Evaluating the Strength of the Correlations between Soil Properties and Crop Yields Using Cross-correlograms. (S01-kravchenko111516-Oral)

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Abstract:

Although regression remains among the most popular numerical methods used for studying relationships between crop yields, soil properties and topography, its main drawback lies in ignoring data locations and spatial structure in data distributions. Cross-correlograms allow to evaluate not only strength and sign (positive vs. negative) of relationships between the variables but also to examine spatial aspects of the relationships, such as distances over which correlation between studied variables exists or directions in space of the strongest/weakest correlation. However, as opposed to correlation coefficients, comparisons between cross-correlograms are more awkward since they involve comparing cross-correlogram values at several distances. In this study, we developed a single criteria that combines information on crosscorrelogram values, spatial correlation range, and cross-correlogram shape and, hence, allows convenient quantitative comparisons between crop yields and other variables. We used cross-correlograms to quantify relationships between corn/soybean yields, soil electrical conductivity, and elevation.

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Presentation Information:

Presentation Date: Wednesday, November 13, 2002 Presentation Time: 9:15 am

Keywords:

cross-correlogram, soil electrical conductivity, corn/soybean grain yield