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14. *DATA REPORT:* GEOCHEMISTRY AND MINERALOGY OF PERIPLATFORM CARBONATE SEDIMENTS: SITES 1006, 1008, AND 1009[1]

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ABSTRACT

An intensive mineralogic and geochemical investigation was conducted on sediments recovered during Ocean Drilling Program Leg 166 from the western Great Bahama Bank at Sites 1006, 1008, and 1009. Pleistocene through middle Miocene sediments recovered from Site 1006, the distal location on the Leg 166 transect, are a mixture of bank-derived and pelagic carbonates with lesser and varying amounts of siliciclastic clays. A thick sequence of Pleistocene periplatform carbonates was recovered near the platform edge at Sites 1008 and 1009. Detailed bulk mineralogic, elemental (Ca, Mg, Sr, and Na), and stable isotopic ($\delta^{18}O$ and $\delta^{13}C$) analyses of sediments are presented from a total of 317 samples from all three sites.

INTRODUCTION

Sites 1006, 1008, and 1009 are located on the western slope of the Great Bahama Bank (Fig. 1). Site 1006 (24°23.989′N, 79°27.451′W), the most distal site in the Bahamas Transect, is situated ~30 km from the platform edge in 658 m of water (Eberli, Swart, Malone, et al., 1997). A 717.3-m-thick Pleistocene to middle Miocene sequence of mixed pelagic and bank-derived carbonates with varying and lesser amounts of siliciclastic, clay-sized material was recovered.

Sites 1008 and 1009 are located ~100 km to the south of the main Bahamas Transect (Fig. 1). Site 1009 (23°36.84′N, 79°3.00′W) is positioned ~4.5 km from the platform edge in 308 m of water. Site 1008 (23°36.64′N, 70°5.01′W) is located 2.7 km more basinward than Site 1009 in 437 m of water. Thick, expanded Pleistocene sequences of periplatform sediments were recovered at both sites. Based on shipboard biostratigraphy, the age at the base of the section at Site 1009 [226.1 meters below seafloor (mbsf)] is ~1.44 Ma, and a similar age is observed at the bottom of the recovered sequence (134.5 mbsf) at Site 1008 (e.g., Eberli, Swart, Malone, et al., 1997).

Periplatform sediments are important components of both modern and ancient carbonate depositional systems (McIlreath and James, 1978; Cook and Mullins, 1983; Enos and Moore, 1983). However, relative to deep-sea oozes and neritic (platform) carbonates, we know much less about the diagenesis of periplatform sediments. In this report, I document the detailed mineralogic and geochemical analyses of sediments from these three sites. Discussion and interpretation of these results will be presented in a future publication.

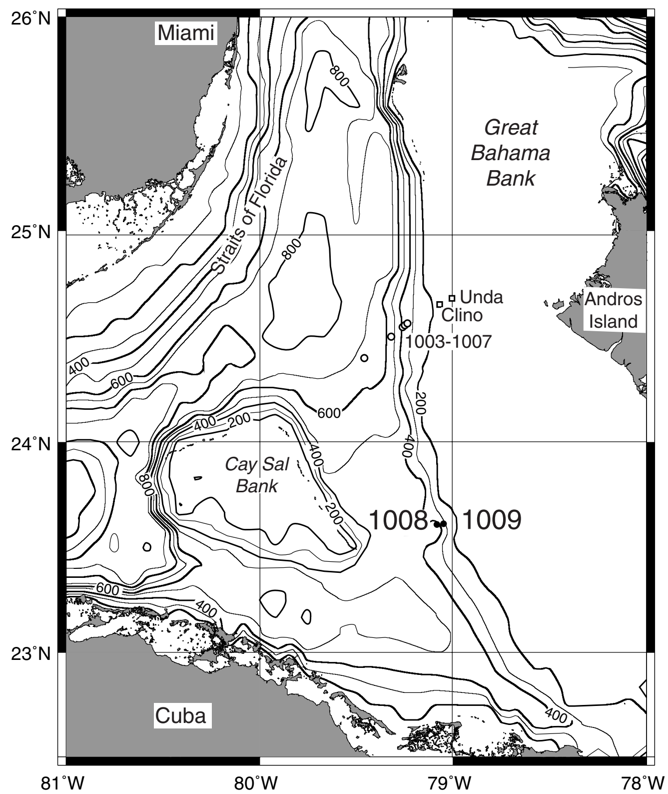

Figure 1. Location of sites drilled during Leg 166. Sites utilized in this report are highlighted in larger, bold type; bathymetry is shown in meters.

METHODS

Sediment samples were analyzed at a frequency of ~1.5 m from Sites 1008 and 1009 and ~10 m from Site 1006. At all three sites, selected lithified horizons were also sampled and analyzed. Before analyses, each sample was examined and classified for the relative degree of lithification. Because the sediments in the present study are not deep-sea oozes, and to be consistent with shipboard descriptions (Eberli, Swart, Malone, et al., 1997), the nongenetic descriptors—unlithified, partially lithified, and lithified—are used rather than ooze, chalk, and limestone. All 317 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 approximately 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 20°–80° 2θ, collecting data every 0.03° 2θ at 2 s/step. Quantitative proportions of aragonite, high-Mg calcite (HMC), low-Mg calcite (LMC), and dolomite (normalized to 100% carbon-

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ate) were determined by Rietveld refinement of XRD patterns (Rietveld, 1969; Post and Bish, 1989; Bish and Post, 1993). Reported accuracy of the method for carbonate minerals is better than ±3% (Bish and Post, 1993; Reid et al., 1992). Replicate analyses indicate that the precision is better than 1% when the phase is present in quantities >~40 wt%. Precision subsequently decreases with decreasing weight percent. In addition to the chemical analyses described below, Mg content of HMC and dolomite was determined from the $d_{\{10.4\}}$ shift using the idealized curve of Goldsmith and Graf (1958) after correcting for specimen displacement by Rietveld refinement. Precision determined from replicates is ± 0.3 mol% Mg.

Each sample was analyzed for stable oxygen and carbon isotopic ratios. Approximately 120 mg of powdered sample was reacted in "100%" phosphoric acid at 70°C in an online, 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 $\delta^{13}C$ (N = 34).

For major and minor elemental compositions, ~50 mg of each sample was leached for 30 min in 25 ml of 1M acetic acid buffered with 1M ammonium acetate (pH of ~5). The buffered acetic acid was chosen to minimize contamination from noncarbonate phases. The leachate was centrifuged, decanted, and stored in HDPE bottles for analyses. After appropriate dilution, the solutions were analyzed for Ca, Mg, Sr, and Na by flame atomic absorption spectroscopy using a Perkin-Elmer Model 603 spectrophotometer. Standardization was achieved with SPEX plasma grade standards, coupled with the following internal check standards: reagent grade calcium carbonate, NBS-1C, and two previously well-characterized periplatform carbonate sediment samples from the Maldives (Malone et al., 1990; Malone, unpubl. data). Replicate analyses of samples yielded the following mean relative error for the entire procedure: <1% for mol% $CaCO_3$, 3% for mol% $MgCO_3$, 3% for Na, and 2% for Sr.

RESULTS

Bulk mineralogic and geochemical data have been compiled for Sites 1006, 1008, and 1009 in Tables 1, 2, and 3, respectively. In addition to the data, the ODP sample identifier, depth (in mbsf), and degree of lithification (as defined above) of each sample analyzed are also tabulated. In Tables 2 and 3, the shipboard lithologic classification (Eberli, Swart, Malone, et al., 1997) of each sample is listed. Data are depicted graphically vs. depth in Figures 2 through 5.

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Table 1. Mineralogic, elemental, and stable isotopic composition of bulk carbonate sediments, Site 1006.

