Dear EEBer:

We are coming away from a very good academic year and heading straight into a new one with great expectations for the future.

We have completed preparations for the accreditation review by the Southern Association of Colleges and Schools which will be conducted this year. The planning included implementation of our first capstone course, which was a huge success thanks to efforts of Dr. Donata Henry and the Newcomb-Tulane College 2010 seniors.

We also welcomed aboard three new faculty members who completed their first year at Tulane: Jordan Karubian, behavioral ecology; Cori Richards-Zawacki, herpetology; Caz Talyor, computational biology. Each one is off to a great start in undergraduate teaching, research, and graduate mentoring.

And we began a department-wide review of the undergraduate curriculum to plan for future academic programs in light of the changes in the study of ecology and evolutionary biology. Discussions included placing an emphasis on molecular techniques and geographical information systems in the curriculum, as well as the overall structure of the undergraduate curriculum in both majors we offer.

As we move forward into the new academic year, we expect activity in teaching, research, and mentoring to reach pre-Katrina levels. The department feels fully vibrant again. Doubtless it is about time because we are now just past the fifth anniversary of Hurricane Katrina.

David C. Heins, Professor & Chair

UNDERGRADUATE STUDENTS

The Fred R. Cagle Memorial Prize

Keeley Irene Briggs - Keeley is awarded the Fred R. Cagle Memorial Prize in recognition of outstanding achievement in Ecology and Evolutionary Biology. Keeley attained the highest grade point average among all EEB seniors, and she served with dedication as an Undergraduate Fellow, helping her fellow students in the introductory biology labs. Among other contributions, Keeley worked as a technician in the University Herbarium, where she developed an interest in natural history collections, which became the topic of her senior capstone project.

The Newcomb Zoology Prize

Katherine L. Schneider - Kate is awarded the Zoology Prize for her strong GPA in EE Biology, her high motivation to continue graduate studies in Zoology, and her enthusiastic and able participation in a research project involving quantifying arthropod communities supporting wintering migratory birds in Jamaican coastal habitats. Her expertise and interest in Entomology gave her the perfect background to do the labwork, and her efforts will likely contribute to a publication on the topic.

The Gerald E. Gunning Memorial Award, for two recipients

Diane E. Crouch - Diane is awarded the Gerald E. Gunning Memorial Award in recognition of her outstanding academic performance in EE Biology (2nd highest GPA of all graduating seniors in department), and for her exceptional service as a field assistant to a graduate student in the department. Diane graciously agreed at very short notice to work under primitive field conditions for ten weeks in Central America, where she contributed eagerly, ably, and often independently to a study of tropical rainforest birds.

Seth W. Cunningham - Seth has demonstrated remarkable commitment to pursuing a career in ecology and evolutionary biology. During his senior year, Seth helped advance research on watershed management of oceanic island stream ecosystems. After completing his degree at Tulane, Seth traveled to west Africa, where he joined team monitoring primate populations on Bioko Island in Equatorial Guinea. In the fall, Seth will begin doctoral work at Fordham University, where he will no doubt make great contributions to the fields of conservation genetics and wildlife management in Africa.

The Stuart S. Bamforth Prize for Excellence in Environmental Studies, The Senior Scholars Award and the Phi Beta Phi Award

Alice Zhang - Alice has distinguished herself by completing an outstanding senior honors thesis titled Can Sexual Selection Drive Biological Invasions? Her thesis research advances understanding of factors promoting aquatic biological invasions and loss of biological diversity. Her work deserves recognition for commendable scholarship and execution. The quality and extent of her accomplishments will undoubtedly inspire other students at Tulane to take on similar challenges.

UNDERGRADUATE STUDENTS (cont.’d)

The George Henry Penn Award

Samantha L. Gerlach - Samantha completed her dissertation in ethnobotany. Her research is described on page 3 of this Newsletter.

Teaching Assistant Awards

Nathan W. Cooper - Nathan is studying the relative importance of density-dependent versus density-independent factors in determining condition, survival, and migratory performance of American redstarts wintering in Jamaica.

Sarah Chioko Hunter - Chioko is studying the effects of habitat fragmentation on trophic cascades in the bottomland hardwood forests of Louisiana.

GRADUATE STUDENTS
Hank Bart and Nelson Rios of the Tulane University Museum of Natural History (TUMNH) were awarded a $1.2 Million grant from the National Science Foundation to improve a computer program developed at TUMNH for geospatially referencing (“georeferencing”) natural history collection data. The program, known as GEO Locate, was initially developed through a grant awarded to Bart and Rios in 2002. The software is presently being used by more than 800 researchers and natural history collection curators worldwide. Rios, a computer programming and database expert, designed the software to use text describing where a collection was made (for example, “Mississippi River at Hwy. 190, Baton Rouge, Louisiana”) to derive and assign latitude and longitude coordinates to the collection location, thereby allowing researchers to relate specimens in the collection to digital maps and geographic information system (GIS) technology. Latitude and longitude coordinates are routinely captured today using global positioning systems (GPS), but natural history collections contain millions of records of early collections that lack these data. GEO Locate allows curators of collections to retroactively assign map coordinates to museum records to collection records that have been digitized. Such information is critical for understanding species distribution, and relating species distribution to environmental conditions.

