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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Estimation of soil erosion considering soil loss tolerance in karst area" *by* Yue Cao et al.

Anonymous Referee #1

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OVERALL COMMENTS: 1. I found the authors presented a nice method to describe the soil formation balance in karst areas in China which can be useful to establish the thresholds of soil tolerance, however, I feel that you need experimental data to evaluate its usefulness and to justify their conclusions. 2. Another point to consider is that soil tolerance is usually defined as a permissible limit of soil erosion which can be based on different criteria depending on the land use, environmental and ecological features and economic activities and interests. It is quite surprising that different criteria about soil tolerance used along the History are not mentioned. There is abundant literature and reviews, however, there is neither discussion nor comparison at all about the different limit which can be taken into account. In addition, the introduction is very poor, particularly if the topic of the manuscript is about the concept of tolerance (please consider

Smith 1941, and some reviews, among others proposed by Mccormack, et al. 1982. Current Criteria for Determining Soil Loss Tolerance; doi:10.2134/asaspecpub45.c9; Lan Li et al. 2009. An overview of soil loss tolerance. Catena 78 (2-15; 93-99); Nearing, M. et al. 2017. Natural and anthropogenic rates of soil erosion. International Soil and Water Conservation Research, 5-2, 77-84). 3. You used RUSLE to compute soil erosion for an area of 286000km2 where I was wondering if you have erosive processes different to splash, sheet and interill/rill erosion. Gullies, slides, etc must be also considered or at least discussed when you compare soil losses and formation.

DETAILED COMMENTS: 4. Abstract (page 1 line 15): please, explain how the current tolerance limits were calculated. 5. Introduction: please, see comment 2. I missed a review about the concepts of soil tolerance. In addition, I found that lines 129-140, (page 9) where you explain the problem to address should be included into the Introduction. 6. M&M: Please, mention in the text Eq. 1. The LS- factor in RUSLE is a unique factor so I suggest grouping. 7. M&M: Please, check and standardize the units in Eq. 1: for A (t.ha-1.y-1); R (MJ.mm.ha-1.h-1); K (t.h.MJ-1.mm-1.y-1) 8. Page 6, line 82, please, consider to rewrite the sentence Zhang and Fu (2003) compared the five methods. . .. Remove the reference in the final of the sentence. 9. R (MJ. Mm.ha-1.h-1), page 6, line 86. 10. Line 89 (page 2) 30 mm sounds a very high limit to consider an erosive event. In RUSLE, the thresholds to consider erosive storms were described because the computation was slower and because the small events had a small contribution to the annual value; but 30 mm in a day is a substantial storm which can be very erosive. . . 11. Page 7, line 97, please put the units of IS; be consistent with the units. 12. Table 2. You should present a complete table about the features of the study site into the chapter 2.1. Table 2 is quite difficult to interpret without a previous context of the study site. 13. Results: page 13, Line 202, please, correct "we estimated" 14. Results: page 14, line 2014, please, correct "we obtained" 15. Line 217, page 15 and abstract. See comment 4, how was calculated the tolerance to compare. 16. Discussion (line 245): how you know that you are improving the accuracy. See also comment 1.

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