Figure F1. Bathymetric map of Fantangisña Seamount, Site U1497, Holes U1498A and U1498B, and ship tracks for MCS Lines EW0202 42-44, 67-68, NS 59-60 with common midpoints labeled. Bathymetry data were collected by Simrad EM300 during a 2003 R/V *Thomas G. Thompson* cruise (Oakley et al., 2008). Holes U1498A and U1498B are shown for context. Contour interval = 50 m.

Figure F2. MCS Lines EW0202-42-44 and EW0202-67-68 and Site U1497.

Figure F3. Bathymetric map of the summit area of Fantangisña Seamount, Site U1497, and MCS Lines EW0202 42-44, 67-68, and 59-60. Insert shows relative positions of holes at Site U1497. Bathymetry data were collected by Simrad EM300 on a 2003 R/V *Thomas G. Thompson* cruise (Oakley et al., 2008).

Figure F4. The observatory construction at Hole U1497D is 106.8 m long. The screened section was placed between 37 and 72 mbsf. The transition from 16 to 10¾ inch casing is highlighted in the dashed circle (Figure F5). This transition occurs at 1.9 mbsf and will support the weight of the CORK-Lite and seal it in the 9.9 inch inner diameter section of this crossover. The depth to the cement (103.0 mbsf) is accurate, based on tagging it with the drill string.

Figure F5. 16 inch casing hanger (Figure F6) and swage (16 × 10¾ inch crossover), Hole U1497D. Downhole instruments must fit in the tolerance of the crossover, which is 9.894 inches in diameter. This transition is the same one deployed at Site U1492 but is different from the one deployed at Site U1496 (see Figures F4 and F5 in the Site U1496 chapter [Fryer et al., 2018e]). The transition in the Hole U1497D deployment includes a 4 ft long pup joint.

Figure F6. Reentry cone and ROV platform on the seafloor, Hole U1497D. The ROV platform remained centered after the drill string was removed.

Figure F7. Lithostratigraphy, Holes U1497A and U1497B. Colors are according to DESClogik with slight changes for subunits or when representative for the particular unit.

Figure F8. Major lithologies, Hole U1497A. A. Clast-rich serpentinite mud (Subunit IIB). B. Contacts between Subunits IIB and IIC and Unit III, showing drilling deformation of the contacts (up-arching). C. Highly deformed sedimentary and volcanic rocks (Unit III). D. Red and gray matrix-supported clasts of ultramafic and sedimentary rocks (Unit IV). E. Clasts and drilling debris (Unit V).

Figure F9. Major lithologies, Hole U1497B. A. Highly deformed sedimentary and volcanic rocks (Unit III). Light clasts are volcanic rocks. B. Mixing of red sedimentary and white volcanic material (Unit III). C. Serpentinite mud and clasts deformed by drilling (Subunit IVA). D. Clast-rich matrix with both serpentinized ultramafic and metavolcanic rock (Subunit IVB). E. Sedimentary and volcanic rocks (Subunit IVC).

Figure F10. Downhole changes in mud composition, Site U1497. D = dominant (>50%), A = abundant (20%–50%), C = common (10%–20%), R = rare (2%–10%), Tr = trace (<1%).

Figure F11. Pelagic sediment, Site U1497. All are plane-polarized light (PPL). A, B. Microfossils, volcaniclastic fragments, and trace serpentine (Srp) (366-U1497A-1F-1, 20 cm). Cpx = clinopyroxene, Foram = foraminifer, Fsp = feldspar. C. Fall-in sediment with microfossils and trace serpentine (2F-1, 1 cm). Rad = radiolarian. D–F. Microfossils, volcaniclastic fragments, Fe oxide, trace serpentine, and aragonite (Arg) (366-U1497B-1F-1, 1 cm). Pl = plagioclase, Clcsp = calcisphere.

Figure F12. Serpentinite mud and other materials, Hole U1497A. A. Yellowish brown serpentinite (Srp) mud with yellowish oxidized serpentines, acicular aragonites (Arg), and Fe oxides (1F-CC, 6 cm; PPL). Cpx = clinopyroxene. B. Bluish gray serpentinite mud with Brucite (brc) fragments in the dusty serpentine matrix (4X-CC, 24 cm; PPL). C. Bluish gray serpentinite mud with garnet (Grt), fragments of glass, and spinel (Spl) in the dusty serpentine matrix (5F-3, 50 cm; PPL). D. Dark reddish mud with sand-sized dusty lithic grains, clinopyroxene, calcite (Cal), plagioclase (Pl), and chlorite (Chl) (12F-1, 84 cm; PPL). E. White pure aragonite with euhedral laths of sand- to silt-sized aragonite (6F-CC, 29 cm; cross-polarized light [XPL]). F. Black mud with pyroxene, feldspar (Fsp), chlorite, and dusty lithic grains (9G-CC, 54 cm; PPL). Opx = orthopyroxene.

