The department welcomed two new faculty members in the Fall of 2015, Dr. Kristina Ramstad, filling the vacancy created by Dr. Hugh Hanlin's retirement, and Dr. Suchreet Mander in the position previously filled by Dr. Stephanie Muga. We invite you to get to know these two newest members of our departmental family.

Kristina grew up in Washington State, where she learned from an early age to love hiking and fishing under the tutelage of her outdoorsy parents. She traded the west coast for the east when she attended Wellesley College in Wellesley, Massachusetts for her undergraduate degree in biology. At Wellesley, she furthered her fascination with fish ecology by working as an Assistant Aquarist at the...
As we move into the new academic year, we say goodbye to the retiring Dr. Bill Pirkle and Professor Karin Willoughby, who have a combined 68 years of service to USC Aiken. Last August, the department initiated a national search for two new geologists to fill these positions. Through that search process we were able to secure two outstanding individuals, who through their teaching and expertise, are bringing new opportunities to our students in terms of course options and undergraduate research.

Dr. Jessica Sullivan, whose research is in salt marsh morphodynamics, received her PhD in Geological Sciences from the University of South Carolina in 2015. After completing her education, she worked as an Estuarine Ecologist for the South Florida Water District. She is a co-Principal Investigator on a $700,000 National Oceanic and Atmospheric Administration grant to study temporal and spatial variability in floodplain circulation. Dr. Sullivan will be teaching a number of geology courses including Environmental Geomorphology and GIS.

Dr. Kelly Gibson, whose research interests are in paleoclimate, marine sedimentology, and geochemistry, received her PhD in Marine Geology and Geophysics from the University of Miami in 2012. After completing her degree, she moved to a post-doctoral fellowship at the University of South Carolina to continue her research in reconstructing paleoclimate and marine paleoenvironmental change in the tropics. Dr. Gibson will be joining us in the Spring 2017 semester following an International Ocean Discovery Program cruise during which she will study the influence of the onset of Northern Hemisphere glaciation on productivity and the carbon cycle in the tropical Western Pacific. She will be teaching in our lower level geology sequence and is eager to develop new courses that complement her expertise.

This fall marks the initial year of our new clinical laboratory science program. The genesis of this program was in 2013 when we began looking for a partner to offer a training program for Clinical Laboratory Scientists, a search that led to the University Health Care System in Augusta, GA. Following an approximately two-year process, we received all of the approvals necessary to offer the program and to create a partnership with the University Hospital, where our students will receive their clinical training. Students in this program will complete 90 semester hours toward the biology degree at USC Aiken before completing a one-year clinical internship during their senior year at the University Hospital. The biology curriculum centers on a number of clinically related courses that include biochemistry, microbiology, and immunology, while the internship is focused on the clinical application of these areas. Students who complete the program will earn a Bachelor of Science in Clinical Laboratory Science from USC Aiken, which will qualify them to work as Clinical Laboratory Scientists, also known as Laboratory Technologists. Graduates will also be able to sit for a number of clinical laboratory certifications, which will allow them even greater upward mobility in the workplace. This is an excellent degree option for students who are interested in a career in health care in which they can make a difference in the treatment and diagnosis of patients, and has great job opportunities in hospital labs, reference labs, and research labs.

Over the summer, we welcomed 101 new students as new biology majors. This group, which consists of both new freshmen and transfer students, represents our largest incoming class ever. A common comment from these students about why they choose to come to USC Aiken is that they understood we have a strong biology program – I could not agree with them more. Welcome everyone, I hope you have a great year!
Geology Student Of The Year

Chancellor Jordan, Ca'Shara Lott, and Dr. Andy Dyer

Ca'Shara (Shay) Lott, a graduating senior with a Bachelor's degree in biology and a geology cognate, has been chosen as this year's Outstanding Student in Geology. Dr. Allen Dennis said of Shay, "In the past year, Shay Lott has been a leader in Paleontology, Historical Geology, and Southern Appalachian Geology. She has shown quiet confidence, determination, and enthusiasm as she has pursued her studies and led her classmates." Shay was even called upon to use her out-of-the-classroom knowledge when the USCA bus broke down on their Spring break field trip for the Appalachian Geology class. An employee at Auto Zone, she was able to diagnose the problem, an invaluable help to Dr. Dennis.

