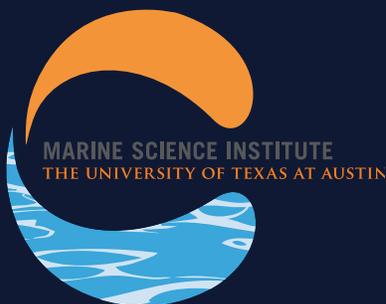
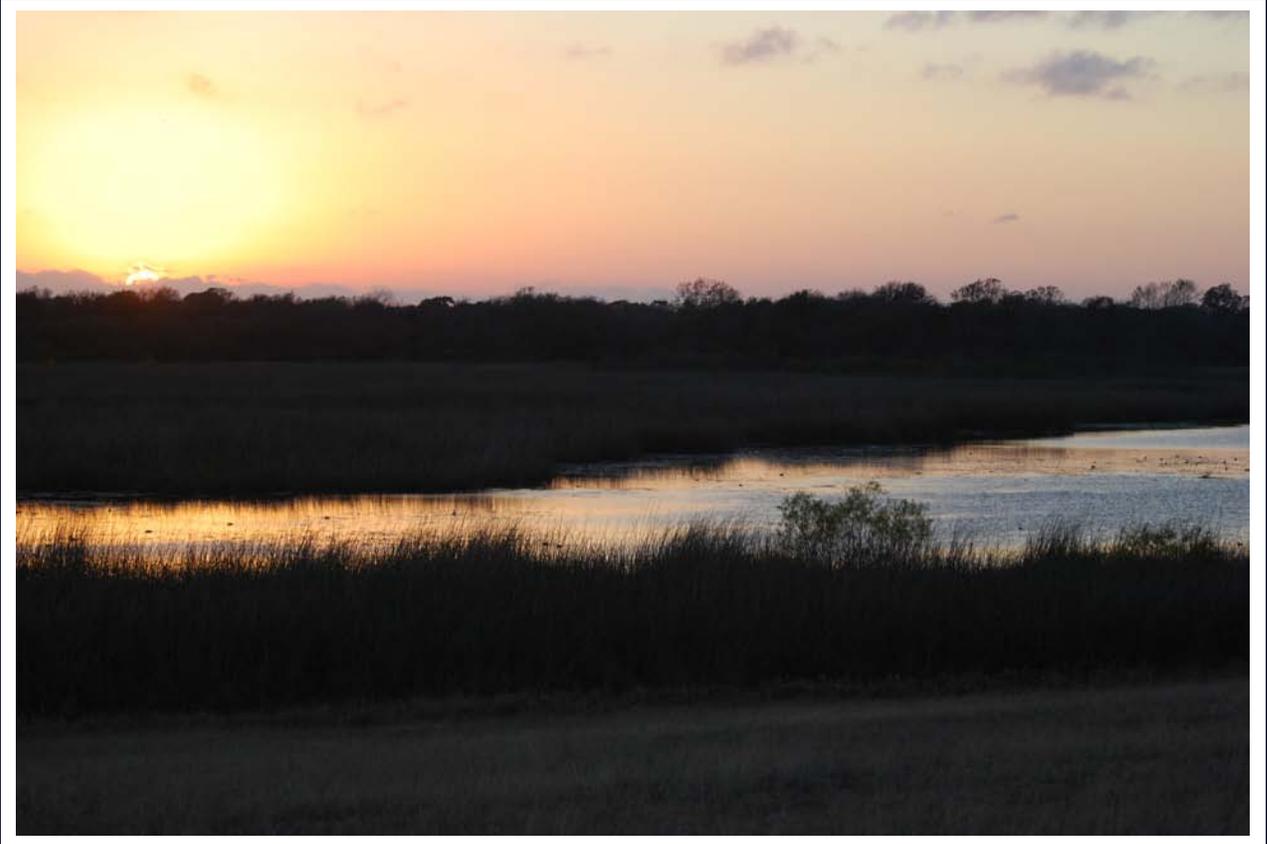
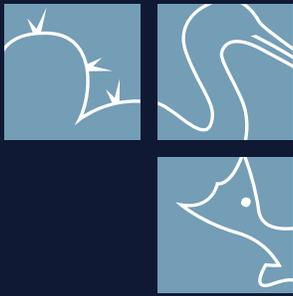


MISSION ★ ARANSAS

NATIONAL ESTUARINE RESEARCH RESERVE

Highlights of Activities and Program Strategies
2006-2011





MISSION ★ ARANSAS

NATIONAL ESTUARINE RESEARCH RESERVE

The mission of the Mission-Aransas National Estuarine Research Reserve is to develop and facilitate partnerships that enhance coastal decision making through an integrated program of research, education, and stewardship

The vision of the Mission-Aransas National Estuarine Research Reserve is to develop a center of excellence to create and disseminate knowledge necessary to maintain a healthy Texas coastal zone

.....

Three goals are used to support the Reserve mission:

Goal 1: To improve understanding of Texas coastal zone ecosystems structure and function. Understanding of ecosystems is based on the creation of new knowledge that is primarily derived through basic and applied research. New knowledge is often an essential component needed to improve coastal decision making.

Goal 2: To increase understanding of coastal ecosystems by diverse audiences. Education and outreach are the primary delivery mechanisms to explain what coastal ecosystems are and how they work. It is essential that information is disseminated broadly within our society.

Goal 3: Promote public appreciation and support for stewardship of coastal resources. In many ways, stewardship is an outcome resulting from the integration of research and education. Research creates information that is communicated through education. This information forms the basis for an appreciation of the values of an environment, and that in turn promotes a public sense of ownership of natural resources.

Highlights of Activities and Program Strategies

2006-2011

In 2006, at the request of the Governor of Texas, the National Oceanic and Atmospheric Administration designated The University of Texas Marine Science Institute (UTMSI) as the managing organization of its newly created Mission-Aransas National Estuarine Research Reserve (NERR). The Mission-Aransas NERR is comprised of 185,708 acres of pristine bays, estuaries, upland conservation tracts, streams, and rivers. The mission of the Reserve is to bring together scientists, landowners, policy-makers, and the public to ensure that coastal management decisions benefit flora and fauna, water quality, and people. These goals are achieved through formal research, education, stewardship, and coastal training programs.



