



Geodynamic models assist in determining the South Loyalty Basin's slab location and its implications for regional topography

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In the Western Pacific, two competing kinematic reconstructions exist: one with wholly westward subduction of the Pacific plate at what is now the Tonga-Kermadec trench and one combining a degree of eastward subduction under what has been termed the New Caledonia trench. New seismological observations indicate that eastward subduction could explain the existence of a fast anomaly, the hypothesised South Loyalty Basin slab, below the 660km transition zone distinct from the fast anomaly aligned with the Tonga-Kermadec slab.

A plate reconstruction dated from the suggested initiation of New Caledonia subduction in the Eocene has been developed. This reconstruction is then used to predict the thermal history of the region and together provide kinematic and thermal boundary conditions for a regional mantle convection model. The model-predicted location of the South Loyalty Basin slab's location will be presented along with the location's dependence on the mantle rheological parameters and the hotspot reference frame. The implications for the topography of the region will also be discussed.