasons stated herein, I find that the Maryland is adhering to the programmatic requirements of the National Estuarine Research Reserve System in the operation of its approved Chesapeake Bay National Estuarine Research Reserve.

DNR and CBNERR have made notable progress in the following areas: integration across and visibility within the Department, developing critical partnerships, facilities enhancement, establishment and growth of the Coastal Training Program, applied research and stewardship efforts.

The findings contain one Necessary Action which must be addressed according to the timeline provided. These evaluation findings also contain two recommendations in the form of Program Suggestions. OCRM recommends that DNR address these Program Suggestions, but they are not mandatory at this time. Summary tables of program accomplishments and recommendations are provided in the Appendix A.

This is a programmatic evaluation of CBNERR that may have implications regarding the state's financial assistance awards. However, it does not make any judgment on or replace any financial audits.

Donna Wieting

MAR 12 2012

Donna Wieting, Acting Director
Office of Ocean and Coastal Resource Management

Date

VII. APPENDICES

Appendix A. Summary of Accomplishments and Recommendations

Accomplishments

Issue Area	Accomplishment
Operations and Management	CBNERR has been successful in promoting its capabilities and developing partnerships across DNR. In addition, DNR's Watershed Services Unit has demonstrated its commitment to the partnership by prioritizing Reserve staff positions.
Partnerships	CBNERR has built strong relationships with new partners in Somerset County, which have enhanced programming opportunities at the Monie Bay component.
Boundary Expansion	CBNERR expanded its boundary to include upland areas critical to the long-term protection of the Otter Point Creek and Jug Bay components.
Facilities Enhancement	The renovation of the Plummer House at Jug Bay has not only provided increased public access and office space for CBNERR, but also excellent opportunities for public engagement and outreach through demonstration Bayscaping, a rain garden, and the installation of solar panels.
Research and Monitoring	CBNERR has demonstrated initiative in developing its capabilities and building the infrastructure necessary to become a sentinel site for sea level change. This capacity will be a great asset to the Reserve, the State, and the Chesapeake Bay region.
Education	CBNERR successfully hosted a number of high visibility special events for NOAA, including NOAA Restoration Days and Earth Day with Dr. Lubchenco, that served to highlight Reserve resources and contributions to coastal research, education and stewardship.
Coastal Training Program	CBNERR has established a Coastal Training Program that is successful in providing critical trainings for site partners, DNR colleagues, and the larger coastal community, and that has raised the visibility of the Reserve.
Stewardship	CBNERR and partners at Jug Bay have been working to restore native wild rice for over a decade, and a recently completed habitat change analysis quantified and confirmed restoration success.

Recommendations

Recommendations are in the form of Necessary Actions (NA) or Program Suggestions (PS).

Issue Area	Recommendation
Staffing	PS: OCRM strongly encourages DNR to afford the Reserve Manager joint oversight responsibility for the office secretary and fiscal officer who are supported in part via the NERR grant.

Management	PS: OCRM encourages DNR to consider optimal organizational placement for the Reserve within the Watershed Service Unit that would promote further integration of CBNERR's expertise and capabilities across the Unit and Department.
Memorandum of Understanding	NA: OCRM requires that DNR develop a revised Memorandum of Understanding between the Watershed Services Unit and the Wildlife and Heritage Service detailing the partnership responsibilities for the management of the Reserve's Monie Bay component. A draft MOU should be submitted to OCRM for review, by the Estuarine Reserves Division and National Ocean Service's General Council, by June 30, 2012.

