



Aquifer Characterization using electromagnetic and geoelectric methods for the study of Keritis Basin in Western Crete, Greece

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Effective management of groundwater resources is a well known problem in several areas around the world. Its importance is designated to areas suffering from the lack of fresh water such as islands. Detailed study of available aquifers has great interest in Crete Island. Electromagnetic and geoelectric surveys in the mode of transient electromagnetic (TEM) and vertical electrical soundings (VES) were conducted in Keritis basin at Western Crete Island, in order to obtain detailed information about the geometry of the different geological layers in the aquifer and depth to the basement. A total of 300 measurements were carried out. Data from existing boreholes in the broader area used to calibrate preliminary and final results.

During the modelling process, results from both methods showed good convergence. Several layers could be identified as being part of an aquifer complex. Maps of resistivity values highly correlate with the general hydrogeological condition in the area. Numerical 3-D modelling results provide useful information about the distribution of subsurface conductivity, thereby enabling to recognize the main geological formations and the pattern of the complex aquifer system. The results show a structure of 5 main different geological formations. The detailed measurements and processing identify the aquifer geometry where its limits clearly identified as well as the direction of its discharge.

The information collected during this survey provides valuable data for estimating the water resources of the Keritis basin aquifer system and for development of a groundwater management plan.

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