COLLEGE of CHARLESTON
GRICE MARINE LABORATORY
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GRICE LOGBOOK

A Newsletter of the Grice Marine Laboratory and the Graduate Program in Marine Biology, College of Charleston

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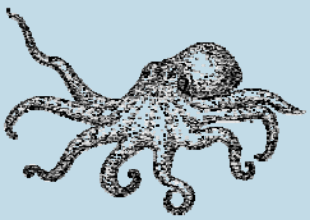
Grice Marine Laboratory
205 Fort Johnson Rd.
Charleston, SC 29412
843-953-9200
grice.cofc.edu

Graduate Program in Marine Biology
cofc.edu/marine



Shedlock Lab Examines Marine Life Through Genomic Lens

Andy Shedlock with a "colleague" on a recent natural history expedition in Madagascar

Andy Shedlock is a marine biologist interested in the genetic architecture of animal complexity and biodiversity. His research approach integrates field studies with laboratory advances in molecular biology and genomics. His lab employs high-throughput DNA sequencing to map the genomes of vertebrates and to study how genes get turned on or off in different major taxa (e.g., in turtles vs. mammals and fishes). His work focuses on how these changes in gene activation can influence behavior and physiological health of individuals in wild populations in response to environmental stressors such as climate change, commercial fishing pressures, and pollution. Since coming here, Andy has developed new research on the loggerhead sea turtle, a threatened species. This work supports undergraduate student training at the interface of computer science and marine genomics. Following up his graduate work at the University of Washington on marine fishes, Andy supports student research on the population genetic structure and conservation management of spotted eagle rays in the

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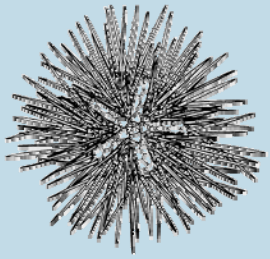
NSF Renovations

The remainder of renovations funded by the National Science Foundation focused this year on the Sancho lab, on a common use equipment room, and on finishing touches to previous renovations. Upgrades included new casework and work benches, student workstations, safety showers, emergency eyewashes, chemical safety cabinets, a new autoclave, and a conference table. As part of these renovations, the College is contributing by replacing the rooftop exhaust fans for fume hoods and has completed significant electrical upgrades. In other College-sponsored renovations, the stucco and windows on the two-story main building were repaired, and the foundation, plumbing and electrical under the older wooden annex building were replaced. The College also continued to provide significant improvements to the heating, ventilation, and air conditioning (HVAC) system, including a new modular boiler system and new digital temperature controls. This spring a new rooftop unit and modular chiller will be installed and electrical service will be upgraded. As funds become available, this new modular system will eventually allow the annex building to transition from window units to a central HVAC system. These renovations are radically improving the operating efficiency of the climate control system at GML.

The Sancho lab after renovations



Ashley Hall students hold a horseshoe crab

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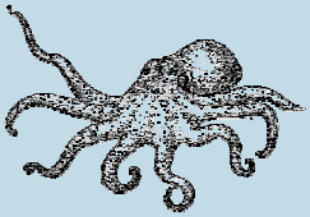


CORAL Program

The CORAL (Community Outreach Research and Learning) Program at Grice began in 2006 as a way for the lab to reach out to the local community, particularly in schools. The primary mission of the program is to expose students of all ages to the local marine environment and hopefully inspire a few of them to pursue a career in marine biology at the College of Charleston. Over the past 6 years, we have conducted 88 programs both on and off campus reaching 7504 students. With the help of graduate students, we bring a touch-tank to schools, environmental fairs, and other events filled with local marine animals including puffer fish, blue crabs, horseshoe crabs, sea stars, and urchins. A typical program will start with an introduction to marine biology, estuaries, and the animals. The students are then allowed to handle the animals and ask questions. Recent additions to the program include a "plankton/food chain workshop" in which the students collect water samples and study them through our collection of dissecting microscopes. We also make use of our HD video camera/microscope equipment which projects high-definition images on a 52" flat screen TV in the classroom. We have found that most students know very little about our local estuary (Charleston Harbor) and what resides there-in. The smile of a fifth grader holding a horseshoe crab for the first time is unparalleled and the inherent inquisitive nature of most children, especially when it comes to marine science, quickly becomes apparent.

