عنوان مقاله:

(Modeling Ground-Water Quality using Time Series Models (A Case Study: Dehloran Plain, Ilam

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خلاصه مقاله:

The main purpose of the present study is to modeling the variation of ground-water quality parameters from ۲۰۰۱ to ۲۰۱۸ and predicting its quality for ۲۰۲۷. To achieve it, we accessed parameters which included total hardness (TH), total dissolved solids (TDS), sodium (Na), sulfates (SO۴), and chlorides (Cl) which acquired from thirty-four wells in Dehloran Plain, Ilam. Due to the large number of wells, the samples were classified through cluster analysis into six clusters. To determine the number of clusters, a hierarchical clustering method was used. Five time-series models of autoregressive (AR), moving-average (MA), auto-regressive moving-average (ARMA), autoregressive integrated moving-average (ARIMA), and seasonal auto-regressive integrated moving-average (SARIMA) were applied to predict the changing ground-water quality. The best model was selected based on the Autocorrelation function (ACF) and Partial autocorrelation function (PACF), Akaike Information Criterion (AIC), and Coefficient of determination (R۲). The results of the prediction indicated that the average concentration of Cl and Na will increase in all the clusters in ۲۰۲۷. Moreover, the average of the predicted SO۴ will increase in all clusters except for the sixth one. The average of TDS also will increase in the first to third clusters, while it will decline in the fourth, fifth, and sixth clusters. The average of the predicted TH in the first, second, third, and fifth clusters will rise, whereas it will be reduced in the fourth and sixth clusters. It can be concluded that the status of ground-water quality is worsening in Dehloran Plain and in ۲۰۲۷ its quality will become lower compared to previous years.

کلمات کلیدی:

ground-water, Time series, Dehloran Plain, auto-regressive