

Interactive comment on “Influencing factors and their interactions of water erosion based on yearly and monthly scale analysis: A case study in the Yellow River basin of China” by T. Hua et al.

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1. Introduction: I noticed that the topic of this special issue is Remote sensing, modelling based hazard and risk assessment, and management of agro-forested ecosystems. Soil erosion is indeed disaster and the authors have used modelling methods in soil erosion assessments. However, the article lacks the expression of the relationship between soil erosion and the agro-forestry ecosystems. The author needs to supplement the relationship in the Introduction and Discussion.

Answer: Thank you very much for your suggestion. To better match the topic of this special issue, we have added some statement about the relationship between soil

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erosion and the agro-forestry ecosystems (please see Lines 32-37, 338-345 of the manuscript).

2. Introduction: Lines 42-46: The author attempts to explain the complex relationship between soil erosion and environmental factors using a few examples, but the expression here is too fragmented. Author needs to summarize the meanings expressed by these sentences in a general language.

Answer: Thank you very much for the opinion of the reviewer, we have modified the original sentence in order to better express and these sentences have been revised into “The identification of the mechanisms of soil erosion and factors affecting soil erosion is an important basis for land use management and ecosystem government. Several studies have focused on determining the driving forces affecting soil erosion, including precipitation, geomorphology, land use type, vegetation, and soil physical properties (Vrieling, 2006; Zhou et al., 2008; Peng and Wang, 2012; Gao and Wang., 2018; Beskow et al., 2009; Tian et al., 2009). Climate factors such as precipitation, temperature and evaporation, all affect regional soil erosion. Among them, rainfall is one of the most important factors affecting erosion. From the time of rainfall exposure to the land surface, the process of splashing and spouting by raindrops has a significant impact on soil erosion. Terrain is one of the important natural geomorphic factors affecting soil erosion, and it is one of the lower interface factors affecting the formation and development of soil erosion. Different characteristics of topography and their changing tendency correspond to different features of slope runoff and confluence, which affect the occurrence and intensity of soil erosion directly (Yang et al., 2007). Among them, the influence of slope on soil erosion is finally reflected by the runoff of the slope and their flow velocity, which is an important factor restricting the spatial distribution of productivity. For vegetation, the vegetation canopy can protect the surface soil from direct impact from raindrops and weaken runoff, thus eventually reducing soil erosion. Excessive land reclamation, unreasonable production activities and land use patterns, and the reductions in surface vegetation cover have a magnifying effect on soil erosion (Wu

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and Cai., 2003)" (please see Lines 43-60 of the manuscript).

3. Lines 198-206: The results in these sentences are missing units. Please further indicate the unit.

Answer: We have already added these units and please see Lines 221-231 of the manuscript.

4. Figure 3: Need to explain some symbols in the box plot.

Answer: Thank you for your reminder and we have already explained these symbols in Figure 3. The solid point represents the amount of soil erosion during this time period, the asterisk represents the average amount of soil erosion during this period, and the horizontal line refers to the median of soil erosion during this period (please see Lines 626-628 of the manuscript).

5. Figure 4: Purple and green shadows appear in these figures such figure4 and figure 6, and the author need to explain these shadows.

Answer: Thank you for your reminder, we have already added it in the corresponding place. In order to express the specific meaning more intuitively, we used different colours of shadows. The shadows of different colours show that the factors represented by the colour during this time period, which contribute more to soil erosion than other factors. Please see Lines 633-635, 639-641 of the manuscript.

6. Discussion: The author carried our research on the interaction of environmental factors on soil erosion, but need to further supplement the comparison between the interaction of multiple factors and effect of single factor.

Answer: Thank you for your helpful suggestion and we have added the expression and 4 figures about the comparison between the interaction of two factors and effect of single factor (please see Lines 275-281, 308-315 of the manuscript, and Figure S2-S5 of the supplement).

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7. Discussion4.3: Need to supplement the impact of the missing P factor calculation on uncertainty of results.

Answer: Thank you for suggestion and we have added some discussion about the uncertainty of the impact of the missing P factor calculation (Please see Lines 415-421 of the manuscript).

Please also note the supplement to this comment:

<https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2019-122/nhess-2019-122-AC1-supplement.zip>

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2019-122>, 2019.

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