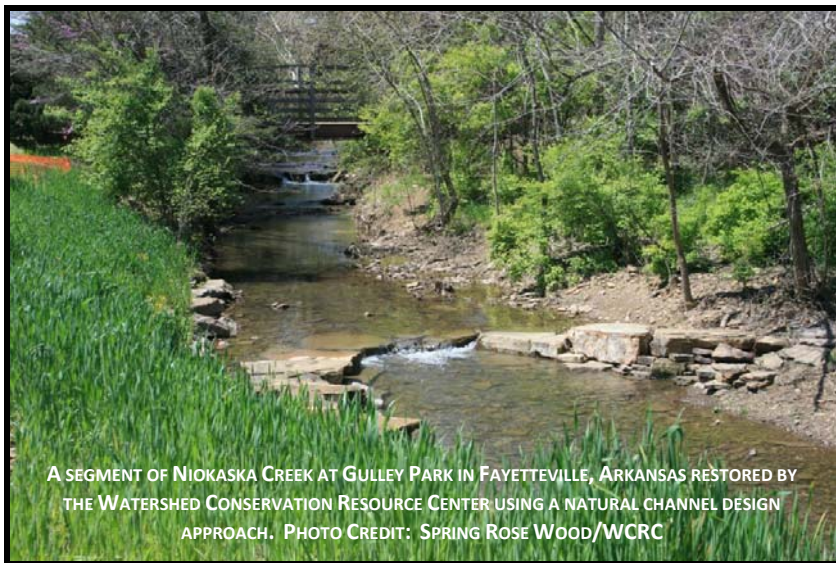




## 2010 ANNUAL RESEARCH AND WATERSHED CONFERENCE

APRIL 13-14, 2010 • FAYETTEVILLE, ARKANSAS  
UNIVERSITY OF ARKANSAS



A SEGMENT OF NIOKASKA CREEK AT GULLEY PARK IN FAYETTEVILLE, ARKANSAS RESTORED BY  
THE WATERSHED CONSERVATION RESOURCE CENTER USING A NATURAL CHANNEL DESIGN  
APPROACH. PHOTO CREDIT: SPRING ROSE WOOD/WCRC

**UofA** UNIVERSITY OF ARKANSAS  
DIVISION OF AGRICULTURE

# Arkansas Water Resources Center

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## THE WATER RESOURCES RESEARCH ACT

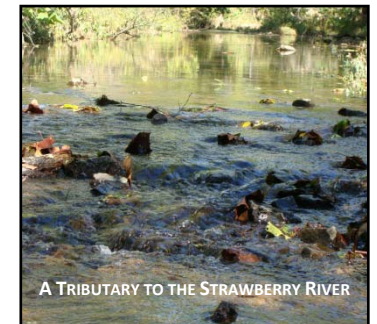


In 1964, Congress passed the Water Resources Research Act, establishing 54 water resources research institutions like Arkansas Water Resources Center at land grant universities throughout the United States. The State Water

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.

Each fall, the AWRC accepts applications for projects funded through the 104b program. This year, the Arkansas Water Resources Center funded three projects including:

- Determination of the magnitude of mercury methylation in the water column of a high organic carbon river, lower Ouachita River, Union and Ashley Counties, Arkansas, Phil Hays, University of Arkansas and US Geological Survey, \$19,761.
- Assessment of water quality and stream bank stability following BMP implementation on the upper Strawberry River watershed, Jennifer Bouldin, Arkansas State University, \$22,000.
- Denitrification, internal nitrogen cycling and nitrogen retention in river impoundment reservoirs, Thad Scott, UA Division of Agriculture, \$20,579.