Core, section, interval (cm)	Depth (mbsf)	Degree of lithification	Aragonite (wt%)	LMC (wt%)	HMC (wt%)	Dolomite (wt%)	mol% Mg HMC (XRD)	mol% Mg Dolomite (XRD)	$CaCO_3$ (mol%)	$MgCO_3$ (mol%)	Mg (ppm)	Sr (ppm)	Na (ppm)	$\delta^{13}C$ PDB	$\delta^{18}O$ PDB
166-1006A-															
1H-3, 25-27	3.25		45.8	30.9	23.3		11.2		94.47	3.7	9,079	5733	2646	2.48	–0.24
1H-5, 88-90	6.88		35.4	21.1	43.5		12.0		92.29	6.2	15,124	5003	2207	2.95	1.12
2H-1, 17-19	7.27	PL	13.7	27.2	59.1		12.2		89.69	9.3	22,977	2296	1653	2.61	2.52
2H-3, 25-27	10.35		51.0	18.8	30.2		12.4		93.33	4.9	11,865	6747	2368	3.93	–0.14
2H-5, 68-70	13.78		6.4	93.6					96.61	2.4	5,888	2336	1622	1.63	1.88
3H-3, 25-27	19.85		17.8	82.2					96.41	1.9	4,574	3377	3031	1.37	0.75
4H-3, 25-27	29.35		18.2	81.8					96.31	2.3	5,660	4252	2009	2.26	1.30
4H-5, 13-15	32.23	PL	11.2	88.8					96.88	2.2	5,308	2614	1482	1.62	1.98
5H-3, 25-27	38.85		55.7	44.3					95.31	2.1	5,099	8321	3739	3.76	0.87
6H-3, 25-27	48.35		34.2	65.8					96.31	2.1	5,047	5417	2281	2.07	0.80
7H-3, 25-27	57.85		54.4	45.6					96.34	1.7	4,081	7895	2456	2.99	0.32
8H-1, 135-137	65.45	PL	28.0	72.0					96.48	2.2	5,266	5048	1778	2.52	1.41
8H-3, 25-27	67.35		50.0	50.0					96.55	1.7	4,021	7821	2045	3.18	0.62
9H-2, 94-96	76.04	PL	20.0	80.0					96.96	2.0	4,792	4020	1398	2.15	1.43
9H-3, 25-27	76.85		54.3	43.7		2.0		42.5	95.38	2.5	6,140	8357	2590	3.56	0.81
10H-1, 15-16	83.25	PL	19.2	80.8					96.99	1.9	4,733	4260	1323	2.37	1.56
10H-3, 25-27	86.35		7.0	92.6		0.4		42.9	97.49	1.7	4,133	3130	1032	1.91	1.41
11H-1, 142-144	94.02	PL	5.7	94.1		0.2			97.59	1.6	3,872	2587	1202	2.17	1.73
11H-3, 25-27	95.85		24.6	75.0		0.4			96.20	2.3	5,699	4732	2105	2.04	1.12
12H-1, 78-80	102.88	PL	14.2	84.4		1.4		41.5	96.30	2.8	6,761	3778	1121	2.54	1.93
12H-3, 25-27	105.35		39.3	56.8		3.9		41.4	94.78	3.7	8,970	6271	1891	2.70	1.17
12H-4, 7-9	106.67	PL	20.3	77.5		2.2		42.1	96.25	2.7	6,509	4245	1354	2.10	1.63
13H-1, 131-133	112.91	PL	24.2	73.8		2.0		42.7	96.71	2.0	4,954	4987	1555	2.10	1.34
13H-3, 25-27	114.85		36.0	61.2		2.8		42.1	95.89	2.5	6,114	5982	2086	2.53	0.99
13H-4, 94-96	117.04	PL	20.8	78.3		0.9			96.68	2.2	5,260	4620	1442	2.04	1.35
14H-3, 25-27	124.35		37.3	61.9		0.8			96.11	2.3	5,554	6148	2073	2.31	0.65
14H-4, 72-74	126.32		10.4	88.9		0.7			97.07	2.0	4,932	3267	1225	1.51	1.54
15H-2, 130-132	133.4	PL	14.7	83.6		1.7		42.1	96.78	2.1	5,214	3847	1470	1.95	1.33
15H-3, 25-27	133.85		27.9	70.4		1.7		42.6	96.52	1.9	4,650	5425	2170	2.36	0.67
16H-2, 76-78	142.36	PL	21.1	75.3		3.6		43.0	96.71	2.2	5,288	4333	1432	2.11	0.82
16H-3, 25-27	143.35		51.3	48.3		0.4			96.64	1.5	3,724	9083	1795	3.61	0.73
17H-3, 25-27	152.85		20.7	79.3					97.18	1.6	3,820	4505	1683	1.33	0.28
18H-3, 25-27	162.35		29.1	67.9		3.0		41.9	96.07	2.5	6,160	5540	1753	2.01	0.87
19H-3, 25-27	171.85		24.3	74.1		1.6		42.1	96.45	2.3	5,640	4993	1515	1.96	0.93
20H-3, 25-27	181.35		36.1	61.4		2.5		42.5	96.28	2.1	5,171	6409	1966	2.70	0.49
20H-4, 116-118	183.76	PL	8.6	89.5		1.9		42.2	96.92	2.3	5,505	3565	945	1.96	1.55
21H-3, 25-27	190.85		31.5	67.6		0.9			96.83	1.6	3,869	5854	2075	1.66	–0.12
22H-3, 25-27	200.35		25.9	72.7		1.4		42.1	96.63	2.1	4,982	5146	1673	2.02	0.77
23H-3, 25-27	209.85		15.5	83.5		1.0		42.9	96.97	2.0	4,872	4125	1271	1.71	0.81
24H-3, 25-27	219.35		28.3	71.2		0.5			96.80	1.8	4,320	5280	1876	1.59	0.37
25H-3, 25-27	228.85		23.4	75.5		1.1		43.6	96.99	1.6	3,926	4675	1977	1.30	0.19
26H-3, 25-27	238.35		14.4	83.6		2.0		43.9	97.09	1.6	3,984	3955	1878	1.36	0.50
27H-3, 25-27	247.85	PL	13.2	84.1		2.7		43.7	97.14	1.8	4,298	4006	1452	1.22	0.76
28H-2, 25-27	255.85		12.2	85.5		2.3		42.7	96.95	1.6	3,782	4044	2357	1.28	0.31
29H-2, 25-27	265.35		14.3	82.7		3.0		42.6	96.95	1.9	4,717	3911	1526	1.14	0.70
30X-1, 43-45	273.53	PL	7.8	88.6		3.6		43.3	97.13	1.8	4,395	3639	1492	0.65	–0.04
30X-2, 25-27	274.85		15.3	81.3		3.4		42.4	97.19	1.5	3,688	4372	1805	1.01	0.02
30X-4, 115-117	278.75	PL	9.0	89.0		2.0		43.6	97.31	1.6	3,862	3638	1581	0.75	–0.18
31X-2, 25-27	280.65		11.4	85.5		3.1		42.8	97.26	1.6	3,779	3911	1684	0.81	–0.28
31X-3, 58-60	282.48		18.0	79.2		2.8		41.9	97.02	1.7	4,166	4525	1722	0.89	–0.02
32X-2, 25-27	286.45		13.5	85.0		1.5		42.1	97.47	1.3	3,227	4065	1685	0.97	0.29
33X-2, 25-27	295.65	PL	8.0	92.0					97.71	1.4	3,296	3326	1270	0.96	0.60
33X-4, 112-115	299.52	PL	7.4	92.6					97.94	1.2	2,924	3290	1112	1.07	0.43
34X-2, 25-27	304.85	PL	8.2	90.1		1.7		43.2	97.64	1.3	3,265	3510	1411	0.94	0.28
34X-3, 130-132	307.4	PL	8.7	90.7		0.6			97.31	1.3	3,200	4052	2094	0.38	–0.45
34X-6, 55-57	311.15	PL	10.0	87.7		2.3		42.6	97.55	1.5	3,579	3539	1315	0.27	–0.43
35X-2, 22-24	314.12		6.7	89.9		3.4		43.0	97.17	1.7	4,169	3372	1668	1.10	0.40
35X-5, 50-52	318.9	LITH	5.4	92.0		2.6		43.1	97.49	1.6	3,866	3133	1297	1.16	0.56
36X-2, 25-27	323.25	PL	12.4	86.3		1.3		43.4	96.88	2.1	5,018	3584	1491	1.47	1.26
37X-2, 25-27	332.35		2.5	96.5		1.0		42.4	97.75	1.4	3,321	2675	1326	0.89	1.02
37X-2, 25-27	333.85	PL	2.4	96.4		1.2		44.3	97.90	1.2	3,010	2705	1262	0.75	0.88
38X-2, 25-27	341.55	PL	12.8	85.8		1.4		43.1	97.72	1.1	2,772	3968	1562	0.84	0.07
39X-2, 25-27	350.65	PL	9.7	86.9		3.4		42.9	97.70	1.3	3,045	3643	1453	0.69	–0.10
40X-2, 25-27	359.85		7.4	90.2		2.4		43.3	97.27	1.5	3,557	3252	2055	0.91	0.42
41X-2, 25-27	369.05	PL	5.7	92.0		2.3		42.9	97.70	1.4	3,509	2961	1183	0.82	0.78
42X-2, 25-27	378.15	PL	6.6	89.8		3.6		42.6	97.45	1.7	4,149	3289	1081	0.51	0.33
43X-CC, 25-27	386.35	PL	13.6	82.8		3.6		42.4	97.47	1.4	3,380	3913	1583	0.87	–0.21
44X-2, 25-27	396.45	PL	14.6	82.9		2.5		42.4	97.61	1.2	2,998	3817	1658	1.15	–0.40
45X-2, 25-27	405.75	PL	14.6	82.1		3.3		42.0	97.02	1.8	4,277	3968	1765	1.14	0.08
46X-2, 25-27	415.15	PL	28.5	69.7		1.8		41.5	96.81	1.4	3,484	5372	2615	1.81	–0.77
47X-2, 25-27	424.55	PL	10.8	87.0		2.2		42.0	97.26	1.8	4,254	3549	1347	1.59	0.35
48X-2, 25-27	433.75	PL	17.8	81.5		0.7			97.33	1.5	3,621	4285	1575	1.93	0.36
48X-5, 115-117	439.15	PL	20.7	79.3					97.41	1.3	3,075	4703	1793	1.65	0.03
49X-2, 25-27	442.75	PL	16.3	83.1		0.6			97.63	1.2	2,880	4462	1537	1.48	0.16
49X-2, 110-111	443.6	LITH	17.6	82.4					97.06	1.3	3,097	5358	2406	1.47	0.23
50X-2, 25-27	451.8	PL	27.3	71.9		0.8			97.45	1.1	2,780	5846	1770	1.80	–0.47
50X-5, 134-136	457.44	LITH	12.8	86.3		0.9			97.79	1.3	3,218	4175	945	1.79	–0.43
51X-2, 25-27	461.05	PL	37.0	62.3		0.7			97.06	1.2	3,020	6613	2136	1.75	–0.66
51X-5, 19-22	465.49	LITH	12.1	87.9					97.62	1.4	3,518	4065	1078	1.74	0.39
51X-5, 116-119	466.46	LITH	21.8	77.8		0.4			97.44	1.3	3,091	5198	1584	1.80	–0.15
52X-2, 25-27	470.45	PL	33.6	65.7		0.7			97.27	1.2	2,837	5967	2005	1.53	–0.74
52X-6, 20-22	476.4	LITH	10.6	88.8		0.6			97.65	1.3	3,273	3976	1249	1.43	0.40
53X-1, 32-34	478.42	LITH	7.8	92.2					97.84	1.3	3,122	3844	1001	1.44	0.29
53X-2, 25-27	479.85	PL	26.7	72.5		0.8			97.40	1.2	2,984	5203	1768	1.36	–0.55
54X-2, 9-11	488.79	PL	15.8	83.7		0.5			97.53	1.3	3,259	4718	1353	1.75	0.28
54X-5, 120-122	494.4	PL	40.0	59.5		0.5			96.80	1.1	2,734	8084	2624	1.07	–1.05
55X-2, 20-22	498	PL	30.8	68.4		0.8			97.11	1.3	3,110	6115	2074	1.76	–0.30

