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From hydrological modelling to decision support

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Abstract. Decision support for planning and management of water resources needs to consider many target criteria simultaneously like water availability, water quality, flood protection, agriculture, ecology, etc. Hydrologic models provide information about the water balance components and are fundamental for the simulation of ecological processes. Objective of this contribution is to discuss the suitability of classical hydrologic models on one hand and of complex eco-hydrologic models on the other hand to be used as part of decision support systems. The discussion is based on results from two model comparison studies. It becomes clear that none of the hydrologic models tested fulfils all requirements in an optimal sense. Regarding the simulation of water quality parameters like nitrogen leaching a high uncertainty needs to be considered. Recommended for decision support is a hybrid metamodel approach, which comprises a hydrologic model, empirical relationships for the less dynamic processes and makes use of simulation results from complex eco-hydrologic models through second-order modelling at a generalized level.

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