



DANUBIA: Design and implementation of an integrative simulation and decision support system for the Upper Danube basin

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The assessment of Global Change impacts on the availability of water and the sustainability of water resources management activities is a key issue in integrative hydrological research. However, solitary sciences approaches, with their inevitably unilateral perspective, usually encounter severe difficulties to develop methods for sustainable water resource management under globally changing boundary conditions for which a transdisciplinary integration of expertise is required. The principle objective of the GLOWA-Danube project is to support the analysis of water-related global change scenarios and the investigation of sustainable methods for future water resource management in the Upper Danube Basin (77.000 km²), by means of the Global Change decision support tool DANUBIA. This poster provides an overview on the concepts and design principles of DANUBIA, which is designed as an open, distributed network integrating the distributed simulation models of all socio-economic and natural sciences involved in the GLOWA-Danube project. With more than a dozen simulation models from various disciplines being integrated in the DANUBIA system (e.g. meteorology, hydrology and hydraulics, groundwater dynamics, demography and economics, plant growth and farming practices), transdisciplinary effects of mutually dependent processes can be analysed and evaluated as a result of coupled simulations. The development of DANUBIA is based on object-oriented software engineering methods and on the Unified Modeling Language UML which is used by all partners as a common graphical notation for modelling the integrative aspects of the system. We illustrate how the mutually exchanged informations between components are modelled by in-

terfaces, we show how spatial aspects are represented in terms of process pixels (proxels) and we discuss temporal aspects of integrative simulations and the coordination of local models by a global time controller. The poster presentation will be accompanied by an interactive software demonstration.