GEMS PROFESSOR PARTICIPATES IN SOUTH DAKOTA DINOSAUR DIG

Dr. Bill Gallagher, Assistant Professor of Paleontology at Rider University, joined an international team of paleontologists this past summer on an expedition to a remote area of the Hell Creek Formation in South Dakota. The team traveled into rugged badlands to do mapping, stratigraphic section measuring, and preliminary excavation and collecting of fossils from near the end of the Mesozoic era, the age of dinosaurs. They worked in two new sites rich in dinosaur bones, crocodiles, turtles, tiny little mammal teeth and jaws, fish remains, fossil plants, and amber.

Careful study of the sediments and the fossils revealed an ancient environment quite different from today. The dry, semi-arid northern Great Plains of South Dakota are rugged eroded grasslands today, suitable only for cattle grazing. The coyotes, pronghorn antelopes, horned toads, and rattlesnakes that live here are adapted to dry conditions and sparse vegetation. But the fossils and rocks reveal that a wet, subtropical forest existed there some 66 million years ago near the end of the Mesozoic Era. The bones of larger dinosaurs were found, including the top predator Tyrannosaurus rex, the smaller, but no less deadly, velociraptors, several species of horned dinosaurs, a partial skeleton of a giant duck-billed dinosaur, and some smaller bird-hipped dinosaurs as well.

Much tinier, but just as exciting, were the dozen or so small mammal teeth and jaw bones found with the dinosaur material. These require a keen eye to spot. Dr. Gallagher discovered a jaw section containing two teeth of one of these little critters. The teeth are distinctive enough to identify them as the remains of a multituberculate, a kind of small Cretaceous mammal that is now extinct. Other small teeth indicated the presence of small marsupial mammals similar to opossums.

The expedition required hot, hard work in the open sun, but the results were worth it. This is a new and very rich area for fossil prospecting, and it promises to yield a wealth of information and data about the last fauna of the giant dinosaurs and the other animals and plants that lived with them. Future excavations in the badlands are being planned.

DISCOVERY SCIENCE COURSE EXPLORES THE NATURE OF SCIENCE

A new introductory science course for undeclared college freshmen at Rider University will be introduced this coming fall semester. Part of the Discovery Pilot Program, Integrated Science (SCI-100) will investigate a broad selection of subjects centered on a specific scientific mystery. For this year the main question is: What was responsible for killing off all the great dinosaurs (and many other animals and plants as well) 66 million years ago?

Students will make their own discoveries in this class, unearthing their own clues while going on a variety of field trips to fossil sites and museums, and conducting investigations...
and analyses in the lab and classroom at Rider. The over-arching theme for the course focuses on getting students to investigate how science functions as a philosophical, historical, and social process, and how scientists go about their practice in formal and informal ways.

Students will be involved in active inquiry, pursuing their own areas of curiosity, investigation, and research. Students will select from three topics for a team project: Organizing a paleontological expedition to a remote fossil site, constructing a museum dinosaur exhibit, or conducting a scientific research project. The class will culminate in a series of presentations of the class projects in these three areas, competing for a fictional grant award for the best project.

The course will conclude by focusing students’ attention on modern concerns about environmental issues such as global climate change, biodiversity loss, and the extinction of living species.

$100K NATIONAL SCIENCE FOUNDATION GRANT OBTAINED

Dr. Hongbing Sun (PI), Dr. Jonathan Husch (Co-PI), Dr. Reed Schwimmer (Co-PI), Dr. Feng Chen (Chemistry; Co-PI), and Dr. Laura Hyatt (LAS Associate Dean; Co-PI) were awarded a $100,207 grant by the prestigious National Science Foundation for the purchase of a new Inductively Coupled Plasma (ICP) Emission Spectrometer to replace our aging (but much loved) Baird 2070 ICP that has been used for the past 17 years! The new, state-of-the-art, Spectro ARCOS ICP not only can detect of all the metallic elements that a traditional ICP can, but also can detect the halogen elements (Cl, Br, I, etc.) at low parts per billion (ppb) levels. The instrument should be up and running for student and faculty research, and for teaching use, by the beginning of the spring 2012 semester. This grant is another success following the $155,291 NSF grant awarded to Drs. Chen, Husch, Sun, McCarroll, and Pajer for the acquisition of a new automated Powder X-ray Diffractometer in 2008.

