Figure F1. Lithostratigraphic variations in Hole 1105A as redescribed during Expedition 360. A. Relative abundances of rocks are averaged over 10 m. Dashed lines = unit boundaries, black bars = locations of felsic veins. Oxide gabbro includes oxide gabbro and oxide olivine gabbro. B. Hole 1105A compared to Hole 735B. To facilitate comparison, oxide-bearing gabbro from Hole 1105A is grouped with oxide gabbro, similar to the approach followed in Hole 735B. In Hole 735B, relative abundances of rocks are averaged over 20 m intervals. Black lines = corresponding thickness of Hole 1105A within Hole 735B, presented so that Hole 1105A corresponds to Units III and IV in Hole 735B.

Figure F2. Variations of mineral mode with depth plotted by interval (thin lines, 107 points), Hole 1105A. Thick lines = calculated as a running average over 11 intervals.

Figure F3. Correlations between plagioclase and oxide modes, Hole 1105A.

Figure F4. Boundary between olivine-bearing oxide gabbro (Interval 91) and olivine-bearing gabbro (Interval 92), Hole 1105A. Note the concentrations of oxide toward the contacts.

Figure F5. Boundary between coarse-grained olivine-bearing oxide gabbro (Interval 77) and fine-grained oxide-bearing olivine gabbro (Interval 78), Hole 1105A.

Figure F6. Variations in contact type with depth, Hole 1105A.

Figure F7. Variations in mean grain sizes of plagioclase, clinopyroxene, and olivine with depth plotted by interval (thin lines), Hole 1105A. Thick lines = 11-interval running average.

Figure F8. Correlations of mean grain size between plagioclase and clinopyroxene and olivine, Hole 1105A.

Figure F9. Core sections showing (A) medium-grained olivine gabbro, (B) coarse-grained olivine gabbro, and (C) pegmatitic olivine gabbro, Hole 1105A.

Figure F10. Magmatic felsic vein in gabbro (179-1105A-1R-1, 19–26 cm).

Figure F11. (A) Olivine (Ol)-plagioclase (Pl)-clinopyroxene (Cpx) and (B) oxide-Pl-Cpx ternary diagrams, Hole 1105A.

Figure F12. A. Subhedral olivine (Ol), tabular plagioclase (Pl), and clinopyroxene (Cpx), with small equant anhedral Pl enclosed in Cpx (13R-3, 79–82 cm). B. Cpx and Ol inclusions within Pl (17R-2, 23–26 cm). C. Small equant Pl inclusions within Ol (13R-3, 79–82 cm). D. Amoeboidal Ol interstitial between Pl (27R-3, 93–94 cm). E. Blebs of brown amphibole (Am) and opaque oxides on an equant Cpx with faint exsolution lamellae (11R-2, 51–54 cm). F. Deformed Pl with undulose extinction and deformation twins (19R-3, 94–97 cm).

Figure F13. A, B. Olivine (Ol) rimmed by interstitial orthopyroxene (Opx) and brown amphibole (Am) (16R-3, 22–25 cm). C. Clinopyroxene (Cpx) overgrown and partially replaced by Am (30R-3, 102–106 cm). D. Cpx rimmed by intergrowth of brown Am, green Am, and opaque oxides (30R-1, 27–31 cm).

Figure F14. Magmatic oxides and related minerals in thin section. A. Brown amphibole (Am) enclosing ilmenite (Ilm) and chalcopyrite (Ccp) (1R-2, 88–91 cm; transmitted light). Pl = plagioclase, Ol = olivine. B. Secondary pyrite (Py) replacing globular magmatic sulfides in Ilm (4R-4, 57–62 cm; reflected light). C. Apatite (Ap) crystal with a train of fluid inclusions enclosed in Ilm (4R-4, 57–62 cm; transmitted light). D. Irregular patch of magnetite (Mag) with Ilm exsolution lamellae (4R-4, 57–62 cm; reflected light and partially crossed polars).

