



MWRRI Newsletter

Winter Issue

February 2015

From the Director's Desk ...

Another year has passed; it's amazing how quickly time flies by these days! 2014 was a very busy year for the Institute and we were able to achieve significant progress in a number of areas. I am happy to report that our efforts have yielded the following results:

- Successfully implementing our 2014 water conference;
- Updating our five year strategic plan;
- Filling out our Advisory Board to its full complement;
- Revising our water resources research priorities to better foster currently-needed applied research;
- Funding and managing three new 104b research projects;
- Incorporating social science into our water research efforts;
- Collaboratively developing and advancing a number of research project concepts and proposals reflecting our new priorities;
- Successfully implementing our Year 1 Work Plan for the Center of Excellence for Watershed Management;
- Developing several collaborative watershed-based restoration and protection project concepts and proposals;
- Conceptualizing and advancing the establishment of the Catalpa Creek Watershed Project and Watershed Demonstration, Research, Education, Application and Management (D.R.E.A.M.) Center; and
- Planning for and enhancing our upcoming 2015 Water Resources Conference.



You will find more information about some of these activities in this newsletter.

We are very excited about the upcoming Water Resources Conference to be held on April 7-8 at the Jackson Hilton. We have over 60 presentations scheduled that will address many facets of water resources research and management. I hope you will seize upon the opportunity to participate in the conference and learn more about the latest water research in Mississippi.

Respectfully,

Joe Street

2015 Mississippi Water Resources Conference

April 7-8, 2015

From water quality to water supply ...from groundwater to surface water ...from estuaries to uplands ...from the Gulf of Mexico to the Mississippi Delta ...from research to management ...a wide range of oral and poster presentations are scheduled during our upcoming 2015 Water Resources Conference to be held at the Jackson Hilton on April 7-8. Researchers and students from colleges and universities as well as water resources planners, managers, and regulators from state and federal agencies, industry, and other backgrounds will describe projects and outcomes from over 60 water resources research and watershed-based projects. Presentations are organized thematically in 14 technical sessions and a poster session.

Opening Plenary Session – Tuesday, April 7

Theme: **Water Resources Issues in Mississippi**

Speaker(s): **Don Underwood**, Executive Director, Mississippi Soil & Water Conservation Commission; **George Ramseur**, Director, Office of Coastal Restoration and Resiliency, Mississippi Department of Marine Resources

Luncheon Plenary – Tuesday, April 7

Theme: **MDEQ's Prioritization Framework for Managing, Preserving and Restoring Mississippi's Water Resources**

Speakers: **Mike Freiman**, Surface Water Division Chief, and **Greg Jackson**, Modeling and TMDL Branch Chief, Mississippi Department of Environmental Quality

Luncheon Plenary – Wednesday, April 8

Theme: **Gulf of Mexico Alliance – Collaboration as a Necessity for Coastal Restoration**

Speaker: **Laura Bowie**, Executive Director, Gulf of Mexico Alliance

Technical Session Themes:

- Water Quality of the Gulf of Mexico
- Gulf of Mexico Coastal Issues
- Understanding the Impacts of Coastal Water Quality on Ecological and Human Health
- Agricultural Water Management
- Sustainable Agricultural Water Management Strategy, Technology and Practice
- Spatial and Temporal Controls on Surface and Groundwater Hydrology in the Mississippi Delta
- Water Resource Management in the Mississippi Delta
- Impacts of Reforestation and Agricultural and Forestry Management on Surface Water Quality in the Lower Mississippi River Basin

- Phosphorus Dynamics in the Mississippi Landscape
- Watershed Management
- Wetlands
- Groundwater
- Policy
- Methodology

Sponsors and Organizers:

Mississippi Water Resources Research Institute
U.S. Geological Survey Mississippi Water Science Center
Mississippi Department of Environmental Quality

Registration for the conference is \$225 for professionals and \$50 for full time students. Hotel reservations should be made by March 7 in order to receive the conference room rate. The agenda with abstracts is now available for review on MWRRI's website.

We are looking for conference sponsors as well as volunteers to judge the student poster competition. Sponsors and exhibitors should complete the forms and return them to Jessie Schmidt. We hope to see you in Jackson on April 7-8.

Register now at www.wrri.msstate.edu!

Welcome New Advisory Board Members

Kurt Readus, State Conservationist, Mississippi National Resources Conservation Service

Kurt graduated from Alabama Agricultural & Mechanical University with a bachelor's degree in environmental science. His career began with NRCS in 1998 as a student trainee where he worked in both Arizona and Alabama. In 2000, Readus became a Soil Conservationist and promoted in 2005 to District Conservationist in the Avondale Field Office in Arizona. In 2007 he became Area Conservationist for Central Mississippi overseeing 20 field offices in addition to the MBCI Tribal Field Office. Readus served as Assistant State Conservationist-Programs in Mississippi from January 2011 to September 2013 after which he became the State Conservationist for Mississippi.