In Memoriam

Frances Brigman
August 20, 1938 – April 16, 2012

Frances Brigman passed away on April 16th, 2012 at the age of 73. Ms. Brigman was the secretary of the GML from 1980-1999. Professor Emeritus at CofC Charles "Chip" Biernbaum remembers Frances, "I don't have to tell you how important Frances was to the Grice Lab, the Marine Biology Graduate Program, and especially to the marine biology grad students. She was well loved, had a wonderful sense of humor, was sympathetic and supportive to those with problems, and, in short, had a major positive influence on many people during her lifetime – she will be greatly missed."

Welcome, Savannah!

Savannah Gilmore joined the GML staff in February, 2013. She moved to Charleston from Atlanta, GA in November, 2012. She is a graduate of Emory University with a BA in Educational Studies. She provides administrative support to both GML and the GPMB, including managing the social media accounts and attending Science Board meetings. Savannah manages the application process for the REU program, as well as assisting with the applications for the GPMB. She maintains the GPMB Facebook page, as well as the Grice Marine Lab Twitter account. Her job duties include managing the dorms, recruiting for the GPMB, assisting with the CORAL program, providing tours for prospective students, as well as general office management. When Savannah is not at work, you can find her pretending like she works out, inhaling chili cheese fries at Poe's Tavern, neglecting the sunglasses slung around her neck and squinting into the sunset on Sullivan's Island. Or just sitting at home with the Food Network on, *Southern Living* open in her lap, with a pen in her hand jotting down her newest ideas for her YouTube channel, Single Serving Cooking.

GPMB Degrees

Jennifer Bennett–Effects of Light and Iron on Growth and Physiology of a Polar Diatom, *Fragilariopsis cylindrus*. (Advisor: Jack DiTullio)

Tessa Bricker–The Effects of Sediment Grain Size and Shell Content on the Burrowing Rate of the Surf Clam, *Donax variabilis*. (Advisor: Derk Bergquist)

Paul Cosmann–Associations between Parasite Burden and Health in the Spotted Seatrout, *Cynoscion nebulosus* (Cuvier 1830). (Advisor: Isaure de Buron)

Cameron Doll–Determining Factors that Influence the Molecular Quantification of the Harmful Raphidophyte *Heterosigma akashiwo* Using a Sandwich Hybridization Assay. (Advisor: Dianne Greenfield)

Ashley Duquette–Quantification of the Interaction between Bottlenose Dolphins and the Atlantic Blue Crab Fishery in Charleston, South Carolina. (Advisor: Laura Kracker)

Peter Feltman–Characterization of the Symbiodinium Spliced Leader RNA and its Response to Stress. (Advisor: Fran Van Dolah)

Leah Fisher–A Laboratory Evaluation of Hatchling Loggerhead Sea Turtle *Caretta caretta* Performance in Response to Differing Controlled Incubation Temperatures. (Advisor: David Owens)

Casey Darling Kniffin– Recovery from Hypoxia and Hypercapnic Hypoxia: Impacts on the Transcription of Key Antioxidants in the Shrimp *Litopenaeus vannamei*. (Advisor: Karen Burnett)

Anna Manyak – A Latitudinal Body Size Pattern in a Marine Isopod Suggests Local Adaptation to Predator Risk. (Advisor: Erik Sotka)

David Murray – Spatial and Temporal Variation of Genetic Diversity in Red Porgy *Pagrus pagrus* in the South Atlantic Bight. (Advisor: Marcel Reichert)

Kristin Stover – Locomotory Fatigue in the Atlantic Blue Crab, *Callinectes sapidus*. (Advisor: Lou Burnett)

Jena Wirth – Emerging Contaminants in the Marine Environment: An *In Vitro* Study of the Immunotoxicological Effects of DE-71, a Commercial Polybrominated Diphenylether Mixture, and Perfluorooctane Sulfonate on Dolphin and Murine Immune Cells. (Advisor: Pat Fair)

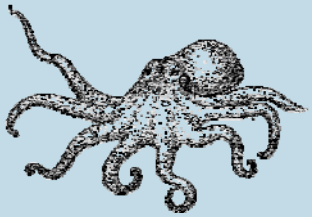
Graduates Kristin Stover & Casey Darling Kniffin with Dr. Karen Burnett