A native of Trenton, SC, Shay attended Strom Thurmand high school before beginning her college career at USCA. "Ever since I was little I wanted to study biology. I was very inspired by my 6th grade science teacher, Ms. Yonce. She loved science and I wanted to be like her," Shay remembers. Marine Biology became her primary focus at USCA with Biology of fishes taught by Dr. Virginia Shervette one of her favorite classes, along with Animal Nutrition taught by Dr. Michelle Vieyra. She especially loved the classes where they got to go outside and discover things for themselves, like the Appalachian Geology class. Shay said of Dr. Dennis, "He really loves what he does and it really inspired me. I have adopted his favorite saying, 'Don't worry!', because everything will turn out okay."

Shay will begin working for the Department of Health and Environmental Control in the Coastal Zone and Resource Management Department in Charleston this June, and hopes to attend the College of Charleston for a master's degree in Marine Biology in the future. Congratulations, Shay, and best of luck in your career and future studies.

Recent Faculty Activities

Grants awarded:
Exposure to Mercury through Subsistence Fishing: Assessment and Community Outreach in Lower Gills Creek, SC, Gills Creek Watershed Association/EPA, PI Virginia Shervette.

A Resource for Functional Genomics to Support Soybean Genetics and Breeding, NSF/subaward with UGA, PI Nathan Hancock.

ASPIRE I: Panmixia, promiscuity, and nest parasitism among wood storks (Mycteria americana), USC Office of Research, PI Kristina Ramstad.

RISE: Fine-scale isolation by distance and inbreeding in New Zealand's rarest kiwi (Apteryx rowi), USC Office of Research, PI Kristina Ramstad.


Selected Presentations:


Congratulations to Dr. Michele Harmon, promoted to Professor of Biology!
The Department of Biology and Geology is a recent recipient of a five-year, $500,000 National Institutes of Health-funded grant to support biomedical program expansion and networking of biomedical research activities of faculty and students throughout South Carolina. This outreach program is funded as part of NIH’s INBRE (Idea Network of Biomedical Research Excellence) program. As a member institution of the South Carolina INBRE program, USC Aiken joins the three state research institutions (USC Columbia, Clemson University, and the Medical University of South Carolina) and nine primarily undergraduate institutions (PUIs) to support faculty development and hands-on research training.

USC Aiken’s INBRE program is termed the Passport to Research Opportunities in Biomedicine (PROBE), which is designed as a multi-pronged strategy to identify students interested in biomedical research and team them with a USC Aiken faculty mentor. In addition to supporting biomedical research within the department, USC Aiken INBRE also supports biomedical research in the departments of Chemistry and Physics and Psychology. The faculty member participants include Drs. April DeLaurier, Nathan Hancock, and William Jackson from the Department of Biology and Geology; Dr. Ken Roberts from the Department of Chemistry and Physics; and Drs. Alexandra Roach, Laura Swain, and Keri Weed from the Department of Psychology.

Identifying students to involve in the research process early in their studies is a primary goal of USC Aiken INBRE program, as it relates directly to student learning and retention. This past year, approximately 25 students were identified, 15 of whom were subsequently recruited into the research labs of participating faculty member. These students, once paired with a faculty member, were introduced to research in their chosen field and given a project on which to work. Mentoring strategies include hands-on work in the research lab, one-on-one discussions with their mentor, attending on-campus research seminars, and participating in weekly lab
meetings to discuss their research results with other members of their lab. The PROBE program supports undergraduate projects by awarding two levels of research awards, for which students must describe their project and propose studies necessary to complete the work. The Primer award, in the amount of $2000, is designed for students just beginning their projects, while the Extension award, in the amount of $5000, is designed for more experienced students, who are further along in their projects.

Eight Primer and seven Extension grants, totaling $49,000, were awarded during the first year of the program, which began January 1, 2016. These 15 students began work on their projects in earnest this past summer as part of the USC Aiken INBRE Summer Research Experience. This 10-week program brought INBRE students and their mentors together as a cohort to promote crosstalk between labs, develop friendships, and provide a forum to discuss interesting topics in the biomedical sciences. The summer experience culminated in a mini-symposium at USCA during which each student presented the results of their summer work. This preceded the larger South Carolina INBRE research symposium, which took place at the USC School of Medicine on August 27. During this event, our students sat in on a variety of research talks from faculty located across the SC INBRE network and participated in the symposium’s poster session. From the approximately 80 poster presentations, USC Aiken student and biology major Allison Swiecki was awarded one of three top honors for her presentation entitled, Developing Tol2-based activation tag constructs.

