Figure F1. Regional bathymetry, seismic reflection lines, and boreholes near Site U1508 (not all data near Taranaki are shown). Reinga Basin is the region between West Norfolk Ridge, Reinga Ridge, and Northland. Stars = Expedition 371 sites, white dots = petroleum borehole sites, gray dots = Deep Sea Drilling Project sites.

Figure F2. Regional seismic reflection Line REI09-012 near Site U1508 with interpretation of stratal age and structure. VE = vertical exaggeration.

Figure F3. Detailed view of seismic reflection Line REI09-012 and location of Site U1508 (near CDP 8470). CDP spacing is 6.25 m. Key reflectors (A–F) are labeled.

Figure F4. Lithostratigraphic summary of sedimentary section, Site U1508. cps = counts per second.

Figure F5. Major biogenic and lithologic constituent abundances in sediment based on smear slide analysis, Site U1508. + symbols and darkest lines = Hole U1508A, x symbols and medium-shaded lines = Hole U1508B, circles and lightest colored lines = Hole U1508C. D = dominant (>50%), A = abundant (25%–50%), C = common (10%–25%), R = rare (1%–10%), T = trace (>0%–1%).

Figure F6. Representative Unit I lithologies, Site U1508. A. Foraminiferal (frm) ooze with bioclasts. nanno = nannofossil, sp = sponge spicule. B. Foraminiferal ooze with bryozoans (bry). bcl = bioclast. PPL = plane-polarized light, XPL = cross-polarized light.

Figure F7. Representative Subunit IIa lithologies, Site U1508. A. Nannofossil (nanno) ooze with clay. B. Nannofossil ooze with foraminifers (frm). C. Foraminiferal nannofossil ooze with sponge spicules (sp). D. Volcanic ash. gls = volcanic glass/shards, clay = clay minerals.

Figure F8. Representative Subunit IIb lithologies, Site U1508. A. Nannofossil (nanno) chalk with foraminifers (frm). B. Nannofossil-rich foraminiferal chalk. C. Silicate mineral–rich foraminiferal chalk with bioclasts. qtz = quartz, bt = biotite, vlc = volcanic clast.

Figure F9. Erosional bioturbated surfaces. Boxes indicate surface locations. A. Sharp erosional surface at 321.48 m separates light greenish gray (GLEY 1 7/10GY) nannofossil-rich foraminiferal chalk with rare amounts of glauconite above and greenish gray (GLEY 1 5/10Y) nannofossil chalk with foraminifers below. B. Sharp erosional bioturbated surface at 336.24 m separates greenish gray (GLEY 1 5/5GY) normal-graded, fine sand–sized, silicate mineral–rich foraminiferal chalk with bioclasts above from greenish gray (GLEY 1 5/5GY) silt-sized, silicate mineral–rich foraminiferal chalk with bioclasts below. C. Sharp erosional surface at 336.99 m separates greenish gray (GLEY 1 5/10GY) silicate mineral–rich foraminiferal chalk with bioclasts above and light greenish gray (GLEY 1 8/5GY) nannofossil-rich foraminiferal chalk with glauconite below.

Figure F10. Representative Subunit IIIa and IIIb lithologies, Site U1508. A. Clayey nannofossil (nanno) chalk. frm = foraminifer, clay = clay minerals. B. Cherty limestone.

Figure F11. Depth distribution of cherty limestone horizons in macroscopic core descriptions and correlation with downhole logging data, Site U1508. Green arrows = cherty limestone observed in Hole U1508B and U1508C macroscopic core descriptions. Logging data (red curve) is medium resistivity (RLA3) measured in Hole U1508C. Peaks in resistivity between 380 and 500 m WMSF are interpreted as individual cherty horizons.

Figure F12. XRD diffractograms and PPL smear slide photomicrographs of three samples from Subunit IIb, Site U1508. Carbonate was removed (decarb.) to enhance noncarbonate fraction signal. Samples show similar composition, dominated by quartz (qtz) with minor amounts of plagioclase (plag) and clinoptilolite (clin) zeolite. The latter is recognizable in smear slide as small needles in the finest fraction. glc = glauconite. Note decreasing amount of volcanic minerals from upper part of Subunit IIb (black; A) to that from lower part (blue; C).

Figure F13. Handheld XRF results from siliceous intervals, Site U1508. Cherty limestone intervals are shaded green; all background lithology is nannofossil chalk. Fe, Ca, and Si and Ca/Fe and Si/Fe ratios represent a simple normalization to clay content.

Figure F14. Detail of siliceous interval (371-U1508B-22R-1, 100–102 cm). A. XRD spectrum of homogenized cherty limestone with peaks of calcite and SiO_2 forms tridymite, cristobalite, and quartz identified. B. Cherty limestone interval between nannofossil chalk. C–E. Cherty limestone demonstrating foraminifers (frm), radiolarians (rad), glauconite (glc), sponge spicules (sp), and quartz (qtz) as foraminiferal chamber infill.

