

2018

Harte Research Institute for Gulf of Mexico Studies

Fellowships, Scholarships and Internships



TEXAS A&M
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CORPUS
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HARTE
RESEARCH INSTITUTE
FOR GULF OF MEXICO STUDIES

From the Director

Nearly two decades after Ed Harte founded our institute with the goal of “making a difference” for the Gulf of Mexico, HRI is expanding into exciting new research areas, taking on three new chairs who will focus on important environmental challenges like water quality, coastal restoration and conservation, marine resources and aquaculture. With those chairs comes a whole new crew of researchers and students — you’ll find some of these new faces in the pages ahead.

Our vision at HRI is a Gulf of Mexico that is economically and environmentally sustainable, and we believe that vision can only be sustained if we continue to attract and educate the best and brightest scientific minds. One of the ways we try to “make a difference” here at HRI is in the lives of our students. With the cost of higher education rising and many students increasingly burdened by debt, we believe it is important to ensure our graduate students are as close to fully funded as possible so they can focus on their future research careers.

This report profiles the HRI students whose education and research have been funded by sponsors and donors sharing Ed’s vision. With your help, some have already begun new careers helping to manage the Gulf of Mexico’s rich coastal resources and securing the future of coastal communities.

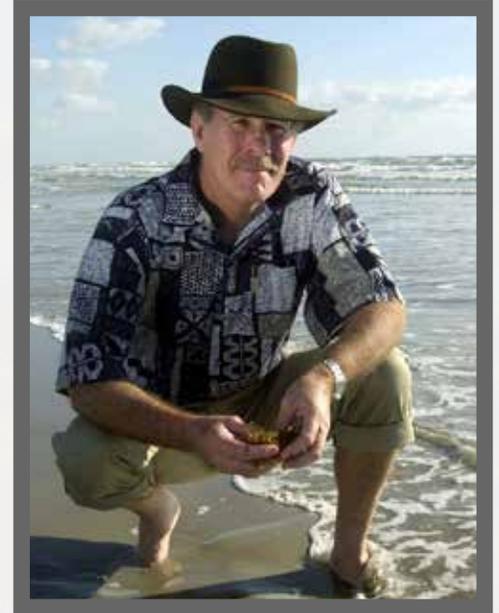
Thank you for supporting the next generation of Gulf scientists and conservationists.



Larry McKinney, Ph.D.
Executive Director

Tunnell Fellowship Endowment

In April 2016, a new fellowship was established to continue the teaching legacy of long-time educator, author and marine scientist Dr. Wes Tunnell, Harte Research Institute (HRI) for Gulf of Mexico Studies Endowed Chair for Biodiversity and Conservation Science. The fellowship will support a Mexican or American graduate student with a commitment to research in Mexico while he or she pursues graduate education at HRI. The Harte Charitable Foundation will establish the fellowship program in perpetuity, funding the program at \$50,000 per year for the first eight years before establishing a \$1M endowment.



Coral Lozada

Doctoral Student
Coastal and Marine Systems Science

Graduation Date: 2021

Hometown: Katy, Texas



Dissertation:

Motivating Factors of Continued Participation in Risky Behavior by Small-Scale Fishermen in the Yucatan

My project is a combination the biophysical and social sciences. The hypothesis for this project is that gender and perceptions of masculinity play a role in the adoption of risky fishing behaviors. The goal of the study is to understand what motivates fishermen to adopt risky practices and what the role of gender and perceptions of masculinity, if any, are in these decisions. It is important to move beyond identifying perceptions of risk and look towards assessing the drivers that lead people to make these risky choices. Understanding why fishermen are making the choices that they are and taking risks can help develop policy that can meet fisheries management goals and save lives.

Crutchfield Fellowship Endowment

In May 2012, the Crutchfield Fellowships were established by John H. and Danna Crutchfield in honor of John's late father, John W. Crutchfield. The purpose of the endowment was to fund educational expenses for Harte Research Institute masters and doctoral students. These expenses include, but are not limited to, tuition, books, travel to meetings and workshops and necessary research supplies or equipment.

