Spatial Variability Analysis of Soil Physical and Chemical Properties in Research Field of Zabol University

Spatial variability is common in soil physical and chemical properties. Recognition of these changes is unavoidable for careful planning and management, especially in farmland. Geostatistical interpolation methods (i.e. kriging) that have been gained a lot of attention in recent decades are able to estimate soil physical and chemical parameters in unknown locations with considering the spatial variability between values of desired parameter.
This study was conducted in the field research of Zabol University, area of about 85 hectares in order to investigate the spatial variability of soil physical and chemical properties. Samples were collected from 123 points in depth of 0-15 and 15-30 cm of soil. Then both methods, ordinary kriging and log normal kriging, were used and compared for estimation. Cross-validation technique with comparison criteria such as MAE, MBE and RMSE, was used to evaluate and compare the performance of both methods. The results showed that spatial structure of most properties follow a spherical and exponential model for depth 0-15 and 15 to 30, respectively. The results also showed that spatial variability generally increases with increasing depth. Among all parameters studied in both the depth, the percentage of loam did not show any spatial correlation. Cross-validation results indicated that ordinary krigging metho provides slightly better results of estimating soil properties than log normal krigging.

Key words: Ordinary kriging, Log normal kriging, Physical and Chemical properties, Soil, Zabol.

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