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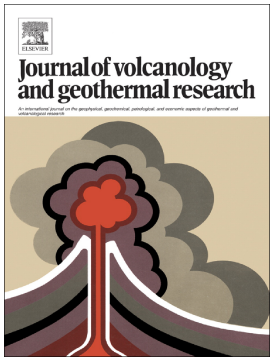

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Thermal history of volcanic debris flow deposits on the eastern flanks of Mt Taranaki, New Zealand: implications for future hazards

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Abstract

We use palaeomagnetic methods to decipher the thermal histories of a succession of massive to weakly stratified debris flow deposits (Ngatoro and Te Popo formations) of late Holocene age located on the eastern lower flanks of Mt Taranaki/Egmont Volcano, western North Island, New Zealand. Results from two sites, Vickers Quarry and Surrey Road Quarry, both c. 9.6 km from the present-day summit, enable us to distinguish between clast incorporation temperatures of about 400°C and emplacement temperatures between 150 and 200°C, consistent with observation of superficial charring and desiccation of outer podocarp-hardwood tree trunks at Vickers Quarry. Analysis of palaeomagnetic directions and lithofacies architecture suggest that these deposits were likely initiated as a closely-spaced succession of block-and-ash flows (BAFs) that rapidly cooled as they descended the volcano flanks. Radiocarbon chronology and the widespread occurrence of a palaeosol between the products of the preceding Inglewood eruptive phase, c. 3.4 cal. ka B.P., and the overlying Ngatoro Formation suggest that these two events are temporally unrelated. Certainly, there is no field evidence of contemporaneous explosive volcanic activity that might be related to the

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