Figure F13. Serpentinite mud and other materials, Hole U1497B. All are PPL. A. Yellowish brown serpentinite mud with yellowish oxidized serpentines, aragonite (Arg) laths, glass, and Fe oxides (1F-1, 25 cm). B. Yellowish green serpentinite mud with garnet (Grt) grains, spinel (Spl) fragments, and glass in the serpentinite mud matrix (1F-1, 61 cm). C. Bluish gray serpentinite mud with fragments of chlorite (Chl) in the dusty serpentine matrix (1F-3, 43 cm). D. Light bluish gray serpentinite mud with fragments of dusty brucite (Brc) and spinel (2F-2, 43 cm). E, F. Dark reddish mud with sand-sized dusty lithic grains, calcite (Cal), clinopyroxene (Cpx), and serpentine (Srp) (5F-2, 45 cm).

Figure F14. Harzburgite (366-U1497A-3G-CC, 4–5 cm; TS 90; XPL). A. Fine-grained equant olivine (Ol) neoblasts occur around the grain boundary of a coarse-grained orthopyroxene (Opx) porphyroclast with undulatory extinction and holly leaf chromian spinels (Sp) at the rim. B. Elongated olivine neoblasts included in orthopyroxene porphyroclast. Equant clinopyroxene grains, occasionally twinned, occur at the boundary between orthopyroxene and olivine. Cpx = clinopyroxene.

Figure F15. Dunite (366-U1497A-13G-CC, 61–63 cm; TS 99; XPL) A. Optically continuous fine-grained olivine neoblasts with undulatory extinction (center) recrystallized from an original millimeter-sized strain-deformed olivine grain and surrounded by fine-grained equant or tabular olivine crystals. B. Equigranular mosaic texture.

Figure F16. Fine-grained augite microphyric basalt (366-U1497B-6F-3, 64–66 cm; TS 105). Groundmass consists of very fine grained plagioclase and augite with some interstitial glass and Fe oxides. Augite glomerocryst is visible (lower right). Texture is intergranular to intersertal. Plagioclase and glass are replaced by secondary alteration; augite and oxides are relatively unaffected. A. PPL. B. XPL.

Figure F17. Brecciated (meta-) sediments (366-U1497A-7X-CC, 26–28 cm [TS 93], and 9G-CC, 35–37 cm [TS 96]; PPL). A. Clast of siliceous, low-grade metamorphic limestone with recrystallized microfossils (circular features). B. Matrix-supported (dark) angular clasts of cherty limestone (light). C. Microbreccia with angular clasts of fossil-bearing siliceous limestone (light) and a matrix of shale (dark).

Figure F18. Brecciated volcanic rocks (366-U1497A-9G-CC, 31–33 cm [TS 95], and 9G-CC, 40–42 cm [TS 97]). A. Brecciated dolerite (PPL). Internal texture of fragments is composed of altered plagioclase (light gray) and titanaugite (irregular pink grains enclosed in plagioclase and scattered throughout). B. Brecciated dolerite with fine-grained, ultracataclasite matrix (dark) (XPL). C. Fragment of fine-grained basalt composed of acicular plagioclase (light gray to white low-order birefringence colored elongate laths) and pyroxene (higher-order birefringent colors) (XPL). D. Brecciated fine-grained basalt (white elongate laths of plagioclase and small pyroxene grains) with fine-grained, ultracataclasite veins (brownish) and chlorite (bright green at lower right) (XPL).

Figure F19. Ultracataclasite (366-U1497B-5F-CC, 11–13 cm; TS 100; PPL). A. Clasts of smeared chert (reddish color) and fossiliferous siliceous limestone (light color) within ultrafine-grained matrix (dark). B. Delta-type clast of fossiliferous siliceous limestone (pale tan at right center) within ultrafine-grained matrix (dark). C. shear bands (trending from upper left to lower right) transect the penetrative fabric.

Figure F20. Drilling-induced structures. A. Flow-in structures (366-U1497A-6F-1, 57–88 cm). B. Soupy aspect of the mud caused by downward motion of coring tool (366-U1497B-2F-1, 29–60 cm).

