UF IFAS UNIVERSITY of FLORIDA

SOIL, WATER, AND ECOSYSTEM SCIENCES

SOIL, WATER, AND ECOSYSTEM SCIENCES

20th Research Forum

February 6th, 2023

INTRODUCTION

A Message from:
Dr. Matt Whiles
Department Chair, Soil, Water, and Ecosystem Sciences Department, UF/IFAS

Welcome to the 20th Soil, Water, and Ecosystem Sciences Research Forum sponsored by the Soil, Water, and Ecosystem Sciences Department (SWESD), IFAS, UF Water Institute, 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, water, and ecosystem sciences to interact with our students, faculty, and administrators on campus. The keynote speaker for this year's Forum is Dr. Walter Dodds, University Distinguished Professor, Division of Biology, Kansas State University. His presentation is entitled "Laws, Theories, and Patterns in Ecology." Dr. Dodd's biographical sketch is posted in this brochure.

Research conducted by graduate students, visiting scholars, and post-doctoral fellows is the core of the SWESD research programs. At present, 166 graduate students (including 62 PhD and 104 MS students), 114 undergraduates (19 SWES and 95 IS - EMANR) several visiting scholars, and 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 38 poster presentations. In addition, we have five (5) posters from postdoctoral research associates/visiting scholars. 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 Robert Daffron, Carina Dybevick, Jessica McGarrah, Michael Sisk, Kyle Davis, and the SWESD Graduate Student Association in planning for the Forum. Finally, I want to express my appreciation to all students, post-doctoral fellows, staff, visiting scholars, and faculty for their active participation in the Forum. Assistance of judges in selecting best oral/poster presentations is greatly appreciated.

INTRODUCTION

Dr. Damian Adams

Associate Dean for Research and Associate Director of the FAES, UF/IFAS

Damian Adams is a natural resource economist tenured in the School of Forest, Fisheries & Geomatics Sciences with a joint appointment in the Food and Resource Economics Department at UF. He earned his Ph.D. (2007) in Food and Resource Economics and his J.D. (2001) from the University of Florida, and an M.Phil. (2004) in Land Economy from the University of Cambridge in England. He joined UF/IFAS Administration as Interim Assistant Dean for Research in June 2019 after participating as the Research Dean's representative in LEAD21, a year-long leadership program supporting the mission of land grant universities across the nation. He was promoted to Interim Associate Dean for Research in May 2020 and Associate Dean for Research in July 2021.

At UF, Dr. Adams has served in a number of governance roles at the department, college, and university level, including as a member of Faculty Senate (2017-2019), and is affiliate faculty of the School of Natural Resources and the Environment, the Tropical Conservation and Development Program, and the UF Water Institute. He currently serves as Director of a region-wide initiative called ProForest (Proactive Forest Health & Resilience), which unites experts in the area of forest management and policy to sustain forest systems and their benefits to society. He also serves as an Editor-in-Chief at the journal Forests.

Dr. Adams has published 66 journal articles, 79 book chapters, and other non-refereed publications, and multiple technical reports and conference presentations, and he has been an investigator on projects totaling $27 million from a variety of funding sources. Recently, he led the economics and policy work for a $20 million USDA-funded project examining climate change adaptation and mitigation strategies for southern forests.

KEYNOTE SPEAKER

Dr. Walter Dodds

University Distinguised Professor,
Division of Biology
Kansas State University

Dr. Walter Dodds, University Distinguished Professor in Biology at Kansas State University, received his graduate degree in Biology from the University of Oregon.

During the last 35 years, he has focused on nutrient biogeochemistry of freshwaters, aquatic ecology, prairie stream ecology, and water quality with emphasis on eutrophication. His research spans theoretical to applied management topics. He has researched streams around the world.

While the research belongs to areas of Ecosystem, Walter K. Dodds spends his time largely on the problem of Species richness, intersecting his research to questions surrounding Invertebrate. His work on Eutrophication, Nutrient cycle and Trophic state index as part of general Nutrient research is frequently linked to Phosphate, bridging the gap between disciplines. The concepts of his Environmental chemistry study are interwoven with issues in Nitrification, Botany, Nitrogen cycle, Denitrification and Nitrate.

Dr. Dodds has authored more than 220 peer reviewed publications as well as four books. He has been ranked in the top 2% of world scientists based on citations in the September 2022 data-update for "Updated science-wide author databases of standardized citation indicators". His two popular books are on the global environment and global problems facing humanity. His textbook, Freshwater Ecology (coauthored by Dr. Matt Whiles), is in its third edition and has been adopted by universities around the world. He is a fellow of the American Association for the Advancement of Science, the Association for the Sciences of Limnology and Oceanography, and the Society for Freshwater Science.

