

Modeling within field variability in the Wind Erosion Prediction System

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The Wind Erosion Prediction System (WEPS), as presently used for conservation planning in the United States and around the world, is limited to simulating uniform conditions across the entire simulation region. In many agricultural areas where wind erosion may occur, either soil type and/or management practices often vary across conservation planning sites. Such changes across a field can affect wind erosion processes and are not currently accounted for in WEPS. A multiple sub-region capable WEPS will account for these changes in conditions and wind erosion processes as the wind travels across a field to more accurately simulate losses from typical fields. The WEPS modeling code has been extended to allow multiple soils and multiple management practices to be specified across a single simulation region. Two scenarios comparing conservation planning using the limited version and the newly extended version are presented. The first scenario is the simulation of a field with highly erodible soil in a small sub-area, or what is commonly referred to as a “hot spot.” In the current WEPS, only the “hot spot” would be simulated. With the extended model, the effect of the soil flux from the “hot spot” onto the surrounding less erodible soil is quantified. The second scenario is simulation of strip cropping for conservation planning. Similarly, the extended WEPS quantifies the interaction between the strips. Results including plots of modeled soil movement for specific erosion events are presented to illustrate the advantages of the extended model.