**Dr. Alan M. Shiller, Professor, Department of Marine Science,
University of Southern Mississippi**

Dr. Shiller is a geochemist at USM. His work in the lab located at Stennis Space Center includes all environments ranging from estuaries to coastal sediments and alpine rivers. Current research involves trace elements in rivers and streams including mechanisms of season concentration variations in the Mississippi River, effect of landscape differences on trace elements in the Yukon River Basin, and the global variability of concentrations. Shiller also teaches courses in marine chemistry, estuaries, aquatic chemistry, and global carbon system. Shiller received his bachelor's in Chemistry from Caltech and PhD in Oceanography from Scripps Institution of Oceanography, University of California.



**Dr. Martin A. Locke, Research Leader, USDA-Agricultural Research Service,
National Sedimentation Laboratory**

Dr. Locke began his career as a post-doc research associate in the Southern Weed Science Research Unit 1987 at USDA-ARS. Coming on full-time in 1989, Locke became a research leader as a soil scientist until 2003 when he became leader of the water quality and ecology research unit. A native of Missouri, Locke earned his bachelor's degree from Southwest Missouri State University (Business, 1976) and General Agriculture in 1982. He earned his PhD in Agronomy (soil science emphasis) in 1984 from University of Missouri. Locke's early research focused on evaluating how conservation management practices affect herbicide dissipation in soil. He has applied his environmental research experience in assessing the value and impact of conservation management systems and edge-of-field practices.



**George Ramseur, Jr., Director, Office of Coastal Restoration and Resiliency,
Mississippi Department of Marine Resources**

George Ramseur was recently appointed Director of MDMR's Office of Coastal Restoration and Resiliency. In this position, Ramseur oversees the agency's efforts to restore, preserve and enhance Mississippi's coastal and marine resources in a manner that helps coastal communities, ecosystems, and economies become more resilient to coastal hazards.

Ramseur joined MDMR in 2006 planning and managing large scale restoration of coastal habitats with special emphasis on the Mississippi Beneficial Use of Dredged Material Program. Since that time, he has also actively participated in the Gulf of Mexico Alliance Habitat Conservation and Restoration Team. Ramseur received a B.S. with majors in geology and anthropology from Tulane University, and prior to coming to MDMR had a diverse career in private business, federal government, consulting and non-profit environmental organizations. Ramseur has worked in ecological restoration for 17 years.



Current MWRRI Water Resources Research Priorities

Climatic Water Research Topics

- **Comparison of past climate trends and projections of future climatic conditions.** Spatially referenced changes that have occurred in the amount of rainfall, variability, and recurrence in the past is needed as well as projections of future climatic scenarios.

Groundwater Research Topics

- **Aquifer recharge.** There is a need for innovative, scientifically defensible approaches to estimate recharge which, if developed, would be invaluable in determining water budgets for the various aquifers in the state.
- **Aquifer transmissivity and/or ranges of transmissivity.** The hydrogeology of an aquifer can vary significantly spatially. Additional information from pump tests would be very useful in determining how much water can be pumped in a particular location in the state.
- **Naturally occurring aquifer characteristics.** Naturally occurring aquifer characteristics such as color, high iron content, and low pH, among others, can affect the taste, color, odor, use, and treatment of water from different aquifers. This information is very useful for water resources and economic development planning.

Surface Water Research Topics

- **Best Management Practices (BMP) effectiveness.** Research on which traditional and innovative BMPs should be used for a variety of environmental management scenarios, as well as BMP reliability, is a continuing need.
- **Innovative wastewater treatment for small communities.** Many of Mississippi's smaller communities have difficulty servicing debt on even low or no interest loans; therefore innovative and affordable technologies in wastewater treatment and/or disposal for small communities are increasingly needed.

- **Nutrients and response variables/combined criteria.** To develop appropriate and protective nutrient criteria for Mississippi, research is needed to (1) identify the appropriate response measures for Mississippi's waters and (2) to show the link between nutrient concentrations and the identified response measures.
- **Nutrient loading trends from point sources.** With the ongoing work related to the development of nutrient criteria and ongoing work related to the State's nutrient reduction strategies, a detailed analysis of nutrient loading trends from point sources would be of great value.
- **Social Science Research.** The need to better understand stakeholder behaviors, perceptions and beliefs at varying spatial and temporal scales is of great importance in order to effectively develop and incrementally measure education and outreach designed to change behavior. Also, the development of social indicators can assist in the planning, implementation, and evaluation of nonpoint source management projects.
- **Education and outreach related to construction and urban storm water.** The development and implementation of activities that promote the adoption of effective construction and urban storm water best management practices and the benefits of low impact development and green infrastructure is critically needed.
- **Water Reuse and Conservation.** Water reclamation and reuse offers an effective means of conserving supplies while helping to meet the ever growing demands for water. Such applications may include landscape and agricultural irrigation, industrial processing, power plant cooling, wetland habitat creation, and water harvesting.
- **Protection of Source Water Resources.** Reducing the threats to public water supplies has significant public health, environmental, and fiscal benefits. Work is needed with some of our State's water systems to delineate the source water protection areas, identify known and potential sources of contamination, and develop emergency contingency plans.

