



Hydrological and erosive response of a Mediterranean forest soil in recovery after different impacts

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Land use changes, including land abandonment, and forest fires have been two key factors that have characterized the evolution of Mediterranean ecosystems. This work studies the evolution of the hydrologic dynamics and the erosive response of a Mediterranean forest soil (Rendzic Leptosol), which has undergone during years changes in its forest use and the fire impact. This soil is in recovering since the last disturbance (experimental fire) in 1996.

The study has been carried out in the Experimental Station of Porta-Coeli (Valencia, Spain) in a system of four erosion plots of 320 m² (40 x 8 m) of closed type. Each of the plots suffered different impacts: Plot 1 (T1) sustained the original shrub vegetation and suffered an experimental fire in 1997; Plot 2 (T2) and Plot 3 (T3) were used since 1988 to test different plant species to control erosion, in 1996 plot 3 was affected by fire in a 30% of its surface; Plot 4 (T4) was maintained bare of vegetation since 1987. All plots were left to recover since 1996.

The climatic characteristics and the hydrologic and erosive parameters of these plots have been studied in each rain event of the period 2004-2008. This period reflects the great variations in rain quantity and distribution that characterize the Mediterranean climate. During this period a total of 562 rains were monitored, from which 66 showed runoff generation, and only in 14 events sediment production was detected.

After 12 years in state of recovery, the vegetation cover has reached similar values in all plots but differences in the hydrologic response between them have been observed. The behaviour of T1 and T4 becomes similar mainly in rain events with intensities higher than 15 mm h⁻¹, producing always the maximum values on runoff generation. However, the improvement in their conditions regarding erosion is clear, giving in all cases very low soil losses (the maximum observed was 8.62 g m² in T4, 9/6/2004).

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