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Faculty of Agriculture
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Title

**Mapping groundwater table using
geostatistical methods in Sistan plain**

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Abstract

Management of water resources such as groundwater is very important especially in arid and semi arid areas. Spatial variability analysis and accurate estimation of groundwater have a basic role in better management of these resources. Geostatistical interpolation methods, which are increasingly used in the last decades, have ability to estimate many soil physical and hydraulic properties based on a spatial correlation between the sampling points. In this paper, geostatistical interpolation methods including ordinary kriging, indicator kriging and log-normal kriging are used to map groundwater level in Shib-ab and Posht-ab payeen regions in Sistan plain. The study area is about 47000 ha and groundwater level observations are 2026, which were sampled 500 m apart in an square grid. The evaluations technique was cross-validation with three comparison criteria of MAE (Mean absolute error), MBE (Mean bias error) and RMSE (Root mean square error). The results obtained in this study indicated that groundwater level is moderately spatially correlated in this area. Cross-validation results showed that log-normal kriging is the most accurate method and indicator kriging is the most inaccurate one for estimation of groundwater level. On the other hand, estimation variance map, which is a tool for representing estimation uncertainty is dependent mainly to sampling location for both ordinary and log-normal kriging. Indicator kriging estimation variance was dependent to sample values as well. Therefore in environmental studies where the focus is on estimation uncertainty rather than estimation only, indicator kriging should be preferred to more classical ordinary kriging.

Keywords: Ordinary kriging, log-normal kriging, indicator kriging, groundwater table, Sistan plain