THE
MISSION ★ ARANSAS OBSERVER

A Newsletter of the Mission ★ Aransas National Estuarine Reserve

AUTUMN 2011

Open For Business

by Sally Morehead, Reserve Manager

Construction of the Mission-Aransas Reserve Headquarters facility is complete and we recently celebrated with a ribbon-cutting ceremony on July 23rd! The Headquarters is located in the 36,000 square foot Estuarine Research Center on the University of Texas Marine Science Institute campus. The Center has unique design features and was constructed to be energy efficient and to withstand the conditions of our harsh coastal environment. It features three floors of state-of-the-art marine laboratories and also contains space on the third floor for the University of Texas Marine Science Institute to expand.

The new Headquarters will enable Reserve staff and student researchers to continue their ground-breaking research and stewardship activities within the Mission-Aransas Estuary. Their projects will further our understanding of the role that estuarine ecosystems play for our economy and environment, including serving as filters for pollutants and buffers from storms.

The building is the first educational facility in South Texas constructed for certification by Leadership in Energy and Environmental Design at the silver level, and includes a number of innovative features. Designed by Richter Architects, the building's east-west orientation helps decrease solar heat gain and will help to protect it from storm surges. The southern face of the building is stepped inward from roof-to-ground to provide shading from summer sun, while its north face opens upward to provide natural light to the interiors. It also features solar panels, large cisterns for rainwater capture, and surrounding gardens that highlight local flora.

Construction waste being recycled.

Rainwater cistern.

The Estuarine Research Center was built as a partnership between The University of Texas at Austin and the National Oceanic and Atmospheric Administration with support from the Texas General Land Office and individual donors.

The new Estuarine Research Center.

INSIDE

Keeping an Eye on the Plankton

by Jena Campbell, Graduate Research Fellow

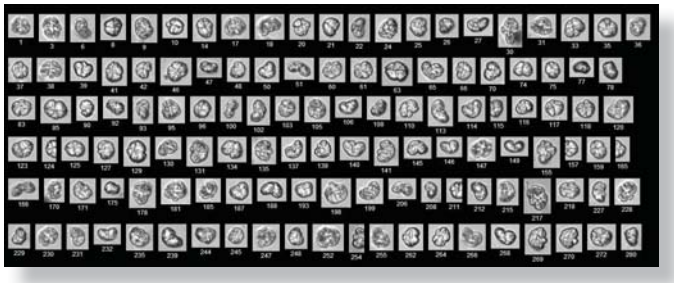
As a recipient of the Reserve Graduate Research Fellowship, I have conducted my doctoral research within the Mission-Aransas Reserve for the past three years. My research has focused on the food web dynamics of harmful algal bloom species within the Mission-Aransas Estuary. These algal species are considered harmful because they form toxins that cause fish kills and/or human health effects. These species can also disrupt the aquatic food webs, by blocking out light for seagrasses and other plants on the bay bottoms.

N. Padre 2009 Karenia brevis bloom. Photo by Brad Gemmell.

Early detection of harmful algal species is especially important within the Reserve because in many cases we do not see symptoms of a bloom until the damage has already occurred. In the case of *Karenia brevis*, a red tide species responsible for fish kills, human respiratory distress, and neurotoxic shellfish poisoning, blooms are not typically noticed until after there is a fish kill. This occurs when levels reach a concentration of around 100 cells per mL of water, but shellfish beds should be closed to fishing at 5 cells per mL. Another harmful algal species, *Dinophysis*, does not cause fish kills, but it is responsible for diarrhetic shellfish poisoning. The only way to detect the presence of *Dinophysis* before people become ill is analyzing water samples taken from the bays.

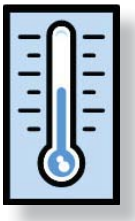
In order to determine if harmful species are present within the Reserve, water samples are taken twice a month. Normally, the screening process is done with a microscope, but the process takes many hours and requires training in identification of the different organisms. The FlowCAM, an imaging flow cytometer, decreases the time needed to detect harmful species by taking pictures of the cells in the water. If harmful cells are detected we can quickly notify the proper authorities.

