Soil Landscape Modeling: the Promise and Limitations of Quantitative Approaches. (S05-mcsweeney104846-Oral)

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Abstract:

Partitioning water across a landscape is a complicated process to model due to the dynamic interface of vegetation, rainfall, and soil properties. Previous research on soil landscape modeling has focused on infiltration at the millimeter scale and runoff on the meter or landscape scale. A vital aspect of landscape modeling is to represent the biophysical processes that regulate water partitioning at both scales with equal levels of quantitative rigor, while maintaining the ability to parameterize the equations with readily available sources of soil information. For example, a macropore flow subroutine in the Precision Agricultural Landscape Modeling System, PALMS, uses soil structure and shrink swell information available in USDA Soil Survey books for parameterization. The flow of water through soil macropores is calculated using basic physical equations that describe geometry of slits and pores created by soil structure. The differences of water partitioning across a landscape and throughout soil horizons are shown for two soil-management cases that affect soil structure.

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