SOIL AND WATER SCIENCES
19th Annual Research Forum

October 15, 2018

INTRODUCTION

A Message from:

Dr. Thomas Obreza

Interim Chair, Soil and Water Sciences Department, UF/IFAS

Welcome to the 19th Annual Soil and Water Sciences 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 sciences to interact with our students, faculty, and administrators on campus.

The keynote speaker for this year's Forum is Dr. Johannes Lehmann, Liberty Hyde Bailey Professor, Soil and Crop Sciences, School of Integrative Plant Sciences, College of Agriculture and Life Sciences, Cornell University. His presentation is entitled "Soil Organic Matter Formation: Concepts and Controversies." Dr. Lehmann'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, 100 graduate students (including 45 PhD and 55 MS students), 107 undergraduates (13 SWS and 94 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. Student presentations include 5 oral papers and 46 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. Patrick Inglett, Committee Chair) for coordinating activities related to the Forum. Thanks to Rachelle Berger, Caleb Gravesen, Dipti Rai, Robert Daffron, 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. Jack Payne

Senior Vice President for Agriculture and Natural Resources, UF/IFAS

Jack Payne is senior vice president for agriculture and natural resources at the University of Florida. He's one of the nation's highest-ranking university administrators to come from the ranks of wildlife faculty.

He began his academic career as a faculty member at Penn State University and Texas A&M. As soon as he got tenure, he promptly left academia to spend a decade at Ducks Unlimited as its national director of conservation, during which he expanded the organization's Mexican program into Central and South America.

He returned to university life in 2001 to become a vice president at Utah State University, and later served as a vice president at Iowa State University. As head of UF's Institute of Food and Agricultural Sciences since 2010, Jack has led a $400-million-a-year organization with 4,000 employees who do teaching, research and Extension across the state of Florida.

During his tenure at UF, UF/IFAS research funding has soared to record level -- $166 million last fiscal year. The College of Agricultural and Life Sciences has record enrollment with more than 6,300 students. Extension has added innovative positions such as the five regional specialized water agents he authorized two years ago.

Jack has a Ph.D. in wildlife ecology from Utah State. He is a graduate of the Institute for Educational Management at Harvard University.

KEYNOTE SPEAKER

Dr. Johannes Lehmann

Liberty Hyde Bailey Professor, Soil and Crop Sciences
School of Integrative Plant Sciences,
College of Agriculture and Life Sciences, Cornell University

Johannes Lehmann, Liberty Hyde Bailey professor of soil biogeochemistry and soil fertility management at Cornell University, received his graduate degrees in Soil Science at the University of Bayreuth, Germany.

During the past 20 years, he has focused on nano-scale investigations of soil organic matter, the biogeochemistry of pyrogenic carbon and sequestration in soil, and sustainable land management practices in tropical agriculture, focusing in innovative recycling of carbon and nutrients.

Dr. Lehmann is a member of the steering group of the International Soil Carbon Network, has testified in the US congress, and briefed the President's council of advisors. Dr. Lehmann has authored more than 200 journal publications, was named Highly-Cited Researcher by Thomson Reuter in 2014-2016, is member of the German National Academy of Sciences and Fellow of the Soil Science Society of America, and the Institute of Advanced Studies at the Technical University of Munich, and serves as editor-in-chief of the journal Nutrient Cycling in Agroecosystems.

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*** **Thomas Obreza** Senior Associate Dean for Extension and Interim Chair, Soil and Water Sciences Department, UF
9:20 am – 9:30 am	***Opening Remarks*** **Jack Payne** Senior Vice President for Agriculture and Natural Resources, UF
9:30 am – 10:30 am	***Soil Organic Matter Formation: Concepts and Controversies*** **Johannes Lehmann** Liberty Hyde Bailey Professor, Soil and Crop Sciences School of Integrative Plant Sciences, College of Agriculture and Life Sciences, Cornell University
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: Patrick Inglett**
10:50 am – 11:10 am	***Functional Diversity of Soil Microbiomes and Their Consequences*** **Hui-Ling (Sunny) Liao**, Assistant Professor Soil Microbial Ecology North Florida Research and Education Center Soil and Water Sciences Department, University of Florida
11:10 am – 11:30 am	***Urban Ecosystem Ecology from a Watershed Perspective*** **A.J. Reisinger**, Assistant Professor Urban Soil and Water Quality Soil and Water Sciences Department, University of Florida
11:30 am – 11:50 am	***The Potential Benefits of Agroecological Practices on Soil Fertility and Soil Health in Florida Agroecosystems*** **Gabriel Maltais-Landry,** Assistant Professor Sustainable Nutrient Management Systems 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 **PhD Graduate Student Oral Presentations**
Session Chairs: Caleb Gravesen, Dipti Rai, and Rachelle Berger

