



GRICE LOGBOOK

A NEWSLETTER OF THE GRICE MARINE LABORATORY AND THE GRADUATE PROGRAM IN MARINE BIOLOGY, COLLEGE OF CHARLESTON

VOLUME 2, No. 1
MAY 8, 2003

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NEWSLETTER AT
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Undergraduate Research Receives National Funding

The National Science Foundation has awarded another site grant to the Grice Marine Laboratory through the Research Experiences for Undergraduates (REU) program. The research program has operated since 1992 and is a ten-week program combining formal classroom work with independent research in areas of crucial concern for marine biologists today. The program is designed to provide undergraduate students with a modern research experience employing physiological, cellular and molecular techniques to address questions in areas such as species diversity, mechanisms of adaptation to environmental change, environmental bioindicators, microbial ecology, and evolutionary biology. The College of Charleston serves as primary host institution for the program, but research mentors and course instructors are drawn from among more than 100 Ph.D.



scientists whose primary appointments lie with the Fort Johnson partner institutions including the Medical University of South Carolina, the National Institute of Standards and Technology, the National Ocean Service and the South Carolina Department of Natural Resources. Working side-by-side with graduate students, technicians, and mentors at Fort Johnson, South Carolina, student participants are exposed to a broad range of career opportunities in science, making them better prepared to enter the workforce in industry and government. In

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The Gill: Not Just for Respiration Anymore?

Almost any marine biology student knows that the gills of crustaceans such as shrimp and crabs play a vital role in respiration. In the gills, oxygen diffuses from the surrounding water into the blood while carbon dioxide moves in the opposite direction. The respiratory organ also maintains the acid-base and ion balance of crustacean blood. Lou Burnett and Karen



Student Joe Burgents prepares shrimp for injections of pathogenic bacteria.

Burnett are now examining yet another potential role for the gill with the support of a grant from the National Science Foundation. Over the past several years the Burnett lab has accumulated data suggesting that under conditions of low oxygen (hypoxia), crustaceans become more

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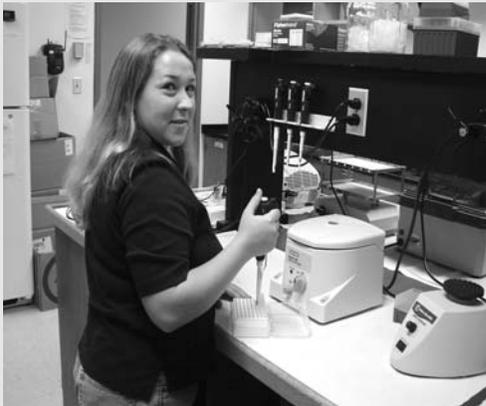
A First Class Act

David Whitaker joined the first matriculating class for the Graduate Program in Marine Biology in 1973. He had a great experience with his teaching assistantships for the first two years at CofC. He says teaching "was a very good experience, terrifying at first, but very useful for public speaking and dealing with people." These people skills have served David well, as he is well known in South Carolina as a good listener and strong supporter of both fisheries and environmental groups. In 1976 he took a position with DNR, where he has worked ever since. While his thesis was actually on squid, (with the MARFIN

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Molecular Facility Opens

A Molecular Core Facility has been established at GML. It will provide DNA sequencing services and fragment analysis to College of Charleston faculty, undergraduate and graduate students, visiting scientists, summer interns, as well as scientists throughout the Fort Johnson research complex and other local institutions. Funding for the facility was provided through a grant from the National Science Foundation through the efforts of Drs. Craig Plante and Lou Burnett. The College of Charleston Biology Department and Grice Marine Lab have also provided support for the facility. Recent users



Dana Adkins manages the Molecular Biology Core Facility at the Grice Marine Laboratory.

