

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

### **Anonymous Referee #1**

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The manuscript describes verification of seasonal drought prediction frameworks using six hydro-meteorological data sets as input. Overall the manuscript is well-written and potentially interesting. However, the methodology section is not well explained. Moreover, the verification scores used in the manuscript couldn't evaluate the performance of the frameworks, comprehensively. It suffers from some drawbacks listed in "specific comments" and "technical corrections".

specific comments

1- Reasons for choosing the two specific GCM models, ECMWF and ECHAM, and the manner in which output of the models were combined needs further description to

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enhance readability of the manuscript.

2- Further description on calculation of SWSI should be added to the manuscript.

3-It is not fully cleared that why only time scales of 1, 12 and 36 months are selected for drought indices. It is clear that long time scales would be more meaningful in deriving reservoir storage by a regression equation. However, using time scales longer than 6 months distorted evaluation of the forecasting framework.

4-RMSE, used in the manuscript, measures "average" error, weighted according to the square of the error and does not indicate the direction of the deviations. Moreover, ROC skill score used for evaluation of the proposed prediction framework. One of key features of any prediction framework is to evaluate reliability of the predictions. Reliability is the average agreement between the forecast values and the observed values. If all forecasts are considered together (not categorized into bins), then the overall reliability term is used which is the same as the bias.

Generally, ROC skill score is insensitive to forecast biases. Thus, care is needed when interpreting and comparing the performance of model forecasts based on the ROC score. It is recommended to use other skill scores reflecting reliability (bias) in addition to ROC skill score. Brier Score may be a choice.

5- On page 15, line 27: "Results showed that models with little to no skill by a deterministic measure (RMSE) showed skill under a probabilistic skill score. This underlines the importance of having at least one deterministic and one probabilistic measure of skill."

RMSE and ROCSS measures different aspects in evaluation of a prediction framework. In other words, different values for those scores are because they measure different attributes. So, such a conclusion is weak.

6- Justification needed on choosing -1 as threshold of the drought indices for drought events.

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7- In regression, do you have any suggestion to address the problem of division by indices when the indices are close to zero?

technical corrections

1- On page 5, line 18, citation of "Philipp et al. (2016)" should be modified to the correct form: "Philipp et al. (2014) ".

2- On page 5, line 24, change "The numbers in the index name refer" to "subscripted number refers"

3- The table on page 14 doesn't have any caption.

4- In whole text, "Sect." should be written in its full form: "section"

5- Gray solid line indicating values of multi-model ensemble should be mentioned in legends of Figs. 4, 7 and 9.

6- Fig. 7 is not showing boxplots. Change the caption.

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