1:00 pm – 1:15 pm ***Soil and/or Foliar Applied Nutrients on Water Uptake, Vegetative Growth, and Nutrient Accumulation on HLB Affected 'Valencia' Citrus Trees***
Alisheikh A. Atta, Kelly T. Morgan and Davie M. Kadyampakeni

1:15 pm – 1:30 pm ***Biochar from Varying Feedstocks as Phosphorus Fertilizer Sources***
Andressa M. Freitas, Vimala D. Nair, Lynn E. Sollenberger, Willie G. Harris and P.K.R. Nair

1:30 pm – 1:45 pm ***Constructed Wetland Maintenance in South India***
Claire N. Friedrichsen, Samira H. Daroub, Martha C. Monroe, John R. Stepp and Suhas P. Wani

1:45 pm – 2:00 pm ***Background and Bioaccessible Concentrations of PAHs in Florida Urban Soils***
Peng Gao, Evandro B. da Silva, Timothy G. Townsend and Lena Q. Ma

2:00 pm – 2:15 pm ***What Controls Ecosystem CO_2 Fluxes in North American Wetlands?***
Yan Liao and Stefan Gerber

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. *A Novel Method for the Inclusion of Categorical Covariates in Latent Variable Models for Factorial Modeling of Soil Carbon in Florida*

   Setyono H. Adi, Sabine Grunwald and Denis Ribeiro do Valle

2. *Sensitivity Analysis Reveals Critical Factors that Affect Wetland Methane Emissions using Soil Biogeochemistry Model*

   Carla Alonso-Contes, Stefan Gerber, Isaac Duerr and Nikolay Bliznyuk

3. *Reduced Soil Nutrient Enrichment and* Typha *Presence due to Restoration Efforts: A Temporal Analysis of Taylor Slough in Everglades National Park*

   Kaylee A. August, Lorae T. Simpson and Todd Z. Osborne

4. *Ammonium and Nitrate Distributions, Water- and Nitrogen-use Efficiencies as Affected by Irrigation Scheduling in Open-Field Fresh-Market Tomato Production*

   Ibukun T. Ayankojo and Kelly T. Morgan

5. *Water Management Impacts to Soil Fertility in Rice Production in the Everglades Agricultural Area*

   Rachelle J. Berger, Maryory Orton, Jennifer A. Cooper, Timothy A. Lang and Samira H. Daroub

6. *Sustainable Farming: Application of Solar Power for Irrigation on Small Farms*

   Lars Bjorndal and Ann C. Wilkie

7. *Soil Texture Analysis as a Proxy for Wave Energy*

   Haley Cox and Mark Clark

8. *Landscape-scale Nitrogen Budget Informed by in situ Measurements of Nitrate Attenuation*

   Amanda Desormeaux, Michael D. Annable, Dean Dobberfuhl, Patrick W. Inglett and James W. Jawitz

9. *Soil and Water Conservation Generate Profits for Vulnerable Communities in Porto Alegre, Brazil*

   Carlita Fiestas-Nuñez and Ann C. Wilkie

10. *Retention and Release Characteristics of Biosolids-borne Azithromycin and Ciprofloxacin*

    Caleb Gravesen, Harmanpreet Sidhu, George O'Connor and Jonathan Judy

11. *Soil Microbial Community Response to Nitrogen Management in Florida Pastures*

    Victor Guerra, Lukas Beule, Hui-Ling Liao, Cheryl Mackowiak, Jose Dubeux, Ann Blount and Diane Rowland

12. *Fish Habitat Enhancement: Do "Living Shorelines" Improve Richness, Diversity and Abundance?*