Table 1 (continued).

Core, section, interval (cm)	Depth (mbsf)	Degree of lithification	Aragonite (wt%)	LMC (wt%)	HMC (wt%)	Dolomite (wt%)	mol% Mg HMC (XRD)	mol% Mg Dolomite (XRD)	$CaCO_3$ (mol%)	$MgCO_3$ (mol%)	Mg (ppm)	Sr (ppm)	Na (ppm)	$\delta^{13}C$ PDB	$\delta^{18}O$ PDB
55X-4, 24-26	501.04	PL	29.8	69.1		1.1		42.8	97.12	1.3	3,216	6060	1964	1.59	–0.51
56X-2, 25-27	507.15	PL	17.5	81.6		0.9			97.33	1.5	3,736	4504	1404	1.91	0.43
56X-4, 61-63	510.51	LITH	41.4	57.9		0.7			96.91	1.2	2,874	7105	2490	1.78	–0.88
56X-6, 94-97	513.84	LITH	11.6	87.2		1.2		42.9	97.14	1.7	4,193	4341	1458	1.69	0.58
57X-1, 140-142	516.4	PL	53.2	46.8					96.65	1.2	2,931	8097	2767	1.92	–0.78
57X-2, 25-27	516.75	PL	27.6	71.3		1.1		42.5	96.73	1.8	4,456	5281	1907	1.80	0.25
58X-2, 25-27	526.45	PL	27.4	71.4		1.2		42.9	97.21	1.3	3,087	6049	1881	1.67	–0.56
59X-2, 114-116	536.94	PL	31.6	66.9		1.5		41.9	96.95	1.5	3,574	6108	2001	1.78	–0.33
60X-2, 25-27	545.65	PL	27.6	71.8		0.6			97.15	1.2	2,954	5984	2180	1.38	–0.54
60X-3, 16-18	547.06	PL	20.4	79.2		0.4			97.48	1.2	2,853	5377	1669	1.37	–0.12
61X-2, 25-27	555.25	LITH	21.4	77.7		0.9			97.39	1.3	3,036	5667	1627	1.27	–0.72
61X-5, 98-100	560.48	LITH	7.6	91.3		1.1		42.9	97.58	1.4	3,505	4223	1131	1.18	0.07
62X-2, 25-27	564.95	LITH	24.8	74.2		1.0		42.8	96.91	1.4	3,461	5819	2280	1.17	–0.67
62X-2, 63-65	565.33	PL	11.4	87.2		1.4		42.7	97.66	1.2	3,006	4036	1458	0.87	–0.41
63X-2, 25-27	574.55	PL		99.1		0.9			97.70	1.6	3,936	3321	687	1.42	0.39
63X-5, 54-56	579.34	LITH	14.8	85.2					95.99	1.0	2,401	5367	5515	1.06	–0.61
63X-5, 61-63	579.41	PL	14.8	85.2					97.52	0.9	2,141	4537	2470	1.21	–0.59
64X-2, 25-27	584.15	PL	9.1	90.3		0.6			97.35	1.6	3,998	3835	1305	1.49	0.63
64X-CC, 30-32	589.88	LITH	2.5	97.5					98.04	1.2	2,811	3630	879	1.26	0.43
65X-4, 103-105	597.63	PL	4.2	95.3		0.5			97.40	1.2	3,000	3025	2332	1.34	0.39
65X-6, 26-28	599.86	PL	26.1	73.9					96.64	1.0	2,353	5713	3984	0.83	–1.01
68X-2, 25-27	622.75	PL	26.0	71.0		3.0		42.9	96.49	1.7	4,175	5194	2737	1.66	–0.36
77X-3, 62-64	711.3	PL	4.5	94.6		0.9			97.72	1.0	2,348	3231	2173	1.54	–0.86
77X-4, 4-6	712.24	PL		100.0					97.94	0.8	1,843	2983	2204	1.64	–0.50

Notes: LMC = low-Mg calcite, HMC = high-Mg calcite, XRD = X-ray diffraction, PDB = Peedee belemnite standard. Degree of lithification column abbreviations: PL = partially lithified, LITH = lithified, unmarked areas = unlithified. See text for method of lithification classification.

This table also appears on the volume CD-ROM.

Table 2. Mineralogic, elemental, and stable isotopic composition of bulk carbonate sediments, Site 1008.

