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Hydrology and Earth System Sciences Discussions

Interactive comment on "Suspended sediment fluxes in an Indonesian river draining a rainforested basin subject to land cover change" *by* F. A. Buschman et al.

Anonymous Referee #2

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This manuscript is a case study and provides some interesting results about the time series of the flow field velocity and suspended sediment concentration (SSC) measurements in a river affected by semidiurnal tidal flow. The Berau River is located in Indonesia in a catchment area that is dominantly a rainforest, and the area is characterized by a climate with relatively high rainfall. In general, the manuscript can be beneficial as a reference for future studies considering that there is very little work done in a remote area such as the study site. However, the work lacks novelty and no sediment rating curve is provided. The only significant contribution of the paper is that provides few suspended sediment concentration and flow discharge measurements for

this type of environment exist. To the reviewer's opinion the authors should compile additional data in order to provide material that is suited for publication to HES. Some specific comments for consideration are provided below:

1. The objectives of the study need to be stated clearly.

2. There is some discrepancy between the title of the paper and the material presented in the manuscript. The given title of the paper eludes that the authors have assessed the role of the rapid change in land cover in the study area on sediment transport. However, the authors neglect to provide a sensitivity analysis of the effects of different land use and land cover (LU/LC) may have on the suspended sediment flux in the Berau River. Such an analysis is needed if more conclusive results need to be derived about the role of different LU/LC schemes in controlling upland erosion of the topsoil. Furthermore, the authors are using the USLE parametric analysis to perform their thought experiments. This reviewer will suggest the use of a distributed model than the USLE method. The error that USLE method can produce due to the P and C parameters could exceed in some cases 600% in terms of the SDR (sediment delivery ratio). Further, the USLE method is a lumped model with a limited application in humid environments. The USDA NSCS has performed a lot of studies in Indonesia and there are a lot of datasets available describing the landscape attributes.

3. It would be helpful if the authors provided a clear statement on the selection of the monitoring locations where HADCP and OMS were mounted and where the concentration profiles were captured with OBS (half of the depth?), since the flow pattern in the river is affected by river planform and the sediment delivery ratio is affected by the river order.

4. On page 7146 line 15, the authors justified the assumption that the point measurement with OMS can represent the cross-section averaged concentrations by showing the agreement between plotted OMS data and OBS-derived data of September, 2007 in figure 6 and implicitly consider this assumption was applicable for the period of May

until June, 2007. It would be better if the authors plotted the OMS and OBS-derived data following the similar procedure for the period of May until June (which are available according to the statement on page 7144 line 14, although with less temporal resolution).

5. On page 7144 line 14, the authors stated that the profiles of turbidity were measured covering tidal cycles at neap tide, at spring tide, and during an intermediate tidal range in May. The result of this measurement should be presented to support the assumption that the variation of concentration was not significant during that period, therefore the OMS-derived concentration can be considered as a representative value for the whole cross section.

6. Soil laboratory tests might be proposed to determine the sediment size in the river and to verify the accuracy of the predicted sediment size given on page 7150 line 3. The agreement between them can be an indication that the overall field measurements and procedure of analysis are sound.

7. Some improvements are needed for figure 5 , e.g: 1) The vertical axis should represent normalized depth as defined in equation (1) instead of using water depth. 2) Use ebb, slack and full flood respectively to indicate the three different phases in a tidal cycle for the Neap tide.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 7137, 2011.