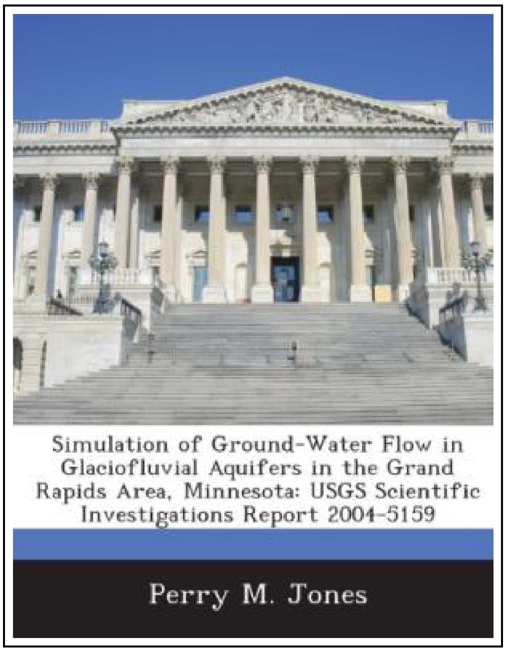
Simulation of Ground-Water Flow in Glaciofluvial Aquifers in the Grand Rapids Area, Minnesota: Usgs Scientific Investigations Report 2004-5159



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Great e-book and helpful one. It usually fails to cost an excessive amount of. I discovered this publication from my dad and i encouraged this pdf to find out.
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SIMULATION OF GROUND-WATER FLOW IN GLACIOFLUVIAL AQUIFERS IN THE GRAND RAPIDS AREA, MINNESOTA: USGS SCIENTIFIC INVESTIGATIONS REPORT 2004-5159

Bibliogov, United States, 2013. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book ***** Print on Demand *****.A calibrated steady-state, finite-difference, ground-waterflow model was constructed to simulate ground-water flow in three glaciofluvial aquifers, defined in this report as the upper, middle, and lower aquifers, in an area of about 114 mi2 surrounding the city of Grand Rapids in north-central Minnesota. The calibrated model will be used by Minnesota Department of Health and communities in the Grand Rapids area in the development of wellhead protection plans for their water supplies. The model was calibrated through comparison of simulated ground-water levels to measured static water levels in 351 wells, and comparison of simulated base-flow rates to estimated base-flow rates for reaches of the Mississippi and Prairie Rivers. Model statistics indicate that the model tends to overestimate ground-water levels. The root mean square errors ranged from +12.83 ft in wells completed in the upper aquifer to +19.10 ft in wells completed in the middle aquifer. Mean absolute differences between simulated and measured water levels ranged from +4.43 ft for wells completed in the upper aquifer to +9.25 ft for wells completed in the middle aquifer. Mean algebraic differences ranged from +9.35 ft for wells completed in the upper aquifer to +14.44 ft for wells completed in the middle aquifer, with the positive differences indicating that the simulated water levels were higher than the measured water levels. Percentage errors between simulated and estimated base-flow rates for the three monitored reaches all were less than 10 percent, indicating good agreement. Simulated ground-water levels were most sensitive to changes in general-head boundary conductance, indicating that this characteristic is the predominant model input variable controlling steady-state water-level conditions. Simulated groundwater flow to stream reaches was most sensitive to changes in horizontal hydraulic...

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