



The hydrological response of a small catchment after the abandonment of terrace cultivation. A study case in northwestern Spain

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Terrace construction for cultivation results in a complete transformation of the hillslopes to a series of flat sectors and almost vertical steps. This strategy, which involves a redistribution of soils and a re-organization of the drainage network, provides fertile soil over steep slopes, improves infiltration and controls overland flow under conditions of intense rainstorms. In Camero Viejo (north-western Iberian ranges) most of the hillslopes are occupied by terraced fields. During the XXth century, rural population declined and agricultural practices were abandoned.

In this area, a small catchment (1.9 km²) was monitored in 2012 for studying how the abandonment of agricultural terraces affect water and sediment transfer from the hillslopes to the channels. Terraces occupy 40% of the catchment and are covered by sparse grass and shrubs. The equipment installed in the catchment registers continuously meteorological data, discharge and water table fluctuations. Data on suspended sediment transport is obtained by means of a rising-stage sampler. Here we present the hydrological results corresponding to the years 2012-13 and 2013-14.

The hydrological response of the catchment was moderate (annual runoff coefficient < 0.20), which could be in part explained by the high evapotranspiration rates reported in the area. Lows flows were recorded in summer and autumn, when the water reserves of the catchment were dry, and high flows occurred from January, when the catchment became wetter. The shape of the hydrographs, with slow response times, moderate peakflows and long recession limbs suggested a large contribution of subsurface flow, probably favored by deep and well structured soils in the bench terraces.

Soil saturation areas were not observed during the study period, suggesting that soil infiltration processes and subsurface flow are important, and that the drainage system of the terraces is probably well maintained.

No suspended sediment has been collected so far, confirming the hypothesis that subsurface flow might be a dominant runoff generation process.