Salt Water Habitats (and other creatures)

They were both tomboys growing up. Biology majors Sarah Tracy and Kalyn Estep grew up in the country, Sarah by a creek and Kalyn by a lake. “We must have driven our parents crazy with all the critters we would bring home,” Kalyn muses. They have put their love of animals into action in the Biology 102 lab this year, setting up two salt water aquaria for the enjoyment and education of students and faculty alike. The 55-gallon tank pictured is home to a yellow tang, a maroon clownfish, a green birdfish, a spotfin lion fish, a snowflake moray eel, and a Banggai cardinalfish. The smaller 20-gallon tank in the back corner of the room is a mini-reef system with live rock providing a habitat for a polychaete worm, red coral, and a variety of bacteria and other microorganisms. A banded coral shrimp hides in an artificial coral.

The two friends set up a 20-gallon tank in Kalyn’s home last year and had so much fun, they wanted to try something bigger. The large tank in the biology lab was just collecting dust, so the girls asked permission to set up the aquarium. “We thought it would be really good for the introductory biology students to see some of the things they were learning about in an actual habitat,” said Kalyn. “It’s also medically proven that watching fish swim around lowers the blood pressure, and we thought that would be good for everyone!” Kalyn, who has worked at Petland in North Augusta for the past three years, will graduate next May with a biology degree.

Sarah Tracy and Kalyn Estep tend to their fish friends.

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From The Chair:

Sometimes change comes in small steps and sometimes in leaps and bounds. When you look around our department lately it seems that we are currently on either a leap or a bound. One manifestation of the changes taking place in the Department of Biology and Geology is the new look of our newsletter. A facelift was in order and I hope you like what we have done. This publication would not be possible were it not for the hard work of Carol Cutsinger, our Administrative Assistant who not only finds time to write most of the articles, but to take all of the photographs as well. A special thanks goes to Jeff Mastromonico, the USCA Director of Visual Communications for his help in the new design. As usual you can access the full color version at our website: http://www.usca.edu/bio-geo/news.asp. We are also working on a new look for the web site and hope to have something up and running soon. Visit us often and let us know how you are doing!

In our last edition, I reported the hiring of Dr. Michele Harmon to teach physiology. Although she does not officially start until the fall, she is already on campus and has hit the ground running. She recently visited the University of Georgia where she learned the finer techniques of *C. elegans* culture. Although these nematodes have been most commonly used to study development, Michele is hoping to put them to work in the area of environmental toxicology. In addition to filling the physiology position, I am pleased to report that we are currently searching for a tenure-track faculty position to teach anatomy, something we have not had since the retirement of John Spooner. We are currently conducting on-campus interviews and I am hopeful that we can hire someone for the fall semester.

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Faculty Focus: Andy Dyer

He calls his office a haven, and during the five years Dr. Andy Dyer has been at USCA, he has filled it with soothing, interesting items. The Zen garden, bubbling fountain, Hindu prayer flags, plants, and collection of rocks, fossils, arrow heads, and tree cores are indicative of the varied interests of our resident Plant Ecologist. Dr. Dyer is one of the principal teachers for ABIO 102, Biological Sciences II, and teaches ABIO 370, Ecology and Evolution, ABIO 570, Principles of Ecology, and has been the instructor for ABIO 355, Integrated Research Techniques. In 2002, ABIO 370 became a core requirement for all Biology majors and Dr. Dyer revamped the class to include evolutionary theory. Educated at California State University, Fresno (B.A., Zoology and M.A., Wildlife biology) and the University of California, Davis (Ph.D., Plant ecology), Dr. Dyer served two post-docs before joining our faculty in 2000. The first, with the Univ. of Michigan, took him and his family to Israel on an NSF-funded project investigating the competitive interactions of species from two desert annual communities. The second took him back to UC-Davis to investigate the population ecology of invasive species such as barbed goatgrass.

