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NATIONAL OCEAN SERVICE
OFFICE OF OCEAN AND COASTAL RESOURCE MANAGEMENT
Silver Spring, Maryland 20910

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William W. Walker, PhD
Executive Director
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1141 Bayview Avenue, Suite 101
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Dear Dr. Walker:

Enclosed are the final evaluation findings for the Grand Bay National Estuarine Research Reserve (GBNERR) for the period from March 2004 through November 2007.

The fundamental conclusion of this evaluation is that the Mississippi Department of Marine Resources is adhering to the programmatic requirements of the NERR System in its operation of the federally approved GBNERR. This document contains a number of program accomplishments and six recommendations, one of which is mandatory.

We appreciate your cooperation and assistance, and that of your staff, throughout the evaluation process.

Sincerely,

David M. Kennedy
Director

Enclosure

cc: David Ruple, Manager, Grand Bay NERR, Mississippi
L. G. Adams, Manager, Weeks Bay NERR, Alabama
Kate Barba, OCRM National Policy and Evaluation Division
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FINAL Evaluation Findings
Grand Bay National Estuarine Research Reserve

March 2004 – November 2007

November 2008



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

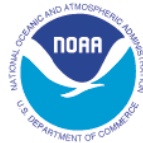


TABLE OF CONTENTS

I.	Executive Summary	1
II.	Program Review Procedures	2
	A. Overview	2
	B. Document Review and Issue Development	2
	C. Site Visit to Mississippi	3
III.	Reserve Program Description	4
IV.	Review Findings, Accomplishments and Recommendations	5
	A. Operations and Management	5
	1. Reserve Administration	5
	2. Staffing and Program Integration	6
	3. Reserve Advisory Groups	7
	4. Management Plan	8
	5. Partnerships	8
	6. Facilities	10
	B. Research and Monitoring Program	11
	1. Reserve Research	12
	2. Monitoring Programs	14
	3. Site Profile	17
	4. Environmental Cooperative Science Center	17
	C. General Education Program	18
	D. Coastal Training Program	21
	E. Stewardship Program	23
	1. Restoration	24
	2. Monitoring Habitat Change	25
	3. Land Management	26
	4. Land Acquisition.....	27
VI.	Conclusion	28
VII.	Appendices	29
	Appendix A. Summary of Accomplishments and Recommendations	29
	Appendix B. Program Response to 2004 Evaluation Findings.....	31
	Appendix C. People and Institutions Contacted	32
	Appendix D. People Attending the Public Meeting.....	34
	Appendix E. NOAA’s Response to Written Comments.....	35

I. EXECUTIVE SUMMARY

The Coastal Zone Management Act (CZMA) of 1972, as amended, established the National Estuarine Research Reserve System (NERRS). Sections 312 and 315 of the CZMA require the National Oceanic and Atmospheric Administration (NOAA) to conduct periodic performance reviews or evaluations of all federally approved National Estuarine Research Reserves (NERRs). The review described in this document examined the operation and management of the Grand Bay National Estuarine Research Reserve (GBNERR) during the period of March 2004 through November 2007. The Grand Bay National Estuarine Research Reserve is administered by the Mississippi Department of Marine Resources (DMR).

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

The evaluation team documented a number of GBNERR accomplishments during this review period. The Reserve has continued to expand and enhance its research, education and stewardship programs through new partnerships, projects, and programming. OCRM finds that GBNERR programs have reached a high level of maturity in the relatively short eight years of implementation, in part due to the strong support provided by the State. Notable Reserve efforts during this evaluation period included: the implementation and expansion of research and monitoring efforts including SWMP; the development of a number of community education and interpretation opportunities; the implementation of the Coastal Training Program; and the expansion of stewardship efforts including demonstration projects that have the potential to inform coastal management in the region. GBNERR has also completed the design of, and begun construction on, a new office and visitor center.

The evaluation team also identified areas where the Reserve and its programming could be enhanced. All but one of the recommendations for GBNERR are in the form of Program Suggestions, and describe actions that NOAA believes DMR should take to improve the program but that are not currently mandatory. As mentioned above, GBNERR programming has matured substantially during this review period, and continued growth is expected with the future completion of a new facility. This programmatic and physical expansion of the Reserve motivated evaluation recommendations that primarily address capacity, which will be understandably challenged by such growth. Program suggestions thus include: promoting the Reserve's capabilities across DMR; reconsidering the roles and responsibilities of advisory groups; and planning for the operational requirements of a new facility. The Reserve also has one Necessary Action related to its management plan revision.

II. PROGRAM REVIEW PROCEDURES

A. OVERVIEW

NOAA began its review of GBNERR in September 2007. 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 Mississippi 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 GBNERR approved by NOAA. These must be carried out by the date(s) specified;

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

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

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

B. DOCUMENT REVIEW AND ISSUE DEVELOPMENT

The evaluation team reviewed a wide variety of documents prior to the site visit, including: (1) federally approved Environmental Impact Statement and Reserve Management Plan; (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 Mississippi.

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;
- status of the management plan revision;
- facilities development and operations planning;
- land acquisition efforts;
- implementation of the Reserve's research, monitoring, 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; and
- major accomplishments during the review period.
- the manner in which GBNERR has addressed the recommendations contained in the §312 evaluation findings released in 2005. The GBNERR's assessment of how it has responded to each of the recommendations in the evaluation findings dated 2005 is located in Appendix B.

C. SITE VISIT TO MISSISSIPPI

Notification of the scheduled evaluation was sent to the Mississippi Department of Marine Resources (DMR), GBNERR, relevant federal environmental agencies, Mississippi's congressional delegation and regional newspapers. In addition, a notice of NOAA's "Intent to Evaluate" was published in the *Federal Register* on October 12, 2007.

The site visit to Mississippi was conducted November 27-30, 2007. Kimberly Penn, Evaluation Team Leader, OCRM National Policy and Evaluation Division, Matt Chasse, GBNERR Program Specialist, OCRM Estuarine Reserves Division, and LG Adams, Reserve Manager, Weeks Bay National Estuarine Research Reserve in Alabama, formed the evaluation team.

During the site visit, the evaluation team interviewed GBNERR staff, DMR management and staff and other state officials, federal agency representatives, coastal researchers, educators, nongovernmental representatives, local elected officials, and private citizens. Appendix C lists persons and institutions contacted during this review.

As required by the CZMA, NOAA held an advertised public meeting during the evaluation at 6:30 p.m., Tuesday, November 27, 2007, at the East Jackson County/Orange Grove Community Center, 9313 Old Stage Road, Moss Point, Mississippi. The public meeting was provided to give members of the general public the opportunity to express their opinions about the overall operation and management of GBNERR. Appendix D lists individuals who registered at the meeting. NOAA's responses to written comments submitted during this evaluation are summarized in Appendix E.

The excellent support of GBNERR 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 approved the Grand Bay National Estuarine Research Reserve (GBNERR or Reserve) in 1999 as the 24th reserve to be established within the National Estuarine Research Reserve System. The lead agency responsible for the coordination of the Grand Bay NERR is the Mississippi Department of Marine Resources (DMR). DMR is the primary marine resource management agency within the state. The Reserve is organized as a Bureau within the Coastal Ecology Division of DMR, which also administers and implements the Mississippi Coastal Program.

DMR and GBNERR also receive input and policy guidance from the Reserve Management Board (RMB). The RMB currently represents stakeholders from DMR, the Mississippi Secretary of State, the U.S. Fish and Wildlife Service, The Nature Conservancy, Mississippi State University, the University of Southern Mississippi, and a Citizens Advisory Committee.

GBNERR is located in the southeastern corner of Mississippi and is part of the greater Mississippi Sound estuary. It is bounded on the east by the Mississippi-Alabama state line, on the west by the Bayou Cassotte Industrial Park, on the north by the communities of Pecan, Kreole, and Orange Grove, and on the south by the Mississippi Sound. The Reserve is representative of the Mississippi Delta subregion of the Louisianian biogeographic region encompassing approximately 18,400 acres of a broad variety of estuarine and non-estuarine wetland habitats that together form a largely intact coastal watershed. The open-water estuarine areas support large productive oyster reefs and seagrass habitats. The intertidal portion of the site includes a wide variety of marsh types (low, mid-level and high elevation zones across a wide range of salinity) as well as some of the most extensive, unvegetated salt flats in this part of the Mississippi Sound. The non-tidal areas include wet pine savannas, cypress swamps, freshwater marshes and maritime forests. Bayous Cumbest and Heron are the major water courses discharging into Point aux Chenes Bay and Grand Bay, respectively. Both bayous are relatively small with slow flowing waters rich in tannic acid. Of the 18,400 acres included within the Reserve boundaries, approximately 75% are publicly owned.

Ownership of the public lands within the Reserve is a combination of two state and one federal entity, including the Mississippi Department of Marine Resources (DMR), the Mississippi Secretary of State (SOS), and the U.S. Fish and Wildlife Service (USFWS). The state lands are part of the Grand Bay Coastal Preserve, a state-designated system of key estuarine areas, while the federal lands are part of the Grand Bay National Wildlife Refuge. A Memorandum of Understanding between NOAA and the DMR establishes the roles and responsibilities of these key agencies in managing the reserve. In addition, there are other MOUs between the various partners including:

- an MOU between the DMR, the USFWS, and the SOS regarding details about the designation of land holdings as part of the Reserve,
- an MOU between the DMR and the USFWS regarding details about surveillance and enforcement for the Reserve, and
- an MOU between the DMR and USFWS regarding the operations and maintenance of the joint facilities.

IV. REVIEW FINDINGS, ACCOMPLISHMENTS AND RECOMMENDATIONS

A. OPERATIONS AND MANAGEMENT

Overall, OCRM finds that Mississippi's implementation and management of the Grand Bay National Estuarine Research Reserve (GBNERR) is exceptional.

1. Reserve Administration

Throughout the site visit, the evaluation team observed many ways in which Mississippi's Department of Marine Resources (DMR) and the Grand Bay NERR support and complement each other's operations and missions. The DMR provides substantial administration support to the Reserve, including financial, human resources, legal and IT services, and marine enforcement. In addition, the State provides cash match for the federal grant, which greatly benefits the Reserve by allowing them to invest substantially in programming. As will be discussed further later in this document, the State contributed significant resources towards the Reserve's new facility, which is the first DMR built and owned building. Overall, OCRM is highly impressed with the level of support provided to GBNERR by DMR, and commends the State for fostering this relationship.

Accomplishment: Mississippi's DMR provides exceptional support for the operation and management of the Grand Bay NERR.

Though it was evident to the evaluation team that DMR acknowledges the value of the Reserve and its initiatives, it was noted that the staff expertise, information, and products produced by the Reserve are not used to their full potential by the Department. OCRM therefore encourages the DMR to promote and better integrate GBNERR, its capabilities, and capacity across the Department. The Reserve's relationship with DMR's Coastal Preserves Program is a good example of how the Reserve can support the Department's resource management decisions. The evaluation team heard specifically about how information gained from GBNERR research and monitoring programs is used to guide the Coastal Preserve Program's land management and restoration plans.

Program Suggestion: OCRM encourages DMR to identify ways to promote and better integrate GBNERR and its capabilities across the Department to meet the scientific, conservation and management objectives of both entities.

