

UF | IFAS
UNIVERSITY of FLORIDA



SOIL AND WATER SCIENCES

18th Annual Research Forum



November 13, 2017

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

INTRODUCTION

A Message from:

Dr. K. Ramesh Reddy

Chair, Soil and Water Sciences Department, UF/IFAS

Welcome to the 18th Annual Soil and Water Science Research Forum sponsored by the Soil and Water Sciences 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 keynote speaker for this year's Forum is **Dr. Thomas S. Bianchi**, Jon and Beverly Thomson Endowed Chair, Department of Geological Sciences, UF. His presentation is entitled "**Carbon Remineralization and Burial in the Coastal Margin: Linkages in the Anthropocene**". Dr. Bianchi'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 110 graduate students (including 46 Ph. D and 64 MS students, 95 undergraduates (12 SWS and 83 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 new faculty members on topics related to water sciences. Student presentations include 5 oral papers and 24 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 Rose Collins, Saroop Sandhu, Claire Friedrichsen, Susan Curry, Barbra Larson, Angela Petringelo, and Michael Sisk 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 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.

INTRODUCTION

Dr. Jackie Burns

Dean for Research, UF/IFAS



Jackie is the UF/IFAS Dean for Research and Director of the Florida Agricultural Experiment Station, the research arm of the land-grant mission. She was appointed to this position in November 2014. The mission of the FAES is to discover new scientific knowledge, promote innovative study, and to encourage translation of sound science into solutions for our stakeholders. The goals are to enhance scholarly activities that will strengthen our relevance to all that we serve, and to amplify the linkages between research, teaching, and extension. We are

committed to training the next generation of researchers that will deliver solutions to the challenges facing agriculture, natural resources, and the life sciences.

Jackie was the Center Director at the UF/IFAS Citrus Research and Education Center in Lake Alfred and IFAS Citrus Programs Coordinator for 4 years. Before that appointment, she was a faculty member at the CREC. She's been at the UF/IFAS for 28 years. Jackie's career research portfolio includes production and post-production agriculture activities with a number of diverse specialty crops. As Center Director, Jackie administered trans-disciplinary, international, and mission-oriented programs that served a diverse stakeholder group. As IFAS Citrus Programs Coordinator, she encouraged development of programs important to stakeholders, obtained support for citrus programs, and promoted the advancement of foundational science that will underpin solutions.

KEYNOTE SPEAKER

Dr. Thomas S. Bianchi

Jon and Beverly Thomson Endowed Chair

Department of Geological Sciences

University of Florida



Thomas S. Bianchi obtained his Ph.D from the University of Maryland in Marine Sciences in 1987; since that time he has been a Professor in Earth and Environmental Sciences at Tulane University for 11 years.

He then moved to Texas A&M University in 2006 where he held the James R. Whatley Endowed Chair in Geosciences in the Dept. of Oceanography for 7 years. In 2013, he joined the Dept. of Geological Sciences at the University of Florida, where he is currently a full professor and

holder of the Jon and Beverly Thompson Endowed Chair in Geological Sciences.

His general areas of expertise are organic geochemistry, biogeochemical dynamics of aquatic ecosystems, carbon cycling, and applications of chemical biomarkers. He has published over 190 articles in refereed journals, has published 7 books, has been an Associate Editor for numerous journals and is currently Editor-in Chief of the journal Marine Chemistry.

He has been the recipient of two Research Fulbrights (Sweden and Cyprus), in 2012 became a Fellow of the American Association for the Advancement of Science (AAAS), and more recently in 2017, was made Fellow of the Geochemical Society and The European Association of Geochemistry.

