

Interactive comment on “Developing a hydrological monitoring and sub-seasonal to seasonal forecasting system for South and Southeast Asian river basins” by Yifan Zhou et al.

Yifan Zhou et al.

zyffyz8001@gmail.com

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We thank the referee for the efforts and constructive suggestions. We clarify the year range of the simulations, revise the section structures, and add explanations of overestimation of drought area in August based on your suggestions. The detailed responses are listed below.

Line 46-49: Repeated statements Response: We deleted one of the repeated statements in the revised manuscript.

Line 167: "2000-2018" and later in line 183 "from 2000 to 2017". Please double check.

C1

Response: The "2000-2018" in line 167 is referring to the year range of spin-up simulation. We then use the restart file of Dec 31st, 2018 to initiate the retrospective run, which starts from 2000 and extends to 2017, therefore, in line 183, "the year 2000 to 2017" is referring to the year range for the retrospective simulation. We now modify the text in line 183 to avoid ambiguity.

Line 275: For forecast results of multiple members, the ensemble mean is based on standardized values of each member? Please clarify Response: Regarding the ensemble mean of the forecast results, we average all the ensemble members first and then standardized the averaged time series. We now clarify in line 275 as "For simplicity, the results presented in the following sections are only based on the standardized ensemble mean for forecast simulation related analyses, for which the standardization is applied after the calculation of ensemble mean".

Line 286-293: It seems the correlation is particularly high in northwestern regions of the study area even after 3-6 months. Could you please explain this? Response: The same initial conditions are used in hindcast-RIC and retrospective simulation. The northwestern region has relatively low precipitation and thus this region has a long hydrological memory which is drawn from the initial conditions. This phenomenon is further explained in detail in section 3.2. We now add this explanation to line 290.

Section 3.4 "Case study of the 2015 South and Southeast Asia drought" and section "3.5 Application to drought". The "case study of 2015 drought" is not an "application to drought"? Please think about this and revise them accordingly if needed. Response: We designed these two sections as we meant to use section 3.4 to show the capability of the model to capture a historical drought event and to use section 3.5 to illustrate the potential to use soil moisture-based drought indicators in general. We now modified the name of section 3.5 to "Application of drought indicator" in the revised manuscript.

Line 472-474: This overestimation of drought area from August is due to the low performance of precipitation forecast during the monsoon season? Please clarify this

C2

overestimation. Response: Yes, and the overestimation of drought area for August is mainly attributed to the lower precipitation prediction from the downscaled GEOS-S2S-1, which is shown in Figure S1. We now add this explanation in line 474 in the revised manuscript.

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