

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 #1

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General comments: The authors compare the MEWP distribution to the MGPWP distribution with the purpose of modeling central rainfall values in Norway. This is an important contribution to the field of extreme value modeling of rainfall, in a part of the world with complex topography and several types of weather systems that generate extreme precipitation. In Norway, extreme precipitation varies greatly with location and season, and the authors tackle this issue by seasonal splitting and the use of different weather patterns. The manuscript is very well written; clear and concise, and holds a logical structure. I have specific comments that could help making the manuscript even more clear, and to better fit the work into the field of extreme value modeling.

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Specific comments:

1. The objective is stated several places in the manuscript (p.3544,l.3; p.3547,l.1; p.3551,l.4; p.3555,l.10). It is not entirely clear why you chose to evaluate the MEWP model by comparing it to MGPWP. Also, on p.3551,l.4 you mention that the regional scale is of main interest, but this is also not clear in the introduction.
2. p.3546,l.25: What does this inhomogeneous distribution of stations mean for the analysis?
3. p.355,l.20: Please state why you use L-moments, and not other estimation methods.
4. p.3555,section 4.1: Please consider whether this section should be moved to chapter 3, as it does not present any actual results (at least not the first part). You could also split it.
5. p.3559,l.4 and l.19; Fig.5: which eight models? on p.3556 you describe 12 models, what happened to the other 4 models? In Fig.5 only eight models are shown, but on p.3559,l.19 you refer to models that are not shown (case (1,4) and (1,8)). Please refer to rows in Fig.5, as you did on l.17.
6. p.3559,l.18: do you here mean (2,1) instead of (1,2) (ref.Fig.5)?
7. p.3559,l.14-16: do you have a reference to damn safety regulations in Norway?
8. p.3560,l.11-12: do you have a reference for the claim that the shape parameter is difficult to estimate?
9. p.3563,l.15-20: I suggest to move this paragraph to section 4.4 and only briefly summarize it here in Conclusions.
10. p.3563,l.25: I believe the GPD can also be light-tailed (shape parameter < 0) (given that you use the definition of heavy-tailed to be distributions whose tails are not exponentially bounded). If I am not mistaken, this should also be corrected on p.3544,l.8. Perhaps the meaning of the shape parameter on return levels should be

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clarified on p.3548.

11. You conclude that the best model is the most complex MEWP model (2 seasons, 8 WPs); what does this imply for the computation? Are there any drawbacks?
12. p.3577, Fig.11: Increase figure size, as the points are hard to see (especially on the right map).
13. Fig.1, Fig.4, and Fig.11: Which stations is outside the west coast of Sweden in the south? I can not find this station in other figures of Norwegian weather stations.
14. Fig.5: As mentioned under 5, you should point out which eight models are shown and/or why only these are shown.
15. The literature on this field is becoming quite large, and some papers are very relevant to the current manuscript. I encourage the authors to add more references to former work on extreme value estimation; both in general, and for the region of interest.

Technical corrections:

16. p.3544, l.19-22: Long sentence, try to split it.
17. p.3545, l.17-20: Long sentence, try to split it.
18. p.3546, l.17: ...for 368... → ...from 368...
19. p.3557, l.20: ...which if computed... → ...which is computed...
20. p.3557, l.22: ...of month m. → ...for month m.
21. p.3558, l.9: A word missing in "...be in or out the defined...".
22. p.3558, l.9: suggest → believe
23. p.3558, l.15-16: Use either northwestern and southwestern part, or "the intense season in west..."
24. p.3558, l.22: ...sheltered... → ...somewhat sheltered...

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25. p.3559, l.23: ...get better... → ...improve...
26. p.3559, l.24: ...gets larger... → ...increases...
27. p.3560, l.12: ...a much influence... → ...a large/great influence...
28. p.3560, l.13: large return periods → long return periods or large return levels/values.
29. p.3561, l.1: move "usually" before "seems"
30. p.3563, l.7: put a comma before "which"
31. p.3563, l.23: large return periods → long return periods or large return levels/values.

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 3, 3543, 2015.

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