



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

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AUG 12 2011

Dear Dean Laude:

Enclosed are the final evaluation findings for the Mission-Aransas National Estuarine Research Reserve (Reserve) for the period from designation in May 2006 through April 2011.

The fundamental conclusion of this evaluation is that Texas is adhering to the programmatic requirements of the NERR system in its operation of the approved Mission-Aransas Reserve. This evaluation findings document contains three recommendations, none of which is mandatory.

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

Sincerely,

Donna Wieting
Acting Director

Enclosure

cc: Dr. Lee Fuiman, Director, University of Texas Marine Science Institute
Dr. W. Arthur "Skip" Porter, Associate Dean for Innovation and Science Enterprise,
University of Oklahoma
Ms. Sally Morehead, Manager, Mission-Aransas National Estuarine Research Reserve
Mr. Matt Chasse, Program Specialist, Estuarine Reserves Division, OCRM
Mr. Peter Wellenberger, Manager, Great Bay National Estuarine Research Reserve



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FINAL EVALUATION FINDINGS
MISSION-ARANSAS NATIONAL ESTUARINE RESEARCH RESERVE
May 2006 through April 2011

August 2011



All photos courtesy of Peter Wellenberger, Great Bay NERR



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

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I. EXECUTIVE SUMMARY

The Coastal Zone Management Act (CZMA) of 1972, as amended, established the National Estuarine Research Reserve System (NERRS). Sections 312 and 315 of the CZMA require the National Oceanic and Atmospheric Administration (NOAA) to conduct periodic performance reviews or evaluations of all federally approved National Estuarine Research Reserves (NERRs). The review described in this document examined the operation and management of the Mission-Aransas National Estuarine Research Reserve (MANERR or the Reserve) during the period from its designation in May 2006 through April 2011. The Reserve is administered by the University of Texas Marine Science Institute (MSI).

This document describes the evaluation findings of the Director of NOAA's Office of Ocean and Coastal Resource Management (OCRM) with respect to the Mission-Aransas NERR during the review period. These evaluation findings include discussions of major accomplishments as well as recommendations for program improvement. The fundamental conclusion of the findings is that the State of Texas is adhering to the programmatic requirements of the National Estuarine Research Reserve System in its operation of the Mission-Aransas National Estuarine Research Reserve.

The evaluation team documented a number of Mission-Aransas Reserve accomplishments during this review period. Within just the five years since designation, the Reserve has assembled a highly respected and knowledgeable staff, has formed numerous partnerships and collaborations that strengthen the Reserve's outreach and program effectiveness, and has successfully built facilities and infrastructure to establish the Reserve's presence in both the community and on the Marine Science Institute campus. This includes the Estuarine Research Center, the Wetlands Education Center, and the Bay Education Center.

Since 2006 the Reserve has successfully developed several programs that support the national system. Infrastructure to support the System-wide Monitoring Program (SWMP) was completely established and implemented within a year of designation. Direct services to local decision-maker audiences were established through the implementation of a Coastal Training Program as well. At the regional level, the Reserve is participating with the other four Gulf coast reserves to support priority issues of the Gulf of Mexico Alliance, and has held climate change-related workshops addressing community resilience and a very well-received 'living shorelines' workshop. The submerged aquatic vegetation and emergent marsh biomonitoring program at the Reserve is leading to the establishment of a statewide seagrass monitoring plan, while a project to assist planners and resource managers in applying ecosystem-based management principles to land use planning has created more demand for training of this type.

The evaluation team also identified areas where the Reserve and its programming could be strengthened. Because the Reserve is located on the MSI campus, which has had a well-established presence since 1941, and because the Reserve staff and MSI staff and faculty work together seamlessly on so many programs, the Reserve's identity is, to many people, virtually

indistinguishable from that of MSI. The Mission-Aransas NERR's identity and its contributions locally and nationally should be clearly and consistently recognized and acknowledged by the MSI.

Select MSI staff also should be given access to the "Grants Online" process, to prevent delays and confusion that sometimes arise when dealing with CZMA awards and actions for the Reserve. Finally, the Reserve should consider how to make greater use of the expertise and interests of Reserve Advisory Board members to support the Reserve's goals and objectives.

II. PROGRAM REVIEW PROCEDURES

A. OVERVIEW

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

- an initial document review and identification of specific issues of particular concern;
- a site visit to Texas, including interviews and public meetings;
- development of draft evaluation findings; and
- preparation of the final evaluation findings, partly based on comments from the State regarding the content and timetables of recommendations specified in the draft document.

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

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

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

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

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

B. DOCUMENT REVIEW AND ISSUES DEVELOPMENT

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

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

- The Reserve's general administration, including grants and fiscal management
- Status of Reserve staffing and needs
- Implementation and status of the Management Plan
- Facilities development and operations planning
- Implementation of the Reserve's research, stewardship, monitoring, coastal training, and education programs
- The manner in which the Reserve coordinates with other governmental and non-governmental organizations and programs in the State and region
- Major accomplishments and challenges during the review period

C. SITE VISIT TO MISSION-ARANSAS NATIONAL ESTUARINE RESEARCH RESERVE

Notification of the scheduled evaluation was sent to the University of Texas at Austin College of Natural Sciences, the University of Texas Marine Science Institute, and regional newspapers. In addition, a notice of NOAA's "Intent to Evaluate" was published in the Federal Register on February 24, 2011.

The site visit to the Mission-Aransas Reserve was conducted from April 11 – 15, 2011. The evaluation team consisted of Ms. Chris McCay, Evaluation Team Leader, National Policy and Evaluation Division, OCRM; Mr. Matt Chasse, Program Specialist, Estuarine Reserves Division, OCRM; and Mr. Peter Wellenberger, Manager, Great Bay (NH) National Estuarine Research Reserve.

During the site visit, the evaluation team met with Mission-Aransas Reserve staff, the dean and assistant dean of the UT at Austin College of Natural Sciences, the director and other staff from the Marine Science Institute, state agency staff, coastal researchers, educators, local government staff and officials, and representatives from non-profit organizations. Appendix B lists people and institutions contacted during this review.

As required by the CZMA, NOAA held an advertised public meeting on Wednesday, April 13, 2011, at 5:00 p.m. at the Mission-Aransas Reserve Bay Education Center, 121 Seabreeze Drive, Rockport, Texas. The public meeting gave members of the general public the opportunity to express their opinions about the overall operation and management of the Mission-Aransas Reserve. Appendix C lists individuals who registered at the meeting. NOAA's responses to written comments submitted during this evaluation are summarized in Appendix D.

The Mission-Aransas Reserve staff members were crucial in setting up meetings and arranging logistics for the evaluation site visit. Their hospitality and support are gratefully acknowledged.

III. RESERVE PROGRAM DESCRIPTION

NOAA's Office of Ocean and Coastal Resource Management designated the Mission-Aransas National Estuarine Research Reserve (MANERR or the Reserve) in May 2006. The lead agency is the University of Texas Austin Marine Science Institute (UTMSI or MSI). This is the Reserve's first CZMA Section 312 evaluation since designation.

The Reserve is located in Aransas, Nueces, San Patricio, Calhoun, and Refugio counties on the southeastern coast of Texas, approximately 30 miles northeast of Corpus Christi.

