Soil-Landscape Modeling across a Physiographic Region: Topographic Patterns and Scales of Soil Variability. (S05-thompson110348-Oral)

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Abstract:
Soil-landscape modeling techniques have developed as a quantitative method to predict patterns of soil properties from observed patterns in soil forming factors. However, transportability of these models to unsampled landscapes is unknown. Our objective is to develop quantitative soil-landscape models for multiple study sites and examine the similarity of these quantitative models, and therefore the similarity of soil-landscape relationships among areas with similar soils. We have collected high-resolution digital elevation models (DEM) for multiple study sites across the Pennyroyal physiographic region of Kentucky, and for each study site used terrain attributes derived from the DEM to collect discrete soil samples for morphological, physical, and chemical characterization using a stratified random sampling design. We examined the inherent differences in terrain attributes among sites, and developed quantitative soil-landscape models that predict the spatial patterns of A-horizon depth, surface soil organic carbon content, and surface clay content. Terrain attribute distributions differ significantly among study sites, but predictive models have similar structure among fields.

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