# 2017

# FELLOWSHIPS SCHOLARSHIPS and INTERNSHIPS

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

# From the Director

2017 was another unprecedented year for the Gulf of Mexico, with a half-dozen hurricanes impacting the Gulf Coast during a hyperactive season that showed the power of our changing climate. That includes August's Hurricane Harvey, which made landfall near Rockport, Texas as a destructive Category 4 storm and went on to become the costliest natural disaster in U.S. history, and Hurricane Irma, which devastated our neighbors in the Caribbean, Cuba and Florida.

When Ed Harte founded the Harte Research Institute for Gulf of Mexico Studies in 2000, he directed us to "make a difference." One of the ways we do so is by seeking support to fund the needs of our students and research programs so we can continue to work to ensure an economically and ecologically sustainable Gulf of Mexico. This report profiles 10 HRI students, their research and workshops funded by donors sharing Ed's vision, including students and researchers conducting the science to ensure that our coastal communities will be ready for a changing climate. Thank you for helping us to fund the next generation of Gulf science.

Larry McKinney, PhD
Executive Director

# 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 $235,000 in funding for students. For fiscal year 2017 the fellowship was able to fund nine students with $62,500.

# Michelle Culver *Crutchfield Fellow*

Hometown
*El Dorado, Arkansas*

MS Student
*Coastal and Marine System Science*

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

Graduation Date: *Spring 2018*

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.

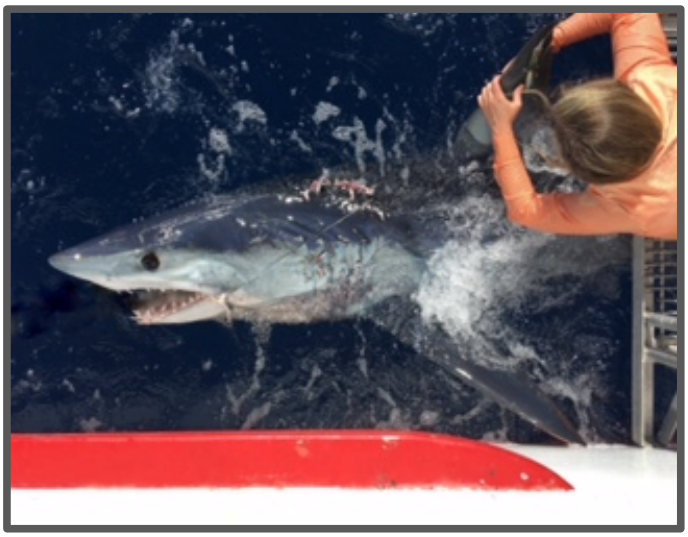
# Kesley Gibson *Crutchfield Fellow*

Hometown
*Martin, Texas*

PhD Student
*Marine Biology*

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

Graduation Date: *Fall 2019*



Artificial reefs provide hotspots for recreational and commercial fishing as well as unique SCUBA diving opportunities. The purpose of my dissertation is to evaluate these habitats in the northwestern Gulf of Mexico, specifically their importance to species that demonstrate varying degrees of attraction to these structures. Some fish like Red Snapper are structure dependent while others such as King Mackerel and sharks are less dependent but commonly take advantage of these structures for feeding opportunities and possible spawning locations. My research is specifically focused on the habitat use of reef dependent (Red Snapper), coastal migratory pelagic (King Mackerel), and highly migratory species (sharks) to various artificial structures off the Texas coast using a combination of acoustic and satellite transmitters. This combination will allow me to track these individual fish at both fine (i.e., movement around a particular reef) and large (i.e., global movements) scales. Results of this research will provide much needed information on the ecological role these structures play in the marine ecosystem as well as provide fisheries managers with useful information for designing artificial reefs and managing these important species.

# Meagan Hardegree *Crutchfield Fellow*

Hometown
*Port Aransas, Texas*

MS Student
*Environmental Science*

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

Graduation Date: Spring 2018

Over the past 20 years benthic community biomass, abundance, and diversity has declined in the Lavaca-Colorado Estuary. The decline of benthos in the Lavaca-Colorado Estuary was attributed to climate effects. My research wants to investigate whether this decline is isolated to the Lavaca-Colorado Estuary or is this 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.

