



USDA-CSREES 2007 National Water Quality Conference

A decision support system framework for integrated agricultural watershed management

We have developed an internet based decision support system (DSS) for evaluating the impacts of watershed management decisions on water quality, agricultural production and farm profit. The DSS was developed for the L'Anguille River watershed located in eastern Arkansas. The watershed area is 620,000 acres, 80% of which are in row crop agriculture; predominantly soybeans, rice, and cotton. 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. Field and watershed scales models, such as Soil and Water Assessment Tool (SWAT), STEP-L and LTHIA were used for integrated assessment of water quantity and quality as a function of land use in the watershed. The models were used to quantify sediment and nutrient 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 the DSS framework. Several workshops were organized to solicit stakeholder feedback on the use of DSS. 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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