

Dear Editor,

Thank you very much for your message and for handling the review process of our manuscript. We appreciate the time and effort you and the reviewers have invested in evaluating our work. We are also sorry to hear that you were unwell and hope that you are fully recovered. We have carefully addressed the additional minor comments provided by the reviewer and revised the manuscript accordingly. Please find the revised version attached below, as requested. Thank you again for your continued support and for the constructive collaboration throughout the review process.

Reply to reviewers comments

1. General statement

I have reviewed the manuscript entitled "Exploring Controls on Solute Export Mechanisms in Anthropogenically Impacted Catchments in Southern Germany in Climatically Different Periods" by Frietsch et al. for the third time now. The work addresses a timely topic and is conducted and discussed thoroughly. My previous suggestion to tone down the direct causality to climate change has been neatly addressed. The differentiation between periods makes the work more concise. However, it would be good to mention somewhere that the climatic differences between the periods are likely due to climate change and are the result of gradual changes, rather than presenting the two periods as entirely independent of each other. All my other comments have been addressed to my full satisfaction, and I recommend the manuscript for publication, convinced that it will be a valuable addition to HESS. I have only a few very minor corrections and suggestions remaining, which are listed below:

In response to your final comment, we have revised the manuscript to better clarify that the climatic differences between Period 1 and Period 2 likely reflect gradual climate-change-related developments rather than two entirely independent climatic states. This clarification has been implemented in the Introduction section as follows: "This validates the use of both periods for comparing SEM under climatically different conditions, with the gradual changes from period 1 to period 2 as a means to quantify potential climate-induced alterations in SEM (L. 72-73)."

2. L. 189:

*„Further“ at the start of a paragraph reads a little odd. I would simply delete that word and start with
“A slope close to zero ...”*

The word “Further” has been removed, and the sentence now begins with “A slope close to zero ...”.

3. L.294-302:

This is nice but it rather belongs to the discussion.

Thank you for the suggestion. This part has been moved to the Discussion and is now addressed in lines 440–446.

4. L. 344-346

discussion as well.

This part has been removed from the Results section, and the topic is now addressed in the Discussion (L 546–550).

5. L. 386

showing slower decrease CAN BE explain by legacy...

The sentence has been corrected accordingly.

6. L. 387

THE climate of period.

The sentence has been corrected accordingly.

7. L. 389

“remove “.” Behind export

The punctuation mark has been removed accordingly.

8. L. 394

*You might add here Winter et al. (2024) as the authors explicitly compare long-term low-frequency and event-scale high-frequency export patterns.
<https://doi.org/10.1029/2024GL108437>*

Thank you for the suggestion. This reference fits very well within the context of our discussion and has been added accordingly.

9. L. 415

*Maybe cite here Zhi et al. (2021) for their shallow deep hypothesis
<https://pubs.acs.org/doi/10.1021/acs.est.0c01340>.*

This reference also describes the discussed mechanisms very well and has therefore been included accordingly.

10. L. 530

I assume this remains Table 4, not Table 42

The table reference has been corrected to Table 4.

11. L. 567

White space missing behind 2015)

Thank you for pointing this out. The missing whitespace has been corrected.

12. L. 623-624

Unfortunately, climate will very likely not remain as it was during period 2 (although I would wish for that). Hence I would rephrase that sentences towards something like “The change from period 1 to period 2 may serve as a good proxy on how climate change might alter both”

As the observed changes reflect an ongoing development rather than a stable future state, the sentence has been rephrased accordingly to reflect that the change from Period 1 to Period 2 may serve as a proxy for how climate change might alter the pathways. We included the suggestion as following: “The gradual climatic change from period 1 to period 2 may serve as a good proxy for how future climatic changes could increasingly alter both transport pathways, leading to shifts in SEM (L. 582-583)”.