ADMINISTRATION

The Reserve is administered by UTMSI, in partnership with the following key state, federal, and private organizations: Texas General Land Office, United States Fish and Wildlife Service, Texas Parks and Wildlife Department, Coastal Bend Land Trust, The Nature Conservancy, Fennessey Ranch, Texas Department of Transportation, Coastal Bend Bays & Estuary Program, and a local governmental representative mutually agreed upon by Aransas County and the City of Rockport. Reserve staff work with these partners to ensure that the goals of the Reserve are met and to complete management plan objectives.

Reserve Advisory Board meetings have offered opportunities for increased collaboration among Reserve partners. For example, a memorandum of understanding was developed between the Reserve, the City of Rockport, and the Aransas County Navigation District for the maintenance and operation of the Bay Education Center.



Advice from the Community

The Reserve Advisory Board (RAB) was established during the designation process and has met twice-a-year since 2006. Meeting presentations are made available to RAB members prior to the meeting and all meeting minutes are posted to the Reserve website. The RAB meetings have been successful and have served their purpose of gathering advice from local partners and stakeholders. Many of the RAB members renewed their position on the board after their term expired, which has promoted strong connections and good communications between the Reserve and its partners. Advisory committees have also been held for each core position, but on a less frequent basis. Advisory committee meetings are often held to discuss a key issue, such as the following: Research = local projects, Stewardship = conservation action plan, CTP = work plan, and Education = market analysis/needs assessment.

Recruit and Maintain Staff

Although still new to NERR System, the Reserve has hired all core and supporting positions (with the exception of an administrative assistant and an undergraduate intern). While there has been some turnover in research technician positions and one retirement, all other staff members have stayed with the Reserve.



The Reserve is fully staffed and has gone from zero employees since designation in 2006 to 11 full-time and 6 part-time employees in 2011.

External Funding

The Reserve has been successful at securing funding from external grants and donations. Examples of these include funding from the Gulf of Mexico Alliance, Environmental Protection Agency, David and Lucile Packard Foundation, and Port Aransas Rod and Reel.

Reserve staff have secured over \$950,000 in external funding to support the Reserve mission.

FACILITIES DEVELOPMENT

As a new Reserve, the Mission-Aransas NERR has undergone major initiatives to develop core facilities for the program. Reserve staff members are currently using existing spaces within UTMSI. While many of the Reserve programs will continue to use facilities at UTMSI, the following facilities have been (or are) in the process of being constructed to serve NERR programs.



Headquarters Facility

The Mission-Aransas NERR Headquarters is being constructed on the grounds of the UTMSI. This facility is 35,940 gross square feet and will also include an expansion of the Marine Science Institute on the third floor. The Reserve will occupy the first and second floors of the facility. The Mission-Aransas NERR Headquarters will house administrative offices, research offices, wet laboratories, dry laboratories, small meeting rooms, a work/map room, a large meeting room for Coastal Training Program (CTP) workshops, and a Resource Center.

The Resource Center is an integral component of the NERR facility. It will provide much needed space for printed and electronic resources that are critical to the research, education, and stewardship programs of the Reserve. Construction of the Resource Center will also vacate 4,633 assigned square feet of space that will be renovated by UTMSI for Mission-Aransas NERR educational programs. This space is contiguous with the existing public education space at UTMSI and adjacent to the recently completed Wetlands Education Center. The NERR headquarters is scheduled for substantial completion by the end of June and a ribbon cutting event is planned for July 23, 2011. Conversion of the existing library space to NERR education space will be completed by July 2012.

The NERR headquarters facility has been designed and is being constructed to meet the demand for both survivability and sustainability. The project is committed to formal Leadership in Energy & Environmental Design (LEED) certification while being resistant to the harsh coastal environment, robust enough to withstand high-category hurricanes, and minimizing the visual impact on the low-lying dune topography. This project is registered with the U.S. Green Building Council with a minimum goal of achieving LEED silver certification.

The Mission-Aransas NERR Headquarters' Facility will be the first educational building in South Texas that is LEED certified.

Bay Education Center

The Bay Education Center is the newest facility of the Mission-Aransas NERR and was opened in the summer of 2010. The Center is located in the City of Rockport, which is a tourist destination that attracts visitors from all over the state of Texas and throughout the United States and Canada. This 4,400 square foot facility contains an auditorium, visitor center, public rest rooms, office space for the Mission-Aransas NERR, offices for the City of Rockport staff, and an outdoor courtyard space for school groups. The visitor center and auditorium are outfitted with educational exhibits that are designed to educate visitors about the importance of our estuaries and the habitats they support. The Center also contains the National Oceanic and Atmospheric Administration's exhibit of Science on a Sphere®. This educational tool projects images and animations onto a large sphere to illustrate complex environmental processes through an engaging and dynamic method.

The Bay Education Center is open Tuesday through Saturday from 1-4 pm and already receives an average of 34 visitors per day.



Wetlands Education Center

The Wetlands Education Center is a key educational facility of the Mission-Aransas NERR and UTMSI's Marine Education Services. This 3.6-acre man-made wetland is landscaped and planted with seagrass and high and low salt marsh plants. The plants are nourished by water from the Aransas Pass Ship Channel. This site is ADA compliant and provides students and visitors alike a hands-on wetland experience, complete with informational signage and a geodetic marker.



The Wetlands Education Center was funded by federal, state, and county governments, contributions from the University of Texas, and private donations. The Center is free and open to the public with guided tours available twice a week. K-12 curriculum and activities are also available for students, teachers, and the public.

An average of 300 individuals take part in self-guided tours each week.

Fennessey Ranch

Fennessey Ranch is a privately owned 3,324-acre ranch that is managed to be an environmentally sound as well as economically viable business. A conservation easement was purchased on the Ranch by The University of Texas for the Mission-Aransas NERR in 2006. The Ranch borders nine miles of the Mission River - one of the two rivers that flow into the Mission-Aransas Estuary. Meadows, brush, prairie, freshwater wetlands, natural lakes, and riparian woodlands compose the landscape of the Ranch. These diverse habitats are host to more than 400 species of birds, 16 plant communities, 50 kinds of amphibians and reptiles, 70 types of moths and butterflies, and numerous types of mammals, such as armadillo, deer, wild boar, coyote, bobcat, and cougar. Current management activities on the Ranch include: brush control, rotational grazing, enhancement and restoration of wetlands, nine mile riparian recovery zone with no grazing, restoration of prairie and grasslands, controlled burns, controlled hunting program with no top predator hunts, and an electrical fencing system that does not impede wildlife. Fennessey Ranch incorporates hunting, wildlife tours, photography, and cattle enterprises to maintain a viable business. The Reserve provides annual support for maintenance and management activities of the Ranch.

