



## **Linear and non-linear bias correction of RCM rainfall for the simulation of extreme river flows**

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Daily rainfall in Regional Climate Model (RCM) simulations systematically differs from observed daily rainfall. Linear scaling of RCM output corrects for differences in the mean. As an alternative a relatively simple nonlinear bias correction is proposed, which adjusts the mean as well as the standard deviation. This nonlinear correction affects the autocorrelation, which may lead to undesirable biases in the statistical properties of the multi-day rainfall amounts and simulated river flows. Both methods of bias correction are compared for the river Meuse basin (approx. 21 000 square kilometres) using RCM data from the EU-funded project PRUDENCE and the semi-distributed HBV rainfall-runoff model to simulate streamflows. Nearest-Neighbour resampling of the RCM data is used to improve the estimation of flood quantiles. The nonlinear correction turns out to be superior to the linear correction. The advantage of adjusting for the variability of 10-day rainfall rather than daily rainfall is demonstrated.