

2012 Annual Watershed and Research Conference July 11-12, 2012 · Fayetteville, Arkansas

State Water Planning Process and Reservoir Management



DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
University of Arkansas System

# Welcome to the 2012 Annual Watershed and Research Conference

#### **Arkansas Water Resources Center**

203 Engineering Hall University of Arkansas Fayetteville, Arkansas 72703

www.uark.edu/depts/awrc

Dr. Brian E. Haggard, Professor and Director Leslie B. Massey, Project Manager

### **2012 AWRC Technical Advisory Committee**

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AWRC would like to thank the Technical Advisory Committee (TAC) for their service to AWRC. The TAC has the opportunity to evaluate proposals submitted annually to the USGS 104B Program, to recommend session topics included in the annual research conference and to provide general advice to the AWRC Director and staff.



## Wednesday, July 11, 2012 · Program At-A-Glance

8:00-9:20	Registration/Coffee, Juice & Pastries
9:30-9:40	Welcome and Introduction, Brian Haggard, Director, Arkansas Water Resources Center
9:40-11:30	Session 1: The State Water Planning Process
11:30-12:30	Networking Lunch (Foyer)
12:30-1:30	REU Student Poster Presentations and Competition
1:30-2:30	Session 2: State and Federal Agency Perspective on Water Data Availability
2:30-2:55	Refreshment Break
3:00-4:20	Session 3: Drinking Water Supply Perspective on State Water Planning
7:00-9:00	Evening Social at Farrell's Lounge



## Thursday, July 12, 2012 · Program At-A -Glance

7:45-8:10	Registration/Coffee, Juice & Pastries
8:15-9:50	Session 4: Source Water Protection to Reservoir Restoration I
9:50-10:15	Refreshment Break
10:15-11:45	Session 5: Source Water Protection to Reservoir Restoration II
11:45-12:55	Networking Lunch (Foyer)
1:00-2:20	Session 6: Source Water Protection to Reservoir Restoration III
2:20-2:50	Refreshment Break
2:50-4:00	Session 7: Source Water Protection to Reservoir Restoration IV
4:00	Adjourn



### Wednesday, July 11, 2012 · Oral Sessions

8:00 Registration/Coffee, Juice & Pastries

#### **Session 1: The State Water Planning Process**

**Moderator: Brian Haggard,** Professor and Director, Arkansas Water Resources Center, UA System Division of Agriculture

- 9:30 **Welcome and Introduction, Brian Haggard**, Professor and Director, Arkansas Water Resources Center, UA System Division of Agriculture
- 9:40 Introduction to the Session and Overview of the Legislative
  Approval Process Authorizing the Update to the Arkansas Water
  Plan, Edward Swaim, Arkansas Natural Resources Commission
- 9:50 Developing Statewide Water Resource Plans—Select Findings, Trends and Lessons Learned, Rick Brown, CDM Smith
- 10:15 Water Issues in Arkansas—Looking Back-What Do We Know Today about Some of Arkansas's Water Resource Challenges and Opportunities, Kent Thornton, FTN & Associates
- 10:40 The Update to the Arkansas Water Plan—Looking Forward-The Status and Next Steps for Completing the Arkansas Water Plan, Mike Beezhold, CDM Smith
- 11:05 A Retrospective of the Oklahoma State Water Planning Process,
  Duane Smith, Formerly Oklahoma Water Resources Board

#### **Lunch and REU Student Poster Session**

- 11:30 Lunch Provided in the Foyer
- 12:30 REU Poster Session and Competition

## **Networking Lunch**

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### Wednesday, July 11, 2012 Poster Session

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

#### **REU Student Poster Competition:**

The Research Experience for Undergraduates (REU) Program supports active research participation by undergraduate students in any of the areas of research funded by the National Science Foundation. Each student is associated with a specific research project, where he or she works closely with faculty and other researchers. The following posters represent the work of the students participating in the 2012 REU Summer Research Program at the University of Arkansas at Fayetteville. On the form provided in your registration packet, 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 3 PM today. The winners will be announced at the conclusion of Session 3.

1. Plankton Composition, Biomass, and Stoichiometry along an N:P Supply Gradient

**REU Students:** Blake Ahrendsen, University of Arkansas and Katherine Hooker, Baylor University

**Co Authors:** Dr. J. Thad Scott, Department of Crop, Soil and Environmental Sciences, University of Arkansas

2. Evaluation of Stable Isotope Analysis for Determining Diet Breadth of the Western Cottonmouth (Agkistrodon piscivorus leucostoma)

**REU Student:** Joseph Baecher, University of Arkansas

**Co Authors:** Jason Ortega and Dr. Steven Beaupre, Department of Biological Sciences, University of Arkansas

3. Identifying Incentives for Swine Producer Participation in a Carbon

#### **Trading Market**

**REU Student:** Michael Black, Cornell University

**Co Authors:** Dr. German Rodriquez and Dr. Jennie Popp, Department of Agricultural Economics and Agribusiness, University of Arkansas

