MY JOURNEY TO THE NORTH POLE by LAURA WHITMORE

Upon arriving at USM in August 2014, I was given the opportunity to participate in a research expedition to the Arctic Ocean. Ever since I spoke with my family, my sister has been telling everyone I’m finding Santa Claus – like “Finding Bigfoot,” but cooler. And I’m doing it all for science! I like to think I’ll encounter something magical at the North Pole; whether or not it will be Santa and his workshop is left to be discovered.

GEOTRACES is an international program characterizing the marine geochemistry of trace metals and their isotopes in the world’s oceans. As a part of this mission, the U.S. National Science Foundation is sponsoring a GEOTRACES cruise this summer in the Arctic Ocean on the USCGC Healy. The USCGC Healy is a 128-meter icebreaker designed primarily as a research vessel, which 50 scientists and the Coast Guard crew will call home for 70 days, as the ship sails from Dutch Harbor, Alaska, to the North Pole (ice conditions permitting) and back.

The Arctic Ocean plays an important role in ocean circulation, and these high-latitude areas are especially sensitive to climate change.

However, the difficulties of working in this environment have limited our understanding of the oceanography and especially the marine chemistry of this ocean basin. Aboard ship will be research groups studying distributions of micronutrients, like iron and zinc; toxic elements, like arsenic and copper; and elements indicative of material sources, such as barium and gallium (both of which will be determined in the Shiller lab when the samples come back from sea).

Aboard ship I will be studying dissolved methane in seawater. Because methane is a potent Greenhouse Gas, understanding its seawater distribution and flux to the atmosphere is an important problem in climate science. Additionally, the Arctic has large reservoirs of methane sequestered in permafrost and sediment hydrates, all of which are susceptible to release into the water and atmosphere with increased temperatures. Thus, I’ll be studying a region that could play a key feedback role in continued global warming. Our instrumentation and techniques will allow us to measure methane concentrations in two distinct patterns. The first will be a continuous surface water measurement, and the second will be discrete samples from Niskin bottles to generate depth profiles. We hope to be able to understand methane transport and flux by coupling our data with trace metal data.

In mid-June, I traveled to Seattle to set up instrumentation and prepare our supplies for transit to Dutch Harbor. With a menagerie of unorganized people and equipment aboard the boat, there was expected chaos. We faced challenges securing equipment and mostly fitting everyone’s required gear in the spaces available. We will embark from Dutch Harbor in early August and return in mid-October. I am hoping to engage in discussions with a few teachers in the greater Gulf Coast region to bring the experiences and discoveries from the cruise to K-12 students. I am very excited and thankful for this opportunity.
As a new academic year approaches, I want to take a moment and express my gratitude to all of those in the Department of Marine Science for making the past year so memorable. Our research and education programs have really flourished, and it’s hard to keep up with all the activity.

In March, The University of Southern Mississippi took ownership of the 135’ research vessel *Point Sur*. This was particularly sentimental for me and some others in the department, as we’ve sailed on her around Pacific waters in the past. Bringing her through the Panama Canal with USM administration and guests was an added treat, and we are happy to have her call Gulfport her home! Thanks go to Governor Bryant, President Bennett, Vice-President for Research Cannon and the Department of Environmental Quality for making the *Point Sur* a reality. We are once again a truly “wet oceanography” research and academic program!

We’ve also been busy gearing up our new GoMRI-funded research grant, CONCORDE. In addition to the 15 faculty and staff members at DMS who are on this project, we have a number of graduate students and newly hired post-docs joining our ranks. We’re excited for this opportunity to use new technology and collaborate with institutions across the country, including Oregon State University, the Naval Research Lab, Mississippi State University, Old Dominion University, University of South Alabama/Dauphin Island Sea Lab, and Rutgers.

Our Hydrographic Science program has expanded! The USM Gulf Park campus will begin hosting undergraduate students interested in earning their Category B hydrographic certification this fall. In addition, our Category A program, based at Stennis, will see its biggest incoming class ever, with 18 students enrolled in the fall semester. Our class of 2015 graduated 13 students from the Category A program on July 30, and we’re looking forward to a new crop of students wandering our halls in the fall.

