Soil Classification Using Hyperspectral Remote Sensing Data: Application for Natural Resource Management. (S05-wadia100936-Oral)

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Abstract:
The objective was to integrate hyperspectral and field data for providing soil parameter information that could be applied for precision agricultural applications. The study area is Wolf Field, Champaign County, Illinois. The data was collected using the ITD/Spectral Vision's RDACSH3, providing 120 bands in the V and NIR regions with a spectral and spatial resolution of 0.003 micrometers and 1 meter, respectively. Unsupervised classification was correlated with field classification, and its accuracy was evaluated. In addition, principal component analysis (PCA), selected band ratios, and a fuzzy-c-means (FCM) analysis were carried out. The unsupervised classification yielded a higher accuracy (70 %) than PCA (65 %). Band ratios did not highlight any distinguishing characteristics and FCM analysis results were of a qualitative nature. The unsupervised classification performed better than other methods in carrying out detailed soil classification. The results suggest that further research is required to refine the classification product for differentiating soils into series and subseries by performing a comprehensive classification scheme, and the selection of more sample sites.

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