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# 11. Data Report: Stable Isotopic Composition and Carbonate Mineralogy of Cool-Water Carbonate Sediments, Sites 1127, 1129, and 1131[1]

Mitchell J. Malone[2]

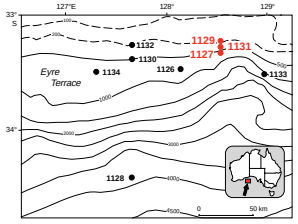
## ABSTRACT

An intensive stable isotopic investigation was conducted on sediments recovered from the Great Australian Bight during Ocean Drilling Program Leg 182 at Sites 1127, 1129, and 1131. The sites comprise a transect from the shelf edge to upper slope through a thick sequence of predominately Quaternary cool-water carbonate sediments. Detailed mineralogic and stable isotopic ($\delta^{18}O$ and $\delta^{13}C$) analyses of sediments from a total of 306 samples are presented from all three sites.

## INTRODUCTION

Sites 1127, 1129, and 1131 are located in a transect on the slope adjacent to the Eucla shelf in the Great Australian Bight (Fig. F1). At Site 1127 (33°21.45′S, 128°28.88′E), the most distal site in the transect at a water depth of 479 m, we recovered a 511-m uppermost Miocene–Quaternary section (Feary, Hine, Malone, et al., 2000). The Quaternary sequence (~470-m thick) dominated the drilled interval. Site 1131 (33°19.57′S, 128°28.88′E) is the intermediate site in the transect, situated in 332 m of water. A 617-m lower Miocene–Quaternary section was recovered at Site 1131, with an expanded ~510-m Quaternary sequence. Site 1129 (33°17.79′S, 128°28.88′E) is the most

F1. Sites drilled during Leg 182, p. 5.




[1]Malone, M.J, 2002. Data report: Stable isotopic composition and carbonate mineralogy of cool-water carbonate sediments, Sites 1127, 1129, and 1131. *In* Hine, A.C., Feary, D.A., and Malone, M.J. (Eds.), *Proc. ODP, Sci. Results,* 182, 1–14 [Online]. Available from World Wide Web: <http://www-odp.tamu.edu/publications/182_SR/VOLUME/CHAPTERS/012.PDF>. [Cited YYYY-MM-DD]
[2]Ocean Drilling Program and Department of Geology and Geophysics, Texas A&M University, College Station, TX 77845-9547, USA. malone@odpemail.tamu.edu

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proximal site of the transect at a water depth of 202 m. A 602-m lower Miocene–Quaternary section was recovered at Site 1129, with the thickest Quaternary sequence at ~554 m.

The sediments are composed of a mixture of pelagic material and shallow-water components that originated on the shelf. Sediments are unlithified to partially lithified bioclastic packstones and grainstones. The allochems are fine carbonate sand and silt composed of skeletal fragments, mainly bryozoans, ostracodes, benthic and planktonic foraminifer tests, tunicate sclerites, and siliceous sponge spicules. Shipboard macroscopic descriptions indicate that lithification increases downcore at all sites, becoming partially lithified (i.e., equivalent to chalk texture) between 120 meters below seafloor (mbsf) (Site 1131) and 235 mbsf (Site 1127).

Drilling at Sites 1129 and 1131 penetrated mound features on the seismic data, which are bryozoan mound complexes (Feary, Hine, Malone, et al., 2000). Individual mounds have synoptic relief of up to 65 m, are up to 2 km across in a dip direction, and extend for tens of kilometers along slope. Superimposed individual mounds formed mound complexes that persisted throughout much of the Pleistocene (Feary and James, 1998; James et al., 2000). Discrete mounds are recognizable at Site 1129 in the upper ~100 mbsf, whereas mounds are present in the upper ~25 mbsf at Site 1131 (Feary, Hine, Malone, et al., 2000). No mound facies were observed in seismic surveys or in cores at Site 1127.

Cool-water carbonate sediments (defined as carbonates accumulating in seawater that is generally colder than 20°C) are an important component in modern and ancient carbonate settings (Nelson, 1988; James, 1997). In particular, Cenozoic cool-water carbonates are remarkably similar to many Paleozoic and Mesozoic skeletal limestones (James, 1997). Unlike tropical settings, where several legs have already been drilled (Legs 101, 133, 143, 144, and 166), Leg 182 is the first Deep Sea Drilling Project/Ocean Drilling Program (ODP) cruise to core in a cool-water carbonate setting. Thus, prior to Leg 182, our knowledge of the depositional and diagenetic evolution of cool-water carbonates had been derived from modern surficial sediments, shallow piston cores, and from the rock record (James, 1997). The purpose of the present report is to provide initial data on the geochemistry and diagenesis of Pleistocene cool-water carbonate sediments. In this report, I document the detailed mineralogic and stable isotopic analyses of sediments from these three sites. Discussion and interpretation of these results will be presented in a future publication.

## METHODS

Sediment samples were analyzed at a frequency of about two per core (i.e., a little less than every 5 m). In addition, selected lithified horizons were also sampled, combining for a total of 306 samples. Prior to analyses, all samples were subjected to the same cleaning and analytical procedures. The outer edge of the sample was scraped away to avoid any contamination obtained during sampling, and then ~1 g of bulk sediment was rinsed twice in deionized water, centrifuged and decanted, and dried overnight at 60°C. Lithified samples were crushed prior to rinsing.

A portion of each sample was analyzed by powder X-ray diffraction (XRD) using CuKα radiation on a Rigaku D-Max 111V-B X-ray diffractometer equipped with a graphite monochromator. Samples were ground

in acetone, then smear-mounted onto glass plates, and step-scanned from 25° to 35°2θ, collecting data every 0.03°2θ at 2 s/step. Quantitative proportions of aragonite, high-Mg calcite, low-Mg calcite, and dolomite (normalized to 100% carbonate) were determined using a set of standards produced at the University of Miami. The method follows that of Hooton and Giorgetta (1977). The peak area ratios for the appropriate peaks of aragonite, high-Mg calcite, and dolomite were determined relative to the ratio of low-Mg calcite + high-Mg calcite and correlated to the same ratios in the weighted components of the standards. Additional details on the standardization and methods, as well as high-resolution mineralogic data sets for all the Leg 182 sites, can be found in **Swart et al.** (this volume).

Each sample was analyzed for stable oxygen and carbon isotopic ratios. In addition, selected samples containing dolomite were leached in buffered acetic acid to remove nondolomitic carbonate phases (verified by XRD) prior to analyses. Approximately 120 µg of powdered sample was reacted in "100%" phosphoric acid at 70°C in an on-line, automated Kiel device coupled to a Finnigan MAT 251 stable isotope-ratio mass spectrometer. The carbonate standard NBS-19 ($\delta^{13}C$ = 1.95‰; $\delta^{18}O$ = –2.20‰) was used to calibrate to the Peedee belemnite (PDB) standard. Repeated analyses of NBS-19 yielded reproducibility of better than 0.1‰ for $\delta^{18}O$ and $\delta^{13}C$. No correction was made for the difference in the phosphoric acid fractionation factors between dolomite and calcite.

## RESULTS

Mineralogic and isotopic data are compiled for Sites 1127, 1129, and 1131 in Tables **T1, T2,** and **T3,** respectively. In addition to the data, ODP sample identifier, and depth (mbsf) of each sample analyzed are also tabulated. Stable isotopic and mineralogic data are depicted graphically vs. depth in Figures **F2, F3,** and **F4.**

## ACKNOWLEDGMENTS

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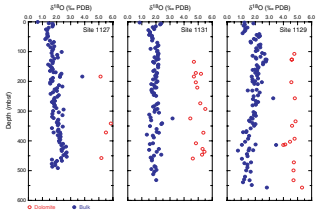




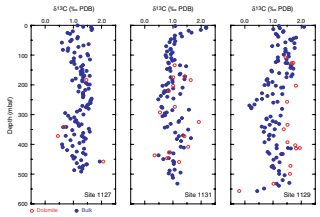




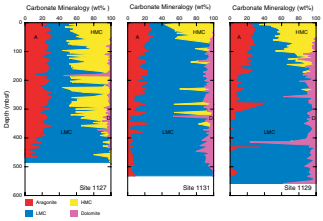

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James, N.P., Feary, D.A., Surlyk, F., Simo, J.A., Betzler, C., Holbourn, A.E., Li, Q., Matsuda, H., Machiyama, H., Brooks, G.R., Andres, M.S., Hine, A.C., Malone, M.J., and the ODP Leg 182 Science Party, 2000. Quaternary bryozoan reef mounds in cool-water, upper slope environments, Great Australian Bight. *Geology*, 28:647–650.

Nelson C.S., 1988. An introductory perspective on non-tropical shelf carbonates. *Sediment. Geol.,* 60:3–12.

**Figure F1.** Locations of sites drilled during Leg 182. Sites utilized in this report are highlighted in larger, red type; bathymetry is in m (modified from Feary, Hine, Malone, et al., 2000).