PROGRAM

OPENING SESSION - Welcome & Keynote Speaker
Rion Ballroom - J. Wayne Reitz Union

8:15 am – 9:00 am — Registration & Continental Breakfast

9:10 am – 9:20 am — ***Opening Remarks***
Matt Whiles
Department Chair
Soil, Water, and Ecosystem Sciences Department
University of Florida

9:20 am – 9:30 am — ***Opening Remarks***
Damian Adams
Professor and Associate Dean for Research and Associate Director of the Florida Agricultural Experiment Station (FAES)
University of Florida

9:30 am – 10:30 am — ***Laws, Theories, and Patterns in Ecology***
Walter Dodds
University Distinguished Professor, Division of Biology
Kansas State University

10:30 am – 10:50 am — BREAK/Mid-Morning Coffee Refresh

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 — ***Leveraging Long-Term Research Networks to Advance Ecosystem Science***
Yang Lin, Assistant Professor
Soil Health
Soil, Water, and Ecosystem Sciences Department
University of Florida

11:10 am – 11:30 am — ***Applied Microbial Ecology for Improved Ecosystem Function in Florida's Coral Reef***
Julie Meyer, Assistant Professor
Microbial Ecology and Bioinformatics
Soil, Water, and Ecosystem Sciences Department
University of Florida

PROGRAM

11:30 am – 11:50 am — ***Small But Mighty: How Microbes Help Agroecosystems Function***
Sarah Strauss**,** Assistant Professor
Southwest Florida Research and Education Center
Soil, Water, and Ecosystem Sciences Department
University of Florida

11:50 am - 1:00 pm — **LUNCH ON OWN -** (Refreshments provided after SESSION II)

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: Julia Barra Netto-Ferreira, Daniel Colopietro, Mohkam Singh, and Yasmeen Saleem

1:00 pm – 1:15 pm — ***Seagrass Meadows Emit Greenhouse Gases But Are Still Net Carbon Sinks***
Alexandra Bijak, Ashley R. Smyth, Laura K. Reynolds, and Willm Martens-Habbena

1:15 pm – 1:30 pm — ***Abundance of Ultrafine P in <0.45 µm "Dissolved" Fraction of Waters Entering and Leaving Everglades Stormwater Treatment Areas and Implications for Management Practices***
Caroline Buchanan and Jonathan Judy

1:30 pm – 1:45 pm — ***Shifts in the Coral Microbiome in Response to In Situ Experimental Deoxygenation***
Rachel Howard, Monica Schul, Lucia M. Rodriguez Bravo, Andrew Altieri, and Julie L. Meyer

1:45 pm – 2:00 pm — ***Manatee Bioturbation Effects Supersede Nutrient Inputs to Alter Ecosystem Function***
Adam C. Siders, Alexander J. Reisinger, Matt R. Whiles

2:00 pm – 2:15 pm — ***Metabolic Regimes of Sub-Tropical Urban Streams***
Emily Taylor, Jacob Hosen, Matthew Cohen, and Alexander J. Reisinger

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. *Estimating Cover Crop Quantity and Quality Through the Use of Optical Sensors*
   Julia Barra Netto-Ferreira, Diego Arruda Huggins de Sá Leitão, Winniefred Griffin, Lakesh K. Sharma, and Gabriel Maltais-Landry
2. *Soil Health Assessment of Sugarcane and Flooded Rice Crop Rotation Within the Everglades Agriculture Area, Florida*
   Xue Bai, Yuchuan Fan, Fatemeh Maghsood, Samuel Smidt, Young Gu Her, and Jehangir Bhadha
3. *The Catawampus Theory*
   Shelby M. Beck, Jeremy A. Rapp, and Samuel J. Smidt
4. *Charaterization Of Fecal Indicator Bacteria, Microbial Sources, Water Quality, And Nutrients Dynamics Seasonally For Mixed-Use Watersheds And Land Uses In NW Florida*
   Ronell S.H. Bridgemohan, Matthew J. Deitch, Tesfay Gebremicael, Dave Bachoon, Matt Whiles, P. Christopher Wilson, Eban Bean, Emily Harmon, and Caitlyn Turnball
5. *Innovative Learning for NASA Earth Science Applications: A Pilot Study for Game-Based Learning Using a Design Thinking Approach*
   Trista Brophy, Margaux Reynolds, and Shobhana Gupta
6. *Characterization of Deep Podzolized Carbon with Infrared Spectroscopy*
   Bella Brush and Dr. Yang Lin
7. *Assessing Soil Health Indicators Across Various Cropping Systems in Florida*
   Franky Celestin, Rao Mylavarapu, and Yang Lin
8. *Enhancing Nutrient Uptake and Grapefruit (Citrus paradisi) Growth through Soil Application of Beneficial Bacteria Species (Bacillus spp.)*
   Laura Cano, Laura Waldo, Napoleon Mariner, Timothy Ebert, and Perseveranca Mungofa, Shankar Shrestha, and Arnold Schumann
9. *Energy and Nutrient Limitations to Degradation of Deep Podzolized Carbon*
   Ryan E. Champiny and Yang Lin
10. *Biogas Energy for Remote Villages in Zambia*
    Caitlyn Claverie and Ann C. Wilkie
11. *Analyzing Heavy Metal Removal in Point-Of-Use Water Filter Systems: GOW & Biosand Water Filtration*
    Jeantel Cheramy, Andrew L. Rainey, Samuel Smidt, Joseph H. Bisesi, Jr, and Anthony T. Maurelli
12. *Sediment Nitrogen Cycling and Phytoplankton Nutrient Limitation in an Urbanizing Estuary*
    Justina Dacey, Ashley Smyth, and A.J. Reisinger

