

## **Karioi volcano, western North Island, New Zealand: a behind arc polygenetic intraplate-convergent margin volcanic complex**

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Karioi is a 756 m high Late Pliocene to Early Pleistocene basaltic shield volcano surmounted by a low-angle composite cone. It is situated 130 km behind the active Taupo Volcanic Zone (TVZ) and 250 km above the subducted Pacific slab, at the northwestern end of a 65-km long chain of volcanoes on the Tasman Sea coast of western North Island, New Zealand. Karioi volcano is constructed of lavas derived from two contrasting basalt magma series: an arc magma series, and an alkalic intraplate series. Both series of lavas are stratigraphically intercalated, with no evidence of any significant time break between them. The alkalic basalts have geochemical compositions typical of other intraplate basalt volcanic fields of western and northern North Island, i.e. steep REE patterns indicating derivation from a garnet peridotite source, low LIL/HFS element ratios, and Sr, Nd and Pb isotopic compositions with a HIMU-OIB source. The arc lavas are primitive low SiO<sub>2</sub> ankaramites with compositions typical of subduction-derived convergent margin magmas, i.e. high LIL/LREE and LIL/HFS element ratios, and Sr, Nd, and Pb isotopic compositions derived from a depleted mantle component, a component from subducted oceanic lithosphere, and possibly a minor component from subducted sediments. Some stratigraphically younger lavas on the summit cone of Karioi have more evolved high-K andesitic compositions, but others are basaltic and have transitional compositions, possibly representing mixing of intraplate and arc type magmas. Although Karioi volcano is surrounded by a contemporaneous monogenetic volcanic field, the intraplate lavas of Karioi have constructed a basal polygenetic lava shield sequence. Also, since they are intercalated and contemporaneous with arc lavas, they cannot be derived from a recent deep mantle plume source because of the existence of the underlying subducted slab.