As we move into year two of USC Aiken INBRE, we look forward to recruiting a new cohort into the program and continuing the development of the year-one cohort. The next round of Primer and Extension awards will begin January 1, 2017, and we are looking forward to disseminating the work of these students. The first opportunity to do so will be at USC Aiken’s Scholar Showcase, slated for April 14, 2017, during which our students will present their work, along with others from across campus, to the faculty and invited guests.
New England Aquarium and undertaking a Semester at Sea, where she sailed through the Sargasso Sea and the Bermuda Triangle while doing research on eels! A common theme running through Kristina's life seems to be one of adventure—if she hasn't been someplace before, she is eager to try out something new! Following her graduation from Wellesley, she spent a year in Alaska as an observer on fishing boats before beginning a master's degree in Aquatic & Fisheries Sciences at the University of Washington. Her primary focus was on the ecology of salmon, and she continued spending the spawning seasons in Alaska, getting to know the indigenous peoples and learning much from their traditional knowledge. Next she moved to Montana for her Ph.D. in Organismal Biology and Ecology at the University of Montana in Missoula, mentored by Dr. Fred Allendorf and shifting her emphasis to the genetics and evolution of salmon.

The next stage in Kristina's life was the most adventurous yet. Dr. Allendorf, knowing of her interest in traditional ecological knowledge, introduced her to his very first graduate student, Dr. Charles Daugherty, who was now at Victoria University in Wellington, New Zealand. She went to New Zealand at his invitation to work with the Maori tribes, recording their traditional knowledge of tuatara (a reptile native to New Zealand), and was then offered a Postdoctoral Fellowship, combining her Maori outreach work with genetic research on kiwi, New Zealand's national bird. The postdoctoral fellowship turned into a research fellowship, and the two years she had planned to be in New Zealand turned into eight!

Moving back to the States was for Kristina a quest for her "dream job." "I wanted to teach in a small, liberal arts college and have the opportunity to set up my own lab, so I started job hunting. New Zealand does not have small colleges, so I knew I would not find it there. USC Aiken fit the bill and was in a part of the country where I had never lived. It's also an incredibly biodiverse part of the country, and I knew I'd have no trouble finding exciting study systems here," she explains. So yet another adventure began last Fall when she arrived in Aiken to pursue that dream. She spent the year teaching Biological Sciences II, the organismal part of our introductory sequence for biology majors, and setting up her lab. In the coming year she will add Conservation Biology and Vertebrate Zoology to her teaching schedule.

It is a well-known fact that South Carolina has neither kiwi nor salmon, but she has found her niche here collaborating with the South Carolina and Georgia Departments of Natural Resources, the U.S. Fish & Wildlife Service, and the University of Georgia/Savannah River Ecology Lab working with the threatened wood stork population in the southeast. She received internal funding from the university's research foundation to pursue those studies, and along with Magellan scholar David Hodges, she has been out in the field collecting samples from chicks in the wood stork nests all summer. "People call them ugly, but I think they are handsome," she says of her new research species. Her tales of canoeing to isolated wetland nesting colonies, scaling the trees to reach the huge nests high in the branches, taking the measurements and samples from the chicks and returning them to the nests, along with avoiding alligators and snakes, make it clear that this is a new adventure she thoroughly enjoys. And the department and students are delighted to have her in our midst!

(Photography by David Scott)
Our second new hire, Dr. Suchreet Mander, grew up in the industrial hub of Punjab, India. “Our life revolved around education,” Suchreet remembers, “There was no question my brother and I would go to university.” She first earned a B.S. in Biochemistry at the Government College for Women in Ludhiana and then a M.S., also in Biochemistry, at Punjab University in Chandigarh. She came to the U.S. in 2005 when she married. Her husband had a degree in computer engineering from UNC Greensboro, but they first settled in McCormick, SC with his parents and helped with the family business of running gas stations. It was a huge shock for her to move from the big city to a small village in the United States, but she pitched right in helping with the family business, studying for the GRE on the side. She is fluent in English, Hindi, and Punjabi, the state language. “All kids in the big cities are expected to learn three languages,” Suchreet reported, “English, Hindi, and the state language of their own state. I could not understand someone from the south speaking in their state language any better than an American could!” While her husband got a contractor’s license and expanded the business, Suchreet matriculated at Georgia Regents University in 2007 to begin a Ph.D. in Cellular Biology and Anatomy. They moved to Augusta in 2010, and she completed her degree in 2013. Two daughters were born along the way, the first, Sahej, in 2007 and the second, Suhani, in 2013.

