**Natural Hazards
and Earth System
Sciences**

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Discussions

Interactive comment on "Evaluation of a compound distribution based on weather patterns subsampling for extreme rainfall in Norway" *by* J. Blanchet et al.

Anonymous Referee #2

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This paper compares different methods to estimate extreme precipitation in Norway, concluding that a division based on weather patterns and seasonal splitting should be preferred. The main issues I have found with the paper are:

- I don't think I can teach other scientists how to write a paper, but to me the technical language, even if mostly appropriate, is not clear and lacks definitions, explanations on the meaning of the statistics, information on what the author is trying to do in the different chapters and why. This undermines the readability of the work.

- The methods that the authors are using are mostly taken from the literature, but with

some modification. I suggest to highlight what are the novelties also in the methodology introduced by this paper and discuss it.

- I think that the last part, where you observe a trend applying the statistics to two different periods, is out of place in the current paper. It can be an interesting observation, but it is not treated appropriately (as you state in your conclusions "should be taken as a motivation for such an analysis of trends") and I feel like it is not very much related with the rest of the analysis. I think the paper is much more coherent without this section or, if you want to keep it, you should point out how it is related with the rest of the analysis.

- Right now I think that the conclusions are poor. In section 4 you present the results, and then without discussion you move to the conclusion, which are very short. You simply state what you have observed in the results and then described the trend (which I think should be removed). I think you should discuss why the model performs better with subsampling by season and weather pattern, the relation with literature (is it the same result observed in other regions? Was it expected?). What part of this analysis do you think could be generalized and where do you think these results do not hold? Does the use of central rainfall compromise the comparison with other cases in literature? Could a similar analysis apply to floods?

More specific comments:

- P3551 L2: what is q+?

- P3551 L9: I think the reason behind the division of data in two subsamples is not explained clearly. Also I suggest adding an explanation on what you want to do in this paragraph and how.

- P3551 L18: missing number of the equation

- P3551 L18: is it $C1i$ instead of $C2i$?

- P3552: the explanation of FF (lines 9-16) is not clear. Please add a definition and

make a clearer description. In general for each of the three statistics I would add at the begin a brief definition, with what exactly they describe.

- P3553: I understand you develop case 1 and 2 to prove your point, but to make it clearer I suggest trying to connect case 1 and 2 to hypothetical situations in your data, and to explain what is the problem connected with judging the two cases as different.

- P3554: Again, I think the explanation in this page and begin of pag3555 is very technical, but lacks in clear explanations, examples and definitions.

- P3556: in your list of exponential model you name 4. Next page you say there are 6 (k = 4 and k = 8). In figure 5 you compare 4, which are different from the 4 you listed before. Please improve the cohesion.

- P3557: again, the description of the method used to estimate the season at risk is not clear enough to me. I suggest to improve the description at L12 including a schematic explanation of what you are going to present next.

- P3559 L6: instead of starting the paragraph with a list of details for the comparison I suggest to explain what are you going to do. (why do you use different T for different statistics? Why do you compare for different alpha? What do you want to show?). Instead of "the closer to zero the better the score", which does not explain the reason why you are using three statistics, it would be better to include a short summary with the meaning of the statistics.

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