



DISCOVERY STARTS HERE

Discoveries & News

Reading the Tea Leaves

Sometimes well known, simple household objects can be the best tools to use in a science experiment. Researchers at the [Mission-Aransas Reserve](#) are part of an international experiment with the [Smithsonian MarineGEO](#) (Global Earth Observatory). Tea bags are used to determine salt marsh decomposition rates, how microbes help the decomposition and if the environment makes a difference. Tea bags it turns out are a great resource for science because they are readily available throughout the globe and are similar in size, weight and composition.

The rate of decomposition in salt marshes is important to understand because vast amounts of organic matter are stored in the sediments. You will often hear salt marshes referred to as a sink for atmospheric carbon

dioxide. A better understanding of how carbon decomposes and microbes role in the decomposition, via teabags in this case, will be used to develop better predictions of greenhouse gases that are stored in estuaries.

Researchers buried both green and rooibos tea bags along transects. Each tea bag is put in a window screen pouch to protect the tea from being

eaten by larger animals, such as worms.

Researchers are also interested in understanding how decomposition differs in areas with high nutrients and some of the tea bags are buried with fertilizer. The tea bags are unearthed after 90 days and then measured to see how much carbon is left and what microbes are present. Microbes are



Kelley Savage, Research Scientist Associate with the Mission-Aransas Reserve, lays out a transect line in order to place multiple tea bag samples in the salt marsh on Mustang Island. Photo credit: Christina Marconi.

Marine Science News

The University of Texas at Austin
Marine Science Institute
Activities and Events (Oct-Dec)



4th Quarter 2021

determined with next-generation microbial sequencing.

There are 49 sites across the globe conducting this experiment. This massive sampling effort will allow researchers to understand how temperature across the multiple latitudes impacts decomposition rates and if temperature or latitude changes the microbial communities. The international teabag experiment is led by MarineGeo, which is a global network of partners focused on understanding how coastal marine ecosystems work. This portion of the tea bag experiments is in partnership with David M. Baker, Isis Guibert and Shelby McIlroy of the School of Biological Sciences, Swire Institute of Marine Science, The University of Hong Kong.

Researchers at Mission-Aransas Reserves are also partnering with 18 sites around the country to use tea bags to understand how factors in the environment, such as salinity, temperature and nutrients, affects decomposition. The researchers are deploying tea bags in several different habitats at Egery Flats, Mud Island West, Mud Island East and Aransas National Wildlife Refuge. The national effort is in partnership with the National Estuarine Research Reserve System and with Kari St. Laurent (Research Coordinator, Delaware National Estuarine Research Reserve) and Kyle Derby (Research Coordinator, Chesapeake Bay National Estuarine Research Reserve).

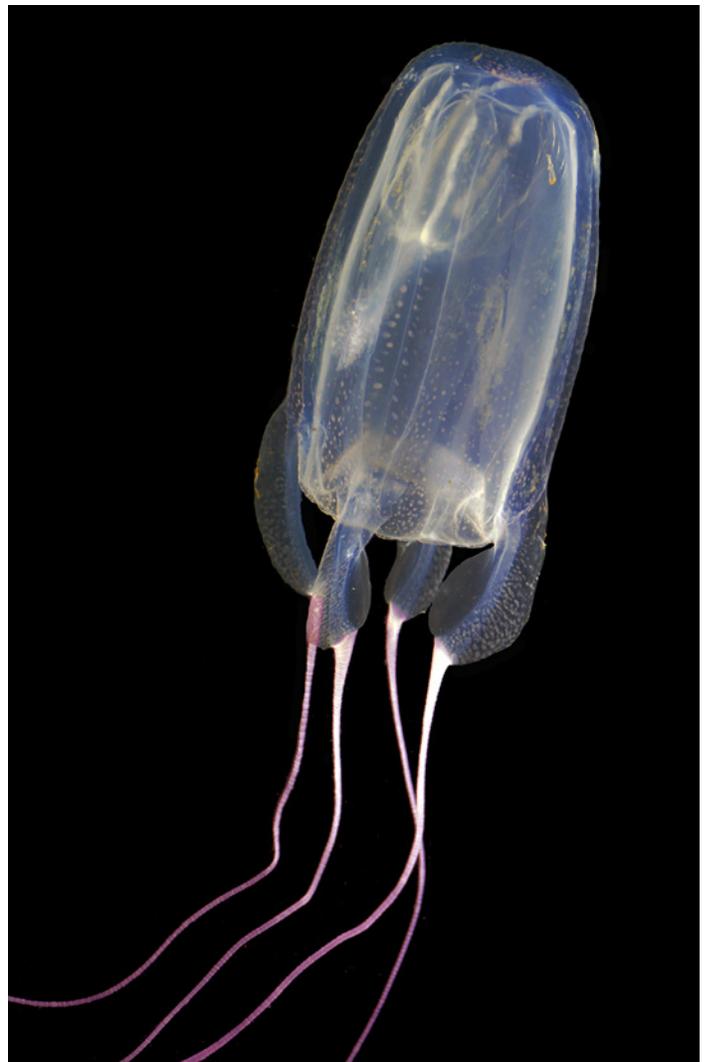
Both the international and national experiments have concluded this past fall and the researchers are currently working up the data to report how the 'tea leaves read' approximately a year from now.

