Geophysical Research Abstracts
Vol. 17, EGU2015-11802, 2015
EGU General Assembly 2015

Multimodel Combination of Extreme Precipitation Projections

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This study seeks to combine projections of extreme precipitation from several RCMs into one single projection. Ensembles of models are increasingly used in climate science. Combining information from several models is a non-trivial task. Most often the models are averaged with equal weights, i.e. “one model, one vote”. We seek a combination of models that exploits the strengths of each model.
Here we fit a bayesian spatial model (BSM) to the extremes in Denmark, both with data from observations and from RCMs. The parameters of the different BSMs are compared to evaluate the RCMs ability to represent extreme precipitation in Denmark. A BSM is also fitted to future RCM projections in the time periods 2021-2050 and 2071-2100.
The parameters of the BSM from each RCM are weighted with respect to that RCM’s internal variability, consensus with other RCMs, the variability of the real climate and the collective deviation of all RCMs from reality. With this weighting the combined BSM projects the future extremes on the basis of all the models.