# Insights in Cenozoic intraplate magmatism in Tasmania, Australia, using Sr-Nd-Pb isotopes

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Typical explanations for intraplate, dominantly mafic magmatic provinces often invoke the role of upwelling thermal mantle plumes, resulting in linear volcanic chains due to plate motion. The role of competing asthenospheric and lithospheric mantle sources however, still remains a source of on-going debate, as not all intraplate volcanic provinces show a clear age-relationship with plate motions.

The Tasmanian Cenozoic volcanic fields form an example of an intraplate magmatic province with no clear spatial age-relationship. Compositions span a wide range from highly undersaturated olivine melilitite and nephelinite to basanite, *ne*-hawaiite, olivine basalt and *Q*-tholeiite. In this study, new Sr-Nd-Pb isotopic data combined with major and trace element geochemistry show that the most undersaturated rocks are most enriched in incompatible elements and have most primitive Sr and Nd isotope ratios. Sr-Nd-Pb isotopes of the most oversaturated rocks tend to trend towards values of an older magmatic event preserved as the 'Jurassic dolerites', which are part of the Ferrar Magmatic Province. Several sources can be identified as Sr and Nd isotope values form an array, going from Pacific MORB and HIMU towards Jurassic dolerites. Pb isotope values confirm the HIMU component in the array. Polybaric and different amounts of melting have also contributed to the wide range of compositions observed, with most undersaturated rocks originating at higher pressures and thus higher depth and smaller amounts of melting.

We suggest that different partial melting conditions combined with mixing of different MORB and HIMU asthenospheric and lithospheric sources containing remnant Jurassic signatures, have resulted in the wide range of compositions of Cenozoic volcanic rocks observed today.