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Evaluation of Groundwater Quality and Its Suitability for Drinking and Agricultural Purposes Using Self-Organizing Maps

Authors : L. Belkhiri, L. Mouni, A. Tiri, T.S. Narany

Abstract : In the present study, the self-organizing map (SOM) clustering technique was applied to identify homogeneous clusters of hydrochemical parameters in El Milia plain, Algeria, to assess the quality of groundwater for potable and agricultural purposes. The visualization of SOM-analysis indicated that 35 groundwater samples collected in the study area were classified into three clusters, which showed progressive increase in electrical conductivity from cluster one to cluster three. Samples belonging to cluster one are mostly located in the recharge zone showing hard fresh water type, however, water type gradually changed to hard-brackish type in the discharge zone, including clusters two and three. Ionic ratio studies indicated the role of carbonate rock dissolution in increases on groundwater hardness, especially in cluster one. However, evaporation and evapotranspiration are the main processes increasing salinity in cluster two and three.

Keywords : groundwater quality, self-organizing maps, drinking water, irrigation water
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