

FISHING FOR ANSWERS

Some people find their passion early in life. Gorka Sancho knew he wanted to study fishes since he was eight years old. It may have been regular visits to the New England Aquarium or going fishing with his father in Boston—childhood fish ID guides full of crayon and colored pencil writing tell that early story.

Gorka took the long road to GML. After moving to Spain with his parents when the Franco dictatorship ended, he grew up in a 10th floor flat in Madrid. His passion for fishes continued through fishing trips to mountain rivers on weekends and spearfishing in the Mediterranean during family vacations. He obtained a bachelor's degree in General Biology at the Autonomia University of Madrid, followed by a PhD in Biological Oceanography at the MIT/WHOI Joint Program, studying the behavioral ecology of coral reef fishes in Johnston Atoll in the Central Pacific. He stayed for a short postdoc at WHOI to study the feeding ecology of fishes at hydrothermal vents (and got to dive in Alvin) and taught oceanography at Sea Education Association. He left Cape Cod to work with his wife Deb Bidwell as co-Director of the Hofstra University Marine Lab in Jamaica for a year. He then returned to Europe to work as a fishery scientist in the Basque Regional Fisheries Institute in Spain, studying the effects of abandoned "ghost" fishing nets and the management of eel elver fisheries. In 2002, after having his first kid, Gorka hopped back across the Atlantic to GML to research fish and to teach undergraduate courses in the Biology of Fishes and Oceanography, which he continues to enjoy.



While his original research projects at GML were based in the equatorial Indian Ocean, he eventually shifted to studying coastal and estuarine species of the southeast. In fruitful collaboration with scientists at SCDNR and with multiple graduate students over the years, he has studied the movements of spotted seatrout, southern flounder and tiger sharks, dietary ecology of multiple shark species and invasive lionfish, ingestion of microplastics by fishes, and effects of catch and release recreational fisheries on blacktip sharks. In addition, smaller projects with undergraduates have provided rewarding learning opportunities and in some cases publications with students as lead authors.

Gorka is continuing to study microplastic ingestion by fishes in Lowcountry estuaries and the natural history of local shark species. He is also beginning studies of spawning aggregations of silversides in Charleston Harbor and the movement of large particulate organic carbon (POC) in river and oceanic environments. He continues to advocate for increased use of Marine Protected Areas in the U.S to protect valuable resources and increase the resilience of fisheries. He also dreams of moving from his office out to the rocks behind GML, where you might find him directly studying the feeding behavior of the local spotted seatrout with a fishing rod in his hand.

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UNDERGRADUATES HOLD DOWN THE FORT

The pandemic has been a challenging time for students, but several undergrads have been a major force in continuing research in laboratories at GML. To honor their perseverance in the face of shutdowns, slowdowns, space limitations, and supply chain disruptions, we feature the work of three who kept research going despite the challenges.

Emily Dombrowski (Beers Lab)

I started working with Dr. Jody Beers in the fall of 2019. We received SURF grant funding through the College of Charleston to do a summer research project at Hollings Marine Lab on the effect of a parasite, *Kudoa inornata*, on spotted seatrout, *Cynoscion nebulosus*. We were interested in how metabolic indicators related to parasite function at different temperatures. When HML closed we were fortunate to move into space at GML. We recently completed the project, discovering that hematocrit levels and lactate levels are significantly altered in infected seatrout at different temperatures. This project introduced me to so many valuable parts of the research process,



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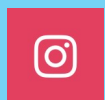
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UNDERGRADS HOLD DOWN THE FORT

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from collaborating with the graduate students to accommodating unforeseen changes. I have genuinely loved getting to know the GML staff and pursuing unique opportunities as they arise, like seining in the harbor and working alongside other undergraduate students.

This summer I am participating in the Fort Johnson REU program and continuing to work with Dr. Beers on a project on the horseshoe crab *Limulus polyphemus*. *Limulus* blood is used as a chemical indicator to detect minute bacterial contamination in batches of vaccines or IVs. We are interested in learning about temperature's effect on enzymatic activity. These organisms are at risk as demand for blood has led to overharvesting. Our research will analyze the most effective temperatures for enzyme analysis and effects of blood draws on crabs to ensure higher survival rates following re-release.

