

***Interactive comment on* “Sediment budget analysis of the Guayas River using a process-based model” by P. D. Barrera Crespo et al.**

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Dear Authors,

I read the manuscript Sediment budget analysis of the Guayas River using a process-based model and I found it very interesting. The results of the performed research enabled a comparison of the contribution of various anthropogenic and natural impacts on sediment transport in the Guayas River. Some of the findings and conclusions presented in this article could undoubtedly help to further mitigation measures preventing excessive sedimentation along the river.

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My major concerns are the following:

1. The accuracy of the initial riverbed topography modelling: nowhere in the text the agreement with (scarce, definitely, but not entirely non-existent!) measurements are mentioned. Even the qualitative agreement (of phenomena – sedimentation/erosion) is questionable with simulations using a poorly matched riverbed. Quantification of sedimentation/erosion is of course even more questionable. A comparison (where available) would help to increase the scientific and practical value of the results.

2. Very coarse river discharge data. The monthly averaged discharge presented in figure 2 lies within a relatively large range of discharges between the months. What is the daily discharge dynamics? At least a reference to a (more or less detailed) hydrology-study of the river(s) under consideration would be very helpful. Without at least the range of (minimum/maximum) discharge or the variance of discharge within a month all short-term events are excluded from simulations. Possible extreme events are never mentioned in the text (is there none?). Moreover, the non-linear dependence of sediment transport on discharge increases the significance of short-term high-discharge events. An out-of-season extreme discharge could significantly change the quantities of downstream sediment transport as well as the conclusions given by the authors. These two questions are, in my opinion, crucial for justification of the conclusions. Nonetheless, I would like to encourage the authors to improve the manuscript and to explain the accuracy of the applied procedures and the simulated processes. Other minor remarks and suggestions can be found in the text, uploaded as a supplement.

I will be pleased to re-read the improved manuscript!

Dušan Žagar

Please also note the supplement to this comment:

<https://www.hydrol-earth-syst-sci-discuss.net/hess-2018-467/hess-2018-467-RC2-supplement.pdf>

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2018-467>, 2018.

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