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## 2008 ANNUAL RESEARCH AND WATERSHED CONFERENCE

APRIL 22-23, 2008 • FAYETTEVILLE, ARKANSAS  
UNIVERSITY OF ARKANSAS



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### ARKANSAS WATER RESOURCES CENTER

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#### **BRIAN E. HAGGARD**

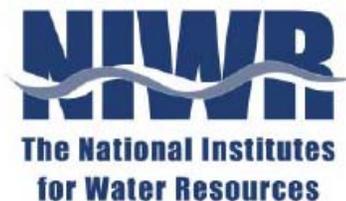
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Picture courtesy of Terry Boyd Photography

## 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:

- Role of Fluvial Sediments in Modifying Phosphorus Exports from Northwest Arkansas Watersheds, Andrew Sharpley, UA Division of Agriculture, \$24,098.
- Biogeochemical Controls and Interactions of Carbon and Nutrient Cycling in Karst Hydrologic Systems, Erik Pollock, UA Stable Isotope Lab, \$20,814.
- Spatial and Historical Distribution of Geosmin and MIB Producers in Beaver Reservoir, Northwest Arkansas, Sonja Hausmann, UA Division of Agriculture, \$25,423.

This year, the National Institute of Water Resources highlighted one of the AWRC's recently funded investigations; this study focused on the occurrence of antibiotic resistance in fauna of natural systems. For more information on this project please contact Mary Savin (msavin@uark.edu).

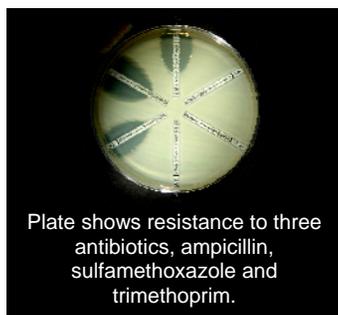


Plate shows resistance to three antibiotics, ampicillin, sulfamethoxazole and trimethoprim.

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## AWRC ANNUAL CONFERENCE PROGRAM AT A GLANCE

### TUESDAY APRIL 22, 2008

- 7:30- 8:15** Coffee, Juice, Pastries
- 8:15- 9:45** Session 1: Nutrient Loads into the Gulf of Mexico
- 9:45-10:10** Coffee Break and Posters
- 10:10-11:30** Session 2: Federal Agency Water Research Activities-  
Water Quality, Modeling and Biology
- 11:30- 1:30** Lunch and Poster Session
- 12:30- 1:30** Rolling Slide Show of the Scenic Beauty of Arkansas
- 1:30- 2:50** Session 3: New Water Science Faculty Research and  
Previous USGS 104b State Water Resources Institute  
Projects
- 2:50- 3:15** Coffee Break and Posters
- 3:15- 4:35** Session 4: Aquatic Conservation and Implementation of  
the State Wildlife Grants Program
- 7:00- 9:00** Social at On the Rocks Bar & Grill

### WEDNESDAY APRIL 23, 2008

- 7:30- 8:30** Coffee, Juice, Pastries
- 8:15- 9:45** Session 5: Water Research Activities and Stakeholder  
Assessment in the Upper White River and the Illinois River
- 9:45-10:05** Coffee Break
- 10:05-12:00** Session 6: Watershed Management and Municipal  
Nutrient Reduction Activities across Arkansas
- 12:00-12:30** Concluding Remarks and Thank You

# ORAL SESSION SCHEDULE

**TUESDAY APRIL 22, 2008**

## **SESSION 1: NUTRIENT LOADS INTO THE GULF OF MEXICO**

**MODERATOR: RALPH DAVIS, GEOSCIENCES DEPARTMENT  
UNIVERSITY OF ARKANSAS**

- 8:15** Welcome and Introduction  
**8:20** Nutrient Loads into the Gulf of Mexico – New USGS SPARROW Modeling Results from the Mississippi River Basin, Richard Smith, US Geological Survey (rsmith1@usgs.gov)  
**8:50** Nutrient Trends in Major River Basins in South-Central United States- Relevance to the Arkansas-White-Red River Basin, Richard Rebich, US Geological Survey (rarebich@usgs.gov)  
**9:20** Discussion and Questions