Figure F15. Biozonations, Site U1508.

Figure F16. Microfossil preservation and abundance, Site U1508. Abundance: D = dominant, A = abundant, C = common, F = few, R = rare, P = present, tr = trace, B = barren. Preservation: E = excellent, VG = very good, G = good, M = moderate, P = poor.

Figure F17. Preservation state of planktic foraminifers. Scale bars = 200 µm. A. Excellent (371-U1508A-1H-CC). B. Very good (371-U1508B-2R-CC). C. Good (371-U1508A-8H-CC). D. Moderate (371-U1508C-38R-CC). E. Poor (35R-CC).

Figure F18. Summary of ostracod preservation, abundance, and assemblage composition, Site U1508.

Figure F19. Selected dinocyst taxa. Scale bars = 50 µm. A. *Areosphaeridium diktyoplokum* (371-U1508C-20R-CC). B, C. *Cleistosphaeridium diversispinosum* (371-U1508B-22R-CC). D, E. *Cleistosphaeridium placacanthum* (22R-CC). F. *Corrudinium otagoense* (37R-CC). G, H. *Corrudinium regulare* (371-U1508C-18R-CC). I. *Diphyes colligerum* (371-U1508B-33R-CC).

Figure F20. Selected dinocyst taxa. Scale bars = 50 µm. A. *Dracodinium rhomboideum* (371-U1508C-13R-CC). B. *Dracodinium waipawaense* (13R-CC). C, D. *Enneadocysta pectiniformis* (371-U1508B-25R-CC). E. *Histiocysta palla* (371-U1508C-20R-CC). F. *Hystrichosphaeridium truswelliae* (18R-CC). G. *Impagidinium* sp. (371-U1508A-11H-CC). H. *Lejeunecysta* sp. (371-U1508B-25R-CC). I. *Spiniferites pseudofurcatus* (25R-CC).

Figure F21. Selected dinocyst and sporomorph taxa. Scale bars = 50 µm. A, B. *Membranophoridium* sp. (371-U1508B-21R-CC). C, F. *Stoveracysta ornata* (25R-CC). D, E. Bisaccate pollen grain (21R-CC). G. *Nothofagidites* sp. (21R-CC). H, I. Trilete spores (21R-CC).

Figure F22. Selected palynomorphs and palynofacies. Scale bars = 50 µm. A, B. *Prasinophyte phycoma* cf. *Pterospermella* (371-U1508B-15R-CC). C. *Tasmanites* sp. (371-U1508A-11H-CC). D. *Tasmanites* sp. (371-U1508C-13R-CC). E. Biserial organic foraminiferal lining (22R-CC). F. Spiral organic foraminiferal lining (21R-CC). G. Fungal spore (371-U1508B-21R-CC). H. Insect spine (371-U1508A-21H-CC). I. Pyritized siliceous microfossils (371-U1508B-29R-CC).

Figure F23. Invertebrate and vertebrate fossils. Scale bars = 200 µm unless otherwise noted. A. Crinoid columnal (371-U1508B-33R-CC). B. Otolith (371-U1508A-5H-CC). C. Bivalve (371-U1508C-26R-CC). D. Sponge spicule (371-U1508B-24R-CC). E. Articulate brachiopod (371-U1508A-8H-CC). F. Bryozoa fragment (6H-CC). G. Echinoderm spine (8H-CC). H. Gastropod (1H-CC).

Figure F24. Pass-through paleomagnetic data, Hole U1508A. Black dots = NRM intensity and inclination, gray dots = inclination after 20 mT AF cleaning interpolated by 10-point moving average (black line), red dots = inclination of directions from discrete sample analysis.

Figure F25. Pass-through paleomagnetic data, Hole U1508B. Black dots = NRM intensity and inclination, gray dots = inclination after 20 mT AF cleaning interpolated by 10-point moving average (black line), red dots = inclination from discrete sample analysis. Magnetic polarity: black = normal, white = reversed, gray = unidentified. Correlation with GPTS2012 is shown.

Figure F26. Pass-through paleomagnetic data, Hole U1508C. Black dots = NRM intensity and inclination, gray dots = inclination after 20 mT AF cleaning interpolated by 10-point moving average (black line), red dots = inclination from discrete sample analysis. Magnetic polarity: black = normal, white = reversed, gray = unidentified. Correlation with GPTS2012 is shown.

Figure F27. Inclination values after 20 mT AF demagnetization from pass-through paleomagnetic measurements of archive-half sections. A. Hole U1508A. B. Hole U1508B (180–380 m). C. Hole U1508B (380–500 m). D. Hole U1508C. *N* = number of data points.

Figure F28. Vector endpoint demagnetization diagrams (Zijderveld, 1967) and AF demagnetization behavior for three representative discrete samples. Open squares = projections onto vertical plane, solid squares = projections onto horizontal plane, blue lines = components fitted using selected data points (red squares) by PCA (Kirschvink, 1980). A. Hole U1508A. B. Hole U1508B. C. Hole U1508C.