# AWRC ANNUAL CONFERENCE PROGRAM AT A GLANCE

**TUESDAY APRIL 13, 2010**

- 7:45-8:15 Coffee, Juice, Pastries  
8:15- 9:30 Session 1: Groundwater Issues near Eureka Springs, Arkansas  
9:30-9:45 Refreshment Break  
9:45-11:35 Session 2: Emerging Issues Facing Groundwater in Arkansas  
11:35-12:30 Lunch Break  
12:30-1:30 Poster Session and Student Poster Competition  
1:30-3:00 Session 3: Reservoirs—Understanding and Managing Ecosystem Services  
3:00-3:15 Refreshment Break  
3:15-5:00 Session 4: Water Supply Reservoirs—Research Needs and Consortium Possibilities  
8:00-9:30 Social at Damgoode Pies

**WEDNESDAY APRIL 14, 2010**

- 7:45- 8:15 Coffee, Juice, Pastries  
8:15- 10:10 Session 5: Improving Aquatic Habitat, Water Quality, and Riparian Areas through Stream Restoration and Bank Stabilization Projects  
10:10-10:30 Coffee Break  
10:30-11:30 Session 6: Improving Aquatic Habitat, Water Quality, and Riparian Areas through Stream Restoration and Bank Stabilization Projects—Continued  
11:55-1:00 Lunch (On Your Own)  
1:00-5:00 Field Tour of West Fork White River Stream Restoration at Brentwood (Meet in front of the Cosmopolitan Hotel)

# ORAL SESSION SCHEDULE

**TUESDAY APRIL 13, 2010**

## **SESSION 1: GROUNDWATER ISSUES NEAR EUREKA SPRINGS, ARKANSAS**

**MODERATOR: SUSAN BOLYARD, U.S. GEOLOGICAL SURVEY**

- 8:15** Welcome and Introduction, Brian Haggard, Director, AWRC  
**8:20** The Crumbling Karst of Eureka Springs, Arkansas, Jim Helwig, Consulting Geologist, Eureka Springs (jahelwig@hotmail.com)  
**8:50** Emerging Contaminants Analysis Results for a Single Sampling Event at Eureka Springs, Arkansas—Implications for the Status of Groundwater Quality, Phillip Hays, U.S. Geological Survey (pdhays@usgs.gov)  
**9:10** Results of Initial Reconnaissance of Major Ions, Trace Metals and Nutrients in Groundwater in Eureka Springs, Roger Miller, Arkansas Department of Environmental Quality (millerr@adeq.state.ar.us)  
**9:30** Follow-up Discussion, Questions and Refreshment Break

## **SESSION 2: EMERGING ISSUES FACING GROUNDWATER IN ARKANSAS**

**MODERATOR: PHIL HAYS, U.S. GEOLOGICAL SURVEY**

- 9:45** Industry Perspective on Shale Gas Drilling and Production on Water Resources, Doug Melton, Southwest Energy Company, (Doug\_Melton@swn.com) *Key Note Speaker*  
**10:10** Regulatory Perspective on Shale Gas Drilling and Production on Water Resources, Chris Davidson, U.S. Fish and Wildlife Service (chris\_davidson@fws.gov) *Key Note Speaker*  
**10:35** Hot Springs Management Strategy for Recharge Protection, Steve Rudd, National Parks Service (stephen\_rudd@nps.gov)  
**11:00** Surface Water and Groundwater Interaction: Using Groundwater Geochemistry to Assess River-Water Infiltration and Natural geochemical Evolution in the Arkansas river Alluvial Aquifer, Tim Kresse, U.S. Geological Survey (tkresse@usgs.gov)

## **LUNCH AND POSTER SESSION**

- 11:35- 12:30** Lunch Break – Penguin Ed’s Barbeque (Foyer and Room 405)  
**12:30- 1:30** Poster Session and Student Poster Competition (Presenters should stand at Posters, Room 405)

# NOTES

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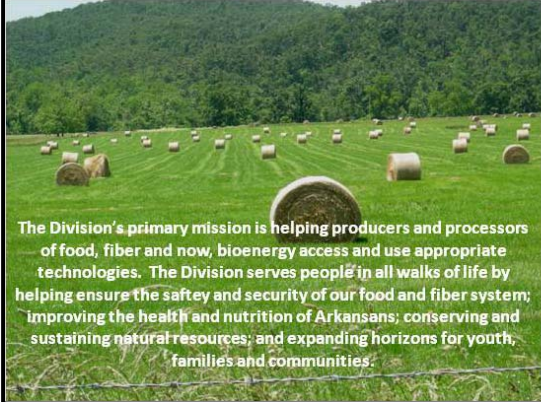
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# PENGUIN ED’S BBQ

**11:35-12:30** in the Foyer  
Sponsored by UA Division of Agriculture



The Division's primary mission is helping producers and processors of food, fiber and now, bioenergy access and use appropriate technologies. The Division serves people in all walks of life by helping ensure the safety and security of our food and fiber system; improving the health and nutrition of Arkansans; conserving and sustaining natural resources; and expanding horizons for youth, families and communities.