Since inception, this endowment has provided almost \$300,000 in funding for students. For fiscal year 2018 the Crutchfield fellowship was able to fund seven students with a total of \$63,500.

our 2018 students...

Michelle Culver

Master's Student

Coastal and Marine Systems Science

Graduation Date: 2018

Thesis

Beach Geomorphology and Kemp's
Ridley (*Lepidochelys kempii*) Nest Site
Selection Along Padre Island, Texas,
USA

Hometown: El Dorado, Arkansas



The Kemp's ridley sea turtle is the most endangered sea turtle in the world, largely due to the limited range of its nesting habitat. My research involves characterizing the relationship between various geomorphology characteristics of a beach, such as beach width and beach slope, and Kemp's ridley nesting preferences. This is the first study of its kind regarding this sea turtle species, but studies regarding other sea turtles have found that these beach characteristics influence where turtles nest. The results of this research will include new insights into the beach habitat of the Kemp's ridley sea turtle, which could prove to be invaluable for the conservation and management of the species. For example, if the results of this research conclude that Kemp's ridleys prefer to nest on narrow beaches, then monitoring efforts could be emphasized on that type of beach and preservation efforts could focus on maintaining that specific beach characteristic. Ultimately, it is my hope that this research project, along with any work I conduct in the future, will help save a species in peril.

Kesley Gibson



Doctoral Student
Marine Biology
Graduation Date: 2019

Dissertation
Importance of Artificial Reefs as Fish
Habitat in the Northwestern Gulf of
Mexico

Hometown: Martin, Tennessee

Habitat is a crucial factor in the conservation of fisheries; so much so, that state agencies and conservation groups continually fund installation of artificial reefs and the monitoring of the fish that use them. While we are still exploring the nuances of artificial reefs and investigating how these reefs compare to natural habitat, studies to date have demonstrated that these man-made reefs are providing necessary habitat for many economically important fisheries, such as Red Snapper, King Mackerel and sharks. Without appropriate habitats, the abundance of fish decline, resulting in anglers struggling to obtain the same amount of catch or targeting a different species, which may be less rewarding. Reduced catch and increased effort may inversely affect the number of anglers, leading to decreased spending in economies mostly supported by the fishing industry. Fishing means a great deal to me as I have bonded with many family members through this wonderful pastime. That is why I became interested in working on this project — to help ensure the future of this wonderful pastime for coming generations.

Meagan Hardegree

Master's Student
Environmental Science
Graduation Date: 2018

Thesis
Effect of Climate on Estuarine Benthos
at Regional Scales Along the Texas
Coast

Hometown: Port Aransas, Texas



Over the past 20 years benthic community biomass, abundance and diversity has declined in the Lavaca-Colorado Estuary and has been attributed to climate effects. My research investigates whether this decline is isolated to the Lavaca-Colorado Estuary or if it is occurring in other estuary systems along the Texas Gulf Coast. To determine if benthos is declining in other estuary systems, benthic community characteristics will be measured in the Nueces Estuary and the Guadalupe Estuary. Benthic organisms provide food for many bottom feeding fish, so if benthos across the state of Texas are declining due to climate, how is this affecting fish populations within Texas estuaries? Texas Parks and Wildlife fish catch data will be correlated with trends in benthic abundance, biomass and diversity to determine potential ecological consequences and determine if declining benthos is a problem for Texas Estuaries.

Quinn McColly



Doctoral Student
Coastal and Marine Systems Science

Graduation Date: 2020

Dissertation

Market Mechanisms and Efficient Allocation of Water: Predicting Water Prices, Option Contracts on Water, and Enhancing Frameworks

Hometown: Chesterton, Indiana

My work revolves around using market-based approaches to help efficiently allocate water. Water is a vital resource upon which all human life depends. Water is also a finite resource, so managing the supply effectively is important. This is particularly important as populations continue to grow, putting ever more pressure on water supplies. For example, South Africa — before recent rain activity — had predicted that in some areas municipal water taps would literally run dry in 2018. I hope that by helping to build tools to help manage our water supply now, we will be better equipped to face challenges associated with future scarcity. To better understand and build water markets, we can look to where they have been implemented successfully. I am grateful and excited to have the opportunity to travel to Australia this fall to study their water markets, which are the most robust and successful in the world. By looking at the evolution of markets abroad, we hope to learn from their experience so that we can avoid mistakes that have already been made, and take key parts of the system and adapt them for use in the U.S. in general and Texas in particular.