While in graduate school in Augusta, Suchreet had a teaching assistantship for four years, teaching Medical Histology to the medical students. Her Ph.D. advisor, Dr. Patricia Schoenlien, pushed her to take anatomy with the allied health students. “I can never thank her enough for that,” Suchreet said, “as it prepared me to teach anatomy and physiology to undergraduates.” She was also a Research Assistant in Dr. Schoenlien’s lab working in the field of breast cancer. Upon graduating, she became a Postdoctoral Fellow in the Department of Oral Biology, where she taught gross anatomy labs to the dental students, as well as nurse anesthesia and respiratory therapy students. She was also an adjunct instructor at Aiken Technical College, so she was eminently qualified to fill the position at USC Aiken for an instructor of anatomy and physiology. Suchreet reports that her first year with us has been great. The position is a perfect fit for her, as she does not have research responsibilities, giving her time for her family. Cooking, eating out, and working-out are some of her favorite activities, and she makes time to go to the gym every day, encouraging her own children and her students to adopt a healthy lifestyle.
Student Awards

South Carolina Academy of Science Annual Meeting awards for outstanding undergraduate research, Winthrop University:

Erin McLaughlin, 2nd place, Molecular Biology Oral Session, Bicistronic Expression from a HIV-1 Dependent Lentiviral Vecto, mentor Dr. William Jackson.

Madelyn Wasden, 2nd place, Cell Biology Oral Session, Optimizing In Vitro Fertilization Procedures in Zebrafish, mentor Dr. April DeLaurier.

Lisette Payero, 1st place, Molecular Biology Poster Session I, The role of Ping’s ORF1 Repetitive Sequence on mPing Transposition, mentor Dr. Nathan Hancock.

Alec Jones and Tiana Chandler, 2nd place, Molecular Biology Poster Session I, mPing as a Tool for Transposon Mutagenesis in D. rerio, mentor Dr. April DeLaurier.

Kasey Kreutz, 2nd place, Molecular Biology Poster Session II, Using CRISPR/Cas9 to Study the Role of ZMYM2 and ZMYM3 in Zebrafish Craniofacial Development, mentor Dr. April DeLaurier.

Christina Thomas, 1st place, Medicine/Pharmacology/Pharmacy/Public Health Combined Session, The Effect of Monosaccharides and Artificial Sweeteners on Bone Density in Sprague-Dawley rats, mentor Dr. Michelle Vieyra.

David Gilbert, Dwight Camper Outstanding Undergraduate Research Award, Characterizing the Replicative Transposition Mechanism of the MITE mPing, mentor Dr. Nathan Hancock.

SE Regional Society for Developmental Biology meeting at Whitney Laboratory for Marine Biology, St. Augustine, Florida:

Frances Loyo Rosado (first prize): Understanding the function of the PHF21A complex using CRISPR/Cas9 in zebrafish (Dr. DeLaurier)

Kenneth Glenn (second prize): Generating mef2ca and mef2cb transgenic zebrafish using BAC-mediated recombination (Dr. DeLaurier)

USC Discovery Day, USC Columbia:

First Place

Biological Sciences Posters:

Biology A - Afternoon Poster Session
Kasey Kreutz, Biology
Mentor: Dr. April DeLaurier,
Using CRISPR/Cas9 to study the role of zym2 and zym3 in zebrafish craniofacial development.

Biology B - Afternoon Poster Session
Frances Loyo-Rosado, Biology
Mentor: Dr. April DeLaurier,
Understanding the function of components of PHF21A complex using CRISPR/Cas9.

Biology A - Mid-day Poster Session
Emily Webb, Biology
Mentor: Dr. William Jackson
Measuring the effectiveness of anti-HIV tat siRNAs on HIV replication and gene expression

Biomedical Sciences A - Morning Poster Session
Austin Worden, Biology
Mentor: Dr. William Jackson
Design and cloning of an anti-HIV 1 Vif siRNA into a retroviral vector.

Second Place

Environmental Sciences - Afternoon Poster Session
Arnisha Atkinson, Biology
Mentor: Dr. Michele Harmon
Using Antibiotic Resistance Analysis to Identify Fecal Pollution Sources in Sand River.

Biology A - Mid-day Poster Session
Natalie Arthur, Biology
Mentor: Dr. William Jackson
HIV-1 dependent bicistronic expression of LucR and eGFP from a lentiviral vector.

