Faculty Facts

Swimmer takes Citizen Science to a New Level

Extreme endurance athlete Ben Lecomte teams up with researchers at The University of Texas Marine Science Institute and others to promote ocean sustainability. Lecomte is preparing to swim across the Pacific Ocean, from Tokyo to San Francisco. This feat, “The Longest Swim,” is a vehicle to get people’s attention on growing environmental and sustainability issues. Ben Lecomte and his crew are citizen scientists and will be collecting samples during the entire journey to contribute to oceanic and medical research led by several science partners. They are working with University of Texas Marine Science Institute oceanographer Dr. Tracy Villareal and microbiologist Dr. Brett Baker to collect rhizosolena mats. Rhizosolenia are diatoms (single celled algae) that can clump together to form mats visible to a swimmer. In the nutrient-poor Pacific Ocean, scientists believe that these mats are a vital mechanism to transport nutrients into the surface waters. Villareal and Baker are interested in the bacteria that lives on them and how common these mats are. The Long Swim will provide a unique survey with very high resolution and in a part of the ocean that has been rarely sampled. You can follow this adventure at: http://thelongestswim.com

Arctic Science Graces Cover of Estuaries and Coasts

Dr. Ken Dunton’s photograph of Arctic estuaries is featured on the cover of this year’s journal of Estuaries and Coasts. Dr. Dunton has been conducting research in the Arctic for nearly four decades with a focus on productivity and food webs. He is interested in how Arctic estuarine and coastal systems are responding to warming and rapid ice retreat. He and Dr. Jim McClelland have collaborated over the past five years on a National Science Foundation funded study to examine the unique chemical and biological processes that take place in Arctic lagoons during the eight month period of ice cover, spring break-up,
Break-up linked estuarine and lagoon system on Arctic coasts is a dynamic event, as captured in this aerial image taken on June 20, 2013. With the Brooks Range on the horizon, freshwater has begun to thread its way down the Pokok River, pushing broken ice from the shoreline of Pokok lagoon as it mixes with ice melt waters and the marine waters of the Polar Mixed Layer. Pokok Lagoon is connected on the west to Oruktalik Lagoon, about 35 km east of Barter Island in the eastern Alaskan Beaufort Sea (70° 2.75’ N; 142° 45.3’ W). Credit: Ken Dunton, UTMSI.

Note-worthy Manuscripts & Reports

**Relying on the Unseen Majority to Eat the Oil: how bacteria are our stealthy crusaders**

Microbiologists at The University of Texas with their colleagues have cracked the genetic code of how bacteria break down oil from the Deepwater Horizon Oil Spill and which specific bacteria are responsible. Their understanding of which bacteria are important in breaking down oil can lead to human emergency responses that are more “bacteria-friendly,” for example by the development of better dispersants. It may also provide solutions to creating dispersants that are more susceptible to breakdown by bacteria after they have done their job of dispersing oil. Scientists know that certain bacteria thrive after a spill and help break down oil, but lacked insights into how this is coordinated. In a study recently published in *Nature Microbiology*, Nina Dombrowski (Postdoctoral Fellow in the Baker Lab at The University of Texas Marine Science Institute) and her colleagues have cataloged the genes of several bacteria from the Deepwater Horizon Oil spill to figure out how bacteria “eat” oil. Oil is a very complex fluid that contains up to 1000 different types of chemicals, many of which are difficult to break down. With these new findings, scientists can now pin point the pathways that native Gulf of Mexico bacteria use to help break up oil. The bacterial community naturally found in the ocean is extremely complex and these findings indicate bacteria are relying upon each other as a community to break down oil. “It’s the equivalent to a concert. All the musicians have to work together to make a piece of beautiful music. After the spill, bacteria must work together to efficiently degrade oil,” Nina Dombrowski said. The microbiologists even found evidence that some of these bacteria can degrade sulfur-containing compounds, which are also part of the Corexit dispersant used during the Deepwater Horizon oil spill. Another significant finding was that they also found bacteria that can eat the really robust oil components, like aromatic hydrocarbons, which can cause cancer. “In our research we find a number of bacteria which can deal with these environmentally dangerous compounds,” Dombrowski said. This new information provides evidence that the incredibly diverse bacterial community that is already living in the ocean has the ability to help break it down in the event of future oil spills.

The research was supported by a Marie Curie International
Outgoing Fellowship, The Gulf of Mexico Research Initiative and the National Science Foundation.

