Figure F1. Seismic Line AWI-20050201 showing Site U1579. Preliminary interpretation of seismic units according to the drilled lithologic units is shown. The marked green reflection corresponds in structure to Reflector M of the precruise seismostratigraphic model (see Figure F4 in the Expedition 392 summary chapter [Uenzelmann-Neben et al., 2023b]), the magenta reflection to Reflector LE, and the blue reflection to Reflector LO. CDP = common depth point, TWT = two-way traveltime. ZS = zeolitic silicified sediment.

Figure F2. Lithostratigraphic summary, Site U1579.

Figure F3. Smear slide component compilation, Site U1579. 0 = not present, T = trace (0%–1%), R = rare (1%–10%), C = common (10%–25%), A = abundant (25%–50%), D = dominant (>50%).

Figure F4. Major lithologies of Lithostratigraphic Units I and II, Holes U1579B–U1579D. A. Nannofossil-rich foraminiferal ooze. B. White nannofossil ooze. C. White and pinkish white nannofossil chalk with clay. D. White nannofossil ooze with mottled bioturbation and pyrite staining. E. White to light greenish nannofossil chalk with bioturbation (*Skolithos* and *Zoophycos*). F. Light greenish gray to brownish calcareous with heavy bioturbation. G. Light greenish gray calcareous chalk and dark reddish gray clayey calcareous chalk. H. Light greenish gray calcareous chalk with clay. I. Light greenish gray calcareous chalk with clay. J. Reddish brown clayey calcareous chalk with poorly preserved inoceramid.

Figure F6. Pyrite mottles and framboids, Hole U1579B. A. Linescan image demonstrating dispersed framboidal pyrite staining (red arrows) (9F-3, 67–73 cm). B. Smear slide showing framboidal pyrite (red arrow) (9F-2, 70 cm). C, D. SEM images of pyrite framboids (9F-3, 70 cm).

Figure F7. Schematic of the K/Pg boundary, Hole U1579D. Boundary is marked by a sharp change in color at 33R-6A, 96–99 cm, from reddish brown clayey calcareous chalk to grayish green calcareous chalk with clay and is disturbed by drilling-related deformation and includes a narrow (~1 cm) greenish gray zone of calcareous ooze with clay.

Figure F8. Thin sections (TS) from Lithostratigraphic Unit II, 392-U1579D-52R. A. Altered carbonate grains and infilled foraminifera shells. B. Altered carbonate grains and infilled foraminifera shells in reddish-brown silica-rich cement. Images are taken under XPL using a petrographic microscope.

Figure F9. Major lithologies of Lithostratigraphic Unit III, Hole U1579D. A. Green glauconitic sandstone/siltstone with a distinct layer of normally graded medium sandstone and irregular contacts between layers. B. Green zeolitic sandstone with glauconite that has a normally graded interval at the top. C. Green zeolitic sandstone with glauconite that has a distinct layer of normally graded very coarse sandstone. D. Green zeolitic sandstone with glauconite with irregular and sharp contacts. E. Green zeolitic medium-grained sandstone with glauconite that is massively bedded.

Figure F10. Thin sections (TS) from Lithostratigraphic Unit III, Hole U1579D. Magnification = 10×. A. Altered carbonate grains and glauconite. B. Zeolite mineral growth in between larger opaque grains indicates secondary mineral formation. C. Zeolite minerals and infilled vesicles in zeolitic siltstone with clay. D. Altered grain (brown) with infilled vesicles. E. High-relief detrital grain (green under PPL) surrounded by glauconite and other altered grains. F. Foraminifera shells in carbonate-bearing glauconitic sandstones. G. Lithic fragments and zeolite minerals from a coarse sandstone layer. H. Zeolite minerals growing in between larger grains and an altered feldspar grain. All images except D and E are taken under XPL using a petrographic microscope.

Figure F11. A, B. Bulk XRD results. The mineralogical composition of zeolitic sandstone (Lithostratigraphic Unit III) is dominated by analcime. Other common minerals in bulk sediment include siderite, dolomite, glauconite, chabazite and montmorillonite. C. Clay-fraction (<2 µm size fraction) XRD results (sample taken from the PAL residue immediately underlying this section-half image). Dominant phases of analcime, chabazite, ferrous celadonite, glauconite, and montmorillonite with analcime are shown. cps = counts per second.