# Lauren Hutchison *Crutchfield Fellow*

Hometown
*San Antonio, Texas*

PhD Student
*Coastal and Marine System Science*

Dissertation
*Operationalizing Coastal Wetland Ecosystem Services for Enhanced Decision Making and Resilience*

Graduation Date: *Fall 2016*

My dissertation research focused on documenting what we know about the ability of coastal wetlands in the northern Gulf of Mexico to store carbon in their biomass and soils. The carbon stored in wetlands is commonly referred to as blue carbon. The better we are able to quantify how much blue carbon is in our wetlands, the easier it will be for us to make informed decisions regarding how we use and develop our coastal resources. In the northern Gulf of Mexico, mangroves are migrating northward into salt marsh wetlands due to changing climatic conditions, such as a decrease in the number of freeze events, which historically limited the northern extent of mangroves. This transition from salt marsh to mangrove habitat has implications regarding the amount of blue carbon stored along our coasts, but will also affect ecosystem services (such as water purification and storm protection) that enhance our human well-being. Understanding these ecosystem services is important so that we can better allocate our scarce resources to protect land that provides highly valuable ecosystem services which coastal communities depend on to enhance their resilience and quality of life.

# Quinn McColly *Crutchfield Fellow*

Hometown
*Chesterton, Indiana*

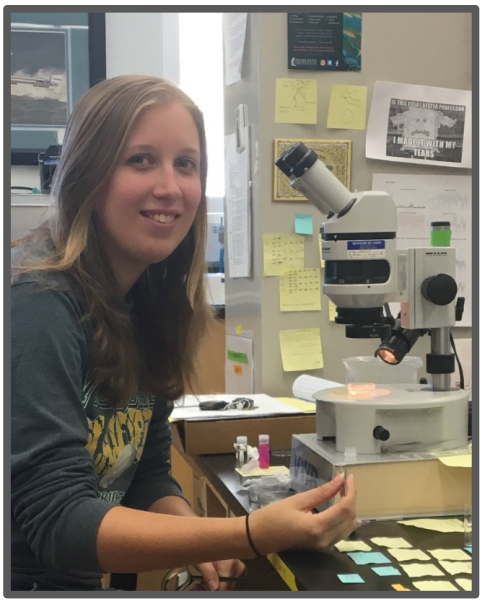
PhD Student
*Coastal and Marine System Science*

Dissertation
*Evaluating Buyers' Interest in an Ecosystem Services Exchange*

Graduation Date: *Fall 2019*

The work I have done, and continue to do, is made possible by generous contributions by donors like you, so thank you. 2017 has been a busy year; I defended my master's thesis and started the Coastal and Marine System Science PhD program. My work revolves around finding ways to engage capital in conservation finance. Often investors speak of "return on investment," I have been looking at ways to quantify returns that are not associated with the traditional dollars and cents methods. For example, an organization may be willing to fund conservation efforts if they see value in the marketing opportunities that participation brings. There is a need to increase the amount of funding available for conservation efforts, and this work can help to bridge that gap. Having spent time as a floor trader and a financial advisor, this work combines finance and science in a way that fits my niche. I hope that by finding creative solutions, with multiple benefits for multiple participants, I may help advance the funding opportunities for conservation for the people of today, and tomorrow.

# Jamie Smith *Crutchfield Fellow*



Hometown
*Houston, Texas*

MS Student
*Coastal and Marine Systems Science*

Thesis
*The Interactive Effects of Hypoxia and High Salinity on Macrobenthic Communities in Corpus Christi Bay, Texas, U.S.A.*

Graduation Date: *Spring 2018*

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.

