

VUW contributions to Hikurangi research proposed or in process

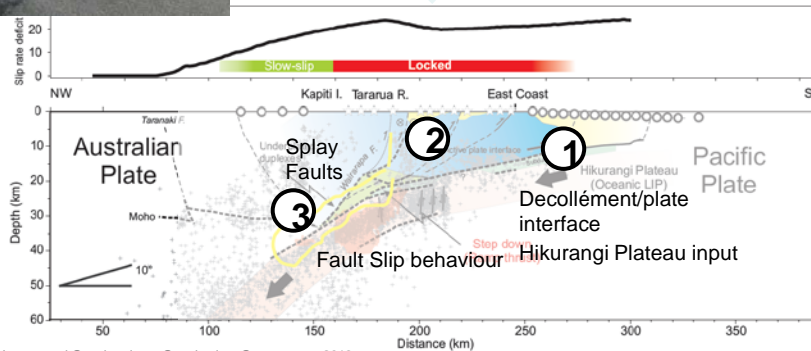
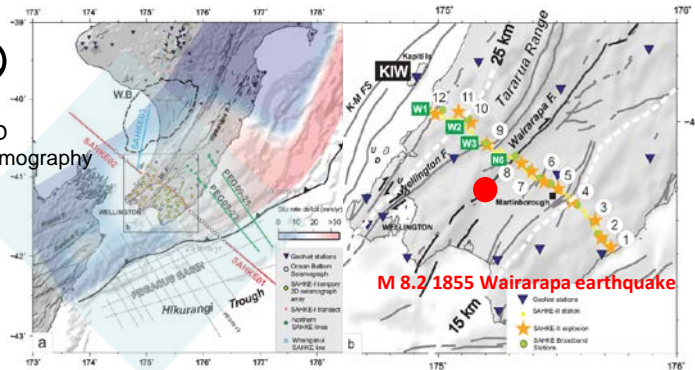
- SAHKE studies
 - LAB/Receiver Functions/Anisotropy
- SEASI deployment: Plate structure
- Volcano-tectonic interactions:
Geodesy and seismology and volcanic
activity

SAHKE 2009 - Present: Active and passive seismology GNS, VUW, ERI, USC



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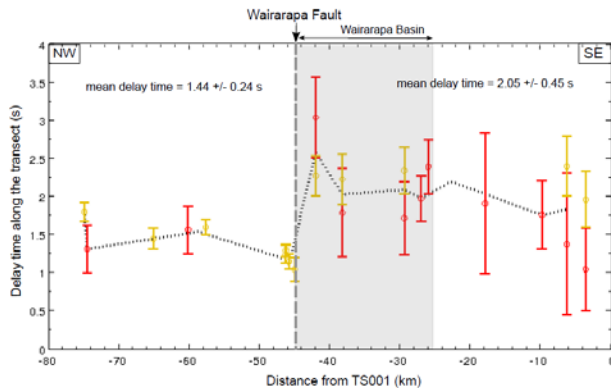
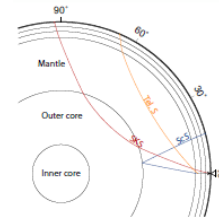
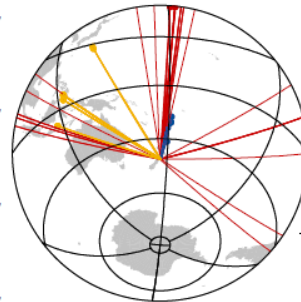
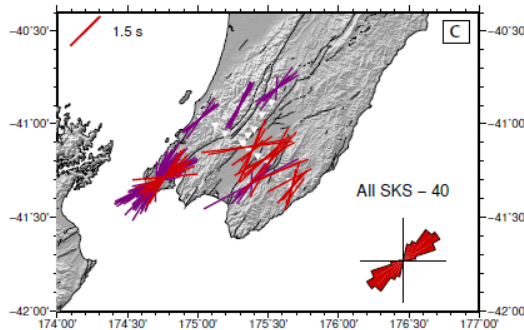
3D
tomography



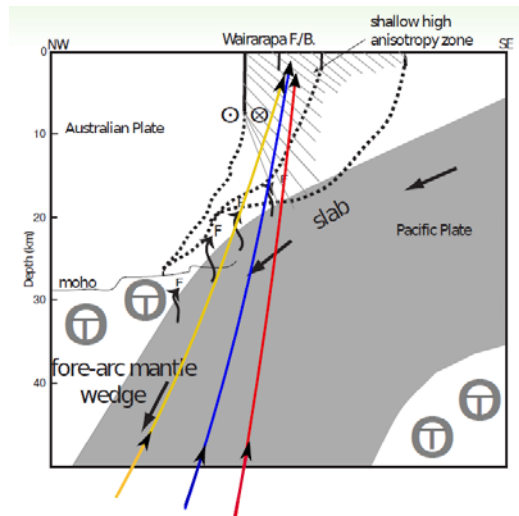
Henrys et al Geochemistry, Geophysics, Geosystems, 2013

