

Interactive comment on “Brief communication: 4 Mm³ collapse of a cirque glacier in the Central Andes of Argentina” by Daniel Falaschi et al.

Anonymous Referee #3

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1. Summary

Falaschi and coauthors describe an apparent sudden collapse of a small cirque glacier in the central Andes, Argentina. They describe this event largely through the use of remote sensing and limited field surveys. Although largely documentary in nature, this brief report provides additional evidence for sudden failure of alpine glaciers – these events present an unusual type of mountain hazard that may occur with greater frequency in the years ahead. Overall, I found the evidence for the failure convincing, and the manuscript’s organization made their arguments mostly easy to follow. The paper will require moderate revisions to bring it up to the level required for publication in The Cryosphere, however. Below, I outline major points I have with the manuscript. I also include a marked up copy of the manuscript to help the coauthors revise their

C1

paper.

2. Major Points

A) Remove or substantially trim speculative material - This manuscript represents a short note (Brief Communications) in The Cryosphere, and simply providing sound documentation for the event is sufficient for publication (largely because of the hazard implications associated with these events). In many places, however, the authors tend to go a bit too far in the interpretation of their data that leads to too much speculation (mostly about whether event was enhanced by fine-grained bed or whether events happened before). The authors point out, for example, that they have limited field observations, but then they go on to make claims that really require additional field observations or require modeling data that they currently do not have in hand (or report in the paper). I think a proper documentation of the event is enough. Simply state factors that caused the event to happen are currently uncertain. The logic of several statements are flawed at least in the way they are written. (e.g. towards the end of the paper ‘...no strong evidence, but can’t rule out past events...’)

B) Stick to the event described in the methods/study area – In the discussion section the authors (line 240+) describe methods used to study another glacier collapse, but this site really wasn’t described except primarily in the introduction of the paper. A reader can’t really evaluate the evidence for that event as it now stands since it’s only briefly described in the introduction of the paper. I would recommend the paper be revised to either describe both events or simply to refer to the other one in passing (in the present version of the paper the authors start to tell us about their DEM differencing and uncertainties in the discussion section of the paper).

C) Check co-registration/uncertainty analysis – The authors co-registered their DEMs prior to differencing, but I would request that they check the quality of that co-registration (see artifacts near top of cirque in Figure 2a). It may simply be as good as they can get, but some explanation for this offset over steep terrain would be useful.

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D) English needs to be improved –The paper includes many statements that are unclear or overly vague. I would suggest that the second and third authors spend some time with the text to improve the English. There are also many topographical errors in the manuscript. These errors really should have been cleaned up prior to submission.

3. Figures and Tables

Figure 1. Latitude/longitude (even two) needed so one can locate this glacier. Also, please state which bands (spectral range) were used for the color composite.

Figures 2 and 3. I found the order of these figures to be reversed. I would first report on Figure 2 as this shows when the event happened. Figure 3 really is a derivative product of stereo imagery, so DEM make more sense to show after you introduce Figure 2.

4. References

I did not check the references for consistency, but this should be done on the revised paper.

5. Title – It's always awkward to start a title (or sentence) with a number. Why not just, 'Sudden collapse of

Interactive comment on The Cryosphere Discuss., <https://doi.org/10.5194/tc-2018-201>, 2018.