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Inverse Modeling of Groundwater Flow of Delta Wadi El-Arish

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ABSTRACT

Egypt is mainly covered by desert and only 4% of total lands is arable, mainly the alluvial plain of the Nile and its delta. In order to cope with the increasing population, the government of Egypt has been pressed into the development of Sinai Peninsula. So, it is indispensable to evaluate the potential groundwater resources for the development of the Sinai Peninsula. The key components are a conceptual model and a groundwater model with certain mathematical components. The conceptual model is a system analysis of the hydrogeological understanding of how water flows into, through and out of a groundwater system. Based on available borehole data, the study area is characterized to reach to the most representative conceptual models. Finally, a finite difference groundwater model was applied utilizing the graphic user interface GMS were used. In order to handle problems at regional scale, automated parameter estimation (PEST) was used in GMS. Moreover, recharge was parameterized using zones by defining these zones several factors were considered; for example, surface geology, density of vegetation, general land use, and LANDSAT image. However, Groundwater flow model successfully calibrated. Calibrated groundwater model helped to identify the heterogeneity in the aquifer.

KEYWORDS

GMS; PEST; LANDSAT

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References

- [1] Faculty of Engineering, Cairo University, "Groundwater Management Study in El-Arish Rafaa Plain Area," Phase 1, Main Report, Vol. 1, Water Resources Research Institute, Ministry of Public Works and Water Resources, 1989.
- [2] Faculty of Engineering, Cairo University, "Geological sounding survey in El-Arish, Sheikh Zuwyied, Rafah area," Main Report, Vol. 1, Water Resources Research Institute, Ministry of Public Works and Water Resources, 1989b.
- [3] A. W. Harbaugh, E. R. Banta, M. C. Hill and M. G. McDonald, "MODFLOW-2000, the US Geological Survey Modular Ground-Water Model—User Guide to Modularization Concepts and the Ground-Water Flow Process," US Geological Survey Open-File Report 00-92, 2000.
- [4] JICA, North Sinai, "Groundwater Resources Study in the Arab Republic of Egypt," Final Report, 1992,
- [5] A. Shata, "Groundwater and Geomorphology of the Northern Sector of Wadi El Arish Basin," *Bulletin Society Geograph Egypt*, Vol. 32, 1959.
- [6] J. J. Seguin, M. Bakr, "Sinai Water Resources Study, Modelling of three aquifers: El Arish, Rafah, and El Qaa," WRRRI, NWRC, Egypt, 1992.
- [7] J. Doherty, "PEST: Model-Independent Parameter Estimation," *Watermark Computing*, 1994.

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