

DELTA WATER RESOURCES

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Climatological and cultural influences on annual groundwater decline in the Mississippi Delta shallow alluvial aquifer

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Characterization of water quality in unmonitored streams in the Mississippi Alluvial Plain, Northwestern Mississippi, May-June 2006

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Influence of surface-water recharge on the potential for agricultural nutrient and pesticide transport to the Mississippi River alluvial aquifer, Northwestern Mississippi

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Use of a field method for determining hydraulic conductivity in soils in the Bogue Phalia Basin in the Mississippi River alluvial plain

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Influence of surface-water recharge on the potential for agricultural nutrient and pesticide transport to the Mississippi River alluvial aquifer, Northwestern Mississippi

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In December 2006, the Agricultural Chemical Transport (ACT) topical team of the U.S Geological Survey National Water Quality Assessment (NAWQA) Program began a study in northwestern Mississippi to evaluate the influence of surface-water recharge on the occurrence of agriculturally related nutrients and pesticides in the Mississippi River alluvial aquifer. A series of nine piezometers was installed along a transect across the Bogue Phalia, a stream located near Leland, Miss., Washington County. Water levels were monitored continuously in nine piezometers and in one monitoring well approximately 1 mile north of the site. Local ground-water flow direction was determined using bi-annual water-level data collected by the Yazoo-Mississippi-Delta Joint Water Management District (YMD) in selected irrigation wells screened in the alluvial aquifer. Routine and event-driven water-quality samples were collected from 2006-2007 and were evaluated for major ions, nutrients, organic carbon, and physical parameters. In addition, water samples were analyzed for two commonly used pesticides in the area, atrazine and glyphosate.

Regionally, flow in the alluvial aquifer tends to be toward the axis of the Mississippi Embayment, which is the Mississippi River. Local ground-water flow patterns were evaluated to determine potential movement of nutrients and pesticides from streams to the alluvial aquifer. Historically, water-quality results indicate that nutrients are present in ground water. Although pesticides have occasionally been detected in ground-water samples, their detections indicate that there is potential for anthropogenic contamination of the alluvial aquifer. Data collected as part of this study will be used to quantify surface-water recharge to the alluvial aquifer as a transport mechanism for nutrient and pesticide movement into the ground-water system.

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