Cameron Page

Master's Student

Coastal and Marine Systems Science

Graduation Date: 2019

Thesis

Dissolved Organic Matter in Estuarine
Primary Production Models

Hometown: Corpus Christi, Texas



Recently, it was discovered that high levels of dissolved organic Nitrogen (DON) occur in areas of high salinity and hypersalinity, and then DON decreases with decreasing salinity. This implies that a Nitrogen form is being generated, but not consumed, in high salinity estuaries. Chlorophyll concentration has the same pattern DON on both ends of the salinity spectrum. The relationship between nutrients and chlorophyll is often modeled using nutrient-phytoplankton-zooplankton (NPZ) formulations. Even though DON is likely important in controlling productivity in Texas estuaries, it is not included in NPZ models. The goal of her study is to create an NPZ model with a DON component and flows.

Claire Pollard



Master's Student
Environmental Science

Graduation Date: Fall 2017

Thesis

Determining the Efficacy of Beach and Dune Nourishment Projects to Mitigate Storm Washover on a Low-Lying Barrier Island

Hometown: Dallas, Texas

My research focused on the morphological and hydrodynamic processes that occur when storm surge penetrates a low-lying barrier island. Barrier Islands are the first line of defense when an extreme storm strikes the coast. Sand dunes act like a barrier, protecting the island, and any development inhabiting it. However, if the sand dunes are not tall or wide enough, they can't keep the power of storm surge from pushing through. Hurricane Ike struck Galveston Island in 2008, and caused catastrophic damage to the landscape and community. I used a computer model that simulated Hurricane Ike's water level and waves, and the morphological processes that occurred when it impacted the coast. I also digitized a hypothetical enhanced dune system and a wider beach scenario into the model, to see if it would have mitigated the destruction of Ike's powerful storm surge. The results of my work can help guide coastal managers and planners towards the efficient use of sand for reconstructing and enhancing the beach and dune system on a barrier island, in order to protect the communities and habitats from the threats of storm surge.

Mikaela Ziegler

Master's Student

Marine Biology

Graduation Date: Summer 2018

Thesis

Facilitation Plays a Key Role in Marsh-Mangrove Interactions Along a Salinity Gradient in South Texas

Hometown: Merritt Island, Florida



My thesis research focused on understanding the colonization of black mangroves in south Texas salt marshes. My project measured seedling survival and growth rates in different salt marsh habitats at moderate and hypersaline conditions. Understanding how vegetation and salinity interactions affect seedling survival and growth provided more insight into what salt marsh habitats may be vulnerable to mangrove encroachment. During my time at HRI, I also assisted the late Dr. Wes Tunnell with the new edition of his *Laguna Madre of Texas and Tamaulipas* book, organizing files and figures, copy-editing chapters, compiling bibliographies, scanning slides and conducting literature searches. I am currently in Kailua, Hawaii and volunteer with Hui o Ko'olaupoko, a non-profit watershed management group, and will be starting a position with the Research Corporation of the University of Hawaii.

Danielle Zimmerman



Master's Student
Marine Biology

Graduation Date: 2018

Thesis

Effects of Extreme Freshwater Events
and *Perkinsus marinus* on Eastern
Oyster (*Crassostrea virginica*) Stress
Response

Hometown: Katy, TX

My research focused on the stress response of oysters to changes in salinity resulting from freshwater floods into estuaries. Although freshwater is necessary to maintain the salinity of an estuary, large inputs of freshwater over a long period can have damaging effects on oyster populations. In my experiments, I simulated freshwater floods of different magnitudes and observed the stress response of oysters to the reduction in salinity over a weeklong period. To determine this, I monitored the food consumption, waste production, breathing rates and disease levels of each oyster. I found that, even after experiencing rapid reductions in salinity, oysters from my study site in the Lower Laguna Madre had enough energy to maintain normal body functions and to grow. This is important because this means that oysters will be able to survive salinity fluctuations resulting from the more variable climate Texas is predicted to experience. I completed my research and graduated in August 2018, and now work at the Harte Research Institute updating the GulfBase database, an important resource for the people, places, events and species that call the Gulf of Mexico home.

