A Stochastic Analysis of Profile Soil Moisture Change Within a Meso-Landscape. (S06-grove133220-Oral)

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Abstract:

The water content at any point within a profile, at a particular time, is due to properties at that point and to properties elsewhere. Three general factors drive the steady state horizontal distribution of moisture within soil: topography, climate, and soil properties. The objective of the study was to use a stochastic approach to analyze soil moisture changes in the field. A field area of 0.36 ha, mostly Maury silt loam (Typic Paleudalf) was used. Capacitance access tubes were installed in a rectangular grid, at interval multiples of 3.66 m, and to a depth of 80 cm. Soil bulk density and texture were measured at 10-cm depth intervals using soil cores removed during tube installation. Moisture was measured in 10-cm depth increments after crop harvest; on a daily basis before, during and after a rain event; and every two days of subsequent drainage. The stochastic approach delineated areas with a greater probability of higher soil moisture for a longer duration. These areas were not randomly allocated, but were related to soil and landscape properties. The stochastic approach is a promising approach to developing an understanding of soil moisture distributions in space and time.

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