



## Over the River and through the Woods

### Plant Biology at SREL

by Becky Sharitz and Linda Lee

Although many Plant Biology students have never visited the Savannah River Ecology Laboratory (SREL)—located across the border in South Carolina and behind Federal security barricades—the Department has actually had a long and fruitful association with SREL.

SREL had its genesis in the early 1950s with the construction of the Savannah River Plant (now Savannah River Site, or SRS), a nuclear weapons production facility in southwestern South Carolina. Concerned about environmental impacts of the facility, the Atomic Energy Commission (now Department of Energy) partnered with the University of Georgia to begin biological monitoring on the site. Baseline ecological characterizations and radioecological studies soon developed into a wide array of ecological research. The large tracts of



Dr. Eugene Odum initiated ecological research on abandoned fields on the SRS in the 1950s that lead to the establishment of SREL. This field, the site of many long-term studies, is still available for research.



undeveloped, secured-access land, diversity of vegetation types, presence of both natural and impacted areas, and potential for long-term studies all made the 300 mi<sup>2</sup> SRS an ideal outdoor laboratory for plant research, particularly plant ecology, ecophysiology, and phytoremediation.

Over the years, more than 30 students from UGA Plant Biology have conducted graduate research at SREL, with projects ranging from the population genetics and conservation of rare plants, to organic nitrogen uptake by plants in temperate wetlands, to evaluating the effectiveness of engineered biointrusion barriers in restricting plant root penetration in landfills. Many students from other UGA programs, particularly Ecology, have also worked there. One longtime Plant Biology faculty member, Rebecca Sharitz, has been based at SREL, and other department faculty, including Lisa Donovan, Jim Hamrick and Chris Peterson have been associated with SREL through their own or their students' research activities. More than 400 M.S. and Ph.D. studies have been completed at SREL, with students from a variety of other universities as well as UGA.

Historically supported largely by core funding from DOE, significant changes in funding structure during 2007 required SREL to rapidly transition to an entirely externally funded model. The result was that Plant Biology and UGA nearly lost this valuable resource. Fortunately, key support from both the UGA Provost and the Office of the Vice President for Research enabled the laboratory to remain open, giving SREL faculty critical time to regroup. SREL's new interim director, Carl Bergmann of the UGA Complex Carbohydrate Research Center, worked quickly and very effectively with the SREL faculty

and staff to secure support and assist with reorganization during the transition.

Though significantly smaller in research staff and programs, the laboratory is rebounding and continues to pursue a variety of ecological and plant-related research. Current plant-focused initiatives include effects of land management on populations of rare sandhills plants, wetland restoration, construction of wetlands for mitigation of industrial contaminants, and effects of managed flows on river and stream floodplain communities. Stabilization of SREL also preserved long-term research programs in wetland ecology, plant and animal population ecology, conservation, and environmental stewardship that will provide opportunities for further studies. SREL looks forward to years of future opportunities to contribute to plant biology research, and to the greater UGA community.



Former Plant Biology graduate students Adrienne Edwards and Palmer Hough sampled populations of *Sagittaria isoetiformis*, a rare wetland plant, in a Carolina bay on the Savannah River Site.



Chris Peterson



Shu-Mei Chang

## How Do You Make a Better Elementary School Science Teacher?

With the desire to answer that question, Shu-Mei Chang and Chris Peterson designed a new course to prepare education students for teaching science to elementary education students. Both of them have their roots in plant ecology and evolutionary biology, yet they took the time to broaden their knowledge of biochemistry, molecular biology and geology to offer a new course this spring semester entitled *Life & Earth Science*. Shu-Mei is teaching the life science portion of the class and Chris is teaching earth science. Together they have set their goals for the class to include:

- A familiarization with the nature and limitations of science
- Learning how science is done
- Examining fundamental life and earth science principles and examples
- Awareness of global climate change
- Awareness of the ongoing, open-ended nature of science research and discovery

Taking it one step further, Shu-Mei said, “my goal of teaching this course is to help students realize that science is not just the boring and sometimes scarily complex facts that they have to memorize in order to do well on the exams. It is something that they can understand and is very relevant to their day-to-day lives. One way to achieve that is through using a lot of examples on things they see or do in their daily lives, such as exercise, diet, news reports on forensic DNA evidence, cloning, peanut butter contamination, and biotechnology in my lectures to show them that what they are learning is not just something to be used in their future classroom, but also something they will encounter in their lives.” These examples give students a real world approach to science that they can use in their future classrooms.

