



CORE LABORATORIES

FROM THE CHAIR



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The Soil and Water Science Department (SWSD) faculty and students use a wide range of analytical and field instrumentation in their research programs. To maximize the use of these analytical instruments, groups of faculty established several core laboratories in the department with the objective of sharing instrumentation and avoiding duplication of facilities. The instrumentation in each core laboratory was purchased by select faculty through their grants and contracts with some matching support from state funds. Instrumentation in these laboratories are primarily used by these faculty and by their graduate students. In addition, at a minimal cost, the instrumentation in each of these core laboratories are now made available to other SWSD faculty and to those outside the department. Details of costs associated with the use of these laboratories can be obtained from the coordinator of each laboratory. A brief description of the core laboratories is presented in this newsletter.

Here are few highlights since the last newsletter:

Steve Bloom, Senior Chemist retired after 23 years of dedicated service with the department. For the past four years, Steve worked in the GIS Research Laboratory. Prior to this assignment, he worked with the Soil Physics group. We thank Steve for his outstanding service to the department.

L. Rex Ellis has been appointed as an Assistant Research Scientist in the Environmental Pedology program. Rex will conduct research on subaqueous soils.

Todd Osborne has been appointed as an Assistant Research Scientist in the Wetlands program. Todd will conduct research on biogeochemical cycling of nutrients in wetlands and aquatic ecosystems.

KRM

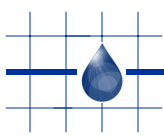
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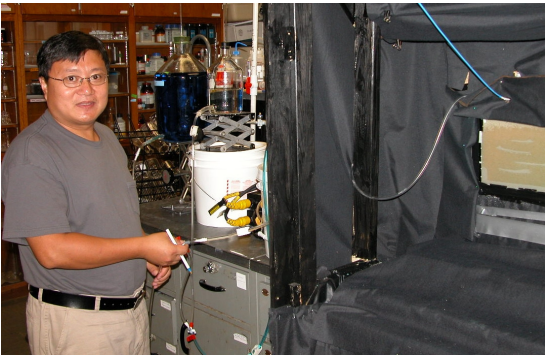
Soil Chemistry, Environmental Hydrology & Soil Moisture Labs

Soil Chemistry Laboratory

The Soil Chemistry Laboratory was established to provide basic soil chemical analyses to students and faculty in the SWSD. Instrumentation consists of a Varian Fast Sequential Atomic Absorption Spectrophotometer, model 220FS and a High performance liquid chromatograph (HPLC) (Waters 2690 Separations Module, Waters 2487 Dual Wavelength Detector, and a Waters 432 Conductivity Detector). The Soil Chemistry Laboratory is primarily a teaching facility and, therefore, students are given priority in use of this facility. Users are trained to use the instruments and associated software and are expected to prepare, process, run, and analyze their own samples. Users provide their own standards and QA/QC samples. Users must also provide their own HPLC columns and mobile phases. For additional information and fees for use of instrumentation, contact Dean Rhue at rdr@ifas.ufl.edu.



Bill Reve loads a sample into the HPLC to test for organic acids.



Huaguo Wang uses visualization research for quantifying DNAPL dynamics.

Environmental Hydrology Laboratory

The Environmental Hydrology Laboratory provides specialized laboratory equipment including a Perkin Elmer gas chromatograph, Dionex accelerated solvent extractor, and an Ocean Optics fiber optic spectrophotometer. Specialized field equipment includes pressure transducers, autosamplers, and a Sontek acoustic doppler velocimeter. Services available include equipment usage, field hydrology assistance, and modeling of contaminant transport in soils and sediments. For additional information, visit <http://hydrology.ifas.ufl.edu> or contact Jim Jawitz at jwjawitz@ifas.ufl.edu.