My work in the Beers Lab continues to foster my interest in research and has brought new opportunities. I was recently named an Ernest F. Hollings Scholar, which will provide a scholarship and internship with NOAA next summer. Following my graduation in 2023, I hope to pursue a PhD in marine biology and work as faculty at a research university or do conservation work with a government agency.

Morgan Lattomus (Sancho Lab)

My research focuses on microplastic ingestion by pups of five different species of sharks found in South Carolina estuaries. I worked with the SCDNR shark monitoring program last summer to collect samples from their bycatch, which is how I spent most of my Mondays and Wednesdays. I then dissolved the stomachs and intestinal tracts of the shark pups and vacuum filtered the microplastics away from the digested tissue. I am currently working with Dr. Barbara Beckingham in the Geology Dept. to quantify and identify the ingested microplastics.

With more than 80 sharks and 4 filters per shark, I have about 360 filters to examine! The research was already going to take a long time, but with a two-month delay because of the pandemic, I'm now extending my work into this upcoming summer to finish up processing all of my samples.

My favorite part of doing research is getting to work with amazing people to find out something new. It's like a really complicated puzzle (and in my case, very smelly - sorry to everyone on the second floor who had to smell my digesting samples). Gorka was an awesome resource this past summer while I was figuring out methods and small details of the research, and now Barbara is a massive help in microplastic identification. I was very lucky to have two advisors specializing in separate parts of my research, and pooling their advice has been a really educational experience. And although the pandemic secluded me to working in the lab by myself, the other summer research students and I made the most of it with lunch outdoors, discussions of our research, and massive building-wide Jenga games.

Hails Tanaka (Podolsky Lab)

I met Dr. Podolsky in the fall of 2019 at the SSM research mixer. I initially started working with his graduate student Juliana, helping her with collections of porcelain crabs for her thesis. When Dr. Podolsky and I talked about the summer, we discussed doing a project that would be based on my interests in crabs and barnacles.

We started out asking whether salinity affects the survival of parasitic barnacles (*Loxothylacus panopaei*) or their mud crab (*Eurypanopeus depressus*) hosts. We collected parasitized and non-parasitized crabs from the estuary and placed them under different salinity conditions, tracking their survival as well as growth of the barnacle's "externa," or reproductive organ. Overall, non-parasitized crabs survived better than parasitized ones, and survival was highest at intermediate to high salinities. Similarly,

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barnacle externae grew most at intermediate salinity levels. Our results so far do not point to an ecological factor that can allow the host to escape the parasite.

Working at GML during the pandemic summer was certainly different from working there during the previous spring. There were fewer people around and it felt eerie to be the only person in the building at times. However, the few of us that were around formed a small community over lunches and socially distanced giant Jenga. Given the isolating effects of the pandemic, it was nice to be able to continue to carry on research and to see some people safely as we worked on our projects. The benefits of this opportunity to my education were important, as I got to create my own research project and work out methods and data analysis with Dr. Podolsky. He was very supportive and helped me to troubleshoot and also to take care of the crabs.

I am currently doing research as a Summer Student Fellow as part of the Woods Hole Oceanographic Institute's summer program. In the fall I plan to be working on my bachelor's essay with Dr. Podolsky, and I will be applying to graduate school to continue pursuing a career in research following graduation.



MARINE BIOLOGY GRAD STUDENT ASSOCIATION

Despite the crazy year we have had, the MBGSA has remained active and engaged within our marine biology community. During the fall semester, our students started strong with many volunteer events. We began with a beach cleanup at several locations, including the beach behind the Department of Natural Resources MRRI building at Fort Johnson, as well as at points along Folly Beach. Later in the semester we also led a road clean-up along our adopted portion of Fort Johnson Road. Both of these events brought our community together while removing bags of litter from our environment! During a long outdoor workday, the fall semester also allowed us to bring some well-needed TLC to the Green Teaching Garden at GML.

This spring has brought more opportunities to be innovative with pandemic-safe MBGSA events. We hosted another Garden Day for our Green Teaching Garden. Students came together for a nice spring cleaning, and got the spots ready to plant again! We also got in touch with our creative sides and painted some lovely rocks to decorate the garden.

During the fall, we proudly supported some awesome GPMB student defenses, all held online due to the pandemic. Although there were tight restrictions put in place for events at the College this year, we were able to stay connected with our community, environment, and with each other. We are looking forward to things getting back to normal and allowing all of us in the graduate program to interact more in person once again.

