

Figure F1. Site map, Expedition 386. Bathymetric overview map of the Japan Trench (modified after Kioka et al., 2019) between the Daiichi Seamount in the south and the Erimo Seamount in the north.

Figure F2. Site M0090. Left: high-resolution bathymetric map with 5 m contours, site locations, and track lines and locations of previously acquired high-resolution subbottom profiles and short cores during the site survey cruise (Strasser et al., 2019). Right: site survey subbottom profiles showing depths (assuming 1500 m/s *P*-wave velocities) of the 20 and 40 m GPC barrels used to recover cores. Exact hole positions and depths are given in Table T1, Hydro-acoustics, and Table T1 in the Expedition 386 methods chapter (Strasser et al., 2023a). SP = shotpoint.

Figure F3. Bathymetry and grid of subbottom profiler lines acquired around Site M0090 in Basin C1. Contour Interval = 5 m.

Figure F4. Line 396_Underway_089, near Site M0090, showing the acoustic character at Site M0090. SP = shotpoint.

Figure F5. Normally graded sand/silt layers, Site M0090. Images are adjusted for contrast and color. Left: linescan images. Right: X-ray CT images.

Figure F6. Lithostratigraphic summary, Holes M0090A and M0090B. XCT = X-ray CT, MS = magnetic susceptibility, cps = counts per second.

Figure F7. Ternary diagrams of major components and grain size, Site M0090.

Figure F8. Smear slide summary, Holes M0090A and M0090B. The most abundant lithogenics (clay, quartz, feldspar, and pyrite) are in a brown color gradient, the volcanoclastics/vitrics are pink, and the biogenics are in a blue gradient for the siliceous biogenics (diatoms, sponge spicules, and radiolaria) and are green for the calcareous microfossils. See legend in Figure F14 in the Expedition 386 methods chapter (Strasser et al., 2023a). XCT = X-ray CT.

Figure F9. A–F. Lithologic and biogenic components, Site M0090.

Figure F10. A–J. Main tephra lithologies observed in smear slides, Site M0090.

Figure F11. Lithostratigraphic summary, Holes M0090C and M0090D. XCT = X-ray CT, MS = magnetic susceptibility, cps = counts per second. (Continued on next page.)

Figure F12. Smear slide summary, Holes M0090C and M0090D. The most abundant lithogenics (clay, quartz, feldspar and pyrite) quartz, feldspars, micas and clay, clay, quartz, feldspar, and pyrite) are in a brown color gradient, the volcanoclastics/vitrics are pink, and the biogenics are in a blue gradient for the siliceous biogenics (diatoms, sponge spicules, and radiolaria) and are green for the calcareous microfossils. See legend in Figure F14 in the Expedition 386 methods chapter (Strasser et al., 2023). XCT = X-ray CT. (Continued on next page.)

Figure F13. Volcanic ash occurrences, Site M0090. Volcanic ash was observed as patches or thin parallel or lenticular beds/laminae on the split core surface, and glass shards were observed in smear slides (Table T3; Figure F25; see Tephra). Images are adjusted for contrast and color. A, B. Uppermost tephra. C, D. Two tephra in potentially correlative depth intervals. E, F. Two tephra layers.

Figure F14. Variation in iron monosulfide occurrence, Site M0090. Images are adjusted for contrast and color. A. Small dots or patches in fine-grained slightly bioturbated sediment. B. Moderate intensity of iron monosulfide in mottled sediment. C. Abundant iron monosulfide intensity in alternating silt and silty clay with slight bioturbation and color bands.

Figure F15. XRD mineralogy, Hole M0090D.

Figure F16. Tephra (brackets) in Basin C1. A. M0090B-1H-1, 67 cm (386-M0090B-1H-1, 63–67 cm). B. M0090B-1H-13, 23 cm (386-M0090B-1H-13, 21–23 cm). C. M0090D-1H-3, 84 cm (386-M0090D-1H-3, 81–84 cm). D. M0090D-1H-16, 48.7 cm (386-M0090D-1H-16, 45.8–48.7 cm). E. M0090D-1H-16, 82.8 cm (386-

M0090D-1H-16, 82.3–82.8 cm). F. M0090D-1H-26, 57.8 cm (386-M0090D-1H-26, 54.4–57.8 cm). G. M0090D-1H-30, 82.5 cm (386-M0090D-1H-30, 78.4–82.5 cm). H. M0090D-1H-32, 24 cm (386-M0090D-1H-32, 21–24 cm).