Appendix B. Persons and Institutions Contacted

Chesapeake Bay National Estuarine Research Reserve

Name	Title
Beth Ebersole	Reserve Manager
Patricia Delgado	Research Coordinator
Sasha Land	CTP Coordinator
Chris Snow	Stewardship Coordinator
Coreen Weilminster	Education Coordinator
Lindsay Carroll	Research Assistant
Julia Puzak	Research Intern
Rebecca Lang	Research Intern
Peggy Wooldridge	CTP Aide
Trystan Sill	Education Assistant
Leslie Wright	Seasonal Volunteer Coordinator at Monie Bay
Dionne Bell	Office Secretary

CBNERR - Otter Point Creek

Name	Title, Office
Kriste Garman	Director, Anita C. Leight Estuary Center
Bryon Bodt	President, Harford County Chapter of the Izaak Walton League of America
Sharyn Spray	President, Otter Point Creek Alliance
Christine Buckley	Chief, Bureau of Water Resources, Harford County Department of Public Works
Peg Niland	Harford Land Trust

CBNERR - Jug Bay

Name	Title, Office
Christopher J. Carroll	Chief of Park Operations-South, Anne Arundel County
Chris Swarth	Director, Jug Bay Wetlands Sanctuary (JBWS)
Lindsay Hollister	Volunteer Coordinator, JBWS; CBNERR Stewardship Intern
Susan Matthews	Naturalist, JBWS
Anthony Noland	Chief, Maryland-National Capital Park and Planning Commission Natural and Historical Resources Division
Greg Lewis	Director, Patuxent River Park (PRP), Maryland-National Capital Park and Planning Commission
Heather Goad	PRP Naturalist and CBNERR Research Intern

Maryland Department of Natural Resources

Name	Title, Office
Frank Dawson	Assistant Secretary for Water Resources
Jeff Horan	Director, Watershed Services Unit (WSU)
Catherine Shanks	Director, Community and Local Government Services, WSU

Matt Fleming	Director, Chesapeake and Coastal Programs, WSU
Willa Mae Jones	Director, Administration and Support, WSU
Laura Younger	Grants and Funding Services, Chesapeake and Coastal Programs
Penny McGarry	Fiscal Officer
Mike Bilek	Tributary Strategies
Sandi Olek	Office for a Sustainable Future
Mary Owens	Critical Area Commission
Catherine McCall	Chesapeake and Coastal Programs
Laurel Crawford	Shoreline Conservation and Management Service
Mark Trice	Eyes on the Bay, Resource Assessment Service
Stacy Epperson	Aquatic Resources Education
Karen Jarboe	Maryland Conservation Corps/Civic Justice Corps at Merkle Wildlife Sanctuary
Dave Foreman	Geographic Information Systems Division
Kevin Smith	Director, Ecosystem Restoration Services
John Moulis	Acting Manager Monie Bay, Wildlife and Heritage Service at Wye Mills
Benjamin Custis (Lee)	Wildlife and Heritage Service at Wellington
Wade Bradford	Wildlife and Heritage Service at Wellington
Philip Jarusek (Buck)	Wildlife and Heritage Service at Wellington
Russ Hill	Wildlife and Heritage Service at Salisbury

Program Partners

Name	Affiliation
Vicky Carrasco	Maryland Sea Grant
Amy Seitz	MD Department of Housing and Community Development
Rob Savidge	City of Annapolis, Neighborhood and Environmental Programs
Kate Fritz	Maryland-National Capital Park and Planning Commission
Paul Magness	Harford County Department of Parks and Recreation
Emily Seldomridge	CBNERR Graduate Research Fellow
Ben Fertig	CBNERR Graduate Research Fellow
Dennis Whigham	Smithsonian Environmental Research Center and Jug Bay Scientific Advisory Committee
Lora Harris	University of Maryland
Ronald Gutberlet	Salisbury University
Bart Merrick	NOAA Chesapeake Bay Program
Jan Steeger	Prince George's County teacher
Lisa Hopkins	Principal, Somerset Intermediate School (SIS)
Pat Benner	SIS 6th grade teacher
Gary Pusey	Somerset County Planning and Zoning
Tom Lawton	Somerset County Planning and Zoning
Bob Cadwallader	Somerset County Planning and Zoning

Appendix C: Persons Attending the Public Meeting

Name	Affiliation
Harry Coulomb	Friends of Jug Bay
Dotty Mumford	Friends of Jug Bay
Kathy Sclavecz	Johns Hopkins University
Jeff Shenot	Friends of Jug Bay
Jeffrey Campbell	Jug Bay Wetlands Sanctuary Scientific Advisory Board
David Farr	Friends of Jug Bay
Dennis Whigham	Smithsonian Environmental Research Center
Kelton Clark	Morgan State University
Kent Mountford	Friends of Jug Bay
Susan Matthews	Naturalist, JBWS
Pat Megonigal	Smithsonian Environmental Research Center
Dave Linthicum	Friends of Jug Bay

Appendix D: OCRM's Response to Written Comments

OCRM received one written comment regarding the evaluation of the Chesapeake Bay NERR, Maryland.