    Niamh Hays, Mark Clark and Lindsey Kelly

JUDGED POSTER TITLES & AUTHORS

13. *Local Phycoprospecting for Filamentous Algae*
    Brett Higgins and Ann C. Wilkie
14. *Carbon and Nitrogen Cycling in a Gainesville Soil Amended with Dairy- and Food-derived Composts*
    A.J. Kelley, G. Maltais-Landry and A.C. Wilkie
15. *Evaluating Physical, Agricultural, and Social Drivers to Irrigation Water Use in Western Kansas*
    Susan Lamb and Samuel J. Smidt
16. *Simulating the Tug of War between Transport and Nutrient Uptake in Low Flow Treatment Wetlands Demonstrates the Need to Model Biogeochemistry*
    Kalindhi Larios and Stefan Gerber
17. *Water Table Variations and Carbon Dynamic in a Short Hydroperiod Sawgrass Marsh under Present and Future Conditions in a Land Surface Model*
    Yan Liao and Stefan Gerber
18. *Biochar Effects on Nitrogen Leaching from a Spodosol Amended with Different N Fertilizer Sources*
    Yanyan Lu, Maria Lucia Silveira, George A. O'Connor, Joao M.B. Vendramini, John E. Erickson and Yuncong Li
19. *Comparison of Fitness and Nutrient Effects between Conventional and Sustainable Fertilizers for Subtropical Seagrass Restoration*
    Conor MacDonnell, Frank Bydalek, Anna Thornton, Todd Osborne, and Patrick W. Inglett
20. *Aginate/Glomalin Biobeads: An Initial Determination of Structural Cohesivity, Nutrient Remediation Ability, and Reapplication Viability*
    Kelly Mahan-Percivall and Jehangir H. Bhadha
21. *Land Cover and Climate as Drivers of Global Mean Annual Evapotranspiration*
    Katie McCurley and Jim Jawitz
22. *The Developmental History of Soil Concepts*
    Katsutoshi Mizuta and Sabine Grunwald
23. *Algae Cultivation: Growth of the Filamentous Alga* Oedogonium *Compared to Microalgae*
    Rebecca O'Connell and Ann C. Wilkie
24. *Let's Get Physical - Properties of Particle Interactions at the Calhoun Critical Zone Observatory*
    Julio C. Pachon, Allan B. Bacon, Daniel D. Richter and Sharon A. Billings
25. *Controls on Mineral Phosphate Dissolution Kinetics in Aquatic Systems*
    Sara A. Phelps and Todd Z. Osborne

JUDGED POSTER TITLES & AUTHORS

26. *Seasonal Carbon Fluxes in a Patterned Karst Landscape: The Implications for Basin Development and Pattern Reinforcement*
    Carlos Quintero and Matthew Cohen
27. *DNDC Simulation of Soil Carbon Dynamics in Subtropical Native Rangelands of Florida Requires Adjustments in Both Growth and Decomposition Parameterization*
    Dipti Rai, Stefan Gerber, Maria L. Silveira, K.S. Inglett, Saroop Sandhu and Patrick W. Inglett
28. *Stakeholder Survey of Impacts Resulting from Coastal Erosion: User Perceptions Prior to Living Shoreline Intervention*
    Vitaliya Repina and Mark Clark
29. *Student Compost Cooperative - Reducing UF's Ecological Footprint*
    Sierra Richardson and Ann C. Wilkie
30. *Estimating Isotherm Parameters from Soil Test Data across Eastern and Central United States*
    Amanda Rodriguez and Vimala Nair
31. *A Model of Soil Subsidence in a Subtropical Drained Peatland*
    Andres F. Rodriguez, Stefan Gerber and Samira Daroub
32. *Seasonal Variations in Soil Enzyme Activities and Carbon Fractions in Sub-Tropical Grazing Lands*
    Saroop S. Sandhu, K.S. Inglett, Patrick W. Inglett, Maria L. Silveira and Stefan Gerber
33. *Influence of Rootstock, Propagation Method, and Soil Type on Citrus Rhizosphere Composition*
    John M. Santiago, Ute Albrecht, and Sarah L. Strauss
34. *DNA-Based Methods used to Explore the Root and Soil Microbiome in Sod-Based Rotation System*
    Neetika Thakur, Chih-Ming Hsu, Zane Grabau, Lesley Schumacher, David Wright, an Small and Hui-Ling Liao
35. *Boron (B) Uptake and Availability in Citrus on a Sandy Entisol*
    Qudus Uthman, Davie Kadyampakeni and Peter Nkedi-Kizza
36. *Perceptions, Beliefs, and Values of Soil and its Health*
    Kay Wilcox, Sabine Grunwald, Monika Ardelt and Tracy Irani
37. *Application of Bagasse for Sugarcane Production on Sandy Soils in South Florida*
    Nan Xu, Jehangir Bhadha, Raju Khatiwada, Stewart Swanson and Rao Mylavarapu
38. *Temporal Trend in Water Salinity of the Suwannee River Estuary and the Effects of Freshwater Supply and Sea Level Rise*
    Jiahua Zhou, Matthew Deitch, Sabine Grunwald and Bill Pine