Rare box jelly that packs a sting is found in Port Aransas

Scientific observations can happen when you least expect it. Dr. Brad Gemmell, a visiting alumni and Associate Professor at University of South Florida, and his mentor Dr. Edward Buskey, Interim Director at The University of Texas Marine Science Institute, were strolling along the Institute's marina when they couldn't help but notice a strange phenomenon. Several giant box jellies were swimming right at the surface, perhaps feeding on the large masses of smaller comb jellies, or ctenophores, that were present. This particular species of box jelly is found in tropical and subtropical waters worldwide, but is rare to

the Gulf of Mexico and is usually only sighted far offshore. The scientists identified it as *Alatina alata*, which is one of the largest species of box jellies with an average bell length of 10-inches. It can be easily identified from other jellies by the box-like shape and four purple tentacles that originate from each corner of the bell. While this species is related to the deadly box jelly species found in the Pacific and Indian Ocean, there have been no known deaths associated with the species, but literature indicates that a sting from its long purple tentacles can cause excruciating pain. We are unaware of any reports in the area or beaches of stings from this species.

Upon finding the box jelly, Dr. Gemmell who studies locomotion in marine organisms, immediately put the jelly in a tank to measure how such a large box jelly moves



Several rare box jellies, *Alatina alata* species, were recently found in Port Aransas. Video credit: Brad Gemmell

through the water with such high speeds. Initially, the data shows that this large box jelly can swim faster than any species of jellyfish using jet propulsion that appears to differ somewhat from its smaller relatives. The pulsation of the bell and resulting jets also creates vortex rings that may help entrain prey into the potent tentacles.

Despite being at the UT Marine Science Institute to deliver a scientific seminar to his alma mater, Dr. Gemmell is never one to pass up an opportunity to make observations in the natural environment. In this case, he is hopeful that a chance encounter will lead to a greater understanding of how these rare animals propel themselves so effectively through the water and may even provide insights that can be used for future designs of underwater vehicles.

UT Leadership Comes to the Coast

The University of Texas at Austin leadership, including President Jay Hartzell, Executive Vice President and Provost Sharon Wood, Vice President for Research Dan Jaffe, Dean of the School of Undergraduate Studies Brent Iverson and College of Natural Sciences Dean David Vanden Bout, visited University of Texas Marine Science Institute mid-December, to tour the facilities and meet with staff and faculty. This is President Hartzell's first visit to the campus since his inauguration in September of 2021. The President and his leadership team met with faculty to learn more about their research and discuss the strategic vision for the university's future. The team also toured the



The University of Texas at Austin leadership, including President Jay Hartzell, Executive Vice President and Provost Sharon Wood, Vice President for Research Dan Jaffe, Dean of the School of Undergraduate Studies Brent Iverson and College of Natural Sciences Dean David Vanden Bout, visited UT's Marine Science Institute mid-December to tour the facilities and meet with staff and faculty.

facilities and construction repairs caused by Hurricane Harvey. During the tour, administrators were joined by Port Aransas homeowners and Marine Science Advisory Council members Bobby and Sherri Patton to see the construction progress of the new Patton Center for Marine Science Education, which is slated to be completed in August of 2022.