Harte Fellows

When Ed Harte, Corpus Christi newspaper publisher and noted conservationist, gave his \$46 million gift in 2000 to found the Harte Research Institute for Gulf of Mexico Studies, he emphasized the role that student support would play in his vision. The Harte Fellows were created in his name, ensuring that every chair would have at least one fully-funded graduate student in their program.

The endowment funds educational expenses for 6-8 HRI masters and doctoral students each year, including tuition, books, travel and research supplies.

our 2018 fellows...

Elena Keen



Doctoral Student
Coastal and Marine Systems Science

Graduation Date: 2017

Dissertation

Status, Strategies and Cost
Management of Offshore Oil Rig
Decommissioning and Rigs-to-Reef
Programs in the Gulf of Mexico

Hometown: Ann Arbor, Michigan

My dissertation research reviewed oil rig decommissioning strategies and rigs-to-reefs programs in the Gulf of Mexico and California with an emphasis on financial liability and cost estimation, incorporating international perspectives and global case studies. I received a Master's Degree in Marine and Environmental Science from the University of the Virgin Islands where I became an avid SCUBA diver. Prior to my time in the Virgin Islands, I spent six years in Washington, D.C. at the environmental law firm of Beveridge & Diamond, P.C. Since 2012, I have become involved in film and its ability to translate information between marine science and the public. In 2013, I was the Film Festival Chair for GCFI's CINEFISH Film Festival, in addition to co-founding the Reef Renaissance Film Festival being held annually in the U.S. Virgin Islands. I was a Competition Jury Member for the BLUE Ocean Film Festival and Conservation Summit in 2014, and is a part of the HRI Team that coordinated BLUE On Tour 2016, which also launched the first-ever BLUE Gulf Film Competition.

Elaine Kurr

Master's Student

Coastal and Marine Systems Science

Graduation Date: 2019

Thesis

Focused Flows to Natural Hatcheries in Texas Estuaries

Hometown: Chicago, Illinois



With increasing coastal development and human population, high demands for fresh water have impacts that severely affect the condition of estuarine systems. By maintaining adequate freshwater inflow, the integrity of estuaries and sequential resources can be sustained. My research focuses on protecting the vital nursery functions in the upper reaches of estuaries where freshwater inflows are influential. Two extensive datasets from long term monitoring projects conducted by the Harte Research Institute and Texas Parks and Wildlife Department are being used to examine three different populations within the community: nekton, epifauna and infauna invertebrates. This project closely aligns with the goals I have from my future career and continued work in environmental conservation. I have always been interested and enthusiastic about the protecting aquatic resources and associated activities that are valued by many people, including myself. Understanding how freshwater inflow impacts estuarine species population will allow for better management and protection of the Texas estuaries and resources.

Claire Pollard



Master's Student
Environmental Science
Graduation Date: 2017

Thesis

Determining the Efficacy of Beach and Dune Nourishment Projects to Mitigate Storm Washover on a Low-Lying Barrier Island

Hometown: Dallas, Texas

My research focused on the morphological and hydrodynamic processes that occur when storm surge penetrates a low-lying barrier island. Barrier Islands are the first line of defense when an extreme storm strikes the coast. Sand dunes act like a barrier, protecting the island, and any development inhabiting it. However, if the sand dunes are not tall or wide enough, they can't keep the power of storm surge from pushing through. Hurricane Ike struck Galveston Island in 2008, and caused catastrophic damage to the landscape and community. I used a computer model that simulated Hurricane Ike's water level and waves, and the morphological processes that occurred when it impacted the coast. I also digitized a hypothetical enhanced dune system and a wider beach scenario into the model, to see if it would have mitigated the destruction of Ike's powerful storm surge. The results of my work can help guide coastal managers and planners towards the efficient use of sand for reconstructing and enhancing the beach and dune system on a barrier island, in order to protect the communities and habitats from the threats of storm surge.

