

# SOIL AND WATER SCIENCE

## 16<sup>th</sup> Annual Research Forum



**September 17, 2015**

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

## INTRODUCTION

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### *A Message from*

**Dr. K. Ramesh Reddy**  
**Chair, Soil and Water Science Department**

Welcome to the 16<sup>th</sup> Annual Soil and Water Science Research Forum sponsored by the Soil and Water Science Department (SWSD), IFAS, and the 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: Nutrient, Pesticide, and Waste Management; Soil, Water, and Aquifer Remediation; Carbon Dynamics and Ecosystem Services; Landscape Analysis and Modeling; and Wetlands and Aquatic Systems.

The keynote speaker for this year's Forum is **Dr. Andrew Sharpley**, Professor of Soils and Water Quality, Crop, Soil, and Environmental Sciences, Division of Agriculture - University of Arkansas. His presentation is entitled "**Exploring Phosphorus Paradoxes to Avoid Unintended Consequences.**" Dr. Sharpley's 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, 117 graduate students (including 53 PhD and 64 MS students), 60 undergraduates (8 SWS and 52 EMANR) and several 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 three faculty members. Student presentations include 5 oral papers and 35 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 Steph Jamis, Wade Ross, Tracey Schafer, Susan Curry, Barbra Larson, Ivonne Black, Michael Sisk and student volunteers for their excellent work in making arrangements for the Forum. Finally, I want to express my appreciation to all students, post-doctoral fellows, staff, and faculty for their active participation in the assistance of judges in selecting best oral/poster presentations. We thank our Forum collaborators from various state agencies and the industry for their support of our programs.

## INTRODUCTION

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### *A Message from*

**Dr. Jack Payne**  
**Senior Vice President for Agriculture and Natural Resources, UF/IFAS**

Soil and water serve as the foundation for urban, agricultural, and natural ecosystems. We've known this for so long that the UF/IFAS Soil & Water Science Department (SWSD) was publishing soil science research as early as 1888. Ever since, its faculty has made major contributions to help solve soil and water quality challenges for Florida, the nation and the world. That running head start positions the department as one of the leading sources of expertise to tackle challenges not dreamed of in the 19th century: climate change, sea-level rise, and meeting the food and fiber needs of a projected 9.7 billion people in 2050. It has also become immensely more complicated to decrease rates of soil degradation and to protect natural resources.



People tend to take soil for granted. They overlook that life as we know it could not exist without soil. Soil science is so important in the management and protection of this hidden treasure that supports food production and natural resources. I'm proud of SWSD's leadership in teaching, research, and Extension programs to improve the productivity of agriculture with environmentally sound management practices.

UF's first soil-related master's degree was awarded to John Hazard in 1925. A formal soils department was established in 1933, and the first Ph.D. was awarded to Frank Bartlett in 1955. SWSD has provided steady service to clientele in agriculture and natural resources for more than a century.

Since your work rarely gets widespread public notice, I'm gratified to see that the United Nations has declared 2015 the **International Year of Soils**. Congratulations, SWSD, for your outstanding accomplishments and on your year in the spotlight.

## INVITED SPEAKER

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### Dr. Andrew Sharpley

*Department of Crop, Soil, & Environmental Sciences  
Division of Agriculture  
University of Arkansas*

**Andrew Sharpley** joined the Department of Crop, Soil and Environmental Sciences, University of Arkansas, Fayetteville in 2006. He is Distinguished Professor of Soil and Water Sciences, Director of the Discovery Farms for Arkansas Program and Chair of the Division of Agriculture's Environmental Task Force. He received degrees from the University of North Wales and Massey University, New Zealand and spent 25 years with the USDA-ARS in Oklahoma and then Pennsylvania. His research investigates the cycling of phosphorus in soil-plant-water systems in relation to soil

productivity and water quality and includes the management of animal manures, fertilizers, and crop residues. He also evaluates the role of stream and river sediments in modifying phosphorus transport and response of receiving lakes and reservoirs. He developed widely accepted decision-making tools for agricultural field staff to identify sensitive areas of the landscape and to target management alternatives and remedial measures that have reduced the risk of nutrient loss from farms.

He works closely with producers, farmers, and action agencies, stressing the dissemination and application of his research findings and is leading an on-farm demonstration, verification, and research program to show the benefits of Best Management Practices that protect water quality and promote sustainability of farming systems. He is the 2016 President-Elect of the Soil Science Society of America, Editor-in-Chief of the Soil Science Society of America, a Fellow of the American Society of Agronomy, Soil Science Society of America Soil, and Water Conservation Society. In 2008 he was inducted into the USDA-ARS Hall of Fame and in 2012 he received the Christopher Columbus Foundation Agriscience Award.



