

# **Spatial variation of suspended sediment concentrations in a tropical Andean river system: The Paute River, southern Ecuador**

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Tropical mountain ecosystems are sensitive to environmental change brought about by natural and anthropogenic processes. The steep topography, shallow soils and unsustainable land use practices following forest conversion often lead to enhanced rates of geomorphic activity including soil erosion, landsliding and fluvial activity. Rapid demographic growth and socio-economic development have accelerated environmental change over the past few decades. During the last 50 years, water erosion on agricultural fields caused by inappropriate agricultural practices was perceived as the major source of stream sediment in tropical Andean catchments. However, because of sporadic data on sediment production, -transport and -export in tropical Andean catchments, it is unclear as to whether geomorphic activity is mainly controlled by natural or anthropogenic factors. A research program has been carried out in the 5176 km<sup>2</sup> Paute River catchment located in southern Ecuador to examine the variability in sediment loads in rivers. A monitoring program was set up in the central part of the watershed to extract information on the spatial variability in river sediment load in relation to catchment variables describing climate, lithology, topography and land use. Twenty-nine river sections were sampled during two successive rainy seasons. At each visit, suspended sediment samples were taken and instantaneous river discharge was measured. Geographic data related to topography, landscape morphology, rainfall, land cover and geology were collected. Watersheds that were affected by intense landslide erosion in the upstream area have a significantly higher weighted suspended sediment concentration than the remaining watersheds. There is some evidence to suggest that occurrence of these large, infrequent landslides is mainly related to topographic steepness, rather than to actual land use practices or human activities.

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