Core, section, interval (cm)	Depth (mbsf)	Shipboard lithology	Degree of lithification	Aragonite (wt%)	HMC (wt%)	LMC (wt%)	Dolomite (wt%)	mol% Mg HMC (XRD)	mol% Mg Dolomite (XRD)	$CaCO_3$ (mol%)	$MgCO_3$ (mol%)	Mg (ppm)	Na (ppm)	Sr (ppm)	$\delta^{13}C$ PDB	$\delta^{18}O$ PDB
166-1008A-																
1H-1, 26-28	0.26	ul pel foram wack		62.6	27.7	9.8	0	11.6		93.13	4.5	10,999	3320	7,990	3.90	–0.35
1H-2, 29-31	1.79	ul pel foram wack		68.2	24.2	7.6	0	12.5		93.71	3.6	8,761	3719	9,281	4.16	–0.25
1H-3, 29-31	3.29	ul pel foram wack		80.4	13.3	6.3	0	12.4		93.67	2.8	6,848	4713	12,560	4.51	–0.26
1H-4, 29-31	4.79	ul mud-wack		88.8	7.2	4.0	0	11.5		94.59	1.5	3,651	6027	10,949	4.88	–0.24
1H-5, 43-45	6.43	pl floatstone	LITH	6.9	83.5	9.6	0	12.7		86.88	12.2	30,116	1718	1,828	2.98	2.86
2H-1, 29-31	6.89	pl floatsone w/nodules	PL	19.1	64.0	16.9	0	12.6		89.77	9.0	22,131	2094	2,924	3.21	2.12
2H-2, 29-31	8.39	ul pel wackestone		84.1	10.0	5.9	0	11.5		95.16	1.7	4,021	4695	9,854	4.34	–0.18
2H-3, 29-31	9.89	ul mud-wackestone		77.8	15.5	6.7	0	12.4		94.51	2.8	6,679	3975	8,750	4.32	–0.02
2H-3, 98-101	10.58	pl packstone w/hard layers	LITH	3.9	87.7	8.4	0	13.1		87.33	11.5	28,304	2375	1,667	3.52	3.62
2H-4, 29-31	11.39	pl floatstone w/hard layers	PL	4.3	73.9	21.8	0	12.5		86.40	12.5	30,851	2119	1,952	3.08	3.27
2H-5, 29-31	12.89	ul foram pel wackestone		52.4	33.6	14.0	0	11.9		92.16	5.3	12,849	4191	6,580	3.89	0.44
2H-6, 29-31	14.39	ul foram wackestone		69.3	17.9	12.8	0	12.0		94.39	3.1	7,636	3348	8,806	4.26	0.29
2H-7, 29-31	15.89	ul pel wackestone		66.7	19.6	13.7	0	11.8		94.24	3.2	7,833	3548	8,642	4.27	0.22
3H-1, 29-31	16.39	ul foram wackestone		74.1	12.7	13.2	0	12.1		95.07	2.6	6,292	2819	9,639	4.37	0.34
3H-2, 29-31	17.89	ul pteropod for wack-pack		62.1	23.8	14.1	0	12.2		93.01	4.1	9,999	4401	8,390	3.95	0.28
3H-3, 29-31	19.39	ul foram, pel wackestone		82.3	7.9	9.8	0	12.0		95.60	1.6	3,878	3862	9,640	4.42	0.14
3H-3, 119-121	20.29	pl bio pack-wack	PL	12.3	59.2	28.5	0	12.3		97.58	1.4	3,308	1866	2,142	2.48	2.27
3H-4, 29-31	20.89	ul bio pack-wack		51.7	26.9	21.4	0	11.9		93.99	4.4	10,668	2193	5,981	3.56	0.70
3H-5, 29-31	22.39	ul for wack w/nannos		51.4	29.4	19.2	0	11.8		93.63	4.6	11,199	2500	6,074	3.22	–0.08
3H-6, 29-31	23.89	ul foram wack		67.5	21.3	11.2	0	12.3		94.29	3.2	7,745	3357	9,265	3.77	–0.39
3H-7, 29-31	25.39	ul pel wack		71.6	14.4	14.0	0	11.5		95.15	2.6	6,329	2834	8,795	3.65	–0.19
4H-1, 29-31	25.89	ul pel wack		78.3	8.9	12.8	0	11.7		95.95	1.8	4,237	2901	9,005	4.03	0.07
4H-1, 138-140	26.98	nodule w/black grains	PL	23.8	25.0	51.2	0	12.1		93.86	5.1	12,338	1681	3,147	2.06	1.36
4H-2, 29-31	27.39	nanno ooze w/forams		43.4	31.6	25.0	0	12.2		92.74	5.4	13,155	2607	6,472	3.42	0.50
4H-3, 29-31	28.89	nanno ooze		43.0	36.5	20.5	0	11.9		92.36	5.9	14,370	2559	5,701	3.70	–0.14
4H-4, 29-31	30.39	nanno ooze		48.7	32.8	18.5	0	12.5		92.48	5.7	13,896	2620	6,067	3.73	–0.16
4H-5, 29-31	31.89	nanno ooze		51.8	32.6	15.6	0	12.7		92.90	5.2	12,707	2649	6,489	3.68	–0.10
4H-6, 29-31	33.39	nanno ooze		64.2	19.5	16.3	0	12.0		94.57	3.4	8,136	2612	8,216	4.03	0.01
4H-7, 29-31	34.89	nanno ooze		79.2	9.7	11.1	0	12.0		95.39	2.1	5,125	3011	10,317	4.40	–0.14
5H-1, 29-31	35.39	ul pel wack		83.7	7.3	9.0	0	12.0		96.01	1.5	3,671	2950	10,278	4.60	0.33
5H-2, 29-31	36.89	ul pel wack		80.2	9.7	10.1	0	11.9		95.75	2.0	4,780	2710	9,551	4.68	0.33
5H-3, 29-31	38.39	nanno ooze w/nodules	PL	24.6	50.5	24.9	0	12.4		91.47	7.4	18,160	1794	3,060	2.87	2.03
6H-1, 29-31	40.49	ul foram wack		37.7	23.9	38.4	0	12.4		93.89	4.8	11,640	1910	4,457	2.87	1.06
6H-2, 29-31	41.99	ul pel wack		9.6	54.6	35.8	0	12.6		90.72	8.5	20,907	1291	1,901	2.59	2.52
6H-2, 74-76	42.44	ul pel wack	PL	9.7	57.9	32.4	0	12.5		89.45	9.6	23,549	1722	2,158	3.07	2.75
6H-3, 29-31	43.49	ul pel mud-wack		74.6	9.8	15.6	0	11.7		95.25	2.1	5,199	3538	9,232	4.65	0.78
6H-4, 29-31	44.99	ul-pl pel wack		57.3	17.3	25.4	0	12.8		94.20	4.0	9,703	2287	7,133	4.11	1.09
6H-5, 29-31	46.49	ul pel wack		68.5	8.0	23.5	0	12.2		95.83	2.2	5,438	2305	8,104	4.52	0.69
6H-6, 29-31	47.99	ul pel wack		83.7	4.0	12.3	0	12.7		96.49	1.3	3,168	2411	9,981	4.88	0.33
6H-7, 29-31	49.49	ul pel wack-mud		77.2	3.6	19.2	0	11.9		95.82	1.7	4,130	2986	10,208	4.74	0.16
7H-1, 29-31	49.99	ul pel wack-mud		77.5	5.0	17.5	0	13.0		95.93	1.7	4,152	2847	9,673	4.72	0.19
7H-2, 29-31	51.49	ul pel wack-mud		80.6	6.6	12.8	0	11.0		94.99	2.2	5,376	3174	12,240	5.05	0.13
7H-3, 29-31	52.99	ul pel wack		77.1	4.7	17.8	0.5	11.7		95.80	1.8	4,446	2861	9,740	4.63	0.25
7H-4, 29-31	54.49	ul pel mud-wack		81.0	6.1	12.6	0.3	12.4		95.71	1.9	4,693	2965	9,226	4.63	0.17

Table 2 (continued).

Core, section, interval (cm)	Depth (mbsf)	Shipboard lithology	Degree of lithification	Aragonite (wt%)	HMC (wt%)	LMC (wt%)	Dolomite (wt%)	mol% Mg HMC (XRD)	mol% Mg Dolomite (XRD)	$CaCO_3$ (mol%)	$MgCO_3$ (mol%)	Mg (ppm)	Na (ppm)	Sr (ppm)	$\delta^{13}C$ PDB	$\delta^{18}O$ PDB
7H-5, 29-31	55.99	ul pel mud-wack		77.7	4.6	17.1	0.6	12.4		95.59	2.0	4,910	3079	9,048	4.59	0.30
7H-5, 112-114	56.82	nanno ooze w/forams	PL	15.0	12.5	72.5	0	11.1		94.98	4.0	9,806	1655	2,524	1.82	1.43
7H-6, 6-8	57.26	nanno w/forams, nodules	LITH	15.8	25.7	58.5	0	11.7		93.18	5.9	14,476	1432	2,512	2.26	1.53
7H-6, 29-31	57.49	nanno w/forams		23.3	21.4	55.3	0	11.3		94.27	4.6	11,306	1668	3,291	2.43	1.17
7H-7, 22-24	58.92	ul pel wack-mud		59.6	5.8	33.1	1.5	11.8	40.5	94.63	3.1	7,606	3160	7,521	4.29	0.86
8H-1, 29-31	59.49	ul pel mud-wack		62.9	5.2	30.7	1.2	10.7	41.4	95.35	2.8	6,687	2383	7,481	4.19	0.49
8H-2, 29-31	60.99	ul pel wack		54.7	10.0	33.7	1.6	5.7	41	95.30	3.0	7,196	2273	6,551	3.80	0.57
8H-2, 137-139	62.07	nodule	LITH	24.5	26.9	46.6	2	11.3	41.7	92.28	6.8	16,538	1257	3,703	3.20	1.76
8H-3, 29-31	62.49	ul-pl floatstone		36.7	20.0	41.6	1.7	11.9	40.7	93.35	5.2	12,719	2060	4,850	3.63	1.13
8H-4, 29-31	63.99	ul pel wack	PL	40.9	23.9	35.2	0	11.6		93.50	4.8	11,659	2608	5,197	3.57	0.60
8H-5, 29-31	65.49	ul pel wack-pack		69.8	10.4	19.1	0.7	12.4	43.9	95.20	3.0	7,236	1981	8,393	4.62	0.78
8H-5, 121-123	66.41	foram wack	LITH	16.9	56.8	26.3	0	13.0		88.80	10.3	25,252	1464	2,828	3.47	2.68
8H-6, 29-31	66.99	ul pel wack		37.8	17.2	45.0	0	11.2		93.68	4.4	10,651	2824	6,292	3.53	1.01
8H-7, 29-31	68.26	ul pel wack		37.4	25.4	37.2	0	11.5		93.40	5.0	12,262	2339	4,969	3.64	0.97
8H-CC, 29-31	68.88	ul pel wack		41.4	24.0	34.8	0	11.6		93.39	5.0	12,192	2320	5,303	3.54	0.66
9H-1, 29-31	68.99	ul pel wack-biowack		63.6	14.5	19.4	2.5	12.2	40.6	93.34	4.6	11,123	2668	8,159	4.13	0.93
9H-2, 29-31	70.49	ul pel wack		43.6	23.4	33.0	0	11.5		93.39	4.8	11,678	2736	5,519	3.66	0.78
9H-3, 29-31	71.99	ul pel mud-wack		36.1	21.4	42.5	0	11.8		93.71	4.9	11,864	1986	4,998	3.54	0.84
9H-4, 29-31	73.42	ul pel mud-wack		55.1	15.3	28.9	0.7	11.8	40.9	90.85	7.5	18,254	2083	6,968	3.96	0.52
9H-5, 29-31	74.99	ul pel mud-wack		60.7	10.7	28.6	0	11.5		95.25	3.0	7,242	2045	7,680	3.81	0.51
9H-6, 29-31	76.49	ul pel mud-wack		65.6	9.2	23.6	1.6	11.7	40.4	95.01	3.2	7,739	1892	8,580	4.51	0.93
9H-6, 123-125	77.43	lithoclast wack	LITH	5.7	65.1	29.2	0	12.9		88.04	11.2	27,619	1353	1,713	3.33	2.89
10H-1, 25-27	78.45	ul bio-floatstone		31.9	18.0	50.1	0	11.7		94.18	4.6	11,279	1568	4,520	3.28	1.26
11X-1, 28-30	78.98	ul litho float (debris flow)		37.4	28.6	32.7	1.3	12.4	40.9	92.52	6.1	14,949	1789	5,191	3.53	1.32
11X-2, 28-30	80.48	ul lithoclast floatstone		53.2	17.5	27.7	1.6	12.6	41.4	94.05	4.3	10,433	1898	7,394	3.98	0.80
15X-1, 28-30	116.38	ul biowack		64.4	13.5	22.1	0	12.3		94.72	3.3	8,067	2209	8,708	4.26	0.66
15X-2, 29-31	117.89	ul pel wack		69.5	8.1	22.4	0	11.2		95.68	2.3	5,672	2059	9,411	4.78	0.94
15X-3, 29-31	119.39	ul pel wack		77.6	3.7	18.7	0	12.2		96.08	1.6	3,918	2447	10,732	4.60	0.94
15X-4, 29-31	120.89	ul pel wack		79.2	4.9	15.9	0	12.1		96.04	1.7	4,172	2254	10,926	4.68	0.97
15X-5, 29-31	122.39	ul pel wack		81.2	5.1	13.7	0	11.9		96.17	1.6	3,799	2241	11,169	4.83	0.82
15X-5, 49-52	122.59	biopack	LITH	25.0	0.0	75.0	0			97.41	1.6	3,995	1185	3,772	2.60	1.30

