Current Water Resources Projects.


The goal of this project is to collect water samples at multiple sites in the Upper Illinois River Watershed and Upper White River Basin in northwest Arkansas, to estimate annual constituent loads, and then to evaluate changes in water quality. The information gained from this project will be used by scientists, stakeholders, and policy-decision makers in Arkansas, who will update or remove streams from the 303(d) list. This project also monitors the water quality of select stream reaches listed on the 303(d) list to address impairment by pathogens and low dissolved oxygen concentrations.


The goal of this project is to collect water samples across selected watersheds to better understand how water quality changes across sub-watersheds draining different land uses. We will also estimate nitrogen, phosphorus, and sediment loads at sites where US Geological Survey discharge monitoring stations exist. The knowledge attained from this project will help validate the SWAT modeling output conducted under a separate Arkansas Natural Resources Commission 319 Program project, and improve the level of confidence that we have in the sub-watershed prioritizations based on the model output.
Microbes in Beaver Lake Swim Beach Regions.

In 2011, AWRC funded Kristen Gibson to assess the microbial population at Beaver Lake swim beaches to determine the origin of fecal pollution. The study was prompted by the closure of two swim beaches at Beaver Lake during the summer of 2010 due to elevated levels of E. coli. Personnel have been collecting water samples twice a month from four swim beaches. The current standard methods for evaluating microbial organisms use generic bacterial indicators such as total coliform, fecal coliform and E. coli. These indicators do not provide enough information to determine the source of bacteria. Identification of the bacterial sources can help develop mitigation strategies would prevent future lake closures.

“Elevated levels of E. coli—an indicator of potential human pathogens such as pathogenic bacteria, enteric viruses and protozoan parasites—could be a health risk to those using the lake for recreational purposes”—Kristen Gibson.

This project was funded through the USGS 104B Program 2011-2012. Gibson was interviewed Nov. 10, 2011 by KTHV’s Lindsey Tugman.

Each year the AWRC funds projects through the 104B Program as instituted by the Water Resources Research Act of 1964. The AWRC has selected the following projects to fund for the 2012-2013 project year.

Preparining Drinking Water Utilities on Beaver Lake Reservoir to Meet Disinfection Byproduct Regulations: The Impact of Continued Nutrient Enrichments. Wen Zhang and Julian Fairey, Civil Engineering, University of Arkansas. The objective of this project is to determine the impact of nitrogen and phosphorus enrichment on source water quality from Beaver Lake and subsequent disinfection byproduct (DBP) formation and control. A series of nutrient enrichment mesocosms will be used to study the impacts of phytoplankton biomasses and algal speciation on DBP formation and control. The results of this study will be of vital importance to the four drinking water utilities on Beaver Lake as they develop strategies to meet current and pending DBP regulations.

Development and Implementation of Nutrient Runoff Reduction Measures for Poultry Houses. Andrew Sharpley and Sheri Herron, Crop, Soil and Environmental Sciences, University of Arkansas. This project will address the emerging issue of nutrient loss from around the poultry houses during cleanout and from ventilation fans. This research will determine the extent to which nutrients can be lost from these areas during rainfall-runoff events and evaluate best management practices to mitigate these losses where appropriate. This project will document the magnitude and extent of nutrient losses and provide measures to minimize any losses, which can be used to address and overcome EPA concerns.

Effect of Global Climate Change on Algal Biomass and Total Organic Carbon Concentrations in Beaver Lake. J. Thad Scott, Crop, Soil and Environmental Sciences, University of Arkansas. This project aims to quantify whether expected changes in atmospheric carbon dioxide concentrations may impact water quality by increasing total organic carbon in source waters. The impact of global climate change on algal biomass and production has been explored for oceans, but not for freshwater ecosystems even though the potential exists for algal biomass to increase in response to increased carbon dioxide availability.

EVENTS

Upcoming—Fayetteville Shale Symposium

Co-sponsored by the USGS Arkansas Water Science Center, the Arkansas State Chapter of the American Water Resources Association and the Arkansas Water Resources Center, this symposium will focus on the surface water, groundwater, and biological interactions and the environmental regulations and economics related to natural gas exploration and development in Arkansas. The symposium will be held March 20-21, 2012 at Holiday Inn in downtown Fort Smith, Arkansas. Key note speakers include Mark Boling, Executive Vice President, Southwestern Energy; Scott Ausbrooks, Arkansas Geological Survey; Michael Overbay, USEPA Region VI; and Ian Duncan, University of Texas at Austin.

Recap—2011 Watershed and Research Conference

The AWRC hosted its annual conference July 6-7, 2011, in Fayetteville, Arkansas. The conference focused on what’s next for the Illinois River and the Statement of Joint Principles and Actions. The conference drew in close to 150 attendees and provided an update on the EPA TMDL process, HSPF watershed modeling and EFDC reservoir modeling of Lake Tenkiller.