

Thanks to our state-wide Soil and Water Science
Faculty Programs for sponsoring
12th Annual Research Forum

UF UNIVERSITY of FLORIDA
SOIL & WATER SCIENCE

Citrus REC Soil Microbiology Program, Lake Alfred
(James Graham)

Environmental Hydrology Laboratory
(James Jawitz)

Everglades BMP Program, Belle Glade
(Samira Daroub)

Soil Fertility and Plant Nutrition Program
(George Hochmuth)

Wetland Biogeochemistry Laboratory

12th Annual Research Forum

J. Wayne Reitz Union. September 9, 2011



PLAN TO ATTEND

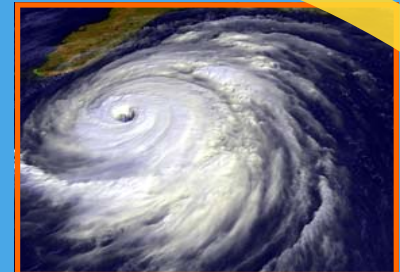
13th Annual Soil & Water Science Research Forum

September 7, 2012

J. W. Reitz Union

University of Florida - IFAS

Gainesville, Florida



Soil, Water, and Climate Change

making a difference in quality of life ... for everyone

INTRODUCTION

Welcome to the 12th Annual Soil and Water Science Research Forum sponsored by the Soil and Water Science Department (SWSD), IFAS, University of Florida. The Forum is designed to bring together representatives from state and federal agencies as well as private industry, faculty, graduate students, and prospective students. The Forum provides an opportunity for all those interested in soil and water science to interact with our students, faculty, and administrators on campus.

The SWSD faculty are located both on the main campus in Gainesville and at several off-campus Research and Education Centers. The mission of the department is to conduct basic and applied research on soil and water-related problems associated with sustaining agriculture and protecting natural resources. Thus, our faculty and students conduct research and education in a wide range of ecosystems including: agricultural lands, urban lands, rangelands, forested lands, and wetlands and aquatic ecosystems, with emphasis on productivity, water quality, carbon sequestration, and greenhouse gas emissions. Research efforts are organized into the following thrust areas: Management of Nutrients, Pesticides, and Wastes, Soil, Water, and Aquifer Remediation, Carbon Dynamics and Ecosystem Services, Landscape Analysis and Modeling, and Wetlands and Aquatic Systems. This year's Forum will focus on Soil, Water, and Climate Change, with invited presentations from Dr. Teresa Balsler, Dr. Jim Jones and Dr. Chris Field. Their biographical information is posted in this brochure.

Research conducted by graduate students and post-doctoral fellows is the core of the SWSD research programs. At present 160 graduate students (including 68 Ph. D and 92 MS students, 54 undergraduates (24 SWS and 30 EMANR) and 10 post-doctoral associates support current research activities in the department. For this year's Forum we offer you select examples of the research conducted by these young scientists. Presentations include 6 oral papers and 44 poster presentations. For those of you interested in our programs, please contact me or any one of our faculty members.

Thanks to the Faculty Research Forum Committee (Dr. James Jawitz, Committee Chair) for coordinating activities related to the Forum. Thanks to Rupesh Bhomia, Susan Curry, and Michael Sisk for their excellent work in making arrangements for the Forum. Special thanks to Drs. Jack and Kathy Ewel for hosting Dr. Chris Field. Finally, I want to express my appreciation to all students, post-doctoral fellows, staff, and faculty for their active participation in the Forum. Assistance of judges in selecting best oral/poster presentations is greatly appreciated. We thank our collaborators from various state agencies and the industry for their support of our programs.

