Geophysical Research Abstracts
Vol. 12, EGU2010-1032, 2010
EGU General Assembly 2010

The impact of patterns and scale on overland low and erosion yield at burned areas

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Albeit a natural phenomenon at Mediterranean ecosystems, fire has become one of the main degradation agents in southern Europe as a result of global changes (i.e. climate, land use and socio-economic change).
It disrupts the hydrological cycle, and promotes overspread soil degradation, leading to the occurrence of deleterious processes that may trigger catastrophic events .Together with extreme rainfall events; it has been known to originate bedload transport in excess of 2.5 ton.ha-1 in a single event, at catchment level. The impacts on soil hydrological properties and processes are also important, as are the impacts on soil erosion.
Being such a deleterious problem, a key issue is how to deal with burned areas and how to reduce wildfire impacts after they occurred.
To answer to this question, we must understand how different fire intensities change the spatial distribution of soil hydrological properties and processes, and therefore erosion processes.
Experimental data acquired at slope and catchment scales in areas burned with different intensities, shows that the spatial distribution of water repellent properties plays an important role not only on overland flow generation, but also on it's increasing or decreasing downslope and downstream.
Pattern continuity will add up the water and sediments coming from upslope and upstream, and may even trigger more violent processes, both on and off site. Pattern discontinuity will on the other hand reduce the amount of water and sediments downslope and downstream.
Fire intensity often has an important role on the continuity of these soil water repellent patterns. High intensity fires tend to generate more continuous patterns than the light fires such as prescribed fires.
In what concerns soil and water conservation after fire, the acknowledge of the impact of fire severity on soil degradation processes provide us with a valuable tool on how to manage our forest and range land, both before and after the fire, to reduce soil degradation. A set of techniques to mitigate fire impact will be discussed at the light of the impact of fire severity on soil water repellence patterns.