GPMB STUDENT TAKES ON LEADERSHIP ROLE

For her graduate research, **GPMB student Brooke Blosser** has taken on the challenge of understanding microplastic contamination in oysters, a topic with implications for the health of both marine organisms and humans. She has also recently taken on another big challenge, having been elected President of the campus-wide Graduate Student Association. Fueled by personal experiences and financial hardships during her own time in graduate school, she was inspired to become a voice for her fellow graduate students. One of her first actions was to conduct a survey of the graduate student experience, including the admissions process, financial challenges, and impacts of COVID-19. The important results of this survey will soon be communicated to College administration. Acknowledging the need to adapt to current conditions, Brooke says, "Although the events of the Graduate Student Association have looked different in the face of the COVID-19 pandemic, I am eternally grateful for the opportunity to represent my fellow students and provide a voice for underrepresented groups." In this role, Brooke has also been tasked with participation in several important campus committees, including the graduate dean search committee, the Strategic Planning Pillar I Steering Committee for Student Experience and Success, and the Commencement Committee. She is writing her thesis and plans to defend in the fall.



FACULTY NOTES

Beers Lab: We were fortunate this past year to be able to set up shop at GML to work around Covid-related limitations at HML. Our temporary lab home has allowed us to continue our research in various areas. Several lab members have been studying the unique relationship between spotted seatrout and the muscle myxozoan, *Kudoa inornata*, a parasite that has previously been shown to enhance swimming performance in the fish. GPMB students Jess Daly (3rd year) and Gus Snyder (2nd year) have been leading the charge on this work and are pursuing projects investigating the physiological mechanisms underlying the relationship between seatrout and *Kudoa*. Jess is set to defend her thesis before the end of the summer and will be the first graduate from the Beers Lab! Emily Dombrowski and Rylie Talmadge, CofC marine biology undergraduates from the Honor's College, also made valuable contributions to the seatrout work through SURF Grants. Jake Cashour (GPMB 2nd year) has been busy in the field and the lab examining the physiological stress response and post-release mortality of bonnethead sharks in relation to biotic (recreational angling) and abiotic (temperature and dissolved oxygen) factors. Finally, we have just begun to explore an exciting new area of research – physiology and blood (i.e. hemolymph) biochemistry of horseshoe crabs. This work is starting this summer and Emily, via a CofC Summer REU Fellowship, will be assisting in a pilot project examining heart rate and hemolymph quality of horseshoe crabs in response to temperature. It's been a productive year with a lot more to come!

de Buron Lab: The motto of the Buron lab this unusual past year has been "Tie up loose ends!" And so we did, or rather we started to, ...there is so much more to do!... In collaboration with my colleagues, Eric McElroy and Kristy Hill-Spanik, among others, we were invited to publish our work on seatrout blood flukes in the International Journal for Parasitology. Happily done! And to our great pleasure our colleague Jody Beers is now adding her perspective, expertise, and students to the pursuit of understanding the fascinating world of seatrout parasites. Fully masked and appropriately distanced, we were also able to squeeze in limited but intense field sampling of coquinas at Folly Beach. This allowed us to wrap up a study on their parasites that was based upon GPMB alumna Tessa Bricker's observations some 10 years ago!... the study took on a whole new and exciting dimension based upon Kristy's inquisitiveness and thoroughness, which was a great model for all students involved, even remotely. Many thanks to GPMB alumni Andrea Margiotta O'Donnell and Timothy O'Donnell for sampling coquinas up North! The paper is now 'in press' in the well-received journal, Parasite. One other highlight of this year is the thrill of seeing a former undergraduate in the laboratory, Kaitlyn Dalrymple, receive a scholarship from the University of Paraná in Brazil to pursue her Master's in Ecology and Conservation with fellow evolutionary parasitologist, Walter Boeger. Kaitlyn is pursuing her thesis on the taxonomy and phylogeny of gill parasites of hammerhead sharks, a project she had started while an undergraduate in the lab and in collaboration with the SCDNR. While there was no time to wrap up

our work on the parasites of the fish of the Moroccan desert, the slides are on the microscope, so stay tuned....

