

Abstract

Groundwater modeling studies are considered among the indirect methods to estimate groundwater inflows and are frequently used due to their higher efficiency and lower cost in comparison to other methods. The groundwater decline of the plains of Sirjan, Iran, has been studied through this type of modeling. The plains cover an area of 12.797 square kilometers of which 6.853 square kilometers are valleys and 5944 square kilometers are considered to be plateaus. In this study, the Sirjan plains aquifer has been studied by finite difference methods simulated by the Processing Modflow for Windows (PMWIN) software. Initially, areas that include evaporation, rainfall inflow, borders, pump flow and basic hydrodynamic coefficients were built. Subsequently, mathematical modeling and a calibration process were performed for both stable and unstable conditions. During the calibration process the external parameter estimation software PEST, was utilized for optimization of direct modeling, hydraulic conductivity and storage coefficient of the aquifer layer. In the following steps, a model sensitivity analysis was performed for various parameters. The model was validated while different management scenarios were considered for the plains and the reaction of the aquifer to these were simulated.

Key words: Aquifer, groundwater modeling, finite difference method, drought, SPI, PEST.



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Optimization of

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