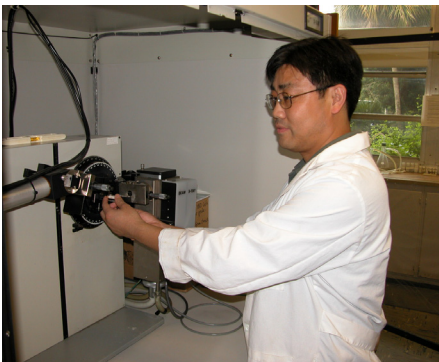
Soil Moisture Laboratory

The Soil Moisture Laboratory is located in McCarty Hall and offers procedures for determining soil moisture release curves, saturated hydraulic conductivity and bulk density on individual samples. Specific equipment and soil cores required for soil sample collection for moisture release procedure can be borrowed by contacting the Lab at 352-392-1951 x223. Additionally, services to determine particle size distribution on a separate soil sample are also available. For additional information, contact Rao Mylavarapu at raum@ufl.edu.



Kelly Nielson connects a temper cell to pressure lines to determine moisture retention.

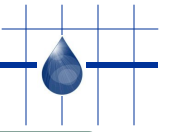
Environmental Pedology and Mineralogy Laboratory



Rocky Cao is operating the x-ray diffractometer for determining mineral change in soil with amendments.

The Pedology-Mineralogy Laboratory has personnel with expertise who perform physical, chemical, and mineralogical characterization of soils. Much of the data generated by the Laboratory is pertinent to soil genesis, classification, and management. Routine analyses include particle size, organic carbon, extractable metals, cation exchange capacity, pH, electrical conductivity, total phosphorus, and mineralogy. Major instrumentation within or associated with the Laboratory includes an x-ray diffractometer, thermogravimetric analyzer, differential scanning calorimeter, and ground-penetrating radar system. A list of services provided by the Pedology-Mineralogy Core Laboratory can be found at <http://soils.ifas.ufl.edu/research/pedology.pdf>.

For additional information, contact Willie Harris at wghs@ifas.ufl.edu.



Stable Isotope Mass Spectrometry Laboratory

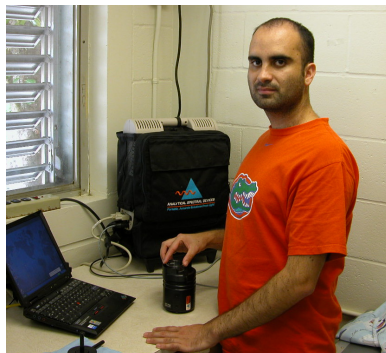
The Stable Isotope Mass Spectrometry Laboratory (SIMSL) located in the Soil and Water Science Department, utilizes a Thermo Finnigan MAT Delta Plus XL mass spectrometer designed to cover a mass range up to 70 amu to determine the stable isotope ratios of certain gaseous elements. Since most elements of biological interest including C, H, O, N, and S have two or more stable isotopes which fall within this range the Delta Plus XL is well suited for determining the stable isotope ratio for these elements. The stable isotope ratios of C & N are routinely determined by Elemental Analyzer Mass Spectrometry in this facility from plant and soil samples submitted for analysis. Results are reported as Atom %, Atom % excess, or Delta o/oo units. Three peripherals (elemental analyzer, gas chromatograph, and gas bench) are presently dedicated to the mass spectrometer for the purpose of converting the sample from a solid or liquid state to a gaseous state prior to introduction into the mass spectrometer. The SIMSL is under the supervision of the Soil and Water Science Department; cooperating departments are the departments of Geological Sciences and Botany. For additional information on using this facility, contact Don Graetz at dag@ifas.ufl.edu.



Patrick Inglett analyzing carbon at the Stable Isotope Mass Spec Lab.

NIR Spectrometer Laboratory

The NIR Spectrometer Laboratory is available for researchers requiring scanning of soil/plant tissue samples in the Near Infrared region (350-2800 nm). For additional information and fees for instrument use, contact Camilo Cornejo at ccordav1@ufl.edu or Rao Mylavarapu at



Camilo Cornejo scanning samples through FieldPro NIR spectrometer.

ARL & ESTL Labs



Mary MacLeod, analyzes samples for nitrate plus nitrite by semi-automated colorimetry.

Analytical Research Laboratory

The UF/IFAS Analytical Research Laboratory (ARL) offers high quality analytical services to all UF/IFAS researchers state-wide. Researchers are requested to contact the Lab a few months in advance regarding their analytical needs and for scheduling analyses. Most of the analyses are certified by National Environmental Laboratory Accreditation Program (NELAP), E72850. All information on analytical services, available schedules and sample submission forms are available at <http://arl.ifas.ufl.edu/> or by contacting ARL at arl@ifas.ufl.edu.

