Comparison and Applications of Geostatistical and Determined Methods for Groundwater Quality Zonation of Drinking

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Abstract

Groundwater resources management is very important in arid and semi-arid areas. Study of spatial variation of groundwater quality parameters have important role in recognition of aquifer quality condition, pollution sources and determination the most suitable managerial strategies. Geostatistical and GIS methods can be useful in this regard. In this article, by using of Inverse Distance Weighting method and Radial Basis Function, Global Polynomial Interpolation, Local Polynomial Interpolation and Ordinary Kriging Geostatistical methods in Arc GIS software distribution of EC, TDS, TH and pH pollutants in Hamedan province of Kabudrahang plain's groundwater evaluated and spatial distribution maps were prepared for each one. on based 27 wells groundwater samples were analyzed. after the variogram reviewed and the spatial variations of parameters studied parameters with mentioned different ways interpolation was done and using with Cross Validation method and Root mean square error the best model for evaluation with the lowest RMSE was selected. the results showed that the EC, TDS and TH parameters had lowest RMSE with using RBF method and pH parameter had lowest RMSE with using LPI method and to catering spatial distribution map of groundwater quality parameters used with methods. according to the drinking water standards the world health organization and map obtained with using from geostatistical the results showed that TH and pH parameters in the plains don't have limits for drinking and EC parameter in the southeastern of plain that only covers a very small area have limit, and the other place of plain is without limitation. TDS parameter value from the Plain's center to the northeast which is uninhabited has a decreasing trend and is no limit and the other locations is limiting of drinking. reason of decreasing of groundwater resources quality is the excessive harvesting of groundwater resource and illegal drilling wells.

Keywords: Spatial Variation, Geostatistical, Kabudrahang, Root Mean Square Error.

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