Figure F1. Overview of general shipboard workflow, Expedition 360.

Figure F2. Core handling, Expedition 360. A. If coring without core liner (only 1 core during Expedition 360), pieces extracted from core barrel were placed into 1.5 m long temporary split liner sections labeled alphanumerically from bottom to top. When coring with a core liner, liners and cores were cut on the catwalk into temporary sections ~1.4 m long (not shown). B. After transfer of temporary sections to core splitting room, pieces were arranged with dividers, resulting in curated sections. C. Sections were registered and assigned depths contiguously from the top of the core. The position of each piece has an uncertainty proportional to the gaps between pieces plus the remaining nonrecovered interval at the bottom of the core barrel. During Expedition 360, the total length of all curated sections often exceeded the length of the corresponding (D) cored interval; we constructed a core composite depth below seafloor (CCSF) depth scale to eliminate resulting overlaps (see **Depth computations**).

Figure F3. Core reference frame for structural and paleomagnetic orientation measurements used on the *JOIDES Resolution* (modified from Expedition 335 Scientists, 2012), Expedition 360. A. Primary orientation of each core piece is up and down along the core axis. B. Coordinates in both archive and working section halves. C. Conventions for labeling samples and thin sections taken from working section half.

Figure F4. Overview of depth scale types generated on the *JOIDES Resolution*. LRF = logging-while-drilling (LWD) depth below rig floor, LSF = LWD depth below seafloor, MRF = mud depth below rig floor, MSF = mud depth below seafloor, SSL = seismic depth below sea level, SSF = seismic depth below seafloor. Depth scales used during Expedition 360 are defined in text.

Figure F5. Example of a graphic summary (VCD), Expedition 360.

Figure F6. Overview of general data flow and software tools used during Expedition 360. The *JOIDES Resolution* "tool box" includes a mixture of custom-built software applications (blue), commercial software programs (red), and combinations of both (green). All data are loaded to the LIMS database and can be downloaded in various ways as text files or Excel workbooks (yellow). QC = quality control.

Figure F7. Colors, patterns, abbreviations, and symbols used on graphic summaries (VCDs), Expedition 360.

Figure F8. Example of a thin section report, Expedition 360. (Continued on next page.

Figure F8 (continued).

Figure F9. Rock classification, Expedition 360.

Figure F10. Rock name modifiers based on modal mineralogy, Expedition 360.

Figure F11. Terms used to describe textural relationships between different silicate grains, Expedition 360. Pl = plagioclase, Cpx = clinopyroxene.

Figure F12. Schematic illustration of how structures were logged, Expedition 360. Top and bottom offsets from top of section of a structure are logged where structure intersects center line of section half surface. A. Magmatic fabric is logged for the interval over which it occurs and for its perpendicular thickness. B. If structural features do not cross center line of core (e.g., veins or fractures), then their center point is logged as its interval. If structural feature is a vein or fracture network, the interval over which the network occurs is logged.

Figure F13. A–C. Reference frame and method of measuring the orientation of a planar feature, Expedition 360. If a piece is cut perpendicular to strike of a structural feature, dip/dip azimuth can be measured directly. If a structural feature is oblique to cut face, two measurements must be made.

Figure F14. Predicted distribution of a random set of planar features, Expedition 360. Curve I (Equation **1**) shows effect of spherical geometry on true dip data. Curve II (Equation **3**) shows bias effect introduced by sampling with a vertical borehole. Curve III (Equation **4**) combines the two effects and shows predicted distribution of a random set of planes in a vertical borehole.

Figure F15. Intensity ranks used to describe macroscopic and microscopic observations for magmatic foliation, gabbro and peridotite crystal-plastic deformation, fault rock deformation, serpentine network orientation, vein density, and open fracture density, Expedition 360.

Figure F16. Characteristics of veins and vein network classifications used by both structural geology and metamorphic petrology teams, Expedition 360.

Figure F17. Classification of fracture and fracture network morphologies, Expedition 360.

Figure F18. Calibration curves determined from seven rock standards for selected elements measured by ICP-AES, Expedition 360. Note that in most cases the relationship between emission line intensity and concentration is linear, but MgO and K_2O (and Na_2O) are best fitted with a polynomial. Standards may lie away from the curves as a result of spectral interferences or, in some cases, due to systematic differences in the reference values (e.g., reference values determined by different laboratories). This may be the cause of scatter for Co, which has a high reproducibility (Table **T5**).

Figure F19. Examples of major and trace element reproducibility in the MRG-1 standard analyzed as an unknown in all analytical sessions (Table **T5**), Expedition 360.

Figure F20. Calibration curves for the CHNS analyzer sulfanilamide (sulf.) and MRG-1 analyzed during the 24 h run all lie on single calibration curves for H_2O, CO_2, and S. Reproducibility refers to variability of H_2O, CO_2, and S in the standards calculated from peak area and best fit equations shown. Reproducibility of sulfanilamide is limited by errors associated with weighing submilligram-sized aliquots. Reproducibility of MRG-1 represents the maximum 1σ internal precision attainable for analyses of ~50 mg sample aliquots.