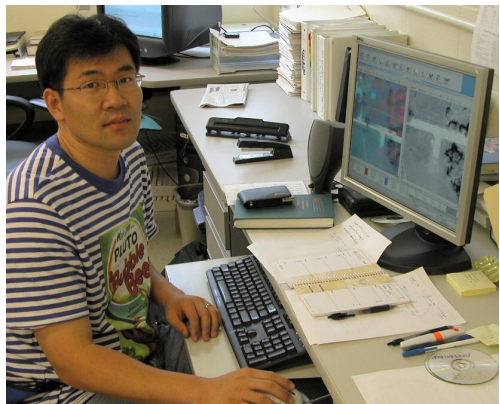
Extension Soil Testing Laboratory

The UF/IFAS Extension Soil Testing Laboratory (ESTL) offers a variety of diagnostic tests for mineral soils, container media, tissue (blueberry and pecan), pine nursery and irrigation water. Test results will include recommendations and general guidelines for lime and nutrient applications and for improving irrigation water quality. These services are available to all Florida residents for a fee. Information about the available tests, fee schedule and free sample boxes/bags can be obtained by contacting ESTL at soilslab@ifas.ufl.edu or by contacting your local County Extension Office. Additional information can be found at <http://soilslab.ifas.ufl.edu/>.



Maintenance of instrumentation insures that our clients receive quality data. Hui X Lu working with one of the lab's ICP instruments for metals analysis.

GIS Research & Soil Microbiology Labs



Jinseok Hong models soil properties using GIS and Remote Sensing.

GIS Research Laboratory

The GIS Research Laboratory provides professional services on the use of geographic information systems, geostatistical and statistical methods, remote and soil sensing (e.g., visible/near-infrared diffuse reflectance spectroscopy). The GIS laboratory is a modern computer laboratory providing hardware and software including multiple data servers, 16 PCs with flatscreen monitors, large format color printers, and scanners. Available software packages include: MS Office Suite; MS SQL database; ArcGIS Suite (ESRI) including Spatial Analyst and 3D Analyst; Idrisi Kilimanjaro GIS; Erdas Imagine for remote sensing analysis; SGeMS, SAS, GenStat and SPSSWin for geostatistical and statistical analyses; Adobe Photoshop; Adobe Acrobat; CART - Classification and Regression Trees; Treenet; Neurosolutions for neural network modeling; DreamWeaver; Unscrambler for chemometric modeling; Environmental Visualization Software (EVS-PRO), and RockWorks for 3D modeling and scientific visualization. A

sub-meter accuracy, differential GPS unit (Trimble Pathfinder) is available for geo-referencing of sampling locations. In addition, several handheld GPS units are available for field navigation. For additional information, contact Sabine Grunwald at sgrunwald@ifas.ufl.edu.

Soil Microbiology Laboratory

The Soil Microbiology Laboratory (SML) has a wide array of equipment and services available for analysis of the biological component of soils. The primary areas of expertise are characterization of nucleic acids, from extraction from soil samples through phylogenetic analysis, enumeration of functional groups by most probable number analysis, and development and characterization of endomycorrhizal fungi inocula, including assessment of mycorrhizal inoculum potential and development of commercial scale inocula. The SML also conducts short courses on isolation and characterization of mycorrhizal fungi each summer. A full listing of services and fees may be found at <http://molecol.ifas.ufl.edu/core.html>. For additional information, contact Andy Ogram at aogram@ufl.edu.



Abid Al-Agely determining mycorrhizal inoculum potential.

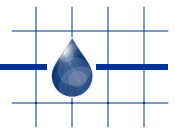
Wetland Biogeochemistry Laboratory



Yu Wang, Dawn Lucas, and Gavin Wilson discuss results of an Ortho P test run on the AutoAnalyzer 3.

