Reviewer #1:

In the submitted manuscript, the authors seek to understand how glacier changes in the Tibetan Plateau may have affected precipitation amounts. WRF simulations at a 4km resolution are used, nested within a 12km outer domain which extends well beyond the Tibetan Plateau. Glacier inventories using data collected from the 1960's to the 1980's are compared with a glacier inventory derived from data collected between 2004-2011 as a proxy for glacier change. The authors then compare precipitation amounts under a warm year or a cold year for the two glacier scenarios. The study promises an interesting compliment to existing studies of glacier-precipitation feedback over the Tibetan plateau, considering marginal changes to glacier extent instead of absolute retreat, as studied by Ren et al., 2020 and Lin et al., 2021.

Reply: Thank you very much for reviewing our paper and providing insightful comments. Your feedback is both valuable and helpful. We have carefully addressed these comments in our revisions.

When analyzing precipitation, the authors report relative difference in precipitation between the two glacier scenarios. This exaggerates the effect of changing the glacial land surface data, where relative differences for areas receiving little precipitation are sensitive to small changes in absolute precipitation amount. The maps of summer extreme precipitation suffer from the same problem of reporting relative differences though, making it difficult to tell how much changes to glacier extents have impacted precipitation amounts. The authors indeed note that "the relative differences in mean daily precipitation between the two glacier conditions are not statistically significant ($p<0.1$) for almost all grids". Section 4.3 is then devoted to explaining these differences. This contradicts the previous finding of the daily-mean (or seasonal total) differences not being significant, and the proposed mechanism of WVF is not supported by the plots shown. Furthermore, the authors focus on areas along the crest of the range, while their methodology only altered glacier extents for Chinese glaciers. This methodological quirk rules out the mechanism proposed by Lin et al., 2021 and Ren et al., 2020, which involved the northerly katabatic flows from glaciers to the south of the crest. Because these glaciers remain unchanged in the study, the mechanism proposed by these two earlier studies cannot be responsible for changes to precipitation. The authors still falsely conclude that their results support the findings of these two prior studies. The manuscript thus shows that changing the land surface type for some cells in the domain results in slight changes to precipitation due to a mechanism which has not been rigorously demonstrated.

Reply: Considering there are great seasonal and regional variations of precipitation over the Tibetan Plateau, we used the relative difference of precipitation between the two glacier conditions to facilitate comparisons for differences across regions and seasons. Having said these, we do agree with you that absolute values are useful too. Thus, we will add the results of absolute changes in precipitation induced by glacier changes in the revised manuscript.

The works of Lin et al. (2021) and Ren et al. (2020) have a totally different design with

regard to model resolution and domain. The aim is also different. Thus, their results are not directly comparable with this study and we realize now that our previous discussions were not entirely appropriate. As a result, we will not directly compare the results of this study with theirs in the revision. Your comments are much appreciated.

For these reasons I recommend rejection of the manuscript in its current form. I believe that the study does robustly show that recent glacial retreat/advance in the Tibetan Plateau has resulted in local changes to the surface energy balance. These local changes may cause localized changes to convection. In a follow up, the authors could focus on demonstrating the mechanisms through which glacial retreat and advance affects convective storms, and quantify this effect. For example, section 4.2.3 references non-local changes to precipitation fields as a result of local changes to glacier extent and thus the surface energy balance. Illustrating particular convective cells and extreme precipitation events which occur as a result of recently retreated glaciers would be interesting to see. The dependency on grid resolution, as it impacts convective processes and the representation of glacier retreat, could thus also be investigated. This, in combination with a clearer reporting of changes to precipitation amounts, would improve the manuscript.

Reply: We see your point. By following your suggestions above, we are confident to deliver an improved manuscript. However, we don't think it is a good strategy to focus on particular convective cells and extreme precipitation events that occur as a result of recently retreated glaciers as these most likely contain a large amount of noise. By looking at mean conditions over a relatively long period (one season), instead of individual extreme events (a few days), we hope to be able to identify robust signals of changes induced by the changed glaciers. Besides, your suggestion to focus on particular convective cells and extreme precipitation events, as well as the sensitivity of the model simulation to model resolution deviate from our aims, although these are interesting topics. Implementing these ideas would require another study.