

Review of 21st century global glacier evolution under CMIP6 scenarios and the role of glacier-specific observations by Zekollari et al

General comments

This is an interesting and well-designed paper by Zekollari et al, which provides a comparison of global glacier volume change under CMIP6. Additionally, the paper investigates the use of glacier-specific calibration techniques. Overall, the paper well written with the results thoroughly discussed. I have no major comments, but think the clarity of the text could be improved in certain places and have listed some minor comments below (including some adjustments to figures).

Specific and technical comments

L90 – I find the description of this methodology a bit confusing, please consider rephrasing

L136 – Please state the year which the ice thickness dataset represents

L168 – Please specify when the past climate starts (e.g. XXXX until 2020)

L171 – Please specify when the future climate ends

L180 – What is the debiasing procedure?

L192 – I think 'Alternatively' should be changed to 'Additionally'

L227 – The sentence beginning 'In general, if...' is phrased in a slightly confusing way and could be reworked for better clarity – maybe something like 'In general, the mass balance calibration parameters are calibrated to give a more negative SMB for glaciers which have a lower mass balance than the regional average. This translates...'

L284 – I would change the sentence 'For most other regions, these differences are even more outspoken..'. I do not think outspoken is a good choice of word, and this sentence is a bit dense and confusing to read. Could be changed to something like 'For most other regions, there is an even larger proportion of glaciers which show differences of more

than 10% in their 2015-2050 volume projections. For instance, in High mountain Asia...'

L288 – This could also be rephrased/ broken up into two sentences. Else, add '..independent of calibration methodology' or similar.

L299 – I do not understand what you mean by 'since discharge is calculated over initial glacier area'

Fig.2 – Please make the text in the 2015-2100 volume change boxes larger

Fig. 3 – Please also make the text large in this figure (for the calibrated values)

Figs 2 and 3: It could be beneficial to move some of the panels to the supplementary material, so that the remaining panels can be more easily seen – as of now, they are quite busy.

Fig.7 – If possible, please extend the width so that it takes up the full page width/ has the same dimensions as Fig.6

L424 – The explanation of why the inclusion of frontal ablation in GloGEM leads to less global volume loss does makes sense, but I had to read it a few times to understand. It would be good to add in a bit more detail here to make it extra clear.

L468 – Formatting error (sentence beginning with 'Table1Figure7A')

Fig. 9 – It would be nice to move the GloGEM panel next to the panel which compares CMIP5 GloGEM to CMIP model ensemble, for ease of comparing the GloGEM results with each other. Also include a 'CMIP6' label under the GloGEM results like in the other panels. It could additionally be beneficial to add results showing the mean of the CMIP6 forced GloGEM/OGGM/PyGEM simulations, to be compared to the CMIP5 ensemble mean. In this case, you could move the CMIP5 GloGEM results to the GloGEM panel and then have an 'ensemble mean/ CMIP5 vs CMIP6' panel.

L519 – Here you compare CMIP5 ensemble to your new CMIP6 results, which I think would be strengthened through the above changes to Fig. 9.

I understand the caveats to direct comparison that you explain in the text, but still think this would be a useful visual aid.

L600 – This is a very long sentence that could benefit from being broken up into a few parts

Fig. S3 – Make this figure take up the full page width; the panels are too small at the moment