INTRODUCTION TO FIELD MARINE SCIENCE: ROATAN, HONDURAS 2011

This past May and June, 15 Rider students and two faculty flew to the Caribbean island of Roatan, Honduras, and spent 15 days immersed in the tropical marine environment. The trip was part of the course, MAR-229 Introduction to Field Marine Science: Tropical Environments, and was team-taught by Dr. Gabriela Smalley, Assistant Professor of GEMS, and Danielle Schmitt, Adjunct Instructor at Rider and of Princeton University. The group stayed at the Institute for Marine Science, part of Anthony’s Key Resort in Roatan.

Students conducted a number of investigations in different marine environments, often by boat and with snorkel or even SCUBA gear. They received their introduction to snorkeling and reef life when surveying several fish species that indicate coral reef health. The group then looked at seafan orientation relative to prevailing current direction and tromped around a seagrass bed, cataloguing the flora and fauna along several transects. They also snorkeled in the murky (and somewhat spooky) waters of the mangroves, inspecting the submerged roots, and went on a boat trip to a private island, learning about pirate history in the region. The group also investigated vertical zonation along a very scenic tropical rocky intertidal area at the western tip of Roatan and mapped out a coral reef teeming
with tropical fish just off Maya Key. Students also spent an entire day with the dolphins of Anthony’s Key Resort, holding them, snorkeling with them, learning about dolphin biology and training, and trying out their training skills first-hand (with varying degrees of success).

![Dolphin training](image)

Dolphin training

During the last three days of the course, students designed and conducted their own individual experiments, resulting in a wide variety of research projects. Several students studied movement and habitat selection of different species of hermit crabs, urchins, and chitons, either in the field, the lab, or both. Several others investigated distribution, behavior, or territoriality in a variety of reef fish, including damselfish, pufferfish, blue tang, parrotfish, and butterfly fish. Others looked at mountainous star coral orientation, sponge filtration rates, withdrawal of feather duster worms, and turtle grass biology.

![Dolphin encounter](image)

Dolphin encounter

But it wasn’t all fieldwork and lab report writing (well, mostly, but not all…); during their well-deserved time off, some of the group kept busy with horseback riding, SCUBA diving, snorkeling, kayaking, cracking open coconuts, or just hanging out by the pool. Rider University was also well represented at the Fiesta Night organized by Anthony’s Key Resort, winning the hermit crab race (go Kelli!) and coming in second in the limbo contest (Amanda, that victory should have been yours…!).

If you missed all the fun in the sun because you were unable to come along on this trip, stay tuned for our next Field Marine Science course.

**NATURE’S BUSINESS: PERU - FROM THE ANDES TO THE AMAZON AND EVERYTHING IN BETWEEN**

Sometimes there really are no words to describe the truth about a place; you just have to see it for yourself. This certainly was the case for the 26 Rider students and faculty, as well as four family members, who traveled to Peru while participating in one of the most memorable, amazing, and educational experiences of their lives.

Over ten incredible days in January 2011, the group crisscrossed Peru on bus, boat, canoe, pedicab (that’s a whole other story), plane, and train, learning first hand about the country’s history, culture, economy, geography, geology, ecology, environment, biodiversity, business climate, ecotourism industry, and of course, its unique Inca heritage. GEMS students who participated in the Nature’s Business: Peru course and trip were Denise Breen ’11, Amy Crowe ’12, and Robert Weber ’11. Other students came from the business, liberal arts, science, and MBA programs.

Team-taught by Dr. Cynthia Newman, Associate Professor of Marketing and Advertising, Dr. Susan Denbo, Professor of Legal Studies and Business Ethics, and Dr. Jonathan Husch, GEMS Chair and Professor of Geological and Environmental Sciences, the trip was the culminating experience of the
A semester-long Nature’s Business course co-sponsored by the Rider University Colleges of Business Administration and Liberal Arts, Education, and Science.