Notes: HMC = high-Mg calcite, LMC = low-Mg calcite, XRD = X-ray diffraction, PDB = Peedee belemnite standard. Shipboard lithologic descriptions are abbreviations of the Dunham classification (Eberli, Swart, Malone, et al., 1997): ul = unlithified, pl = partially lithified, pel = peloidal, bio = bioclastic, wack = wackestone, pack = packstone, mud = mudstone; forams = foraminifers, nannos = nannofossils. Degree of lithification column abbreviations: PL = partially lithified, LITH = lithified, unmarked areas = unlithified. See text for method of lithification classification.

This table also appears on the volume CD-ROM.

Table 3. Mineralogic, elemental, and stable isotopic composition of bulk carbonate sediments, Site 1009.

Core, section, interval (cm)	Depth (mbsf)	Shipboard lithology	Degree of lithification	Aragonite (wt%)	LMC (wt%)	HMC (wt%)	Dolomite (wt%)	mol% Mg HMC (XRD)	mol% Mg Dolomite (XRD)	$CaCO_3$ (mol%)	$MgCO_3$ (mol%)	Mg (ppm)	Na (ppm)	Sr (ppm)	$\delta^{13}C$ PDB	$\delta^{18}O$ PDB
166-1009A-																
1H-1, 29-31	0.29	ul pel, bio wack		59.3	33.0	7.7	0	11.7		92.82	4.9	11,856	3375	7,444	4.04	–0.49
1H-2, 29-31	1.79	ul pel wack		76.9	19.4	3.7	0	11.6		94.19	3.5	8,554	2912	8,937	4.34	–0.39
1H-3, 29-31	3.29	ul pel wack		78.6	17.5	3.9	0	11.8		95.28	2.4	5,919	2721	9,498	4.49	–0.40
2H-1, 29-31	5.09	ul pel wack		81.7	14.8	3.5	0	11.6		95.35	2.4	5,812	2682	9,430	4.83	0.04
2H-2, 29-31	6.59	ul pel wack		84.3	12.0	3.7	0	11.8		95.95	1.8	4,353	2610	9,720	4.76	–0.28
2H-3, 29-31	8.09	ul pel bio wack		89.3	6.2	4.5	0	10.3		96.55	1.1	2,620	2694	10,370	4.87	–0.12
2H-4, 29-31	9.59	ul pel bio wack		92.0	5.5	2.5	0	11.9		96.61	0.9	2,273	2841	10,539	4.96	–0.14
2H-6, 29-31	12.59	ul pel mud-wack		88.8	8.2	3.0	0	12.3		96.41	1.3	3,241	2537	9,937	4.92	–0.22
3H-1, 29-31	14.59	ul pel wack-mud		92.2	5.3	2.5	0	12.3		96.79	0.9	2,199	2479	10,558	5.01	–0.19
3H-2, 29-31	16.09	ul pel mud		93.4	4.9	1.7	0	11.8		96.60	0.9	2,291	2763	10,836	4.94	–0.08
3H-3, 29-31	17.59	ul pel mud		92.8	5.1	2.1	0	11.6		96.84	0.9	2,215	2419	10,292	5.02	–0.18
3H-4, 29-31	19.09	ul pel mud		92.0	5.8	2.2	0	12.1		96.77	1.0	2,484	2369	10,131	4.91	–0.33
3H-5, 29-31	20.59	ul pel mud		88.9	8.0	3.1	0	11.9		96.25	1.5	3,614	2453	10,364	4.96	–0.23
3H-6, 29-31	22.09	packestone	PL	25.2	61.9	12.9	0	13.0		89.22	9.5	23,391	2087	3,320	2.92	1.63
4H-1, 29-31	24.09	ul pel wack-pack		43.2	44.9	11.9	0	12.9		91.85	6.6	16,178	2255	4,948	3.66	0.05
4H-2, 29-31	25.59	ul pel wack		78.3	15.4	6.3	0	11.8		95.72	2.2	5,315	2479	8,821	4.21	–0.35
4H-3, 29-31	27.09	ul pel wack		78.4	14.7	6.9	0	12.5		95.41	2.4	5,791	2547	9,523	4.05	0.17
4H-CC, 29-31	28.32	ul pel mud-wack		85.1	9.8	5.1	0	12.1		96.05	1.7	4,005	2608	10,048	4.27	–0.26
5H-1, 29-31	33.59	ul mud wack		90.3	5.7	4.0	0	12.2		96.53	1.1	2,648	2614	10,718	4.52	–0.21
5H-2, 29-31	35.09	ul mud-wack		93.1	4.6	2.3	0	12.4		97.04	0.8	2,013	2228	10,072	4.54	–0.26
5H-3, 29-31	36.59	ul pel mud-wack		86.9	9.9	3.2	0	12.6		95.81	1.8	4,236	2876	10,308	4.53	–0.15
6H-1, 29-31	38.58	floatstone	PL	23.2	65.0	11.8	0	12.9		89.05	9.7	23,984	1908	3,370	3.35	1.60
6H-1, 84-85	39.14	wackestone	LITH	6.1	80.1	13.8	0	13.1		85.47	13.6	33,647	1776	1,745	3.54	2.90
7H-1, 29-31	42.59	ul pel wack-pack		52.4	37.4	10.2	0	12.4		92.52	5.6	13,729	2524	6,675	3.66	0.30
7H-2, 29-31	44.09	ul pel wack		52.7	35.3	12.0	0	12.0		92.53	5.6	13,564	2645	6,723	3.79	0.54
7H-3, 29-31	45.59	ul for pel wack		62.4	27.6	10.0	0	12.2		93.27	4.7	11,362	2733	7,713	4.09	0.03
7H-4, 29-31	47.09	ul pel wack		61.0	28.6	10.4	0	12.0		93.54	4.5	10,830	2574	7,846	4.04	0.12
7H-5, 29-31	48.59	ul pel wack		76.3	16.0	7.7	0	12.1		95.27	2.7	6,463	2418	8,851	4.17	–0.31
7H-6, 29-31	50.09	ul pel wack		78.8	13.4	7.8	0	12.3		95.49	2.3	5,543	2565	9,642	4.58	0.17
8H-1, 29-31	52.09	ul pel mud-wack		82.3	9.5	8.2	0	12.6		95.63	1.9	4,675	2886	10,282	4.59	–0.07
8H-1, 29-31	53.59	ul pel mud-wack		86.0	8.5	5.5	0	11.8		96.19	1.6	3,761	2606	9,775	4.67	0.14
8H-3, 29-31	55.09	ul pel mud-wack		85.9	9.2	4.9	0	11.5		96.11	1.7	4,217	2292	10,018	4.72	0.15
8H-4, 29-31	56.59	ul pel wack		66.0	24.6	9.4	0	12.4		93.59	4.3	10,459	2730	8,134	4.27	0.25
8H-5, 29-31	58.09	ul pel wack		82.3	11.1	6.6	0	12.0		95.37	2.4	5,729	2649	9,709	4.79	0.24
8H-1, 29-31	59.59	ul pel wack		63.2	23.3	13.5	0	12.2		94.23	3.8	9,275	2459	7,725	4.14	0.24
8H-7, 29-31	61.09	ul pel wack		81.1	11.6	7.3	0	12.3		95.41	2.0	4,955	3218	9,930	4.56	0.09

Table 3 (continued).

