

# HOBITSS: Hikurangi ocean bottom investigation of tremor and slow slip

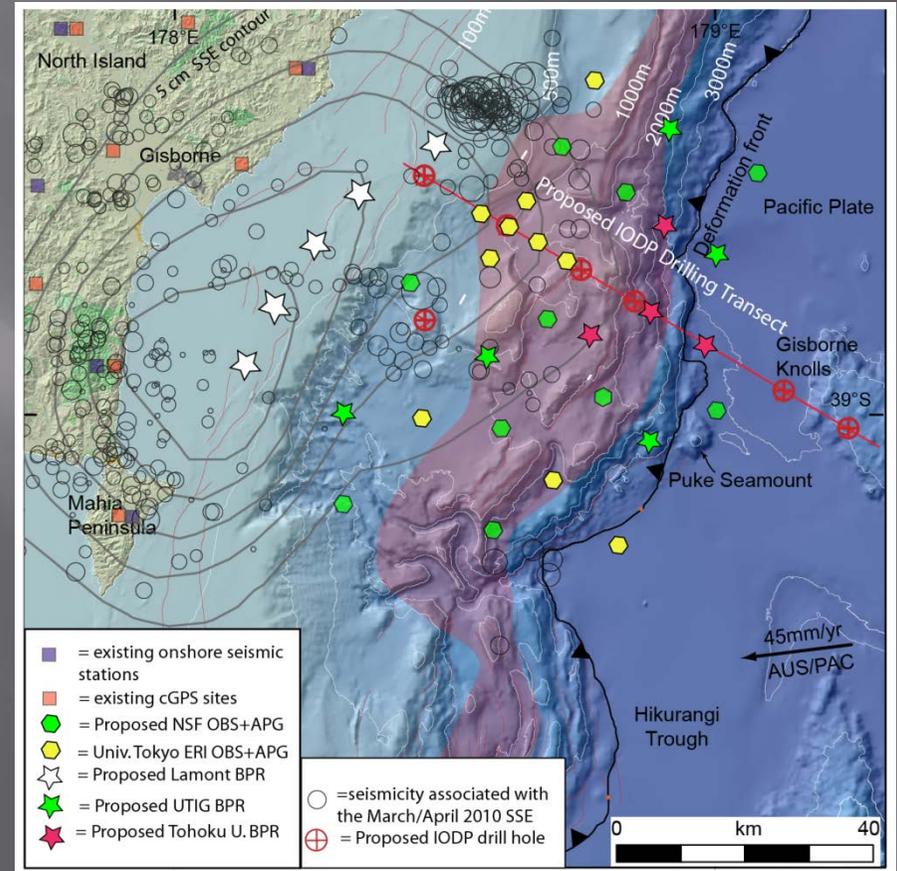
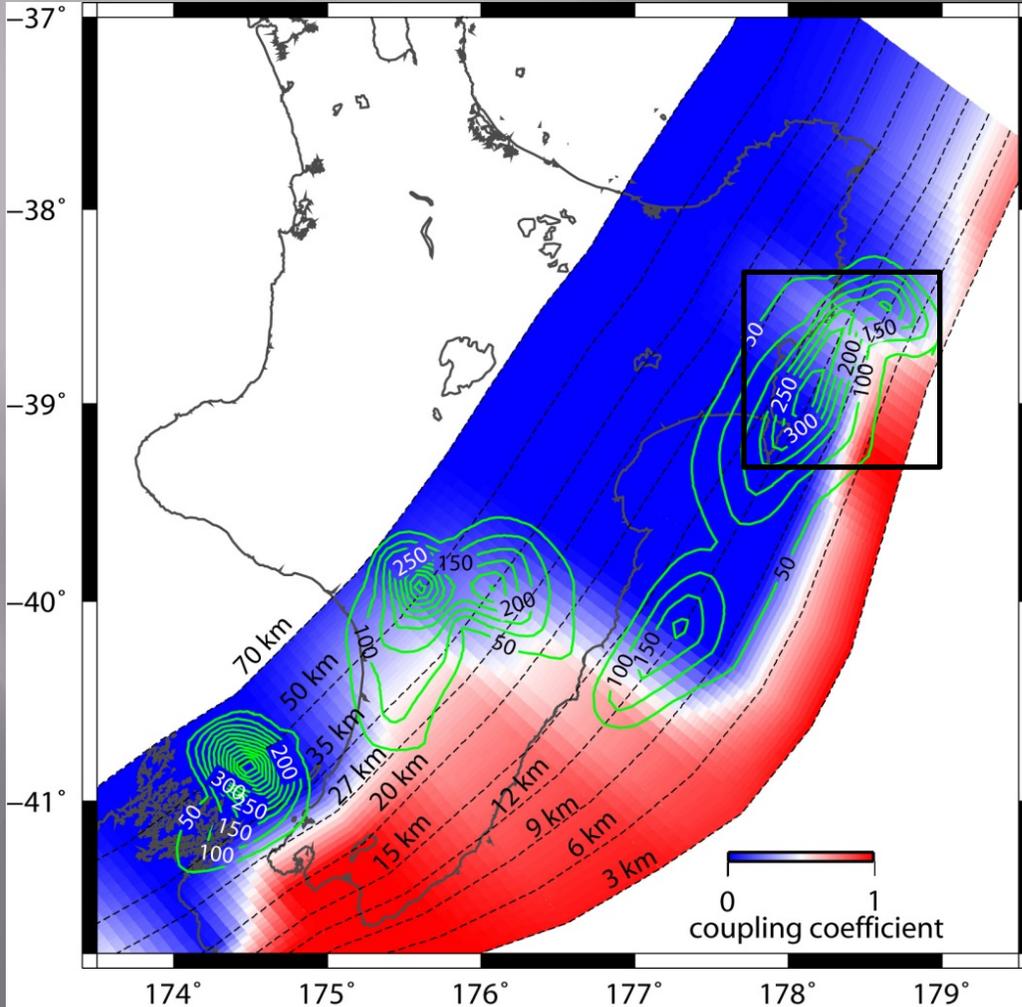


