Assessing the Trend and Quality Classification of Groundwater Resources in Boroujerd – Dorod plain

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Abstract

Groundwater resources are the largest available freshwater reservoir on the Earth. Therefore, the management of these resources and their quality control is an essential issue. The purpose of this study is to investigate the trend of changes in groundwater quality parameters by Mann-Kendall test and qualitative classification of Boroujerd-Dorod plain using GQI index. For this purpose, the values of different parameters including chlorine, sulfate, acidity, total hardness and total dissolve solid from 41 sources during the period of 1993-2016 were used. The results showed that based on Mann-Kendall test, the acidity and chlorine parameters had positive Z value, and the acidity trend was significant at 95% level, while other parameters had negative Z value with decreasing trend. According to the GQI index, all parameters in the year 2016 were in accordance with ISIRI criteria. Based on the ranking of different parameters, it was found that TH, pH and EC had the greatest impact on the quality of groundwater resources in the studied plain. From the spatial point of view, the highest concentration of qualitative parameters except pH is in the center of the plain, and the northeast area of the plain is also prone to high pollution compared to other parts of the plain, especially in terms of cations and EC. Based on Schuler's classification which was used to validate the GQI results, the quality is located in good and acceptable class, which confirms the result of this index.

Keywords: Groundwater, Groundwater Quality Index, Schuler, Kriging.