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Hydrology and Earth System Sciences Discussions

Interactive comment on "The relevance of glacier melt in the water cycle of the Alps: an example from Austria" *by* G. R. Koboltschnig and W. Schöner

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The paper proposes to give an overview of " available methods how the contribution of glacier melt to runoff can be calculated with and without glacio-hydrological models." In addition, it proposes a simple method to assess the relative importance of glacier melt contribution to total runoff for the extreme year 2003 in the Austrian Alps. The method relates anomalies of mean runoff during August to the glacierization of the studied catchment.

The underlying question is very important for water managers: how much does net glacier ice melt contribute to total annual runoff? the answer to this question is relevant

to assess the climate sensitivity of high Alpine catchments and could namely give some hints about how much the total annual runoff would decrease if all glaciers were gone.

As the provided literature review illustrates, existing studies do not give a lot of insight into this question, namely because most studies only report estimated modifications of the total runoff and do not provide details about runoff from ice melt for different climates (past, present, future).

I have the impression that the proposed analysis of monthly runoff anomalies for August 2003 cannot provide much more insight. Obviously, the anomalies scale somehow with relative glacier surface. But the results section is so short that the reader is left with more questions than answers. What can be learnt from the found relationships? from the spread? Can the found results be used to make statements for ungauged catchments? Do we learn something about the importance of net glacier melt for the investigated catchments? about their climate sensitivity?

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