Summer 2012 REU

With ongoing support from the National Science Foundation's Research Experience for Undergraduates (REU) Program, we welcomed another group of ten undergraduates from around the United States to participate in the 2012 Fort Johnson Undergraduate Summer Research Program. Selected from a record high number of applicants, the REU Interns conducted independent research projects centered on the theme "Marine Organism Health: Resilience and Response to Environmental Change," under the guidance of scientists from the five Fort Johnson partners, including the College of Charleston's GML, MUSC, NOAA/CCEHBR, NIST, and SCDNR/MRRI. Research projects ranged from profiling lipids of dolphins and measuring fatigue in crabs with bacterial infections, to assessing impacts of parasite load on swimming performance in fish, pesticide effects on frogs, and thermal stress in sea urchins. Interns also participated in workshops, field trips and exercises in communicating science to professional scientists and other audiences, such as policymakers, middle and high school students, and the public. At the end of the summer, the interns left Fort Johnson with new skills in research and communication and with an appreciation for the importance of using those skills in combination to capture public support for science and science education. Much of their research data will eventually be published in peer-reviewed journals. We expect to hear great things from the 2012 Fort Johnson REU Interns as they pursue their chosen careers.

Grice Logbook is available on-line at grice.cofc.edu

Be sure to Like us on Facebook! Grad Program in Marine Biology/ Grice Marine Lab - College of Charleston



Faculty Notes

DiTullio lab in Antarctica

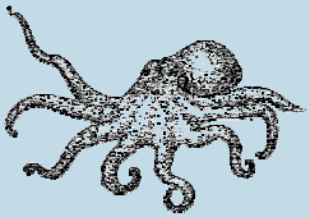
Follow us on Twitter!
@GriceMarineLab

Burnett Lab: Graduate students Casey Darling Kniffin and Kristin Stover successfully defended their Master's theses last year. Casey is now in the job market, and Kris is pursuing a PhD at Brown University. Anna Tommerdahl, Becca Derex, and Sarah Song continue their Master's research. Anna has determined that the hemocyanin in aquacultured shrimp have an extraordinarily high oxygen affinity compared with the local wild shrimp species, a finding that is somewhat surprising. Marissa Roman was in the lab as a summer undergraduate REU student; she evaluated the performance of blue crabs injected with the bacterium *Vibrio campbelli* using some of the same tests that Kris Stover pioneered in her thesis work. Marissa is a full-time student at UNC Wilmington. Karen and Lou Burnett, Marissa Roman, and Anna Tommerdahl attended the annual meeting of the Society for Integrative and Comparative Biology in San Francisco in January 2013 to present their research.

deBuron Lab: Graduate students Paul Cosmann (GPMB) and Jen Hein (MES) defended their theses. Jen (Outstanding Graduate Student award, Best presentation award at SCFWA, one paper submitted in Biological Invasions) is currently employed by the DNR to pursue her studies on invasive parasites of the American eel. Isaure deBuron was invited to organize a session on parasite ecology at the Eastern Fish Health Association in NY and to write a review paper on philometrids with expert F. Moravec (Institute of Parasitology, CZ). Ongoing collaboration with Eric McElroy (CofC Biology Dept) and Bill Roumillat (DNR) led to a paper in the Journal of Fish Biology with undergraduate Carrie Umberger as primary author. Michelle Taliercio (DNR) has discovered a nasty little parasite in striped bass that needs some attention. We found one more myxozoan species (#3!) in the spotted seatrout (Dyková et al. Int. J. Parasitol.) and have surprising results about swimming performance of spotted seatrout infected by fluke and myxozoans. Stay tuned for exciting collaborative studies with Eric McElroy and the mariculture group at the DNR!

