Earth Syst. Sci. Data Discuss., referee comment RC3
https://doi.org/10.5194/essd-2020-370-RC3, 2021

Comment on essd-2020-370

Anonymous Referee #3

Referee comment on "Rainfall erosivity mapping over mainland China based on high density hourly rainfall records" by Tianyu Yue et al., Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2020-370-RC3, 2021

Overview and general recommendation:

The authors developed a new R-factor for Mainland China that requires a huge dataset and work. This study is really beneficial to future studies that requires a representative map of the R-factor for their purposes of application related to sediment transportation. However, there are some places that should be made up before published.

Many studies have developed a better R-factor map for now. So far just developing a R-factor map was meaningful as there was a few maps people can employ, but now it is different. The R-factor map at a large scale should be developed based on understanding of application domains (e.g. climate zones, hydrological regimes, and the other characteristics that can affect estimating the R-factor). In this point of view, I think authors can improve the current manuscript more.

General comments

- Mainland China has a large area consisting of a variety of climate zones and hydrological units (e.g. basins, hydrological regimes, and so on). Providing a map of rainfall erosivity is good motivation to readers and users in the future, but if authors provide the data with meaningful analysis and findings it would be great. You could consider the previous study here (Kim et al., 2020).
- Again, as the domain is considerable, there is a question mark to using one energy equation for entire Mainland China. Also, please describe more about using the conversion factor, 1.871, as a representative value for entire domain.
- Using a conversion factor to correct the hourly data is good for estimating the 1-in10-year EI30 but it is concerned that whether the factor, 1.489, could be employed uniformly for entire Mainland China. I suggest authors provide some more details that can describe the uncertainty and its variability so readers can pre-understand its reliability before employing the newly developed map to their own applications.
- In the verification part, suggest authors show the error on the map. This is to present the spatial distributed error and accuracy of the developed map. Also, it would be nice if authors describe errors varying in different density of gauge network.

Reference

Kim et al., 2020. Use of a high-resolution-satellite-based precipitation product in mapping continental-scale rainfall erosivity: A case study of the United States, Catena.

Specific comments

- [Page 1 line 10] are indispensable for soil erosion assessment -> are necessary for sediment transportation estimation based on the ~
- Recommend using a consistent word, for example, erosivity, rainfall erosivity, rainfall erosivity factor, erosivity factor, or R factor and erosivity map or R factor map. In addition, most studies use the 'R-factor' instead of 'R factor'.
- [Page 1 line 12-13] not a good place to provide data-source where the data is available. Please put the information somewhere in the introduction or data section.
- Please mark the thousand commas into all of the values that over a thousand.
- [Table 1] Please re-write the title.
- [Introduction] please re-write the first paragraph and it is too long as one paragraph.
- [Figure 6] Instead of saying 'changes', please find other words to express that. The developed map can be compared with the previous work, but the previous work having lower accuracy cannot be employed to analyze the changes.