



## **Mediterranean eco-geomorphological system response variability to the 2004-06 drought along a climatic gradient.**

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One of the main characteristics of Mediterranean climate is the frequent succession of droughts lasting for a year or more and the appearance of dry spells during the wet season. The South of the Iberian Peninsula, in the Andalusian Mediterranean Watershed, shows a climatic gradient from the Straits of Gibraltar (1,600 mm year<sup>-1</sup>) to the Cabo de Gata (150 mm year<sup>-1</sup>). As such, differing climatic conditions are defined, which translate into variations in the elements of the eco-geomorphological system at the hillslope scale. This study aimed to analyse and determine the immediate consequences of a period of drought (2004-06) on several elements of the Mediterranean eco-geomorphological system at various hillslopes with differing climatic conditions (sub-humid, dry Mediterranean and semi-arid).

The soil water content, the pattern of vegetation and certain properties of the soil (organic matter content, aggregate stability and permeability) were analysed before (Nov-2003) and during (Nov-2005) the drought period. The most important findings were: i) reduction in soil water content, which reached in the supposedly wet seasons values below wilting point, with the water available for vegetation dropping, especially in the wettest environments, ii) reduction in vegetation cover and in the number of individuals, especially at semi-arid field sites, iii) modification in the organic matter content during the drought, which aggravates the loss of stability of soil aggregates, a process seen more clearly under more arid conditions, and iv) reduction of soil permeability in all situations in the climate gradient studied, which supposes a priori an

increase in erosive processes due to surface runoff. These results indicate increased vulnerability of the eco-geomorphological system because of the rainfall drought situation and within the general context of desertification phenomena. However, as all the observed changes in the system are not yet very significant, further checks and monitoring of the analysed elements will be needed before modifications and tendencies can be clearly defined.