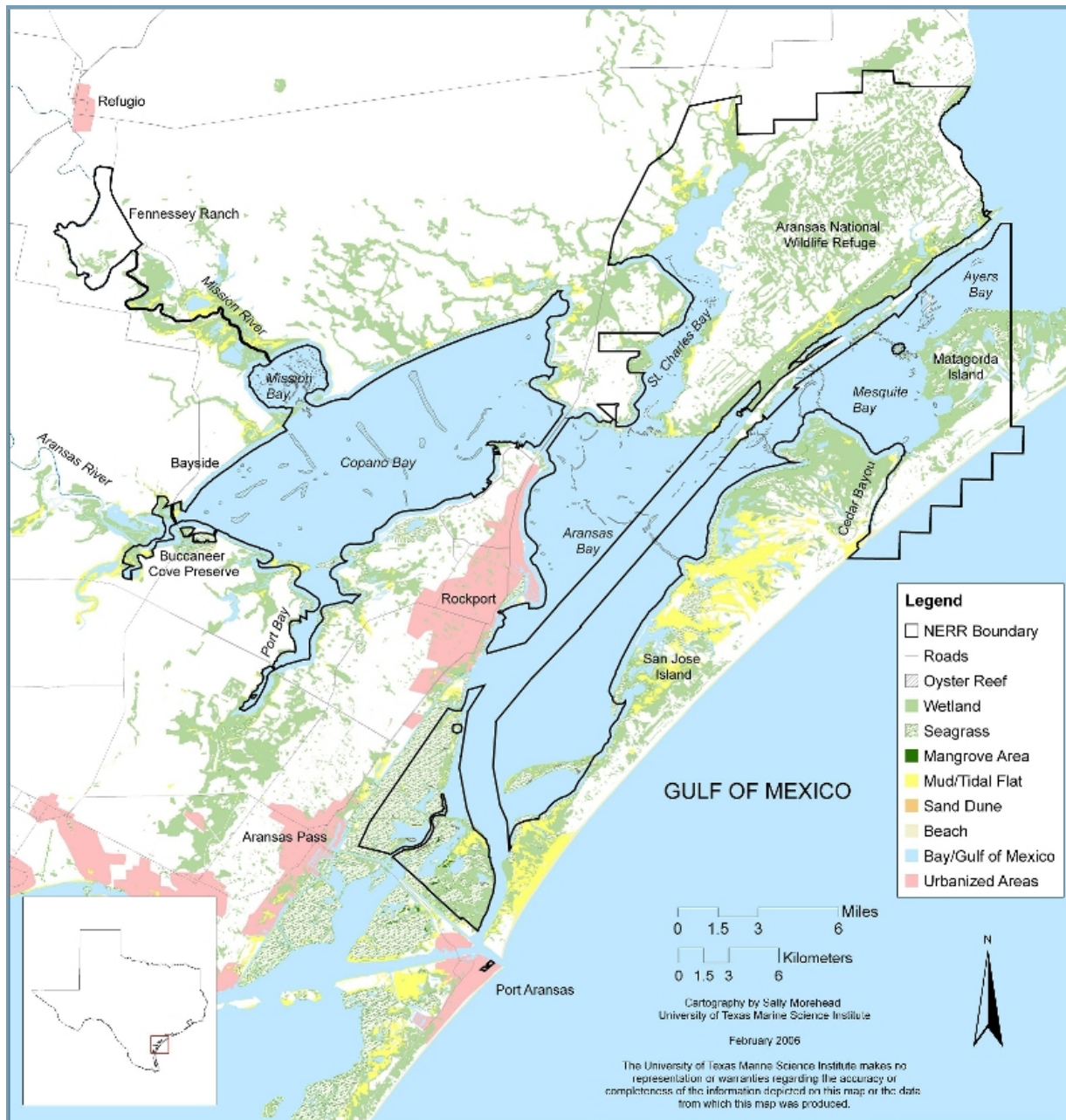
The Mission-Aransas Reserve is a large contiguous complex of wetland, terrestrial and marine environments named for the two river systems that flow into it. Its 185,708 acres are representative of Western Gulf estuaries. The estuarine system is composed of the Mission and Aransas rivers flowing into tertiary, secondary, and primary bays. Mission Bay is the only tertiary bay, and Port Bay is a minor tertiary bay. Copano Bay and St. Charles Bay are secondary bays. Mesquite, Aransas, and Redfish Bays are primary bays because they are adjacent to oceanic outlets. The bay systems are shallow, ranging from 0.6 meter in Mission Bay to 3 meters in Aransas Bay.

The Reserve has a large salinity gradient, with high salinities in Redfish Bay to lower salinities in Mission Bay. Salinity within the Reserve is determined by isolated freshwater pulses, which tend to lower salinities for long periods of time because of the shallowness of the bay and the restricted inlet connection.

Along with open-water habitats, the Reserve includes several types of wetlands: freshwater, brackish, salt marshes, and mangrove communities. The largest wetland habitat (24,400 acres) on the north side of the Reserve is part of the Aransas National Wildlife Refuge and is the winter home to the critically endangered Whooping Crane. The wetland and open water habitats also support benthic and nektonic populations, as well as large areas of oyster reefs. Large areas of seagrass and mangroves are present in the southern boundaries of the Reserve.

The Reserve's extensive public and private lands include coastal prairie, oak motte, and riparian woodlands. This includes the private Fennessey Ranch with its more than 2,000 acres of uplands and nine miles of river frontage. All of the Reserve's habitats support endangered species, such as the Whooping Crane, and culturally important species, such as shrimp and fish.

Mission-Aransas National Estuarine Research Reserve, Texas



IV. REVIEW FINDINGS, ACCOMPLISHMENTS, AND RECOMMENDATIONS

A. OPERATIONS AND MANAGEMENT

1. Administration and Staffing

The Mission-Aransas Reserve has made significant progress since its designation in May 2006. Much of that progress is, by necessity, related to establishing and securing the Reserve's administrative framework, hiring staff members, and building partnerships – all the steps necessary to build the Reserve's 'infrastructure' and move beyond the initial designation and organizational phases to implement the goals and objectives that the Reserve has set forth. In addition, however, the Reserve has made impressive progress in developing and implementing programs and activities.

The Reserve is housed administratively in the University of Texas Austin Marine Science Institute (UTMSI or Institute). The Institute has had a well-established presence at its location on Mustang Island since 1941. In addition to administrative personnel and researchers (both students and faculty), the UTMSI also has a Marine Education Services (MES) program.

The Reserve has moved from no employees at the time of designation to a full complement of 11 full-time and six part-time employees at the time of the site visit. Virtually everyone with whom the evaluation team met commended the Reserve staff members on their professionalism, knowledge and expertise, dedication, and willingness to collaborate on numerous projects.

Many of the staff are active participants or serve leadership roles in workgroups and committees locally, regionally, and nationally. The Reserve manager is a Member-at-Large of the National Estuarine Research Reserve Association Executive Committee and has served as a representative to the NERRS Strategic Committee. She also serves on the Coastal Bend Bays & Estuaries Program (CBBEP) Habitat and Living Resources Implementation Team.

The research coordinator serves as the president of the Gulf Estuarine Research Society, whose annual meeting was hosted at the Reserve in 2010, and serves on the Guadalupe-San Antonio Bay and Basin Expert Science Team. He is co-leader of the UTMSI *Research Experiences for Undergraduates* program. In addition he serves on the NERRS Systemwide Monitoring Program (SWMP) Guidance Committee, the NERRS Science Collaborative Committee, the Gulf of Mexico Alliance (GOMA) Nutrient Priority Issue Team, and the Port Aransas Planning and Zoning Board.

The Coastal Training Program (CTP) coordinator participates in the City of Rockport Water Quality Committee meetings and serves on or participates on several NERRS national groups, including the SWMP Guidance Committee, Strategic Committee, and the CTP Marketing Workgroup. The national Education Coordinator and CTP Coordinator joint sectors meeting

was hosted at the Reserve in 2009. He also serves on the CBBEP Water and Sediment Quality Implementation Team and the GOMA Water Quality Priority Issue Team.

The stewardship coordinator serves as the co-chair of the NERRS Habitat Mapping Oversight Committee of the SWMP Data Management Committee, serves on the NERRS Data Management Committee, and has also served as a representative to the NERRS Strategic Committee. She serves on the CBBEP Habitat and Living Resources Implementation Team and is president of the Marine Science Institute “Green Team.”

The Reserve’s first education coordinator served as a representative to the NERRS Strategic Committee. The current education coordinator serves on the CBBEP Environmental Education & Outreach Implementation Team and the City of Rockport Educators Coordination Team.

There is a high degree of integration among the programs and activities of the Reserve that enhances the quality of those activities and their results. For example, the Graduate Research Fellows (GRFs) actively assist in many reserve activities outside their fellowship-directed research, including SWMP logistics and analysis, serving as content experts at CTP workshops, working at the Animal Rehabilitation Keep, and some stewardship activities. Other Reserve researchers and stewardship staff members also serve as content experts at CTP workshops. The Reserve’s SWMP data is used by the education staff, the CTP, and by UTMSI researchers, and real-time SWMP data is used in displays at the Bay Education Center. The Little Bay project in Rockport (discussed in the “Research Activities” section) involved research, monitoring, stewardship, and CTP staff in a study of water quality and seagrass in Little Bay.

ACCOMPLISHMENT: The Mission-Aransas Reserve staff members are highly respected by their peers and the community at large for their professionalism, knowledge and expertise, dedication, and willingness to collaborate. They have assumed leadership roles at local, regional, and national levels. Staff members work together to integrate many of the activities and programs of the Reserve.

The Reserve staff and UTMSI staff and faculty work together almost seamlessly on numerous education, research, and stewardship programs. In addition, the UTMSI administrative staff function as the Reserve’s administrative support staff. This has generally worked quite well, except that the UTMSI Fiscal Office does not have access to Grants Online, which is the Department of Commerce electronic web-based grants management system by which all CZMA cooperative agreement awards, post-award action requests, progress reports, and financial reports, including those for Mission-Aransas NERR, are submitted and processed. This lack of access creates some delays and confusion and should be rectified.