Celebrating our Hispanic Scientists

This past Hispanic Heritage month, September 15th-October 15th, we recognized some of our Hispanic scientists and celebrated their work and contributions to marine scientist:



Dr. Valerie De Anda is a Research Associate and is using computational biology to understand the microbial ecology of the deep sea and other extreme environments. Her work has been published in the most prestigious scientific journals and is changing what we know about the tree of life. [Example news story on her research.](#)



Dr. Tracy Villareal is a Professor Emeritus of phytoplankton ecology. Dr. Villareal's research focuses on how the physics and chemistry of the ocean control phytoplankton species distributions. This in turn, regulates important processes such as nitrogen-fixation. He was one of the first to discover that small overlooked phytoplankton that fix nitrogen, make major contributions to the oceanic nitrogen budget. [Learn more](#)



Dr. Mirna Vázquez Rosas Landa is a Postdoctoral Fellow and studies uncultured microbes that live in the hydrothermal vents and other habitats like sediments laden with oil. She works to decipher their metabolic capabilities through metagenomics. [Learn more](#)



Miranda Madrid is a recent Master's of Science graduate. Miranda studies large-scale monitoring programs, as well as how and why black mangroves are changing in the local marshes. She was recently awarded a Science Policy Fellowships by the Gulf

Research Program of the National Academies of Sciences, Engineering, and Medicine and will be working with the NOAA RESTORE Science Program. [Learn more](#)



Benjamin Negrete, Jr. is a Ph.D. candidate and studies the physiological, behavioral, and genomic responses of coastal fish to environmental stresses. His work focuses on how coastal fish respond to and tolerate low oxygen levels.

[Learn more](#)

Around Campus

Current Projects

- Port Street monument with Ullberg sailfish sculpture is under construction.
- The Pier construction has remobilized. Construction estimated to be complete late spring.
- The visiting scientist lodging, Lund House, is under construction, with completion estimated in the spring.
- The research vehicle garage is under construction.
- The Patton Center for Marine Science Education is under construction, with completion estimated at the end of the summer.
- The Center for Coastal Ocean Science is under construction.
- Invasive vegetation species treatment at the Wetlands Education Center is ongoing and the area will be replanted this spring.



The Lund House for visiting scientist is nearing construction.



The Port Street monument sign is under construction with anticipated completion this spring.



A new garage in the physical plant compound is being constructed. This building will hold research vehicle fleet and a vehicle wash station.

Future Projects

- The new seawater system will begin construction this spring.
- At the Amos Rehabilitation Keep: the Animal Hospital is in design, the Oiled Wildlife Facility will be resided and get a new roof this summer, and the bird enclosure's net and cable system will be repaired this spring.
- The Estuarine Research Center Dormitory will start construction beginning this spring.

- We anticipate construction of the Wilson Cottage Complex expansion to also begin this spring.
- The wet laboratory (Room 120) at the Fisheries and Mariculture Laboratory will be repaired this fall.
- HVAC repairs will occur to both the Administration Building (bid in summer) and Fisheries and Mariculture Laboratory (in committee review).
- Campus irrigation repair will begin soon.
- The main laboratory building will receive chiller plant upgrades and fire pipe replacement.

A contractor at the Center for Coastal Ocean Science compacts sand after working on sanitary sewer lines.



Mission-Aransas Reserve

MissionAransas.org

Unlikely Partners: Bees and Turtles

Honey bees and sea turtles may seem like strange bedfellows, but through two of the Mission-Aransas National Estuarine Research Reserve's (NERR) stewardship programs – Fennessey Ranch and the Amos Rehabilitation Keep (ARK) – these two species are connected through a unique collaboration.

Fennessey Ranch, located just outside of Refugio, Texas, is a rich network of meadows, brush, prairie, freshwater wetlands, natural lakes, and riparian woodlands. In 2006, The University of Texas at Austin

through its Mission-Aransas NERR purchased a conservation easement on the privately-owned ranch. The 3,261-acre wildlife oasis is host to numerous types of birds, plants, amphibians, reptiles, insects, and mammals. The Ranch is designed to be an environmentally friendly business that profits from traditional livestock ranching, as well as wildlife tours, hunting leases and photography trips. The conservation easement restricts development from occurring and ensures that the valuable habitats of Fennessey Ranch will continue to support wildlife well into the future.