Looking out for the student’s best interest can be incorporated as a valuable teaching tool and Shu-Mei uses this approach with her students. “I want my

students to also be able to use what they learn in this class to help them make decisions on things like leading a healthy life style, making a decision whether they want to accept food from genetically-modified organisms, and understanding scientific evidence used in trials and so on. But beyond that, I also believe if I can change these student’s attitudes towards biology and science in general and perhaps even alleviate their fear towards science, it will hopefully have an effect on their future teaching. I believe that a teacher who is passionate about the subject and can see the relevance of the things they are teaching will be a much better teacher than one who just wants to communicate the materials to their students,” Shu-Mei stated.

After the lecture, there are lab sessions and some of the labs involve field trips. Besides going to the Plant Biology greenhouse where the diversity of plant life is astonishing, Chris plans to have their students sample river water for their study of



Students in the earth science lab wrestle with the geologic time scale

## EDUCATION KUDOS

**Yainitza Hernández-Rodríguez helps a student identify micro-organisms in pond water**



river flow. The 'hydrology' lab will utilize the samples that students collected weekly throughout the first half of the semester, and calculate rates of sediment transport by different-sized streams, amount of erosion happening in catchments with different land cover types, and the relationship between rise and fall in stream flow and local precipitation levels. The objective is for the students to see the linkages among all of these factors and realize that the real world operates as a complex set of interconnected systems. "Actually having the students collect some data 'in the field' helps them appreciate that real science does not happen in a vacuum, and the fieldwork becomes a valuable teaching resource," stated Chris, so field trips have been included to broaden the whole learning experience.

As parents, Shu-Mei and Chris were inspired to undertake the development of this course knowing that each student will finish the semester with a deeper appreciation and understanding of science and

pass that appreciation on to the next generation. Shu-Mei added, "for me, that was definitely something that motivated me. My kids are eight and two years old now and to think that one of the my students in this class might one day become their teacher is the extra motivation for me to find a way to get these students interested and "turned on" by biology. If I can "infect" these students with the "scientific bug" that we all have in the Plant Biology department and make them interested and excited about science, hopefully, these future teachers can spread the "bugs" and stimulate the scientific interests of our next generation. And, if one of the students does teach Cassie or Alex in the future that will be really neat!"



**Paula Lemons** joined the department as an Assistant Professor in January 2009. She has a joint appointment in the Division of Biological Sciences where she teaches introductory biology and does research in the teaching and learning of biology. Her primary area of research is investigating learning in beginning biology students, specifically attempting to understand how their critical-thinking abilities develop over time. She was co-developer of a methodology for generating assessments that simultaneously measure content knowledge and critical-thinking skills and is currently gathering evidence on the reliability and validity of the method as a measure of critical-thinking skill. She is also building a multi-institution community of faculty and graduate students who engage in critical-thinking assessment design.

Paula received her Ph.D. in Biochemistry from the University of Kentucky. She was a postdoc and faculty member in the Biology Department at Duke University prior to coming to UGA this year. **Welcome Paula!**



The National Academies recognized **Kathrin F. Stanger-Hall** as a Fellow in 2008 for participation in the Summer Institute on Undergraduate Education in Biology.



Teaching assistants for the course are Scott Gevaert, and Yainitza Hernández-Rodríguez



Cecile Deen is responsible for the lab prep

# Q&A

## Outstanding in the Field

### Catching up with David Giannasi and his former student, Lisa Kruse

by Beth Richardson



Dave Giannasi finding fossil plants

**Q** Dr G, you have not stopped working even though you officially retired on Jan 1, 2004. Are you currently working on a book or paper or both? How is retired life?