## **SESSION 2: FEDERAL AGENCY WATER RESEARCH ACTIVITIES – WATER QUALITY, MODELING AND BIOLOGY**

**MODERATOR: ANDREW SHARPLEY, WATERSHED RESEARCH AND  
EDUCATION CENTER  
UA DIVISION OF AGRICULTURE**

- 10:10** Water Quality Monitoring of Selected Springs at the Buffalo River, Faron Usrey, National Park Service (faron\_usrey@nps.gov)  
**10:30** Water Quality Characteristics Resulting from a Mass Gathering on the Ozark – St Francis National Forests – The Largest Drum Circle on the Buffalo River, Michael Crump, US Forest Service (mcrump@fs.fed.us)  
**10:50** Interagency Collaboration at the Savoy Experimental Watershed- New Insights for Ground-Water Quality in Mantled Karst , Van Brahana, Department of Geosciences, University of Arkansas (brahana@uark.edu)  
**11:10** The Future: Data-Driven Lake and Reservoir Monitoring Using Real-Time 3-D Hydrodynamic and Water-Quality Simulations, Reed Green, US Geological Survey (wrgreen@usgs.gov)

## **LUNCH, POSTERS AND ROLLING SLIDE SHOW**

- 11:30- 1:30** Lunch Break – Penguin Ed's Barbeque and Poster Session (Foyer and Room 405)  
**12:30- 1:30** Rolling Slide Show of the Scenic Beauty of Arkansas Waters (Room 405) Terry Boyd, Naturalist and Photographer, Russellville, Arkansas

## **General:**

### **Solids:**

Dissolved	10.00
Suspended	10.00
Total	10.00
Volatile	15.00
Ash Free Dry Weight	15.00
Sulfate, SO <sub>4</sub>	10.00
Turbidity	7.00

## **Biological:**

Chlorophyll a, b, & c (spectrophotometric)	15.00
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## **Microbiological:**

MMO-MUG (Colilert):	
Total coliform+E. Coli (1 dilution)	20.00
Additional dilutions	10.00

\*Must use 100 mL sterile containers and be next day mailed to the laboratory

\*Not certified for drinking water

## **Metals:**

Aluminum, Al	10.00
Barium, Ba	10.00
Cadmium, Cd	10.00
Calcium, Ca	10.00
Cobalt, Co	10.00
Copper, Cu	10.00
Iron, Fe	10.00
Lead, Pb (ICP)	10.00
Magnesium, Mg	10.00
Managnese, Mn	10.00
Potassium, K	10.00
Sodium, Na	10.00
Vanadium	10.00
Zinc, Zn	10.00

\*Call before submitting metal samples

**Discounts negotiable for multiple samples**

## AWRC FEE SCHEDULE FOR WATER TESTING

The AWRC Water Lab offers the following basic packages:

Domestic \$75	Fish Pond \$90
Irrigation-All crops \$75	Livestock \$75
Irrigation-Drip or Trickle \$80	Poultry \$135
Water Quality Assessment \$165	

For more information about these packages visit:  
[www.uark.edu/depts/awrc/AWRCWaterQualityLab.htm](http://www.uark.edu/depts/awrc/AWRCWaterQualityLab.htm)

The AWRC Water Lab also offers individual tests as follows:

### Sample Handling (per sample) 5.00

#### General:

Alkalinity	8.00
Anions (NO <sub>3</sub> -N, F, SO <sub>4</sub> , Cl)	20.00
Bromide, Br	10.00
Carbon:	
Total Organic	20.00
Non-purgable	20.00
Chloride, Cl	10.00
Chemical Oxygen Demand (COD)	25.00
Fluoride	5.00
Hardness	10.00
Nitrogen:	
Ammonia, NH <sub>3</sub> -N	15.00
Nitrite, NO <sub>2</sub> -N	10.00
Nitrate, NO <sub>3</sub> -N	10.00
Nitrate+Nitrite	15.00
Total Nitrogen & Phosphorus	35.00
pH	4.00
Phosphorus:	
Ortho-phosphate, PO <sub>4</sub> -P	10.00
Total P	20.00
Total Nitrogen & Phosphorus	35.00
Silica, SiO <sub>s</sub>	10.00



