

Interactive comment on “Seasonal forecasts of drought indices in African basins” by E. Dutra et al.

Anonymous Referee #1

Received and published: 20 November 2012

The investigation of drought predictability is an important topic. Especially in regions with low resilience and strong dependency on the magnitude and duration of the rainy season it may be helpful to forecast dry conditions as this might enable water management to mitigate the impacts.

Therefore I like the idea of this study to combine existing monitoring products with a state-of-the-art seasonal forecasting system to study the predictability of droughts in different climatic regions,

General comments:

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The paper needs minor revisions. In my opinion the paper could be improved in terms of the clarity of the presentation (suggestions below). Furthermore it would be nice to see, as an example, how the forecasting system would have predicted the recent drought at the Horn of Africa in the Blue Nile catchment. Another (partly related) issue is the decrease of the number of rain gauge stations contributing to the monitoring. This may cause a reduction of skill of forecasts that consists of both, a monitoring and a forecasting component. Investigating skills of these forecasts in e.g. the first and second half of the observational period only may allow to speculate about the skill of such forecasts nowadays using the current stations.

Specific comments:

page 11094 line 4: change "mitigate their impacts" to "mitigate drought impacts" line 6: be consistent with the use of capital letters for "Standard Precipitation Index" line 9: change "then is" to "is then" line 22/23: rephrase sentence; the skill is not only reduced in 2 and 4 months lead time

What I am missing in the abstract is information about the fact that the study is based on monthly data and regarding the lead times until which forecasting skill beyond climatology is observed.

page 11095 line 4: change "have" to "has" line 5: Why "also"? line 7: It would be nice to provide an example (in the results section) how well the forecasting system would have predicted the recent drought in the Blue Nile catchment located close to the impacted area. line 17: change "referred to time-scale" to "referred to as time-scale" line 17: change "accordingly" to "according" line 19-27: Before you state that this study is focussed on meteorological droughts as it uses SPI, but here you try to relate the SPI of different time scales to soil moisture, runoff and groundwater. Evidence is needed to support this. Furthermore you could test how SPI-3 and SPI-6 compare to GPCP, additionally to SPI-12 as given in Table 3. You may find that runoff is better related with

shorter time scales.

page 11096 line 10/11: order studies chronologically and provide some information how their results compare with yours (e.g. in the conclusions section) line 15: "such" is not needed

page 11097 line 2: change "in terms of" to "caused by" line 7: change "Africa" to "African" lines 9/10: rephrase sentence

page 11098 lines 18-21: I do not understand this.

page 11099 line 5: what is CPC?

page 11100 lines 1/2: change "(SPI) Mckee et al. (1993)" to "(SPI, McKee et al. 1993)" lines 13/14: If there are statistical tests to assess the suitability of a selected distribution, you could use them and provide information on the suitability of your chosen gamma distribution. line 25: change "advance" to "advanced"

page 11101 line 14: change "alpha a multiplicative" to "alpha is a multiplicative" line 15: change "I the calendar" to "I is the calendar" lines 13 and 17: list these equations separated from the text as you did for equation (1)

page 11102 equation 1, upper row: the "max" is not needed line 15: change "this skill score" to "the related skill score"

page 11103 Why do you use so many different verification metrics as described in Section 2.3? What is the advantage of each as compared to the others?

page 11104 lines 7-9: rephrase sentence line 25: "(LP)" missing after "Limpopo" lines 26: The Limpopo and Zambesi basins are located in central south Africa rather than in the east

page 11106: line 4: Why SPI-12 and not e.g. SPI-3? lines 19/20: Can you speculate why there is lower variability in S4L0?

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page 11108 line 28: change "outperform" to "ouperformed"

pag 11109 line 1: change "results showing" to "results, showing" line 7: also in the NG catchment the slope exceeds 1 lines 9-12: Why is skill of SPI-3 highest after 2 months and of SPI-6 highest after 5 months?

page 11110 line 18: change "although" to "despite" line 20: change "serve" to "serves"

page 11111 line 2: Is this statement based on Table 2? If yes, than the correlation of S4L0 with GPCP does not exceed the correlation between ERAI and CAMS-OPI with GPCP in the Zambesi catchment.

Table 1: change "Basins" to "Basin" in the caption.

Table 2: rephrase caption

Figure 3: What is "TP" on the y-axis?

Figure 4: 3rd line of caption: remove comma after "rows"

Figure 5: Label the axis.

Figure 6: 1st line of caption: change "monthlhy" to "monthly"

Figure 7: Label the x-axis with months as letters or words. First line of caption: change "(ACC) the" to "(ACC) of the" Fifth line of caption: change "beta,>" to ">"

Figure 8: The caption (and text) states that the false alarm rate is displayed versus the hit rate, but in fact it is the other way round.

Figure 9: Third line of caption: Diagonal line is dotted instead of dashed. Last line of caption: change "(lines)" to "(rows)" change "has" to "as"

Figure 10: After 3,6 and 12, "months" is missing in the caption.

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Figure 11: y-axis label: change "(month)" to "(months)" Second line of caption: change "(lines)" to "(rows)", furthermore you mixed up "rows" and "columns" here

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