Multi-site learning for hydrological uncertainty prediction: the case of quantile random forests

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Reply to Derek Karssenberg's comments

Thank you very much for your comments on our manuscript, which will help improve our work. Please find below our replies (in blue) to your comments (in black), as well as how we intend to modify the paper to account for your suggestions and recommendations.

Title

Thank you for considering the change in the title. After rereading your manuscript, I actually am in the opinion that your original title was a good representation of the manuscript. The focus of the manuscript is on 'uncertainty prediction' as one could say the methodology adds uncertainty information (highly valuable) to streamflow predictions from a process-based simulation model. In a certain way it does 'error correct' (although in a probabilistic approach errors are 'modelled' and not really 'corrected') but the capability of adding uncertainty information is arguably more important (and the focus here, also because the tuning is based on the full distributions). However, the study is closely related to what is referred to as 'error-correction' (sometimes 'residual modelling') in other studies and it would be desirable to make this connection clear in the title or keywords. I leave it up to the authors to decide.

Thank you for your comment. Indeed, error correction is not the main focus of the QRF method. We have added deterministic metrics to explore if multi-site learning can also improve deterministic metrics. We have restored the original title to better reflect the scope of the study ; Multi-site learning for hydrological uncertainty prediction: the case of quantile random forests. Also, we will include the term « error-correction » as a keyword of the article.

p. 2 (line 48 and 52) The name of the model is PCR-GLOBWB not PCR-Global.

Thank you for raising this typo. We have corrected "PCR-Global" to "PCR-GLOBWB" throughout the article.

p. 13 (line 311) 'aforementioned selection criterion' – please give the name or symbol used instead as this is unclear. I recommend changing it in the Figure 4 caption as well.

We have clarified this reference. The text now explicitly represents the selection criterion." We did similarly to the caption of Figure 4.

Figure 3 I may be wrong but it seems Figure 3 is not referred to in the main text. There is also a minor issue with the caption. The caption refers to two shades (related to two confidence intervals). The figure however seems to show three shades and also additional lines (in orange) which remain unexplained. I think it would be best to adjust the figure, if possible.

Thank you for pointing this out. Figure 3 is referenced in the main text (p13. line 308). We have also revised Figure 3 to clearly reflect the three uncertainty intervals ((25%, 75%), (5%, 95%), and (2.5%, 97.5%)), in addition to the orange line, representing the median of the uncertainty estimates.

p. 24 (line 482)

We have updated Kratzert et al. (2018) to (Kratzert et al, 2018).

L271 "coverage across all confidence levels To assess the sharpness" is missing a fullstop

We have corrected this typo error in the revised manuscript.