POSTER SESSION

The bi-national HASBOS	Barbara Ambrose National Oceanic and Atmospheric Administration
Assessing water quality and phytoplankton in streams of the leaf river and black creek watersheds	Nestor R. Anzola, George F. Pessoney, and Carmen L. Hernandez University of Southern Mississippi
Long-term performance of a pump and treat system at a wood treating site	Hamid Borazjani, Susan Diehl, Mary Hannigan, and M. Lynn Prewitt Mississippi State University
Small farm plots and application of simulated rain to determine the potential for bacterial runoff after poultry litter surface application to bermudagrass	John Brooks and Ardeshir Adeli USDA Agricultural Research Service
Sensitivity analysis of simultaneous nitrification-denitrification process by simulation with activated sludge model number one	Ayanangshu Dey and Benjamin S. Magbanua Mississippi State University
Primary productivity, hydro perdio, and nutrient cycling in four flood-plain forest communities on a blackwater river	Marianne K. Burke, Mark H. Eisenbies, Charles A. Harrison, and Hal O. Liechty USDA Forest Service
Interactions between ground water and surface water in the Bogue Phalia near Leland, Mississippi, Summer 2007	Curtis Gebhard and Katherine Stone U.S. Geological Survey
National Weather Service flood inundation mapping	Jeffrey Graschel National Weather Service
Potential for recharge in agricultural soils of the Mississippi Delta	Kim S. Perkins, John R. Nimmo, Richard H. Coupe, Claire E. Rose, and Michael A. Manning U.S. Geological Survey
Aerobic-anaerobic lagoon evaluation in a small rural community in Columbia, South America	Germania Salazar-Mejia, Jorge A. Ramirez, Luz S. Cadavid, Jairo N. Diaz-Ramirez Universidad Nacional de Colombia
The phytoplankton monitoring network	Angela Sallis National Oceanic and Atmospheric Administration
Big Sunflower River water quality assessments following streamflow augmentation	Todd Tietjen and Gary Ervin Mississippi State University
1:24,000-scale watershed boundary dataset for Mississippi	K. Van Wilson Jr. and Michael G. Clair III U.S. Geological Survey

Interactions between ground water and surface water in the Bogue Phalia near Leland, Mississippi, Summer 2007

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Ground-water discharge is a key control on streamflow quality and quantity and associated aquatic ecosystems; however, factors that affect the spatial and temporal distribution of water flux across stream beds remain poorly understood. The objective of this study is to characterize ground-water and surface-water interaction in the Bogue Phalia, which drains an agricultural area in northwestern Mississippi. Study sites are located near the Bogue Phalia gaging station near Leland, MS. At the study sites, the Bogue Phalia is about 35 meters wide with a maximum depth at low flow of 1.2 meters and a discharge of 78 cubic feet per second during the study period (June – August 2007). Ground-water discharge was measured with pan and bag seepage meters fitted with extensions for deployment in deep (>1 meter) water. Five arrays were measured across the width of the river, with an average of 10 meters between each array and at least 5 meters per array. Seepage data were supplemented with measurements of head gradient, hydraulic conductivity, bed sediment grain size, and temperature in order to better understand interactions between ground water and surface water. Drought conditions in the area were temporarily relieved by storms in late June and early July when flow in the river reached a maximum of 5,120 cubic feet per second. Measurements were made both before the storms and after flow in the river returned to base conditions in order to evaluate the effects of flooding on ground-water discharge.

Preliminary results indicate that the highest ground-water discharge fluxes occurred along the central axis of the Bogue Phalia; whereas, the lowest fluxes occurred along the banks. The main channel was gaining at the study sites, although losing reaches were common in ditch-like tributaries. The average and (standard deviation) of vertical flux through the study area was 1.2 x 10-6 meters per second (m/s) (6.3 x 10^{-7} m/s), and ranged from a minimum of 3 x10^{-8} m/s to a maximum of 5 x10^{-6} m/s. Techniques for setting seepage meters in deeper water produced an average coefficient of variation (COV) of 0.5, which is greater than the typical value for shallow water application (COV = 0.3). The mean flux before the storms in late June and early July is statistically indistinguishable from the mean after the storms. Although the maximum flux increased slightly from 4.2 x10^{-6}m/s (2.7 x 10^{-6} m/s) to 5.6 x10^{-6}m/s (1.8 x 10^{-6}cm/s) and shifted position by approximately 30 m upstream following the storm. The highest fluxes always occurred in areas where the stream bed was composed of medium- to coarse-grained sand, whereas the lowest fluxes occurred where the bed sediment was fine-grained, primarily along the banks and particularly downstream of a tributary. Seepage-meter studies elsewhere in the Southeastern United States have shown average ground water discharge fluxes of approximately an order of magnitude greater than those at the Bogue Phalia, an effect that could be due to either ground-water pumping or drought conditions.

Keywords: Agriculture, Water Quality, Surface Water, Management and Planning

student presenter