



MWRRI E-Newsletter

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Fall 2018

From the Director's Desk ...

Summer passed by quickly and classes are already past mid-semester at MSU. We are actively conducting research on campus and other surrounding areas. As we prepare for potential future funding for water-related research, I'd like to remind you that MWRRI advertises funding opportunities, job openings, legislative issues, and upcoming events. Watch for these emails. If you, or someone that you know, are not receiving these messages, please contact Jessie Schmidt to be included in the institute's listserv. A few research projects funded through the USGS 104b program are continuing through this season. Several have been featured in past newsletters. If you'd like to review them or share them with others, they can be found on our website, www.wrri.msstate.edu. Click on the Publications tab and scroll down on the right hand side under Newsletters. If you'd like to share events, or information, please send this to Jessie Schmidt for review.



We are beginning the process of planning for the 2019 Mississippi Water Resources Conference. The dates are April 2-3, 2019 at the Hilton Jackson. We are asking for session topics and moderators. Please consider sponsoring and exhibiting your agency at the conference. This is a wonderful opportunity for the future researchers to learn more about how water and natural resources are sustained and provide yields to feed our families.

We hope to see you in April at 2019 MWRC.

Jason

Jason Krutz, Ph.D.

2019 Mississippi Water Resource Conference

April 2-3, 2019

The annual Mississippi Water Resources Conference, hosted by MWRRI, will be held at the Jackson Hilton on April 2-3, 2019. Researchers and students from colleges and universities as well as water resources planners, managers, and policy-makers from state and federal agencies, industry, are invited to submit an abstract for technical sessions on the following topics:

- Coastal Issues
- Measurements and Mechanisms for Earthen Levee and Gully Erosion
- Streamflow Alteration Assessments to Support Bay and Estuary Restoration in Gulf States
- BMP Effectiveness
- Challenges to Establishing Targets and Practices for Managing Nutrients in Delta Waterbodies
- Streamflow & Sedimentation
- Irrigation Efficiency and Conservation
- Surface Water – Groundwater Interaction
- Water Treatment
- Groundwater Availability in the Mississippi River Alluvial Plain
- Reservoirs & Streams
- Management of Water Resources in Mississippi

At 2019 MRC, students will have the opportunity to be involved in both an oral and/or poster presentation competition. Cash prizes of \$1,000 for 1st place, \$750 for 2nd place, and \$500 for 3rd place will be awarded to the winners in both categories.



Call for Abstracts

The Call for Abstracts is now open. Details can be found on the MWRRI website;

www.wrri.msstate.edu/conference. Sponsors for the competition awards, various events, and

exhibitors can also be found. Any questions should be directed to Jessie Schmidt at jessie.schmidt@msstate.edu. We hope to see everyone in Jackson for the 2019 MWRC. Immediately following the lunch on April 3 will be an Advisory Board meeting. More details will be forthcoming as we get closer to April.

2019 Mississippi Water Resources Conference

April 2-3, 2019 | Hilton Jackson | Jackson, MS

CALL FOR SESSION ORGANIZERS & ABSTRACTS

The Mississippi Water Resources Research Institute (MWRRI) is pleased to issue a call for session organizers and abstracts (presentations and posters) for the 2019 Mississippi Water Resources Conference. The event will be held in Jackson, MS on April 2-3, 2019 at the Jackson Hilton. This well-attended annual conference is the premiere water resources event in Mississippi and regularly features a wide range of session topics of statewide, regional, and national interest.

Abstracts are now being accepted from individuals/teams that desire to organize and moderate special sessions on water topics of their choice as well as persons that wish to perform oral and/or poster presentations. We again will feature a student competition for oral and poster presentations and monetary awards for 1st, 2nd and 3rd place in each category.

