Review of "Hydrological response of Andean catchments to recent glacier mass loss"
by Caro et al.

This study investigates the changes in glacier mass, area, and runoff for different glaciated catchments in the Southern Andes from 2000-2019. The study uses the Open Global Glacier Model, calibrated with geodetic mass balance data from 2000-2019, and forced by a bias-corrected climate dataset. The focus of the study is on all land-terminating glaciers (i.e., lake- and marine-terminating glaciers are excluded) and specific attention is given to how the changes in climate over 2000-2009 vs. 2010-2019 affect the glacier runoff across the different catchments, which notably span different climatologies. The main conclusions are that most glaciers are losing mass leading to increases in runoff in the Tropical Andes and Dry Andes. Furthermore, results are consistent with previous studies and the glacier contribution to runoff is highest for some catchments in the summer and others in the transition season prior to summer.

This is the second time I'm reviewing this article and I'm pleased to say the manuscript is greatly improved! Excellent job. The methods are now incredibly detailed and thus easy to understand what was done and what the advances are. Specifically, the major advance/novelty is the use of a bias-corrected climate dataset and the in-situ glaciological observations. Hence, even though the study primarily confirms existing knowledge (although they do not some key differences and do a nice job framing results with respect to previous studies in the discussion), it is a valuable contribution to the literature.

My comments are primarily related to improving readability as several areas were a bit unclear; however, rephrasing these or being more explicit will resolve these issues easily. Similarly, several areas felt quite repetitive, so sentences/sections could be removed, which would also reduce the length of now a fairly long study. I thus would suggest accepting subject to minor revisions. General and specific comments are described below.

General Comments
Abstract is very detailed. Suggest shortening and highlighting only the key research findings.

Methods are now very detailed. Thanks for this.

Section 4.3 states there is a similar regional pattern; however, this is largely due to overparameterization issues with the model and the assumption of having different temperatures of melt onset for the different regions (L263-264). The authors should mention this overparameterization issue and avoid overinterpreting their "regional patterns". That said, this is well discussed in Section 4.4. I would recommend removing Section 4.3.

Specific Comments
L23 – "emphasize on" consider new word choice.

L24 – repetitive of L20.

L25-27 – likely too detailed for abstract, which is already quite long.

L32-33 – unclear what these values refer to as there are two variables and two periods, so would expect 4 numbers. Please clarify.

L53-57 – need to provide context of the time period these results are being discussed in. I assume it's end of century.

L57-58 – "… overlook the diverse climates and morphologies of Andean glaciers" is very vague. Climate data was used, which should account for some diversity of climate. Unclear if morphologies is referring to glacier types (e.g., land-terminating, marine-terminating) or something different. Please be specific to help with readability.

L84 – suggest removing the word "precisely" as this is a bit misleading for global modeled products. The sentence appears to be describing that the model can be applied at the glacier scale as opposed to how accurate it can predict changes.

L96-97 – "Whereas…" is not a complete sentence.

L107 – suggest just referencing Figure 1 in parentheses after the previous sentence and deleting this sentence.

L145 – suggest removing results from the methods section.

L240 – "In a second time," I assume this refers to post-processing? Perhaps "After simulations were completed, …" or this could be deleted.

L277-282 – this feels very repetitive of earlier in the methods. Given the length of the methods now, I would recommend deleting this.

Table2 and throughout, I highly encourage zones to just be listed as "Dry Andes 1", "Dry Andes 2", etc. to improve readability. When reading comparisons of DA1 and WA2 (e.g., L297) it becomes very hard to follow.

L323-331 – The first sentence is incredibly hard to follow. Please rephrase. I think what is being stated is simply that only 36% of the total glacierized area of the Andes was simulated. This whole paragraph could likely be one sentence and likely belongs in the methods.

L32-333 – same issue as with abstract. Two time periods and two variables are being reported, yet only two values are shared. Please clarify.

Figure 2 – "SMB" is currently being used for "simulated mass balance". It is clear that this is a modeled product, so including "simulated" is unnecessary. I recommend removing this S. This also will avoid confusion with the common acronym SMB for surface mass balance. I'll note that this also is inconsistent with Figure 5 which uses SMB for "specific" mass balance.

L369 – be explicit what the model limitations are. Is sublimation, which is described as a limitation for the Dry Andes, also a problem for the Tropical Andes?

Figure 5 – specify if the mass balance is cumulative or not. It appears that it is cumulative.

L666 – the conclusion mentions the "accuracy" that has been improved, but it's unclear what this "enhanced accuracy" is being compared to. Later in this bullet it mentions compared to global values, but I did not see any estimates of what the error was for global models; hence, how can one state that these are more accurate when it's unknown how accurate the other models are?

References – check that all studies included in the text are included in the references. Rounce et al. (2020) is cited but not in the references.