Figure F12. Stratigraphic summary of the lowermost ~65 m of Hole U1579D.

Figure F13. Igneous rock, Hole U1579D. A–C. Lithostratigraphic Unit IV: (A) 61R-6, 0–3 cm, (B) 63R-3, 17–19 cm, and (C) 63R-3, 17–19 cm. D. Lithostratigraphic Unit VI (65R-5, 2–4 cm). Note the smaller grain size in D compared to the interior of Lithostratigraphic Unit IV shown in A–C. OL = olivine, CPX = clinopyroxene, PLAG = plagioclase. All images in XPL.

Figure F14. Partial recovery of Lithostratigraphic Unit V (sediment)/VI (basalt) contact (392-U1579D-65R-3, 91–105 cm). The basalt is completely altered, and the sediment shows signs of contact metamorphism. The contact (red dashed line) was not recovered oriented, so individual pieces were arranged to better show the contact.

Figure F15. Overview of the preservation of calcareous nannofossils, planktonic foraminifera, and palynomorphs and abundance of siliceous microfossils studied at Site U1579. Preservation: P = poor, M = moderate, G = good, VG = very good, E = excellent. Abundance: B = barren, Tr = trace, R = rare, Fr = frequent.

Figure F16. Calcareous nannofossil abundance, zones, and distribution of biostratigraphically important taxa, Site U1579. Dashed lines = epoch boundaries, wavy line = unconformity between Pleistocene and Miocene sediment. Abundance: D = dominant, A = abundant, C = common, F = few, R = rare, B = barren.

Figure F17. Select Paleogene calcareous nannofossils. Scale bars = 10 µm. A. *Zygrhablithus bijugatus* (392-U1579D-19R-CC). B. *Reticulofenestra oamaruensis* (392-U1579C-25X-1, 13 cm). C. *Pletolithus gigas* (392-U1579D-11R-2, 105 cm). D. *Furcatolithus distentus* (392-U1579A-6R-CC). E. *Ellipsolithus macellus* (392-U1579D-15R-CC). F. *Discoaster multiradiatus* (392-U1579D-19R-CC). G. *Discoaster lodoensis* (392-U1579D-12R-3, 80 cm). H. *Campylosphaera eodela* (392-U1579D-15R-CC). I. *Furcatolithus ciperoensis* (392-U1579A-4H-CC). J. *Reticulofenestra isabellae* (392-U1579D-6R-CC). K. *Discoaster tanii*? (392-U1579B-27X-CC). L. *Reticulofenestra bisecta* > 10 µm (392-U1579B-26X-2, 57 cm). M. *Chiasmolithus altus* (392-U1579A-8H-CC). N. *Sphenolithus pseudoradians* (392-U1579B-24F-CC). O. *Reticulofenestra umbilicus* > 14 µm (392-U1579B-26X-CC). P. *Coccolithus formosus* (392-U1579B-25X-CC). Q. *Nannotetrina fulgens* (392-U1579D-10R-CC). R. *Cruciplacolithus primus* (392-U1579D-33R-5, 70–71 cm). S. *Isthmolithus recurvus* (392-U1579D-5R-CC). T. *Toweius eminens* (392-U1579D-19R-CC).

Figure F18. Select Cretaceous calcareous nannofossils, Hole U1579D. Scale bar = 10 µm. A. *Micula staurophora* (33R-5, 70–71 cm). B. *Nephrolithus frequens* (33R-6, 102 cm). C. *Prediscosphaera cretacea* (33R-CC). D. *Prediscosphaera stoveri* (33R-CC). E. *Kamptnerius magnificus* (33R-CC). F. *Arkhangelskiella cymbiformis* (33R-CC). G. *Eiffellithus turriseiffelii* (33R-CC). H. *Helicolithus trabeculatus* (54R-2, 102 cm). I. *Biscutum magnum* (41R-CC). J. *Monomarginatus quaternarius* (42R-CC). K. *Uniplanarius gothicus* (42X-CC). L. *Seribiscutum primitivum* (54R-2, 102 cm). M. *Broinsonia enormis* (48R-CC). N. *Watznaueria barnesiae* (54R-2, 102 cm). O. *Broinsonia parca parca* (49R-CC). P. *Eiffellithus eximius* s.s. (51R-CC).

