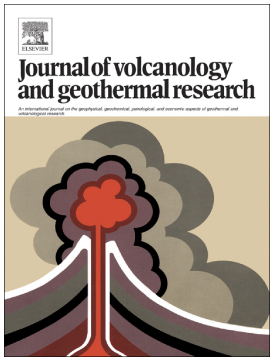

Surface morphology of caldera-forming eruption deposits revealed by lidar mapping of Crater Lake National Park, Oregon – Implications for deposition and surface modification

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Surface morphology of caldera-forming eruption deposits revealed by lidar mapping of Crater Lake National Park, Oregon– Implications for deposition and surface modification

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Abstract

Large explosive eruptions of silicic magma can produce widespread pumice fall, extensive ignimbrite sheets, and collapse calderas. The surfaces of voluminous ignimbrites are rarely preserved or documented because most terrestrial examples are heavily vegetated, or severely modified by post-depositional processes. Much research addresses the internal sedimentary characteristics, flow processes, and depositional mechanisms of ignimbrites, however, surface features of ignimbrites are less well documented and understood, except for comparatively small-volume deposits of historical eruptions. The ~7,700 calendar year B.P. climactic eruption of Mount Mazama, USA, vented ~50 km^3 of magma, deposited first as rhyodacite pumice fall and then as a zoned rhyodacite-to-andesite ignimbrite as Crater Lake caldera collapsed. Lidar collected during summer 2010 reveals the remarkably well-preserved surface of the Mazama ignimbrite and related deposits surrounding Crater Lake caldera in