Grand Bay was one of the areas along the Gulf Coast that was significantly impacted by Hurricane Katrina in 2005. Located on the eastern side of the storm, GBNERR and the Department of Marine Resources in Biloxi were hit extremely hard. The Reserve and its facilities received approximately 9 feet of tidal surge and were inundated for a period of days, which obviously significantly affected staff and resources. The evaluation team was extremely

impressed by GBNERR's ability to persevere, adapt, and continue to grow after the dramatic impacts of Hurricane Katrina.

2. Staffing and Program Integration

The widespread success of GBNERR programs is directly 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 work well together to advance Reserve goals. Reserve staff are also trusted partners in the research, education and resource stewardship communities. The evaluation team received a record number of letters of support for staff members, and for the programs that they have developed and are implementing. Staff also contribute to system-wide efforts, such as serving on various NERRS committees and acting as liaisons for sector meetings. The drive and ability to advance both site-specific and system-wide initiatives is to be commended.

Reserve staff are successfully implementing the programmatic initiatives pursued by GBNERR, as will be described throughout this document. All core positions are currently filled along with many support staff primarily for research and stewardship. Research, education, and stewardship staff are making concerted efforts to integrate programming. This situation has resulted in many successful efforts, examples of which include Firewise Awareness, Grand Bay Bioblitz, marsh bird workshop, and the *Juncus* marsh restoration demonstration project. Each project had various staff members, as well as some external partners, bringing individual and programmatic strengths to the support the effort. Program integration seems natural as staff support each other by bringing together assets and expertise that enhance Reserve initiatives.

Accomplishment: GBNERR staff are trusted and respected partners in the scientific, education, and coastal management communities. Staff members also work effectively across Reserve sectors in order to develop and implement initiatives that address research, education, and stewardship goals through integrated efforts.

The evaluation team did note that there will likely be new staffing needs as the new Grand Bay Coastal Resources Center comes on line. The specific impacts that operating a new facility will have on reserve staff time and duties are uncertain, but it is clear that there will be increased programming and maintenance needs (to be discussed in the Facilities section). Programmatic roles may have to be adjusted based on increased visitor use of the Reserve and the new building. The greatest impacts will likely be on the Education Program (to be discussed in more detail in that section), but all core program areas could be affected in some way.

One way that GBNERR could address the increased public relation and interpretation needs is to build capacity through a volunteer or "friends" program. The development of a volunteer base was discussed with various partners throughout the site visit, including the Reserve's Citizens' Advisory Committee, which already provides some of this type of support. A volunteer program would allow GBNERR to take advantage of the opportunities associated with the new Center

without further encumbering staff. A strong volunteer base, trained by GBNERR staff, could also support and enhance the Reserve's programs by participating in education, stewardship and research program activities. Many reserves benefit from the support of an active volunteer/friends program, and GBNERR could look to other successful programs within the NERR System as models. OCRM encourages GBNERR to assess the operational and programming needs of the new Grand Bay Coastal Resources Center, as well as the volunteer assets in the community, and to consider developing a volunteer program to support Center operations as well as Reserve programs. Any plans for a volunteer program should be included in the Reserve's management plan revision.

3. Reserve Advisory Groups

Reserve advisory groups comprised of diverse and dedicated individuals can significantly assist in furthering a reserve's mission and increasing its visibility. GBNERR has both a Citizens' Advisory Committee (CAC) and a Reserve Management Board (RMB), which were formed during the Reserve's designation. The CAC is composed of 20-22 members who represent a variety of interests including industry, citizen/community, local government, and the Mississippi State Legislature. The RMB includes representatives from the primary NERR partners, including the U.S. Fish and Wildlife Service, the Office of the Secretary of State, Mississippi State University, the University of Southern Mississippi, The Nature Conservancy, and the president of the CAC.

The evaluation team was able to meet with members of both groups during the site visit and also attended a routinely scheduled RMB meeting. The current role of the RMB is derived from the Management Plan developed during the Reserve designation process, and includes: seeing that the Reserve's strategic plan is implemented, bringing partnership resources to the table, helping to coordinate efforts across agencies, and establishing special committees or task forces to handle special projects as needed. Given the operational and programmatic growth of the Reserve over the past eight years, including the development of strong management capacity, DMR should reconsider the roles and responsibilities of this group. In addition, while the evaluation team noted that one of the strengths of the Board is the diverse representation, OCRM suggests that DMR consider if the Board's membership is appropriate and adequate given a potential change in role.

The CAC has been a strong advocate for the Reserve since before it was designated. Throughout the GBNERR's development, the Committee has provided substantial support to the Reserve. The evaluation team noted, and was impressed with, the strong commitment and talents of CAC members, and the valuable link they provide to the local coastal community. OCRM thus encourages the CAC and GBNERR to consider the strengths of the Committee, and current and future needs of the Reserve, to help identify the most valuable role for the CAC into the future. For example, given the dedication of Committee membership, OCRM suggests that GBNERR consider encouraging the CAC to assist the Reserve in the development of a friends' group and/or volunteer network in anticipation of the new facility.

The Reserve has very different operational and management needs now, and the management plan revision provides a good opportunity to evaluate these needs and to consider what advisory group structure would most benefit both the Reserve and group members into the future. In order to effectively expand their role, and make both support groups more beneficial to Reserve operations and management, GBNERR should carefully consider program needs and align the RMB and CAC functions accordingly.

Program Suggestion: OCRM encourages GBNERR and DMR to work with the current Reserve Management Board and the Citizens' Advisory Committee to determine how to best align the roles of these advisory groups with the Reserve's current and future needs.

4. Management Plan

Reserves are required by Federal regulation to have a current NOAA-approved management plan (15 C.F.R. Part 921.13). The plan should describe the reserve's goals, objectives and management issues, as well as strategies for research, education and interpretation, public access, construction, acquisition and resource preservation, volunteer, 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 for meeting the goals to constituents; and (4) to guide program evaluations. Regulations require that a reserve's plan must be updated every five years.

GBNERR's Management Plan is currently out of date and in the process of being revised. In August 2005, NOAA's Coastal Services worked with Reserve staff to develop a logic model to aid with the development of strategies that will guide the prioritization of programming activities and help to keep focus on longer term outcomes and vision. Considering the ongoing facilities development, long-term community impacts and changes from Hurricane Katrina, and evolving reserve partnerships, it is imperative that the Reserve have an updated Management Plan that considers the previously mentioned drivers and maps the direction for Reserve efforts in the future.

OCRM was provided a rough draft of the Management Plan just prior to the site visit, with a completed draft of the plan expected in 2008. The revision of the Management Plan and its approval must be a high priority of the Reserve.

Necessary Action: GBNERR must provide OCRM with a complete draft Management Plan by March 30, 2009. The Reserve's final Management Plan must be submitted by June 30, 2009.

5. Partnerships

GBNERR develops and maintains productive partnerships to further Reserve goals, including those with universities, state and federal agencies, local elected officials, and community members. 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 resource management demonstration projects. The Reserve's ability to cultivate these productive partnerships has resulted in not only many successful initiatives, but also a situation where Reserve funds are leveraged significantly. Partners seem enthusiastic about collaborating with GBNERR, and do so at local, regional and national levels. Partners include the U.S. Fish and Wildlife Service (USFWS), Jackson County, the University of Southern Mississippi, The Nature Conservancy, and other NOAA entities (e.g., the Air Resources Laboratory). GBNERR is also an active participant in the Gulf of Mexico Alliance, with staff serving on various committees.

These, and other, collaborations help GBNERR to accomplish much more than would be possible on its own; specific examples will be elaborated on throughout this document. In some instances, the success of these partnerships has also led to additional financial and/or logistical support for the Reserve. For example, GBNERR's strong relationship with the Jackson County Board of Supervisors resulted in dormitory space for visiting students and researchers to the Reserve. The Reserve partnered with the County to convert portions of a former county health clinic into dormitory space. The County supplied labor and supplies to remodel rooms, while GBNERR provided furnishings. This support illustrates the value that the local community places on GBNERR and its initiatives.

Grand Bay National Wildlife Refuge

Probably the Reserve's most significant partnership is with the USFWS Grand Bay National Wildlife Refuge (GBNWR), a part of the Gulf Coast National Wildlife Refuge Complex. Approximately one-third of the Reserve acreage is located within the boundaries of the GBNWR. A portion of the GBNERR potential buffer expansion is also located within the boundary of the Refuge. Given their proximity and overlap, it is imperative that the Reserve and Refuge coordinate on land management efforts. GBNERR and GBNWR currently partner on issues including invasive species management, monitoring, and prescribed burning. Also, as mentioned, USFWS staff will share space at the Grand Bay Coastal Resources Center (to be discussed later in this document), so DMR and USFWS have developed and signed an MOU on the operations and maintenance of the new facilities. Some Reserve (state-owned) facilities are also located on the GBNWR properties including buildings, a boat ramp, and interpretive trails. Another MOU between the DMR and USFWS addresses these joint activities as well. While the evaluation team noted that there seems to be good coordination between the two entities, there is obviously potential for greater/more seamless coordination and increased collaboration.

OCRM encourages GBNERR to look for ways to enhance and expand this partnership. Great opportunities exist for the Reserve and Refuge to work together on resource management, research, monitoring, and public outreach activities for the joint properties. For example, the evaluation team was excited to hear that the USFWS recently hired an educator for the Gulf Coast National Wildlife Refuge Complex who will spend a portion of her time working at the GBNWR. This position will greatly increase the potential for collaborative educational and interpretive programming at the new Grand Bay Coastal Resources Center.

Program Suggestion: OCRM encourages GBNERR to continue to enhance and expand the partnership with the GBNWR, specifically in the realms of education and land management/stewardship.

6. Facilities

GBNERR made substantial progress with regards to facilities enhancement during this evaluation period. Since designation in 1999, Reserve staff have been working, and running successful programs, out of “temporary” trailers on the Reserve property. Funding to design and construct new facilities at GBNERR has been supplied by several NOAA awards to the State starting in 2003, and DMR planned to go out to bid for construction in 2005. Due to Hurricane Katrina, however, these plans were set back, and by the time DMR was able to request bids for facility construction in late 2006, the cost of the building was projected to be more than double the available funding. OCRM commends the State for making several key contributions to the effort including supplying shortfall funding beyond the 30% match requirement using Coastal Impact Assistance Program funds and other state funding sources, and for supporting the incorporation of sustainable building aspects into the facility.

A significant accomplishment of GBNERR during this evaluation period was completion of the design of these new facilities, with construction of the Grand Bay Coastal Resources Center commencing shortly before the site visit on October 30, 2007. The new building will be LEED (Leadership in Energy and Environmental Design) certified at the Gold level, incorporating sustainable features such as the use of native vegetation for landscaping, ultra low flow toilets and innovative wastewater technologies, and the use of harvested rainwater for boat-wash spigots. The Coastal Resource Center will include: office space for Reserve and GBNWR staff; classroom and meeting space; an interpretive area; research laboratories; dormitory space; and secured boat storage area. The Reserve also received money from the Mississippi Forestry Commission for firewise landscaping around the new building. These facilities will greatly enhance GBNERR’s capacity, as well as increase the Reserve’s visibility in the community and region.

Accomplishment: GBNERR completed the design of, and began construction on, its new office and visitors’ center, the Grand Bay Coastal Resources Center. By incorporating sustainable design features in the new facility, the State and Reserve took into account the sensitivity of its coastal location, while not compromising the current and future needs of the Reserve.

