

Hydrol. Earth Syst. Sci. Discuss., referee comment RC2
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Comment on hess-2022-89

Anonymous Referee #2

Referee comment on "The suitability of a seasonal ensemble hybrid framework including data-driven approaches for hydrological forecasting" by Sandra M. Hauswirth et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2022-89-RC2>, 2022

The study is building heavily on results published elsewhere (Hauswirth et al., 2021). I guess that is fine and always a difficult call to decide just how much information to provide so that a paper becomes a stand-alone piece of work without unnecessary repetition. However, in places I would have liked a little more info in this paper so I would not necessarily have to read the previous paper. For example, lines 114-117; this seems important and a bit more in-depth description of the datasets (SEAS5) and the 'lagged time series approach' which I am not familiar with.

Perhaps I have overlooked something, but I am not sure how the all the forecasts made by the different models and different ensembles are aggregated into one CDF (as per Fig.2)? Also, If there is only a minor difference in the performance between the five different ML models (line 205) then what is the advantage of using all of them rather than selecting the 'best' or most credible model for a particular site and use that? Might it be useful to add a section highlighting the performance of each of the five ML models in contrast to the aggregate performance of the entire system?

Minor comments:

- The acronym LSTM is not defined?
- Figs.2-6 did not come off well in my black and white copy, but ok for online viewing (which in fairness is probably the most common by now).
- Line 253: Why the 20th percentile? Or why only the 20th percentile? I could imagine that the ability to assess low-flow across a range of severities would be of interest?
- Line 253: Do any of your models include the effect of human interventions and their

potential impacts on low flow? For example, water restrictions, operation of control structures to manage low flows etc? If not, is this likely to be important in a highly regulated system such as the Netherlands' water ways? I think there is no mention of this in lines 220-225, but seems to me this is particularly important during low flow?

- Line 293: I am not sure I understand how you incorporated water management into your models? Was this done in this study, or is that something that was part of the Hauswirth et al. (2021) study? I think perhaps more detail on this could be included in this manuscript as this seems interesting and important (even if you did not find a strong effect).