

Author's response

Dear Editor and Reviewers,

Thank you for the review on manuscript *egusphere-2025-599*. We greatly appreciate the attention you have given to the paper, which has been revised in accordance with your request.

Following your recommendations to condense the paper and refocus the discussion, we have moved specific result sections out of the core manuscript while preserving the central narrative.

Relocated materials (now as Appendices):

- Analysis of the increase in occurrences above 15 °C
→ Appendix B: Rising occurrence of ecological thermal threshold exceedance
- Joint spatio-temporal evolution along the reach
→ Appendix C: Stream temperature evolution under combined spatial and seasonal dimensions

We selected these sections because they offer valuable additional results but do not materially strengthen the broader discussion or core message.

We propose to include them as appendices rather than supplementary material, in line with the journal's guideline that "*In no case can supplementary material contain scientific interpretations or findings that would go beyond the contents of the manuscript*". If you would prefer these materials to be handled differently, we are of course happy to adapt.

Beyond these relocations and minor consistency edits, no other changes were made.

We appreciate the reviewers' careful consideration and believe the manuscript is now clearer and more concise. We would be happy to make any further adjustments if needed.

With best wishes,

David Dorthé

For the co-authors

Editor decision: Publish subject to minor revisions (review by editor)

Your manuscript has been reassessed by two out of the three original reviewers who appreciate the changes you have made to your manuscript. I agree with reviewer 2 that your manuscript will profit from some condensing before publication. Please consider moving some of the materials presented in the results section to a supplementary information document and to refocus the discussion.

Report #1

Accepted as is.

No further comments.

Report #2

Accepted subject to minor revisions.

I commend the authors for piecing together a very impressive study with significant implications for climate change impacts on thermal dynamics in regulated systems. But while I recognise process-based Tw model approaches require higher number figures compared to other empirical study types, I believe that some figures should be moved to supplementary, the manuscript condensed and the discussion slightly refocussed to avoid this seeming like a continuation of results in parts. Please review the attached for further details.