Figure F1. A. Structural elements of the northern part of the Vøring Plateau (after Gernigon et al., 2021). Insets: (B) Skoll High (see Figures F2 and F3), (C) Eldhø (see Figure F1 in the Site U1574 chapter [Planke et al., 2023c]), and (D) Lofoten Basin (see Figure F1 in the Site U1573 chapter [Planke et al., 2023b]) regions.

Figure F2. Crustal transects across the Vøring Basin and Vøring Marginal High (after Zastrozhnov et al., 2020). Note the pronounced magmatic crustal thickening of the outer part of the Vøring Basin, including as thick as 6 km extrusive basalt flows. TWT = two-way traveltime.

Figure F3. Depth converted arbitrary seismic line from 3-D Cube CVX1101, Sites U1571 and U1572.

Figure F4. Lithostratigraphic summary, Sites U1571 and U1572. Holes are shown along a 118° bearing (Hole U1572B to U1571B) and tied along unit/subunit boundaries (black horizontal lines). Epochs (Eocene, Oligocene, and Miocene) or periods (Quaternary) and preliminary informal ages are constrained by coarse-resolution biostratigraphic observations (see Biostratigraphy). Boundaries between informal ages that are likely not continuous, based on abrupt shifts in assemblages, are denoted with a thick black line. Some informal ages are abbreviated: e = early, m = middle, l = late. For igneous intervals, ages are constrained by overlying sediments and seismic profile interpretation with ODP Site 642 because shipboard biostratigraphy did not yield age constraints for these intervals. All ties are supported by lithologic change and biostratigraphic zonation. A chair-cut portion of the 3-D seismic cube CVX1101 with approximate hole locations is also shown.

Figure F5. Lithostratigraphic columns, Holes U1571A, U1571B, and U1572A. Epochs (Eocene, Miocene, and Oligocene) or periods (Quaternary) and preliminary informal ages are constrained by biostratigraphic observations (see Biostratigraphy). Boundaries between informal ages that are likely not continuous, based on abrupt shifts in assemblages, are denoted with a thick black line. For igneous intervals, ages are constrained by overlying sediments and seismic profile interpretation with ODP Site 642 because shipboard biostratigraphy did not yield age constraints for these intervals. (Continued on next two pages.)

Figure F6. Core composites, Sites U1571 and U1572. Sedimentary successions and uppermost basement (Units V and VI and Subunit VIIIa) are from Holes U1571B and U1572B. Basement succession (Unit VII and Subunit VIIIb) is from Holes U1571A and U1572A. B1, B2, B3, etc. = basaltic subunits.

Figure F7. Ash beds and oozes, Site U1572. A. Volcanic ash bed from Unit II containing fresh glass sand as large as approximately 100 µm (plane-polarized light [PPL]). B. Volcanic ash bed from Unit III containing coarse fresh glass sand as large as approximately 600 µm (PPL). C. Nannofossil ooze (PPL). D. Nannofossil (nannos) ooze (cross-polarized light). E. Inspection stereoscope image of radiolarian ooze with agglutinated foraminifers.

Figure F8. Unit II–III and Unit I–III transitions. A. Nannofossil ooze with ash, Hole U1572B. B. Disturbed nannofossil-rich sediment above the soupy Unit II–III transition, Hole U1572B. C. Unit II/III boundary in Hole U1572B, placed at the point where a distinct change in color is observed, consolidation distinctly increases, and nannofossil abundance drops. D. Unit I/III boundary in Hole U1571B, placed at the point where a color change and an increase in consolidation of the mud is observed.

Figure F9. Unit III–IV and IV–V transitions and Unit V lithology. A. Unit III–IV transition in Hole U1572B, marked by a change in color and lithology from dark grayish brown diatomite to dark greenish gray claystone. B. Unit IV–V transition in Hole U1572B, marked by the transition to organic-rich laminated clay and claystone. C. Bioturbated siliceous sediments in Unit V below the Unit IV–V transition, Hole U1572B. D. Representative lithology of Unit V bioturbated siliceous sediments, Hole U1571B.

Figure F10. Core composite showing the base of Unit V (396-U1571A-12R-3, 84 cm) to the top of Subunit VIIIb (23R-1, 41 cm).

Figure F11. Core composite showing the middle of Unit VI (396-U1571A-21R-1, 137 cm) to the top of Subunit VIIIb (33R-3, 147 cm).