**UNIVERSITY OF ARKANSAS**  
**DIVISION OF AGRICULTURE**

Arkansas Is Our Campus

## POSTER SESSION

**12:30-1:30** in Rooms 405-407  
Sponsored by UA Division of Agriculture

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. Persistence of Broad-Host-Range Plasmids in Municipal Wastewater Treatment Plants Utilizing Chlorination and UV-Irradiation Disinfection Regimes. K.L. Asfahl\*, T. Akiyama and M.C. Savin, Department of Crop, Soil and Environmental Sciences, University of Arkansas, kasfahl@uark.edu.  
*Student Poster Presenter.*
2. Biologically-Mediated Phosphorus Flux in Illinois River Tributaries. B. Drake\* and J.T. Scott, Department of Crop, Soil and Environmental Sciences, University of Arkansas, mdrake@uark.edu.  
*Student Poster Presenter.*
3. Assessment of OHV Trails in the Lee Creek Watershed. P.R. Easley\* and Don Clover, Fort Smith Utility, RandyE@fortsmithar.gov.
4. Tangential Flow, Ultrafiltration and Molecular Detection of Human and Animal Enteric Viruses in Environmental Water Samples. K. Gibson, Johns Hopkins Bloomberg School of Public Health, kgibson@jhsph.edu.
5. Nitrogen Retention and Denitrification Efficiency in Reservoirs. E.M. Grantz\* and J.T. Scott, Department of Crop, Soil and Environmental Sciences, University of Arkansas, egrantz@uark.edu.  
*Student Poster Presenter.*
6. Designing a Demonstration of Nutrient Removal from a Wastewater Treatment Process Utilizing an Algal Growth Bed. J. Hickie and E. Boles. Department of Biological and Agricultural Engineering, University of Arkansas, jphickle@uark.edu, e.boles@uark.edu.  
*Student Poster Presenter.*
7. Modeling Watershed Scale Sediment Loading in the West Fork of the White River using the Soil and Water Assessment Tool. C. N. Jones\*, M.D. Leh, and S.G. Bajwa, Department of Biological and Agricultural Engineering, University of Arkansas, cnj001@uark.edu.  
*Student Poster Presenter.*
8. Application of the Annualized Agricultural Non-Point Source (AnnAGNPS) Model in the West Fork White River Watershed. M.D. Leh\*, S.G. Bajwa and I. Chaubey, Department of Biological and Agricultural Engineering, University of Arkansas, mleh@uark.edu.
9. Cooperative Stakeholder Engagement for Fostering Participation and Gaining Effective Results. J.H. Pennington\*, J. Popp, G. Rodriguez, I. Chaubey, and E. Gbur, Washington County Cooperative Extension, jhpennington@uaex.edu
10. Outreach and Education at Its Finest: Working with all Stakeholder Groups to Address Water Quality Issues in an Impaired Watershed. J.H. Pennington\* and K. Teague, Washington County Cooperative Extension, jhpennington@uaex.edu
11. Sediment-Water Column Interaction for Streams in the Upper Illinois River Watershed. C.W. Rogers\*, A.N. Sharpley, and B.E. Haggard, Department of Crop, Soil and Environmental Sciences, University of Arkansas, cwrogers@uark.edu.  
*Student Poster Presenter.*
12. Effects of Natural Gas Drilling on Stream Quality and Periphyton in the Fayetteville Shale. A. Jackson, M. Evans-White\*, and S. Entekin, Department of Biological Sciences, University of Arkansas, mevanswh@uark.edu.
13. Cooling Broiler Chickens with Less Water Using Controlled Surface Wetting Method. Y. Liang\*, G.T. Tabler, S. Watkins, and I. Berry, Department of Biological and Agricultural Engineering, yliang@uark.edu
14. Connecting Arkansans to their Watershed. S. DeVries\* and K. Finefield, Arkansas Watershed Advisory Group, DEVRIES@adeq.state.ar.us.