Figure F19. SEM photomicrographs of select planktonic foraminifera. A (1,2). *Globorotaloides quadrocameratus* (SEM A9: 392-U1579A-1H-CC). B (1–3). *Dentoglobigerina* sp. (SEM F22: 392-U1579A-7H-CC). C (1–3). *Subbotina* sp. (SEM F3: 392-U1579B-13F-CC). D (1, 2). *Subbotina utilisindex* (SEM D12: 392-U1579B-21F-CC). E (1–3). *Globoturborotalita labiacrassata* (SEM D7: 392-U1579B-19F-CC). F (1,2). *Gublerina rajagopalani* (SEM G14: 392-U1579D-33R-CC). G (1,2). *Chiloguembelina cubensis* (SEM B12: 392-U1579B-17F-CC). H (1–3). *Globotruncanella havanensis* (SEM G15: 392-U1579D-33R-CC).

Figure F20. SEM photomicrographs of select benthic foraminifera. A (1,2). *Cibicidoides subhaidingerii* (SEM B11: 392-U1579A-6H-CC). B, C. Unknown; (B) SEM F13: 392-U1579A-17F-CC; (C) SEM F12: 392-U1579A-17F-CC. D (1,2). *Bolivinoides draco* (SEM I21: 392-U1579D-33R-CC). E (1,2). *Cibicidoides* cf. *excavatus* (SEM I8: 392-U1579A-25X-CC). F (1–3). *Heronallenia lingulata* (SEM F2: 392-U1579A-13F-CC). G (1,2). *Lenticulina* sp. (SEM I19: 392-U1579D-33R-CC). H (1–3). *Pleurostomella* sp. (SEM F15: 392-U1579A-19F-CC). I (1–3). *Bolivina* sp. (SEM F9: 392-U1579A-13F-CC). J (1,2). *Pullenia* sp. (SEM I4: 392-U1579A-23F-CC).

Figure F21. Selected siliceous microfossils. A, D, E. *Liostephania* sp. stage diatom frustules; (A) 392-U1579A-27X-CC; (D) 392-U1579D-5R-CC; (E) 392-U1579D-5R-CC. B, C. *Naviculopsis biapiculata* (392-U1579D-5R-CC). F. *Hemiaulus* sp. fragment (392-U1579D-5R-CC). G, H. *Distephanus crux* (392-U1579D-5R-CC).

Figure F22. Selected palynomorphs (392-U1579D-58R-4, 109–111 cm). A. *Conosphaeridium striatoconus*. B. *Downiesphaeridium armatum*? C. *Dinopterygium cladoides*? D. *Dinogymnium acuminatum*. E. *Dinogymnium euclaense*. F–H. *Heterosphaeridium spinaconjunctum*. I. *Impagidinium cristatum*. J, K, R. *Trithyrodinium suspectum*. L. *Odontochitina cribropoda*. M, N. *Oligosphaeridium complex*. O, P. *Pterodinium cingulatum*. Q. *Spiniferites ramosus*. S, T. *Satyrodinium haumuriense*. U–W. *Deltoidospora* cf. *australis*. X. Trilete spore (*Leptolepidites*?). Y. Trilete spore (*Concavissisporites*?). Z. Bisaccate pollen. AA, AB. *Pterospermella*.

Figure F23. Magnetostratigraphic results, Hole U1579A. Dark blue dots = NRM intensity before AF demagnetization. Cyan dots = NRM intensity and inclination after 20 mT AF cleaning of archive halves. Black line in inclination column = 10 point moving average, red dots = discrete samples. Negative (up-pointing) inclination indicates deposition during a normal geomagnetic polarity field (black bands in polarity columns). In Hole U1579A, a reliable correlation with the GPTS was not possible.

Figure F24. Magnetostratigraphic results, Hole U1579B. Dark blue dots = NRM intensity before AF demagnetization. Cyan dots = NRM intensity and inclination after 20 mT AF cleaning of archive halves. Black line in inclination column = 10 point moving average, red dots = discrete samples. Negative (up-pointing) inclination indicates deposition during a normal geomagnetic polarity field (black bands in the polarity columns). In Hole U1579B, a reliable correlation with the GPTS was not possible.

