

## ***Interactive comment on “Historical glacier outlines from digitized topographic maps of the Swiss Alps” by Daphné Freudiger et al.***

### **Anonymous Referee #2**

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General comments: I found this to be a highly interesting methodological paper at the top of its field, developing new methodologies for analysing longer-term glacier change. Although methods for analysing glacier change from satellite images are well established, there are few published protocols for digitising topographic maps. However, these topographic maps offer the opportunity to extend the glaciological record far beyond the satellite era. Methodological papers such as this are therefore highly welcome. This paper is well written and clear.

The evaluation and validation of the digitization of the topographic maps is especially nice work. There is little analysis of the glacier recession trends and dynamic; I assume therefore that this is coming in a companion paper. If this is not the case, then the paper should include further analyses of the trends in glacier changes and hydrological

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modelling.

Specific comments:

I have few comments regarding the paper. In places the phrasing is slightly awkward or unclear and could be tightened.

In section 3, it was unclear to me whether the glacier outlines were mapped in this paper, or whether glacier outlines were mapped by previous authors and imported into this work. If they authors did not map the glacier outlines from A1850, A1973 and A2010, how comparable are they as surely different methods were used? If the authors mapped the glacier outlines themselves, then further detailed description and evaluation of this is required; comparing glacier outlines derived from multiple different methods and by different researchers should be discussed.

For the map survey sheets, when did the surveying take place? Did it use orthorectified aerial photographs and when were these taken? How different is this to the date of map publication? The delimitation of the glaciers into different catchments – why not use the same ice divides and catchments as the previously published GLIMS glaciers?

Technical comments:

Page 1

Line 17: “inaccuracy”?

Line 28: “majority were only recently. . .”

Page 2

Line 2: “Little Ice Age represents the largest. . .”

Awkward phrasing in this paragraph, unclear.

Line 10: Do these maps have a reference and publication information?

Line 13: “(2879 m asl)”

Page 8 – I would question whether the ages and genders of the students is necessary information. Are they undergraduate students? Or graduate students? This may be pertinent. How were they selected? Was this part of an undergraduate research project? How reliable and robust are their results? Their degree of training has implications for their skill level in interpreting the topographic maps and mapping the glaciers.

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