RC#1

- The authors present an interesting article improving water management options in the global hydrological model Xanthos where these novel options for global hydrological models forsee irrigation, hydropower and flood control reservoirs. The spatial resolution is 0.5 °. Different operation rules were applied to the different reservoir type after optimizing long-term hydropower production. Model results were compared to measured streamflow data and the agreement was improved for most basins. The paper can be published after minor revisions:

→ We sincerely appreciate your valuable feedback and are encouraged by your acknowledgment of our work's contribution to enhancing water management strategies in global hydrological models. Your constructive comments have greatly aided in refining our manuscript. We are delighted to learn of your support for the publication of our paper following minor revisions, which we have addressed diligently. Thank you again for your time and thoughtful review.

Minor:

- Setup a list of abbreviations

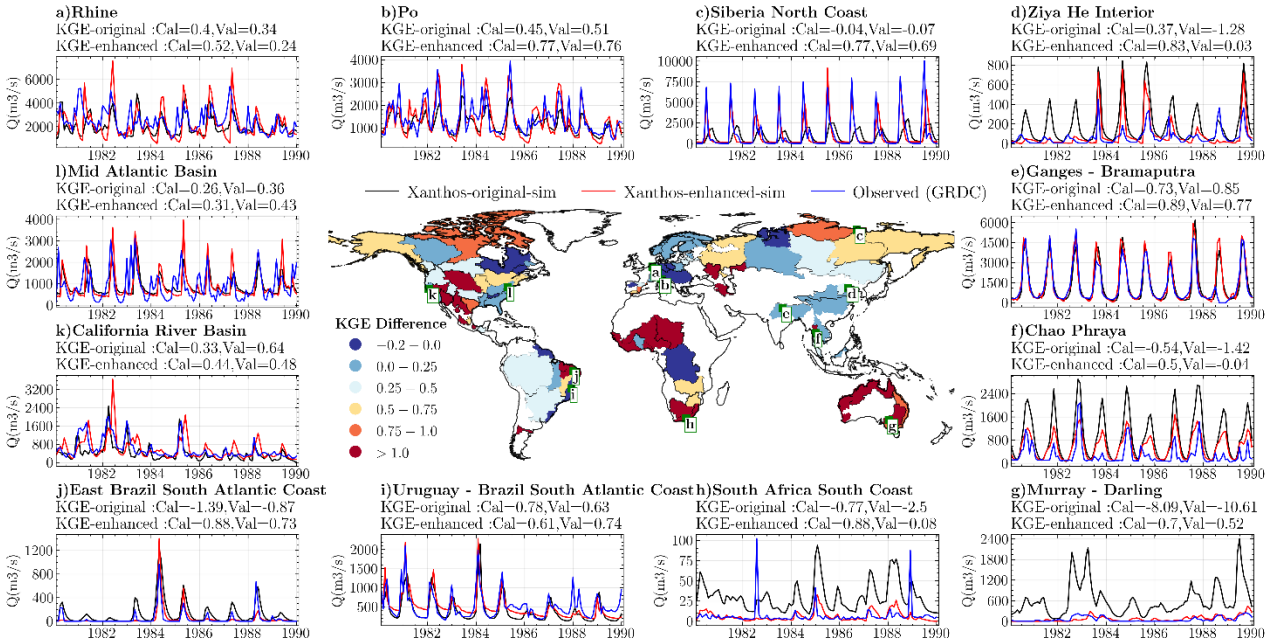
→ Thank you for your suggestion to create a list of abbreviations. We acknowledge the potential merits of such a list for reader comprehension. However, after careful consideration, we have chosen to maintain the current format where abbreviations are defined within the text at their first instance of use. We believe this method provides immediate clarification and maintains the narrative flow. To ensure clarity, we have thoroughly reviewed and corrected any issues pertaining to abbreviations within the manuscript based on the provided comments. We hope this approach adequately addresses your concern while preserving the intended structure of the paper.

- Check the figure numbers starting in sec. 3.2

→ Thank you for bringing this to our attention. To address any potential confusion, we have updated the figure references in Section 3.2 and throughout the manuscript. Previously, we referred to supplementary figures as Fig. S1, Fig. S2, and Fig. S3. Now, for the sake of clarity, these references have been revised to 'supplementary Fig. S1' and 'supplementary Fig. S2' in the text.

