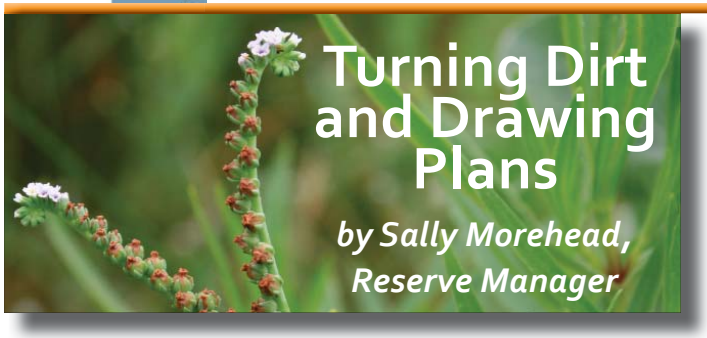
THE
MISSION ★ ARANSAS OBSERVER

A Newsletter of the Mission ★ Aransas National Estuarine Reserve

AUTUMN 2009



Turning Dirt and Drawing Plans

by Sally Morehead, Reserve Manager

Greetings! This fall has been a flurry of activity for the NERR program. We are now in major construction mode. This past August 1st we had a very successful groundbreaking for the Mission-Aransas NERR Headquarters and the construction firm has already begun the site work. Soon, the big concrete pilings will be set, and the giant cranes will be on site. It is an extremely exciting time. This is the first major construction project on this side of the campus since 1981!

The plans for the Bay Education Center are also being drawn. This project will be located in downtown Rockport, Texas adjacent to the Rockport Beach Park. The Bay Education Center will have a visitor center for education displays, auditorium, courtyard for education programs, and office space for NERR and the City of Rockport. We are also in the process of hiring an exhibit firm to design and fabricate the displays for the visitor center. This project is on a fast track and should be completed by May 2010.

Other construction projects include expanding the MSI visitor center parking lot to accommodate the additional buses and traffic created by the Wetlands Education Center, as well as construction of a new boardwalk at Fennessey Ranch. A boardwalk and floating platform are planned at McGuill Lake in Fennessey Ranch to allow access to the freshwater wetland for educational and research programs.

Our staff is doing an amazing amount of work to develop programs for our existing and planned buildings. Turn the page to learn a little more and don't hesitate to give us a call if you have questions about our programs or how to get involved.

Groundbreaking for Mission-Aransas NERR Headquarters.

Conceptual model for Bay Education Center.

INSIDE

REUFest in the Mission-Aransas NERR

by Ed Buskey, Ph.D., Research Coordinator

The University of Texas Marine Science Institute (UTMSI) administers the Mission-Aransas National Estuarine Research Reserve (Mission-Aransas NERR) and hosts a Research Experiences for Undergraduates (REU) program, funded by the Ocean Sciences section of the National Science Foundation. Our 10-week REU summer program, "Field Experiences in South Texas," (REUFest) sponsors students to carry out independent research projects with UTMSI faculty mentors. Sophomore or junior college students from any institution in the country are eligible to apply. The program pays for their transportation to Texas, room and board, and a $4500 stipend. The program is intended to help students decide if they would be interested in a marine science career.

The REU program starts with a 2-day cruise on the R/V Katy, from Port Aransas to the Laguna Madre. Along the way, we collect marine organisms with nets, trawls and bottom grabs, and the students learn how to use oceanographic equipment. We spend the night at the Laguna Madre field station, operated by Texas A&M University at Corpus Christi. This gives the students a good introduction to Texas marine life, and hopefully inspires some good ideas for research projects. We usually collect a good number of large shrimp in our nets on this trip, which we marinate and barbeque the same day. This is a great introduction to South Texas seafood for the students – you just can't get it any fresher! When we return to Port Aransas the students start working with their mentors to choose research projects.

Twelve students from 10 different universities participated in the summer 2009 program and six of these students conducted part or all of their research on priority issues within the Mission-Aransas NERR. These included studies of fecal coliform bacteria concentrations, diversity of picoplanktonic and benthic communities, stable isotopes within oyster tissues, distribution of fluoride in fresh and salt waters and studies of chromophoric dissolved organic matter. The program ended with a research symposium where students present the results of their studies.

