Unveiling the secrets of the Queen Charlotte Basin

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In July 1988, a large seismic reflection and refraction survey was carried out in the Queen Charlotte Basin, north of Vancouver Island, in order to study its structure and evolution. The refractions and wide angle reflections from a 6300 cubic inch airgun were recorded on 19 land-based single channel seismometers placed along the basin. Thirteen seismic lines were modelled. The results of line 3 are the focus of this presentation.

The Queen Charlotte Sound is situated in an area containing a large plate-boundary transform fault, a triple junction and a subduction zone. Previous lines showed that the Sound is extensional with Moho depth ranging from 26 to 28 km in the northern part of the Sound and 18 km in the south. Line 3 lies in the northern Sound and was modelled using both seismic and gravity data.

The seismic modelling gives upper, mid and lower crustal velocities very close to those adjacent lines, one of which intersects line 3. The Moho depth is also comparable to the previous established depth of 26 to 28 km.

The gravity model defines the boundary between the oceanic and continental crust as well as constraining the seismic model.