



International Programs

A Message from the Chair - K. Ramesh Reddy

Increased population, rapid urban development, sustainable agriculture, and protection of natural resources have placed a greater demand on the fragile global soil and water resources. Consequently, soil and water resource problems have grown in magnitude and scope at state, national, and international levels. In this newsletter we highlight the Soil and Water Science Department's (SWSD) international programs and activities in soil, water, and environmental sciences. Our faculty are deeply involved in many international activities, and the department offers educational programs (such as short courses and on-line programs) and research programs in several countries: Brazil, Chile, China, Ecuador, Guatemala, Haiti, Honduras, India, Italy, Jordan, Lebanon, Mexico, Nigeria, Panama, Peru, Uganda, and others.

For the past several years, Soil and Water (SWS) faculty strength has been severely depleted as a result of budget cuts and faculty retirements, which has limited our ability to address critical research and educational needs related to soil and water resources at local and global levels. Thanks to the IFAS Senior Vice President and the deans for allocating several faculty positions to fill in some of the gaps created in the department during the past few years. In the next few months we will be filling three faculty positions in Gainesville and four at the Research and Education Centers to increase our capacity to address potential impacts of climate change and sea level rise on soil, water, and environmental issues, as related to food security and protection of natural resources at local and international scales.

The SWSD serves as home for international students from all over the world - currently, international students from 20 countries represent 40% of our graduate students - and many of these students go on to hold high-level positions in their countries at universities and in industry. Moreover, many international post-doctoral fellows and visiting scientists find our department an ideal place to pursue their research and educational goals. A few examples of our current international activities are presented here.

UF/IFAS Global, Serving Florida through Global Engagement

The overarching goal of IFAS Global is to make UF the world's best university supporting higher education, research, and extension for sustainable agriculture and natural resource management. To accomplish this goal, IFAS Global works to build strong partnerships and strategic alliances with other first-class research and education institutes in the US and around the world. Through these partnerships, IFAS Global has obtained external funding for carrying out human and institutional capacity building programs to improve higher education, research, and extension services in several low income countries, thus helping these countries themselves to reduce poverty, hunger, and malnutrition. In the past six years, these funds have helped finance—or are continuing to finance—the graduate degree programs across several UF/IFAS academic departments for a total of 56 students (14 PhD, 42 MS) from the U.S., Bangladesh, Brazil, Ecuador, Ghana, Haiti, Malawi, Nepal, Peru, and Tanzania. These students, whether they're from high income or low income countries, enrich the experience of all faculty, students, and staff at UF, as they also make significant contributions to the research agenda at UF and help strengthen the capabilities of our own



UF/IFAS Graduate students from Haiti (From Left to Right): (Top) Isnel Pierreval, Ronald Cademus, Arthur Bonicet, Joseph Beneche (Bottom) Marie Pascale Saint Martin Francois, Reginald Toussaint, Lidwine Hyppolite, and Dakson Sanon.

faculty for meaningful and long lasting global engagement in teaching, research, and extension. For additional information, contact Dr. Bowen at: wbowen@ufl.edu.

Collaborative Program with Brazil

The Soil and Water Science program at the UF/IFAS Range Cattle Research and Education Center in Ona, FL is focused primarily on grassland biogeochemistry. During the past nine years, Maria Silveira has formed interdisciplinary teams to study different aspects of cycling of nutrients in soil-plant-water interface and important environmental services associated with cultivated and native grasslands. She developed strong international collaborations with foreign institutions, particularly in Brazil where her work in the area of soil carbon is recognized as an important contribution to the sustainability of subtropical grasslands. Silveira is strongly engaged in student training, and one of her main goals is to provide students with opportunities for training



with global perspectives through a culturally diverse learning environment. Because of her collaborative relationship with Brazilian partners, as well as the similar environmental and soils conditions to tropical and subtropical grasslands in Brazil, her program is viewed as an outstanding tool for the training of students in the area of soil science and grassland biogeochemistry. Since 2006, she has hosted and trained more than 20 undergrad and graduate students and visiting scientists from Brazil. More recently, she developed a short course in collaboration with George O'Connor, specifically designed for Brazilian graduate students. Silveira also participates in several joint projects with research partners in Brazil on global issues related to grassland sustainability. For additional information, contact Maria Silveira at: mlas@ufl.edu.