Chris Swarth
Sanctuary Director and CBNERR Site Manager
Jug Bay Wetlands Sanctuary & Chesapeake Bay NERR, Maryland
Anne Arundel County Department of Recreation and Parks

Comments:

Mr. Swarth described what he believes is a very productive relationship between Anne Arundel County and CBNERR in managing the Jug Bay Wetlands Sanctuary component. He gave numerous examples of how the Sanctuary's participation in CBNERR complements and strengthens the education, stewardship and research programs of both entities. Mr. Swarth detailed the ways that he believes CBNERR and the State-County partnership has grown and become more effective the past year, for example the boundary expansion, completion of the Plummer House construction, and research at the Sanctuary.

In addition, Mr. Swarth notes where challenges continue to exist. He describes the difficulty that the County has processing grant funds from CBNERR, which almost seems cost ineffective, and includes the County Council having to pass special legislation authorizing acceptance of the grant monies from the State. Mr. Swarth recommends providing larger grants awarded less frequently, if possible, or providing the grants to the Friends of Jug Bay which has a simpler grants management process. He also recommended ways to raise the profile and visibility of CBNERR (and its research, education, and stewardship assets) in the County writ large – not just in the area around Jug Bay.

Mr. Swarth also expressed concern regarding a number of environmental issues, external to but threatening the Jug Bay (and thus CBNERR) ecosystem. These included, but were not limited to, poorly treated effluent from wastewater treatment facilities, commercial over-fishing, development, trash, and fly ash. He encourages CBNERR to become more engaged in these issues and recommends that the Reserve work with partners such as the Sanctuary and Friends of Jug Bay to inform the public and identify solutions to address issues threatening the Patuxent River and Chesapeake Bay.

Mr. Swarth also noted that CBNERR is one of many entities in Chesapeake Bay scientific community and provided several ideas that might help CBNERR to raise its profile and become better integrated in the community. These included: publishing more research results in peer-reviewed publications, presenting at conferences and through seminar series, and forming a scientific advisory committee.

OCRM's Response: The evaluation teams thanks Mr. Swarth for his comments and thoughtful suggestions. OCRM agrees that CBNERR and the Jug Bay Wetlands Sanctuary have a very productive partnership, and with the numerous accomplishments of the Sanctuary/CBNERR as outlined by Mr. Swarth, and expanded upon throughout this findings document. The evaluation team also acknowledges the challenges described by Mr. Swarth, and has attempted to address some of these in the findings. In addition, OCRM encourages Mr. Swarth to work with the CBNERR management team to discuss the thoughtful options and opportunities for addressing challenges as presented in his comments.

Appendix E: CBNERR Response to 2006 Findings

OCRM Necessary Action: DNR must fill the EC position.

> ***CBNERR Response:*** DNR filled the EC position in October 2006 and the EC (Bart Merrick) developed outstanding programs and was awarded Maryland Association for Environmental and Outdoor Education "Bob Finton Educator of the Year Award." The EC position was vacated again in May 2010 and was filled in January 2011 (Coreen Weilminster).

OCRM Program Suggestion: DNR is strongly encouraged to designate a CTP coordinator and implement a CTP.

> ***CBNERR Response:*** DNR hired a full-time Coastal Training Program Coordinator (Sasha Bishton Land) in November 2006, and she since has been made a permanent and elevated from a Grade 15 to a Grade 17 . Sasha launched the program in 2008 and has developed it into an outstanding Coastal Training Program that rivals the best in the NERR System. Her program held 20 workshops in FY 2008 and 13 workshops in FY 2009, and meets all federal requirements as well as DNR needs.