Although the FlowCAM does not provide exact cell counts when compared to the microscope, it provides a historical record of the plankton community within the Mission-Aransas Estuary. There are other benefits to using the FlowCAM. Preserved water samples can sometimes degrade, but we have a picture record of each sample and can easily scroll through to find cells of interest. We can then compare the cells we find with water quality information, such as salinity, temperature, and nutrient concentrations, to help determine any patterns between the plankton community and environmental conditions. Continued sampling will allow us to keep an eye on the plankton and build a larger historical archive.



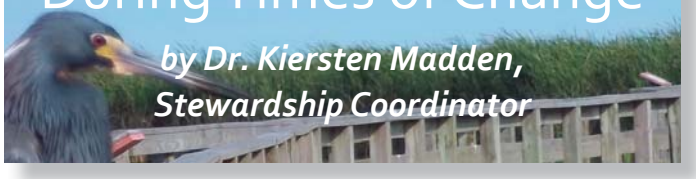
Photos of individual Karenia brevis cells.

Above is an October 9, 2011 screen shot of individual cells of the red tide species *Karenia brevis*. These photos were taken by the FlowCAM in the Buskey lab at UTMSI. Measurements were taken after reports of aerosol effects from Tony Amos, Director of the Animal Rehabilitation Keep. The concentrations were measured at almost 4,800 cells per mL of sea water. Concentrations this high can cause fish kills and irritation to human respiratory systems.



Visit: http://lighthouse.tamucc.edu/MissionAransas/HomePage *to get real-time water quality and weather data, collected at the System-Wide Monitoring Program stations.*

Planning for the Future During Times of Change



by Dr. Kiersten Madden, Stewardship Coordinator

Estuaries are biologically rich areas that provide habitat and nursery grounds for many commercially and recreationally important fish and shellfish. They serve as significant places for industry, commerce, and recreation, and they also protect human communities from storm surge, storm water runoff, and flooding. Climate change will have significant impacts on estuaries by exacerbating existing stressors such as sea level rise, inundation and flooding from storms, drought, and changes to freshwater inflows. Climate change could ultimately lead to the loss of estuarine habitats and associated species and cause adverse impacts to local economies, development, and infrastructure.

In order to improve the resiliency of our estuaries, we must strengthen our understanding of climate change impacts and develop strategies that help us adapt to these impacts. The National System, including the Mission-Aransas Reserve, recently made a formal commitment to understanding and adapting to climate change. Vulnerability assessments are an extremely valuable tool for developing this understanding and identifying strategies for adaptation. To determine the vulnerability of species, habitats, and ecosystems you must determine their exposure to climate change threats, their sensitivity to the impacts, and their capacity to adapt to these impacts. The Mission-Aransas Estuary is an ideal location to conduct this type of vulnerability assessment. It is situated in an area that is already exposed to episodic changes in climate and is forecasted to have increases in the frequency and duration of these episodic changes.

Understanding the vulnerability of endangered animals like the Whooping Crane will help managers plan better for the future. Photo Courtesy of Dick Fischer.

The Mission-Aransas Reserve is pursuing several funding opportunities that will allow them to assess the vulnerability of Reserve habitats, species, and communities to climate change. Identifying which resources are most vulnerable will enable the Reserve and its partners to set priorities for conservation and provide a basis for developing appropriate management and conservation responses. I recently had the opportunity to receive formal training in conducting ecological vulnerability assessments. This training was hosted by the U.S. Fish and Wildlife Service on the National Wildlife Federation's guidebook titled "Scanning the Conservation Horizon: A Guide to Climate Change Vulnerability Assessment." The training covered the basic concepts of how to plan, execute, and interpret climate change vulnerability assessments. I plan to use the knowledge acquired at the training to help guide the Reserve's efforts to understand and adapt to climate change. Keep your ears open for more information about this in the future!

The human communities that surround the Reserve also face threats from climate change, such as more frequent droughts, hurricane force winds, coastal flooding, and sea level rise.