He has been working on two major research projects here at USCA, involving a number of our students.
Biology/Geology alums Jackie Davis and Jason Hall were married May 7, 2005 at a beautiful ceremony at Lake Murray. Attending the bride were classmates Natalie Surzenko, Vanessa Guy, and Pam Wall. Jackie, who is currently working at MCG, has been accepted into the Cardiac and Vascular Technology Program at the University Hospital. Jason is employed with a family business in Jackson. Natalie has completed her first year in a Ph.D. program at UNC Chapel Hill, Vanessa, employed at MCG, is preparing for her own wedding in June, and Pam is beginning her 3rd year of doctoral studies at MCG.

Doing Senior Research Projects. With funding from the National Wild Turkey Federation, he has been studying the biology and ecology of Chufa, a domesticated nutseed which is fodder for wild turkeys. The NWTF was interested in learning whether Chufa would hybridize with wild nutsedges (the answer has turned out to be very unlikely), but Dr. Dyer’s studies went much further, investigating different growing conditions, competition, and germination.

He has also continued his work with barbed goatgrass, a weed that has been spreading wildly in Northern California since the 1990s. First recognized in this country in 1914 and carried here from the Mediterranean by cows, it is not understood what has caused it to start spreading so rapidly. Barbed goatgrass, related to wheat, is a hybrid of two other species of goatgrass and is teaching us new things about the genetics of invasive species.

This summer Dr. Dyer is studying tuber reproduction in nutsedges, funded by a USC Research and Productive Scholarship grant.

Dr. Dyer has also been very active in the community. An avid swimmer (he currently holds five Georgia Masters state records), he is the founder and coach of the Aiken High School swim team. He also serves on the Board of Directors of the Fermata Club and Smart Growth Aiken.
Students Of the Year

Katie Anderson, Biology Student of the Year, transferred to USCA as a sophomore majoring in pre-pharmacy. She later changed her major to psychology and her interests to medical school - specifically psychiatry. However, after taking two introductory biology courses, Katie became more interested in the biological aspects of psychiatric illnesses and addiction. She once again changed her major, this time to biology where she soon immersed herself in the activities of the department.

In addition to her regular coursework she began working in the research laboratory of Dr. William Jackson on the use of ribozymes as therapeutic agents against the Human Immunodeficiency Virus. This work culminated in the presentation of her data at the South Carolina Academy of Sciences meeting held this past March at Winthrop University. She recently submitted her work as a manuscript for publication. Katie also participated in departmental operations by working in the office and as a student laboratory assistant for introductory biology.

For the short-term Katie is continuing her research with Dr. Jackson over the summer before entering graduate school at the Medical College of Georgia this fall. Her long term goals are to obtain a PhD in Pharmacology or Neuroscience and obtain a position at the National Institutes of Health. We are very proud of Katie and look forward to her continued success.

Dwight Jones, Student of the Year in Geology, will be a familiar face to regular readers of our newsletter, as this is the second year in a row Dwight has earned this honor. During the past year, Dwight completed an Independent Study Project related to his internship at the Savannah River Site last summer, also presenting his work at the SC Academy of Sciences meeting. He was a leader in Karin Willoughby’s Geomorphology class in the Spring. Dwight is transferring to the Columbia campus in the Fall and hopes to complete a double major in geology and anthropology (archaeology). Summing up his time at USCA Dwight said, “I can’t explain how great the geology program is at USCA .. the faculty provided me with real life opportunities to use what I had learned in real life applications.” Good luck, Dwight!

“I can’t explain how great the geology program is at USCA .. the faculty provided me with real life opportunities to use what I had learned in real life applications.”

-Dwight Jones
South Carolina Academy Of Science

USC Aiken was well represented at this year’s South Carolina Academy of Science meeting, held March 16th on the campus of Winthrop University in Rock Hill, South Carolina.