Some students also have the opportunity to present their research at a national oceanographic meeting. This year, four of our REUFest students, July Enriquez, Luisa Rubio, Stephanie Miller and Rachel Hartnett, were awarded scholarships to fund their attendance at the American Geophysical Union – American Society for Limnology and Oceanography Ocean Sciences Conference in Portland, Oregon, in February 2010. All three students will be presenting results of research carried out in the Mission-Aransas NERR. CONGRATULATIONS REUFesters!!!

Summer 2009 REUFesters at the Laguna Madre Field Station.

Interested students can get REU program information and application materials online at http://reu.utmsi.utexas.edu/about/.

Tip for Greener Holidays

Make your own wrapping paper. Most wrapping paper you find in stores is not recyclable and ends up in landfills. Try using old maps, the comics section of a newspaper, children's artwork or a scarf to wrap your holiday gifts this year.

Graduate Research Experience at the Mission-Aransas NERR

by Rae Mooney,
Former Graduate Research Fellow

For the past two years I have been conducting my master's degree research in the Mission-Aransas NERR. The Mission-Aransas NERR funds two graduate research fellowships per year and I was fortunate to be chosen for this outstanding opportunity. In addition to my research, I assisted with the system wide monitoring program (SWMP) which monitors basic water quality parameters, such as temperature, salinity, dissolved oxygen, and nutrients, and is standardized across all reserves. Participating in the SWMP boat trips enabled me to quickly familiarize myself with the Gulf Coast environment and learn new field and lab techniques.

My master's research focused on watershed-estuary interactions in the Mission-Aransas ecosystem. Land use/land cover in the watershed plays an important role in the health and productivity of coastal ecosystems. For example, forests and grasslands capture and utilize nutrients and organic matter, reducing the amount that reaches rivers and ultimately the estuary. Agriculture and urban areas, on the other hand, tend to increase the amount of nutrients, organic matter, and pollutants in the waterways due to fertilizers, wastewater effluents, and urban runoff.

Rae Mooney taking water samples after a major flood event on the Aransas River.

During my research, I calculated the amount of nutrients and organic matter exported by the Mission and Aransas rivers during normal (low) flow and storm events. Storm events are important to South Texas because river discharge is generally low and estuaries depend on storm events for freshwater and nutrient inputs. My results showed that a series of major storm events in the summer of 2007 changed the salinity structure of the bays and the increased influx of nutrients supported increased production in Copano Bay for nine months.

Rae Mooney (left) and Cammie Hyatt returning from a SWMP monitoring trip to Aransas Bay.

Although increased nutrients might sound positive, in areas with excess nutrients due to large populations and altered landscapes, nutrients can be "too much of a good thing." A surplus of nutrients can cause harmful algal blooms (algal blooms that cause harm by producing toxins or by dense populations blocking light or affecting food web dynamics) and water quality issues that harm aquatic life and/or humans. Currently, the watersheds of the Mission and Aransas rivers are relatively unaltered and have low density populations. This is projected to change, however, in the future with growing population trends. Therefore it is important to understand the effects of watershed exports on Copano Bay so that we can better manage our coastal natural resources for the future.

Text to World Connections

by Rick Tinnin, Ph.D., Education Coordinator

This fall is a busy one for the education and outreach programs. The Mission-Aransas NERR has partnered with the Aransas County Commissioners and the Aransas County Independent School District (ACISD) in Rockport to provide field experiences for 1,420 students, across five campuses. This program is supported with Coastal Impact Assistance Program (CIAP) funds, which were generously set aside by the Commissioners for education. The program allows students and teachers from grades 1-2, 4-5, 6, 8, and 12 to visit the Mission-Aransas NERR headquarters and the Wetlands Education Center (WEC), located on the campus of the University of Texas Marine Science Institute (UTMSI) on Mustang Island.

During the field experience, the first and second graders participate in scavenger hunts in the WEC, UTMSI Visitor's Center, and research exhibit hall. Hands-on touch labs offer these younger students an opportunity to observe and touch locally-collected marine animals. The fourth and fifth graders study plankton and nekton, taken from trawl samples, while aboard the R/V Katy. They also learn about the value of vegetated versus bare sand dunes, life on rock jetties, and adaptations of halophyte or salt-tolerant plants. The WEC's new lower marsh trail allows them to walk and sit among the plants at the water's edge. The students make observations and drawings of the plants and animals that they see there. After observing plants in the field, the students spend time in the pier lab, using hand lenses to get a closer look at plant adaptations to life in the salt marsh. Older students participate in more in-depth studies of plankton and nekton aboard the R/V KATY and then visit the WEC to explore marsh plants, animals, and water chemistry.

