

Imprecise probabilities to specify hydrological loads for flood risk management

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Abstract Assessments of the performance and the risk of failures of complex technical flood retention systems demand the specification of hydrological loads under a wide range of possible circumstances. The outcome of risk assessments depends on these pre-assumptions. The existing lack of information demands new approaches to characterise uncertainties. As it is more widely recognised that the concept of uncertainty is too broad to be captured by probability theory alone, the application of imprecise probabilities can be useful in this context. In a case study, a wide range of possible flood events was specified by hydrological models, which combine stochastic and deterministic components. The simulation results were analysed by multivariate statistics. With respect to the uncertainties of simulations the plausibility of the flood scenarios was specified by fuzzy sets. This measure of plausibility was incorporated subsequently in a decision support system as basic characteristic of impact assessments of planning decisions.

Key words water; rivers; groundwater