of the facility have included Dr. Scott France who is studying molecular systematics of Anthozoa and population genetics of deep sea invertebrates and Dr. Allan Strand who is using the facility to study AFLPs of *Saracenia* hybrids (Pitcher Plant) and *Cakile* (Searocket). In

addition, undergraduate students in Dr. Stephanie Dellis' Molecular Biology Lab (BIOL 312) prepared samples that were submitted for sequencing. Next semester, students in this course will isolate DNA from unknown bacteria, prepare and submit samples for sequencing and attempt to identify the bacteria based on their genetic sequences using GenBank. Numerous undergraduate and graduate students are also using the facility to obtain data for their research. Additional equipment, including an imager, thermal cycler, electrophoresis workstation and a Macintosh computer for sequence analysis, is available to GML researchers.

Guidelines for submitting samples and fees can be found at the Molecular Core Facility web page, which can be accessed through the Grice Marine Laboratory homepage (www.cofc.edu/~grice).

Please contact Dana Adkins (pictured above), by phone (843) 953-9193 or email Adkinsd@cofc.edu with any questions.



Alumni Notes

Melissa Alm ('02) is working as a naturalist at the Alliance Redwoods Conference Center in the outdoor education program. **David Cabrera** ('00) is working on dopamine receptor-mediated signal transduction for the Molecular Neuropharmacology section of the National Institute of Neurological Disorders and Stroke. **Felicia Coleman** ('81) is an Associate Scholar Scientist in Biological Sciences at Florida State University. She is Program Director of the department's Institute for Fishery Resource Ecology. **Nicole Cuellar** ('95) is a Research Toxicologist at SC Johnson. **Louis Daniel** ('86) is the Executive Assistant to the Director at the NC Division of Marine Fisheries in Morehead City. He deals with management and science issues for NC and represents the state on the South Atlantic Fisheries Management Council and Atlantic States Marine Fisheries Commission. **Todd Haney** ('99) is in the final year of his Ph.D. program, working jointly in UCLA's Department of Organismic Biology, Ecology and Evolution and the Natural History Museum of Los Angeles County. There is a website that describes some of what he is doing at crustacea.nhm.org/peet. **Daniel Karen** ('94) got married in September, and just moved into a home last month. He is working at CH2M HILL as an Associate Scientist in the Ecological Risk Assessment group. **Peko Kauppert** ('02) is pursuing a Ph.D. in Marine Biomedicine and Environmental Sciences at MUSC. She works on cancer prevention using marine and human models. **Paula Keener-Chavis** ('84) is the National Education Coordinator/Marine Biologist at the NOAA Office of Ocean Exploration. **Todd Kellison** ('95) is working for the National Park Service as a Fishery Biologist at Biscayne National Park (south of Miami). He is also an adjunct faculty member at NC State University. **Sarah Kingston** ('02) is working for Dr. Patricia Rosel on delphinid phylogenetics and population genetics in the National Marine Fisheries Service, Southeast Fisheries Science Center, Marine Mammal Molecular Genetics lab. **Trey Knott** ('98) is a Forensic Biologist with the National Ocean Service Marine Forensics Lab in Charleston. His department provides various analyses of evidence in cases involving poaching of protected and regulated marine species (mainly sharks, tunas, miscellaneous other finfish, turtles, lobsters). **Bob Martore** ('86) has been with the SC Department of Natural Resources since graduating. He is currently the Program Manager for SCDNR's Marine Artificial Reef Program. **Chris Milardo** ('01) is working for Merck in their Clinical Trials department in NJ. He is doing data analysis for

Undergrad Research - Cont. from page 1

addition to providing students with an opportunity to conduct independent studies guided by a faculty mentor, the objectives of the program are (1) to engage students directly in discussing graduate school and career options in basic and applied sciences, (2) to show students the interdisciplinary nature of science and (3) to teach students to think critically.

Undergraduate students are selected to participate in this program based on outstanding academic and personal achievement, evidence of advanced course work in physiology and cell or molecular biology and on the potential benefits of this research experience to the student.