The Grand Bay Coastal Resources Center will not only increase GBNERR’s visibility, programming, and partnership opportunities, but will also greatly alter current Reserve operations and management. Planning in advance for these changes will be essential for a smooth transition to the new building. GBNERR needs to think critically about the operational needs of the facility and expected public use, and how these changes will affect current staff roles and Reserve programming (primarily education and interpretation—which will be discussed in more detail in that section). For example, there will inevitably be an increase in the level of effort required to manage and maintain the new building and grounds. In order for

program-specific staff not to have to expand their current duties to include tasks related to facilities maintenance, OCRM recommends that DMR considers developing a staff position dedicated to facilities operation and management.

Program Suggestion: OCRM encourages GBNERR to consider the operation and management needs of the new facility and the associated staffing requirements as part of their management plan revision. In addition, OCRM encourages DMR consider supporting a staff position dedicated to facilities operations and management.

B. RESEARCH AND MONITORING PROGRAM

The evaluation team found GBNERR's Research and Monitoring Program efforts to be excellent. This program has expanded significantly over the last three years, despite logistical impediments resulting from Hurricane Katrina. The Reserve has developed a diverse portfolio of research and monitoring projects, and staff strive to transfer information and data into application by the resource management community. The Reserve also completed its site profile in 2007, which summarizes the current state of biological and ecological knowledge for GBNERR and identifies gaps in the scientific knowledge of the Grand Bay area.

Accomplishment: GBNERR has successfully increased the number and diversity of research and monitoring efforts within the Reserve, with a clear focus on informing coastal resource management in the region.

As stated in its Strategic Plan, GBNERR's research and monitoring goal is to establish conditions for a successful research program including: monitoring program, site characterization, Research Advisory Committee, and research cooperatives. At the time of the evaluation, most of these aspects have been achieved to some extent. The Reserve also discussed plans to develop a science plan to direct monitoring and research efforts at the Grand Bay NERR and NWR for the next 10 years. The Reserve plans to incorporate into the plan the research needs identified in the site profile and the Environmental Cooperative Science Center Risk Assessment Conceptual Model (further discussed later), as well as the results of a proposed regional symposium for researchers working in the northern Gulf Coast. The evaluation team noted substantial enthusiasm for the symposium from the Reserve's research partners, who were excited by the possibility of such an opportunity to identify new collaborations and share information about research and monitoring in the region with each other and the resource management community. The Reserve plans to hold a facilitated workshop following the symposium with representatives from both the science and management communities to further develop a science plan for the Grand Bay region. OCRM encourages the Reserve to move forward with planning such a symposium.

GBNERR's current goals and objectives for its Research and Monitoring Program reflect both the desire to promote basic and applied research activities, as well as to effectively incorporate research results in management decision-making processes within the Reserve and larger Grand Bay region. Given the growth of the program during this evaluation period, and the current

depth and breadth in the research and monitoring projects conducted at GBNERR, the evaluation team noted that the Reserve could develop a more strategic focus and direction for research and monitoring efforts. The Reserve's Management plan revision provides an excellent opportunity to reflect on the successes and strengths of research and monitoring efforts thus far, and to develop a strategy to enhance the program for the future.

The Research Coordinator position continues to be jointly funded (50/50) through a partnership with Mississippi State University (DMR's percentage is met using funds from the NOAA operations award). This arrangement seems to benefit both the Reserve and University by providing a strong link between the resource management and research communities. In addition, it has enabled the Research and Monitoring Program to have dedicated laboratory space at MSU. The evaluation team noted that the Coordinator does a commendable job of encouraging scientists from a number of different universities to conduct research in the Reserve.

1. Reserve Research

During this evaluation period, GBNERR has amassed a truly impressive list of research and monitoring activities that range from those conducted by outside researchers using external funding to those developed and implemented by staff alone. The evaluation team heard from many scientists who regularly use the Reserve for field work ranging from salt panne research to sea level rise, and who commend staff for sharing their knowledge and logistical support. Some of these key partners include Mississippi State University, University of Southern Mississippi, University of Georgia, Louisiana State University, Jackson State University, and the Gulf Coast Research Laboratory. In order to help coordinate the increase in both internal and external research efforts, GBNERR hired a full-time research technician for the program. OCRM commends the Reserve on supporting diverse research projects that will benefit not only Grand Bay and the regional resource management community, but also the NERR System and coastal management nationally.

In addition to supporting visiting researchers from various institutions, GBNERR has also attracted a number of NERRS Graduate Research Fellowship (GRF) applications. GRF projects this evaluation period have included: assessment of coastal hammocks as stopover habitat for passerine migrants; tidal marsh bird ecology; Grand Bay hydrology and water quality simulation modeling; and herpetofauna parasite biodiversity. The evaluation team noted that GRFs at the Reserve are provided excellent technical and logistical support for their research. OCRM would encourage, however, that GBNERR consider how to best introduce and involve these students in other aspects of the Reserve's programming (e.g., education and stewardship activities) when or where appropriate.

While an exhaustive discussion of research activities conducted at GBNERR is outside the scope of this document, the following projects are a sampling of initiatives during this evaluation period.

a. Coastal Transition Zone Study

The Coastal Transition Zone Study at Grand Bay is a collaborative project with researchers at Louisiana State University and Mississippi State University. The goal is to study the effects of sea level rise and hurricanes through the establishment of a transect and permanent vegetation monitoring plots that cross the coastal transition from marine to terrestrial (pine savanna) habitats. Information from these plots over time will document floristic diversity to measure long-term shifts in community composition as a result of sea-level rise, invasion by non-native flora, and the effects of disturbance. As of the site visit, researchers had established a greater than 12 km transect with elevations every 100 meters and five vegetation sample plots per 100 meter section of transect (equaling more than 60 plots). The Reserve is seeking to establish georeferenced sediment elevation tables to support this study and future research.

b. Salt Panne Ecology Research Cooperative

In 2004, GBNERR initiated the Salt Panne Ecology Research Cooperative, in collaboration with the Mississippi State University, the University of Georgia, the University of Southern Mississippi, and the DMR, in order to determine the ecological importance of these rare habitats. Salt pannes are more salty and support different flora than the surrounding marsh, and the Reserve has some of the most extensive and best examples of this habitat on the northern coast of the Gulf of Mexico. The Research Cooperative aims to survey and inventory flora and fauna, such as benthic and terrestrial invertebrates, fish, birds, and mammals, on a seasonal basis in these salt pannes.

Staff began collecting field data in January 2005 at six salt panne sites within the Reserve: two sandy clay type soils on Point aux Chenes; two muddy clay type soils on Middle Bay; and two sandy clay type soils on Deer Island. Parameters monitored include: vegetation density, water depth, water temperature, and the frequency and duration of flooding associated with these salt pannes. The Reserve is using a transect-based sampling design and taxa-specific protocols for sampling vegetation, insects, fishes, birds and mammals.

Data collection was completed in December 2006, and staff are currently sorting, identifying, and cataloging specimen samples. Staff have regularly observed four species of conservation concern on pannes: the Saltmarsh Topminnow, Gulf saltmarsh snake; Gull-billed Tern and Wilson's Plover. They have also observed and collected an unreported breeding population of tiger beetle, the Gulfshore tiger beetle. Using information from this project, the Reserve is developing a GIS "Catalog of Salt Pannes" for the Grand Bay NERR.

c. Saltmarsh Topminnow Conservation Plan Project

GBNERR, in partnership with The Nature Conservancy and The University of Southern Mississippi, received a five-year grant from NOAA's National Marine Fisheries Service's proactive Species Conservation Program in 2006 to develop a conservation plan for the saltmarsh topminnow (*Fundulus jenkinsi*). The saltmarsh topminnow occurs sporadically along the Gulf Coast from Galveston, Texas to Escambia Bay, Florida, primarily associated with

Spartina marsh and low salinities. It is listed as a federal Species of Concern for these coastal areas, and is also listed as a Species of Concern in Mississippi and Louisiana, endangered in Alabama, and threatened in Florida. Given the difficulties inherent to sampling in saltmarsh systems, however, little is known about the abundance, distribution, and habitat preferences of the species. The Saltmarsh Topminnow Conservation Plan Project aims to gain a better understanding of species' habitat needs and stressors and to develop a regional conservation plan that would outline strategies for increasing its viability in the northern Gulf of Mexico.

The Project includes four study sites: GBNERR; Weeks Bay NERR, Alabama; Barataria-Terrebonne NEP, Louisiana; and Apalachicola Bay NERR, Florida. Data collection occurs via trapping over a three-day period each spring, summer, and fall. Samples are then sorted, identified, measured, cataloged, and entered into a database. In addition to *Fundulus jenkinsi*, GBNERR staff have identified at least 20 other species of fish. Using information gathered for the plan, the Reserve is also compiling a larval/young juvenile photographic identification guide to 6 species of Fundulidae and 3 species of Poeciliidae.

2. Monitoring Programs

Grand Bay NERR has expanded its monitoring program during this review period to include not only a fully implemented System-Wide Monitoring Program (SWMP) component, but also atmospheric mercury deposition monitoring and biological monitoring of marsh birds and nekton. Monitoring this breadth of variables is integral to resource management and research programs in and around Grand Bay, as well as to the NERR system as a whole. In the future, GBNERR is seeking to expand its monitoring capabilities to include tidal measurements through the installation of a tide gauge at the Reserve.

The evaluation team was also very pleased to hear about the emphasis that the Reserve places on using the wealth of data collected for a variety of research projects. GBNERR actively promotes the use of its monitoring data to enhance education, research, resource stewardship, and management. OCRM commends GBNERR for developing robust monitoring programs with a focus on addressing current coastal management issues.

d. System-wide Monitoring Program

The goal of the NERR System-wide Monitoring Program (SWMP) is to identify and track short-term variability and long-term changes in estuarine water quality and weather, habitat and biodiversity, 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 predict how these systems will respond to anthropogenic changes. As of February 2005, GBNERR had been fully compliant with NERRS SWMP requirements, monitoring four water quality stations and a weather station for submission to the Centralized Data Management Office (CDMO). (The Reserve had established the requisite stations in 2004 but was pending review from the SWMP Oversight Committee until 2005, at which time one of the sites was re-located.) Nutrient sampling was also initiated at this time, with samples analyzed in-house in collaboration with Weeks Bay NERR. Water quality stations are currently maintained at the Bayou Heron,

Point Aux Chenes Bay, Bayou Cumbest, and Bangs Lake. As required, GBNERR also has one water quality station and the weather station that are successfully delivering data via telemetry using the GOES satellite.

A significant success of GBNERR's SWMP was that no water quality data was lost during Hurricane Katrina. The storm surge did, however, affect the Reserve's weather station. The platform and memory unit were recovered almost two miles northwest of the station's pre-storm location. Fortunately, staff were able to send the unit to Campbell Inc., which was able to retrieve the data. GBNERR provided data collected during Hurricane Katrina to the NERRS Education Sector for inclusion in the development of Estuaries 101 lesson plans.

Also during this evaluation period, the Reserve hired a SWMP technician who has made great contributions to the Reserve's SWMP efforts. For example, she was appointed as the NERRS' Gulf of Mexico regional telemetry support technician in 2005, and the Reserve has since been identified as a telemetry demonstration site by YSI. In order to expand SWMP telemetry efforts, the Reserve proposed a hydrologic monitoring project to Jackson County as an extension of work on county hydrologic issues previously funded through the Stateline Restoration Project (which expired in 2007). This funding will provide for a Reserve-wide telemetry system, as well as groundwater monitors for the study of sea level rise.