Abstract should be submitted to Jessie Schmidt (jessie.schmidt@msstate.edu) by Friday, January 11, 2019. Session organizers will be expected to develop and submit a session abstract, solicit session presenters, and moderate the session during the conference. Individual presenters will be required to submit abstracts for their oral presentations and/or posters. All session organizers and presenters who abstracts are accepted are required to register for the conference and pay their registration fee which will cover all conference activities for the dates they register. The full conference registration is \$225 (\$275 for late registration after February 28, 2019) for professionals and \$50 for full-time students (\$100 for late registration). A one-day registration for Tuesday is available for \$150 (professionals) or \$30 (students). Cancellations after March 1, 2019 will be responsible for payment of their registration fee.

Papers and poster presented at the conference will be published in the Proceedings which is usually released near the end of the conference year. Authors will be expected to adhere to guidelines and deadlines established for submission of their manuscripts. Manuscripts will be the sole responsibility of the authors and presenters as MWRRI does not edit manuscripts for the Proceedings.

**Abstracts due by January 11, 2019
to Jessie Schmidt at
jessie.schmidt@msstate.edu**

Sponsored by: Mississippi Department of Environmental Quality, Mississippi Water Resources Research Institute, and the U.S. Geological Survey

All submissions must include the following information:

- Title
- Type of Presentation (oral, poster, both)
- Presenter's Name, Title and Affiliation
- Presenter's Address (business preferred, if applicable), Phone, Fax and Email
- Any Co-authors and Affiliation
- Whether a Student (and, if so, name of major advisor)
- Abstract

Abstracts for session topics, oral presentations, and posters may address any water-related topic and should contain 200-400 words. Examples of potential session topics include, but are not limited to, the following:

- Climate – precipitation trends and forecasts; innovative water capture applications
- Coastal Issues – Harmful algal blooms and other pathogens; hypoxia; fresh water inputs; ecosystem restoration
- Drinking Water and Wastewater – Lead corrosion; Infrastructure longevity; capacity assurance and development
- Economics of Water – Value of drinking water and wastewater; energy optimization
- Ecosystem Health – Case studies; nutrient concentrations and responses; stream restoration
- Emerging and Innovative Technologies – Nutrient reduction; model development; unmanned aerial vehicles
- Groundwater – Aquifer characterization and recharge; water budgets; management challenges and approaches
- Policy and Planning – Policy impacts; planning approaches; case studies
- Surface Water – Quality and quantity (various topics); BMP effectiveness; nutrient concentrations and responses
- Water Management–Social Science Nexus – Social indicators; civic engagement measures
- Water Use Efficiency and Reuse – Water reclamation and reuse; water use and irrigation efficiency
- Watershed Management – Case studies; innovative management and modeling approaches

2019 Annual Mississippi Water Resources Conference

Hilton Jackson, Jackson, MS

April 2-3, 2019

Sponsor & Exhibitor Application

Name: _____

Title: _____

Company/Organization: _____

Address: _____

City/State/Zip: _____

Phone: _____ Fax: _____ Email: _____



Mississippi
Water Resources Conference

		<u>Full Sponsor</u>	<u>Co-sponsor</u>
Breakfast	Single Day – \$600 (full sponsor) or \$300 (co-sponsor)	<input type="checkbox"/>	<input type="checkbox"/>
	Both Days – \$1,000 (full sponsor) or \$500 (co-sponsor)	<input type="checkbox"/>	<input type="checkbox"/>
AM Break	Single Day – \$400 (full sponsor) or \$200 (co-sponsor)	<input type="checkbox"/>	<input type="checkbox"/>
	Both Days – \$600 (full sponsor) or \$300 (co-sponsor)	<input type="checkbox"/>	<input type="checkbox"/>
Luncheon	Single Day – \$1,000 (full sponsor) or \$500 (co-sponsor)	<input type="checkbox"/>	<input type="checkbox"/>
	Both Days – \$1,800 (full sponsor) or \$900 (co-sponsor)	<input type="checkbox"/>	<input type="checkbox"/>
PM Break	(First Day) \$400 (full sponsor) or \$200 (co-sponsor)	<input type="checkbox"/>	<input type="checkbox"/>
Icebreaker	\$1,200 (full sponsor) or \$600 (co-sponsor)	<input type="checkbox"/>	<input type="checkbox"/>
Student Oral Competition	\$300 (full sponsor)	<input type="checkbox"/>	
Student Poster Competition	\$300 (full sponsor)	<input type="checkbox"/>	
Exhibitor Table	Both Days – \$500 (full sponsor)	<input type="checkbox"/>	
Exhibitor Space (for standup exhibits)	Both Days – \$500 (full sponsor)	<input type="checkbox"/>	