OCRM Program Suggestion: The Reserve should consider conducting a series of meetings or a retreat for staff to more clearly define staffing needs and roles, opportunities and efficiencies in working with partners, and priorities for the Reserve and its programs and staff. These discussions could also address conditions leading to staff turnover, understaffing, the addition of new Reserve staff (education coordinator and coastal training program coordinator), recent personnel changes in DNR leadership levels, and the management plan update.

> ***CBNERR Response:*** Site managers meetings are held quarterly. They have focused from 2007 now largely on information and technology exchange and coordination. CBNERR DNR Core staff held a visioning/strategy Pow-Wow in January 2011 and plans to move toward making the site managers' meetings focus more on group visioning/strategy to achieve CBNERR and the NERRS mission and goals.

OCRM Necessary Action: The Reserve must complete revisions to its management plan. A complete draft of the revised plan must be submitted to OCRM by September 30, 2006.

> ***CBNERR Response:*** Due in large part to turnover in CBNERR and ERD staff, DNR worked on the Management Plan for over 12 years. The CBNERR Management Plan was completed and approved by NOAA in September 2008.

OCRM Program Suggestion: The Department of Natural Resources is urged to support the stewardship coordinator and research coordinator positions with state funding as soon as possible.

CBNERR Response: The Research Coordinator position is state-funded, but the Stewardship Coordinator and Education Coordinator position are federally-funded. The national economic downturn has resulted in a State of Maryland budget crisis prompting staff reductions through layoffs and buyouts. Given the realities of the state budget, it is virtually impossible to get new state-funded positions at this time or in the foreseeable future.

OCRM Program Suggestion: As part of the development of the revised management plan, the Reserve and its partners should consider the facilities and infrastructure needs, if any, for current and future years at all three components.

CBNERR Response: The Management Plan outlines facility and infrastructure needs. Some of these have been completed or begun in this evaluation period at Jug Bay. At Otter Point Creek, none have been completed or begun due to the lack of non-federal match available for those projects. At Monie Bay, efforts to acquire a property suitable for a pavilion and vistor center have been unsuccessful to date. A relatively new partnership with Somerset County offers a solution by building a CBNERR Pavilion on the water at Somerset Intermediate School. We were unsuccessful this year in acquiring federal funding for this project, and it will not be able to move forward without federal funding.

OCRM Program Suggestion: The Reserve is encouraged to further develop connections and partnerships with academic institutions near Monie Bay. Such partnerships can help attract research to the Monie Bay area and generate greater visibility and support for the Reserve and its programs and activities.

CBNERR Response: The Research Coordinator has developed a strong relationship with Salisbury State University. Efforts were made to develop a stronger relationship with University of Maryland Eastern Shore, but have borne little fruit.

OCRM Program Suggestion: The Reserve and the Department should develop a strategy to communicate the work of the Reserve and should continue efforts to enhance the Reserve's visibility, stressing both its unique identity as well as its roles as a partner in many collaborative efforts. In particular, the Reserve's website should be made more accessible and become a forum for sharing research data and other information from the site components.

CBNERR Response: CBNERR has made great strides in communicating the work of the Reserve and enhancing its visibility, in part through better communication/marketing materials, articles and news coverage, and increased and improved programming. The CBNERR website was completely revamped in 2007-2008 and a traveling poster exhibit was created and exhibited at many events over the last several years. Of particular note are the Coastal Training Program's efforts to meet both DNR needs and local partner/local government needs through targeted coastal training programs, which have increased visibility and appreciation by DNR and county agency leadership. In addition, hosting large scale events such as two NOAA Restoration Days (one at Jug Bay in 2007

and one at Otter Point Creek in 2009) and an Earth Day event in April 2010 with Jane Lubchenco has increased visibility.

OCRM Program Suggestion: The Reserve should work with OCRM to develop a time frame for completion of the Reserve's site profile. The time frame may be phased to address each component separately, with submittal of a draft for each component as developed.

CBNERR Response: The Otter Point Creek draft Site Profile was submitted to ERD in 2010, and the Jug Bay and Monie Bay draft Site Profiles will be submitted in January 2011.