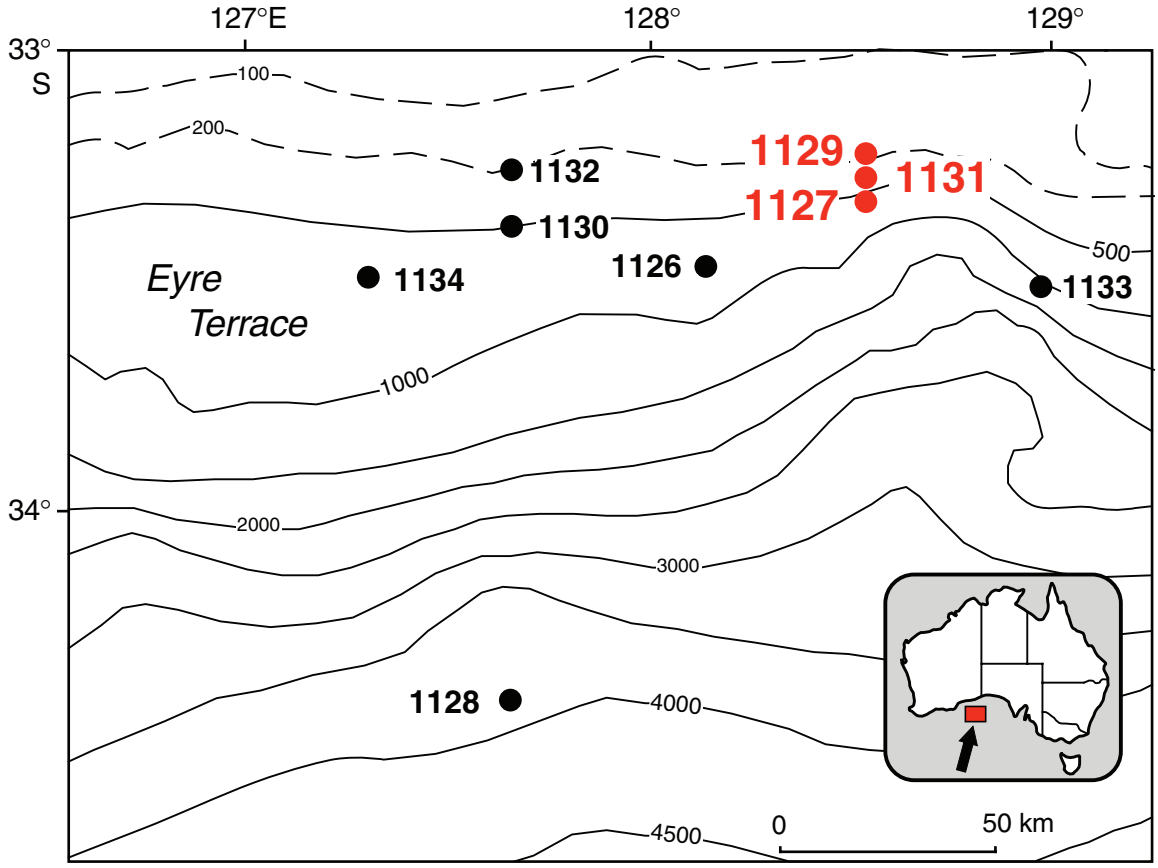
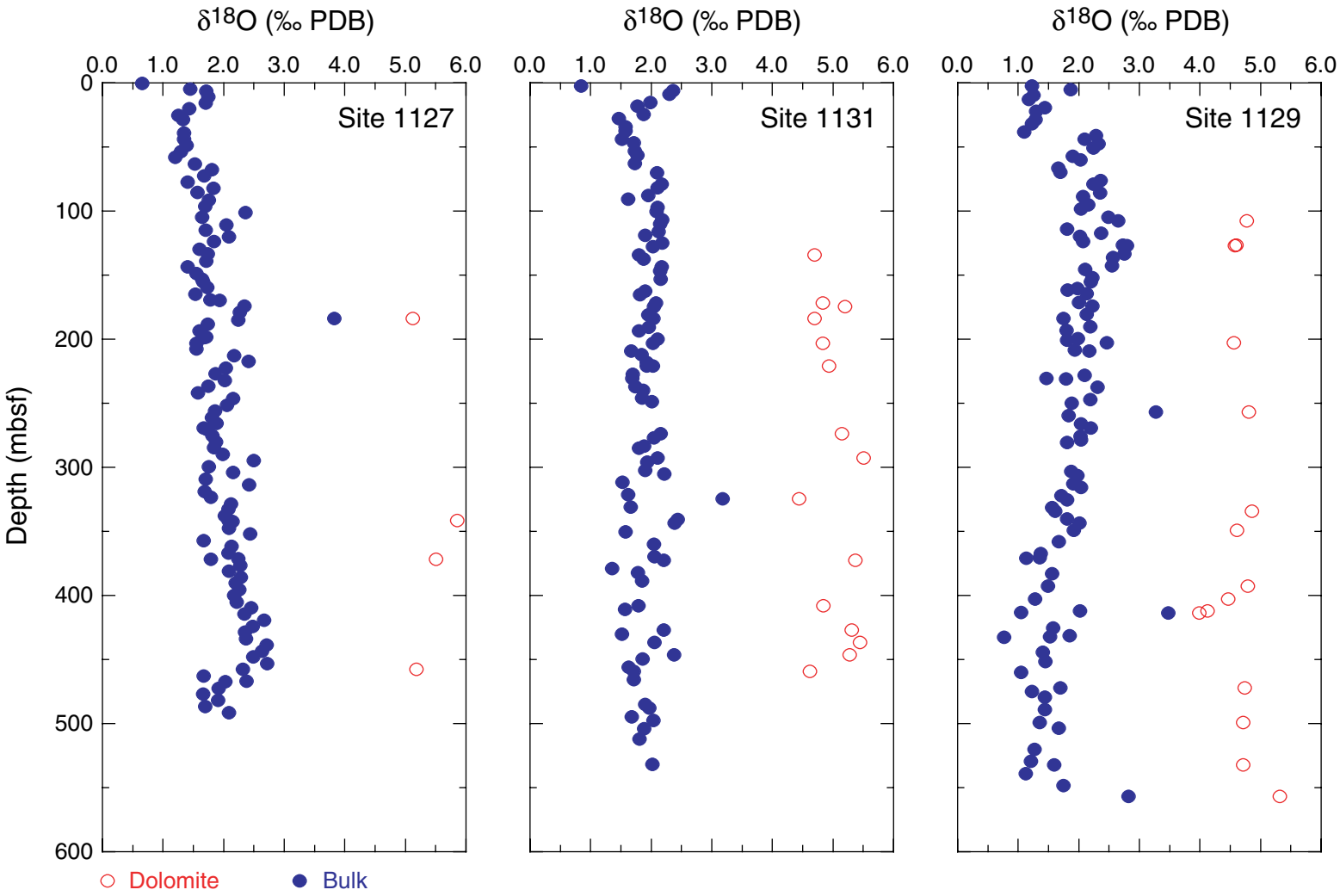


