

Authors' Responses to Reviewer#2 and Editor Decision:
'Recent Trends in Frequency and Duration of Global Floods' by Nasser Najibi and Naresh Devineni

Comments to the Author:

Dear Authors,

Thank you for submitting a revised version of your manuscript

The manuscript improved during the discussion phase, particularly due to the additional analysis performed to identify/account for possible data shortcomings/inaccuracies and the increased attention to the physical interpretation of the results obtained.

After the revisions there is one point remaining that should be better accounted for/discussed and communicated to the reader:

From the responses and the figures provided by the authors to the reviewers, it becomes evident that there is a likely bias of the start date of floods that is reported in the DFO.

The authors highlight that only 11% of the entire number of flood events starts on the 1st (6.5%) and the 15th (4.5%) of a month. However, the flood counts on these dates are considerably higher (more and almost double respectively) compared to the ~2.8% of flood events starting on an 'average day'.

This indicates the existence of a bias in the reporting of the start date in the DFO database.

Additionally, when examining the distribution of flood dates across the month, it becomes also apparent that the day 1, 5, 10, 15, 20 and 25 have also an increased number of flood counts (roughly ~4%), which also suggest a reporting bias (likely rounding of the start date to a number that can be divided by 5).

Therefore, the authors need to discuss the possibility of a reporting bias in the date in the data section, together with the possible implications of such a bias for the results of the analysis in the discussion section (and provide the figure with the counts per day in the appendix).

Additionally, the authors also need to check and report on this for the end date of the floods.

The authors should also note in the data section (as they have already done so in their response to the referees) that there seems to be no spatial pattern for these apparent reporting biases)

When conducting the revision, please also incorporate the technical corrections suggested by Referee #2.

Dear Editor,

Thank you for providing the feedback. We have modified the manuscript based on your comments and the reviewer's suggestions. We modified the data section and also added the Appendix B3 in order to address the possible reporting bias in the starting/ending date of the DFO's floods.

Additional comments:

P4 L9: Please provide the reference to the publication in which the DFO reports this statement.

Fixed.

P14 L1-5: Please describe in more details what 'very little errors' are (i.e quantify what 'very little' entails in number of days). Additionally, given the discussed shortcomings of the DFO data, please replace 'evidently reliable' with a term that better describes the outcome of the comparison.

We have quantified what the “very little errors” mean. We have also replaced the term “evidently reliable” with “appear to be reliable with respect to the GRDC river discharge measurements” in order to precisely reflect the comparison.

P18L1-2 Please specify in more detail what ‘fairly reliable’ entails.

Fixed.

Figure 8a: The grey color used for the point data is too light, which makes it very difficult to distinguish the shapes used to indicate the different countries. Maybe the grey color used for the points could be replaced by the colors used for the countries. Additionally, the two different shades of red are too similar. Please consider using different colors.

Thank you for pointing this out. We have modified the colors of lines and scatters in figure 8a and also the axes scale for figure 8c to have a more readable presentation.

Report #1

Anonymous Referee #2

The authors have taken on board my previous concerns by providing additional clarification and most importantly now include some validation of the DFO dataset in the Appendix. I believe this step was absolutely necessary. The uncertainty about the validity of flood duration in DFO has been assessed and the flood frequency patterns have been corroborated by the EM-DAT data at the global scale between 1985-2015. The map of the overlap between GRDC stations and reported flood events in the DFO dataset across 1985-2015 in the response to referee #2 just shows the limited global (open) availability of in situ discharge observations – there is no substitute to good quality observations, but given the limited availability this study provides a worthwhile contribution to the literature. I commend the authors on their efforts to address previous concerns during the peer-review process and recommend for publication in the special issue. Below are some suggested technical corrections:

Dear Reviewer,

Thank you for providing the feedback and comments. We have modified the manuscript based on your comments.

Pg1; L2: Suggest changing “detect the significant trends” to “explore evidence of trends”, or something similar.

Pg1; L2: Change “at the global and the latitudinal scales” to “at global and latitudinal scales”.

Pg1; L4: Please remove “(H1, H2, and H3)” as these are not explicitly (nor need to be) defined in the abstract

Pg1; L5: Please remove reference to H4, suggest to change to “We also evaluated if trends could be related to large-scale atmospheric teleconnections using a Generalized Linear Model framework”.

Pg14; L1: Change “ground-based” to “in situ”

Pg18; L2: Please change “fairly” to “reasonably”.

We have modified the manuscript based on the six comments listed above. We are grateful for your constructive suggestions and comments.

Pg20; L24: No need to add “(it is significant at 5% significance level)” given you provide the p-value anyway, please make sure to remove this in any other instance throughout the manuscript.

We agree with you completely. The reason to have such note is as following; since we have presented the statistical significance using the check marks or multiplication signs in the tables related to the summary of trend analysis, we add this short note to highlight the coherency throughout the manuscript.