PROGRAM SUGGESTION: The University of Texas at Austin should provide the Marine Science Institute Fiscal Office with access to the U.S. Department of Commerce “Grants Online” electronic process for purposes of processing Mission-Aransas Reserve CZMA awards and related documentation.

As noted above, the Marine Science Institute has had a well-established presence at its location on Mustang Island since 1941, and the Reserve staff and UTMSI staff and faculty work together almost seamlessly on numerous education, research, and stewardship programs. Both of these are very positive aspects, yet the two factors together have created an identity and recognition issue for the Reserve. Several people with whom the evaluation team met were not at all sure whether the programming or staff members they dealt with were part of UTMSI or the Reserve. The extensive partnerships with UTMSI personnel and programs are so integrated that the Reserve's identity seems virtually indistinguishable for activities conducted on the UTMSI campus. The identity issue was less of a concern in the City of Rockport at the Bay Education Center. Furthermore, several partners of the Reserve noted that many people do not realize Mission-Aransas NERR is part of a larger system in partnership with NOAA.

Both NOAA and the Reserve are very pleased with the active support and participation the UTMSI and its personnel provide to the Reserve. With the pending completion of the Reserve's headquarters building and its signage, the Reserve will gain some level of separate identity. However, the need for an independent identity and separate recognition of the Reserve's contributions will still remain and should be continuously and actively addressed. The cooperative agreement awards to UTMSI for the administration and operation of the Mission-Aransas NERR are not the same as research awards generated by UTMSI, and that difference should be recognized. Reserve-generated research also is contributing to NOAA's understanding of estuaries and coastal management. Reserve staff members individually and as an organization assume leadership roles regionally and nationally. Their contributions to the national system of reserves and to NOAA should be clearly and consistently recognized and credited as such, separate from any roles they may have as UTMSI researchers or educators. For example, if guidelines do not already exist, procedures and guidelines should be established so that any PowerPoint or other presentation, articles, or research funded by Mission-Aransas NERR will clearly and consistently acknowledge the Reserve.

PROGRAM SUGGESTION: The University of Texas Marine Science Institute should clearly and consistently recognize and acknowledge the important and valuable contributions of the Mission-Aransas Reserve and its individual staff members to the national system of national estuarine research reserves, to local communities, and to the Marine Science Institute. The Reserve, in turn, should evaluate how its role as part of a national system of reserves in partnership with NOAA is presented to the public.

2. 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, and, if applicable, restoration and habitat manipulation. A management plan so written 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.

The Reserve's current management plan was developed and approved as part of the reserve designation process. The plan is dated 2006, and because NERRS regulations require management plans to be updated every five years, Mission-Aransas NERR will update its plan within the next evaluation period.

3. Facilities and Infrastructure

The Reserve has been quite successful in building the infrastructure to support its programs and operations. Since designation, Reserve staff have been housed on the UTMSI campus in Marine Science Institute buildings in Port Aransas. In the summer of 2009, ground was broken on the campus for the Estuarine Research Center to house the Reserve headquarters on the first and second floors and an expansion of the MSI on the third floor. The new 36,000-square-foot building will contain Reserve office space, wet and dry laboratories, space for visiting scientists and partners, small meeting rooms, a large coastal training program seminar room, and a new resource center. It is the first educational facility in South Texas to be built to meet LEED (Leadership in Energy and Environmental Design – an internationally recognized green building certification system) Silver Certification criteria. A ribbon-cutting ceremony was held on July 23, 2011.

The Wetlands Education Center (WEC) was built and completed during this evaluation period with funding from federal, state, and county governments, the University of Texas, and private donations. Located on the UTMSI campus, it serves as an experiential educational facility for both the Reserve and UTMSI's Marine Education Services (MES). It is a 3.6-acre manmade wetland, landscaped and planted with seagrass and high and low salt marsh plants that receive water from the Aransas Pass Ship Channel. Guided tours of the WEC are offered twice a week, and an interpretive trail with informational signage and a geodetic marker gives visitors the opportunity to explore the WEC on their own. A K-12 curriculum and activities are available for students, teachers, and the public. Teachers also are able to bring classes to the WEC and lead their own activities. Over 300 visitors per week or over 15,000 visitors annually have taken advantage of the WEC since its completion.

The Reserve's management plan identified a need for an educational facility centrally located near Copano Bay. The Copano Bay Research and Education Center would have served as a research field station and have provided additional opportunities for educational programs. Because the University of Texas and the property owner of the proposed Center were not able to come to an agreement on the transfer of land required for construction of the Center, construction funds awarded to Mission-Aransas NERR for that purpose were reprogrammed to construct the Bay Education Center, which was also identified in the management plan as a needed facility.

The Bay Education Center (BEC) opened in July 2010 in the City of Rockport. Located on Aransas Bay, the building is the result of a partnership among the Reserve, the City, and the

Aransas County Navigation District. It has a visitor center for education displays, an auditorium, courtyard for education programs, and office space for NERR and Rockport city employees. The exhibits teach the importance of Texas coastal estuaries and provide visitors with a better understanding of how they function.

It also houses Science On a Sphere[®], which is a room sized, global display system that uses computers and video projectors to display planetary data onto a six foot diameter sphere, analogous to a giant animated globe. Researchers at NOAA developed Science On a Sphere[®] as an educational tool to help illustrate earth system science to people of all ages. Animated images of atmospheric storms, climate change, and ocean temperature can be shown on the sphere, which is used to explain complex environmental processes in a way that is intuitive and engaging to an audience. The system has been installed at approximately 70 locations internationally, but the Mission Aransas Reserve is the only NERR where one is located. Since its opening, the BEC has seen over 7,000 visitors.

The Fennessey Ranch is a privately owned ranch on which a conservation easement was purchased in 2006 by the University of Texas for the Reserve. The ranch borders the Mission River, one of two rivers flowing into the Mission-Aransas estuary. Fennessey Ranch is managed to be environmentally sound and an economically viable business enterprise, and the Reserve provides some annual support for maintenance and management activities. The Reserve hosts a wide range of educational programs here (see later sections of this document entitled “Education Programs” and “Stewardship and Resource Management” for further detail). Since designation, the Reserve has constructed a boardwalk and floating platform on McGuill Lake, which is the most frequently visited aquatic habitat at Fennessey Ranch. This serves as a primary location for some of the Reserve’s educational and ecotourism programs.

Within approximately one year of designation, the Reserve established the required four System-wide Monitoring Program (SWMP) water quality stations as well as an additional station; all are compliant with SWMP protocols. A sixth station was added to support seagrass and water quality monitoring in Little Bay. Mission-Aransas NERR has also installed a network of sediment elevation tables to support climate and sea level rise research.

ACCOMPLISHMENT: The Mission-Aransas Reserve, the University of Texas at Austin, and the UT Marine Science Institute have successfully built facilities and infrastructure to establish the Reserve’s presence in both the community and on campus. The facilities and infrastructure provide multiple locations for the Reserve to meet a variety of educational and outreach needs.

4. Coordination and Partnerships

The Reserve has a number of strong partnerships that serve it well. Although the UTMSI is the Reserve’s lead agency, the UTMSI Marine Education Services program and the research faculty and students have formed partnerships with the Mission-Aransas NERR beyond the administrative relationship. Outcomes of some of those partnerships are discussed elsewhere in these findings. Some of the Reserve’s other partnerships and coordination efforts include:

The Aransas National Wildlife Refuge (NWR) is included within the boundaries of the Reserve, although it operates according to its own rules and regulations. The Refuge manager serves on the Reserve's Advisory Board. Aransas NWR hosts the largest flock of wintering Whooping Cranes in North America with over 250 birds, so maintaining habitat for the cranes is vital. Blue crabs are the favorite food of Whooping Cranes, so information about blue crabs is important as well. The Refuge manager indicated that the Refuge is proposing to conduct blue crab studies, so when the Reserve's Coastal Training Program hosted a conference entitled "Blue Crabs and Texas Coastal Ecosystems" in early 2011, Refuge input was critical to the issue. The Refuge also was a geographic area of focus for the conference.

The Reserve partnered with the Refuge on National Public Lands Day in September 2009 and 2010 to clean up sections of Whooping Crane habitat at the Refuge. National Public Lands Day also fell on National Estuaries Day and the fall Texas Adopt-A-Beach Day, so the Refuge clean-up benefitted local public lands, estuaries, and shorelines, as well as Whooping Cranes, all at once. Over a ton of bagged trash (as well as larger items) was collected by volunteers along a 3.5-mile stretch of Refuge shoreline.

The Refuge uses data generated from the Reserve's SWMP as it relates to Whooping Cranes. Also, one of the Reserve's surface elevation tables (SETs) is located in the Refuge. In the long term, the SET will help Refuge staff understand changes in the open marsh habitats that are vital to sustaining a viable wild Whooping Crane population.