**Figure F2.** Oxygen isotopic composition of bulk samples and dolomite separates vs. depth. PDB = Peedee belemnite.



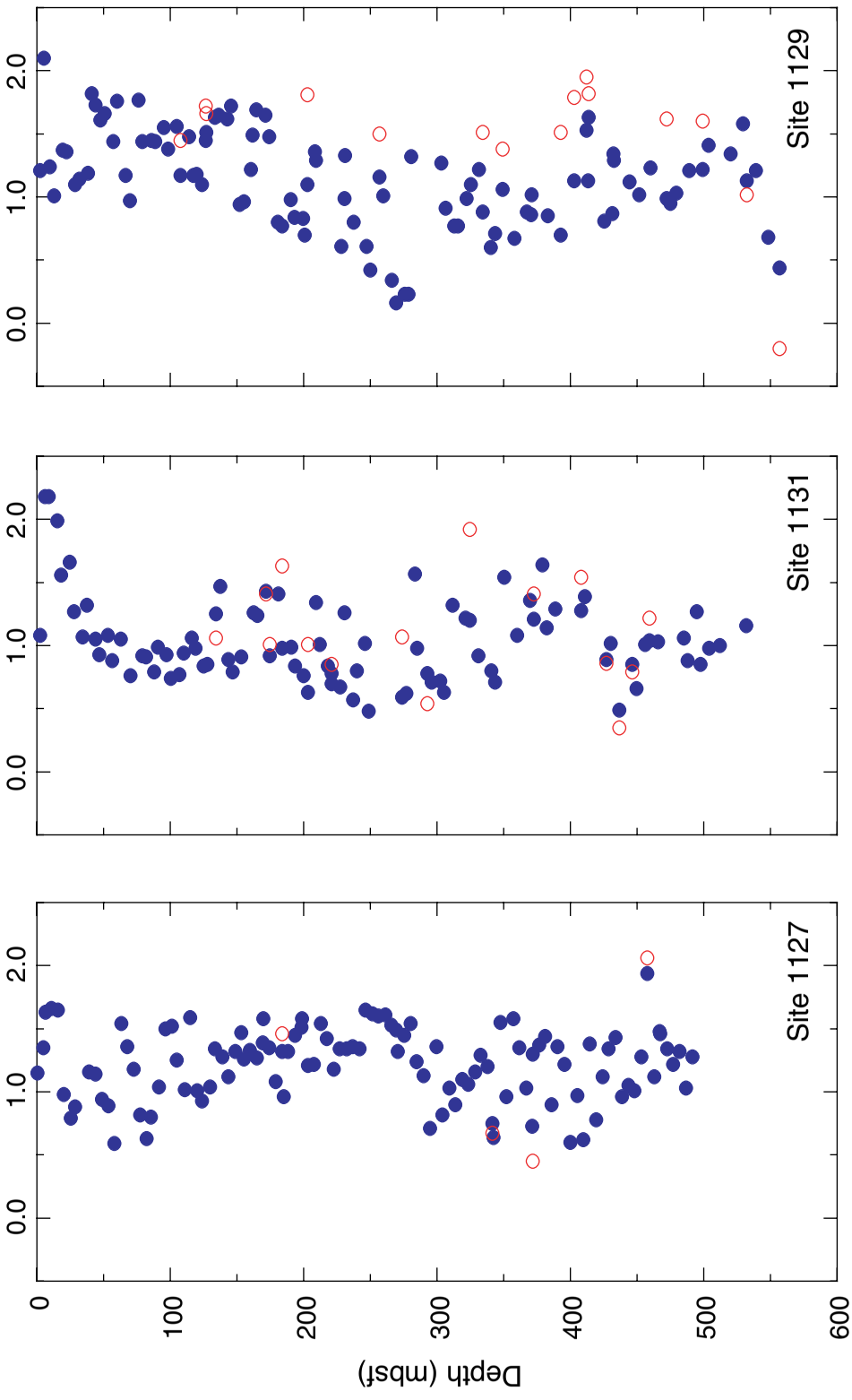



**Figure F3.** Carbon isotopic composition of bulk samples and dolomite separates vs. depth. PDB = Peedee belemnite.

**Figure F4.** Bulk carbonate mineralogy shown as cumulative weight percent.

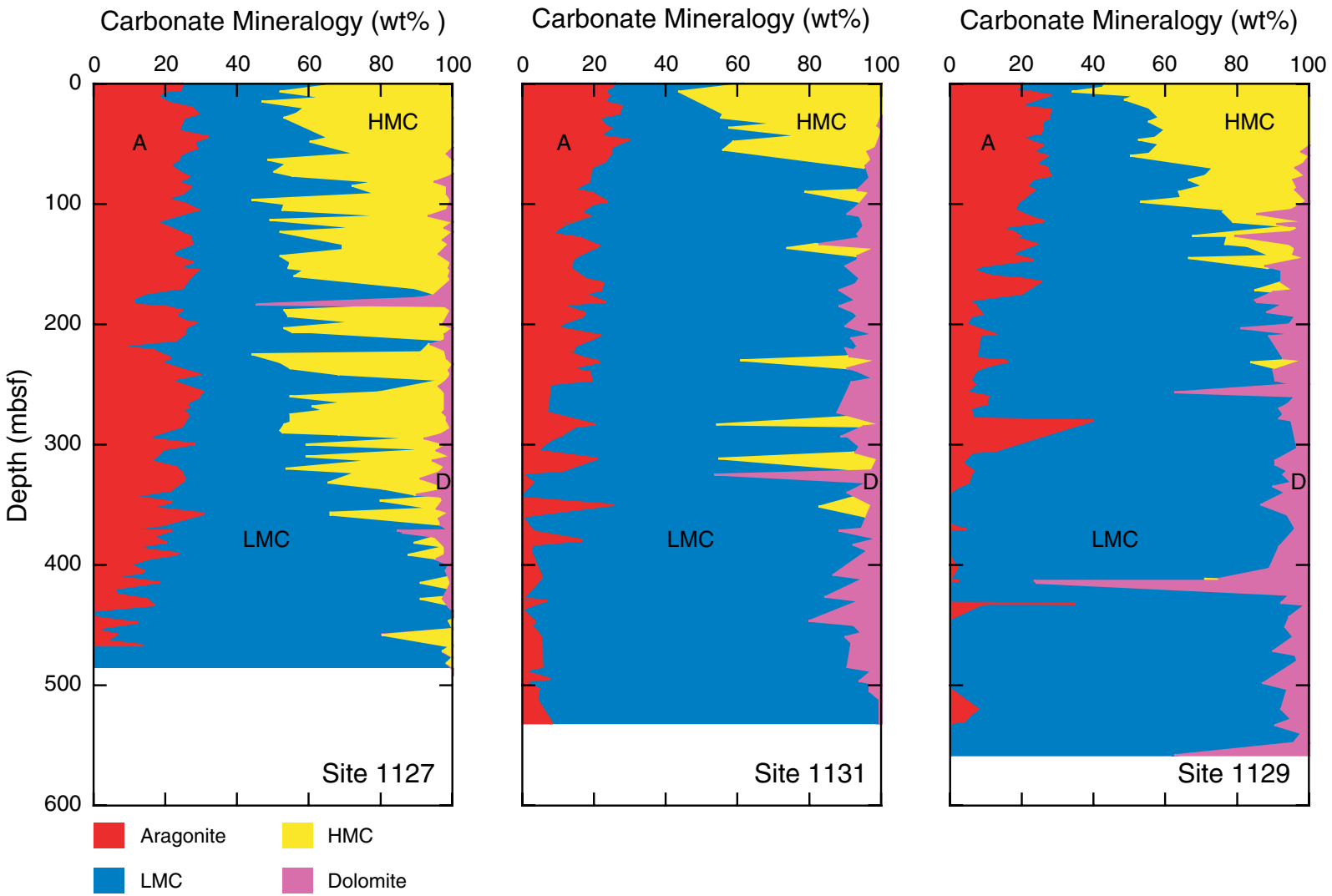


**Table T1.** Carbonate mineralogy and stable isotopes, Site 1127. (See table notes. Continued on next page.)

| Core, section, interval (cm) | Depth (mbsf) | Aragonite (wt%) | LMC (wt%) | HMC (wt%) | Dolomite (wt%) | Bulk (‰ PDB) | | Dolomite (‰ PDB) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $\delta^{13}C$ | $\delta^{18}O$ | $\delta^{13}C$ | $\delta^{18}O$ |
| 182-1127B- | | | | | | | | | |
| 1H-1, 38.0–40.0 | 0.38 | 24.9 | 41.5 | 33.6 | 0.0 | 1.15 | 0.66 | | |
| 1H-4, 38.0–40.0 | 4.88 | 24.0 | 31.2 | 44.8 | 0.0 | 1.35 | 1.45 | | |
| 2H-1, 42.0–44.0 | 6.32 | 19.3 | 29.8 | 50.9 | 0.0 | 1.63 | 1.72 | | |
| 2H-4, 38.0–40.0 | 10.78 | 17.9 | 47.2 | 34.9 | 0.0 | 1.66 | 1.75 | | |
| 3H-1, 38.0–40.0 | 15.78 | 20.8 | 23.3 | 55.9 | 0.0 | 1.65 | 1.71 | | |
| 3H-4, 38.0–40.0 | 20.28 | 27.2 | 31.6 | 41.2 | 0.0 | 0.98 | 1.43 | | |
| 4H-1, 38.0–40.0 | 25.28 | 29.1 | 27.5 | 43.3 | 0.0 | 0.79 | 1.25 | | |
| 4H-4, 38.0–40.0 | 28.71 | 25.0 | 27.8 | 47.2 | 0.0 | 0.88 | 1.33 | | |
| 5H-4, 38.0–40.0 | 39.28 | 23.7 | 36.7 | 39.7 | 0.0 | 1.16 | 1.35 | | |
| 6H-1, 8.0–40.0 | 44.28 | 31.7 | 33.4 | 34.9 | 0.0 | 1.14 | 1.35 | | |
| 6H-4, 38.0–40.0 | 48.78 | 28.0 | 31.9 | 40.2 | 0.0 | 0.94 | 1.39 | | |
| 7H-1, 38.0–40.0 | 53.78 | 28.7 | 38.5 | 32.7 | 0.0 | 0.89 | 1.30 | | |
| 7H-4, 38.0–40.0 | 58.28 | 24.5 | 48.7 | 24.7 | 2.2 | 0.59 | 1.20 | | |
| 8H-1, 38.0–40.0 | 63.28 | 23.5 | 23.9 | 52.7 | 0.0 | 1.54 | 1.53 | | |
| 8H-4, 38.0–40.0 | 67.78 | 21.2 | 32.8 | 46.0 | 0.0 | 1.36 | 1.81 | | |
| 9H-1, 38.0–40.0 | 72.78 | 23.3 | 26.1 | 50.5 | 0.0 | 1.18 | 1.68 | | |
| 9H-4, 38.0–40.0 | 77.28 | 26.4 | 28.6 | 44.2 | 0.8 | 0.82 | 1.41 | | |
| 10H-1, 37.0–38.0 | 82.27 | 23.5 | 55.1 | 16.4 | 4.9 | 0.63 | 1.83 | | |
| 10H-4, 38.0–40.0 | 85.67 | 26.8 | 44.7 | 26.8 | 1.8 | 0.80 | 1.57 | | |
| 11H-1, 38.0–40.0 | 91.78 | 24.8 | 54.3 | 19.4 | 1.5 | 1.04 | 1.76 | | |
| 11H-4, 38.0–40.0 | 96.28 | 19.5 | 22.6 | 57.3 | 0.6 | 1.50 | 1.70 | | |
| 12H-1, 38.0–40.0 | 101.28 | 26.2 | 27.0 | 45.6 | 1.2 | 1.52 | 2.36 | | |
| 12H-4, 38.0–40.0 | 105.02 | 28.6 | 24.0 | 45.4 | 2.0 | 1.25 | 1.65 | | |
| 13H-1, 38.0–40.0 | 110.78 | 22.1 | 61.5 | 9.4 | 7.0 | 1.02 | 2.05 | | |
| 13H-4, 38.0–40.0 | 115.21 | 17.4 | 27.9 | 54.7 | 0.0 | 1.59 | 1.71 | | |
| 14H-1, 38.0–40.0 | 120.28 | 21.4 | 53.2 | 22.8 | 2.7 | 1.01 | 2.09 | | |
| 14H-4, 38.0–40.0 | 123.93 | 24.3 | 25.0 | 50.7 | 0.0 | 0.93 | 1.84 | | |
| 15H-1, 38.0–40.0 | 129.78 | 27.0 | 30.6 | 39.9 | 2.5 | 1.04 | 1.60 | | |