The Wetland Biogeochemistry Laboratory is a NELAC certified facility (certification # E72949) in the category of General Chemistry for water and soil samples. The lab is equipped with four flow analyzers for nitrogen and phosphorus analysis, a new discrete analyzer, four gas chromatographs, ion chromatograph (Dionex), CNS analyzer, dissolved carbon analyzer, and other routine instruments such as spectrophotometer, centrifuge, Eh/pH controllers, EC meters, and incubators. The laboratory provides specialized services (analytical and experimental) to our collaborators working on joint projects.

For additional information, contact Ramesh Reddy at krr@ufl.edu or visit <http://wetlands.ifas.ufl.edu>.



Research and Education Center Labs

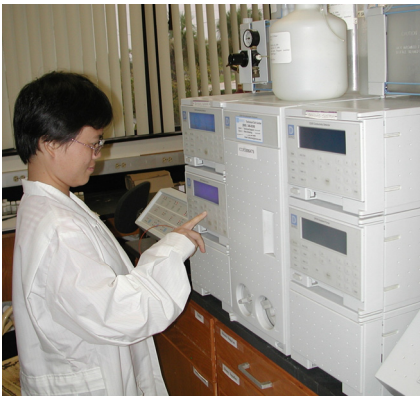
Soil and Water Laboratory at the Tropical Research and Education Center, Homestead

The Soil and Water Laboratory (SWL) at the Tropical Research and Education Center in Homestead is certified by the National Environmental Accreditation Conference (NELAC). The lab employs three full-time, well-trained lab technicians and is equipped with state-of-the-art instruments. These instruments include an Atomic Absorption Spectrophotometer (Shimadzu AA-6300 with GFA-EX7i), an Autoanalyzer (Bran and Luebbe AutoAnalyzer III), a CNS analyzer (Elementar Vario MAX), an Ion Chromatograph (Dionex ICS-2500), and an Auto-digestion block (Environmental Express, SC860). The SWL provides services only to their own research team and collaborators. The SWL is interested in collaborating with other researchers on research and extension projects related to water quality, soil chemistry, nutrient and waste management, ecosystem restoration, etc. For further information visit <http://yuncong.ifas.ufl.edu> or contact Yuncong Li at yunli@ifas.ufl.edu.



In-service training for state and county faculty on analyzing soil and water samples.

Soil and Water Science Laboratory at the Indian River Research Education Center, Ft. Pierce



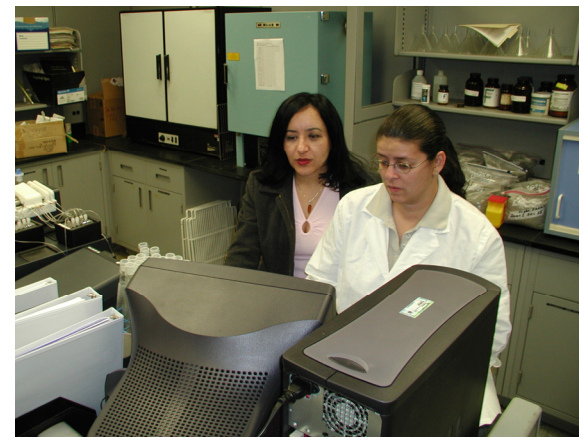
Qin Lu operating the Ion Chromatograph.

The Soil and Water Science Laboratory (SWSL) at the Indian River Research Education Center (IRREC) in Fort Pierce is a self-supporting laboratory. Its mission is to provide legally defensible and scientifically credible analytical and technical support to the Research and Education Programs in Soil and Water Science at the IRREC. The laboratory is a certified NELAC standard lab for environmental tests in the category of General Chemistry and Trace Metals (NELAC certification # E76888). It is equipped with inductively coupled plasma atomic emission spectrometry (ICPAES, Ultima, JY Horiba, NJ), CN Analyzer (Vario Max, Elementar, Germany), N/P Discrete Analyzer (EasyChem Plus, Systea Scientific, Inc., Italy), Ion Chromatograph (DX 500, Dionex, CA), Root Scanner (WIN/MAC-LA1600), and other routine instruments such as UV-Spectrometry, centrifuge and Ion/Eh/EC meters, and incubators. The SWSL is currently not certified as a commercial lab and therefore, is not qualified to provide analytical services to outside clients. However, the laboratory provides services to our collaborators working on joint projects. For additional information, contact Zhenli He at zhe@ufl.edu.

