



2009 ANNUAL RESEARCH AND WATERSHED CONFERENCE

APRIL 14-15, 2009 • FAYETTEVILLE, ARKANSAS
UNIVERSITY OF ARKANSAS



UofA UNIVERSITY OF ARKANSAS
DIVISION OF AGRICULTURE

CONFERENCE SPONSORS AND EXHIBITORS

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In addition, over 20 participants registered on-site during the conference.



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THE WATER RESOURCES RESEARCH ACT



In 1964, Congress passed the Water Resources Research Act, establishing water research institutions like Arkansas Water Resources Center at land grant universities throughout the United States. The State Water

Resources Research Center Institutes were charged with arranging for competent research that addresses water problems and enhances our understanding, aiding the entry of new research scientists into water resources fields, helping to train future water scientists and engineers, and transferring results of sponsored research to water managers and the public.

This year, the Arkansas Water Resources Center funded three projects including:

- Land-Use Effects on Resistance and Resilience of Stream Metabolism to Flood Events in Ozark Highland Headwater Streams, Michelle Evans-White, University of Arkansas, \$20,000.
- Denitrification, Internal Nitrogen Cycling, and Nitrogen Retention in River Impoundment Reservoirs, Thad Scott, UA Division of Agriculture, \$21,180.
- Longitudinal Evolution of Nutrients in a Mixed-Use Watershed Under Storm and Non-Storm Flow Regimes, Joshua Romeis, UA Division of Agriculture, \$20,380.

This year, the National Institute of Water Resources highlighted several of the AWRC's cooperative projects with the Illinois River Watershed Partnership including the IRWP's volunteer monitoring program and the development of its watershed management plan.



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AWRC ANNUAL CONFERENCE PROGRAM AT A GLANCE

TUESDAY APRIL 14, 2009

- 7:30- 8:15** Coffee, Juice, Pastries
- 8:15- 9:50** Session 1: Water Resources Management-Special Topics
- 9:50-10:15** Coffee Break
- 10:15-11:35** Session 2: Water Quality Studies in Transboundary Watersheds
- 11:35-12:30** Lunch Break
- 12:30-13:30** Poster Session and Student Poster Competition
- 13:30-14:50** Session 3: Nutrient Hotspots and Riparian Forest Buffers
- 14:50-15:10** Coffee Break
- 15:10-16:50** Session 4: Arkansas Agency and Scenic River Updates
- 19:00-19:50** AETN Presents "Troubled Water" in the Arkansas Union Theater on the University of Arkansas Campus.
- 20:00-22:00** Social at Railhead Saloon

WEDNESDAY APRIL 15, 2009

- 7:30- 8:25** Coffee, Juice, Pastries
- 8:25- 9:50** Session 5: Riparian Forest Buffers (RFBs) 101— Everything You Need to Know
- 9:50-10:15** Coffee Break
- 10:15-11:30** Session 6: Stakeholder Willingness, Volunteerism and Educational Opportunities
- 11:30-13:00** Lunch (On Your Own)
- 13:00-15:00** Riparian Forest Buffer Field Tour and Workshop (Meet at Pauline Whitaker Animal Sciences Arena Parking Lot)

ORAL SESSION SCHEDULE

TUESDAY APRIL 14, 2009

SESSION 1: WATER RESOURCES MANAGEMENT-SPECIAL TOPICS

**MODERATOR: BRIAN HAGGARD, ARKANSAS WATER RESOURCES CENTER
UA DIVISION OF AGRICULTURE**

- 8:15** Welcome and Introduction
- 8:20** Bacterial Source Identification—Merging Food Science and Water Resources, Steve Ricke, Institute of Food Science and Engineering, University of Arkansas (sricke@uark.edu)
- 8:50** Trend Analysis with Water Quality—Basic Principles and Data Needs, Dave Mueller, US Geological Survey, Denver, Colorado (mueller@usgs.gov)
- 9:20** Soft Sciences and the Hard Reality of Water Resources Management, Kent Thornton, FTN Associates (kwt@ftn-assoc.com)
- 9:50** Follow-up Discussion, Questions and Refreshment Break

