Figure F1. Tectonic setting (upper left inset) and location of slip on the interface in September/October 2014 captured by a seafloor network of Absolute Pressure Gauges (black contours, labeled in 50 mm increments; Wallace et al., 2016) and the reflective properties of the subduction interface (Bell et al., 2010) at northern Hikurangi. Black dashed line = location of the drilling transect (see Figure F2), pink ellipses = drill sites, stars = locations of two tsunamigenic subduction interface earthquakes (Mw 6.9–7.1) in March and May of 1947. LRZ = low reflectivity zone, HRZ = high reflectivity zone. Lower left inset: east component of the position-time series for a cGPS site near Gisborne that demonstrates the repeatability of SSEs since they were first observed in 2002.

Figure F2. Depth-converted Seismic Profile 05CM-04 showing locations and depths of sites drilled during Expedition 375 and structural interpretation (modified from Barker et al., 2018). Star = projected location of March 1947 tsunami earthquake. Location of the profile coincides with the drilling transect shown in Figure F1. VB = volcanic cone. VE = vertical exaggeration.

Figure F3. Bathymetry and locations of Seismic Line 05CM-04 (black line) (see Figure F2) and Expedition 375 sites.

Figure F4. Observatory configurations, Sites U1518 and U1519.

Figure F5. Observatory components of ACORK and CORK-II installations. A. ACORK wellhead with bay containing valves facing forward, Hole U1518H. B. Attachment of hydraulic umbilical to ACORK casing in the moonpool, Hole U1518H. C. Hydraulic line connections at the base of an ACORK casing screen, Hole U1519B. D. CORK-II wellhead connection to 4½ inch casing at the rig floor, Hole U1519B. E. OsmoSampler pump (right) and Teflon coil (left), Hole U1518H. F. Miniature temperature sensor attached to Spectra line prior to wrapping and taping, Hole U1518H.

Figure F6. Composite plot of seismic image (Profile 05CM-04) and selected LWD measurements for 50–600 mbsf, Hole U1518B. Prestack depth migration (PSDM) from Barker et al. (2018).

Figure F7. Stratigraphic column, Holes U1518E and U1518F. Filtered gamma ray data are from LWD measurements acquired during Expedition 372. Vshale = shale content estimates.

Figure F8. Selected drilling results and core-log-seismic tie (synthetic seismic trace), Site U1518. Bedding, fault, and fracture dips: solid dots = high confidence, open dots = low confidence. Chlorinity: blue = Hole U1518E, red = Hole U1518F, dashed line = seawater concentration. CDP = common depth point.

Figure F9. Composite plot of seismic image (Profile 05CM-04) and selected LWD measurements, Site U1519. PSDM from Barker et al. (2018).

Figure F10. Stratigraphic column, Holes U1519C–U1519E. Gamma ray, caliper, and resistivity are from LWD measurements acquired during Expedition 372. TD = total depth.

Figure F11. Selected drilling results and core-log-seismic tie (synthetic seismic trace), Site U1519. Chlorinity: red = Hole U1519D, green = Hole U1519E, blue = Hole U1519C, dashed line = seawater concentration.

Figure F12. Composite plot of seismic image (Profile 05CM-04) and selected LWD measurements, Site U1520. PSDM from Barker et al. (2018).

Figure F13. Stratigraphic column, Holes U1520C and U1520D. Gamma ray (GR), caliper, and resistivity (Res) are from LWD data acquired during Expedition 372 and wireline logging data acquired during Expedition 375. Wireline data are shown only for the main pass at depths below the casing shoe at 642 mbsf.

Figure F14. Selected drilling results and core-log-seismic tie (synthetic seismic trace), Site U1520. Chlorinity: red = Hole U1520D, blue = Hole U1520C, dashed line = seawater concentration.

Figure F15. Stratigraphic column, Holes U1526A and U1526B.

Figure F16. Selected drilling results and core-seismic tie (synthetic seismic trace), Site U1526.