

Nonlin. Processes Geophys. Discuss., referee comment RC1
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Comment on npg-2021-12

Anonymous Referee #1

Referee 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-RC1>, 2021

The paper presents two methods to adjust ensemble mean of variables projected by climate models (CM) and compares their performances against two other adjusting approaches (i.e., conventional Akaike model averaging and statistical testing) and unadjusted mean, considering change along different future time frames, seasons, precipitation variables and RCP scenarios over the whole Europe.

The two proposed methods (MMA) have a common derivation based on minimisation of the predictive mean squared error.

The paper discusses the relative advantages of all the considered methods and shows that the application of MMA is particularly advantageous when the uncertainty of a given change is high due to small predicted changes and large spread among the CM signals (in such cases rejection of a null hypothesis of no change is usually the outcome of statistical tests).

As a general comment it is my opinion that the paper is timely, and results are of interest for NPG readers. However, the readability of the paper is not fluent and can be improved by a careful proofreading, since there are many parts of the manuscript that I needed to read and read again to understand the underlying message.

Apart from these aspects I have only some minor issues, that are listed below.

- The two presented methods (MMA) have been previously published in technical reports

by the first author ((Jewson & Hawkins, 2009a, b; see reference list in the manuscript), as credited in Section 3.5. I suggest anticipating this information by providing proper credits in previous sections (e.g. sections 3.2 and 3.3) and to remove Section 3.5.

- Line 243. "the scale parameter" should be "the square of the scale parameter", "numbers" is "number"
- Lines 251-256. Clarify if the objective prior is adjusted or unadjusted. Moreover the implementation of the Bayesian approach should be better explained.
- Line 263. Please explain the rationale of statistical testing and conventional AICc model averaging.
- Line 295. Similarly to previous comment: Please explain the rationale of Predictive mean log-likelihood
- Line 327. "Fig. 4d" I do not understand what is plotted in such subplot.
- Fig 4. Put unit of measures as in Fig. 2
- Line 367. "8%" would be "7%"
- Line 443. "... Root mean squared size ..." please explain better
- Line 454. "Fig. 2" should be "Fig. 3"
- Fig 9c. Adjust the y-axis label