Graduate students Nicole Kollars, Becca Derex, Meredith Smylie, and Alyssa Demko dissecting two types of echinoderms: sea stars and sea cucumbers

DiTullio Lab: During spring semester 2013, the DiTullio lab participated on a research cruise to the Ross Sea, Antarctica as part of the *TRACERS* (TRacing Algal Carbon Export in the Ross Sea) expedition. The researchers left McMurdo Station aboard the U.S. Antarctic Program icebreaker the RV/IB *Nathaniel B. Palmer* on Feb 10, 2013. Research was performed in Terra Nova Bay (in the western Ross Sea) and in the Southern Ocean before returning to port in Punta Arenas, Chile on April 6, 2013. The 6 CofC cruise participants included oceanographers Jack DiTullio and Peter Lee, research technician Amanda McLenon, GPMB student Jacob Kendrick, CofC undergraduate student Rachel Stevens and Swiss research intern Gianluca Paglia. The researchers investigated the role of phytoplankton in affecting carbon export during the late summer and early fall period when pack ice is rapidly closing up the open waters of the Ross Sea polynya. Crossing of the Antarctic Circle allowed researchers Kendrick, McLenon, Paglia and Stevens to become honorary *shellback* members. The lab's ocean going research van (*Cougar Town*) equipped with a gas chromatograph and a high speed sorting flow cytometer was shipped in October, 2012 and was loaded on the icebreaker before the start of the research cruise. Rachel Stevens will complete her Bachelor's Essay in Biology, and GPMB student Jacob Kendrick will complete his M.S. in Marine Biology (CofC). The lab also welcomed the addition of two new graduate students, Nicole Schanke and Jessica Snyder who are finishing up their first year core courses. Finally, we would like to congratulate Emily Cooper (our lab manager) on the successful and healthy delivery of our newest addition (Rose Marie) to the GML/HML family.



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Research Colloquium 2012

The 16th annual Marine Biology Student Research Colloquium was held on September 28rd and 29th, 2012. The colloquium featured keynote speaker Dr. Thomas Near, an evolutionary biologist and Associate Professor at Yale University. Thomas's research focuses on the use of phylogenetic hypotheses for studying patterns of speciation and adaptive radiation in monophyletic groups of teleost fishes. He gave two addresses at this year's colloquium: "Climate change and biodiversity of the Southern Ocean" and "Charles Darwin: Natural history, a voyage of discovery, and a scientific revolution." Thomas's research currently focuses on North American lineages as well as fishes endemic to Antarctica. Thomas also serves as curator of the Ichthyology collection in the Yale University Peabody Museum of Natural History. Sixteen marine biology students gave oral presentations of their research at this year's colloquium. Tim O'Donnell received the best oral presentation award for his talk "Characterizing the genetic population structure of spotted seatrout (*Cynoscion* nebulosus) along the southeast United States." Amanda Kelly received the best poster presentation award for her research "Life history trends of gray triggerfish *Balistes capriscus* in the South Atlantic Bight from 1992-2012." The colloquium concluded with a cookout and Lowcountry Boil for students, professors, and attendees at the Marshland's House outdoor classroom.

Dr. Thomas Near
Yale University
2012 Research Colloquium keynote speaker

Best Oral Presentation winner Tim O'Donnell with Dr. Karen Burnett

Student Awards

Vanessa Bezy –National Science Foundation Graduate Research Fellowship Program; Young Explorers Grant, National Geographic Society; PADI Foundation Grant; Archie Carr Award for Best Poster and Student Travel Award, International Sea Turtle Society; Summer Marine Genomics Fellowship; CofC Graduate Student Research Award; GSA Research Grant; MBGSA Travel Grant; GPMB Travel Grant.

Sarah Doty – Lerner-Gray Grant; GPMB Travel Award

Robin Garcia – Student Travel Award from Southeastern Estuarine Research Society, GPMB Travel Award, CofC Graduate Student Association Grant

Amanda Kelly – Best Poster at the 2012 CofC Student Research Colloquium

Nicole Kollars – ZEN student-exchange research fellowship in N. Japan; travel award from the Northwest Algal Symposium, Presidential Summer Research Award. Poster presentations at: Northwest Algal Symposium, Southeast Phycological Colloquy.