NON-JUDGED PROPOSAL POSTER TITLES & AUTHORS

39. *Cover Crop Biomass Production for Five Summer Cover Crop Treatments Grown before Fall Bell Pepper* (Capsicum annuum) *Production in Florida*
John Allar and Gabriel Maltais-Landry
40. *Aquatic Weeds: One Man's Trash is Another Man's Treasure*
Yuting Fu, Jehangir H. Bhadha and Ramdas Kanissery
41. *Digging a Little Deeper: An Analysis on Environmental Education in Soil and Water Science for Rice Production*
Leandra Gonzalez and Jehangir Bhadha
42. *Comparison of Soil C, N and P Dynamics in Sod-Based versus Conventional Peanut-Cotton Rotations in the Southeastern US*
Michael James and Gabriel Maltais-Landry
43. *Investigating Biological Soil Crusts and Nutrient Availability in Citrus Agroecosystems*
Clayton Nevins, Patrick Inglett and Sarah Strauss
44. *Nitrogen Fixation Capabilities and Cyanobacterial Composition of Biocrusts in an Agricultural Ecosystem*
Kira Sorochkina, Patrick Inglett and Sarah Strauss

NON-JUDGED POSTER TITLES & AUTHORS

45. *Florida Pine Flatwoods: Sustainability in the Context of Long-Term Agroecosystem Research (LTAR)*
Marta Moura Kohmann, **Carolina Brandani**, Maria Lucia A. Silveira, Kacey Aukema, Raoul Boughton, Joao M.B. Vendramini, Philipe Moriel, Brent Sellers, Elizabeth Boughton and Hilary Swain
46. *Sugarcane Response to Nitrogen Application: Comparing Brazil and Florida Sites*
Matheus Angeli, Jehangir H. Bhadha, Chris LaBorde, Rafael Otto and Gerson Marquesi Netto
47. *Coupling Ethanol Extraction with Anaerobic Digestion to Remove As from As-hyperaccumulator* Pteris vittata
Evandro B. da Silva, Ann C. Wilkie and Lena Q. Ma
48. *Wastewater Treatment Plant Phosphorus Mass Balance Using Stella Model*
John Hallas, Cheryl Mackowiak and Ann C. Wilkie
49. *Effects of Hurricane Irma on Water Quality and Dissolved Organic Carbon Concentrations across Pellicer Creek*
Tracey B. Schafer, Nick Ward, Paul Julian, K.R. Reddy and Todd Z. Osborne
50. *Water Balance Variation across North America - the Long-Term Agroecosystems Research Network*
Carolina Marta, Betsey Amartya and Claire Baffaut
Maria Silveira's Research Group
51. *The Characteristics of Biofuel Residues and their Potential Impacts on Soil Properties*
Lilit Vardanyan, Tanumoy Bera, Kanika Sharma Inglett, George O'Connor, Ann C. Wilkie and K.R. Reddy
52. *Biochar and P Fertilizer Amendments Affect As Tolerance and Uptake by Rice*
Min Xu, Evandro da Silva and Lena Ma

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
https://soils.ifas.ufl.edu

Citrus Research & Education Center, Lake Alfred
https://www.crec.ifas.ufl.edu

Everglades Research & Education Center, Belle Glade
https://erec.ifas.ufl.edu

Gulf Coast Research & Education Center, Wimauma
https://gcrec.ifas.ufl.edu

Indian River Research & Education Center, Fort Pierce
https://irrec.ifas.ufl.edu

North Florida Research & Education Center, Quincy
https://nfrec.ifas.ufl.edu

Range Cattle Research & Education Center, Ona
http://rcrec-ona.ifas.ufl.edu

Southwest Florida Research & Education Center, Immokalee
https://swfrec.ifas.ufl.edu/

Tropical Research & Education Center, Homestead
https://trec.ifas.ufl.edu

West Florida Research & Education Center, Milton
https://wfrec.ifas.ufl.edu

Whitney Laboratory for Marine Bioscience, St. Augustine
https://www.whitney.ufl.edu

Thanks to the following co-sponsors of the 19th Annual Soil and Water Sciences Research Forum:

The Soil Chemistry Group, Dr. George O'Connor (Oral Presentation Award)
UF Water Institute (Keynote Presentation Live Stream)
Wetland Biogeochemistry Laboratory (Poster Awards)

Special thanks to Michael Sisk for event organization.

PLAN TO ATTEND

20th Annual Soil & Water Sciences Research Forum
Fall 2019 (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.