Geophysical Research Abstracts
Vol. 16, EGU2014-16283-1, 2014
EGU General Assembly 2014

Effects of fire on organic matter content and aggregate stability of soils in South of Spain.

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Wildfires affect dramatically to soil physical, chemical and biological properties, which changes the hydrological and erosive soil response. The objectives of this study are to compare some soil properties affected by fire in field conditions. The experimental area is located in the South of Spain, 32 km western of the city of Málaga. In general, the area is characterized by a sub-humid Mediterranean climate (mean annual precipitation: 699 mm year-1; mean annual temperature: 17°C), with a substratum of alkaline metamorphic rocks. Vegetation cover consists on a mixed open wood of Quercus spp. and Pinus spp. with typical degraded Mediterranean scrub, where the dominant genus are Ulex spp. and Cistus spp. This area was partially affected by a wildfire on September 11th 2011.
Soil samples were taken in burned and unburned areas: soil covered by shrubs, trees and bare soils. Unburned area was adjacent to the burned one and both of them had the same general conditions. On each microenvironment samples of the first 5 cm of soil were collected on September 19th 2011. The analyzed properties in the laboratory were organic matter (OM) and aggregate stability (AS).
In general, fire affected mainly to OM ($p<0.01$). When we performed the analyses dividing the samples according to vegetal cover, the ANOVA showed that the wildfire only affected the OM content in soil covered by shrubs. In soil covered by trees and bare soil OM decreased, but it was insignificant. AS were not affected in any sampled environment.