

Practical exercises:

Exercise

Run a groundwater simulation for a 1000 times 2000 meter unconstrained aquifer with a hydraulic gradient from west to east of 1 meters over the 2000 m domain length. Chose reasonable parameters for hydraulic conductivity (such as 0.0025 m/s) and effective porosity (such as 15 %) and start with an aquifer thickness of 100 meter. Run the simulation until steady state is achieved. Output the flow velocities as well as the hydraulic head.

Exercise

Analyze the result by plotting profiles across the domain. Discuss the quality of the simulation. For comparison, repeat the simulation with the additional commands `error=0.000000000000001` and `maxit=100000000000`. How does this change the result? Calculate, which flow velocity you would expect for the scenario given above.

Exercise

Modify the exercise above by varying aquifer parameters such as hydraulic conductivity and effective porosity to see the effect on the result.

Theoretical exercises:

Exercise

Name three physical processes you will need to evaluate for relevance before modeling a pumping test in a heterogeneous aquifer.

Exercise

Name five categories of information you will need to collect before you are able to setup a model of a pumping test in a heterogeneous aquifer.

Exercise

Repeat the 6 steps of the simple modeling workflow and describe each step with a single sentence.