Accomplishment: GBNERR has fully implemented its SWMP during this evaluation period. Remarkably, the Reserve's water quality monitoring was continuous throughout Hurricane Katrina, data from which has already been used for a variety of educational programs.

e. Marsh Bird Monitoring

Relatively little is known about the marsh bird distribution along the Mississippi Gulf Coast, so in 2003, GBNERR initiated surveys to determine the abundance, distribution, and habitat use of winter marsh birds in the Grand Bay region. Building on these efforts in 2005, the Reserve initiated a collaborative project with researchers at the University of Georgia to determine the population status, breeding distribution, and species-specific habitat associations of marsh bird species of conservation concern. This study is funded by a grant from the Power of Flight Bird Conservation Program administered through the National Fish and Wildlife Foundation with funds provided by the Southern Company.

Monitoring sites for the study are located in GBNERR, the Grand Bay NWR, the Lower Pascagoula River Marshes Coastal Preserve, and Deer Island Coastal Preserve. Additional objectives of the project include: testing a standardized monitoring protocol for marsh birds (in collaboration with the US Geological Survey), and evaluating the use of Clapper Rails as an indicator of tidal marsh health.

One peer-reviewed publication using information from this research is currently *In Press*. Research and Monitoring Program staff also worked with the GBNERR's Coastal Training Program (CTP) and North Inlet-Winyah Bay NERR to develop and conduct a Marsh Bird

Identification/Ecology Workshop at the North Inlet-Winyah Bay NERR. The goal of the workshop was to train practitioners in how to identify common calls of marsh birds, and how to use the National Marsh Bird Monitoring Protocol.

OCRM commends the Reserve on enhancing this monitoring effort through new partnerships and resources and on working with the CTP to integrate information gained through it into workshop materials.

f. Atmospheric Mercury Monitoring

In 2006, GBNERR partnered with NOAA's Air Resources Laboratory (ARL) to study the emission, transport, and atmospheric deposition of mercury compounds in the coastal waters of the Gulf of Mexico. The Reserve is one of just three core mercury monitoring sites (the others being Beltsville, Maryland and Canaan Valley, West Virginia) that are part of a new national monitoring network designed to address total mercury deposition across the country. Data collected at these sites are then correlated with other air quality data and meteorological measurements to provide an overall sense of how airborne mercury is transported and deposited. Such understanding is essential for developing effective regulations and policies.

The station at the Reserve monitors gaseous elemental, reactive gaseous, and particulate-phase mercury, as well as trace gases including sulphur dioxide, carbon monoxide and ozone. Data has been collected continuously since October 2006, and is submitted weekly to ARL. In 2007, the Reserve upgraded trace gas machines and computers and moved the station to a pavilion near the boat launch. The Reserve also added a second mercury monitoring system at this point that runs simultaneously to verify accuracy and to prevent data loss if one system has issues.

Data collected thus far indicates that mercury levels are not particularly high or low. The project measured atmospheric mercury released from a prescribed burn adjacent to the site in March 2007. Data showed that gaseous elemental mercury levels in the smoke were three to four times higher than ambient air, and that particulate mercury deposition was slightly elevated, but levels of reactive gaseous mercury remained stable. There are a number of projects that have been proposed (primarily through the Environmental Cooperative Sciences Center) to use this monitoring data, including those studying benthic algae, pipefish, marsh birds, and ecotoxicology and risk assessment. Given the resource investment to continue this monitoring, GBNERR will assess the use of data collected via this effort in five years. During that time, staff will continue to look for and develop projects that could use the information. OCRM commends the Reserve on initiating mercury monitoring in the Gulf Coast region, and for encouraging the use of the information generated.

g. Nekton Monitoring

GBNERR initiated quarterly nekton monitoring based on NERRS protocol in 2005. Staff samples five habitat types (marsh edge, erosional edge, shell midden, sea grass, and sandy beach) at two-three locations per type. Samples are identified, measured, and cataloged in a database

and sent to the Mississippi Museum of Natural Science where they are incorporated into the ichthyology collection. As of the site visit, Reserve staff collected and identified 63 species.

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.

The Grand Bay NERR provided the NOAA Estuarine Reserves Division with its final site profile in September 2007. The profile includes 17 chapters written by local and regional experts in the subjects discussed. Also included is a chapter describing current research and monitoring needs, which includes examples of ecological studies, inventory and survey projects, and management/socio-economic projects. OCRM commends GBNERR on the completion of its site profile, the Grand Bay NERR Ecological Characterization, during this evaluation period. The document is comprehensive and should be an excellent tool to guide future research in the region.

4. Environmental Cooperative Science Center

GBNERR has continued to partner with Florida A&M University's (FAMU) Environmental Cooperative Science Center (ECSC). The ECSC, funded via NOAA and administered through FAMU, was developed with the goal of promoting minorities in NOAA-related sciences. Researchers and students from a network of minority serving institutions receive federal funds from FAMU to participate in the ECSC, to conduct their research with nearby Reserves in order to develop tools for coastal resource managers and decision makers.

GBNERR is directly partnering with Jackson State University (JSU) located in Jackson, Mississippi. JSU research is centered on one of five thematic areas: 1) integrated assessment in support of environmental decision making, 2) integrated social sciences, 3) ecological processes and indicators of ecosystem health, 4) geospatial analyses and data development, and 5) education and outreach. Research foci include submerged aquatic vegetation (SAV), water quality parameters and nutrient analysis, and bacteriological and chemical contamination. During this evaluation period, the Reserve coordinated 24 field trips and worked with nine graduate students from JSU.

In 2006, NOAA renewed funding for the ECSC for five more years. In order to improve communication between GBNERR and the ECSC, FAMU is supporting a staff position at the Reserve to be a liaison between the two programs. The Grand Bay NERR/ECSC Coordinator was thus hired in August 2007. In September 2007, the new Coordinator, Reserve Manager and Research Coordinator met with JSU faculty and students to discuss future activities. JSU subsequently submitted five proposals (four on mercury contamination, a current research

interest of the Reserve's) to the ECSC Ecological Processes area for graduate student work at GBNERR.

In December 2007, after the site visit, the Reserve was planning to hold a workshop to revisit and revise the Grand Bay conceptual model for ecological risk and assessment. Participants were to include Reserve staff, JSU collaborators, research partners from USM's Gulf Coast Research Laboratory, Dauphin Island Sea Laboratory and ECSC facilitators. The Reserve anticipates that the completed conceptual model will be published in Gulf and Caribbean Research.

Accomplishment: GBNERR has demonstrated a strong commitment to the Environmental Cooperative Science Center concept and to its relationship with Jackson State University. The support of a new staff position (funded by Florida A & M University) has greatly increased the productivity of this partnership for the Reserve.

C. GENERAL 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 educational programming to key audiences depending on watershed and community needs and the specific capacity of each reserve. As stated in the draft management plan revision, the GBNERR intends to design an interdisciplinary and interactive program of education and interpretation that emphasizes the Reserve's unique biological, geological, hydrological, archaeological characteristics and historical and cultural uses. The Education Program's specific goals include: expanding on-site and community outreach programs; encouraging use of the Reserve for educational experiences; developing educational opportunities and programs that target a broad range of adult audiences; serving as a regional center for life-long, experiential learning opportunities relating to estuarine/coastal resource management issues.

During this evaluation period, GBNERR enhanced its education and outreach in notable ways, including the development of new community education and outreach programs and the implementation of the Coastal Training Program. The Reserve subsequently formally separated the education/interpretation and Coastal Training Program components of its general education program. The two sectors, however, continue to collaborate to provide information and outreach on similar current coastal management topics to different audiences.

As demonstrated by the Reserve's draft goals, the Education Program has begun to focus more on providing on-site educational opportunities and activities to a community audience. The Reserve has also more clearly identified its subject niche in the region, focusing on estuarine science and biodiversity. To this end, GBNERR coordinates with a number of partners to produce high-quality education and interpretive programs and communication tools. Some key partners include the University of Southern Mississippi's (USM) J.L. Scott Marine Education Center (MEC), the Gulf of Mexico Alliance, Audubon, NOAA's Coastal Services Center,

Jackson County, and the Northern Gulf Institute. The Reserve has continued its strong collaboration with the MEC. This partnership is anchored by the shared K-12 Education Specialist, a joint funded position that is highly valued by the Reserve. This arrangement not only provides GBNERR with an extra educator during fall and winter, its highest need period, but also with a strong link to education efforts at the MEC. When at the Reserve, this educator is primarily dedicated to conducting field experiences and helping to develop estuarine curricula to be used in the Reserve's K-12 education. This partnership is also key in that it helps to mitigate against the duplication of efforts between GBNERR and the MEC, which focuses primarily on K-12 marine education.

GBNERR has thus developed and implemented a number of successful education programs and tools during this evaluation period that more specifically target community audiences. Examples include: the Grand Bay BioBlitz, a post- Hurricane Katrina Estuary Live program, a *Field Guide to the Plants of the Grand Bay National Estuarine Research Reserve and Refuge*, the Celebrate the Gulf Marine Education Festival, and an Adventure Quencher Program Series. Three of these initiatives received Gulf Guardian Awards during this evaluation period: the Bioblitz, the plant guide, and the marine education festival.

The Reserve's first "Grand Bay Bioblitz" was held in collaboration with partners including Mississippi-Alabama Sea Grant, Mississippi Power, Chevron Refinery, and USFWS. The Bioblitz was a 24-hour inventory of the plant and animal species found within the Reserve and Refuge, integrated with educational activities throughout the event in order to promote the importance of maintaining biodiversity within our coastal habitats. This extremely successful event engaged students, teachers, and community members in a number of hands-on activities including interacting with the researchers. The Bioblitz not only helped to establish a baseline of species and environmental information for the Reserve, but also provided a wonderful opportunity to get members of local communities in the field to learn about estuarine and coastal biodiversity and the Reserve.

GBNERR hosted Estuary Live during this evaluation period as well. Three weeks prior to the scheduled broadcast originally entitled "Marshian Invaders," however, Hurricane Katrina made landfall. Co-sponsors Mobile Bay NEP and Weeks Bay NERR helped staff from the Reserve to identify a new location and develop a new, more timely, focus that included relevant information about hurricanes, the effects of coastal storms on estuarine biology and hydrology, and specific information and video about the impact of Hurricane Katrina on GBNERR. There was a great deal of interest in the broadcast, and the Reserve received much positive feedback.

The Reserve has also begun to offer community "Adventures" and "Quenchers" such as cast netting, a photography class, and nighttime bug talks. This series of community programs was designed to establish a sense of place for the Reserve within the community by providing unique activities for a variety of audiences. The goal is to provide such opportunities monthly. In order to further develop this series, the Reserve purchased eight kayaks for use with upcoming education (and research) programs.

Notable communication products include the Reserve' *Field Guide to the Plants of the Grand Bay National Estuarine Research Reserve and Refuge* and the newly designed program website, www.grandbaynerr.org. Originally developed with the University of Southern Mississippi, the Field Guide is currently being revised and updated in collaboration with Weeks Bay NERR in Alabama. The Reserve has also finalized the exhibit design for the new interpretive section of the Grand Bay Coastal Resources Center. The educational theme of the Center, "Living on the Edge—The Nature of Change," will reflect the Reserve's mission of maintaining biodiversity in coastal habitats. The exhibitory design is not intended to recreate habitats indoors but to entice visitors to actually experience habitats through Reserve educational and interpretive opportunities that include a new nature trail associated with the Center.

