

Interactive comment on “Skill of a global forecasting system in seasonal ensemble streamflow prediction” by Naze Candogan Yossef et al.

Anonymous Referee #1

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Review of “Skill of a global forecasting system in seasonal ensemble streamflow prediction” by Candogan Yossef et al.

General Comments:

This paper uses a global hydrological model to produce seasonal forecasts for 20 large rivers across the globe, using both the ECMWF System3 forecasts as forcing, and the ESP technique. The ‘theoretical’ and ‘actual’ skill of the two approaches is assessed for high and low flows using the Brier Score.

I read this paper with great interest, and liked the comparison of the S3 forecasts with the ESP. The paper is very well written throughout, the methodology is sound and I

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believe the results and conclusions are of interest to the hydrometeorology community and relevant for publication in HESS.

My only concern with this paper is the authors' decision to use ECMWF's System 3 forecasts, rather than the current System 4 which has been in operation since 2011. This is not currently justified in the manuscript - as such it may seem that the results could become outdated due to the existence of newer, potentially more skilful seasonal meteorological forecast.

Specific Comments & Corrections:

Overall, the text is very well written, but I have a few comments:

Page 2 Line 13: The authors state that medium-range NWP is based on atmosphere-only integrations; however, many NWP systems are now coupled atmosphere-ocean models. For example, ECMWF's medium-range ensemble forecasts are coupled, and the authors indeed later state that S3 is a coupled model (which not medium-range, this is still a NWP system). The explanation of NWP vs GCM should be amended as such and clarified, as this is not the key difference between the two.

Page 2 Line 31: While I have no issue with the number of rivers or their distribution, I don't believe the authors provide an explanation of why they chose to conduct the study in this way, and why 20 rivers were chosen. Is this a good representation of global rivers? Some further explanation with regards to this choice would be helpful.

Page 5 Line 13: I would ask the authors to please explain the reason for choosing to use ECMWF System 3 forecasts rather than the current version, System 4, which has been in operation since November 2011.

Page 7, BS: Having read the full paper, my understanding that the authors have calculated the BS for both the ESP and ECMWF S3 forecasts, however this is not clear from the explanation provided here, please could the authors clarify this.

Page 6/7: For the skill assessment, it is not clear exactly what data are used and

there is very little information provided about the actual discharge observations. Is the forecast discharge used the basin-average discharge? Or the discharge at the basin outlet? Where exactly are the GRDC stations located, at the basin outlet also? Is just one GRDC station used per river? How long are the GRDC observation records and does this affect the skill assessment if they are not of the same length as the control, or contain missing data? More information on this is required, and in fact in general there is little discussion of the limitations of the datasets used.

Page 8, Line 1: With regards to the tables, 20 8-panel tables is rather too much to include in the main manuscript. I would recommend choosing one, or part of one, table to use as an example in the main text, and move the remaining tables to an appendix or supplementary material to which the reader can refer.

Page 8, Line 5: I presume here that the BS presented are those for the ECMWF S3 forecast, not the ESP, but I am unsure of this - please clarify when introducing the tables, which forecast the BS is shown for, and that the BSS compares this to the other forecast to indicate the improvement.

Figures: I would recommend adding an additional map showing the basin names, to avoid the reader needing to look up those they are not familiar with.

On the global maps (figure 1), it is not clear what a white circle indicates - I presume that these are the basins which do not see an improved forecast skill for that scenario - I would recommend either not showing a circle at all for those which do not see improved skill, or clarifying this in the legend.

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