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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Influence of initial soil moisture in a Regional Climate Model study over West Africa. Part 2: Impact on the climate extremes" *by* Brahima Koné et al.

Anonymous Referee #1

Received and published: 17 June 2020

Reviewer Comments: Influence of initial soil moisture in a Regional Climate Model study over West Africa. Part 2: Impact on the climate extremes.

This manuscript is a follow-up to "Influence of initial soil moisture in a Regional Climate Model study over West Africa: Part 1: Impact on the climate mean", and focuses on changes to extreme indices over West Africa in a variety of experiments. The authors find that dry experiments decrease the number of precipitation events (vice versa for wet events), but does not impact the intensity. Temperature is more significantly impacted, particularly maximum temperature.

I think that the results for extremes will be of great use, however, I will note that I

also reviewed part one of this manuscript, any many of my initial points and concerns about the experiment design still stand. These have been copied below under "major comments". I have some other points and concerns for this manuscript below as well. Overall, I think both manuscripts are in need of major revision.

Major Comments: 1. As noted above, my main concern stems from your year choices. While this results in 6 experiments for comparison, I am not convinced that the results are robust given only a 2 year sample size. Moreover, I'm curious how these years were chosen - are they extreme wet and dry years? How often do years such as these occur? How is "wet" and "dry" defined?

2. Given you only have a few experiments, a significance test would be difficult to achieve. Do you feel that you have sufficiently large "n" to address significance? You may have enough grid points to address spatial significance (given that you modify your n due to autocorrelation, but I note in my minor comments that you should include your sample size), but temporally I don't feel the results are robust.

3. It would be prudent to discuss the implications of this work beyond a summary, perhaps in the concluding remarks.

4. You offer a comparison of CHIRPS and TRMM, and find large differences in the two datasets. How does this impact your results?

5. I have this problem a lot with manuscripts that include extreme indices - there are a huge amount of indices to show, and this adds to length and can cause the reader to get lost in the paper as you go through each one. 21 figures is a lot! I like the way that you have isolated each index, but I think you could cut down on the detail slightly to save some words and not have the reader get lost in the details.

Minor Comments: 1. I noticed a number of grammatical and spelling errors in the manuscript, I suggest having someone read and edit the manuscript specifically for editorial remarks such as these.

2. You use a number of parenthetical references such as "impacts of the wet (dry) soil moisture on wet (dry) years etc." - I do not mind these at all, but sometimes the text is very difficult to read when they are used in excess.

3. Define the lat and lon range of your domain(s).

4. Line 102: Does this contradict your statement on line 23 of part 1? Perhaps rewording is necessary.

5. Line 138 to 147: I believe you're talking about autocorrelation - neighboring grid points are spatially dependent. You do not necessarily need to resample, but you can estimate your n given autocorrelation - sometimes called effective sample size. I think you're using NCL in much of this manuscript (at least, your Figures look like NCL!), which has functions to calculate sample autocorrelation and equivalent sample size.

6. Line 198: "Indicating that the number of wet days occurrence are occurred more likely not only in wet experiments but also in the dry experiments." I do not understand this sentence. 7. I noticed that sometimes your section summaries only include some of your results - is there a way to make these more comprehensive without adding to length?

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