Green Tip

Texas is currently experiencing one of the worst droughts on record. Water conservation is more important now than ever before. Take shorter showers, run the dishwasher with a full load, water your yard once every 5 days, and check faucets for leaks. Being water conscious could also save you money. According to the Texas Water Development Board, homeowners can install two low-flow shower heads, place dams in their toilet tanks, install low-flow aerators on faucets, and repair dripping faucets/leaking toilets for approximately $10-20. This could save 10,000 to more than 25,000 gallons per year and would pay for itself in less than a year!

Estuary Explorers

by Carolyn Rose, Education Coordinator

This past summer families from near and far explored the Mission-Aransas Estuary, while participating in the new "Estuary Explorer" programs at the Bay Education Center in Rockport and the Wetlands Education Center in Port Aransas. These programs allowed children and their parents to have fun together outdoors and learn the value and function of coastal habitats. Families learned about the importance of estuary habitats to wildlife and people through hands-on field investigations in Aransas Bay and the salt marsh and dune habitats at the Wetlands Education Center. Topics included estuary adaptations, plants, crustaceans, mollusks, and seagrass ecology.

Many of the families who participated in the Rockport programs live in the local area and frequently visit the beach near the Bay Education Center. However, after using nets to sample the seagrass beds near the beach and examining the marine life that they collected, they were astonished at the diversity of organisms that live there. Other families were vacationing far from their inland homes and enjoyed having the opportunity to experience the coastal environment in a more in-depth and meaningful way, rather than simply enjoying the sand and surf.

Young explorers sampling seagrass habitat at the Bay Education Center.

The success of last summer's programs is encouraging. It shows that visitors are very interested in learning about the nature of the Estuary and how we can protect it. Mission-Aransas Reserve staff will offer Estuary Explorer Labs again next summer for families with children aged 6 and above at the Bay Education Center. We will also offer programs for pre-school age children at the Wetlands Education Center. The dates and times will be announced in our spring newsletter, so please stay posted if you would like to join us.

Volunteer, Cheryl Wilson, teaching fascinated children about blue crab anatomy.

NEW WEBSITE !!!

The Mission-Aransas NERR is excited to introduce our new website to the public ...

missionaransas.org

Check the site often for interesting posts and updates.

The website was designed by Geoff Hensgen, a former UT student and content will be updated by Reserve staff.

A new partnership with Texas Sea Grant

by Sally Morehead, Reserve Manager

The Reserve and Texas Sea Grant have partnered to host the first coastal community development agent in our region. We are pleased to announce that Heather Wade will be serving our region and working with Reserve staff to provide local communities with technical assistance on land use and development issues. Ms. Wade will help local leaders, elected officials and area citizens to "map out ways for communities in the NERR area to grow in environmentally responsible ways while retaining their coastal charm," said Logan Respess, Texas Sea Grant's Associate Director and head of its Extension Program.

"We talk about coastal community development allowing communities to keep a sense of place, and that means allowing these communities to have a stake in how they grow so they do not lose the look and feel of the area that attracted people to move there in the first place," Respess said.

Heather Wade has experience working on a wide range of development projects that will be valuable to our region. She has a bachelor's degree in Environmental Studies and a master's degree in Urban Planning, and will provide leadership, guidance and direction in the broad arena of sustainable development to small coastal communities whose planning resources can be limited. Proper coastal development reduces the environmental impact people have on the surrounding ecosystems and allows communities to be better prepared for natural hazards like hurricanes.

Heather Wade

A Changing CTP

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

This past spring and summer has brought many changes to the coastal training program (CTP). The biggest change is that our CTP coordinator, Chad Leister, recently left the program to move closer to his family. Fortunately, Chad will maintain a strong connection with the Reserve because he is serving as a liaison with the Gulf of Mexico CTP programs to finish out a grant received from the Gulf of Mexico Alliance for training events. We are currently hiring a new CTP coordinator and will introduce him/her by the next newsletter edition.

Workshop participants set adaptation goals for changes in their community.