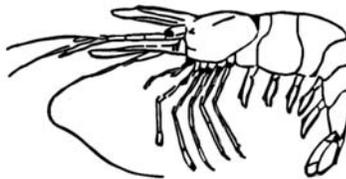
Recruitment efforts cast a broad net, with particularly strong participation by women both as students and faculty. Participants live on-site in dormitories at the Grice Marine Laboratory. Projects are selected for their interdisciplinary and inter-institutional nature, and their relationship to current biological, biomedical or environmental concerns. The program takes pride in maintaining particularly strong ties with former REU participants in order to evaluate the impact of the research experience on career choices. Up-to-date information regarding the program, participants in prior years and their research projects, as well as an application form are available on the Web at www.cofc.edu/~grice/summer.htm, or by contacting the Program Director, Dr. Louis E. Burnett, at (843) 953-9200 or burnettl@cofc.edu. ■

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Shrimp Immunology - Cont. from page 1

susceptible to infection with disease-causing bacteria. Along with collaborators Dr. Patricia Glas from the Citadel and Dr. Eric Stabb at the University of Georgia, the Burnetts are exploring the mechanisms behind these effects of hypoxia on disease resistance.



One exciting possibility is that the gill itself may play a major role in the killing and removal of disease-causing bacteria, such as *Vibrio* spp. To approach this question, the investigators inject blue crabs (*Callinectes sapidus*) or Pacific white shrimp (*Litopenaeus vannamei*) with a *Vibrio* sp. that has been genetically modified to express the jellyfish green fluorescent protein (GFP). The animals injected with bacteria are exposed to various levels of oxygen and carbon dioxide. Tissue accumulation of the fluorescent *Vibrio*, as well as bacterial killing and elimination can be monitored by standard bacterial culture and histology techniques, as well as molecular and immunochemical assays that target GFP. The data from this study will determine whether immune defense can be added to the list of functions carried out by the crustacean gill. The investigators also hope that these studies will support improvements in aquaculture production and preservation of natural crustacean populations.

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First Class Act - Cont. from page 1

group) he soon moved on to doing fisheries research and management analyses on the two most valuable South Carolina fisheries species, shrimp and crab. Today he is the Marine Research Division - DNR's Director of Fisheries Management where he is regularly in the middle of things working on regulations such as fishing seasons and Turtle Excluder Device adaptations. He has also been a regular committee member (as well as employer) of many CofC graduate students over the years in his position as an Adjunct Professor with the Graduate Program in Marine Biology. He has written many externally funded grants which have been valuable in supporting graduate research and top level fisheries research. In short, he continues to be a key supporter of graduate research at the Fort Johnson Laboratories.



David Whitaker weighs a live loggerhead turtle on the DNR boat Lady Lisa, for the In-Water Survey Program.

New Faculty and Staff

Gorka Sancho is the new Fish Biologist at Grice. After earning a B.S. in Biology from the Autonoma University of Madrid (Spain), he was granted a "La Caixa" fellowship to study in the United States, joining the Massachusetts Institute of Technology /Woods Hole Oceanographic Institution Joint Program in Oceanography in 1992. With Lauren Mullineaux as an advisor he worked on the behavioral ecology of coral reef fishes at spawning aggregation sites, obtaining his Ph.D. in 1998. He then stayed in Woods Hole working at WHOI as a postdoc studying hydrothermal vent fishes, getting to dive in ALVIN. He also worked for Sea Education Association, teaching oceanography and sailing as the Chief Scientist on board the SSV Westward. Dr. Gorka and his wife, Deborah



