

## ***Interactive comment on “Soil erosion evolution and spatial correlation analysis in a typical karst geomorphology, using RUSLE with GIS” by Cheng Zeng et al.***

**Cheng Zeng et al.**

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Dear Reviewers: Thank you for your concerning our manuscript. Those comments are all valuable and very helpful for revising and improving our paper, as well as the important guiding significance to our researches. Some of your questions were answered below.

1.OVERALL COMMENT: i)The most important environmental problem in Karst is the loss of soil and water, which causes serious social, environmental and economic problems. Although the predecessors have done a lot of work in this area, but there are soil erosion and topography, lithology, rocky desertification and other spatial factors are not clear, clear this is very important for soil erosion control in Karst. This article tries to

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make it clear by means of RUSLE model and GIS. Following the reviewer's comment, a new sub-section(5.3) has been added to the manuscript, in order to verify our work; ii)We will carefully sort out these parts to make their relationship more reasonable. And the spelling and syntax errors have been checked and corrected.

2.DETAILED COMMENTS: Abstract: -Line 19, in this manuscript, the soil erosion in typical Karst area is calculated, and the characteristics of spatial variation and the correlation analysis of spatial elements are analyzed. The spatial elements are mainly related to the soil erosion, including topography, lithology, rocky desertification and so on. -Line 25 and 62, it is necessary to increase the interpretation of rocky desertification. Rocky desertification refers to the fragile ecological environment in Karst, as a result of the social economy unreasonable human activities caused by the obvious contradiction between people and land, vegetation destruction, soil erosion, decline or loss of the production capacity of the land surface, showing evolution of desert like landscape rocks gradually exposed. -Line29, the results of 15-35 degrees are obtained by calculation. The slope of 15-35 degree is a region affected by human activities, which is consistent with the results of previous studies (the area around 25 degrees is the area of soil erosion prone). - Lines 36-37, the lithology determines the formation of soil parent material, soil erosion in different soil types are different, so the lithology is the geological foundation soil erosion produced.

3.Introduction: - Lines 49-52, In this paper, the spatial variation of soil erosion in Karst area is studied. It is also because of the special natural environment in Karst area, which leads to the fact that the soil erosion is more special than other regions. - Line 54, we are very sorry for our negligence. the meaning of the original sentence is consistent with that of the reviewer,These methods are useful, but are difficult to apply to the Karst area.These methods can also provide references for this article. - Line 72, because the carbonate rocks in Karst area are widely distributed, the slow process of soil formation, thin soil, is unfavorable for the growth of vegetation, the ecological environment destruction once it is very difficult to recover, so the ecological environment

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of Karst area is very fragile. - Lines 86-93, thank you for your advice, we will analyze and summarize the results of other authors, and strive for better integration with the research in this paper. Most of the previous studies in the Karst river basin or mountain area; Few scholars have studied the response of rock desertification and lithology to soil erosion, at the same time, few scholars have applied the influence of spatial factors on the evolution of soil erosion in Karst area. - Line 101, during the thesis writing and writing before, we conducted a number of field investigation in Yinjiang County, which relates to the meteorological characteristics of Yinjiang County, the lithology, rock desertification, topography, soil type, vegetation type. - Line 105, this paper studied the characteristics of soil erosion in Yinjiang county and its spatial factors on soil erosion, soil erosion will have an impact on the ecological environment, the ecological environment will also respond to soil erosion characteristics, including the impact of human activities on soil erosion, soil erosion effect on vegetation etc..

4. Material and Methods Thank you this proposal, The description of the data sources and the description of the method, we will follow your recommendations to improve. And the source of the data corresponds to the steps of the calculation, so that each part of the materials and methods have a very good correspondence. lines 226-229 part of the material can be described in the M&M section after a brief description of the source. The study region is of 1969 ha, the rainfall erosivity in the study area is calculated by using Zhou Fujian's formula based on monthly rainfall. The values of 2000, 2005 and 2013 were calculated respectively, and the average monthly precipitation was calculated. This equation is applicable to the case of Rainfall Erosivity in southern china.

5. Results, discussion and conclusions The study area in southern China, there are very abundant precipitation, however, the widespread distribution of Karst landform, precipitation will be quickly transferred to the underground through surface cracks, resulting in the precipitation of Karst is difficult to use. And the chapters 4.3.3. and 5.1.1 the soil forming rate of Karst area is small, the soil layer is thin, and the

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soil erosion is very small. Therefore, there is no obvious difference between the different soil surface erosion rates controlled by lithology. This is because there is a large number of underground leakage of soil in Karst. We would like to express our great appreciation to you for comments on our paper. Thank you and best regards. Sincerely yours, Cheng Zeng Corresponding author: Name: Xiaoyong Bai E-mail: baixiaoyong@126.com

Please also note the supplement to this comment:  
<http://www.solid-earth-discuss.net/se-2017-1/se-2017-1-AC4-supplement.pdf>

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Interactive comment on Solid Earth Discuss., doi:10.5194/se-2017-1, 2017.

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