



Impact of climate change on hydrological extremes

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Design values for hydraulic structures, such as river dikes, dams and bridges, are usually calculated using methods from extreme value statistics. The quality of the resulting estimates is dependent on the length of the time series and very crucially on the stability of the climatic and hydrologic situation. The aim of this project is to apply and develop suitable statistical methods to analyze the consequences of climate change on extreme values of river discharge and other important hydrological variables. In order to provide a reliable basis for decision makers, the model uncertainties should be included into the space of extreme events. We are planning to analyse extreme seasonal river discharge of large scale European catchments with respect to the question how a changing climate influences runoff extremes. A non-stationary generalized extreme value distribution (GEV) is used to describe the seasonal maxima. We first identify typical seasonal runoff patterns and study their responses to changing meteorological conditions. Secondly, hydrological and climatological observations provide covariates for the GEV to resolve the relation between changing meteorological variables and hydrological extremes. The project will be concluded with large scale hydrological modelling using extreme climatic states as those mentioned e.g. in the IPCC report.