Response to reviews and to the Associate Editor's assessment

Hydrology and Earth System Sciences Manuscript ID hess-2024-67 "Changes in the flowing drainage network and stream chemistry during rainfall events for two pre-Alpine catchments" by Dr. Bujak-Ozga et al.

We appreciate the detailed feedback provided. The comments on the manuscript have been helpful in enhancing its quality. Below, we present a detailed point-by-point response to the review comments, explaining how they were incorporated into the revised manuscript.

Note: Reviewer comments are printed in *italics*. Line numbers in italics in the reviewers' comments refer to the previously submitted version of the manuscript. Line numbers in our responses refer to the revised version of the manuscript without track changes. We also provide a version of the manuscript with all the changes tracked as a separate file.

Reviewer 2 Comments and Responses

Line 684: I am slightly confused about the use of runoff in this sentence, do you mean shallow source?

Thank you for your comment. You are correct that the term "runoff pathways" could be confusing in this context. Our intent was to emphasize shallow flow pathways as the likely source of chloride and potassium, rather than a connectivity to a different groundwater source. To address this, we have revised the text and replaced the original sentence ("This quick response suggests that a contribution from shallow flow pathways is more likely runoff pathways for chloride and potassium than connectivity to a different groundwater source.") with "This quick response suggests that a contribution from shallow flow pathways is a more likely source of chloride and potassium than connectivity to a different groundwater source." (L683-684).

Line 759: Do you mean that event flow is due to the direct contribution of rainfall in the channel, and only at the start of events? Based on the discussion, I thought the rewetting was due to the connection of saturated areas, not limited precipitation directly over the channel. A slight rewording will help here.

We edited the manuscript text to make the mechanisms contributing to event water clearer. Indeed, direct rainfall onto the channel plays an important role only at the very beginning of events. As events progress, other sources (e.g., overland flow from saturated areas or quick interflow through the topsoil) become more important sources of event water.

We have revised the text to address this and clarify the distinction between these mechanisms. Before corrections the text was: "The event water contributions could be explained by rain falling on the channels only at the beginning of rainfall events. During wetter conditions, overland flow from saturated areas (Fig. 6) or quick interflow through the topsoil must have contributed event water to the stream as well.". After corrections it is: "At the beginning of rainfall events, event water contributions could be explained by rain falling onto the channels. However, as the events progress, this is insufficient to account for the observed event water flux. Thus, additional contributions from overland flow from saturated areas (Fig. 6) or quick interflow through the topsoil are also important, particularly under wetter conditions when saturated areas become connected to the stream." (L759-763)

Figure 6: Perhaps it is my screen but the "green" lines in 6e-h appear blue not green.

Thank you for pointing this out. Indeed, it should be blue. We corrected it.

Besides addressing the requested changes, we have also proofread the manuscript again and made two minor corrections: (1) corrected a typo in the equipment name on line 210, (2) updated the reference to the dataset on lines 780 and 849, and (3) corrected a typo in the abstract on line 14.

We think that the careful reading of the reviewer and suggested revisions have further improved the manuscript by avoiding confusing and making our findings clearer and more accessible to readers. Thank you again for your valuable feedback.

Kind regards, Izabela Bujak-Ozga on behalf of all co-authors