Figure F12. Comparison of microstructures of the main igneous facies in Unit VII and Subunit VIIIb. Unit VII: A, B. Basaltic andesite: (A) 396-U1572A-23R-1, 37–40 cm; (B) 23R-1, 89–92 cm. The difference in color is due to alteration. C. Medium-grained phaneritic basalt (24R-4, 47–49 cm). D. Contact between a small enclave of basaltic andesite and the host basalt (26R-4, 92–5 cm). The proportion of plagioclase is slightly higher and the basalt shows a higher degree of alteration with vesicles filled by green saponite. Subunit VIIIb: E. Olivine plagioclase basalt (396-U1571A-30R-1, 75–78 cm). F. Highly vesicular, sparsely plagioclase-phyric basalt (39R-1, 32–34 cm). G. Highly vesicular aphyric basalt (32R-2, 31–33 cm). H. Highly vesicular, aphyric, aphanitic basalt (35R-1, 94–98 cm). Vesicles are filled with saponite. Bas and = basaltic andesite.

Figure F13. Basalt/sediment and lava flow contacts in Units VII and VIII, Sites U1571 and U1572.

Figure F14. Pipe vesicles observed in Units VII and VIII, Hole U1572A.

Figure F15. Unit VII mineralogy, Hole U1572A. A, B. Fine-grained basaltic andesite: (A) 23R-1, 37–39.5 cm; (B) 23R-1, 89–92 cm. C, D. Fine-grained phaneritic basalt (24R-4, 47–49 cm). Plg = plagioclase, cpx = clinopyroxene, cal = calcite, sap = saponite.

Figure F16. Chemical stratigraphy of Unit VII and Subunit VIIIb igneous rocks, Hole U1572A. Mg# (=Mg/[Mg + Fe^{2+}]*100, assuming FeO/Fe_2O_3 = 0.85) (Tegner et al., 1998; see Lithostratigraphy in the Expedition 396 methods chapter [Planke et al., 2023a] and Geochemistry for details).

Figure F17. Selected photos illustrating the change of vesicularity into single lava flows, Hole U1571A.

Figure F18. Subunit VIIIb mineralogy, Hole U1571A. A. Fine-grained, olivine plagioclase basalt (30R-1, 75–78 cm). Olivine is completely replaced by iddingsite and brown saponite. B. Fine-grained basalt (22R-2, 75–78 cm). C. Aphyric basalt (32R-2, 31–33 cm). D. Sparsely plagioclase-phyric basalt (39R-1, 32–34 cm). Plg = plagioclase, cpx = clinopyroxene, idd = iddingsite, sap = saponite.

Figure F19. Chemical stratigraphy of Subunit VIIIb basalts, Hole U1571A. Mg# = Mg/(Mg + Fe^{2+})*100, assuming FeO/Fe_2O_3 = 0.85 (Tegner et al., 1998; see Lithostratigraphy in the Expedition 396 methods chapter [Planke et al., 2023a] and Geochemistry for details).

Figure F20. *Fenneria brachiata*–dominated diatom assemblage, 396-U1572B-21F-CC. Strong dominance of this single species extends for nearly 5 m in 21F-1 and 22F-2. The event is noted in Holes U1572A and U1572B and was first recognized by Schrader and Fenner (1976) in the lowermost diatomaceous sample of DSDP Sample 338-29-CC, ~50 nmi from Site U1572.

Figure F21. Selected Early to Middle Eocene dinocysts, 396-U1571A-12R-CC. Scale bar = ~25 µm. A. *Thalassiphora microperforata*. B. *Thalassiphora gracilis*. C, D. *Oligokolpoma* sp. 1: (C) high focus; (D) low focus. E. *Diphyes colligerum*. F. *Lentinia serrata*. G, H. *Corrudinium incompositum*: (G) high focus; (H) low focus. I. *Damassadinium abbreviatum*, low parasutural ridges. J. *Damassadinium abbreviatum*, well-developed parasutural processes, resembling species of *Achilleodinium*. K. *Cribroperidinium giuseppei*. L. Top left: *Achomosphaera* sp. cf. *Hystrichostrogylon* sp.; bottom right: *Phthanoperidinium geminatum*.