Figure F29. AMS data for discrete samples from (A) Hole U1508A, (B) Hole U1508B, and (C) Hole U1508C. Top: stereoscopic plots. Blue squares = κ_{max} axes, green triangles = κ_{int} axes, purple circles = κ_{min} axes. Mean directions of κ_{max} (open square), κ_{int} (open triangle), and κ_{min} (open circle) axes, shown along with their 95% confidence ellipses. *N* = number of samples. Bottom: corresponding lineation ($\kappa_{max}/\kappa_{int}$) vs. foliation ($\kappa_{int}/\kappa_{min}$) data from each hole.

Figure F30. Bulk density, grain density, porosity, and *P*-wave velocity. Large dots = MAD and PWC values, black lines = wireline logging bulk density and *P*-wave velocity, small dots = whole-round section GRA density and *P*-wave velocity (*P*-wave logger [PWL]). Horizontal lines = lithostratigraphic unit boundaries, dashed horizontal lines = subunit boundaries. For porosity, best-fitting exponential decay curve (line) is shown (see text for details). WMSF scale is for logging results; CSF-A scale is for core results.

Figure F31. Wireline logging data for hole size, gamma ray, resistivity, *P*-wave velocity, and *S*-wave velocity, Hole U1508C. HSGR = total spectral gamma ray, HNGS = Hostile Environment Natural Gamma Ray Sonde. mbsf = meters below seafloor.

Figure F32. Magnetic susceptibility (MSL and MSP), NGR, and L*, a*, b*, Site U1508. Black lines = wireline logging measurements of magnetic susceptibility and NGR (scales at bottom). Horizontal lines = lithostratigraphic unit boundaries, dashed horizontal lines = subunit boundaries. WMSF scale is for logging results; CSF-A scale is for core results.

Figure F33. Heat flow. Note the vertical scale unit changes. A. APCT-3 temperature with depth profile, Hole U1508A. B. Thermal conductivity with 95% confidence interval estimate with three repeat measurements shown as error bars, Hole U1508A cores. C. Bullard plot (see Petrophysics in the Expedition 371 methods chapter [Sutherland et al., 2019a]) showing thermal resistance (Ω) vs. measured temperature. D. Thermal conductivity with error bars as in B, Hole U1508A (red), U1508B (orange), and U1508C (blue) cores.

Figure F34. Strength, Site U1508. A. Shear strength measured by automated vane shear. B. Compressive strength measured using pocket and needle penetrometers.

Figure F35. Borehole data to MCS data tie, Site U1508. A. Impedance calculated from combined laboratory-measured and wireline log *P*-wave velocity and density data vs. TWT. Horizontal lines = lithostratigraphic unit boundaries, dashed horizontal lines = subunit boundaries. B. TWT calculated from depths below seafloor, PWC *P*-wave velocity data (0–87 and 655–700 m CSF-A), and in situ wireline log *P*-wave velocity (87–655 m WMSF). Numerical solution for TWT (*t*) with depth (*z*) is given by $z = 319.67t^2 - 788.69t$. Circles = positions of strong reflectors shown in C and D (red = strongly correlated, open = not well correlated), dashed lines = match between real data in D and synthetic trace in C. C. Synthetic seismograms (red) and MCS trace data at CDP 8470 (black). Seismic Reflectors A–E* and seafloor (SF) are labeled. D. MCS data.

Figure F36. Methane in bulk sediment and sulfate and ammonium in IW, Site U1508.

Figure F37. IW chemistry, Site U1508.

Figure F38. Bulk sediment profiles of $CaCO_3$, total carbon (TC), total inorganic carbon (TIC), TOC, and TN, Site U1508.

Figure F39. Depth correlation between Holes U1508A and U1508B based on NGR records and core images. Black line = tie point.

Figure F40. Depth correlation between Holes U1508B and U1508C based on NGR records, nannofossil data, and core images. Black lines = tie points.

Figure F41. Depth correlation between Hole U1508B core data and wireline data across Unit II/ III boundary based on (A) NGR and (B) magnetic susceptibility records. Green = whole-round core NGR and MSL data on CSF-A scale, blue = shifted NGR and MSP core data on WMSF scale, red = wireline logging NGR and magnetic susceptibility data.

Figure F42. Depth correlation between Hole U1508B and U1508C core data and wireline data across overlapping interval based on NGR records. Red and blue lines = shifted whole-round core NGR data on WMSF scale, black line = wireline logging NGR data.

Figure F43. Sedimentation accumulation over time, Site U1508. A. Core recovery. B. Shipboard biostratigraphic and magnetostratigraphic datums and interpreted age-depth model. C. LSR and total MAR. Horizontal lines = lithostratigraphic unit boundaries, dashed horizontal lines = subunit boundaries.