Sincerely,



SOIL AND WATER SCIENCE LOCATIONS

Soil & Water Science Department
106 Newell Hall
P.O. Box 110510
Gainesville, FL 32611-0510
(352) 392.1803
<http://soils.ifas.ufl.edu/>

2169 McCarty Hall
P.O. Box 110290
Gainesville, FL 32611-0290
(352) 392.1951

Citrus Research & Education Center
700 Experiment Station Road
Lake Alfred, FL 33850-2299
(863) 956.1151
<http://www.crec.ifas.ufl.edu/>

Everglades Research & Education Center
3200 E. Palm Beach Road
Belle Glade, FL 33430-8003
(561) 993.1500
<http://erec.ifas.ufl.edu/>

Ft. Lauderdale Research & Education Center
3205 College Avenue
Ft. Lauderdale, FL 33314-7799
(954) 577-6300
<http://flrec.ifas.ufl.edu/>

Gulf Coast Research & Education Center
14625 County Road 672
Wimauma, FL 33598
(813) 634.0000
<http://gcrec.ifas.ufl.edu/>

Indian River Research & Education Center
2199 South Rock Road
Fort Pierce, FL 34945-3138
(772) 468.3922
<http://irrec.ifas.ufl.edu/>

North Florida Research & Education Center
155 Research Road
Quincy, FL 32351-5677
(850) 875.7100
<http://nfrec.ifas.ufl.edu/>

Range Cattle Research & Education Center
3401 Experiment Station Road
Ona, FL 33865-9706
(863) 735.1314
<http://rcrec-ona.ifas.ufl.edu/>

Southwest Florida Research & Education Center
2686 State Road 29 North
Immokalee, FL 34142
(239) 658.3400
<http://www.imok.ufl.edu/>

Tropical Research & Education Center
18905 SW 280th Street
Homestead, FL 33031-3314
(305) 246.7000
<http://trec.ifas.ufl.edu/>

DR. TERESA BALSER

**Dean
College of Agricultural and Life Sciences
University of Florida**



Dr. Teresa Balsler is the Dean of College of Agricultural and Life Sciences and a Professor of Soil Microbial Ecology at the University of Florida. Dr. Balsler earned her Ph.D. degree from University of California at Berkeley, followed by post doctoral research at Stanford University. In 2001, Dr. Balsler joined University of Wisconsin as an Assistant Professor of Soil Microbiology in Soil Science Department. In 2007 she was promoted to Associate Professor and appointed as the Director for the Institute for Biology Education at University of Wisconsin. As Director, she was responsible to oversee administration and advising of three non-departmental majors: Biology, Molecular Biology, and Biological Aspects of Conservation; as well as provision of general support and advising for the ~6000 students on campus. Dr. Balsler maintained an active collaborative, interdisciplinary research program in environmental science with funding obtained from the National Science Foundation (including 2006 NSF Early Career Award), USDA, US DOE, the University of Wisconsin Alumni Research Foundation, and the Howard Hughes Medical Institute.

Dr. Balsler has a strong teaching/education record with incorporation of active learning, innovative curriculum design, and teaching-as-research to advance educational goals. Dr. Balsler received numerous awards for her teaching accomplishments including: UW System Madison Teaching Fellow; National Biology Scholar; USDA National Excellence in College and University Teaching Award recipient; and 2010 U.S. Professor of the Year, Carnegie Foundation for the Advancement of Teaching Outstanding Doctoral and Research Universities. She was the Co-founder of the Society for Advancement of Biology Education Research (SABER). She published 50+ peer reviewed journal articles, several book chapters, and currently working on two books. Dr. Balsler gave several invited presentations nationally and internationally. Topics included soil and climate change, carbon sequestration, and ecosystem ecology.