## PROGRAM

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Grand Ballroom – J. Wayne Reitz Union

**8:15 - 9:00 AM** Registration

**9:10 - 9:20**     **K. Ramesh Reddy**  
*Opening Remarks*  
Soil and Water Science Department Chairman

**9:20 - 9:30**     **Joel Brendemuhl**  
*Opening Remarks*  
Associate Dean, College of Agricultural and Life Sciences

**9:30 - 10:30**   **Exploring Phosphorus Paradoxes to Avoid Unintended Consequences**  
Andrew Sharpley  
Dept. Crop, Soil, & Environmental Sciences  
Division of Agriculture, University of Arkansas

**10:30 - 10:50**   **BREAK**

### SESSION I – Faculty Oral Presentations

Grand Ballroom – J. Wayne Reitz Union

**10:50 – 11:50**   **Invited Faculty Session**  
**Session Chair: James Jawitz**

**10:50 – 11:10**   **Nanotechnology Application in Agriculture and Environment**  
**Zhenli He**, Professor  
Indian River Research and Education Center – Ft. Pierce, FL  
Soil and Water Science Department  
University of Florida

**11:10 – 11:30**   **Soil Phosphorus Saturation Ratio for Risk Assessment in Land-use Systems**  
**Vimala Nair**, Research Professor  
Soil and Water Science Department  
University of Florida

## PROGRAM

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11:30 – 11:50 ***Use of the Solvophobic Theory to Predict Extraction Efficiency of Hydrophobic Organic Chemicals from Container Walls and Soils***  
**Peter Nkedi-Kizza**, Professor  
Soil and Water Science Department  
University of Florida

11:50 – 1:00 **LUNCH**

## SESSION II – PhD Graduate Student Oral Presentations

Grand Ballroom – J. Wayne Reitz Union

1:00 – 2:15 **Graduate Student Oral Presentations**  
**Session Chairs: Wade Ross, Steph Jamis, and Tracey Schafer**

1:00 – 1:15 ***Evaluation of Surfactant Coated Seed in Water Repellent Soil and Deficit Irrigation***  
**Mica Franklin**, M.D. Madsen, S.H. Daroub, S.J. Kostka, J.E. Erickson, J.B. Sartain, and K.A. Moore

1:15 – 1:30 ***Global Soil Nitrous Oxide Emissions in a Dynamic Carbon-Nitrogen Model***  
**Yuanyuan Huang** and Stefan Gerber

1:30 – 1:45 ***Understanding the Persistence of Salmonella enterica in the Environment, and its Implications for Food Safety***  
**Marcos H. de Moraes**, Kenneth D. Parker, Carol Hoffman, David W. Pascual, and Max Teplitski

1:45 – 2:00 ***Managing Expectations: Creating a Community Based Stormwater Pond Nutrient Management Program***  
**Charlie Patrick Nealis** and Mark Clark

2:00 – 2:15 ***Region-wide Soil Carbon Assessment across “The Land of Pines”***  
**C. Wade Ross**, Sabine Grunwald, Stephen J. Del Grosso, Stefan Gerber, and Eric K. Jokela

## JUDGED POSTER TITLES & AUTHORS

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### SESSION III – Student Poster Viewing and Reception

Grand Ballroom – J. Wayne Reitz Union

2:30 – 3:30 **Poster Session I**  
Judging of Even Numbered Posters at This Time

3:30– 4:30 **Poster Session II**  
Judging of Odd Numbered Posters at This Time

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### Judged Posters

1. ***Potential use of Japanese Sweetflag for Remediation of Contaminated Surface Water***  
**Noha Abdel-Mottaleb** and P. Chris Wilson
2. ***Cadmium Monitoring in Cacao Farms of Southern Ecuador: Soil Contamination and Potential Remediation***  
**E. Chavez**, Z. L. He, P. J. Stoffella, R. S. Mylavarapu, Y. C. Li, B. Moyano, and V. C. Baligar
3. ***Development and First Tests of a Simple Wetland Methane Model***  
**Carla Alonso-Contes** and Stefan Gerber
4. ***The Effect of Short Term Inundation on Potential Nitrogen Flux in a Coastal Ecosystem***  
**Rose Collins**, Rao Mylavarapu, Mark Clark, and Todd Osborne
5. ***Nitrate Loading and Source Identification across Dominant Land Uses in the Silver Springs Springshed***  
**Amanda Desormeaux**, Marc G. Kramer, James W. Jawitz, Patrick Inglett, and Michael D. Annable
6. ***Catching Nitrate at the Source?: Potential for Soil and Vadose Zone Denitrification in the Silver Springs Springshed***  
**Katelyn Foster** and Patrick Inglett

