Applying knowledge to improve water quality
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Methods for Simulating Conservation Practices and Estimating Effects for the CEAP National Assessment

The purpose of the Conservation Effects Assessment Project (CEAP) national assessment for cropland is to estimate the environmental benefits for conservation practices applied to cropland. Using a national sampling framework, current information on farming practices and conservation practices are obtained from farm surveys. These data are used in the APEX biophysical fate and transport simulation model to establish the CEAP Baseline which includes estimates of soil erosion by water and wind, soluble nitrogen losses in surface runoff and through leaching, particulate nitrogen lost with sediment, particulate phosphorus lost with sediment, carbon sequestration, and pesticide fate. An alternative modeling scenario is constructed by estimating these outcomes under the assumption that no conservation practices were in use. By comparing this alternative scenario to the CEAP Baseline, the benefits of conservation practices currently in use can be estimated.

This work describes the major conservation practices reported in the farm survey, practice design considerations, and the attendant simulation model implications. Methods for representing individual practices and groups of practices in the APEX model are described. Environmental effects from various practices are illustrated through simulations on a sub-sample selected to cover a broad range of conditions. The alternative modeling scenario is constructed for the sub-sample so that estimates of conservation practice effects relative to the effects from similar simulations without practices can be shown. The primary purpose for presenting this work is to obtain useful feedback to improve the national assessment results and begin the process of gaining acceptance of the methods through peer review and USDA-NRCS technical oversight.

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