



Vegetation and erosion: the case of forest wildfires with a special emphasis on Portugal

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Vegetation or, to be more precise, the lack of it is widely regarded to play a key role in enhanced overland flow generation and associated sediment losses following wildfires. Nonetheless, as pointed out by Shakesby and Doerr (2006) in their review paper on wildfire as a hydrological and geomorphological agent, there continues to be a need to further untangle the effects of vegetation destruction and its post-fire recovery from those of the fire-induced changes in other factors, of which soil water repellency has received particular research attention. This is an all but trivial task, however, especially under field conditions, since post-fire changes in potentially influencing factors can be expected to correlate with time after fire and, thus, with each other, even if these factors are in fact themselves unrelated.

Post-fire erosion control measures commonly aim at decreasing bare soil cover and, thereby, are perhaps easily taken to invoke the role of vegetation in reducing erosion risk. In the case of simple mulching, for example with straw, the provided cover rather emulates the function of a litter layer than that of vegetation. Furthermore, the presence of mulch, except perhaps immediately after its application, may well affect other factors that potentially play a direct role in runoff generation and soil erosion, including vegetation regeneration itself.

The proposed presentation will involve a critical review of a selected number of published erosion studies that have or have not clearly suggested or demonstrated the importance of vegetation destruction and recovery in observed soil erosion rates following forest wildfires. Due attention will be given to case studies on the effectiveness of cover-increasing post-fire management practices.

The main conclusions of this review will be confronted with results obtained in the ongoing EROSFIRE-I and II projects in north-central Portugal on the short-term effects of forest fire on soil erosion. Possibly, an outlook will be included on the implications for a recently started study on the longer term effects of wildfire in the same region, comparing the situation of the past few decades with that under likely climate change scenarios with increased fire frequencies.