Wildfire effects on soil organic carbon and losses in a burnt forest area, north-central Portugal

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Wildfires can be expected to affect the organic carbon stocks of the litter and topsoil layers directly, through combustion, as well as indirectly, through enhanced runoff generation and the associated transport of dissolved and particulate matter. However, in particular carbon losses by post-fire runoff have been poorly studied, including in Portugal. This research gap is being addressed by the FIRECNUTS project (PTDC/AGR-CFL/104559/2008). In a study area is located in north-central Portugal, runoff and erosion are being monitored at regular intervals since the occurrence of a wildfire in July 2010. This is done at two slopes with contrasting pre-fire land covers (Maritime Pine and eucalypt), using micro- and slope-scale runoff plots (0.28 and 80-170 m^2) as well as slope-scale erosion plots (sediment fences). The (in-)organic carbon content of the runoff and sediment samples was analyzed using a Shimadzu TOC Analyser 5050A.

The proposed presentation will focus on: i) the 1- to 2-weekly concentrations and losses of dissolved (in-)organic carbon in the runoff produced by the micro-plots during the 6 to 12 months following the wildfire; ii) the concurrent monthly (in-)organic carbon losses as recorded by the sediment fences. As to the former results, they suggested marked differences between the two studied sites that could be explained by discrepancies in litter cover associated to differences in fire severity. On the other, both sites revealed the expected decrease in organic carbon concentration with time-since-fire, pointing to the exhaustion of the carbon stock available for export.

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