Figure F1. Bathymetry of North Atlantic Ocean. Brown polygons = contourite drifts.

Figure F2. Free-air gravity anomaly filtered to remove wavelengths > 250 km showing Expedition 395 region. Solid black line = Seismic Profile JC50-1, small black circles = DSDP/ODP sites, dashed red line = Mid-Atlantic Ridge, red star = Iceland plume center (Shorttle and Maclennan, 2011), arrows = VSRs, dotted polygons = transition from smooth to segmented ocean floor, black box = location of Figure F4.

Figure F3. Competing hypotheses for VSR formation (Parnell-Turner et al., 2017). A. Thermal pulsing hypothesis (Vogt, 1971). Dark gray blocks = lithospheric plates, pink block with red patches = asthenospheric channel containing thermal pulses, light gray block = upper mantle, solid arrows = propagation direction of thermal pulses, dashed arrows = plate spreading direction, yellow shading = melting region, red/blue ribs = VSRs/VSTs, black line = MOR. B. Propagating rift hypothesis (Hey et al., 2010). Solid arrows = propagating rift direction. VSRs are regarded as ridge segments with thicker crust and VSTs are regarded as pseudofaults that propagate along axis generating thinner crust. C. Buoyant mantle upwelling hypothesis (Martinez and Hey, 2017). Gray blobs = buoyant upwelling cells that generate damp melting and thicker crust in absence of thermal anomaly, vertical arrows = vertical upwelling in a given cell, dashed lines = dry/wet solidi.

Figure F4. Free-air gravity anomaly filtered to remove wavelengths > 250 km showing numbered VSRs and VSTs. Small black circles = ODP sites.

Figure F5. 3D perspective view, Expedition 395 sites. Dotted lines = overflow of deep water from Norwegian Sea, via Denmark Strait (DS) and Iceland-Faroe Ridge (IFR).

Figure F6. Depth transect showing seafloor depth, sediment/basement interface depth, sedimentary thickness (shading), and Expedition 395 sites. Figure based on Seismic Profile JC50-1 and velocity model from Parnell-Turner et al. (2017).

Figure F7. Lithostratigraphic summary, Site U1554. cps = counts per second, Roman numerals = sedimentary units, Arabic numerals = igneous units. For lithology legend, see Figures F9 and F11 in the Expedition 395 methods chapter (Parnell-Turner et al., 2025a).

Figure F8. Summary of observed flow morphologies at the five sites that recovered oceanic crust, Expedition 395. The cumulative percentages include intervals without recovery. Sites U1554 and U1555 cored through VSTs, Sites U1562 and U1563 cored through VSRs, and Site U1564 serves as the control site because it cored through segmented crust.

Figure F9. Composite gas analyses of methane concentrations and sulfate concentrations, Site U1554.

Figure F10. Lithostratigraphic summary, Site U1555. cps = counts per second, Roman numerals = sedimentary units, Arabic numerals = igneous units. For lithology legend, see Figures F9 and F11 in the Expedition 395 methods chapter (Parnell-Turner et al., 2025a).

Figure F11. Lithostratigraphic summary, Site U1562. cps = counts per second, Roman numerals = sedimentary units, Arabic numerals = igneous units. For lithology legend, see Figures F9 and F11 in the Expedition 395 methods chapter (Parnell-Turner et al., 2025a).

Figure F12. Physical properties measurements, Hole U1562C. cps = counts per second.

Figure F13. Inclinations and interpreted polarity chrons, Holes U1562A–U1562C. Magnetic polarity: n = normal, r = reverse, gray = depth for which a polarity interpretation was not unequivocal.

Figure F14. Composite gas analyses of methane concentrations and sulfate concentrations, Site U1562.

Figure F15. Lithostratigraphic summary, Site U1563. cps = counts per second, Roman numerals = sedimentary units, Arabic numerals = igneous units. For lithology legend, see Figures F9 and F11 in the Expedition 395 methods chapter (Parnell-Turner et al., 2025a).

