



Measuring erosion in burnt areas at multiple spatial scales: the EROSFIRE 2 project

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Forest fires destroy the vegetation cover, increasing the propensity for soil erosion while vegetation recovers. Previous work in central Portugal has shown the relationship between vegetation, litter cover and soil properties (especially soil water repellence) and the increase in runoff generation and soil loss, with measurements made at the microplot, plot and hillslope scales. There is also evidence on the link between forest fires and severe flooding and erosion at the catchment scale. However, the link between processes operating at both scales is still unclear; studying this link is the main objective of project EROSFIRE 2.

Current work on this project focuses on the simultaneous measurement of runoff and soil erosion at multiple spatial scales. The study area is the Colmeal catchment (ca. 20 ha), in central Portugal, which was almost completely burnt in August 2008. The catchment was instrumented at different spatial scales, including:

- 20 bounded micro-plots located on 5 slopes, collecting weekly runoff and sediment from areas of ca. 0.25 m² (10 plots) and ca. 0.5 m² (10 plots)
- 5 open slope-scale plots, collecting weekly runoff and sediment using gerlough troughs from areas with ca. 20 to 50 m²;
- 14 sediment fences, 10 located in regular hillslopes and 4 at the end of permanent gullies, with collection areas up to ca. 300 m² and monitored at irregular intervals;
- continuous runoff and sediment monitoring at the catchment scale (20 ha).

Other data collected in the catchment includes rainfall at several points inside the watershed; soil water repellence in burnt and unburnt areas; vegetation recovery; continuous soil moisture monitoring on two of the slopes instrumented with plots and next to the hydrometric station; and microtopography transects on roads and gullies. These data are expected to complement the main monitoring network and help understand the processes linking runoff and sediment from small to large scales.

This communication will present preliminary data from the Colmeal catchment, focusing on simultaneous measurements during large rainfall events in the autumn and winter of 2008/09. The results are expected to show how sediment is generated, transported and exported in the Colmeal watershed and contribute to understand and simulate erosion processes in burnt catchments.