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**BUILDING MULTILEVEL BAYESIAN MODELS TO ASSESS EFFECTS OF
CONSERVATION PRACTICES IN REDUCING NUTRIENT LOADINGS TO WATERSHEDS**

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ABSTRACT: Water and soil conservation practices are often recommended as the most effective means of reducing nonpoint source pollution, but their effectiveness has not been systematically assessed using randomized experiments. The USDA compiled a meta database of results of soil and nutrient loss field scale experiments conducted throughout the country. This database includes observational data that cannot be directly used for assessing the causal effect of conservation practices. However, the database covers a wide range of natural conditions and agriculture practices, information about the effectiveness of conservation practices can be extracted when using proper data analysis methods. This presentation focuses on the quantification of the effectiveness of several conservation practices in reducing nitrogen and phosphorus loadings to surrounding water. In addition to the estimated level of reduction of nitrogen and phosphorus through the use of conservation practices, the presentation also compares two competing methods of causal analysis using observational data. The results of this study can be used to form prior distributions of watershed water quality models such as SPARROW.

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