#### 4. Impact of Canopy Cover, In-Stream Factors and Periphyton on Dissolved Oxygen

**REU Students:** Brooke Brehm, Arkansas School for Math, Science & Arts and Christopher Rose, Bloomsberg University of Pennsylvania **Co Authors:** Eric Cummings and Dr. Marty Matlock, Department of Biological and Agricultural Engineering, University of Arkansas

#### The Relationship between Crayfish Abundance and Hydrologic Factors in Ozark Highland Streams

**REU Student:** Kelsey Deal, Baylor University

**Co Authors:** Dustin Lynch and Dr. Dan Magoulick, Department of Biological Sciences, University of Arkansas

#### 6. A Comparison of Water Use Across U.S. Pork Production Strategies

**REU Student:** Heather Humphrey-Patton, University of Central Arkansas **Co Authors:** Eric Boles and Dr. Marty Matlcok, Department of Biological and Agricultural Engineering, University of Arkansas

## 7. Influence of Geomorphology and Land Use on Fish and Invertebrate Community Structure

**REU Student:** Alexa Kusmik, University of Maine at Farmington **Co Authors:** Dustin Lynch and Dr. Dan Magoulick, Department of Biological Sciences, University of Arkansas

#### 8. Making Bubbles: Parameters & Processes for Spinning Hollow Fiber Membranes for CO2 Diffusion

**REU Students:** Joel Mounts, Grand Valley State University and Dustin Bonzo, Pittsburg State University

**Co Authors:** Amy McGraw, and Dr. Jamie Hestekin, Department of Chemical Engineering, University of Arkansas

## **REU Poster Session and Competition**

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#### Phosphorus Dynamics in Soils Amended with Chitosan-Treated Poultry Litter

**REU Student:** Willis Runyon, University of Arkansas

 $\textbf{Co Authors:} \ \textbf{lain Bailey and Dr. Brian Haggard, Department of Biological}$ 

and Agricultural Engineering, University of Arkansas

#### 10. Benthic Sedimentation Effects

**REU Student:** Dakota Scrivener, University of Arkansas

Co Authors: Katie Rose and Dr. Michelle Evans-White, Department of

Biological Sciences, University of Arkansas

## 11. Search for New Biofuel Microbes: Isolation of Thermophilic Microbes from Soil

**REU Student:** Alexis Solis, Bowie State University

Co Authors Dr. Ravi Barabote, Department of Biological Sciences,

University of Arkansas

## 12. A Novel Method to Determine the Threshold Elemental Ratio of the Aquatic Grazer *Stenonema*

**REU Student:** Katharine Stewart, Northeastern State University

Co Authors: Halvor Halvorson and Dr. Michelle Evans-White, Department

of Biological Sciences, University of Arkansas

#### 13. A Genomic Comparison among Mesophilic and Thermophilic Bacteria

**REU Student:** Kip Teegardin, University of Arkansas, Fort Smith

Co Authors: Dr. Ravi Barabote, Department of Biological Sciences,

University of Arkansas

#### 14. What's the Best Method to Measure Sestonic Chlorophyll-a?

**REU Student:** Derrick Washington, University of Arkansas

**Co Authors:** Leslie Massey and Dr. Brian Haggard, Department of Biological and Agricultural Engineering, University of Arkansas



### Wednesday, July 11, 2012 · Oral Sessions

## Session 2: State and Federal Agency Perspectives on Water Data Availability

**Moderator: Edward Swaim,** Chief, Water Resources Management Division, Arkansas Natural Resources Commission

- 1:30 Source Water Protection at ADH-Engineering: An Update, Darcia Routh, Geology Supervisor, AR Department of Health-Engineering
- 1:50 Groundwater Resources in Arkansas—Building the Framework, Brian Clark, Hydrologist, U.S. Geological Survey, Arkansas Water Science Center
- 2:10 Surface Water Data Availability in Arkansas, David Freiwald,
  Director, U.S. Geological Survey, Arkansas Water Science Center
- 2:30 Networking Break

## Session 3: Drinking Water Supply Perspective on State Water Planning

**Moderator, Thad Scott,** Assistant Professor, Department of Crop, Soil and Environmental Sciences, University of Arkansas

- 3:00 Updating the State Water Plan, A Water Utility Perspective, Randy Easley, Director of Water Quality, Central Arkansas Water
- 3:20 Source Water Protection and Other Water Utility Issues, Robert Hart, Technical Services Officer, Central Arkansas Water
- 3:40 Water Supply and Source Water Protection Issues in Northwest Arkansas, Bob Morgan, Manager of Environmental Quality, Beaver Water District
- 4:00 Lag in Water Quality from BMP Implementation at the Watershed Scale, Don Meals, Environmental Scientist, Ice.Nine Environmental Consulting
- 7:00 Evening Social at Farrell's Lounge

## **Networking Break**

Sponsored by Ozarks Water Watch



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## **Evening Social at Farrell's Lounge**

Sponsored by Hach Hydromet

Wednesday, July 11, 7:00-9:00 PM

Farrell's is located at 311 West Dickson Street.

