

2024 Kentucky Water Resources Annual Symposium

September 27, 2024

Central Bank Center, Lexington, Kentucky

Registration and Continental Breakfast (8:00 a.m. - 8:50 a.m.)

PLENARY SESSION (8:50 a.m. - 09:50 a.m.)

Location: Meeting Rooms 12 & 13

- 8:50 *Welcome, Introductions, and KWRI Updates*, Jason Unrine, Director, KWRI.
- 9:10 *Climate Resiliency: How the Corps' Is Managing Infrastructure Through Climate Change*, Michael Borchers, Hydrology and Hydraulics Section Chief, USACE.
- 9:40 Q & A.

Break/Poster Viewing (09:50 a.m. - 10:20 a.m.)

Location: Meeting Rooms 10 & 11

SESSION 1 (10:20 a.m. - 12:00 p.m.)

Location: Meeting Rooms 9 & 14

Track 1A - Room 9—Watershed & Hydrology

Moderator: Malissa McAlister

- 10:20 *Machine Learning in Hydrology: Challenges and Opportunities*, Arlex Marin-Ramirez, Civil and Environmental Engineering, UL.
- 10:40 *Advancing Watershed Management and Planning Using Integrated Data Monitoring Networks*, Jason Polk, Center for Human GeoEnvironmental Studies, WKU.
- 11:00 *Contributions of Small Towns to Impervious Area of Rural Watersheds in Eastern South Dakota*, John McMaine, Biosystems and Agricultural Engineering, UK.
- 11:20 *Project Management Best Practices: Challenges and Advances for Working in Urban Hydrologic Systems*, Adam Desloge, Center for Human GeoEnvironmental Studies, WKU.
- 11:40 *It'll Buff Out: Riparian Reforestation Improved Streamwater Quality in Urban Streams in Lexington, KY*, Kenton Sena, Lewis Honors College, UK.

Track 1B - Room 14 — Water Treatment

Moderator: Donna McNeil

- Drinking Water Affordability in Kentucky*, Mary Cromer, Ella Helmuth, & Rebecca Shelton, Appalachian Citizens' Law Center, Inc.
- Modeling the Tradeoff Between Water Loss and Water Quality in the Martin County Water Distribution System*, George Fordjour, Civil Engineering, UK.
- Assessing Toxicity of Nanomaterials (Hexagonal-Boron Nitride and Phosphorene) and Per- and Polyfluoroalkyl Substances (PFAS) Towards *Caenorhabditis Elegans**, Lucca Madeo Cortarelli, Plant and Soil Sciences, UK.
- Unraveling the Regulatory Policy Landscape of Per- and Polyfluoroalkyl Substances (PFAS): A Comprehensive View*, Ariel Robinson, Civil Engineering, UK.
- *Impact of Water Containment "Cocktails" on Treatment Wetland Biogeochemical Processes*, Emily Nottingham Byers, Soil Drainage Research Unit, USDA-ARS Columbus, OH.

* Denotes project supported by USGS 104b grant funds.

AWARDS LUNCHEON (12:00 p.m. - 1:00 p.m.)

Location: Meeting Rooms 12 & 13

SESSION 2 (1:00 p.m. - 2:20 p.m.)

Location: Meeting Rooms 9 & 14

2A - Room 9—Groundwater

Moderator: Steve Evans

- 1:00 *On the Role of Soil Permeability and Precipitation Rate in Saturation of Shallow Subsurface*, Fereydoun Najafian Jazi, Civil and Environmental Engineering, UL.
- 1:20 *Investigating Groundwater Dynamics and Aquifer Recharge Patterns in Barbados Using Forensic Hydrology*, Ben Hauschild, Center for Human GeoEnvironmental Studies, WKU.
- 1:40 *Hydrochemical Delineation of Stormwater Infiltration and Recharge in the McConnell Springs Basin, Lexington, Kentucky*, Alan Fryar, Earth and Environmental Sciences, UK.
- 2:00 *Protecting Kentucky's Geo-Heritage: A Dye Trace Investigation to Study Groundwater Resources in the Glenss Creek Drainage Basin, Franklin and Woodford Counties, Kentucky*, Lee Anne Bledsoe, Crawford Hydrology Laboratory, WKU.

2B - Room 14—Nutrients & Sediment

Moderator: Andrea Drayer

- Nutrient Trends in Kentucky: Making Progress with a Changing Climate*, Josiah Frey and Caroline Chan, KDOW.
- Predicting Cyanobacteria Harmful Algal Bloom Toxins and Genes in the Ohio River and Wabash River, 2020-22*, Angie Crain, USGS, Ohio-Kentucky-Indiana Water Science Center.
- Investigating Sediment Transport in Fluviokarst Systems Using Sensor Networks in the South Elkhorn Watershed*, Melissa Beckman, Civil Engineering, UK.
- Phosphorus Dynamics in a Palustrine Wetland Chronosequence in the Jackson Purchase Region*, Cora Aossey, Plant and Soil Sciences, UK.

POSTER SESSION (2:20 p.m. - 3:20 p.m.)

Location: Meeting Rooms 10 & 11

SESSION 3 (3:20 p.m. - 4:40 p.m.)

Location: Meeting Rooms 9 and 14

3A - Room 9—Flooding

Moderator: John McMaine

- 3:20 *U.S. Geological Survey Flood Alert Systems—Working to Protect Life and Property*, Thomas E. Harris, USGS.

3:40

3B - Room 14—Climate

Moderator: Lee Anne Bledsoe

- *A Remote Sensing Application for Characterizing Small Wetland Ponds and Their Surrounding Landscapes in Louisville, KY*, Andrea Gaughan, Geographic and Environmental Sciences, UL.

