GEOSTATISTICAL MODELING TO QUANTIFY THE TRANSMISSIVITY FIELD IN AN AQUIFER

THESIS

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ABSTRACT

The purpose of the present study is to use a geostatistical approach and to show how it can be applied to the analysis of uncertainity resulting from the spatial variability of transmissivity data. For this the kriging technique is used to map the transmissivity of Kulachi Tank aquifer.

Kriging utilizes a statistically based procedure of spatial interplolation that incorporates the spatial correlation structure of the phenomenon and provides an error estimate. Kriging was applied to a total of 27 transmissivity values in an attempt to quantify the transmissivity distribution of the Kulachi Tank aquifer in Dera Ismail Khan district. The analysis produced contour maps of estimated transmissivity and fitting of a spherical variogram to 27 log of transmissivity ($Log_{10}T$) values, the range was determined to be 90 Km, the average variance (δ^2_{logT}=0.3715) with the mean of 1.2366. Kriged estimates were a little higher when compared to estimates based on available transmissity estimates.