INVITED SPEAKER

DR. JAMES JONES

Director and Distinguished Professor
Florida Climate Institute
University of Florida



Dr. Jones is Director of the Florida Climate Institute, a joint institute of the University of Florida and Florida State University for interdisciplinary research and education aimed at providing information and technologies to guide societal responses to climate change. Dr Jones is also a developer and co-leader of the Southeast Climate Consortium (SECC), a NOAA Regional Integrated Science Assessment (RISA) Center of six universities in three SE states. This Center conducts research on climate change/variability for use in adaptive management of agriculture and natural resources. Also a Distinguished Professor at the University of Florida, he has conducted research and taught graduate classes for the last 34 years. His fields of study are mathematical modeling of plant growth and environmental interactions (with soil and atmosphere); analysis of agricultural systems for research and decision support applications; climate effects on cropping systems, including climate risk management and decision support for agriculture and water resources; the integration of crop models with other tools for application at field and broader spatial scales; and providing leadership in communities of agricultural systems modeling. He has conducted research for over 30 years on impacts of climate change on cropping systems, and for over 10 years on climate forecasts for agriculture and water resources risk management in the Southeast USA. During his career, he has been a leader in modeling cropping systems, including the widely used DSSAT cropping system model, and applying those models for improving agricultural productivity and resource use efficiency in a number of countries worldwide. He has also been an organizer and teacher in many courses worldwide on concepts and applications of agricultural systems models for assessment of climate and management responses during the last 25 years.

POSTER TITLES & AUTHORS

40. **Colloid-Facilitated Hg Transport in Hg-Contaminated Soils: Effect of Ionic Strength, Humic Acid and Flow Interruption.** *Yingjia Zhu, Lena Q Ma, Willie Harris, J.C. Bonzongo, and Fengxiang X. Han*
41. **Towards Understanding the Impact of Floating Aquatic Vegetation on Farm Phosphorus Loads in the Everglades Agricultural Area, Florida.** * *Jehangir H. Bhadha, Samira H. Daroub, Timothy A. Lang, Manohardeep S. Josan, Susanna M. Gomez*
42. **Effectiveness of Best Management Practices in Pb Stabilization and Weathering in Shooting Ranges.*** *Rui Liu and Lena Ma*
43. **Enhancing Model-Data Symbiosis to Improve Global Carbon-Sink Predictions.*** *Stuart Muller and Stefan Gerber*
44. **Effects of Chromate and Sulfate on Arsenic Uptake and Translocation by Arsenic Hyperaccumulator* *Pteris vittata* L.** *Letuzia M. Oliveira, Lena Q Ma, Luiz R. G.G.*

* **Non-judged entries**

This is a Zero Waste Event!

The Soil and Water Science Department is working to reduce waste from this year's Forum and aid the University of Florida's goal of producing **Zero Waste by 2015.**

For more information on Zero Waste Events, you can visit the websites of the **UF Office of Sustainability** and **UF Biogas – A Renewable Biofuel.**

POSTER TITLES & AUTHORS

- 30. Linkages Between Pollutants and Physiological Processes in Fish Exposed to Typical Urban Waters.** *Ignacio Rodriguez-Jorquera, K. J. Kroll, G. S. Toor & N. D. Denslow.*
- 31. Soil Morphological Indicators of Seasonal High Saturation along a Uduft-Aquod Catena.** *Alexandra G. Rozin, Larry R. Ellis, and G. Wade Hurt*
- 32. Effect of Organic Soil Amendments and Continuous Tomato Monoculture on Arbuscular Mycorrhizal Communities.** *Megan M. Smith, Graham, J.H., Chellemi, D., Ogram, A., Koenig, R.*
- 33. The Role of Roots and Litter in Maintaining Forest Soil Carbon.** *Aja Stoppe, Nicholas Comerford, Eric Jokela*
- 34. Role of Arsenic-Resistant Bacteria in Enhancing Tomato Growth.** *Rujira Tisarum, Lena Ma, Piyasa Ghosh, and Bala Rathinasabapathi*
- 35. Investigation of Alternative Sources of Inocula for Anaerobic Digestion.** *Reginald Toussaint and Ann C. Wilkie*
- 36. Comparison of Extracellular Enzyme Activities in Everglades Stormwater Treatment Areas.** *Christine M. VanZomeran, Rupesh K. Bhomia, Kanika S. Inglett, and K. Ramesh Reddy*
- 37. Screening of Plant Growth Regulators (PGRs) to Confer Plant Heat and Salt Stress.** *Shengsen Wang and Arnold W. Schumann*
- 38. Characterization of Diverse Naphthalene Degradative Pathways among Soil Actinobacteria.** *C. Weidow, A. Chauhan, and A. Ogram*
- 39. Utilizing Geostatistics to Increase the Efficacy of Sampling Protocols Used to Measure Soil Organic Carbon.** *Kiara S. Winans, Pierre Goovaerts, Suhas Wani, K. Ramesh Reddy*