| 15H-4, 38.0–40.0 | 133.54 | 27.4 | 41.6 | 29.7 | 1.3 | 1.34 | 1.74 | | |
| 16H-1, 38.0–40.0 | 139.28 | 22.2 | 46.6 | 28.1 | 3.1 | 1.28 | 1.72 | | |
| 16H-4, 38.0–40.0 | 143.78 | 22.6 | 28.9 | 45.5 | 3.0 | 1.12 | 1.41 | | |
| 17X-1, 38.0–40.0 | 148.78 | 27.4 | 27.6 | 44.2 | 0.7 | 1.32 | 1.55 | | |
| 17X-4, 38.0–40.0 | 153.11 | 22.6 | 31.8 | 44.8 | 0.7 | 1.47 | 1.65 | | |
| 18X-1, 38.0–40.0 | 155.28 | 29.1 | 29.7 | 40.7 | 0.5 | 1.26 | 1.66 | | |
| 18X-4, 38.0–40.0 | 159.78 | 27.4 | 27.7 | 43.7 | 1.2 | 1.33 | 1.73 | | |
| 19X-1, 38.0–40.0 | 164.88 | 25.6 | 42.2 | 31.7 | 0.5 | 1.27 | 1.54 | | |
| 19X-4, 38.0–40.0 | 169.38 | 24.9 | 64.8 | 7.9 | 2.3 | 1.39 | 1.78 | | |
| 19X-4, 94.0–96.0 | 169.94 | 24.2 | 62.9 | 10.8 | 2.1 | 1.58 | 1.94 | | |
| 20X-1, 38.0–40.0 | 174.48 | 14.4 | 81.2 | 0.0 | 4.4 | 1.35 | 2.34 | | |
| 20X-4, 38.0–40.0 | 178.98 | 11.1 | 79.8 | 0.0 | 9.1 | 1.08 | 2.27 | | |
| 21X-1, 39.0–41.0 | 184.09 | 11.2 | 34.2 | 0.0 | 54.7 | 1.32 | 3.83 | 1.46 | 5.12 |
| 21X-2, 37.0–39.0 | 185.28 | 17.7 | 64.7 | 15.4 | 2.2 | 0.96 | 2.24 | | |
| 21X-4, 38.0–40.0 | 188.29 | 24.5 | 28.3 | 46.6 | 0.5 | 1.32 | 1.74 | | |
| 22X-1, 38.0–40.0 | 193.78 | 22.4 | 31.4 | 44.9 | 1.3 | 1.45 | 1.60 | | |
| 22X-4, 38.0–40.0 | 198.28 | 26.2 | 40.9 | 30.3 | 2.6 | 1.51 | 1.72 | | |
| 22X-4, 87.0–89.0 | 198.77 | 28.5 | 45.0 | 22.7 | 3.7 | 1.58 | 1.68 | | |
| 23X-1, 38.0–40.0 | 203.38 | 25.4 | 26.6 | 48.0 | 0.0 | 1.21 | 1.55 | | |
| 23X-4, 38.0–40.0 | 207.88 | 25.3 | 30.9 | 41.7 | 2.1 | 1.22 | 1.55 | | |
| 24X-1, 38.0–40.0 | 212.98 | 22.9 | 75.2 | 0.0 | 1.9 | 1.54 | 2.17 | | |
| 24X-4, 38.0–40.0 | 217.48 | 6.0 | 87.8 | 0.0 | 6.2 | 1.41 | 2.41 | | |
| 25X-1, 38.0–40.0 | 222.68 | 16.9 | 75.0 | 6.1 | 2.0 | 1.18 | 2.04 | | |
| 25X-4, 38.0–40.0 | 227.18 | 21.0 | 23.1 | 54.2 | 1.7 | 1.34 | 1.87 | | |
| 26X-1, 38.0–40.0 | 232.28 | 18.4 | 34.1 | 47.4 | 0.0 | 1.34 | 2.02 | | |
| 26X-4, 38.0–40.0 | 236.78 | 23.3 | 31.5 | 44.4 | 0.8 | 1.36 | 1.75 | | |
| 27X-1, 38.0–49.0 | 241.88 | 29.6 | 36.2 | 33.4 | 0.8 | 1.34 | 1.58 | | |
| 27X-4, 38.0–49.0 | 246.38 | 20.8 | 77.5 | 0.0 | 1.7 | 1.65 | 2.16 | | |
| 28X-1, 38.0–40.0 | 251.48 | 25.5 | 63.3 | 7.0 | 4.2 | 1.62 | 2.06 | | |
| 28X-4, 38.0–40.0 | 255.98 | 30.4 | 49.5 | 17.7 | 2.5 | 1.60 | 1.86 | | |
| 29X-1, 38.0–40.0 | 261.18 | 29.0 | 23.3 | 45.3 | 2.4 | 1.61 | 1.81 | | |
| 29X-4, 38.0–40.0 | 265.68 | 26.0 | 44.8 | 26.8 | 2.4 | 1.53 | 1.89 | | |
| 29X-7, 38.0–40.0 | 269.53 | 26.3 | 33.2 | 38.0 | 2.5 | 1.49 | 1.67 | | |
| 30X-1, 38.0–40.0 | 270.78 | 24.6 | 39.8 | 32.8 | 2.9 | 1.32 | 1.73 | | |
| 30X-4, 38.0–40.0 | 275.28 | 26.1 | 28.8 | 43.5 | 1.6 | 1.45 | 1.82 | | |
| 31X-1, 38.0–40.0 | 280.38 | 25.2 | 29.7 | 43.4 | 1.6 | 1.54 | 1.88 | | |
| 31X-4, 37.0–39.0 | 284.87 | 24.5 | 28.1 | 46.8 | 0.6 | 1.24 | 1.84 | | |
| 32X-1, 38.0–40.0 | 290.08 | 19.2 | 32.6 | 45.9 | 2.2 | 1.13 | 1.99 | | |

