

Interactive comment on “Opportunities from low-resolution modelling of river morphology in remote parts of the world” by M. Nones et al.

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Dear Referee, Thank you for your constructive comments on our manuscript. We appreciate your feedback and have accounted for your corrections to the text. Your main concern regards the reliability of the 1-D simplified model to simulate the evolution of a surveyed river, with regards to the measured data. Actually, the model uncertainties were already evaluated (albeit for an older and less accurate version of the code, which assumed a fixed river width) by means of various study cases for which detailed data were available (small watersheds in Italy), such as the Mallerio and the Adige rivers in Italy. The analysis of the evolution of the Mallerio River is reported in Di Silvio and Peviani (1991). A sensitivity analysis of the new 1-D model (coupled with the synthetic description of the cross-section) applied to the case of the Zambezi River was re-

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ported in Nones et al., 2013 (Int. Journal of River Basin Management, 11(2), 221-236). The mathematical background and a thorough analysis of the LUF hypothesis and the other simplifications and the applicability's field of these assumptions are reported in Fasolato et al., 2011. Indeed, the presented applications were aimed to show model applicability to remote parts of the world with regard to available data set as input and for the model performance evaluation. In the study cases, the river width was determined by means of Landsat 7satellite images taken for the USGS database. These images have a resolution of 15 m, only a few percent of the active river width. For this reason the use of satellite images is an acceptable simplification for studying the evolution of large rivers. With regards to the spatial scale, also the use of morphological boxes of 50-80 km length is acceptable, because of the homogeneity of width, slope, grain size composition and flow inside these boxes. The length of them were computed with respect to the geometrical and sedimentological parameters, as reported in Fasolato et al., 2011. The use of a simple at-a-site hydraulic geometry relationship (Singh, 2003) for computing the river width for discharges lower than the bankfull values is verified by the authors in various study cases, both for large (Zambezi, Parana) and small (Adige, Po) rivers. Not all the results are published. The grain size composition of the rivers' beds permits the extrapolation of the few data available along the Zambezi and the Parana to cover the complete study area, with a very low uncertainty. Of course, in the case of small mountain rivers (Mallerio, Adige), it is necessary more spreading samplers for characterizing the bed composition.

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