Figure F25. Magnetostratigraphic results, Hole U1579C. Dark blue dots = NRM intensity before AF demagnetization. Cyan dots = NRM intensity and inclination after 20 mT AF cleaning of archive halves. Black line in inclination column = 10 point moving average. Negative (up-pointing) inclination indicates deposition during a normal geomagnetic polarity field (black bands in the polarity columns). Gray bands = undefined magnetic polarity due to recovery gaps. In Hole U1579C, a reliable correlation with the GPTS was not possible.

Figure F26. Magnetostratigraphic results, Hole U1579D. Dark blue dots = NRM intensity before AF demagnetization. Cyan dots = NRM intensity and inclination after 15 mT AF cleaning of archive halves. Black line in inclination column = 15 point moving average, red dots = discrete samples. The magnetic polarity plot is generated from the moving average: negative (up-pointing) inclination indicates deposition during normal geomagnetic polarity field (black bands), and positive (down-pointing) paleomagnetic inclination is representative of reversed geomagnetic field. Gray bands = uncertain magnetic polarity due to recovery gaps. Preliminary correlation with the GPTS of Ogg (2020) (GPTS2020) is shown (blue bands).

Figure F27. AMS data, Site U1579. *P′* and T are dimensionless.

Figure F28. SIRM, HIRM, *S*-ratio, and MS (*k*), Site U1579.

Figure F29. Discrete sample demagnetization results, Site U1579. A–C. Samples were demagnetized by AF protocol. D. Sample underwent thermal demagnetization. A. Weak magnetization; ChRM determination was difficult. B. Low magnetization (~1×10^{-5} A/m); ChRM was constrained using Fisher statistics (Fisher, 1953). C. Gyroremanent magnetization acquired during AF demagnetization (Lithostratigraphic Unit III). D. Thermal demagnetization results on a basaltic sample (Lithostratigraphic Unit IV). In A–D, vector endpoint diagrams are shown (left-hand panels) with the equal area projection of the vector endpoints (round panels) and a graph showing natural magnetization (M) decay during demagnetization (top right panels). Vector endpoint diagrams: white symbols = projections onto the vertical plane, black symbols = projections onto the horizontal plane, X and Y = axes of the working halves, and Up = vertical up-pointing (–Z-)axis of the core. Equal-area projections: open symbols = negative (up-pointing) directions, black symbols = positive (down-pointing) directions. All plots: red symbols = steps used to determine the characteristic remanent directions. E. Equal-area projection with all down-pointing (reversed) and up-pointing (normal) paleomagnetic directions. F. Quantile-quantile analyses used to attest the uniformity of measured declinations; if $\mu > 1.207$, the null hypothesis of a uniform distribution of declination can be excluded at a 95% certainty (Fisher et al., 1987; Tauxe, 2010). The uniformly distributed declination values support the lack of pervasive drilling-induced magnetic overprints.

Figure F30. Histograms of all magnetic inclination data, Site U1579. Marked peaks at approximately ±30° are due to unusually high background noise of the cryogenic magnetometer. Holes U1579A–U1579C are shown after 20 mT AF demagnetization. Hole U1579D is shown after 15 mT AF demagnetization.

Figure F31. Composite record for 0–50 m CSF-A, Site U1579. Composite core photographs: yellow = tops of splice tie points, purple = bottoms of splice tie points. cps = counts per second. Gray arrows = splice path, red lines = Hole U1579A, blue lines = Hole U1579B. Far right = spliced composite core image. MS data are from the WRMSL, and red RGB channel data are from the SHIL core images.

Figure F32. Composite record for 50–100 m CSF-A, Site U1579. Composite core photographs: yellow = tops of splice tie points, purple = bottoms of splice tie points. cps = counts per second, gray arrows = splice path, red lines = Hole U1579A, blue lines = Hole U1579B, green lines = Hole U1579C. Far right = spliced composite core image. MS data are from the WRMSL, and red RGB channel data are from the SHIL core images.