**Table T1 (continued).**

| Core, section, interval (cm) | Depth (mbsf) | Aragonite (wt%) | LMC (wt%) | HMC (wt%) | Dolomite (wt%) | Bulk (‰ PDB) | | Dolomite (‰ PDB) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $\delta^{13}C$ | $\delta^{18}O$ | $\delta^{13}C$ | $\delta^{18}O$ |
| 32X-4, 38.0–40.0 | 294.58 | 14.4 | 76.8 | 0.0 | 8.8 | 0.71 | 2.50 | | |
| 33X-1, 38.0–40.0 | 299.68 | 28.0 | 29.6 | 40.9 | 1.5 | 1.36 | 1.76 | | |
| 33X-4, 38.0–40.0 | 304.18 | 19.5 | 71.0 | 5.1 | 4.4 | 0.82 | 2.16 | | |
| 34X-1, 38.0–40.0 | 309.28 | 17.7 | 37.0 | 44.5 | 0.8 | 1.03 | 1.71 | | |
| 34X-4, 38.0–40.0 | 313.78 | 15.7 | 63.1 | 15.1 | 6.1 | 0.90 | 2.42 | | |
| 35X-1, 38.0–40.0 | 318.88 | 22.9 | 29.1 | 45.9 | 2.0 | 1.10 | 1.69 | | |
| 35X-4, 38.0–40.0 | 323.38 | 24.5 | 48.8 | 22.8 | 4.0 | 1.06 | 1.79 | | |
| 36X-1, 38.0–40.0 | 328.48 | 25.3 | 42.6 | 23.2 | 8.9 | 1.16 | 2.12 | | |
| 36X-4, 37.0–39.0 | 332.97 | 23.8 | 40.1 | 32.1 | 4.0 | 1.29 | 2.08 | | |
| 37X-1, 38.0–40.0 | 338.08 | 20.9 | 61.8 | 13.5 | 3.8 | 1.20 | 2.02 | | |
| 37X-3, 86.0–89.0 | 341.56 | 14.3 | 74.9 | 0.0 | 10.8 | 0.75 | 2.08 | 0.67 | 5.86 |
| 37X-4, 38.0–40.0 | 342.58 | 9.2 | 87.6 | 0.0 | 3.2 | 0.64 | 2.15 | | |
| 38X-1, 36.0–38.0 | 347.66 | 21.5 | 58.4 | 17.5 | 2.6 | 1.55 | 2.09 | | |
| 38X-4, 38.0–40.0 | 352.18 | 14.5 | 80.1 | 0.0 | 5.5 | 0.96 | 2.44 | | |
| 39X-1, 38.0–40.0 | 357.38 | 30.5 | 31.9 | 36.7 | 1.0 | 1.58 | 1.67 | | |
| 39X-4, 38.0–40.0 | 361.88 | 25.7 | 54.8 | 15.7 | 3.7 | 1.35 | 2.13 | | |
| 40X-1, 38.0–40.0 | 366.98 | 19.2 | 77.4 | 0.0 | 3.4 | 1.03 | 2.08 | | |
| 40X-4, 38.0–40.0 | 371.48 | 7.7 | 91.6 | 0.0 | 0.7 | 0.73 | 2.24 | | |
| 40X-4, 84.0–87.0 | 371.94 | 21.5 | 63.2 | 0.0 | 15.3 | 1.30 | 1.79 | 0.45 | 5.51 |
| 41X-1, 38.0–40.0 | 376.58 | 16.3 | 79.1 | 0.0 | 4.6 | 1.37 | 2.28 | | |
| 41X-4, 38.0–40.0 | 381.08 | 20.1 | 69.0 | 7.2 | 3.7 | 1.44 | 2.09 | | |
| 42X-1, 38.0–40.0 | 385.98 | 10.9 | 87.7 | 0.0 | 1.4 | 0.90 | 2.29 | | |
| 42X-4, 38.0–40.0 | 390.48 | 23.5 | 62.4 | 12.1 | 2.0 | 1.36 | 2.20 | | |
| 43X-1, 38.0–40.0 | 395.58 | 14.7 | 80.6 | 0.0 | 4.7 | 1.22 | 2.26 | | |
| 43X-4, 38.0–40.0 | 400.08 | 10.2 | 88.7 | 0.0 | 1.1 | 0.60 | 2.17 | | |
| 44X-1, 38.0–40.0 | 405.18 | 13.9 | 84.2 | 0.0 | 1.9 | 0.97 | 2.22 | | |
| 44X-4, 36.0–38.0 | 409.66 | 5.4 | 93.4 | 0.0 | 1.2 | 0.62 | 2.46 | | |
| 45X-1, 38.0–40.0 | 414.78 | 18.1 | 72.7 | 8.8 | 0.5 | 1.38 | 2.34 | | |
| 45X-4, 38.0–40.0 | 419.28 | 5.8 | 93.5 | 0.0 | 0.8 | 0.78 | 2.67 | | |
| 46X-1, 42.0–44.0 | 424.42 | 6.2 | 91.7 | 0.0 | 2.1 | 1.12 | 2.48 | | |
| 46X-4, 38.0–40.0 | 428.88 | 14.5 | 76.3 | 6.5 | 2.7 | 1.34 | 2.35 | | |
| 47X-1, 38.0–40.0 | 434.08 | 16.3 | 82.7 | 0.0 | 1.0 | 1.43 | 2.37 | | |
| 47X-4, 38.0–40.0 | 438.58 | 0.0 | 99.6 | 0.4 | 0.0 | 0.96 | 2.71 | | |
| 48X-1, 38.0–40.0 | 443.68 | 0.0 | 100.0 | 0.0 | 0.0 | 1.05 | 2.64 | | |
| 48X-4, 38.0–40.0 | 448.18 | 11.9 | 87.5 | 0.0 | 0.6 | 1.01 | 2.49 | | |
| 49X-1, 38.0–40.0 | 453.28 | 0.0 | 100.0 | 0.0 | 0.0 | 1.28 | 2.72 | | |
| 49X-4, 36.0–38.0 | 457.76 | 6.5 | 73.8 | 0.0 | 19.7 | 1.94 | 2.32 | 2.06 | 5.18 |
| 50X-1, 38.0–40.0 | 462.88 | 3.0 | 88.9 | 0.0 | 8.1 | 1.12 | 1.67 | | |
| 50X-4, 14.0–17.0 | 467.14 | 13.6 | 84.9 | 0.0 | 1.5 | 1.48 | 2.38 | | |
| 50X-4, 28.0–30.0 | 467.28 | 0.0 | 100.0 | 0.0 | 0.0 | 1.46 | 2.03 | | |
| 51X-1, 38.0–40.0 | 472.48 | 0.0 | 97.2 | 0.0 | 2.8 | 1.34 | 1.92 | | |
| 51X-4, 38.0–40.0 | 476.98 | 0.0 | 100.0 | 0.0 | 0.0 | 1.22 | 1.66 | | |
| 52X-1, 38.0–40.0 | 482.08 | 0.0 | 98.3 | 0.0 | 1.7 | 1.32 | 1.91 | | |
| 52X-4, 36.0–38.0 | 486.56 | 0.0 | 100.0 | 0.0 | 0.0 | 1.03 | 1.70 | | |
| 53X-1, 38.0–40.0 | 491.78 | 0.0 | 100.0 | 0.0 | 0.0 | 1.28 | 2.09 | | |

Notes: LMC = low-Mg calcite, HMC = high-Mg calcite. PDB = Peedee belemnite.