Figure F17. Smear slides representing tephra (in parentheses). A. 386-M0090B-1H-1, 66 cm (M0090B-1H-1, 67 cm). B. 386-M0090B-1H-13, 22 cm (M0090B-1H-13, 23 cm). C. 386-M0090D-1H-3, 84.5 cm (M0090D-1H-3, 84 cm). D. 386-M0090D-1H-16, 49 cm (M0090D-1H-16, 48.7 cm). E. 386-M0090D-1H-16, 83 cm (M0090D-1H-16, 82.8 cm). F. 386-M0090D-1H-26, 57 cm (M0090D-1H-26, 57.8 cm). G. 386-M0090D-1H-30, 75 cm (M0090D-1H-30, 82.5 cm). H. 386-M0090D-1H-30, 81 cm (M0090D-1H-30, 82.5 cm). I. 386-M0090D-1H-32, 23.5 cm (M0090D-1H-32, 24 cm).

Figure F18. Abundance changes of radiolarian species *L. setosa*, *C. davisiana*, and the *Tetrapyle* group, Hole M0090D. Event 2 = *L. setosa* peak (~7 ka); Event 5 = *C. davisiana* Zone 'a/b' boundary (~11 ka); Event 6 = *C. davisiana* Peak 1 (~12 ka). See Micropaleontology in the Expedition 386 methods chapter (Strasser et al., 2023) for explanations of radiolarian zonation and events.

Figure F19. IW salinity, total alkalinity, and ammonium (NH₄⁺) concentrations, Site M0090.

Figure F20. IW V, Mo, and U concentrations, Site M0090.

Figure F21. IW Li, B, Si, Mn, Fe, Sr, and Ba concentrations, Site M0090.

Figure F22. IW Cl⁻, Br⁻, and SO₄²⁻ concentrations, Site M0090.

Figure F23. Methane (C₁) and ethane (C₂) concentrations and C₁/C₂ ratios, Holes M0090A and M0090B. One sample at 0.665 mbsf is from Hole M0090A (red diamonds).

Figure F24. Solid-phase major elements in sediments, Site M0090. Open symbols = trigger core samples.

Figure F25. TC, TOC, TIC, and TS in sediments, Site M0090.

Figure F26. Physical properties summary, Holes M0090A and M0090B. Bulk density: black and red curves = MSCL, red and blue dots = MAD. P-wave velocity: black and red curves = MSCL, red and blue dots = laboratory-derived data with error bars of ± 50 m/s. Red curves and blue dots = trigger core (Hole M0090A), black curves and red dots = GPC core (Hole M0090B). MS = magnetic susceptibility, cps = counts per second.

Figure F27. Physical properties summary, Holes M0090C and M0090D. Bulk density: black and red curves = MSCL, red and blue dots = MAD. P-wave velocity: black and red curves = MSCL, red and blue dots = laboratory-derived data with error bars of ± 50 m/s. Red curves and blue dots = trigger core (Hole M0090C), black curves and red dots = GPC core (Hole M0090D). MS = magnetic susceptibility, cps = counts per second.

Figure F28. Undrained shear strength from fall cone penetrometer and AVS, Site M0090.

Figure F29. MAD data, Holes M0090A (red) and M0090B (black).

Figure F30. MAD data, Holes M0090C (red) and M0090D (black).

Figure F31. Color data, Hole M0090B.

Figure F32. Color data, Hole M0090D.

Figure F33. Intensity, inclination, and declination, Holes M0090A and M0090C.

Figure F34. Intensity, Holes M0090B and M0090D.

Figure F35. Declination, Holes M0090B and M0090D.

Figure F36. Rescaled declination, Hole M0090B, and corrected declination, Hole M0090D.

Figure F37. Inclination, Holes M0090B and M0090D.