Figure F33. Composite record for 100–150 m CSF-A, Site U1579. Composite core photographs: yellow = tops of splice tie points; purple = bottoms of splice tie points. cps = counts per second; gray arrows = splice path; blue lines = data from Hole U1579B; green lines = data from Hole U1579C; far right = spliced composite core image. MS data are from the WRMSL, and the red RGB channel data are from the SHIL core images.

Figure F34. Composite record for 150–200 m CSF-A, Site U1579. Composite core photographs: yellow = tops of splice tie points; purple = bottoms of splice tie points. cps = counts per second; gray arrows = splice path; blue lines = data from Hole U1579B; green lines = data from Hole U1579C; brown lines = data from Hole U1579D; far right = spliced composite core image. MS data are from the WRMSL, and the red RGB channel data are from the SHIL core images.

Figure F35. CSF-A vs. CCSF depths for the tops of cores recovered from Holes U1579A–U1579D. Letters correspond to holes. A 1:1 line is plotted for reference.

Figure F36. Correlation of NGR measured on cores (orange) to HSGR data from downhole logging with the HNGS (black) plotted on individual, equally spaced scales (left) and shifted scales to overlap visually (right), Site U1579. Dashed gray lines = tie points to individual cores. cps = counts per second.

Figure F37. Age-depth model and average sedimentation rates, Site U1579. Numbers for bioevents correspond to those in Table T3. Numbers for magnetic reversals correspond to those in Table T13. GTS2020 = Geologic Time Scale 2020 (Gradstein et al., 2020).

Figure F38. Methane concentration, Site U1579.

Figure F39. Alkalinity and pH, Site U1579.

Figure F40. IW sulfate, chloride, sodium, calcium, magnesium, and potassium, Site U1579.

Figure F41. IW lithium, strontium, boron, and iron, Site U1579.

Figure F42. Total carbon, calcium carbonate, and organic carbon, Site U1579. Organic carbon is calculated as the difference between total and inorganic carbon.

Figure F43. Sediment aluminum, calcium, iron, potassium, sulfur, and silicon, Site U1579.

Figure F44. A. Total alkali vs. silica (TAS) diagram (normalized to 100% on a volatile free base) with alkaline/tholeiitic boundary after MacDonald and Katsura (1964). B. Mg/Zr vs. Ti/V from two samples from Igneous Unit 1 and one sample from Igneous Unit 2 (all data calibrated with liquid standards). Discrimination lines for rock types in (B) are based on Shervais (2022). All three samples plot as tholeiitic basalts. Reference data from dredged samples from neighboring Mozambique Ridge (MOZR) taken from Jacques et al. (2019). Data from the Southwest Indian Ridge (SWIR) from Le Voyer et al. (2019) and references therein. OIB = ocean-island basalt, MORB = mid-ocean-ridge basalt.

Figure F45. Physical properties, Site U1579. All plotted data sets omit data points of poor quality such as from section ends and cracks in the cores. Dotted lines = lithostratigraphic boundaries. cps = counts per second.

Figure F46. NGR and K, Th, and U abundances from deconvolution of the total NGR energy spectra, Hole U1579B. Dotted lines = lithostratigraphic boundaries. cps = counts per second.

Figure F47. NGR and K, Th, and U abundances from deconvolution of the total NGR energy spectra, Hole U1579D. Dotted lines = lithostratigraphic boundaries. cps = counts per second.

Figure F48. MAD and thermal conductivity results, Site U1579. Dotted lines = lithostratigraphic boundaries.

Figure F49. WRMSL density and *P*-wave velocity measurements, Site U1579. Plotted WRMSL data omit data points of poor quality such as from section ends and cracks in the cores.

Figure F50. Bulk density, Site U1579. A. WRMSL GRA bulk density vs. wet bulk density from discrete MAD measurements. B. GRA bulk density vs. MAD dry bulk density.

Figure F51. Downhole wireline logging results, Hole U1579D. Right column shows part of Seismic Profile AWI-20050201 in two-way traveltime (TWT) (50 traces around Site U1579, located at common depth point [CDP] 12,650). HRLT = High-Resolution Laterolog Array.

Figure F52. High-resolution downhole wireline logging results, Hole U1579D. HRLT = High-Resolution Laterolog Array.

Figure F53. Crossplot of K vs. Th abundance data from the HNGS log, Hole U1579D.