**Table T2.** Carbonate mineralogy and stable isotopes, Site 1129. (See table notes. Continued on next page.)

| Core, section, interval (cm) | Depth (mbsf) | Aragonite (wt%) | LMC (wt%) | HMC (wt%) | Dolomite (wt%) | Bulk (‰ PDB) | | Dolomite (‰ PDB) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $\delta^{13}C$ | $\delta^{18}O$ | $\delta^{13}C$ | $\delta^{18}O$ |
| 182-1129C- | | | | | | | | | |
| 1H-2, 100.0–102.0 | 2.50 | 19.8 | 23.4 | 56.7 | 0.0 | 1.21 | 1.23 | | |
| 1H-4, 100.0–102.0 | 5.50 | 16.9 | 16.2 | 66.8 | 0.0 | 2.10 | 1.87 | | |
| 2H-2, 100.0–102.0 | 9.80 | 28.0 | 23.7 | 48.3 | 0.0 | 1.24 | 1.25 | | |
| 2H-4, 100.0–102.0 | 12.80 | 23.2 | 25.0 | 51.8 | 0.0 | 1.01 | 1.18 | | |
| 3H-2, 100.0–102.0 | 19.30 | 18.5 | 35.3 | 46.2 | 0.0 | 1.37 | 1.44 | | |
| 3H-4, 100.0–102.0 | 22.30 | 27.7 | 28.0 | 44.3 | 0.0 | 1.36 | 1.30 | | |
| 4H-2, 100.0–102.0 | 28.80 | 27.5 | 30.7 | 41.8 | 0.0 | 1.10 | 1.29 | | |
| 4H-4, 100.0–102.0 | 31.80 | 25.4 | 29.6 | 45.0 | 0.0 | 1.14 | 1.23 | | |
| 5H-2, 100.0–102.0 | 38.30 | 25.7 | 33.6 | 40.7 | 0.0 | 1.19 | 1.10 | | |
| 5H-4, 100.0–102.0 | 41.30 | 25.0 | 33.4 | 41.6 | 0.0 | 1.82 | 2.29 | | |
| 5H-6, 65.0–67.0 | 43.95 | 19.9 | 37.8 | 42.3 | 0.0 | 1.73 | 2.10 | | |
| 6H-2, 100.0–102.0 | 47.80 | 21.7 | 30.1 | 48.2 | 0.0 | 1.61 | 2.33 | | |
| 6H-4, 100.0–102.0 | 50.80 | 25.5 | 32.5 | 42.0 | 0.0 | 1.66 | 2.24 | | |
| 7H-2, 100.0–102.0 | 57.30 | 23.1 | 32.5 | 42.3 | 2.1 | 1.44 | 1.90 | | |
| 7H-4, 100.0–102.0 | 60.30 | 27.1 | 21.8 | 50.8 | 0.3 | 1.76 | 2.03 | | |
| 8H-2, 100.0–102.0 | 66.80 | 23.6 | 40.5 | 34.4 | 1.5 | 1.17 | 1.66 | | |
| 8H-4, 100.0–102.0 | 69.80 | 26.9 | 46.7 | 22.5 | 3.9 | 0.97 | 1.70 | | |
| 9H-2, 100.0–102.0 | 76.30 | 28.0 | 43.6 | 27.4 | 1.0 | 1.77 | 2.36 | | |
| 9H-4, 100.0–102.0 | 79.30 | 23.3 | 42.4 | 30.1 | 4.2 | 1.44 | 2.24 | | |
| 10H-2, 100.0–102.0 | 85.80 | 20.9 | 49.4 | 26.4 | 3.2 | 1.45 | 2.35 | | |
| 10H-4, 100.0–102.0 | 88.80 | 23.1 | 40.7 | 32.3 | 4.0 | 1.44 | 2.07 | | |
| 11H-2, 100.0–102.0 | 95.30 | 20.5 | 44.0 | 33.8 | 1.6 | 1.55 | 2.16 | | |
| 11H-4, 100.0–102.0 | 98.30 | 18.9 | 32.9 | 47.7 | 0.5 | 1.38 | 2.04 | | |
| 12H-2, 100.0–102.0 | 104.80 | 17.7 | 60.2 | 17.0 | 5.0 | 1.56 | 2.49 | | |
| 12H-4, 100.0–102.0 | 107.80 | 18.8 | 57.2 | 8.9 | 15.1 | 1.17 | 2.65 | 1.45 | 4.77 |
| 13H-2, 100.0–102.0 | 114.30 | 26.1 | 52.5 | 20.6 | 0.9 | 1.48 | 1.81 | | |
| 13H-4, 100.0–102.0 | 117.30 | 17.5 | 72.6 | 0.0 | 9.9 | 1.17 | 2.37 | | |
| 13H-6, 54.0–56.0 | 119.84 | 12.8 | 84.4 | 0.0 | 2.8 | 1.18 | 2.02 | | |
| 14H-2, 100.0–102.0 | 123.80 | 18.0 | 68.8 | 8.5 | 4.7 | 1.10 | 2.07 | | |
| 14H-4, 100.0–102.0 | 126.80 | 18.7 | 44.8 | 15.2 | 21.3 | 1.45 | 2.73 | 1.72 | 4.60 |
| 14H-4, 108.0–110.0 | 126.88 | 16.2 | 61.1 | 0.0 | 22.7 | 1.51 | 2.80 | 1.66 | 4.58 |
| 15H-2, 100.0–102.0 | 133.30 | 24.1 | 52.5 | 17.4 | 6.1 | 1.63 | 2.75 | | |
| 15H-4, 100.0–102.0 | 136.30 | 19.0 | 63.5 | 13.8 | 3.7 | 1.65 | 2.57 | | |
| 16H-2, 100.0–102.0 | 142.80 | 17.3 | 71.8 | 6.1 | 4.7 | 1.62 | 2.55 | | |
| 16H-4, 100.0–102.0 | 145.80 | 22.6 | 42.2 | 34.1 | 1.1 | 1.72 | 2.11 | | |
| 17H-2, 100.0–102.0 | 152.30 | 8.4 | 80.7 | 0.0 | 10.8 | 0.94 | 2.23 | | |
| 17H-4, 100.0–102.0 | 155.30 | 5.9 | 86.3 | 0.0 | 7.8 | 0.96 | 2.20 | | |
| 18H-1, 132.0–134.0 | 160.62 | 12.3 | 79.9 | 0.0 | 7.8 | 1.22 | 1.98 | | |
| 18H-2, 100.0–102.0 | 161.80 | 19.3 | 73.2 | 0.0 | 7.5 | 1.49 | 1.82 | | |
| 18H-4, 100.0–102.0 | 164.80 | 25.1 | 67.5 | 0.0 | 7.4 | 1.69 | 2.13 | | |
| 19H-2, 100.0–102.0 | 171.30 | 21.6 | 61.7 | 12.0 | 4.7 | 1.65 | 2.00 | | |
| 19H-4, 100.0–102.0 | 174.30 | 20.1 | 71.1 | 0.0 | 8.8 | 1.48 | 2.23 | | |
| 20H-2, 100.0–102.0 | 180.80 | 4.4 | 80.2 | 0.0 | 15.5 | 0.80 | 2.13 | | |
| 20H-4, 100.0–102.0 | 183.80 | 6.9 | 86.2 | 0.0 | 7.0 | 0.77 | 1.75 | | |
| 21H-2, 100.0–102.0 | 190.30 | 8.4 | 80.0 | 0.0 | 11.5 | 0.98 | 2.19 | | |
| 21H-4, 103.0–105.0 | 193.33 | 5.7 | 90.1 | 0.0 | 4.2 | 0.84 | 1.80 | | |
| 22H-2, 100.0–102.0 | 199.80 | 4.7 | 89.5 | 0.0 | 5.7 | 0.83 | 1.99 | | |
| 22H-3, 53.0–56.0 | 200.83 | 5.0 | 90.7 | 0.0 | 4.3 | 0.70 | 1.81 | | |
| 22H-4, 100.0–102.0 | 202.80 | 6.9 | 73.5 | 0.0 | 19.6 | 1.10 | 2.47 | 1.81 | 4.56 |
| 23H-2, 29.0–31.0 | 208.59 | 12.7 | 83.5 | 0.0 | 3.8 | 1.36 | 1.94 | | |
| 23H-2, 100.0–102.0 | 209.30 | 8.0 | 80.9 | 0.0 | 11.1 | 1.29 | 2.17 | | |
| 25X-2, 100.0–102.0 | 228.20 | 7.4 | 85.2 | 0.0 | 7.4 | 0.61 | 2.10 | | |
| 25X-4, 56.0–59.0 | 230.76 | 12.5 | 86.3 | 0.0 | 1.2 | 0.99 | 1.47 | | |
| 25X-4, 100.0–102.0 | 231.20 | 15.6 | 66.2 | 16.6 | 1.6 | 1.33 | 1.79 | | |
| 26X-2, 100.0–102.0 | 237.70 | 6.9 | 83.6 | 0.0 | 9.5 | 0.80 | 2.31 | | |
| 27X-2, 100.0–102.0 | 247.20 | 5.6 | 85.0 | 0.0 | 9.4 | 0.61 | 2.19 | | |
| 27X-4, 100.0–102.0 | 250.20 | 6.9 | 88.6 | 0.0 | 4.5 | 0.42 | 1.89 | | |
| 28X-2, 100.0–102.0 | 256.90 | 4.2 | 58.0 | 0.0 | 37.8 | 1.16 | 3.27 | 1.50 | 4.81 |
| 28X-4, 100.0–102.0 | 259.90 | 10.3 | 85.8 | 0.0 | 3.8 | 1.01 | 1.83 | | |
| 29X-2, 100.0–102.0 | 266.40 | 10.1 | 83.8 | 0.0 | 6.1 | 0.34 | 2.04 | | |
| 29X-4, 100.0–102.0 | 269.40 | 5.1 | 86.9 | 0.0 | 8.0 | 0.16 | 2.20 | | |
| 30X-2, 100.0–102.0 | 275.80 | 6.0 | 86.9 | 0.0 | 7.1 | 0.23 | 2.03 | | |
| 30X-4, 98.0–100.0 | 278.78 | 6.0 | 86.1 | 0.0 | 8.0 | 0.23 | 2.04 | | |
| 33X-2, 100.0–102.0 | 303.50 | 13.1 | 83.7 | 0.0 | 3.2 | 1.27 | 1.88 | | |
| 33X-4, 100.0–102.0 | 306.50 | 5.8 | 88.0 | 0.0 | 6.2 | 0.91 | 1.98 | | |
| 34X-2, 100.0–102.0 | 312.90 | 3.7 | 87.1 | 0.0 | 9.2 | 0.77 | 1.91 | | |