GBNERR's Education Program has also been advancing ecotourism in the region. The Reserve collaborates with a number of partners (e.g., Sea Grant, The Nature Conservancy, DMR's Comprehensive Resource Management Plan Program, and EPA) not only to encourage ecotourism opportunities, but also to develop and establish ecotourism guidelines. For example, the Reserve will be promoting the new Grand Bay Coastal Resources Center as an ecotourism destination. In addition, Reserve staff have been involved in planning and executing what is anticipated to be an annual weeklong festival aimed at introducing ecotourism to the local communities. The festival included several different outdoor/environmental activities throughout Jackson County, such as a birdbanding event at one of the shell middens in GBNERR.

The evaluation team was impressed by the variety of education and interpretation opportunities offered by GBNERR. Community interaction and involvement is high, and partner support for Reserve programming is evident. OCRM finds that GBNERR is addressing its education goals through the implementation of a Program that engages its target audiences through a range of opportunities and outreach.

Accomplishment: GBNERR's Education Program is successfully engaging its target audience through the development and implementation of a variety of new community education and interpretation opportunities, and communication tools.

This evaluation period has been an exciting one for the Education Program, further developing its niche in the community and designing the interpretive exhibits for the Grand Bay Coastal Resources Center. With all of this growth, however, the Education Program in particular has the potential to be overwhelmed by the resource demands of the new Center. In addition to the education and interpretation needs at the facility itself, the Center will undoubtedly increase the visibility of—and demand for—the other educational programming offered by the Reserve. OCRM thus strongly encourages GBNERR to prioritize current and future education and interpretation initiatives, and re-assess how these strategically address Education Program goals.

Currently the Reserve's education staff consists of the full-time Education Coordinator and the part-time Pre-K12 Education Specialist that the Reserve shares with USM. An important developing relationship is that with the new educator who has been hired by the USFWS for the Gulf Coast Refuge Complex, who will be spending at least some of his/her time at GBNWR.

The evaluation team is hopeful that this position will work closely with the Reserve to coordinate and support educational and interpretive programming offered at the Center. Depending on the prioritization of education and interpretation efforts, DMR and GBNERR might consider supporting another part- or full-time educator position. Alternatively, an active volunteer group (as discussed earlier) might be able to fulfill some of the public relation and interpretive needs of the Center.

Program Suggestion: OCRM strongly encourages GBNERR to prioritize education and interpretation initiatives as part of its management plan revision, with consideration given to the resource demands of the new Grand Bay Coastal Resources Center and the resulting increase in program visibility.

D. COASTAL TRAINING PROGRAM

An important element of a reserve's education portfolio is the Coastal Training Program (CTP). The CTP, a NERR system-wide program, 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. Eligibility requirements for NERRS funding for this program include 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.

GBNERR's Coastal Training Program was fully implemented in 2005, upon ERD approval of the Reserve's planning documents. Reserve staff worked with the CTP Advisory Committee to complete the analysis for these documents in-house using the online Survey Monkey statistical tool. The goal of the Reserve's CTP is to enhance the decision-making abilities of professional audiences whose actions influence the management of natural resources along the north-central Gulf Coast. The primary training issues to be addressed by the CTP (per the market analysis and needs assessment surveys) were initially: 1) wetland protection and management, and 2) water resources (supply and quality).

The CTP has rapidly become a key asset to the Reserve and its reputation in coastal Mississippi. After Hurricane Katrina, staff met with the CTP Advisory Committee to reassess the needs of its target audiences and decided to focus on the (then current) information needs of local government, elected officials, and staff in Jackson County (initially the primary audience included three coastal counties). The CTP thus developed trainings and workshops on topics such as grant writing, stormwater management, land use planning, and green building to address the needs identified. GBNERR also offers some technical assistance workshops for natural resource managers given this audience's strong interest in training opportunities. Examples of CTP workshops held during this evaluation period include:

- Managing the Impacts of Residential Docks and Piers
- Green Building is Storm Resistant

- Mississippi Wetland Plant Identification Workshop
- Identification and Management of Invasive Terrestrial and Aquatic Plants Common to Coastal Mississippi
- Firewise Awareness Workshop
- Success Starts at the Top: What Decision-Makers Need to Know and Support to Maximize Funding for Coastal Resource Projects
- Creating Success: Writing, Researching, and Tracking Grants
- New Approaches to Floodplain Management for Coastal Communities

CTP workshops have been well received and attended, and the potential for their replication to different coastal counties and regions is great. The evaluation team met with a number of local elected officials and partners that highly praised the CTP and the proactive nature and leadership of the coordinator. The Mayor of Moss Point said he considered GBNER staff “an extension of his own staff, his experts in the field.” The team heard repeatedly from partners that one of great strengths of the Program is that everyone is comfortable that they are receiving reliable, unbiased information from CTP workshops. Representatives from the CTP’s target audiences also emphasized that they wanted training opportunities to be expanded, indicating both the success of and need for the Program in the region. The evaluation team also noted a number of instances where trainings informed specific coastal management outcomes such as a new floodplain ordinance and the revision of a sewer use ordinance in the City of Moss Point.

The Reserve’s success in engaging target audiences has greatly increased the visibility and respect of Reserve staff and science-based information in local communities and the region. OCRM commends GBNER staff for their responsiveness to communities and their changing information needs in the wake of Hurricane Katrina.

Accomplishment: GBNER’s CTP has demonstrated great initiative in the two years of active program implementation. After Hurricane Katrina, the Reserve proactively adapted its initial strategy by immediately identifying, and successfully responding to, the new training needs of the local community.

The evaluation team was highly 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. Active partners include: Weeks Bay NERR; Mississippi Coastal Management Program; academic institutions; NOAA; Mississippi-Alabama Sea Grant; and various non-profits. The evaluation team was able to meet with a number of these, all of whom were extremely supportive of the management and direction of the Program. Representatives from NOAA’s Coastal Services Center and Sea Grant, and DMR also highlighted the Reserve’s consideration of duplication of efforts and strongly supported the niche that the CTP has identified and is addressing in the region.

The CTP also does a commendable job of integrating its offerings with the information available from the stewardship and research sectors. Examples of this include workshops on invasive plants, Firewise Awareness, and marsh birds. A Stormwater Workshop held in 2007 provides a particularly good example of integration across programs. The CTP was able to incorporate

research conducted at the Reserve on the ability of *Juncus roemerianus* to filter pollutants from stormwater runoff into this workshop for Jackson County.

A Living Shorelines Workshop, held the week of the site visit, is another good example of the CTP's intent to integrate across Reserve programs as well as with diverse partners in the region. This workshop was a truly collaborative effort with Weeks Bay NERR and a host of other regional partners including Florida and Mississippi-Alabama Sea Grants, USFWS, the Mobile Bay National Estuary Program and Mississippi State University. The Living Shorelines Workshop was designed to inform participants about alternative shoreline stabilization mechanisms such as the use of native plants and other materials to prevent shoreline erosion. Workshop curriculum incorporated current research on the subject, design and maintenance issues, permitting requirements, and funding opportunities. The target audience was thus broad and included coastal planners and managers, property owners, and marine contractors.

Accomplishment: GBNERR's CTP makes a concerted effort to integrate information gained from the Reserve's Research and Stewardship Programs into workshop offerings.

In order to sustain the value and quality of workshop offerings, the CTP Coordinator is initiating a revision of the Program's broad based audience needs assessment. The Reserve is also considering how to best focus topical training opportunities for specific audiences, and potentially to develop topical "series" of trainings. Thoughtful evaluation and refinement in these ways will help the CTP to stay relevant and effective. OCRM supports and encourages the Reserve in these efforts to continue to enhance and expand the CTP.

E. STEWARDSHIP PROGRAM

Many Reserves in the NERRS have developed a stewardship component to complement their existing research and education programs. Stewardship staff generally participate in activities including research, monitoring, education, and implementation of resource management actions. Stewardship at GBNERR is focused on natural resource protection and management, an integral part of the Reserve's mission. Aspects of the GBNERR Stewardship Program include restoration activities, monitoring, land management, and land acquisition. Resource management priorities include protection of cultural resources, erosion, and existing human uses. Stewardship activities at GBNERR are designed to demonstrate best management practices that other resource professionals, local decision-makers, and the general public can apply in their own communities. The evaluation team noted a number of projects that are or will directly affect coastal management in the region. Stewardship staff also support other Reserve programs, for example by providing GIS mapping capacity for research projects.

GBNERR's stewardship program has grown substantially during this evaluation period. In addition to new restoration and monitoring initiatives, the Reserve was able to hire a GIS Specialist and a Stewardship Assistant to enhance resource management capacity at the Reserve. OCRM commends DMR and the Reserve for identifying the need for, and supporting, these positions, and for making the development of the Stewardship Program a priority. GBNERR has

also developed productive partnerships with Mississippi-Alabama Sea Grant, the Dauphin Island Sea Laboratory, and the University of Southern Alabama to implement stewardship activities. The Stewardship Program also collaborates closely with the GBNWR on various land management activities.

Accomplishment: GBNERR has thoughtfully expanded its Stewardship Program during this evaluation period through both the initiation of a variety of demonstration projects that directly benefit resource management efforts in the region, and the addition of two staff positions to enhance the Reserve's land management capacity.

1. Restoration

Habitat restoration is a key component of GBNERR's Stewardship Program. Both natural and human influences have caused a variety of changes in the Grand Bay region. Some of these changes have resulted in a degradation of the natural ecosystem, in which case the Reserve might address them through restoration activities. GBNERR currently has a number of demonstration projects underway in order to assess the effectiveness of potential restoration and habitat management methods. These projects are often collaborative in nature, involving not only GBNERR staff, but also university researchers and volunteers. In some cases, the Stewardship Program has worked with the CTP to provide information gained through these projects to resource managers. The Reserve is thoughtful in its selection of restoration projects, and had focused on those which not only benefit habitat management at GBNERR, but also are applicable, and transferable, to other areas along the Gulf Coast. Current restoration projects at Grand Bay NERR include:

Intertidal oysters reefs

GBNERR is collaborating with The Nature Conservancy and researchers at the University of Southern Mississippi – Gulf Coast Research Laboratory to study and compare oyster growth rates at natural and restored oyster beds within the Grand Bay ecosystem. The ultimate goal of the project, which is funded through NOAA's Community-Based Habitat Restoration program, is to restore intertidal oyster reef habitat along the shorelines of three bayous, Crooked Bayou, North Rigolets, and Bayou Cumbest. A graduate student from USM will monitor both restored and natural oyster reefs to assess whether oyster growth and use of the reefs by aquatic organisms are comparable between the two reef types. Community volunteers will help "plant" shells in the restored areas and will participate in some aspects of data collection.

Pine savanna

A large portion of the GBNERR's northern buffer consists of fire-dependent wet pine savanna and pine flatwood habitat. Given the historic suppression of fire in the region, these habitats have deteriorated due to the overgrowth of shrubs and overstock of trees. Restoration to historic open savanna conditions requires both initial tree-thinning and maintenance through prescribed burning. This management regime will allow traditional pine savanna and flatwood flora and fauna reestablishment in the areas. In 2006, GBNERR staff worked with GBNWR to mechanically clear overstocked slash pines with a drum chopper. The drum chopper works by pushing over small trees and shrubs and breaking them into pieces. The Reserve and Refuge

have used prescribed fire in the treated areas to reduce the organic fuels produced by the drum chopper and return nutrients to the soils. GBNWR, in coordination with the Reserve, is following USFWS protocols to maintain the open pine savanna habitat through periodic prescribed burns.

