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ABSTRACT BOOK

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EFFECTS OF THE ANTHROPOGENIC ACTIVITIES ON THE GROUNDWATER HYDROLOGY AND CHEMISTRY IN DELİÇAY-TARSUS COASTAL AQUIFER (MERSİN)

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Deliçay-Tarsus coastal plain (DTCP) is located along the Mediterranean Sea coast of the Mersin province and covers an area of 234 km² between Deliçay and Tarsus (Berdan) Rivers. Due to ongoing intense anthropogenic activities in the area, the land use is very complex, where a significant portion (84%) of the area is utilized by various forms of agricultural activities. The most of the remaining area can be classified as forest, industrial, and residential. The ecological importance of the DTCP area, on the other hand, can be attributed to existence of important coastal ecosystems. For instance, the 4.5 km beach at Kazanlı is the second most important nesting site in the Mediterranean for the “critically endangered” marine turtle species. Nevertheless, the DTCP ecosystem has been irreparably altered by land use/cover (LULC) changes that took place mostly through human intervention, which in turn, resulted in modification of the basin hydrology, drainage patterns, groundwater storage and chemistry.

This study is aimed at investigating the impact of natural processes and ongoing anthropogenic activities on the groundwater chemistry and hydrology in the DTCP area. For this purpose, in August 2008, a total of 193 well and 10 surface water samples were collected for the characterization of their physicochemical properties and to gain a better understanding on interactions occurring between groundwater and surface waters in the study area. Additionally, in-situ hydraulic conductivity and water-level measurements were carried out in selected locations to determine the hydrogeologic properties of the DTCP coastal aquifer. The results obtained from this study were analyzed using various statistical and geostatistical techniques and compiled in a database using a Geographic Information System (GIS) to create, display and visualize various thematic maps showing the impact of human activities on groundwater hydrology and chemistry in the area. By far the most important pollution source in the area is seawater intrusion, which is caused by heavy groundwater pumping for agricultural, industrial, and domestic purposes. Especially, the vicinity of Kazanlı and Kulak coastal settlements were greatly affected by salinization of groundwater resources. Intense anthropogenic activities and land use changes occurred in the past 30 years have greatly affected the groundwater levels (compared to pre 1978 data), where in places 2 to 5 m declines observed in groundwater levels. This situation, in turn, has resulted in the modification of the groundwater flow directions and deterioration of groundwater quality and quantity in the DTCP area.

Keywords: Land Use, Multivariate Data Analysis, GIS, Groundwater Level, Water Chemistry

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