# NOTES

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# TUESDAY APRIL 13, 2010

**SESSION 3: RESERVOIRS—UNDERSTANDING AND MANAGING ECOSYSTEM SERVICES  
MODERATOR: THAD SCOTT, UA DIVISION OF AGRICULTURE**

- 1:30 Water Management 101—Corps of Engineers Little Rock District, Janis Jones, US Army Corps of Engineers (jan.r.jones@usace.army.mil)
- 2:00 Reservoir Eutrophication—déjà vu All Over Again, Kent Thornton, FTN & Associates (kwt@ftn-assoc.com)
- 2:15 Eutrophication Trends Inferred from Hypolimnetic Dissolved Oxygen Dynamics within Selected White River Reservoirs, Northern Arkansas-Southern Missouri, 1974-2008, Reed Green, Jeanne DeLanois and Drew Westerman, U.S. Geological Survey (wrgreen@usgs.gov)
- 2:30 General Principles of Sedimentation in Ozark Reservoirs, Steve Boss, University of Arkansas (sboss@uark.edu)
- 2:45 Reservoir Fisheries Management: The Basics and Conflicts, Darrell Bowman, Bella Vista Property Owners Association (DarrellB@bwpoa.com)
- 3:00 Refreshment Break

**SESSION 4: WATER SUPPLY RESERVOIRS—RESEARCH NEEDS AND CONSORTIUM  
POSSIBILITIES  
MODERATOR: BOB MORGAN, BEAVER WATER DISTRICT**

- 3:15 Regulated Drinking Water Contaminants in Arkansas Reservoirs, Robert Hart, Arkansas Department (Robert.Hart@arkansas.gov)
- 3:30 Water Quality Concerns and Research Needs—Fort Smith Water Supplies, Randy Easley, Fort Smith Utility (RandyE@fortsmithar.gov)
- 3:45 Water Quality Concerns and Research Needs—Russellville Water Supplies, Craig Noble, Russellville Water Utilities (cnoble@citycorporation.com)
- 4:00 Qualitative Risk Assessment for Lake Maumelle, Martin Maner, Central Arkansas Water (Martin.Maner@carkw.com)
- 4:15 Water Quality Concerns and Research Needs—Lake Wister, OK, Steve Patterson, Bio x Design (spatterson5000@earthlink.net)
- 4:30 Baylor’s Research-Management Partnership Experience: The Center for Reservoir and Aquatic Systems Research, Robert Doyle, Baylor University (Robert\_Doyle@baylor.edu)
- 4:45 Follow-up Discussion, Questions and Next Steps



## DAMGOODE PIES SOCIAL

Tuesday, April 13 from 8:00-9:30 PM  
Sponsored by Hach Environmental

Damgoode Pies is located at 37 East Center Street  
(Just East of the Square)  
~ 2 minute walk from the Cosmopolitan Hotel



HACH Hydromet manufactures Hydrolab water quality instruments and OTT water level/discharge instruments. Contact Dave Procyk, Factory Direct Manager, at 512-288-5831 or check them out at [www.hachhydromet.com](http://www.hachhydromet.com).



## WEDNESDAY APRIL 14, 2010

**SESSION 5: IMPROVING AQUATIC HABITAT, WATER QUALITY, AND RIPARIAN AREAS THROUGH STREAM RESTORATION AND BANK STABILIZATION PROJECTS**  
**MODERATOR: MAT VAN EPPS, WATERSHED CONSERVATION RESOURCE CENTER**