Please note that all of Fayetteville's downtown parking is now pay parking at a rate of \$1 per hour.



#### National Institutes for Water Resources



US Congress passed the Water Resources Research Act in 1964 establishing fifty-four water resources research institutions such as the Arkansas Water Resources Center at land grant universities through-

out the United States. The State Water Resources Research 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:

- Preparing Drinking Water Utilities on Beaver Lake Reservoir to Meet Disinfection Byproduct Regulations: The Impact of Continued Nutrient Enrichments, Julian Fairey and Wen Zhang, University of Arkansas, \$31,996
- Development and Implementation of Nutrient Runoff Reduction Measures for Poultry Houses, Andrew Sharpley and David Miller, UA Division of Agriculture
- The Effect of Global Climate Change on Algal Biomass and Total Organic Carbon Concentrations in Beaver Lake, Thad Scott, UA Division of Agriculture

For more information about the National Institutes for Water Resources visit niwr.net.



Thursday, July 12, 2012 Oral Sessions

### Coffee, Juice & Pastries 7:15-8:15 AM

Sponsored by BlueInGreen



7:15 Registration/Coffee, Juice & Pastries

#### Session 4: Source Water Protection to Reservoir Restoration I

Moderator: Steve Patterson, Restoration Ecologist, BioXDesign

- 8:15 Welcome and Introduction: From Source Water Protection to Restoration and Ecosystem Design, Steve Patterson, Restoration Ecologist, BioXDesign
- 8:35 **Keynote Speaker:** 
  - **17 Methods (of Lake Restoration) in 17 Minutes, Alex Horne**, Professor Emeritus, Department of Civil and Environmental Engineering, University of California, Berkeley
- 8:55 **Keynote Speaker:** 
  - Case Studies of Hypolimnetic Oxygenation in Western Lakes and Reservoirs, Marc Beutel, Associate Professor, Department of Civil and Environmental Engineering, Washington State University
- 9:25 Supersaturated Dissolved Oxygen Injection at Lake Brittany and Other Arkansas Reservoirs, Clay Thompson, Senior Engineer, BlueInGreen, LLC
- 9:50 Networking Break

### **Networking Break**

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#### Water Monitoring Solutions




#### Session 5: Source Water Protection to Reservoir Restoration II

**Moderator: Marty Matlock,** Professor, Department of Biological and Agricultural Engineering, University of Arkansas

- 10:15 Design and Performance of a Hypolimnetic System in Lake
  Thunderbird, Norman, Oklahoma, Steven Cadenhead, Environmental
  Program Specialist, Oklahoma Water Resources Board
- 10:45 Influence of Natural Processes on Artificial Oxygenation, Paul Gantzer,
  President, Gantzer Water Resource Engineering
- 11:15 Oxygenation Options for Lake Tenkiller: A More Reliable Solution for Fish than Lawsuit of Watershed Management?, Alex Horne, Professor Emeritus, Department of Civil and Environmental Engineering, University of California at Berkeley

#### **Networking Lunch**

11:45 Lunch Provided in the Foyer

#### Session 6: Source Water Protection to Reservoir Restoration III

**Moderator: Scott Osborn,** Associate Professor, Department of Biological and Agricultural Engineering, University of Arkansas

- 1:00 A Historical Overview of Alum Treatment in Lakes in Washington State, Marc Beutel, Associate Professor, Department of Civil and Environmental Engineering, Washington State University
- 1:30 Use of Aluminum Sulfate (Alum) to Improve Lake Water Quality, John Holz, Tadd Barrow and Paul Brakhage, HAB Aquatic Solutions
- 2:00 A Passive Flocculent Injection System for Sediment Control on Construction Sites, Jason Vogel, Dan Storm, Karl Garbrecht and Bill Barfield, Oklahoma State University
- 2:30 Networking Break

#### Session 7: Source Water Protection to Reservoir Restoration IV

Moderator: Steve Patterson, Restoration Ecologist, BioXDesign

- 2:50 Balancing Competing Uses: The Potential of Reservoirs as Nutrient and Sediment Sinks in the Landscape, Thad Scott and Erin Grantz, Assistant Professor, Department of Crop, Soil and Environmental Sciences, University of Arkansas
- 3:10 Nutrient Abatement Program for Lake Ecosystems (NAPLE): A New Funding Source for Lakes? John Holz, Tadd Barrow and Paul Brakhage, HAB Aquatic Solutions
- 3:40 Panel Discussion: Reservoir Restoration and Ecosystem Design Issues
- 4:00 Adjourn

## **Networking Lunch**

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## **Pre-Registered Conference Participants**

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The AWRC is grateful for the support given by the sponsors and exhibitors. See back of program for a list of sponsors; sponsors of individual events are recognized throughout the program.

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