# Imaging the Plate Interface at the Hikurangi Subduction Margin, New Zealand

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Along the Hikurangi margin on New Zealand’ s east coast (Figure 1), plate-coupling changes from weakly coupled in the north to locked in the south. Slow slip events occur at shallow depth where the margin is weakly coupled. The conditions needed for slow slip are poorly understood but the presence of fluid and/or clay rich sediments may play an important role in controlling the frictional strength of the interface and thus inter-seismic plate coupling.
Magnetotelluric (MT) measurements from the northern part of the Hikurangi margin have shown that a dipping electrically conductive zone is present above the subduction interface and it is interpreted to mark fluid and/or clay rich sediments within the subduction-interface-shear-zone. A more detailed 3-D follow-up study showed that the plate is heterogeneous and higher resistivity areas of the conductive interface correlate with similar areas of seismicity within a few km of the interface. This correlation suggests that more resistive regions correspond to regions with greater frictional-strength.
A joint project between the Royal Society of New Zealand and the Japan Society for the Promotion of Science in currently underway to test this correlation. 160 MT site have been collected across the transition from weakly to strongly coupled plate interface (Figure 1) in Hawke’ s Bay. Here we present the results of the data analysis and preliminary 3-D inverse modelling.

**Figure 1**: Map of Hikurangi subduction interface plate coupling, with a coupling coefficient of 1 being fully locked. Dashed contours show the depth to the to the subduction interface. The black arrow shows the motion of the Australian Plate relative to the Pacific. Locations of the MT measurements in the northern part of the Hikurangi margin are shown by yellow dots. Green dots show a line of measurements in the southern part of the margin and red dots the new MT sites of the joint RSNZ - JSPS research project. Insert shows the location of the Hawke’ s Bay MT survey in relation to Hikurangi subduction zone where the Pacific Plate is being subducted beneath the North Island.

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