**Figure F1.** Site map. Red = Site U1593, yellow = other sites. Inset: location map. See Figure F1 in the Site U1589 chapter (Druitt et al., 2024a) for citations for the swath data on which this map is based. KVC = Kolumbo volcanic chain.

**Figure F2.** Seismic profile across the Kolumbo Volcano along Seismic Line HH06-22. Site U1593 is offset 600 m northeast of this seismic line. Units K1–K5 are related to the construction of Kolumbo Volcano, Unit K5 being the edifice of the 1650 CE eruption (Unit K1 is deeper and not shown). Strata intercalated with Units K1–K5 contain marine sediments and volcaniclastic layers from Santorini. Insets: locations of Sites U1590 and U1593 in the same basin and Holes U1593A–U1593C, U1590A, and U1590B. Depths in meters. TWT = two-way traveltime.

**Figure F3.** Lithostratigraphic summary, Site U1593. Subunits are further characterized in Figures F4 and F5. Unit color = dominant lithology.

**Figure F4.** Relative percentages of volcanic, tuffaceous, and nonvolcanic lithologies, Site U1593.

**Figure F5.** Grain size distribution of volcanic, tuffaceous, and nonvolcanic sediments, Site U1593. Length of colored bars = relative grain size (ash = <2 mm; lapilli = 2–64 mm; mud = <63 µm; 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 U1593. A. Uparching. B. Fall-in. C. Soupy. D. Sediment flowage. E. Brecciation. F. Crack.

**Figure F7.** A–D. Common lithologies from Subunit Ia, Hole U1593A. Subunit Ia is dominated by two large intervals of lapilli-ash separated by 20 cm thick brown-colored mud or organic-rich tuffaceous ooze at ~10 mbsf. A. Mud overlying ash at the top of the hole. B. Biotite-bearing lapilli. C. Ash layers with sharp bases that transition upward gradationally into tuffaceous mud. D. Biotite-absent lapilli.

**Figure F8.** Common lithologies from Subunit Ib, Hole U1593A. A. Ooze. B. Dark ash layer with sharp base. C. Organic-rich calcareous mud with high bioturbation. D, E. Lapilli.

**Figure F9.** Common lithologies from Subunit Ic, Site U1593. A, E, F. White ash. B, C. Lapilli. D, E. Darker lapilli with lithics.

**Figure F10.** Common lithologies from Subunit Id, Site U1593. Subunit Id is dominated by ooze mixed with other components. A. Ooze with ash pods. B. Ooze with lapilli intercalated with ash with lapilli. C. Ooze and organic-rich ooze. D. Ooze with dark ash layers.

**Figure F11.** Representative lithologies, Hole U1593A. Subunit Ia: (A) ash consisting of transparent and blocky nonvesicular glass shards and (B) transparent cuspate glass shards. Subunit Ib: (C) transparent glass, calcite, and foraminifera and (D) ash, crystals, and sponge spicules.

**Figure F12.** Representative lithologies from Subunits Ic and Id, Hole U1593A. A. Glass shards with elongated vesicles. B, C. Cuspate to blocky glass shards. D. Dark glass shards with rounded vesicles.

**Figure F13.** Common lithologies from Unit II, Hole U1593A. A. Organic-rich tuffaceous ooze and tuffaceous ooze with shell fragments. B. Organic-rich ooze. C. Ooze with ash. D. Ooze with organic material.

**Figure F14.** A–F. Correlatable stratigraphic intervals between Holes U1593A and U1593B.

**Figure F15.** Selected XRD spectra of Unit I lithologies. A. Ooze with ash. B. Ooze. C. Volcanic ash. D. Tuffaceous mud. Il = illite, Qtz = quartz, Cc = calcium carbonate (calcite, aragonite), Pl = Ca-rich plagioclase, Chl = chlorite, Dol = dolomite.

**Figure F16.** WRMSL-derived MS data, Holes U1593A and U1593B. MS data are on the CCSF-A depth scale in the interval where the holes overlap, and the spliced section (right) is on the CCSF-D depth scale. For WRMSL data, see Physical properties.

**Figure F17.** Splice, Site U1593. MS, NGR, and GRA density, as well as the respective spliced core interval from Holes U1593A and U1593B, are shown. For WRMSL data, see Physical properties. cps = counts per second.