Core, section, interval (cm)	Depth (mbsf)	Shipboard lithology	Degree of lithification	Aragonite (wt%)	LMC (wt%)	HMC (wt%)	Dolomite (wt%)	mol% Mg HMC (XRD)	mol% Mg Dolomite (XRD)	$CaCO_3$ (mol%)	$MgCO_3$ (mol%)	Mg (ppm)	Na (ppm)	Sr (ppm)	$\delta^{13}C$ PDB	$\delta^{18}O$ PDB
9H-1, 29-31	61.59	ul pel mud-wack		81.0	12.3	6.7	0	12.6		95.46	2.0	4,912	3188	9,806	4.52	0.11
9H-2, 29-31	63.09	ul pel mud-wack		76.0	17.5	6.5	0	12.5		94.75	2.9	6,975	3091	9,021	4.55	0.11
9H-3, 29-31	64.59	ul biowack		63.1	27.8	9.1	0	12.6		92.77	4.7	11,431	3831	7,630	4.18	0.01
9H-3, 84-85	65.14	floatstone	LITH	10.7	53.4	35.9	0	12.7		89.67	9.5	23,360	1414	2,059	2.79	2.10
9H-4, 29-31	66.09	ul pel mud-wack		86.9	8.2	4.9	0	11.2		96.38	1.4	3,356	2475	10,033	4.71	0.25
9H-5, 29-31	67.59	ul pel mud		86.5	7.6	5.9	0	12.4		96.09	1.5	3,617	2835	10,249	4.67	0.00
9H-6, 29-31	69.09	ul pel mud		87.2	7.8	5.0	0	11.7		96.33	1.5	3,532	2367	10,233	4.88	0.00
9H-7, 29-31	70.59	ul pel mud		83.8	10.8	5.4	0	11.6		95.87	1.7	4,186	2855	10,069	4.79	–0.01
10H-1, 29-31	71.09	ul-drilling disturb		73.7	18.9	7.4	0	12.0		94.20	3.6	8,755	2760	8,744	4.48	0.01
11H-1, 29-31	74.09	ul pel wack		76.1	17.5	6.4	0	12.1		95.11	2.8	6,850	2433	8,792	3.98	–0.27
11H-2, 29-31	75.59	ul pel wack		80.8	11.4	7.8	0	11.6		96.00	1.9	4,563	2400	9,331	4.13	–0.28
11H-3, 29-31	77.09	ul pel wack		83.4	8.1	8.5	0	11.5		96.27	1.5	3,522	2662	9,688	4.26	–0.22
11H-4, 29-31	78.59	ul pel wack		87.4	5.1	7.5	0	11.7		96.55	1.0	2,443	2931	10,087	4.55	–0.23
11H-5, 29-31	79.89	ul pel wack		88.3	5.3	6.4	0	11.6		96.63	1.0	2,534	2542	10,545	4.62	–0.13
11H-5, 127-129	80.87	nodule	LITH	89.2	5.6	5.2	0	11.9		96.72	1.2	2,858	1917	10,960	4.40	0.43
11H-6, 29-31	81.39	ul pel wack		87.7	6.5	5.8	0	12.3		96.32	1.4	3,340	2528	10,392	4.70	0.00
12H-1, 29-31	83.59	ul pack		43.3	29.1	27.6	0	11.9		92.91	5.6	13,566	2125	5,401	3.69	0.13
13H-1, 29-31	86.59	ul pack		57.1	29.7	13.2	0	12.1		93.06	5.0	12,265	2651	6,687	3.68	–0.61
13H-2, 29-31	88.09	ul pack		56.4	30.2	13.4	0	11.8		93.34	4.6	11,297	2775	7,198	ND	ND
13H-3, 29-31	89.59	ul foram pel pack		70.9	18.3	10.8	0	11.5		95.04	2.8	6,814	2612	8,887	4.51	–0.26
13H-4, 29-31	91.09	ul pack-wack		80.6	12.3	7.1	0	11.6		95.61	2.1	5,073	2642	9,934	4.62	–0.26
13H-5, 29-31	92.59	ul pel wack		87.1	6.5	6.4	0	12.1		96.22	1.3	3,143	2861	10,681	4.64	–0.22
13H-6, 29-31	94.09	ul pel wack-mud		88.5	5.6	5.9	0	12.1		96.37	1.1	2,729	2932	10,631	4.79	–0.27
13H-7, 29-31	95.59	ul pel wack-mud		89.3	5.9	4.8	0	12.0		96.61	1.1	2,674	2404	10,722	4.83	–0.12
14H-2, 29-31	97.59	nanno ooze		75.1	16.1	8.8	0	11.6		95.01	2.8	6,906	2568	8,967	4.53	–0.10
14H-3, 29-31	99.09	ul bio pack w/lith		16.3	11.1	72.6	0	12.1		95.24	3.7	9,048	1615	3,023	1.84	1.07
14H-3, 29-31	99.54	hardground	LITH	5.6	82.8	11.6	0	12.8		86.85	12.3	30,507	1478	1,611	3.22	2.98
14H-4, 29-31	100.59	bio grainstone (turb)		57.8	23.2	19.0	0	12.6		93.35	4.9	12,026	2173	6,764	3.92	–0.01
14H-5, 29-31	102.09	ul pel wack		65.1	24.3	10.6	0	11.9		93.16	4.3	10,508	3518	8,628	4.74	0.30
14H-6, 29-31	103.59	ul pel wack		53.4	30.4	16.2	0	11.4		93.09	5.0	12,207	2534	7,045	3.87	–0.10
15H-1, 29-31	105.59	ul pel wack		79.4	6.2	14.4	0	11.7		96.34	1.5	3,562	2399	9,932	4.58	–0.18
15H-2, 29-31	107.09	ul pel mud-wack		86.1	3.6	10.3	0	11.7		96.39	1.1	2,570	2943	10,970	4.59	–0.20
15H-3, 29-31	108.59	ul pel mud-wack		86.3	4.1	9.6	0	11.6		96.50	1.1	2,635	2674	10,782	4.76	–0.17
15H-4, 29-31	110.09	ul pel wack		64.3	21.0	14.7	0	11.1		94.43	3.4	8,347	2668	8,544	4.02	–0.41
15H-5, 29-31	111.58	ul pel wack		76.2	12.7	11.1	0	11.4		95.40	2.5	6,024	2374	9,414	4.30	–0.09
16H-1, 29-31	111.98	hardground	LITH	26.0	19.4	54.6	0	11.7		93.96	4.9	12,036	1481	4,095	2.88	1.15
16H-CC, 27-29	113.57	ul pel wack		76.7	15.7	7.6	0	11.7		94.97	3.0	7,196	2294	9,271	4.77	0.28
17X-1, 29-31	114.09	ul floatstone		86.7	4.5	8.8	0	12.2		96.29	1.4	3,443	2340	10,986	5.08	–0.12
17X-2, 29-31	115.59	ul float/ul wack w/lith		78.9	6.3	14.8	0	12.0		96.13	1.7	4,194	2237	10,140	4.67	0.04
17X-3, 29-31	117.09	ul wack-float		81.4	5.2	13.4	0	12.2		96.11	1.5	3,680	2656	10,494	4.78	–0.10
17X-4, 29-31	118.59	ul bio wack-float	PL	86.5	5.2	8.3	0	12.2		96.38	1.3	3,081	2488	10,980	5.10	0.15
17X-5, 29-31	120.09	ul bio wack-float		82.7	6.8	10.5	0	11.7		96.09	1.6	3,980	2409	10,585	4.68	0.03
18X-1, 29-31	123.79	ul bio wack		65.7	9.0	23.9	1.4	10.1	38.5	95.12	3.0	7,168	2331	7,957	4.28	0.22
18X-2, 29-31	125.29	ul bio wack		55.9	9.8	32.2	2.1	9.3	41.1	95.02	3.2	7,866	2175	7,010	3.80	0.35
19X-1, 29-31	133.19	pl bio wack	PL	33.5	25.9	40.6	0	11.5		92.81	5.6	13,757	2325	4,810	3.65	0.80
19X-2, 29-31	134.69	pl bio wack	PL	33.7	22.3	44.0	0	11.7		93.26	5.3	13,002	2011	4,816	3.72	0.94
19X-3, 29-31	136.19	pl bio wack	PL	38.7	26.6	34.7	0	12.1		93.00	5.4	13,133	2331	5,324	3.71	0.53
19X-3, 72-74	136.62	pl bio wack	PL	37.9	22.3	39.8	0	11.9		93.35	5.1	12,474	2195	5,125	3.64	0.71
19X-4, 29-31	137.69	pl bio wack	PL	41.5	22.4	36.1	0	11.1		93.89	4.6	11,214	2008	5,580	3.68	0.46
19X-4, 112-114	138.52	pl bio wack	PL	57.3	5.1	36.2	1.4	11.5	41.9	95.21	3.1	7,532	1983	7,279	4.01	0.76
19X-5, 29-31	139.19	ul pl mud-wack		63.5	10.1	26.4	0	10.7		95.19	3.0	7,368	1938	8,191	4.55	0.90
20X-1, 29-30	142.79	ul pel wack-mud		73.0	8.0	16.5	2.5	11.7	40.7	94.57	3.4	8,319	2171	9,259	4.88	0.79
20X-2, 28-30	144.28	ul foram wack-mud		71.2	11.0	14.9	2.9	10.7	40.4	93.89	3.8	9,220	3022	8,753	4.83	0.84
20X-3, 28-30	145.78	pl wack	PL	74.9	8.2	16.9	0	12.3		95.59	2.2	5,405	2492	9,494	4.59	0.04
22X-1, 29-31	161.79	pl bio wack	PL	44.1	27.9	28.0	0	11.7		93.20	5.0	12,307	2509	5,832	3.10	0.41
22X-2, 29-31	163.29	pl bio wack	PL	50.1	27.2	22.7	0	11.3		93.50	4.6	11,131	2734	6,517	3.29	0.06
22X-3, 29-31	164.79	pl bio wack	PL	50.6	9.1	40.3	0	10.8		95.60	2.7	6,595	2160	6,490	4.21	1.12
22X-4, 29-31	166.29	pl pel wack-pack	PL	73.0	3.5	23.5	0	10.7		96.50	1.5	3,673	2085	9,347	4.85	0.95
23X-1, 29-31	171.09	pl pel wack	PL	70.8	0.7	28.5	0			96.35	1.7	4,143	2118	8,846	4.97	1.04
23X-2, 29-31	172.59	ul pel mud-wack		83.9	1.9	14.2	0	10.0		96.54	1.3	3,075	2274	10,433	5.03	0.45
23X-3, 29-31	174.09	ul-pl pel wack	PL	82.0	4.8	13.2	0	10.4		96.39	1.4	3,338	2295	10,664	5.09	0.61
23X-4, 29-31	175.59	pl pel wack	PL	74.4	0.2	24.0	1.4		43.2	96.16	1.8	4,428	2164	9,295	4.70	0.35
23X-5, 29-31	177.09	pl pel wack	PL	68.4	6.6	21.6	3.4	11.6	40.9	94.25	3.8	9,232	2252	8,496	4.41	0.67
23X-6, 29-31	178.59	pl bio float-pel wack	PL	54.1	16.5	29.4		11.4		94.63	3.5	8,506	2310	7,589	4.32	1.03
24X-1, 29-31	180.39	ul-pl pel bio mud wack	PL	59.5	8.8	31.7	0	10.0		95.56	2.5	6,144	2159	8,483	4.70	1.10
24X-2, 29-31	181.89	ul-pl pel bio mud wack		66.6	8.3	25.1	0	10.8		95.36	2.5	6,037	2452	9,475	4.85	0.93
24X-3, 29-31	183.39	ul-pl mud-wack	PL	66.4	9.3	24.3	0	10.7		95.52	2.5	6,020	2195	9,061	4.89	0.86
24X-4, 29-31	184.89	ul-pl pel bio mud wack	PL	57.6	5.5	36.9	0	10.9		95.48	2.7	6,438	1922	9,004	4.93	1.29
24X-5, 29-31	186.39	pl bio pel mud-wack	PL	62.0	6.7	31.3	0	11.0		95.63	2.5	6,101	1922	8,899	4.86	0.96
24X-6, 29-31	187.89	pl bio pel mud-wack	PL	73.2	12.4	14.4	0	11.2		95.66	2.3	5,522	2119	9,931	4.83	0.50
24X-7, 29-31	189.39	pl bio wack	PL	47.6	1.0	51.4	0	13.1		95.84	2.7	6,642	1380	7,174	4.81	1.41
25X-1, 29-31	189.69	pl bio wack	PL	63.8	5.6	30.6	0	12.0		95.72	2.4	5,809	1917	9,118	4.97	1.16
25X-2, 29-31	191.19	pl bio mud-wack	PL	71.0	9.1	19.9	0	11.3		95.78	2.2	5,400	1997	9,763	5.12	0.54
25X-3, 29-31	192.69	pl pel bio wack	PL	70.6	6.3	23.1	0	11.4		95.83	2.1	4,970	2171	10,233	4.99	0.87
25X-4, 29-31	194.19	pl bio mud-wack	PL	56.3	2.3	41.4	0	9.3		95.87	2.5	5,979	1695	8,076	4.89	1.30
25X-5, 29-31	195.69	pl bio wack	PL	64.9	5.3	29.8	0	10.7		95.84	2.2	5,367	1995	9,428	4.96	1.03