Terry has dedicated the last seven years of his life to his work, living one roll of film at a time, doing his best to be at the right place at the right light. In late August 1998 when he was 23 and trying to figure out a way to make a living mountain biking or small mouth bass fishing, he made a random stop into a pawn shop and purchased a used Canon Rebel even though he knew absolutely nothing about photography. The first time he photographed a sunset from a bluff top above the Arkansas River the waters of his existence were no longer murky but instantly as clear as Richland Creek in the summertime. He told himself he had a lot of catching up to do and photographed with reckless abandon.



Highest quality archival prints are printed on Kodak Endura Metallic Paper, very high gloss with a unique pearlescent finish. Black and white images are printed on Kodak True Digital Black and White Paper.

For more information about Terry and his photography or to order additional prints visit him at:

<http://www.terryboydphotography.com>



## PENGUIN ED'S BBQ AND POSTER SESSION

Sponsored by Arkansas Farm Bureau



Farm Bureau is an independent, voluntary organization of farm and ranch families united for the purpose of analyzing their problems and formulating action to achieve educational improvement, economic opportunity, social advancement and promote the national well-being.

[www.arfb.com](http://www.arfb.com)

**FARM BUREAU**  
**ARKANSAS**

THE VOICE OF AGRICULTURE

### List of Posters

1. Patterns of Multi-Drug Resistance in Escherichia Coli Isolated from a Stream Receiving Treated Wastewater, Tatsuya Akiyama\* and Mary Savin, Crop, Soil, and Environmental Sciences Department, University of Arkansas, [tatkiyam@uark.edu](mailto:tatkiyam@uark.edu).
2. Antibiotic Fate and Transport in Three Effluent-Dominated Ozark Streams, Leslie Bartsch\*, Brian Haggard, Joel Galloway, and Reed Green, Biological and Agricultural Engineering Department, University of Arkansas, [lbartsc@uark.edu](mailto:lbartsc@uark.edu).
3. Getting to the Other Side: A Look at Road-Stream Interactions Adjacent to Low Water Stream Crossings on the Ozark-St. Francis National Forest, Arkansas, S. Bennet, T. Hocut, and M.A. Crump\*, US Forest Service, [mcrump@fs.fed.us](mailto:mcrump@fs.fed.us).
4. Flood History of the Lower White River Correlated with Climatic Change, Ruchi Bhattacharya\* and Sonja Hausmann, Arts and Sciences Department, University of Arkansas, [rbhattac@uark.edu](mailto:rbhattac@uark.edu).
5. Study of Endocrine Disrupting Chemicals on the Lee Creek Tailwaters, Paul Etzkorn\*, Paul R. Easley, and Roger Lightner, University of Arkansas at Fort Smith in Conjunction with the City of Fort Smith Department of Environmental Quality, [petzko00@uafortsmith.edu](mailto:petzko00@uafortsmith.edu).

## AWRC WATER QUALITY LABORATORY

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The AWRC Water Quality Laboratory provides a variety of analytical analyses for surface and drinking water. The AWRC lab is the only lab in the state accredited under the EPA NELAC standards. For more information about the lab's analytical capability and equipment visit:

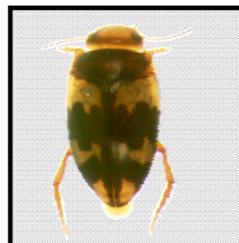
[www.uark.edu/depts/awrc/AWRCWaterQualityLab.htm](http://www.uark.edu/depts/awrc/AWRCWaterQualityLab.htm)

### WHAT'S NEW?

Starting July 1, 2008, aquatic invertebrate identification and bioassessment services will be available through the AWRC Bug Lab in Engineering Hall 318 at the University of Arkansas. The Bug Lab will provide:

- Taxonomic identifications of aquatic invertebrates
- Archive of regional fauna using specimen cataloguing software
- Field sampling, laboratory processing and taxonomic identification—Let us do all the work for you!
- Outreach, extension and bioassessment technology transfer—We can be your information resource.