Can Urban and Peri-Urban Constructed Ponds Serve as Carbon Sinks?, Andrew Mehring, Biology, UL.

(Session 3 continued on next page)

SESSION 3 (3:20 p.m. - 4:40 p.m.)

Location: Meeting Rooms 9 and 14

3A - Room 9—Flooding

Moderator: John McMaine

4:00 *Predicting Flooding in Vulnerable Communities Using the Latest Innovations*, Katherine Osborne, Stantec.

4:20 *Real-Time Monitoring and Modeling of Urban Karst Flooding for Hazard Mitigation: Case Study of Fairview Plaza, Bowling Green, KY*, Alex Sitz, Center for Human GeoEnvironmental Studies, WKU

3B - Room 14—Climate

Moderator: Lee Anne Bledsoe

Community Perspectives on Wetland Health and Use in Louisville, KY, Kalpana Venkatasubramanian, Geographic and Environmental Sciences, UL.

Spatial Patterning of Resources Can Affect Microbial Carbon Dynamics in Hydric Mineral Soils, JB Moon, Biological Sciences and the Watershed Studies Institute, MSU.

Student Awards (4:40 p.m. - 5:00 p.m.)

Location: Meeting Rooms 10 & 11

Adjourn (5:00 p.m.)

Poster Session (2:30 p.m. - 3:30 p.m.)

1. *Fabrication of a Composite Polymeric Membrane Made with Eco-Friendly Solvents for Water Filtration*, Sophia Tseng, Chemical Engineering, University of Kentucky.
2. *Deep Eutectic Solvent-Resistant Membranes for Sustainable Lignin Recovery in Agricultural Biomass Processing: A Comparative Study*, Odianosen Ewah, Chemical Engineering, University of Kentucky.
3. *Riparian Repairing: Effects of Conservation Efforts on Microbial Communities and Soil Characteristics*, Cooper Samuelson, Lewis Honors College, University of Kentucky.
4. *Life Cycle Assessment to Inform Sustainable Design of Constructed Wetlands*, David Hancock, Civil Engineering, University of Kentucky.
5. *Navigating Sustainability Impacts of Bioretention Design for Stormwater Reuse*, Isaac Oluk, Civil Engineering, University of Kentucky.
6. *Cooling Tower Stormwater Harvesting Project*, Keren Kenner, Civil Engineering, University of Kentucky.
7. *Fate and Transport of Nanopesticides in Agricultural Field Plots in Central Kentucky*, Caleb Stickney, Biosystems and Agricultural Engineering, University of Kentucky.
8. *Glenns Creek Watershed Project*, Steve Evans, Kentucky Water Research Institute, University of Kentucky.
9. **Investigating Controls of Flash Floods in the Headwaters of the Cumberland Plateau Using Process Based Modeling*, Luke Ott, Civil and Environmental Engineering, University of Louisville.
10. *Assessing the Impacts of Climate Change on Headwater Streamflow Regime in Appalachia, USA*, Hasan Taylan, Civil and Environmental Engineering, University of Louisville.
11. *Blue Water Farms: Edge Of Field Nutrient and Sediment Monitoring Network in Western Kentucky*, Brad Lee, Plant & Soil Sciences, University of Kentucky.
12. *Phosphorus Removal at the West Hickman Wastewater Plant – What Can Be Done to Quickly Solve This Arising Problem?*, Kyle E. Kmiec, Lexington-Fayette Urban County Government, Division of Water Quality.
13. **Stable Isotope Tracing of Nitrate Sources during Precipitation Events in a Kentucky Karst Watershed*, Carion Williams, Earth & Environmental Sciences, University of Kentucky.
14. *Evaluating Karst Susceptibility and Vulnerability for the Lincoln Trail Area Development District, Kentucky, from High-Resolution Data and a Ranking-Based Approach*, Junfeng Zhu and Hudson Koch, Kentucky Geological Survey, University of Kentucky.
15. *On-Farm Water Management Small Scale Grants for Kentucky Specialty Crop Growers*, Cindy Finneseth, Horticulture, University of Kentucky.
16. *Sampling Kentucky Ground and Surface Water Sources Used for Produce Pre- and Post-Harvest Activities*, Cindy Finneseth, Horticulture, University of Kentucky.
17. *Surface Roughness and Topographic Change at a Reclaimed Mine Site. A Preliminary Assessment Using Lidar Data*, Demetrio P. Zourarakis, Martin-Gatton College of Agriculture, Food and Environment, University of Kentucky.
18. *Helping Small-Scale and Socially Disadvantaged Farmers with Irrigation Water Quality*, John Thomas, Cooperative Extension, Kentucky State University.
19. **Investigating Methane Fluxes and Porewater Chemistry in Proximity to Bald Cypress “Knees”*, Skylar Ross, Earth and Environmental Sciences and the Watershed Studies Institute, Murray State University.
20. **Impacts of Duckweed (*Lemna* and *Wolffia* spp.) on Carbon Storage and Decomposition in Small Ponds*, Josh A. Snipes, Biology, University of Louisville.
21. **Evaluating the Effects of Ecological Restoration Efforts on Stream Health in the Inner Bluegrass Through eDNA Assessment of Invertebrate Communities*, Sara A. Brewer, Science and Health, Asbury University.
22. *Community-Based Participatory Research on Drinking Water Disinfection Byproducts in Appalachia*, Jason Unrine, Kentucky Water Research Institute, University of Kentucky.
23. *Hybrid Solutions for DOT applications for Proactive Road Flooding Alerts*, Chuck Kozora, OTT Hydromet