Figure F1. Location map of Mariana Trench and seamounts.

Figure F2. Permeability as a function of effective pressure for seven seamount cores.

Figure F3. Porosity change with effective pressure for seven seamount cores.

Figure F4. Permeability as a function of porosity for seven seamount cores.

Figure F5. A–B. Coefficient of friction (μ) as a function of axial displacement at effective normal stresses of 4, 9, and 14 MPa. Sliding velocity values (in μm/s) are shown above red line.

Figure F6. Coefficient of friction (μ) at 8 mm axial displacement as a function of effective normal stress for seven seamount cores.

Figure F7. *a-b* as a function of effective normal stress. Downward triangles = *a-b* for velocity steps from 0.01 to 0.1 μm/s, upward triangles = *a-b* for velocity steps from 0.1 to 1.0 μm/s. Trend lines are for average *a-b* values of the two rate steps.

Figure AF1. XRD data, Holes U1492B and U1492C. cps = counts per second.

Figure AF2. XRD data, Hole U1496A.

Figure AF3. XRD data for smectite clay-bearing sample, Hole U1497B. A. Glycolated sample. B. Comparison of untreated and glycolated sample results, showing spacing changes in 5 basal reflections.

Figure AF4. XRD data, Hole U1498B.

Figure AF5. XRD data for sample that contains two swelling clays: saponite and corrensite, Hole U1498B. A. Glycolated sample. B. Spacing changes in several (00*l*) reflections of saponite and corrensite accompanying glycolation.

Figure BF1. Coefficient of friction (μ) as a function of axial displacement at effective normal stresses of 4, 9, and 14 MPa, Hole U1492B. Sliding velocity (in μm/s) are shown above the data.

Figure BF2. Coefficient of friction (μ) as a function of axial displacement at effective normal stresses of 4, 9, and 14 MPa, Hole U1492C. Sliding velocity (in μm/s) are shown above the data.

Figure BF3. Coefficient of friction (μ) as a function of axial displacement at effective normal stresses of 4, 9, and 14 MPa, Hole U1496B. Sliding velocity (in μm/s) are shown above the data.

Figure BF4. Coefficient of friction (μ) as a function of axial displacement at effective normal stresses of 4, 9, and 14 MPa, Hole U1496A. Sliding velocity (in μm/s) are shown above the data.

Figure BF5. Coefficient of friction (μ) as a function of axial displacement at effective normal stresses of 4, 9, and 14 MPa, Hole U1497B. Sliding velocity (in μm/s) are shown above the data.