We are currently working on prices; please contact Brian Haggard, Interim AWRC Director, for more details.



## WEDNESDAY APRIL 23, 2008

### SESSION 5: WATER RESEARCH ACTIVITIES AND STAKEHOLDER ASSESSMENT IN THE UPPER WHITE RIVER AND THE ILLINOIS RIVER

**MODERATOR: BOB MORGAN, BEAVER WATER DISTRICT**

- 8:15** Introduction
- 8:20** Developing Recommended Beaver Lake Water Quality Criteria, Kent Thornton, FTN and Associates (kwt@ftn-assoc.com)
- 8:40** Application of an Upper White River Watershed Scale Model for NPS Load Scenario Analysis, Marty Matlock, Biological and Agricultural Engineering Department, University of Arkansas (mmatlock@uark.edu)
- 9:00** Polluters, Payers and Policy: Stakeholder Opinions of Water Quality in Lincoln Lake Watershed, Jennie Popp, Agricultural Economics and Agribusiness, University of Arkansas (jhpopp@uark.edu)
- 9:20** Implementation of Holistic Watershed Water Monitoring Model for the Illinois River Watershed, Rick Stubblefield, Adair County Representative, Oklahoma Scenic Rivers Commission (grstub@hotmail.com)

### SESSION 6: WATERSHED MANAGEMENT AND MUNICIPAL NUTRIENT REDUCTION ACTIVITIES ACROSS ARKANSAS

**MODERATOR: MIKE MALONE, NORTHWEST ARKANSAS COUNCIL**

- 10:05** Introduction, Format and Panel Assembly
- 10:10** Nonpoint Source Nutrient Management in Fayetteville, Susan Thomas, City of Fayetteville, Arkansas (stthomas@ci.fayetteville.ar.us)
- 10:25** Lake Maumelle Watershed Management Plan and Now What? Martin Maner, Central Arkansas Water (martin.maner@caw.org)
- 10:40** Illinois River Watershed Management Plan: Preliminary Results and Scope, Delia Haak, Illinois River Watershed Partnership (deliahaak@irwp.org)
- 10:55** Comparisons and Contrasts: Driving Forces and Management Objectives for the Beaver Lake, Illinois River, and Lake Maumelle Watersheds, Barry Topping, Tetra Tech (barry.topping@tetrattech-ffx.com)
- 11:10** Questions and Panel Discussion
  - Panel Members:** Delia Haak (IRWP),  
Martin Maner (Central Arkansas Water)  
Susan Thomas (City of Fayetteville)  
Barry Topping (Tetra Tech)
- 12:00** Concluding Remarks and Thank You – Rick Roeder, Associate Director of UA Agricultural Experiment Station

- 6.** 2008 Floods in Arkansas- A USGS Perspective, Jaysson Funkhouser, US Geological Survey, jefunkho@usgs.gov.
- 7.** Water-Use and Population Trends in Northwestern Arkansas, 1960-2005, Terry W. Holland, US Geological Survey, tholland@usgs.gov.
- 8.** The Discovery of a Correlation between Fluorescent Whitening Agents and Macro-invertebrate Biodiversity in Streams, Kaleb Horlick, Fayetteville High School, k\_horlick@fayar.net.
- 9.** An Investigation of Riparian Land Use Changes Adjacent to the Mulberry River and Big Piney Creek from 1936, 1967, and 2001, Ozark-St. Francis National Forests, Arkansas, Melissa J. Jenks and Michael A. Crump\*, US Forest Service, mcrump@fs.fed.us.
- 10.** Photogrammetric Measurement of Stream Bank Erosion in the West Fork White River Watershed, Mansoor D. Leh\*, Sreekala G. Bajwa, Indrajeet Chaubey, Jackson Cothren, and Kwasi Asante, Biological and Agricultural Engineering Department, University of Arkansas, mleh@uark.edu.
- 11.** Modeling L'Anguille River Watershed using Soil and Water Assessment Tool (SWAT) Model, N. Pai\*, D. Saraswat, and P. Tacker, Biological and Agricultural Engineering Department, University of Arkansas, npai@uark.edu.
- 12.** Sager Creek Watershed Management Plan Implementation, Greg Phillips, GBMc & Associates, gphillips@gbmcassoc.com.
- 13.** Identifying Nutrient Thresholds that Alter Stream Microbial Community Function, Thad Scott\*, Jeff Back, Jason Taylor, and Ryan King, Crop Soil and Environmental Sciences Department, University of Arkansas, jts004@uark.edu.
- 14.** Preliminary Investigation of the Distribution of Trace Metals in Soil, Water and Poultry Litter in Northwest Arkansas, Ken Steele\*, Kris Brye, Van Brahana, and Ralph Davis, Geosciences Department, University of Arkansas, ksteele@uark.edu.
- 15.** Long-Term Variation in Sediment Phosphorus below a Rural Effluent Discharge, Ryan Stoner\* and Brian Haggard, Crop, Soil, and Environmental Sciences Department, University of Arkansas, rstoner@uark.edu