Biology B - Afternoon Poster Session
Lisette Payero, Biology
Mentor: Dr. C. Nathan Hancock
The role of Ping’s ORF1 repetitive sequence on mPing transposition.

Biological Sciences A - Mid-day Poster Session
Kasey Kreutz, Biology
Mentor: Dr. April DeLaurier,
Using CRISPR/Cas9 to study the role of zym2 and zym3 in zebrafish craniofacial development.

Environmental Sciences B - Mid-day Poster Session
Kendell Woods, Biology
Mentor: Dr. Michele Harmon
Does Vegetation Enhance Sulfide Production in an Experimental Wetland System?
Clinical Lab Science Degree

A new degree program is being offered through the department beginning in the Fall of 2016. The Department of Biology and Geology’s Bachelor of Science in Clinical Laboratory Science degree provides a regional professional program for USC Aiken biology majors who are interested in an Allied Health career in a medical laboratory setting. As the only program of its type in this area of South Carolina, we will supply well-qualified Medical Laboratory Scientists to hospitals and clinical laboratories within the Central Savannah River Area (CSRA). The BSCLS degree is offered in collaboration with the University Health Care System in Augusta, Georgia, where the professional clinical component of the program will be offered.

Clinical Laboratory Science, also called Medical Technology, is the health profession that provides laboratory information and services needed for the diagnosis and treatment of disease. Clinical laboratory scientists perform, develop, evaluate, correlate and assure accuracy and validity of laboratory information; direct and supervise clinical laboratory resources and operations; and collaborate in the diagnosis and treatment of patients (NAACLS).

Application to the clinical component of the degree occurs following the completion of 60 credit hours (junior standing) and requires a 2.75 or higher cumulative GPA. The clinical component is limited to 12 students per year, selected in a competitive process by the CLS Admissions committee. For further details about this program, visit http://web.usca.edu/biology/academics/bs-clinical-laboratory-science.dot or contact Dr. Suchreet Mander at suchreetm@usca.edu.
Magellan Scholars

The department is proud to announce that one of our students has been named a Magellan scholar in the 2015-16 academic year, and two more were awarded Mini-Magellan grants to fund their research projects. Magellan scholars are awarded up to $3,000 to fund their research, and the mini-Magellan awards $1,000. Congratulations to these students and their research mentors.

David Hodges, Mating dynamics and conservation genomics of American wood storks, Mentor: Kristina Ramstad

The research that I was fortunate enough to participate in with Dr. Ramstad this summer was a fantastic opportunity for me to take what I have learned in the classroom and apply it in the field. Our mornings often started before sunrise. Upon arrival at our site, sunrise now slanting slowly through the trees, we slid our canoes quietly into a variety of wetland habitats throughout the Southeast in search of Wood Stork nestlings. Some nests that we discovered in Elderberry bushes were only two to three meters off the ground and were relatively easy to access, while others that we found in Bald Cypress trees were five to seven meters or more above the water and took a bit more effort to reach.

For these taller trees growing in the water we used a system of sectional ladders, ropes, and climbing belts to access the nests. This system took some practice to learn, but after a few trees, Dr. Ramstad and I were climbing with confidence. One of my favorite moments of a climb was the first instant that my eyes peered over the edge of the nest and I could see the nestlings face to face. Our climbing belts allowed us to stand securely on the ladders or tree branches and left our hands free to work with the birds. Upon accessing a nest, the climber would quickly cover the chicks with thin cloth (this calms them and keeps them cool) and begin to slowly gather each chick into a breathable bag and gently lower the bag by rope to the canoe below. In the canoe, measurements and samples were gathered from the chicks before they were raised back up to the nest in the manner they were lowered. Once all chicks were returned to the nest and uncovered, the climber bid them a grateful farewell and descended promptly to make way for the return of the parent birds. Incidentally, this process was often carefully observed by a host of curious alligators.

In addition to gaining new skills in field research this summer, I got to work alongside several experts in various fields related to conservation genetics. I met and worked with folks from Savannah River Ecology Lab, Jacksonville Zoo, Georgia Department of Natural Resources, and University of Georgia among others. This was an amazing opportunity to glean from their intellectual expertise and their volumes of field experience. With their guidance and assistance we were able to collect samples from over 200 wood storks, and I am excited for the next phase of this project as we organize and analyze the data we gathered in the field and are extracting in the lab. Who knows what we might find?

Magellan Mini-Grants

Rachael Jackson, A Strategy to Produce Pollen-Specific Transposition using the Arabidopsis thaliana DLL Promoter, Mentor: Nathan Hancock.

