Geophysical Research Abstracts, Vol. 7, 06032, 2005
SRef-ID: 1607-7962/gra/EGU05-A-06032

The response of water repellency to wildfire in Australian eucalypt forests

G. Sheridan, P. Lane, P. Noske, J. Costenaro
School of Forest and Ecosystem Science, University of Melbourne, Australia

The complex inter-relationships between forest fire, and; a) soil water repellency, b), infiltration capacity, c) erosion, and d) nutrient generation, are poorly understood. Limited understanding of the interaction between these processes, and catchment exports of sediment and nutrients, hinders the successful prediction and modelling of the affect of fire on forest water quality. Findings are presented from a 2 year research project aimed at quantifying the temporal change in these soil properties and processes as a native Eucalypt forest in SE Australia recovers from severe wildfire. Field research methods included rainfall simulation, flow shear experiments, unconfined flow experiments, soil water-repellency tests, and catchment soil surveys. Rainfall simulation results showed that immediately following the fire, saturated hydraulic conductivity values in both bunt and unburnt areas were similar. However following the first rainfall season after the fire, the conductivity of the burnt areas decreased to about, 25 mm/h while in the unburnt areas it increased to $>$ 1500 mm/h. In the following summer, conductivity values had again returned to similar values in both the burnt and unburnt areas. Results from the rainfall simulation experiments were supported by results from the unconfined overland flow experiments. These seasonal and fire induced changes in soil hydraulic conductivity are combined with erosion data from rainfall simulation and overland flow experiments, and detailed assessments of soil water repellency, to improve our ability to predict nutrient and sediment generation rates from burnt forests at the hillslope scale.