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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Downsizing parameter ensembles for simulations of extreme floods" *by* Anna E. Sikorska-Senoner et al.

Anonymous Referee #2

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General comments:

The contribution provides an interesting approach to the selection of representative parameter sets for continuous hydrological modelling in the framework of derived flood frequency analyses considering uncertainty. The methodology is quite clear and plausible. The manuscript is well written and concise. I have only some minor comments for improvement (see detailed comments).

Detailed comments:

1. Line 129: . . . "selected in step (d)" should read "selected in step (b)"

2. Line 196: It is not clear to me how Q5, Q50 and Q95 are obtained? For each parameter set there is one of such quantiles. Are they averaged over all parameter

sets or are they estimated as double quantiles (quantiles from the set of quantiles)?

3. Line 344: I would suggest to put the figure A2 with the study region also in the main text.

4. Line 446: I think the bias is "highest" for the ranking method and not "lowest".

5. Figures 7-10: I assume the "blue" range is bounded by the infimum and supremum, here coming from the 0.05 and 0.95 quantiles, meaning only 90% of the possible range are cov-ered. What are the boundaries for the "grey" range? Is it covering 100%. May be this need to be indicated in the figure caption.

6. Limitations: This study uses sufficient long hourly discharge time series of 25 years for calibration on extremes. Often the hourly records are much shorter (e.g. 5 to 10 years) and a calibration on extremes is not feasible this way. Then, the calibration is done alternatively on observed flood statistics, for which often longer records are available, using synthetic rainfall as input. In this case the proposed procedure is hardly possible. Please discuss.

7. Appendix A. This appendix is not really necessary from my point of view.

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