



Runoff and sediment production in a Mediterranean basin with two different land uses (2005-2009)

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The hydrological and hydro-geomorphological basin studies allow more detailed understanding of the processes involved in the production of runoff and sediment in catchments of the Mediterranean environments. The aim of this study is to analyze the influence of different land uses in the hydrology and in the sediment transport in relation with the different rainfall events in terms of quantity and intensity. The study area is located in the northeast of the Iberian Peninsula, in the Gavarres massif. The area of the basin of the Vernegà River is 2.57km², who has a seasonal flow, conditioned by the substrate and rainfall variability. This basin is influenced by a Mediterranean climate, with an average of 689mm of annual rainfall. Being the distribution as follows: winter 33.9%, fall 24.7%, spring 24.4% and summer 17.1%. It highlights the torrential rainfall in the autumn and spring, and a marked water deficit in the summer months. The lithology consists mainly of granites, although metamorphic rocks are present in the upper parts of the basin and alluvial deposits in the lower part. The most of the area are forests, mainly communities of *Quercus suber* and *Pinus pinaster* with understory composed by *Arbutus unedo* and *Erica arborea*. The lower part of the basin is agricultural lands, planted with cereals. There is a totalizer rain gauge since 1982, and a meteorological station with rainfall intensity records since 1993. Since 2005 there is data of rainfall interception by the vegetation. The basin has a first gauging station (BOSC) closing and recording the data of the forested area 1.6km². This altitude of this first area ranges from 440 to 190m. At the outlet of the basin there is another gauging station (CAMPÀS) which controlled the 2.57km² of the entire basin and where are included the agricultural lands which represents a 10% of the total uses. The outlet of the basin is in an altitude of 150m. Both gauging stations have an OTT type water level recorder and a pressure sensor. The water and sediment samples are sampled with an ISCO 3700 in periods of flood and manually each week. The data presented here are the last four year (2005-2009) although different projects permit us a total serial data of 18 years. The average rainfall in the basin is 689mm/year (data compiled from records of 30 years). The maximum intensity was recorded in October 18, 2005 with 55.5mm/h and with a total rainfall of 220mm. Surface runoff is concentrated in the months of October and June. The average runoff coefficient is low. In BOSC is 9.75% and 9.85% in CAMPÀS, with a maximum of 34.6% and 32.5%, and a minimum of 0.38% and 0.49% and the coefficient of variation is 58.7% and 72.9% respectively. The suspended sediment concentrations are low. There is an average of 0.05g/l in BOSC and 0.04g/l in CAMPÀS. As a solution load the average of these four hydrological years was 0.16g/l and 0.19g/l, which means a total export of 18.53t/km² and 24.53t/km² respectively. CAMPÀS gauging station recorded a 23.58% more runoff than BOSC gauging station. Part of this phenomenon may be due to the interception of the rainfall in the forested area. The interception has been calculated in approximately a 10.3% of the annual precipitation. Maximum transport values are recorded in the October events; because, the agricultural fields are tilled and unprotected and due to the occurrence of more intense rainfall events.