- Several times you mention several basins (e.g. l. 445f) or rivers (Fig 5); it would be interesting to see were they are located in the world; try to include that in the figures:

→ Thank you for your suggestion. We appreciate the importance of providing clear geographical context for our study. To this end, the locations of all 91 basins referenced in this study are presented in Fig. 3c; in addition, we included labeled basins in the supplementary material as Fig. S7. Additionally, in Fig. 5, the subplots' labels (a, b, c, ...) correspond to the labels on the map. We noticed and corrected a labeling error in Figure 5 where the labels were misplaced. We trust that these modifications will clarify the geographical context of the basins and rivers involved in our study.



Updated Figure 5

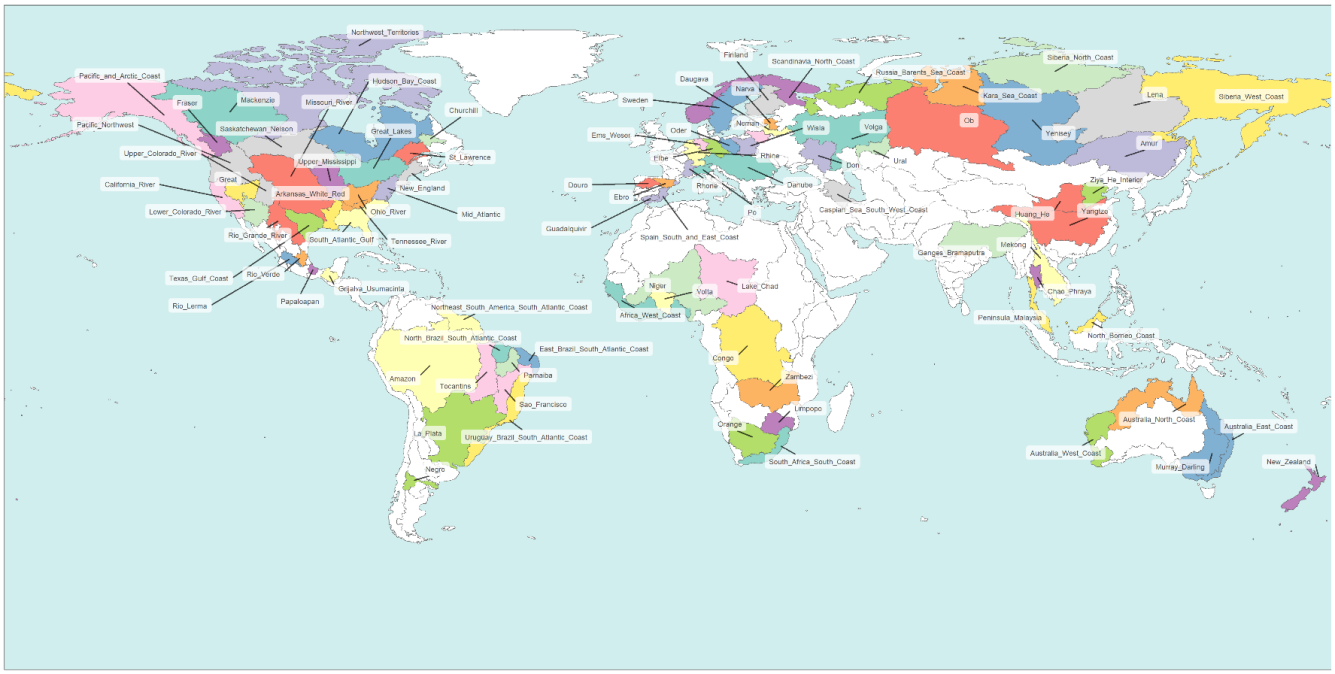


Figure S7: The 91 Xanthos basins calibrated in this study with basin name label

- Further minor comments are in a pdf

→ Thank you for providing additional feedback in the PDF document. We have carefully reviewed and addressed each of the minor comments in our revised manuscript. We appreciate your detailed review and constructive feedback, which have helped to improve the quality of our manuscript.