The Texas Parks and Wildlife Department (TPWD) also serves on the Reserve's Advisory Board. The TPWD is responsible for on-water enforcement of Texas state laws, including within the Reserve. The TPWD contributed to the success of the Reserve's CTP training on living shorelines, and the Reserve works with the TPWD on its abandoned crab trap removal program. Both collaborated to draft an FY11 proposal for a Conservation and Estuarine Land Conservation Program (CELCP) funding opportunity to acquire the 82-acre Big Tree Ranch property that provides critical habitat for endangered Whooping Cranes. The TPWD has significant interest in sea level rise, and because the regional TPWD staff members are out in the field frequently, the TPWD regional director sees ample opportunities to collaborate with the Reserve on a variety of activities related to sea level rise.

The Nature Conservancy (TNC) is represented on the Reserve's Advisory Board. TNC played a role in helping to acquire the Fennessey Ranch conservation easement for the Reserve. In 2008 the Conservancy partnered with NOAA's Community Restoration Program, the TPWD, and Texas A & M University in restoring an oyster reef by depositing 200 cubic yards of oyster shell into the shallow waters at Copano Bay near Corpus Christi. Although the Reserve did not directly participate in this effort, it supported the program and may benefit from a successful outcome.

The Coastal Bend Bays & Estuaries Program (CBBEP), which is part of the U.S. Environmental Protection Agency's National Estuary Program (NEP), is yet another one of the Reserve's partners that serves on the Reserve Advisory Board. In turn, the Reserve manager and several other staff serve on various CBBEP Implementation Teams. The CBBEP worked in partnership

with the Reserve and the City of Rockport to address water quality issues and loss of sea grasses in Little Bay. It also contributed to the success of the Reserve's CTP training on Coastal Bend Introduction to Living Shorelines.

Texas Sea Grant has worked with the Reserve's CTP and made presentations at trainings. In partnership with the Texas Sea Grant, the Reserve participates in a monofilament recovery and recycling program. At the time of the site visit, Sea Grant was planning to place a Coastal Community Development Agent (CCDA) at the Reserve through a partnership between the Texas Sea Grant College Program, based at Texas A&M University, and the NERR, based at The University of Texas Marine Science Institute in Port Aransas, to extend the geographic reach of extension agents and to provide leadership, guidance and direction in the broad arena of sustainable development to small coastal communities whose planning resources can be limited. (Since the site visit, a CCDA has been hired, and this should result in even greater collaboration with the Reserve.) Sea Grant has funded some research projects within the Reserve and is interested in continuing to do so.

The Texas Coastal Management Program, located in the Texas General Land Office, serves on the Reserve Advisory Board. The General Land Office leases the submerged lands within the Reserve to the University of Texas at Austin. This partnership has good potential for further joint efforts. The Reserve is an eligible applicant for CZMA funding from the Texas Coastal Management Program (TCMP). A TCMP representative expressed an interest in outreach activities as an effort and product of such funding, given the NERR's strengths in education, outreach, and its Coastal Training Program, and the TCMP's staffing losses and reduced abilities to conduct outreach. The TCMP has also identified coastal and marine spatial planning as a priority in its CZMA Section 309 assessment and strategy, and there is a desire to work with the Reserve on the strategy, perhaps taking advantage of SWMP data.

The City of Rockport has become a valuable partner working with the Reserve. The Bay Education Center is probably the most visible evidence of this partnership, but the City and Reserve have also collaborated through the Coastal Training Program. There is greater detail about this collaboration in the findings section entitled "Coastal Training Program."

ACCOMPLISHMENT: Since its designation, the Mission-Aransas NERR has developed a strong and wide range of partnerships and collaborations with numerous agencies and organizations. These partnerships strengthen the Reserve's outreach and program effectiveness.

5. Volunteer Support

At the time of the site visit, the Reserve had approximately 130 active volunteers. The volunteer program has built upon the existing and active group of volunteers serving the UTMSI Animal Rehabilitation Keep (ARK). The ARK rescues, rehabilitates, and when possible, releases wildlife, particularly sea turtles and sea birds, found sick or injured in or adjacent to the Reserve. See further discussion of the ARK under the "Stewardship and Resource Management" section

of this document. Reserve volunteers donate time to the ARK, other Reserve programs, beach/marsh clean-ups, vegetation monitoring, K-12 education programs, and guided tours.

The volunteer program is consistent with the University of Texas rules and regulations, which require liability forms, background checks, and copyright waivers. Mission-Aransas NERR has a full-time volunteer coordinator position and has developed appreciation events to recognize the time and effort donated to the Reserve by its volunteers.

6. Advisory Board and Committees

The Mission-Aransas NERR has a Reserve Advisory Board (RAB) that was established during the designation process. It has met twice a year since the 2006 designation. The RAB provides an opportunity for collaboration between Reserve staff and partners for management, research and monitoring activities, stewardship objectives, and educational programs based on the approved Reserve management plan.

The RAB is made up of key state, federal, and private partners of the Reserve, including the Texas General Land Office (GLO), United State Fish and Wildlife Service (USFWS), Texas Parks and Wildlife Department (TPWD), Coastal Bend Land Trust (CBLT), The Nature Conservancy (TNC), Fennessey Ranch, Texas Department of Transportation (TxDOT), Coastal Bend Bays & Estuaries Program (CBBEP), and a local governmental representative mutually agreed upon by Aransas County and the City of Rockport. These partnerships have been established based on mutual interest in the program and to provide a means by which key aspects of the Reserve will function (i.e., research, education, monitoring, administration, resource protection, facilities).

Mission-Aransas Reserve also has education, research, stewardship, and Coastal Training Program advisory committees to advise the core programs. The programmatic advisory committees are generally made up of persons with specific interests or expertise on the program but do not necessarily represent an agency or organization.

The evaluation team met with five of the RAB members during the site visit. All were pleased to serve on the RAB and saw that service as one of the ways to maintain the partnerships between the Reserve and the agencies or organizations they represent. Several of the members, however, expressed some uncertainty about the purpose of the RAB now, the roles they should or could play as RAB members, and they indicated they believe their interests and expertise are not being fully utilized.

The Reserve's management plan needs to be updated soon, and this could provide an appropriate time and mechanism to consider the role of the RAB and its members. The plan section entitled "Administration Plan – Reserve Advisory Board" could be modified to more specifically identify roles for the RAB and identify how particular RAB member organization skills and expertise could be used. Some of the member organization representatives on the RAB could also be used for their expertise to revise other sections of the management plan. As an example, some of the organizations represented on the RAB are actively involved in acquiring land or conservation

easements, a process involving a number of appraisal, legal, contractual, and other skills. That is not likely to be a skill set commonly held within the UTMSI or Mission-Aransas NERR. As the Reserve considers any revisions to the boundaries and acquisition plan within the overall management plan, RAB members could offer expertise or insight during that process as well as during the implementation of appropriate portions of the plan.

PROGRAM SUGGESTION: The Mission-Aransas NERR and the Marine Science Institute should consider how to make greater use of the expertise and interests of Reserve Advisory Board members to support the Reserve's goals and objectives, particularly as those are developed in a revised management plan.

B. RESEARCH AND MONITORING

1. Research Activities

The national estuarine research reserve system (NERRS) was created to provide opportunities for long-term research, education, and interpretation to promote comprehensive, sustainable management of the nation's coasts. Because of the location of the UT Marine Science Institute, research has been conducted within the Mission-Aransas estuary since long before the designation of the Mission-Aransas Reserve. That factor is one of the reasons why the Reserve's research program was developed and implemented quickly and is able to provide a depth of previous research and long-term data sets. The research coordinator is a professor at the Marine Science Institute, and many other professors and students have been and are carrying out research projects. In several instances, the Reserve and UTMSI researchers have collaborated on projects. As is noted in further discussions below, the Reserve's System-wide Monitoring Program (SWMP) is used by numerous researchers, students, and educators. The Reserve's research program is involved in providing numerous research opportunities from the undergraduate to post-doctoral levels.

The Reserve received funding from the Gulf of Mexico Alliance to conduct a three-year pilot study to understand nutrient loads and transformations within the Mission-Aransas estuary and to provide information to help develop nutrient criteria for other Gulf of Mexico estuaries to maintain their health. The project is in its second year. The Reserve leveraged the unique capabilities offered by its SWMP stations and datasets and the expertise of a UTMSI professor in nutrient/energy transformations in coastal ecosystems to support the study.

Another demonstration of the value of the Reserve's research and monitoring programs occurred when the Reserve conducted a study to determine the seagrass and water quality conditions for Little Bay, located in Rockport. As part of that study, in 2009 the Reserve placed a sixth SWMP station (discussed in the Monitoring section below) adjacent to the Reserve boundary in Little Bay through partnerships with Rockport, Aransas County Navigation District, and the Coastal Bend Bays & Estuaries Program. Based on the results of the study, it appears one of the causes of seagrass loss at this location is a change in salinity associated with heavy rainfall events and a resulting influx of freshwater.

