



The influence of HBV model calibration on flood predictions for future climate

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The temporal variability of HBV rainfall-runoff model parameters was tested to address the influence of climate characteristics on the values of model optimal parameters. HBV is a conceptual model with a physically-based structure that takes into account soil moisture, snow-melt and dynamic runoff components. The model parameters were optimized by the DEGL method (Differential Evolution with Global and Local neighbours) for a set of catchments located in Poland. The methodology consisted of the calibration and cross-validation of the HBV models on a series of five-year periods within a moving window. The optimal parameter values show large temporal variability and dependence on climatic conditions described by the mean and standard deviation of precipitation, air temperature and PET. Derived regressions models between parameters and climatic indices were statistically significant at the 0.05 level. The set of model optimal values was applied to simulate future flows in a changed climate. We used the precipitation and temperature series from 6 RCM/GCM models for 2071-2100 following the A1B climate change scenario. The climatic variables were obtained from the KLIMADA project. The resulting flow series for the future climate scenario were used to derive flow indices, including the flood quantiles. Results indicate a large influence of climatic variability on flow indices.

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