Figure F15. Downhole alteration intensity of primary igneous phases and occurrence of vein filling minerals, Hole 1105A described during Expedition 360. A critical point here is alteration intensity index may be the sum of several different processes that have affected cores. Plagioclase (Pl) alteration index here includes high-temperature dynamically recrystallized Pl (neoblasts) and that produced by lower-temperature hydrothermal alteration because they cannot be confidently separated macroscopically; however, pyroxene and olivine alteration intensities are based solely on proportion of low-temperature secondary minerals, which are more easily separated macroscopically from original igneous clinopyroxene and olivine. Alteration intensity: 1 = <10%, 2 = 10%–29%, 3 = 30%–59%, 4 = 60%–90%, 5 = >90%. Vein filling proportion: 0 = <10%, 1 = 10%–29%, 2 = 30%–59%, 3 = 60%–90%, 4 = >90%. Chl = chlorite, Am = amphibole.

Figure F16. Clinopyroxene (Cpx) alteration. A, B. Brown hornblende (Br Hbl) and green amphibole (Gr Am) replacing Cpx (30R-1, 27–31 cm; A: plane-polarized light [PPL], B: cross-polarized light [XPL]). C, D. Secondary clinopyroxene (2nd Cpx) replacing primary Cpx (13R-1, 24–26 cm; C: PPL, D: XPL).

Figure F17. Olivine (Ol) and plagioclase (Pl) alteration. A, B. Coronitic aggregate of amphibole (Am), talc (Tlc), and chlorite (Chl) between Ol and Pl (1R-5, 135–141 cm; A: PPL, B: XPL). Chl also fills microfractures in Pl. Ol is replaced along microfractures by serpentine, opaque minerals (possibly magnetite), and minor brownish clay. Clinopyroxene (Cpx) is relatively fresh but partially replaced by secondary minerals (Am or Chl and opaque minerals) along cleavage surfaces. C, D. Brownish clay (Br clay) replacing Ol (21R-1, 49–52 cm; C: PPL, D: XPL).

Figure F18. Types of amphibole veins in gabbros. A, B. Veins in primary plagioclase crystal filled with brown-green hornblendes that form individual crystals up to 1 mm long. When these veins contact larger hornblende clusters from background alteration, they form coherent larger crystals (white arrow), implying a close relationship between vein formation and background alteration (21R-1, 49–52 cm; A: PPL, B: XPL). C, D. Veins in a cataclastic zone filled with actinolitic amphibole (Act) forming aggregates of tiny needles associated with chlorite (Chl) (22R-1, 103–106 cm; C: PPL, D: XPL).

Figure F19. A, B. Whole thin section images of mylonitic olivine gabbro composed of porphyroclasts of clinopyroxene (Cpx) and plagioclase (Pl) and neoblasts of olivine (Ol), Cpx, Pl, and minor brown hornblende (29R-1, 102–106 cm; A: PPL, B: XPL). Brown hornblende mainly occurs as neoblasts in fine-grained ultramylonitic zones or as alteration products of Cpx porphyroclasts. Yellow boxes = location and orientation of images in Figure **F20**.

Figure F20. A, B. Enlarged photomicrographs of boxed areas in Figure **F19**, showing aggregates dominated by brown hornblende (Br Hbl) (29R-1, 102–106 cm; A: PPL, B: XPL). In the bottom part of photomicrographs, Br Hbl is associated with plagioclase (Pl) and minor oxides and clinopyroxene. Ol = olivine.

Figure F21. Cataclastic intervals with brownish/whitish veins and brown clay pseudomorphs after olivine and pyroxene A. 21R-1, 19–32 cm. B. 26R-2, 0–14 cm. C. 26R-2, 98–114 cm.

Figure F22. Examples of magmatic veins. A. 3 cm wide undeformed magmatic felsic vein intruding oxide-bearing olivine gabbro (1R-1, 19–27 cm). B. 1.2 cm wide leucocratic gabbro vein intruded into relatively undeformed olivine-bearing gabbro (4R-1, 76–84 cm). The vein gabbro is sheared and exhibits crystal-plastic deformation of plagioclase and clinopyroxene.

Figure F23. A. Frequency dip distribution of the 96 magmatic veins measured, Hole 1105A. Red dashed line = expected dip distribution for randomly oriented small-scale (10 cm to 1 m) planar features, N = number of measurements, mean = mean dip, Std = standard deviation, S = skewness of the distribution. B. Depth dip distribution of magmatic veins. Veins are concentrated shallower than 65 m CCSF and deeper than 140 m CCSF.

Figure F24. Example of a sharp structural contact (arrow) between a largely undeformed olivine gabbro and a crystal-plastically deformed olivine-bearing oxide gabbro (26R-2, 100–109 cm).

