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A Multi-Criteria Decision Support Model for Ranking Factors Affecting Conservation Practice Adoption in a CEAP Watershed

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Abstract Text:

The Little River Experimental Watershed (LREW) in Georgia, USA is one of 13 watersheds being evaluated by the USDA-CSREES Conservation Effects Assessment Project (CEAP). CEAP's goal is to assess the effect of three decades of conservation practice implementation on water quality in the USA. The success of conservation practices is determined by many factors including biophysical processes, landscape features, and socioeconomic factors. In our evaluation of the LREW, we are using a facilitated modeling approach to illustrate the interactions among these factors. Facilitated modeling is a multidisciplinary approach to problem solving and consensus building. The process combines systems modeling and consensus decision making to enhance collaboration and problem solving. The approach allows participants to develop a shared understanding of how a system of interest works in a relatively short time frame. Our system process model will display the interactions that lead to the production of water quality benefits from application of conservation practices on a watershed scale. Our first step was to develop a Multi-Criteria Decision Support Model (MCDSM) which is being used to identify the relative importance of biological, physical, social, and economic factors affecting farmer decisions to implement conservation practices. Ultimately, these farmer decisions determine what conservation practices are implemented, where they are implemented, and when they are implemented. By using the MCDSM we can not only determine which factors determined the adoption of existing conservation practices but we can also evaluate alternative scenarios. The water quality effect of these alternative scenarios will be evaluated with the SWAT model. This paper reports on the development of the MCDSM and its application to the Little River Experimental Watershed.

Impact Statement:

The Multi-Criteria Decision Support Model allows us to determine which factors determined the adoption of existing conservation practices but also allows us to evaluate alternative scenarios. The water quality effect of these alternative scenarios can be evaluated with a watershed model. If one of these scenarios provides a significant water quality benefit, then policy can be shaped appropriately to promote the desired results.