

Figure F1. Location map of Site U1476 with main surface currents (arrows) in the southwest Indian Ocean and atmospheric circulation over southern Africa during austral summer (December, January, February) with approximate position of the Intertropical Convergence Zone (ITCZ) and Congo Air Boundary (CAB) (dashed lines; adapted from Reason et al., 2006). AC = Agulhas Current, SEC = South Equatorial Current, SEMC = South East Madagascar Current, NEMC = North East Madagascar Current, EACC = East Africa Coastal Current, TB = Transkei Basin. Purple shading = Zambezi Catchment, green shading = Limpopo Catchment, gray double-headed arrows = main pathways of moisture supply to the African continent from the northwest Atlantic (through Congo) and the northwest and southwest Indian Ocean.

Figure F2. Geomorphologic and oceanographic features near Site U1476. Bottom map shows the location of seismic Line M753-GeoB08-205. Dashed arrow = bottom water currents, solid arrows = main surface currents. NADW = North Atlantic Deep Water, AAIW = Antarctic Intermediate Water.

Figure F3. Temperature-salinity diagram of hydrographic stations from the Comoros Basin, close to the location of Site U1476 (from Collins et al., 2016). ASHSW = Arabian Sea High Salinity Water, TSW, Tropical Surface Water, STSW = Subtropical Surface Water, EIOW = Equatorial Indian Ocean Water, SICW = South Indian Central Water, AAIW = Antarctic Intermediate Water, RSIW = Red Sea Intermediate Water, UCDW = Upper Circumpolar Deep Water.

Figure F4. Multibeam bathymetry around Site U1476 and DSDP Site 242 surveyed during R/V Meteor Cruise M75/3 (2008). Seismic lines with common depth point annotation are indicated by dotted lines.

Figure F5. Parasound data along seismic Line M753-GeoB08-203 across DSDP Site 242. Surface sediment is characterized by closely spaced hyperbolic returns and a lack of continuous deeper reflections. SP = shot point. 3

Figure F6. Seismic Line M753-GeoB08-205 across Site U1476.

Figure F7. Detail of seismic Line M753-GeoB08-205 at Site U1476.

Figure F8. Core recovery, Holes U1476A–U1476E.

Figure F9. Lithostratigraphic summary with selected physical property and geochemical data. Hole U1476C comprises only one core and is presented in the visual core description (see [Core descriptions](#)). Bioturbation intensity: 1 = slight, 2 = moderate, 3 = strong. A. Hole U1476A. (Continued on next three pages.)

Figure F9 (continued). B. Hole U1476B. (Continued on next page.)

Figure F9 (continued). C. Hole U1476D. (Continued on next page.)

Figure F9 (continued). D. Hole U1476E.

Figure F10. A–L. Representative lithologies per interval. Section-half (left) surfaces and smear slide photomicrographs taken under plane-polarized (middle) and cross-polarized (right) light, Site U1476. Scale bars = 100 µm.

Figure F11. A–E. Sediment deformations and disturbances, Site U1476.

Figure F12. A–C. Relative percentages of major compositions of sediment determined by smear slide observations, Holes U1476A–U1476E.

Figure F13. Comparison of CaCO₃ content determined using measurements on discrete samples and biogenic carbonate proportions estimated in smear slides, Hole U1476A.

Figure F14. A, B. Scanning electron microscope images of magnetite found in a magnetic susceptibility peak in Hole U1476D. C. XRD diffractogram of a bulk sediment sample from the same prominent magnetic susceptibility peak in Hole U1476B (16H-3, 117–118 cm).

Figure F15. Color reflectance, Hole U1476A. Parameters were filtered to remove outliers.

Figure F16. SHIL RGB color data, Hole U1476A.

Figure F17. NGR and magnetic susceptibility, Hole U1476A. Black lines = WRMSL measurements, red circles = SHMSL measurements.

Figure F18. P-wave velocity and bulk density, Hole U1476A. Black lines = WRMSL measurements, red circles = MAD measurements.

Figure F19. Porosity, grain density, and thermal conductivity, Hole U1476A.

Figure F20. Biochronology at Site U1476 with the locations of significant planktonic foraminifer and calcareous nannofossil events. Upward arrows indicate the base (B), base reentrance (Br), base acme (Ba), and base common (Bc) occurrence for nannofossils and the B occurrence events for planktonic foraminifers. Downward arrows indicate the top (T) and top common (Tc) occurrence events for nannofossils and T occurrence events for planktonic foraminifers. Dashed lines in planktonic foraminifer zonation indicate the absence or biostratigraphic unreliability of the zonal marker species. Biochronology is based entirely on sampling in Hole U1476A.

Figure F21. Calcareous nannofossils, Hole U1476A. Scale bars = 5 µm.

