

Figure F1. Site map. Red = Site U1598, yellow = other sites. Inset = location map. See Figure F1 in the Site U1589 chapter (Druitt et al., 2024a) for the swath data on which this map is based. KVC = Kolumbo volcanic chain.

Figure F2. Seismic profile across the Christiana Basin along Seismic Line Geomar_P5009. The basin fill has six seismic stratigraphic units (U1–U6), following Preine et al. (2022b). Inset: location of Sites U1598 and U1591 in the same basin. Depths in meters. TWT = two-way traveltime.

Figure F3. Lithostratigraphic summary, Site U1598. Unit color = dominant lithology.

Figure F4. Relative percentages of volcanic, tuffaceous, and nonvolcanic lithologies, Site U1598. Unit I is volcanic rich. Unit I subunits correspond to smaller scale variations of volcanic versus nonvolcanic lithologies.

Figure F5. Grain size distributions of volcanics (ash, lapilli-ash, and lapilli), tuffaceous mud, and nonvolcanic sediments, Site U1598. Length of colored bars = relative grain size (ash = <2 mm; lapilli = 2–64 mm; mud = <63 μ m; sand = 0.063–2 mm), with separate scales shown for volcanic grain size (top) and nonvolcanic grain size (bottom; used for tuffaceous and nonvolcanic sediments). Mixed lithologies such as lapilli-ash (dark pink) that have relative grain sizes between two categories are plotted between ticks.

Figure F6. Core disturbances, Site U1598. A. Uparching. B. Fall-in. C. Mixed sediment. D. Sediment flowage. E. Crack.

Figure F7. Representative lithologies in Unit I, Site U1598. A. Lapilli-ash with coarser grained pumice-rich and finer grained lithic-rich segregations. B. Ooze and organic-rich calcareous mud with intercalated thin ash layers. C. Ooze overlain by dark gray ash. D. White pumice lapilli. E. Normally graded coarse to fine ash.

Figure F8. Representative lithologies in Unit I, Site U1598. A. Tuffaceous mud (Subunit Ia). B. Crystal-rich ash (Subunit Ib). C. Crystal-rich tuffaceous ooze (Subunit Ib). D. Ash (Subunit Ib).

Figure F9. Selected XRD spectra of Subunit Ia and Ib lithologies, Site U1598. A. Tuffaceous mud. B. Calcareous mud. C. Ooze. Il = illite, Pl = Ca-rich plagioclase, Cc = calcium carbonate (calcite, aragonite), Hal = halite, Qtz = quartz, Py = pyrite, Dol = dolomite.

Figure F10. MS, NGR, and GRA density, Site U1598. For WRMSL data, see Physical properties.

Figure F11. Dip data, Site U1598.

Figure F12. Age-depth plot, Hole U1598A. Integrated biochronology is shown. CN = calcareous nannofossil. PF = planktonic foraminifer. Biohorizons correspond to those given in Tables T3 and T4. Biohorizons denoted with a question mark are not fully constrained and are interpolated.

Figure F13. Calcareous nannofossils, Hole U1598A. 1. *Emiliana huxleyi* (Lohmann) Hay and Mohler (1H-CC, 12–19 cm). 2. *Pseudoemiliana lacunosa* (Kamptner) Gartner (5H-CC, 28–30 cm).

Figure F14. Foraminiferal oceanicity and paleowater depth estimates, Site U1598. Blue colors show relationship between oceanicity index and paleowater depth. Observers: OK = Olga Koukousioura, AW = Adam Woodhouse. NA = not applicable.

Figure F15. Biostratigraphic summary, Site U1598. CN = calcareous nannofossil, PF = planktonic foraminifer. Interpreted oceanicity: solid line/red points = interpreted oceanicity, dashed line = extrapolation through barren/unreliable sample data. Interpreted paleowater depths: light blue points/shading = shallower paleowater depths, dark blue points/shading = deeper paleowater depths.

Figure F16. Planktonic foraminifera, Sample 398-U1598A-2H-CC, 0–3 cm. A. *Globigerina bulloides*. B. *Globigerinita glutinata*. C. *Globoconella inflata*. D. *Neogloboquadrina pachyderma*. E. *Turborotalita quinqueloba*. F. *Neogloboquadrina incompta*.

Figure F17. Left: AF demagnetization of archive-half sections, Hole U1598A. Solid circles = projection onto horizontal plane, open circles = projection onto vertical plane. NRM = natural remanent magnetization. Right: archive-half section magnetic inclinations, Hole U1598A. Open symbols = principal component analysis inclinations from 15–25 mT demagnetization, solid symbols = Fisher mean inclinations from 15–25 mT demagnetization, crosses = inclinations after 25 mT demagnetization. Red dashed line = geocentric axial dipole inclinations expected at this site.

Figure F18. Physical properties, Site U1598. Dots = whole-round measurements, open symbols = discrete measurements. Note that MS values > 1500 $\times 10^{-5}$ SI are not shown. cps = counts per second.

Figure F19. Discrete physical properties measurements, Site U1598. Dashed line = AVS upper measurement limit, solid lines = PP measurement limits.

Figure F20. ICP-AES analyses of selected volcanoclastic units used to discriminate between potential volcanic sources, Site U1598. A. Total alkali vs. SiO₂ plot with the rock nomenclature of Le Maitre et al. (2002) overlain used for sample naming. Ol = olivine. B. Ba/Y vs. Ba/Zr plot used to correlate samples.

Figure F21. IW salinity, alkalinity, and pH, Site U1598. Lithostratigraphic Unit I is described in Lithostratigraphy.

Figure F22. IC and ICP-AES concentrations of Br, Cl, B, Na, K, Mg, Ca, and SO₄²⁻ in IW samples, Site U1598. Lithostratigraphic Unit I is described in Lithostratigraphy.

Figure F23. ICP-AES concentrations of Li, Fe, Mn, Ba, Si, and Sr in IW samples, Site U1598. Lithostratigraphic Unit I is described in Lithostratigraphy.

Figure F24. TOC and carbonate, Site U1598. Lithostratigraphic Unit I is described in Lithostratigraphy. Sapropel conventions follow Kidd et al. (1978).