# Matthew Streich *Crutchfield Fellow*

Hometown
*Lilburn, Georgia*

PhD Student
*Marine Biology*

Dissertation
*Ecology of Red Snapper in the Western Gulf of Mexico: Comparisons Among Artificial and Natural Habitats*

Graduation Date: *Fall 2016*

I decided to come to TAMUCC and HRI in Fall 2012 because of the growing marine biology program and especially the fisheries research lab of Dr. Greg Stunz. My dissertation research at HRI focused on comparing Red Snapper ecology at artificial habitats relative to natural habitats. Comparisons of fish from both natural and artificial habitats were rare until my studies but are essential for understanding the value of artificial reefs. Some of the more important takeaways from my work were that: 1) artificial reefs are important tools for managing the distribution of fishing effort, 2) Red Snapper at artificial reefs grow as well or better than those at natural reefs, and 3) nearshore artificial reefs are important nursery areas for juvenile Red Snapper and can help enhance the Gulf of Mexico population. Collectively, these findings showed that artificial reefs can be beneficial to Red Snapper and they provided valuable insight for managers tasked with future artificial reef development. I graduated with a PhD in Marine Biology in December 2016. Since that time, I have continued working as a postdoctoral research associate with Dr. Greg Stunz at the Center for Sportfish Science and Conservation at HRI to provide sound science for better fisheries management.

# Travis Washburn *Crutchfield Fellow*

Hometown
*Nixa, Missouri*

PhD Student
*Marine Biology*

Dissertation
*The Effects of Oil on Deep-sea Gulf of Mexico Benthos*

Graduation Date: *Spring 2017*

My research focuses on the little understood ocean floor over a mile below the surface. I have always loved the unknown and have been drawn to the mysteries of the deep sea since I began my career. I am studying the effects of the 2010 Deepwater Horizon blowout on the deep sea Gulf of Mexico. I am not only examining the impacts and extent of damages from the spill but also comparing these communities to areas near natural oil seeps. To put these impacts into perspective my project also explores the benefits humans receive from the deep sea (such as food and oil) and how humans can impact these benefits. I graduated with my doctorate in May 2017 and am currently finishing up all of my dissertation work. I have just received a post doctoral position at the Duke Marine Laboratory examining the impacts of deep-sea mining on the environment.

# Danielle Zimmerman *Crutchfield Fellow*

Hometown
*Katy, Texas*

MS Student
*Marine Biology*

Thesis
*Effects of Salinity and Disease on Scope for Growth of Oysters (Crassostrea virginica)*

Graduation Date: *Spring 2018*

My research focuses on the effects changes in salinity have on the health of oysters. To study this, I am collecting oysters and conducting week long lab experiments that are designed to assess physiological changes, such as changes in eating habits, breathing rates, and disease intensity. Each oyster is held at a constant salinity after it is collected from the bay, and then put into its test salinity without any acclimation time. This is intended to simulate natural decreases in salinity from freshwater input, typically from rivers and rain. After the experiment has ended, I take a tissue sample from the oyster and analyze it for the presence of disease. Oysters can be infected by a parasite commonly referred to as Dermo. While not harmful to humans, Dermo has the potential to kill heavily infected oysters, and eventually decimate oyster populations. The effects of changes in salinity on oyster health are important to understand because oysters represent a valuable fishery in Texas.

# Furgason Fellowship Endowment

In June 2007, the Furgason Fellowships were established by Ed Harte and Joe Hornblower in honor of Dr. Robert Furgason, President Emeritus of Texas A&M University-Corpus Christi and founding Executive Director of the Harte Research Institute for Gulf of Mexico Studies. The purpose of the endowment is to fund teaching and research fellowships at HRI exclusively from Mexican or Cuban universities. In August 2010, the purpose of the fellowship was expanded to include funding of conferences, workshops, and symposia on subjects related to the Gulf of Mexico.

Funding expended during fiscal year 2017 totaled $60,000.

# Furgason Student Workshop in International Management: Cuba

HRI hosted 18 graduate students from institutions in Mexico, Cuba and the United States from July 9-16 for the week-long Furgason Student Workshop in International Management in Cuba, funded through the Furgason Fellowship Endowment. The program was designed to bring future leaders in marine science together to work on a professional project, and begin to develop personal and professional relationships that will extend into their careers. Students visited a model agro-tourism community called La Picadora and Caguanes National Park, where they went birding, caving, and met with the park rangers to discuss their plans and needs. The students had breakout sessions to discuss ideas for tourism development that could also help to protect the park's natural resources, providing input for Cuban National Park officials as they move forward, and real world working experience for the international students. This was the third in a series of workshops that have now visited locations in each Gulf country: Corpus Christi, Texas; Veracruz, Mexico and Cuba. HRI plans to continue to host the workshop both locally and internationally in the future.

