



Debris flow erosion rate in a semiarid Andes catchment using ^{10}Be concentrations in alluvial stream sediment

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Terrestrial cosmogenic nuclide concentrations in stream deposits are used to quantify mean erosion rates in catchments. This article explores the ^{10}Be concentration differences in fine (sand) and coarse (pebbles) river sediment of the Huasco Valley, in the arid Chilean Andes. The river pebbles of the Huasco semi-arid catchment have about half the ^{10}Be concentration compared to river sand. The examination of the possible sources for these differences suggests that the mean ^{10}Be concentration of pebbles allows landslide and debris flow related erosion rate to be quantified whereas ^{10}Be concentration in sand allow the catchment mean erosion rate to be determined. The most promising perspective is that a TCN based geomorphic mapping can be performed and mean rates of individual geomorphic processes can be obtained within a catchment, by simply taken sand and pebbles samples at the outlet of a catchment and measuring their TCN concentrations.