PROGRAM

OPENING SESSION - Welcome & Keynote Speaker

Rion Ballroom - J. Wayne Reitz Union

8:15 am – 9:00 am	Registration
9:10 am – 9:20 am	Opening Remarks K. Ramesh Reddy Soil and Water Sciences Department Chair
9:20 am – 9:30 am	Opening Remarks Jackie Burns IFAS – Dean for Research
9:30 am – 10:30 am	Carbon Remineralization and Burial in the Coastal Margin: Linkages in the Anthropocene Thomas S. Bianchi Jon and Beverly Thomson Endowed Chair Department of Geological Sciences, University of Florida
10:30 am – 10:50 am	BREAK

SESSION I - Featured Faculty Oral Presentations

Rion Ballroom - J. Wayne Reitz Union

10:50 am – 11:50 am	Featured Faculty Oral Presentations Session Chair: James Jawitz
10:50 am – 11:10 am	Effects of Climate Change Induced Vegetation Shifts on Biogeochemical Processes of Coastal Marshes Todd Osborne , Assistant Professor Coastal Biogeochemistry UF Whitney Lab - St. Augustine, FL Soil and Water Sciences Department, University of Florida
11:10 am – 11:30 am	Coastal Biodiversity: Ecological Consequences and Implications for Effective Management and Restoration Laura Reynolds , Assistant Professor Coastal Ecology Soil and Water Sciences Department, University of Florida
11:30 am – 11:50 am	Environmental Risks and Risk Mitigation Strategies for Pesticides and Emerging Contaminants in Contaminated Surface Water P. Christopher Wilson , Professor Environmental Toxicology Soil and Water Sciences Department, University of Florida
11:50 am - 1:00 pm	LUNCH ON OWN

PROGRAM

SESSION II - PhD Graduate Student Oral Presentations Rion Ballroom - J. Wayne Reitz Union

- 1:00 pm – 2:15 pm **Graduate Student Oral Presentations**
Session Chairs: Rose Collins, Saroop Sandhu, and Claire Friedrichsen
- 1:00 pm – 1:15 pm ***Arsenic Recovery from As-hyperaccumulator Pteris vittata Biomass: Coupling Extraction with Precipitation***
Evandro B. da Silva, Letuzia M. de Oliveira, Ann C. Wilkie, and Lena Q. Ma
- 1:15 pm – 1:30 pm ***In Situ Measurement of Nitrate Fluxes and Attenuation in a Mixed-Land Use Springshed***
Amanda Desormeaux, J.W. Jawitz, M. Annable, D. Dobberfuhl, P. Inglett, and M. Yang
- 1:30 pm – 1:45 pm ***Understanding Soil Organic Carbon Spatial Variability in the Peruvian Central Andes using Digital Soil Mapping***
Carla Gavilan, Sabine Grunwald, and Roberto Quiroz
- 1:45 pm – 2:00 pm ***Struvite Recovery from Aerobically Digested Municipal Wastewater Filtrate: A Sustainable P Recovery Source***
John Hallas, Cheryl Mackowiak, and Ann Wilkie
- 2:00 pm – 2:15 pm ***Landscape Self-Organization and the Development of Regular Topographic Patterning of Karst Depressions***
Carlos Quintero and Matthew Cohen

SESSION III - Student Poster Viewing and Reception Rion Ballroom - J. Wayne Reitz Union

- 3:00 pm – 4:00 pm **Poster Session I**
Judging of Even Numbered Posters Will Occur During This Time
- 4:00 pm – 5:00 pm **Poster Session II**
Judging of Odd Numbered Posters Will Occur During This Time

