## Abstract

Groundwater s are the main sources for supplying water to agricultural and drinking areas in the plain of Sarayan. Hence, the study of spatial variations - when water resources are important in the planning and management of these resources, is of great importance. In this research, the purpose of estimation and zoning of groundwater levels in the plain of Sarayan with the help of land statistics and neural network during the years 88-87 to 96-95. Required information included groundwater level statistics of 20 piezometric wells in the plain (extracted from regional waters of South Khorasan Province). Initially, groundwater level was studied during the annual period. And also monthly on the basis of the highest, the most moderate and lowest levels of groundwater in the plain. In the analysis of the geostatistics method, ordinary and simple Karjing was used with three spherical, exponential and Gaussian spatial transformation models and the Lunberg-Marquard algorithm was used in the neural network (MLP). were used to evaluate the modelsRMSE and R2. In the method of geostatistics, the best method, ordinary Korging with a half Gaussian change for the annual scale and the spherical model for the monthly scale were selected. Estimated error in estimation of groundwater level in ordinary Kriging method in comparison with ANN method was 1.2 m and 2.3 m, respectively, and the coefficient of determination was 0.92 and 0.85, respectively. On a monthly scale, the error of the ordinary Kriging method and the artificial neural network for December was 1.6 meters and 2.52 meters, respectively, and the coefficient of explanation was 0.90 and 0.86, respectively. Also, the estimation error of groundwater level for May of the year was 1.12 m and 1.8 m error, and the coefficient of explanation was 0.92 and 0.87, and September was 1.3 m and 21.2 m, respectively, and the coefficient of explanation Equal to 0.91 and 0.84 respectively. The groundwater level in the plain of Sarayan during the 9-year period showed that the level of groundwater level during this period fell by 4.93 meters. In the northwest and northeast regions, the Middle and Southwest have been more pronounced, due to the fact that agricultural and rural densities, deep and semi-deep wells, and excessive groundwater abstraction are among the most effective factors.

Keywords: Artificial Neural Network, Kriging, Underground water, Sarayan Plain,



University of Zabol Graduate School Faculty of Engineering Department of Construction

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## **Resources Management and Zoning of Sarayan Plain Ground** Water Table by Geostatistics and Artificial Neural Network

**Supervisors:** Dr. H. Derkhshan

Advisor: Dr. M.Delbari

**By:** Seyed Javad Alipour

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