



## **Spatial patterns of duff consumption during forest fires**

**C. Valeo** (1), J. Davidson (2), L. D. Raaflaub (1), K. Miyanishi (3), E. A. Johnson (4)

(1) Geomatics Engineering, University of Calgary, Calgary, AB, T2N 1N4, Canada  
(valeo@geomatics.ucalgary.ca / Fax: +01 403 284-1980), (2) Civil Engineering, University of Calgary, (3) Geography, University of Guelph, Canada, (4) Biological Sciences, University of Calgary

Duff consumption from forest fires in the Canadian Boreal forest is known to be dependent on the depth, density and moisture content of the organic matter layer of the forest floor. Consumption down to mineral soil is essential to forest regeneration and reliable modeling of this duff consumption can provide information to forest managers on regrowth patterns and mitigation practices. Spatial patterns of duff consumption are not random because of the dependency on moisture content, which is a function of interception and possibly hillslope position. Recent hypotheses extolling the dependency on hillslope position have yet to be proven conclusively in the field.

Laboratory studies are currently being conducted by the authors to determine variation in duff and soil moisture content for samples taken from Black Spruce, White Spruce, Jack Pine and Lodgepole Pine stands in the northern Boreal forest of Canada. Preliminary estimates indicate little interaction between the mineral soil and the organic matter layer, indicating that hillslope position may not provide a strong factor in duff moisture. Furthermore, a spatial statistical analysis was conducted on duff consumption mapped at a high resolution for twenty-one 100 m<sup>2</sup> areas of Black Spruce and Jack Pine after a large fire in the northern Boreal forest. The analysis was conducted to determine the dominance of the interception process on duff consumption as opposed to other factors related to moisture content such as hillslope position. Current analysis indicates that duff consumption is highly correlated to distance from the tree (a surrogate for interception) but hillslope position may provide some influence for duff consumed to mineral soil.