Frances Loyo-Rasado, Understanding the function of components of PHF21A complex using CRISPR/Cas9, Mentor: Dr. April DeLaurier.
Marilyn Mason, our 2015-16 Biology Student of the Year, graduates in August with a 4.0 gpa. Majoring in biology and minoring in chemistry, Marilyn was an outstanding student in every class she took. She declined to name a favorite class saying, "I loved all of them!" She was homeschooled through high school and then attended Aiken Technical College for 2 1/2 years, earning both Associate in Science and Associate in Arts degrees. Always interested in nature, how things work, and scientific processes, Marilyn says she did not think of herself as science-oriented until she started taking science classes.

As a biology major at USCA, she not only excelled in her classwork, but became an invaluable lab assistant, prepping and cleaning up labs, maintaining the collection of snakes and reptiles, and assisting other students in the lab. She was also a subject tutor for biology, physics, and chemistry.

Marilyn completed her senior research project in Dr. Garriet Smith's lab in microbial ecology and then joined Dr. Shervette's Fish Conservation Lab, where she was involved in several ongoing research projects. She was selected as a participant in SREL's Research Experience for Undergraduates in Radioecology during the summer of 2015. She presented her research at USCA's Research Day in 2015 and 2016 and at SREL's Summer Symposium. She is a leading author on one manuscript and a co-author on two others being submitted by Dr. Shervette.

In her nomination of Marilyn, Dr. Shervette gives her high praise, "I really cannot emphasize enough how incredible a student Marilyn is and how her thirst for knowledge is exceptional and something I have not ever before observed in any of the graduate and undergraduate students I have worked with." Marilyn hopes to attend medical or graduate school in the near future. We wish her well and know that whatever she does, she will be a great success!
Geology Retirements

The department is seeing a big change in the geology faculty for the 2016-17 academic year, with two retirements and two new hires. Dr. William Pirkle has retired after 44 years of service to the university and Sr. Instructor Karin Willoughby after 25 years.

Dr. Pirkle earned degrees in geology at Emory University (B.S.) and the University of North Carolina Chapel Hill (M.S. and Ph.D.) before coming to USCA as an assistant professor in 1972. In addition to his teaching duties, he served as chair of the Division of Natural Sciences (1983-86) and Dean of the College of Sciences (1986-93). He also served as the Director of Sponsored Programs from 1993 until the present.

Dr. Pirkle's research interests lie in sedimentology, mineral deposits, coastal processes, and hydrogeology. He has contributed to his scholarly field with approximately 45 publications and technical reports, and has served as Principal Investigator or Project Director on numerous projects and grants funded by the South Carolina Geological Survey, the National Science Foundation, the Department of Energy/WSRC, and most recently, the Department of Homeland Security where he is Project Director for several ongoing projects. He will continue on as Director of Sponsored Programs and Project Director of the DHS projects in the coming year.

Karin Willoughby earned a B.A. in geology at the University of Wisconsin-Oshkosh and a M.S. in geology at Virginia Polytechnic Institute and State University. She undertook advanced coursework in geology and museum management at Indiana University and the University of Kansas, as well as workshops in copy editing and the conservation of earth science materials at the Smithsonian Institution. She came to USCA as an instructor after serving as the Curator of Natural Sciences at McKissick Museum on the Columbia campus for nine years.

She was the principal investigator on two grants designed to enhance recycling efforts on campus and has been an active member of many professional organizations. She provides a display case of geological specimens for the Aiken-Augusta Gem, Mineral, and Fossil Show each year, serves on the CSRA Science Fair committee and acts as a judge at the Science Fair. She has also been the state coordinator for the earth science contests at the Jr. and Sr. South Carolina Science Olympiad since 1989. Her dedication to teaching earth science has been particularly influential with the myriad education majors who have passed through her classes on their way to becoming teachers in the public school system. She will continue to teach Earth Science on the Salkehatchie campus as well as Critical Inquiry classes at USCA in the coming year.
This spring a new free-standing research-quality greenhouse was constructed by the department. ASPIRE III funding from the USC Research Foundation was granted to Dr. Dyer, Dr. Hancock, Dr. Harmon, and Dr. Shervette to build the greenhouse. Although the grant provided the funds for the materials and preparation of the foundation, the actual construction of the greenhouse was performed by members of the department under the direction of Charlie Hancock, Nathan's contractor dad. Despite having minimal instructions, the greenhouse was framed and had the “glass” installed in just over a week. The USCA Facilities crew then completed the electrical and plumbing. Thanks to all those that helped.