SESSION 2: WATER QUALITY STUDIES IN TRANSBOUNDARY WATERSHEDS

MODERATOR: TOMMY DANIEL, UA DIVISION OF AGRICULTURE

- 10:15** Subsurface Transport of Phosphorus through Preferential Flow Paths in Riparian Floodplains, Garey Fox, Biosystems Engineering Department, Oklahoma State University (garey.gox@okstate.edu)
- 10:35** Phosphorus Concentrations and Trends in the Lower Illinois River Watershed, Thad Scott, Crop, Soil, and Environmental Sciences Department, UA Division of Agriculture (jts004@uark.edu)
- 10:55** Regression Models to Estimate Nutrient Concentrations in Beaty and Spavinaw Creeks in Real-Time, Rachel Esralew, US Geological Survey, Oklahoma City, Oklahoma (resralew@usgs.gov)
- 11:15** Water Quality Changes in the Eucha—Spavinaw Basin after Watershed Management Changes, Brian Haggard, Arkansas Water Resources Center (haggard@uark.edu)

LUNCH AND POSTER SESSION

- 11:35- 12:30** Lunch Break – Penguin Ed's Barbeque (Foyer)
- 12:30- 13:30** Poster Session and Student Poster Competition (Presenters should stand at Posters, Room 405)

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RIPARIAN FOREST BUFFER FIELD TOUR AND WORKSHOP CONTINUED
WATERSHED RESEARCH AND EDUCATION CENTER
TOUR LEADERS: KYLE CUNNINGHAM, BRIAN HAGGARD, HAL LIECHTY, CHRIS
STUHLINGER AND CHUCK WEST, UA DIVISION OF AGRICULTURE

13:00 Tour Starts at the Pauline Whitaker Animal Sciences Arena
Parking Lot

**Pauline Whitaker Animal Sciences Center is located at 1335 W
Knapp Street, Fayetteville Arkansas.**

From the Cosmopolitan Hotel, head north on N East Avenue. Turn left onto Dickson Street. Turn right on N West Avenue. Turn left onto W Maple Street. Turn right onto Garland Ave/ AR-112. Follow Garland/AR-112 until you reach Knapp Street on your left. You will notice a large wall sign denoting Pauline Whitaker Animal Science Center.



PENGUIN ED's BBQ

11:35-12:30 in the Foyer
Sponsored by Arkansas Farm Bureau



POSTER SESSION

12:30-1:30 in Rooms 405-407
Sponsored by Arkansas Farm Bureau

Poster presenters will be at their posters from 12:30-1:30.

Student Poster Competition:

Several students are participating in the student poster competition this year. On the form provided in your folder, please rank the top three student posters based on the poster itself, as well as the student's ability to answer questions. Please return the completed form to the registration desk by 5 PM on Tuesday. The winner of the student poster competition will be announced during the social Tuesday evening.

List of Posters:

1. Maximizing Digital Resources: Combining GIS Technology and Field Work for Depicting Low-Order Streams in the Ozark Mountains. A.S. Bartell, M.A. Crump*, and A. Clingenpeel. US DA Forest Service, Russellville, Arkansas, mcrup@fs.fed.us.
2. Persistence of Broad Host Range Plasmids in a Municipal Wastewater Treatment Plant. K.L. Asfahl* and M.C. Savin, Department of Crop, Soil and Environmental Sciences, University of Arkansas, kasfahl@uark.edu. *Student Poster Presenter.*
3. Pharmaceuticals and Organic Wastewater Compounds in Water and Bed Material Downstream of Three Municipal Effluent Discharges. L.D. Bartsch* and B.E. Haggard, Arkansas Water Resources Center, UA Division of Agriculture, lbartsc@uark.edu.
4. Tracking Stream Nitrate Sources and Flow Paths Using Isotopes on a Basin with Mixed Land-Uses and Karst Terrain. A. Buda* and D.R. DeWalle, USDA-ARS, University Park, Pennsylvania, anothony.buda@ars.usda.gov.
5. An Evaluation of Heavy Metal Concentrations in Pond Sediments on the Ozark – St. Francis National Forests. M. Crump* and M. Weeks, USDA Forest Service, Russellville, Arkansas, mcrup@fs.fed.us
6. The Effect of Light and Temperature on Periphyton Phosphorus Uptake over Two Seasons in Several Northwest Arkansas Streams. B.M. Drake*, J.T. Scott, A.N. Sharpley, B.E. Haggard, and C.W. Rogers, Department of Crop, Soil and Environmental Sciences, University of Arkansas, bmdrake@uark.edu. *Student Poster Presenter.*
7. Nutrient Concentrations, Loads, and Yields in the Eucha-Spavinaw Basin. R. Esralew, US Geological Survey, Oklahoma City, resralew@usgs.gov.
8. Development of Regression-Based Models to Predict Fecal Indicator Bacteria at the Illinois River Basin, Arkansas and Oklahoma. B.E. Haggard* and M.M. David, Arkansas Water Resources Center, UA Division of Agriculture, haggard@uark.edu.
9. Benthic Macroinvertebrate Food Web Patterns in a Headwater Stream Prior to a Riparian Zone Restoration. E.N. Jensen*, M. Evans-White, and B.E. Haggard, Department of Biological Sciences, University of Arkansas, exj12@uark.edu. *Student Poster Presenter.*