Figure F25. A. Frequency dip distribution of the 58 magmatic contacts measured, Hole 1105A. *N* = number of measurements, mean = mean dip, Std = standard deviation. B. Depth dip distribution of magmatic contacts. Few contacts are seen shallower than 40 m CCSF and there is no trend of dips with depth.

Figure F26. Example of a relatively gradational contact between a mostly undeformed fine-grained intrusive olivine- and oxide-bearing gabbro and a slightly crystal-plastically deformed olivine-bearing oxide gabbro (19R-2, 91–104 cm).

Figure F27. Different contact styles between intruding microgabbros and their coarser-grained gabbro hosts. A. Largely undeformed microgabbro, with plagioclase showing extensive albite twinning, intruded into a slightly deformed oxide and olivine-bearing gabbro (13R-1, 24–26 cm; TS 111; XPL). B. Gradational contact pictured in Figure **F26** between a fine-grained intrusive olivine- and oxide-bearing gabbro and an olivine-bearing oxide gabbro that is partially recrystallized at the contact (19R-2, 95–98 cm; TS 128; XPL). C. Relatively sharp contact between an intrusive, but fine-grained, recrystallized, and foliated oxide olivine microgabbro and an olivine-bearing oxide gabbro (25R-1, 26–30 cm; TS 137; XPL). Note that thin zones of recrystallized plagioclase developed in the host olivine-bearing oxide gabbro. Black arrow = "up" in the core reference frame.

Figure F28. Example of high-temperature deformation crosscutting relationships, Hole 1105A. Narrow high-temperature vertical shear zone (red dashed line) crosscuts and displaces a thin foliated microgabbro (blue dashed lines). The microgabbro is "necked" by the shear zone and also shows evidence for earlier crystal-plastic deformation, which also affected the host olivine-bearing oxide gabbro.

Figure F29. A. Histogram of magmatic fabric intensity, Hole 1105A. B. Variation of magmatic fabric intensity with depth plotted as raw data in comparison with CPF intensity. Magmatic fabric intensity: 0 = isotropic, 1 = weak, 2 = moderate, 3 = strong. CPF deformation intensity: 0 = undeformed, 1 = foliated, 2 = porphyroclastic, 3 = protomylonitic, 4 = mylonitic, 5 = ultramylonitic. CPF intensity is plotted as a thickness-corrected running average.

Figure F30. A. Frequency distribution of magmatic fabric dips, Hole 1105A. *N* = number of measurements, mean = mean dip, Std = standard deviation in 2σ. B. Depth distribution of magmatic fabric (MF) and magmatic contact (MC) dips.

Figure F31. CPF intensity with depth plotted as a thickness-corrected 11-cell running average and as raw data, Hole 1105A. CPF intensity: 0 = undeformed, 1 = foliated, 2 = porphyroclastic, 3 = protomylonitic, 4 = mylonitic, 5 = ultramylonitic.

Figure F32. A. Frequency distribution histogram of CPF dips, Hole 1105A. *N* = number of measurements, mean = mean dip, Std = standard deviation. B. Depth distribution of CPF dips.

Figure F33. Typical aspect of ductile shear zones with sharp boundaries (dashed lines), Hole 1105A.

Figure F34. High-temperature solid-state foliation defined by the orientation of plagioclase layers and sigmoidal clinopyroxene grains, immersed in a fine-grained plagioclase + clinopyroxene + olivine + oxide mixture, Hole 1105A. Note sharp contact of shear zone with less crystal-plastically deformed gabbro at bottom of image.

Figure F35. Metamorphic vein density and vein fill proportion with depth, Hole 1105A. A. Vein density. 0 = no veins, 1 = <1 vein/10 cm, 2 = 1–5 veins/10 cm, 3 = 5–10 veins/10 cm, 4 = 10–20 veins/10 cm, 5 = >20 veins/10 cm. Red = raw vein density determined every 10 cm, black = 11-point running average. Vein frequency, number of veins within a 10 m interval, of (B) amphibole and (C) clay veins.