DiTullio Lab: During the 2020-21 academic year, our research activities in the Hollings Marine Laboratory were markedly curtailed due to the ongoing pandemic. Current laboratory members include research associate Dr. Peter Lee, research assistant Nicole Schanke and recent CofC graduate Emmy Sheahan. Laboratory analyses are ongoing from samples collected during our 2018 "Pole to Pole" expeditions to the Central Arctic and Antarctica. During this academic year, three manuscripts were published, and another is in-press in the journals *PNAS*, *Nature Microbiology* *Limnology and Oceanography* and



Global Biogeochemical Cycles. As usual the citations for these publications can be found at the CofC Biology Dept faculty website. Nicole Schanke was the lead author on our 2021 publication entitled "Biogeochemical and ecological variability at an ice-floe drift station during the summer-autumn transition in the Central Arctic Ocean". This paper was published in the L&O special issue on "Biogeochemistry and ecology across Arctic aquatic ecosystems in the face of change" published in February 2021. This manuscript represents our first publication from the North Pole expedition aboard the Swedish Icebreaker *Oden*. It reported a changing phytoplankton community composition from sea-ice diatoms towards an ecosystem dominated by smaller nanoplanktonic algal species such as prasinophytes. This change will not only impact carbon export processes in the Arctic Ocean but will also have important implications for fisheries and upper trophic levels in the near future. Several other publications are now in various states of preparation from our Antarctic expedition and should be submitted soon. The GBC manuscript (in-press) represents our 2nd publication from the 2018 Antarctic CICLOPS expedition.

Freeman Lab: We haven't done much travelling this year, but CofC graduate Bailey Fallon currently has a publication in review on microplastics in seawater and sponges from Panama. In addition, CofC undergraduate students Mylene Gonzales and Kylene Flynn have almost completed their Bachelor's Essays. Mylene is investigating recruitment on settlement tiles in the intertidal zones around Grice and Kylene is mining literature on Caribbean sponges to test for evolutionary tradeoffs between traits within this group. Graduate student Alex Parry travelled to the Smithsonian Marine Station in Fort Pierce Florida to measure the filter feeding efficiency of ten of the most common sponge species in the Caribbean. To take this measure, he used flow cytometry to count heterotrophic

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FACULTY NOTES

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bacteria in seawater before and after it had passed through a sponge. Alex has also been exploring local habitats around Charleston for freshwater sponges and has found several species that are likely new records for this area. The summer of 2021 will be busy with at least two trips to the Florida Keys to continue work on sponge-microbe symbioses and additional collections of freshwater sponges here in South Carolina.

Harold Lab: There are two students of the Graduate Program in Marine Biology working with our lab, Mary Ann Taylor and Carly Lynn Strange. Mary Ann's research is mainly a histology-based study of life history of the Naked Goby, *Gobiosoma bosc* (Gobiidae). We thank Kevin Kolmos and David Wyanski at the Marine Resources Research Institute (SCDNR), Fort Johnson, for resources in aid of her work. Carly Lynn completed her undergraduate training here at CofC and then joined our lab in fall 2020 as a graduate student. As an undergraduate she worked tirelessly on our study of patterns of abundance and diversity of larval, postlarval and other early life history stages of fishes inhabiting algal beds dominated by the invasive alga *Agarophyton* (previously known as *Gracilaria*) *vermiculophyllum*. She is now developing her graduate project in this area. Senior undergraduate Finnian Cashel completed his Bachelor's Essay (Spring 2020) on the relationship between tidal cycle and the abundance of *Fundulus heteroclitus* and other fishes in intertidal habitats. Tony has been on sabbatical during spring 2021 and working on systematics, taxonomy and ecology of mesopelagic fishes, especially the codlets (Bregmacerotidae) and the hatchetfishes (Sternoptychidae). Tracey Sutton, Nova Southeastern University, is collaborating on a paper with Tony on a new species of *Bregmaceros*. Finally, I want to thank Danielle Beers and Josiah Waters, both Graduate Assistants (GPMB), for their great work in the Grice Fish and Invertebrate Collection.