Weatherly Meadors – McLeod-Frampton Scholarship

Tim O'Donnell – Best Oral Presentation at the 2012 CofC Student Research Colloquium

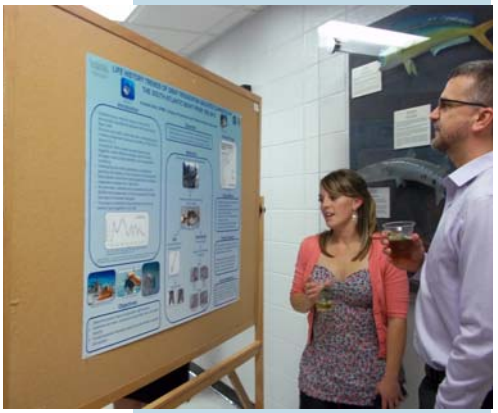
Ashley Shaw - Poster presentation at the SCAFS-SCWFA meeting; poster and oral presentation at the Joint Meeting of Ichthyologists and Herpetologists in Vancouver, B.C.

Sammi Smoot – Joanna Deep Water Foundation Fellowship

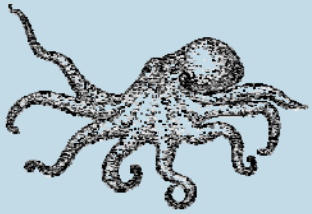
The following GPMB students gave presentations at research conferences:

Poster Presentations: Katie Anweiler, Vanessa Bezy, Callie Crawford, Robin Garcia, Nicole Kollars, Ashley Shaw, Sammi Smoot, Anna Tommerdahl

Oral Presentations: Carly Altizer, Drew Anderson, Katie Anweiler, Michelle D'Aguillo, Robin Garcia, Adam Lytton, Tim O'Donnell, Jennifer Newby, Ashley Shaw, Sammi Smoot



Amanda Kelly won Best Poster Presentation



Alumni,
please let us know
what you are up to!
marine@cofc.edu

Faculty Notes

(Continued from page 4)

Harold Lab: There are several research projects concerning systematics, evolution, and ecology of fishes in progress in Tony Harold's lab. Michelle D'Aguillo (GPMB graduate student) is studying trophic biology of estuarine gobies, with an emphasis on *Gobiosoma bosc*. Analytical work on Dan Zurlo's lionfish diet project continued through much of the year. Norma Salcedo, adjunct instructor in Biology, is contining her research on South American loracariid catfishes in association with the lab and the fish collection. Several presentations were made at the SICB meeting in San Francisco based on these various projects. Manuscripts in preparation based on some long term projects in the Harold lab include a study of geographic variation in the Indo-Pacific deep-sea hatchet fish, *Polyipnus triphanos*, and reports on unusual bregmacerotid fishes from the eastern Mediterranean and Red Seas. Emily Phillips (GML staff), Erica Levine (lab assistant), and Tess Dooley (undergraduate volunteer) are assisting with fish collection curation (e.g., physical maintenance, loans processing, database).

Students prepare to sample DNA from an Atlantic Sharpnose Shark used for genomic library construction in the Shedlock laboratory. Tissue biopsies and digital voucher data were collected during a Fall 2012 offshore reef fishing expedition aboard the Grice Marine Laboratory's educational support vessel* R/V Pursuit*, supported in part by an Innovative Teaching and Learning Grant from the College of Charleston Office of Academic Affairs awarded to Dr. Shedlock.

Owens Lab: In February, the Owens lab made a low-Carbon footprint meeting trek by train to the International Sea Turtle Society meeting in Baltimore. Dave Owens presented a paper on terrapins and Mercury contamination along the east coast. Leah Fisher, who graduated in December and is now serving as a John Knauss Fellow with NOAA, also presented a paper on her MS work on loggerhead hatchling behavior. Jeff Schwenter of SCDNR (2007 MS graduate), Dr. Al Segars of SCDNR, and Dave Owens also just returned from the Keys Marine Lab on Long Key in Florida Bay where they did ultrasounds and laparoscopies on sea turtles up to 320 lbs and assisted in attaching Argos/GPS transmitters on 8 adult loggerheads. You can check out their 2013 tracks at: http://www.seaturtle.org/tracking/index.shtml?project_id=597

Plante Lab: The research focus of the Plante lab is the microbial ecology of marine sediments. Recent efforts have centered on the application of neutral models to the community assembly of benthic microalgae. This has been a collaborative effort with REU summer intern Virginia Fleer and Martin Jones of the CofC Math Dept. In a related project, Chelsea McCurry (MUSC-SURP summer intern) and Tricia Roth developed a method using propidium monoazide and molecular techniques to characterize the live-only community of microalgae. A second focus deals with antimicrobial compounds produced by benthic bacteria. GPMB student Whitney Hook is using microcosm experiments to determine how interference competition influences community structure. Another GPMB student, Vanessa Bezy, studies mass nesting events (arribadas) of the Olive Ridley sea turtle in Costa Rica. She is testing whether the high microbial load caused by the abundant broken eggs during arribadas contributes to the low hatching success at these beaches.

