Geoscientific
Model Development
Discussions

Interactive comment on "Developing a global operational seasonal hydro-meteorological forecasting system: GloFAS v2.2 Seasonal v1.0" *by* Rebecca Emerton et al.

Rebecca Emerton et al.

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- AC: We would like to thank the reviewer for their positive comments and suggestions for improvement. Please find our responses to any questions raised, and suggested changes to the manuscript, below.

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This paper describes the modelling chain used to provide the new GloFAS global streamflow forecasting product: 4-month ensemble streamflow forecasts generated at the weekly time step. The manuscript is commendably clear and concise, guiding the

reader through the components of the system, and clearly describing its advances and its value. I believe the manuscript is well suited to the aims of GMD. This forecasting service is of global significance, and the manuscript is likely to be of high interest to forecast researchers and beyond. However, I thought the evaluation of their system (Section 4) could be improved: a crucial property of ensemble forecasts - reliability - is completely ignored, as ROC curves ignore this aspect of forecasts. I therefore suggest the authors consider revising their manuscript to include a measure of reliability.

Major comments

1) Reliability is ignored in this manuscript. The system presents precise confidence intervals on their forecasts, which a user could reasonably assume to mean, for example, that "the 80% confidence interval indicates an 8 in 10 likelihood that the observation will fall in this band". The user's decisions may be influenced by this assumption. Uncalibrated precipitation ensemble forecasts from GCMs are generally overconfident (I'm not sure about SYS5), meaning that this assumption could be wrong. I suggest the authors acknowledge this issue by presenting a figure summarising the reliability of the forecasts (e.g., an attributes diagram pooling information from all sites for forecasts exceeding the 80th %ile and dropping below the 20%ile). If the forecasts are overconfident, this is an avenue for future improvement (and if they are reliable, then great!).

- AC: We agree that it would be of benefit to provide further discussion on the reliability, and we will produce and include an attributes diagram in order to address this, as suggested by the reviewer.

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Specific (minor) comments

P1 L27-28 "will differ from normal conditions" No change suggested here, but I'd note that some forecasting systems aim to forecast specific quantities of rainfall, streamflow,

etc.. This sentence implies that forecasts of deviations from the (model) climatology are the only aim of seasonal forecasts. The two aims align in the case of perfectly unbiased and reliable forecasts, but reliability in purely dynamical forecasting systems like this one is very difficult to achieve. Some comment on reliability of forecasts in the introduction is probably warranted (not necessarily here, but at some point).

- AC: In addition to the planned inclusion of an attributes diagram, we will include a comment on forecast reliability within the introduction.

P4 L13-14 "that it better simulates" Better than...? Do the authors mean that it improves over SYS4?

- AC: Yes, this is correct - we will modify this sentence to make it more clear that these are improvements over SYS4.

P5 L11 "resampled" Resampling usually implies (at least in statistics) that some sort of random process is used. Is this what the authors are implying? Or do the authors mean 'interpolated' or perhaps 'regridded'?

- AC: We will change "resampled" to "interpolated".

P8 L12 "The interface consists of three principal modules, outlined below." For clarity, I suggest: "The interface consists of three principal modules: MapServer, GloGAS Web Map Service Time and Forecast Viewer. Each module is outlined below."

- AC: Thank you for the suggestion, this definitely reads better and we will update the text.

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Typos/Grammar

P3 L9 "In 2016, work began in collaboration with the University of Reading, to implement" The collaboration is parenthetical, but not the work. Suggest "Work began in 2016, in collaboration with the Unversity of Reading, to implement..." (or perhaps: "In

2016, work began (in collaboration with the Univeristy of Reading) to implement...")

P3 L11 "...was released; this..." should be "...was released. This..."

- AC: We will correct the two highlighted changes to the text as suggested.

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Interactive comment on Geosci. Model Dev. Discuss., https://doi.org/10.5194/gmd-2018-118, 2018.