

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 #3

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While the research focus is in line with the journal scope and aims, the paper in its current form is far from being ready for publication. The paper needs a thorough English review. As of now the way it is written makes it very complicated to understand the research itself. Further major concerns are related to the paper structure, which appears very disorganised, in addition to the paper lack of clarity. As well, the material and methods are not sufficiently described, thus making this study unreproducible to others. The authors describe the two main sediment delivery method and SWAT

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model that are already coded and well known in the literature. However, they leave out a huge part of their method. How was the rainfall erosivity determined based on the 1-minute rainfall data? The authors do not describe the method used to define a spatial distribution of the rainfall erosivity, yet they presented it in the discussion session. The methods do not describe how they calibrated their models. Many info on the study site, pertaining the method itself, are also missing (measured sediment? Soil characteristics?) Finally, the discussion itself is not broad enough to be convincing about the research value. Few lines are spent to describe the results in each subchapter; the reader is left just to see nice figures, that are however barely described in the text. I do not feel this is enough for a scientific paper. As well part of the results are actually methods.

Some more detailed comments follow ABSTRACT Abstract needs rephrasing. Aside from the english form, as it is now, it is very dense in acronyms and numbers, and this makes it hard to read. There is too much focus on the methods that, however, still do not appear clear to the reader due to the sentences structures. Furthermore, methods are mixed with results as well. The point of the abstract should be to be as clear as possible to give the idea of the study: as of now this is not accomplished at all. What is the aim of the study? The authors state is to estimate watershed scale sediment yield distribution, but the number given in the abstract refers to the rain erosivity, spatial KTC, and about the sediment yield the only information given is the relationship with the measured values. The paper afterwords describe a different aim of the study, which is to evaluate the KTC...

INTRODUCTION The introduction is very redundant and doesn't really get the point across. The whole introduction should be rephrased and reorganised. Line 9 to 16 page 2. This whole part is a mess. Line 10-11 do not make sense: "However, spatial data is often scarce possibilities to model spatial patterns of sediment delivery and to identify source areas of sediment are very limited". While this is a citation from another work, I think the author are missing some verbs or words or periods... Line 15-16 page

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2: “the sediment delivery ratio needs to be determine to generate the sediment.”???
 What does this mean? The sediment delivery ratio does not generate sediment. . . Line 17-20 page 2: numerous models exist. As the text is written now it seems that these models have been applied only in Ethiopia. I do not think this is true. If the authors choose to speak about each model and the locations where it has been applied, they should be consistent and nominate all the locations for all models. If not, the fact that it has been applied in Ethiopia can be removed. Line 27-28 page 2: you can put the references together, no need to describe the specific application to Spain. Line 2 and 3 of page 3 states “the KTC is traced by the sediment delivery of SWAT model determined by comparing the MUSLE based SWAT simulated sediment yield”, this sentence is very unclear. What is the aim of the study? The authors in the abstract state they want to evaluate the watershed-scale sediment yield distribution, but in the introduction, they state they want to assess the KTC (Transport Capacity Coefficient) of the TC equation, so which one is it? The abstract speaks of 14 years of rain; the introduction speaks about 15 years, please be consistent.

METHODS The authors describe the two main sediment delivery method and SWAT model, that are already coded and well known in the literature. However, they leave out a huge part of their method. How was the rainfall erosivity determined based on the 1-minute rainfall data? The authors do not describe the method used to define a spatial distribution of the rainfall erosivity, nor how they calibrated the model. Many info on the study site, pertaining the method itself, are also missing (measured sediment? Soil characteristics?)

DISCUSSIONS The discussion is very short. Too much. There is no mention of any relationship with other studies in the literature, nor details on how these results could be useful for other researchers in the field. The discussion is mainly spent in figures, which are however barely described or commented. just to mention some issues, in chapter 3.1 the maps are not described in the text, are they a result? Are they part of the method? Where do they come from? What is their use? In chapter 3.2 the

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authors seem to focus more on calibration and validation, which is part of the method. However, they do not give enough information, and they refer the reader to unpublished studies (e.g. line 12 page 8)...

Overall I think this paper needs a deep rethinking and reorganization before being ready for publication.

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