The Fennessey Ranch has hosted educational programs for elementary, middle school, and high school students the past eight years. The Mission-Aransas NERR, The University of Texas, Texas A&M University, and University of Houston also host a multitude of educational programs at Fennessey Ranch, including but not limited to teacher trainings, undergraduate student fieldtrips, graduate student independent studies, and Road's Scholar (formerly Elderhostel) fieldtrips. Some of the more well-known programs at Fennessey Ranch include Monarch Madness Day and Earth Science Field Day that are each attended by over 200 K-12 students and teachers. The current programs serve several thousand students each year.

The Reserve recently constructed a floating boardwalk on McGill Lake that, when combined with the existing pavilion, serves as the primary location for educational and ecotourism programs. The NERR is also in the process of constructing additional improvements at the Ranch, such as a gravel parking area and a path that connects the existing pavilion to the newly constructed boardwalk.



Over 3,300 acres of riparian, upland, and freshwater wetland habitat have been conserved in perpetuity for research and education.

Other Initiatives

Copano Bay Research and Education Center: The Copano Bay Research and Education Center was identified as a facility need in the Reserve management plan. This Center would serve as a research field station on Copano Bay and provide additional opportunities for educational programs within Aransas County. The University of Texas at Austin and the property owner of the proposed Copano Bay Research and Education Center were not able to come to an agreement on the transfer of land required for construction of this Center.

Future plans include: Developing facilities for lodging of visiting scientist, establishing a Copano Bay Research and Education Center, working with USFWS to enhance the visitor experience at the Aransas Wildlife Refuge, and continuing improvements at Fennessey Ranch.

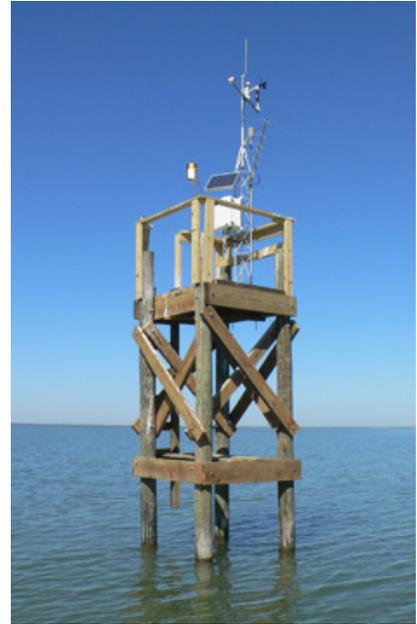


Photo courtesy of Marie Bundy

Research and Monitoring Program

System-Wide Monitoring Program

The Mission-Aransas NERR installed and operated five water quality monitoring stations within a year of its designation. These stations are located in the Port Aransas Ship Channel, Aransas Bay, East Copano Bay, West Copano Bay, and Mesquite Bay. Each station measures temperature, conductivity, salinity, dissolved oxygen, depth, pH, turbidity, and chlorophyll. Nutrients are monitored at stations on a monthly basis and samples for nutrient analysis are also collected at the Port Aransas Ship Channel Station once a month for a 24-hour period with an automated ISCO sampler. All nutrient samples are analyzed at UTMSI by Dr. Tracy Villareal. The Reserve uses YSI 6600 v2 sondes with optical dissolved oxygen probes to reduce the maintenance cost and increase the quality of the data. In addition, chlorophyll probes are used to help quantify primary production values in the system. With the exception of the Port Aransas Ship Channel Station, all stations are located on standalone platforms in the middle of the bays. The weather station data from Copano East and the hydrographic data from Aransas Bay are telemetered directly to CDMO via satellite. The rest of the stations are telemetered in real-time to the Texas Coastal Ocean Observing Network (TCOON) and made available to the public (<http://lighthouse.tamucc.edu/MissionAransas/HomePage>). The Centralized Data Management Office is also able to capture the real-time information from TCOON and make it available on their website in real-time.



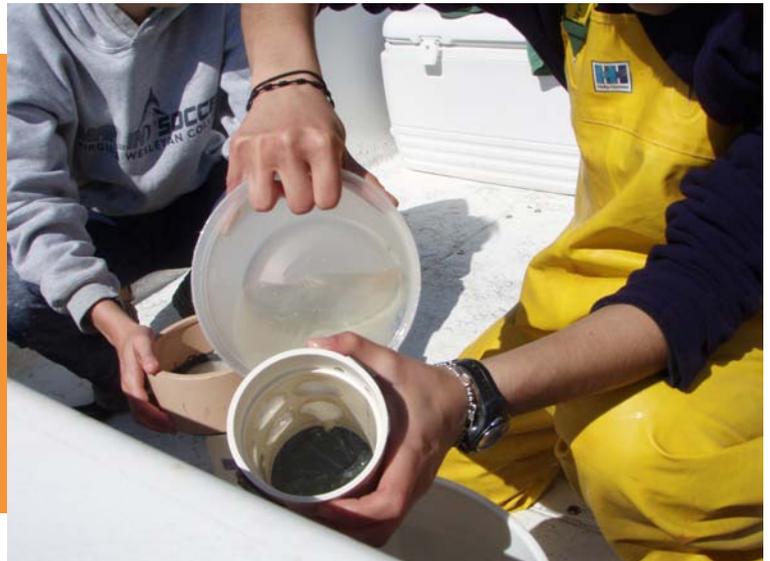
A sixth station was added in 2009 in Little Bay, Rockport, Texas through partnerships with the City of Rockport, Aransas County Navigation District, and Coastal Bend Bays & Estuaries Program. This station is located adjacent to the NERR boundary and is operated and maintained with the rest of the NERR water quality SWMP stations.

