



Coupled surface water - groundwater modelling for ecological purposes

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Floodplains are characterised by variable surface water depths within watercourses as well as inundated areas and fluctuating groundwater tables along with consequences for the local aquatic and terrestrial ecology. The flow regimes of surface water and groundwater strongly affect the complex system of several habitats.

In the present study a two-dimensional finite-difference model is applied for modelling the surface water flow. The groundwater flow regime is simulated using a two-dimensional finite-element model. Interactions between surface water and groundwater play a decisive role within this system of watercourses. Therefore the groundwater model is coupled to the surface water model to represent the interactions of the waterbodies. Simulated water depths of surface water serve as additional boundary conditions and are embedded as leakage objects in the groundwater model. Both numeric models provide simulation results which are relevant for ecological analyses. Water depths and flow velocities are needed for aquatic ecology, whereas groundwater tables and depths to groundwater are of particular interest to terrestrial ecology. Simulated inundated areas are verified by aerial photographs.