Figure F16. Lithostratigraphic summary, Site U1564. cps = counts per second, Roman numerals = sedimentary units, Arabic numerals = igneous units. For lithology legend, see Figures F9 and F11 in the Expedition 395 methods chapter (Parnell-Turner et al., 2025a).

Figure F17. Fracturing, soft-sediment deformation, glauconite-rich interval, stylolites, malachite-bearing breccia, and pink chalk, Hole U1564F. A. Network of thin, calcite-infilled fractures. B. Parallel fractures. C. Well-defined soft-sediment fold. D–F. Brightly colored sediment with abundant glauconite pellets. This layer coincides with a strong peak in NGR values. G. Stylolites (thin dark brown bands) within nannofossil chalk. H. Breccia with clasts of malachite and malachite-rimmed calcite, along with other minerals associated with hydrothermal alteration such as jarosite. The matrix of this breccia is pinkish nannofossil chalk, as seen in I.

Figure F18. Alteration, calcite replacement, and vesicles, Hole U1564F. A. Celadonite alteration in groundmass (49R-1, 145–147 cm; plane-polarized light [PPL]). B. Saponite alteration (45R-2, 60–62 cm; cross-polarized light [XPL]). C. Calcite replacement in crystals (61R-2, 86–89 cm; XPL). D. FeO/OH-rimmed vesicles (63R-1, 40–43 cm; PPL). E. Yellow and green celadonite-rimmed vesicles filled with calcite (73R-1, 21–23 cm). F, G. Zoned vesicle containing, from the rim to the center, green celadonite, brown celadonite spherules and calcite in (F) XPL and (G) PPL (53R-2, 114–116 cm). Vesicle filled with zeolite and calcite (63R-1, 99–102 cm; XPL).

Figure F19. Calcareous microfossil preservation summary, Expedition 395. Foraminifer preservation below 800 m CSF-A at Site U1564 is not well documented because the sediments are lithified. Paleomagnetic chrons and geologic timescale are from Ogg (2020).

Figure F20. Lithostratigraphic summary, Site U1602. cps = counts per second. Lithostratigraphic units: sedimentary units are shown. For lithology legend, see Figures F9 and F11 in the Expedition 395 methods chapter (Parnell-Turner et al., 2025a).

Figure F21. Sedimentary textures and features, Site U1602. A. Silty clay layer with thin bands of silt layers and a dark thick band of glass (ash) layer in the middle. B. Nannofossil silty claystone interval including a fracture with slickensides at the base. C. Nannofossil chalk with an interval of cross bedded siltstone. D. Sandstone containing complex bedform showing rip-up clast or possible flaser bedding features. E. Silty clay with a silt interval displaying cross bedding, graded bedding, and fining-upwards sequence. F. Highly bioturbated silty clay interval with laminations and burrows crosscutting the laminations. G. Nannofossil chalk with sand injection in the middle. H. Laminated siltstone contained within fine- and coarse-grained sandstone.

Figure F22. Deformed and broken planktonic foraminifer shells with equant crystal infillings identified as analcime (395-U1602E-25R-CC; 757.61 m CSF-A).

Figure F23. Archive-half XSCAN images showing typical characteristics, Site U1602. A. Dropstone. B. Laminated sequences. C. IRD deposits. D. A large clast that is most likely not in situ. E. Cross-bedding. F. Laminated interval.

Figure F24. Summary of completed operations, Expeditions 384, 395C, and 395.

Figure F25. Core recovery summary, Expedition 395.

Figure F26. Age-depth plots for all six Expedition 395 sites. The selected datum points can be found in Age model in each site chapter. Inset: enlarged age-depth plot from 0 to 5 Ma. An increase in sedimentation rates at three sites occurs ~3.6 Ma. Geologic stages to periods and magnetochrons are from Ogg (2020). Eoc. = Eocene, Pri. = Priabonian.