

The stratigraphy, age and correlation of post-18 cal. ka eruptive products from Chaitén Volcano within the super-humid (western) to semi-arid (eastern) Andean environments straddling southern Chile & Argentina

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Key words: Chaitén Volcano, eruption history, rhyolite, Andean volcanism

The 2008 eruption of Chaitén Volcano in southern Chile was the first explosive rhyolitic eruption to have occurred in the last century and provided an unprecedented scientific opportunity to examine all facets of the eruption ranging from magma rheology/ascendency rates to ash-fall effects on biota and infrastructure. Despite the flurry of research activity in the aftermath of the 2008 eruption very little was then known about its eruptive history. Up to very recently it was thought that the last eruption prior to the 2008 event occurred c. 9600 14C years ago. Since that initial survey, a number of subsequent researchers have recognised additional eruptive products but their stratigraphy, age, correlation and geochemical attributes have not been systematically described and/or recorded. In this study, we provide a very detailed examination of the andic cover-beds adjacent to Chaitén Volcano, record a series of hitherto unknown rhyolitic eruptive products and place all previous observations firmly within a coherent stratigraphic framework and eruptive inventory that will ultimately be useful for accurately determining long-term eruptive tempo as well as corresponding temporal changes in magmatic evolution. Through major and trace element glass shard geochemistry we are able to confidently verify eruptive source and indicate that Chaitén Volcano has been continuously but intermittently active as far back as c. 18 cal. ka BP. Thereafter the eruptive record has been essentially obscured and/or all but erased by widespread Andean glaciation during the Last Glacial Maximum (LGM) to late Last Glacial period. The only opportunity of perhaps retrieving pre-18 cal. ka eruptive record for Chaitén Volcano will likely come from the study of proximal intra-caldera volcanoclastic successions and/or equivalent-aged distal tephra found within high-resolution lake records retrieved from



Cities on Volcanoes 9
November 20-25, 2016
Puerto Varas, Chile



regions located downwind (east) from Chaiten Volcano and beyond the overwhelming influence of Andean glaciation.