Figure F21. Veined clasts and breccia fragments, Hole U1497A. A. Ultramafic clast with serpentine veins (2F-4, 41–50 cm). B. Sedimentary clast with carbonate veins (11G-CC, 11–26 cm). C. Breccia with serpentinized ultramafic rock clasts cemented by reddish matrix material and ultramafic rock clasts embedded in the sedimentary matrix (8F-2, 14–30 cm).

Figure F22. Headspace and interstitial water H_2, CH_4, and AVS concentrations, Holes U1497A and U1497B. pH, chloride, and sulfate concentrations are shown for comparison.

Figure F23. Interstitial water alkalinity, pH, and salinity concentrations, Holes U1497A and U1497B. Data from the WSTP sample are plotted at 0 m (actual depth = 44.2 mbsf). Bottom seawater values are from Mottl et al. (2003, 2004).

Figure F24. Interstitial water phosphate, sulfate, and ammonium concentrations, Holes U1497A and U1497B. Data from the WSTP sample are plotted at 0 m (actual depth = 44.2 mbsf). Bottom seawater values are from Mottl et al. (2003, 2004).

Figure F25. Interstitial water Cl, Br, and Na concentrations, Holes U1497A and U1497B. Data from the WSTP sample are plotted at 0 m (actual depth = 44.2 mbsf). Bottom seawater values are from Mottl et al. (2003, 2004).

Figure F26. Interstitial water K, Na, Sr, Ca, B, Li, Mg, and SiO_2 concentrations, Holes U1497A and U1497B. Data from the WSTP sample are plotted at 0 m (actual depth = 44.2 mbsf). Bottom seawater values are from Mottl et al. (2003, 2004).

Figure F27. Interstitial water DIC and DOC concentrations, Holes U1497A and U1497B. Data from the WSTP sample are plotted at 0 m (actual depth = 44.2 mbsf). Bottom seawater values are from Eglinton and Repeta (2014).

Figure F28. PFMD concentrations from the interior, halfway, and exterior of the microbiology whole round, the top of the core, and the drilling fluid recovered from the top of the core, Site U1497. All PFMD concentrations are given in headspace parts per million (ppm). Alkalinity and pH data are shown to provide a measure for the level of active serpentinization and potential seawater contamination (see Fluid geochemistry).

Figure F29. Color reflectance, GRA density and discrete bulk density, *P*-wave velocity, magnetic susceptibility, and NGR data, Hole U1497A.

Figure F30. Color reflectance, GRA density and discrete bulk density, *P*-wave velocity, magnetic susceptibility, and NGR data, Hole U1497B.

Figure F31. Index property data (grain density, bulk density, and porosity), thermal conductivity, and shear strength, Hole U1497A.

Figure F32. Index property data (grain density, bulk density, and porosity), thermal conductivity, and shear strength, Hole U1497B.

Figure F33. APCT-3 temperature measurements during insertion and recovery, Hole U1497B.

Figure F34. Calculated APCT-3 formation and bottom seawater temperatures and best fit linear thermal gradient, Hole U1497B.

Figure F35. Measured WSTP temperatures and depths during borehole operations, Hole U1497D. Probe depth is not exactly equal to coreline depth; corrected probe depths are used in Figure F36. See Table T10 for probe depth calculations.

Figure F36. Estimated WSTP and APCT-3 temperatures and calculated linear thermal gradients, Hole U1497D. Temperatures were measured at the start of each interval when the wireline was held at a constant depth (Table T10). Two thermal gradients are shown, one based on the WSTP data and the other based on APCT-3 data.

Figure F37. NRM decay (left) and AF demagnetization vector (right) diagrams of discrete samples, Site U1497. A. 366-U1497A-2F-1, 1.54 mbsf. B. 366-U1497B-1F-1, 0.15 mbsf. C. 366-U1497B-5F-1, 13.64 mbsf. Demagnetization diagrams: points = projected endpoints of the remanent magnetization vector measured for each sample in core coordinates, blue lines = principal component directions from discrete samples, open symbols = vector endpoints projected on a vertical plane, solid symbols = vector endpoints projected on a horizontal plane.

Figure F38. Paleomagnetic intensity, inclination, and declination of archive halves and discrete samples after 5 mT AF demagnetization, and magnetic susceptibility of discrete samples, Hole U1497A. For intensity and inclination, dots are the original data and lines are running averages of that data.

Figure F39. Paleomagnetic intensity, inclination, and declination of archive halves and discrete samples after 5 mT AF demagnetization, and magnetic susceptibility of discrete samples, Hole U1497B. For intensity and inclination, dots are the original data and lines are running averages of that data.