Too Much of a Good Thing - Carbon from Permafrost in Mackenzie River Basin

Carbon is an essential building block for all living things on Earth, and carbon-containing compounds in the ocean and atmosphere contribute to ocean acidity and global climate. Scientists from the University of Alberta, United States Geological Survey, Northwest Territories Geological Survey, and The University of Texas Marine Science Institute released a recent study showing that the amount of carbon transported to the ocean by the Mackenzie River, which drains the second largest watershed in North America, has increased substantially over the past 40 years. This includes a 39% increase in dissolved organic carbon transport that may be linked to thawing of Arctic soils that have been frozen for thousands of years.

"The Mackenzie River is the largest source of dissolved organic carbon to the Arctic Ocean on the North American continent. Some of this organic carbon is stored in the ocean, but a large portion is decomposed by marine organisms," said collaborator Dr. James McClelland from UTMSI. Dissolved organic carbon in rivers primarily comes from plant material. Think tea. When you put tea leaves in water, the brown coloration comes from organic compounds that are drawn from the leaves into the water. A massive amount of plant material is trapped in perennally frozen soils (permafrost) in the Arctic, but rising summer air temperatures are causing permafrost to thaw and thus greater amounts of dissolved organic carbon are released. This can happen slowly through gradual warming of soils, or catastrophically with landslide events where large sections of earth break off and collapse all at once. In addition, thaw-induced changes influence how water flows across landscapes and can cause carbon closer to the soil surface (non-permafrost carbon) to be transported in greater amounts to river networks. This research was supported by Environment Canada, Natural Sciences and Engineering Research Council of Canada, Campus Alberta Innovates Program Chair, University of Alberta, and the US National Science Foundation.

Scientists Unveil the Most Comprehensive Genomic Tree of Life

An international team of researchers, including Brett Baker from The University of Texas Marine Science Institute, New research suggests that the Tree of Life is vastly different than previously thought. It has dramatically expanded with evidence of new organisms. In this simplified version, each line represents a species and each new species is indicted by a red dot. About one-third of all biodiversity comes from bacteria, one-third from uncultivable bacteria, and a bit less than one-third from Archaea and eukaryotes (including people, plants and animals).
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has made the most comprehensive tree of life based on genomes. This research greatly expands our view of the diversity of life on the planet. Using genetic data collected in recent years, the researchers found a group of bacteria that are so diverse genetically that they represent half of all the diversity of bacteria on the planet. Much of this microbial diversity remained hidden because it could not be cultured in the laboratory. Less than 0.1 percent of microbes in the world can be cultured, which means there are thousands, maybe even millions, of microbes yet to be discovered. According to Baker, the new technique of using genomes to discover new microorganisms is akin to the invention of the telescope and the resulting discoveries of new stars and galaxies. Scientists have previously created trees of life that include more species than this latest tree, but those tended to focus disproportionately on plants and animals. This newest tree — incorporating 3,083 organisms, one from each genus for which fully or almost fully sequenced genomes were available — more closely represents the full richness of life on the planet. The new tree, published online April 11 in the journal *Nature Microbiology*, reinforces once again that the life we see around us — plants, animals, humans and other eukaryotes — represents a tiny percentage of the world’s biodiversity.

The research was supported primarily by the Department of Energy (DOE) through Lawrence Berkeley National Laboratory, with metagenomic sequencing by DOE’s Joint Genome Institute in Walnut Creek, California.

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Administrative Services

New Funding Received Since March

*Primary funding organization in parenthesis*

- The oxygen limit for thermal tolerance (PTcrit) a novel index for classifying the oxygen-dependent thermal sensitivity of different species - Rasmus Ern and Andrew Esbaugh (Carlsberg Foundation)
- Bioavailability and Chemical Characterization of dissolved organic nitrogen in South Texas rivers - Zhanfei Liu (Texas Sea Grant)
- Sea Turtle Program support for Stranding, Rehabilitation, and Nesting - Tony Amos (Texas Trustees, RESTORE)
- Dunescape Creation and Access in Port Aransas, Texas - Jace Tunnell (Coastal Bend Bays & Estuaries Program)

Faculty Recruitment

We are very pleased to announce that Dr. Lauren Yeager will join the faculty at the Marine Science Institute as a new assistant professor this coming September. Dr. Yeager is a landscape and food web ecologist. UTMSI administration is also in the recruitment phase for a new fisheries scientist who would start in 2017.

Marine Laboratories from Across the Region Convene

In early May, UTMSI was happy to host, for the first time, directors and representatives from marine laboratories across the southern US region and the Caribbean for the annual meeting of the Southern Association of Marine Laboratories. This organization provides an opportunity to develop solutions for problems common to non-profit marine laboratories. The meeting increases the effectiveness of member institutions in their work on marine and coastal resources and fosters new collaborations. While the group was in Port Aransas, they focused on learning more about national monitoring initiatives like the Integrated Ocean Observing System.