Aransas County ISD school children touring the Wetlands Education Center.

This educational outreach program offers novel experiences for ACISD students and it helps them make connections between things they read about in their textbooks and the real world. For some of these students, the ferry ride over to the island and the trip on the R/V KATY are their first experiences on a boat of any kind. The relevance of the field experience to the classroom is revealed in this comment from an ACISD reading teacher, who wrote: "... we were reading about conserving habitats and the Florida Everglades. They recognized the word wetlands and were able to identify what it meant. That's what text to world connections are all about!"

Aransas County ISD school children observing marsh plants at the water's edge.

Tip for Greener Holidays

Decorate your house with LED holiday lights. LED lights use 90% less energy than conventional holiday lights, and can save your family money on your energy bills during the holiday season!

CTP brings Geographic Information Systems training to the Coastal Bend

by Chad Leister, Coastal Training Program Coordinator

In July, CTP partnered with the NOAA Coastal Services Center (CSC), Texas A&M University – Corpus Christi (TAMUCC), Harte Research Institute for Gulf of Mexico Studies, and the Gulf of Mexico Regional Partnership of CTPs to host two trainings in Geographic Information Systems (GIS) for local coastal decision-makers. GIS uses computer-based tools to display and analyze spatial data. These tools help users answer questions and solve problems by presenting data in a format that is easily understood and shared (e.g., map, model, or chart).

A "Coastal Inundation Mapping" workshop was hosted on July 21-22 at TAMUCC. This training taught experienced GIS users how to apply GIS tools to map water levels, explore topographic data, create digital elevation models, model storm events, and conduct risk and vulnerability assessments. These skills are essential to understand local impacts of severe weather events and the potential long-term effects of climate induced sea level change. Given the vulnerability of the Coastal Bend to hurricanes, it is important for communities to model storm effects in advance of a catastrophic event to ensure a functional plan for evacuation and recovery. NOAA CSC trainers, Matt Pendleton and Steve Walker, led this event and helped the participants apply these valuable tools.

Participants receiving hands-on instruction at the "Introduction to GIS" training.

A second event, "Introduction to GIS," was led by Steve Walker from NOAA CSC, on July 23-24. The purpose of this course was to help beginning GIS users learn the basics of GIS and its applications. Participants learned fundamental GIS concepts and familiarized themselves with the functionality of the software. Activities included: (1) creating, editing, and working with geographically referenced data; (2) manipulating tabular data; (3) querying a GIS database; and (4) producing maps, reports, and graphs.

Enhancing participants' knowledge of GIS will help local stakeholders incorporate more scientific analyses in their coastal decision-making. For example, the Stewardship program has been working to improve coastal land use planning through the integration of multiple GIS tools. Several local coastal decision-makers were interested in initiating similar projects, but did not have the necessary GIS skills to use or fully understand the tools. "Introduction to GIS" provided some of the skills that these individuals would need in order to take advantage of a project that combines several GIS tools. Additionally, Aransas County is creating a storm water management plan that could benefit from the improved understanding of GIS technology by local decision-makers involved in this plan and its implementation.

A complete list of upcoming CTP events is available at: http://www.utmsi.utexas.edu/about-the-institute/mission-aransas-nerr/coastal-training-program.html. If you have questions regarding the CTP, please contact CTP Coordinator, Chad Leister, at cleister@mail.utexas.edu or 361.749.6782.

What is CTP?

The Coastal Training Program (CTP) provides needs based training to local coastal decision-makers. Decision-makers are typically defined as individuals who make routine decisions about the management or use of coastal and estuarine resources in a professional or volunteer capacity.