Figure F22. Selected Early to Middle Eocene dinocysts and other palynomorphs. Scale bar = ~25 µm. A. Representatives of the *Phthanoperidinium geminatum-regalis-clithridium* complex, *Deflandrea phosphoritica*, and *Cerebrocysta* spp. (396-U1571A-12R-CC). B. *Azolla* massulae (396-U1571B-14R-1, 140–150 cm). C, D. Mass occurrence of the *Phthanoperidinium geminatum-regalis-clithridium* complex showing the typical anterior intercalary (2a) archaeopyle, although a combination of 2a and 3P ("keyhole") occurs frequently as well (396-U1571A-12R-CC). E. Overview of Sample 396-U1571B-14R-1, 140–150 cm (200× magnification). Arrows = *Azolla* massulae. Larger cysts are representatives of *Wetzeliella* *articulata brevicornuta*. Note the occurrence of *Homotryblium tenuispinosum* (upper right), *Lentinia serrata* (middle right), and other typical mid-Eocene taxa.

Figure F23. Selected Early to Middle Eocene dinocysts and other palynomorphs. Scale bar = ~25 µm. A, B. *Distatodinium pilosum* (396-U1572A-17R-CC): (A) low focus; (B) high focus. C. *Azolla* massulae (396-U1571B-21R-CC). D. *Wetzeliella articulata brevicornuta* (top), *Distatodinium pilosum* (middle), and (matured) *Deflandrea denticulata* (bottom) (396-U1571B-20R-CC) (200× magnification). E. *Diphyes ficusoides* (396-U1571A-20R-CC). F, G. *Achomosphaera* sp. cf. *Hystrichostrogylon* sp. (20R-CC): (F) high focus; (G) mid-focus.

Figure F24. Selected Early to Middle Eocene dinocysts and other palynomorphs, Hole U1572B. Scale bar = ~25 µm. A, B. *Melitasphaeridium asterium* (15H-CC): (A) high focus; (B) mid-focus. C–F. *Areosphaeridium diktyoplokum*, high to low focus (16H-CC). G. *Oligokolpoma* sp. 1, showing apical archaeopyle (23F-CC) (mid-focus). H. *Hemiplacophora* cf. *semilunifera* (18F-CC).

Figure F25. Selected Early to Middle Eocene dinocysts, Hole U1572B. Scale bar = ~25 µm. A. *Eatonicysta ursulae*, mid-focus (28F-CC). B. *Deflandrea granulosa*, high focus (18F-CC). C. *Deflandrea phosphoritica*, low focus (18F-CC). D–G. *Areosphaeridium michoudii*, high to low focus (17F-CC).

Figure F26. Selected Early to Middle Eocene dinocysts, Hole U1572B. Scale bar = ~25 µm. A. *Svalbardella partimtabulata* (left) and a representative of the *Phthanoperidinium geminatum-regalis-clithridium* complex (right) (18F-CC). B–D. *Enneadocysta arcuata*, high to low focus (19F-CC). E. *Charlesdowniea columna* (28F-CC). F. *Dracodinium pachydermum* (25F-CC). G. *Hapsocysta kysingensis*, low focus (24F-CC).

Figure F27. Selected Early to Middle Eocene dinocysts, Hole U1572B. Scale bar = ~25 µm. A–C. *Schematophora speciosa*, high to low focus (17F-CC). D, E. *Schematophora speciosa* (19F-CC): (D) archaeopyle margin, high focus; (E) antapical sexiform configuration, low focus. F–H. *Hemiplacophora*? sp. A of Van Mourik et al. (2001), high to low focus (25F-CC). I, J. *Batiacasphaera compta* (16H-CC): (I) low focus; (J) high focus.

Figure F28. Age-depth estimates, Hole U1572B. Interpretation utilizes paleomagnetic reversal data, lithostratigraphic analyses, trends in physical properties data, and bioevents. PAL = paleontology. Abbreviations of bioevents can be found in Table T12. (Continued on next page.)

Figure F29. Fish tooth, 396-U1571B-13X-CC, 25–30 cm.

Figure F30. Lithostratigraphic and chronobiostratigraphic correlation panel, Sites U1571 and U1572. Note the absence of Upper Eocene strata at Site U1571.

Figure F31. Synthesis diagram of magnetic inclinations and inferred magnetic polarities, Sites U1571 and U1572.