Table 3 (continued).

Core, section, interval (cm)	Depth (mbsf)	Shipboard lithology	Degree of lithification	Aragonite (wt%)	LMC (wt%)	HMC (wt%)	Dolomite (wt%)	mol% Mg HMC (XRD)	mol% Mg Dolomite (XRD)	$CaCO_3$ (mol%)	$MgCO_3$ (mol%)	Mg (ppm)	Na (ppm)	Sr (ppm)	$\delta^{13}C$ PDB	$\delta^{18}O$ PDB
25X-6, 29-31	197.19	pl bio wack	PL	65.3	5.9	28.8	0	11.9		95.93	2.2	5,348	1945	8,877	4.96	0.99
25X-7, 29-31	198.69	pl bio mud-wack	PL	69.0	7.4	23.6	0	11.1		96.00	2.1	5,125	1934	9,101	4.88	0.79
26X-1, 29-31	198.79	pl pel bio wack	PL	68.6	7.4	24.0	0	11.1		95.88	2.1	5,208	1985	9,662	4.93	0.83
26X-2, 29-31	200.29	pl bio wack	PL	69.2	8.7	22.1	0	11.2		95.53	2.5	6,030	1994	9,722	4.94	0.66
26X-3, 29-31	201.79	pl bio wack	PL	70.4	9.4	20.2	0	10.6		95.72	2.3	5,464	2135	9,593	4.99	0.76
26X-4, 29-31	203.29	pl bio wack	PL	71.1	10.2	18.7	0	11.8		95.55	2.4	5,724	2169	9,961	4.84	0.57
26X-5, 29-31	204.79	pl bio wack	PL	72.1	10.8	17.1	0	11.0		95.41	2.4	5,732	2438	10,173	4.92	0.56
27X-1, 29-31	207.89	pl bio wack	PL	67.4	11.2	21.4	0	11.2		95.57	2.5	6,085	1960	9,323	4.81	0.80
27X-2, 29-31	209.39	pl bio wack	PL	70.9	10.0	19.1	0	11.3		95.70	2.3	5,592	1943	10,023	4.81	0.63
27X-3, 29-31	210.89	pl wack mud	PL	71.3	12.6	16.1	0	11.5		95.43	2.5	6,029	2128	10,079	4.79	0.75
27X-4, 29-31	212.39	pl bio mud-wack	PL	73.0	11.5	15.5	0	11.6		95.45	2.3	5,664	2433	10,050	4.90	0.55
27X-5, 29-31	213.89	pl bio mud wack	PL	72.1	10.6	17.3	0	11.4		95.73	2.3	5,564	1942	9,879	5.01	0.85
27X-6, 29-31	215.39	pl bio mud wack	PL	75.9	13.2	10.9	0	11.8		95.48	2.4	5,793	2129	10,493	4.93	0.52
27X-7, 29-31	216.89	pl bio mud	PL	78.2	10.6	11.2	0	11.7		95.87	2.0	4,858	2158	10,297	4.96	0.51
28X-1, 29-31	216.99	pl wack	PL	71.0	4.0	24.4	0.6	11.8	46.6	96.20	2.0	4,761	1802	9,128	4.97	0.96
28X-2, 29-31	218.49	pl wack	PL	69.5	4.4	23.8	2.3	10.3	41.6	95.32	2.7	6,597	2084	9,166	4.95	0.91
28X-3, 29-31	219.99	pl bio wack	PL	50.9	14.8	29.9	4.4	12.1	42.3	92.60	5.8	14,147	1847	7,073	4.16	1.00
28X-4, 29-31	221.49	pl pel mud wack	PL	77.8	3.1	17.3	1.8	11.3	41.6	95.66	2.2	5,256	2233	10,397	5.01	0.39
28X-5, 29-31	222.99	pl bio mud wack	PL	81.5	4.5	12.9	1.1	12.8	45.4	95.57	2.1	5,200	2363	10,916	4.92	0.43

Notes: HMC = high-Mg calcite, LMC = low-Mg calcite, XRD = X-ray diffraction, PDB = Peedee belemnite standard. Shipboard lithologic descriptions are abbreviations of the Dunham classification (Eberli, Swart, Malone, et al., 1997): ul = unlithified, pl = partially lithified, pel = peloidal, bio = bioclastic, wack = wackestone, pack = packstone, mud = mudstone; forams = foraminifers, nannos = nannofossils. Degree of lithification column abbreviations: PL = partially lithified, LITH = lithified, unmarked areas = unlithified. ND = not determined. See text for method of lithification classification.

This table also appears on the volume CD-ROM.