The Reserve sponsored research through the *Research Experiences for Undergraduates* program to analyze water collected at the water quality SWMP stations and in the Port Aransas Marina to detect the presence of coliform bacteria. The City of Port Aransas supported this effort.

The Reserve coordinated with its coastal management program partner, the Texas General Land Office, during the Deepwater Horizon Spill. This involved being prepared to conduct pre-assessment analysis and training staff in the appropriate safety procedures. The Reserve has also partnered with a fellow UTMSI scientist to conduct an analysis of background hydrocarbon levels within the Reserve boundary. Several UTMSI and Reserve scientists have submitted proposals to the Gulf Research Initiative to conduct further analysis of the effects from the Deepwater Horizon Spill.

2. Monitoring

The goal of the NERRS System-wide Monitoring Program (SWMP) is to identify and track short-term variability and long-term changes in estuarine water quality, habitat, and land use in each reserve in order to understand how human activities and natural events can affect ecosystems. In the NERRS, each reserve is required to maintain at least four data loggers to collect nearly continuous water quality data, and to collect and analyze nutrient samples once a month. Each reserve has also established a weather station. More recently, SWMP has begun expanding to monitor biologic conditions and the effects of land use on habitats and water quality.

Within approximately one year of designation, Mission-Aransas NERR established the required four SWMP water quality stations as well as an additional station and is compliant with SWMP protocols. All five stations are telemetered. The weather station is located at the SWMP station in East Copano Bay. A sixth water quality station was added in 2009 adjacent to the Reserve boundary in Little Bay (Rockport) through partnerships with Rockport, Aransas County Navigation District, and the Coastal Bend Bays & Estuaries Program. The water quality and meteorological data from all five SWMP stations have been incorporated in an educational display at the Bay Education Center. SWMP data is used extensively by UTMSI researchers in their own research and in undergraduate classes, by graduate and undergraduate students, by Reserve and UTMSI educational programs and local school teachers, and by the Aransas National Wildlife Refuge as it relates to Whooping Cranes.

ACCOMPLISHMENT: Within a year of designation, the Mission-Aransas Reserve established five NERRS SWMP water quality monitoring stations and a weather station. A sixth water quality monitoring station was established three years later. The SWMP data is made available to and used by researchers, students, and educators.

As part of its biomonitoring efforts, the Reserve has established a harmful algal bloom (HAB) program. Samples from the SWMP stations are collected monthly and analyzed for microplankton composition. The HAB program also uses an Imaging FlowCytobot (IFCB) at the UTMSI pier for continuous microplankton monitoring. The IFCB at the Reserve is one of

only a few in the U.S. The IFCB program is a partnership with Woods Hole Oceanographic Institution and Texas A&M University and was initially funded through the Cooperative Institute for Coastal and Estuarine Environmental Technology. NOAA, Texas Sea Grant, and the national ECOHAB (Ecology and Oceanography of Harmful Algal Blooms) Research Program provide additional funding. The IFCB represents the development of a warning system for the presence of harmful algae, like those that cause red and brown tides. In 2008 the IFCB detected a toxic bloom of *Dinophysis*, which allowed for the closure of oyster beds before any human illness was reported. A similar *Dinophysis* bloom was detected in 2010, while a major *Karenia* bloom was detected in 2009. The IFCB also detected the dinoflagellate *Brachidinium* in the Port Aransas channel. *Brachidinium* was previously thought to be a rare species existing only in tropical Pacific Ocean waters off the coast of Japan and in the Mediterranean Sea.

In 2010 the Reserve began to implement a submerged aquatic vegetation and emergent marsh biomonitoring program. One of the Reserve's cooperating scientists is leading this program. With this work in the Reserve and similar efforts in several other Texas estuaries, he is leading the state's efforts to establish a statewide seagrass monitoring plan.

ACCOMPLISHMENT: Mission-Aransas NERR's harmful algal bloom program uses new state-of-the-art equipment that serves as an early warning detection system to protect human health. The submerged aquatic vegetation and emergent marsh biomonitoring program at the Reserve is leading to the establishment by Texas of a statewide seagrass monitoring plan.

3. Graduate Research Fellowship (GRF) Program and Other Student Research Opportunities

The NERRS' Graduate Research Fellowship (GRF) Program was established in 1997 to support graduate students interested in coastal and estuarine sciences. By providing stipends, a living laboratory, and a broad network of fellow scientists, the Reserve system aims to encourage and enable talented young scientists to contribute to the knowledge base, provide the science to support coastal decision-making, and train future coastal scientists and policy-makers. The GRF program has supported more than 300 students since 1997. Fellows conduct their master's and doctoral research in the National Estuarine Research Reserves.

The Mission-Aransas NERR has been very successful in recruiting GRFs to conduct research at the Reserve and has hosted four since designation. The GRFs with whom the evaluation team met were pleased with the logistical support they received from the Reserve. In addition to their own research projects, the GRFs have been able to work with the Reserve's Coastal Training Program, with the UTMSI Animal Rehabilitation Keep, and on Reserve stewardship projects.

The Marine Science Institute has developed a similar program to promote UTMSI graduate student research in Reserve priority areas, and the Reserve has hosted two graduate research assistants. In addition, the Reserve has developed an undergraduate internship program to foster collaboration with UTMSI researchers and promote Reserve science. The Mission-Aransas NERR has hosted two interns to date.

A fourth program to support student researchers is the *Research Experiences for Undergraduates (REU)* program, led by the Reserve's research coordinator and another UTMSI faculty member. Initially funded as a three-year program by the National Science Foundation, the program has since received another three-year award. The REU program supports ten undergraduate students each summer to conduct research with a UTMSI faculty member. Thirteen students have carried out research in the Mission-Aransas Reserve through this program since 2008.

ACCOMPLISHMENT: The Reserve takes seriously a responsibility to offer research opportunities to undergraduate and graduate students alike as part of its overall responsibility to provide a stable environment for research. In just five years since designation, the Mission-Aransas NERR has hosted four Graduate Research Fellows. It has also hosted 17 undergraduate and graduate students in addition to the four GRFs.

4. Site Profile

The purpose of a NERR site profile is to review the existing state of knowledge for a specific Reserve's research and monitoring activities and to identify research needs that should be addressed in the future. The development of a site profile is implemented by each Reserve as part of a monitoring program required by the NERRS regulations at 15 CFR §921.60. The site profile is a synthesis of all information that is known and what is not known about a reserve's natural and cultural resources at a particular point in time. It provides an overall picture of the Reserve in terms of resources, issues, management constraints, and research needs, and it helps Reserve management to identify information gaps in resources. Generally a site should work to complete its site profile within approximately three years of designation.

The Mission-Aransas NERR has completed a draft version of its site profile, OCRM has reviewed it and provided comments to the Reserve, and the Reserve is now in the process of making revisions to finalize it.

C. EDUCATION AND OUTREACH

1. Education Programs

The NERR system was created to provide opportunities for long-term research, education, and interpretation to promote comprehensive, sustainable management of the nation's coasts. To meet a part of its mandate, the system has created the *K-12 Estuarine Education Program (KEEP)* to increase the ocean literacy of students, teachers and the general public. Reserves offer classes for K-12 students; support teachers through professional development programs in coastal and estuary education; provide adult audiences with training on estuarine issues of concern in their local communities; and provide public education events. Each reserve takes a local approach to educating the public about estuaries and provides opportunities for everyone interested in learning about, protecting, and restoring estuaries.

The Mission-Aransas NERR education program has quickly taken advantage of the learning environment and facilities that have become available to them since designation and often collaborates with the UTMSI Marine Education Services on educational activities. Reserve staff uses the Wetlands Education Center to let students and the public explore salt marsh and sand dune environments through observation, sampling, and hands-on activities. The Bay Education Center is used to educate with a broader estuarine-oriented focus, while Science on a Sphere[®] can be used to explain larger, more complex environmental processes like atmospheric storms, climate change, and ocean temperature that have effects at a global scale down to the local scale at Mission-Aransas estuary. The new boardwalk and floating platform at Fennessey Ranch, in conjunction with an existing pavilion, provide the primary location for Reserve educational programs at the Ranch. The R/V KATY is used to take students out in the estuary on half-day trips, where they collect and analyze water samples, conduct plankton tows and bottom trawls, and collect sediment samples.