For the past 15 years, the Ranch has supported a thriving population of honey bees and beehives. Two apiarists (beekeepers) tend to the hives. Currently, about 25 hives are maintained on the Ranch. 2020 was a record harvest year, producing 40 gallons of honey, compared to an average harvest year of 15 gallons. The Mission-Aransas NERR put the surplus honey to good use through the ARK's turtle rehabilitation program.

The ARK rescues and rehabilitates sick and injured birds, sea turtles, terrestrial turtles, and tortoises found along the South Texas coast and returns them to their native habitat. For the past several years, the ARK has been using honey on injured turtles. Honey has antimicrobial and antibacterial properties that help to promote wound healing. It also encourages healthy tissue granulation in wounds and helps to treat inflammation.

The partnership between the ARK and Fennessey Ranch began in late 2020 during a coffee break. Alicia Walker, ARK Program Coordinator and Katie Swanson,



An injured sea turtle has had honey from Fennessey Ranch applied to a wound to promote healing. Credit: Andrew Orgill.

Stewardship Coordinator and Fennessey Ranch Manager, were catching up over coffee/tea (presumably with honey), when Alicia mentioned the use of honey on injured turtles and the expense it incurred. Katie told her about the honey from the Ranch and asked if they could use some. The donated honey the ARK received from the Ranch saved them \$634.

In 2020, the ARK rescued and/or received 130 live stranded sea turtles, many of them treated with honey from Fennessey Ranch, located 40 miles inland. Bees helping sea turtles...who would have guessed?

Friends of the ARK (FOTA) Donates \$100,000

2021 cumulated with a big bang for the Amos Rehabilitation Keep (ARK). The non-profit Friends of the ARK (FOTA), raised \$100,000 over the course of nine months and presented the check to the ARK just before the holidays. The funds will help furnish and equip the planned animal hospital that is slated to begin construction this year. The new hospital building is part of the Hurricane Harvey rebuild support received from the National Oceanic and Atmospheric Administration for its Mission-Aransas Reserve program. The FOTA began raising funds in April 2021 by selling t-shirts at a temporary store and other large events throughout



Friends of the ARK (FOTA) donation to support supplies for the new animal hospital. Bottom row: Alicia Walker, ARK Coordinator; Lee Harrison, FOTA President; Jace Tunnell, Mission-Aransas Reserve Director. Second row: Vi Dalton, FOTA member; Nancy Peters, FOTA member; Bobbi Erben, FOTA member; Andrea Colunga Bussey, FOTA member; Lynn Amos, FOTA member. Third row: Hope Hogan, FOTA member; Tim Parke, FOTA Treasurer; Edward Buskey, UTMSI Interim Director. Top row: Michael Amos, FOTA member.

the year in addition to FOTA's annual fundraiser, *Fall for the ARK*. FOTA was organized in 2006 and to-date has donated over \$790,000 dollars to the ARK since that time.

Public Lecture Series

Lectures at 7:00 p.m., doors open at 6:30 p.m. on Thursday
Pioneer Beach Resort, 120 Gulfwind Drive, Hwy 361, Port Aransas

January 27 *Listen In: Sounds of Estuary*

Dr. Chris Biggs, The University of Texas Marine Science Institute

February 3 *Oh, the Places You'll Go!*

Alicia Walker, Amos Rehabilitation Keep, The University of Texas Marine Science Institute

February 10 *The fate of microplastics in marine environments*

Dr. Zhanfei Liu, The University of Texas Marine Science Institute

February 17 *A Review of the February 2021 Arctic Outbreak*

Melissa Huffman, National Weather Service

February 24 *Migratory connections: how an Arctic-breeding shorebird ties together a hemisphere*

David Newstead, Coastal Bend Bays & Estuaries Program

March 3 *75th Anniversary of The University of Texas Marine Science Institute*

Panel discussion of pivotal stories that shaped UTMSI

You can also join virtually:

<https://buff.ly/3nbLzdy>
 Meeting ID: 922 6934 1180

Passcode: 239279

TEXAS PLASTIC POLLUTION SYMPOSIUM

Texas Plastic Pollution Symposium

March 31, 2022 in Port Aransas, Texas

The purpose of this meeting is to bring scientists together to discuss plastic research being conducted in the state of Texas, and to bring awareness to plastics in the environment.