Collaborative Program with Nanjing University, China



Summer school on Environmental Remediation & Biogeochemistry, School of the Environment, Nanjing University, July 8-21, 2012.

With the support of IFAS administration, an international program between UF and Nanjing University (NU) was established. Its goal is to promote international collaboration and exchange between the two universities. During the past few years, the program has: 1) offered a summer school at NU to over 100 graduate students from over 40 universities in China where three professors from SWSD participated; 2) established the US-Sino Center for Environmental Research, with UF as one of the main partners, where K. Ramesh Reddy attended the opening ceremony; 3) collaborated with Dr. Bala Rathinasabapathi

from the Horticultural Sciences Department, who served as the Siyuan Professor at Nanjing University for 3 years; 4) funded visits to NU for 5 professors, 3 post-docs and 2 graduate students from UF; 5) facilitated visits to UF by 12 professors and undergraduate students from NU; and 6) hosted the 8th International Workshop on Chemical Bioavailability at NU with UF as co-sponsor. This collaborative effort has greatly enhanced the international exchange between the two universities and beyond. For additional information, contact Lena Ma at: lqma@ufl.edu.

Collaborative Program with Zhejiang University, China

Zhejiang University is one of the top comprehensive universities in China, with approximately 24,000 undergraduate and 22,000 graduate students. University of Florida (UF) is one of the early US universities that have established academic exchange and research collaboration with Zhejiang University, particularly with the SWSD. K. Ramesh Reddy visited Zhejiang University, providing seminars at the College of Natural Resources and Environmental Sciences. Zhenli He has been actively engaged in research collaboration and link-training of graduate students, postdoctoral scientists, and young faculty with Zhejiang University. Since 2004, he co-chaired more than ten PhD supervisory committees at Zhejiang University, hosted six postdoctoral scientists and four visiting scientists from Zhejiang University, and conducted several research projects funded by Chinese government and US funding sources. These collaborative efforts



have resulted in more than 100 academic publications and patents. Currently, Zhejiang University also offers professorships, fellowships, and graduate scholarships for faculty, newly graduated PhDs, and graduate students from foreign countries. For additional information, contact Zhenli He at: zhe@ufl.edu.

Collaborative Program with Haiti



Wayne Worthley, PhD student, conducting fertilizer trials in Haiti.

Requested by the USAID-WINNER project in Haiti, Yuncong Li, Ed Hanlon and their graduate students have conducted experiments on soil fertility and developed fertilizer

recommendations for major crops in Haiti. Li and graduate students visited Haiti to collect and analyze over 1200 soil samples and set up four field fertilizer experiments on corn, leek, broccoli and cabbage. They found that Haitian soils are rich in potassium, but lack in sufficient nitrogen and phosphorus to support healthy crops. The proper balanced fertilizers will greatly increase crop yields. Their findings provided critical information for improving food production. Li provided recommendations training for setting up a soil testing laboratory in Haiti and a report for the assessment of building capability to produce fertilizers in Haiti. Li traveled to Haiti again in December to investigate potential sources of organic fertilizers and soil amendments and develop a fertilizer handbook for small-scale farmers. For additional information, contact Yuncong Li at: yunli@ufl.edu.

Study Abroad: Water Resources in Florence, Italy

Since 2012 the Soil and Water Science Department has taught a study-abroad course on water resources in Florence, Italy. Florence is the birthplace of the Renaissance and was home to Leonardo da Vinci, Michelangelo, Botticelli, the Medici, Machiavelli, Galileo, and numerous other luminaries. The UF International Center coordinates a student exchange program with Florence University of the Arts (FUA), and Jim Jawitz is currently director of that program. In 2015, 150 UF undergraduate students spent 6 weeks in Florence with the opportunity to take FUA elective courses on topics ranging from Renaissance history and architecture to oenology (the study of wine).

Twenty UF students were enrolled in Dr. Jawitz's course "Global Water Resource Sustainability". The program features human interaction with water resources on a global scale, with a strong connection to the place and history of our location in Florence, from ancient times through the Renaissance and to the present day. The program includes several walking tours featuring ancient and modern hydrologic features and monuments, and field trips to Bologna and Venice. The 2016 class is scheduled for 15 May - 24 June, with registration open until 18 March, 2016. Interested students can learn more from the UF International Center website, <http://www.ufic.ufl.edu/sas/> or by contacting James Jawitz, jawitz@ufl.edu.



