Geophysical Research Abstracts
Vol. 21, EGU2019-17096, 2019
EGU General Assembly 2019

Evaluation of different cutoff thresholds for the Double-Gamma distribution bias-correction of RCM precipitation

Ernesto Pasten-Zapata and Torben Sonnenborg
Geological Survey of Denmark and Greenland, Hydrology, Denmark (ernestopasten@gmail.com)

Precipitation simulated by Regional Climate Models (RCMs) is expected to be provide useful information for regional impact models. However, when compared with the local observations, in some cases the precipitation simulated by RCMs is biased. When that is the case, the confidence on the future projections decreases. In such cases, statistical bias correction is widely used to decrease the simulation biases. Distribution based scaling is one of the common methods that is applied to decrease the biases. For precipitation, the simulations are corrected using two Gamma distributions (DGBC). One distribution corrects the upper extreme of the simulations while the other corrects the rest of the simulations. However, there is no clear analysis on which is the most appropriate cutoff threshold between the distributions.
Here we evaluate different percentiles as cutoff threshold for the double Gamma bias correction method and compare it to the simulation outputs from a single gamma bias correction and the uncorrected RCM outputs. For this, we use a set of Euro-CORDEX RCMs and evaluate their simulation skill using different metrics that focus on means, extremes and dry/wet spell lengths. Gridded observations of 10km are used to evaluate the simulation skill. We perform the analysis for single grid cells located in contrasting regions of Denmark and also over a larger area (approx. 1000 sq. km).
Our results demonstrate the uncertainty linked to the selection of the cutoff threshold. Additionally, we provide results that serve as comparison between the skill from uncorrected precipitation simulations and simulations corrected using DGBC and single Gamma bias correction. This can be used as future guidance on which is the most appropriate method to use according to research objectives.