

Influence of the intensity of the forest fire and the effects on the properties of the soil, the case of Sierra Mijas (Málaga)

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Abstract

Fire is one of the main destroyers of forest areas in Mediterranean ecosystems, characterized by highly irregular rainfall, with mild temperatures, exchanging dry seasons with warm ones, with which susceptibility to forest fires increases, due to the dry vegetation in summer, together with its pyrophilic nature, and the appearance of torrential rains from the dry season, eroding large amounts of soil, soils that are more fragile if they have been subjected to combustion, in such a way, such as nutrient flushing. In the present study we take as a reference the short-term effects on the soils as a consequence of the forest fire of July 2022 in Sierra Mijas, with which we have been able to determine its incidence through various factors such as lithology, topography, vegetation, land use, intensity and severity of the fire.

For this, an analysis of the affected area has been carried out, since it is essential to understand the effectiveness of post-fire management treatments and to identify the most positive practices in each area. The example studied in this work puts an essential aspect, which is the result of the interaction of physical-natural and human factors, and cannot be understood without paying attention to the territorial impact of fire.

Fire radically transforms the visual aspect of the landscape and the different aspects that make up the eco-geomorphological system. The elimination of the vegetal cover leads it to a relict state, which is also exacerbated by the post-fire management of the burned area, without taking into account, not only aspects related to the hydro-geomorphological dynamics and its direct consequences, but with the visual quality of the landscape and its recovery in the post-fire situation, which could also be a determining factor in the local economic scale. As conclusions we can highlight how the stability of aggregates has decreased in the samples analyzed, causing a considerable fragility of the soil against erosion. In addition, superficial crusts have appeared, which have caused conditioning in the face of water infiltration processes and, therefore, have modified the hydrological dynamics of the soil. This work represents a first approximation in the analysis of the eco-geomorphological dynamics in a Mediterranean area recently affected by a forest fire.

Keywords: Fire, Soil, Ecosystems, Mediterranean