Dr. Gorka Sancho

Bidwell, moved to Jamaica for a year as the Resident Co-Directors of the Hofstra University Marine Laboratory (HUML). This was a great experience, living in a third world country by the water and being in-charge of a field laboratory visited by various groups taking marine biology courses. In 2000 they

decided to find long-term jobs, and returned to Gorka's homeland. He took a research position at the AZTI Fisheries and Food Technological Institute in the Basque Region of Spain, working on various fisheries conservation research projects, including the ecological effects of lost 'ghost' fishing nets and the design of a regulation plan for an larval eel fishery. Re-adapting to living and working in Spain after 8 years abroad was challenging, though they greatly enjoyed the slower paced European lifestyle and their son Eneko was born there. After a couple of years Gorka again crossed the Atlantic when he was offered an assistant professorship at the College of Charleston. He is presently teaching fish biology, oceanography, general biology and tropical marine ecology. He is greatly enjoying teaching again, while trying to find sufficient time to pursue research interests in behavioral ecology of fishes. His grant supported research at the present time is restricted to a multinational European-American cooperative project named FADIO (Fish Aggregating Devices as Instrumented Observatories of Pelagic Ecosystems), which aims to develop new floating buoys for the remote observation and study of

fishes (initially aimed at tropical tuna) that aggregate around floating objects. This 3 year project will take place in Hawaii and the Seychelles, and he hopes to gain a better understanding of the aggregation behaviors of tuna. With the help of undergraduate students he is also interested in studying different behavioral aspects of coral reef and hydrothermal vent fishes through the analysis of underwater images previously recorded at Johnston Atoll and East Pacific Rise, and he is looking forward to future projects that will allow him to travel to coral reefs and vents to obtain new data. Finally he is also very interested in starting projects on the behavioral ecology of local fish species in Charleston, mainly through the use of hydroacoustic tags, and collaborating with scientists at Grice and DNR.

Dana Adkins who arrived at the College of Charleston in late October 2002 is managing the new Molecular Core Facility, located at GML. She is originally from Bluefield, WV but relocated to Charleston from Raleigh, NC where she worked in the Department of Gene Expression and Protein Biochemistry at GlaxoSmithKline. Previously, she attended the University of North Carolina at Wilmington, where she earned a Bachelor of Science in Biology.

Student Presentations

Students attended local and national scientific meetings and presented the results of their research.

Anne Blair, Phenotypic variability in the octocoral *Leptogorgia virgulata* Lamarck, presented at the South Eastern Population Ecology and Genetics Group Fall 2002 meeting in Beaufort, NC.

Majbritt Bolton-Warberg, Impacts of harvesting and boating on oyster habitat recovery, restoration and shoreline erosion in tidal creek systems, presented at the Benthic Ecology Meeting from March 27-30th 2003 in Groton, Connecticut.

Joseph Burgents, Enhanced Disease Resistance in the Pacific White Shrimp, *Litopenaeus vannamei*, Through the Dietary Administration of a Yeast Culture Food Supplement, presented at The Southeastern Estuarine Research Society (SEERS) 2002 Fall Meeting, from October 17-19, in Conway, SC and The Society for Integrative and Comparative Biology (SICB) 2003 Annual Meeting, from January 4-8, in Toronto, Ontario.

David Couillard, Genetic Inference of Seed Dispersal in the Beach Annual *Cakile edentula* Harperi, presented at the SEEPAGE meeting at

Recent GPMB Degrees

Rusty Day - Mercury Contamination in Loggerheads, *Caretta caretta*, in the South Atlantic Bight: Monitoring Strategies and Trends in Distribution (Advisor David Owens)

David Gillett - Secondary Production of *Monopylephorus rubroniveus*, Levisen, 1884 (Tubificidae) and the Month-to-Month Variation of Tidal Creek Oligochaete Assemblages (Advisor Fred Holland)

Bob Grant - Use of Natural and Artificial Habitats by Juvenile (age 0+) Black Sea Bass, *Centropristis striata*: A Laboratory Study (Advisor Ted Smith)

Sarah Hopsfenger - Phylogenetic and Biogeographic Relationships of the genus *Hypseurochilus* Gill 1861 (Pisces: Blenniidae: Parablenniini) (Advisor Tony Harold)

