Hydrology and Earth System Sciences

Discussions

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Interactive comment on "Extending seasonal predictability of Yangtze River summer floods" *by* Shanshan Wang and Xing Yuan

Anonymous Referee #1

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This article by Wang and Yuan investigates seasonal predictability of water vapor flux and precipitation in the CFSv2 forecasts to see if water vapor flux could provide higher predictability of floods. I enjoyed reading the study and believe that this is an interesting study and one that is relevant to forecast users. I currently have two major concerns which I lay out below, and some further more minor comments. I hope the authors will find them of use. Major comments:

1. While the language is generally very good, there are grammatical issues, so the paper would benefit from being read by a native English speaker. Also, I think the authors need to be careful with their terminology. For example, on many occasions they say "moisture" when in fact they mean "moisture flux" or "water vapor flux". This needs to be corrected so that readers are not confused by the terms (moisture could

be viewed as total column water vapor).

2. The authors only analyse monthly fields and I believe that this is not sufficient. This is useful, but I think some testing should be done on at least weekly or 2-weekly averaged fields. The reason is that it will be easier (and more beneficial) to see when the predictability drops off in the model at a finer time resolution. For example, Luo and Wood (2006) have some good plots that may help you to consider other time averages.

Other comments:

Line 19: "atmospheric moisture" – see major comment 1.

Line 33: "ability to be predicted" is a strange phrase. Perhaps consider re-phrasing.

Line 40: Precipitation is connected to mesoscale (or more local scale) circulation and orography.

Line 61: I think Lavers et al (2016a) investigated prediction skill, not predictability.

Line 75: What pressure levels were used? Please add some details here.

Lines 103-112: Why does the AC go from 0.33 to 0.44 (compare Figure 1b and 1d)? You would expect the predictability to drop with lead time.

Line 116: I would advise not to use the "upper limit of forecasting skill". This is not always true, as explained in Kumar et al (2014).

Line 119: "Seasonal predictability" is probably seasonal predictive skill.

Line 124: "b" is not in the equation. Please remove.

Line 131: It is hard to see the Yangtze River. Can this figure be edited so that the river is more clear?

Line 133: "pummelled" is not really scientific. Can this be rephrased?

Line 183: Can you consider plotting the differences between precipitation and moisture

flux in Figure 4g? This would more clearly show any significant differences between the variables.

Figure 2: In panel c can you use the total column-integrated moisture flux instead of just the 850 hPa level? This would match the rest of the paper.

Figure 3: What initialisation times are used in this figure (e.g. 1st May 2016)? Please consider adding to the caption.

Figure 6: Panels c-d. Perhaps a few extra contours should be added to more clearly show the 500 hPa geopotential height?