Hughes Lab: The shift to online teaching really took over much of this year. Working with colleagues across the country, we published a "soup to nuts" guide to teaching animal behavior (or any organismal focused course) online (<https://onlinelibrary.wiley.com/doi/10.1111/eth.13096>), and I was invited to present on inclusive pedagogy in online environments for a workshop during the upcoming Animal Behavior Society conference. I am also currently working with colleagues in both Women's and Gender Studies and Sustainability Studies to develop the third iteration of our feminist pedagogy workshop "Teaching with Intent". In spite of the numerous challenges presented by the pandemic, MES student Nolan Schillerstrom managed to complete his thesis work on better understanding human motivations underlying disturbances to migratory shorebirds (specifically, Red Knots) – we expect he'll defend this spring or summer. GPMB student Rachel Prostko is working out methods to assess nonconsumptive effects of predators on snapping shrimp, and Rebecca Lucia (also GPMB) recently changed her thesis plans, due to challenges associated with the pandemic, and

will be exploring ways of building on her undergraduate snapping shrimp research. While my own time in the lab has been limited for health reasons, I wrote – with some colleagues in the UK – an invited chapter on animal communication for an upcoming edition of the Routledge Guide to Animal Behavior, and former GPMB student Whitney Heuring and I have resumed work on our seasonal variation in monogamy manuscript.

Janech Lab: In 2020, the Janech lab was awarded an NIH R15 grant to create the UROCUP program for undergraduate research (Undergraduate Research Opportunity to explore the Composition of Urinary casts using Proteomics). In conjunction with Dr. Juan Carlos Velez (Ochsner Medical Center, LA) and Ben Neely (NIST-Charleston), this project will explore the proteome of urinary casts (little plugs in the kidney tubules) that are excreted in the urine and are diagnostic for kidney injury. Although very human centric, Drs. Janech, Velez and veterinarians at The Marine Mammal Center discovered California Sea Lions also excrete urinary casts in a scenario of kidney disease, potentially opening a new avenue for the detection and diagnosis of kidney injury in sea lions and perhaps marine mammals in general. So far 6 undergraduates have participated in the project which is being coordinated with the help of Alison Bland. The Janech lab is preparing to initiate another project involving domoic acid toxicosis in California sea lions with The Marine Mammal Center this summer. Drs. Janech and Neely continue to expand proteomic capabilities at Ft. Johnson and have been working on metaproteomic pipelines for coral disease with Dr. Cheryl Woodley (NOAA) in addition to continuing work on the mammalian CoMPARe project (<https://www.nist.gov/programs-projects/comparative-mammalian-proteome-aggregator-resource-compare-program>).

Plante Lab: Our research once again focused on the ecology and biogeography of benthic microorganisms. A South Carolina Sea Grant-funded study of the biogeography of benthic diatoms in South Carolina saltmarshes was published in *Estuaries and Coasts* (Plante et al. 2021). This project started with intense field sampling conducted in summer 2018 with REU summer intern, Connor Graham, CofC undergraduate student Max Cook, and Kristy Hill-Spanik. Earlier biogeographic work with former Summer (REU) intern Jessica Lowry, conceptually similar but performed on barrier island beaches, was published in the journal *Marine Ecology Progress Series* (Plante, Hill-Spanik, and Lowry 2021). Former graduate student, Vanessa Bezy, published another portion of her thesis research in *Aquatic Microbial Ecology* (Bezy et al. 2020). This work analyzed the nest microbiology of olive ridley sea turtles, which lay eggs in mass nesting events (arribadas) and generally exhibit high embryo mortality. It employed DNA sequencing to compare fungal and bacterial communities in high- and low-hatching-success nests to test whether high metabolic activity due to abundant broken eggs or specific pathogens caused nest failure. Although-Covid-19 made lab and field work difficult, we did accomplish a bit of both.

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FACULTY NOTES

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First-year GPMB student, Josiah Waters, studying drivers of microbial community structure in saltmarshes over various temporal scales, was able to complete the majority of his field work over the past year. CofC undergraduate, Rowan Emerson, conducted research designed to characterize the gut microbiome of the super-abundant eastern mud snail (*Tritia obsoleta*) as a School of Science & Mathematics Summer Research Fellow.