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Shedlock Lab

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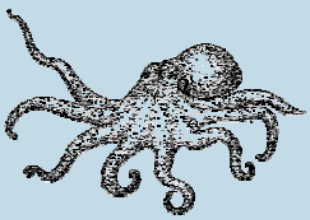
Gulf of Mexico and on the forensic DNA identification of pelagic marine fish larvae sampled from the southeast Atlantic. As an extension of his PhD research, Andy also investigates the effects of extreme environmental conditions on adaptive molecular evolution in the genomes of deep-sea fishes. Andy teaches courses in molecular biology to CofC undergraduates, and courses in genome biology, computational genomics, and conservation genetics to CofC and MUSC graduate students. He also teaches a summer field course, "Investigative Marine Biology," at Cornell University's Shoals Marine Laboratory in the Gulf of Maine. Andy's a strong advocate of student experiential learning though natural history travel and the integration of field biology and experimental laboratory research.



Faculty Notes

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Podolsky Lab: The Podolsky lab asks questions about the performance capacities of marine invertebrates in response to environmental variation, particularly involving early life history stages. Grad student Sammi Smoot has been working on three thesis manuscripts focused on invertebrate egg masses, involving the effects of environmental conditions on their anti-microbial properties, and on phylogenetic patterns in the degree of anti-microbial protection across the Mollusca. Alyssa Currie, an undergraduate from the University of Maryland, spent the summer examining ATPase enzyme activity in tube feet of the sea urchin *Arbacia punctulata*, comparing Northern and Southern populations. Her research complements Bob's work on latitudinal differences in ATPase activity of sea urchin sperm. Former undergrad Diego Castro expanded his work on swimming activity of sea urchin sperm in response to ocean acidification and temperature by carrying out comparisons using the same Northern and Southern populations of sea urchins. Diego and Bob also published Diego's first paper on the tethering properties of invertebrate egg masses in soft sediment.

Sancho Lab: The fish ecology lab has been busy with multiple research projects in the last year. Ashley Shaw (GPMB) spent the fall collecting tissue samples with the SCDNR inshore fisheries group from multiple predatory fish species in Bull's Bay. She also finished running stable isotope samples at Skidaway Institute of Oceanography in order to characterize trophic ecology of this high salinity estuary. Sarah Doty (GPMB) has been analyzing stomach samples from lionfish collected in Key Biscayne National Park in Florida, in order to characterize the diet of this invasive species. Kelsey Yetsko (CofC undergraduate), in collaboration with Eric McElroy from the Biology Department, finished comparing the swimming performances under different salinities of two species of mummichugs found in the Charleston estuaries (*Fundulus heteroclitus* and *F. majalis*). Gorka Sancho spent the fall semester in Trujillo, Spain teaching classes in Natural History of Spain and Conservation Biology to College of Charleston undergraduate stu-

(Continued on page 8)

Alumni Notes

Paula Keener (1984): As Director of Education Programs for the National Oceanic and Atmospheric Administration's (NOAA's) Office of Ocean Exploration, Paula oversees a team that develops products for educators that convey the science supporting NOAA's ocean exploration expeditions to poorly-known and unknown regions of the global ocean. Her office operates the first federally-funded ship dedicated to ocean exploration, the NOAA Ship *Okeanos Explorer*, of which she is an honorary Plank Owner. Enhancing ocean literacy of the American public through NOAA ocean exploration is at the core of all of her work. Paula writes a lot, speaks a lot, and recently spent 19 days at sea on the Scripp's Institution of Oceanography's R/V *Roger Revelle* in the NE Lau Basin off Fiji exploring for submarine volcanoes and their associated hydrothermal vents. Paula lives in Charleston, SC, with her 16 year-old son, and her job is based at NOAA Headquarters in Silver Spring, MD.

