



Simulation of regional groundwater flow regarding different hydrogeological characterizations: the case of Naegelstedt catchment

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We present the numerical analysis of a 3-D regional groundwater model for the Naegelstedt catchment in central Germany. The hydrogeological system is reproduced according to sparsely distributed boreholes data. The numerical analysis is carried out using the scientific software OpenGeoSys. Three alternative representations of hydrogeological zonation were systematically explored to understand their impact on groundwater travel times and paths. For each of these representations, the groundwater model was calibrated against groundwater water levels. The result shows the incorporation of gravel zone produces a better fit to the observations. Furthermore, upscaling of bore-hole scale parameter to field scale parameter is critical to model performance. Travel times calculated for all scenarios had a plausible order of magnitude. We concluded that data commonly used in groundwater modeling such as water tables and apparent groundwater ages may be insufficient to reliably estimate hydrogeological parameters.