# Engaging Students in Experiential Learning: Texas Integrated Diving and Ecological Studies (TIDES) Laboratory

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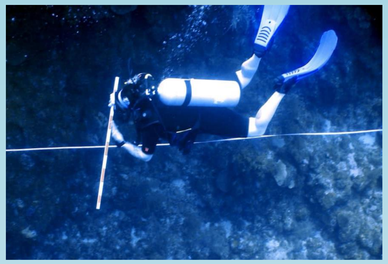
## Program Description

The Texas Integrated Diving & Ecological Studies (TIDES) laboratory is a multi-institutional, international, undergraduate research program that focuses on student driven research projects on the Mesoamerican Barrier Reef (MBR) System. Research is conducted in Roatan, Honduras as an official TTU study abroad faculty-led course. The TIDES laboratory is a joint research pipeline between McLennan Community College and Texas Tech University. The Spring course is front loaded with lectures on oceanography, marine ecology, marine invertebrates, coral ecology and identification, as well as fish ecology and identification. As part of the course students must pass a lecture exam covering the above marine topics and a skills test. The skills test assesses their understanding of research design and identification of the individual project's specimens. Students design their research projects collaboratively with other TTU and/or MCC students. Faculty meet each week with research groups to discuss literature search, research design, and materials and methods. The Maymester course covers the trip to Honduras and a "bootcamp" upon return. The primary focus of the trip is to conduct the student's research on the MBR. Upon return from Honduras, we have a weeklong "bootcamp" where students analyze their data, develop and present a research poster and abstract. Many students present their research at local and regional conferences.



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PORIFERAN ABUNDANCE IS NEGATIVELY ASSOCIATED WITH CORAL HEALTH IN THE MESOAMERICAN REEF

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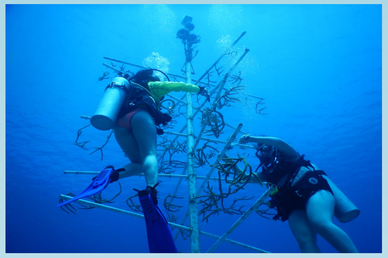

## 2019 Student Research Projects

- Macroorganisms within the Spongocoels of *Callyspongia vaginalis, C. plicifera* and *Xestospongia muta* on the Mesoamerican Reef in Roatán, Honduras
- Associations between Turf algae, *Halimeda* species, and *Caulerpa toxifolia* on sponge disease in *Xestospongia muta* and *Aplysina* species observed in Roatán, Honduras
- Prevalence and Abundance of Dark Spot Syndrome on Starlet Corals on the Mesoamerican Barrier Reef in Roatán, Honduras
- Effects of dusky damselfish algal farms on host coral health on the Mesoamerican Barrier Reef in Roatán, Honduras
- Potential Vectors Affecting the Prevalence and Abundance of *Millepora* encrusting octocorals on the Mesoamerican Barrier Reef in Roatán, Honduras.
- Fish Assemblages of the Mesoamerican Barrier Reef, in Roatán, Honduras
- Boulder Coral Abundance and Disease Prevalence in Association with *Spirobranchus giganteus* in Roatán, Honduras
- Microplastic Loading in the Sediment of Mesoamerican Reef in Roatán, Honduras

## Program Equipment

- Hydrolab water quality sonde (DS5)
- Meter sticks
- Quadrats
- Identification books
- Pelican cases
- Microscope (if needed)
- Weights for equipment
- Rulers
- Plankton net
- Rite-In-The Rain paper
- Dive slates
- Dive computers
- Dive safety sausages
- Dive cameras
- Dive lights
- Dive compasses
- Scuba gloves (fire coral)

## Research Site & Facilities

The Roatan Institute for Marine Sciences is located at Anthony's Key Resort (AKR) on the island of Roatan, Honduras. The RIMS facilities include a three room student building that can accommodate 15 students (additional rooms are available), dry lab, wet lab, gear room, and classroom. For 11 paying, you get one free. The RIMS' education coordinator, Jennifer Keck, accompanies the class on dive trips and makes directions to specific dive sites based on student research needs. She can also provide lectures on sea turtles, dolphins, marine invertebrates, coral ID and diseases, mangroves, fish ID, coral research methods, reef issues, etc. Students also get the opportunity to snorkel with bottlenose dolphins.

## Scuba Diving Certification

New students receive their open water dive certification. Returning researchers/ divers receive advanced training based on their level of diving experience (e.g. advanced open water, master diver). Specialty dive courses include boat, night/limited visibility, computer, buoyancy, stress and rescue, and/or science of diving. All dive classes were completed through W.W. Diving (Kingwood, TX) and are certified using the Scuba School International dive program. Scuba equipment was rented from AKR's dive shop (e.g. buoyancy compensator, regulators, weights, dive tanks). Dive computers are apart of the program's equipment and provided to the students. All students were restricted to a depth of 60 feet.

## Student Success

**Conferences:** National Poster Conference, CCURI – Washington DC., Community College Undergraduate Research Initiative Conference, Texas Academy of Science, MCC Scholar Day, Texas Tech Annual Biological Science Symposium

**Manuscripts:** 1 published, 4 in prep

**Internships:** Cameron Park Zoo (Aquarium), Roatan Marine Institute for Marine Sciences (Roatan, Honduras), Whale Shark & Oceanic Research Center (Utila, Honduras)

**Graduate/Professional Schools**: Texas Tech University, Texas A&M, UTMB – Galveston (PA School, PT School), University of Michigan (Navy Commission)