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The sediment budget of a highly dynamic mountainous catchment

J. A. Lopez-Tarazon (1), R.J. Batalla (1,2,3), D. Vericat (1,2,4)

(1) Department of Environment and Soil Sciences, University of Lleida, Lleida, Catalonia, Spain (jlopez@macs.udl.cat), (2) Forest Sciences Center of Catalonia, Solsona, Catalonia, Spain, (3) Catalan Institute for Water Research, Girona, Catalonia, Spain, (4) Institute of Geography and Earth Sciences, Aberystwyth University, Ceredigion, Wales, UK

The suspended sediment transport and its temporal dynamics have been studied, during 4 hydrological years (2005-2009), at the River Isábena basin, a mesoscale mountainous catchment (e.g. 445 km^2) located at the Southern Pyrenees. Hydrologically, the study period can be considered as dry if it is compared with the mean long-term annual water yield (i.e. 114 hm^3/y for the period 2005-2009, 177 hm^3/y for the period 1945-2009). Mean annual suspended sediment load for the whole study period was 202,512 t, supposing a specific suspended sediment yield of 455 t/km^2y, a high or very high value by comparing it with catchments of similar size. Floods dominate the sediment transport and yield; however, sediment transport is much more constant through time than observed in other Mediterranean basins, a fact that can be attributed to the role of baseflows and even small discharge fluctuations that entrain fine sediment stored in the channel and force the river to carry high sediment concentrations. The hydro-sedimentological response of the basin is very variable to similar rainfalls and there are not relations between rainfall intensities, runoff and sediment transport. That behaviour suggests that, apart from rainfall, factors such as sediment availability in the badlands present at the basin and the accumulation of sediment in the channels influences the river's sedimentary response. Water and suspended sediment budget explains that the Cabecera subcatchment controls the hydrology of the basin whereas the Villacarli and Lascuarre sub-basins are the responsible of the most of the suspended sediment transport. Finally, the calculated high sediment loads confirm that the sediment input of the River Isábena is one of the main causes of the Barasona reservoir's siltation, contributing with more than 0.13 hm^3/y of fine sediment, a value that represents more than 0.15% of the original reservoir capacity.