The prediction of Soil Moisture Distribution for a small catchment by the Distributed Hydrology Soil Vegetation Model (DHSVM) based on SSURGO soil maps in southern Indiana.

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Abstract. The soil series applied to a map unit uses ranges for most of the soil characteristics; therefore, inherent variability exists within a soil map unit. The soil map units may include more than one soil series which introduces another source of variability. These shortcomings can be critical when the soil map units are viewed from a watershed perspective and modeling, especially for quantitative assessment of the role that soil characteristics have on soil moisture distribution, interflow, water table depth, and vice versa. The objectives of this research were to: i) evaluate the spatial distribution of soil data based on polygons from order 2 soil survey (SSURGO) and measured values from zero order soil survey; and ii) compare hydrologic indicator predictions using the Distributed Hydrology Soil Vegetation Model (DHSVM) for zero order and order 2 data input. The use of average, minimum, and maximum ranges of soil characteristics as inputs to the DHSVM based on SSURGO indicated significant differences in the predicted soil moisture distribution patterns. This is expected given the inherent variability of the soil characteristics by the order 2 soil survey. The DHSVM prediction of soil moisture distribution using soil characteristics based on zero order soil survey was more closely related to the geomorphic characteristics of the catchment compared to the order 2 soil survey. The spatial distribution of the depth to the limiting layer had a major influence on the moisture spatial distribution in the soil profile and water table depth and duration.

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