KEYNOTE SPEAKER

DR. CHRISTOPHER B. FIELD

Director

Department of Global Ecology
Carnegie Institution of Washington
Stanford University



Chris Field is the founding director of the Carnegie Institution's Department of Global Ecology, Professor of Biology and Environmental Earth System Science at Stanford University, and Faculty Director of Stanford's Jasper Ridge Biological Preserve. Field's research emphasizes impacts of climate change, from the molecular to the global scale. He has, for nearly two decades, led major experiments on responses of California grassland to multi-factor global change. Field has served on many national and international committees related to global ecology and climate change. He was a coordinating lead author for the fourth assessment report of the Intergovernmental Panel on Climate Change and a member of the IPCC delegation that received the Nobel Peace Prize in 2007. In September, 2008, he was elected co-chair of working group 2 of the IPCC, and will lead the next assessment on climate change impacts, adaptation, and vulnerability. He is a fellow of the American Association for the Advancement of Science and an elected member of the American Academy of Arts and Sciences and the National Academy of Sciences. Field received his PhD from Stanford in 1981 and has been at the Carnegie Institution for Science since 1984.

PROGRAM

Room 282 – J. Wayne Reitz Union

- 8:00 AM Registration
- 8:30 - 8:40 **Dr. K. Ramesh Reddy**
Opening Remarks
Graduate Research Professor and Chair
Soil and Water Science Department
- 8:40 - 8:50 **Dr. Teresa Balsler**
Welcome Message
Dean - College of Agricultural and Life Sciences
- 8:50 - 9:10 **Dr. James Jones**
Advancing Agricultural Sciences for Climate Change Assessments
Director and Distinguished Professor
Florida Climate Institute
University of Florida
- 9:10 - 10:00 **Dr. Christopher Field**
Climate Change in a Skeptical Era
Keynote Speaker
Director, Department of Global Ecology
Carnegie Institution of Washington
Stanford University
- 10:00 - 10:30 **BREAK**

SESSION I – Oral Presentations

Room 282 – J. Wayne Reitz Union

- 10:30 – 12:00 **Invited Faculty Session - Soil, Water & Climate Change**
Session Chair: Dr. James Jawitz
- 10:30 – 10:50 **Dr. H. Carl Fitz: Modeling Coastal Everglades Ecology under Current and Future Sea Level Forcings**
Fort Lauderdale Research and Education Center
Department of Soil and Water Science
University of Florida