Biological Monitoring Program

The Mission-Aransas NERR has established a Harmful Algal Monitoring Program. This program collects samples from the water quality SWMP stations on a monthly basis and analyzes them for microplankton composition with a FlowCAM analyzer. The Harmful Algal Monitoring Program has also implemented the use of the Imaging FlowCytoBot (IFCB) on the UTMSI pier at the Ship Channel Station. The IFCB project is a partnership with Texas A&M University (Dr. Lisa Campbell), and Woods Hole Oceanographic Institution (Dr.s Rob Olsen and Heidi Sosik). The IFCB was initially funded by the Cooperative Institute for Coastal and Estuarine Environmental Technology and additional funding has been secured through the ECOHAB program and Texas Sea Grant to continue monitoring with the IFCB. The Reserve currently receives partial salary support for one of our technicians to perform weekly maintenance on the IFCB from NOAA.

The Mission-Aransas NERR received funding in 2010 to begin a submerged aquatic vegetation (SAV) and emergent marsh biomonitoring program. This program will be led by Dr. Ken Dunton, who is an expert on SAV and marsh communities. Dr. Dunton's laboratory is also conducting a similar program for several estuaries in the State of Texas and has spear-headed the effort within the state to develop a state-wide seagrass monitoring plan. Dr. Dunton attended the Research Coordinator meeting in March 2011 and is prepared to complete the project. Sampling will begin in Spring 2011.

The Imaging FlowCytobot (IFCB) detected a toxic bloom of Dinophysis in February 2008, which led to closure of oyster beds before any human illness was reported. The IFCB detected a similar Dinophysis bloom in April 2010, and facilitated the first detection of a major Karenia bloom in September-October of 2009.



Developing Pilot Nutrient Criteria for Gulf of Mexico Estuaries



The goal of this study is to understand nutrient loads and transformations within the Mission-Aransas Estuary and provide information to help develop nutrient criteria for Gulf of Mexico Estuaries. This project is funded through the Gulf of Mexico Alliance by the Environmental Protection Agency. The Mission-Aransas Estuary experiences episodic precipitation events that are very important in determining the nutrient inputs to the system. This study involves monthly sampling of nutrients in the Mission and Aransas rivers and at the Copano Bay (East and West) SWMP stations, as well as sampling during storm events. Analysis of nutrients will include determining sediment nutrient transformations, including denitrification, in Copano Bay (East and West) stations, and water column and sediment ammonium demand from Copano Bay and river sites. Researchers at the Reserve started collecting data in August 2010 and collected the first storm events in September through October in

2010. Sediment and water column incubations are performed seasonally to quantify nitrogen transformation rates within the Reserve.

Reserve staff have also developed a computer model that estimates net community metabolism continuously within the Reserve based on dissolved oxygen and meteorological data. Ecosystem metabolism metrics (GPP, ER, NEM) are also being used as a tool for examining ecosystem responses to a variety of factors such as storms, nutrients, invasive species, and climate change.

Other Research Projects

Seagrass and Water Quality Monitoring in Little Bay, Rockport: A study was conducted to determine the seagrass and water quality conditions for Little Bay, located in Rockport, Texas. A continuous water quality monitoring station (identical to a SWMP station in equipment and protocols) was placed in the bay and is telemetered in real-time to the TCOON network.

Research Experiences for Undergraduates- Field experiences in Texas coastal dynamics: This project is led by Dr. Ed Buskey and Dr. Deana Erdner of UTMSI. This project supports ten undergraduate students each summer to carry out research with a UTMSI faculty mentor and was initially funded as a three-year program by the National Science Foundation. Many of these students carried out research in Mission-Aransas NERR: four in 2008, six in 2009, and three in 2010. The project just received notice of award for an additional three years.



Pathogenic Bacteria: The Mission-Aransas NERR has sponsored several undergraduate research projects through the Research Experience for Undergraduates program at UTMSI. Students analyzed water collected at the water quality SWMP stations and within the Port Aransas Marina for the presence of pathogenic bacteria. Samples were analyzed for coliform bacteria during the summers of 2009 and 2010. This study was also supported by the City of Port Aransas and is a great example of partnership with the local community.

Transferring Research Knowledge

To Classrooms: The BWET “START” Project provided teachers from five surrounding counties within the Mission-Aransas watershed with the opportunity to work with Mission-Aransas NERR scientists, Artist Boat artists, and marine biologists. The program was designed to provide teachers with a professional development opportunity, while also providing meaningful watershed educational experiences for their students. In addition to the locally-based curriculum developed for the Wetlands Education Center and the Fennessey Ranch, Teachers on the Estuary (TOTE), Estuaries 101, and the Coastal Watershed Institute & Eco-Art Workshop and Adventure curriculum were used for both teacher professional development and field experiences for students.

To Public: The water quality and meteorological data from all five SWMP stations were recently incorporated in an educational display at the Bay Education Center. In this display, visitors can view a mock-up version of a monitoring platform and use a computer touch screen to view the latest water quality and weather information in the bays. Researchers and staff from the Reserve have also presented at many public events, such as the Whooping Crane festival and UTMSI Public Lecture Series.

To Decision-Makers, and Research Community: Reserve staff have participated in several events to inform researchers and decision-makers of research results.

- Hosted Gulf Estuarine Research Society (GERS) meeting in 2010; Ed Buskey is serving as President of GERS and serves on the governing board of the Coastal and Estuarine Research Federation.
- Dr. Buskey serves on the Guadalupe-San Antonio Bay and Basin Expert Science Team (BBEST). The BBEST was formed as a mandate from Texas Senate Bill 3 and teams are charged with

creating recommendations for freshwater inflow requirements.

- A draft of the site profile is complete and was submitted to the Estuarine Reserves Division for review in October of 2010. Comments were received in February 2011 and are currently being incorporated.



Student Participation in Reserve Research

The Mission-Aransas NERR has made a large effort to advertise for the NERRS Graduate Research Fellowship (GRF) program, and as a result, has received more applications than any other reserve for the last two years. Since designation, the Reserve has hosted four GRFs. A graduate research assistant opportunity has also been developed for UTMSI graduate students. This program is structured similar to the NERRS GRF program with the purpose of promoting graduate student research in Reserve priority areas. Since designation, the Reserve has hosted two GRAs. The Reserve has also developed an undergraduate internship program to foster collaboration with UTMSI researchers and promote Reserve science and the UTMSI degree program.

