Determination of optimal time scales and object functions for quantile mapping based bias correction scheme

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Abstract

A systematic bias in temperature and precipitation from climate models has been a well known problem. In that sense, climate simulations need to be adjusted in order to produce reliable scenario which can be used to assess impact of climate change on water resources. Quantile mapping based bias correction schemes for daily temperature and precipitation data simulated by regional climate models (RCMs) are evaluated in this study. The quantile mapping approach is a common strategy, which is designed to adjust the distribution of modeled data, that matches observed data. However, no previous methods have addressed the issue how to adequately deal with the determination associated with temporal scales and object functions in a systematic manner. In this study, we introduce a new quantile method which considered optimal temporal scales determined by AIC value and various object functions informed by different statistical moments. It was found that the proposed scheme based on the optimal temporal scale and the relevant object function performs better than existing approach based on monthly or seasonal temporal scale.

Keywords : RCM, Bias correction, Object function, optimal temporal scale, AIC

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