Podolsky Lab: Our lab was crustacean-themed during this pandemic year. Student projects addressed questions about environmental constraints on the distribution of two invasive species. Graduate student Julianna Ventresca continued her work the invasive anomuran porcelain crab *Petrolisthes armatus*, picking up on earlier work by Kevin Mack on adult stages to focus on thermal constraints on early developmental stages. In addition to studying the effects of temperature on hatching success, Julianna took our first measurements of heart rate in porcelain crab larvae, a measurement we hope to continue into future studies. Julianna is writing up and plans to defend her thesis soon before heading to law school. Undergrad Hails Tanaka carried on work over the summer and into fall, looking at an invasive rhizocephalan cirripede *Loxothylacus panopiae*, which parasitizes decapod crustaceans, in this case the mud crab *Eurypanopeus depressus*. Hails is testing whether salinity changes as would be experienced up into the estuary more strongly affect sur-

vival of the crab or reproduction of the parasite, which inhabits and castrates the body of the crab in order to serve its own reproduction. We are also testing the hypothesis that the parasite reduces the probability of limb autotomy in the crab, given that parasitized crabs do not molt and the parasite therefore depends on the crab retaining its claws. Undergrads Zoe Munson and Sierra Thomas-Frazier have recently joined the lab and are planning studies on the strength of crab claw pinching forces following molting and on light preferences of symbiotic anemones, respectively.

Sotka Lab: The Sotka lab focused on various efforts on the historical genetics and parasite detection in native and introduced populations of *Crassostrea gigas* oysters. MBI major Hannah Rothkopf began a collaboration with Molecular Core Facility manager Kristy Hill-Spanik to detect disease-causing *Bonamia* parasites in *Crassostrea gigas*. MBI major Dallas Crowder continues to help extract oysters. MBI major Charles Taibi continues to work on the sediment chemistry within *Spartina* salt marshes, and MBI major Laney Pound continues to compile grey- and peer-reviewed literature on historical pathways of oyster invasions. Cynthia Hays (Keene State), Sarit Truskey (Northeastern), John Wares (UGA) and Elizabeth Weatherup (VIMS) visited the lab to pursue our genotype-by-sequencing protocol.



and foster new opportunities for collaboration. On the porch just outside the flex lab, the addition of ceiling fans, and ultimately insect screening, will hopefully add to the welcoming concept of the new space.

NEW FLEX LAB AT GML

Finishing touches are being put on a renovation of GML 121, formerly part of the Owens lab. The goal of this new flex lab is to accommodate scientists who do not otherwise have laboratory space at GML, whether coming over from HML or from the SSM departments downtown or visiting from outside institutions. Prior to the renovation, the Beers and Janech labs, temporarily displaced by the pandemic closure of HML, made use of the temporarily patched up room, but thanks to funds from the Biology Department, the lab received new cabinetry, a stainless sink, new electrical outlets and a new floor to go along with a recently installed fume hood. We hope the availability of this space will encourage greater use of GML

DISTEM FORUM SPOTLIGHTS IDENTITY ISSUES IN THE WORKPLACE

The DISTEM Forum (*Diversity and Inclusion in STEM*) is a new opportunity for communication across the Ft. Johnson campus. The mission of the Forum is to engage participants in topics that will help to promote understanding, empathy, and action for making Ft. Johnson a better place for all to work. The Forum, which meets about every two months, focuses on a different aspect of identity at each meeting. It seeks to engage participants in the experiences of diverse members of campus through education and small group discussion, using clarifying definitions, interactive responses, case

studies and question prompts. The Forum met in January, March, and May, focusing on the topics of self-identity, mental health, and gender in the workplace, respectively. This summer's meeting will focus on diverse aspects of age in the workplace and will be especially oriented toward identity issues that students (including those in the Ft. Johnson REU program) may encounter as they navigate through a career track. The DISTEM Forum is organized and presented by representatives of each of the Ft. Johnson partners, who welcome increased participation by all members of our campus.

RECENT GPMB DEGREES

Juliane Caughron - Exploring and Scaling Up the Diversity-Stability Relationship Using Fisheries-Independent Monitoring Data (Advisor: Daniel McGlenn)

Alejandra Enriquez - An Analysis of Iron-Oxidizing Zetaproteobacteria in the Salt Marshes of South Carolina (Advisor: Heather Fullerton)

Breanne Hanson - Effect of Bifenthrin and Reduced Salinity Exposure on Larval Sheepshead Minnows (*Cyprinodon variegatus*), and Grass Shrimp (*Palaemonetes pugio*) (Advisor: Marie DeLorenzo)

Sarah Kell - An Assessment of the Fate and Effects of Tire Wear Particles in Charleston Harbor, South Carolina (Advisor: John Weinstein)