- Sponsorships of \$500 and above will receive one (1) complimentary registration. A second person from the same organization can register for \$150.
- All sponsors and exhibitors will be recognized on the 2019 MWRC poster (company logo), from the podium, at luncheons, and in the program book as well as online on the conference website.
- In order to be included in the program book, all payments must be received no later than Friday, March 1, 2019.
- Sponsorship Questions: Please contact Jessie Schmidt, jessie.schmidt@msstate.edu

Please email this form to Jessie Schmidt, jessie.schmidt@msstate.edu

Or mail to MWRRI, Box 9547, Mississippi State, MS 39762

Researcher Profile: Gray Turnage, M.S., Research Associate II, GeoSystems Research Institute, Mississippi State University

Tell us a little bit about your background and your current position.

I earned B.S. and M.S. degrees in Biological Sciences from Mississippi State University. In 2011, I joined Dr. John Madsen's lab at MSU as his Research Associate studying the biology, ecology, and control of aquatic/wetland invasive plant species. I initially managed all of Dr. Madsen's projects at MSU's Aquatic Plant Research Facility (APRF), which was designed to conduct small-scale chemical control (herbicides) trials on aquatic plants prior to implementing large-scale field trials. By 2013, I had taken over management of most of our field trials in addition to projects in the APRF. This work took me all over the country helping various government (federal and state) and private entities (citizens and privately held companies) manage nuisance plant species in their aquatic/wetland resources. Our field projects ranged in size from private ponds in MS to entire watersheds in MT. In 2014, Dr. Madsen took a position with USDA and I assumed responsibility for all ongoing projects at field sites and in the APRF and have been continuing in this work to this day.

Later in 2014, a new opportunity arose that allowed me to continue my existing projects while branching out into a new field: I was asked to join the small Unmanned Aerial Systems (UAS) team at MSU's Geosystems Research Institute as the team lead on natural areas projects. This was initiated through previous work I had done with the team in 2013 in field sites using UAS (drones) to map waterways and aquatic/wetland plant species. Through this opportunity, I was one of the first researchers to bring drone technology into the field of aquatic plant management.

What are your current research activities?

Currently, I'm finishing my Ph.D. in Weed Science while continuing my research in Aquatics and UAS. Some of our current work focuses on control of the non-native plants hydrilla, flowering rush, Cuban bulrush, and crested floating heart, which are causing economic and environmental problems in the U.S. My lab is also collaborating with Dr. Gary Ervin's lab through a grant from MS WRRI to study control methodologies of native nuisance plants (which are often overlooked) in waterbodies in the southeastern U.S.

My research with UAS primarily focuses on detection and/or monitoring of plant species in natural and restored wetland and aquatic sites. This work has identified a number of detection methodologies for non-native *Phragmites australis* (common reed or Roseau cane) and aims to develop usable UAS methodologies for natural resource managers trying to restore native coastal plant species like *Spartina alterniflora* and *Juncus romerianus*.

How does the Water Resources Research Institute fit into your future plans? How can we help you be successful?

