

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

### **Anonymous Referee #2**

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Overall comments The authors present an interesting method to evaluate the soil formation balance in karst areas and derive a soil erosion tolerance. It must be clearly stated that only splash, sheet and interrill/rill water erosion is considered. To estimate soil erosion, soil loss tolerance is not needed; to evaluate soil erosion tolerance yes. Consider to change the work title to something like: “Estimation of soil erosion tolerance in karst area and derived evaluation/categorization of RUSLE soil losses”. There are parts of the manuscript, in the methodology, results and discussion sections, that have to be improved.

Specific comments Revise word spacing; e.g. page 2 line 36 “basin(Vigiak” Homogenize soil loss units and abbreviations; e.g. page1 line 16,  $t_{\text{cha}}^{-1}$ , page 5 line 77  $\text{km}^2\text{a}^{-1}$ . Be consistent also for R and K units. Keep in mind that some

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values are similar, but with different units. Page 1 line 20, replace “idea” by “procedure”. Page 4 line 61, specify “more than 800 mm”. Page 4 line 62, “exposed karst” or “karst area”? “Exposed karst” means rock without no soil? Page 7 line 109-110, the formula was presented previously by Wischmeier (1978) –considering slope length in US customary units-. Consider refer the historical authors. Page 8 line 115-117, how is calculated the slope length values. In my knowledge and experience is a critical point, e.g. see Honghu et al 2011. Effects of DEM horizontal resolution and methods on calculating the slope length factor in gently rolling landscapes. Page 8 line 120, close } Page 9 Table 2, coefficients for paddy fields and especially for cropland must be justified. Coefficients for town, water. . . consider a mask over the area, excluding these features. Page 9 line 129, do you refer to soil loss tolerance? Page 9 line 134, “parent rock exposure” or “parent rock edafization”? Review the text from this point of view. Page 13 line 205-206, specify the limits considered to qualify erosion. Page 14, fig 2, make explicit the factor for each map. Consider using a mask to remove items where analysis is not appropriate (water, towns) and yield strange values. You must consider points 7.115 and 9.2 before working in this point. Page 14 line 210-211, “... have low soil formation rates and less soil. Therefore ... soil erosion not exceed the allowable loss of soil” do not seems coherent. Page 14 line 213, rock formation or rock exposure? Page 14 line 215, where are considered the soil loss tolerance of clastic rocs? Values seem very different. What clastic rocs can be found in the area? Page 15, fig 3, specify units and limits (see 13.205). Page 16-17, table 3. Soil erosion estimates do not change because the soil loss tolerance (T) changes. Are you considering an “effective soil” loss that could be defined as soil loss estimate minus soil loss tolerance? Review it. Specify the meaning of each table file (e.g. erosion area has not area units but a total soil loss units). Perhaps the approach would be qualify/categorize erosion with the T found, and others T values form other methods/references. 4 Discussions. Consider the notes on Table 3. Section 4.1 do not account for validity. Section 4.2. is more interesting. Page 18 line 260, some reference about experimental soil erosion data (0.4) is needed. Page 18, Table 4. Title must be “Compilation of the measured. . .”

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and compare with your estimates in text. Variability must be considered. Because the main contribution of the work is the soil loss tolerance, it would be compared with other tolerance limits proposed for karst areas.

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