Collaborative Program with the International Crops Research Institute for Semiarid Tropics (ICRISAT), Telangana, India

To help improve the sustainability of agriculture and natural resources in developing nations, UF/IFAS offered joint educational and research programs with ICRISAT. Through this program, several IFAS faculty, including Ken Boote, Mark Clark, Sabine

Grunwald, Kanika Inglett, Patrick Inglett, Jim Jones, Rao Mylavarapu, P.K. Nair, Vimala Nair, Ramesh Reddy, Sanjay Shukla, and others offered one week short courses at ICRISAT. In addition, two graduate students (ABE and SWS) conducted research at ICRISAT as a part of their graduate



programs. Dr. Suhas Wani (ICRISAT) served as a special committee member on both student committees. In addition, two graduate students (Christopher Clingensmith - SWS and Yiming Xu - SNRE) evaluated spatial patterns in soil nutrient status in two sub-tropical

watersheds as part of a joint research project (UF and ICRISAT) funded by the National Science Foundation (PI - Grunwald). For details about this collaborative effort with ICRISAT, contact K. Ramesh Reddy at: krr@ufl.edu.

One Agriculture-One Science: Global Education Consortium (OAOS)

In the context of Global Food Security there is also need to look at ways to bring crop, livestock, fisheries etc. under one roof by providing a common platform, “One Agriculture-One Science (OAOS),” to address pressing global food security, accessibility and affordability challenges. While there are many complex factors that influence food security and sustainable agriculture development, it is clear that education in agriculture plays an important role in preparing farmers, researchers, educators, extension staff and others to make productive contributions. While there are advanced efforts underway at a number of institutions, there is as yet no single entity that can comprehensively address and support a “One Agriculture-One Science: Global Education Consortium (OAOS)” with the latest advancements in technology and knowledge flow strategies. The OAOS will serve as the global repository for comprehensive educational materials on food and agriculture available to the public without limitations. The OAOS will transform vital research findings from the global agricultural knowledge base into accessible, value-added learning materials for instructional use in higher education and professional training in developing countries. Founding members of

this Global Education Consortium - Auburn University; California Polytech-Pomona; Colorado State University; the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT); Iowa State University; Michigan State University; Oklahoma State University; University of California-Davis; and University of Florida - are currently working on details related to the future course of action. Additional information on guidelines to join this global effort of capacity building in the context of global food security will be available shortly. For additional information about this collaborative effort, contact K. Ramesh Reddy at: krr@ufl.edu.



Understanding Soil Carbon Dynamics and Soil Security in the Central Andes – Peru

The Andes represent the largest and highest mountain range in the tropics. Even though it is expected that the Andean Region will become one of the most vulnerable ecosystems under future climate scenarios, there is a lack of knowledge on the interactive effects of land use, topography and climate on soil organic carbon dynamics in the Andean ecosystems. The ecological integrity of this highland ecosystem is under threat, impacting soil, food and human security.

The University of Florida and the International Potato Center (CIP), from the Consortium of International Agricultural Research Centers (CGIAR), are partners in this project led by Sabine Grunwald. Carla Gavilan, a third year PhD student and native Peruvian, is conducting this research in three study regions in the Andes with elevations ranging from ~2,000 to 4,900 m.a.s.l.: Jauja, Concepcion and Huancayo. Our project goals are to (1) assess the impact of land use change and climate on soil



organic carbon dynamics at different spatial scales, (2) develop soil spectral soil carbon models and (3) model biophysical and human dimensions in this region that is undergoing rapid change.

We are using cutting edge proximal soil sensing, geospatial and remote sensing technologies, integrative soil-landscape-climate simulation modeling (Roth-C) and agent-based models. This project will bring new insights through the exploration of complex interrelationships between soils, topography, climate and humans in a remote and fragile tropical ecosystem that has been understudied and is data sparse. We adopt the Integral Ecology framework to synthesize our scientific findings and people’s beliefs, values and uses of the land to address soil security.

For additional information, contact Carla Gavilan at: cgavilanf@ufl.edu or Sabine Grunwald at: sabgru@ufl.edu.