[TexasPlasticPollutionSymposium.com](https://www.texasplasticpollutionsymposium.com)



Texas Bays and Estuaries Meeting

September 21-22, 2022 at UTMSI

TBEM is hosted by The University of Texas Marine Science Institute and the Mission-Aransas Reserve and will feature a special session on extreme weather impacts.

[TexasBaysandEstuaries.com](https://www.texasbaysandestuaries.com)

Bay Education Center Winter Programs

The Bay Education Center [located in downtown Rockport](#) is offering free programs this winter every Thursday at 11 a.m. from January 20 - February 24. Come explore the Science On a Sphere®, engage in hands-on activities and crafts while enjoying coffee and great conversation.

- January 20 - Fish Printing: Bring items from home or use the muslin provided to create your own fish print!
- January 27 - Marine Debris Art: Create a piece of art using marine debris picked up from local beaches. Artwork can be displayed or taken home.
- February 3 - Weather: Easy to make rain gauges for your backyard or porch!
- February 10 - Plankton: Plankton sampling with microscope viewing.
- February 17 - Nurdles: Learn more about this pesky plastic.
- February 24 - Celebrating Birds: BINGO and Jeo-birdy!

Contact [Savannah Martinez](#) 361-749-3153 for more info.



In a recent public education outreach event, Dr. Ryan Hladyniuk, Core Facilities Lab Manager, gave an introduction to geology to the North Padre Island Cub Scouts Pack 949 in December. During the presentation, Dr. Hladyniuk spoke about why geology is important to the world. The event was complete with hands-on activities of hunting for rocks, identifying rocks, and testing minerals. Photo credit: Javier Villarreal.

Spotlight on Students

Graduations

- Hunter Bailey, M.S. “Nutritional ecology of a marine teleost: maternal maturation diets affect egg and larval composition of Southern Flounder” with advisor: Lee Fuiman.
- Ian Rambo, Ph.D. “Novel Microbes and Viruses with Roles in Biogeochemical Cycling and Eukaryogenesis in Marine Systems” with advisor: Brett Baker.

Putting the Science into the Port Aransas Science Fair

The Port Aransas Science Fair occurred this November and was a culmination of six weeks of research and experimentation by 4th and 5th grade students at the H.G. Olsen Elementary School. The students were assisted by UTMSI graduate students Berit Batterton, JD Carlton, Kathryn Appler, Kyle Runion, and Sarah Douglas, as well as research technician Kaylie Plumb, all who helped the students understand what it takes to develop an experiment and how to communicate the results. Each student designed, executed, and analyzed the results of their own science experiment. Students presented posters detailing their experiments to local UTMSI judges. Student projects spanned a range of topics from floating, to aerodynamics, to candy content. Congratulations to the winners: 4th Grade; 1st place Parker Whitfield, 2nd place (tie) Lizzie Dayton and Corbin



Kathleen Roark, graduate student and judge, speaks to 4th grader Maddie McLaughlin about her experiment. Photo credit: Lisa Smykla.

Williams, 3rd place Alexis Molina and 5th grade; 1st place Kyle Davis, 2nd place Kirra Sohl, 3rd place Beckem Edwards. The fair also received organizational support from research technician, Lisa Smykla and graduate student, Kyle Capistrant-Fossa.

Human Resources

New Employees

Welcome! Savannah Martinez (Education Specialist with Mission-Aransas Reserve), Kayla Gainer-Edwards (Animal Attendant at ARK), Caroline Matkin (Postdoc. Fellow in Thomas Lab), Carol Gonzalez (Research Engineering/Scientist Assistant in Min Lab, in Austin).

Retirements and Appointments

- Dr. Tracy Villareal retired at the end of 2021 and is now a Professor Emeritus.
- Dr. Ed Buskey was appointed to Port Aransas Tourism Bureau & Chamber of Commerce Board.



Interim Director, Dr. Ed Buskey, presented a retirement award to Dr. Tracy Villareal at the annual holiday arts and craft party. Photo credit: Liz DeHart.