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Keynote Presentation

The Theoretical Foundation of Environmental Decision Support and its Application to River Management

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Abstract

Environmental decision support intends to use the best available scientific knowledge to support achieving societal objectives in environmental management. This requires a careful analysis of (i) how scientific knowledge can be formally represented and quantified, (ii) how societal preferences can be described and elicited, and (iii) how such theoretical concepts can best be used for communication with authorities, politicians and the public, and in stakeholder involvement processes for environmental management. With respect to (i) and (ii) we argue for an intersubjective interpretation of probabilities with an extension to imprecise probabilities as the most adequate representation of scientific knowledge and for expected utility theory based on multi-attribute utility functions as a basis for describing societal preferences. We discuss conceptual arguments in favour of this approach, its limitations, and compare it to other suggested approaches. With respect to (iii) we outline a procedure for environmental decision support, exemplified for the case of river management, which relies on these concepts and tries to visualize the results to the degree possible to facilitate communication. We discuss the potential and challenges of transferring this approach to practice based on first experiences with its application to river management in Switzerland.