Peko Kauppert - Feeding Habits and Trophic Relationships of an Assemblage of Fishes Associated with a Newly Established Artificial Reef off South Carolina (Advisor Pam Jutte)

Andrea LePard - Analysis of Variation in the Mitochondrial Encoded MSH1 in the Genus *Leptogorgia* (Cnidaria: Octocorallia) and Implications for Population and Systematics Studies (Advisor Scott France)

Wendy Nadik - Assessment of the critical habitat in South Carolina for the juvenile horseshoe crab (*Limulus polyphemus*) (Advisor Betty Wenner)

Karen Tuerk - Persistent Organic Pollutants in Atlantic White-Sided Dolphins (*Lagenorhynchus acutus*) and Rough-Toothed Dolphins (*Steno bredanensis*) (Advisor John Kucklick)

Stacy VanderPol - Persistent Organic Pollutants (POPs) in Alaskan Murre (*Uria* spp.) Eggs (Advisor Paul Becker)



Student Presentations - Cont. from page 4

the Duke Marine Lab in Beaufort, NC, September 13-15, 2002.

Rusty Day, Mercury in loggerhead sea turtles in the southeast US: Developing monitoring strategies and assessing health impacts, presented at the Society of Environmental Toxicology and Chemistry, Salt Lake City, Utah, November 17-20, 2002 and at the International Sea Turtle Symposium, Kuala Lumpur, Malaysia, March 17-21, 2003. **Rusty earned the best student presentation award.**

Jennifer Emblidge, A Proposal to Study the Effects of a Blood Lipid Regulating Drug on

Estuarine Organisms, presented at the Southeastern Estuarine Research Society (SEERS) meeting in Conway, SC, October 17-19, 2002.

Jennifer Emblidge, The Effects of a Blood Lipid Regulating Drug on Estuarine Organisms, presented at Carolina's Society of Environmental Toxicology and Chemistry (SETAC) meeting at Fort Johnson, April 2-4, 2003.

Amy Filipowicz, Using Watershed Characteristics to Predict Water, Sediment, and Biological Quality of Headwater Tidal Creeks in the May River, Bluffton, South Carolina, presented at the Southeastern Estuarine Research Society (SEERS) in Atlantic Beach, North Carolina, March 20 – 22, 2003.

Robert Javonillo, The Southeastern Regional Taxonomic Center: a new resource located at Fort Johnson, Charleston, South Carolina, presented at the 82nd Annual Meeting of the American Society of Ichthyologists and Herpetologists from July 3-8, 2002 and Species discrimination in the blenniid genus *Chasmodes* (Teleostei: Perciformes), presented at the 82nd Annual Meeting of the American Society of Ichthyologists and Herpetologists from July 3-8, 2002.

Michelle Lee, Reproductive Biology and Testosterone Cycling of the Diamondback Terrapin, *Malaclemys terrapin*, in South Carolina Estuaries, presented at the Joint Meeting of the American Society of Ichthyologists and Herpetologists, Society for the Study of Amphibians and Reptiles, and the American Elasmobranch Society: July 3-8, 2002, Kansas City, MO.

Jeanine Miller, Stress Responses in *Karenia brevis*: Identification and Response Characterization of Stress Proteins and Antioxidant Enzymes, presented at the 10th International Conference on Harmful Algae held October 21-25, 2002 in St. Petersburg Beach, FL.

Connie Moy, Development and validation of an estuarine biotic integrity index for South Carolina tidal creeks, presented at the Southeastern Estuarine Research Society/Atlantic Estuarine Research Society (SEERS/AERS) conference in Atlantic Beach, NC, March 20-22, 2003.