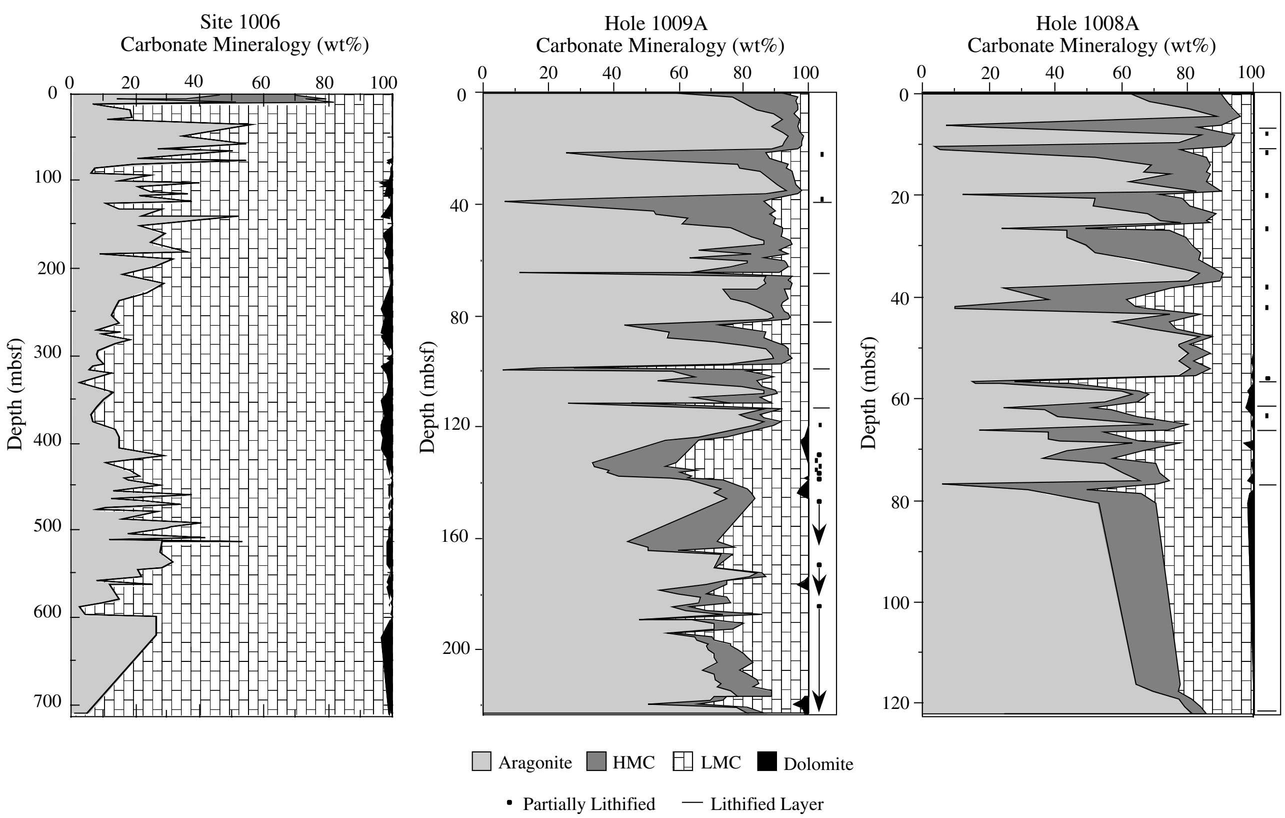

Figure 2. Bulk, cumulative carbonate mineralogy vs. depth. Relative degree of lithification is also shown for Holes 1009A and 1008A.

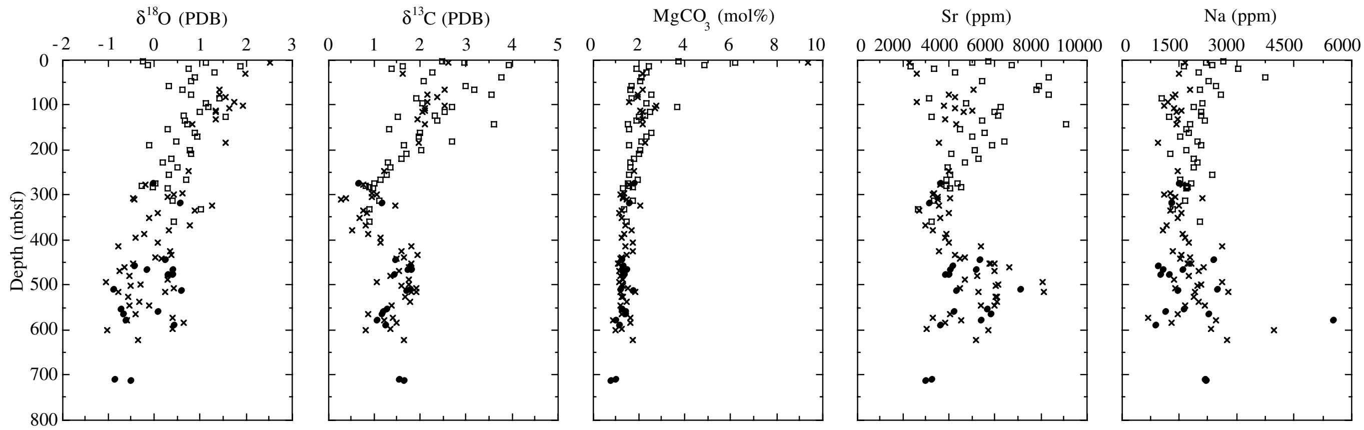

Figure 3. Geochemical data from Site 1006 vs. depth. Open squares = unlithified, crosses = partially lithified, and solid circles = lithified, PDB = Peedee belemnite standard.

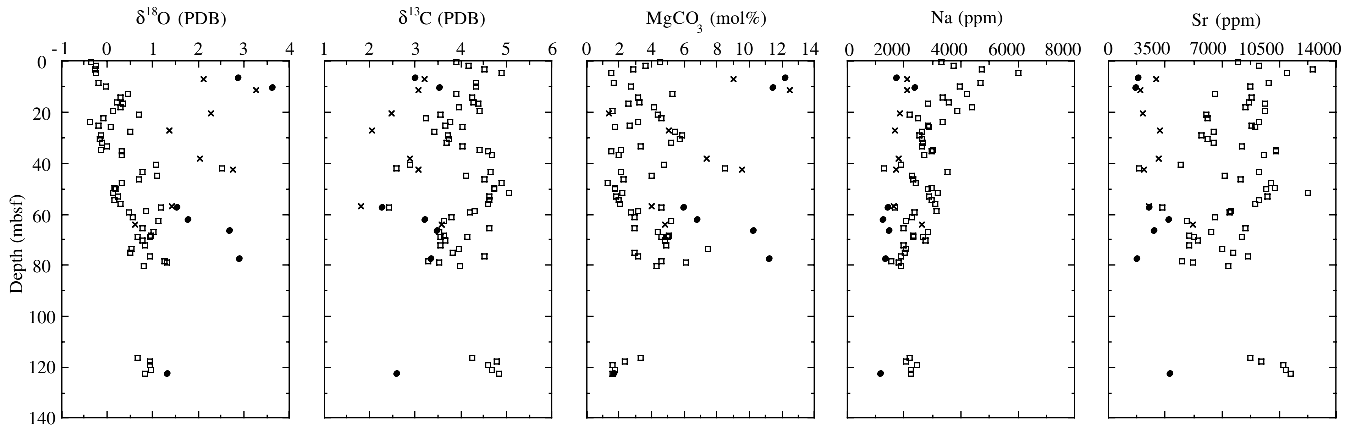

Figure 4. Geochemical data from Site 1008 vs. depth. Open squares = unlithified, crosses = partially lithified, and solid circles = lithified, PDB = Peedee belemnite standard.

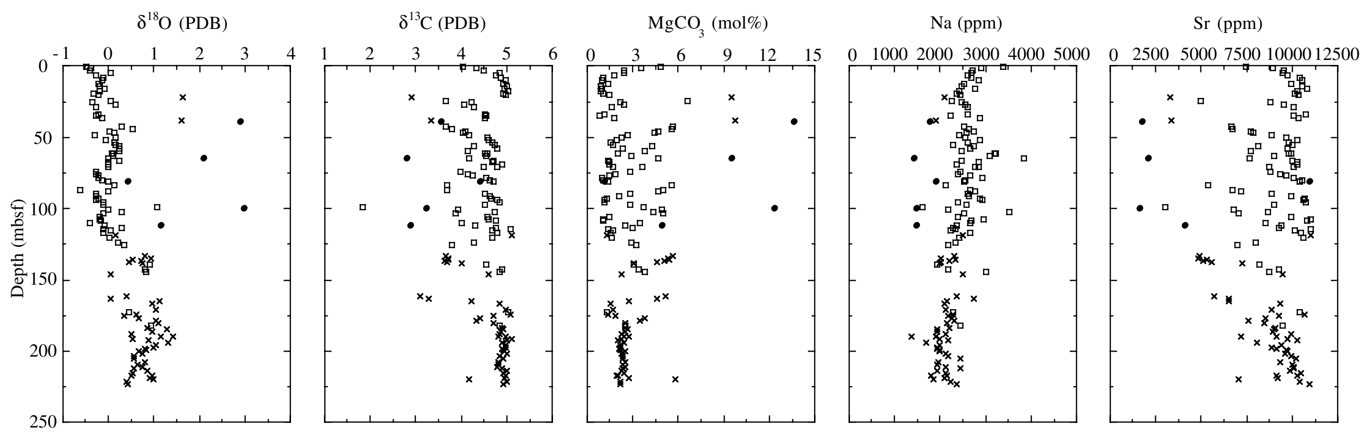

Figure 5. Geochemical data from Site 1009 vs. depth. Open squares = unlithified, crosses = partially lithified, and solid circles = lithified, PDB = Peedee belemnite standard.