Submeter to Landscape Scale Spatial Variability of Soil Phosphorus: Modeling and Implications. (S05-needelman081654-Poster)

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Abstract:

The mapping of soil phosphorus (P) concentration is necessary to assess the risk of P loss in runoff from agricultural lands. Researchers have observed spatial autocorrelation of soil P concentrations at different scales; the importance and integration of these scales of variability warrants further analysis. In this study, several Mehlich-3 extractable soil P (M3P) data sets were integrated to model and evaluate soil P spatial distributions at submeter, field, and farm scales. The study was conducted on an east-central Pennsylvania 39.5-ha watershed (FD-36) with an average field size of 1.0 ha. Spatial autocorrelation was observed at all scales. Data from submeter, 10-m, and 30-m grids were integrated into a multi-scale variogram. This variogram was used to generate theoretical distributions. In combination with desorption/sorption kinetics equations, Monte Carlo simulations were performed to assess the importance of spatial variability on nutrient transport at multiple scales.

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