**A** No books in progress, but I have concentrated on field survey contract work for the National Park Service with Dr. Wendy Zomlefer, our curator, since I retired. These have included surveys of Fort Matanzas and Castillo San Marcos, national park areas in Florida containing old Spanish fortifications and surveys of Cumberland Island National Wildlife Refuge, Kennesaw National Battlefield Monument and, most recently, the Chattahoochee National Recreation Area. These surveys have added many new specimens to the UGA Herbarium and quite often added new county and state records. Indeed, such field work with my predecessor, Dr. Sam Jones, introduced me to many new botanists, including Harriet DiGioia, a forest ranger in the Cohuttas who enjoyed the Herbarium and our visit-

ing dinners so much, she eventually left the Herbarium an endowment in her will which was mentioned in your last issue. You never know how your experience and friendships will effect your professional work.

Retired life is just great. I can work as much and as often as I want on any field project and now have adequate time and monies from contracts and grants with Dr. Zomlefer to finish up the Georgia Plant Atlas, a county by county dot distribution map of all of the plant species in Georgia (<http://www.plantbio.uga.edu/herbarium/GeorgiaAtlas/index.html>). And I reserve a portion of my time to read books on topics other than science. Travel in the future will be for fun and a trip to the Galapagos with my wife sounds intriguing.

**Q** You worked for the department for 26 years studying plant biochemical systematics, taxonomy, and fossils. Tell me some of the highlights of your career at UGA.

**A** Highlights of my career have included my work on using plant chemistry to study the taxonomy of plants and later, DNA sequencing for the same purpose. Later, I and several colleagues were able to extract DNA from a fourteen million year old leaf compression and sequence a gene from the material that allowed us to confirm its identity as a fossil species of Magnolia, something never done before and since repeated and confirmed by other independent molecular taxonomists.

I also enjoyed very much teaching courses in plant taxonomy and aquatic plants, getting out into the field with students and getting a little wet and muddy as we collected plants for identification back at the lab. It was most satisfying to see the students digest all of the complex terminology and morphology of plants to suddenly be able to identify plants with sureness.

Most significantly, I was able to revive the departmental master's degree program in plant floristic studies as a terminal professional degree that allowed students to compete directly for jobs in the state and elsewhere that required plant identification and field botany skills for state agencies and private agencies evaluating plant mitigation survey prior to construction companies developing lands in the state.

**Q** I sincerely regret that I never took your very popular Herbs, Spices and Medicinal Plants class. The final projects for that class were put on display in the herbarium and the resulting "herb fest" was one of my favorite events to attend each year. Do you continue to work or lecture on that topic?

**A** Dr. James Affolter and I started the Herbs, Spices and Medicinal Plants Course some twelve years ago and although



Kelly Bettinger, Dr G, Lee Echols, and Lisa Kruse on Cumberland Island



Lisa Kruse takes a call while working on a DNR project.



Lisa Kruse checks a forest after a prescribed burn

I am retired I still give a guest lecture in the course every year. The course is still very popular and has recently increased its enrollment from 150 to over 300 students. I no longer teach at UGA, but do teach a short course in plant taxonomy twice a year at the State Botanical Garden at UGA as part of their Certificate in Botany and Native Plants program. It is just enough to keep my memory of the topics up to date.

**Q** I know several of your former students and they all have rewarding careers in plant research and education. Who was your mentor? How rewarding has it been to mentor students?

**A** My first mentor was Dr. C. Marvin Rogers, a taxonomy specialist in American flax plants. He got me started in plant taxonomy. After receiving my Ph.D. at the University of Iowa, I went to the New York Botanical Garden as a research scientist and met and worked with Dr. Arthur Cronquist, one of the world experts in the sunflower family. Both Drs. Rogers and Cronquist were firm, but compassionate advisors on their own and provided great role models for the time when I began advising my own students at UGA.

In mentoring my own students, some were quite independent while others needed regular advice and guidance, but no more than I did as a student. However, such advising does include lots of listening, sympathy coupled with firm requirements for completion of their projects, not unlike managing your own offspring.

Perhaps my greatest satisfaction is that all of the twenty or so students I mentored and graduated are all employed in taxonomy or closely related fields as professionals, Lisa Kruse, being the latest example.

**Q** Lisa, you are working for the Department of Natural Resources (DNR). Tell me about your job. How long have you been there? Do you love your work?