JUDGED POSTER TITLES & AUTHORS

- 1. Sensitivity Analysis Reveals Critical Factors that Affect Wetland Methane Emissions using Soil Biogeochemistry Model***
Carla Alonso-Contes, Stefan Gerber, Isaac Duerr, and Nikolay Bliznyuk
- 2. Enzyme Activity Responses to Flowing Conditions in the Everglades Stormwater Treatment Areas***
Sara Baker, Patrick Inglett, and K.S. Inglett
- 3. Application of Aquatic Vegetation as a Bio-filter for Phosphorous Reduction from Farm Canals***
Jay Capasso, Jehangir Bhadha, Allan Bacon, Raju Khatiwada, Mark Clark, Samira Daroub, and Timothy Lang
- 4. Phosphorus Association and Release from Biosolids and Corresponding Biochars***
Andressa M. Freitas, Vimala D. Nair, and Willie Harris
- 5. Mental Models of Soil Management for Food Security in Peri-urban India***
Claire N. Friedrichsen, Samira H. Daroub, Martha C. Monroe, John R. Stepp, and Suhas P. Wani
- 6. Total and Bioaccessible Concentrations of PAHs in Florida Urban Soils***
Peng Gao, Evandro B. da Silva, Timothy G. Townsend and Lena Q. Ma
- 7. Soil Morphology Reveals the Different Origins of Podzolized Carbon***
Yaslin Gonzalez, Allan Bacon, and Willie Harris
- 8. The Effect of Harvesting Frequency on Microalgal Cultures in Open Raceway Ponds***
Brett Higgins and Ann Wilkie
- 9. Sensitivity Analysis of a Wetland Biogeochemistry Model based on Spiraling Theory Suggests Internal Nutrient Cycling becomes an Important Factor to Performance***
Kalindhi Larios and Stefan Gerber

JUDGED POSTER TITLES & AUTHORS

10. *Agronomic and Environmental Impacts of Land Application of Biosolids on Bahiagrass Pastures in Florida*

Yanyan Lu, Maria Lucia Silveira, George O'Connor, Joao M.B. Vendramini, John E. Erickson, and Yuncong Li

11. *Impacts of Tropical Land Use Change on the Local Hydrologic Regime*

Kathryn McCurley and James Jawitz

12. *Evidence for Accelerated Geologic Phosphate Dissolution in Dark-colored Drainage Lakes and Associated Wetlands*

Sara Miller, Todd Osborne, and Angelique Keppler-Bochnak

13. *The Impact of Salt Water Inundation on the Stability of Freshwater Wetland Soils*

Kaitlyn Mroczka, Mark Clark, Allan Bacon, Andrew Ogram, Scott Wasman, Todd Z. Osborne

14. *Student Compost Cooperative – Making Campus More Sustainable*

Rebecca O'Connell and Ann C. Wilkie

15. *Microbial composition of Everglades Stormwater Treatment Areas is Linked to Sulfur Cycle*

Hanh Nguyen, R. Bhomia, M. Fujimoto, J. Meyer, and K. R. Reddy

16. *Does the Real Refractive Index Matter when Estimating Florida's Soil Particle Size Distribution?*

Julio Pachon and Allan Bacon

17. *Bottom-up Controls of Recent Harmful Algal Blooms in the Northern Indian River Lagoon, FL*

Joshua Papacek, Edward Philips, Margaret Lasi and Patrick Inglett

18. *Influence of Carbon Lability and Flooding Treatment in Potential Oxidation of Histosols in the Everglades Agricultural Area*

Andres F. Rodriguez, Samira Daroub, and Stefan Gerber

JUDGED POSTER TITLES & AUTHORS

19. *Management Intensification Effects on Soil Biogeochemical Processes and Carbon Storage in Subtropical Grazing Lands*

S.S. Sandhu, K.S. Inglett, P.W. Inglett, M.L. Silveira and S. Gerber

20. *Photo-mineralization of Organic Phosphorus and Nitrogen Compounds Present in Vegetation*

Tracey Schafer, Todd Osborne, and K.R. Reddy

21. *Microbial Response to Biosolids-borne Ciprofloxacin (CIP) and Azithromycin (AZ)*

Harmanpreet Sidhu, Andrew Ogram, George O'Connor

22. *Diel Variability in Fish and Invertebrate Community Structure of Big Bend Seagrass Meadows*

Samantha Tiffany, Laura Reynolds, Whitney Scheffel, Sara Kopetman, and Charles Martin

23. *Using Aquarium Salt Mix as a Proxy for Seawater in Sea Level Rise and Climate Change Research*

Mohsen Tootoonchi, Lyn A Gettys, Kyle L Thayer and Ian J Markovich

24. *The Capacity of the Saprophytic Fungus *Fusarium solani* to Affect the Population Dynamics and Insecticidal Efficiency of the Entomopathogenic Nematode *Steinernema diaprepesi**

