

ARKANSAS WATER RESOURCES CENTER

Nutrients, Water Quality and Harmful Algal Blooms



*Lake Ouachita, Arkansas
Courtesy of Mark Corder*

JULY 26 & 27, 2016
AWRC Annual Conference
Fayetteville Town Center

WELCOME TO THE 2016 ANNUAL WATERSHED & RESEARCH CONFERENCE

Dr. Brian Haggard, Professor & Director
Erin Scott, Program Manager

2016 TECHNICAL ADVISORY COMMITTEE

Nathan Wentz - ADEQ

Randy Easley - Central Arkansas Water

Michelle Evans-White - University of Arkansas

Jerry Farris - Arkansas State University

Reed Green - US Geological Survey

Hal Liechty - University of Arkansas Monticello

Robert Morgan - Beaver Water District

Tony Ramick - ANRC

Michele Reba - USDA-ARS

Andrew Sharpley - UA Division of Agriculture

Tim Snell - The Nature Conservancy

Billy Ammons - CH₂M HILL OMI

Darcia Routh - ADH

John Pennington - Beaver Watershed Alliance

David Johnston - Arkansas Geological Survey

We appreciate your service!



Tuesday July 26

7:00 am

Check-in, Coffee, Juice, Pastries

*Session 1: The Complex Nature of Water
Quality Management*

8:30 am

Conference Welcome & Introduction

Brian Haggard, *AWRC Director, UA Dept. of
Biological and Agricultural Engineering*

8:40 am

Weather in 2016 So Far/A Look Ahead

John Lewis, *National Weather Service Little Rock*

9:10 am

Water Quality – Why Such a Challenge?

Rick Cruse, *Iowa Water Center*

9:35 am

Progress Report: Nutrient Trading in
Arkansas and Act 335 – The Possibilities

Heath Ward, *Springdale Water Utilities,
Nutrient Trading Advisory Panel*

10:00 am Networking Break

*Thank you
sponsors!*



Networking Break
sponsored by





Session 2: Nutrient Sources and Transport

10:30 am

Nitrate Transport in Karst Environments:
Surface Runoff vs Groundwater Inputs

Tim Kresse, *US Geological Survey Arkansas
Water Science Center*

10:45 am

Hydrologic Connectivity and its Effects on
Downstream Hydrology and Water Quality

Nate Jones, *Virginia Tech Department of Forest
Resources and Environmental Conservation*

11:00 am

Phosphorus in Streambanks: a Source of
Phosphorus to Streams and Rivers

Garey Fox, *Oklahoma Water Resources Center*

11:15 am

Applications of Reservoir Limnology
Theory and Steady State Modeling to
Eutrophication Management in Beaver
Reservoir, Arkansas

Matthew Rich, *University of Arkansas Depart-
ment of Crop, Soil and Environmental Sciences*

Lunch & Poster Session

11:30 am Lunch Provided

12:30 pm Poster Session

**Presenters should chaperone their
posters.**

POSTER SESSION

REU STUDENT POSTERS

Gross Energy Output of Global Fisheries and Aquaculture

Student Barbara M. Barnett, York College

Advisor Dr. Stephen K. Boss

Mentor Quinn Montana

Inter-annual Variability in Ozark Stream Metabolism

Student Tyler Fletcher, University of Arkansas

Advisor Dr. Michelle Evans-White

Mentor Allyn Dodd

Effects of Non-Native Vegetation on Aquatic Communities and Prairie Associated Amphibians

Student Micalea Klaus, Ottawa University

Advisor Dr. John D. Willson

Mentor Chelsea Kross-Bramlett

Predation of Lotic Crayfish Before and During Drought

Student Scott Koenigbauer, University of Michigan

Advisor Dr. Daniel Magoulick

Mentor Christopher Middaugh

Ethnography of Hawaiian Culture and Health with Food Hub Solutions to Health Disparities

Student Olivia Lynn Morgan, University of Arkansas

Advisor Dr. Marty Matlock

Sediment Phosphorus Flux at Lake Tenkiller, Oklahoma: How Important are Internal Sources?