1. *Reticulofenestra asanoi* (3H-4, 75 cm).
2. *Discoaster triradiatus* (6H-4, 75 cm).
3. *Scyphosphaera* sp. (8H-3, 75 cm).
4. *Discoaster surculus* (8H-3, 75 cm).
5. *Discoaster pentaradiatus* (8H-4, 75 cm).
6. *Discoaster brouweri* (9H-5, 75 cm).
7. *Ceratolithus telesmus* (9H-6, 75 cm).
8. *Discoaster asymmetricus* (9H-6, 75 cm).
9. *Rhabdosphaera clavigera* (10H-1, 75 cm).
10. *Discoaster tamalis* (10H-1, 75 cm).
11. *Amaurolithus tricorniculatus* (16H-1, 75 cm).
12. *Ceratolithus armatus* (16H-3, 75 cm).
13. *Ceratolithus acutus* (17H-2, 75 cm).
14. *Triquetrorhabdulus rugosus* (22H-4, 75 cm).
15. *Coccolithus pelagicus* (22H-4, 75 cm).
16. *Discoaster challengerii* (22H-4, 75 cm).
17. *Amaurolithus delicatus* (22H-4, 75 cm).
18. *Nicklithus amplificus* (22H-6, 75 cm).
19. *Discoaster quinqueramus* (22H-4, 75 cm).
20. *Sphenolithus* sp. (24H-CC).
21. Example of good preservation (24H-CC; dark field).
22. Example of good preservation and abundance (16H-CC; bright field).

Figure F22. Planktonic foraminifers, Hole U1476A. Scale bars = 100 µm.

1. *Neogloquadrina acostaensis* (5H-5, 70–72 cm).
2. *Globoturborotalita nepenthes* (14H-CC).
3. *Sphaeroidinella dehiscens* (11H-4, 70–72 cm).
4. *Sphaeroidinellopsis seminudina* (11H-4, 70–72 cm).
5. *Globoturborotalita apertura* (14H-CC).
6. *Globorotalia tosaensis* (4H-4, 70–72 cm).
7. *Globigerinoides obliquus* (13H-3, 70–72 cm).
8. *Globigerinoides extremus* (5H-5, 60–62 cm).
- 9–12. Genus *Globorotalia*; (9) *G. limbata* (11H-4, 70–72 cm); (10) *G. flexuosa* (11H-4, 70–72 cm); (11) *G. pseudomiciocenica* (6H-6, 70–72 cm); (12) *G. margaritae* (13H-3, 70–72 cm).

Figure F23. Planktonic foraminifers, Hole U1476A. Scale bars = 100 µm.

- 1–7. Mudline samples (1H-1); (1) *Globigerinella siphonifera*; (2) *Globigerinoides sacculifer*; (3, 4) *Globigerinella calida*; (5) *Globigerinella siphonifera*; (6) *Bella digitata*; (7) *Globigerinella adamsi*.
- 8, 9. Light microscope images (scale bar = 1 mm) of microfossil assemblage with pteropods and glassy preservation of planktonic foraminifers.

Figure F24. (A) S-ratio, (B) HIRM, (C) SIRM, and (D) magnetic susceptibility (gray line = SHMSL measurements, red circles = discrete sample measurements, black line = 7-point weighted average), Site U1476.

Figure F25. Comparison between section-half (line) and discrete sample (circle) inclinations, Site U1476. SRM = superconducting rock magnetometer.

Figure F26. A–D. Downhole inclination, declination, and intensity, Site U1476. Inclination and intensity: gray lines = data, vertical dashed line = present-day inclination, red and green circles = data without the last and first sections of each core (prone to drilling disturbance). Declination: gray

line = data, blue circles = orientation-corrected data. Black squares = discrete sample data from PCA.

Figure F27. Spliced inclination record, Site U1476. Age based on a preliminary shipboard age model. Gray line indicates the inclination after 15 or 25 mT demagnetization, red line corresponds to 15-point running average. Polarity chron ages after Gradstein et al. (2012).

Figure F28. Magnetic susceptibility records, Site U1476. Scale applies to all offset data from individual holes. (Continued on next page.)

Figure F28 (continued).

Figure F29. Composite spliced records of RGB blue values, magnetic susceptibility, and NGR, Site U1476.

Figure F30. Dissolved magnesium, potassium, sodium, and chloride profiles, Holes U1476A (blue) and U1476B (red).

Figure F31. Alkalinity, dissolved phosphate, and pH profiles, Holes U1476A (blue) and U1476B (red). Two pH outlier points plotted as open circles. Phosphate values below the detection limit are plotted as the detection limit value (1.33 μM).

Figure F32. Dissolved nitrate from Rhizon sampling in Core 361-U1476B-1H (red) and bottom-water nitrate from the Hole U1476E mudline sample (black).

Figure F33. Dissolved iron, manganese, and sulfate, Holes U1476A (blue) and U1476B (red). Samples with values below the detection limit are plotted as zeros.

Figure F34. Dissolved calcium and strontium profiles, Holes U1476A (blue) and U1476B (red).

Figure F35. Dissolved silicon, lithium, and boron profiles, Holes U1476A (blue) and U1476B (red).

Figure F36. Calcium carbonate (blue) and magnetic susceptibility (red), TOC, and bulk sediment elemental ratios, Hole U1476A.

Figure F37. Sedimentary major and trace element concentrations vs. aluminum oxide content, Hole U1476A.

Figure F38. Age-depth relationships based on calcareous nannofossils and planktonic foraminifers, Site U1476. Open red circles indicate planktonic foraminifer datums that use the age calibration of Sinha and Singh (2008); ages for solid red circles are based on Gradstein et al. (2012). A regression line (not shown) that is a linear fit to all data and forced through the origin indicates a long-term sedimentation rate of 3.0 cm/ky.