JUDGED POSTER TITLES & AUTHORS

13. *Soil and Nutrient Accretion Rates in Everglades Stormwater Treatment Area Wetlands*

    Ankita Datta, Praveen Subedi, Alan Wright, and Patrick Inglett

14. *Do Cover Crops Alter the Rhizosphere Composition and Predicted Functionality of Two Sub-Tropical Perennial Tree Crops?*

    Emma Dawson, Antonio Castellano Hinojosa, and Sarah L. Strauss

15. *Nutrient Controls on Algal Biomass in Biscayne Bay*

    Camila Del Sol Pina and Dr. Ashley Smyth

16. *Seasonal and Long-Term Surface Water Quality Trends Relevant to Drinking Water Supply in Tampa, FL*

    Casey Harris, AJ Reisinger, and Wendy Graham

17. *Advancing Applied Environmental Sustainability in Geo-, Eco-, and Agro-Sciences*

    Hayden Henke, Samuel J. Smidt, Trista Brophy, Xiang Bi, Anne Mook, Damian C. Adams, Shelby M. Beck, Zoe Spielman, Gretchen Stokes, and Genaro Guerrero Espinosa

18. *Characterization of Pesticides in Urban Waterbodies of Gainesville, FL*

    Francisca Ordonez Hinz and P. Chris Wilson

19. *Soil Health and Compost Education for Elementary School Students*

    Chioma Iyamu and Ann C. Wilkie

20. *Predictability of Phosphorus Leaching in Biosolids-Treated Soil Columns*

    Yewon "Julia" Lee, Allan Bacon, and Yang Lin

21. *Soil Health Stabilizes US Corn Yield Under Drought*

    Swarnali Mahmood, Daniel A. Kane, Márcio R. Nunes, and Yang Lin

22. *Unlocking the Chemistry of Legacy Phosphorus to Maintain Sustainable Agriculture and a Healthy Environment*

    MD Anik Mahmud, Xue Bai, Caroline Buchanan, Shin-Ah Lee, Elise Morrison, Luke Gatiboni, Owen Duckworth, Jonathan Judy, and Jehangir Bhadha*Kenaf Cultivation: Growth of the Filamentous Alga* Oedogonium *Compared to Microalgae*

23. *Kenaf (Hibiscus Cannabinus): A Sustainable Source of Horticultural Growth Media*

    Colleen Mondell and Ann C. Wilkie

24. *Carbon Sequestration Potential of Regenerative Farming Practices on Mitigating Soil Subsidence within the Everglades Agricultural Area, Florida*

    Noel Manirakiza, Yang Lin, Abul Rabbany, Yuchuan Fan, and Jehangir Bhadha

25. *Spartina Alterniflora (Smooth Cordgrass) in Living Shorelines: Traits and Planting Design May Influence Sediment Stabilization and Sediment Enhancement in the Indian River Lagoon*

    Kiki Montgomery, Jesse Crawford, Carrie Reinhardt Adams, Laura K. Reynolds, Xiao Yu, Christine Rohal, and Ashley McDonald

