



## **A new field method to characterise the runoff generation potential of burned hillslopes**

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The prediction of post fire runoff generation is critical for the estimation of post fire erosion processes and rates. Typical field measures for determining infiltration model parameters include ring infiltrometers, tension infiltrometers, rainfall simulators and natural runoff plots. However predicting the runoff generating potential of post-fire hillslopes is difficult due to the high spatial variability of soil properties relative to the size of the measurement method, the poorly understood relationship between water repellence and runoff generation, known scaling issues with all the above hydraulic measurements, and logistical limitations for measurements in remote environments. In this study we tested a new field method for characterizing surface runoff generation potential that overcomes these limitations and is quick, simple and cheap to apply in the field. The new field method involves the manual application of a 40mm depth of Brilliant Blue FCF food dye along a 10cm wide and 5m long transect along the contour under slightly-ponded conditions. After 24 hours the transect is excavated to a depth of 10cm and the percentage dyed area within the soil profile recorded manually. The dyed area is an index of infiltration potential of the soil during intense rainfall events, and captures both spatial variability and water repellence effects. The dye measurements were made adjacent to long term instrumented post fire rainfall-runoff plots on 7 contrasting soil types over a 6 month period, and the results show surprisingly strong correlations ( $r^2 = 0.9$ ) between the runoff-ratio from the plots and the dyed area. The results are used to develop an initial conceptual model that links the dye index with an infiltration model and parameters suited to burnt hillslopes. The capacity of this method to provide a simple, and reliable indicator of post fire runoff potential from different fire severities, soil types and treatments is explored in this presentation.