

Interactive comment on “Trends in West African floods: a comparative analysis with rainfall and vegetation indices” by B. N. Nka et al.

Anonymous Referee #1

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Please see the attached pdf file

Please also note the supplement to this comment:

<http://www.hydrol-earth-syst-sci-discuss.net/12/C2829/2015/hessd-12-C2829-2015-supplement.pdf>

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 12, 5083, 2015.

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Interactive Discussion

Discussion Paper

Review of the manuscript hessd-19-1-2015: “Trends in West African floods: a comparative analysis with rainfall and vegetation indices” by Nka et al.

I. Recommendation: Minor revisions

II. General comments

This study examines the trends in West African floods. The evolution of two potential drivers of flood evolution (rainfall and Land-Use-Land-Cover by analyzing daily rainfall and NDVI indices) was also analyzed. The study concerns 14 catchments in West Africa and can be divided in three parts:

1. The analysis of flood evolution which consists in two steps: (i) extraction of extreme flow values: two sampling methods from the Extreme Value Theory (Coles, 2001) were used to extract extreme values of river flow (Block Maxima and POT); and (ii) detection of non-stationarities in time-series by using two statistical tests : Pettitt (break) and Mann-Kendall (trend).
2. Same tests were used to detect evolution of daily rainfall and NDVI indices.
3. The statistical correspondence between flood evolution and indices evolution.

It is one of the first paper that address the issue of flood evolution in West Africa. Thus, the results obtained concerning the first part are original and I have no major comment on that. However, I consider that the second and the third part can be improved. Particularly, authors should be more cautious with the conclusions made from the results of part 3. Furthermore, the paper is well organized and well written.

In my opinion this paper can be published in HESS if the authors improve the manuscript following the specific comments and minor remarks below.

III. Specific comments

Spe. 1.

Along the paper, authors use regularly the attribution terminology to describe the results obtained in section “4.3 Agreements between flood trends and NDVI index trends” (p. 17):

- “For the overall catchments studied, the maximum 5 day consecutive rainfall index ($Rt5d$) seems to follow the flood trend, while the NDVI indices do not show a significant link with the flood trends, meaning that this index has no impact in the behavior of floods in the region.” (p. 2)
- “The trends detected in flood time series were compared to the rainfall index trends and vegetation indices using contingency tables, in order to identify the main driver of change in flood magnitude and flood frequency” (p. 2)
- “We also investigate the relation between flood trends and climate and environmental trends in order to identify the main drivers of flood variability.” (p. 4)
- “where CD (correct detection) is the number ... and CR (correct rejection) is the number of catchments that present non stationary behavior for both indices.” (p. 11-12)
- “This allowed us to identify the factor with the greatest influence on flooding” (p. 12)
- “are more attributable to the evolution in mean rainfall since 1970.” (p. 19)

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Fig. 1.