Collaborative Programs in the Middle East

Samira Daroub's international program includes research and educational projects in water resources and food security in the Middle East. Daroub is a collaborator with Dr. Sandra Russo and a UF International Center team in the Water and Livelihood Initiative (WLI) in Middle East. The goal of the WLI is to improve the livelihoods of rural households and communities in areas where water scarcity, land degradation, water quality deterioration, food security and health problems are prevalent in the seven participating countries (Egypt, Syria, Lebanon, Jordan, Palestine, Iraq and Yemen), focusing initially on specific benchmark sites. This project is directed by ICARDA (International Center for Research in the Dry Areas) and funded by USAID (US Agency for International Development). Daroub is a collaborator with the UF International Center team and Virginia Tech with InnovATE - Jordan. The mission of the Innovation for Agricultural Training and Education (InnovATE) project is to develop the human and institutional capacity necessary for developing countries to promote rural innovation needed



to achieve sustainable food security, reduce poverty, and conserve natural resources. A scoping assessment of the current and future demand for human resources in the agricultural sector in Jordan was accomplished as part of this project in 2014. For additional information, contact Samira Daroub at: sdaroub@ufl.edu.

Congratulations! Fall 2015 Graduates!

PhD

Eduardo Chavez (He & Mylavarapu)
Rajendra Gautam (Hochmuth)
Yuanyuan Huang (Gerber)
Charlie Nealis (Clark)
Jian Wu (Graham)
Minjune Yang (Jawitz & Annable)

MS

Betsy Colon (Toor)
Jason Frank (Daroub)
Amanda Hirst (Toor & Stanley)
Hamza Keskin (Grunwald)
Stephanie McLean (Toor)
Virginia Rigdon (Wright)
Patrick Ritchie (Clark)
Pamela Vaughn (Wright)

BS - IS-EMANR (Advisor - Curry)

Joshua Tveraas

SWS Minor (Advisor - Bonczek)

Joy Spalding

The 16th Annual Soil and Water Science Research Forum

The 16th Annual Soil and Water Science Research Forum was held September 17, 2015, in Gainesville, Florida. The forum, designed to bring together representatives from state and federal agencies, private industry, faculty,



graduate students, and prospective students interested in soil and water science, provided an opportunity for all those interested in soil and water science to interact with our students, faculty, and administrators on campus. Our Keynote Speaker was Dr. Andrew Sharpley, Professor of Soils and Water Quality, University of Arkansas, who spoke on *Exploring Phosphorus Paradoxes to Avoid Unintended Consequences*.



Save the Date: September 15, 2016 17th Annual Soil and Water Science Research Forum

For additional information, contact James Jawitz at: Jawitz@ufl.edu.

Carnegie African Diaspora Fellowship Program (CADFP) at Makerere University, Kampala, Uganda

The Carnegie African Diaspora Fellowship Program (CADFP) is a scholar fellowship program funded by the Carnegie Corporation of New York for educational projects at African higher education institutions. African Diaspora scholars are selected to collaborate with higher education institutions in Africa on curriculum co-development, research, graduate teaching, training and mentoring activities. During the summer 2015, a course on “Environmental Fate and Transport of Agricultural Chemicals Used for Production of Cash Crops in Uganda Near the Shores of Lake Victoria” was developed and taught by Peter Nkedi-Kizza and Jorge A. Leiva from the UF Soil and Water Science Department; and from Makerere University, Drs. Gabriel Kasozi, John Wasswa, and Patrick Ssebugere, from the Chemistry department, and Dr. Giregon Olupot from the Department of Agricultural Production.



Students and professors who participated in the CADFP/ANCAP summer course.

Lake Victoria is the second largest freshwater body in the world. The Lake basin attracts extensive commercial and subsistence farming along its catchment area. In addition, it is the source of domestic and industrial water and fish for local consumption and export to Europe. Because of the importance of the Lake, the course covered disciplines that included Soil Physics, Soil Chemistry, Soil Microbiology, Environmental Science, Biogeochemistry,



Soil sampling in sugar cane and oil palm fields. To reach the sampling sites, the group had to cross the waterfall near the River Nile, or the Murchison National Park in Uganda.

Analytical Chemistry, and process-oriented modeling of agrochemicals in the environment. During lectures and labs, we emphasized principles pertaining to interactions of agrochemicals with lake sediments and soils because they act as sink/source of pollutants (pesticides and nutrients) used for the production of cash crops such as tea, coffee, sugar cane and oil palm.

