

Dear Dr. Raschke,

Thank you for taking into account my previous comments and giving me a chance to review again your manuscript "About the return period of a catastrophe".

First, I have to mention that I am very pleased by the improvement of the writing and the readability of the article in its current stage. I think most of the comments/issues that I raised during my last review have been addressed/resolved. Adding this to other improvements you have done, I feel this article is much stronger now. However, I still have a few comments, one bouncing back on one of your answers and others arising from changes you have done.

In summary, a lot of improvements have been done, but the authors need a minor revision to correct some small typos, unclear sentences and improve slightly the clarity of the results.

General comments:

*Original comment:*

a) *Structure*

*It is not very clear what is the exact aim or major finding of the article. In my opinion, it is the development of the CRP and its application to catastrophe modelling. Probably rewriting the abstract could help to point towards the main objectives and findings of the study. Section 1 and 2 are relatively clear in their objectives. However, I don't understand how Section 3 relates to the first two sections and the added value of discussing a "secondary method". Is there a comparison between this secondary method and the CRP, I believe there is one but it is extremely hard to identify how, why and where. I do not understand the why Section 4 can not be included into Section, to which it is related. Section 5 summarises well some of the key aspects of the paper. I think the paragraph on spatial dependence comes too late, as the stakes around this concept are never introduced in the article. The article needs a paragraph on spatial dependence right in the introduction.*

*Reply: As aforementioned, I will change the structure and modify the introduction. However, spatial dependence is not topic the first time in section 4 in the current MS. The issue of max-stability in section 2 is obviously related to spatial dependence. What is about Figure 2 a and b?*

The structure of the article has really improved and the article is much easier to follow. However, Section 5 does not fit in the flow of the article (data, method, analysis, result) in my opinion. One option could be to put it in appendix or to merge it with Section 4. I let the author decide on what is best.

a) *Abstract, communication on the potential of the new method*

I still think that the main results of the study and the potential of the CRP are not clearly highlighted in the abstract and the conclusion. For example, spatial dependencies and spatial characteristics of events are extensively discussed, but I am still unsure about how you accounted for spatial dependencies in the CRP and how this is impacting the loss estimates. Here I explain what I understood from the method and why it leads me to that comment. Please correct me if I am wrong.

- You estimated the CRP for each historical event by averaging local RPs of these events (obtained with Gumbel distribution fitted on annual maxima).
- You then associated these CRPs with losses to obtain a vulnerability curve.

- You then scaled up the CRPs assuming non max-stability (as you show statistical indicators provide evidences in that direction) with scaling factors specific to each event (1.435).

My question is: how do you then obtain a “generic” loss estimate for high return periods if each storm in the region has specific set of parameters?

#### Specific comments:

- 1) L.58, p2: “An example illustrates the difference; the random variable *local annual loss from catastrophes* is realized every year even though not one catastrophe and loss event need to be occurred”. I don’t understand which difference you are referring to in this sentence.
- 2) L.97 p4: “to remain clarity of the main paper and limit its extent”. I think “remain does not work here, you could use “preserve”. But in my opinion this sentence is not very useful, most readers know that supplements are here to provide complementary information and reduce main article length.
- 3) L.109, p4: Why is there an indent for that sentence?
- 4) L.115, p4: “These are well-known facts...”. You can keep this sentence if you wish, in my opinion it is over-emphasizing the fact that these are “basics”. You do this in other places in the manuscript (e.g., L.343) and it gives the impression that you are proving something to someone, which is not the aim of an article like this in my opinion.
- 5) Section 4: Maybe a figure showing how the method computes in practice the CRP of a given event and its position Figure 7b could be beneficial.
- 6) L.362, p13: “wind winter windstorms”. Is it really what you want to write?
- 7) L376, p14: “wind gust” instead of “wind guest”
- 8) L.426, p15: I think it should be “normally” instead of “normal”
- 9) L.461, p17: I don’t think TSI has been introduced before, I personally don’t know what it means
- 10) L.498, p18: “A further bias was discovered, the EF is well estimated by (30) in contrast to the RP  $T$ , this is strongly biased”. I do not understand what you mean here.
- 11) L. 513, p19: “At first, an extensive physical explanation would be required if some wind stations are concerned by a finite upper bound for  $\gamma < 0$  and other stations not with  $\gamma \geq 0$  according to (29). Why should be local wind hazard short tailed for some wind stations and heavy tailed for others?”  
This is almost inquisitorial, I don’t think it is appropriate and needed in the manuscript. I understand that you did not like my comment (comment z) in the previous round of review. In the first version of the manuscript, you stated rather arbitrarily that it was the best choice to constraint the shape parameter. I personally believe that invoking physics

to justify values of statistical parameters is always tricky, but I accept the explanation you offer. I am more convinced by the by the fact that statistics suggest that the shape parameter is indeed very close to 0. Thank you for you making the effort to estimate the shape parameter for every station.

12) L.515, p19: “(catchword Reynolds number)”. Maybe something else should be written here? Same thing happens L.635 and L.648.

13) For supplement, it is SupplementAry not SupplementOry.