Figure F36. Dip of amphibole, clay, and other (secondary plagioclase, carbonate, and fracture wall mineralization) veins, Hole 1105A. A. Frequency distribution of dip orientations. Dashed bell curves = predicted distribution of a random set of planes in a borehole due to biases introduced by spherical geometry of true dip data and vertical nature of the borehole (see **Structural geology** in the Expedition 360 methods chapter [MacLeod et al., 2017]). Curves were fitted to total number of measured veins of each vein type. Deviations from this curve depict nonrandomness of vein dip measurements. *N* = number of measurements, mean = mean dip, Std = standard deviation in 2σ, S = skewness of the distribution. B. Depth dip distribution highlighting overall prevalence of amphibole veins in the upper part (shallower than 80 m CCSF) and clay-filled veins as well as open fractures with vein wall mineralization (e.g., calcite) in the lower part (deeper than 110 m CCSF) of the borehole.

Figure F37. Various metamorphic veins. A. Steeply dipping amphibole veins with replacement front halos, which have spread away from veins into feldspar grains (14R-4A, 55–68 cm). B. Calcite precipitated within fracture leaving voids within the vein center (30R-1A, 1–8 cm). C. Open fracture crosscutting the core section (26R-1A, 90–107 cm). D. Fracture wall displaying botryoidal calcite growth (26R-1A, 96–100 cm).

Figure F38. (A) Fracture density increasing with depth, a trend that correlates with the presence of fractured zones, and (B) fault rock intensity with depth, Hole 1105A. The majority of fracture zones are in the bottom part of the hole (gray bars). Fault intensity: 0 = undeformed; 1 = minor fracturing; 2 = moderate fracturing; 3 = dense anastomosing fracturing and no significant clast rotation, incipient breccia; 4 = well-developed fault, breccia, and clast rotation; 5 = cataclasite.

Figure F39. A. Fault breccia (26R-3A, 0–26 cm). The most densely fractured and brecciated zone occurs from 3 to 15 cm and is surrounded by a highly fractured and altered zone. B. Densely fractured zone composed of mostly plagioclase surrounded by elongate Fe-Ti oxide-rich zones with entrained clasts of pyroxene (18R-2A, 7–17 cm).

Figure F40. A. Frequency distribution of fracture dips, Hole 1105A. Red dashed line = expected distribution of dips for randomly oriented small-scale (10 cm to 1 m) planar features. *N* = number of measurements, mean = mean dip, Std = standard deviation in 2σ, S = skewness of the distribution. B. Depth distribution of fracture dip magnitude.

Figure F41. A. Magmatic breccia with leucocratic and oxide-rich host and pyroxene clasts (27R-1, 42–54 cm). B. Hydrothermal breccia with two irregular bands with fragmented clasts of pyroxene (21R-1, 27–32 cm).

Figure F42. Examples of magmatic and incipient crystal-plastic microstructures. A. Common weak magmatic fabric with euhedral to subhedral elongated plagioclase (Pl) and subhedral to poikilitic undeformed clinopyroxene (Cpx) (4R-3, 46–60 cm; XPL). B. Subhedral elongated Pl with curved grain boundaries and anhedral Cpx (13R-1, 87–89 cm; XPL). SPO of Pl defines the moderate magmatic fabric. C. Magmatic contact between coarse-grained (left) and fine-grained (right) olivine (Ol) gabbro (13R-1, 24–26 cm; XPL). Magmatic fabric displayed by elongated Pl is subparallel to the contact. D. Elongated subhedral Pl and elongated Ol that define a magmatic fabric in Ol gabbro (12R-2, 50–53 cm; XPL). E. Interstitial Fe-Ti oxide (Ox) pods in between coarse Pl grains (4R-4, 57–62 cm; PPL). F. Magmatic foliation defined by SPO of Pl, Cpx, and Ox pods (11R-2, 51–54 cm; XPL). Incipient crystal-plastic overprint observed in recrystallization of fine-grained Pl. Some Fe-Ti Ox pods may include Pl neoblasts. G. Porphyroclastic fabric consisting of a fine-grained polyphase mixture showing a SPO of constituent phases (16R-1, 91–94 cm; XPL).

