Geophysical Research Abstracts
Vol. 18, EGU2016-10907, 2016
EGU General Assembly 2016

An in-situ field plot study of hillslope runoff connectivity and scaling

Gary Sheridan, Patrick Lane, Leila Pourfathali Kasmaei, and Christoph Langhans
The University of Melbourne, School of Forest and Ecosystem Science, Melbourne, Australia (sheridan@unimelb.edu.au)

The critical role of connectivity on the spatial scaling of hillslope surface runoff rates has long been recognised, however experimental data are uncommon, constraining the development of new conceptual models. In this study hillslope runoff from natural rainfall events was measured at 1 minute intervals from a total of 40 runoff plots on burned forested hillslopes varying in length from 0.5m to 16m length on six contrasting soil types between 2010 to 2015. The data universally show the dramatic reduction in per unit area runoff generation with increasing slope length that has been documented frequently from experimental work over the last 80 years. However the new data also show runoff relationships with slope length that are surprising and counter-intuitive. For example, slope length related reductions in runoff volumes per unit contour width (in contrast to runoff volume per unit area) are frequently observed at some threshold slope length, an outcome that is not conceivable based on current conceptual models of infiltration and hillslope runoff generation. In this presentation this unexpected result will be explored and a range of recent field experiments to identify the processes involved will be discussed.