Lesson plans and activities have been developed for the Wetlands Education Center, the Bay Education Center, and for the NERR system's Estuaries 101 middle school curriculum. (The Estuaries 101 curriculum, created by the NERR system, focuses on comprehensive lessons and activities addressing estuarine environments. The curriculum contains sections on life science, earth science, and physical science and includes activities from assessing nutrients and biodiversity to analyzing salinity, extreme weather, and human impacts.) Wetlands Education Center and Bay Education Center activities are aligned with the Texas Essential Knowledge and Skills (TEKS - which details curriculum state standards for what students should know and be able to do at specific grade levels in various subject areas) and are designed for K-12 classes.

Locally-based curricula have been developed for Fennessey Ranch. "Birding 101 for Kids" programs provide outdoor learning opportunities for students aged 7 – 16 years old. The Reserve partnered with the Aransas County Independent School District and Aransas County Commissioners (who provided funding with Coastal Impact Assistant Program funds) to provide field experiences for over 1,400 students. Students and teachers from grades 1-2, 4-5, 6, 8, and 12 visited the Wetlands Education Center and the Reserve headquarters to participate in hands-on touch labs, studies aboard the R/V KATY, and observations in the field.

Some reserves are able to offer educational programs or presentations in school classrooms. This method of offering programs is used for varying reasons, often involving a lack of resources to allow teachers to bring classes to the reserve or the distance required to travel, although this does not seem to be the case for the Reserve. Nevertheless, another avenue the Reserve might consider to reach students, in addition to bringing students to the Reserve or having staff take programs to school classrooms, is the 'traveling trunk.' Several reserves have found this a good way to get programs to students. Some sort of sturdy trunk, plastic container, or other substantial receptacle is filled with various items that complement a script or teaching lesson created by the reserve for a particular grade level to highlight a specific topic or subject. The kit can be reserved by a teacher, either be shipped/mailed to or picked up by the teacher, used by the teacher in the classroom, and then returned to the reserve to be used again.

Teacher training is also a portion of the education program's portfolio. Teacher workshops are intended to increase a teacher's skill set and proficiency in introducing marine and estuarine

science topics and techniques into the curriculum of all school subjects. The Reserve and the UTMSI Marine Education Services partner to host weekend workshops for teachers, giving them practical experience with on-ship collecting gear and methods, as well as exposure to current research problems and methods.

As a part of KEEP, the NERRS has a system-wide research and field-based teacher training initiative called the *Teachers on the Estuary* (TOTE) program. The goal of TOTE is to improve teachers' and students' understanding of the environment using local examples and to provide resources and experience to support the incorporation of estuary and watershed topics into classroom teaching. The initiative is also designed to promote stewardship of watersheds and estuaries.

As a prerequisite to implementing TOTE professional development workshops, the Reserve is conducting a market analysis according to NERRS protocols to gather information on science-based programs offered by agencies and outreach education providers with the nine-county area of the Mission-Aransas watershed. It is also conducting a needs assessment according to NERRS protocols to gather information on the training needs of two audiences: K-12 teachers within the nine counties of the Mission-Aransas watershed and K-12 teachers located outside of the nine local watershed counties. The Reserve is targeting these two distinct audiences because of a relatively unusual situation – there is a much lower percentage of participation by local teachers and school groups compared to teachers and school groups outside of the local watershed counties. Over 275 participants completed a data-gathering survey, which remained 'open' for an entire school year. The Reserve's Education Advisory Committee has been working with the Education Coordinator on the market analysis. The Reserve anticipates completion of the market analysis and needs assessment by the end of the 2011 calendar year.

Data from the needs assessment should help to identify specific needs of teachers and any obstacles (e.g., cost, timing, length of training) the Reserve can address to provide more effective training and programs. One problem identified during the evaluation site visit was the difficulty of holding teacher trainings during the summer because of the lack of dormitory space for overnight stays.

During the evaluation site visit, the topic of evaluating the Reserve's education programs was briefly raised. Evaluating the success or effectiveness of any program is an integral part of the process of adaptive management, and OCRM encourages such evaluations. However, the education coordinators from all reserves and the OCRM Estuarine Reserves Division staff are currently working to refine a performance measurement framework and system to analyze and evaluate individual reserve education programs, in much the same way individual reserve coastal training programs are evaluated. Whether the Mission-Aransas NERR wants to evaluate its own programs is a management decision, but the NERR systemwide evaluation process currently being developed should be helpful to the Reserve when it is completed and implemented.

ACCOMPLISHMENT: The Mission-Aransas NERR has quickly taken advantage of the learning environment and facilities that have become available to it since designation and often collaborates with the UTMSI Marine Education Services on educational activities. Curricula have been developed to meet Texas state education standards, and the Reserve is conducting an education market analysis and needs assessment on order to implement *Teacher on the Estuary* professional development workshops.

2. Outreach Programs and Activities

The Reserve and the UTMSI Marine Education Services (MES) frequently collaborate on general public outreach programs and activities. They partner to host public lectures on marine science research every Thursday night during the winter season at the UTMSI Visitor Center. With support from the City of Rockport and Aransas County, the Reserve has the lectures professionally filmed, and they are now available for viewing at the Bay Education Center.

The Reserve and the MES partner to host Road Scholar programs at various locations such as Rockport, Fennessey Ranch, and Port Aransas. (The Road Scholar educational adventures program was created by Elderhostel, Inc.) These are short-term academic programs that are field-based and designed for active participation, covering subjects that include coastal ecology, birding, and history.

Mission-Aransas NERR is involved in the statewide Texas Nature Challenge, which is coordinated regionally by the Coastal Bend Bays & Estuaries Program. The goal of the Challenge is to encourage families to engage in nature exploration in local parks, museums, and natural areas. The Reserve participated in the Texas Nature Challenge in 2010, which was the first time the Challenge was offered in the Coastal Bend. Nature challenge activities were offered at the Wetlands and the Bay Educations Centers. The Reserve plans to offer activities again in 2011.

The Mission-Aransas NERR participates in a variety of community outreach activities during the year. Participation generally includes a booth with educational materials, touch tanks, or other hands-on activities. Outreach activities have been offered at numerous events, including but not limited to National Estuaries Day, Conference for the Advancement of Science Teaching, Monarch Madness at Fennessey Ranch, and the annual Whooping Crane Festival hosted by Port Aransas. The Reserve also publishes a twice-yearly newsletter and maintains a website.

3. Coastal Training Program

The NERR System's Coastal Training Program (CTP) was initiated to provide up-to-date scientific information and skill-building opportunities to the people who are responsible for making decisions affecting coastal lands and waters. The program aims to provide coastal decision-makers with the knowledge and tools they need to address critical resource management issues. All reserves must meet certain criteria to have a nationally approved CTP: 1) a CTP advisory committee, which must include Sea Grant and state coastal management program

representatives; 2) a market analysis addressing what entities are providing training at a local and regional scale. This analysis also helps the reserve identify potential audiences; 3) a needs assessment of any potential audiences the CTP will address; 4) a strategy to guide the reserve's CTP activities over a three-year period; and 5) a marketing plan identifying how the reserve will promote its CTP to its audiences.

The Reserve's Coastal Training Program (CTP) was initiated in fiscal year 2007, and in two years, the CTP completed a market analysis and needs assessment as well as its strategy and market plan. In 2010, its first full year of operation, the CTP hosted nine events serving 250 people. The program offered events with topics including, but not limited to, Introduction to Coastal Geographic Information Systems, Blue Crabs and Texas Coastal Ecosystems, Erosion and Sediment Control, and Coastal Bend Living Shorelines. According to the Reserve, post-event evaluations of trainings and workshops show that 98% of attendees improved their scientific understanding of events and that 93% of attendees intend to apply the knowledge and skills learned at the event in their jobs.

ACCOMPLISHMENT: The Mission-Aransas Reserve created and implemented an approved Coastal Training Program within a short period of time after designation. Post-training evaluations indicate that from 93 percent to 98 percent of participants improved their scientific understanding of the training topic and intend to apply what they learned in their jobs.

The Blue Crabs and Texas Coastal Ecosystems conference provided expert information to participants about blue crabs, which are economically valuable as a food item for both humans and other animals, including the endangered Whooping Crane. However, the blue crab population is declining locally and statewide. The conference was also a timely event for a state senate bill process, which allows scientists and other stakeholders to submit freshwater inflow recommendations to the Texas Commission on Environmental Quality. Experts involved in the process had considered using blue crabs as a salinity level indicator, but knowledge about local blue crab populations is limited. The CTP conference provided a forum for exchanging information among experts, local resource managers, scientists, and stakeholders.