- 8:15** Stream Channel Process and Ecological Services, Eric Cummings, UA Division of Agriculture (ecummin@uark.edu)
- 8:40** Prioritizing Stream Reaches for Restoration on the West Fork White River, Sandi Formica, Watershed Conservation Resource Center (formica@watershedconservation.org)
- 9:10** Designing and Constructing Stream Restoration to Improve Habitat for Fish and Mussel Species of Concern in the Saline River, Joy DeClerk, The Nature Conservancy (jdeclerk@tnc.org)
- 9:40** Improving Arkansas Fisheries and Providing Hands-On Environmental Education through Streambank Restoration Projects, Dave Evans and Tim Burnley, Arkansas Game & Fish Commission (daevans@agfc.state.ar.us; tburnley@agfc.state.ar.us)
- 10:10** Refreshment Break

**SESSION 6: IMPROVING AQUATIC HABITAT, WATER QUALITY, AND RIPARIAN AREAS THROUGH STREAM RESTORATION AND BANK STABILIZATION PROJECTS—CONTINUED**  
**MODERATOR: MARTY MATLOCK, CENTER FOR AGRICULTURAL AND RURAL SUSTAINABILITY**

- 10:30** Addressing Headwater Streams as a Sediment Source in the Delta, Matt Lindsey, The Nature Conservancy (mlindsey@tnc.org)
- 11:00** Design and Construction of a Streambank Stabilization Project to Improve Habitat for the Yellowcheek Darter and Speckled Pocketbook Mussel in the Little Red River Watershed, Josh Duzan and Ethan Inlander, The Nature Conservancy (jduzan@tnc.org; einlander@tnc.org)
- 11:30** Design and Implementation of Urban and Rural Stream Restoration to Reduce Sediment and Phosphorus Loadings in the Illinois River and Beaver Lake Watersheds, Matt Van Eps, Watershed Conservation Resource Center (vaneps@watershedconservation.org)
- 11:55** Lunch Break (On Your Own)



# NOTES

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**FIELD TOUR OF WEST FORK WHITE RIVER STREAM RESTORATION AT BRENTWOOD  
TOUR LEADERS: SANDI FORMICA AND MATT VAN EPS, WATERSHED CONSERVATION AND  
RESOURCE CENTER**

You are invited to join us for a field tour of the West Fork White River Stream Restoration Project at Brentwood. The project site is about 20 minutes from Fayetteville, just off of Highway 71 South at the community of Brentwood. Wear comfortable clothes and walking shoes. Also bring water and bug spray. Transportation is provided; please meet in front of the Cosmopolitan Hotel by no later than 1:00 PM. It takes approximately one and a half to two hours to walk and discuss the site, so plan to be back at the hotel before 4:00 PM. If you are headed south that day, you may want to bring your own vehicle.

The Watershed Conservation Resource Center (WCRC) worked with local landowners and partners to restore a 1,600 ft section of the West Fork White River (WFWR) near Brentwood, AR. A natural channel stream restoration design was developed and implemented for the unstable section of river, which had streambank erosion rates as high as 13 ft/year and was contributing an average of 1,400 tons of sediment for an average flow year. The new channel design resulted in locating the river away from severely eroding banks and eliminating abrupt and sharp turns in the river channel. Structures made of natural materials were constructed to deflect higher velocity flow toward the center of the channel, further reducing near-bank shear stress and minimizing erosion. The old channel was converted into a series of four settling ponds that act as ephemeral wetlands. Hundreds of native trees, shrubs, and grasses were planted and native grass and wildflower seeds were distributed throughout the site to provide erosion control, improve the riparian areas, and enhance the terrestrial habitat. The project was funded by an EPA Section 319(h) grant administered by the Arkansas Natural Resources Commission with matching funds provided by project partners. Through this project, accelerated streambank erosion has been eliminated; aquatic habitat has been improved; riparian areas have been enhanced; and sediment loadings to the WFWR from this site have been reduced by over 97% improving the WFWR and Beaver Lake's water quality.

**Project Partners**  
Arkansas Natural Resource  
Commission  
U.S. Environmental Protection  
Agency  
Watershed Conservation Resource  
Center  
Arkansas Game & Fish Commission

The image shows a green-bordered box containing the text 'Project Partners' followed by a list of four organizations: Arkansas Natural Resource Commission, U.S. Environmental Protection Agency, Watershed Conservation Resource Center, and Arkansas Game & Fish Commission.



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