Terrain and agricultural management-based spatial modeling of soil organic carbon. (S05-venteris130928-Oral)

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Abstract:

Spatial models of soil organic carbon (%C) were created for four zero-order watersheds (5,000 to 10,000 m-2) at the North Appalachian Experimental Watershed in Coshocton, OH. The watersheds represented hay, pasture, conventional tillage, and continuous no-till corn. 49 samples per watershed were collected in radial arrays for estimation of spatial autocorrelation. An additional 45 random samples per watershed were collected for terrain-based (2 m DEM) environmental correlation. The discrete samples were converted to continuous grids using both kriging and multiple least squares regression. Model methods produced similar grids and the RMSEs were within 0.05 %C. The residuals from the terrain regression models were checked for autocorrelation using variography. The residuals lacked spatial structure. A search for model improvements through additional spatial correlates or regression techniques was not warranted. %C noise within the area of one DEM pixel (4 m2) resulted in low r2 (0.3 - 0.5 %C) for individual models. All terrain models combined had an r2 of 0.64 because there was more variability between management practices than terrain positions.

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