

Interactive comment on “Evaluating the importance of surface soil contributions to reservoir sediment in alpine environments: a combined modelling and fingerprinting approach in the Posets-Maladeta Natural Park” by L. Palazón et al.

Anonymous Referee #1

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The authors propose an original approach combining discharge/erosion modelling and sediment fingerprinting in a catchment of the Pyrenees. Associating SWAT model and sediment fingerprinting results could provide a very useful contribution to the literature. However, for the reasons detailed below, I think that this paper is not ready for publication.

Overall, English language should be significantly improved throughout the

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manuscript, and the introduction should focus on soil erosion problems (and avoid too frequent wider ecological considerations, which fall beyond the scope of this study, in my opinion).

I have several major concerns regarding the methodology followed by the authors: * Fingerprint measurements are provided for the source material, but not for the target sediment. This crucial information should be provided, as it would be very useful for the readers to compare property values in both source and target material; * The authors measured the potential fingerprint properties in only 2 to 3 samples per source, and I think that analysing such a small number of samples is not sufficient and is very unlikely to lead to relevant results; * channel sediment material is used as a surrogate of soil sources, which is not relevant in my opinion, except in very specific contexts (at river locations draining an area covered by a single soil type). Furthermore, based on the results of the fingerprinting approach, the authors state that channel bed sediment is one of the main sediment sources, which does not provide a very robust finding; * the Leptosol source was not sampled for logistical reasons, but the SWAT model shows that Leptosols rank among the main sediment sources in the catchment, which is quite inconsistent; * the authors argue that contribution of riverbank material to river sediment is negligible. However, when comparing the Cs-137 activities (Table 3) in soil sources (> 47 Bq/kg) and corresponding measurements in channel bed sediment (0-12 Bq/kg), I suspect that soil material supplied to the river should be mixed with subsurface or riverbank material depleted in Cs-137 to explain those low values.

Overall, I encourage the authors to address the points listed above to correct their manuscript, which could then provide a very useful contribution to the literature.

Interactive comment on Solid Earth Discuss., 6, 1155, 2014.