



Regionalisation of climate change factors of peak flow quantiles in Lower Saxony

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In order to project changes in flood flows climate change factors can be used. These are estimated by hydrological modelling for future and historical conditions, deriving flood peak distributions each and calculating ratios of the obtained peak flow quantiles. The changes factors can then be applied to observed or modelled flood quantiles to estimate possible future design flows. To predict in ungauged basins a regionalisation of the change factors is necessary. This utilisation of change factors is assumed to be more robust regarding the bias in climate models, regarding scale problems when using daily time steps for modelling and allows the application to any reference data set.

For 178 meso-scale catchments in Lower Saxony the conceptual rainfall-runoff-model HBV-IWW is set up on a lumped and daily basis. The models are calibrated using a multi-criteria optimisation approach for the time period 1951-2013. 8 RCP 8.5 and 6 SRES A1B scenario datasets are used to derive the climate change factors of peak flow quantiles for the far future 2071-2100 against the reference time period 1971-2000.

Three different methods: Multiple Linear Regression, Ordinary Kriging and Kriging with External Drift are investigated to regionalise the climate change factors. Due to the uncertainty of future climate an ensemble of simulations is used. This contribution answers questions regarding the best interpolation method, the optimal combination of climate scenarios and the assessment of uncertainty in the prediction.