Everglades Research and Education Center Laboratories, Belle Glade

The Water Resources Group at the Everglades Research and Education Center (EREC) has established a NELAC certified lab (certification # E76463) in the category of General Chemistry. The lab is equipped with two flow analyzers for phosphorus analysis (LCHAT and ALPKEM), a new discrete analyzer (SEAL) mainly used for nitrogen analysis, ion chromatograph (Dionex) and other routine instruments such as spectrophotometer, centrifuge and EC meters, and incubators. The laboratory provides services to our collaborators working on joint projects.

The EREC also hosts a Soil Testing Laboratory (ESTL) serving clients throughout the Everglades Agricultural Area by doing routine tests on organic and sandy soils including pH, P, K, Si, specific conductance and trace elements, and providing fertilizer recommendations. In addition to routine instruments, the laboratory has an Atomic Absorption Spectrometry, and an Inductively Coupled Plasma Atomic Emission Spectrometry. For additional information on both laboratories, contact Samira Daroub at sdaroub@ifas.ufl.edu.



Viviana Nadal (right) with Samira Daroub analyzing water samples.

New Graduate Students Fall 2006

PhD

Alex Cheesman, Advisor, K. Reddy
 Jinghua Fan, Advisor, Z. He & L. Ma
 Yandi Fan, Advisor, R. Mylavarapu
 Hiral Gohil, Advisor, A. Ogram
 Tae-Goo Oh, Advisor, M. Clark
 Anhui Huang, Advisor, M. Teplitski
 Ying Liu, Advisor, G. O'Connor
 Shiny Mathews, Advisor, L. Ma
 Jing Nie, Advisor, M. Teplitski
 Julie Padowski, Advisor, J. Jawitz
 Rajendra Paudel, Advisor, J. Jawitz
 Priyanka Roy, Advisor, C. Mackowiak
 Rongzhong Ye, Advisor, A. Wright

MS

Subodh Acharya, Advisor, R. Mylavarapu
 Jay Bost, Advisor, H. Popenoe
 Dwain J. Butler, Advisor, M. Teplitski
 Julie Driscoll, Advisor, D. Graetz
 Robin Ferguson, Advisor, K. Reddy
 William Grant, Advisor, M. Clark
 Jason Hood, Advisor, M. Clark
 Italo Lenta, Advisor, M. Clark
 Louis Mantini, Advisor, K. Reddy
 Stephen McCullers, Advisor, M. Clark
 Frank W. Meadows, Advisor, K. Morgan
 Matthew Miller, Advisor, G. O'Connor
 Jason Neumann, Advisor, M. Clark
 Regina Price, Advisor, L. Ellis
 John Rowland, Advisor, G. Snyder
 Elisabeth Solchik, Advisor, K. Reddy
 Veronica Villasenor, Advisor, R. Mylavarapu
 Justin Vogel, Advisor, M. Cohen
 Laura Waldo, Advisor, A. Schumann

Congratulations... Summer 2006 Graduates—Master of Science

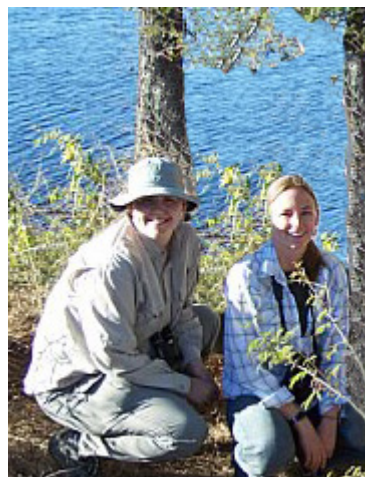
Jeanna Ragsdale, Advisor, M. Clark
 Jason Smith, Advisor, A. Ogram
 Jeffrey Smith, Advisor, M. Clark

Our Outstanding Students

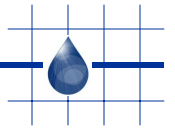
Gabriel Kasozi, graduate student in the soil physics program (Peter Nkedi-Kizza, major advisor) was awarded the Scarborough Insurance Award by the International Student Center, University of Florida.

