

Comments to egusphere-2026-1241

General comments

The study by Hartl et al. is presenting the results of a new glacier inventory for Austria that has been derived by manual digitisation of orthorectified aerial photography and DEMs along with a detailed comparison to an earlier inventory for glacier-specific assessment of area changes. As the effort required to digitize glacier outlines strongly increases towards higher resolution images, the effort of the authors to create this new dataset must have been tremendous. I also acknowledge the detailed information compiled for each glacier in the attribute table. As numerous outline overlays have been provided in the paper and the suppl. material, I do not comment on the outlines itself. I have only two larger comments related to the contents and numerous small suggestions for improving the tables and figures (see specific comments). The two larger comments are detailed below. Otherwise, great work, thank you for taking the creation of glacier inventories and the related documentation to this level!

I appreciate the detailed discussion and visualization of digitizing variability by different analysts (interpretation uncertainty), yet what is missing is the digitizing uncertainty. This can be determined when the same analyst is digitizing the same glacier independently a few times. Usually this uncertainty is smaller than the interpretation uncertainty, but I think for completely manually digitized outlines it would nevertheless be insightful. I do not know if time is available, but maybe just a few of the colleagues who participated in the digitizing can do it 3 to 5 times for the six glaciers? Contrasting the resulting digitizing uncertainty (e.g. the standard deviation of the obtained areas by one analyst) with the interpretation uncertainty (from different analysts) by the values and outline overlays will likely help in interpreting the deviations across analysts.

Whereas the issues with debris and snow cover for AGI 5 are discussed in detail, I miss a note on the impact of wrongly mapped snow in AGI 3 on area change rates. As far as I remember, the images used for it were not always optimal and due to the required consistency with previous inventories seasonal and perennial snow fields might have been included (possibly resulting in the strong area changes between 2009 and 2010 visible in Fig. 2d). As the area change rates listed in Table 4 are very high, snow fields in AGI 3 that all disappeared in 2022/23 might have an impact. As I do not know how the AGI 3 orthophotos look like, I might be wrong, but please check if this could be an explanation for the high loss rates and include a related comment in the discussion.

Specific comments

Comments to figures and tables

What is currently missing, but in my view also very interesting, are scatter plots showing:

- Mean aspect vs. median elevation (e.g. using differently sized and coloured circles for the size class)
- A map showing glaciers >0.1 or 0.5 km^2 as filled circles that are colour-coded by median elevation (with the precipitation colour table)
- A rose diagram showing area change rates vs. aspect sector

Table 2:

I think this is important information, but it does not much contribute to the science. I would move the table into the supplement.

Figure. 2:

All panels: Please use more different colours for the outlines of AGI 3 and 5. At this scale the dotted lines are hard to distinguish from the solid ones.

For panels e) to h), please use thicker lines, they are barely visible.

Panel a): Instead of using AGI 3 and AGI 5 please write to which year the outlines refer to. I assume for individual glaciers this is possible. Should the lines in the lower four panels (Schalf Ferner) have different years than the upper four, please repeat the legend on panel e), maybe in the lower left.

Legend: As the two EPSGs are difficult to translate, please add for both glaciers' approximate longitude/latitude coordinates.

Table 3:

Also very important, but maybe not for the science part. I suggest moving this table also to the supplemental material.

Figure 3: The legend for the outlines is missing. Regarding panel d, I think including the elongated ski run is a bit of a far stretch. When zooming in, it looks as if it is not connected to the glacier. But even if it is, I think it can be safely cut away as there is no active ice included here.

Figure 4:

Panels a/b: Please think about the colours used for the two pie charts. They jump around but are still difficult to separate (e.g. the light blue and green). Please also consider colour-blind people (no red and green in the same chart).

Panel c: Please use numbers instead of exponents for the km^2 scale (e.g. 1 instead of 10^0 or 10 instead of 10^1). I also suggest reducing the size of the filled circles a bit to better see the lines. Please also move the x-axis annotation to the bottom of the plot and show minor tick marks on both sides (please add 100 m tick marks on the y-axis). For the colours of the largest glaciers, I would use more saturated colours that change gradually rather than random.

Figure 5

Panels a: Please add minor tick marks to the x-axis and stretch it a bit in the x-direction.

Panel b: I find it rather difficult to obtain the area change value from the colour table. I suggest using discrete values and maybe a dichromatic or spectral/rainbow colour table that is suitable for colourblind view.

Figure 6

Panel c: I suggest changing the 0.01 to 0.1 size class to two size classes 0.01 to 0.05 and 0.05 to 0.1 km^2 . Please also provide the values (of the area change rates) in the plot or a separate table. Try to avoid on overlap with the bars for the vanished glaciers.

Panel d: As for Fig. 4c, please use normal numbers instead of the exponential form for the area in km^2 . As the distribution against median elevation is already shown in Fig. 4c and I think there is not much to learn from it (there is no dependence with glacier size), I suggest using a more interesting parameter for the y-axis, for example elevation range. Moreover, it is quite difficult to derive area change values from the monochromatic colour table. Hence, I suggest using here relative area change for the y-axis (size for the x-axis) and elevation range for the y-axis of Fig. 4c.

Fig. 7

The light blue circles are hard to see against the grey background of the hillshade. You might either use a much brighter (white/yellow) or darker colour.

Fig. 8

Panel a: Please add minor tick marks on both axes.

Table 5

I suggest adding a further decimal to the area change rates in %.

Figure 9

As we read from left to right, I would arrange 0, 1, 2, etc. in the first row and 8 to 14 in the second row. If individual analysts should be identifiable in the plot, I would not only use coloured circles but also other symbols in the plot. The x-axis legend is missing below all plots (what is shown, what is the unit)? As all glaciers have different sizes, wouldn't it be better to show relative differences?

Supplemental Material

I suggest showing Figures S1 to S7 at full page width. I suggest adding a column to Table S1 showing the size of the glacier. Please make Fig. S11 readable for (red-green) colour-blind people.