

2022 Kentucky Water Resources Annual Symposium

September 19, 2022

Central Bank Center, Lexington, Kentucky

Registration and Continental Breakfast (8:00 a.m. - 8:30 a.m.)

PLENARY SESSION (8:30 a.m. - 10:00 a.m.)

Location: Meeting Rooms 7 & 8

- 8:30 *Welcome & Introductions*, Steve Evans, Associate Director, KWRRI.
- 8:40 *Past Reflections and Future Challenges for Water Research*, Lindell Ormsbee, Professor, Dept. of Civil Engineering, UK.
- 9:00 *Overcoming Persistent and Emerging Water Resource Challenges by Building Bridges Between Sectors and Disciplines*, Jason Unrine, Director, KWRRI.
- 9:20 *Environmental Monitoring and Modeling—Establishing Baseline Conditions*, Tanja Williamson, Research Hydrologist—Pedologist, USGS, OH-KY-IN Water Science Center.
- 9:40 Panel Discussion and Q & A.

Break/Poster Viewing (10:00 a.m. - 10:20 a.m.)

Location: Meeting Rooms 3 & 4

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

Location: Meeting Rooms 5 & 6

Track 1A - Room 5—Watershed Management

Moderator: Malissa McAlister (KWRRI)

- 10:20 **Motivations and Barriers to the Implementation of Riparian Buffer Zones on Central Kentucky Horse Farms*, Leanna Hartsough, KWRRI, Dept. of Communications, UK.
- 10:40 *Engaging Urban Watershed Stewards in Stormwater Management*, Amanda Gumbert, Cooperative Extension, UK.
- 11:00 **Efficacy Examination of Urban Reforestation Efforts on Streams in Lexington, KY: Macroinvertebrates and Water Quality Assessments*, Peyton Mills, Dept. of Forestry and Natural Resources, UK.
- 11:20 *Over a Decade of Monitoring Water Quality at McConnell Springs— What Have We Learned?*, David Price, Lexington-Fayette Urban County Government.
- 11:40 *Glenns Creek Watershed Characterization Efforts*, Steve Evans, KWRRI, UK.

Track 1B - Room 6 — Contaminant Exposure & Treatment

Moderator: Donna McNeil (KWRRI)

- Cyanobacteria, Cyanotoxin Synthetase Genes, and Cyanotoxin Occurrence Among Selected Large River Sites in the Lower Ohio River Basin, 2020–21*, Angie Crain, Ohio-Kentucky-Indiana Water Science Center, USGS.
- *Emerging Contaminant Exposure Following WWTP Processes to Surface Waters*, Tiffany Messer, University Researcher, UK.
- Reactive Membrane Synthesis for Capture and Degradation of Toxic Water Contaminants*, Rollie Mills, Dept. of Chemical and Materials Engineering, UK.
- Implications to Tap and Stream Water Chemistry Due to Variations in Sampling Location and Watershed Land Use*, Tiffany Messer, University Researcher, UK.
- Examining Toxicity of 2D Nanomaterial Phosphorene, Free-Standing and Embedded Onto Membranes, and Its Application for Removal of Per- and Polyfluoroalkyl Substances (PFAS)*, Olga Tsyusko, Dept. of Plant and Soil Sciences, UK.

AWARDS LUNCHEON (12:00 p.m. - 1:30 p.m.)

Location: Meeting Rooms 1 & 2

SESSION 2 (1:30 p.m. - 2:30 p.m.)

Location: Meeting Rooms 7 & 8

Water and the Community

Moderator: Steve Evans (KWRRI)

- 1:30 *Development of Human Health Criteria for Surface Waters of the Commonwealth of Kentucky*, Caroline Chan and Andrea Fredenburg, Kentucky Division of Water.
- 1:50 *Kentucky Workforce Survey Results*, Donna McNeil and James Shelley, KWRRI, UK.
- 2:10 *Modeling, Managing, and Mitigating Stormwater Flooding Using a Real-Time Monitoring Network and Environmental Equity Approach*, Jason Polk, Dept. Of Earth, Environmental and Atmospheric Sciences, WKU.

POSTER SESSION (2:30 p.m. - 3:30 p.m.)

Location: Meeting Rooms 3 & 4

SESSION 3 (3:30 p.m. - 4:30 p.m.)

Location: Meeting Rooms 5 and 6

3A - Room 5—Karst & Ground Water

Moderator: James Shelley (KWRRI)

- 3:30 **Examining the Utility of Tryptophan-Like Fluorescence As a Proxy for Fecal Contamination in Karst Basins, Inner Bluegrass Region, Kentucky*, Ryan Dapkus, Dept. of Earth and Environmental Sciences/Dept. of Civil Engineering, UK.
- 3:50 *A Predictive Flood Model for Urban Karst Environments*, Trayson Lawler, Dept. Of Earth, Environmental and Atmospheric Sciences, WKU.
- 4:10 **Improving Best Management Practices for The Siting, Maintenance, and Design of Urban Karst Groundwater Injection Wells*, Abby Williams, Dept. Of Earth, Environmental and Atmospheric Sciences, WKU.