The purpose of the new facility is to provide research space for ongoing projects including undergraduate studies. Planned projects include gene discovery in wheat and soybean (Dr. Nathan Hancock) and analysis of ecotypic variation of an invasive grass species (Dr. Andy Dyer). Despite high temperatures this summer, Hancock and Dyer have begun planting (see picture). In addition, the facility will benefit Dr. Michelle Harmon (wetland toxicology and remediation) and Dr. Virginia Shervette (fisheries management) by freeing up space in the Science Building greenhouse.
Newest Alumni

May-August graduates in attendance at the Senior Brunch:
L-r Front row, Pragya Rajpurohit, Kristin Garlick, Lauren Masanovich, Christina Thomas, Kayce Van Pelt, 
Austin Fuchs, Brandee Desmarais
Back row, Daymond Parrilla, David Gilbert, Madelyn Wasden, Austin Worden, Mustafa Elhallaoui, Marilyn Mason

Alumni News

Spring 2016 graduate Kayce Van Pelt with her dad, Dr. Robert Van Pelt. Dr. Van Pelt has been an adjunct professor of geology at USC Aiken for the past 22 years.

Audrey Hendley, 2009, Ph.D. in Human Genetics and Molecular Biology, Johns Hopkins University School of Medicine, 2016. Audrey is currently a Post-doctoral Scholar at the University of California-San Francisco School of Medicine working with Matthias Hebrok, Director of the Diabetes Center at UCSF.

Amanda Steffan, 2012, DVM, University of Tennessee College of Veterinary Medicine, 2016. She is currently an emergency veterinarian in Atlanta.

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 http://www.usca.edu/alumni/about/index.dot
Research continues to be an integral part of our department’s program. Students pursue independent study projects under the tutelage of faculty members. Those pursuing a B.S. degree are required to complete a senior research project. Listed below are projects for Fall 2015 and Spring 2016.

**Fall 2015 Senior Research Projects**

Aubrey Blackman: *The germination ecology of barbed goatgrass (Aegilops triuncialis).* Dr. Andy Dyer.

Erika Boyd: *Zinc Toxicity in a Model Constructed Wetland.* Dr. Michele Harmon.

Shannon Burton: *Tributaries as sources of fecal coliform bacteria pollution along the Sand River, Aiken, SC.* Dr. Michele Harmon.

Melissa Del Tufo: *Role of the immune response in determining susceptibility to helminth infection.* Dr. Derek Zelmer.

Kristie Farah: *Understanding the function of components of the PHF21A complex using CRISPR/Cas9.* Dr. April DeLaurier

Joshua King: *Toxicity Response of Daphnia ambigua and Ceriodaphnia dubia to a Potassium Humate Addition System at the H-12 Outfall Within Savannah River Site.* Dr. Michele Harmon.

Tiffany Smith: *Copper Toxicity in a Model Constructed Wetland.* Dr. Michele Harmon.

**Spring 2016 Senior Research Projects**

Arnisha Atkinson: *Investigating fecal coliform pollution in Horse Creek, Aiken, SC.* Dr. Michele Harmon

Megan Berry: *Interspecific interactions mediated by nutrient transport in the rhizosphere.* Dr. Andy Dyer.

Brandee Desmarais: *The effects of natural and artificial sweeteners on depressive symptoms in rats.* Dr. Michelle Vieyra.

Stephanie Diaz: *mPing-based activation tagging in Arabidopsis thaliana.* Dr. Nathan Hancock.

Mustafa Elhallaoui: *The effects of natural and artificial sweeteners on gut microbe populations.* Dr. Michelle Vieyra.

Austin Fuchs: *Behavioral ecology of aquatic snakes.* Dr. Virginia Shervette.

Ryan George: *Life-cycle of species of Haematoloechus infecting Ferissia fragilis.* Dr. Derek Zelmer.

David Gilbert: *Characterizing the mechanism of replicative transposition of MITE mPing.* Dr. Nathan Hancock.

Heather Jones: *The effects of natural and artificial sweeteners on blood glucose and obesity.* Dr. Michelle Vieyra.

Jessica Owens: *The influence of soil microbia on nutrient exchange between plants.* Dr. Andy Dyer.

Daymond Parrilla: *Analysis of mPing transposition promoting sequences.* Dr. Nathan Hancock.

