Author´s response

Dear Prof. Dr. Brunner

Please find attached with this document the new version of our manuscript, which incorporates the changes suggested during the review process. Attached to this document, you will find the revised manuscript along with a tracked changes version. Below, we provide a point-by-point answer to the changes proposed by Dr. Kraft, which are written in blue.

L31 ". . . does provide ~~a sense~~ of interpretability . . . "
Response: Thank you for the suggestion. We did the respective change.

L36 "Building on this research line~~,~~ and . . . "
Response: Thank you for the suggestion. We did the respective change.

L44 "Does ~~the combination of process based and data-driven tecniques~~ hybrid modeling offer . . . "
Response: Thank you for the suggestion. We did the respective change.

L61 ". . .we split the training and test ~~periods~~ set temporally by years . . . "
Response: Thank you for the suggestion. We changed the word "periods" to "set".

Figure 1 Use "Time" or "Date" as label for x-axis (also in Figure 5). The legend label "obs" should be changed to "Observed", also for consistency with Figure 5.
Response: Thank you for the suggestion. We changed the x-axis label to "Date", and modified the legend to "observed".

L151 "~~The result that both the LSTM and the hybrid model outperform the stand-alone HBV~~ This is not surprising, and as . . . "
Response: Even if the idea is repeated in two consecutive sentences, we believe it makes a clearer statement, so we would like to keep it as it is.

L154 ". . . attributed to the fact that **conceptual** process-based models . . . ". Some process-based models are very complex, maybe use "conceptual"?
Response: Thank you for the suggestion. We did the respective change.

L158 "Moreover, we ~~also~~ show . . . "
Response: Thank you for the suggestion. We did the respective change.

Figure 2 Here and in other figures: I usually re-introduce abbreviations (NSE, later APE) in figure captions.
Response: Thank you for the suggestion. We re-introduce the abbreviations in all the figures.

225 "This saturation limit **could** explains . . . "
Response: Thank you for the suggestion. We did the respective change.

Figure 6 For consistency, I suggest to remove the last sentence in the caption. You don't do this for figure 1, for example, and it is clear anyway.
Response: Thank you for the suggestion. We did the respective change.

L261 Also glacier melt in addition to snow?
Response: Thank you for the suggestion. We incorporated glacier melting into the text.

L280 Semicolon between "Kraft et al. (2022); Hoge et al. (2022)" probably wrong.
Response: Thank you for the suggestion. We changed the citation type.

S3.6 Limitations: you could mention here that you did not test for spatial generalizability.
Response: Thank you for the suggestion. We added this to the limitations section.

Appendix D I appreciate the inclusion of a brief analysis of the learned hybrid model dynamic parameters in Appendix D. The appendix/figure is not mentioned in the main body. This would be an opportunity to briefly discuss "interpretability" of hybrid models and the usefullness for understanding / debugging / establishing trust in the model.
Response: Thank you for the suggestion. In the first paragraph of the limitations, we included the reference to the appendix and expanded on the importance of model interpretability.

L393 It is **Högge** with umlaut.
Response: Thank you for pointing this out, we added the umlaut. About the double "g", we doubled checked the paper, and the last name only contains one "g".

We believe the modifications made cover the changes proposed by Dr Kraft. We would like to thank both referees, as their input in the review process allowed us to produce a better manuscript.

Kind regards,
Eduardo Acuña on behalf of the co-authors.