

Interactive comment on “Reliability and robustness of rainfall compound distribution model based on weather pattern sub-sampling” by F. Garavaglia et al.

Anonymous Referee #2

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The paper compares the performance of a probability distribution based on weather pattern sub-sampling developed by the authors with standard extreme value distributions for estimation of extreme precipitation. They introduce two performance measures; a reliability and a robustness measure.

The paper is, in general, well written, well organised and technically sound. It provides an interesting contribution to the research area on extreme value analysis.

Detailed comments:

1. P. 6762, l. 15-20. I think the description of the applied probability distributions needs
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to be a bit more elaborated, especially the MEWP and MGPWP which are new in this context. It should be described how the peak over threshold samples are defined.

2. P. 6783, l. 1-2. It is not clear why the WP frequencies should not be considered as model parameters. They are sample estimates.

3. P. 6769-6770. I am not convinced that COVER is a good robustness criterion. As also shown in the results, models that provide very wide confidence intervals get better COVER scores. One could maybe include some kind of accuracy measure to trade-off the coverage and the widths of the confidence intervals.

4. P. 6771, l. 8-9. Why do the GUM and EXP and GEV and GP perform identically? There is a theoretical relationship between these distributions, but their sampling properties differ. This is also reflected in the reported results. They are not identical.

5. P. 6772, l. 10-11. The fitting of the shape parameter is problematic for small samples. Especially, it has been shown in several papers that for small samples the ML method may provide highly biased shape parameter estimates. Why not apply a more efficient estimator for small samples, e.g. the L-moment method. Would this affect the conclusions with respect to the GP and MGPWP performances?

6. P. 6772, l. 24-25. Not clear what is referred to here.

7. Table 1. Explain symbols. Variable x has different interpretations for annual maxima and peak over threshold models.

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