Solid Earth
Discussions

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Interactive comment on "Soil aggregation, erodibility and erosion rates in mountain soils (NW-Alps, Italy)" *by* S. Stanchi

Anonymous Referee #1

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GENERAL COMMENTS

I found this manuscript ver y interesting and direct , however, personally I think that there are important points to improve. My main concern is related with the influence of C-factor in your analysis. I consider that your objectives should be only focused on the relationships with erodibility. It seems nice to me that with simple analysis of aggregation you can determine TOC and at the same time erodibility. The TOC-erodibility-aggregation analysis is valuable because you might be optimizing effort and investment to predict soil susceptibility to the erosion. In addition, as you mentioned in the lines 87-92, you can continue the lines of those works.

Nevertheless, I think it does not make sense to relate soil resistance factors such as the aggregation with the potential erosion provided by RUSLE. Please consider that

in the triangle energy-soil resistance-protection determining the erosion rates, K is the only one component directly related with the soil resistance. Please, consider that if you have a very high erodibility but all the energy is dissipated by the vegetation (mulch, rock, etc), "the aggregation must not mirror soil erosion rates" (line 17). Thus, if you work in natural areas, the protection provided by the vegetation should be very fine described. In fact, the dissipation of energy associated to C factor must be quite different for shrubs, trees and grass. You used tabular annual values for C without considering the cover degree which must also have an important role. Remember that in C (fall height, residues, cover, soil moisture and previous land use) are their subfactors. They are implied in your hypothesis to discuss your results. In this line, the description of the vegetation type and the cover degree in each LUT is crucial if you want to quantify/relate the erosion. You mentioned this in the lines 64-67, but you do not consider these aspects.

Therefore, I think you should modify the objectives and I recommend a Major Revision.

SPECIFIC COMMENTS

The following points are thought to improve the readability. I hope they are useful. 1. Abstract – line 17. Please, review the sentence.

2. Abstract – I think you should briefly describe Material and Methods: i) soil analysis; ii) statistical tests. Without ii) "residual negative" cannot be understood (line 25).

3. Abstract – lines 28-35, be careful with these paragraph because you calculated C with a tabular factor (only two values to discriminate 15 LUTs?).

4. Lines 116-117. Scientific names of the species are fundamental. Please, also consider include the main formation to complete the categories pasture/forest.

5. Line 136. The catchment was divided into 15 LUTs but in Tables 1 and 2, you have 25 and 33 samples/points. Can you clarify the approach?

6. Lines 193-198- You selected 1680 MJmm/ha.h or year? Why? It is a mean value.

Which was the standard deviation? Did you calculate the fortnightly values to weight K? It is not clear. See line 197, please correct "does not".

7. Lines 229-231. Please, see the overall comment.

8. Line 233. Please, include the statistical tests carried out.

9. Line 300, I do not agree with it, see overall comment.

10. Please, review the conclusions according to the implications of C-factor.

11. Figure 1, it would be good to include the limit of the catchment and some pictures.

12. Figure 4, please see my comment 5