We will be welcoming two new faculty members, Dr. Jessica Pilarczyk (climate change oceanography) and Dr. Chris Hayes (marine chemistry), in January. Our other young faculty members have been busy: Dr. Davin Wallace was the recipient of the National Academy of Sciences Early Career Research Fellowship; Dr. Ian Church has presented at national conferences and has collaborated with researchers from Canada, the U.K. and Japan; Dr. Maarten Buijsman has published four papers and received funding from three grants; and Dr. Danielle Greenhow has been working with another GoMRI consortium, LADC-GEMM, all within the last seven months! We are proud of our young faculty who continue to prove that DMS is among the top Marine Science programs in the nation, and we look forward to seeing how they change the face of Marine Science research.

As most of you know, I’ve also been serving as the interim director of the Gulf Coast Research Laboratory for the last six months, in addition to my duties as chair of the Marine Science program at Stennis. With the support of the dean of the College of Science and Technology, we are developing a proposal to integrate USM’s vast capabilities in marine sciences across the Mississippi coast.

In addition to all of the above accomplishments, we’ve seen two of our students earn awards from the national office for the Marine Technology Society (MTS). Another student will be spending most of her fall semester in the Artic on a GEOTRACES cruise, and we welcome seven new marine science graduate students into the fold when classes start.

We’ve been busy over the last seven months, and are looking forward to seeing what the rest of this year has in store for us. Stay tuned!

Monty Graham
WORLD OCEANS DAY 2015

World Oceans Day is recognized by the United Nations on June 8 as the official day to be aware of our oceans.

People all over our blue planet organize celebrations to support action to protect the ocean. This year, the theme was *Healthy Oceans, Healthy Planet*. DMS celebrated with a number of faculty and staff by inviting D'Iberville Boys and Girls club members to tour the R/V *Endeavor* and the R/V *Point Sur*. The event was sponsored by ECOGIG with help from CONCORDE. Both are consortia funded by the Gulf of Mexico Research Initiative (GoMRI). The event kicked off with the Port of Gulfport’s Jonathan Daniels welcoming all in attendance. Kids were also given the opportunity to work on building ROVs with undergraduate students from Missouri currently taking an oceanography summer class with Dr. Jessica Kastler from the Gulf Coast Research Laboratory (GCRL).

Students were encouraged to think about what the ocean means to them and what it has to offer. World Oceans Day 2015 = SUCCESS!

A NEW BILATERAL AGREEMENT BETWEEN SOUTHERN MISS AND THE ENVIRONMENTAL PROTECTION AGENCY

In June, The University of Southern Mississippi and the Environmental Protection Agency’s Gulf of Mexico Program (EPA Gulf Program) signed a Memorandum of Understanding (MOU) that will increase collaboration, resolving environmental and natural resource problems within the ecological system of the Gulf of Mexico. This new agreement will only strengthen current relations and will make work as a team more efficient and effective.

According to USM President Rodney D. Bennett, this will create a stronger link between Gulf resources, education and research opportunities, and community and economic development.

Ultimately, this cooperative endeavor will pave the way for future careers in science, technology, engineering, and mathematics (STEM).

EARLY-CAREER RESEARCH FELLOWSHIP IN THE NATIONAL ACADEMY OF SCIENCES (NAS) GULF RESEARCH PROGRAM

Department of Marine Science assistant professor, Dr. Davin Wallace, has been awarded a prestigious and highly competitive Early-Career Research Fellowship by the National Academy of Sciences (NAS) Gulf Research Program.

Dr. Wallace stated that his aim is to “understand the dynamics of coastal barrier islands, bays, and marshes along the northern Gulf of Mexico in response to variable rates of sea-level rise, storm impacts, and sediment supply.”