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New Zealand: Stuart Henrys, Bill Fry, Stephen Bannister

# HOBITSS is a seafloor geodetic and OBS investigation of shallow (<5-10 km depth) SSES at north Hikurangi (offshore Gisborne)

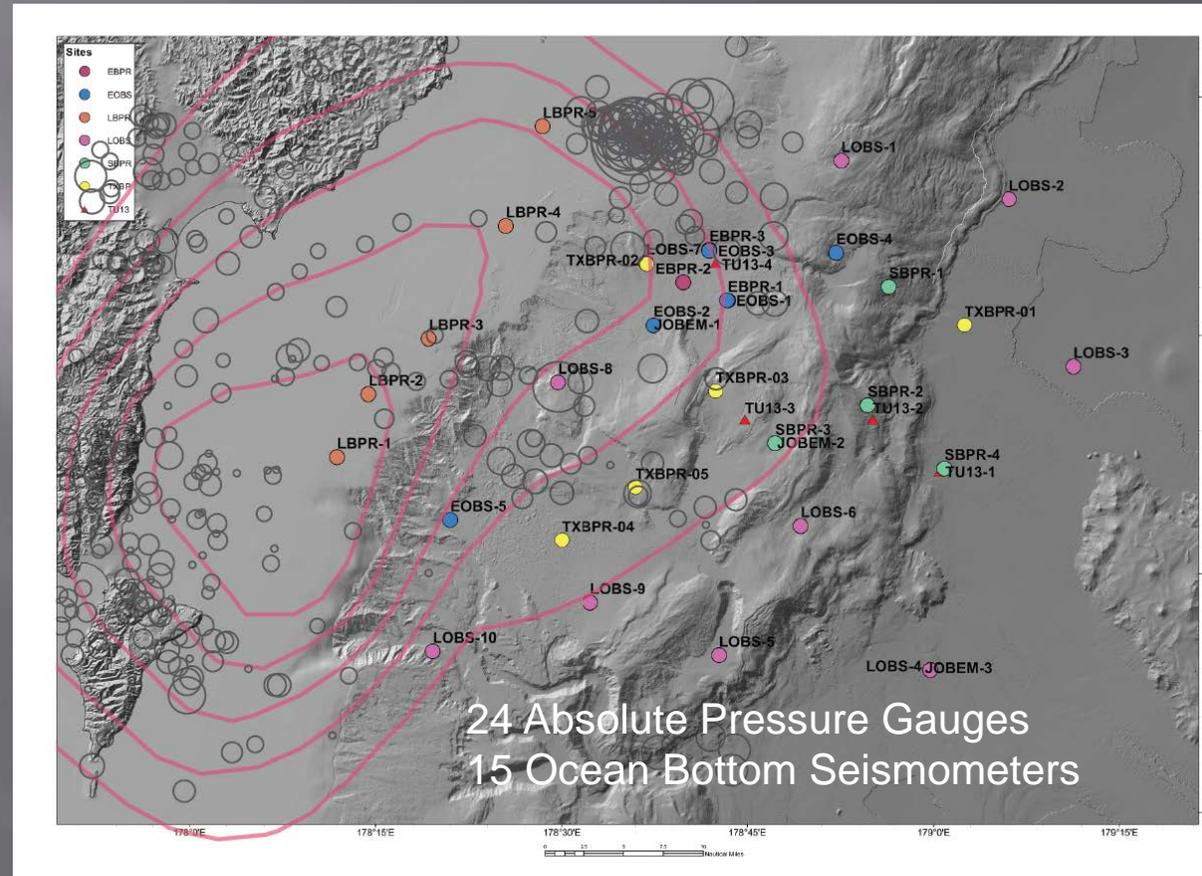


Deployment focused on area around proposed IODP drilling (Saffer, next talk)

# 24 Absolute Pressure Gauges, 15 OBS, and 3 OBEM instruments deployed in May 2014

Seafloor geodesy using absolute pressure gauges will reveal the vertical deformation during shallow (<10 km) SSEs and enable us to resolve the detailed slip distribution offshore. Does SSE slip go all the way to the trench? OBS will reveal relationship between the shallow SSEs and seismicity.

We expect to resolve vertical deformation > 5 mm



US and Japanese instruments were deployed in May 2014 with NZ's R/V Tangaroa, and will be recovered using the R/V Revelle in mid-June 2015.

