

Interactive comment on “Seasonal forecasting of hydrological drought in the Limpopo basin: A comparison of statistical methods.” by M. Seibert et al.

Anonymous Referee #1

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This manuscript investigates the capability of Multiple Linear Regression (MLM), Artificial Neural Network (ANN) in conjunction with Genetic Algorithm (GA) and Regression Tree to forecast drought in Limpopo basin based on large scale and customized scale climate factors, mostly SST based. The manuscript is well presented and the method and discussion is clear. The results indicate that, with the use of customized SST based factors as predictors, the MLM model is capable of forecasting the drought in the region with a higher forecast skill compared to the other two methods. One of the main contributions of this manuscript is revealing how the customized climate factors have increased the forecast skill compared to the large scale climate indices such as ENSO. Comments: Page 7, line 3: "The standardised streamflow indices (SSI) are cal-

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culated for each station at the scale of 6 months. SSI6 May of May at that scale covers the desired main runoff period from December to May, henceforth named SSIDJFMAM (Figure 2)".

When discussing the SSI, it is not clear if the SSI is a single value (averaged or summation?) for the months Dec-May or each month has its own SSI value. I would assume that there is only one SSI value for Dec-May, in that case Figure 2 is showing the Box-Plots of Monthly streamflow and not the SSI. I don't see the use of Figure 2 in this manuscript in relation to SSI.

Page 13, line 2: "Therefore, the RFOR predictor importance was modified for comparison." How was it modified?

Suggestion: As ANN is not bound by any linear assumptions (as opposed to MLM), the use of the MLM predictors which were selected based on Pearson correlation (a linear technique) and relying on MLM stepwise predictor selection has limited the performance of ANN in this study. I suggest that in the future studies, the authors do not bound ANN to limited linear selection of inputs (predictors) and investigate a wider range of inputs using either a simple method of trial and error with ANN or more complicated methods such as mutual information or genetic algorithm to select ANN's inputs.

Please also note the supplement to this comment:

<http://www.hydrol-earth-syst-sci-discuss.net/hess-2016-4/hess-2016-4-RC1-supplement.pdf>

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