- Rae Mooney, The University of Texas (GRF): Nitrogen dynamics during and after storm events in the Mission-Aransas NERR.
- Juan M. Jiménez, University of Houston (GRF): Eutrophication and salinity stress: top-down and bottom-up regulation of Aransas salt-marshes community structure.
- Bridgett Froeschke, Texas A&M University Corpus Christi (GRF): Identification of southern flounder nursery habitat within an estuary: the influence of abiotic and biotic factors.
- Jena Campbell, The University of Texas (GRF): The role of protozoan planktonic grazers in harmful algal bloom dynamics.
- Il-Nam Kim, The University of Texas (GRA): A study on freshwater discharge and material exchange influenced by climate variability at the Mission-Aransas NERR using multi-parameter measurements.
- Brad Gemmell, The University of Texas (GRA): Zooplankton monitoring within the Mission-Aransas NERR.
- Samantha Myers, The University of Texas (Intern): Investigating organic carbon dynamics along the Mission River.
- Charlotte Heron, The University of Texas (Intern): Effect of hard structures on the biodiversity found in the Mission-Aransas NERR.

Education and Outreach

Teacher Training

Teacher workshops are aimed at upgrading the proficiency of classroom teachers at all levels by the introduction of marine science topics and techniques into the curriculum of all subjects, from science to art and history. Students of all ages are fascinated by the oceans and once you have focused their attention, whether it is on an aquarium, a shell, or a photo of earth from space, you can teach almost any subject using marine science as the medium. Getting the student's attention and making the subject exciting is half the battle in classroom education today. The Reserve partners with UTMSI Marine Education Services to host weekend workshops. At these workshops teachers gain practical experience with shipboard collecting gear, as well as exposure to current research problems and methods to gain a better understanding of the marine environment. The teachers will then be able to transfer to their students the knowledge and experience gained through workshop participation, thus enabling them to become more effective educators. Many teacher training programs have been hosted since designation, such as Scientists, Teachers, and Artists in the Texas Gulf Coast (START), Informal Science Education Association (ISEA), and Marine Activities, Resources & Education (MARE) teacher trainings.

Road Scholar

Road Scholar (formally known as Elderhostel) is an educational/travel adventure for adults over 55 (or accompanied by an adult over 55) who are looking for something different. These short-term academic programs are typically six days and five nights. The Reserve partners with UTMSI Marine Education Services to host programs in Port Aransas, Rockport, Kingsville, Brownsville, and McAllen, Texas. Programs cover a variety of subject matter, including coastal ecology, birding, and history. All programs are field based and designed for active participation.



Research Vessel Katy

On a typical class trip aboard the R/V KATY, students collect water samples and analyze them for salinity, dissolved oxygen, and nutrients; conduct plankton tows and bottom trawls; and collect sediment samples. Half-day trips usually visit the bays and channels where bottlenose dolphins, brown pelicans, and many other forms of marine life can be seen. An understanding of the marine environment that supports marine diversity is gained through measurement, observation, and sampling.

Over 4,413 students gained a better understanding of the marine environment by traveling aboard the R/V Katy in 2010.

UTMSI Visitor Center

Interest in marine science is promoted by the UTMSI Visitor's Center where self-guided tours and educational movies are among the attractions offered. Seven aquaria display typical Texas coastal habitats and the organisms that can be found in these environments. Habitats include black mangrove, oyster reef, open bay bottom, rock jetty, and offshore artificial reefs. Other displays in the main building highlight current and past research projects and feature representative specimens or photographs of local plants and animals. Over 40,000 visitors tour the facility annually.



Public Lectures

The Reserve partners with the UTMSI Marine Education Services to host public lectures every Thursday night during the winter season. These lectures feature accomplished scientists discussing marine science research in a way that is especially designed for the general public. Often times, attendance exceeds 150 people. The Reserve has recently begun to professionally film the public lectures, with support from the City of Rockport and Aransas County. The recordings are available for viewing at the Bay Education Center.

Local Outreach Events

The Mission-Aransas NERR participates in a variety of community outreach activities during the year, including outreach programs in K-12 classrooms and public events, community fairs, and expositions. Participation typically includes a booth with educational materials, touch tanks, or other hands-on activities. Reserve staff participate in the following events: Texas Coastal Expo, National Estuaries Day, Restore America's Estuaries Conference, National Council for Science and the Environment Conference, Conference for the Advancement of Science Teaching, UTMSI Open House, Hummer / Bird Celebration, Earth Day - Bay Day, Nature Challenge, Monarch Madness, Whooping Crane Festival, Port Aransas ISD Science Night, Teacher Extravaganza, and Texas Marine Educator Association Conference.



School Curriculum

Lesson plans and activities have been developed for the Wetlands Education Center, the Bay Education Center, and for the Estuaries 101 Middle School Curriculum. Wetlands and Bay Education Center activities are aligned with the Texas Essential Knowledge and Skills and are designed for K-12 classes. The Mission-Aransas NERR provided data for two Estuaries 101 Middle School Curriculum activities and assisted with additional activity development. All Estuaries 101 activities will be posted on the Estuaries.gov website after review and final revisions are complete.

K-12 programs

Thousands of school groups have participated in programs at the Wetlands Education Center, the Bay Education Center, the R/V Katy, and the Birding 101 for Kids program.

Wetlands Education Center programs allow students to explore salt marsh and sand dune environments first-hand. Students learn about marsh and dune ecology through observation, sampling, and various hands-on activities, both outdoors and in the Pier Lab (a wet laboratory located adjacent to the Wetlands Education Center).

The Bay Education Center offers students the opportunity to learn about the importance of estuaries through interactive exhibits and to explore ocean, land, atmospheric, and astronomical data via NOAA's Science on a Sphere®. Opportunities for K-12, TEKS aligned, outdoor, experiential learning are currently being developed for the Bay Education Center and will include, but are not limited to, the diversity of life in seagrass beds and estuarine water chemistry.



Birding 101 for Kids was developed for students aged 7 - 16 years old. These programs are outdoor learning opportunities and are designed to help students identify birds as well as give students a greater awareness of the environment. Students learn how to use binoculars, how to identify birds using field marks, make a bird feeder, and sketch a bird or plant just like the famous ornithologist, James Audubon.