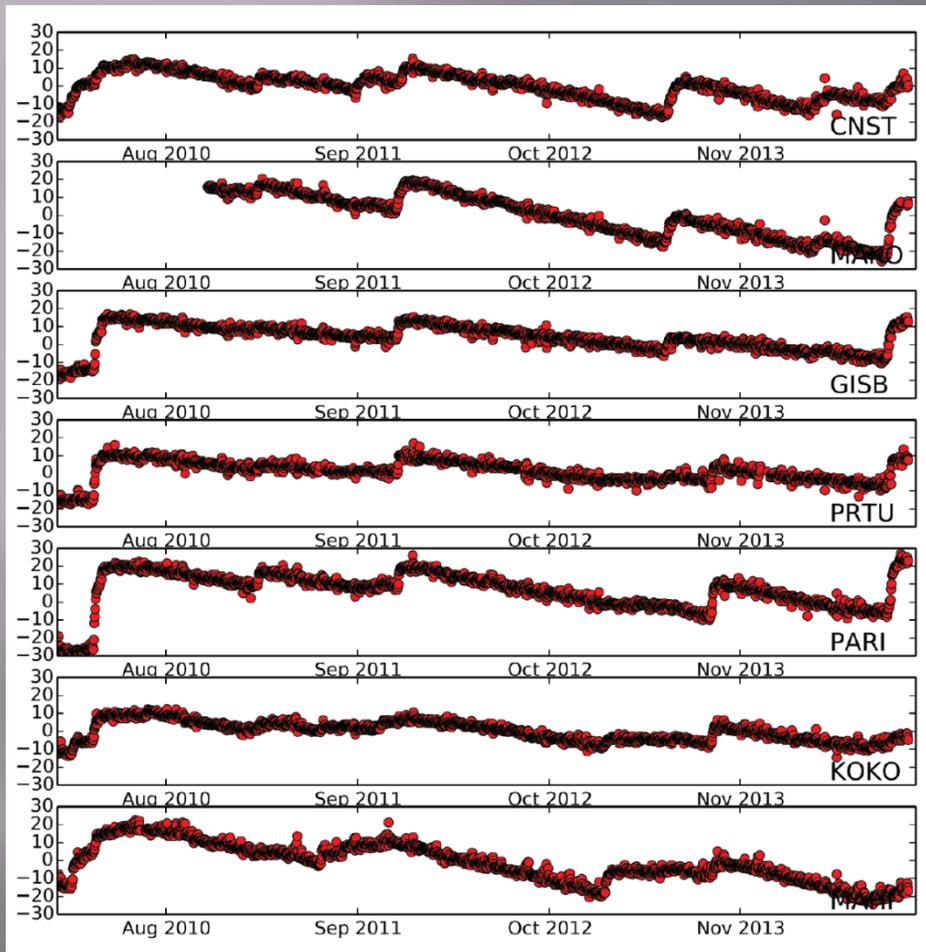
Funded by: NSF MGG, Japan (Kakenhi), and NZ Oceans 2020 program

# Main project objectives:

- (1) To determine the spatial distribution of SSE slip (including the trenchward limit of slip) using vertical deformation data from the Absolute Pressure gauges;
- (2) To identify and precisely locate seismicity and tremor related to SSEs at the offshore northern Hikurangi subduction margin, and assess the spatial and temporal relationship to SSE slip;
- (3) To discern the relationship of SSE slip, microseismicity, and tremor to properties of the plate interface and surrounding lithosphere from seismic imaging (passive source and existing active source data).

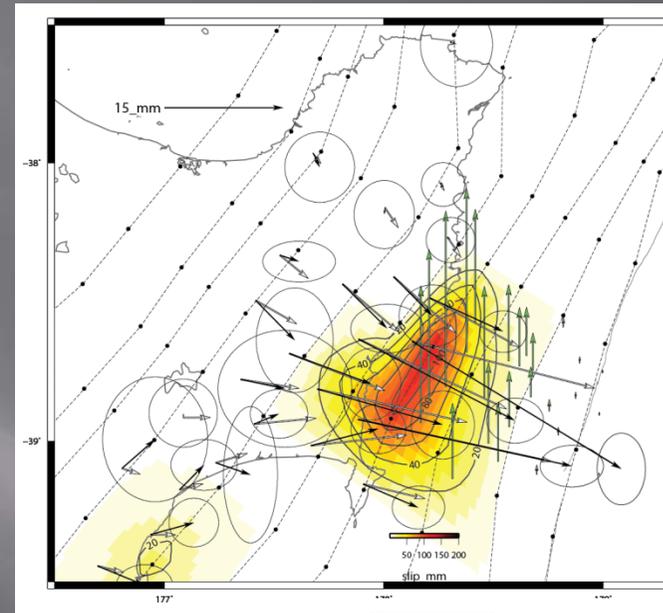
HOBITSS is the largest-ever seafloor geodetic deployment specifically targeted at studying subduction zone slow slip events

# A VERY large slow slip event occurred beneath HOBITSS in late September/early October!



Horizontal displacement onshore  $>3$  cm

Expected vertical deformation at offshore APG network is 1-4 cm, and should be easily detectable



Two SSE slip models fit the GPS data well, with VERY different offshore predictions