Street scene in Cuzco

In addition to lots of reading and fact finding about Peru and its many natural and cultural wonders during the fall 2010 semester, each student in the course kept a detailed journal during the trip and wrote a research paper on a faculty-approved topic of his/her choice after returning to Rider. Prior to the trip, students attended a special course lecture on Inca history and society, presented by Dr. Christopher Heaney, author of the book, *Cradle of Gold, The Story of Hiram Bingham, a Real-Life Indiana Jones, and the Search for Machu Picchu*. Dr. Heaney also gave a very well-attended talk to a general community audience as part of Rider’s International Week activities.

After a overnight flight from New York, the group arrived in Lima and was greeted at the hotel with the first of many glasses of Pisco Sour, Peru’s national drink. Then, it was on to a bus tour of the capital city, including stops at a number of colonial-era cathedrals and government buildings (one even had huge catacombs filled with the skeletal remains of long-dead Peruvians!). Lima is a sprawling city of over eight million people with neighborhoods of great wealth and beauty, as well as immense poverty. Everywhere there was traffic and congestion, but also a sense of great potential and possibility.

The next day, after a short flight, it was on to Cuzco, the former capital of the Inca Empire located high in the Andes Mountains at an elevation of over 11,000 feet. After having some much-needed coca leaf tea at the hotel to help fight off the very real effects of altitude sickness, the group walked around Cuzco (see photo) with stops at various cathedrals and Inca sites, including the Temple of the Sun. In the evening, after a detailed lecture on Inca history, the group was treated to a traditional Peruvian dinner (including guinea pig and alpaca!), complete with local music and dance.

Day three started off with a bus ride out of Cuzco and into the heart of the Andes Mountains. After passing through some of the most beautiful scenery imaginable, the bus wound its way up a long, twisting highway to an elevation of over 14,000 feet to the small agricultural area of Comunidad de Cuyuni, where the group was met by some local, indigenous farmers and their families. Over the next few hours, they explained their way of life and invited everyone to participate in their religious, agricultural, and cultural rituals and practices, including making offerings to their various gods, especially Pachamama, the Inca goddess of the Earth and fertility (see photo). It really was an amazing experience. Then it was back down the mountain to “only” an elevation of 10,000 feet and on to the town of...
Urubamba, located in the heart of the Sacred Valley of the Inca, for the night.

The next day started off normally enough (as if anything was “normal” on this trip) with another bus ride through the Andes to the town of Ollantaytambo, where the group boarded the train to Aguas Calientes, the town nearest to Machu Picchu, the famous “lost city of the Incas” discovered (actually rediscovered) by Hiram Bingham in 1911. With no roads leading into the area, it was either take the train or hike for four days along the Inca Trail. Unfortunately, due to time constraints, there really was no choice. Fortunately, the train was very comfortable and the scenery along the Rio Urubamba was magnificent!

Upon arriving in Aguas Calientes, everyone immediately boarded buses for the very twisty ride up to Machu Picchu. Words, and even pictures (see photo), just do not do the place justice and the ruins are both awe inspiring and humbling at the same time. It really is hard to comprehend how the Inca, with very limited technology, could build such a beautiful place in such a remote locality. However, what made the visit even better was that following some rain, most visitors left, leaving those who stayed behind a chance to enjoy the ruins in quiet solitude and without any distractions, other than letting the wild llamas that roam the grounds go past you on a steep stairway. The whole experience just took your breath away.

After a fantastic dinner, some gift shopping, and an overnight stay in Aguas Calientes, it was back to Cuzco by train and bus, then a flight to Lima, and a change of planes for a flight to Iquitos, an industrial and port city of about 400,000 people located on the Amazon River in northeastern Peru. After being in the very dry climate of Lima and the cool, damp mountains of the Andes, it was quite a shock to suddenly feel the oppressive heat and humidity of the Amazon Basin; you just knew you weren’t in Cuzco anymore. Because it was late and it had been a very long day of traveling, the group headed straight to the hotel for dinner and some much need rest (and, of course, a Pisco Sour or two).

