

Abstract

The optimal management of water resources, and keeping their quality within the standard criteria, need the basic information about the range of chemical elements and their coordinate information in a specific geographical location. The appropriate zoning on the sufficiency of the statistical data as well as their local condition; which is an important step for the better management of water resources. This research investigate the spatial and temporal distribution of groundwater quality and quantity of Shahre-Babak Plains through 10 and 12 years periods, using geostatistical techniques. After the evaluation of best resources, data were evaluated for restoration purposes according to their accuracy and distribution; because it was observed that the data do not fit to normal distribution based on Kolmogrov-Smirnov test, therefore the logarithm of the data were used. Then the spherical variogram model had the best fit to the spatial distribution of the depth and all over of the quality parameters (TDS, EC, CL and PH) using the GS+ software. Result showed that the best semi-variogram model is the spherical model to fit all data such as the depth and the quality parameters. It has to be mentioned that according to the RMSE, MBE and ASE using Cross Validation technique (C.V), the Kriging was chosen as the best interpolation method among kriging, Co-kriging and IDW. It was also found that there is a strong correlation between EC and TDS and their decreasing trend within the study period along the Shahre-Babak plain. Assessment of the 12 year of the water table data showed 4 meter decline related to the qualification data. The quality of the plain water for agricultural and potable usages were evaluated based on Wilcox and Shouler standard and the scale was poor for agriculture, but it can be harvested for drinking temporarily. The spatial quality map shows a decrease along the North – Southwest and the North – Southeast pathes. In other word, the plain in Southwest and Southeast locations (The watershed outlet) represents the worst quality of the water, and the it goes toward alkalisation. This is probably due to the intensive agricultural activities in these location (Southwest and Southeast location) and the presense of salt pan in southwest part, also because of low quality of geological formation. Also, the Iso-decline map of water table showed highest decrease in these area which overlap the dense rural area.

Keywords: Geostatistic, GS+ software, Variogram model, Interpolation, Shahre-Babak.



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