

On the importance of observational data properties when assessing regional climate model performance of extreme precipitation - DTU Orbit (09/11/2017)

On the importance of observational data properties when assessing regional climate model performance of extreme precipitation

In recent years, there has been an increase in the number of climate studies addressing changes in extreme precipitation. A common step in these studies involves the assessment of the climate model performance. This is often measured by comparing climate model output with observational data. In the majority of such studies the characteristics and uncertainties of the observational data are neglected.

This study addresses the influence of using different observational datasets to assess the climate model performance. Four different datasets covering Denmark using different gauge systems and comprising both networks of point measurements and gridded datasets are considered. Additionally, the influence of using different performance indices and metrics is addressed. A set of indices ranging from mean to extreme precipitation properties is calculated for all the datasets. For each of the observational datasets, the RCMs are ranked according to their performance using two different metrics. These are based on the error in representing the indices and the spatial correlation.

In comparison to the mean, extreme precipitation indices are highly dependent on the spatial resolution of the observations. The spatial correlation also shows differences between the observational datasets. These differences have a clear impact on the ranking of the climate models, which is highly dependent on the observational dataset, the index and the metric used. The results highlight the need to be aware of the properties of observational data chosen in order to avoid overconfident and misleading conclusions with respect to climate model performance.

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