**Table T2 (continued).**

| Core, section, interval (cm) | Depth (mbsf) | Aragonite (wt%) | LMC (wt%) | HMC (wt%) | Dolomite (wt%) | Bulk (‰ PDB) | | Dolomite (‰ PDB) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $\delta^{13}C$ | $\delta^{18}O$ | $\delta^{13}C$ | $\delta^{18}O$ |
| 34X-4, 100.0–102.0 | 315.90 | 3.3 | 87.6 | 0.0 | 9.1 | 0.77 | 2.04 | | |
| 35X-2, 100.0–102.0 | 322.30 | 6.3 | 88.2 | 0.0 | 5.5 | 0.99 | 1.72 | | |
| 35X-4, 100.0–102.0 | 325.30 | 4.9 | 88.1 | 0.0 | 7.0 | 1.10 | 1.81 | | |
| 36X-2, 100.0–102.0 | 331.60 | 5.1 | 90.5 | 0.0 | 4.4 | 1.22 | 1.56 | | |
| 36X-4, 100.0–102.0 | 334.60 | 2.3 | 87.9 | 0.0 | 9.8 | 0.88 | 1.61 | 1.51 | 4.86 |
| 37X-2, 100.0–102.0 | 340.50 | 0.0 | 94.0 | 0.0 | 6.0 | 0.60 | 1.81 | | |
| 37X-4, 100.0–102.0 | 343.50 | 0.0 | 91.6 | 0.0 | 8.4 | 0.71 | 2.01 | | |
| 38X-2, 100.0–102.0 | 349.40 | 0.0 | 86.8 | 0.0 | 13.2 | 1.06 | 1.92 | 1.38 | 4.61 |
| 39X-2, 100.0–102.0 | 358.20 | 0.0 | 93.3 | 0.0 | 6.7 | 0.67 | 1.67 | | |
| 40X-2, 100.0–102.0 | 367.50 | 0.0 | 96.0 | 0.0 | 4.0 | 0.88 | 1.37 | | |
| 40X-4, 100.0–102.0 | 370.48 | 4.2 | 91.3 | 0.0 | 4.5 | 0.86 | 1.36 | | |
| 40X-5, 43.0–45.0 | 371.11 | 0.0 | 96.1 | 0.0 | 3.9 | 1.02 | 1.14 | | |
| 45X-1, 12.0–14.0 | 413.42 | 2.1 | 93.9 | 0.0 | 4.0 | 1.13 | 1.05 | | |
| 45X-CC, 12.0–14.0 | 413.92 | 0.0 | 19.1 | 0.0 | 80.9 | 1.63 | 3.48 | 1.82 | 3.99 |
| 46X-2, 101.0–102.0 | 425.41 | 0.0 | 95.0 | 0.0 | 5.0 | 0.81 | 1.58 | | |
| 46X-6, 101.0–102.0 | 431.41 | 0.0 | 92.2 | 0.0 | 7.8 | 0.87 | 1.85 | | |
| 47X-1, 31.0–34.0 | 432.71 | 8.6 | 90.5 | 0.0 | 0.9 | 1.29 | 0.77 | | |
| 48X-2, 100.0–102.0 | 444.50 | 0.0 | 94.5 | 0.0 | 5.5 | 1.12 | 1.41 | | |
| 182-1129D- | | | | | | | | | |
| 1R-1, 60.0–62.0 | 280.60 | 39.7 | 55.6 | 0.0 | 4.7 | 1.32 | 1.81 | | |
| 4R-1, 30.0–33.0 | 383.10 | 0.0 | 91.9 | 0.0 | 8.1 | 0.85 | 1.56 | | |
| 5R-1, 13.0–15.0 | 392.73 | 0.0 | 90.1 | 0.0 | 9.9 | 0.70 | 1.49 | 1.51 | 4.80 |
| 6R-1, 45.0–47.0 | 402.75 | 1.9 | 87.2 | 0.0 | 10.8 | 1.13 | 1.28 | 1.79 | 4.47 |
| 7R-1, 26.0–28.0 | 412.16 | 0.0 | 70.6 | 0.0 | 29.4 | 1.53 | 2.02 | 1.95 | 4.13 |
| 9R-1, 138.0–140.0 | 432.48 | 34.4 | 63.2 | 0.0 | 2.4 | 1.34 | 1.53 | | |
| 11R-1, 126.0–128.0 | 451.56 | 0.0 | 93.5 | 0.0 | 6.5 | 1.02 | 1.45 | | |
| 12R-1, 30.0–32.0 | 460.20 | 0.0 | 95.5 | 0.0 | 4.5 | 1.23 | 1.05 | | |
| 13R-2, 100.0–102.0 | 472.00 | 0.0 | 89.8 | 0.0 | 10.2 | 0.99 | 1.70 | 1.62 | 4.74 |
| 13R-4, 100.0–102.0 | 475.00 | 0.0 | 96.3 | 0.0 | 3.7 | 0.95 | 1.23 | | |
| 14R-1, 60.0–62.0 | 479.70 | 0.0 | 96.5 | 0.0 | 3.5 | 1.03 | 1.44 | | |
| 15R-1, 43.0–45.0 | 489.13 | 0.0 | 91.7 | 0.0 | 8.3 | 1.21 | 1.44 | | |
| 16R-1, 92.0–94.0 | 499.22 | 0.0 | 87.0 | 0.0 | 13.0 | 1.22 | 1.36 | 1.60 | 4.72 |
| 16R-4, 83.0–85.0 | 503.63 | 0.0 | 93.6 | 0.0 | 6.4 | 1.41 | 1.67 | | |
| 18R-2, 124.0–126.0 | 520.24 | 7.7 | 84.5 | 0.0 | 7.8 | 1.34 | 1.27 | | |
| 19R-2, 102.0–104.0 | 529.62 | 3.4 | 92.0 | 0.0 | 4.6 | 1.58 | 1.21 | | |
| 19R-4, 59.0–61.0 | 532.19 | 0.0 | 90.3 | 0.0 | 9.7 | 1.13 | 1.59 | 1.02 | 4.72 |
| 20R-2, 112.0–114.0 | 539.42 | 0.0 | 97.9 | 0.0 | 2.1 | 1.21 | 1.13 | | |
| 21R-2, 34.0–36.0 | 548.28 | 0.0 | 95.5 | 0.0 | 4.5 | 0.68 | 1.75 | | |
| 22R-1, 101.0–105.0 | 557.11 | 0.0 | 62.3 | 0.0 | 37.7 | 0.44 | 2.82 | -0.20 | 5.32 |

Notes: LMC = low-Mg calcite, HMC = high-Mg calcite. PDB = Peedee belemnite.

**Table T3.** Carbonate mineralogy and stable isotopes, Site 1131. (See table notes. Continued on next page.)

| Core, section, interval (cm) | Depth (mbsf) | Aragonite (wt%) | LMC (wt%) | HMC (wt%) | Dolomite (wt%) | Bulk (‰ PDB) | | Dolomite (‰ PDB) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $\delta^{13}C$ | $\delta^{18}O$ | $\delta^{13}C$ | $\delta^{18}O$ |
| 182-1131A- | | | | | | | | | |
| 1H-2, 100.0–102.0 | 2.50 | 25.0 | 36.7 | 38.3 | 0.0 | 1.08 | 0.84 | | |
| 2H-2, 100.0–102.0 | 5.90 | 22.8 | 19.8 | 57.4 | 0.0 | 2.18 | 2.36 | | |
| 2H-4, 100.0–102.0 | 8.90 | 23.9 | 20.7 | 55.4 | 0.0 | 2.18 | 2.30 | | |
| 3H-2, 100.0–102.0 | 15.40 | 22.8 | 25.5 | 51.8 | 0.0 | 1.99 | 1.99 | | |
| 3H-4, 100.0–102.0 | 18.40 | 27.5 | 23.6 | 48.9 | 0.0 | 1.56 | 1.77 | | |
| 4H-2, 100.0–102.0 | 24.90 | 26.8 | 29.4 | 43.4 | 0.5 | 1.66 | 1.88 | | |
| 4H-4, 100.0–102.0 | 27.90 | 21.4 | 34.5 | 44.1 | 0.0 | 1.27 | 1.47 | | |
| 5H-2, 100.0–102.0 | 34.40 | 22.9 | 48.0 | 28.2 | 0.8 | 1.07 | 1.58 | | |
| 5H-4, 100.0–102.0 | 37.40 | 24.6 | 31.3 | 43.7 | 0.4 | 1.32 | 1.58 | | |
| 6H-2, 100.0–102.0 | 43.90 | 21.2 | 56.6 | 22.2 | 0.0 | 1.05 | 1.52 | | |
| 6H-4, 100.0–102.0 | 46.90 | 29.6 | 29.4 | 40.0 | 1.0 | 0.93 | 1.72 | | |
| 7H-2, 100.0–102.0 | 53.40 | 24.5 | 32.1 | 41.5 | 1.9 | 1.08 | 1.73 | | |
| 7H-4, 100.0–102.0 | 56.40 | 24.4 | 32.5 | 39.2 | 3.8 | 0.88 | 1.77 | | |
| 8X-2, 100.0–102.0 | 62.90 | 23.0 | 51.0 | 23.4 | 2.6 | 1.05 | 1.73 | | |
| 9X-2, 100.0–102.0 | 70.10 | 19.2 | 76.2 | 0.0 | 4.6 | 0.76 | 2.10 | | |
| 10X-2, 100.0–102.0 | 79.10 | 18.7 | 77.6 | 0.0 | 3.7 | 0.92 | 2.17 | | |
| 10X-4, 100.0–102.0 | 82.10 | 17.5 | 78.0 | 0.0 | 4.5 | 0.91 | 2.11 | | |
| 11X-2, 100.0–102.0 | 87.90 | 14.3 | 79.2 | 0.0 | 6.5 | 0.79 | 1.95 | | |
| 11X-4, 100.0–102.0 | 90.90 | 19.5 | 58.7 | 18.7 | 3.1 | 0.99 | 1.62 | | |
| 12X-2, 100.0–102.0 | 97.50 | 23.4 | 70.9 | 0.0 | 5.7 | 0.93 | 2.11 | | |
| 12X-4, 100.0–102.0 | 100.50 | 19.6 | 73.9 | 0.0 | 6.5 | 0.74 | 2.09 | | |
| 13X-2, 100.0–102.0 | 107.10 | 16.3 | 74.7 | 0.0 | 9.0 | 0.77 | 2.18 | | |
| 13X-4, 100.0–102.0 | 110.10 | 18.8 | 74.6 | 0.0 | 6.6 | 0.94 | 2.15 | | |
| 14X-2, 100.0–102.0 | 116.10 | 12.7 | 82.0 | 0.0 | 5.3 | 1.06 | 2.12 | | |
| 14X-4, 100.0–102.0 | 119.10 | 10.6 | 84.3 | 0.0 | 5.1 | 0.98 | 1.90 | | |
| 15X-2, 100.0–102.0 | 125.10 | 8.3 | 84.8 | 0.0 | 6.9 | 0.84 | 2.18 | | |
| 15X-4, 100.0–102.0 | 128.10 | 15.5 | 78.5 | 0.0 | 6.0 | 0.85 | 2.03 | | |
| 16X-2, 100.0–102.0 | 134.40 | 21.1 | 59.8 | 0.0 | 19.2 | 1.25 | 1.80 | 1.06 | 4.70 |
| 16X-4, 100.0–102.0 | 137.40 | 19.9 | 51.3 | 27.2 | 1.7 | 1.47 | 1.88 | | |
| 17X-2, 100.0–102.0 | 143.80 | 14.9 | 78.7 | 0.0 | 6.4 | 0.89 | 2.17 | | |
| 17X-4, 100.0–102.0 | 146.80 | 14.0 | 79.1 | 0.0 | 6.9 | 0.79 | 2.15 | | |
| 18X-2, 100.0–102.0 | 153.10 | 13.2 | 77.4 | 0.0 | 9.4 | 0.91 | 2.16 | | |
| 19X-2, 100.0–102.0 | 162.50 | 17.7 | 75.9 | 0.0 | 6.4 | 1.26 | 1.90 | | |
| 19X-4, 100.0–102.0 | 165.50 | 22.5 | 70.4 | 0.0 | 7.1 | 1.24 | 1.82 | | |
| 20X-2, 100.0–102.0 | 171.80 | 21.6 | 67.5 | 0.0 | 11.0 | 1.43 | 2.08 | 1.41 | 4.83 |
| 20X-4, 100.0–102.0 | 174.80 | 17.1 | 72.1 | 0.0 | 10.8 | 0.92 | 2.05 | 1.01 | 5.20 |
| 21X-2, 100.0–102.0 | 181.10 | 23.0 | 70.6 | 0.0 | 6.5 | 1.41 | 1.95 | | |
| 21X-4, 100.0–102.0 | 184.10 | 10.7 | 77.6 | 0.0 | 11.8 | 0.98 | 2.04 | 1.64 | 4.70 |
| 22X-2, 100.0–102.0 | 190.70 | 17.3 | 74.7 | 0.0 | 8.0 | 0.99 | 1.96 | | |
| 22X-4, 100.0–102.0 | 193.70 | 16.7 | 76.3 | 0.0 | 7.0 | 0.84 | 1.80 | | |
| 23X-2, 100.0–102.0 | 200.10 | 10.9 | 80.5 | 0.0 | 8.6 | 0.76 | 2.11 | | |
| 23X-4, 100.0–102.0 | 203.10 | 10.1 | 79.8 | 0.0 | 10.2 | 0.63 | 2.03 | 1.01 | 4.83 |
| 24X-2, 100.0–102.0 | 209.10 | 21.7 | 75.9 | 0.0 | 2.4 | 1.34 | 1.67 | | |
| 24X-4, 100.0–102.0 | 212.10 | 19.6 | 72.3 | 0.0 | 8.1 | 1.01 | 1.84 | | |
| 25X-2, 100.0–102.0 | 218.10 | 14.6 | 78.5 | 0.0 | 6.9 | 0.84 | 1.93 | | |
| 25X-4, 88.0–90.0 | 220.98 | 14.3 | 78.4 | 0.0 | 7.3 | 0.78 | 1.93 | | |
| 25X-4, 100.0–102.0 | 221.10 | 11.5 | 78.7 | 0.0 | 9.8 | 0.70 | 2.03 | 0.85 | 4.94 |
| 26X-2, 100.0–102.0 | 227.50 | 16.6 | 74.3 | 0.0 | 9.2 | 0.67 | 1.70 | | |
| 26X-4, 100.0–102.0 | 230.50 | 20.9 | 36.7 | 41.2 | 1.2 | 1.26 | 1.69 | | |
| 27X-2, 100.0–102.0 | 237.00 | 13.3 | 77.2 | 0.0 | 9.4 | 0.57 | 1.74 | | |
| 27X-4, 100.0–102.0 | 240.00 | 18.7 | 74.9 | 0.0 | 6.3 | 0.80 | 1.87 | | |
| 28X-2, 100.0–102.0 | 246.00 | 19.2 | 78.4 | 0.0 | 2.3 | 1.02 | 1.85 | | |
| 28X-4, 100.0–102.0 | 249.00 | 7.8 | 84.1 | 0.0 | 8.1 | 0.48 | 2.01 | | |
| 31X-2, 100.0–102.0 | 273.90 | 6.7 | 80.5 | 0.0 | 12.8 | 0.59 | 2.16 | 1.07 | 5.15 |
| 31X-4, 100.0–102.0 | 276.90 | 9.9 | 83.5 | 0.0 | 6.5 | 0.62 | 2.05 | | |
| 32X-2, 100.0–102.0 | 283.40 | 20.1 | 27.8 | 51.8 | 0.4 | 1.57 | 1.89 | | |
| 32X-4, 14.0–16.0 | 285.04 | 15.0 | 80.4 | 0.0 | 4.7 | 0.98 | 1.80 | | |
| 33X-2, 100.0–102.0 | 292.90 | 10.5 | 78.0 | 0.0 | 11.5 | 0.78 | 2.11 | 0.54 | 5.51 |
| 33X-4, 100.0–102.0 | 295.90 | 8.1 | 83.2 | 0.0 | 8.7 | 0.71 | 1.94 | | |
| 34X-2, 100.0–102.0 | 302.40 | 5.2 | 89.0 | 0.0 | 5.8 | 0.72 | 1.90 | | |
| 34X-4, 100.0–102.0 | 305.40 | 4.5 | 87.6 | 0.0 | 7.9 | 0.63 | 2.22 | | |
| 35X-2, 100.0–102.0 | 312.00 | 20.6 | 30.7 | 47.7 | 0.9 | 1.32 | 1.53 | | |
| 36X-2, 99.0–101.0 | 321.59 | 11.3 | 85.9 | 0.0 | 2.9 | 1.22 | 1.62 | | |
| 36X-CC, 24.0–26.0 | 324.61 | 0.0 | 50.3 | 0.0 | 49.7 | 1.20 | 3.18 | 1.92 | 4.44 |
| 37X-2, 100.0–102.0 | 331.20 | 2.8 | 93.0 | 0.0 | 4.2 | 0.92 | 1.66 | | |
| 38X-2, 100.0–102.0 | 340.80 | 0.0 | 90.5 | 0.0 | 9.5 | 0.80 | 2.44 | | |

