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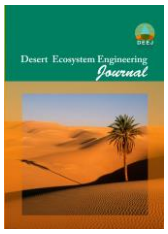

Investigation of Temporal and Spatial Variation of Groundwater Quality and Quantity in Garmsar Plain

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Abstract

Groundwater resources as one of the most important sources of water needed for agriculture, industry and drinking is important, that are encountered with different risks such as water level fall, recharge reduction due to lack of rainfall and normal and abnormal contaminants. This study was conducted in Garmsar alluvial plain in Semnan province. According to the research purposes, process and effect water table fluctuations were investigated in the 4 periods, 1995-1997, 1997-2003, 2003-2009 and 2010-2012 in 75 wells. In order to investigate the effects of variations in water quality parameters including EC and SAR, Results of chemical analysis in 52 wells were evaluated and analyzed in the second periods (2003-2009 and 2010-2012). For zoning of quantity properties of water, IDW method (with a power of 1 to 5) and Geostatistical methods (Kriging and Cokriging) was used using Surfer8 and ArcGIS. For investigating process and variations of water table fluctuations and water quality parameters the Classification and rate of IMDPA desertification model was used. Finally, results showed that decline in groundwater levels were 1.05, 8.2, 4.27 and 5.34 meters in periods of 1995-1997, 1997-2003, 2003-2009 and 2010-2012, respectively and Groundwater decline average was 0.99 cm or in other word equal to 1 meter drop in Garmsar plain, yearly. Also Wilcox classification to determine the level and types of water quality was used. According to obtained results and based on quantitative parameters of EC and SAR, water was located in C4S1 category.

Keywords: Groundwater, Quality parameters, IMDPA, Wilcox method, Zonation.

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