**Figure F18.** CCSF-A versus CSF-A core top depths, Holes U1593A and U1593B. Lines fit through the core top depths of all holes give an estimate of the core expansion. At Site U1593, this is estimated to be 1.6%.

**Figure F19.** Dip data, Site U1593.

**Figure F20.** Box plots of bedding dip distribution, Site U1593. The minimum (P5), first quartile (P25), median value (P50), third quartile (P75), and maximum (P95) are shown. Only the first outlier smaller than P5 and larger than P95 is plotted as a dot. Md = median dip, N = number of samples.

**Figure F21.** Age-depth plot, Holes U1593A and U1593B. Integrated biochronology is shown. CN = calcareous nannofossil, MNN = Mediterranean Neogene Nannoplankton, PF = planktonic foraminifer. Biohorizons correspond to those in Tables T5 and T6.

**Figure F22.** Calcareous nannofossils, Hole U1593A. 1, 2. *Emiliania huxleyi* (Lohmann) Hay and Mohler (2H-CC, 6–7 cm). 3. *Gephyrocapsa* sp. 3 and *Pseudoemiliania lacunosa* (Kamptner) Gartner (36F-CC, 21–23 cm). 4. *Reticulofenestra asanoi* Sato and Takayama (37F-CC, 22–24 cm).

**Figure F23.** Foraminiferal oceanicity and paleowater depth estimates, Site U1593. Blue colors show relationship between oceanicity index and paleowater depth. Observers: AW = Adam Woodhouse, OK = Olga Koukousioura. NA = not applicable.

**Figure F24.** Biostratigraphic summary, Site U1593. CN = calcareous nannofossil, MNN = Mediterranean Neogene Nannoplankton, 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 F25.** Planktonic foraminifera, Hole U1593A. A. *Globigerinella siphonifera*. B. *Globigerinella calida*. C. *Hastigerina pelagica*. D. *Globigerinoides ruber*. E. *Globigerinoides elongatus*. F. *Globigerinoides pyramidalis*. G. *Trilobatus trilobus*. H. *Trilobatus quadrilobatus*. I. *Trilobatus sacculifer*. J. *Turborotalita quinqueloba*. K. *Globigerina bulloides*. L. *Neogloboquadrina pachyderma*. (A: 5H-CC, 15–17 cm; B–I, K: 2H-4, 63–65 cm; J, L: 12H-CC, 35–37 cm).

**Figure F26.** Benthic foraminifera, Hole U1593A (unless otherwise specified). A. *Cassidulina carinata*, spiral view (12H-CC, 35–37 cm). B. *Cibicidoides wuellerstorfi*, side view (9H-1, 60–62 cm). C. *Trifarina angulosa* (35F-CC, 0–5 cm). D. *Bolivina striatula* (398-U1593B-1H-CC, 7–9 cm). E. *Uvigerina peregrina* (12H-CC, 35–37 cm).

**Figure F27.** Archive-half section magnetic inclinations, Hole U1593A. Red dashed lines = GAD inclinations expected at this site. Dark blue/white = normal/reversed polarity magnetozones, gray shading = intervals with no available paleomagnetic data. GPTS = geomagnetic polarity timescale.

**Figure F28.** Alternating field demagnetization of discrete samples and archive-half sections, Hole U1593A. Solid circles = projection onto horizontal plane, open circles = projection onto vertical plane.

**Figure F29.** Physical properties, Site U1593. Dots = whole-round measurements, open symbols = discrete sample measurements. cps = counts per second.

**Figure F30.** Discrete physical properties measurements, Site U1593. Shear strength: open symbols = measurements outside the instrument range.

**Figure F31.** ICP-AES analyses of selected volcaniclastic units used to discriminate between potential volcanic sources, Hole U1593A. A. Total alkali vs. $SiO_2$ 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 F32.** IW salinity, alkalinity, and pH, Site U1593. Dashed lines = unit boundaries.

**Figure F33.** IC and ICP-AES concentrations of Br, Cl, B, Na, K, Mg, Ca, and $SO_4^{2-}$ in IW samples, Site U1593. Dashed lines = unit boundaries.

**Figure F34.** ICP-AES concentrations of Li, Fe, Mn, Ba, Si, and Sr in IW samples, Site U1593. Dashed lines = unit boundaries.

**Figure F35.** TOC and carbonate, Site U1593. Dashed lines = unit boundaries. Sapropel units follow convention from Kidd et al. (1978).