Representatives from marine laboratories across the region met this spring to share lessons learned and brainstorm about new national science initiatives.
**Hurricane Preparedness**

The UTMSI hurricane plan has been completely revised with specific tasks for each department to perform in the event that we have to implement Phase I and/or Phase II of the plan due to severe weather. UTMSI Director, Dr. Dickey, is also working closely with the City of Port Aransas and Nueces County with these hurricane preparations.

**Housing Master Plan**

Turner and Ramirez Architects are creating a concept design and master plan for a housing village project. This plan will create a design of long-term housing options for our students, visiting scientists, and postdoctoral fellows.

**New Aquaria**

The Marine Science Institute recently contracted with Tenji, Inc., specialty contractors of aquatic systems and exhibits, to develop a conceptual plan and design for renovation of the existing aquaria in the Marine Science Education Center.

**External Affairs**

*Growing Fish in a New Green House*

Thanks to a generous donation from the Ed Rachal Foundation, the greenhouse at the Fisheries and Mariculture Laboratory is being replaced with a metal pre-fabricated building similar to the SEALab. Design and engineering plans have been completed and we anticipate beginning installation in June.

**New Advisory Council Members**

The Marine Science Advisory Council is very happy to introduce several new members to the council: Mr. Hayden Head of Corpus Christi, Texas; Mr. John Carlson of Corpus Christi, Texas; and Mr. Tim Franke of Austin, Texas. For the first time, the Marine Science Advisory Council has a full compliment of members.

**New Gifts**

We are pleased to announce that the funding match for the Guenther / Herrman gift towards Dr. Peter Thomas’s novel steroid receptor research is complete. Thanks to all who have participated.

**Coming soon...** Thanks to advisory council member, Donnie Garcia, a golf tournament will be hosted at the La Pamilla Golf Course benefiting UTMSI. More details to come!
Where We've Been

- In March, researchers, students, and staff presented at and/or attended the National Association of Marine Laboratories Annual Meeting in Washington D.C.; National Science Foundation Funded Collaborators Meeting in Petaluma, California; National Wildlife Rehabilitator Association Symposium in Norman, Oklahoma; 3rd Annual Southeastern Biogeochemistry Symposium in Knoxville, Tennessee; NERR Technician Training Workshop in Pawley’s Island, South Carolina; Arctic Observing Summit in Fairbanks, Alaska; and the Orientation for East Asia and Pacific Summer Institute Program in Washington, D.C. Researchers also conducted fieldwork in Cairns, Australia, and in San Felipe of Baja California, Mexico.
- In May, faculty members presented at the Southern California Academy of Sciences Meeting in Los Angeles, California, and gave a presentation to Pershing Park Elementary School in Killeen, Texas.

Around Campus

Campus Improvements

- The engineering and physical condition assessment for the rebuilding of the marina and bulkheads has been completed. The final design-build plans and contractual format will be completed this summer. This $2.8 million project was made possible by our strong advisory council support and outstanding representation by Chairman Todd Hunter during the 84th State Legislature.
- Campus housing at Wilson Cottages has been equipped with WiFi through Time Warner Cable.
- Replacement of the majority of exterior doors with storm-rated fiberglass doors has been completed. There are still a few more that will be replaced this summer.
- Concrete and waterproofing repairs on buildings throughout the main campus and at the Fisheries and Mariculture Laboratory is ongoing.

Coming Soon

- Renovation of the main laboratory elevator to correct long-standing design deficiencies and to restore reliability.
- Before the end of the year, the Fisheries and Mariculture Laboratory will be receiving an improved electrical distribution system and renovation of the pump house behind the main laboratory.
- It is anticipated that in September, UTMSI will have a one-stop system for reserving meeting rooms,
classrooms, short-term housing, vehicles, boats, and R/V Katy trips through a new event management system.

- Campus housing at Beach Street will soon be equipped with WiFi through Time Warner Cable. Estimated completion is June.
- We are renovating the Dormitory D apartment and completion is expected by the end of June.
- New entrance signs will be installed at the Fisheries and Mariculture Laboratory.
- New composting toilets will be installed at Fennessey Ranch this summer.

**Water Wise Wildlife Garden Opening**

The University of Texas Marine Science Institute is pleased to officially open the Water Wise Wildlife Garden to the public. This garden is a unique piece of landscaping that is designed to showcase native plants and their use for conserving water and offering a home and shelter to wildlife.