Guided tours at the Wetlands Education Center

Guided tours are offered free of charge to the public twice a week at the Wetlands Education Center (WEC). Tours last approximately 45 minutes and are designed to help people appreciate the ecological and economic importance of coastal wetlands. The tours stop at several pavilions within the WEC and discuss the importance and benefits of different habitats. The Reserve has been successful in enlisting the help of several volunteers to assist with tours. A tour guidebook has been developed so that information about the WEC is consistent regardless of who is giving the tour.



On average, public guided tours serve 12 people per week, but numbers increase to 19 during the height of the winter tourist season.

Interpretive Displays

Interpretive displays are an ideal mechanism to increase awareness of the Reserve and NERR System. The Reserve has installed educational signage at the City of Rockport Harbor, the Wetlands Education Center, the UTMSI Visitor's Center and Laboratory facility, Fennessey Ranch, and the Egery Flats salt marsh. Interpretive exhibits at the Bay Education Center reveal the ecological and economic value of the Mission-Aransas Estuary.



Science on a Sphere Programs

Science on a Sphere® (SOS) presentations are offered five days a week and free of charge to the public at the Bay Education Center. SOS is a display system created by NOAA to help people learn about the Earth and other planetary sciences. SOS presentations are designed to explore environmental data in a visually engaging and fun manner, while still teaching the public about the importance of our natural environment and coastal ecosystems.

On average, SOS presentations serve more than 80 people per week, but numbers can reach over 240 during the height of the tourist season. Many visitors return multiple times and bring friends and family members to experience these programs.

VOLUNTEER PROGRAM

A volunteer program has been developed to (1) increase the Reserve's monitoring capacity, (2) increase the Reserve's capacity to provide educational experiences to K-12 students, (3) foster a stewardship ethic within local communities, and (4) increase the Reserve's capacity to promote public appreciation of Texas coastal resources. This program has been built with strong support from an existing cadre of volunteers for the Animal Rehabilitation Keep. The Reserve has established a program that is consistent with The University of Texas rules and regulations, which require liability forms, background checks, and copyright waivers. The Reserve has worked with University staff to establish a successful volunteer program that, not only meets University regulations, but also provides consistent communication among volunteers. The Reserve has also been successful in recruiting many new volunteers to serve Reserve programs and participate in other events such as beach/marsh clean-ups, vegetation monitoring, K-12 education programs, and guided tours. The Reserve has also established volunteer appreciation events to further foster support and attendance by volunteers.

The Mission-Aransas NERR currently has 131 active volunteers. Collectively, they put in approximately 419 total volunteer hours per month.



Stewardship

Vertical Control

Staff are currently working to establish a vertical control network within the Reserve. Through funding from the Gulf of Mexico Alliance and technical assistance from the National Geodetic Survey (NGS), Reserve staff have installed 15 Surface Elevation Tables (SETs) within 5 different habitats of the Reserve (high salt marsh, low salt marsh, mangrove, mud tidal flat, and brackish marsh). Equipment for a continuous operating reference station has also been purchased and will be installed in Rockport, Texas with assistance of staff from NGS and the Texas Spatial Reference Center. Future efforts are planned to tie the network of SETs (as well as biomonitoring transects) to the National Spatial Reference System.



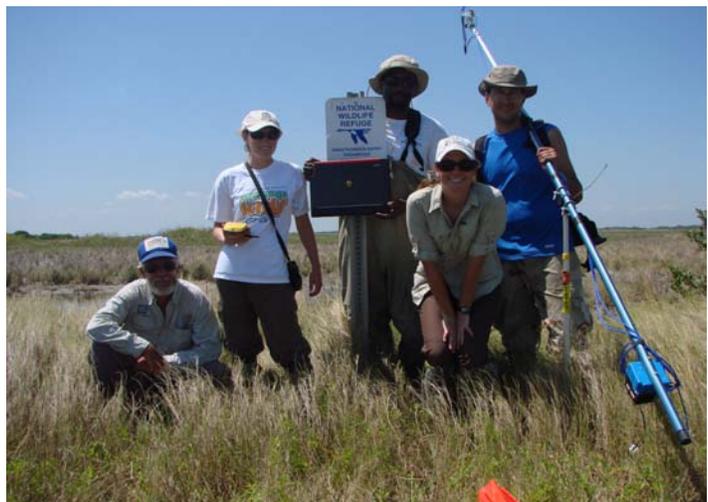
Community Characterization

The Reserve worked with NOAA Coastal Services Center to characterize the human dimensions of the Reserve and its watershed. This project identified and summarized the social, cultural, economic, and political aspects of the Reserve's watershed. Input for the report was collected from the 2000 census. A report was provided to stakeholders and Reserve partners. Particular aspects of the community characterization report were also incorporated into the Reserve's site profile.

Habitat Mapping and Change

NERRS Classification Scheme: The Mission-Aransas NERR reclassified existing high-resolution habitat data of the wetlands on Texas barrier islands into the NERRS Classification Scheme. The methods, challenges, and recommendations for reclassifying existing data to the NERRS Classification Scheme were documented in a technical report.

Hyperspectral Imagery: The hyperspectral imaging project was a joint initiative between the Mission-Aransas NERR and the NOAA Environmental Cooperative Science Center. The AISA-Eagle Airborne Hyperspectral Imaging System was used to collect imagery in many narrowly defined spectral channels with a resolution of 1-meter. Ground truthing was conducted during and shortly after the acquisition of the imagery. Imagery was collected for (1) salt marsh and wind-tidal flats at the Aransas National Wildlife Refuge, (2) freshwater marsh and upland habitats at



Fennessey Ranch, (3) mangroves at Harbor Island, and (4) seagrass meadows in Redfish Bay. Results of the hyperspectral imaging project are being used to produce high-resolution maps of priority habitats within the Reserve.

Habitat Mapping and Change Plan: In order to coordinate the habitat mapping (and vertical control) efforts within the Reserve, the Reserve has developed the Mission-Aransas NERR Land Use, Land Cover, and Habitat Change Plan. The plan will guide future mapping and vertical control/elevation projects within the Reserve and its watershed, while also providing information on how the land use/land cover component of SWMP will support the different Reserve sectors and partner initiatives. In addition, the Stewardship Coordinator has served as the co-chair for the Habitat Mapping and Change Technical Committee for the last three years.

