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**New Zealand Wide model 2.2 seismic velocity and Qs and Qp models for New Zealand**

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New Zealand Wide model 2.2 has a seismic velocity model for New Zealand developed from local-earthquake tomography studies. It is updated, from nzwide2.1 (zenodo.org/record/1043558), to incorporate results from the western North Island (Eberhart-Phillips and Fry, 2017) and the southern Hikurangi Cook Strait region (Henrys, et al., 2020). The Cook Strait results were interpolated and merged into the NZwide model and then additional inversion including some Kaikoura aftershocks was carried out to assure the model is appropriate for regional use.

The Qp model 2.2 is updated from Qpnzw1 (Eberhart-Phillips et al., 2015), to incorporate results from the eastern North Island (Eberhart-Phillips et al., 2017) and southern South Island (Eberhart-Phillips et al., 2018).

There has not been New Zealand wide Qs coverage until this year, and the NZwide 2.2 Qs model is the first complete Qs model. We are using the version name **nzw2.2** to denote all the seismic property models since many applications require all the parameters. The Qs model 2.2 incorporates results from the eastern North Island (Eberhart-Phillips et al., 2017), western North Island and mantle wedge (Eberhart-Phillips et al., 2020), northern South Island (Eberhart-Phillips et al., 2014), and southern South Island (Eberhart-Phillips et al., 2018).

The models are provided in tables, where the Spread Function (SF) shows the resolution, such that where SF<4, there is little information.

vlnzw2p2dnxyzltln.tbl.txt

Qpnzw2p2xyzltln.tbl.txt

Qsnzw2p2xyzltln.tbl.txt

There are also simul format velocity and Q files.

vlnzw2p2.mod.txt

Qpnzw2p2.mod.txt

Qsnzw2p2.mod.txt

And map plots with white lines denoting limits of adequate data.

mapvpvpvsnzw2p2.pdf

mapQpnzw2p2.pdf

mapQsnzw2p2.pdf

Velocity and Q at any point within the 3D gridded models are defined by linearly interpolating between nodes.

The models use Transverse Mercator coordinate transformation with a central meridian= 173, and counterclockwise rotation of 140.  Earth-flattening transformation is used for velocity during ray-tracing. The depths are relative to sea-level. Density has been included in the velocity table, by using an empirical relationship (Gardner et al., 1974; Hill, 1978).

References:

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