3B - Room 6—Sediments

Moderator: Donna McNeil (KWRRI)

- Sediment Degradation Experiments for a Low Gradient Stream Suggest the Watershed's Connectivity Regime Exhibits Control on Stream Biogeochemistry*, Brenden Riddle, Dept. of Civil Engineering, UK.
- *Does Sediment Organic Matter Content Mediate the Effects of Chironomid Larvae on Benthic Nitrous Oxide Flux*, Andrew Mehring, Dept. of Biology, UL.
- *Drivers of Variability in Annual Sediment Accretion Rates Within Wetland Easements of Western Kentucky*, Jessica Moon, Dept. of Biological Sciences and the Watershed Studies Institute, MSU.

Student Awards (4:30 p.m. - 5:00 p.m.)

Location: Meeting Rooms 3 & 4

Adjourn (5:00 p.m.)

* Denotes project supported by USGS 104b grant funds.

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

1. **Evaluating the Effects of Beaver Dam Removal on the Hydrology, Water Quality, and Bioindicators of a Restored Wetland*, Marla Ashby, Biological Sciences and Watershed Studies Institute, Murray State University.
2. *Predictive Sediment Flux Modeling of a Karst Spring Using High Resolution Sensors and Stable Carbon and Nitrogen Isotopes*, Leonie Bettel, Department of Civil Engineering, University of Kentucky.
3. *Development and Validation of qPCR Assays for Use in eDNA Detection of Four Species of Semiaquatic Salamanders*, Sara Brewer, Department of Science and Health, Asbury University.
4. **Analyzing Recent Spatio-temporal Rainfall Erosivity Patterns and Trends Across Kentucky*, Andrew Day, Department of Geographic and Environmental Sciences, University of Louisville.
5. *Development of eDNA Protocols for Detection of Four Darter (Percidae: Etheostomatinae) species in central Kentucky streams*, Abby Fletcher, Department of Science and Health, Asbury University.
6. *Assessing Change in the Seasonality of Stable Isotopes $\delta^{18}O$ and δ^2H for Meteoric and Terrestrial Waters of Central Kentucky*, Ariel Gold-McCoy, Department of Civil Engineering, University of Kentucky.
7. *Coupling Sediment Fingerprinting and Hysteresis Analysis to Characterize Sediment Connectivity in a Low-gradient Watershed*, Arlex Marin-Ramirez, Department of Civil and Environmental Engineering, University of Louisville.
8. *A Multi-Watershed Study exploring Surface Water Quality and Reclaimed Surface Mines Land Use in The Eastern Kentucky Coal Field Region*, Whitney Maynard, College of Agriculture, Community, and the Sciences, Kentucky State University.
9. *Degradation of Phenolic Aldehyde Pollutants in Water*, Reagan Patton, Department of Chemistry, University of Kentucky.
10. *Investigating Fate and Transport of Nitrate in Karst Groundwater Using High Resolution Sensors and Stable Isotope Measurements*, Brenden Riddle, Department of Civil Engineering, University of Kentucky.
11. *Polydimethylsiloxane Beads with Incorporated Titanium Dioxide as a Treatment for Organic Water Pollutants*, Connor Schulte, Department of Chemistry, Western Kentucky University
12. *An Assessment of Three Pathways of Greenhouse Gas Flux in Small Kentucky Wetlands*, Mark Tierney, Department of Biology, University of Louisville.
13. *Topographic Change Detection in Selected 14-Digit Watersheds of Martin Co., Kentucky Using Lidar Elevation Data for the Years 2011 – 2019*, Demetrio Zourarakis, College of Agriculture, University of Kentucky
14. *Modeling Chlorine and Disinfection By-Products in Water Distribution Systems in Eastern Kentucky*, Yogesh Gautam, Department of Civil Engineering, KWRRI, University of Kentucky.
15. **Using 16S rRNA Gene Sequencing of the Gut Microbiome to Understand the Effects of Freshwater Mussels on Water Quality*, Mary Foley, Department of Biology, Department of Plant Sciences, U.S. Forest Service, University of Kentucky.
16. *Nutrient Effects on Microcystin Toxin Production by Cyanobacteria in Kentucky Lakes across a Trophic Continuum*, Angelo Elisa, Department of Plant Sciences, University of Kentucky.
17. *Sampling Ground and Surface Water Sources Used by Kentucky Produce Growers for Production and Post-Harvest Activities*, Cindy Finneseth, Kentucky Horticulture Council.
18. *Sustainability in Membrane Separations: Integration of Eco-Friendly Solvents and Recycled PET in Polymeric Membranes for Water Purification*, David Lu, Department of Chemical and Materials Engineering, University of Kentucky.
19. *Effect of Organic Matter Type on Formation of Drinking Water Disinfection Byproducts in the Presence of Elevated Concentrations of Bromide*, Alicia Harriamn, Department of Plant and Soil Sciences, University of Kentucky.
20. **Aerobic Scope in Kentucky Stream Fishes as a Fitness Indicator of Climate Change Impacts*, Richard Durtsche, Department of Biological Sciences, Northern Kentucky University.
21. *Synthesis and Application of Biochar-based Membranes in Water Treatment Around Appalachian Region*, Fionah Abelline, Department of Chemistry, University of Kentucky.

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