## JUDGED POSTER TITLES & AUTHORS

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7. ***Anthropogenic Factors that Influence Soil Management: Ethnopedology and Ethnopedozoology***  
Claire Friedrichsen, Samira Daroub, and Ann Wilkie
8. ***Cellulosic Ethanol Stillage as a Cultivation Medium for Spirulina***  
Kimberly D. Hafner and Ann C. Wilkie
9. ***The Responses of Key Nitrogen Cycling Genes to Seasonal and Tidal Variations in a Tropical Estuary***  
Laibin Huang, Caitlin Young, Andrea Pain, Jonathan B. Martin, and Andrew Ogram
10. ***Struvite Recovery from Small Wastewater Treatment Plants***  
John Hallas, Cheryl Mackowiak, and Ann C. Wilkie
11. ***Florida Wildfires during the Holocene Climatic Optimum (9,000-5,000 BP)***  
Kalindhi Larios, Stefan Gerber, and Mark Brenner
12. ***Dissolved Organic Nitrogen in Runoff/Surface Water from Agricultural Fields***  
Liguang Li, Zhenli He, Rory J. S. Kates, Thomas S. Bianchi and Peter J. Stoffella
13. ***Simulating Everglades Carbon Fluxes and GHG Emission under Varying Hydrology Parameterization in the Community Land Model***  
Yan Liao and Stefan Gerber
14. ***Reducing Labile Phosphorus Pools by Controlling Floating Aquatic Vegetation in Drainage Canal Sediments***  
Anne E. Sexton, Jehangir H. Bhadha, Timothy A. Lang, and Samira Daroub
15. ***Assessment of Microbial Community Structure within an Oligotrophic Tropical Peatland***  
E. Morrison, S. Newman, K.R. Reddy, Z. He, J. Zhou, B. Turner, P. Thomas, T. Kahveci, and A. Ogram
16. ***Modeling Peat Growth and Soil Subsidence in the Everglades Agricultural Area***  
Andres Rodriguez and Stefan Gerber

## JUDGED POSTER TITLES & AUTHORS

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17. ***Investigating N Source Preference for Bloom Forming Pico-cyanobacteria in the Northern Indian River Lagoon, Florida***  
Joshua Papacek, Edward Philips, Margaret Lasi, and Patrick Inglett
18. ***Landscape Denudation Rates of a Low Relief Carbonate Platform***  
Eron Raines, Matthew Cohen, and Todd Osborne
19. ***Influence of Sediments on the Fate of Granular/Pelleted Formulations of the Aquatic Herbicide Fluridone***  
Matt Nance, William Haller, and P. Chris Wilson
20. ***Evaluation of an Organic Carbon Trajectory over a 10-year period on a Restored Spoil Island in South-central Florida***  
Tracey Schafer, Caitlin Hicks, Rex Ellis, and Todd Osborne
21. ***Synthesis and Characterization of Lignin-based Dendrimer Gel for Application in Fertilizers' Controlled Release***  
Shanyu Meng, Zhaohui Tong, Fei Wang, Nusheng Chen, and Yuncong Li
22. ***Decomposition in a Shifting Coastal Wetland Habitat***  
L.T. Simpson, T.Z. Osborne, and I.C. Feller
23. ***Water and Nitrogen Fluxes within the Upper Floridan Aquifer in the Silver River Springshed***  
Antonio Yaquian, James Jawitz, Michael Annable, Jaehyun Cho, and Harald Klammler
24. ***Impact of Flooded Rice Cultivation on Water Quality in the Everglades Agricultural Area***  
Mohsen Tootoonchi, Timothy Lang, Jehangir Bhadha, Ron Cherry, and Samira Daroub
25. ***Soil Salinity Differences between Irridrain and Conventional Seepage Irrigation***  
Eunice Yarney and Mark Clark
26. ***Effect of pH and Solid-liquid Ratio on Metal Leachability in Coal Combustion Residual***  
Evandro Barbosa da Silva, Xiaoling Dong, Julia Gress, and Lena Ma