Ecosystem Based Management

The Reserve received funding from the David and Lucille Packard Foundation to conduct a project entitled “Improving Coastal Land Use Planning Through the Application and Evaluation of the Interoperability of Three Decision Support Tools.” The purpose of this project was to allow for the development of sound policies that can maintain the social, economic, and ecological values of coastal communities by increasing our understanding of the linkages between land use strategies and their effects on coastal-marine ecosystems. The project collaborated with the local community to apply three decision support tools (CommunityViz, NatureServe Vista, and N-SPECT) using a scenario-based approach. The three tools were integrated to: (1) evaluate the current condition and sustainability of the ecosystem and socioeconomic indicators, (2) evaluate future development trends based on current policies and economic forces, and (3) develop alternative land use strategies to meet sustainability objectives for ecological and socioeconomic values.

Conservation and Acquisition

Reserve staff have hosted several workshops to inform stakeholders and the Reserve about conservation and acquisition activities. Recently the Reserve hosted a workshop to help formulate the Mission-Aransas NERR Habitat Conservation and Acquisition Plan. The Reserve also hosted a half-day workshop to discuss the Coastal and Estuarine Land Conservation Program (CELCP) with local stakeholders and partners. Reserve staff have participated in a number of additional acquisition-focused meetings and conferences, such as the Land Trust Alliance Rally, Whooping Crane Conservation Plan, and CBBEP Habitat and Living Resources Team.

The Mission-Aransas NERR collaborated with the Texas Parks and Wildlife Department to draft a proposal for the CELCP funding opportunity. If funded, the proposal would result in the fee-simple acquisition of the 82-acre Big Tree Ranch property, which would provide critical habitat for endangered Whooping Cranes.



Monitor Land Management Practices

Fennessey Ranch Management Plan: Fennessey Ranch has a detailed management plan that outlines its strategy for maintaining the conservation value of its habitats while still generating revenue. To ensure that Ranch management activities support the terms of the conservation easement, the Stewardship Coordinator works with the manager of Fennessey Ranch to complete an annual assessment of management activities.

Fennessey Ranch Vegetation Monitoring: The Reserve Stewardship program conducts an annual assessment of vegetation characteristics at Fennessey Ranch. Staff work with volunteers from the Texas Mid-Coast Master Naturalists to conduct a detailed classification of vegetation at 50 plots located throughout the different habitats of the Ranch. This monitoring program allows both Reserve and Ranch staff to assess impacts of current management practices and make changes accordingly.

Animal Rehabilitation Keep

The mission of the UTMSI Animal Rehabilitation Keep (ARK) is to rescue and rehabilitate wildlife found sick or injured in the area adjacent to and including Mustang, San Jose, and Padre Islands, including the Mission-Aransas NERR, Corpus Christi Bay, and the Upper Laguna Madre. To help facilitate this mission, the Reserve provides funding to support up to three part-time staff members at the ARK. Reserve staff also support the ARK through the coordination of its extensive volunteer network.

From March to August 2010, the ARK rescued 169 sea turtles, 627 birds, 38 mammals, and 42 terrestrial reptiles. Following rehabilitation, staff were able to release 46 sea turtles, 180 birds, 28 mammals, and 32 terrestrial reptiles.

Cleanup and Recycling Programs

Reserve staff partner with Texas Sea Grant on the Monofilament Recovery and Recycling Program (MRRP). To reduce the amount of monofilament left in the environment, the Mission-Aransas NERR and local volunteers help maintain monofilament recycling bins at boat ramps and in tackle shops and bait stands in Port Aransas, Rockport, and throughout Aransas County. The collected fishing line is sent off for recycling into other plastic products.

The Stewardship Coordinator established a volunteer-based “Green Team” at UTMSI in 2008. The purpose of the UTMSI Green Team is to provide faculty, staff and students in the Marine Science Department an opportunity to discuss environmental issues that affect their department, building/grounds, and nearby community. Some noteworthy accomplishments of the Green Team include establishing a plastic, aluminum, and battery recycling program at UTMSI, hosting regular cleanup events, and creating an incentive program for bicycling to work.



Reserve staff have also partnered with other local organizations to host and enhance cleanup events. For example, the Reserve worked with the USFWS, the Texas General Land Office, and a local boat captain to conduct a volunteer cleanup of several miles of shoreline at the Aransas National Wildlife Refuge. The cleanup was held the last two years on National Public Lands Day, which has also coincided with National Estuaries Day.

Reserve staff and volunteers have collected over 311 lbs of monofilament to date and the UTMSI Green Team has held nine cleanups of the Port Aransas South Jetty since its development in 2008.



Fennessey Ranch will have over 40 signs that highlight the important habitats of the Ranch and the diversity of wildlife that can be seen on the property.

Outreach

The Stewardship Coordinator is involved in a number of local and regional advisory committees and working groups, such as the Coastal Bend Bays & Estuaries Program Habitat and Living Resource Team. She has also attended a number of important local conferences and workshops, such as the Freshwater Inflow Conference, International Conference on Sea Level Rise in the Gulf of Mexico, Gulf Estuarine Research Society Meeting, and the Texas Bays and Estuaries Meeting.

Through the creation of interpretive signs, the Mission-Aransas NERR has worked to promote public appreciation and stewardship of coastal resources. Funding from the CBBEP was used by the Reserve staff to develop and fabricate educational signs for the Egery Flats area. The signs highlight the importance of estuaries and the detrimental effects of marine debris. Reserve staff have also developed a number of interpretive trail signs for Fennessey Ranch.

Restoration

The Mission-Aransas NERR is working with staff from the Texas Parks and Wildlife Department to identify potential funding opportunities for a living shorelines restoration project on 2 kilometers of shoreline in Copano Bay. This area is the location of the historic port of El Copano, which was established in 1722 to serve the Spanish Missions in Refugio, Goliad, and San Antonio. The remains of El Copano are situated on a bluff that is eroding rapidly into Copano Bay. A living shorelines restoration project will help protect this important archaeological resource, while also creating additional habitat for many estuary-dependent animals.

Reserve staff recently hosted a booth in the exhibition hall at the Restore America's Estuary Conference where visitors could obtain information about the Reserve and speak with the staff members. This was a good opportunity for networking with potential restoration partners at the federal, regional, and local level.