Kayce Van Pelt: *Using forward and reverse genetics to identify the mutation underlying b1187.* Dr. April DeLaurier.

Madelyn Wasden: *Generating zebrafish embryos using in vitro fertilization.* Dr. April DeLaurier.

Emily Webb: *Analysis of siRNA-mediated HIV inhibition.* Dr. William Jackson.

Kendell Woods: *Phytoremediation of heavy metals.* Dr. Michele Harmon.

Austin Worden: *Cloning and analysis of an anti-HIV siRNA against Vif.* Dr. William Jackson

In the Spring of 2013, a new course was introduced to offer another option for our majors to gain research experience - BIOL 498 Research Design, Implementation, and Analysis. It is required of those earning a Bachelor of Arts degree in biology. Those pursuing a Bachelor of Science degree can choose either BIOL 498 or 490/499 to fulfill this requirement. Students in both classes attend our weekly Friday afternoon seminars. Dr. Andy Dyer, the instructor for BIOL 498, describes the content of this class: ”This course is designed to offer an in-class research experience to graduating seniors who are not engaged in laboratory research. The course has two objectives: the first is to learn the important basics of experimental design, and the second is to apply that information. To accomplish the second goal, we use the death certificate database from Ancestry.com to test hypotheses related to mortality patterns in South Carolina from 1915 to 1960. We ask questions about types and numbers of infectious diseases, cardiovascular disease and cancer; we compare data between years, urban and rural counties, men and women, racial groups, and especially age groups. After gaining expertise reading doctor’s handwriting, we review hundreds to thousands of death certificates, compile and analyze the data, produce graphs, look up background literature, and finally produce a research poster. With this course, all of our seniors have had an opportunity to produce and defend a supervised research project before they graduate from the Department of Biology & Geology.”
Alumni Focus
Marlon Smith

Marlon Smith, '02 graduate, is a husband, father, high school biology teacher, and coach. The path to this place in his life led through the Biology/Geology department at USCA, but when he was a high school student himself at Swansea High School, it was not his intended journey. USCA was not his school of choice, and he considered joining the military when other plans did not work out, but his Upward Bound Counselor introduced him to the idea of going to USCA, and Marlon is very grateful for the way things turned out.

Marlon describes himself as "very inquisitive." "Growing up, I can remember people telling me all the time, 'You ask too many questions!' I can remember learning something new and then asking my parents and siblings if they knew it, just to see if I was getting smarter than they were. I always wanted to be the first person to learn new information or know something that others didn’t. This attitude developed what I consider my scientific mind. The thought of discovery through observation and experimentation peaked my interest and led to my choosing Biology as my major. From elementary school, I always knew I wanted to be a scientist."

While at USCA, Marlon particularly enjoyed Seasonal Flora with Dr. Shealy and the ecology classes he took with Dr. Dyer. "Dr. Dyer is my guy! I have never told him this, but he is one person that inspired me the most. He helped me to maintain focus and finish my Biology degree. I really appreciated his guidance then and we still stay in contact today." And Dr. Dyer remembers Marlon well as one of his early students.

"He was very sharp, but very unsure of what he wanted to do after leaving USCA. He tried several jobs, but once he got into teaching, I think he found his calling. I knew Marlon was serious about teaching science when he emailed me shortly after getting his first job. He wanted to borrow labs we had done in my courses and adapt them to his high school classes. I gladly sent him anything he wanted and appreciated the vote of confidence he was giving me in my own job."

After completing his degree, Marlon worked at the Savannah River Ecology Lab and then the Columbia Wastewater Plant. For the past ten years he has been a high school biology teacher, currently teaching AP Biology, AP Environmental Science, and Biology II at C.A Johnson High School in Columbia. "I really love working with the students and providing them with scientific knowledge and experiences. I am also the Head Varsity Girls Basketball Coach and Head Varsity Track Coach. Each day provides a different experience and I love it."

Marlon met his future wife, Bianca (West) while at USCA as well. Bianca graduated in 2005, also with a degree in biology, and is currently an Inspector for the USDA. They have two lovely children, Joshua, 12, and Makenna, 5, along with a boxer named Lenox. Marlon enjoys playing basketball, spending time with family, and hanging out with old USCA Alum buddies (Kevin Rouse, Joey Bouknight, Trevor Raysor, Steven Lykes, Orlando Rivera, and Arlo Walker).

Marlon sums up, "USCA will forever be a part of my life, and I will forever cherish the memories and people I have met here!!"