

## ***Interactive comment on “Estimation of 1 km Grid-based WATEM/SEDEM Sediment Transport Capacity Using 1 Minute Rainfall Data and SWAT Semi-distributed Sediment Transport Capacity Results for Han River Basin of South Korea” by Chung-Gil Jung et al.***

**Anonymous Referee #2**

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The submission describes the estimation of transport capacity coefficient (KTC) in WATEM/SEDEM algorithm with the evaluation of RUSLE R factor using 1 min rainfall data in Han River basin of South Korea. The SWAT model, which includes the MUSLE function for calculating soil losses from the watershed, has been used to determine the WATEM/SEDEM sediment transport estimation. Studies such as this are relatively rare, and the model appears to be effectively calibrated and applied. This reviewer agrees that the manuscript contains novel information that could be useful for the readers of

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HESS. Much of the theoretical development presented in this manuscript is clear and well described. However, it reads more like a book chapter than a journal article. It is because the authors present few theoretical background and discussion of results, implications and limitations. For example, there is a lack of information regarding how the variation of KTC could affect the sediment yield at the sub-watershed scale. Moreover, several sections of the manuscript are not connected well, and importantly it is hard to understand what the major findings are. Although I generally recommend the paper for publication in HESS, I have the following comments which have, to my opinion, to be considered in a revised version.

1. Introduction. P2.L29-32: it confuses me why you used such long content to introduce SWAT studies, which are not the key topic of your study. I would like see a clear hypothesis (framework) of your study, following introduction of your aim line P2.L33-P3.L3. Then, if essentially, introduce some method to test your hypothesis.

2. Study area description. P4.L13-21: please introduce rough annual distribution of precipitation and temperature, e.g. precipitation mostly occurred in some month, min and max temperature over year. Add a description of land use and soil data modeled in this study. How were point sources of sediment, N and P accounted for? Figure 1: Please remove the layers that were not used in model calibration.

3. Method: Authors should provide proper justification to consider this approach for possible use in other studies. The differences and limitations should be included in the Methodology.

4. Model implementation. P5.L4-15: More detail about soils how similar were the attributes (e.g. soil type) of the sub-watersheds. How were data for the individual KTC determined?

5. Results and discussion: Overall, the authors failed to provide a detailed report on the data obtained during the study and then need to discuss the importance of this study with regard to the relevant scientific or technical issues about sediment transport

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capacity. In this section, the authors simply explained the outcomes from model simulation that could not support to the significant results. Discussion should be concise and add only essential points in terms of the current results and limitations.

6. Conclusions: The findings of this study will be more useful if the authors can address how these findings will impact the evaluation of sediment transport capacity. Conclusions could be better stated by a better interpretation of the data and model predictions.

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