On going
studies

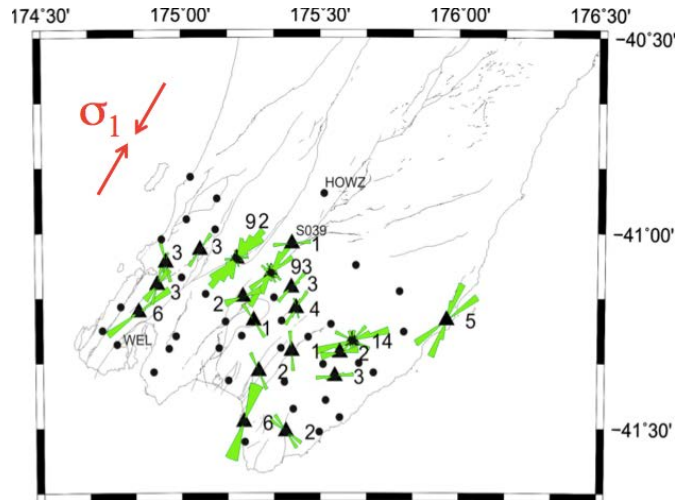
Teleseismic S-wave splitting



Dt changes by > 0.5 s in 4 km
Must be strong crustal effect



Preliminary results-Local Earthquakes



(Preliminary results from AGU Poster: Savage et al., 2012)

- Rose plots show fast direction measured at SAHKE stations
- Direction of maximum horizontal compressive stress from (Townend et al., 2012)

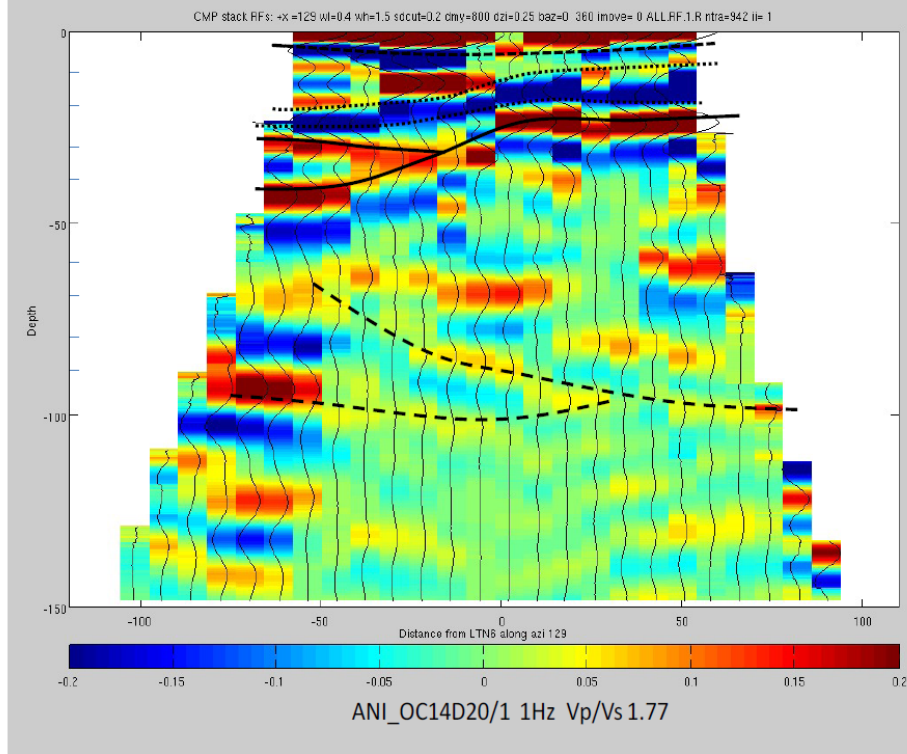


Figure 64 Best and Final CCP stack. Interpreted using OC14D20 at 1Hz with a VP/Vs =1.77. Dashed black line showing discontinuities in the upper mantle at depths <100 km, dipping in the opposite direction to the dip of the downgoing slab. Solid black line showing down going slab with imbricated structure to the west (left). Small black dotted line delineating top and bottom of the low velocity layer (LVL) at the top of the down going slab. Short dashes indicate a low velocity layer at shallow crustal depths.