The $1.2 million in new funding continues a long period of development support for GEO Locate. Previous enhancements include flexible architecture that can be modified to support georeferencing in virtually any language, and cyberinfrastructure that allows teams of researchers to collaboratively georeference large amounts of collection event data. However, the software, which currently installs and runs as a desktop application with about 2 gigabytes of data, is becoming increasingly difficult to update and expand. The new grant will allow Rios and his development team to improve GEO Locate’s core georeferencing algorithms, completely redesign the software to run over the Internet, and operate within other natural history software applications.

Tara Massad Takes Post-Doc at Max Planck Institute of Biochemistry, Germany

Tara Joy Massad defended her Ph.D. dissertation (“The efficacy and environmental controls of plant defenses and their application to tropical reforestation”, working in Lee Dyer’s lab) in Spring 2010. Her dissertation research, resulting in several publications already, shows that secondary plant chemicals indeed limit herbivory, particularly by generalist herbivores, and supports the Resource-Availability Hypothesis in explaining patterns of secondary metabolite production. She focused her research on a challenging group of secondary compounds (saponins = triterpenoids), which comprise a distinct biosynthetic pathway that appears to compete with photosynthesis rather than plant growth, necessitating new models of secondary plant chemical dynamics. She also showed experimentally (Costa Rica and Brazil) that saponins in fast-growing rainforest zone trees do best in mixed-species reforestation plantings. Tara was supported in her research by a prestigious EPA Science To Achieve Results (STAR) Fellowship, as well as support from the Philanthropic Education Organization, Torrey Botanical Society, Society of Sigma Xi, Organization for Tropical Studies, and Tulane’s Stone Center for Latin American Studies. Among her other accomplishments she won the Graduate Teaching Assistant of the Year award in EE Biology (2005), represented the department in the Graduate School Association (GSA), served as president of the Ecology and Evolutionary Biology Graduate Student Club, and mentored or supervised Tulane LAMP students as well as multiple Earthwatch research teams. Tara is currently doing post-doctoral research in the Max Planck Institute of Biochemistry, Jena, Germany.

Michael H. Doosey Takes Post-Doc position at the University of Kansas

Michael H. Doosey defended his dissertation in the Fall 2009 and graduated in Spring 2010. His dissertation, entitled “Morphology and Evolution of the Dorsal Pharyngeal Feeding Apparatus of Suckers (Cypriniformes, Catostomidae)“, involved a structure called the palatal organ, which many cypriniform fishes use to separate food items from inorganic debris during feeding. Cypriniforms lack mandibular and oral teeth. So, all mastication of food items occurs in the pharynx, aided by the palatal organ and pharyngeal teeth. The palatal organ is especially prominent in the throat of catostomid fishes and in one group of minnows (family Cyprinidae). Mike examined size and shape variation in the palatal organ of catostomids and cyprinids, and compared soft and skeletal anatomy of the structure in these fishes. He also sequenced nuclear and mitochondrial genes to produce a phylogeny for cypriniforms, then mapped various palatal organ characters on the phylogeny to establish homology. He showed that despite the superficial resemblance, the palatal organs of catostomids and cyprinids are different morphological structures with different evolutionary histories.

Mike received a number of honors and awards while a graduate student at Tulane. He was an IBM Corporation Fellow in Computational Science from 2008-09. He received a National Science Foundation, East Asia and Pacific Summer Institute Fellowship, 2005. He spent the summer of 2005 learning mitogenome sequencing methods in the laboratory of Dr. Kenji Saitoh of the Tohoku National Fisheries Research Institute in Shio-gama, Japan. Mike was an American Association for the Advancement of Science, Excellence in Science Fellow in 2004. He also received an Outstanding Teaching Assistant, Ecology and Evolutionary Biology in 2004.

One chapter of Mike’s dissertation is published. A paper based on a second chapter is in review in the Journal of Morphology. Mike is also a co-author on three other published or in press papers based on his work as a graduate research assistant on the Cypriniformes Tree of Life Project:


Mike is currently a postdoctoral researcher in the Natural History Museum and Biodiversity Research Center at the University of Kansas.
Samantha Gerlach Discovers Anticancer and AntiHIV Properties of the Psychotria Cyclotides

Samantha Gerlach's investigation into traditional Polynesian medicine has led to the discovery of plant proteins that boost the power of anticancer and antiHIV drugs. Based on interviews with Samoan healers, Samantha focused her study on the chemistry of Psychotria, a Pacific Island shrub related to coffee. Travel grants from The Institute for Ethnomedicine (Wyoming), The Garden Club of America, and the American-Scandinavian Foundation allowed Samantha to take her plant samples to the Department of Medicinal Chemistry at Uppsala University, Sweden, where she extracted, characterized, and then synthesized several cyclotides, a class of circular proteins first identified in 1999. Back in New Orleans, Samantha discovered the anticancer and antiHIV properties of the Psychotria cyclotides while working in the laboratory of Debasis Mondal, Department of Pharmacology, Tulane School of Medicine. The results of Samantha's research, directed by Steven Darwin, will be published in the journal Biopolymers (Peptide Science) in 2010. Samantha has received the 2010 George Henry Penn Award for outstanding dissertation research and has successfully defended her Ph.D. dissertation.