## TUESDAY APRIL 22, 2008

**SESSION 3: NEW WATER SCIENCE FACULTY RESEARCH AND PREVIOUS  
USGS 104B STATE WATER RESOURCES INSTITUTE PROJECTS**  
**MODERATOR: BRIAN HAGGARD, ARKANSAS WATER RESOURCES CENTER  
UA DIVISION OF AGRICULTURE**

- 1:30** Watershed and Lacustrine Controls on Nitrogen Fixation in Reservoirs, Thad Scott, Crop, Soil and Environmental Sciences Department, University of Arkansas (jts004@uark.edu)
- 1:50** Biological Thresholds and Water Quality Criteria in Central Plains Streams, Michelle Evans-White, Biology Department, University of Arkansas (mevanswh@uark.edu)
- 2:10** Seasonal Limnological Changes of Beaver Reservoir, Sonja Hausmann, Geosciences Department, University of Arkansas (shausman@uark.edu)
- 2:30** Oxygen Isotope Ratios as a Tracer for Sources and Cycling of Phosphorus in the Illinois River in Arkansas and Oklahoma, Brian Breaker, Geosciences Department, University of Arkansas (bbreake@uark.edu)

**SESSION 4: AQUATIC CONSERVATION AND IMPLEMENTATION OF THE STATE  
WILDLIFE GRANTS PROGRAM**  
**MODERATOR: JANE ANDERSON, STATE WILD LIFE GRANTS PROGRAM  
ARKANSAS GAME AND FISH COMMISSION**

- 3:15** Overview of the State Wildlife Grants Program and Its Relevance to Water Resources, Jane Anderson, Arkansas Game and Fish Commission (jeanderson@agfc.state.ar.us)
- 3:35** Finding a Needle in a Channelized Haystack: Updated Distribution of an Endemic Water Beetle in the Ozark Highland and Boston Mountain Ecoregions, Scott Longing, Biological and Agricultural Engineering Department, University of Arkansas (slonging@uark.edu)
- 3:55** Influence of Land Use, Flow Regime and Ecoregion on Stream Habitat and Fish Assemblage Structure, Dan Magoulick, Arkansas Fish and Wildlife Cooperative Research Unit, University of Arkansas (danmag@uark.edu)
- 4:15** Status and Distribution of Williams' Crayfish, *Orconectes williamsi*, in Arkansas, Brian Wagner, Arkansas Game and Fish Commission (bkwagner@agfc.state.ar.us)

## ON THE ROCKS PATIO & GRILL SOCIAL

Sponsored by Hach Environmental  
Tuesday, April 22 from 7:00-9:00 PM

On the Rocks Patio & Grill is located at 339 North West Avenue (north of Dickson Street)  
~15 minute walk from the Cosmopolitan hotel



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*Be Right. The Environment is Worth it.*

Hach Environmental manufactures Hydrolab water quality instruments and OTT water level/discharge instruments. Dave Procyk is a Factory Direct Manager and please contact him at 512-288-5831 or check us out at [www.hachenvironmental.com](http://www.hachenvironmental.com).

