

## Reply to comments from Referee#4

### Anonymous Referee #4

*The authors thank the reviewer for insightful comments.*

#### General comments

- Title too long, and confusing.

*We will address this during editing. The title will be shortened to "Hydroclimatology of Lake Victoria region using in-situ and satellite remote sensing data"*

- Abstract, is disjoint, and lack (specific) quantitative results, e.g., accuracy of calibration and validation, effect of land use change. The paper does not have a clear story line. The link is not clear between hydrological modeling, statistical analysis, effect of land use change, and climatology.

*Results of statistical analysis will be added in the abstract. We will try to refine the abstract and the conclusion part of manuscript.*

#### Specific comments

- p. 4788, L 26: "Hydro-climatology deals with the interactions of climate with surface water", with "hydrology" or with "surface water"?

*This sentence will be edited for the next version of the paper. It will be change to hydrology.*

- p. 4789, L 21-23: The question remains whether with the existing spatial and temporal coverage of satellite precipitation and other estimates, how can we achieve their optimal use to compute a less uncertain water budget? Better if the discussion in the introduction concentrates around this question, rather than on hydroclimatology supported by no review of literature.

*More literature review will be added with discussion.*

- p. 4789, L 25: hydroclimatology doesn't appear in the three specific objectives of the study.

*Objective 1) deals with hydroclimatology, more relevant additions will be made to clarify this objective.*

- p. 4790, L 1: Add one sentence how FEWS computed PET. How actual ET derived from potential PET?

*FEWS PET is at a 1-degree spatiotemporal resolution is from the NOAA Global Data Assimilation System (GDAS) calculated using global-scale meteorological datasets.*

- p. 4807 to 4812: too many plots fig. 2 to 7, for little information on statistics. Most of the information can be provided in the text or at least in summary tables.

*Thank you for the suggestion. The number of figure will be reduced.*

*Following figure will be removed*

*Figure 2 (b) and (c), because it is shown in the Hydrograph*

*Figure 6, because it is repeated in figure 2 (b) and (c)*

*Figure 3 (b) will be removed*

*Combine Fig.2 a and Fig 3 (a).*

*Delete Fig (7). Information available in Table 2*

- p. 4793, L1 - L12: the given discussion of mean annual discharge doesn't need a full hydrograph. Time domain is too short to make sensible trend analysis. However, with a sufficiently long series, it is possible to make a credible statistical analysis of discharge trend, and the associated degree of significance.

- p. 4795, L 10 "climate state", or "hydrological state"?

*Thank you for pointing out it should be hydrologic state.*

- p. 4795, L 23: include RMSE in the results. Add NSE, Bias, RMSE to abstract.

*More statistic will be added in the abstract.*

- p. 4796, L 5: could be more insightful to validate TRMM data with ground stations data, and next to do the modeling to single out error sources.

*The TRMM validation study is already done by a colleague in this basin (reference added). This information will be added for more clarity.*

*Li L., Y. Hong, J. Wang, R. Adler, F. Policelli, S. Habib, S., D. Irwn, T. Korme, Tand L. Okello, 2009, Evaluation of the Real-time TRMM-based Multi-satellite Precipitation Analysis for an Operational Flood Prediction System in Nzoia Basin, Lake Victoria, Africa, Journal of Natural Hazards.*

- p. 4797, L3: "The results from the climatological water balance"  $P+E+R=ds/dt$ ; is a hydrological or surface water balance, it is not "climatological"

That is true. This will be fixed.

- p. 4797, L24: would make sense to validate model ET with observed ET

At this point we don't have observed ET, therefore this will be deferred for future studies.

Typing errors

*Thank you for catching this. Every effort will be made to correct any grammatical mistake during the revision.*

- p. 4787, L 2: "is important in understanding ...." remove "an"

Done

- p. 4796, L 18: "all in per time"? do you mean m, mm, m3, ...?

Done