Isabela Torres, graduate student in wetlands program (K. R. Reddy, major advisor) won the best poster award at the 2006 annual meetings of the American Society of Limnology and Oceanography, Vancouver, Canada.

Olawale Oladeji (George O'Connor, major advisor) was awarded the first place and **Manohardeep Josan** (Vimala Nair, major advisor), the second place in the oral presentation competition at [the 2006 Joint Meeting of the Florida State Horticultural Society and the Soil and Crop Science Society of Florida](#). The third place was awarded jointly to **Carolina Medina** (Tom Obreza, major advisor) and **TJ Rew** (Don Graetz, major advisor).



Julie Padowski and **Melissa Martin**, two SWSD graduate students, spent this summer in southern Africa participating in a six week-long IGERT course titled Adaptive Management Field Methods. This course introduced the social, political, and scientific concerns surrounding the management of the Okavango River Delta, Botswana and neighboring watersheds. As Ph.D. fellows in the NSF funded IGERT program on Adaptive Management of Wetlands and Watersheds, Julie and Melissa will take coursework and develop projects that focus on issues impacting water quality in Florida, Africa, South America, Mexico, and other international sites.



Faculty & Staff News

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P. K. Nair, Distinguished Affiliate Professor, has been selected to receive the 2006 Humboldt Research Award of the Alexander von Humboldt Foundation, Bonn, Germany. The award, known as the Humboldt Prize, is Germany's highest recognition for international senior scientists and carries a cash award of about \$60,000. Congratulations to P. K. for winning this prestigious recognition.

Several SWS faculty taught short courses during this summer: Hydric Soils (**Wade Hurt**); Soil Microbiology-Mycorrhizal Fungi (**Andy Ogram**, **Krishna Sundari**, and **Abid Al-Agely**); Modern Methods for Detection of Water- and Soil-borne Pathogens (**Max Teplitski**); and Geostatistical Analysis of Environmental Data (**Pierre Goovaerts**). These courses were organized by the University of Florida/IFAS Office of Conferences & Institutes (OCI) <http://conference.ifas.ufl.edu/soils/index.html>. We thank OCI for the excellent work in organizing these courses.

Lena Ma, **Zhenli He**, and **Ramesh Reddy** traveled to China and presented several seminars at various universities and research institutes. The purpose of these visits was to discuss collaborative research and educational opportunities between UF and Chinese universities.

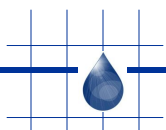
Wendy Graham, **Sabine Grunwald**, **Rao Mylavarapu**, and **Ramesh Reddy** traveled to Hyderabad-India to discuss collaborative research and educational opportunities. During their visit Graham, Grunwald, and Reddy visited the International Semiarid Crops Research Institute and Acharya N.G. Ranga Agricultural University and presented seminars. Rao presented a seminar at the Jawaharlal Nehru Technological University.

Sabine Grunwald taught a short course on GIS applications in land resource management at the International Crops Research Institute for Semiarid Tropics (ICRISAT), Hyderabad, India during July 31 - August 4, 2006. The course was attended by land resource professionals from several Indian universities, state and federal agencies. The course was joint effort between the UF and ICRISAT as a part of the MOU between the two organizations.

Amy Shober joined the SWSD as an Assistant Professor of Landscape Nutrient/Runoff Management at the Gulf Coast Research and Education Center, Balm, Florida. Amy received a B.S. (1998) in Environmental Science and a B.A. (1998) in Chemistry from Virginia Tech, an M.S. (2002) in Soil Science from Penn State University, and a Ph.D. (2006) in Environmental Soil Management from the University of Delaware. Amy's Ph.D. research focused on understanding the solubility of P in municipal biosolids (sewage sludge) or animal manures to assess the risk of phosphorus loss to surface and ground water when these materials are land applied. She has published in refereed journals and presented her research at regional, national, and international meetings and conferences. In 2005, Amy was awarded the J. Fielding Reed Potash and Phosphate Institute Fellowship and the Hazel Burgett Endowed PEO (Philanthropic Education Organization) Scholar award. In 2006, she was named as a Presidential Management Fellowship finalist. Amy is a member of the Soil Science Society of America (SSSA), the American Society of Agronomy (ASA), Phi Beta Kappa, the Golden Key International Honor Society, and Alpha Zeta. Outside of work, Amy enjoys swimming, walking, kayaking, and crocheting. Amy can be reached at alshober@ufl.edu.