The WRRI annual conference has proven to be a great venue for me to share results from my lab with resource managers and other researchers in MS as well as learn about other issues facing our state. Additionally, the grants they administer are great for recruiting and educating graduate students in MS as well as solving water related issues specific to the state. I believe the WRRI has been and will continue to be a positive resource for my lab and the state of MS.



Photo 1. Turnage evaluating a field site.



Photo 2. Ongoing mesocosm trial at the MSU APRF.

Ongoing research project

MWRRI recently received funding from USDA-ARS to cooperative with the assessing the integration of conservation and irrigation scheduling technologies to protect and enhance soil and water resources while addressing critical water needs of crop production under variable and adverse climate conditions and declining Mississippi River Alluvial Aquifer levels. Studies have been established at or near the Delta Branch Experiment Station or on privately owned farms throughout the Mississippi Delta region. Combining field reconnaissance, detailed data collection, and computation modeling techniques will be performed. Irrigation equipment will be installed to monitor and supply water needs of crops. Qualitative assessment tools (P-Index and N-Index) will be developed, evaluated and/or enhanced to properly represent agricultural management and production conditions and scenarios in the Mississippi Delta. APEX and APLE will be adapted or enhanced to represent management and conservation practices and then compared against existing monitored crop yield and water quality data from various scenarios.

Funded researchers include Dr. Jason Krutz, Dr. Beth Baker, MSU Wildlife, Fisheries & Aquaculture, Dr. Mary Love Tagert, MSU Ag & Bioengineering, and Dr. John Ramirez-Avila, MSU Civil & Environmental Engineering. MSU researchers and their graduate students will be working closely with Dr. Martin Locke and a team from USDA-ARS in planning and conducting the research.

Researcher publications

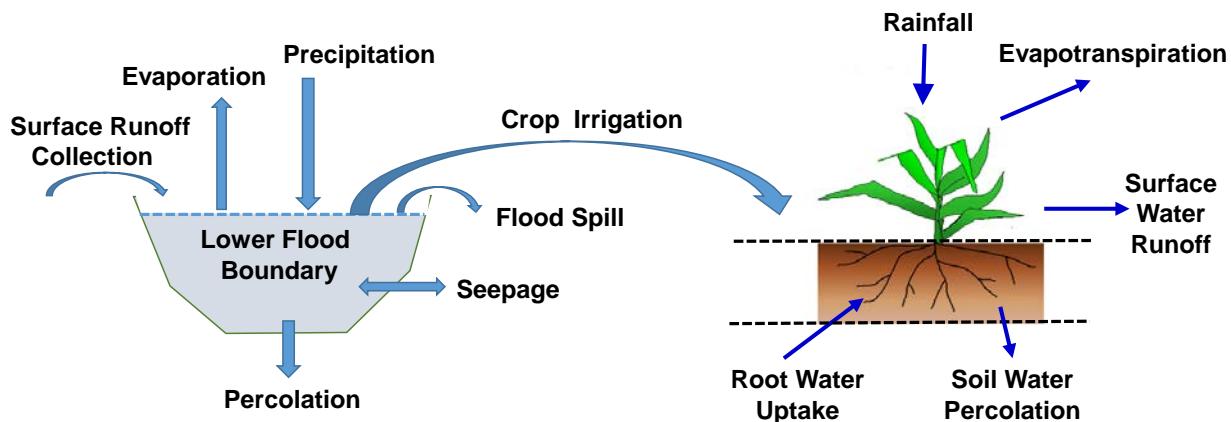
Recent published articles by Dr. Anna Linhoss, Assistant Professor, Agricultural and Biological Engineering, at Mississippi State University, appeared in The Conversation. Dr. Linhoss' article discusses how barrier islands protect coasts from storms, especially during hurricane events such as Florence which pounded the eastern coast between North and South Carolina. These barrier islands, while protectors, are also very vulnerable. For more information, you can read Dr. Linhoss' article through this link: <http://theconversation.com/barrier-islands-protect-coasts-from-storms-but-are-vulnerable-too-103120>