David Klett - Nutritional Performance of Juvenile Red Drum, *Sciaenops ocellatus*, Fed Various Fish, Shrimp, and Squid Diets (Advisor: Aaron Watson)

Jenna Klingsick - Evaluating the potential for North American River Otter (*Lontra canadensis*) to serve as a costal indicator species; comparison of trace metal data to Bottlenose Dolphin (*Tursiops truncatus*) (Advisor: Ed Wirth)

Julie Loewenstein - Biochemical Analysis of Coral Exposed to Possible Future Ocean Acidification and Thermal Stress Using ^1H NMR Metabolomics (Advisor: Tracey Schock)

Kyra Reisenfeld - The Effect of Head-Starting on Morphology, Bite Force, and Diet in the Diamond-back Terrapin (*Malaclemys terrapin*) (Advisor: Eric McElroy)

Jessica Ramirez - Determining the Effect of Marine Fuel Oil on *Spartina alterniflora* and *Spartina patens* Growth and the Effect of Fertilizer on *Spartina alterniflora* Growth and Root Production (Advisor: Paul Pennington)

Nicholas Strait - $\delta^{15}\text{N}$ and Tissue Nitrogen Content of Hawaiian Macroalgae from Shallow-Water Reefs and Mesophotic Coral Ecosystems (Advisor: Heather Spalding)

Juliana Ventresca - The Reproductive Response of *Petrolisthes armatus* to Cold Temperatures in its Non-native Range (Advisors: Dara Wilber and Bob Podolsky)

GRADUATE STUDENT AWARDS

Alejandra Enriquez was awarded the John A. Knauss Marine Policy Fellowship.

Lindsey Transue was awarded the Barans Marine Biology Fellowship.

Augustus Snyder was awarded the Marine Genomics Fellowship for Spring 2021.

Courtney Saldana, Clayr Kroenke and **Gabrielle Kuba** were awarded Marine Genomics Fellowships for the 2020-2021 academic year.

Josiah Waters received a Graduate School Research and Presentation Grant.

Jessica Wenclawiak was awarded the Simon F. Gallagher Fellowship.

Nicole Principe and **Josiah Waters** were awarded Graduate School Research Grants.

Robin Minch, Rachel Prostko, Brandon Reding and **Lukas Troha** were awarded Presidential Summer Research Awards from the College of Charleston.

Jacob Cashour, Augustus Snyder, and Josiah Waters were awarded the Marine Genomics supplies grants.

Shannon Bley, Jacob Cashour, and Augustus Snyder were nominated and elected to the Sigma Xi Scientific Research Society.

Augustus Snyder and **Josiah Waters** received Slocum-Lunz Foundation awards.

Morgan Will won the Sciences, Mathematics, and Business award at the 15th annual Graduate Research Poster Session of the Graduate School, University of Charleston.

GETTING BACK ON THE WATER!

It's tough to socially distance on a boat, which has made this pandemic year difficult for boat use and class field trips, as the College's policy on social distancing applied even outdoors. Unfortunately we had to cancel all class-related boat use after March 2020 and through much of spring 2021. As restrictions have eased, however, we managed to arrange some lab field trips for 4 classes (Marine Botany, Biology of Fishes, Biology of Invertebrates, and Oceanography) aboard SCDNR's EV Discovery. The vessel is a 45' catamaran and can accommodate up to 10 students plus crew with social distancing. We spent a few windy/cool February days out on the harbor collecting water samples, profiling with our CTD unit and trawling for benthic life. Students were thankful to finally be back out on the water!



New GPMB Students 2020-2021

Elizabeth Bullard

University of Illinois at Urbana-Champaign

Hunt Jones

Wofford College

Rebecca Lucia

University of South Carolina

Josh Ratay

University of Miami

Brandon Reding

Creighton University

Courtney Saldana

Saint Xavier University

Carly Lynn Strange

College of Charleston

Luke Troha

Villanova University

Jessica Wenclawiak

University of Georgia

Morgan Will

Nova Southeastern University

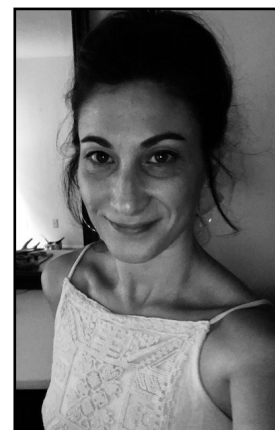
ALUMNUS NOTE: HOW THE GPMB PREPARED ME FOR THE FBI

Lara Delores Adams (nee Bero) '01: I'll bet not many people know how a whale stranded overseas helped the FBI Missing Persons program improve their success in recovery of DNA from saponified bones. Or how the experiences of one GPMB alumna as a graduate student in the NMFS Marine Mammal Molecular Genetics Laboratory, then at CCEHBR, gave her the foundation to troubleshoot daily operations in the DNA Casework Unit at the FBI.