POSTER TITLES & AUTHORS

20. **Fire Effects on Nitrogen Cycle in Calcareous Wetlands of Florida Everglades.** Xiaolin Liao, Patrick W. Inglett, Benjamin Hogue, Cassandra Medvedeff, Kanika Sharma Inglett
21. **Using Polynomial Modeled LiDAR Elevation Data to Identify Wetland Boundaries.** William D. Mahler, L. Rex Ellis, and Travis C. Richardson
22. **Effect of Topsoil Created from Spodic Materials on Turfgrass.** Drew McLean, Amy Shoher, and Rex Ellis
23. **Effect of Fire Residues (Ash and Char) on Microbial Activity, Respiration and Methanogenesis in Three Subtropical Wetland Soils.** CA Medvedeff, B. Hogue, PW Inglett
24. **Effects of Supporting Electrolytes and Fertilizer Mixture on Sorption Behavior of Phosphorus in Immokalee Soil Used for Sugarcane Production.** A. Muwamba, P. Nkedi-Kizza, K.T. Morgan and W. Harris
25. **Macro-Elements Concentration of Manures Deposited By Selected Large Herbivores in African Tropical Savanna Ecosystem.** L. W. Ngatia, P. W. Inglett, B.L., Turner, and K. R. Reddy
26. **Untapped Reservoirs: A Storage-Based Approach for Assessing Urban Water Availability & Vulnerability across the United States.** J.C. Padowski and J.W. Jawitz
27. **Subaqueous Podzolic Carbon Resulting From Sea-Level Rise.** Ashley N. Phillips, L. Rex Ellis and Todd Osborne
28. **Nitrogen Mass Balance in Potato Production: What it means to the Environment.** Rishi Prasad and George Hochmuth
29. **Evaluation of Nutrient Leaching From Simulated Residential Mixed Landscapes.** Zhixuan Qin, Amy Shoher and Vimala Nair

POSTER TITLES & AUTHORS

11. **Fluorescent Arsenic-Resistant Bacteria Enhanced Solubilization of Arsenic and Increased Growth of Arsenic Hyperaccumulator *Pteris vittata* L.** *Piyasa Ghosh, Bala Rathinasabapathi, and Lena Q. Ma*
12. **The Effect of Aquatic Vegetation on Water Quality in the Everglades Agricultural Area Canals.** *Susanna M. Gomez, Jehangir H. Bhadha, Timothy A. Lang, Manohardeep S. Josan, Samira H. Daroub*
13. **Anaerobic Digestion Potential of Organic Wastes from Small Farms.** *Ryan E. Graunke and Ann C. Wilkie*
14. **Perceptions of risk associated with living near the Koppers Superfund Site, Gainesville, Florida.** *Julia "Ky" Gress and Mihai G. Giurcano*
15. **Nitrogen Mass Budget of a Silage Corn Field at the University of Florida's Dairy Research Unit in Hague, FL.** *Rebecca Hellmuth and George Hochmuth*
16. **Effects of Laboratory Combustion on Impacted and Native Plant Biomass from a Subtropical Calcareous Wetland.** *Benjamin A. Hogue and Patrick W. Inglett*
17. **Hydrological and Biogeochemical Controls on the Nitrous Oxide (N₂O) Production and Consumption in Subtropical Isolated Wetlands.** *J Hu, K S Inglett, M Clark, K R Reddy*
18. **Soil Phosphorus Forms in Tree Island Ecosystems of the Central and Southern Everglades.** *Daniel L. Irick, Yuncong Li, Patrick W. Inglett, Binhe Gu, Michael Ross, Willie Harris, and Alan Wright*
19. **Estimation of Water Uptake using the Stem-Heat Balance Technique for 2- and 4-year old Citrus.** *Davie Kadyampakeni, Kelly Morgan, Arnold Schumann, Peter Nkedi-Kizza*

PROGRAM

- 10:50 – 11:10 Dr. Stefan Gerber : ***Probing the Land Uptake of Anthropogenic CO₂ with Global Models***
Department of Soil and Water Science
University of Florida
- 11:10 – 11:30 Dr. Patrick Inglett : ***Fire in Calcareous Wetlands: Effects on Biogeochemistry and Greenhouse Gas Emissions***
Department of Soil and Water Science
University of Florida
- 11:30 – 11:50 Dr. Maria Silveira : ***Carbon Sequestration in Grassland Ecosystems***
Range Cattle Research and Education Center
Department of Soil and Water Science
University of Florida

12:00 – 1:10 LUNCH

SESSION II – Oral Presentations

Room 282 – J. Wayne Reitz Union

Session Chair: Rupesh Bhomia

- 1:15 – 1:30 **Post-Doctoral Associate Presentation**
Quantitative Approach for Assessment of Phosphorus Loss Risk from Alaquod and Paleudult Soil Profiles
Debolina Chakraborty and Vimala Nair
- 1:30 – 1:45 **Student Presentation**
Impact of Simulated Storm Surge on Organic Carbon Loss in Coastal Wetland Soils
Lisa G. Chambers and K. Ramesh Reddy

