



The effects of forest cover in the hydrological and sediment response in a small Mediterranean mountain catchment

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The hydrological response of two neighboring contrasted areas in the Araguás catchment (Central Spanish Pyrenees) has been recorded since June 2007, and 43 events have co-occurred in both areas. The lower part of the Araguás catchment is characterized by extensive badlands, whereas the upper catchment is covered by a reforestation on terraced slopes carried out during the 60's. The data showed great differences on discharge generation, both by runoff generation processes and by its frequency and water volume. In general a decrease of the number of floods was recorded in the reforested area; peakflows were always greater in the gauging station than in the reforestation area; and, the response time was faster in the outlet gauging station due to badland morphologies.

The availability of sediment in the badland area is so high that even short, low-intensity rainfall and flood events record high suspended sediment concentrations. Such behavior contrasts with that in reforested areas: the absence of well-defined eroded or degraded areas in the reforested area explains the low values of suspended sediment concentration, the absence of bedload and the predominance of solutes in sediment outputs.

From a hydrological point of view, badland morphologies increase water production and flood frequency. In the other hand, reforested areas decreases flooding and erosion risk, but also generate a big reduction of water resources disposability.