Spatially correlated mixed-effects models for the analysis of soil water retention

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Abstract

The knowledge of hydraulic properties of soil is necessary in many environmental applications and land planning. These properties, however, are difficult to determine and often they demand high labour costs, for which the tendency is to estimate them on the base of other more easily measurable or already available soil data. The level of detail reached using this method is not always satisfactory for some applications to basin scale, where variables to measure the morphologic property of the landscape are required. This study is proposed to characterize the spatial distribution of the water retention of a soil on wide scale using data relative to the physical, topographical and chemical characteristics of the soil within a model based approach.

Keywords: Linear Mixed Models, Spatial Continuous Autoregressive Correlation Structure, Soil Water Retention.

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