Estimating Soil Salinity from Remote Sensing Data in Corn Fields

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Abstract: This paper describes an approach for developing soil salinity maps by comparing field-collected data with remotely sensed data. This approach is applied to the salinity monitoring program that has been conducted in a portion of the Arkansas Valley in southeastern Colorado. The approach involves integrating remote sensing data, GIS, and spatial analysis. GIS data has been collected along with soil samples at multiple locations in corn fields. Using this spatial soil salinity data, salinity maps are produced. The collected soil salinity data is then tied to the corresponding values from Ikonos satellite imagery. A stepwise regression method is applied to determine the best correlation between soil salinity data and the corresponding pixel values on the satellite image. Two regression methods have been tested with the combinations of variables: ordinary least squares (OLS) and spatial autoregressive (SAR). The best model based on the smallest Akaike Information Corrected Criteria (AICC) was the SAR model.

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