The course was attended by graduate students (MS and PhD) from the departments of Chemistry, Agriculture and Environmental Science. The students came from Ethiopia, Kenya, Rwanda, Sudan, Tanzania, Zimbabwe, and Uganda. A total of 24 students participated in the course. Some of the students were members of the African Network for Chemical Analysis of Pesticides [ANCAP]. Therefore, the last week of the course was devoted to the 11th ANCAP summer school. For additional information, contact Peter Nkedi-Kizza at: kizza@ufl.edu.

Welcome New Students Spring 2016

MS

Gurcan Baysal (Toor)
Seth Christman (Wilson)
Rebecca Ellis (K. Inglett)
Alexandra Waldon (Reddy)

BS - SWS (Advisor - Bonczek)

Steven Gregory
Kayci Kowalski
Yewon Lee
John Santiago

BS - IS-EMANR (Advisor - Curry)

Michael Black
Daniel Bromley
Harley Davidson
Shelby Grafton
Robert Guggenheim

Heather Kershner
Ryan Pugh
Michael Vaccaro
Kimberly White
Wyatt Windham

Current and former students, faculty, staff and departmental affiliates: Join the department's new LinkedIn group, "University of Florida Soil and Water Science Department," to network with and learn from fellow alumni and students: <https://www.linkedin.com/grp/home?gid=8390114>.

LinkedIn™

Faculty, Staff and Students

Jehangir Bhadha joins SWSD faculty

Jehangir Bhadha joins the department as an Assistant Professor of Nutrient Management at the Everglades Research and Education Center (EREC), Belle Glade. His research priorities are in the field of water quality, soil sustainability and sustainable agriculture. Bhadha received a B.S. from St. Xavier's College, Mumbai, India, MS degree from UF (Geological Sciences) and PhD from the UF Soil and Water Science Department. Bhadha served two postdoctoral assignments, one in Gainesville and another at the EREC. In 2013 he was appointed as an Assistant Research Scientist at EREC, to conduct research on developing Best Management Practices to reduce phosphorus loads from farm canals in the Everglades Agricultural Area. For additional information about his research and extension activities, contact Jehangir Bhadha at: jango@ufl.edu.



Congratulations to faculty and students for their outstanding achievements:

Julie Meyer, a postdoctoral associate with Max Teplitski's lab, was a recipient of the 2015 US Fellow award by the L'Oréal USA For Women In Science Program. Julie received a grant in support of her research. http://lorealusa.com/Foundation/FWIS.aspx?topcode=Foundation_AccessibleScience_WE_2015_US_Fellows.

Soil NMR research by **Anna Normand (Reddy)** is highlighted on the National High Magnetic Field Laboratory webpage: <https://nationalmaglab.org/about/around-the-lab/what-goes-in-the-magnet/peat-soil>.

Elise Morrison (Ogram) received the Francis & Evelyn Clark Soil Biology Scholarship from the Soil Science Society of America.

Chelsea Hazlett (IS-EMANR-Curry) received an outstanding poster award at the Society of Wetland Scientists, South Atlantic Chapter meeting. She was the only undergraduate and this was the first conference she attended.

Student awards at the 2015 Graduate Student Poster Competition at the ASA-CSSA-SSSA Meetings (Minneapolis, MN)

Anne Sexton (Daroub): 3rd Place, *Wetland Soils Division Award*

Nilovna Chatterjee (Minor in SWSD, guided by Nair): 3rd Place, *Biochar: Agronomic and Environmental Uses Community Award*

2015 Soil and Water Science Research Forum Student Competition Winners

Best Oral Presentation: Charlie Nealis (Clark)

Best Graduate Student Poster Presentation:

Eduardo Chavez (He and Mylavarapu)

Katelyn Foster (P. Inglett)

Laibin Huang (Ogram)

Elise Morrison (Ogram)

Best Undergraduate Poster Presentation: Kimberly Hafner (Wilkie and Mussoline)

2015 Departmental Awards

Sam Polston Scholarship - Marcos Moraes (Teplitski)

William K. (Bill) Robertson - Elise Morrison (Ogram)

Ben Skulnick Fellowship - Katsutoshi Mizuta (Grunwald)

Quantitative Environmental Soil Science Pedometrics Award - Hamza Keskin (Grunwald)

Biogeochemistry Graduate Fellow Award - Paul Julian (Wright) and Joshua Papacek (P. Inglett)

Outstanding Undergraduate Award - Chelsea Hazlett (Curry)

Fredrick B. Smith Scholarship - Sara Baker (Bonczek)

Donald A. Graetz Education Award - Haley Glaab (Curry)