Machu Picchu

The next day started with one of the most interesting and unexpected modes of transportation of the entire trip. Because the tour bus (actually an old blue school bus) did not show up at the hotel as planned, the group had to split up and take 15 different pedicabs (rickety motor scooters with tricycle wheels and two seats in the back) down to the river; it was a blast despite at times having no clue where the driver was going. Once at the river, everyone boarded two motorboats for a three-hour ride up the debris-filled (due to floods in Columbia) Amazon River to the Tahauyo River Amazon Research Center (see photo), a place about as far removed from civilization as one could hope to get. After buying a 50-pound catfish for dinner at a local village along the way, and dropping of their luggage at the Tahauyo Lodge, the group split up to participate in various activities, including hiking through the jungle, canoeing along the river, bird and monkey watching, and zip lining through the rainforest canopy. Dinner that evening and a cold soda or beer never tasted so good.

Day seven saw the group on the move yet again, this time 15 miles up the Tahauyo River by canoe to the even more remote (as if that were possible) Tahauyo Research Center cabins. Along the way, howler monkeys, parrots, toucans, herons, and even pink river
dolphins were spotted. Once at the cabins, a few brave students even went for a refreshing swim in the river, despite the appearance of Pedro, the local, and apparently quite friendly, caiman, a type of crocodile. After lunch, there was a choice of more hiking, canoeing, bird watching, and even piranha spear fishing. Without a doubt, it was one more unusual and unforgettable day in Peru.

At the Tahauyo River Research Center

The next morning began the group’s return back to reality, civilization, and Lima with another motorboat ride down the Amazon to Iquitos, with a quick stop along the way for shopping at a local village market. This was followed by a short bus ride (everyone was secretly hoping for another pedicab adventure) across Iquitos to the airport, an evening flight to Lima, and then a final bus ride to the hotel for much needed warm showers, clean clothes, dinner, and a good night’s sleep.

The last full day in Peru focused on the Peruvian economy with visits to Cobrecon S.A, a copper wire manufacturer, and the Universidad de Pacifico for a lecture on the present economic and political climate in Peru. Finally, after a lovely farewell dinner (and, yes, more Pisco Sours), the group made its way through the ever-present Lima traffic to the airport for an overnight flight to New York and one final bus ride the next morning back to Rider.

Like previous Nature’s Business trips to Costa Rica, Iceland, Ecuador and the Galapagos Islands, and Panama, the Peru trip was an unforgettable way to learn, travel, make new friends, see amazing sights, and experience many new things. However, if you’ve missed out on the chance to join us on previous trips or regret not having been part of the Peru experience, don’t despair, because new courses and trips are being planned for 2012 and beyond. At this point, it’s uncertain where they’ll be going next, but you can be sure it will be someplace fun, memorable, unique, and, of course, very educational. Even if you don’t take the courses for credit, you can still participate in a Nature’s Business trip if space is available. Contact Professor Denbo (denbo@rider.edu), Dr. Newman (cnewman@rider.edu), or Dr. Husch (husch@rider.edu) for details on the next destination.

GEMS NEWS AND AWARDS

Total GEMS enrollment, including the ISM major, is now about 120 majors and minors, the highest ever! And it looks like this high level of interest will continue because the projected number of new students for fall 2011 is approximately 20, including 11 in environmental sciences. And that’s not to mention the high number of internal transfers into GEMS during the 2010-2011 academic year.

With 22 continuing environmental sciences majors, the total enrollment for the program looks like it will above 30 this coming year, a number exceeding all expectations. Everyone in GEMS believes this is the direct result of the appropriateness of our current curricular and co-curricular programs, the continuing high level of scholarly and professional activity of all GEMS faculty, and the hard work of Dr. Druckenbrod in creating a greater interest in the program.

Dr. Druckenbrod also was promoted to Assistant Professor II and Dr. Smalley was promoted to Associate Professor with Tenure. Congratulations to both for their well-deserved
promotions and for all their hard work and dedication to Rider, GEMS, and our students.

**Dr. Gallagher**, who has been a very popular and active adjunct faculty member for GEMS for over five years, has been hired to a three-year teaching position starting this fall (see story). In addition to offering his usual GEMS courses (Mesozoic Ruling Reptiles and Marine Life Through Time) and becoming the sixth full-time GEMS faculty member, Dr. Gallagher will be teaching the new science course in the Discovery Pilot Program for undeclared LAS majors. Although he’s been at Rider for some time, it’s even better having him here all the time.

