Using IKONOS Imagery to Predict Soil Properties in Two Physiographic Regions of Alabama. (S06-sullivan163819-Oral)

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Abstract:

Knowledge of surface soils is used to assess erosion, nutrient requirements, and infiltration for agronomic management decisions. IKONOS satellite imagery may facilitate mapping of surface soil attributes. This study was designed to evaluate IKONOS multispectral images as a tool for mapping soil properties. Imagery was acquired over conventionally tilled fields from the Coastal Plain and Tennessee Valley physiographic regions of Alabama. Soils consisted mostly of fine-loamy, kaolinitic, thermic Plinthic Kandiudults at the Coastal Plain site and fine, kaolinitic, thermic Rhodic Paleudults at the Tennessee Valley site. Soils were sampled in 0.20 ha grids to a depth of 15 cm and analyzed for particle size distribution, citrate dithionite extractable iron (Fed), and soil organic carbon (SOC). Preliminary results indicate correlation ($p < 0.01$) between surface soil properties and remotely sensed data is stronger at the Coastal Plain site. Nugget semivariance (NS) values showed soil organic carbon and clay content were highly spatially dependent at both sites (NS = 0.05 to 39 %). Additional analyses will utilize spatial relationships among soil properties to assess the predictive capabilities of co-kriging with remotely sensed data.

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Presentation Information:

Presentation Date: Wednesday, November 13, 2002

Presentation Time: 10:30 am

Keywords:
Remote Sensing, IKONOS, Soil Properties, Grid Sampling