Melissa Rohal

Doctoral Student

Coastal and Marine Systems Science

Graduation Date: 2018

Dissertation

Ecosystem Impacts of Oil Spills on the Offshore Environment in the Gulf of Mexico

Hometown: Columbus, Ohio



My dissertation research explores the ecosystem impacts of an oil spill on the deep sea. I hold a Master's Degree in Biological Oceanography from Florida State University under the advisement of Dr. David Thistle and a Bachelor's of Marine Science from Coastal Carolina University. Prior to my time in Florida I worked at the Columbus Zoo and Aquarium and as a marine mammal observer in the Gulf of Mexico. While at Texas A&M-Corpus Christi I have served as the adjunct professor of Oceanography, the adjunct professor of Environmental Biology, and am a member of the science fair scientific review committee. I was also a participant in the East Asian and Pacific Summer Institute where I studied in South Korea for two months under Dr. Wonchoel Lee learning taxonomic identification techniques. I successfully defended my dissertation on September 28, 2018 and after graduation will continue to work with Dr. Paul Montagna on estuarine organisms while continuing to pursue employment.

Jamie Smith



Master's Student
Coastal and Marine Systems Science
Graduation Date: 2018

Thesis
The Interactive Effects of Hypoxia and
High Salinity on Macrobenthic
Communities in Corpus Christi Bay,
Texas

Hometown: Houston, Texas

Benthic community structure and metrics have widely been used as biological indicators of ecosystem health and in environmental assessments. In the southeastern region of Corpus Christi Bay, declines in benthic macrofaunal community abundance, biomass, diversity, species richness and species evenness have indicated an environment under stress. It is uncertain how much of the benthic community response in Corpus Christi Bay is due to low dissolved oxygen levels, and how much is due to high salinity values. The main purpose of this study will be to determine if there is an interaction between dissolved oxygen concentrations and bottom salinity values in Corpus Christi Bay affecting benthic macrofaunal community structure and metrics. I was drawn to this study because of the taxonomic work. Benthic macrofauna make great biological indicators of environmental health because they are relatively immobile, long lived and utilize the detrital food chain. I like being able to see my data on a very personal level over years and seasons.

Jill Thompson-Grim

Master's Student

Marine Biology

Graduation Date: 2020

Thesis

Fine-Scale Habitat Use by Reef Fish in the Western Gulf of Mexico

Hometown: Pearland, Texas

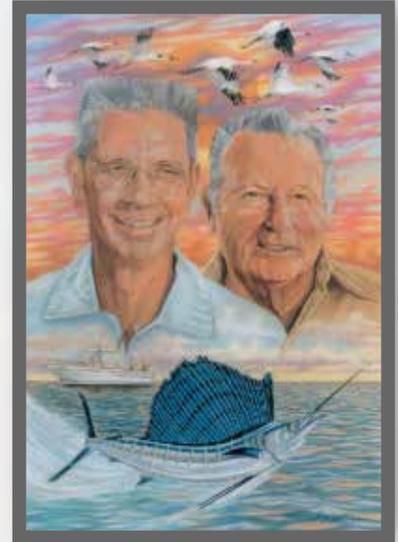


Since I can remember, I have had a passion for the ocean and a desire to understand more about the life under the water's surface. I was first introduced to the complexities of marine science through my undergraduate studies, where I knew that I wanted to further my knowledge of these topics. Now as a graduate student in the Center for Sportfish Science and Conservation, I am working on determining how Red Snapper, a commercially and recreationally important fish in the Gulf of Mexico, utilizes both natural and artificial habitat. I am working to compare differences in Red Snapper densities and reef fish communities on different parts of the South Texas Banks. These different parts of the bank include the crest, slope and rise. The intention of this project is to confirm if Red Snapper utilize sections of greater relief more than areas with less rugosity. In addition to this, my thesis also aims to determine how Red Snapper use artificial reef habitats, especially oil and gas platforms in the Gulf of Mexico, with the expectation of determining the optimal placement of oil and gas structures so that they foster the greatest density of Red Snapper.