The Reserve CTP is collaborating with other reserve coastal training programs in the Gulf of Mexico on a regional effort in support of the Gulf of Mexico Alliance (GOMA). Through this collaboration, the five reserves participate in GOMA priority issue teams. The five Gulf reserves host coordinated workshops aimed at training and maintaining an even level of expertise on various issues throughout the Gulf region. At the time of the site visit, the five reserves were in the last year of a three-year project to address climate change through the CTP programs. In year two, the Mission-Aransas NERR CTP and the other NERR CTPs each hosted a living shorelines workshop as part of this Gulf-wide climate change partnership. These were extremely well-received, and because of the interest and success in these living shoreline workshops, the reserves hosted a session on that topic at Restore America's Estuaries meeting in November 2010.

In year three, each reserve CTP is addressing climate change in its own way. At Mission-Aransas NERR, the CTP has plans to hold a three-part workshop addressing the climate change topic at the county level. The first part is a presentation of general information and some data collection from the participants; the second part addresses local planning and resiliency using a community risk index (CRI). The CRI was contract-funded by the NOAA Coastal Services Center and is designed specifically for Gulf coast communities to assess and enhance their resilience against a range of coastal hazards. The third part includes some goal setting exercises for participants, so they complete the workshops with something concrete in hand to use. The topic of vulnerability assessments came up during some meetings during the evaluation team site visit, and clearly the Mission-Aransas NERR has been addressing that concern. (Since the site visit, the three-part workshop was held.)

The City of Rockport and the Reserve have developed a strong partnership, particularly through the CTP. The CTP coordinator serves on the City's water quality committee. An important element of the partnership involves the CTP and the City's Department of Public Works. The City has a land disturbance ordinance, which requires certification in order to conduct activities that result in land disturbance. The CTP has held several trainings to address stormwater and sediment control issues, including training required for contractors to obtain certification. Rockport plans to develop a non-mandatory requirement for landscaping, and the CTP is developing a training workshop for that. This partnership also resulted in the identification of funding from the Coastal Bend Bays & Estuaries Program for a local seagrass monitoring project requested by the City and performed by the Reserve.

ACCOMPLISHMENT: The Mission-Aransas NERR Coastal Training Program has quickly formed collaborative partnerships that benefit the communities in the Mission-Aransas estuary area. The Coastal Training Program is successfully collaborating with other reserve coastal training programs in the Gulf of Mexico to support priority issues of the Gulf of Mexico Alliance, including climate change. It is also addressing specific knowledge gaps through conferences such as the "Blue Crabs and Texas Coastal Ecosystems Conference," in which timely information exchange is vital.

D. STEWARDSHIP AND RESOURCE MANAGEMENT

Within the NERR system, many reserves conduct or accomplish programs or activities related to land acquisition, enforcement, restoration, restoration science, technical advice and support, and community education under the general rubric of stewardship and resource management. Because the Mission-Aransas Reserve has so well integrated its stewardship, research, and education components, many elements of stewardship and resource management are identifiable in numerous activities and programs, as is noted in the discussions above. During this evaluation period, some other activities are discussed below.

The Mission-Aransas NERR conducted a project entitled "Improving Coastal Land Use Planning through the Application and Evaluation of the Interoperability of Three Decision Support Tools." The project was designed to increase the understanding of linkages between land use strategies and their effects on coastal-marine ecosystems. With funding from the David and Lucille

Packard Foundation, the two-year project involved a partnership of local, state, and federal agencies, academic institutions, and non-profit organizations that developed and evaluated a toolkit of three decision support tools designed to assist planners and resource managers in applying ecosystem-based management principles to land use planning. The tools (CommunityViz, NatureServe Vista, and N-SPECT) were used to evaluate the ecological, social, and economic effects of current and future development scenarios on terrestrial, freshwater, and marine ecosystems.

Aransas County served as the pilot location. Three land use planning scenarios were developed and evaluated using the integrated toolkit to evaluate the current condition and sustainability of the ecosystem and socioeconomic indicators, to evaluate future development trends based on current policies and economic forces, and to develop alternative land use strategies to meet sustainability objectives for ecological and socioeconomic values. A presentation of the final results was held in Rockport, and a report was completed and made available to the public upon request. A post-training evaluation of participants was also conducted that indicated that 100% of the participants said their knowledge and understanding of evaluating land use decisions, their ability to use decision support tools, and their ability to access resources increased. Over 85% indicated that they will apply the knowledge they learned in their work and/or decision-making and will contact others about the information. However, 100% of the participants said they still need further training on the tools, so recommendations for future trainings were included to develop different lengths and types of training to serve specific audiences and to develop more qualified trainers and training capacity.

ACCOMPLISHMENT: The Mission-Aransas NERR obtained external funding and completed a project to assist planners and resource managers in applying ecosystem-based management principles to land use planning. Based upon post-training evaluation, the training will make a difference in land use planning within the Mission-Aransas estuary and created a demand for more training of this type.

The Reserve is establishing a vertical control network of surface elevation tables (SETs) within the Reserve and has already installed 15 SETs in five different reserve habitats. This infrastructure will support habitat change and climate-related research activities. In support of the system-wide effort to classify all reserve habitats under one classification scheme, Mission Aransas NERR completed the reclassification of Reserve habitats using national protocols. In order to coordinate the habitat mapping and vertical control efforts, the Reserve has developed a land use, land cover, and habitat change plan to guide future mapping and vertical control/elevation projects and to provide information on how the land use/land cover component of SWMP will support various Reserve activities and partner initiatives. In coordination with the NOAA Environmental Cooperative Science Center, hyperspectral imagery was collected at four locations with different habitats. The Reserve is using the imagery to produce high-resolution maps of priority habitats within the Reserve.

ACCOMPLISHMENT: The Mission-Aransas Reserve has used and is using a variety of techniques, including establishment of a vertical control network; reclassification of Reserve habitats using the NERRS habitat classification scheme; development of a land use, land cover, and habitat change plan; and acquisition of hyperspectral imagery to gather data and information that informs management of Reserve lands and support of Reserve activities and initiatives.

The Reserve holds a conservation easement on Fennessey Ranch, a privately owned property within the Reserve with more than 2,000 acres of uplands and nine miles of river frontage. The Ranch has completed a detailed management plan outlining its strategy for maintaining the conservation value of its habitats while still generating revenue. The stewardship coordinator works with the manager of Fennessey Ranch to conduct an annual assessment of the management activities. The Reserve's stewardship program also works with volunteers to conduct a detailed annual assessment of vegetation characteristics at 50 plots throughout the Ranch's various habitats. The monitoring allows the Reserve and the Ranch to assess the impacts of management practices and make appropriate changes.

ACCOMPLISHMENT: The Mission-Aransas Reserve Stewardship Coordinator works with the Fennessey Ranch manager to complete an annual assessment of management activities to ensure the activities support the terms of the conservation easement. The Stewardship Program conducts annual assessments of vegetation characteristics at Fennessey Ranch to assess impacts of current management practices and revise them if necessary.

In partnership with the Texas Sea Grant, the Reserve participates in a monofilament recovery and recycling program. Recycling bins are placed and maintained by the Reserve and local volunteers at boat ramps, tackle shops, and bait stands in Port Aransas, Rockport, and throughout Aransas County to collect monofilament fishing line. The collected fishing line is sent to recycling facilities to be converted into other plastic products.

The Reserve also assists the Texas Parks and Wildlife Department with the abandoned crab trap removal program. Reserve staff and volunteers are stationed at local boat ramps, hand out supplies to outgoing boats, and assist with unloading and disposal of abandoned traps brought back.

The Reserve provides funding and some staff support through the coordination of the Reserve's volunteer network to assist the UTMSI Animal Rehabilitation Keep (ARK). The ARK rescues, rehabilitates, and when possible, releases wildlife found sick or injured in or adjacent to the Reserve. Its mission also includes educating the public about the problems confronting coastal wildlife and the impact of the increasing human population on coastal resources. Because the ARK and the Reserve are located on the UTMSI campus, Mission-Aransas NERR volunteers are able to donate time to the ARK. The ARK's activities offer educational opportunities and represent stewardship in action to volunteers and visitors to the Reserve. The director of the ARK, who is also its founder, was named one of NOAA's 2010 Environmental Heroes.

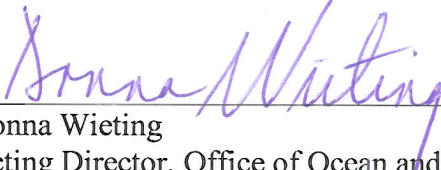
V. CONCLUSION

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

The Mission-Aransas Reserve has made notable progress in: Administration and Staffing; Facilities and Infrastructure; Coordination and Partnerships; Research and Monitoring; Graduate Research Fellows (GRF) Program and Other Student Research Opportunities; Education Programs; Coastal Training Program; and Stewardship and Resource Management.