Melissa Recks, Seasonal Differences in Blubber Lipid Content and Fatty Acid Composition of Bottlenose Dolphins (*Tursiops truncatus*) from the Charleston Harbor Area, South Carolina, presented at the 2003 Southeast and Mid-Atlantic Marine Mammal Symposium (SEAMAMMS) at Christopher Newport University, Newport News, VA, March 28-30, 2003. **Melissa was awarded best student paper for her oral presentation.**

**HAPPY 30TH
GRADUATE PROGRAM
IN MARINE BIOLOGY!**

Faculty Notes

This summer, Dr. **Scott France** and members of his lab will be sampling deep-sea corals on two research cruises. In July, they will head to the New England Seamount Chain (which are on a NW-SE line roughly from southeast of Cape Cod to Bermuda) on board the R/V Atlantis to dive on Gosnold, Balanus, and Bear Seamounts with the Alvin submersible. In August sampling will be conducted in the Gulf of Maine using the remotely operated vehicle (ROV) Kraken. The samples will be returned to Grice for genetic analysis.

Marine Biology Alumni
Tell us what you are up to!
marine@cofc.edu

MBGSA Activities

The Marine Biology Graduate Student Association (MBGSA) is involved in several local community services throughout the year.

- Adopt-A-Highway and Beach Sweep are two such activities which involve clean up of the area around Fort Johnson. Beach Sweep is done in collaboration with the other institutions in the area.
- Students also partake in the DuBose Middle School/Seabrook Island Student Education Program.
- In fall 2002 students participated in Habitat for Humanity on John's Island helping to build houses.
- On April 9th 2003 volunteers assisted at the Earth Force Summit held in Mount Pleasant. This is an event for local school children, which promotes environmental education. Each participating school presents an environmental project they have been involved in. Local businesses and scientists set up information booths, including the South Carolina Department of Natural Resources and Bayer.
- A team representing the graduate program is participating in the Relay for Life, a fundraising event for the American Cancer Society. The event is on May 9th at Joe Riley stadium and will involve teams from North Charleston, West Ashley, downtown Charleston, Mount Pleasant, Isle of Palms and Summerville.
- GSA Officers:
President – Kristine Hiltunen
Vice President – Zeb Schobernd
Secretary – Wally Bubley
Treasurer – Christina Ralph

Happy 30th GPMB

There will be a reunion of alums of the Graduate Program in Marine Biology on **November 8 & 9, 2003**, in celebration of the 30th anniversary of the program. Over 90 of our 156 alums have indicated that they are planning to come, most bringing their families with them. There will be an oyster roast at Fort Johnson on Saturday evening, reduced rates for alums at the SC Aquarium, and reduced rates for lodging...with a beachfront view...at the Folly Beach Holiday Inn. Other possible events (pluff-mud wrestling, pizza party, Fort Johnson facility tours, etc.) have yet to be worked out. "It sounds like our Grice progeny are gonna have one helluva great blast!"



Recent Scholarly Contributions to GML

(see the GML Web Site for a complete list) Please contact Dr. William D. Anderson, Jr. (andersonwd@cofc.edu) for a GML contribution number for manuscripts that have been accepted for publication. Some selected contributions follow:

- **#202.** Janech, M. G. & P. M. Piermarini. 2002. Renal water and solute excretion in the Atlantic stingray in fresh water. *Journal of Fish Biology*, Vol. 61, pp. 1053-1057.
- **#203.** DiTullio, G. R., M. E. Geesey, D. R. Jones, K. L. Daly, L. Campbell, & W. O. Smith, Jr. In press. Phytoplankton assemblage structure and primary productivity along 170°W in the South Pacific Ocean. *Marine Ecology Progress Series*.
- **#205.** Hamann, M., C. J. Limpus, & D. W. Owens. 2003. Reproductive cycles of males and females. Pp. 135-161, *In* P. L. Lutz, J. A. Musick, and J. Wyneken (editors). *The biology of sea turtles*. Vol II. CRC Press, Boca Raton, Florida.
- **#206.** Loefer, J. K. & G. R. Sedberry. 2003. Life history of the Atlantic sharpnose shark (*Rhizoprionodon terraenovae*) (Richardson, 1836) off the southeastern United States. *Fishery Bulletin*, Vol. 101, No. 1, pp. 75-88.
- **#210.** Pennington, P. L., J. W. Daugomah, A. C. Colbert, M. H. Fulton, P. B. Key, B. C. Thompson, E. D. Strozier, & G. I. Scott. 2001. Analysis of pesticide runoff from mid-Texas estuaries and risk assessment implications for marine phytoplankton. *Journal of Environmental Science and Health*, B36(1), pp. 1-14.
- **#211.** Leighfield, T. A., & F. M. Van Dolah. 2001. Cell cycle regulation in a dinoflagellate, *Amphidinium operculatum*: Identification of the diel entraining cue and a possible role for cyclic