Juncus marsh

Both GBNERR and Weeks Bay NERR, Alabama are working with researchers at Dauphin Island Sea Laboratory and the University of North Carolina, Wilmington to conduct a marsh restoration experiment at sites in both reserves. The GBNERR site is located behind the fishing pier at the Bayou Heron boat ramp. Restoration at this site will help to prevent additional erosion of the bank and provide habitat for fish and crabs. In 2006, volunteers helped to harvest marsh vegetation along Bayou Heron to plant at the project site. The Reserve intends to have volunteers continue to monitor the restoration. Researchers will use the site to study the value of *Juncus roemerianus* (black needlerush) marsh as a filter to remove human-based nitrogen from stormwater runoff and groundwater.

2. Monitoring Habitat Change

Submerged Aquatic Vegetation

In 2004, the NERR System initiated the second phase of SWMP characterizing diversity in the reserves' estuarine ecosystems by assessing biological community composition and species abundance and distributions. SWMP Phase II builds on Phase I monitoring capabilities by developing projects that explore patterns of inter-annual variability and spatial distribution of specific estuarine communities, such as submerged aquatic vegetation.

GBNERR has been monitoring submerged aquatic vegetation (SAV) in the Reserve since 2003, with the goal of exploring spatial changes and the effects of water quality. This monitoring is a component of their SWMP Phase II effort. Staff have been mapping the extent of SAV beds and tracking seasonal changes in the size and species composition. A key component of SWMP Phase II biological monitoring is the collection of data for scientists and coastal managers to use in short-term research planning or management decisions, in addition to the long-term goal of tracking biological changes over time. The Reserve has discovered that the most extensive SAV beds occur in Middle Bay and Point aux Chenes Bay. Using the baseline data collected, the Reserve will be able to assess the feasibility and need to restore SAV beds to other areas in the Grand Bay ecosystem that might be able to support them given known abiotic conditions. OCRM commends the Reserve on this monitoring effort, data from which can clearly inform SAV restoration and management efforts in the region.

Shoreline Erosion

As discussed in detail in the last evaluation findings, shoreline erosion is a serious challenge for GBNERR, which encompasses a retrograding delta where the Pascagoula River historically flowed. Without sediment deposition from a river, wave action from the Mississippi Sound is eroding the saltmarshes that dominate the shoreline. During low tides, breaking waves undercut the shoreline, which subsequently sloughs off in large sections during high tides. In order to gain information on erosion rates along the shoreline, the Reserve implemented a monitoring program

in 2003. Erosion is monitored (and rate calculated) at a number of locations along the shoreline that represent different underlying geological substrates and exposure to wave energy. Data from this monitoring project not only will inform the Reserve's restoration and demonstration projects, but also could inform commercial techniques that are typically used to abate erosion. The Stewardship Program's long-term objectives for this project also include describing seasonal variation in erosion rates and studying the impacts of hurricanes and tropical storms on coastal erosion. OCRM commends the Reserve for addressing this important ecological process.

3. Land Management

One significant way that the Stewardship Program has enhanced the Reserve's land management activities this evaluation period is by further developing its GIS capacity. A GIS Technician was hired in 2005 and is paid through the NOAA NERRS cooperative agreement. This increased capacity has allowed for the update and/or development of numerous GIS layers and maps for use by the stewardship, research, and education programs, as well as by GBNERR partners, to aid in natural resource management. For example, the Reserve has developed a fire management map in collaboration with GBNWR and provided GIS data to NOAA's National Marine Fisheries Service for dredge maintenance of Bayou LaBatre channel. GBNERR has also successfully revised the Grand Bay habitat map to match the NERRS classification scheme, and the GIS technician is working to ground-truth the map.

Accomplishment: GBNERR has greatly enhanced its GIS capacity this evaluation period, the results of which have helped to implement a multitude of stewardship and research efforts at the Reserve.

Much of the land management on the Reserve is conducted in collaboration with the USFWS. In particular, stewardship staff coordinate closely with GBNWR personnel on fire and invasive species management. For example, the Stewardship Program recently coordinated with the Refuge on a prescribed burn and also to treat the invasive species Chinese tallow and cogongrass. During this evaluation period, GBNERR has revised its Fire Management Plan and developed an Invasive Species Management Plan to help guide future joint activities such as these.

The Fire Management Plan specifies wildfire suppression policies, the use of prescribed fire for attaining natural resource management objectives, and the operational procedures for the GBNERR's fire program. The USFWS, however, has primary responsibility for fire prevention, suppression, and prescribed fire activities on the Reserve.

Several non-indigenous, invasive species are found throughout the Grand Bay ecosystem. Congongrass and Chinese tallow are the most prevalent of these found in GBNERR and also have the most destructive impacts on the ecology of the system. The Reserve's new Invasive Species Management Plan identifies invasive species known to occur on the Reserve and describes management activities employed for the control and/or eradication of these species. It also describes potential future threats by invasive species and a plan to prevent future biological

invasions. Stewardship staff works to control and manage populations of the species through mechanical and chemical methods, such as mowing and cutting, spraying, and prescribed fire. The Reserve is also developing GPS inventories of phragmites, cogongrass, and Chinese tallow. OCRM commends GBNERR on developing a comprehensive plan to address invasive species issues at the Reserve.

GBNERR's Stewardship Program has also initiated and directed a Grand Bay Coastal Cleanup for the past two years. This was the first Reserve-specific clean-up conducted as part of the Annual Mississippi Coastal Cleanup which is in its 20th year. The Reserve was able to attract and mobilize approximately 30 volunteers for the effort.

OCRM commends GBNERR on its success in partnering with the GBNWR on land management activities that enhance coastal resources within the Reserve. OCRM encourages the Reserve to continue to look for ways to expand this collaboration.

4. Land Acquisition

As stated in GBNERR's draft management plan, the primary goal of the Reserve's acquisition strategy is to establish public control of key aquatic and terrestrial resources with an adequate buffer zone to provide for the protection of the Reserve, allowing for long-term management and research, monitoring, and educational opportunities. The Reserve completed a Land Acquisition Plan in 2005. This Plan describes the criteria that will be used to prioritize the acquisition of property parcels within the acquisition boundary of the Reserve. (It does not prioritize parcels individually.) Criteria that will be considered include: habitat type; land cost; level of disturbance (though information required to assess this criteria does not currently exist); contribution to landscape/ecosystem function; ease of acquisition; and benefit for public use.

Currently, approximately 75% of the land within GBNERR's boundary is publically owned. Primary priority for future acquisition will be given to acquiring existing inholdings within the core area from willing sellers. Decisions on the acquisition of other lands will be based on the priority criteria and rationale for expanding the boundary. During the evaluation period, DMR purchased 40 acres of marsh and salt panne habitat. There is anticipation that additional acquisition through FEMA post-Katrina buy-outs will occur, and it is assumed that those near the Reserve will be considered for inclusion into either the NERR or the NWR.

The evaluation team also heard that The Nature Conservancy (TNC) is interested in being a key land acquisition partner, as GBNERR is located within its Grand Bay Savanna project area. The Grand Bay Savanna project was recognized by the TNC as one of seventy-five outstanding landscapes designated as a bioserve in its "Last Great Places" program due to its biological significance. TNC has been active in acquiring lands within the GBNERR acquisition boundary for several years. TNC expressed interest in working more closely with the Reserve to identify land acquisition opportunities.


V. CONCLUSIONS

For the reasons stated herein, I find that the State of Mississippi is adhering to the programmatic requirements of the National Estuarine Research Reserve System in the operation of its approved Grand Bay National Estuarine Research Reserve (GBNERR).

GBNERR has made notable progress in the following areas: facilities; Research and Monitoring Program expansion, including the full implementation of SWMP; new education and outreach programming; implementation of the Reserve's Coastal Training Program; and growth of the Stewardship Program.

The findings contain one Necessary Action which must be addressed according to the timeline provided. These evaluation findings also contain five recommendations in the form of Program Suggestions. The Program Suggestions should be addressed before the next regularly scheduled program evaluation, but they are not mandatory at this time. Summary tables of program accomplishments and recommendations are provided in the Appendix E.

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



David M. Kennedy
Director, Office of Ocean and Coastal
Resource Management



Date

VII. APPENDICES

APPENDIX A. SUMMARY OF ACCOMPLISHMENTS AND RECOMMENDATIONS

Accomplishments

Issue Area	Accomplishment
Reserve Administration	Mississippi's DMR provides exceptional support for the operation and management of the Grand Bay NERR.
Staffing and Program Integration	GBNERR staff are trusted and respected partners in the scientific, education, and coastal management communities. Staff members also work effectively across Reserve sectors in order to develop and implement initiatives that address research, education, and stewardship goals through integrated efforts.
Facilities	GBNERR completed the design of, and began construction on, its new office and visitors' center, the Grand Bay Coastal Resources Center. By incorporating sustainable design features in the new facility, the State and Reserve took into account the sensitivity of its coastal location, while not compromising the current and future needs of the Reserve.
Research and Monitoring Program	GBNERR has successfully increased the number and diversity of research and monitoring efforts within the Reserve, with a clear focus on informing coastal resource management in the region.
System-wide Monitoring Program	GBNERR has fully implemented its SWMP during this evaluation period. Remarkably, the Reserve's water quality monitoring was continuous throughout Hurricane Katrina, data from which has already been used for a variety of educational programs.
Environmental Cooperative Science Center	GBNERR has demonstrated a strong commitment to the Environmental Cooperative Science Center concept and to its relationship with Jackson State University. The support of a new staff position (funded by Florida A & M University) has greatly increased the productivity of this partnership for the Reserve.
General Education Program	GBNERR's Education Program is successfully engaging its target audience through the development and implementation of a variety of new community education and interpretation opportunities, and communication tools.
Coastal Training Program	GBNERR's CTP has demonstrated great initiative in the two years of active program implementation. After Hurricane Katrina, the Reserve proactively adapted its initial strategy by immediately identifying, and successfully responding to, the new training needs of the local community.
Coastal Training Program	GBNERR's CTP makes a concerted effort to integrate information gained from the Reserve's Research and Stewardship Programs into workshop offerings.
Stewardship Program	GBNERR has thoughtfully expanded its Stewardship Program during this evaluation period through both the initiation of a variety of demonstration projects that directly benefit resource management efforts in the region, and

	the addition of two staff positions to enhance the Reserve's land management capacity.
Land Management	GBNERR has greatly enhanced its GIS capacity this evaluation period, the results of which have helped to implement a multitude of stewardship and research efforts at the Reserve.

