



Impact of rainfall events on sediments and phosphorus losses from a rural catchment

M. L. Rodríguez-Blanco, M. M. Taboada-Castro and M. T. Taboada Castro

Faculty of Sciences, University of A Coruna, A Zapateira, 15071-A Coruña, Spain
(mrodriguezbl@udc.es / Fax: +34 981-167065 / Phone: +34 981-167000)

This study was conducted to evaluate the factors controlling sediment and phosphorus export in a small rural catchment located in the NW Spain. The geology of catchment is characterised by basic schist. The area has steep slopes, generally more than 13%. The predominant soils are Umbrisol and Cambisol with silt and silt-loam texture. In terms of land use, 65% of the total area corresponds to forestry zones and 30% to useful arable surface (mainly grassland, pasture and maize). At the outlet of this catchment discharge was continuously measured and suspended sediment and phosphorus (total, particulate and dissolved) were determined during seven rainfall events. Within catchment, erosion features were observed and the soil loss was calculated. Suspended sediment concentrations and phosphorus contents (total and particulate) were correlated. Sediment and sediment-associated phosphorus export differ significantly between the studied events. During the studied period, a large proportion of the suspended sediment and particulate phosphorus exported from catchment occurred from a relatively small portion of the catchment and during only two events. Erosion features, as such rills and ephemeral gullies, were observed in the upper catchment, in an agricultural field of slope gradient higher than 25%, located in the vicinity of the stream. The development of rills and gullies occurred in autumn, period in which focussed most of the annual rainfall and the soil was under conventional fallow conditions, i.e. soil surfaces ploughed and without any vegetation cover. Rills and gullies deliver the most of the eroded sediment directly to the stream, which contribute to a high sediment and phosphorus exportation at the catchment outlet.

The suspended sediment export during overall events was 35.9 Mg whereas the total

and particulate phosphorus load was 45.3 and 37.5 kg respectively. Approximately the 59% of suspended sediment and 45% of the P load was exported by a single event.