

## **Crust-Mantle Interaction and the Formation of Granitic Terranes in Eastern Gondwanaland**

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The Tasman is a composite orogen, host to Cambrian to Late Permian granites. It is dominated by lithospheric extension rather than compression. Although this is a convergent margin, the magmatic history of the belt is either extensional or as "in-board" fold belts, well west of subducting oceanic slabs. Subduction-controlled magmas inherit their geochemical characteristics from the wedge and subducting slab, but the granites in the Tasman Orogenic Belt have compositions that change in concert with changing lithospheric / crustal strain history.

The cycle starts with crustal thinning associated with basin formation, turbiditic sedimentation and the production of anorogenic mafic magmas. This is followed by basin inversion with deformation of sedimentary fill. Compressional interludes are often short, lasting <~ 25 million years. "Granitic" magmatism ranging from S- to I-type follows the on-set of crustal thickening, though the majority of granite production tends to be late- to post-tectonic.

At least in the Cambrian Delamerian Orogen, in the western part of the belt, convergent deformation is terminated by extension associated with exhumation, erosion and rapid metamorphic cooling and decompression. (Turner et al., 1992, 1996).

Mantle-derived magmatic activity persists through the orogenic history as mafic dyke complexes, but during compression is only indirectly identified by its isotopic signature as a component of syn-tectonic granite. Post-tectonic granites are often mantle-dominated A-types.