During my time as a graduate student in the GPMB, and later as a contractor within the National Ocean Service on the Fort Johnson campus, I developed foundational skills that I use every day as an examiner at the FBI Laboratory in Quantico, VA. My job has allowed me to travel around the world to speak and testify, to draft guidelines for all forensic DNA practitioners in the US offering opinions in trial, and to work on high profile or national security cases being reported to the public in real time. I certainly benefit from the reputation of the FBI when representing them, but the FBI also benefits from my experience gained while working in the Fort Johnson scientific community.

The GPMB allowed me to spend a fantastic, challenging and rewarding decade working in Marine Science, all within the Fort Johnson campus, using cutting edge DNA procedures, techniques and software. This experience allowed me to step directly into a job at the FBI with expertise in types of DNA analysis that few others possess. I apply concepts in population genetics, phylogenetics, and

statistical calculations that I learned as a graduate student to casework for the nation's most closely followed cases. I refer to methods I used to recover DNA from challenging specimens within the Marine Forensics Laboratory to guide me during implementation of new methods for FBI casework. And I convey scientific information to lawyers, jury members, journalists and agents using the techniques I learned as a teaching assistant at CofC.



While many in my field come from Forensic Science graduate programs, my unconventional background has, without a doubt, allowed me to see issues, problems and solutions in a much larger, more integrative light. I know I was well served by the graduate program at GPMB, and I often think very fondly of all of the inspirational instructors and graduate committee members that worked to help me grow as a scientist. While I may not be able to apply my marine knowledge directly these days, my FBI colleagues are no longer surprised to hear about what worked to get DNA out of asian medicinals, smoked whale bacon, or whale bones soaked in oil, and how those experiences are going to help me address our most recent evidence submission.

DIRECTOR'S LOG

What's in a name?

A name can be symbolic. It can reflect whom we choose to honor, what ideas we value, and whom we include. To represent what an institution stands for, a name should reflect more than just its history.

For the last year, Grice Marine Lab has been engaged in educating the College and the public about the legacy of its name. Briefly, it was named to honor the CofC President who founded it, but whose segregationist policies and actions created barriers to equal educational opportunity at the College and throughout the state of South Carolina. In June 2020, we circulated a petition to remove his name, laying out the case for why retaining a symbol of exclusion and educational inequity was fundamentally opposed to our mission. To date, 1448 individuals have added their names to that petition, including alumni, students, parents, faculty, staff, and friends (documents archived at <https://tinyurl.com/82metk5x>).

Through inaction, those with stewardship over the College have so far deferred to a state law that uses the tired trope of "heritage" as a barrier to future progress through reconciliation with the past. There have been other actions, like the lowering of the Confederate flag, where "heritage" was no longer enough to forestall our progress as a state. In short, we should seek to honor the courage of those who break such barriers, not those who erect them.

From here, there is only one path that leads forward. Those who hold power can help to clear that path, reducing the pain and disillusionment of those who work under and feel the burden of this symbol. More positively, they can see this moment as an opportunity to tell a larger audience—prospective students and their families, talented faculty and staff, potential donors, future stewards—what we stand for. At the grass-roots level, this effort to remove a mis-honored symbol will not fade away.

By the end of this academic year, all faculty, staff, and students will be required by the College to complete a training module on diversity in education, helping to start long-overdue conversations about anti-racism. The College will also begin an initiative that requires meaningful coverage of race, equity, and inclusion in student coursework. It can only be a matter of time before our stewards will heed the same insights.

To answer the question at the start: changing the name of our marine lab would be symbolic, only one small sign on the path toward reflection and effective action. But more than a mere symbol, it can be a beacon, showing what we choose to honor, what we value, and whom we include when we say, "welcome." GML must be given that opportunity.

-Bob Podolsky, May 2021