



## **USDA-CSREES 2006 National Water Quality Conference**

### **Integrated BMP assessment for improving water quality in a Rice/Soybean Dominated Watershed in the Arkansas Delta**

The L'Anguille River watershed is an intensely managed agricultural area located in eastern Arkansas and consists of more than 620,000 acres, 80% of which are in row crop agriculture; predominantly soybeans, rice, and cotton. The water used to produce these crops is supplied by a rapidly depleting alluvial aquifer. The drainage from these fields flows into the river carrying potentially large amounts of sediment, nutrients, and pesticide residues. The entire length of the L'Anguille River has been designated impaired due to high sediment concentrations assumed to be coming from intensive row crop agriculture. A Total Maximum Daily Load (TMDL) for sediment was approved in 2000 that required a sediment load reduction of 46% in summer, and 48% in the spring to meet the river turbidity standard of 45NTU.

The objective of this study was to develop a watershed model (Soil and Water Assessment Tool, SWAT model) for integrated assessment of water quantity and quality as a function of land use in the watershed. The model was used to quantify sediment contributions from agricultural activities, and to assess the effects of Best Management Practice (BMP) implementation on water quality in the watershed. In addition, a cost benefit analyses of BMPs have been performed and results have been integrated in a decision support system (DSS) framework. The DSS can be used to evaluate economic and environmental benefits of various management options within the watershed and to develop management plans for optimizing water quality protection and agricultural production in the watershed.

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