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Hydrology and Earth System Sciences Discussions

Interactive comment on "An elusive search for regional flood frequency estimates in the River Nile basin" *by* P. Nyeko-Ogiramoi et al.

Anonymous Referee #1

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General comments:

This article presents a study on regional flood estimation on the Nile basin. Clustering is first used to define a number of homogeneous regions, with several homogeneity tests involved. Then regional estimation of flood quantiles is assessed using a jack-knife procedure. The sensitivity of results to the length of available records was studied.

This is an interesting article that provides a deep investigation of flood quantile estimation on the entire Nile basin, where only limited data are available. I have only a few minor comments detailed below. I feel that the manuscript could be published after moderate revision.

Detailed comments:

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Interactive Discussion

Discussion Paper

1. General: I find the article excessively long. The authors give a lot of details on each aspect of their research. It makes it sometimes difficult to see the most important aspects of their research and results. Although it is difficult to remove full parts of the article, I would suggest that the authors try to go straighter to the point and reduce as much as possible the less important parts of their paper.

2. General: The article is generally clear and well written, but some spelling/grammar mistakes should still be corrected (not detailed here). Some sentences would require rephrasing.

3. General: A few sub-titles could be added to better structure the discussion (e.g. in sections 1, 3.3 or 4)

4. p. 2677, lines 8-9: This sentence is unclear.

5. p. 2681, lines 9-10: The fact that various record lengths are available is a source of instability of the clustering process. This is not discussed in the article (only the impact on flood estimation is discussed). Could the authors further elaborate on this aspect?

6. p. 2681, lines 19-20: Why only mean annual rainfall was used as climatic descriptor? Is it the most relevant meteorological variable to characterize floods on the Nile basin? One could expect that quantiles of rainfall over a given period may also be relevant. Could the authors shortly discuss this point and possibly add other climatic variables in their analysis?

7. p. 2681, line 28: Why this number of catchments? Was it obtained after defining some specific constraints, e.g. on size?

8. p. 2682, lines 9-15: One could expect that geology, soil or vegetation types may play a role. Do the authors consider that this is not the case on the Nile basin, or was this information not available for their study?

9. p. 2683, lines 4-6: This sentence is unclear.

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10. p. 2690, lines 20-22: One objective is actually to identify climatic or physical characteristics that could explain the contrasts between regions. Did the authors investigate other climatic characteristics (aridity index, potential evapotranspiration, quantiles of rainfall amounts over a few days, variability of monthly rainfall within the year, etc.)?

11. p. 2690, lines 24-26: I found it unclear what the authors mean here.

12. p. 2692, line 9: Which interpolation procedure was used?

13. p. 2694, Eq. 6: Please check the numerator of the equation (index j is not used and the lower bound for i appears as l)

14. p. 2696: Practically, what does it mean that 40-year long records should be used? Shall we install new stations on the basin and wait for 40 years? Or do the authors mean that there are other existing records that were not available for this study and that could complement the existing data set?

15. p. 2697: At the beginning of the article, the authors mention other studies on the Nile basin. A short discussion could be introduced on the extent to which their results corroborate/contradict previous findings.

16. p. 2703, Table 1: What is velocity? Write "Mean annual flood". What is the difference between Len1 and RhL? The various elevation indices are probably related. Was a prior analysis on cross-correlation between variables done to check their relative independency?

17. p. 2704, Table 2: I found this table unclear. Please make more explicit the column headings and the content (add in the caption the meaning of letters)

18. p. 2706, Fig. 1: Add a scale in the location map on the left. Write "Atbara". The Jur River is mentioned in the text but does not appear here. The resolution of the maps is poor. Could it be improved?

19. p. 2710-2711, Figs. 5 and 6: Indicate in the figure caption what the acronyms

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Interactive Comment

stand for.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 2675, 2012.