

## Spatial reproducibility of bias corrected daily precipitation compiled from climate models

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Future climate projection has been done by several GCMs (Global Climate Model) and RCMs (Regional Climate Model) and their projections have been, for instance, used to evaluate the impacts of future climate change on hydrological cycles. However, because the outputs of GCM/RCM contain biases and thus, for more reliable climate impact studies, it is important to perform bias correction of GCM/RCM outputs before those data are used for impact studies. Several bias correction methods have been proposed so far. For example, some of those methods are adjustment of GCM/RCM output average value to the observed average value, the use of ratio between GCM/RCM output average to observation average. A popularly used bias correction method is to utilize CDF (Cumulative Distribution Function) of GCM/RCM and observations in order to convert model CDF into the CDF of observation.

However, an issue to be considered is that these methods are applied to each grid point independently when these bias correction methods are employed, and thus this might destroy the spatial structure of target variables. Moreover, considering that the bias corrected products are sometimes used as inputs for spatially distributed hydrological models, we should be careful about the spatial structure of target variables, in particular that of precipitation data.

This study employed several bias correction methods for climate model outputs and examined the characteristics of bias corrected products by particularly focusing on the representation of spatial structure of precipitation. We would like to also mention the reproducibility of extreme precipitations of those methods.

Keywords: global climate model, regional climate model, bias, daily precipitation, spatial distribution, extreme event