A three-part workshop series on Coastal Community Response to Change was held in Aransas County with the purpose of informing the participants about changes in climate and helping the County improve the resiliency of their communities to the predicted changes. The series included workshops that provided background information about global and local climate change, application of a resilience index, and an exercise to set specific and measurable adaptation goals. Participants received a flash-drive with a catalog of resources, including contact information for a climate expert for our region. If you are interested in obtaining this information please contact the Reserve at Sally.Morehead@mail.utexas.edu.

The Animal Rehabilitation Keep (ARK) Update

by Tony Amos, Director of the ARK

Smokey the green sea turtle.

With nearly 1200 birds, 250 sea turtles, 70 terrestrial turtles, 60 small mammals and one 5½ foot iguana admitted to the ARK so far in 2011, there are many stories to tell, but I'll concentrate on three turtle tales.

Legendary high school oceanography teacher (retired), David Bartling and ex-UTMSI library worker Rebecca Ford were walking the Mustang Island beach when they saw a barely recognizable hawksbill sea turtle immobile among the debris at the tide line. It was literally encased in a tangle of string, man-made fibers and Sargassum weed. Fortunately the fibers had not damaged the turtle's neck and limbs and we were able to free the young hawksbill that will be released soon. Hawksbills often are found entangled in onion sacks because we think they use floating debris like this to bask under (and because there are far too many onion sacks floating about in the ocean!)

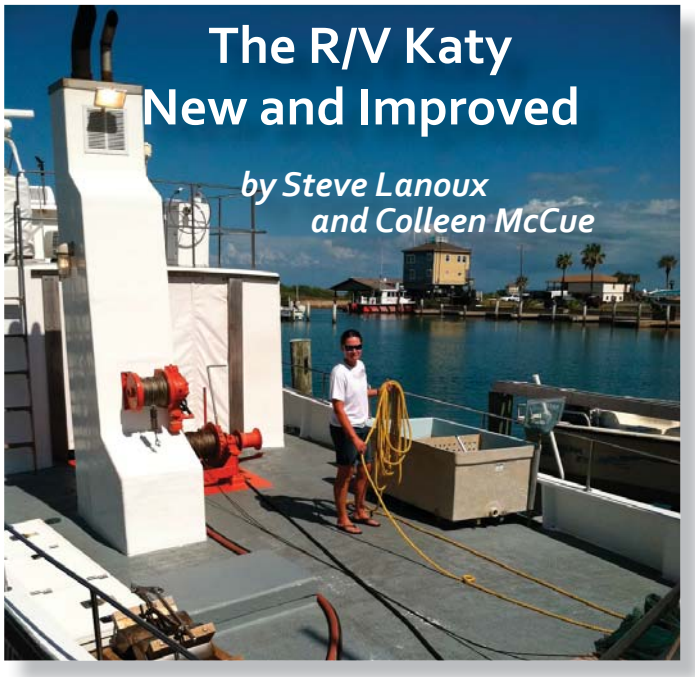
Hawksbill seaturtle when rescued.

Hawksbill seaturtle after clean-up.

Not long after this turtle arrived, another remarkable hawksbill came in; this one notable for its size (97 lb) and the largest hawksbill the ARK has had in 30 years. In fact it was only the second adult hawksbill we've ever had. It was brought in from the Intracoastal Waterway in Port O'Connor by boat captain Lupe Sanchez and Matagorda sea turtle patroller Mike Burnett. Unfortunately this turtle was very weak and did not survive despite our efforts to save it.

A truly successful rescue and release was that of "Smoky", a 193-lb green sea turtle found entangled in long-line fishing gear in the Lydia Ann Channel near the San Jose Island shore. The turtle was spotted struggling to remain afloat by Research Associates Kim Jackson and Dana Sjostrom of Ken Dunton's Lab out on a routine sampling field trip on June 2nd. Fishing Guide Randall Gaines and Lighthouse Keeper and ARK volunteer Rick Reichenbach assisted in the rescue of this heavy turtle. UTMSI, named it after Randall's late father Smokey Gaines. Smokey surprised us by laying sixty eggs in the tank at the ARK (we tried incubating them but none were viable) and incase she had more to lay, we hastened her release – but not before outfitting her with a satellite tracking tag (in cooperation with Dr. Donna Shaver of the Padre Island National Seashore) … and here's the incredible story. After release Smokey travelled down the coast to Mexico, turned left and navigated across the Gulf of Mexico, traversed the Florida Straits, Crossed the Gulf Stream to the Bahamian island of Bimini. Then she ventured out into the Atlantic, possibly in response to Hurricane Maria. In all, Smokey has traveled 5180 km (3,250 miles)!