new drug FDA approval. **Mike Misamore** ('93) has accepted an Assistant Professor position in Biology at Texas Christian University starting this fall. He received his Ph.D. from Louisiana State University, and did a postdoc at the University of Texas - Southwestern Medical Center in Dallas.

Paul Pennington ('96) finished his Ph.D. in Environmental Quality at Univ. of South Carolina in May of '02. He is employed by USC as a Research Assistant Professor within the Arnold School of Public Health. However, he is stationed right here at Fort Johnson at the NOAA CCEHBR lab. His work with USC and NOAA is currently focused on pesticide contamination in estuaries. Paul has been elected as the new Secretary for the Southeastern Estuarine Research Society for '03 and '04 and has recently been appointed to the faculty in Marine Biology. He and his wife, Nancy, are the proud parents of new baby boy, Andrew, born on April 4, 2003. **Jay Pinckney** ('87) is an Assistant Professor in the Department of Oceanography at Texas A&M University in College Station, Texas. **Brad Stevens** ('76) has been a Research Fishery Biologist with the National Marine Fisheries Service, in Kodiak, Alaska, since 1984. He works at the Kodiak

Fishery Research Center, where he studies the reproduction and early life history of crabs. Recent research has focused on settlement behavior and habitat selection by king crabs

(JEMBE, 283:63-78). In 2002 he was chief scientist aboard the R/V Atlantis for an expedition to explore seamounts in the Gulf of Alaska with the submersible Alvin. He just received a grant from the North Pacific Research Board to study the larval biology and settlement behavior of blue king crab (*Paralithodes platypus*). His work involves the cultivation of small crabs, which may some day support stock enhancement of these species. **Anil Thakkar** ('90) has worked at Eichrom Technologies in Darien, IL (a southwest suburb of Chicago) as a manager of Techsupport-Radiochemistry for almost 10 years. **David White** ('97) will graduate this spring with his doctorate from the University of South Carolina in the Marine Science Program. He is also a research faculty member with the Baruch Institute for Marine and Coastal Sciences, specifically working on a project called Caro-COOPS (www.caro-coops.org). Missing Alums – **Chris Bain, Eric Fernandez, Oscar Grados, Ming Sun.**

We plan to feature more alumni news in future issues. Please keep us informed of your activities by emailing us at marine@cofc.edu.

AMP. Journal of Experimental Marine Biology and Ecology, Vol. 262, pp. 177-197.

#213. Moore, M. K. & R. M. Ball, Jr. 2002. Multiple paternity in loggerhead turtle (*Caretta caretta*) nests on Melbourne Beach, Florida: A microsatellite analysis. Molecular Ecology, Vol. 11, pp. 281-288.

#215. Cabrera, D. M., M. G. Janech, T. A. Morinelli, & D. H. Miller. 2003. A thromboxane A2 system in the Atlantic stingray, *Dasyatis sabina*. General and Comparative Endocrinology, Vol. 130, pp. 157-164.

