Figure F1. Borehole configuration for GeniusPlug deployment, Hole C0010A. WH = wellhead, F/C = float collar. TD = total depth.

Figure F2. A. SmartPlug/GeniusPlug schematic. Pressure case = 15 cm diameter, 20 cm outside diameter (OD); flange-mounted end caps with high-pressure port feed through bulkheads leading to pressure sensors. Top end cap fabricated with 3½ inch OD EU 8RD thread for mounting to Baker Hughes retrievable casing packer. B. GeniusPlug extension to SmartPlug including OsmoSampler geochemical observatory and FLOCS unit.

Figure F3. A. GeniusPlug in laboratory after recovery, Expedition 365. Overview showing key components; see also Figure **F2**. B. Retractable inner portion of instrument showing two bullnoses, pressure housing for batteries and data logger, pressure (P) transducers, and MTL. Data communication cable connects central pie plugs from which data extraction to a laptop is achieved. C, D. Two pressure transducers mounted to GeniusPlug deployed during Expedition 332 (Expedition 332 Scientists, 2011). Serial Number 106043 = upward-looking P sensor, 106100 = downward-looking P sensor.

Figure F4. OsmoSampler pumps and FLOCS cylinder prior to installation in GeniusPlug extension unit. From Kopf et al. (2011).

Figure F5. GeniusPlug (white paint) and tubing joints on rig floor before deployment during Expedition 332.

Figure F6. Laboratory technicians measuring and cutting OsmoSampler coil into 1 m sections and transferring fluids into 2 mL sample tubes, Expedition 365.

Figure F7. Attachment of accelerometer sensor to drill pipe showing mounting orientations and dimensions.

Figure F8. Schematic of LTBMS system configuration. Recording Unit A is used for tilt combo; Unit B is used for broadband (BB) seismometer and strainmeter.

Figure F9. Instrument carrier showing geophone, accelerometer, thermistor digitizer, tiltmeter, and broadband seismometer locations and connections. VAM = Vallourec and Mannesmann connection.

Figure F10. Cross sections at top and bottom of instrument carrier with sensor orientation.

Figure F11. Molded electrical cable.

Figure F12. Centralizer and attachment of cables, thermistor, and flatpack using tie wraps and metal bands.

Figure F13. Swellable packer.

Figure F14. Bay 1 of LTBMS head, holding the PSU with four high-precision quartz pressure sensors (Paroscientific, Inc.) and two-way and three-way valves. Note cylindrical pressure housing with data logger and PPC unit. See text.

Figure F15. Assembled LTBMS head with ROV platform and data recorder. Three UMC ports shown in Bay 2.

Figure F16. Diagram of deep-sea borehole strainmeter. FCR = flange connector receptacle, XO = crossover.

Figure F17. Diagram of CMG3T borehole broadband seismometer.

Figure F18. Tilt combo module configuration and schematic. The tilt combo has four different sensors: tiltmeter, geophone, accelerometer, and thermometer digitizer (SAHF). Geophone, accelerometer, and electrical boards are installed in one titanium housing unit. The Lily tiltmeter and SAHF are in separate titanium housings. All three housings are connected by an electrical cable and were fixed to an instrument carrier prior to borehole installation. PCB = printed circuit board.

Figure F19. Diagram of thermistor string.

Figure F20. Miniscreens at lowermost pressure termination (P1).

Figure F21. A. Bolt (white arrow) on seafloor reference pressure sensor with a grounding line. B. Termination of the stainless grounding line on the base of the PSU steel frame.

Figure F22. Location of observatory Sites C0002, C0010, and C0006 (planned). Purple triangles = observatory sites, red lines = DONET cables, red circles = DONET seafloor observatories, green circle = Japan Meteorological Agency (JMA) ocean bottom seismometer, green line = JMA cable.

Figure F23. Graphic patterns and symbols used in visual core descriptions, Expedition 365. GWL = ground rock interstitial normative determination (GRIND) method whole-round core interstitial water liquid, PFC = perfluorocarbon, WH = working half.

Figure F24. Example of log sheet (structural geology observation sheet) used to record structural observations and measurements from the core working half of split cores.

Figure F25. Modified protractor used to measure apparent dip angles, bearings, plunge angles, and rakes of planar and linear features in the working half of split cores.

Figure F26. Core coordinate system showing *x*-, *y*-, and *z*-axes used for orientation data measurements.

Figure F27. Determination of geological plane orientation (shaded) from two auxiliary measurements. First auxiliary measurement is done on flat-lying split core surface and consists of measuring the bearing (α_1) and plunge angle (β_1) of the trace of the plane on the split surface. Second auxiliary measurement is done on a surface perpendicular to the flat-lying split core surface and contains the core axis and consists of measuring the bearing (α_2) and plunge angle (β_2) of the trace of the plane on the surface.

Figure F28. Rake (ϕ_a) measurement of slickenlines on a fault surface. In this example, the slickenlines rake from the azimuth of the plane that points in the western (270°) quadrant in the core reference frame.

Figure F29. Late Cenozoic magnetostratigraphic and biostratigraphic events used during Expedition 365, modified after Expedition 315 Scientists (2009). Polarity: black = normal, white = reversed. FO = first occurrence, LO = last occurrence.

Figure F30. Orientation system used during Expedition 365 for sampling cubes for paleomagnetism analysis.

Figure F31. OsmoSampler coil fluid splits indicating the shipboard measurements conducted on each. Cl + anions = chlorinity and anions, cations + ME = cations and minor elements, trace = trace elements, FID = hydrocarbon gases. A. Fluid splits from chemistry coil. Adjacent cations + ME samples were combined due to low fluid requirements. B. Fluid splits from biology coil. Directly adjacent cations + ME samples and trace samples were combined due to low fluid requirements. Splits bio001, bio002, bio013, bio014, bio025, bio037, bio049, bio061, bio073, bio085, bio097, bio109, bio121, bio133, and bio145 were combined to make one alkalinity measurement. Splits bio100, bio101, bio106, bio107, bio108, bio111, bio112, bio113, bio114, bio116, and bio117 were combined for a single trace element measurement.

Figure F32. FLOCS unit. A. Rock substrates within the FLOCS. Basalt A = AT11-20-4055-B6, Basalt B = J2-246-R2, Basalt C = J2-244-R4. B. Photo of FLOCS unit after it was disconnected from pumps and biology coils, just before it was placed in anaerobic chamber.