Recommendations

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

Issue Area	Recommendation
Reserve Administration	PS: OCRM encourages DMR to identify ways to promote and better integrate GBNERR and its capabilities across the Department to meet the scientific, conservation and management objectives of both entities.
Reserve Advisory Groups	PS: OCRM encourages GBNERR and DMR to work with the current Reserve Management Board and the Citizens' Advisory Committee to determine how to best align the roles of these advisory groups with the Reserve's current and future needs.
Management Plan	NA: GBNERR must provide OCRM with a complete draft Management Plan by March 30, 2008. The Reserve's final Management Plan must be submitted by June 30, 2008.
Partnerships	PS: OCRM encourages GBNERR to continue to enhance and expand the partnership with the GBNWR, specifically in the realms of education and land management/stewardship.
Facilities	PS: OCRM encourages GBNERR to consider the operation and management needs of the new facility and the associated staffing requirements as part of their management plan revision. In addition, OCRM encourages DMR consider supporting a staff position dedicated to facilities operations and management.
General Education Program	PS: OCRM strongly encourages GBNERR to prioritize education and interpretation initiatives as part of its management plan revision, with consideration given to the resource demands of the new Grand Bay Coastal Resources Center and the resulting increase in program visibility.

APPENDIX B. GBNERR'S RESPONSE TO 2004 EVALUATION FINDINGS

Program Suggestion: NOAA strongly encourages GBNERR to develop a strategy and timeline for revising its management plan, which should be completed prior to the reserve's next regularly scheduled evaluation. NOAA also encourages GBNERR to evaluate existing Memoranda of Understanding with its partners during the management plan revision. The status of the management plan's revision process should be described in GBNERR's semi-annual performance reports.

GBNERR Response: The plans to revise the Management Plan were altered by Hurricane Katrina, causing a delay in progress as we revised priorities as a result of the storm. Staff are currently working on revisions, will have a draft complete by the November 27, 2007 evaluation. The plan is scheduled for completion by December 2007.

Program Suggestion: NOAA strongly encourages GBNERR to work with Grand Bay National Wildlife Refuge to develop a Memorandum of Understanding that clearly describes all roles and responsibilities regarding the new facilities.

GBNERR Response: In October 2007, the USFWS and the Mississippi Department of Marine Resources completed an agreement on the operations and maintenance of the new facilities, Grand Bay Coastal Resources Center.

Program Suggestion: NOAA encourages GBNERR to continue its efforts to coordinate with Grand Bay National Wildlife Refuge and to explore alternatives for improving coordination.

GBNERR Response: Coordination continues between USFWS and the NERR to increase communication and coordinate joint projects. Several research, education and stewardship projects are conducted on refuge-owned properties by NERR staff, benefiting both the NERR and the Refuge.

Program Suggestion: NOAA strongly encourages the Research and Monitoring Program to develop a strategy and timeline for completing the site profile, which should be completed prior to GBNERR's next regularly scheduled evaluation. The status of the site profile's progress should be described in GBNERR's semi-annual performance reports.

GBNERR Response: A final site profile was submitted to NOAA October 1, 2007. We are currently working to produce a slick, hard copy publication and CD of the document.

APPENDIX C. PERSONS AND INSTITUTIONS CONTACTED

Grand Bay National Estuarine Research Reserve

Name	Title
Jennifer Buchanan	Education Coordinator
Marian Dicas	CTP Coordinator
Chris May	Stewardship Coordinator
Jay McIlwain	Stewardship Assistant
Rick Ranew	Educator (University of Southern Mississippi)
David Ruple	Reserve Manager
Teresa Stadler	Administrative Assistant
Tom Strange	GIS Coordinator
Gretchen Waggy	Research Assistant
Jake Walker	Research Assistant
Christine Walters	SWMP Coordinator
Christina Watters	Research Assistant (Florida A & M)
Mark Woodrey	Research Coordinator
Megan Hughes	Graduate Research Fellow

Mississippi Department of Marine Resources

Name	Title, Office
Dr. Bill Walker	Executive Director
Jan Boyd	Director, Coastal Ecology
Beth Roberts	Contracts Officer, Administrative Services
Tom Doster	Director, Administrative Services
Kara Vesa	Financial Manager, Administrative Services
Tina Shumate	Coastal Management and Planning
Marcia Garcia	Coastal Management and Planning
Jeff Clark	Coastal Preserves Program

Program Partners

Name	Title, Affiliation
Margaret Bretz	Secretary of State's Office
Lloyd Culp	Gulf Coast Complex Manager, US Fish and Wildlife Service
Durwin Carter	US Fish and Wildlife Service
Sami Gray	US Fish and Wildlife Service
Emily Neidigh	US Fish and Wildlife Service
Lee Yokel	Gulf of Mexico Alliance
Jan Barlow	Citizen's Advisory Committee
Clyde Brown	Citizen's Advisory Committee
Senator Tommy Moffatt	State Senator, Citizen's Advisory Committee member
Patsi Spinks	Citizen's Advisory Committee
Mary Austill Lott	The Nature Conservancy
Mark LaSalle	Audubon Society

Christine Cocker	Mississippi State University
Ann Dower	Mississippi Power
Bob Cooper	University of Georgia
Bill Platt	Louisiana State University
Ben Posadas	Mississippi State University
Shelia Brown	University of Southern Mississippi
Mark Peterson	University of Southern Mississippi
Anne Boettcher	University of South Alabama
Just Cebrian	Dauphin Island Sea Lab
Sharon Hodge	Northern Gulf Institute
Scott Phipps	Weeks Bay NERRS
Patty Rogers	R C & D Council
Xavier Bishop	Mayor, City of Moss Point
Manly Barton	Jackson County Board of Supervisors
Julia Weaver	City of Ocean Springs
Anne Weaver	NOAA Coastal Services Center
LaDon Swann	Sea Grant
Hoppy Allred	Studio South Architects
Steve Weaver	Rod Cooke Construction

APPENDIX D. PERSONS ATTENDING THE PUBLIC MEETING

No one attended the public meeting.

APPENDIX E. NOAA'S RESPONSE TO WRITTEN COMMENTS

OCRM received 23 sets of written comments regarding the Grand Bay NERR. Each set of comments is summarized below and followed by OCRM's response.

Wendy B. Allen
Manager
North Inlet – Winyah Bay NERR
Georgetown, South Carolina

Comments: Ms. Allen described the North Inlet – Winyah Bay (NI-WB) NERR's partnership with GBNERR to produce the "Marsh Bird Training Workshop" held during this evaluation period. The Workshop was also co-sponsored by the ACE Basin NERR and the US Geological Survey. Ms. Allen noted that although the workshop was hosted at NI-WBNERR, staff from GBNERR took the lead in planning and agenda and materials development, as well as participant registration. GBNERR's Research Coordinator was also one of the two instructors. Ms. Allen believes that the success of this workshop illustrates the high degree of professionalism and willingness of the Reserve to partner with others in the southeast to enhance research and coastal resource management efforts.

OCRM's Response: No response necessary. The evaluation teams thanks Ms. Allen for her comments.

Carolyn Burks
Fisheries Biologist and Outreach Coordinator
NOAA's National Marine Fisheries Service
Pascagoula, Mississippi

Comment: Ms. Burkes wrote in support of the educational programs offered by the GBNERR. She specifically commended the Education Coordinator on her implementation of programming, and for her organization and professionalism.

OCRM's Response: No response necessary. The evaluation teams thanks Ms. Jordan for her comments.

Jeff Clark
Bureau Director, Coastal Preserves Program
Mississippi Department of Marine Resources
Biloxi, Mississippi

Comments: Mr. Clark described his productive relationship with GBNERR, and expressed his appreciation of the Reserve's research in specific. He explained how research conducted at the

Reserve is important and applicable to other Coastal Preserves in the State, and how information gained from this research helps his Program to make science-based coastal management decisions including planning for and designing restoration projects. Mr. Clark noted that GBNER staff works hard to include the needs of the Coastal Preserves Program in the development of research projects. He also said that he considers the Reserve to be one of his program's main partners in the effort to protect Mississippi's estuarine areas.

OCRM's Response: No response necessary. The evaluation teams thanks Mr. Clark for his comments.

Hyun Jung Cho, Ph.D.
Assistant Professor Department of Biology
Jackson State University
Jackson, Mississippi

Comments: Dr. Cho described his positive experiences working with GBNER through both the ECSC and for research and education activities that he has collaborated on with the Stewardship Coordinator. He mentioned specifically the support provided by staff for the implementation of research projects and in expanding professional networks. Dr. Cho noted that his productive partnership with the Reserve has resulted in numerous publications and presentations. He has also collaborated with Reserve staff on grant proposals. Dr. Cho commended the professionalism, promptness, coordination, and helpfulness of Reserve staff.

OCRM's Response: No response necessary. The evaluation teams thanks Dr. Cho for his comments.

Mark Cohen, Ph.D.
Physical Scientist
NOAA Air Resources Laboratory
Silver Spring, Maryland

Comment: Dr. Cohen expressed his support for the GBNER's Research and Monitoring Program and staff, specifically in relation to their work to establish and operate a comprehensive atmospheric mercury monitoring station at the Reserve. He stressed the importance of this particular site, given the range of pollutants and other parameters that the Reserve monitors. Dr. Cohen noted that it was in part his positive interactions with the staff and their engagement in the process that lead to the Reserve's selection as the location for the mercury monitoring station in the Gulf of Mexico region. He said that his office relies heavily on GBNER's research staff to carry out required maintenance, troubleshooting, and other necessary activities critical to the monitoring, and that they could not be more pleased with the cooperation, skill, and enthusiasm that his "colleagues" at the Reserve have exhibited in collaboration. Dr. Cohen also stressed the importance and potential of the GBNER relationship to the Air Resources Laboratory, given

the extent to which the issues of mercury contamination as an ecosystem issue can be addressed at the Reserve using information collected through other research and monitoring efforts there.

OCRM's Response: No response necessary. The evaluation teams thanks Dr. Cohen for his comments.

Dr. Courtney J. Conway
Associate Professor and Assistant Unit Leader
US Geological Survey, Biological Resources Division
Tucson, Arizona

Comments: Dr. Conway wrote to describe the positive interactions and collaborations that she has experienced working with GBNERR. In particular, she has worked closely with the Research Coordinator on a variety of projects related to marsh-dependent birds, including co-authoring presentations, co-organizing a training workshop for NERRS staff, and submitting a joint research proposal. Dr. Conway believes that this interaction has greatly benefited the exposure, support, and research output of both the NERRS and her UGSG program. She also noted that the Research Coordinator is well-respected among his peers, and highlighted his energy and enthusiasm.

OCRM's Response: No response necessary. The evaluation teams thanks Dr. Conway for her comments.

Susan Dollar
Principal
N. E. Taconi Elementary School
Ocean Springs, Mississippi

Comment: Ms. Dollar described the great experience she, and a group of fifth grader students at her elementary school, had with GBNERR's K-12 Education Specialist, during a field trip to the J. L. Scott Marine Education Center (MEC). They had the opportunity to learn about marine debris along side First Lady Laura Bush, Secretary of Interior Kempthorne, and Governor Haley Barbour. Ms. Dollar was particularly impressed by the passion and knowledge of the Reserve's Education Specialist. She noted that the students thoroughly enjoyed the lesson and the way it was taught, and that they have demonstrated a greater understanding of the marine debris issue since. She closed by saying that the lesson, teacher, and visit from the First Lady amounted to an experience the student would likely never forget.

OCRM's Response: No response necessary. The evaluation teams thanks Ms. Dollar for her comments.