# Margaret “Maggie” Bains Scholarship

In May 2013, the Margaret “Maggie” Bains Scholarship was established by the Chapel in the Hills Interdenominational Church in Wimberley, Texas, the Harte Research Institute for Gulf of Mexico Studies, and her former co-workers from the Harte Research Institute. Maggie, a former lab assistant at HRI, was recognized for her years of dedication to marine science with the establishment of an endowed scholarship in her name.

Beginning in fiscal year 2017, scholarships are ready and available to students.

# Ageless Science

In 2006, Maggie became part of the HRI team, accepting a part-time job sorting Antarctic benthic samples in Dr. Paul Montagna's benthic ecology lab. She worked in the benthic lab studying samples of animals and plants living at the bottom of seas and lakes, and found her second career with HRI after more than 30 years teaching in Texas public schools.

Maggie retired again in 2011 and Montagna, Endowed Chair for Ecosystems and Modeling, says that in the short time she spent working with his benthic group, Maggie had a tremendous impact on the success of the research program. "Maggie is an inspiration to generations of marine biologists because her love of marine critters is so apparent and infectious.

*"It thrills me to know that this scholarship will help pass my love for marine science on to a new generation and help them acquire valuable knowledge about the Gulf of Mexico" – Maggie Bains*

Wimberley, Texas

BS Biology
Rice University

MS Marine Zoology
Texas A&M University Galveston

Taught in Texas Public Schools for over 30 Years

# 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.

# Gentleman Conservationist

Gentleman Conservationist – a term coined locally that best described Richard Noble "Dick" Conolly. He moved to Corpus Christi as a young boy working his way through high school then going on to Texas A&M University (TAMU), earning a degree in Agriculture Economics and a member of the ROTC. After being discharged from the US Army Air Corps, Dick became a successful businessman who contributed both time and money to Corpus Christi and TAMU. Some of his favorite pastimes were fishing and hunting. When his good friend Harvey Weil passed away, Dick Conolly raised $1 million to establish the Harvey Weil Sportsman Conservation Trust. This trust actively supports conservation efforts and wildlife initiatives throughout South Texas.

The R.N. "Dick" Conolly Scholarship was established by this trust and is managed by the Rotary Club of Corpus Christi.

Born
Athens, Georgia

Home
Corpus Christi, Texas

Bachelor's Agriculture Economics, 1937
Texas A&M University

# Dr. John “Wes” Tunnell Jr. Fellowship

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 $1 million endowment.

# Local Legend

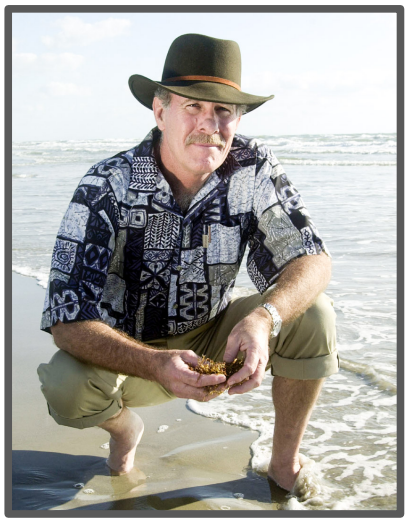
Dr. Wes Tunnell is a marine ecologist and biologist focusing primarily on coastal and coral reef ecosystems, and has been studying the banks off South Texas since his graduate research work in the late 1960s. He is founder and former Director of the Center for Coastal Studies, and he assisted in the development of the Harte Research Institute, served as its first Associate Director and helped design its building. Tunnell also assisted in the development of two Bachelor of Science degree programs along with four master's degree and two doctoral programs at Texas A&M-Corpus Christi. Tunnell was also instrumental in establishing seven graduate student scholarships in the Center for Coastal Studies and has advised or co-advised 70 M.S. students, 7 Ph.D. students and 4 post-doctoral research associates. For 32 years, Tunnell taught Coral Reef Ecology, taking students on two-week field trips to Veracruz and the Mexican Caribbean as part of an international teaching and research program. One of 18 classes Tunnell taught over the course of his career, he was known for making classrooms out of the deck of a boat and conducting his lectures while wearing scuba gear.

