Hydrogeios, an integrated model for simulating complex hydrographic networks - A case study to West Thessaly region

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An integrated scheme, comprising a conjunctive hydrological model and a systems-oriented management model, was developed, based on a semi-distributed approach. Geographical input data include the river network, the sub-basins upstream of each river node and the aquifer dicretization in the form of groundwater cells of arbitrary geometry. Additional layers of distributed geographical information, such as geology, land cover and terrain slope, are used to define the hydrological response units. Various modules are combined to represent the main processes at the water basin such as, soil moisture, groundwater, flood routing and water management models. Model outputs include river discharges, spring flows, groundwater levels and water abstractions. The model can be implemented in daily and monthly basis. A case study to the West Thessaly region performed. The discharges of five hydrometric stations and the water levels of eight boreholes were used simultaneously for model calibration. The implementation of the model to the certain region demonstrated satisfactory agreement between the observed and the simulated data.