GEMS faculty also received a fair amount of much-deserved recognition and support for their professional and scholarly work. **Dr. Druckenbrod** was awarded a $13,000 grant from Bristol-Myers Squibb to provide student environmental fellowships in support of his ongoing research on forest dynamics and climate change at Mount Vernon, Monticello, and Rider. **Dr. Druckenbrod** and **Dr. Smalley** were awarded Rider University Summer Research Fellowships and Reimbursements for Expenses in support of their ongoing research programs. **Dr. Druckenbrod** is working on reconstructing the historical extent of forest cover in the Virginia Piedmont and **Dr. Smalley** is investigating changes in feeding and toxicity in mixotrophic dinoflagellates (say that three times fast!) in response to irradiance. **Dr. Schwimmer** was awarded a Rider University Summer Developmental Fellowship in support of his curriculum development project on an integrated approach to teaching field marine science along the New Jersey shoreline.

Because of their recognized expertise, GEMS faculty members were used by the media as sources of accurate scientific information on a wide variety of subjects. **Dr. Gallagher** appeared in *Earth Magazine* and *Philadelphia Inquirer* articles on dinosaurs in New Jersey and also was interviewed by WWFM radio; **Dr. Husch** gave a live interview on WPIX TV in New York about the August 23 Virginia earthquake, as well as appearing in articles about the earthquake in the *Trenton Times*, *Trentonian*, and *Newark Star-Ledger*; **Dr. Schwimmer** wrote an article for the *Rider Alumni Magazine* on hydraulic fracturing (fracking) and natural gas in the Marcellus Shale; and **Dr. Sun** and **Dr. Husch** were quoted for articles in the *Philadelphia Inquirer*, *Trenton Times*, and many other media outlets nation wide on increasing sodium concentrations in the Delaware River Basin and other watersheds due to the application of winter deicing salt.

A large number of GEMS students also received awards and recognition for their many academic accomplishments. **Victoria Capozzalo '11** graduated with honors in Integrated Sciences and Math; **Christien Laber '11** graduated with honors in Marine Sciences; and **Michael McCormack '11, Leeanne Sinpatanasakul '11, and Robert Weber '11** graduated with honors in Environmental Sciences. **Elissa Connolly-Randazzo '11, Christien Laber '11, Michael McCormack '11, Leeanne Sinpatanasakul '11, and Robert Weber '11** were inducted into the Tri-Beta Honor Society and **Margaret Shaw '11, Nina Joffe '12, Christien Laber '11, Michael McCormack '11, Christine Sookhdeo '12, and Robert Weber '11** were inducted into Sigma Xi. Finally, 47 GEMS students earned Dean’s List recognition for the fall 2010 semester and 44 earned that recognition for the spring 2011 semester. Congratulations to all our students for all their hard work and their accomplishments!

Finally, after 15 years in the position, **Dr. Husch** has stepped down as the NCAA Faculty Athletics Representative (FAR) for Rider University. Also known as “Dr. Rock,” Dr. Husch was presented with “The Rock” by Don Harnum, Director of Athletics (see photo) during halftime of a Rider men’s basketball game in honor of his many contributions to Rider athletics.
Dr. "Rock" Husch receiving “The Rock” basketball from AD Don Harnum

“FRIENDS OF GEMS”

Through the continued initiative and efforts of Randy Kertes ’84, the Friends of GEMS alumni group again donated funds to the Department to help support student learning and research and to serve as a “thank you” to the GEMS Department for providing a positive and rewarding undergraduate experience. Currently, Friends of GEMS consist of the following members: Ronald K. Bannister ’83, Russell Burke ’02, Rodger E. Fedak ’81, Kerry A. Kertes, ’80, Randy Kertes ’84, Reed A. Schwimmer ’84, and Diane Pupa ’84.

If you would like to join this group and help acknowledge and support GEMS, please contact Randy Kertes. Randy is a Senior Project Manager at Sadat Associates, Inc. (Trenton, NJ) and he can be reached at 609-826-9600, ext 149, or by email at rkertes@sadat.com.