Steven Allen (2004): Since graduating from College of Charleston and the GPMB, Steve has moved around a bit. Starting in Lafayette, LA and then off to Boston, MA and finally settling in Annapolis, MD where he currently works for the Oyster Recovery Partnership (ORP), www.oysterrecovery.org. The ORP is a small non-profit organization that is responsible for all of the major large-scale oyster restoration projects in the Maryland portion of the Chesapeake Bay. Steve's role at the ORP is to oversee all of the in-water restoration programs. This includes planting of oysters, monitoring of projects already in the water and overseeing work programs designed to help the watermen community and the ecology of the Bay. Steve has overseen the planting of well over 1 billion spat on shell hatchery produced oysters in the five years that he has held his position at the ORP. He says the best part of the job is when he gets to be out on the Bay and more to the point, under it. They use SCUBA quite extensively to assess the success of their efforts. Steve's wife, and fellow GPMB grad, Sarah Kingston, recently defended her PhD at the University of Maryland. Moho and Sydney, the two dogs that they got while living in Charleston, are still alive and well and miss running around at Fort Johnson.

Grice Marine Lab Staff

Bob Podolsky
GML Director &
Assistant Professor of Biology

Craig Plante
GPMB Director &
Professor of Biology

Shelly Brew
Administrative Coordinator

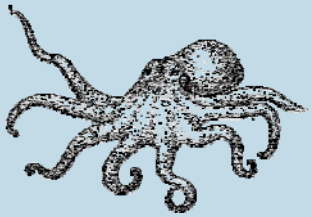
Savannah Gilmore
Administrative Specialist

Peter Meier
Marine Operations Manager

Sarah Oakes
Laboratory Manager

Emily Phillips
Laboratory Assistant

Tricia Roth
Molecular Core Facility Manager



Faculty Notes

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Sarah Doty scuba diving

dents, mainly focusing on terrestrial organisms and ecosystems for a change. Upon returning to Grice he has been working to characterize populations of pelagic stromatopod crustaceans that undergo periodic population booms in the Indian Ocean by analyzing specimens obtained from stomach contents of tuna and dolphinfish.

Sotka Lab: The Sotka lab said goodbye to Dr. Tina Bell, who left after 2.5 years as a postdoc. She leaves behind a legacy of isopods, lots of data, and tasty banana chocolate bread. Tina joined the faculty at Brevard College in North Carolina. Two new GPMB students joined the lab: Alyssa Demko (Williams College undergraduate) is a GPMB Genomics Fellow and Courtney Gerstenmaier (CofC undergraduate) is a GPMB Presidential Scholar. Nicole Kollars (GPMB Masters student) travelled to Japan for work on Zostera (zenscience.org), and was awarded a 2013 Phycological Society of America Grants-In-Aid fellowship. Keryn Bain (UNSW with Dr. Alistair Poore), Lauren Scheinberg (SFSU with Dr. Kathryn Boyer) and an NSF-REU student Aaron Goldman visited in 2012. Our lab continues to work with evolutionary ecology of herbivores, the impacts of an invasive seaweed *Gracilaria vermiculophylla,* and the effects of warming seas on marine populations and communities.

Nicole Kollars in the field studying eelgrass

Fish Flume

Grice Marine Laboratory now has a swimming flume. The flume is an enclosed chamber of water shaped like a track and equipped with a variable speed motor. This allows researchers to vary water speed and measure swimming performance, physiology and behavior in aquatic organisms. Students in the Comparative Biomechanics course use the flume to study how swimming performance and behavior covary with body shape in fishes from the Charleston Harbor.

Grice Marine Lab Merchandise

The Marine Biology Graduate Student Association sells a variety of items to raise money. Funds are used to support students presenting oral and poster presentations at scientific meetings as well as funding some social and community-related activities throughout the year. Your support is greatly appreciated. Items for sale include t-shirts, coffee mugs and pint glasses, koozies, and hats. Go to www.cofc.edu/marine/students/mbgsa.html and click on the merchandise link at the bottom to see pictures and prices.