

Interactive comment on “Estimating the volume of Alpine glacial lakes” by S. J. Cook and D. J. Quincey

Anonymous Referee #1

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1. Does the paper address relevant scientific questions within the scope of ESurf? Yes, it examines the empirical relationship so far obtained for estimating glacial lakes depth (D) and volume (V). Estimating the V of lake is very important aspect for further accessing GLOF risk and vulnerability. 2. Does the paper present novel concepts, ideas, tools, or data? Yes. It attempts to examine the relationship D and V using additional data secondary data. 3. Are substantial conclusions reached? Yes. It fulfills the objective of the paper. 4. Are the scientific methods and assumptions valid and clearly outlined? Yes. 5. Are the results sufficient to support the interpretations and conclusions? Yes. But some of the interpretations need more clarification. The statement on section 4.3 Relationship by region, page 922, line 28: this statement is derived without accessing regional level relationship. In the context of consistent underestimation by 16 to 80 percent of actual volume for large Himalayan glacial lakes using empirical
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cal relationship developed by Huggel et al 2002 (Huggel cited in Huggel et al 2004, Can.Geotec., 41 (1068-1083)) indicates that such relationship by region could perform better relationship. In the paper there is no indication of such assessment by region with sufficient analysis. Page 916, line 7: How the outliers are identified and treated needs to be mentioned. 6. Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)? Yes 7. Do the authors give proper credit to related work and clearly indicate their own new/original contribution? Yes 8. Does the title clearly reflect the contents of the paper? Yes 9. Does the abstract provide a concise and complete summary? Yes 10. Is the overall presentation well structured and clear? Yes 11. Is the language fluent and precise? Yes 12. Are mathematical formulae, symbols, abbreviations, and units correctly defined and used? Yes 13. Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? In figure 3, caption letter and figure letter needs to be consistent. 14. Are the number and quality of references appropriate? Some references cited in the text are missing in the list of reference, for example Richardson and Reynolds 2000 in page 911 line number 9. Need to recheck whether all the references cited in the text are listed in the reference list and cited properly such as ICIMOD 2011 instead of Mool et al. 15. Is the amount and quality of supplementary material appropriate? In the supplementary table S1 and S2, one column is needed showing types of glacial lake in consistent with figure 3 and figure 4.

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