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 M0091. 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 profile lines acquired around Site M0091 in Basin S3. Contour interval = 5 m.

Figure F4. Line 386_Underway_093, an oblique line at the northern end of the basin, showing the acoustic character of Basin S3. SP = shotpoint.

Figure F5. Trench-parallel Line 386_Underway_091, showing the acoustic character along this line, especially in relation to Line 386_Underway_093 and Site M0091. SP = shotpoint.

Figure F6. Trench-parallel Line 386_Underway_092, showing the acoustic character of Basin S3. SP = shotpoint.

Figure F7. Trench-parallel Line 386_Underway_090, showing the acoustic character of Basin S3. SP = shotpoint.

Figure F8. Subbottom profile lines around Site M0091.

Figure F9. Enlarged portion of Line 386_Underway_091, showing acoustic detail at Site M0091. SP = shotpoint.

Figure F10. Enlarged portion of Line 386_Underway_092, showing acoustic detail at Site M0091. SP = shotpoint.

Figure F11. Lithostratigraphic summary, Holes M0091A and M0091B. XCT = X-ray CT, MS = magnetic susceptibility, cps = counts per second.

Figure F12. Ternary diagram of major components and grain size, Site M0091.

Figure F13. Smear slide summary, Holes M0091A and M0091B. The most abundant lithogenics (clay, quartz, feldspar, and pyrite) are in a brown, the volcani-clastics/vitrics are red, and the biogenics are in a blue for the siliceous biogenics (diatoms, sponge spicules, and radiolaria) and are green for the calcareous microfossils. See legend in Figure F14B in the Expedition 386 methods chapter (Strasser et al., 2023a). XCT = X-ray CT.

Figure F14. Event bed, Hole M0091D. Images are adjusted for contrast and color.

Figure F15. Lithologic components, Site M0091. A. Mixed lithogenic and biogenic components. B. Lithogenic and biogenic components. C. Lithogenic with calcareous nannofossils. D. Lithogenic with calcareous nannofossils (cross-polarized light). E. Biogenic (diatom rich) and lithogenic. F. Tephra.

Figure F16. Lithostratigraphic summary, Holes M0091C and M0091D. XCT = X-ray CT, MS = magnetic susceptibility, cps = counts per second. (Continued on next page.)

Figure F17. Smear slide summary, Holes M0091C and M0091D. The most abundant lithogenics (clay, quartz, feldspar, and pyrite) are in a brown, the volcaniclastics/vitrics are red, and the biogenics are in a blue for the siliceous biogenics (diatoms, sponge spicules, and radiolaria) and are green for the calcareous microfossils. See legend in Figure F14B in the Expedition 386 methods chapter (Strasser et al., 2023a). XCT = X-ray CT. (Continued on next page.)

Figure F18. Iron monosulfide modes of occurrence, Hole M0091D. Images are adjusted for contrast and color.

Figure F19. XRD mineralogy, Hole M0091D.

Figure F20. Tephra M0091D-1H-7, 87.6 cm (brackets), in Basin S3 (386-M0091D-1H-7, 82–87.6 cm).

Figure F21. Various types of volcanic glass shards found in Tephra Layer M0091D-1H-7, 87.6 cm.

Figure F22. Abundance changes of radiolarian species *L. setosa*, *C. davisiana*, and the *Tetrapyle* group, Hole M0091D. See Micropaleontology in the Expedition 386 methods chapter (Strasser et al., 2023a) for explanations of radiolarian zonation and events.

Figure F23. IW salinity, total alkalinity, and ammonium (NH_4^+) concentrations, Site M0091.

Figure F24. IW V, Mo, and U concentrations, Site M0091.

Figure F25. IW Li, B, Si, Mn, Fe, Sr, and Ba concentrations, Site M0091.

Figure F26. IW Cl^-, Br^-, and SO_4^{2-} concentrations, Site M0091.

Figure F27. Methane (C_1) and ethane (C_2) concentrations and C_1/C_2 ratios in Hole M0091D and in one trigger core sample from 0.665 mbsf in Hole M0091C (red diamonds).

Figure F28. Solid-phase major elements in sediments, Site M0091. Open symbols = trigger core samples.

Figure F29. TC, TOC, TIC, and TS in sediments, Site M0091.

Figure F30. Physical properties summary, Holes M0091A (red) and M0091B (black). Bulk density: blue dots = Hole M0091A, red dots = Hole M0091B. Undrained shear strength measurements are from the handheld penetrometer. MS = magnetic susceptibility, cps = counts per second.

Figure F31. Physical properties summary, Holes M0091C (red) and M0091D (black). Bulk density: red dots = Hole M0091D. Undrained shear strength measurements are from the handheld penetrometer. MS = magnetic susceptibility, cps = counts per second.

Figure F32. Undrained shear strength (S_u) from fall cone and AVS, Site M0091.

Figure F33. MAD data summary, Holes M0091A (red) and M0091B (black).

Figure F34. MAD data summary, Holes M0091C (red) and M0091D (black).

Figure F35. Color data summary, Holes M0091A and M0091B.

Figure F36. Color data summary, Holes M0091C and M0091D.

Figure F37. Intensity, inclination, and declination, Holes M0091A and M0091C.

Figure F38. Intensity, Holes M0091B and M0091D.

Figure F39. Declination, Holes M0091B and M0091D.

Figure F40. Rescaled declination, Hole M0091B, and corrected declination, Hole M0091D.

Figure F41. Inclination, Holes M0091B and M0091D.

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