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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Forecasting droughts in East Africa" *by* E. Mwangi et al.

Anonymous Referee #1

Received and published: 9 October 2013

General Comments

The paper addresses the important topic of drought forecasting in Africa, analyzing the possibilities for the region of East Africa. The research presented is interesting and relevant and deserves publication in HESS. It needs minor revision.

In general the paper is well written and concise. The introductory section gives a short but clear introduction to the topic, including a description of the current practice in the region and highlighting possibilities for improvement.

The materials and methods section is well described with references for more detailed information on the indicators used. However, this section would benefit from more detailed explanations. Some statements are unclear and need improvement (see specific comments).

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Interactive Discussion
Discussion Paper

With the exception of a few statements and inaccuracies, the results section is clear and easily understandable. Figures support the conclusions.

The English is generally good. Errors are noted in the technical comments section. English spelling and grammar should be checked once more carefully.

Specific Comments

1. Introduction

In the Introduction the East African GHACOF is described as being based on (a) the forecasters subjective knowledge of the relationship between SST and rainfall patterns/amounts, (b) rain gauge data, and (c) dynamical forecasts by other international centers. I assume that "other" stands for non-ECMWF. It may be better to say so or else to delete "other". Later in the introduction, it is twice said that the forecast relies mostly on precipitation/station data. This is contradicting what was said before. To clarify you could indicate the weight of the individual knowledge components in the GHACOF or describe in more detail how decisions are taken (e.g., Which information has the most influence? How are the forecasts entering the decision process?, etc).

2. Material and methods

2.1. Observations and model data

Is there any literature reference on how the sub-division in 34 homogeneous regions has been done? A short explanation of the methodology would be useful, as these regions are the principle spatial reference for the analysis. Is each region represented by only one "representative" station?

2.2. Quantitative assessment of the forecast skill

The phrase ("If CRPSS <= 0, no .....") is unclear or incomplete. Please re-phrase to make clear what your statement is. If CRPSS = 0, then the value of the forecast is equal to the value of a climatology. If it is < 0, than it is actually worse.

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2.3. Qualitative assessment of skill

Headline: add “the forecast” (to be in line with section 2.2)

First paragraph: It is unclear what happens here. What does manually smoothed actually mean? How have the proxies been generated? These are important issues in order to evaluate the results of this whole exercise. Please be more precise.

3. Results and discussion

3.1. System-4 verification against in situ observations

Please re-phrase the first sentence, which is concise but a bit cryptic (e.g. Correlation coefficients between the precipitation anomalies derived from ECMWF system-4 forecasts and in situ measurements during the MAM and OND seasons . . . as well as CRPSSs are . . ...). This is also true for the headings of Figs 2 and 3.

In Figures 4 and 5 I miss an explanation what the different bar-widths mean. Is the white line the mean or the median? Which percentiles are represented by the different part of the bars?

3.2. Use of system-4 in the consensus framework

This section conveys a very positive message. However, it would be interesting to discuss also the situation when the model fails. How should the decision maker manage the uncertainties? What are the consequences?

In Figs 7 to 9 the acronym ECFS4 is used without previous explanation in the text.

4. Conclusions

In general well written. I have two remarks:

In the first paragraph you talk about statistical downscaling. This again refers to the GHACOF procedure and is explained nowhere in more detail. A said before, it is necessary to clarify the procedure and the importance of the various information available

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to the forecasters involved.

I would further remark that (with reference to lines 6 to 9 on page 10219) the “reality check” performed is only valid for this particular region as it relies on specific teleconnections. The sentence as it stands now suggests a more general reliability, which is not proven by this analysis.

Technical Corrections

Page 10210:

Line 5: insert “the” before “Standardized Precipitation Index (SPI)”

Line 10: insert “The forecast for” before “the October-December rain season . . .”

Line 11: “that” should read “than”

Line 11: insert “than the one” before “for the March-May season”

Line 17: insert “and humanitarian” before “impacts since . . .”

Line 21: “at-least” should read “at least”

Line 21: delete each in “. . .one major drought per each decade”

Page 10211:

Line 6: “;” should read “,”

Line 16: “from other international centres” – do you refer to centres other than ECMWF? Which ones?

Page 10212:

Line 16: “forecast” should read “forecasting . . .”

Line 20: “gauges” should read “gauge”

Page 10213:

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Line 1: “precipitation experienced” would better read “precipitation climatology”

Line 22: “hindcast” should read “hindcasts”

Line 28: use capitals for "Analysis of the Correlation Coefficient”

Page 10214:

Line 5: there should be a comma behind “members”

Line 11: “particularly effective” would better read “appropriate”

Line 12: insert “a” before “probabilistic”

Line 20: “hind cast” should read “hindcast”

Line 22: “using the grid nearest neighbour being ….” should read “using the nearest neighbour grid, being ….”

Page 10215:

Line 7: “output” should read “forecasts”

Line 19: “long-term precipitation record which is” should read “long-term precipitation records, which are”

Line 25: Insert “the“ before “Standardized …”

Line 26: No comma after “Index”

Page 10216:

Line 18: “forecast” should read “forecasts”

Line 21: “horn” should be with capital H

Line 24: “season rain” should read “seasonal rains”

Page 10217:

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Line 4: Replace “For” by “Due to”

Line 4: “qualitative” should read “quantitative” (please check!)

Line 6: “yr” should read “years”

Line 18: “wet condition” should read “wet conditions”

Page 10218:

Line 6: “or” should read “for”

Line 14: delete “on”

Line 19: “Forums” should read “Forum”

Page 10219:

Line 14: “informations” should read “information”

Line 15: “exhisting” should read “existing”

Line 19: “Standardise” should read “Standardized”

Line 20: insert “data” after Precipitation and insert an “a” before “proxy”

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 10209, 2013.