Taft, Texas

BS Biology and MS in Biology
Texas A&I University
(now Texas A&M University – Kingsville)

PhD Biology
Texas A&M University

Dr. Tunnell has published over 115 articles, book chapters, and proceedings papers, as well as seven books



# Coral Lozada Perez *Dr. John "Wes" Tunnell Jr. Fellowship*

Hometown
*Katy, Texas*

PhD Student
*Coastal Marine System Science*

Dissertation
*Drivers of Continued Participation in Risky Behavior by Hookah Fishermen in the Yucatan*

Graduation Date: Summer 2019

My project will focus on describing a phenomenon in the hookah-diving fisheries along the Yucatan coast. Hookah-diving or compressor diving is the preferred method for lobster and sea cucumber fishing world-wide and was introduced in the Yucatan in the 80's. With the boom of sea cucumber fishing across Mexico, there has also been an increase in deaths from decompression and carbon monoxide poisoning due to this method of fishing. I spent the summer of 2017 taking a course in Merida, Yucatan and met researchers that had started working with this social problem identified by the communities. Mexico has seen an increase in its tourism and coastal growth in the last couple of years. This rapid growth coupled with changes in management techniques of the fisheries have created socio-economic tensions for the coastal communities. We have to move beyond just identifying perceptions of risk and look towards assessing the drivers that lead people to make the choices they make. Understanding why community members make certain choices and take certain risks help policy makers at both local and state levels draft policies that have a greater chance of successful implementation.

Texas Parks & Wildlife and Coastal Conservation Association

# Summer Internship Program

In May 2002, the Coastal Conservation Association-Texas (CCA) and Texas Parks & Wildlife Department (TPWD) partnered to support a summer internship program. The program was designed to give TAMUCC students hands-on experience in the field working along side state agency personnel. When the students are not in the field working with gill nets or bag seines, they are back at the office repairing gear and completing data entry. It started with one student, and the program has grown to funding seven student interns for a total of $45,500 in 2017. This growth was possible with the addition of other partners, Mr. and Mrs. Big Tournaments. These two organizations have joined CCA in sponsoring the summer internships to expand the program. Since 2002, the internship program has provided students over $392,500 in funding.

