Conservation Practices Targeting for the Future Midwest Landscape Study

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Abstract: The Future Midwest Landscape (FML) project is part of the U.S. Environmental Protection Agency's new Ecosystem Services Research Program, undertaken to examine the variety of ways in which landscapes that include crop lands, conservation areas, wetlands, lakes and streams affect human well-being. The goal of the FML project is to quantify current and future ecosystem services across the region and to examine changes expected to occur as a result of the growing demand for biofuels. Research on future alternatives reducing the adverse environmental impact and sustaining agricultural production is also an important focus of the FML study. Various conservation practices have been adopted to reduce pollutant losses from agricultural areas. Targeted placement of conservation practices in agricultural watersheds can significantly increase the cost-effectiveness of these practices. The objective of this study is to apply hydrological/water quality models and Geographical Information System for best placement of conservation practices to reduce on-site and off-site pollutant losses for maximum environmental benefits. In this study, Soil and Water Assessment Tool (SWAT) was selected to simulate pollutant loadings from the Kaskaskia River watershed in Illinois. The SWAT model has been developed to evaluate the effectiveness of agricultural management practices on watershed water quality at various temporal and spatial scales. Model evaluations including model sensitivity studies, calibration and validation, and model performance on different spatial resolutions were achieved by comparing the observed runoff, sediment and nutrient loadings with the SWAT simulated results. After model validation, model simulations were performed

for various placements of conservation practices and their impact on pollutant loadings on the watershed scale will be presented.

Keywords: Future Midwest Landscape study, SWAT model, watershed modeling, conservation practices placement, alternative futures scenarios and ecosystem services