

## ***Interactive comment on “Future hot-spots for hydro-hazards in Great Britain: a probabilistic assessment” by Lila Collet et al.***

**Anonymous Referee #1**

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The authors have provided a well-prepared manuscript that presents a technique for identifying sites experiencing concurrent increases in the frequency, magnitude and duration of both floods and droughts. The research is sound and the presentation is clear. With the addition of some points for discussion, I do not see a major impediment to the publication of this work. The following comments are provided to provoke discussion and support the authors to deepen the impact of this work.

My main concern is that the work seems to identify only locations with increasing magnitudes of hydrologic hazard, rather than hot-spots of hazards. While this is fine, it needs to be clearly stated. As in line 30 of page 17, there is a tendency to inadvertently slip into calling these locations “hydro-hazard hot-spots” rather than remaining “in the context of increasing hydro-climatic risk” (line 17, page 17). While the nuance

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seems pedantic, I think it important to observe that a location might experience a high probability of hydrologic risk without that risk significantly increasing. Still further, it is possible that, while a location may not be categorized as a hot-spot here, it may still be experiencing stark increases in one or two of categories identified.

On a similar note, I found myself wondering about the locations that experienced some subset of the three criteria described on page 6 and shown in Figure 3. Using the strict criteria that all three be represented is useful, but I would like to see some note about sites that were missed and how strong the correlation between criteria is. (That is, if a site meets the Hazard criteria, how likely is it to meet the Magnitude criteria?) In addition to adding a paragraph of discussion, it might be nice to plot all sites as points on the graphs of Figure 3. At least visually, this would allow us to see what the other quadrants look like. I understand that this would be difficult because you are looking at the 10th, 50th and 90th, but I would suggest just showing the 50th in what I describe.

In thinking about the other quadrants of Figure 3, I am curious to hear from the authors about how floods and droughts are changing individually and collectively. Are there many sites where droughts are “hot-spotty” but floods are not? How do these subclasses compare with your overall conclusions? This, of course, opens other avenues of research beyond the scope of the present work, but I think the authors could provide one or two comments to whet the appetite, so to speak.

Throughout this work I was struck by the unintentional implication that sites not classified as hot-spots will require little changes to water resources management. I think that by showing only positive trends, the implication is that all the other spots (grey dots on figures like Figure 4) are not changing. We all know this is not intended, but I think it might be wise to comment on them. Certainly, the revisions to Figure 3 will help alleviate that unintended implication, but it might also be worth some discussion. As an example, line 3 on page 14 indicates that increases merit changes in management, but I would contend that decreases might also merit changes. I doubt the authors are trying to say that all other spots will be steady as she goes.

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LESS GENERAL COMMENTS:

Page 4, line 11: Please cite the package version and the version of R employed.

Page 6, line 10: What constitutes an acceptable number? This seems unnecessarily subjective, so I would like to see the authors provide more objective guidance.

Figure 3: Aside from what was discussed earlier, was there any exploration of significance of these changes? Significance can be somewhat binary, but I am curious if it was considered at all.

Figure 3: The title of (a) should be events per year, right?

Section 3.5: How was seasonality measured? (I'm sorry if I missed it somewhere, but I had trouble finding it.)

Finally, I want to thank you, the authors, for your hard work. It is always a pleasure to review a well-prepared manuscript and I look forward to your continued work.

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