JUDGED POSTER TITLES & AUTHORS

26. *Approaches for Quantifying Soil Carbon Sequestration in Space and Time*
    Suraj Melkani, Noel Manirakiza, and Jehangir H. Bhadha
27. *Decarbonizing the Cement Industry via Algae Cultivation*
    Hailey Muchnok and Ann C. Wilkie
28. *Water-Dispersible Carbon Nanoparticles as a Soil Amendment for Sandy Soils: Evaluation of Agronomic Performance and Soil Biochemical Quality*
    Jaya Nepal, Xiaoping Xin, Gabriel Maltais-Landry, and Zhenli L. He
29. *Spatiotemporal Variability of N-cycling in the Guana Estuary*
    Jenna Reimer, Ashley Smyth, and A.J. Reisinger
30. *Effect of Silicon Fertilization on Performance of Young Citrus Trees*
    Jose Prieto Fajardo and Davie M. Kadyampakeni
31. *Pesticide Application Method and Timing Influences Contamination of Nectar in Salvia*
    Vanesa Rostán, P. Christopher Wilson, and Sandra B. Wilson
32. *Comparative the Effect of Varying Salinity of Reclaimed Water for Blueberry Production*
    Yasmeen Saleem, Shinsuke Agehara, and Davie Kadyampakeni
33. *Coral Epibionts May Play an Important Role in the Coral Host Microbiome and Delivery of Beneficial Microbes for Coral*
    Monica Schul, Kalie Januszkiewicz, Allison Cauvin, Janna Randle, Joseph Morton, and Julie Meyer
34. *Impacts of Acidification and Fertilization on Soil Quality and Citrus Tree Production*
    Duplicate Sambani and Davie M. Kadyampakeni
35. *Shifting Macrophytes: Thalassia and Caulerpa Support Unique Ecological Communities*
    Adam R. Searles, Laura K. Reynolds, and Charles W. Martin
36. *Estimating Maximum Streamflow Impacts by Land Cover Change in Florida Watersheds*
    Zoe Spielman, Kevin Easton, John Flores, Kyle Williams, and Samuel Smidt
37. *Variability in Seagrass Monitoring Methods: Balancing Precision and Experimenter Bias*
    Kaitlyn Tucker and Dr. Laura Reynolds

NON-JUDGED POSTER TITLES & AUTHORS

38. *Comparison of P Load Reductions of Selected Farms in the EAA Basins under Similar Best Management Practices*
    Pamela Aracena Santos, Mohsen Tootoonchi, Maryory Orton, Viviana Nadal, Irina Ognevich, Johnny Mosley, Manuel Tapia, Maria Medina, and Samira H. Daroub
39. *Effects of Cover Cropping with Legumes and Non-Legume Species on Soil Quality in Florida Citrus Production*
    Miurel Brewer, Sarah L. Strauss, Ramdas Kanissery, and Davie Kadyampakeni
40. *Soil Quality Assessment of Cultivating Flooded Rice on Histosol under Varying Flood Depths*
    Yuchuan Fan, Naba R. Amgain Abul Rabbany, Matthew VanWeelden, and Jehangir H. Bhadha
41. *Coffee Agrosystem Diversification Improves Near-Surface Soil Health Indicators in Brazil*
    Monalisa Fagundes Oliveira, Patrícia Anjos Bittencourt, Barreto-Garcia; Paulo Henrique Marques Monroe, Julia Barra Netto-Ferreira; and Márcio Renato Nunes
42. *Contrasting Effect of Protease on the Enzymatic Hydrolysis o Dissolved Organic P in Constructed Wetlands*
    Praveen Subedi, Li Dili, Patrick W Inglett, and Kanika Sharma Inglett
43. *Effect of Floating Aquatic Vegetation on Canal Water Quality and Drainage Discharges*
    Mohsen Tootoonchi, Anne E. Sexton, Jennifer A. Cooper, Timothy A. Lang, Andres F. Rodriguez, and Samira H. Daroub

SOIL, WATER, AND ECOSYSTEM SCIENCES DEPARTMENT

The SWESD 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, WATER, AND ECOSYSTEM SCIENCES LOCATIONS

Soil, Water, and Ecosystem 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

UF IFAS UNIVERSITY of FLORIDA

SOIL, WATER, AND ECOSYSTEM SCIENCES

Thank you to our co-sponsor of the 20th Soil, Water, and Ecosystem Sciences Research Forum:

UF Water Institute

(Keynote Presentation Live Stream)

Special thanks to Michael Sisk, Robert Daffron, Kyle Davis, Carina Dybevick, and Jessica McGarrah for event organization.

PLAN TO ATTEND

21st Soil, Water, and Ecosystem Sciences Research Forum
2025 (Date TBD)
J. Wayne Reitz Union
University of Florida - IFAS
Gainesville, Florida

Help Minimize Waste at This Event!

The Soil, Water, and Ecosystem 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.