Measuring land and water elevation: A priority issue for the Mission-Aransas NERR

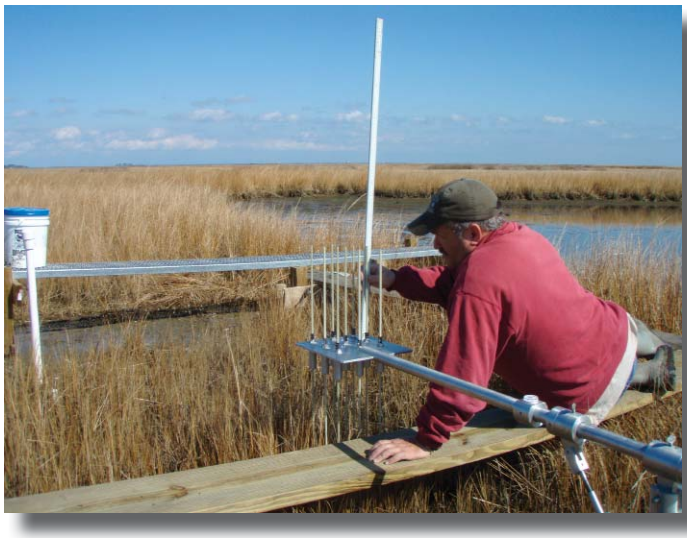
by Kiersten Madden, Ph.D., Stewardship Coordinator

Climate- and human-induced changes dramatically impact coastal ecosystems and affect the sustainability of communities and economies. In Texas, sea level rise and land use change pose tremendous threats to the health and productivity of our coastal resources. To help understand these dynamic threats and their potential impacts to our coast, accurate measurements of land and water elevations are needed. This information is essential because elevations are an important structural component of coastal systems and determine such factors as: (1) frequency and duration of inundation, (2) sedimentation and erosion, (3) distribution of plant and animal species, and (4) the degree to which shorelines are exposed or protected from storm surge. Therefore, information about land and water elevations and their change over time is critical to making decisions related to navigation, coastal hazards, and resource management.

Rates of sea level rise in Texas are higher than the global average due to the effect of local hydrodynamic forces on water levels and regional and local land movements. On the low-lying Texas coast, these small increases in the rate of sea level rise can have dramatic ecosystem effects and may mean the difference between a thriving wetland and a drowning marsh. A recent study by the University of Texas at Austin - Bureau of Economic Geology suggests that sea level rise may already be impacting habitat distribution and abundance in the Texas Coastal Bend. They reported a major decrease in the distribution of tidal flats and freshwater wetlands over the past 50 years. This decrease was accompanied by an increase in the extent of salt marsh and seagrass habitat which can be attributed, at least partially, to sea level rise.

Since millimeter (mm)-scale changes in the rate of local sea level rise can have significant impacts on coastal ecosystems, measurements of elevation require great precision. Currently, however, there is a lack of information regarding small-scale elevation changes in habitats of the Texas Coastal Bend. This knowledge gap makes it difficult to understand and accurately predict the potential impacts of land use change and relative sea level rise in this region.

To help fill this information gap, the Mission-Aransas NERR is collaborating with NOAA 's National Geodetic Survey, the Texas Spatial Reference Center, and the Gulf of Mexico Alliance to install Surface Elevation Tables (SETs) within the reserve. SET technology is a well-accepted method for measuring mm-scale changes of elevation and if frequent measurements are taken, calculations can be made to show how surface elevation is changing over time. On September 10, 2009, local stakeholders and researchers attended a workshop to discuss the placement of SETs within the reserve and their potential use in addressing local sea level rise and land use change issues. The Mission-Aransas NERR hopes to complete installation and begin monitoring SETs within the next six to nine months.



Staff member at the Chesapeake Bay, Virginia NERR measures elevation change of a marsh using a SET. Photo courtesy of Chesapeake Bay, Virginia NERR.

Tip for Greener Holidays

Recycle Your Christmas Tree. Instead of taking up space in a landfill, your tree can be ground up into wood chips and used as mulch. Check with your city to see if they have a tree recycling program.

VOLUNTEERS LEND A HAND ON NATIONAL ESTUARIES DAY

by Carolyn Rose, Volunteer Coordinator

National Estuaries Day fell on National Public Lands Day and the Texas General Land Office's fall Adopt-A-Beach Clean-up Day this year. In an effort to honor all three designations, the Mission-Aransas NERR partnered with the Aransas National Wildlife Refuge (ANWR) and Rockport Birding and Kayak Adventures to sponsor a clean-up of whooping crane habitat along the ANWR shoreline on September 26th.