Coastal Training Program

The Coastal Training Program (CTP) was initiated in fiscal year 2007

Market Analysis and Needs Assessment

A market analysis and needs assessment was completed in August 2008. The market analysis characterized the existing coastal training opportunities in the area surrounding the Mission-Aransas Estuary. It includes a description of the counties in the Mission-Aransas NERR, a review of potential training providers, and information about existing training events (e.g. format of the event, topics covered, target audience, and location). The needs assessment characterized logistical training preferences, as well as the levels of general knowledge, work-related experience, and perceived need for training of local coastal decision-makers. The findings of the market analysis and needs assessment are used by the CTP to guide the types of training opportunities that are offered by the Reserve.



A strategy and marketing plan was also created. This is the blueprint for the continued development of the CTP for a three year period. This document describes the CTP strategies from 2009-2012 including information on (1) goals and objectives, (2) integration, (3) partnerships, (4) priority issues, (5) target audiences, (6) training delivery systems, (7) monitoring and evaluation criteria, and (8) available resources. Information contained in this report is based on the market analysis and needs assessment and input from Reserve staff, partners, and the CTP Advisory Committee.

A Gulf of Mexico Initiative

The Reserve is collaborating with other CTPs in the Gulf of Mexico on a regional CTP funding opportunity from the NOAA Coastal Services Center in support of the Gulf of Mexico Alliance (GOMA). This project enables the



Reserves in the Gulf of Mexico to host coordinated workshops and develop a cadre of stakeholders that are trained to maintain an even level of expertise throughout the Gulf region. Involvement in this project also includes participation with GOMA priority issue teams, which allows the Reserve to stay abreast of GOMA opportunities. A key outcome of this project involved hosting a Living Shorelines Workshop at each Gulf reserve. The purpose of this workshop was to inform participants about the ecological purpose, benefit and function of shoreline alternatives, learn the

role of state and federal agencies in the permit review process, evaluate examples of living shoreline projects, and explore funding opportunities and the cost of living shorelines as compared to hardened shorelines.

The Living Shoreline Workshops received so much interest that a session was hosted at Restore America's Estuaries in Galveston, November 2010. The project was also featured as a highlight at the recent CTP Coordinators meeting in Oregon, March 2011.



Photo courtesy of Marie Bundy

Partnership with City of Rockport

The Reserve has developed a strong partnership with the communities in Aransas County. The CTP has targeted Aransas County and its largest municipality, the City of Rockport, for training events due to its proximity to the Reserve. The CTP Coordinator participates in the Rockport Water Quality Committee Meetings and has developed a partnership with the City of Rockport's Department of Public Works. This partnership has resulted in several training collaborations such as the Stormwater Demonstration Training and Erosion and Sediment Control Training. The CTP training events have made a large impact on the information that is available to local decision-makers

and have resulted in a community that is more informed about the importance of their surrounding natural environment. This partnership also resulted in the identification of funding for a local seagrass monitoring project performed by the NERR at the request of the City and other local partners.

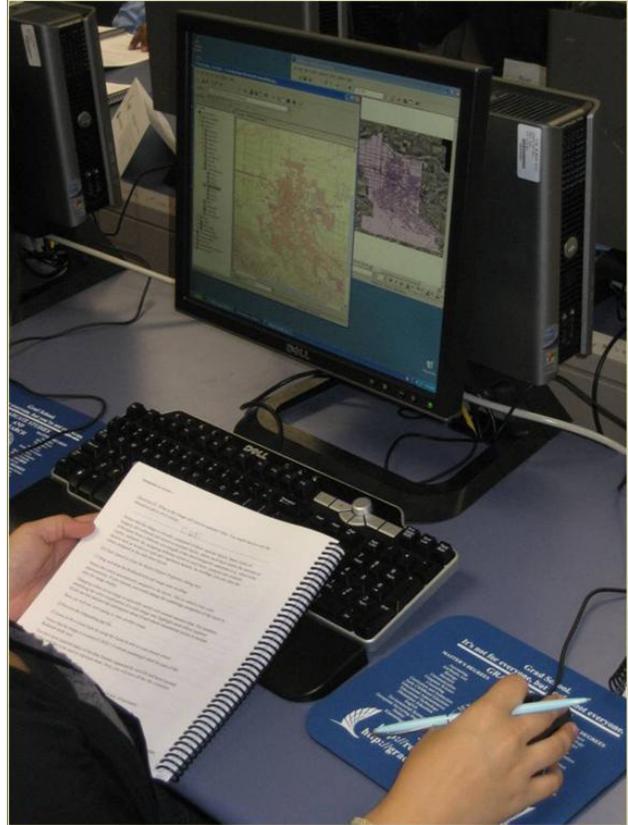
Outreach

The CTP has been very involved in the national system and has participated in several key workgroups and committees (Strategic committee, hosted EC/CTP sector meeting, SWMP Guidance Committee, Annual Meeting CTP Planning Group, CTP Marketing Workgroup). The CTP has also hosted several local advisory committee meetings to keep the local stakeholders informed about the opportunities that the Reserve provides and to gather input on the needs of the local community. In addition, the CTP coordinator has participated as a member of local organizations and provided presentations to numerous professional and volunteer organizations (Coastal Bend Bays & Estuaries Program, Rockport-Fulton Area Chamber of Commerce, Port Aransas Rotary Club, Port Aransas Kiwanis Club, Coastal Bend Guides Association, and the Port Aransas Garden Club).



Training Events

The Reserve's CTP has been very active since its implementation and has hosted many events with topics ranging from *Coastal Inundation Mapping using Geographic Information Systems (GIS)* to a conference on *Blue Crabs in Texas Coastal Ecosystems*. CTP events are popular and in high demand. The *Introduction to GIS* course hosted in July 2010 in Corpus Christi filled to capacity within 24 hours of initial distribution. The Reserve CTP hosted a total of nine events in its first full year of operation last year. During this time period, 250 people attended Reserve events resulting in a total of 2,399 contact hours. Post-event evaluations of trainings and workshops indicate that 98% of attendees improved their scientific understanding at events and 93% of attendees intend to apply the knowledge and skills learned at the event in their jobs. The Reserve CTP intends to continue to expand its offerings to address emerging issues and to better meet the overall needs of local costal decision-makers.



Additional information about the Mission-Aransas National Estuarine Research Reserve can be found at www.utmsi.utexas.edu/nerr



Photo courtesy of Patrick Crist

