

Hydrol. Earth Syst. Sci. Discuss., referee comment RC4
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Comment on hess-2021-44

Anonymous Referee #2

Referee comment on "Hydrological response to warm and dry weather: do glaciers compensate?" by Marit Van Tiel et al., Hydrol. Earth Syst. Sci. Discuss.,
<https://doi.org/10.5194/hess-2021-44-RC4>, 2021

Review of "Hydrological response to warm and dry weather: do glaciers compensate?" submitted by Marit van Tiel, Anne F. Van Loon, Jan Seibert, and Kerstin Stahl to Hydrology and Earth System Sciences (HESS)

I found this study interesting and well-written. The findings are novel and the methodology is clear. My one concern is with the portion of the study dealing with glacier mass balance – which has already been brought up by in the review by Mauro Fischer, see my further general comment on this topic below.

The detailed review by Mauro Fischer caught most of the minor and technical comments that I would have included in my review. To save the authors time in responding to duplicate comments, I will not repeat them here. The few comments below are those I have tried to prune for overlap with Mauro's review. I enjoyed reading this study and, in my opinion, it is worthy of publication in HESS with some minor revision.

General Comments

Like the other reviewer, I have concerns about using the median of measured mass balance data. Using the area-weighted average, as has already been suggested, is a better option and has already been demonstrated in the response from the authors. I recognize the data limitations the authors are contending with, and I wonder if the mass

balance analysis could just be removed from the study. I understand why the authors would like to include this type of analysis, but, in my opinion, it is a very minor part of the study and novelty and importance of the manuscript would not be hindered by removing this small piece. It would be a great avenue for future research. I will leave it up to the authors to decide whether a revised version of the mass balance analysis with the area-weighted averages should or should not be included in the revised manuscript.

Specific Comments

Discussion:

Two sections in the discussion seem to overlap: '5.3 Drivers of Event-to-event variability in compensation levels', and '5.5 Temporal variability in event responses'. Both sections are discussing results presented section 4.4 (drivers of event-to-event variability). From the headings, it is not clear to me what the difference is between the two sections. I suggest combining the two sections into one.

There are several places in the discussion where I found myself wanting a reference back to the relevant results. Below I've listed two locations. In my opinoin, cohesion through the manuscript would be improved by adding a few figure, table, or section references to the discussion.

Line 381 – refer to the results supporting this stated finding.

Line 438-439 – refer to the results supporting the stated finding

Other minor comments:

Figure 1 and Figure S1: Are there just two line thicknesses used in these figures? What gc values do these thicknesses correspond to? What is the break value?

Figure 2 – Add a legend to clarify the relation between color and region.

Figure 8 – What are the glacier cover classes? Perhaps just list them in the caption.

Table 3 – Heading should be 'Average duration of events [d]'?

Line 270: Missing comma in sentence starting with 'All variables,'

Line 393: 'and follow up studies Moyer et al. (2016)).' Seems like part of this sentence is missing