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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 #2

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The authors applied a hierarchical clustering method to classify similar regions for the entire Nile basin using a number of physiographic catchment properties. After classification, a growth curve is obtained for each region using the L-moment. The mean annual max discharge is estimated using a simple regression model and then used to obtain design discharge with a certain return period for each region. A number of intermediate steps were done to check e.g. the homogeneity of the classified region and the regionalisation errors. The authors found the record length <40 years is too short to provide reliable estimation of design floods.

The methods and results are clearly explained. The methods used are not new and not the most sophisticated ones either, but they are probably robust for a data scarce basin

like the Nile. It is a worthwhile attempt for the purpose of water resources engineering design in ungauged basins. I recommend the paper be accepted for publication with some moderate revisions.

My specific comments are listed below:

P2676 L15: 'MAF' Appeared before its full name was explained.

P2677 L27-29: citations should be in a chronological order. There are couple of other instances where citations do not follow a chronological order. Please check and make sure the others are also okay.

P2679 L29: 'peak flow quantiles (for different return periods) estimated' Change to 'peak flow quantiles (for different return periods) are estimated'

P2680 L11: 'took part of a larger project' Change to 'took part in a larger project

P2681 L24: '92m square' SRTM DEM data are not exactly 92x92 m. The size of the grid varies based on actual locations on the globe. L28: 'resulted into' Change to 'resulted in'

P2683 L19: 'four regions (2 and 5; 1 and 14), obtained in the' Change to 'four regions (2 and 5; 1 and 14) obtained in the' L22: 'were found to be similar and were merged' Change to 'were found to be similar and hence merged' L23: 'were found different and were kept separately' Change to 'were found different and kept separately'

P2689 L1-5: 'For regions 9, 11 and 12, the increase in the slope is very strong as the return period increases. In contrast, strong decreasing slopes are in regions 13 and 15. In this case, the growth curves first rise and then fall to almost constant value as the return period increases.' I cannot observe any decrease or fall for regions 13 and 15 in Fig. 7. Please explain.

P2690 L1-5: 'Plots of correlation coefficient of the MAF versus the Len1, Area, MeanE and MAR for the entire basin data is shown in Fig. 8a. The values of the correlation

coefficient vary significantly with these catchment characteristics; indicating that the behaviour of the MAF and also the AMF properties, is controlled differently by the different catchment characteristics.' Can authors comment on the correlation displayed in Fig. 8a? For example, why negative correlations between MAF and MeanE, MAF and MAR?

P2692 L9: 'interpolating the value of the Gf100 to produce a continuous map' What kind of interpolation method did the authors use here? I don't see any theoretical basis for interpolation Gf100. Can one simply interpolate the discharge value/ratio of a certain return period without knowing the spatial distribution function/model of this variable? The continuous map perhaps looks nice, but it doesn't really mean anything.

P2695 L7: 'It is clear from Fig. 9b' Shouldn't this be Fig. 10b?

P2703 Table 1: Please explain Vel and why this property is selected. For peak flows, why didn't the authors use variables that are more relevant such as n-day max rainfall, longest rainfall duration etc. I am not convinced that MAR should be considered as 'paramount in influencing the magnitude of peak flows', as the authors stated. What is the difference between Len1 and RhL?

P2710-2711 Fig.5 and Fig. 6: use different colours or markers for P3 and GEV. I can hardly differentiate them.

P2715: Fig. 10a: markers for t>29 and t>39 are hard to be differentiated, please consider to change one of them.

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