

Interactive comment on “Tracing glacial disintegration from the LIA to the present using a LIDAR-based hi-res glacier inventory” by A. Fischer et al.

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Fischer et al (2014) provide an excellent synopsis of glacier change from the LIA to the 2006 using previous inventories and LIDAR. The goal of the paper is a robust inventory of glacier changes across Austria, not a robust treatment of the causes of this change, or of the specific geographic characteristics of the glaciers, which is appropriate. The paper is a valuable contribution demonstrating the value of LIDAR for assessment of area change for smaller alpine glaciers. In particular in the discussion or conclusion the authors should add a comment on the advantages LIDAR provided versus typical orthophotos or satellite imagery.

C2291

Title: Austria should appear in the title.

5204-11: This paragraph does a poor job of relating the key temporal results for all of Austria. Proceed in a logical progression from LIA are to GI than GII and finally GIII. How many glaciers were lost between LIA and GI? For example see below:

The total glacier LIA area was 941.13 km² without disappeared glaciers, which is a bit lower than the 945.50km² found by Groß (1987). By GI the area had declined 40% to an area of 564.88 km². There was a further loss of 94.21 km² in the 29 years between GI and GII. In GI III, glaciers cover 415.11 km², equivalent to 44% of the glacier area at the LIA. Only four glaciers wasted down completely since. The loss of area between GI II and GI III is 55.97 km², which is the highest annual area loss, at: 0.23 km² year⁻¹. Losses between LIA and GI I averaged–0.16 km² year⁻¹ and exceeded the ones between GI I and GI II of 0.13 km² year⁻¹. There was a period when the majority of glaciers advanced between LIA and GI and GI and GII. The relative annual area loss was only 0.02% until GI II, rising to 0.05%/year⁻¹ for the latest period.

5205-4: In Figure 3 and Table 3 it is evident that the change for Lechtaler is the lowest from GI to GII and from GII to GIII it is Silverettagruppe and Rakiton. Is there something about the elevation range or other characteristic of the glaciers in these areas that led so the most limited changes?

5205-19: Can the shift in the area elevation curve in Figure 4 be used as an approximate indicator of ELA change? Since mass balance programs have been reporting the ELA this can be easily tested too. If not that is good to know as well.

5206-27: It is worth emphasizing the difference statistically in the deviation of summer temperature versus sunshine and precipitation, which indicates that summer temperature has been the principal driver or area lost at least from GII to GIII.

5208-16 to 28: Why is this not in section 3.3?

5208-13: Reference needed.

C2292

5210-5: "Salzburger Kalkalpen, the plateau glacier seems likely to vanish. " Is this a specific glacier, and is this because the annual ELA has risen above the plateau glacier?

Figure 5: Axis font labels too small.

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