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Wildfire effects on different soil organic carbon pools in Mediterranean pine forests

[1]Gimeno-García, E., [1]Carbó, E, [1]Sorando, R and [2]Lerma-Arce, V

[1]*Centro de Investigaciones sobre Desertificación-CIDE (CSIC, UV, GV). Carretera Moncada-Náquera, km 4.5, 46113-Moncada, Valencia, Spain*
[2]*Institute of Information and Communication Technologies (ITACA). Universitat Politècnica de València. Cami de Vera s/n, Edificio 8G, 46022-Valencia, Spain*

DRAFT

Abstract

Pine forests in the Valencian Community are often affected by severe wildfires, which can induce changes in soil organic carbon (SOC). These changes are a mainly consequence of (Certini *et al*., 2011): (1) the input of ashes and charred materials from the scorched vegetation; and (2) the removal of litter layer and some organic matter from the upper few centimeters of soil affected by high temperatures. Net fire-induced gain or loss of SOC results from the dominance of one of these processes. The Forest Chelva Demarcation suffered a huge wildfire in 2012 (Andilla fire) where 20945 ha were burned. In the REMAS project, a methodology to quantify C stock in forested areas is proposed to assess the impact of forest fires and, subsequently in the next immediate future, the application of some management practices over the burned area. In this work, sampling by volume the soil (at two depths: 0-5 cm and 5-30 cm) in both unburned and burned areas (N= 132) of *Pinus halepensis Mill* forest was carried out to assess the intensity of the fire-induced changes on different C stocks (from the more labile C organic forms to the total SOC). The results showed that there were important differences in bulk density, hot water extractable C, particulate organic carbon (POC), mineral associated organic carbon (MOC), easily oxidisable C, total organic C considering both sampling depths and the two fire scenario (burned or unburned).

Keywords: soil, bulk density, labile C forms, stock of C, Mediterranean

References

Certini, G., Nocentini, C., Knicker, H., Arfaioli, P., Rumpel, C. 2011. Wildfire effects on soil organic matter quantity and quality in two fire-prone Mediterranean pine forests. Geoderma 167-168: 148–155.

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