Student Abbie Lasater, University of Arkansas

Advisor Dr. Brian Haggard

Mentor Dr. Brad Austin

Comparing Photosynthesis Model Parameters of Different Rice Genotypes with Varying Drought Sensitivity Using CO₂ and Light Response Curves

Student Madeleine Meadows-McDonnell, Smith College

Advisor Dr. Kusum Naithani

Mentor Dr. Jessica Beth Moon

The Effects of Low Level Salt Concentrations on Photosynthesis, Growth, and Community Composition of Periphyton

Student Anastasia Mogilevski, Gettysburg College

Advisor Dr. Sally Entrekin

Mentors Brooke Howard-Parker, Dr. Michelle Evans-White

Scan Level Life Cycle Assessments of Recirculating Hydroponic, Aquaculture, and Aquaponic systems

Student Kelly Walls, University of Arkansas

Advisor Dr. Marty Matlock

Mentor James McCarty

Do Light and Dissolved Phosphorus Levels Affect Leaf Litter Lignin Decomposition in Experimental Streams

Student Brendon White, University of Arkansas

Advisor Dr. Sally Entrekin

Mentors Brooke Howard Parker, Dr. Michelle Evans-White

Poster session continues on next page



POSTER SESSION

GRADUATE STUDENT POSTERS

Do Climate Risks Affect the use of Irrigation Technologies and Water Management Practices?: Evidence from Arkansas

Student Tyler Knapp, University of Arkansas

Advisor Qiuqiong Huang

Restoration Proposal for University Stream and Surrounding Landscape

Student Elise Coffelt and Nate Weston

Advisor Dr. Sally Entekin

Microbial Respiration Dose-Response to Low Level Salt Concentrations

Student Brooke Howard-Parker

Advisor Dr. Sally Entekin

*Poster Session
sponsored by*



ch2mSM



Evaluating the Benthotorch® for rapid assessment of benthic chlorophyll

Students Brad Rogers, Oklahoma State University

Advisor Dr. Dan Storm

Development of a Watershed Based Plan for Stillwater Creek

Student Curt Dikes, Oklahoma State University

Advisor Scott Stoodley

Investigating Fate of Silver Nanoparticles in Model Wastewater Biofilm

Students Connie Walden, University of Arkansas

Advisor Wen Zhang

Assessing Biodegradable Organic Matter in Source Drinking Water

Student Bernardo Zacouteguy, University of Arkansas

Advisor Wen Zhang

*Poster Session
sponsored by*



eureka
water probes





Session 7: Responding to Blooms:
Lakes Managers' Perspectives

1:00 pm

Harmful Algae Blooms: A U.S. Army
Corps of Engineers Regional and National
Perspective

Tony Clyde, *US Army Corps of Engineers
Tulsa District*

1:15 pm

Walking a Fine Line with HABs in Kansas:
Seeking to Balance Public Safety, Logistics
and Economics

Tom Stiles, *Kansas Department of Health and
Environment*

1:30 pm

Harmful Algal Blooms: The Oklahoma
Experience

Jay Wright, *Oklahoma Department of
Environmental Quality*

1:45 pm

Grand Lake: Its Watershed and the
Great HAB of 2011

Darrell Townsend, *Grand River Dam Authority*

*Thank you for
attending!*



Session 8: Regulating Cyanotoxins and
the Risks to Public Health

2:00 pm

Are Harmful Algal Blooms Becoming the
Greatest Inland Water Quality Threat to
Public Health and Aquatic Ecosystems?

Bryan Brooks, *Baylor University Department
of Environmental Science*

2:15 pm

Cyanotoxins – On a Path to Regulation?

Judy Westrick, *Wayne State University
Department of Chemistry*

2:30 pm

Risk Communication for Cyanotoxins and
Other Difficult to Explain Water Issues

Frank Blaha, *Water Research Foundation*

2:45 pm

ADH and Harmful Algal Blooms: Assessing
the Risks to Public Health and Drinking
Water Supplies

Darcia Routh, *Arkansas Department of Health*

3:00 pm

The Arkansas HABs Working Group –
Where We Are and Where We're Going

Tate Wentz, *Arkansas Department of
Environmental Quality*

3:30 pm Conference Adjourns

Thank You Speakers!