## NON-JUDGED POSTER TITLES & AUTHORS

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### Non-Judged Posters

27. ***Preliminary Analysis for Exploring Nonpoint Source Pollution Indicator Conditions in Coastal Surface Waters of Glynn County, Georgia***  
C.R. Bodrey Jr, S.H. Daroub, S. Grunwald, T.A. Obreza, L.M. Risse, and D.E. Radcliffe
28. ***Estimation of Phosphorus Isotherm Parameters: A Simple and Cost-effective Procedure***  
Biswanath Dari, Vimala D. Nair, James Colee, Willie G. Harris and Rao Mylavarapu
29. ***Cleaning-induced Arsenic Mobilization and Chromium Oxidation from CCA-wood Deck: Potential Risk to Children***  
J. Gress, L.M. de Oliveira, E.B. da Silva, J.M. Lessl, P.C.Wilson, T. Townsend, and L.Q. Ma
30. ***Assessing the Potential for Phosphorus Contamination of Ground Water in Different Land Uses of the Silver Springs Springshed***  
X. Liao, P.W. Inglett, A. Canion, D. Dobberfuhl, and V.D. Nair
31. ***Performance of Hybrid Constructed Wetland Systems for Treating Schoolyard Domestic Wastewater***  
Wen Liu and Gurpal Toor
32. ***Evaluating the Bioethanol Potential of Industrial Sweetpotatoes in Florida***  
Wendy A. Mussoline and Ann C. Wilkie
33. ***Dominant Drivers of Peatland Soil Organic Matter Chemical Composition***  
Normand, Anna E., Benjamin L. Turner, Jamie Lamit, Alex W. Cheesman, Sam P. P. Grover, Adam N. Smith, Ben Baisier, Erik Lilleskov, and K. Ramesh Reddy
34. ***Efficacy of Foliar Nutrient Formulations in Citrus***  
Mylavarapu, R.S., G. Means and L.M. de Oliveira
35. ***Pharmaceuticals and Organochlorine Pesticides in Sediments of an Urban River in Florida***  
Yun-Ya Yang, Gurpal S. Toor, and Clinton F. Williams

## SOIL AND WATER SCIENCE LOCATIONS

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| Soil & Water Science Department<br>2181 McCarty Hall A<br>P.O. Box 110290<br>Gainesville, FL 32611-0290<br>(352) 294.3151<br><a href="http://soils.ifas.ufl.edu/">http://soils.ifas.ufl.edu/</a> | Range Cattle Research & Education Center<br>3401 Experiment Station Road<br>Ona, FL 33865-9706<br>(863) 735.1314<br><a href="http://rcrec-ona.ifas.ufl.edu/">http://rcrec-ona.ifas.ufl.edu/</a> |
| Citrus Research & Education Center<br>700 Experiment Station Road<br>Lake Alfred, FL 33850-2299<br>(863) 956.1151<br><a href="http://www.crec.ifas.ufl.edu/">http://www.crec.ifas.ufl.edu/</a>   | Southwest Florida Research & Education Center<br>2686 State Road 29 North<br>Immokalee, FL 34142<br>(239) 658.3400<br><a href="http://www.imok.ufl.edu/">http://www.imok.ufl.edu/</a>           |
| Everglades Research & Education Center<br>3200 E. Palm Beach Road<br>Belle Glade, FL 33430-8003<br>(561) 993.1500<br><a href="http://erec.ifas.ufl.edu/">http://erec.ifas.ufl.edu/</a>           | Tropical Research & Education Center<br>18905 SW 280th Street<br>Homestead, FL 33031-3314<br>(305) 246.7000<br><a href="http://trec.ifas.ufl.edu/">http://trec.ifas.ufl.edu/</a>                |
| Gulf Coast Research & Education Center<br>14625 County Road 672<br>Wimauma, FL 33598<br>(813) 634.0000<br><a href="http://gcsec.ifas.ufl.edu/">http://gcsec.ifas.ufl.edu/</a>                    | West Florida Research & Education Center<br>5988 Hwy 90, Bldg 4900<br>Milton, FL 32583<br><a href="http://wfrec.ifas.ufl.edu">http://wfrec.ifas.ufl.edu</a><br>(850)983.7125                    |
| Indian River Research & Education Center<br>2199 South Rock Road<br>Fort Pierce, FL 34945-3138<br>(772) 468.3922<br><a href="http://irrec.ifas.ufl.edu/">http://irrec.ifas.ufl.edu/</a>          | Whitney Laboratory for Marine Bioscience<br>9505 Ocean Shore Blvd.<br>St. Augustine, FL 32080<br>(904) 461.4022<br><a href="http://whitney.ufl.edu">http://whitney.ufl.edu</a>                  |
| North Florida Research & Education Center<br>155 Research Road<br>Quincy, FL 32351-5677<br>(850) 875.7100<br><a href="http://nfrec.ifas.ufl.edu/">http://nfrec.ifas.ufl.edu/</a>                 |   |

*Thanks to the following co-sponsors of the  
16<sup>th</sup> Annual Soil and Water Science  
Research Forum:*

**Environmental Hydrology Laboratory  
Wetland Biogeochemistry Laboratory  
UF Water Institute**

**Special thanks to Michael Sisk for event organization.**

## **PLAN TO ATTEND**

**17<sup>th</sup> Annual Soil & Water Science Research Forum  
Thursday, September 15, 2016  
J. W. Reitz Union  
University of Florida - IFAS  
Gainesville, Florida**

### **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.

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