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Bias correction of RCM data for use in hydrological catchment modelling

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Bias correction is essential for the coupling of high resolution driving data produced by regional climate models (RCMs) and hydrological catchment models. There are however no clear answer to how this should be carried out, and there are different methodologies depending on what statistic one is most interested in correcting. The success of the bias correction depends most importantly on the quality of the observations. This includes the temporal extent and temporal resolution, but also on the spatial resolution of the observational data, each of which have varying importance depending on the method and the main purpose of the bias correction. Furthermore, the bias correction method depends on the statistical quantity that is most important to correct, e.g. some methods correct the mean of the variable but in doing so sacrificies the quality of the tails of the distribution.

In this presentation we perform a quality assessment of the generally accessible observational products for a set of medium sized river catchments in Germany, and study the implementation of different bias correction methods. For the observations we make use of gridded data sets and of interpolated higher-density station data networks. A range of uncertainty in the observations is calculated and analysed for the full distribution of the variable. A bias in high resolution model simulations is calculated based on the observations, and a set of bias correction methods are applied. The methods used include simple correction of the mean by addition/subtraction or multiplication of a correction factor, but also more elaborative corrections through a histogram equalization technique.