Lucy Baker

lbaker10@cub.uca.edu

Jessica E. Beyer

jessica.e.beyer-1@ou.edu

Frank Blaha

fbblaha@waterrf.org

Bryan Brooks

Bryan_Brooks@baylor.edu

Tony Clyde

Tony.Clyde@usace.army.mil

Rick Cruse

rmc@iastate.edu

Angela Danovi

adanovi@ozarkswaterwatch.org

Sally Entrekin

sentrekin@uca.edu

Alan Fortenberry

AFortenberry@bwdh2o.org

Garey Fox

garey.fox@okstate.edu

Jennifer Gidden

jjgidden@uark.edu

Erin Grantz

egrantz@uark.edu

Reed Green

wrgreen@usgs.gov

Katherine Hooker

khooker@ou.edu

Forrest John

John.Forrest@epa.gov

Nate Jones

cnjones@vt.edu

Billy Justus

bjustus@usgs.gov

John Lewis

john.lewis@noaa.gov

Tim Kresse

tkresse@usgs.gov

Hans Paerl

hpaerl@email.unc.edu

Steve Patterson

spatterson@bioxdesign.com

Greg Phillips

gphillips@gbmccassoc.com

Matthew Rich

mwrich@uark.edu

Darcia Routh

darcia.routh@arkansas.gov

Kayla Sayre

sayre@uark.edu

Thad Scott

Thad_Scott@baylor.edu

Tom Stiles

stiles@kdheks.gov

Stephanie Stoughton

sstoughton1@cub.uca.edu

Darrell Townsend

dtownsend@grda.com

Heath Ward

hward@springdalewater.com

Tate Wentz

wentz@adeq.state.ar.us

Judy Westrick

westrick@chem.wayne.edu

Alan Wilson

wilson@auburn.edu

Jay Wright

jay.wright@deq.ok.gov

If you have any questions regarding the conference presentations, please feel free to contact the speakers at the email provided.

Thank You Moderators!

Cammy Willett
mdaniels@uaex.edu

Sally Entrekin
sentrekin@uca.edu

Billy Justus
bjustus@usgs.gov

Alan Fortenberry
AFortenberry@bwdh20.org

Randy Easley
Randy.Easley@carlw.com

Robert Morgan
rmorgan@bwdh20.org

Lance McAvoy
lancem@fortsmithar.gov

If you have any questions regarding the conference sessions, please feel free to contact the session moderators at the email provided.

OTT Hydromet Water Quality Solutions

DATA COLLECTION



Hydrolab HL4
Multiparameter
Probe



Sea-Bird Coastal
SUNA Optical
Nitrate

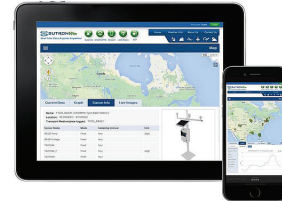


Sea-Bird Coastal
Cycle-P Phosphate

DATA TRANSMISSION



DATA VISUALIZATION



For a full list of available devices and measured parameters, please visit sutron.com or ott.com.



Hydromet



2016 NPS Stakeholder & Project Review Meeting Sept. 21-22, 2016, Little Rock

Registration for annual meeting is now open at www.uaex.edu/ppc

Get Engaged!

Wanted: People who have an interest in setting the tone of Arkansas' Nonpoint Source Pollution Management Plan for 2017-2022. The plan needs your expertise! Stop by our table for more info and to join a working group. Or email publicpolicycenter@uaex.edu.

Working Groups:

- Agriculture
- Silviculture
- Resource Extraction
- Surface Erosion
- Roads
- Urban Runoff



StreamSmart Volunteer Program



Looking to put some of your spare time to good use? Join the Stream Smart volunteer team to help monitor water quality in NW Arkansas!

As a Stream Smart volunteer, you will:

- collect a water sample at your site every three months,
- collect and identify macroinvertebrates (aka “aquatic bugs”),
- gain an appreciation for the natural beauty and services that our area streams provide,
- enjoy the comradery with fellow volunteers.

Contact Angela Danovi for more information, adanovi@ozarkswaterwatch.org or (479)-295-7717

Thank You Sponsors!





Where to Go

Fayetteville Town Center

15 W Mountain St.
Fayetteville, AR 72701

The Chancellor Hotel

70 N East Ave.
Fayetteville, AR 72701

Marley's Pizzeria

609 W. Dickson St. #103
Fayetteville, AR 72701



Arkansas Water Resources Center

203 Engineering Hall
University of Arkansas
Fayetteville, Ark. 72703

arkansas-water-center.uark.edu