GEMS ASSESSMENT REPORT

GEMS completed an extensive and successful self-study and external review. The Department’s 60-page self-study report followed the suggested guidelines of the Council on Undergraduate Research (CUR) and was completed in April with input from numerous faculty, staff, and students from across campus. Two CUR external reviewers, Dr. Patricia Manley, Associate Dean of Undergraduate Research and Professor of Geology, Middlebury College, and Dr. Peter Sak, Associate Professor of Earth Sciences, Dickinson College, visited Rider in early May and met with all full-time members of the Department, a number of GEMS students and adjunct/affiliated faculty, and many administrative personnel, including the provost and CLAES dean. Their report, although highly laudatory of the Department and its programs, also provided useful guidance and suggestions for further improving GEMS.

GEMS FACULTY/STUDENT RESEARCH

Last year was a very productive year for both faculty and student research within GEMS. Dr. Smalley has a research article now in press titled “Influence of inorganic nutrients, irradiance, and time of day on feeding behavior of the mixotrophic dinoflagellate Ceratium furca in the field” that will appear in Aquatic Microbial Ecology. Co-authors were Wayne Coats from the Smithsonian Environmental Research Center and Diane Stoecker from the University of Maryland’s Horn Point Laboratory. The paper deals with the effects of nutrients, light, and time of day on field populations of a harmful algal species (C. furca) and proposes a conceptual model to explain when and why these algae switch from photosynthesis to feeding. Dr. Smalley and Dr. Druckenbrod also presented research at national conferences and Dr. Druckenbrod was invited by the EPA to serve as an expert for a two-day workshop at the Academy of Natural Sciences in Philadelphia to discuss the consequences of mountaintop mining and valley fill on forest ecosystems in the Appalachians. Dr. Sun and Dr. Husch, along with GEMS students Maria Huffine ’10 and Leann Sinpatanasaku ’11, also successfully submitted two conference abstracts for the upcoming national Geological Society of America meeting, as well as a manuscript to
the *Journal of Contaminant Hydrology*. **Dr. Husch** also continues to serve as a member of the NJ Science Advisory Board for the Dept. of Environmental Protection.

GEMS students also had an equally productive year with 16 students completing senior theses or independent study projects, many of whom presented their research at regional and national conferences. Closer to home, 10 GEMS students in marine sciences, environmental sciences, and integrated sciences and math presented their research at ISCAP (Rider University’s undergraduate research day) this past spring as well. Some highlights of their accomplishments include: **Christien Laber '11** and **Caroline Baptist '12** presented a poster at the American Society of Limnology and Oceanography’s (ASLO) 2011 Aquatic Sciences Meeting in San Juan, Puerto Rico in February. The presentation, titled “Influence of irradiance and growth, feeding and toxin production in the mixotrophic dinoflagellate *Karlodinium veneficum,*” was based on research they had conducted as part of their independent study and senior thesis projects, and was co-authored by **Dr. Smalley** and Dr. Allen Place (University of Maryland). Christien and Caroline also presented their research at the Rider ISCAP day.

**Elizabeth Evans '12** gave a talk at Rider ISCAP, summarizing her senior thesis research project, titled “Assessment of three artisanal fisheries in northern Honduras: Rio Esteban, Chachahuate Cay, and Cayo Mejor/East End.” Elizabeth collected data on fishing practices along the northern Honduran coast during the summer of 2010 and spent the academic year analyzing the data and compiling her final report. Her project was supervised by **Dr. Smalley** and Operation Wallacea, a student research organization based in the UK.

**Christine Sookhdeo '12** and **Mike McCormack '11** (with **Dr. Druckenbord**) presented their research on the environmental history of Mount Vernon at the Mid-Atlantic Ecological Society of America’s Annual Meeting at Montclair State University. Mike used geographic information systems (GIS) to overlay historical maps of forest cover at Mount Vernon (the earliest drawn by Washington himself in 1793). Mike found that presence of forest cover was greater in areas of steeper slopes, but that this relationship was less pronounced during the colonial era. Christine determined that soil organic matter in the soil surface increased with forest succession after agricultural abandonment. Christine also attended the national Ecological Society of America Meeting in Austin this summer. This trip was a return back to the southwest for Christine to present research from her NSF research experience last summer at the University of Arizona. **Allison Ingram '13** is studying how tree growth rates at Mount Vernon vary across the landscape in response to climate, soil moisture, and tree competition.

