

User friendly tools to target vulnerable areas at watershed scale: evaluation of the soil vulnerability and conductivity claypan indices.

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One finding of the Conservation Effects Assessment Program (CEAP) watershed studies was that Best Management practices (BMPs) were not always installed where most needed: in many watersheds, only a fraction of BMPs were implemented in the most vulnerable areas. While complex computer simulation models can be used to identify these areas, resources needed for using such models are beyond reach for the managers of most conservation efforts. Conservationists need user-friendly, spatially explicit tools to prioritize BMP placement, thereby increasing their effectiveness. Two indices for identifying areas most prone to erosion were compared in the Goodwater Creek Experimental Watershed, a claypan watershed in Missouri: the Soil Vulnerability Index (SVI) intended for large-scale analyses and the Conductivity Claypan Index (CCI) developed specifically for soils that have a restrictive layer. Factors affecting the critical areas identified by each index were assessed, classified areas were compared, and index performance was assessed through comparison with results from a SWAT model. Slope and depth to claypan had the most variability and were found to be influential in determining area classification by each index. Evaluating SVI and CCI classifications for known vulnerable areas in the watershed showed that the CCI was able to identify these areas more consistently than the SVI. Significant correlation was found between cropland CCI vulnerability levels and SWAT estimated contaminant loads. These results highlight the effects of using a targeting index that is sensitive to local conditions versus one intended for wider-scale analyses. They also provide ways to improve the SVI.