Applications of terrestrial LiDAR, infrared thermography and photogrammetry for mapping volcanic rocks in southern British Columbia

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Remote sensing methods are widely used in geological applications, as many outcrops are difficult to access. Terrestrial LiDAR, infrared thermography, and photogrammetry are used at two field sites in British Columbia: the Cheakamus Valley Basalts and Chilcotin Group Basalts. The physical properties of the rock at each field site were studied through remote sensing, and compared to analyses completed in the laboratory as well as traditional field contact mapping. Units, contacts, alteration, structures, and volcanic textures were distinguished on the basis of patterns in LiDAR reflectivity, thermal contrast, differential erosion, and RGB values in photographs. Laboratory thermal testing, field observations, and samples from the slope substantiated these results. A virtual field site of the Chasm site was constructed from the remote sensing data, and in conjunction with these analyses, this research clearly demonstrates the significant potential of remote sensing in mapping otherwise inaccessible volcanic rock masses.