This fellowship will help support student fellowships, as well as provide resources for his research initiatives. Chair and professor Dr. Graham stated that this is a “great honor for Davin, and we are proud of him!”
USM MTS EARTH DAY

The Marine Technology Society (USM MTS), incorporated in June of 1963, is still successfully guiding its purpose, which is “to promote awareness, understanding, advancement, and application of marine technology.” MTS is consistently demonstrating and hosting successful ROV-in-a-Bag events.

This year, students David Maggio and Stephan O’Brien, along with chapter advisor, Dr. Stephan Howden, visited Pontchartrain Elementary School in Louisiana to celebrate Earth Day at the Elementary Earth and Science Day Festival. The students were taught about underwater robots and where and why they are used. They also learned about the engineering design process and how it is used to solve problems and create new technologies.

Dr. Howden demonstrated an Autonomous Underwater Vehicle (a Slocum Seaglider) and a video showing deployment. Slocum Gliders have the ability to sample in remote subsurface areas at a regional scale. A Slocum Glider carries a variety of sensors that can be programmed to patrol for weeks at a time collecting samples. A Slocum Glider must surface to transmit data to shore and will download new instructions upon surfacing.

USM MTS also set up three mini ROVs in a pool for students to operate. Students were intrigued by the ability to remotely operate a vehicle. Footage could be viewed on a nearby screen.

According to David Maggio, “The students were having a wonderful time driving the ROVs in a small pool. They asked great questions about how the ROVs worked and about the ocean in general, cheered on their classmates, and shouted in excitement whenever someone got splashed by a propeller. It was a great feeling to be a part of getting the students so excited about marine science.”

Mission accomplished! These students have taken a step toward understanding the exciting diverse world of underwater robotics, and USM MTS continues the legacy of ROV-in-a-Bag.

SOS ANNUAL CRAWFISH BOIL 2015

What looks, tastes, and smells like seafood but doesn’t come from the sea? Crawfish! This freshwater shellfish also goes by the name mudbug. The Student Oceanography Society (SOS) hosted their annual Crawfish Boil at Buccaneer State Park along with the annual bonfire on Friday, May 29. Efforts were also made by the SOS committee to merge the Long Beach, GCRL, and Stennis locations together for one big end of semester jamboree.

This year, SOS faculty advisor Davin Wallace was eager to have a “true boil” (actually boiling the crawfish). Dr. Monty Graham chair and professor of DMS, spear headed a small awards ceremony at the “true boil” to honor our Marine Science Scholar, Outstanding Undergraduate Student, and our two Outstanding Graduate Students.
Charlotte Brunner
“Metric to Track Progress of Restored Marshes,” PI: Charlotte Brunner, was funded by Tidelands in the amount of $80,000 for one year starting June 1. The project involves monitoring the progress of a restored marsh at Deer Island, MS.

Alan Shiller
GEOTRACES Arctic Section: Methane, vanadium, barium, and gallium as process indicators in the Arctic Ocean. NSF Chemical Oceanography, 1/15/13 - 12/31/15, $199,955. PI: A.M. Shiller.

ONR-NOPP: Russian Dolls: Nesting a turbulent Large Eddy Simulation within anhydrostatic Adaptive Grid Model within a 1/25 HYCOM model ($130k).

NSF: Collaborative research: Generation of internal waves due to the scattering of semidiurnal hybrid Kelvin-edge waves at varying continental shelf topography ($227k).

Davin Wallace
National Academy of Sciences, Gulf Research Program, Early-Career Research Fellowship ($76,000).

Danielle Greenhow
PIs: Natalia Sodorovskaia and Stan Kuczaj (USM); USM Collaborators: Danielle Greenhow, Ken Barbor, and James Stevens 1/1/2015-12/31/2017 $5.24M ($312,755 Greenhow).

Max van Norden
IHO– Korean Fund: The International Hydrographic Organization and the Korean Hydrographic and Oceanographic Administration agreed to continue funding students from developing nations. For AY 2014-15 ($120k). For AY 2015-16 ($176.5).

PUBLICATIONS