Drs. Ying Ouyang, **Gary Feng**, Theodor D. Leininger, John Read and Johnie N. Jenkins of USDA-FS have recently published research findings in Water Resources Management, An International Journal. Their research is on, Pond and irrigation Model (PIM): a Tool for Simultaneously Evaluating Pond Water Availability and Crop Irrigation Demand. A brief overview of the article is here for your review. The article can be found

Pond and irrigation model (PIM): a tool for simultaneously evaluating pond water availability and crop irrigation demand

Groundwater withdrawals in Mississippi Delta and around the nation have increased dramatically since last century and a consequence of such withdrawals is the depletion of water resources from subsurface aquifers. Although more on-farm water storage ponds have been constructed in recent years to mitigate groundwater depletion in Mississippi, no effort has been made to answer the question: how many hectares of crop land can be irrigated with water from one hectare of farm pond with an average depth of six feet? Scientists from USDA-FS (Drs. Ying Ouyang and Theodor D. Leininger) and USDA-ARS (Drs. Gary Feng, John Read, and Johnie Jenkins) have developed a tool to answer this question (Ouyang et al., 2018, Water Resources Management 32:2969-2983 or <https://www.fs.usda.gov/treesearch/pubs/56349>).

PIM simulates crop land and agricultural pond hydrological processes such as surface runoff, soil drainage, and evapotranspiration as well as crop irrigation demand and pond water availability (see the figure below). More importantly, PIM is able to decide when to conduct crop irrigation based on management allowable depletion (MAD) root zone soil water content and to determine optimal ratios of pond size to crop land with sufficient pond water available for crop irrigation. As a case study, PIM is applied to concomitantly estimate row crops (i.e., corn, cotton, and soybeans) water irrigation demand and pond water availability in a farm located at East-central Mississippi. Our study suggests that PIM is a useful tool for estimating crop irrigation demand and pond water availability simultaneously.



Upcoming Events

MWRRI Advisory Board meeting – Wednesday, November 14 – Pearl, MS

MWRA Annual Conference – October 22-24, 2018 – Biloxi, MS -
<https://www.mswater.org/annual-conference/>

22nd Annual National Conservation Systems Cotton & Rice Conference – January 30 – February 1, 2019 – Baton Rouge, LA - <http://www.nctd.net/>

Georgia Water Resources Conference – April 16-17, 2018 - <http://georgiawaterconference.org/>

MWRRI Advisory Board meeting – April 3, 2019 – Jackson, MS (immediately following 2019 MWRC)

Do you have a publication that you would like to share? Consider distribution through the MWRRI newsletter. Contact Jessie Schmidt for information.

Do you have an upcoming event that all those interested in water-related issues and agriculture would find interesting? Considering adding it to the newsletter and/or listserv. Also available is the MWRRI Twitter account - @MS_WRRI.

About the Mississippi Water Resources Research Institute (MWRRI)

The institute exists as both a federal and a state research unit. Established in 1964, the MWRRI is one of 54 institutes (one in each state, The District of Columbia, Guam, Puerto Rico, and the Virgin Islands) that form a national network to solve water problems of state, regional, or national significance. In 1983, the Mississippi legislature formally designated the MWRRI as a state research institute. Federal funds designated for the institute are used to consult with state water officials to develop coordinated research, technology transfer and training programs that apply academic expertise to water and related land-use problems. These various activities are funded through an annual grant from the United States Geological Survey (USGS). Mississippi state appropriations provide additional funds for cost share. The institute also assists state agencies in the development of a state water management plan, maintaining a technology transfer program, and serves as a liaison between Mississippi and federal funding agencies.

Discrimination based upon race, ethnicity, religion, gender, national origin, age, disability, or veteran's status is a violation of federal and state law and MSU policy and will not be tolerated. Discrimination based upon sexual orientation or group affiliation is a violation of MSU policy and will not be tolerated.



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