WEDNESDAY APRIL 15, 2009

SESSION 5: RIPARIAN FOREST BUFFERS (RFBs) 101— EVERYTHING YOU NEED TO KNOW MODERATOR: MIKE FAUPEL, UNIVERSITY OF ARKANSAS

- 8:25** Introduction, Hal Lietchy, Arkansas Forest Resources Center, UA Monticello (lietchy@uamont.edu)
- 8:30** Riparian Forest Buffers 101—What, Where and Why? Hal Lietchy, Arkansas Forest Resources Center, UA Monticello (lietchy@uamont.edu)
- 8:50** Riparian Forest Buffers 101—Site Preparation, Planting and Tree Selection in a Nutshell, Chris Stuhlinger, University of Arkansas System Forest Manager (stuhlinger@uamont.edu)
- 9:10** Riparian Forest Buffers 101—Planning for Success and Maybe Natural Disasters, Kyle Cunningham, UA Cooperative Extension Service (kcunningham@uaex.edu)
- 9:30** Wildlife Values of Riparian Buffers in Managed Forests, Phil Tappe, Arkansas Forest Resources Center, UA Monticello (tappe@uamont.edu)

SESSION 6: STAKEHOLDER WILLINGNESS, VOLUNTEERISM AND EDUCATIONAL OPPORTUNITIES MODERATOR: KYLE CUNNINGHAM, UA COOPERATIVE EXTENSION SERVICE

- 10:15** Geospatial Technology Approaches for Inventorying Riparian Buffer Cover in L'Anguille River Watershed, Dharmendra Saraswat, UA Cooperative Extension Service (dsaraswat@uaex.edu)
- 10:35** Stakeholder Willingness to Use BMPs in a Mississippi Watershed, Tim Schauwrecker, Department of Landscape Architecture, Mississippi State University (tschauwecker@lalc.msstate.edu)
- 10:55** The Riparian Project and Volunteer Monitoring—Updates from the Illinois River Watershed Partnership, Delia Haak, Executive Director, Illinois River Watershed Partnership
- 11:15** Discovery Farms Concept—Monitoring Farming Practices and BMP Efficiencies in Arkansas, Andrew Sharpley, Crop Soil and Environmental Sciences Department, UA Division of Agriculture (sharpely@uark.edu)
- 11:25** Watershed Research and Education Center—Introduction, Current Activities and Future Plans, Brian Haggard, Arkansas Water Resources Center, UA Division of Agriculture (haggard@uark.edu)
- 11:30** Lunch Break (On Your Own)

RAILHEAD SALOON SOCIAL

Tuesday, April 14 from 8:00-9:30 PM
Sponsored by Hach Environmental

Railhead Saloon is located at 550 W Dickson Street
(Between Wow Japanese Bistro and On the Rocks)
~15 minute walk from the Cosmopolitan Hotel



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www.hachenvironmental.com.**