**Nina Joffe '12** traveled to Albuquerque, NM to present her research on symbiotic relationships between algae and embryonic salamander eggs where she was a student co-author on a paper presented at the 2010 Annual Meeting of the Society for Developmental Biology. Nina also is working on a project to place the alga *Oophila ambystomatis* on the phylogenetic tree of single-celled green algae using a DNA analysis approach. She presented this work at the Ecological Society of America annual meeting in Austin, TX.

**Denise Breen '11** (with **Dr. Druckenbord** and **Dr. Schwimmer**) also completed her independent study investigating the effect of reflectance of roofing materials on heat gain and surface temperatures. And **Robert Weber '11** completed his research on the effect of nutrient pulses on the growth of the common reed, *Phragmites australis*. Denise and Robert joined Mike, Christine, and Nina in also presenting their research at ISCAP. During the Spring 2011 semester, **Jason Dallas '14** and **Frank Pandolfo '14** continued an experiment in the lab of Dr. Todd Weber.
that they'd initiated as a final project for BIO-115 lab in fall 2010, examining the issue of entrainment (i.e., synchronization) of the circadian timekeeping system in mice to their environmental light-dark cycles. To address the artificial "on/off" nature of light cycles typically used in a laboratory setting, they installed nest boxes that shielded mice from much of the light exposure during the daytime that they would usually be hidden from in a natural environment. While mice took advantage of their new housing options, they didn't avoid light like their wild counterparts are known to do in nature, suggesting that their lack of avoidance of brightly lit environments is likely a consequence of selection based on decades of artificial light cycles, and/or a physiological adaptation to being housed under these light cycles from birth. Jason continued research on a related question throughout Summer 2011, where he is examining the effect of light cycle history on responses of the circadian system to manipulations of the light-dark cycle. The research is providing important information to understanding entrainment of the circadian system, which has potential biomedical implications for jetlag and shift work for humans.

Lastly, Nina Joffe '12 and Allison Ingram '13 both received awards during this past year. Nina was awarded a fellowship grant from the Independent College Fund of New Jersey’s Merck Undergraduate Science Endeavors Program and Allison received a scholarship from the NJ Chapter of Women Environmental Science Professionals.

ALUMNI UPDATE

Once again, many GEMS alumni either stopped by the department for a visit or contacted us with their latest news. If you haven’t done so recently, please feel free to bring us up to date with what is going on in your life. You can find additional alumni news, including specific contact information, on the GEMS alumni web page, located at www.rider.edu/ 172_1911.htm. As always, we look forward to hearing from you.

Phillip Pappano Jr. '90 and family stopped by GEMS this past summer to see all the changes on campus and in the department. Phil is a Principal Geophysicist with Statoil ASA, a Norwegian oil, gas, and energy production company with global operations, and is based in their Houston, Texas office. Prior to Statoil, he worked in various management and geophysical positions for a number of energy production companies, including Amoco and ExxonMobil. Phil and his wife, Peggy, just celebrated their 22nd wedding anniversary (congratulations!) and have three children, Phillip, 18, Maggie, 14, and Joey, 10.

Brandon Muffley '96 completed his Masters in Fisheries Science at the University of Maryland in 2001 and then started working on multispecies management issues and studies throughout Chesapeake Bay as a fisheries biologist with the Maryland Department of Natural Resources. Brandon and his wife, Kimberly (also a Rider grad) moved back to New Jersey in late 2003 when he started working as a research scientist with the New Jersey Marine Fisheries Administration within the Division of Fish and Wildlife. Brandon has worked on coast-wide and New Jersey specific fisheries stock assessments, modeling, and survey design focusing primarily on striped bass, bluefish, Atlantic menhaden and blue crabs. In 2008, Brandon was promoted to Bureau Chief for the Bureau of Marine Fisheries and now oversees all of the Bureau's operations, budgets, personnel, regulation development, and fisheries research and interstate management programs. Brandon and Kim have a 5 year-old son, Dylan, and live in Little Egg Harbor, NJ.

