Referee Report of
« Downsizing parameter ensembles for simulations of rare floods»
(NHESS-2020-79-version2)

General comments:

I would like to congratulate the authors for great work of revision that has been done to issue this second version.

All the questions and comments of the reviewers have been addressed, clearly and with many details, both in the "author responses" and in the revised manuscript. New metrics have been introduced to complete the ones from the first version. New figures have been added, and some of the existing ones have been modified, giving more readability to the methods and to the results.

Overall it's a rich paper, sometimes demanding to read, but presenting extensively an interesting method.

I would recommend the publication of this second version "as is", with only one minor modification of a figure as recommended below.

Detailed comments/questions:

Figure 5 : two modifications could improve the readability of this interesting figure :
- For each parameter, the scale of the boxplot could be the same scale as in Table A1 and Figure A1.
- The color mix of the Ranking/Quantiling/Clustering method is sometimes muddled. For each subset (S/M/I), 3 barplots (Ranking/Quantiling/Clustering) could be stacked instead of being mixed, in my opinion giving a clearer vision of the variability of each subset.