**A** I've worked with the Nongame Conservation Program at GA DNR since May 2005— first as an hourly employee, and started full time as a botanist in Oct 2006. After I graduated from UGA in 2003, I held a series of contract positions and so, was fond of calling myself a “free-lance botanist.” I was never without work; I was lucky to have a good network established in Georgia. I worked for US FWS, the State Botanical Garden, the UGA Herbarium, The US Forest Service, and a private developer. At times it was frustrating to not be able to know what was coming next, or to sink my teeth into a long-term project. But, I was happy to be employed in botany.

My job duties at DNR couldn't be better suited for me. My job's main emphasis is monitoring effects of land management on state lands—generally, effects of prescribed fire, invasive species control, or timber harvest. I also participate in prescribed fire and in rare species surveys. All these duties keep me on the ground, continuing to stay active in field botany and taxonomy, but I have also learned valuable hands-on management, teamwork, and leadership skills. Several of my projects are on private lands, so I do a great deal of outreach to private landowners about conservation. I am constantly challenged and learning new things, and I work with fantastically smart, fun people.

**Q** How was your graduate student experience at UGA?

**A** I had an excellent graduate student experience at UGA. Key to this was the Botany Department's flexibility in allowing

me to design my program to meet my goals, and their support of my research. While botany course work was central to my studies, I was excited to take advantage of the diverse course offerings at UGA, in Ecology, Landscape Architecture, Entomology, to name a few. I enjoyed the professors and students of my cohort; student socializing was encouraged and we had good times. Also key was my teaching experience, which was launched by Marshall Darley's teaching seminar. Marshall and Barry Palevitz taught me to think about how my presentation methods affected students.

**Q** Dr G was your major professor and mentor. Did your work with him prepare you for your current job?

**A** Dr. G. helped me immensely in preparation for my current job. Without the experience I gained while doing my floristic inventory work, I would not have the skills I need for my work today. Dr. G. supported my research and gave me confidence that my research was valuable.

After grad school, Dr. G. kept reminding me that I should never give up, especially when I was most frustrated about finding the right opportunity, that I had strong skills for the career I was looking for and shouldn't settle for less.

**Q** What are you doing when you're not in the field or at the office? Anything fun?

**A** I am having a blast with my husband Scott in our new home in East Atlanta (near the zoo). We dug up the entire backyard last year to create our garden. The centerpiece is going to be a pitcher plant bog. Once rains returned to Atlanta in 2008, we discovered our house has the lowest backyard around, and it floods! What better place for creating a pitcher plant bog?

# GRADUATE STUDENT AWARDS



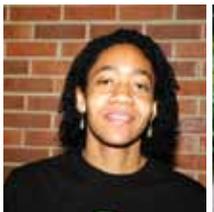
GORMALLY



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PREVOST



SHERMAN



SHIRK



TOPP

**Larry (Beau) Brouillette:** *Donovan Lab*  
Dissertation Completion Award, 2008-09

**Matt Estep:** *Bennetzen Lab*  
Dissertation Completion Award, 2008-09

**Jamie Estill:** *Bennetzen Lab*  
\$100 (tie) 1<sup>st</sup> Place Poster at the Plant Biology Graduate Student Symposium

**Cara Gormally:** *Donovan Lab*  
K. Patricia Cross Future Leaders Award

\$1,000 Excellence in Teaching Award, 2009  
\$5,000 J. W. Fanning Graduate Fellowship

**Chris Graham:** *Peterson Lab*  
\$700 Departmental Palfrey Small Grant

**Yujun Han:** *Wessler Lab*  
Outstanding Teaching Assistant, 2009

**Steve Hovick:** *Peterson Lab*  
\$150 1<sup>st</sup> Place Talk at the Plant Biology Graduate Student Symposium  
\$200 Graduate School Travel Award, 2008

**Ava Howard:** *Donovan Lab*  
\$200 Graduate School Travel Award, 2008

**Thanya Kriangkripipat:** *Momany Lab*  
\$700 Departmental Palfrey Small Grant

**Chanhui Lee:** *Ye Lab*  
\$700 Departmental Palfrey Small Grant

**Xuexian Li:** *Dawe Lab*  
\$75 2<sup>nd</sup> Place Talk at the Plant Biology Graduate Student Symposium

**Patrick Lynch:** *Zomlefer Lab*  
2009 Georgia Botanical Society Grant  
Graduate School Assistantship, 2008-2009  
\$700 Departmental Palfrey Small Grant

