

Interactive comment on “Seasonal Drought Prediction for Semiarid Northeast Brazil: Verification of Six Hydro-Meteorological Forecast Products” by José Miguel Delgado et al.

R. Mirabbasi (Referee)

mirabbasi_r@yahoo.com

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Dear Prof. Carlo De Michele, As desired, my comments on the manuscript entitled "Seasonal Drought Prediction for Semiarid Northeast Brazil: Verification of Six Hydro-Meteorological Forecast Products" (Ms. No. HESS-2017-572) are listed below. In my point of view, this paper can be accepted after revision.

With kind regards, Rasoul Mirabbasi

General comment The manuscript is concerned with assessing the plausibility and skill of a set of drought forecasting models. The considered forecast products were combi-

C1

nations of two models, ECHAM and the ECMWF seasonal forecast, two downscaling techniques, XDS and EQM, and a weather pattern classification approach. In my personal opinion, the present paper fits in the broad scope of the journal. However, it is necessary to modify the present paper before publication. Questions, suggestions and comments regarding the manuscript are listed below:

Major Comments - The methodology is presented very brief and in some cases vague (e.g. Multimodel ensemble forecast). It suggested to explain more about the applied methods. - In Table 2, the authors presented some regression equations for predicting HDI from MDIs. When they stated that forecasting of MDIs haven't good accuracy (especially when increase the lead time), how they expected to achieve acceptable results in calculating HDI from MDIs? Did the author consider the uncertainties in predicting the HDI? - In Figure 5, the authors considered -1 as the threshold for capturing dry spell. As they stated in the manuscript (Page 8, line 9) that in the study area the January, May and June are months with low or no precipitation and February and March are months with high precipitation, therefore the SPI and SPEI cannot account for seasonal variability, i.e. a given amount of precipitation has different effects on moisture status depending on when it occurs. So it suggests to consider the monthly mean as threshold instead of overall mean and calculate the modified SPI and SPEI (See Kao and Govindaraju, 2010; Mirabbasi et al., 2013 for more information). - Kao, S.C., Govindaraju, R.S., 2010. A copula-based joint deficit index for droughts. *J. Hydrol.* 380, 121-134. doi:10.1016/j.jhydrol.2009.10.029

- Mirabbasi, R., Anagnostou, E.N., Fakheri-Fard, A., Dinpashoh, Y., & Eslamian, S. (2013). Analysis of Meteorological Drought in Northwest Iran using the Joint Deficit Index. *Journal of Hydrology*, 492: 35-48 DOI: 10.1016/j.jhydrol.2013.04.019.

- The authors should explain why they choose the 1-, 12- and 36- months time scales for computing the drought indices (MDIs)? As they stated in the manuscript, by increasing the lead time, the accuracy of forecasting drought decreased. What are the advantages of forecasting drought by 36 months time scale? Also the authors said that

C2

for computing the SPI36/SPEI36 forecasts most of the contributing months are coming from past observations and not within the forecast period. So they cannot make correct judgment about the skill of the models in forecasting drought indices with long-term time scales. Therefore, I think calculating the drought indices with smaller time scales (such as 3, 6, 9 months) and higher accuracy will be more acceptable and useful for farmers or water resources managers. Minor Comments - The authors should explain in the manuscript why the seasonal forecasting model only runs for 8 months not for all months of the year? When you consider only 8 months, How you calculate the drought indices with 12 or 36 months time scale? - On page 6, Line 9, (and Page 7, line 18) the authors choose the 30th percentile of each index as the threshold for capturing dry spells. Why you choose this threshold? - On page 7, line 13, the phrase "precipitation in he Jaguaribe basin" should be corrected as "precipitation in the Jaguaribe basin"

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C3