**Table T3 (continued).**

| Core, section, interval (cm) | Depth (mbsf) | Aragonite (wt%) | LMC (wt%) | HMC (wt%) | Dolomite (wt%) | Bulk (‰ PDB) | | Dolomite (‰ PDB) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $\delta^{13}C$ | $\delta^{18}O$ | $\delta^{13}C$ | $\delta^{18}O$ |
| 38X-4, 100.0–102.0 | 343.80 | 0.0 | 93.5 | 0.0 | 6.5 | 0.71 | 2.39 | | |
| 39X-2, 99.0–101.0 | 350.49 | 25.1 | 56.5 | 15.6 | 2.8 | 1.54 | 1.58 | | |
| 40X-2, 100.0–102.0 | 360.10 | 0.0 | 95.8 | 0.0 | 4.2 | 1.08 | 2.05 | | |
| 41X-2, 100.0–102.0 | 369.70 | 2.3 | 91.7 | 0.0 | 6.0 | 1.36 | 2.06 | | |
| 41X-4, 100.0–102.0 | 372.70 | 3.5 | 85.5 | 0.0 | 11.0 | 1.21 | 2.21 | 1.41 | 5.37 |
| 42X-2, 100.0–102.0 | 379.30 | 16.5 | 81.6 | 0.0 | 1.9 | 1.64 | 1.36 | | |
| 42X-4, 100.0–102.0 | 382.30 | 2.7 | 89.7 | 0.0 | 7.6 | 1.14 | 1.78 | | |
| 43X-2, 100.0–102.0 | 388.90 | 2.3 | 94.1 | 0.0 | 3.6 | 1.29 | 1.85 | | |
| 45X-2, 100.0–102.0 | 408.00 | 5.0 | 81.2 | 0.0 | 13.8 | 1.28 | 1.79 | 1.54 | 4.84 |
| 45X-4, 100.0–102.0 | 411.00 | 5.2 | 89.8 | 0.0 | 5.1 | 1.39 | 1.57 | | |
| 47X-2, 100.0–102.0 | 427.20 | 0.0 | 84.7 | 0.0 | 15.3 | 0.89 | 2.21 | 0.86 | 5.31 |
| 47X-4, 100.0–102.0 | 430.20 | 6.6 | 87.4 | 0.0 | 6.0 | 1.02 | 1.52 | | |
| 48X-2, 100.0–102.0 | 436.80 | 0.0 | 89.2 | 0.0 | 10.8 | 0.49 | 2.06 | 0.35 | 5.45 |
| 49X-2, 100.0–102.0 | 446.50 | 3.1 | 77.2 | 0.0 | 19.7 | 0.85 | 2.38 | 0.79 | 5.28 |
| 49X-4, 100.0–102.0 | 449.50 | 2.2 | 89.8 | 0.0 | 8.0 | 0.66 | 1.86 | | |
| 50X-2, 100.0–102.0 | 456.10 | 4.2 | 90.0 | 0.0 | 5.8 | 1.01 | 1.63 | | |
| 50X-4, 100.0–102.0 | 459.10 | 4.9 | 85.2 | 0.0 | 9.9 | 1.04 | 1.72 | 1.22 | 4.62 |
| 51X-2, 100.0–102.0 | 465.70 | 5.3 | 86.0 | 0.0 | 8.7 | 1.03 | 1.72 | | |
| 53X-2, 101.0–103.0 | 485.01 | 5.4 | 85.4 | 0.0 | 9.1 | 1.06 | 1.90 | | |
| 53X-4, 100.0–102.0 | 488.00 | 0.0 | 96.6 | 0.0 | 3.4 | 0.88 | 1.97 | | |
| 54X-2, 100.0–102.0 | 494.60 | 7.4 | 86.3 | 0.0 | 6.3 | 1.27 | 1.68 | | |
| 54X-4, 100.0–102.0 | 497.60 | 0.0 | 96.2 | 0.0 | 3.8 | 0.85 | 2.04 | | |
| 55X-2, 100.0–102.0 | 504.20 | 4.3 | 92.3 | 0.0 | 3.4 | 0.98 | 1.89 | | |
| 56X-CC, 5.0–7.0 | 512.27 | 4.1 | 94.9 | 0.0 | 1.0 | 1.00 | 1.81 | | |
| 58X-1, 113.0–115.0 | 531.73 | 8.3 | 90.4 | 0.0 | 1.3 | 1.16 | 2.02 | | |

Notes: LMC = low-Mg calcite, HMC = high-Mg calcite. PDB = Peedee belemnite.