Sheng-Yen Wu, F. E. El-Borai, L. W. Duncan, and J. H. Graham

NON-JUDGED POSTER TITLES & AUTHORS

- 25. *Tolerance of Biofuel Tree Species to Metal Toxicity of Textile Effluent under Arid Environmental Conditions***
Rafia Abid, Seema Mahmood, Shazia Gaffar, and Lena Q Ma
- 26. *Soil Types Moderate the Impact of Oxygen Fertilizer and Biochar on Reducing Nitrous Oxide Production***
Tanumoy Bera, K.S. Inglett and G. D. Liu
- 27. *An Environmental Phosphorus Monitoring Tool for Soils of the Eastern and Midwestern USA***
Biswanath Dari, Vimala D. Nair, Andrew Sharpley, Dorcas Franklin, Peter Kleinman, and Willie G Harris
- 28. *Heavy Metal Concentrations in Traditional and Herbal Tea: Potential Health Risk to Humans***
Letuzia M. de Oliveira, Suchismita Das, Evandro B. da Silva, Peng Gao, and Lena Q. Ma
- 29. *Soil Health Assessment and Management Strategies***
Raju Khatiwada, Nan Xu, Jay Capasso, Salvador Galindo, and Jehangir Bhadha
- 30. *Phytoremediation of Pb-contaminated Soil by Pelargonium zonale and Associated Growth Response***
Iram Gul, Maria Manzoor, Jean Kallerhoff, Muhammad Arshad, and Lena Q. Ma
- 31. *Tolerance, Mobilizing Ability and Plant Growth Promoting Characteristics of Fungal Strains in Pb-contaminated Soil***
Maria Manzoor, Iram Gul, Jean Kallerhoff, Muhammad Arshad, and Lena Q. Ma
- 32. *Sustainable Irrigation System for Rural Farming Operations***
Wendy Mussoline and Ann Wilkie

SOIL AND WATER SCIENCES DEPARTMENT

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, water, and environmental 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 plant 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.

SOIL AND WATER SCIENCES LOCATIONS

Soil & Water Sciences Department

2181 McCarty Hall A
P.O. Box 110290
Gainesville, FL 32611-0290
(352) 294.3151
<http://soils.ifas.ufl.edu>

Citrus Research & Education Center

Lake Alfred
<http://www.crec.ifas.ufl.edu>

Everglades Research & Education Center

Belle Glade
<http://erec.ifas.ufl.edu>

Gulf Coast Research & Education Center

Wimauma
<http://gcrec.ifas.ufl.edu>

Indian River Research & Education Center

Fort Pierce
<http://irrec.ifas.ufl.edu>

North Florida Research & Education Center

Quincy
<http://nfrec.ifas.ufl.edu>

Range Cattle Research & Education Center

Ona
<http://rcrec-ona.ifas.ufl.edu>

Southwest Florida Research & Education Center

Immokalee
<http://www.imok.ufl.edu>

Tropical Research & Education Center

Homestead
<http://trec.ifas.ufl.edu>

West Florida Research & Education Center

Milton
<http://wfrec.ifas.ufl.edu>

Whitney Laboratory for Marine Bioscience

St. Augustine
<http://www.whitney.ufl.edu>

Thanks to the following co-sponsors of the 18th Annual Soil and Water Sciences Research Forum:

Wetland Biogeochemistry Laboratory
UF Water Institute

Special thanks to Michael Sisk for event organization.

PLAN TO ATTEND

19th Annual Soil & Water Sciences Research Forum

September 2018 (Date TBD)

J. Wayne Reitz Union

University of Florida - IFAS

Gainesville, Florida

Help Minimize Waste at This Event!

The Soil and Water Sciences Department is committed to improving the health of our soils by composting all biodegradable materials from this year's Research Forum, including coffee grounds, food waste, and shredded paper. All compost-friendly waste will be processed by the Student Compost Cooperative, creating an organic soil amendment to feed the future. Be sure to use the appropriate composting and recycling containers during the event.