These evaluation findings also contain three (3) recommendations in the form of Program Suggestions. There are no Necessary Actions. The Program Suggestions should be addressed before the next regularly-scheduled program evaluation, but they are not mandatory at this time. Program Suggestions that must be repeated in subsequent evaluations may be elevated to Necessary Actions. Summary tables of program accomplishments and recommendations are provided in Section VI.

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



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

AUG 12 2011

Date

VI. APPENDICES

Appendix A. Summary of Accomplishments and Recommendations

The evaluation team documented a number of the University of Texas at Austin Marine Science Institute's and Reserve's accomplishments during the review period. These include:

Issue Area	Accomplishment
Administration and Staffing	The Mission-Aransas Reserve staff members are highly respected by their peers and the community at large for their professionalism, knowledge and expertise, dedication, and willingness to collaborate. They have assumed leadership roles at local, regional, and national levels. Staff members work together to integrate internally many of the activities and programs of the Reserve.
Facilities and Infrastructure	The Mission-Aransas Reserve, the University of Texas at Austin, and the UT Marine Science Institute have successfully built facilities and infrastructure to establish the Reserve's presence in both the community and on campus. The facilities and infrastructure provide multiple locations for the Reserve to meet a variety of educational and outreach needs.
Coordination and Partnerships	Since its designation, the Mission-Aransas NERR has developed a strong and wide range of partnerships and collaborations with numerous agencies and organizations. These partnerships strengthen the Reserve's outreach and program effectiveness.
Monitoring Activities	Within a year of designation, the Mission-Aransas Reserve established five NERRS SWMP water quality monitoring stations and a weather station. A sixth water quality monitoring station was established three years later. The SWMP data is made available to and used by researchers, students, and educators.
Monitoring Activities	Mission-Aransas NERR's harmful algal bloom program uses new state-of-the-art equipment that serves as an early warning detection system to protect human health. The submerged aquatic vegetation and emergent marsh biomonitoring program at the Reserve is leading to the establishment by Texas of a statewide seagrass monitoring plan.

Graduate Research Fellows (GRF) Program and Other Student Research Opportunities	In just five years since designation, the Mission-Aransas NERR has hosted four Graduate Research Fellows. The Reserve takes seriously a responsibility to offer research opportunities to undergraduate and graduate students alike as part of its overall responsibility to provide a stable environment for research.
Education and Outreach	The Mission-Aransas NERR has quickly taken advantage of the learning environment and facilities that have become available to it since designation and often collaborates with the UTMSI Marine Education Services on educational activities. Curricula have been developed to meet Texas state education standards, and the Reserve is conducting an education market analysis and needs assessment in order to able to implement Teacher on the Estuary professional development workshops.
Coastal Training Program	The Mission-Aransas Reserve created and implemented an approved Coastal Training Program within a short period of time after designation. Post-training evaluations indicate that from 93 percent to 98 percent of participants improved their scientific understanding of the training topic and intend to apply what they learned in their jobs.
Coastal Training Program	The Mission-Aransas NERR Coastal Training Program has quickly formed collaborative partnerships that benefit the communities in the Mission-Aransas estuary area. The Coastal Training Program is successfully collaborating with other reserve coastal training programs in the Gulf of Mexico to support priority issues of the Gulf of Mexico Alliance, including climate change. It is also addressing specific knowledge gaps through conferences such as the “Blue Crabs and Texas Coastal Ecosystems Conference,” in which timely information exchange is vital.
Stewardship and Resource Management	The Mission-Aransas NERR obtained external funding and completed a project to assist planners and resource managers in applying ecosystem-based management principles to land use planning. Based upon post-training evaluation, the training will make a difference in land use planning within the Mission-Aransas estuary and created a demand for more training of this type.
Stewardship and Resource Management	The Mission-Aransas Reserve has used and is using a variety of techniques, including establishment of a vertical control network; reclassification of Reserve habitats using the NERRS habitat classification scheme; development of a land use, land cover, and habitat change plan; and acquisition of hyperspectral imagery to gather data and information that informs management of Reserve lands and support of Reserve activities and initiatives.

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

Issue Area	Recommendation
Administration and Staffing	PROGRAM SUGGESTION: The University of Texas at Austin should provide the Marine Science Institute Fiscal Office with access to the U.S. Department of Commerce “Grants Online” electronic process for purposes of processing Mission-Aransas Reserve CZMA awards and related documentation.
Administration and Staffing	PROGRAM SUGGESTION: The University of Texas Marine Science Institute should clearly and consistently recognize and acknowledge the important and valuable contributions of the Mission-Aransas Reserve and its individual staff members to the national system of national estuarine research reserves, to local communities, and to the Marine Science Institute. The Reserve, in turn, should evaluate how its role as part of a national system of reserves in partnership with NOAA is presented to the public.
Advisory Board and Committees	PROGRAM SUGGESTION: The Mission-Aransas NERR and the Marine Science Institute should consider how to make greater use of the expertise and interests of Reserve Advisory Board members to support the Reserve’s goals and objectives, particularly as those are developed in a revised management plan.

Appendix B. Persons and Institutions Contacted

University of Texas at Austin College of Natural Sciences

Dr. Mary Ann Rankin, Dean

Dr. Peter Riley, Assistant Dean for Research and Facilities

University of Texas at Austin Marine Science Institute

Dr. Lee Fuiman, Director

Georgia Neblett, Director of Development

Karen Davidson, Supervisor, Fiscal Office

Tony Amos, Director, ARK (Animal Rehabilitation Keep)

Sara Pelleteri, Program Director, Marine Education Services

Dr. Wayne Gardner, Professor

Dr. Dong-Ha Min, Assistant Professor

Dr. Deana Erdner, Assistant Professor

Dr. Jim McClelland, Assistant Professor

Mission-Aransas National Estuarine Research Reserve

Sally Morehead, Manager

Dr. Ed Buskey, Research Coordinator

Carolyn Rose, Education Coordinator

Chad Leister, CTP Coordinator

Dr. Kiersten Madden, Stewardship Coordinator

Colleen McCue, Volunteer Coordinator

Dr. Denise Bruesewitz, Postdoctoral Fellow

Jena Campbell, Graduate Research Fellow

Suzy Citek, Education Specialist

Britt Dean, SWMP Technician

Dr. Ken Dunton, Collaborating Scientist

Anne Evans, Research Assistant

Linda Fuiman, Education Specialist

Brad Gemmell, Graduate Research Assistant

Cammie Hyatt, SWMP Technician

Rae Mooney, Research Assistant

Lindsey Pollard, Research Assistant

Dr. Rick Tinnin, Education Specialist

Dr. Tracy Villareal, Collaborating Scientist

John Williams, Education Specialist

Mission-Aransas NERR Advisory Board

Ray Allen, Coastal Bend Bays & Estuaries Program

Melissa Porter, Texas Coastal Management Program

Mark Dumesnil, The Nature Conservancy

Ed Hegen, Texas Parks and Wildlife Department

Tony Williams, Texas General Land Office

Dan Alonso, Manager, Aransas National Wildlife Refuge

Federal and State Agency Representatives

Helen Young, Texas General Land Office, Deputy Commissioner of Coastal Resources
Melissa Porter, Texas General Land Office, Coastal Resources
Tom Calnan, Texas General Land Office, Coastal Resources
Craig Davis, Texas General Land Office, Coastal Resources
Kate Zultner, Texas General Land Office, Coastal Resources
Jim Weatherford, Texas General Land Office, Coastal Resources
Tony Williams, Texas General Land Office, Professional Services-Coastal Leasing
Tracey Throckmorton, Texas General Land Office, Energy Resources
Ed Hegen, Lower Coast Regional Director, Texas Parks and Wildlife Department
Karen Meador, Texas Parks and Wildlife Department
Dan Alonso, Manager, Aransas National Wildlife Refuge

Local Government Representatives

C.J. Wax, Mayor, City of Rockport
Tom Blazek, City Manager, City of Rockport
Kendra Baird, City of Rockport

Academic/Educational Representatives

Logan Respass, Associate Director and Extension Leader, Texas Sea Grant College Program
Marilyn Cook, H. G. Olsen Elementary School, Port Aransas
Julie Findley, H. G. Olsen Elementary School, Port Aransas
Dr. Paul Montagna, Harte Research Institute Gulf of Mexico Studies, Texas A&M University-
Corpus Christi

Other Organizations

Mark Dumesnil, The Nature Conservancy
Roy Allen, Coastal Bend Bays & Estuaries Program

Appendix C. Persons Attending the Public Meeting

The public meeting was held on Wednesday, April 13, 2011, at 5:00 p.m. at the Mission-Aransas National Estuarine Research Reserve Bay Education Center, 121 Seabreeze Drive, Rockport, Texas. No members of the public attended the public meeting.

Appendix D. NOAA's Response to Written Comments

NOAA received no written comments regarding the management or administration of Mission-Aransas National Estuarine Research Reserve.