Nonlinear Processes in Geophysics Discussions

Nonlin. Processes Geophys. Discuss., community comment CC1
https://doi.org/10.5194/npg-2021-12-CC1, 2021

Comment on npg-2021-12

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Community comment on "Improving the potential accuracy and usability of EURO-CORDEX estimates of future rainfall climate using frequentist model averaging" by Stephen Jewson et al., Nonlin. Processes Geophys. Discuss., https://doi.org/10.5194/npg-2021-12-CC1, 2021

Discussions about *estimation uncertainty* is really timely and important, and I was pleased to come across this paper. One question I have is if this is the same concept that my group has tried to cope with that we call "*the law of small numbers*". We use large multi-model ensembles and downscale them with empirical-statistical donwscaling since we find that RCM-based ensembles tend to be too small, especially since they are not independent and involve many of the same GCM simulations. This is demonstrated in Mezghani A., A. Dobler, R. Benestad, J.E. Haugen, and K.M. Parding (2019), Sub-sampling impact on the climate change signal over Poland based on simulations from statistical and dynamical downscaling, J. Appl. Meteor. Climatol., 0, https://doi.org/10.1175/JAMC-D-18-0179.1.

We also look at ways to evaluate downscaled results from large multi-model ensembles that involve 5 different levels. Two of these look at the ability of the downscaled GCM results reproduce the historical trends and interannual variability (e.g. Benestad, Rasmus; Parding, Kajsa; Isaksen, Ketil, Mezghani, Abdelkader (2016) "Climate change and projections for the Barents region: what is expected to change and what will stay the same?", ERL-102170.R2, DOI: 10.1088/1748-9326/11/5/054017). My question is how such efforts can be combined with SMMA/BMMA to improve our ability to assess the skill of the projections, e.g. for disaster modelling.