



Sub-centimeter digital terrain models for understanding surface flow processes

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Scaling in random roughness (RR), depression storage capacity (DSC), and surface overland flow pathway connectivity is investigated using a high resolution DTM generated from a CYRA 2500 Model laser scanner. Three million points were scanned randomly throughout a 20 m by 10 m area in a recently burned mountainous watershed containing mostly conifers in eastern British Columbia. Points were gridded to a resolution of 7.5 x 7.5 mm and a second DTM to 1 cm by 1 cm. This DTM differs from most of the previous studies of micro-topographical RR and DSC as the surface was not scoured to remove vegetation and dead, woody debris prior to scanning. Statistics were compared for each DTM to discuss goodness of fit. The RR index, DSC, and other surface characteristics determined from variograms and other geospatial tools were determined at a variety of scales. Preliminary results indicate that these terrain surface qualities vary with scale due to the incorporation of varying degrees of surface vegetation and debris. Surface overland flow connectivity was investigated to determine possible pathways of sediment movement at various scales.