Figure F32. Left: magnetic inclinations determined after AF demagnetization at 20 mT, Hole U1572B. Red dots indicate measurements that have low magnetic intensity ($I < 10^{-3}$ A/m) and that may not yield reliable magnetic polarity data due to the possibility of drilling overprint. These measurements correspond mainly to Units III and V and are dominantly associated with normal polarities. Right: coercivity ratio (ΔI_{20mT}/NRM) vs. magnetic intensity after AF demagnetization at 20 mT, showing the lack of correlation between the two parameters. This indicates that the low magnetic intensities are caused by low concentration of magnetically remanent phases rather than by a less magnetic mineral phase.

Figure F33. Top left: stereonet of paleomagnetic directions from AF demagnetization of NRM, 396-U1572B-30X-1, 50 cm (basalt). Top right: orthographic projection of paleomagnetic directions measured through stepwise AF demagnetization. The sample shows both a ChRM interpreted as resulting from thermal magnetic remanence and a minor reverse overprint interpreted as resulting from viscous magnetization. Bottom: demagnetization steps from 0 to 120 mT showing a mean demagnetization field of 10 mT.

Figure F34. AMS stereonets, Holes U1571A, U1571B, U1572A, and U1572B. The dominance of shallowly inclined magnetic foliations (blue circles, K_{min}), a characteristic of horizontal sedimentary beds, is shown.

Figure F35. IW alkalinity, pH, Cl, Br, NH_4^+, and PO_4^{3-}, Holes U1571A and U1571B.

Figure F36. IW content of alkali and alkali earth metals (Li, Na, K, Mg, Ca, Sr, and Ba), Holes U1571A and U1571B.

Figure F37. IW contents of B, Si, S, Mn, and Fe, Holes U1571A and U1571B.

Figure F38. IW alkalinity, pH, Cl, Br, NH_4^+, and PO_4^{3-}, Holes U1572A and U1572B.

Figure F39. IW contents of B, Si, S, Mn, and Fe, Holes U1572A and U1572B.

Figure F40. IW content of alkali and alkali earth metals (Li, Na, K, Mg, Ca, Sr, and Ba), Holes U1572A and U1572B.

Figure F41. NGR-derived K, U, and Th content, Holes U1571A and U1571B.

Figure F42. NGR-derived K, U, and Th content, Holes U1572A and U1572B.

Figure F43. Volcanic rocks, Hole U1571A. A. Total alkali vs. silica (Le Maitre IUGS 1989 normalized to 100% water free; Le Maitre, 1989). B. V vs. Ti (5.10 for basalts) (Shervais, 1982). C. Ti vs. Zr (5.2a Thol. basalts with CaO + MgO 12%–20%). IAT = island-arc tholeiites, BAB = back-arc basin basalt, C-A bas = calc-alkaline basalt.

Figure F44. Volcanic rocks, Hole U1572A. A. Total alkali vs. silica (Le Maitre IUGS 1989 normalized to 100% water free; Le Maitre, 1989). B V vs. Ti (5.10 for basalts) (Shervais, 1982). C. Ti vs. Zr (5.2a Thol. basalts with CaO + MgO 12%–20%). IAT = island-arc tholeiites, BAB = back-arc basin basalt, C-A bas = calc-alkaline basalt.

Figure F45. (A) Mg# vs. TiO_2 and (B) Mg# vs. SiO_2 for basalts, Sites U1571 and U1572.

Figure F46. Carbonate, nitrogen, sulfur, and TOC contents from solid squeeze cake samples, Holes U1571A and U1571B.

Figure F47. Carbonate, nitrogen, sulfur, and TOC contents from solid squeeze cake samples, Holes U1572A and U1572B.

Figure F48. Physical properties summary, Hole U1571A. Filtered point data is presented alongside interpolated traces for selected data with a running average of 50 cm and a maximum interpolation gap of 50 cm applied (denoted "r" in headers). cps = counts per second, WR = WRMSL, G. = SHMG.

Figure F49. Physical properties measurements spanning the basaltic sequences and interbasaltic sediments of Subunit VIIIb, Hole U1571A. Several interbasaltic sedimentary beds and individual lava flows with distinct physical properties throughout the tops, interiors, and bases are highlighted. Filtered point data is presented alongside interpolated traces for selected data with a running average of 50 cm and a maximum interpolation gap of 50 cm applied (denoted "r" in headers). cps = counts per second, WR = WRMSL, G. = SHMG.

