

Interactive comment on “An upper-bound estimate for the accuracy of volume-area scaling” by D. Farinotti and M. Huss

Anonymous Referee #1

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General comments

In this paper, large sets of synthetic and real glacier volume and area information are used to assess the accuracy of volume-area scaling. Although alternatives have recently become available, this scaling relationship is still widely used, especially in studies that involve large numbers of glaciers. The experiments in the paper are designed such that they resemble several real-world applications of volume-area scaling. As such, the results provide a welcome background and reference for those applying volume-area scaling. The manuscript is very well written, the experiments and their connection to commonly used methods are clearly described. I only have a few comments, mainly concerning typographic corrections.

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Detailed comments

Title: I am a bit confused by the use of the term ‘upper-bound’. I associate this term by something like ‘the maximum value’. The paper however presents results from idealised experiments, stating that the uncertainty for real applications will be larger. The values presented are therefore minimum values and the term ‘upper-bound’ seems misplaced. But perhaps there is a strange twist in my mind? At least the authors could consider whether rewording might avoid confusion.

2295,14: ‘to the lack of necessary’

2295,19: ‘deserves’

2302,9: ‘glaciers’

2302,15: Compared to other parts of the manuscript, there is a ‘-’ missing between volume and area, perhaps check the document for more inconsistencies.

2304,19: ‘these criteria’

2304,27: ‘consists of’

2305,7-8: The two randomly selected glaciers both show a considerable volume reduction from their initial state to the equilibrium state. Do all glaciers loose this much volume or is this a coincidence? If this is a general feature, the mass balance gradient and ELA/AAR are ill-defined.

2306,7-9: Perhaps the authors can state explicitly that $n_{M',t1}$ and $n_{M',t2}$ are not equal.

2306,18: The reference to (2.3) slightly confused me, I first thought that it referred to Section 2.3. To avoid confusion, the experiments could be indicated with letters instead of numbers, e.g. A.1, etc.

TCD

7, C1236–C1238, 2013

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2309,6: 'a few dozen' (also at other points in the text) 2311,26: 'in the transient'

2314,2: remove 'results of the'

2315,7: swap 'additional' and '271'

2315,10-13: But should not the values obtained from transient geometries be used for transient applications, the other values may not be representative...

2315,17: 'decreases'

2317,6: 'available for'

Interactive comment on The Cryosphere Discuss., 7, 2293, 2013.

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