Figure F43. Examples of crystal-plastic microstructures (XPL). A. Coarse clinopyroxene (Cpx) porphyroclasts immersed in a matrix of recrystallized plagioclase (Pl) and oxides (Ox) (29R-4, 31–33 cm). Fine-grained Pl grains also have core-mantle structures around Pl porphyroclasts. B. Fine-grained aggregate of recrystallized Pl + olivine + Cpx mixtures (13R-3, 38–42 cm). Mylonitic foliation is defined by the orientation of Pl layers and Fe-Ti Ox pods. C. Fine-grained Pl + amphibole (Am) + Ox recrystallized grains (30R-3, 102–106 cm). D. Recrystallized bands of fine-grained Pl filling cracks and rimming coarse Pl porphyroclasts (5R-1, 115–118 cm). E. Strongly recrystallized mylonite fabric defined by Cpx, Am, and local Pl porphyroclasts in a matrix of fine-grained recrystallized Pl + Cpx + Ox (7R-3, 33–36 cm).

Figure F44. CPF intensity and magnetic susceptibility (MS), Hole 1105A. Red lines and dots = raw data, black lines = smoothed data, blue lines = CPFs that are ≥4 and occur in the same interval as a peak in MS, green lines = peaks in MS not associated with intense crystal-plastic deformation. CPF intensity: 0 = undeformed, 1 = foliated, 2 = porphyroclastic, 3 = protomylonitic, 4 = mylonitic, 5 = ultramylonitic. See text for discussion.

Figure F45. Whole thin section photographs (left: PPL, right: XPL). A. Plagioclase (Pl) and olivine (Ol) define subvertical magmatic foliation with a weak CPF (11R-2, 129–133 cm). Fe-Ti oxide (Ox) pods are elongate to the foliation and form near phenocrysts/porphyroclasts of Ol and pyroxene (Px). B. A mylonite with dispersed networks of Fe-Ti Ox intermingled with very fine grained neoblasts of Pl (5R-1, 144–147 cm). C. Contact (dashed white line) between coarse-grained Ol gabbro and fine-grained gabbro (18R-2, 55–57 cm). There are Ox in both the fine- and coarse-grained gabbros. Am = amphibole.

Figure F46. Comparison between Expedition 360, Leg 179 synthesis (Casey et al., 2007), and Leg 179 *Initial Reports* volume (Pettigrew, Casey, Miller, et al., 1999) crystal-plastic intensity with depth, Hole 1105A. CPF intensity from Expedition 360: 0 = undeformed, 1 = foliated, 2 = porphyroclastic, 3 = protomylonitic, 4 = mylonitic, 5 = ultramylonitic. See text for discussion. Casey et al. (2007) used a modified intensity scale.

Figure F47. Histograms of NRM intensity and low-field magnetic susceptibility for each of three simplified lithologic groups based on oxide content in Hole 1105A, based on archive-half SRM measurements of NRM made during Leg 179 and low-field magnetic susceptibility measurements made during Expedition 360.

Figure F48. A–F. Examples of AF demagnetization of archive section halves, Hole 1105A. Solid circles = projection onto horizontal plane, open circles = projection onto vertical *Y*-Up plane. D_{ang} = angle between free-fit and anchored PCA picks used as a measure of the degree to which free-fit PCAs are directed toward the origin, initial RM = initial measurement of remanent magnetization during Expedition 360 following storage of Hole 1105A archive section halves in core repositories since Leg 179.

Figure F49. A–D. Examples of AF demagnetization of archive section halves, Hole 1105A. Solid circles = projection onto horizontal plane, open circles = projection onto vertical *Y*-Up or *X*-Up planes. D_{ang} = angle between free-fit and anchored PCA picks used as a measure of the degree to which free-fit PCAs are directed toward the origin, initial RM = initial measurement of remanent magnetization during Expedition 360 following storage of Hole 1105A archive section halves in core repositories since Leg 179.

Figure F50. Summary of archive section half remanent inclination data, Hole 1105A. (A) Core recovery, (B) autopicked archive section half PCA inclination data prior to quality filtering (but with data from within 4.5 cm of the ends of core pieces excluded), (C) quality-filtered remanence inclinations (i.e., samples with PCA maximum angular deviation ≤ 10°, D_{ang} ≤ 10°, and median destructive field [MDF] ≥ 25 mT), and (D) piece average inclinations. Piece average inclination: solid circles = pieces containing ≥4 measurement points (for which Fisher statistics are reported in Table **T4**), open circle = pieces containing <4 measurement points.

Figure F51. Summary of MS measurements, Hole 1105A. Lithology columns show correspondence of high values with oxide-bearing rocks.

Figure F52. Downhole summary of thermal conductivity measurements on samples from Hole 1105A conducted during Expedition 360.