**Ryan McCarthy:** *Ye Lab*  
\$700 Departmental Palfrey Small Grant

**Luanna Prevost:** *Peterson Lab*  
\$3,300 Organization for Tropical Studies Graduate Research Fellowship  
\$750 OTS Las Cruces Tropical Forest Restoration & Conservation Workshop Graduate Travel Award, 2008  
Outstanding Teaching Assistant, 2009

**Yainitza Rodriguez:** *Momany Lab*  
\$50 2<sup>nd</sup> Place Poster at the Plant Biology Graduate Student Symposium  
\$400 Departmental Palfrey Small Grant

**Natasha Sherman:** *Burke Lab*  
Graduate School GRSC 7770 Assistantship, 2008  
\$1,000 The 2008 Wilbur Duncan Award for Outstanding Graduate Student  
\$700 Departmental Palfrey Small Grant

**Rebecca Shirk:** *Hamrick Lab*  
Graduate School Assistantship, 2008-2009

**Anna Sugiyama:** *Peterson Lab*  
\$700 Departmental Palfrey Small Grant

**Chris Topp:** *Dawe Lab*  
\$100 (tie) 1<sup>st</sup> Place Poster at the Plant Biology Graduate Student Symposium  
\$5,000 J. William Fanning Graduate Fellowship

**Megan VanEtten:** *Chang Lab*  
\$50 3<sup>rd</sup> Place Talk at the Plant Biology Graduate Student Symposium



## PBGSA establishes new award

In order to initiate a Plant Biology Graduate Student Association (PBGSA) *Research Assistance Award*, the PBGSA held a silent auction during the 2008 Holiday Party. The event was a huge success due to the generosity of many artists donating their work and to the many, merry bidders.

The PBGSA Officers and Silent Auction Committee thank everyone for their support, especially the judging panel for their time and effort in selecting three award-winning proposals. The first PBGSA RA Awards were presented to **Megan Van Etten** (\$250), **Luanna Prevost** (\$250), and **Clint Oakley** (\$100).

Congratulations to the award winners and to the PBGSA for initiating the *Research Assistance Award*!

# NEWS BRIEFS



Staff members **Beth Richardson (15)**, **Joann Davis (15)**, **Carla Ingram (30)**, and **Melanie Smith (20)** received the Department's *Excellent Service Award* for their years of dedicated service to the department.



**RUSSELL L. MALMBERG**  
ASSOCIATE DEAN FOR RESEARCH  
AND GRADUATE EDUCATION



**MICHELLE MOMANY**  
DEPARTMENT HEAD

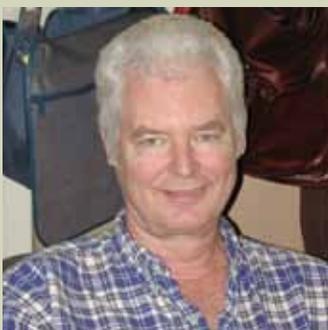


**ANDY PATERSON**  
RESEARCH PROFESSOR AND DIRECTOR OF THE  
PLANT GENOME MAPPING LABORATORY

**Russell L. Malmberg, Michelle Momany and Andy Paterson** were elected Fellows of the American Association for the Advancement of Science (AAAS). **Andy** also received the Cotton Genetics Research Award from the National Cotton Council. In 2009, he received the Lamar Dodd Award for internationally recognized research in the sciences.



**Becky Sharitz** was elected Fellow of the Society of Wetland Scientists. She works at the Savannah River Ecology Laboratory (see SREL story on page 1).



**Jim Hamrick** became a Regents Professor. His research emphasis is on the genetics and evolution of natural plant populations.



**Peggy Brickman** received the Outstanding Professor Award from the National Panhellenic Council and she presented the Honor's Day Talk.



**Sue Wessler** has been named the first UGA Foundation Chair in the Biological Sciences in the Franklin College of Arts and Sciences.



THE UNIVERSITY OF GEORGIA FRANKLIN COLLEGE OF ARTS AND SCIENCES

# PLANTBIO

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Alums—Let us know what you're up to these days. Email [beth@plantbio.uga.edu](mailto:beth@plantbio.uga.edu)



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