

Interactive comment on “Soil erosion in an avalanche release site (Valle d’Aosta: Italy): towards a winter factor for RUSLE in the Alps” by S. Stanchi et al.

Anonymous Referee #2

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General comments

The presented paper quantifies winter erosion by comparing ^{137}Cs measurements and estimates with RUSLE. It thereby (1) attaches importance to winter erosion in general and (2) proposes the use of a correction factor in RUSLE to account for winter erosion. Although the study is based on a relatively low sample size, the used methods, drawn conclusions and presented data should be seen as an important step forward in appropriate consideration of winter erosion in soil erosion calculations. The article includes relevant literature and discusses the limitations of the used materials and methods as well as presented results in a satisfying way. However, modifications in

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presentation of results and delineated conclusions as well as strong discussion of used materials and methods will be necessary to meet the high standards of NHESS. Finally, the paper addresses a very relevant scientific question and uses (partly) relatively simple methods (simple soil loss estimates with RUSLE) to point out the importance of winter erosion. This is a promising concept as it addresses a key point in natural hazard research: how to obtain reliable and generalizable results using simply available data. I recommend the manuscript for publication after moderate revision. My main concerns are: very clear presentation of results and the link to the drawn conclusions; inclusion of more external literature in the ‘Introduction’ section (many citations from authors or co-authors) to better underpin the scientific relevance and gap of knowledge in soil science; further comments please refer to ‘Specific comments’ section.

Specific comments

Abstract:

- please revise / ‘adapt’ the abstract after modifications of the manuscript (suggestions below)

Introduction:

- please include more external literature (other mountainous regions, no authors of this study included)

- present briefly other ‘commonly applied’ methodologies to assess soil erosion in slopy terrain and state pros and cons of each method and reasons for your decision to use RUSLE (or at least comment on this in Results and Discussion)

Materials and Methods:

- p1412, section 2.4 (line 18): the used RUSLE does not account for melting water (as it seems to me from your description); following the USLE procedure snow melt can be taken into account – please state why you did not account for snowmelt; at least discuss in the ‘Results and Discussion’ section – but it would also be nice to see what

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the impacts on your results could be... or do you have severe arguments of NOT using the suggested procedure on your study site? please comment on this.

Results and Discussion:

- this section should be shortened (data is extensively shown in the tables) and more discussion should take place (as proposed above and further below)
- please briefly discuss sensitivity of each factor in the RUSLE; e.g. which effect on the results might a 10% change have? or which factors are the most decisive ones in your calculations, on which factors should the focus be on (in terms of correct specification); most readers might know this implications, but I think it is worth to mention in your paper as the results from RUSLE are an 'important driver' for your conclusions / results.
- p1416 line 17: how did you check statistical significance? based on values shown in Table 1 comparing the mean among subareas? add relevant information to table/text.
- p1417 line 18: how does LS change when using another cell size? might there be implications by using 1m or 20m cell size compared to the 10m cell size you have used? please briefly discuss in general the effects of using different cell size / DEMs

Conclusion

- I think this section should be thoroughly revised (it is more a draft of an abstract than conclusions) or skipped at all; I propose to 'merge' suitable content to the abstract (which should be slightly extended anyway); the 'Results and Discussion' section is clearly understandable and the main conclusions are already obvious at the end of this section.

Technical corrections:

- please improve / extend captions of tables and figures; I often had difficulties to find links or/and relevant information in the text
- please check typos throughout the manuscript and ensure correct wording to improve

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overall quality of the revised version

- p1407 line 1: Finally, Konz et al (2012) concluded in a study...
- p1410 line 14: snow bridges seems not to be the right term. please use snow barrier / avalanche barrier or another appropriate term to correctly name this 'feature'
- p1410 line 26: I am used to [g cm-3] as unit for soil compaction, please revise in your experience
- p1414 line 17: I cannot find this reference in your reference list

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 2, 1405, 2014.