Stacy Aron Grady '97 has had a very busy last 12 months! First and foremost, she married Hank Grady and they are expecting their first child in October (it's a girl!). Stacy also received her Masters Degree in Geosciences from Mississippi State University.
and she just completed her 12th year of teaching earth science, biology, and oceanography at Delaware Valley Regional High School in Frenchtown, NJ. Congratulations on all accounts! As if that weren't enough, and as part of her MSU degree requirements, Stacy took a Western Washington University geology field course and had the opportunity to visit Mt. Saint Helens (see photo) and Mt. Rainer where there was over five inches of snow and people were still skiing in July. She says it was the trip of a lifetime.

Ken Kacperowski '06 completed his M.S. in Geosciences at Montclair State University where he worked on deciphering the geologic history and geomagnetics recorded in a deep marine sediment core from eastern Antarctica. Ken also got married in September 2010 and bought a house in Hamilton, NJ. As if that weren't enough, he recently started working for MACTEC Engineering and Consulting, a national engineering, environmental, geotechnical, and construction services company, in their Hamilton/Trenton office. Congratulations on all accounts!

Jill Loveland '07 is now a biology teacher at John Glenn High School in Elwood, NY, where she also will be coaching the girls varsity track team. Jill also received her Masters degree in Secondary Education/Biology from CUNY Queens College in December 2010. Congratulations on all accounts!

Tim Swavely '07 and Brandi Novak Swavely '07 sent GEMS a beautiful card (see photo) with the following words: “We’re married!! …and both have careers in science we love. Though it’s been some time since we graduated, we thank you for doing such a great job preparing us for life! We just wanted to say “thanks” and spread the good news.” Congratulations and consider the news spread!

Ashleigh Layton '09 is working for Kleinfelder in their Hamilton, NJ office, along with Charlie Zielinski '10 (see below), where they are considered the groundwater sampling "dream team." Ashleigh just passed her six-month, short-service employee exam (congratulations!), so she can now start "high risk" fieldwork, such as monitoring well installations and soil borings. Both Ashleigh and Charlie are contracted out to ExxonMobil, so most of their work sites are at retail gas stations. She also has begun working on vapor intrusion investigations, where she goes into residential and commercial buildings and takes indoor air, ambient air, and soil gas samples to help determine if gasoline related vapors are present.

Sara Pethick '09 is now working as a middle and high school educator (and even for some college groups from time to time) at the Marine Science Consortium at Wallops Island, Virginia. She teaches class on marshes, dunes, maritime forests, plankton, marine invertebrates, and intertidal environments. Sara says she loves teaching, living on the coast, and spending most of her time in the field.

Maria Huffine '10 spent this past summer working for the Student Conservation Organization and Americorps and living in
Georgia at the Cumberland Island National Seashore. There, she assisted with guided nature and history hikes, received multiple CPR and First Aid certifications, and created science-based educational programs for visitors and children. Prior to her time at Cumberland Island, Maria worked for an engineering firm and at an after-school science program.

Michael Kelly '10 is now an environmental consultant for Brookside Environmental Consulting, LLC in Pennington, NJ. His tasks there range from collecting groundwater samples from temporary and monitoring wells to reviewing final reports for submission to the New Jersey Department of Environmental Protection. Eventually, Mike would like to become an Licensed Site Remediation Professional (LSRP).

Charlie Zielinski '10 has been working as a staff geologist with Kleinfelder (where he also tries to keep Ashleigh Layton '09 (see above) out of trouble!) at their Hamilton, NJ office since September 2010. Most of his responsibilities center around groundwater sampling, although he's also involved with drilling, soil boring, and excavation operations. Charlie also mentioned that he is looking into pursuing a Masters in Environmental Engineering sometime in the next few years.

Jacqueline Lehman '11 just started the Veterinary Technology Program at Harcum College in Bryn Mawr, Pennsylvania. In addition to her classes there, Jacqui will be doing practicums at the University of Pennsylvania Veterinary Hospital and at the New Bolton Center. She eventually may have a practicum at the Adventure Aquarium in Camden as well.