



Importance of temporal and spatial resolution on modelling hydrological extremes in a small catchment

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Under the conditions of changing climate the more frequent extremes in hydrological regime are expected. For the small watershed management it is therefore of big interest what the possible range of these changes could be, since it is essential for design of appropriate mitigation measures.

An exemplary case study of possible impacts of the climate change was carried out. The conceptual model HBV was applied in a small hilly pre-alpine Rietholzbach catchment with the aim to assess the frequency and magnitude of hydrological extremes under different climatic conditions. The effect of the time and spatial distribution on the model output characteristics was also investigated.

For impact evaluation a conceptual lumped model HBV was chosen because of its robustness, easy applicability for long-term simulations and perceptually straight-forward parameters. Two different modelling approaches were used, in the first one the catchment of interest was treated as a lumped system and in the other where it was divided into several subcatchments. As a first step HBV was applied to the historical data set to evaluate his performance and suitability for hydrological predictions. One half of the data time-series was used for HBV parameter calibration, the other one for model validation, wherefore several objective functions were used for goodness of fit evaluation. In order to obtain the range of changes in hydrological characteristics which can be expected due to the changing climate, two extreme scenarios were then applied to the catchment model. A standard daily step was used to obtain data for water balance and long-term droughts analysis and a study of applicability of the model with the hourly computational step was performed, so that occurrence of maximum discharges could be evaluated.

The poster presents the model outcomes with focus on flood and long-drought characteristics. The uncertainty of the impacts is illustrated by the range of characteristics obtained from different climatic scenarios, spatial resolution of the model and considers the model reliability as well.