10. The Use of Stable Carbon Isotopes to Identify Carbon and Nutrient Fluxes in a Northwestern Arkansas Soil-Cave System. K.J. Knierim*, E. Pollock, and P. Hays. Environmental Dynamics Program, University of Arkansas, kknierim@uark.edu.
11. Measuring Stream Bank Erosion Using Images and Digital Photogrammetry. M. Leh*, S. Bajaw, I. Chaubey, J. Cothren, and K. Asante, Department of Biological and Agricultural Engineering, University of Arkansas, mleh@uark.edu.
12. An Initial Assessment of the Invertebrate Assemblage and Aquatic Habitat at the Watershed Research and Education Center. S.D. Longing*, B.E. Haggard, Department of Biological Engineering, University of Arkansas, slonging@uark.edu.
13. Selection and Placement of Best Management Practices Used to Reduce Total Phosphorus Runoff in the Lincoln Lake Watershed in Northwest Arkansas. H.G. Rodríguez* and C. Maringanti, Department of Agricultural Economics and Agribusiness, University of Arkansas, hrodrig@uark.edu. *Student Poster Presenter.*
14. Distribution and Phosphorus-Sorption Characteristics of Select Streams within the Illinois River Watershed. C.W. Rogers*, A.N. Sharpley, B.E. Haggard, J.T. Scott, and B.M. Drake, Department of Crop, Soil and Environmental Sciences, University of Arkansas, cwrogers@uark.edu. *Student Poster Presenter.*
15. Estimation of Phosphorus Loads in Headwater Streams Draining Commercial Poultry-Pasture Operations. J. Romeis*, R. Jackson, D.E. Radcliffe, and M. Risse. Department of Crop Soil and Environmental Sciences University of Arkansas, jromeis@uark.edu.
16. Carbon, Nitrogen and Phosphorus Concentrations in Runoff Water from Urban Streams, Established Green Roofs, and Traditional Roofs. C. Toland*, B.E. Haggard, and M. Boyer. Department of Crop, Soil and Environmental Sciences, cteland@uark.edu. *Student Poster Presenter.*
17. Upward Bound Science Academy: Connecting Surface to Ground Water Processes and Policy through Research. Wendi J.W. Williams* and Brian Raborn, Upward Bound Summer Science Academy, University of Arkansas, wjwillia@uark.edu.
18. Climate, Cyanobacteria and MIB—A Bad Tasting Combination. B. Winston*, S. Hausman, J.T. Scott, R. Davis, R.A. Morgan, W.R. Green, and S. Boss. Environmental Dynamics Program, University of Arkansas, bwinsto@uark.edu.

TUESDAY APRIL 14, 2009

AETN'S "TROUBLED WATER"

Tuesday, April 14 from 7:00-8:00 PM
Arkansas Student Union Theater

SESSION 3: NUTRIENT HOTSPOTS AND RIPARIAN FOREST BUFFERS
MODERATOR: HAL LIECHTY, ARKANSAS FOREST RESOURCE CENTER
UA MONTICELLO

- 13:30** Landuse and Water Quality in Alabama Costal Watersheds, Latif Kalin, School of Forestry and Wildlife Sciences, Auburn University (latif@auburn.edu)
- 13:50** Effects of Hydrology and Field Management on Phosphorus Transfers in Surface Runoff along an Agricultural Hillslope in Pennsylvania, Tony Buda, USDA-ARS, State College, Pennsylvania (anthony.buda@ars.usda.gov)
- 14:10** Research at the Agroforestry Center, Richard Straight, USDA National Agroforestry Center, Lincoln, NE (rstraight@fs.fed.us)
- 14:30** Forest BMP Efficiency, Eric Schilling, National Council of Air and Stream Improvement (eschilling@src-ncasi.org)

The Union Theater is located on the University of Arkansas Campus in the Arkansas Student Union.
435 N Garland Ave
~25 minute walk from the Cosmopolitan hotel

SESSION 4: ARKANSAS AGENCY AND SCENIC RIVER UPDATES
MODERATOR: JERRY FARRIS, ASSOCIATE DEAN OF THE COLLEGE OF
SCIENCE AND MATHEMATICS, ARKANSAS STATE UNIVERSITY

- 3:10** Arkansas's 319 Program—Update, Current Projects and Future Directions, Tony Ramick, Arkansas Natural Resources Commission (tony.ramick@arkansas.gov)
- 3:35** Ambient Water Quality Monitoring Program in Arkansas Water Resources, Steve Drown, Arkansas Department of Environmental Quality (drown@adeq.state.ar.us)
- 4:00** Arkansas's Source Water Protection Program, Wellhead Protection Program, and Pathogens, Dan Smith and Sandra Chandler, Arkansas Department of Health (daniel.smith@arkansas.gov; sandra.chandler@arkansas.gov)
- 4:25** Discrete Fecal Bacteria Monitoring and Riparian Plans in the Illinois River Watershed, Ed Fite, Oklahoma Scenic Rivers Commission (osrc@fullnet.net)



A study of water resources in Arkansas is as varied as the people who live here. Different issues in different parts of the state are raising a common concern—that our status as a water rich state may be in doubt. Growth in industry, agriculture, and population is straining this essential resource and the signs are beginning to show. Water quality is suffering from growth and development in the watersheds, and water levels are dropping in aquifers throughout the State.

"Troubled Water" is an AETN original sixty-minute documentary that travels across the state to learn more about the potential for a water crisis in Arkansas. Farmers, geologists, experts, and concerned citizens share their opinions and stories about how water is managed in Arkansas, and what we need to do to protect this irreplaceable resource.