



A Comparison of field and laboratory methods for determining the fire effects on water chemistry

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The main objective of this work is testing the effectiveness of laboratory studies in the determination of fundamental parameters to determine the composition of surface water affected by wild fires and check the advantages and disadvantages of both methodologies. Cations, nitrate, electrical conductivity and pH values in leachates obtained in laboratory rainfall simulations from blocks of burnt Leptic Umbrisol with unaltered structure (microcosm), were compared with 2-years data obtained from three burnt catchments and three unburned catchments where the soil samples were taken (macrocosm). The comparison of maximum and minimum concentrations of nutrients at macrocosm and microcosm level shows much lower values at catchment scale. These differences, if expressed as the ratio between the average of the maximum and minimum of each parameter on the two scales analyzed, reveal values up to 93 times higher in the case of calcium, potassium 37 times, 11 times in magnesium and 3 times in sodium and nitrate. For catchments unaffected by the fire also shown differences in the two scales but smaller. Laboratory rainfall simulations using unaltered soil samples was shown as a useful method for studying the processes of washing substances in soils subjected to similar thermal shock to which occur in forest fires. The fact of controlling rainfall and fire severity and the maintenance of natural conditions, occupy an intermediate position between classical laboratory studies and field studies with plots. This method can be offered ample opportunities for research, so far little explored.