HIKURANGI OCEAN BOTTOM INVESTIGATION OF TREMOR AND SLOW SLIP (HOBITSS)

Laura Wallace¹, Spahr Webb², Susan Schwartz³, Anne Sheehan⁴, Yoshihiro Ito⁵, Kimihiro Mochizuki⁶, Hiroshi Ichihara⁷, Ryota Hino⁸, Stuart Henrys⁹

¹UTIG, ²LDEO, ³UCSC, ⁴CU-Boulder, ⁵Kyoto University, ⁶University of Tokyo, ⁷JAMSTEC, ⁸Tohoku University, ⁹GNS Science, NZ
Other science party members and collaborators

LDEO: Andrew Barclay, Carlos Becceril, Ted Koczynski, Walt Masterton, John Clapp, Yang Zha
UTIG: Anatoly Mironov
Tohoku Univ.: Syuichi Suzuki, Motoyuki Kido, Tatsuya Kubota
Univ. Tokyo: Takeo Yagi, Daisuke Haijima
CU-Boulder: Justin Ball, Jenny Nakai, Steven Plescia
UCSC: Erin Todd
Victoria Univ. Wellington: Martha Savage, Tom Wilson
Kyoto Univ.: Chihiro Kinoshita, Satoshi Katakami
Oregon State University: Rob Harris
GNS Science: Stephen Bannister, Bill Fry
Scripps: Elizabeth Brenner
HOBITSS in New Zealand

Offshore the northern Hikurangi subduction margin
North Hikurangi SSEs are the shallowest well-documented SSEs on Earth

These SSEs recur every one to two years

Accessibility of the SSE source area makes this one of the best locales in the world to investigate mechanisms behind SSE processes

This area is also a focus of recent heatflow acquisition (NSF-funded STINGS; 2015), planned IODP drilling (2018), and a proposed 3D seismic survey
Instruments belonged to LDEO, UTIG, Univ. Tokyo, Tohoku Univ., and JAMSTEC.

They were deployed in May 2014 with NZ’s R/V Tangaroa, and were recovered using the R/V Revelle in late June 2015.

Seafloor geodesy using absolute pressure gauges to reveal the vertical deformation in SSEs. OBS for tremor, seismicity, and passive imaging of SSE source.

24 APGs, 15 OBS, and 3 OBEM instruments.
10 LDEO BB OBS, 7 WITH APG
5 LDEO BPRs
5 UTIG BPRs
4 Tohoku University BPRs
5 Univ. Tokyo Short period OBS, 3 BPRs
3 JAMSTEC OBEM
A very happy science party after getting ALL of the BPRs and OBS back!!
SSEs recur here every 1-2 years, with very large ones every 4-5 years. 2014/2015 looked to be a prime window for catching a big one.
Two VERY large slow slip events occurred beneath HOBITSS in Sept/Oct and late Dec 2014!

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.
The remainder of the presentation will be made available once the results are published