



Long-term effects of fire on soil infiltration in a Mediterranean shrub environment

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Infiltration is a key process in the hydrological and erosional cycle and determines the water available for soil functioning. Fire can strongly affect the infiltration process as soil properties and vegetation are disturbed by fire. This has been well documented for the short-term; however, longer-term monitoring of effects has rarely been carried out. Particularly for regions where fires occur frequently, it is not clear if soil hydrological behaviour recovers completely between fires. To address this research gap in the Mediterranean context, infiltration rates were monitored for dry summer dry and wet winter conditions for soil under scrub vegetation in eastern Spain (El Genovés, Valencia province) since 1990 until now. Measurements were taken with a small rainfall simulator in order to determine the main infiltration parameters (steady-state infiltration rate) on 10 plots (0.25 m²) and cylinder infiltrometers (diameter of 6 cm). The study site had suffered a fire in 1981. In 1990, the scrub vegetation had already recovered and the infiltration rates determined until 1995 were high. The site was burned again in August 1995, resulting in decreased infiltration rates for 2-4 years. A further fire took place in summer 2002 and the infiltration rates showed a similar reduction and recovery behavior. The results demonstrate that under current climatic, fire severity and fire frequency conditions, soil hydrological parameters are able to recover to pre-fire conditions well within the timescale of fire recurrence intervals. Whether this is, also the case under future climatic conditions predicted for this region has yet to be established.