The garden features a trail, benches, and signs about the plants and animals that rely on them. A net cutting ceremony was held on May 20th to commemorate the opening of the garden. Mr. Chairman Todd Hunter provided a keynote address and was followed by a presentation of a commercial yard of the month from Sally Jo Barlett of the Port Aransas Garden Club. The new garden was designed by Texas Master Naturalists Ellen Reisinger and Laura Clark with significant help from the local community during a planting effort held in April. The garden is open to the public for continued enjoyment and learning. A dunescape trail will be built early next year and connect to the garden.

This new garden was made possible with guidance and support from Texas Master Naturalists with funding from The University of Texas Green Fee Program and Coastal Bend Bays & Estuaries Program.
Mission-Aransas Reserve and Education

**MissionAransas.org**

**Trash or Treat**

Mission-Aransas Reserve strives to teach 5th and 6th grade students about the impact of beach debris on the South Texas marine environment. Education takes on a new twist as students turn beach trash into a visual treat - making learning fun. Students from the Flour Bluff Intermediate School are working with the Reserve to learn about marine debris, participate in a beach clean-up event and create artwork from some of their “treasures” to be displayed this fall at the Corpus Christi *Día de los Muertos* Festival. Through this creative process students are learning about what type of trash is common to our Texas beaches. The Reserve even sneaks a bit of scientific method and sampling into the lesson. Students will be transforming their views about this beach trash into creative art and displaying it as a means to visually educate their fellow citizens. This project is funded by the Texas General Land Office, and the National Oceanic and Atmospheric Administration to help future generations understand that they can make a difference in reducing trash on Texas beaches.

Invited speakers, Dan Parker (South Jetty News Editor) David Sikes (Caller-Times Outdoor Columnist) Christine Hale (Texas Sea Grant Oil Spill Science Outreach Specialist) share their experience to local researchers of what works and doesn’t work in translating science during the panel session of the “Communicating Your Science” workshop hosted on Thursday April 28th.

and impacts of marine debris in the Gulf of Mexico and NOAA’s reduction efforts. Dr. Ed Buskey of UTMSI was also a distinguished speaker and kicked-off the special session on Baffin Bay with a brown tide historical overview. The purpose of the event was for researchers from around Texas to come together and learn from each other, which will provide a better understanding of our diverse coastal regions of Texas. The meeting reached maximum capacity with approximately 160 researchers, students, and resource managers. This meeting was generously sponsored by Saltwater-fisheries Enhancement Association, Texas A&M Corpus Christi Harte Research Institute, Coastal Bend Bays & Estuaries Program, Coastal Bend Bays Foundation, Sea Bird Coastal, Texas Sea Grant, and Eureka Water Probes.

**12th Annual Texas Bays and Estuaries Meeting**

This year’s meeting featured distinguished speaker, Kim Albins, the Gulf of Mexico Marine Debris Regional Coordinator, from the National Oceanic and Atmospheric Administration (NOAA). Ms. Albins discussed the types

Students from the Intermediate Nature Club at Flour Bluff Independent School District participate in a beach clean-up event at Mustang Island State Park. Photo Credit: Jace Tunnell.

**2nd Annual Brundrett Research Symposium**

Over the course of the academic year, 8th graders from Brundrett Middle School have been completing environmental sampling in Port Aransas. With this data, they have been investigating research questions such as “How does nutrient loading vary between the beach, ship channel and birding center?” or “How does cloud cover relate to turbidity?” At the 2nd annual research symposium, students held a poster session to display their results. Scientists from the University of Texas Marine Science Institute quizzed the students about their research in a
format similar to that of scientific conferences. Awards were presented for data analysis, creativity, and best overall.

*The Science-in-Residence program is supported by Port Aransas Independent School District, The University of Texas Marine Science Institute, Mission-Aransas Reserve and Port Aransas Education Foundation.*

**Meetings for Management**
The past few months, The Mission-Aransas Reserve has hosted and co-hosted several important meetings to help increase the knowledge of coastal issues for local decision-makers.

- Texas Chapter of American Shore and Beach Preservation Association Annual Symposium
- Seagrass Monitoring Workgroup Meeting
- Harmful Algal Bloom Meeting

**Spotlight on Students**

**Conference Awards**
- 12th Annual Texas Bays and Estuaries Meeting: oral presentation awardees Meredith Evans (1st), Nick Reyna (2nd), and Victoria Congdon (3rd).
- Craig Connolly received a student travel award to attend the Summer 2016 Sciences of Limnology and Oceanography (ASLO) conference in Santa Fe, New Mexico.
- Erin Reed received a student travel award to attend the Ecology and Evolutionary Ethology of Fishes meeting 2016 in Tallahassee, Florida.