PROGRAM

Room 282 – J. Wayne Reitz Union

- 1:45 – 2:00 Student Presentation**
Optimizing Cultural Practices for Saving Water and Fertilizer for Rice-Maize Cropping System in Semi Arid Tropics
Dakshina Murthy Kadiyala, Yuncong Li, Rao Mylavarapu, M.D.Reddy, J.W.Jones, K.R.Reddy and G.B. Reddy
- 2:00 – 2:15 Student Presentation**
Dynamic Interactions between Commensal Bacteria and Opportunistic Pathogens of the Coral Holobiont
Cory J. Krediet and Max Teplitski
- 2:15 – 2:30 Student Presentation**
Effects of Phosphate Rock on Long-Term Arsenic Removal by *Pteris vittata*
Jason T. Lessl and Lena Q. Ma
- 2:30 – 2:45 Student Presentation**
Transferability of Soil Carbon Models across Regions and Scales within Florida
Xiong X., S. Grunwald, D.B. Myers, W.G. Harris, A. Stoppe, N.B. Comerford

SESSION III

Student Presentations – Poster Viewing and Reception

East and West Gallery, J. Wayne Reitz Union

- 3:00 – 4:00 Poster Session I**
Judging of Even Numbered Posters
- 4:00 – 5:00 Poster Session II**
Judging of Odd Numbered Posters

POSTER TITLES & AUTHORS

- 1. Drainable Porosity of Unconfined Aquifers during Evapotranspiration from the Shallow Water Table.** *Subodh Acharya; R.S. Mylavarapu; J.W. Jawitz; J.W. Jones; L. Zotarelli; K.T. Morgan; W.G. Harris*
- 2. Performance of Global and Local Models in Predicting Soil Carbon at Different Scales in a Subtropical Watershed.** *Julius B. Adewopo, Sabine Grunwald, Pasicha Chaikaew, Baijing Cao, Xiong Xiong*
- 3. Effects of External Copper (Cu) Loading and Liming on the Availability and Fractionation of Cu in Soils.** *S. Bakshi, He, Z.L., Harris, W.G.*
- 4. Accretion and Storage of Phosphorus in Recently Accreted Soils (RAS) in the Stormwater Treatment Areas of the Everglades Basin.** *R. Bhomia, P. Inglett, and K. R. Reddy*
- 5. Effects of Cu and Ca on Ciprofloxacin Transport in Saturated Porous Media.** *Chen Hao, Bin Gao, and Lena Q Ma*
- 6. Bioremediation of DDE, DDD, and DDT in Sandy Soil from Site ZSS3027 in Field ZSE-J in the Lake Apopka North Shore Restoration Area.** *Ben Coppenger and John Thomas*
- 7. Assessment of Nutrient Reduction Capabilities of an Algal Based Technology for Pollution Control.** *Kimberleigh Dinkins Patrick Inglett, PhD, Mark Clark, PhD, Mark Zivonovich, Allen Stewart, Robinson Bazurto*
- 8. Effectiveness and Mechanisms of Mercury Sorption by Biochars from Invasive Brazilian Pepper at Different Temperatures.** *Xiaoling Dong, Lena Q Ma*, Yingjia Zhu, Yuncong Li, and Binhe Gu*
- 9. Algal Bioremediation of Landfill Leachate Pretreated by Reverse Osmosis.** *Scott J. Edmundson and Ann C. Wilkie*
- 10. Effects of Sources, Rate and Timing of Nitrogenous Fertilizers on Nitrate Leaching and Aesthetic Quality of St. Augustinegrass.** *Rajendra Gautam, George J. Hochmuth and Laurie E. Trenholm*