

OBSIP Experiment Archive

Year: 2014

Experiment Name: HOBITSS: Hikurangi Ocean Bottom Investigation of Tremor and Slow Slip

Principal Investigator(s): Laura Wallace, University of Texas at Austin
Anne Sheehan, University of Colorado at Boulder
Susan Schwartz, University of California at Santa Cruz
Spahr Webb, Lamont-Doherty Earth Observatory

Experiment Summary: (Taken from the NSF Abstract Award #[1334654](#)): Deployment of a network of pressure gauges and seismometers on the Hikurangi portion of the subduction zone off North Island New Zealand is designed to record a slow-slip event (SSE) expected to occur on the plate boundary fault in the 2014-2015 timeframe. SSE occur every ~18 months in this region, so documenting the deformation associated with this type of event and comparing that couple-week activity with ongoing microseismicity should illustrate the evolution of forces and associated hazards in this region. Twenty US seafloor instruments, including 10 from OBSIP, will be combined with a similar number of Japanese instruments for ~12 months. These data will be evaluated together with data from onshore geodetic and seismic stations in this *Continued Next Page*



Science crew of the HOBITSS deployment cruise aboard the R/V Tangaroa. Photo credit: Jenny Nankai.

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Experiment Summary: ...international collaboration. Results will inform planning for possible future seafloor drilling by IODP and subsequent in-situ measurements.

Cruises:

5/10/2014 - 5/20/2014:

On board the R/V Tangaroa, 10 LDEO trawl resistant OBSs were deployed along with other instruments from University of Texas and University of Tokyo.

6/20/2015 - 6/29/2015:

With the successful capture of a slow slip event occurring in September-October 2014, the R/V Revelle set out to recover the instruments.

Data:

Data from all OBSIP instruments deployed is archived under temporary network code [YH](#) at the IRIS DMC.

Downloads/Links:

[Smithsonian](#)

[Science](#)

[Science Perspectives](#)

[EOS Article](#)

[Cruise Blog—Deploy](#)

[Cruise Blog—Recovery](#)

Due to the shallow dip of the subducting plate, the Hikurangi site offers a unique opportunity to document the small signals associated with SSE, for which motion is too minor for human perception. Insights into this newly-recognized mode of plate interaction are expected to be applicable to other convergent margins. How far 'up-dip' the slip extends, whether all the way to the seafloor near the subduction trench or not, is a key unknown in current estimates of earthquake shaking and tsunami hazard. The extent of slow slip can indicate how much stress on the plate boundary fault is relieved versus building up toward an eventual megathrust earthquake.

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Additional Information: A science crew of 26 aboard the R/V Roger Revelle set out from Napier port to recover the instruments that had been sitting on the seafloor for a year. This video shows the cruise from start to finish, with examples of OBS recoveries during ideal conditions and also in somewhat turbulent weather. The cruise was a great success with 100% of ocean bottom seismometers and pressure sensors returned to shore.

This video of the 2015 recovery cruise was created by Liz Brenner (SIO/UCSD).

