Spatial variability analysis of groundwater quality and quantity in Arak plain using Geostatistic and GIS

Abstract

Groundwater resources consider as an important development factors. Geostatistical methods is one of the appropriate interpolation methods to prepare qualitative and quantitative zoning maps. The aim of this research is to investigate the spatial distribution of groundwater elevations and water quality parameters (EC, TDS, CL- and PH) with acceptable precious. Based on cross validation cross validation and the values of RMSS, RMS, ASE and ME of the different geostatistical models were used for groundwater quality and quantity data, the Log ordinary Kriging model with Guassin semiovariogram was used for TH, the Log universal kriging model with Guassin with linear trend semiovariogram was used for EC, the Log universal kriging model with exponential with linear trend semiovariogram was used for TDS, the Log universal kriging model with linear trend with panta spherical semiovariogram was used for CL- and the ordinary kriging model with Guassin semiovariogram was used for PH. then quality and quantity zoning maps of Arak aquifer have been prepared. The results obtained from the comparison of different interpolation methods using selected models indicate that the geostatistical methods considerably are better than the fixed methods. In addition, the results of zoning maps quantity and quality parameters indicate research, to obtain an optimum monitoring water well network, two Somitting (6 wells) and adding (11 wells) wells methods was applied. In general, the results obtained from the zoning quality map indicate that the groundwater quality reduced in centeral parts of the aquifer.

KEY WORDS: Groundwater, Geostatistic Methods, Arak plain

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