**Fellowships & Internships**
- Craig Connolly was awarded an internship from the National Ocean Sciences Accelerator Mass Spectrometer lab at the Woods Hole Oceanographic Institution.
- Joshua Lonthair was awarded a National Science Foundation EAPSI Fellowship (EAPSI = East Asia and Pacific Summer Institutes).
- Craig Connolly was awarded a graduate research fellowship from the North Pacific Research Board.

**Candidacy**
- Aubrey Converse, in Peter Thomas’s laboratory, officially advanced to candidacy this semester.
- The graduate studies committee approved Yida Gao’s request to transfer to the Ph.D. program.

**Graduations**
- Matthew Dzaugis, M.S. “Importance of a northern Gulf of Mexico spring transition as inferred from marine fish biochronologies” Advisor: Bryan Black. May 2016
- Matt Seeley, M.S. “Habitat use and trophic structure in Atlantic tarpon (*Megalops atlanticus*) inferred from geochemical proxies in scales” Advisor: Bryan Black. May 2016
- Meredith Evans, M.S. “Evaluation of petroleum hydrocarbon weathering on coastal Louisiana beaches and salt marshes following the Deepwater Horizon oil spill using ramped pyrolysis – gas


- Claire Griffin, Ph.D. “Dissolved organic matter in major rivers across the Pan-Arctic from remote sensing” Advisor: Jim McClelland. May 2016

Research Experiences for Undergraduates (REU)
The 2016 REU program kicked off May 31st and will run through August 4th. This summer nine undergraduate students from universities such as Appalachian State University, Trinity University, Texas A&M University Corpus Christi, University of Puerto Rico at Mayaguez, Carnegie Mellon University, and University of Texas will be joining our program. We’d also like to extend a congratulations to our REU alumni: Sierra Melton received a Udall Scholarship and John Donaho published in the prestigious *Nature Microbiology* journal with Brett Baker’s laboratory.

Ms. Cynthia K. Faulk will receive this year’s The University of Texas President’s Outstanding Staff Award for her dedication to promoting advances in research and cultivating a learning atmosphere for the students and staff. Photo credit: Venus Mills.

Welcome & Celebrations

Cindy Faulk Receives President’s Outstanding Staff Award
Ms. Cynthia K. Faulk received this year’s The University of Texas President’s Outstanding Staff Award for her dedication to promoting advances in research and cultivating a learning atmosphere for the students and staff. Cindy received both her bachelor’s degree and her master’s degree from The University of Texas. Upon completion of her graduate degree, she was employed for a few years outside the university, but soon found her way back. She has been working full time at UTMSI’s Fisheries and Mariculture Laboratory for just over 18 years, starting as a Research Scientist Assistant and rising through the ranks to Research Scientist Associate III. Cindy’s job in a nutshell is to facilitate research, but that covers a lot of territory and requires a variety of skills, all of which she has mastered.

Staff Service Awards
UTMSI recognized staff service in a recent all-hands meeting. UTMSI support staff, often unsung heroes, are a driving force behind marine science discoveries that advance knowledge of our estuaries, coastal and blue water oceans. We are pleased to announce recognition and our appreciation for the following members of our UTMSI family who have dedicated their careers in support of the Institute:

- Josh Garcia – 10 years
- Annette Hedemann – 15 years
- Pat Lamas – 20 years
- Veril Barr – 30 years
- John Shedd – 35 years

New Employees
Welcome! Catharine Thomas (Gift Shop)
Would you like to be added to our newsletter mailing list? E-mail Sally Palmer at sally.palmer@utexas.edu

Summer Programs
We have many exciting summer programs planned! Check out our website for more information www.utmsi.utexas.edu

FILM AND DISCOVERY SERIES
Wednesdays 3 – 4 p.m. from Jun 8 to Aug 3

NATURE WALKS, Wetlands Education Center
Tuesdays and Thursdays 10 – 11 a.m.

SATURDAY MORNING PROGRAMS 10 – 11 a.m.
Sea Stars (ages 3-5)
June 18 Sea Star Science
July 2 Hands-On-Habitat

Professor Emeritus, Dr. Joan Holt, was honored with the lifetime achievement award at the 36th annual Y Women In Career Awards ceremony held in March. Pictured here with Director, Dr. Robert Dickey. Photo credit: Georgia Neblett.