A Pedon Approach to Organic Carbon Distribution: Influence of Landscape Position and Climatic Conditions. (S05-rhoton084818-Poster)

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Abstract:

Soil C data collected from near-surface horizons without characterizing the associated hillslope components are of limited value in terms of quantifying C sequestration at the landscape scale. This study was conducted to determine the influence of slope position and soil drainage class on soil C distributions as a function of soil profile depth. The study consisted of five field sites in the loess uplands between northwestern TN and southeastern LA, a distance of approximately 650 km. At all sites, the Memphis (fine silty, mixed, active, thermic Typic Hapludalfs), Loring (fine silty, mixed, active, thermic Oxyaquic Fragiudalfs), and Grenada (fine silty, mixed, active, thermic Oxyaquic Fraglossudalfs) soils were sampled to depths exceeding 300 cm. Samples from each horizon were characterized for bulk density (BD) by the saran-coated clod method and total C (TC) by combustion. Data from these analyses were used to calculate TC on a pedon basis, which averaged 4.8 mg/cm of soil depth for the well-drained Memphis, and 5.6 mg/cm for Loring and 5.9 mg/cm for Grenada, both moderately well-drained members of the catena. These results demonstrate that organic C contents of pedons on the lower landscape components are greater than those of well-drained soils upslope, and can provide the basis for assessments of C sequestration on a regional watershed scale.

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