#217. Zolman, E. S. 2002. Residence patterns of Bottlenose Dolphins (*Tursiops truncatus*) in the Stono River estuary, Charleston County, South Carolina, U.S.A. Marine Mammal Science, Vol. 18, No. 4, pp. 879-892.

#219. Smith, T. I. J., M. R. Denson, L. D. Heyward, Sr., W. E. Jenkins, & L. M. Carter. 1999. Salinity effects on early life stages of Southern Flounder *Paralichthys lethostigma*. Journal of the World Aquaculture Society, Vol. 30, No. 2, pp. 236-244.

#220. Tuckey, L. M., & T. I. J. Smith. 2001. Effects of photoperiod and substrate on larval development and substrate preference of juvenile

Southern Flounder, *Paralichthys lethostigma*. Journal of Applied Aquaculture, Vol. 11, Nos. 1/2, pp. 1-20.

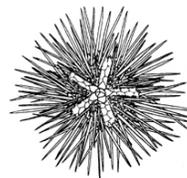
#221. Karnaky, K., Jr., P. Ryder, & L. R.

Forte. In Press. Regulation of intestinal chloride secretion and cloning of uroguanylin in the killifish, *Fundulus heteroclitus*. Bulletin of the Mt. Desert Island Biological Laboratory.

#222. Anderson, W. D., Jr. 2002. Review of THE POETICS OF NATURAL HISTORY: FROM JOHN BARTRAM TO WILLIAM JAMES, by Christoph Irmscher. Isis, Vol. 93, No. 4, pp. 723-724.

#232. Wethington, A. R., E. R. Eastman, & R. T. Dillon, Jr. 1999. No premating reproductive isolation among populations of a simultaneous hermaphrodite, the freshwater snail *Physa*. Proceedings of the First Freshwater Mollusk Conservation Society Symposium, pp. 245-251.

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Student Colloquium

The Graduate Program in Marine Biology (GPMB) successfully staged its 6th Annual Graduate Student Research Colloquium on February 21 – 22, 2003, at the Marine Resources Research Institute, SC Department of Natural Resources at Fort Johnson. The Colloquium aims to provide graduate students with experience in making scientific presentations and to promote interactions among students and faculty conducting research in marine biology. Sixteen graduate students from the GPMB and the Environmental Studies Program took advantage of the opportunity to give oral presentations on their thesis research. Second-year GPMB student **David Couillard** earned the best student oral presentation award. Dave is working under the direction of faculty member **Allan Strand** on the genetic inference of seed dispersal in the beach annual *Cakile* spp. His thesis is an attempt to uncover the historical



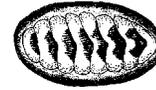
Dave Couillard received the best student oral presentation award.

biogeography of the widely distributed *Cakile* (sea-rocket) using genetic techniques. The study is being conducted on both small and broad scales. The small-scale study consists of 14 populations within SC and the broad-scale study involves sampling from the Great Lakes and the Atlantic and Gulf coasts. Sea-rockets' fruit morphology permits

seed dispersal over hundreds of kilometers via littoral and oceanic currents. It is his hypothesis that genetic differences should be detectable based on biogeographic boundaries such as Cape Hatteras, Cape Canaveral or Cape Cod.

Dr. Walt Boynton, the Stephen Toth Professor of Marine Biology at Duke University, gave the keynote lectures at the Colloquium. Dr. Boynton presented current and future challenges for estuarine science and management. More than 125 students, faculty and visitors attended the Colloquium, which also included a social, a poster session, and an oyster roast.

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Grice Coffee Mugs & T-Shirts

The graduate students in marine biology are selling t-shirts and coffee mugs to raise money to support student travel to meetings and other activities.

- ★ Shirts, long sleeve \$13, short sleeve \$11, in variety of colors and sizes.
- ★ Coffee mugs, \$6 each or \$5 for 3 or more.
- ★ Get more information by emailing gricembgsa@hotmail.com or call (843) 953-9200.



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