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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Evaluating uncertainty in estimates of soil moisture memory with a reverse ensemble approach" *by* D. MacLeod et al.

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During recent years, several studies demonstrated how seasonal hydrological predictability differs across regions and time of the year. This paper applies reverse-ESP approach in order to research the impact of change of parameters of hydrological model.

Generally, this study contributes to the understanding of seasonal predictability and it highlights the importance of "hydrological parameter uncertainty" in this area. As such, I consider it relevant for publication in HESS. The limit of the study is a sparse resolution of application given by the high computational demand of selected ensemble approach. From that point of view, reduced resolution is understandable, but more explanation of selection of grid points is needed, as well as this feature of the study and its impact

on results should be properly discussed. In addition, results are presented only from the point of geographic location of sensitivity anomalies, however if grid characteristics were "picked" from higher resolution data, a link to general orography and vegetation type should be given (e.g. an obvious anomaly of average day of memory loss for level 2 and 3 in North African and Middle East deserts.

Secondly, study uses two initial dates (May and November) and 4 months "forecast period", which however will be for given months heavily impacted by snow occurrence and melting. Different starting dates, even with relatively small temporal shift (e.g. by 1 month) would likely provide different results. I am aware that selection of additional starting dates would be computationally extensive and full year coverage was outside the scope of the study, but I feel that some discussion of this issue would be beneficial for readers.

I also advice authors to try to more explicitly describe (discriminate) the implications of their findings from the perspective of atmosphere-land coupled model on one hand, and from the perspective of seasonal flow forecasting applications.

In conclusion, the paper should be subject to some major revisions reflecting above mentioned comments.

A few typing errors appear in the text, among others: Page 1, line 9 – repetition of "with" Page 3, line 10 - "The forcing comprises three hourly data..."

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