Volunteers from Port Aransas, Rockport, Corpus Christi, and other near-by towns came out to lend a hand with the clean-up. Members of the Texas Master Naturalists, the Texas Outdoors-Woman Network, and staff from the University of Texas Marine Science Institute made up a large portion of the volunteers. The volunteers trudged through mud, vegetation, and walls of mosquitoes to pick up trash along a 3.5 mile stretch of shoreline. They collected and removed approximately 2,100 pounds of bagged trash as well as discarded refrigerators, television sets, tires, and building materials. Captain Tommy Moore, owner of Rockport Birding and Kayak Adventures, volunteered to transport the clean-up crews to, within, and from ANWR on his boat, the Skimmer.

ANWR clean-up volunteers with Captain Tommy Moore.

The Mission-Aransas NERR coordinated the clean-up, staff from ANWR and Texas A&M University-Corpus Christi hauled away the trash, and the Texas General Land Office's Adopt-A-Beach Clean-up program supplied trash-bags and gloves for the event. Thanks to the volunteers and sponsors, the whooping cranes will return to cleaner shores when they arrive in the Texas Coastal Bend this fall.

ANWR staff in one of the trash hauling boats.

If you would like to volunteer with us, please contact Carolyn Rose, the Volunteer Coordinator, at 361.749.6832 or carolyn.rose@mail.utexas.edu.

CALENDAR OF EVENTS

November

20 Water Quality Management Workshop

December

4-6 Teacher Workshop: *Life Science and Whooping Cranes*

January

31-2/4 Exploritas Event: *Exploring the Gulf Coast*

*TBD** Regional Environmental Management: *The Gulf of Mexico Alliance*

February

1-4 Exploritas Event: *Exploring the Gulf Coast*

7-12 Exploritas Event: *Birding Hot Spots of the US*

12-14 Teacher Workshop: *Earth and Physical Science*

*TBD** Living Shorelines Workshop

*TBD** Copano Bay Bacteria Workshop

March

21-27 Exploritas Event: *The Big Enchilada of Birding*

*TBD** Yard Care Best Management Practices

** dates to be determined*

MISSION ★ ARANSAS
NATIONAL ESTUARINE
RESEARCH RESERVE
University of Texas
Marine Science Institute
750 Channel View Drive
Port Aransas, Texas 78373
www.utmsi.utexas.edu/maner

MISSION ★ ARANSAS NATIONAL ESTUARINE RESEARCH RESERVE

Staff

Stewardship

Reserve Manager: *Sally Morehead*
Executive Director: *Georgia Neblett*

Stewardship Coordinator: *Dr. Kiersten Madden*
Cooperating Scientist: *Dr. Ken Dunton*
Animal Rescue: *Gerry Gage, Candice Mottet, and Marsha Owen*
Undergraduate Intern: *Charlotte Heron*
Research Assistant: *Anne Evans*

Coastal Training

Coastal Training Program Coordinator: *Chad Leister*

Education

Education Coordinator: *Dr. Rick Tinnin*
Education Specialist: *John Williams*
Exploritas Coordinator: *Reta Pearson*
Volunteer Coordinator: *Carolyn Rose*
Education Assistant: *Richard Lamb*

Research

Research Coordinator: *Dr. Ed Buskey*
Research Assistants: *Cammie Hyatt, Britt Dean, and Amy Fujarski*
Cooperating Scientist: *Dr. Tracy Villareal*
Graduate Research Fellow: *Jena Campbell and Bridgette Froeschke*

The Mission-Aransas National Estuarine Research Reserve includes 185,708 acres of federal, state, and private land, on the south Texas Coast. A great diversity of habitats are contained within the Reserve, including tidal marsh, riverine, marine, prairie, mangrove and woodland. Protecting these habitats, encouraging resource conservation and providing opportunities for research and education are among the major goals of the Reserve. The Reserve is administered by the University of Texas Marine Science Institute and the National Oceanic and Atmospheric Administration, in partnership with governmental agencies and private organizations. Mission-Aransas NERR partners include the United States Fish and Wildlife Service, Texas General Land Office, Texas Parks and Wildlife Department, Texas Department of Transportation, Coastal Bend Bays & Estuaries Program, Coastal Bend Land Trust, Nature Conservancy, Fennessey Ranch, and Aransas County / City of Rockport.