



## **Plumbing the roots of andesite volcanoes: evidence from short-duration eruptions in the Taupo Volcanic Zone, New Zealand.**

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The Taupo Volcanic Zone is one of the most productive silicic magmatic systems on Earth. Since its inception, around 12,000 – 15,000 km<sup>3</sup> of rhyolite have been erupted, mainly as ignimbrite that now blankets much of the Central Volcanic Region. Accordingly, much of the underlying geology is obscured, including andesite edifices that may be the essential precursors to developing large silicic magma chambers in the crust. The large active andesite volcanoes at the southern extremity of TVZ have complex histories and understanding how these volcanoes work is vital to understanding magmatism in the entire TVZ, including the petrogenesis of the voluminous rhyolites.

Our aim is to study in detail, single eruptions that occurred over short time-scales (days, weeks or months). Here we report new data from events on Tongariro (Oturere Valley), Ruapehu (Ohakune Craters and Rangataua Flows) and Edgecumbe. We have collected multiple samples from these events, where possible in the context of volcano stratigraphy, in an attempt to unravel the complexity of andesite magma systems. Further to our observations for the 1995/96 eruptions on Ruapehu Volcano (Gamble et al, 1999) we show significant variations within these discrete eruption events.

For example the Oturere Valley flow of Tongariro shows a range of SiO<sub>2</sub> compositions from 60.5 to 63.2wt%. SiO<sub>2</sub>-oxide and incompatible trace elements (e.g. Rb, Ba, and Zr) plots invariably show strongly correlated linear trends. In contrast, at Ohakune Craters, samples collected with respect to stratigraphic position are poorly correlated, evidently suggesting a more complex history.