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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Wet and dry spells in Senegal: Evaluation of satellite-based and model re-analysis rainfall estimates" *by* Cheikh Modou Noreyni Fall et al.

Anonymous Referee #1

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General comments

This paper analyses the occurrence of wet and dry spells in Senegal estimated from a set of precipitation products (in situ, satellite and reanalysis). Although the purpose of the paper is valuable and results potentially significant, the overall quality of the analysis and presentation is below acceptable standard.

1) Language needs substantial revision and improvement, by a native speaker if possible;

2) The presentation of the method (description of kriging in Section 1.1 and definition of Wet and Dry spells in Section 1.3) needs improvement, the description of the methods

should be expanded and the presentation clarifyed;

3) The presentation of the results is often unclear, and results themselves are not discussed enough: Section 2 is basically a description of the figures, and the key-point of the paper, i.e. the comparison of the precipitation datasets, is never actually addressed;

4) Figure captions should be improved;

5) Conclusion section is not conclusive at all, it is just a summary of the paper.

For the above reasons I cannot recommend the publication of the paper in NHESS. I suggest the authors to undertake a substantial revision of the paper, and resubmit it for new consideration. I list below my specific comments that I hope can help the authors in improving the paper.

Specific comments

Page 1, line 6: "more variability", do you refer to some intra-dataset variability? If this is the case, this expression is not suitable, please rephrase.

Page 1, lines 9-10: these lines are unclear.

Page 1, line 15: add the reference to Taylor et al. 2017, https://www.nature.com/articles/nature22069.

Page 1, lines 15-16: this sentence should be moved at line 19, before "Recently extreme events. . ."

Page 2, lines 25-27: sentence unclear.

Page 2, line 30: when stating the objective of the paper, it is not clear that you compare satellite/reanalysis products to rain gauges, which you consider as reference. Please clarify this point.

Page 2, line 33: are wet and dry spells "extreme hazards"?

Page 3, line 1: DS, DSC, WS and WSC are not defined in the text.

Section 1.1: do rain-gauge time series have passed any objective homogeneity check?

Section 1.1: BK is poorly described.

Equation 1: how the lambda weight are assigned?

Page 3, line 18: why kriging reduces high values and increase low values? Please explain. Equation 2: what is xq?

Page 3, line 22: square root of OK variance is used for what?

Section 1.2: there are discrepancies in dataset resolutions in the text and Table 1, please check.

Page 5, line 9: where did you define wet and dry spells as extremes? "A maximum number of definition", this sentence is unclear.

Page 5, line 16: on which statistical basis do you define "DS extreme long"? You should use the "extreme" word carefully, and only after an analysis of distributions.

Page 5, line 20: what do you mean by "DSC duration is known"? Please clarify.

Page 6, line 12: why BK is more comparable to averaged values and more in agreement with satellites?

Page 6, line 14: please explain why radar on board of TRMM explain TRMM performance.

Page 6, line 15: please improve the description of the Peanut Basin or highlight it on the map, to facilitate the reader to locate the region.

Page 6, lines 20-21: This actually means that during dry season date are not collected, isn't it? In this case you cannot consider these days as dry.

Page 6, line 26: does "variability" refer to the datasets? I suggest to find another

expression in this case. How can I compare seasonal and intra-seasonal variability in Fig. 3?

Page 6, line 29: datasets are actually four.

Page 8, line 4: "depth of wet day"?

Page 8, lines 22-24: here again you discuss TRMM performance, but discussion should be expanded.

Page 9, line 8: sentence unclear.

Page 9, line 19: how do you define "extreme rainfall deficits"?

Page 9, line 22: according to Table 1, not all the products are upgraded (BTW this is just regridding, so another word should be used).

Page 10, line 5: as in the Abstract, please clarify this sentence.

Page 10, line 14: same sentence on TRMM performance, but no discussion.

Figure 4: what is depicted here? Yearly averages?

Figure 5: what is displayed here? What does the y-axis refer to?

Figure 8: what do the y-axis refer to? Are monthly values represented?

Table 1: check table header.

Technical corrections

Language is below acceptable standard, and the paper requires a substantial revision in this sense, therefore I omit here to indicate individual issues.

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