In the Cellular Biology section, Christina Wilson, Effects of Phosphate and Microbial Amendments on Lead (Pb) Contaminated Soil and Brian Nevius, Survival of Bacteria from African Dust, both mentored by Dr. Garriet Smith.


And in Geography/Geological Sciences, Dwight Jones, GIS Dynamic Population Model Tool for Savannah River Site Emergency Response, faculty mentor Dr. Allen Dennis, and Erin Brown, Burma Road Borrow Pit 2 Soil Investigation, mentored by Dr. Bill Pirkle. Congratulations to all for a successful meeting.

Alumni Update Online

Did you know?
You can update your address and let us know what you’ve been doing since graduation online! Just go to www.usca.edu/bioge/alumni.asp. We’d love to share your news!

Dr. Jennifer Walker 1987 and Mr. Mark Adams were married on May 28, 2005 in Charleston, SC. Dr. Walker received her medical degree from MUSC in 1991 and is currently employed as a Medical Technologist at Edgefield County Hospital. She is married to Lanny Miller from McCormick and has two daughters, Abbie (8) and Sara Frances (3).

Jennifer Vann, 2001, was awarded a Doctor of Veterinary Medicine degree from Tuskegee University on May 8, 2005.

Sydney Jones, 2002, is a first year law student at the Charleston School of Law and is engaged to be married in January 2006 to Aiken native Brent Chavis.

Belinda West Miller, 1993, received a B.S. in Medical Technology from the Medical College of Georgia in 1995 and is currently employed as a Medical Technologist at Edgefield County Hospital. She is married to Lanny Miller from McCormick and has two daughters, Abbie (8) and Sara Frances (3).

Recent Faculty Activities

Dr. Garriet Smith attended the BackReef II Workshop, The Importance of Back Reef Habitats to the Sustainability of Coral Reef Ecosystems, sponsored jointly by NOAA, U.S. EPA, and PIMS on Lee Stocking Island in late January and participated in an American Academy of Microbiology colloquium on Marine Microbial Diversity: The Key to Earth’s Stability in San Francisco April 7-10.

Dr. Bill Jackson, Dr. James Yates, and Dr. Garriet Smith attended a Microbiology & Biodefense Conference sponsored by MCG at the Savannah Rapids Pavilion on May 6, 2005. Dr. Smith was a featured speaker at the conference.

Dr. Allen Dennis, on sabbatical this year, presented Provenance of polymictic conglomerates in the Catskill-Pocono clastic wedge: Implications for the Inner Piedmont of the Carolinas and Devonian Mississippian collisional tectonics in the central Appalachians at the Northeast Section meeting of the Geological Society of America and Middle Paleozoic clastic wedge provenance, dextral collision, and the Southern Appalachian Inner Piedmont: The Spechty Kopf and Rockwell Formations of the Central Appalachians as tectonic markers at the Southeast section of the GSA, both in March.
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Sarah, who is planning a triple major in biology, psychology, and sociology currently has three dogs- a boxer and two dachshund-chihuahua mixes from the SPCA. She is the primary caretaker of the department’s resident alligator, Wally. (Many of our alumni will remember Wally as a sweet little foot-long gater, but in the seven or so years he has lived with us, he has grown to four feet with an attitude!) Her father had fish tanks while she was growing up, so she has enjoyed working with the fish here. Both Sarah and Kalyn have their sights set on medical school studying parasitology and tropical medicine.

When asked what it takes to keep a salt water tank, they said time, patience, and the willingness to do the research in order to learn which species can coexist peacefully in the same tank. The correct lighting and levels of salinity, bacteria, and pH levels are essential ingredients to keeping a healthy tank. A good filter and heater round out the required equipment. The fish are very territorial, too. Any time a new fish is added, the decorations in the tank should be rearranged so that new territories have to be established. It takes time to get a tank ready for its first live inhabitants. The girls are also preparing a salt water tank in the departmental office, which is already home to a red-eared slider named Darwin!