Maria Lucia Silveira joined our department as an Assistant Professor at the Range Cattle REC, Ona, Florida. Maria, a soil scientist, earned her Ph.D. in Soil Chemistry at University of Sao Paulo, Brazil and University of California, Riverside. Her research program will focus on soil fertility and environmental nutrient management practices for sustainable forage production. Research objectives will address critical nutrient and water quality issues related to beef cattle production in South Florida. She will also work closely with IFAS extension faculty to promote BMPs for beef and dairy operations. Maria can be reached at mlas@ufl.edu.



In Memoriam



William G. Blue, 82, Emeritus Professor of Soil and Water Science Department at the University of Florida, died in Gainesville, Florida on July 12, 2006.

He was born in Poplar Bluff, Missouri on November 7, 1923. He enrolled in the University of Missouri in 1941. During World War II, he served as a reconnaissance sergeant in the 78th Infantry Division in Europe and was awarded a Purple Heart. After the end of war, he went back to the University of Missouri, and received his B.S. in agriculture in 1947 and advanced degrees in Soil Science, M.S. in 1948, and Ph.D. in 1950.

Dr. Blue was appointed as an Assistant Biochemist in 1950, by the Florida Agricultural Experiment Station at the University of Florida, working on soil fertility problems in forage production. Later, his research expanded to other areas, including the characterization of the action of anhydrous ammonia in coarse textured soils and its relation to soil chemistry and microbiology as well as plant response. He also studied the nitrogen efficiency of forage plants in poorly drained coarse-textured soils and potassium and phosphorus effects in coarse-textured and highly weathered

soils. In 1964, whole agricultural programs at the University of Florida were reorganized and the Institute of Food and Agricultural Sciences was established. The College of Agriculture, Agricultural Experiment Station, and the Agricultural Extension Service became parts of the Institute. The faculty and their titles in these units were also integrated. Dr. Blue, then a professor, was asked in 1968 to teach a graduate course in soil fertility. From that year to his retirement in 1989, he had taught a total of approximately 400 students. He also served as the advisory committee chair for 17 Ph.D. and 15 M.S. candidates in the Soil and Water Science Department. Many of them came from overseas, including Asia, South America, and Africa. He was also a member of another 80 graduate committees in Soil Science and other departments in the Institute. He published extensively and authored and coauthored approximately 200 scientific papers. He was deeply involved in University international agricultural programs. He was in Costa Rica from 1958 to 1960 as a pasture agronomist and in 1985, he had a two-year assignment as a research and extension advisor in Cameroon, Africa. He also had several short oversea assignments.

He was a member of ASA and SSSA for over 40 years and was elected a Fellow of both societies. He served as Associate Editor for the SSSA Journal. He was a member of Sigma Xi, Alpha Zeta, Gamma Sigma Delta, and Alpha Gamma Rho. He was a member of the Florida Soil and Crop Science Society of which he was president in 1961 and editor of its proceedings.

He retired from the University of Florida in 1989, after 39 years of a successful and outstanding career. He was respected by his colleagues and loved by his students and those who worked under him. He is survived by his wife of 59 years, Bernice, and three daughters, Carol Blue Garcia, Jane Blue Marquez, and Cynthia Blue Russell, as well as seven grandchildren.

Join us at ..

The 7th Annual Soil and Water Science Research Forum

The 7th Annual Soil and Water Science Research Forum (<http://soils.ifas.ufl.edu/forum/>) is scheduled for **September 15, 2006**, in Gainesville, Florida. The forum is designed to bring together representatives from state and federal agencies as well as private industry, faculty and graduate students, and prospective students interested in soil and water science. The forum will provide an opportunity for all those interested in soil and water science to interact with our students, faculty, and administrators on campus. We look forward to your participation in the forum. If you are planning to attend, please register at <http://soils.ifas.ufl.edu/forum/>. For additional information, contact Lena Ma at lqma@ufl.edu.