

A review of “Effects of climate anomalies on low flows in Switzerland” by Floriancic et al. (2nd round of reviews)

In my opinion, authors have considerably improved the manuscript. New methods and results have been added to support the study results (e.g. the GLM model or assessment of human impacts). The clarity of the text has been improved by several text modifications and by splitting results and discussion sections. Additionally, further information has been added to the text to better explain methods and results. Nevertheless, some of the previous comments were not fully addressed and thus I would like to ask for further clarification. Although, my comments below are relatively large in extent, I think that it should not be time demanding to implement suggested changes.

General comments

I am still not convinced about the fact that authors used only catchments where summer low flows are also annual low flows. This way, they excluded most of high elevation catchments from the analysis. Therefore, it is not much surprising that SWE (or winter precipitation) are not important indicators for summer low flows since snow dominated catchments were (probably) not analysed. Nevertheless, I am accepting authors decision to present the results in this way.

However, the fact that only a subset of 380 study catchments was used for most of the analyses is (in my opinion) not fully clear from the methods and results sections. I think that most of readers might be confused about how exactly you proceeded. For example, in Section 3.1 one would conclude that you analysed all 380 catchments and showed the results in Fig. 1 (a-d). However, this would be not fully true since all catchments are shown only in Fig. 1a and 1b, while Fig. 1c and 1d show only those catchments for which the annual low flow occurred in summer (as I understood from your response). I think that most of readers cannot infer this important limitation from the text, despite the fact that you mentioned that Fig. 1c and 1d show May-November low flows (which is mentioned only in the Figure caption, but not in the main text). For the reader this would not be clear since two possible interpretation exists (at least to me); 1) you considered all catchments, but only warm period low flows, or, 2) you considered only those catchments where annual low flows occurred in the warm period. Without knowing your response, I would (wrongly) assume that (1) is how you proceeded. Similar notice, which might be a bit confusing is given in Fig. 2 caption (“winter low flows were excluded”). A clear statement that two different subsets of catchments were used for presented analyses is also missing in methods. I partly found it in Section 2.3 (L 161-163), but, again, I think that the formulation here is not fully clear and do not explicitly mention that this procedure caused exclusion of several snow dominated catchments from analysis.

A clear statement, how you proceeded is given only in discussion Section 4.2 (L 401-406). I would recommend to provide the reader with a clear information already in methods (and results) about the catchment reduction since it widely affects your interpretation and conclusions regarding the role of SWE and winter precipitation. Also maybe add the information how many catchments were excluded in the end. Besides, consider to reformulate the abstract as well which (wrongly) implies that your results regarding winter precipitation and SWE can be related to all selected 380 catchments across Switzerland.

Additional to the above, I think that some interpretation regarding the role of snow or winter precipitation is oversimplified. The reaction of individual catchments to climatic anomalies and thus low flows is also a matter of catchment storage, which is usually longer than one season. Therefore,

the winter conditions most likely influence the summer streamflow (and low flows), although the importance of such influence may be minor (as shown by your results for lower elevation catchments) and it certainly differs from catchment to catchment. I am aware that this goes much beyond the scope of the paper, but I would suggest reflecting the issue of catchment storage in discussion (beyond the sentence on L 370-371).

Specific comments and technical corrections

Authors did not consider a comment to describe (in methods section) the procedure how they analysed the role of winter precipitation (although they declared in the response that they added the description to methods section). Similarly, the newly used predictor (SWE) is not mentioned in methods (there is only the information about source of SWE data).

Regarding the comment of the Reviewer 3 on L237 (original manuscript). All specific terminology (“below-threshold” and “above-threshold” in this case), should be defined at the place, where it is firstly used. This is not the case in the revised version. Additionally, the explanation needs to be in the main text, not only in the Figure caption.

L 169: Perhaps, you wanted to rename Section 3 to “3. Results” since the discussion is newly included as Section 4.

Please use term “elevation” instead of “altitude” consistently in the paper.

Technical note: For the future, it would be great if you would be more specific in the response, specifically, to indicate where one could find the changes you made (e.g. by referring to line numbers in the response). Additionally, to submit a “tracked changes” version of the revised manuscript (as requested by HESS and which was missing here) really helps the reviewers with orientation.