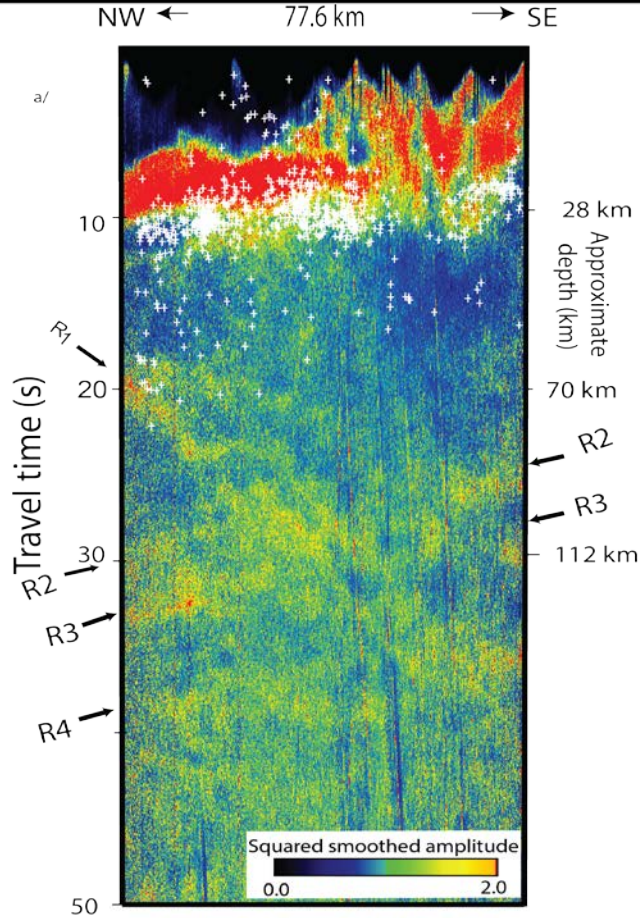
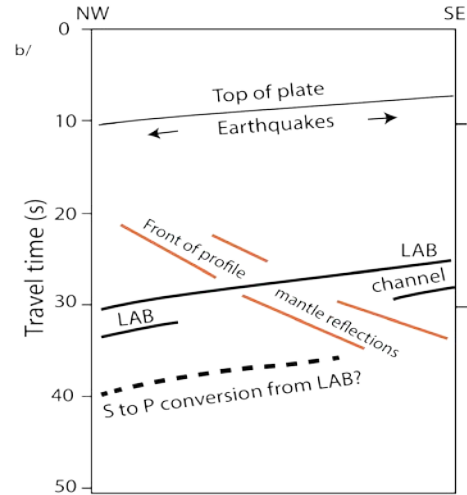


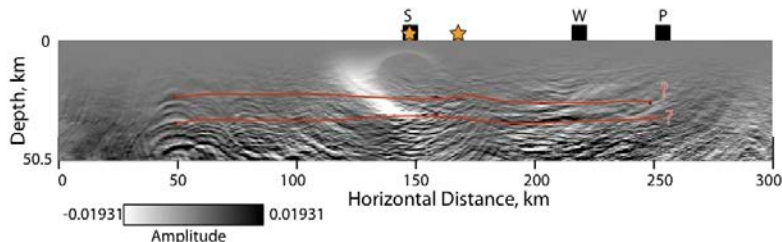
Fig. 3 Stern et al



Checks:

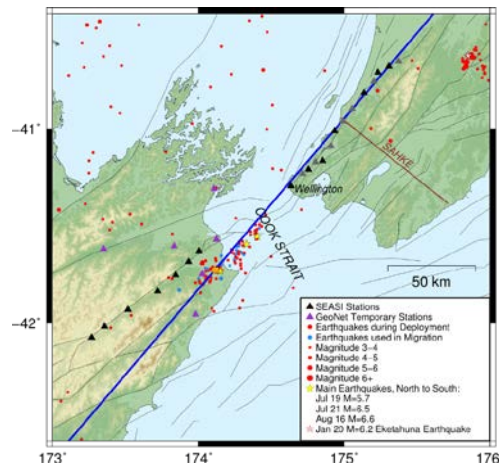
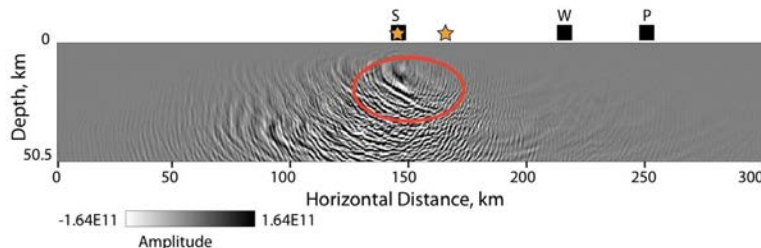
1. Side swipe ?
2. Multiples ?
3. Earthquakes ?