R.N. “Dick” Conolly Endowed Scholarship

In August 2008, the R.N. “Dick” Conolly Scholarship was established by the Rotary Club of Corpus Christi to assist deserving full-time graduate students pursuing a master’s or doctoral degree at Texas A&M University-Corpus Christi. Funding is available to students at the Harte Research Institute for Gulf of Mexico Studies with a program of study within the research focus areas of fisheries conservation, particularly those in the Center for Sportfish Science and Conservation with HRI.

Beginning in fiscal year 2017, scholarships are ready every two years and are available to students through Dr. Greg Stunz, Endowed Chair for Fisheries and Ocean Health.



Chas Downey

Master’s Student
Marine Biology

Graduation Date: 2016

Hometown: Corpus Christi, Texas

Thesis:

Diet and Reproduction of Red Snapper (*Lutjanus campechanus*) on Natural and Artificial Reefs in the Northwestern Gulf of Mexico

Red Snapper are a popular sportfish in the Gulf of Mexico with a controversial management plan. The purpose of my study was to compare the diet and reproductive potential of Red Snapper (*Lutjanus campechanus*) at oil and gas platforms and artificial reefs relative to those from natural banks in the western Gulf of Mexico. This work suggests there may be benefits to converting oil and gas platforms into artificial reefs and may help managers make informed decisions on the management of oil and gas platforms in the western Gulf of Mexico. I accepted a position with Texas Parks and Wildlife Coastal Fisheries after graduation and am now a fisheries biologist in the Corpus Christi Field Office.



New Center for Sportfish Science and Conservation Scholarships

Our endowments, scholarships and internships enable us to educate the next generation of researchers whose work will ensure sustainable management of Gulf of Mexico fisheries.

We are proud to announce several new scholarships made possible by the Sportfish Center's many generous partners. These scholarships will support graduate students whose research focuses specifically on the Gulf of Mexico's marine fisheries.



SPORTFISH CENTER
Center for Sportfish Science & Conservation

Shimano & CCA Texas

National Marine Science
Scholarship Program

Shimano and the Coastal Conservation Association have partnered to fund two scholarships for graduate students dedicated to advancing their education in marine fisheries conservation. Preference will be given to those applicants whose research will contribute to the understanding of Gulf of Mexico marine fisheries and management and those that have a passion for recreational fishing.

We are proud to offer the Dan and Carolyn Pedrotti Endowment for Sportfish Science and Conservation. This scholarship will support a top-tier graduate student with tuition and research support as they pursue an education pertaining to sportfish conservation.

Dan & Carolyn Pedrotti Endowment

for the Center for Sportfish
Science and Conservation

CCA Texas Scholarship Fund - HRI

This scholarship will assist two graduate students at the Harte Research Institute. Preference will be given to students conducting graduate-level research that will contribute to the understanding of marine fisheries science and management in the Gulf of Mexico region. Emphasis should be placed on recreational fishing as it pertains to the mission of the Center for Sportfish Science and Conservation.

2018 CCA Summer Interns

The Coastal Conservation Association (CCA), Texas A&M University-Corpus Christi and HRI have partnered since 2002 to fund student internships with the Texas Parks and Wildlife Department's Coastal Fisheries Management Resource and Harvesting Program. Students learn how to conduct fisheries surveys, collect water quality data and collect marine organisms to help monitor the health of local bay systems and get experience working for the state agency. To date, 69 students have been funded through the program and many have continued to full-time employment with TPWD upon graduation.



Jenna Carpenter	Taylor Janise
Desiree Corbiere	Jeremy McCulloch
Ryker Hall	Benjamin Shepard
Daniel Hardin	Jill Thompson-Grim

Thank you for investing in our students whose work will make a difference in the Gulf of Mexico for years to come!

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to make a contribution



www.harterresearchinstitute.org

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