Figure F21. Reproducibility of samples analyzed for H_2O, CO_2, and S by CHNS and for LOI in different analytical sessions, Expedition 360. 1:1 lines of perfect agreement and envelopes representing an uncertainty of 10% are shown for reference. Insets show enlargements of shaded areas in plots.

Figure F22. Calibration curve for coulometric C measurement showing raw measured C based on manufacturer's calibration of the instrument's electronics versus C in $CaCO_3$ and $NaHCO_3$ standards, Expedition 360. Uncertainty of regression was quantified using Isoplot304 and weighing uncertainty of each data point equally (a Model 2 regression; Ludwig, 2009). MSWD = mean square of weighted deviation.

Figure F23. Clean area designed for microbiology sampling, Expedition 360. A. Side view showing air supply fed from above through a HEPA filter into clean area. Flow rate is high enough to maintain positive air pressure so that air pressure coming in through the top is greater than air pressure coming in through the bottom, effectively minimizing reverse airflow from the bottom. B. Back view showing vinyl curtain used to enter the unit. All other walls are Plexiglas. The curtain extends along the bottom of the unit, completely enclosing the user inside and preventing air from under the table from entering.

Figure F24. Adjustment of SQUID location in SRM software, using a point source aligned parallel to each SQUID sensor axis in the magnetometer coordinate system and located at an offset of 13 cm in the tray, Expedition 360. SQUID sensor response (A) before and (B) after adjusting SQUID location by 1.0 cm in SRM software. C. Prior to adjustment, measured inclination (determined from all three orthogonal SQUID sensors with dipole aligned parallel to SQUID *z*-axis) is ~9° too shallow. D. After adjustment, inclination returned is exactly equal to known value of 89.5°.

Figure F25. Total magnetic field profile through ASC Scientific TD-48 SC thermal demagnetizer, measured with an Applied Physics 3-axis fluxgate sensor while the *JOIDES Resolution* was at Site U1473 with a ship orientation of 039°, Expedition 360. Survey conducted on 22 December 2015.

Figure F26. Filtering of magnetic susceptibility (MS) data measured on whole-round sections with the WRMSL pass-through coil (magenta) and section halves with the SHMSL contact probe (cyan), Expedition 360. Laser profile (black) records many gaps and maps smaller breaks between pieces. Gradient of profile is calculated (green) to get location of breaks. Algorithm (filtWRMSL.m) screens magnetic susceptibility values using specified piece edge offset criteria (Table **T8**). Red + = filtered WRMSL data, blue + = filtered SHMSL data. A. Successful automatic filtering. Wrap around because of values >10^4 IU occurs where oxide is present, near 20 cm, and at 93 cm. B. Example of hand editing (circled points = removed) required after automatic filtering (Pass 1), based on proximity to piece edge. C. Same section as in B with filter Pass 2 applied (larger offsets from piece edge); fewer hand edits are required.

Figure F27. Normalized response curve of MS2C Bartington magnetic susceptibility meter on the WRMSL (modified after Blum, 1997), Expedition 360. Normalized amplitude (*A*) of magnetic susceptibility of thin discs against distance from the center of the MS2C coil (*x*). Amplitudes are normalized against peak value at zero distance. Black line = fitted curve based on inset equation, where the fitted scaling length (C) is ~¼ of the coil diameter. Gray line = cumulative probability function for fitted curve, indicating that 90% of measured signal is sourced from within ±4 cm of the coil (8 cm interval).

Figure F28. Example of corrected whole-round/pass-through magnetic susceptibility (MS) data when signal is higher than maximum value recorded by instrument (9,999 IU). A. MS of 360-U1473A-10R-1, 0–110 cm. Corrected curve obtained by adding 10,000 to measured data. Gray background delimits range of values measured by instrument. B. Corresponding core image. 58–64 and 82–84 cm show recorded wrap-around at oxide-rich zones. 0–6, 10–18, and 34–46 cm illustrate skipped and filtered portions where data are not reliable because they correspond to empty intervals, piece edges, or broken or small pieces.

Figure F29. NGRL detector space resolution and position (Vasiliev et al., 2011), Expedition 360. A. NGR internal space resolution defined as full width at half maximum (FWHM) from measurements with ^{137}Cs, ^{60}Co, and ^{152}Eu calibration sources as well as a Monte Carlo model. Experimental and model data (symbols) are shown together with Gaussian fit (line). B. Monte Carlo models for 8 detector responses (NaI Detectors d1–d8). Each response curve is centered over a detector. Detector positions are indicated as distance from center of sample chamber as modeled by a simulation program (Vasiliev et al., 2011). Response of Detector d8 is truncated because edge of 150 cm long core sample is positioned at center of detector. Similarly, response from Detector d1 is skewed because other edge of sample does not extend across entire region of Detector d1 sensitivity.

Figure F30. Wireline tool strings used during Expedition 360. See Table **T9** for tool acronyms.