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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Transport and bottom accumulation of fine river sediments under typhoon conditions and associated submarine landslides: case study of the Peinan River, Taiwan" *by* A. A. Osadchiev et al.

Anonymous Referee #2

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This paper presents a modeling study designed to simulate sediment dispersal during conditions of moderate and typhoon discharge. The authors nest a Lagrangian model of plume dynamics within a 3D Eulerian model of coastal circulation. Products of their model include reconstructing or predicting plume dynamics, predicting sedimentary deposits, and predicting potential slope failures (based on slope angle and deposit thickness). They validate their model using field data (CTD casts to establish plume dynamics) collected during a relatively quiescent period, and get reasonable results.

In general, this is a well-written paper that could be a useful contribution to our field. My main questions/concerns are as follows:

1) The authors refer to hyperpycnal flow (HPF) as a common occurrence in this area, and indeed their discharge concentration (120 g/l) is well above the threshold for direct HPF (33- 40 g/l), however their STRiPE model is based on the dynamics of a buoyant plume (if I understand it correctly). This would likely have implications for the observed deposit.

2) The authors use a freshet SSC of 4 g/l, which seems high. Perhaps including a figure of gauged SSC vs. Q would be useful, which brings me to my next point.

3) Is a validation performed under quiescent conditions reasonable to use for either the freshet or the monsoon conditions? Flashy systems such as small-mountainous rivers often scale in unpredictable fashion when stochastic events occur.

4) I recognize that this would be a different study altogether, but the lack of field validation of the ensuing deposits seems like an oversight. At the very least, comparing these results to other studies conducted on/near Taiwanese Rivers (of which there are many) would be beneficial.

5) Is 1300 kg/m3 a reasonable sediment density? My understanding is that 2650 kg/m3 is a more commonly used density. Forgive me if I have overlooked something in your calculation.

6) Figures 2 and 3 could be readily combined.

7) I agree with reviewer #1 that the paper would benefit from an additional proofreading by a native english speaker.

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 3, 5155, 2015.