Olivia Graves, Ph.D
Teacher
Harrison Central High School
Gulfport, Mississippi

Comments: Dr. Graves wrote, as a teacher and community member, in support of the education and interpretive opportunities provided by GBNERR and to commend the Reserve's Education Coordinator. Dr. Graves, her family, and her students have participated in a number of Reserve events including the BioBlitz and the Bug-A-Thon. She further described a number of sights and experiences that resonated with her, her grandchildren and students. Dr. Graves noted that the Education Coordinator is knowledgeable, enthusiastic, and inspiring. She also said that the Reserve's engagement of scientists in educational activities enhances the programs for students and adults.

OCRM's Response: No response necessary. The evaluation teams thanks Dr. Graves for her comments.

Dr. D. Jay Grimes
Professor of Coastal Sciences
Gulf Coast Research Laboratory
The University of Southern Mississippi
Ocean Spring, Mississippi

Comments: Dr. Grimes described the support provided by GBNERR particularly with regards to his oyster reef research at the Reserve, which is funded via a NOAA/NOS Oceans and Human Health Initiative grant. He noted that Reserve staff have been most cooperative and helpful. Dr. Grimes also described and enclosed an outreach brochure for the project that he and his colleagues developed in collaboration with GBNERR staff. He closed by saying that he is honored to work with the Reserve program.

OCRM's Response: No response necessary. The evaluation teams thanks Dr. Grimes for his comments.

Flinda R. Hill
Senior Environmental Specialist
Mississippi Power
Gulfport, Mississippi

Comment: Ms. Hill wrote on behalf of Mississippi Power Company's Plant Daniel to express their support for GBNERR's Education Program. They appreciate the opportunity to participate in and benefit from the outreach and educational programming offered to the community by the Reserve. Ms. Hill noted that the partnership between the Reserve and Plant Daniel is beneficially not only to them, but also to the public and the environment.

OCRM's Response: No response necessary. The evaluation teams thanks Ms. Hill for her comments.

Dawn Jordan
Ocean Springs, Mississippi

Comment: Ms. Jordan described her daughter's positive experience with GBNERR, which she called a very important asset to her Gulf Coast Community. Her daughter worked with staff at the Reserve to gather research for her high school science project. Ms. Jordan was extremely appreciated of the time that staff took to explain projects and research at the Reserve to her daughter, and that she was able to work with them to further develop her project and gather information. She specifically mentioned that she and her daughter were even able to join staff researchers in the field, which was "an invaluable experience to her on real world science, ecology, and conservation." Ms. Jordan described Reserve staff as dedicated to their mission of conservation and education, and said that they sparked an interest for her daughter in the coastal environment.

OCRM's Response: No response necessary. The evaluation teams thanks Ms. Jordan for her comments.

Dr. Frank R. Moore
Professor and Chair of Department of Biological Sciences
The University of Southern Mississippi
Hattiesburg, Mississippi

Comments: Dr. Moore described three activities in particular that he believes illustrate the value of GBNERR: graduate education, research experience, and scientific outreach and exchange. He explained how the Reserve supports graduate education by relating the experience of his graduate student (a NERRS GRF). He described how she gained access to research sites and logistical assistance while in the field from GBNERR staff, and valuable advice on her migratory bird research from the Research Coordinator. Dr. Moore also appreciates the research and field experience provided to undergraduates who are able to work as field assistants for researchers at the Reserve. He said that they not only gain experience with field methods and protocols, but also learn how their work contributes to larger research goals. Finally, Dr. Moore noted the involvement of GBNERR's Research Coordinator in the University's Migratory Bird Research Group. He described what he believes the benefits of this relationship are to the NERR, the Group, and the University. Dr. Moore closed by saying that his relationship with the administration and staff of GBNERR has been very positive and productive.

OCRM's Response: No response necessary. The evaluation teams thanks Dr. Moore for his comments.

David H. Nelson, Ph.D.
Associate Professor of Biology
University of South Alabama
Mobile, Alabama

Comments: Dr. Nelson wrote in support of the Research and Monitoring Program at GBNERR. He and his students have worked at the Reserve and with staff on a number of research projects, including those on prescribed fire and pine savannah ecosystems, and has also used the site for field trips. Dr. Nelson believes that the Reserve's programs enhance conservation, environmental stewardship, ecological training, and field research. He said that GBNERR offers excellent opportunities to pursue studies on many species of plants and animals, as well as basic ecological principles, due to its secure, undeveloped areas.

OCRM's Response: No response necessary. The evaluation teams thanks Dr. Nelson for his comments.

Dr. Melanie Nelson
Principal
Beauvoir Elementary School
Biloxi, Mississippi

Comments: Dr. Nelson described her and her staff's experiences with GBNERR's K-12 Education Specialist, who has conducted a number of teacher workshops as well as student sessions on wetlands at her elementary school. She praised his enthusiasm and knowledge, and noted his willingness to go above and beyond to provide the best learning opportunities possible for the teachers. She specifically mentioned how everyone appreciated the guided kayak trips, individual meetings with teachers to plan meaningful activities, age-appropriate materials, and his availability throughout the year to answer questions. Dr. Nelson said that the knowledge base of the teachers increased substantially because of the Reserve's commitment to education.

OCRM's Response: No response necessary. The evaluation teams thanks Dr. Nelson for her comments.

Chet Rakocinski
Associate Professor Department of Coastal Sciences
Gulf Coast Research Laboratory
University of Southern Mississippi
Ocean Springs, Mississippi

Comments: Dr. Rakocinski described a number of research initiatives that he and his colleagues have conducted in, and in partnership with, GBNERR. He expressed his appreciation for the financial and logistical support provided by the Reserve in these efforts. Dr. Rakocinski closed

by stating that he expects GBNERR to continue to play a vital role in supporting important research on coastal resource issues.

OCRM's Response: No response necessary. The evaluation teams thanks Dr. Rakocinski for his comments.

Scott A. Rush
Doctoral Candidate
University of Georgia
Athens, Georgia

Comment: Mr. Rush is a Doctoral Candidate whose research focuses on the ecology of marsh birds, specifically Clapper Rails, along the Mississippi Coast; one of his study sites is at GBNERR. He was also recently awarded a NERRS Graduate Research Fellowship. Mr. Rush described the myriad of ways that he, and his research, have benefitted from his partnership with the Reserve and staff. He specifically is grateful for the technical support, discourse, field and laboratory assistance, and guidance that he has been provided by the Reserve. In addition, Mr. Rush noted the importance of GBNERR in protecting salt marsh habitats along the Northern Gulf Coast, and in providing opportunities for research aimed at assessing disturbance in natural communities.

OCRM's Response: No response necessary. The evaluation teams thanks Mr. Rush for his comments.

Reba Scott
Technology Assistant
Orange Lake Elementary School
Moss Point, Mississippi

Comments: Ms. Scott wrote in support of GBNERR, specifically the Education Program. She described how students enjoyed the virtual field trip, presentation and materials provided to them by the Reserve's K-12 Education Specialist.

OCRM's Response: No response necessary. The evaluation teams thanks Ms. Scott for her comments.

Patricia A. Spinks
Citizen's Advisory Committee
Mississippi

Comments: Ms. Spinks wrote in support of GBNERR, and of the Education Program and Education Coordinator in specific. She commended the Education Coordinator's program

development, organization, and skills as an educator. Ms. Spinks also expressed her appreciation for the opportunity to participate in the Reserve program.

OCRM's Response: No response necessary. The evaluation teams thanks Ms. Spinks for her comments.

Paul B. Tchounwou, Sc.D.
Associate Dean
Jackson State University
Jackson, Mississippi

Comment: Dr. Tchounwou serves as Co-Principle Investigator for the NOAA-supported Environmental Cooperative Science Center (ECSC) at Jackson State University (JSU). Dr. Tchounwou wrote in support of the Grand Bay NERR, and reported that the University's partnership with the Reserve has been very productive. He described some of the work that has been completed through the partnership thus far, noting that the joint research and education projects have resulted not only in great understanding of the Grand Bay ecosystem but also in the training of JSU students in NOAA-related sciences. Dr. Tchounwou listed a number of on-going collaborative research projects that involve MS and PhD students, and confirmed that the partnership with GBNERR is having a substantial impact on the overall mission of Jackson State University.

OCRM's Response: No response necessary. The evaluation teams thanks Dr. Tchounwou for his comments.

Bill Vermillion
Bird Conservation Specialist
Gulf Coast Joint Venture Bird Habitat Conservation Partnership
Lafayette, Louisiana

Comments: Mr. Vermillion expressed his support of the GBNERR's Research Program, and to describe how the Reserve benefits his organization. Because the Reserve is located within the Gulf Coast Joint Venture's region, much of the bird-related research and monitoring conducted at the site is relevant to the organizations work, such as the development of species-specific habitat models. Mr. Vermillion also noted that the Reserve's Research Coordinator participates on the Joint Venture's Monitoring, Evaluation, and Research Team. He hopes to continue the collaboration with Reserve scientists.

OCRM's Response: No response necessary. The evaluation teams thanks Mr. Vermillion for his comments.

Billy Walker
Science Department Chairperson
Gautier High School
Gautier, Mississippi

Comments: Mr. Walker described his high school's "My Two Boots: A Walk Through the Wetlands" event and the role played by the GBNERR's K-12 Education Specialist. This event is hosted for approximately 650 6th grade students from four schools in the Pascagoula School District, to provide field experiences for district students after their two week study of wetland habitats in the classroom. Gautier recruits a number of volunteers to help with the event, one of which was the Reserve's Education Specialist who taught students the importance of wetland plants. Mr. Walker commended the Specialist's enthusiasm, interest, and knowledge. He has heard from a number of parents, teachers, and students how highly they valued this station in particular. Mr. Walker also included a letter of appreciation that was sent to the Education Specialist signed by two of the schools involved in the event.

OCRM's Response: No response necessary. The evaluation teams thanks Mr. Walker for his comments.

Samuel P. Walker, Ph.D
Information Management Coordinator
Southeast Coastal Ocean Observing Regional Association
and the University of South Carolina
Charleston, South Carolina

Comments: Dr. Walker described his experiences with research and stewardship staff at the GBNERR, particularly with the Research and Stewardship Coordinators. He and his colleagues expressed their gratitude to Reserve staff for their support and accommodation of research requests and requirements over a variety of projects. Dr. Walker specifically mentioned how much the Research Coordinator helped him throughout his doctoral research, using GBNERR as a reference site, and how they continue to collaborate on several publications. Dr. Walker described his most lasting impression of his relationship with the Reserve as the support that staff provided to himself and his colleagues in the aftermath of Hurricane Katrina. He said that despite personal and professional obstacles, GBNERR staff were incredibly hospitable and supportive of a University-sponsored research project (CRISIS) that was to assess the physical impacts to the estuary. As a group, they worked for three days, within a month of the storm, to install monitoring transects and equipment to monitor the long-term effects of Hurricane Katrina. Overall, Dr. Walker considers it an honor to be associated with the staff at GBNERR.

OCRM's Response: No response necessary. The evaluation teams thanks Dr. Walker for his comments.

James Weston
Ph.D. Candidate
University of Mississippi
University, Mississippi

Comments: Mr. Weston described the excellent support provided to him by GBNERR staff for his doctoral research conducted at the Reserve. He values the access to the Reserve, its facilities, monitoring program data and staff support. Mr. Weston also noted that this relationship has helped him to obtain additional funding for his research. He also expressed appreciation of the knowledgeable staff, particularly in the design and implementation of experiments on the Reserve.

OCRM's Response: No response necessary. The evaluation teams thanks Mr. Weston for his comments.