Figure F50. Physical properties summary, Hole U1571B. Filtered point data is presented alongside interpolated traces for selected data with a running average of 50 cm and a maximum interpolation gap of 50 cm applied (denoted "r" in headers). cps = counts per second, WR = WRMSL, G. = SHMG.

Figure F51. Physical properties summary, Hole U1572A. Filtered point data is presented alongside interpolated traces for selected data with a running average of 50 cm and a maximum interpolation gap of 50 cm applied (denoted "r" in headers). cps = counts per second, G. = SHMG, WR = WRMSL.

Figure F52. Physical properties measurements spanning the basaltic sequences and interbasaltic sediments of Subunit VIIIb, Hole U1572A. Several interbasaltic sedimentary beds and individual lava flows with distinct physical properties throughout the tops, interiors, and bases are highlighted. Filtered point data is presented alongside interpolated traces for selected data with a running average of 50 cm and a maximum interpolation gap of 50 cm applied (denoted “r” in headers). cps = counts per second, G. = SHMG, WR = WRMSL.

Figure F53. Physical properties summary, Hole U1572B. Filtered point data is presented alongside interpolated traces for selected data with a running average of 50 cm and a maximum interpolation gap of 50 cm applied (denoted “r” in headers). cps = counts per second, WR = WRMSL, G. = SHMG.

Figure F54. Summary of wireline log traces collected in the open hole interval, Hole U1571A. LCAL = caliper, HSGR = total spectral gamma ray, RLA = resistivity, RT_HRLT = true resistivity, V_S = *S*-wave velocity, MSS = magnetic susceptibility sonde, IU = uncalibrated instrument units.

Figure F55. Wireline GR and MS compared to core-based physical properties, Hole U1571A. Wireline data is plotted on the WMSF depth scale, whereas core-based data is plotted on the CSF-A depth scale; the depths are not matched. r = 50 cm running average. cps = counts per second, WR = WRMSL, LCAL = caliper, HSGR = total spectral gamma ray, MSS = magnetic susceptibility sonde, IU = uncalibrated instrument units.

Figure F56. RHOM, PEF, sonic *P*-wave, and calculated AI compared to core-based physical properties, Hole U1571A. Wireline data is plotted on the WMSF depth scale, whereas core-based data is plotted on the CSF-A depth scale; the depths are not matched. r = 50 cm running average. G. = SHMG, LCAL = caliper.

Figure F57. Wireline GR, resistivity, FMS, and UBI borehole image logging results, Hole U1571A. HSGR = total spectral gamma ray, LCAL = caliper, RLA = resistivity, RT_HRLT = true resistivity.

Figure F58. FMS and UBI image log example of a simple lava flow unit, Hole U1571A.

Figure F59. FMS and UBI image log example of a thin pahoehoe lava flow unit, Hole U1571A. Variably conductive (empty) and resistive (calcite-filled) vesicles are shown.

Figure F60. Unfilled and calcite-filled vesicles and fractures, Hole U1571A. Image covers the same interval as Figure F59.

Figure F61. FMS and UBI image log example of possible pillow lava features, Hole U1571A.

Figure F62. Traces of concentrically distributed pipe vesicles, a feature common in pillow lavas, Hole U1571A. Image covers the same interval as Figure F61.

Figure F63. Summary of wireline log traces collected in the open hole interval, Hole U1572A. LCAL = caliper, HSGR = total spectral gamma ray, RLA = resistivity, RT_HRLT = true resistivity, MSS = magnetic susceptibility sonde, IU = uncalibrated instrument units.

Figure F64. Wireline GR and MS compared to core-based physical properties, Hole U1572A. Wireline data is plotted on the WMSF depth scale, whereas core-based data is plotted on the CSF-A depth scale; the depths are not matched. r = 50 cm running average. cps = counts per second, WR = WRMSL, LCAL = caliper, HSGR = total spectral gamma ray, MSS = magnetic susceptibility sonde, IU = uncalibrated instrument units.

Figure F65. APCT-3 temperature measurements, 396-U1572B-12H-CC (111.3 m DSF). RMS = root mean square.

Figure F66. APCT-3 temperature measurements, 396-U1572B-4H-CC (35.3 m DSF). RMS = root mean square.

Figure F67. APCT-3 temperature measurements, 396-U1572B-8H-CC (73.3 m DSF). RMS = root mean square.