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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Early warning of drought in Europe using the monthly ensemble system from ECMWF" *by* C. Lavaysse et al.

Anonymous Referee #2

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Title: Early warning of drought in Europe using the monthly ensemble system from ECMWF

Authors: C. Lavaysse, J. Vogt, and F. Pappenberger

Summary: In this study the authors compare the skill of the European Centre for Medium-range Weather Forecasts' (ECMWF's) extended range forecasts (lead time up to 32 days) and seasonal forecasts (lead time up to 12 months) in forecasting drought at one-month lead-time. The authors use the Standardized Precipitation Index (SPI) to identify drought events and estimate drought severity. This is a very useful analysis. The methods used in this study are technically sound and appropriate. The conclusions are supported by the results. I would certainly recommend publication of this

manuscript however after some minor to moderate changes that I believe can further improve this manuscript. Please see my comments below.

(1) This manuscript can benefit a lot by a careful copy editing for several typos (mostly grammar related). I think it will improve the readability of the manuscript. (2) I understand that the focus of this study is the drought forecast at lead-time of 1 month however I have to wonder, for practical purposes, how useful it is to know about drought severity in the next month. What are the stakeholders that can benefit from the forecasts? I can certainly see the benefit of this during an ongoing drought event but how can one use the drought forecast over the next month to make decision on drought onset or drought propagation since typically drought that persists over a long period of time (varying from a few months to years) are the ones that the decision makers would be concerned about. I also understand (and am sympathetic to the fact) that the skill of seasonal forecasts, beyond a lead time of one month, is generally limited which may have influenced the authors decision to focus on one month lead forecasts nonetheless the implications of the choice of lead time do need to be discussed. Please consider doing so. (3) The authors use several metric scores for the evaluation of ECMWF's forecasts, which is a real strength of this study however I think those metric scores can be better explained. I would suggest dividing the section 2.4 into subsections for each metric scores and explaining them separately. Please also provide the corresponding equations where applicable.

Minor comments:

(1) Page 1975 Lines 5-9: In this paragraph the different categories of drought are mentioned. I found the sequence of drought categories a bit odd. In general, meteorological drought is mentioned before agricultural drought followed by hydrological drought. The reason for which of course is that this the sequence in which drought events generally propagate. Please consider revising this paragraph. (2) Page 1975 Lines 16-17: Do you mean a specific region or is this statement generally valid across the globe? (3) Page 1977 Lines 21-22. Probably no need to mention section 1 here

because it precedes this sentence? (4) Page 1979 Line 14: I think the authors mean the real-time forecasts here which have 50 ensembles members. Please mention that in this sentence. (5) Page 1984 Lines 1-2 and Figure 2. If I understand correctly Fig. 2 shows correlation between observed and forecasts time series across all seasons. How do you think the fact that forecasts capture the seasonal variability (dry vs wet season) might be inflating the correlation score here? (6) Page 1984 Line 18-20: "This result. . .". Please clarify this sentence. I am not sure what you mean by this.

Please also note the supplement to this comment:
http://www.hydrol-earth-syst-sci-discuss.net/12/C578/2015/hessd-12-C578-2015-supplement.pdf

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 12, 1973, 2015.