SEASI – Imaging Parallel to the Southern Hikurangi Margin



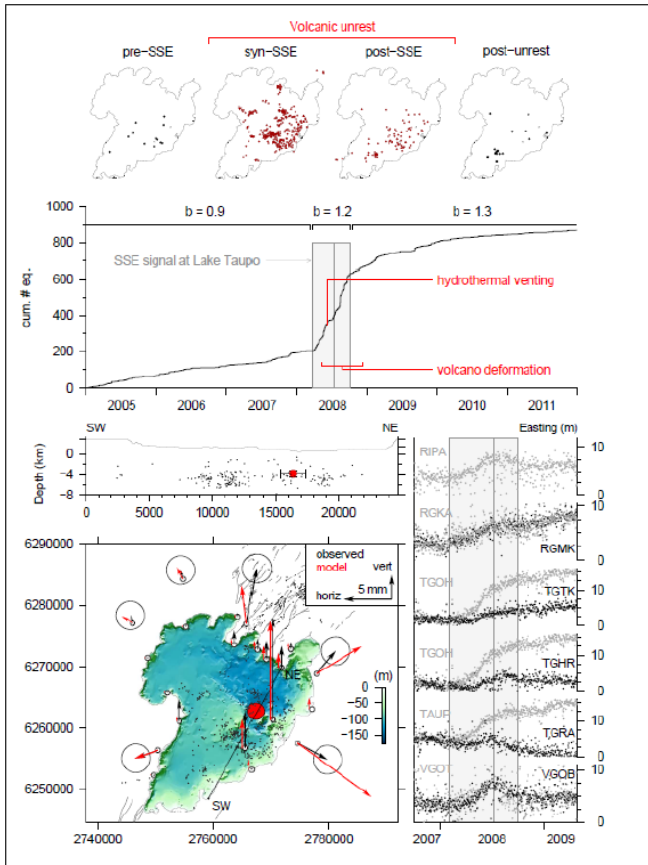
Top: Wedge at 25-35 km depth – possibly underplating seen by SAHKE (Henry et al., 2013). (Dip filtered to emphasise horizontal reflectors.)

Bottom: Reflector with apparent dip of 30° at 15-25 km depth. (2-4 Hz bandpass filtered.)



SEASI stations: black triangles
Migrated profile: blue line
Used (relocated) earthquakes: blue circles

Interactions between Slow slip & volcanoes



- Katrina Jacobs
- Nico Fournier
- Martha Savage
- Calculate strain and seismic properties near volcanoes at time of slow slip events on Hikurangi
- Numerical modelling of strain

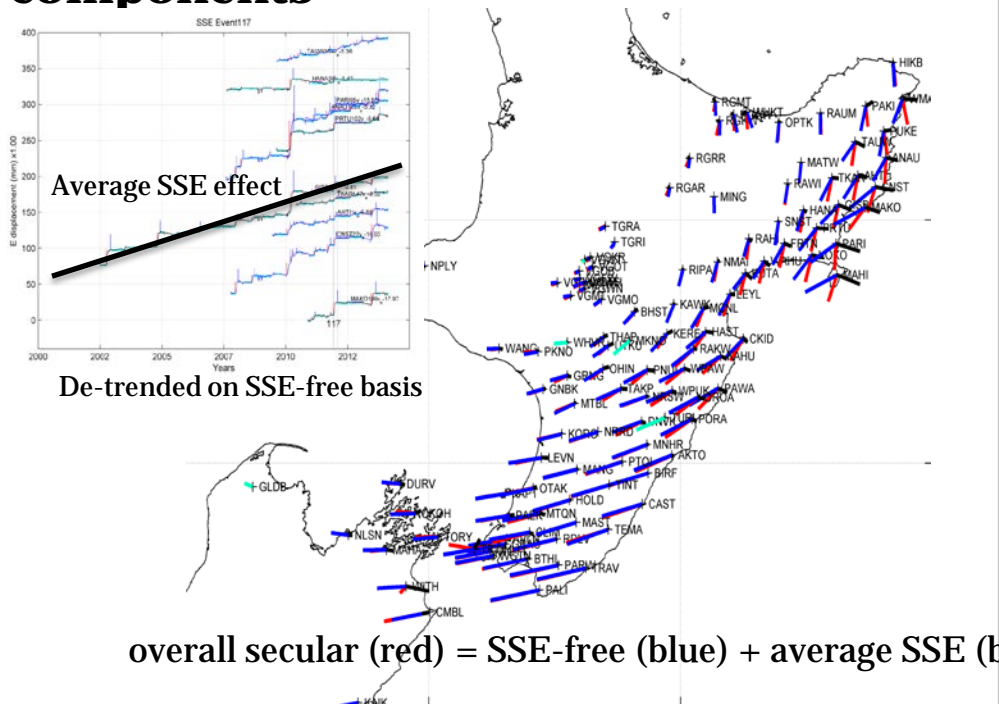
A catalogue of Hikurangi, New Zealand, Slow Slip Earthquakes: Preliminary results

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Secular velocities can be split into components



Regional average strain rates

SSE-free principal strain rates



Average SSE principal strain rates

