Erosion And Runoff Generation From Fire Disturbed Mediterranean Forest Area

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Abstract. In order to assess the effects on runoff, erosion and soil hydraulic properties, following the changes in soil and vegetation induced by forest fires in Mediterranean areas, a set of rainfall simulator experiments was carried out in the Liguria region, Italy, immediately after a fire occurred in early August, 2003. Three rainfall events, with different antecedent soil moisture conditions (dry, wet, very wet), were simulated on two 30 m^2 plots, established on areas with different fire histories (i.e. recently burned and burned six years before the field experiments) and characterized by the same main physiographic features. Each simulation consisted of a single 60 minutes application of rainfall at a constant intensity of about 76 mm h^{-1}. The experimental results showed runoff ratio, evaluated for different pre-event soil moisture conditions, ranging from 0 to 2% in the plot burned six years before, and from 21 to 41% in the recently burned plot. In particular runoff ratio from the burned plot was 60 times more than from the area unburned in the last six years, for the wet run, and 20 times more, for the very wet run. Regarding sediment production, large increases in sediment yields were measured from the burned plot compared with the unburned one. Suspended sediment yields from the burned plot were more than two orders of magnitude higher than the control plot in all the simulated events.

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