Genoveva Rodriguez Takes Post Doc Position at the University of Umea, Sweden

Over the course of her tenure as a doctoral student in the department, Genoveva completed a series of studies on tritrophic interactions that greatly improve understanding of latitudinal gradients in biological diversity. Her work demonstrates, for example, that tritrophic interactions (and by extension, estimates of tropical biological diversity) vary across elevational gradients throughout the Neotropics. In addition to authoring a paper describing this finding, entitled "Topographical variation in arthropod diversity estimates", Genoveva co-authored three other papers with peers she collaborated with during her time at Tulane, and has prepared an additional three papers based on her dissertation research. Genoveva also succeeded in securing competitive grant funding for her dissertation research. She received a Fulbright award as well as grants from the Mosenthal-Xerces Society and the Tulane Center for Latin American Studies. Genoveva has lectured extensively on her work, giving presentations at national and international conferences as well as for courses and groups of volunteers as an Earthwatch team leader. While finishing her dissertation, Genoveva was offered a postdoctoral position at the University of Umea in Sweden, where she is now continuing her work in their Department of Ecology and Environmental Science.

Recent Graduate Kelly Ross Receives Presidential Management Fellowship Position

Kelly Ross has received a prestigious Presidential Management Fellowship. The fellowship program is administered annually by the Office of Personnel Management in an effort to recruit outstanding master’s, law, and doctoral students into the Federal service. After being nominated last October, Kelly took an assessment test and qualified as one of 800 finalists out of a pool of 8,700 applicants. Sixty percent of the finalists are appointed as a Fellow. Earlier this spring Kelly was appointed to a fellowship position with the Bureau of Land Management (BLM) in Las Vegas, Nevada.

Kelly will be working as a program manager for Conservation Initiatives and Multiple Species Habitat Conservation Planning. These are two of eight categories of work that are authorized under the Southern Nevada Public Land Management Act (SNPLMA). The fellowship, which lasts for two years, will require a total of 160 hours of formal classroom training as well as two rotational assignments, one of which is a four to six month developmental assignment. The rotations will allow Kelly to experience and learn from work in other agencies or other locations in order to more fully understand the Federal Government. At the completion of her fellowship, she will have the opportunity to convert to a permanent Federal position and either remain with the BLM in Las Vegas or pursue a career with another Federal agency.

Since the start of this program in 1977, over 3,500 individuals have successfully completed the fellowship and pursued careers in either the Federal Government or the private sector, which has formed a strong alumni network. During her fellowship, Kelly hopes to expand upon her master’s degree in Environmental Biology with an understanding of the role the government has in protecting and conserving the environment. She is excited to live and work on environmental issues in an ecosystem that is very different from that in southern Louisiana. After the completion of the Fellowship, Kelly plans to continue work for the government or to pursue a degree in Environmental Law.

The Finishing Touch - More Than Your Average Capstone

The EBI01 department has a distinctly new feel. We’re settled into our offices in Boggs, three faculty members joined us this past year, and our curriculum is growing and improving. In the 2009-2010 academic year students and faculty alike treaded the uncharted waters of our new capstone requirement. The course, Contemporary Issues in Ecology and Evolutionary Biology, was developed to fulfill the Southern Association of Colleges and Schools accreditation process. Every academic department now has such a course for their senior majors to demonstrate (as quoted from the University Core Curriculum) “the capacity to bring information, skills and ideas acquired from the major to bear on one significant project.” As the coordinator of our first effort, I can report that we have surpassed that and more. At the beginning of the year, students chose faculty advisors to work with on a literature or research based project of their choice. By the end of the year, students completed a paper and presented their work to their peers and faculty advisors. The diverse interests and career tracks of our majors were reflected in their projects. Management techniques for sea turtles were evaluated by a student who’s interested in pursuing a graduate degree in conservation biology; climate change policy was investigated by a student who plans to study environmental law; the functional morphology of shark jaws was reviewed by a future dental school applicant. In addition to working on the individual projects, each week we discussed scientific articles of the students’ choice relevant to their topics, or upcoming departmental seminars. The overall experience provided our undergraduates with a unique opportunity to work one-on-one with faculty members, lead in-depth discussions of current research publications, and attend seminars prepared with questions for the very scientists whose papers they’d read. Yes, the course required a lot of focus and a serious commitment from our seniors, but the capstone has certainly served as both the final achievement of one body of work and a strong foundation for the next.

Dr. Donata Henry’s Ecology lab studies plant diversity in a Tangc hook Parash long leaf pine forest.
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If you are an EEB alum, we would love to hear from you! Please send your career news to eebalums@tulane.edu. We welcome pictures and brief descriptions of what you're up to lately!

**visit us online:** www.eebio.tulane.edu

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