## 2017 Summer Interns funded by CCA-Texas

Son Tran
*Aransas Bay*

Audrey Kuhl
*Corpus Christi Bay*

AnnDee McVicker
*Upper Laguna Madre*

Delaney Felix
*Corpus Christi ERP*

Alfonso Cohuo
*Corpus Christi HAT*

Tyler Purcell
*CCA Marine Development Center*

Cynthia Soliz
*Perry R. Bass MFRS*

COASTAL CONSERVATION ASSOCIATION TEXAS

## 2017 Summer Interns funded by Mr. and Mrs. Big Tournament

Mr. & Mrs. Big TOURNAMENT
LIVE FISH SCHOLARSHIP

Zachary Russell
*Upper Laguna Madre*

Emily Collier
*Upper Laguna Madre*

# TPWD Summer Interns Since Inception

**2002**
Steven Dial

**2003**
Kevin Kolodziejcyk

**2004**
Brian Bartram

**2005**
Aaron Baxter

**2006**
Adriana Leiva

**2007**
Elani Morgan

**2008**
Paul Cason
Sunnie Hart

**2009**
Daniel Pritchard
Brian Witherell
Abigail Lashbrook
Cynthia Kelly

**2010**
Lee Schoech
Bobby Johnson
Jeffrey Long
Abigail Lashbrook
Colin Nash

**2011**
Amanda Gruber
Nathan Gurierrez
Aaron Otero
James Sanchez
Marci Durocher

**2012**
Zaida Hager
Nathan Huysman
Elliot Briell
Nicole Poluson
Michael Birchfield

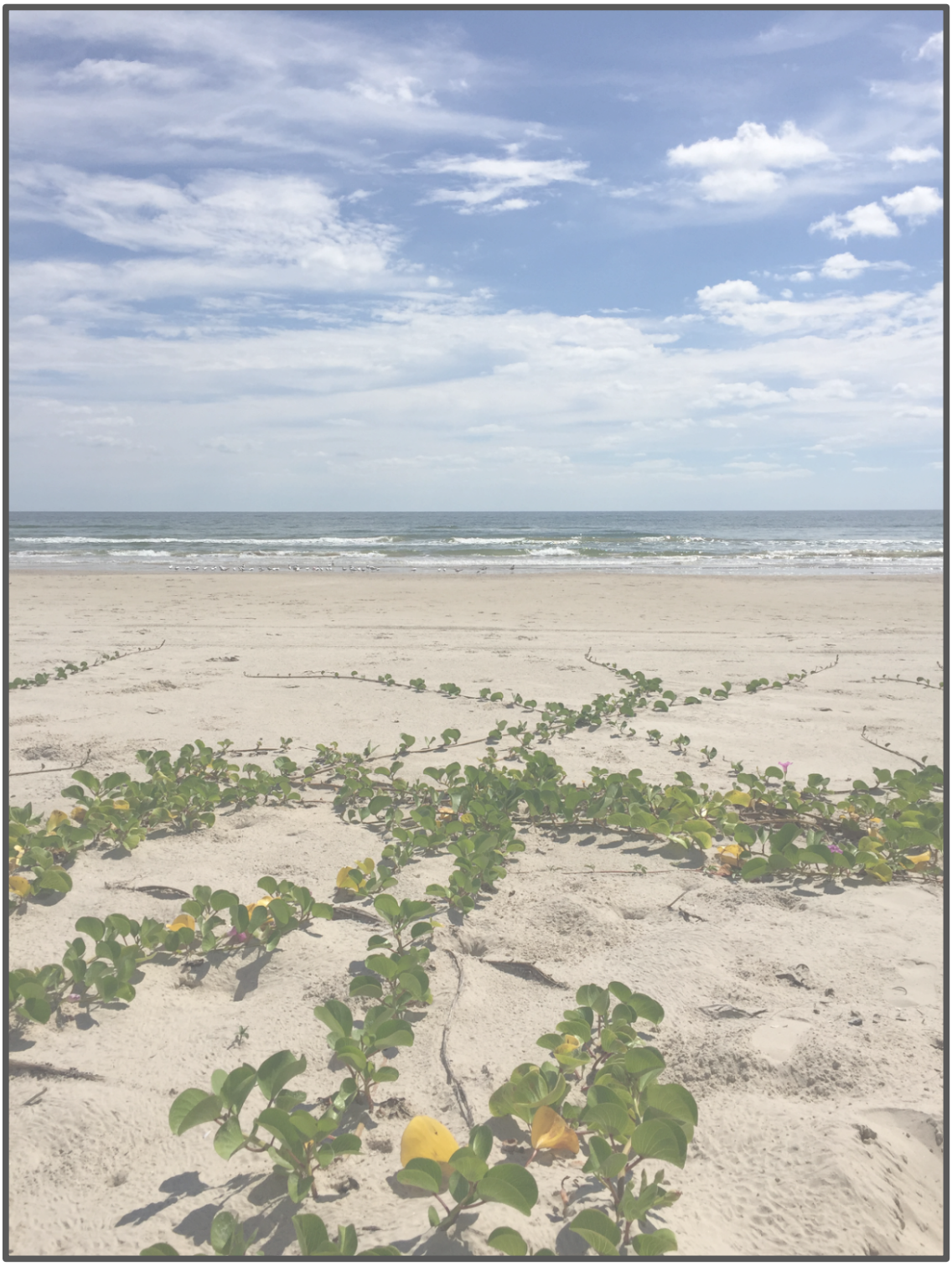
**2013**
Clinton Witherell
Danielle Zimmerman
David Norris
Gloria Alacraz
Erin Buschfort

**2014**
Sarah Kimbrough
Meghan Martinez
Nicole Thomas
Maria Cooksey
Greg Purtle
Heidi Ballew

**2015**
Braden Gross
Erica Phillips
Roxie Miller
Daniel Lord
Courtney Knauer
Julie Rohl
Autumn Torres
Drew Duarte

**2016**
Eric White
Danielle DeVacque
Marie Pendleton
Courtney Wallis
Zach Crain
Melisa Garcia
Julie Rohl

***Thank you for supporting the future of our Gulf of Mexico***



If you wish to contribute, please contact us at 361-825-2020 or info@harteresearchinstitute.org

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