Modeling & Tool Development Research Topic

- **Development of models and tools.** Tools to predict future impacts of climatologic change (including extreme meteorological events), water use changes, social drivers, and proposed infrastructure on water resource availability and costs are useful for planning purposes.

USGS 104g Funding Opportunity

USGS recently issued an RFP for its 104g research program. All Mississippi research projects must be submitted to the MWRRI office no later than 4:00 p.m. CST on February 19. Direct any questions to Jessie Schmidt (jschmidt@msstate.edu).

2015 USGS 104b Proposals Selected for Funding Consideration

The Advisory Board recently evaluated a number of research proposals submitted in response to MWRRI's 104b RFP and recommended the following three projects for USGS 104b funding.

“Towards an Understanding of Surface Water and Groundwater Exchange within Tailwater Recovery Systems”

Dr. Joby Czarnecki

Research Associate

Mississippi State University

Ms. Beth Baker

REACH Director

Mississippi State University

Dr. Eric Dibble

Interim Department Head

Mississippi State University

Cooperator: Mississippi Farm Bureau Federation

“Influence of Wetland Plant Community Types on Water Quality Improvement in Natural and Restored Wetlands of the Mississippi Delta”

Dr. Gary N. Ervin

Professor

Department of Biological Sciences

Mississippi State University

“Water Quality in Bangs Lake: Effects of Recurrent Phosphate Spills to a Coastal Estuary: Year 2”

Dr. Kevin Dillon

Associate Professor

University of Southern Mississippi

Cooperators: Mark Woodrey – Grand Bay National Estuarine Research Reserve and
Mississippi State University

Kim Cressman – Grand Bay National Estuarine Research Reserve

Dr. Ruth Carmichael – Dauphin Island Sea Lab

Dr. Jane Caffrey – University of West Florida

A Vision of the Catalpa Creek Watershed Demonstration, Research, Education, Application and Management (D.R.E.A.M.) Center

A significant portion of Mississippi State University's (MSU) campus and property resides within the Catalpa Creek Watershed (USGS HUC 12 #031601040601 and MDEQ MS #8090). This includes important MSU education and research facilities, such as the Mississippi Agricultural and Forestry Experiment Station's (MAFES) Leveck Animal Research Center (South Farm), which is used by numerous departments and programs. Unfortunately, some of MSU's land uses in this watershed may have contributed to the pollution of Catalpa Creek. Total Maximum Daily Load (TMDL) studies that apply to this watershed include those for sediment, nutrients, and pathogens.

MWRRI, in its role as a Center of Excellence for Watershed Management, is advantageously positioned to bring resources together from various MSU departments and programs; nongovernmental organizations; and state and federal agencies to address the needs in the Catalpa Creek Watershed. This project will not only put appropriate BMPs on the ground in strategic locations in the watershed to restore water quality and habitat, but also establish a venue for watershed-based demonstrations, research, education, application and management.

The vision of the Catalpa Creek Watershed Project is to restore and protect the ecosystem health, ecosystem services and quality of life, and water resources of the watershed; develop an informed citizenry in the watershed and beyond; and create experiential learning activities for students and educators. The establishment of a Watershed Demonstration, Research, Education, Application and Management (D.R.E.A.M.) Center on the South Farm will serve as a showcase for watershed management in the state and southeast through the implemented watershed-based activities and best management practices that are part of the Catalpa Creek watershed restoration and protection project. This facility will be useful to state and federal agencies, water management districts, stakeholder and community service organizations, university departments and programs, secondary education teachers and students, local governments, and others. Beyond complementing the Catalpa Creek watershed project, the center will focus generally on water resources, watersheds, and the ecosystem services they provide in a hands-on interactive way.

The Watershed D.R.E.A.M. Center will leverage significant MSU educational and research assets. These include the Leveck Animal Research Center (South Farm), located in the



MSU's South Farm

headwaters of the Catalpa Creek Watershed, which is one of the largest land reserves adjacent to a university campus in the nation. It encompasses about 1,600 acres used for cattle, equine and poultry management research. The South Farm also hosts a NRCS Grazing Lands Conservation Initiative demonstration site, 18 acres of aquaculture ponds, and various water quality research projects. These projects include monitoring nutrient and sediment runoff under varying climatic conditions and cattle management scenarios, comparison of hydrologic modeling outcomes to

evaluate pre and post BMP implementation related to dairy farm management, identification of potential environmental problem areas throughout South Farm that could impact Catalpa Creek, and development of baseline water quality information and a monitoring plan for Catalpa Creek. Another MSU asset to be leveraged is the Project Wetland Education Theater (WET) that, when constructed, will feature functional wetland ecosystems and associated plant communities, interpretive displays, and an outdoor classroom. Another potential MSU asset is Union Green, an award-winning site design for use as a model for green infrastructure practices, which is currently in the planning phase.