



Fire, water repellency, soil hydraulic conductivity, and overland flow generation in SE Australian forests

Gary Sheridan, Jane Cawson, Petter Nyman, Marita McGuirk, Akiko Ono, Patrick Lane, Phillip Noske, and Hugh Smith

The University of Melbourne, School of Forest and Ecosystem Science, Melbourne, Australia (sheridan@unimelb.edu.au)

Fire can alter the water repellency, infiltration characteristics and overland flow generation of forest soils, however the nature of the relationship between these properties and processes is complex in space and time, and is therefore poorly understood. Priority research questions include; To what degree does fire alter the water repellency of forest soils subject to natural seasonal oscillations in water repellence? What causes soil water repellency to change under field conditions? How does increased water repellency affect soil hydraulic properties (eg. “saturated” and unsaturated conductivity). What is the significance of these changed hydraulic properties for overland flow generation and erosion at the hillslope scale? How do the answers to the above questions vary with soil and forest characteristics? This presentation draws on the results from field studies over the last 8 years in SE Australian forests, and the existing literature, to highlight the complex relationship between fire and soil erosion at the hillslope scale. The presentation concludes with suggestions for future research directions to continue to address these important questions.