From The Chair continued from page 2

Congratulations to our May and August 2005 graduates! One of the greatest joys in this job is to watch as students take control of their future. I look at graduates like Katie Anderson, Carol Journey, Chris Perez, and Bianca West and cannot help but remember back over the past four years to the first time I met each of them. It seems like yesterday that Chris showed up in my Biology 101 class or that Jaina Patel and K’Joy Simms came to annoy the heck out of me with their transfer credits! Several of this year’s class worked in my research lab and as usual it made for a unique cast of characters. Like every year there was laughter and tears, excitement and trepidation as we moved towards the spring and graduation. In a few weeks we will be starting over with a new group of freshmen. This year’s underclassmen will be next year’s graduates. Changes are everywhere - all you have to do is look!
Research continues to be an integral part of our department’s program. Students pursue independent study projects under the tutelage of faculty members, and those pursuing a B.S. degree are required to complete a senior research project. Listed below are projects for Spring 2005.

**Independent Study Projects**

- Connie Arthur: Transient generation of retroviruses as anti-HIV reagents. Advisor: Dr. William Jackson.
- Melinda McDonald: Design and cloning of an anti-HIV-1 hammerhead ribozyme. Advisor: Dr. William Jackson.
- Christina Wilson: Effects of phosphate and microbial amendments on lead (Pb) contaminated soil. Advisor: Dr. Garriet Smith.

**Senior Research Projects**

- Katherine Anderson: Analysis of HIV-1 tat expression by Reverse Transcription-PCR. Advisor: Dr. William Jackson.
- Kimberly Dobson: The importance of moisture in heat-treated *Cyperus* tubers. Advisor: Dr. Andy Dyer.
- Raven Ginn: The effects of food supply on silk moth production. Advisor: Dr. Andy Dyer.
- Carol Journey: Generation of a stable HeLa cell clone expressing a TatFLAG fusion gene. Advisor: Dr. William Jackson.
- Brandon Padgett: Effects of temperature on seed germination and young plants. Advisor: Dr. Harry Shealy.
- Christina Tucker: Determining the presence of coyote (*Canis latrans*) in Hitchcock Woods via scent post surveys. Advisor: Dr. Jeffrey Priest.
- Caroline Weed: Determining coyote (*Canis latrans*) presence and food habits in Hitchcock Woods by means of scent post surveys and scat analysis. Advisor: Dr. Jeffrey Priest.
- Carl Williams: Arm structure and prey handling in *Octopus bimaculatus*. Advisor: Dr. Heather Bennett.
Alumni Focus

We turn our alumni focus this Spring to 1998 graduate Heath Holley. After receiving a B.S. in Biology, Heath went to work for Monsanto Pharmaceutical in Augusta, GA, first as a Quality Control Associate Microbiologist and later as an Aseptic Unit Specialist. He then moved to Miami, FL where he was employed by Schering Laboratories in Miami Lakes. His first position there was as Quality Test Laboratory Microbiologist—Quality Control Microbiologist.

In April of this year he moved to the Validation Department where he serves as Validation Engineer/Cleaning Validation Site Material Expert. This position is focused on review and testing of procedures and processes utilized in pharmaceutical production. He manages multi-functional teams and oversee projects from beginning to end.

In his years at USCA, Heath learned skills in the labs of Dr. Garriet Smith and Dr. James Yates that have helped in his professional career. “In fact, I had the opportunity to show a Biolog Sales Rep where Dr. Smith’s work contributed to their fungal Identification Database,” said Heath. “I feel that every member of the faculty was very supportive, and this support and instruction has had a profound influence on my career. Without the one-on-one attention I received at USCA, I do not feel that I would have been able to excel this far in such a short period of time. The Biology/Geology Department has provided me remarkable experiences and opportunities in growing and learning.” Heath will be married in the near future to Amy Nicole Ray who has a BS in Biology from Georgia State University. Heath says the ceremony will take place on a sailboat in a nice, quiet sunset ceremony off of Key West.