Smokey's track.



The R/V KATY underwent a significant mid-life overhaul this past year. In addition to the standard bottom cleaning, the entire deck aft of the cabin was replaced with new, stronger materials and additional reinforcing. A new A-frame was designed and installed, the towing winch was rebuilt, scuppers were installed to allow water to run off the deck, and new larger engine coolers were added. Other mechanical and electrical work to improve the boat's reliability and performance was accomplished during the three-month yard period. The cost of this work was about $160,000, very close to the original cost of the vessel when the University of Texas purchased it in 1980.

On top of all of the overhauling the R/V Katy now has a new naturalist, Dana Sjostrom. Dana has been working at UTMSI for the past 2 years as a technician in the Dunton Lab. Dana has a degree in Evolutionary Biology from The University of Alberta. She taught K-7 math and science in Galveston, and developed curriculum at Rice University before coming to UTMSI.

Faces of an Estuary Photo Contest

The Mission-Aransas Reserve is accepting photos featuring wildlife, conservation efforts, environmental concerns or people enjoying the wonderful natural resources within our Estuary. Submit photos by January 13, 2012 and be entered to win a cash prize. Visit **www.utmsi.utexas.edu/nerr** to download an entry form and flyer for the contest.

CALENDAR OF EVENTS

November

1 Launch of MissionAransas.org

5 Start Party at the Bay Education Center 7:30-10PM

11 Volunteer Appreciation Event

December

3 "Tropical Christmas" Birding Seminar at the Bay Education Center 8-11AM

January

11 Lecture Series at Bay Education Center Wednesdays 12PM-1PM through March 14th

13 Photo Contest Entries Due

19 Lecture Series starts at UTMSI Thursdays 7PM through March

February

March

TBD Volunteer Appreciation

April

12 World Affairs Council Program at The Bay Education Center

Tours of the Wetlands Education Center
Every Tue. and Thurs. at 10AM
at UTMSI in Port Aransas

Afternoon Movie
Every Mon.-Thurs. 3PM
at the UTMSI Visitor Center in Port Aransas

Science on a Sphere
Every Tues. - Sat. at 2PM and 3PM
at the Bay Education Center in Rockport

MISSION ★ ARANSAS
NATIONAL ESTUARINE
RESEARCH RESERVE
University of Texas
Marine Science Institute
750 Channel View Drive
Port Aransas, Texas 78373
www.missionaransas.org

MISSION ★ ARANSAS NATIONAL ESTUARINE RESEARCH RESERVE

Staff

Reserve Manager: *Sally Morehead*
Administrative Assistant: *Colbi Brown*

Stewardship

Stewardship Coordinator: *Dr. Kiersten Madden*
Cooperating Scientist: *Dr. Ken Dunton*
Animal Rescue: *Candice Mottet and Amanda Terry*
Research Assistant: *Anne Evans*

Coastal Training

Coastal Training Program Coordinator: *TBD*
Sea Grant Extension Agent: *Heather Wade*

Education

Education Coordinator: *Carolyn Rose*
Marine Education Services Director: *Sara Pelleteri*
Education Specialists: *Suzy Citek, Dana Sjostrom*
Outreach/Vol. Coordinator: *Colleen McCue*
Road Scholar Coordinator: *Linda Fuiman*

Research

Research Coordinator: *Dr. Ed Buskey*
Research Assistants: *Cammie Hyatt, Rae Mooney and Lindsey Pollard*
Cooperating Scientist: *Dr. Tracy Villareal*
Graduate Research Fellow: *Kelly Darnell, Jena Campbell*
Graduate Research Assistant: *John Mohan*
Postdoctoral Fellow: *Dr. Denise Bruesewitz*

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.