



## **Geostatistical Study of Groundwater Level Variability in the Messara Valley of Crete**

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This study focuses on the spatial and temporal variability of the groundwater level in the Mires basin of the Messara valley in Crete (Greece). The island of Crete has a dry sub-humid climate, and marginal groundwater resources, which are extensively used for agricultural activities and human consumption. Over-exploitation of limited water resources in conjunction with possible future climatic change impacts in the Mediterranean region, has led to concerns over vulnerability to desertification and the sustainability of water resources on the island. Hence, it is necessary to understand the role of climatic variation and land-use practices on the water resources. The Messara valley is located in the south of the Heraklion prefecture, covers an area of 398 km<sup>2</sup> and is very important for the economy of the island. This study focuses on the Mires basin for reasons of hydro-geological data availability, geological homogeneity, high population and extensive agricultural activity. Seventy four (74) approved and several unauthorized abstraction wells operate in the basin. Accurate estimation of the basin's groundwater table depth is crucial for the management of water resources and for defending against salt water intrusion and possible desertification effects. The geostatistical analysis explicitly accounts for the distance of the wells from a seasonal river crossing the basin river. Interpolated maps will be constructed to better understand the spatial variability of the groundwater level. Datasets from the hydrological years 1999-2000 and 2001-2002 will be investigated, in order to evaluate the temporal dependence of the water table.

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