Srivastava, S. P., Arthur, M., Clement, B., et al., 1989
Proceedings of the Ocean Drilling Program, Scientific Results, Vol. 105

34. MIDDLE TO LATE QUATERNARY SEDIMENT FLUXES IN THE LABRADOR SEA, ODP LEG 105, SITE 646:A SYNTHESIS OF ROCK-MAGNETIC, OXYGEN-ISOTOPIC, CARBONATE, AND PLANKTONIC FORAMINIFERAL DATA[1]

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ABSTRACT

We examine rock-magnetic, carbonate, and planktonic foraminiferal fluxes to identify climatically controlled changes of terrigenous and pelagic sedimentation at Ocean Drilling Program (ODP) Site 646 (the Labrador Sea). Terrigenous sediments are brought to the site principally by bottom currents. We use a rock-magnetic parameter sensitive to changes in magnetic mineral grain size, the ratio of anhysteretic susceptibility to low-field magnetic susceptibility (X_{ARM}/X), to monitor changes in bottom-current intensity over time, with large values of X_{ARM}/X (finer-grained magnetic minerals) indicating weaker bottom currents. A second rock-magnetic parameter, magnetic mineral accumulation rate (K_{ar}) was used to indicate variations in terrigenous flux. Planktonic foraminiferal and carbonate accumulation rates (Pf_{ar} and $CaCO_{3ar}$) are used as indicators of pelagic flux.

Absolute age assignments are based on correlation between the planktonic foraminiferal oxygen-isotope variations for Site 646 and the SPECMAP master oxygen-isotope curve. Cross-correlation analyses of the parameters that we studied with respect to the SPECMAP curve suggest that from oxygen-isotope stages 21 to 11, sedimentation rate, K_{ar}, X, $CaCO_{3ar}$, and Pf_{ar} were at their maximums, whereas X_{ARM}/X was at its minimum during peak interglacials (i.e., 0 k.y. lag time with respect to minimum ice volume). However, all parameters we examined lag behind minimum ice volume from stages 11 to 1, indicating a change in timing of both pelagic and terrigenous fluxes at approximately 400 k.y. BP. The negative correlation coefficient between X_{ARM}/X and the SPECMAP curve further suggest that finer-grained magnetic minerals are deposited during glacial periods, which probably reflects weaker bottom currents.

The shift observed in the lag times of parameters examined with respect to the SPECMAP record is attributed to a change in significance of orbital parameters. Spectral results exhibit strong power in eccentricity (about 100 k.y.) throughout the record. K_{ar}, X, $CaCO_{3ar}$, and Pf_{ar} show significant power in obliquity (about 41 k.y.), whereas X_{ARM}/X shows significant power at 73 k.y. from stages 21 to 11. The 73-k.y. period in X_{ARM}/X is near the difference tone of obliquity and eccentricity: 1/43—1/102 = 1/69. K_{ar} and X_{ARM}/X show power only in eccentricity from stages 11 to 1. X and Pf_{ar} show significant power in precession (about 18 and 22 k.y.) whereas $CaCO_{3ar}$ has power at 34 k.y., which could be a combination of precession and obliquity. The shift in power of orbital parameters may by attributed to the effect of the about 413-k.y. signal of eccentricity.

INTRODUCTION

We examine climatic controls on sediment flux in the northern Labrador Sea, an area of high climatic sensitivity during the middle to late Quaternary. For this study, we used several types of data: rock-magnetic properties, the oxygen isotopic composition of planktonic foraminifers, and the concentrations and accumulation rates of carbonate and planktonic foraminifers.

Site 646 is located in the North Atlantic, just north of the Eirik Drift (58°13′N, 48°22′W: Fig. 1). The site was probably covered by ice during the last glacial interval (Ruddiman and McIntyre, 1979): clearly, the advance and retreat of northern high-latitude ice is important for controlling deposition in this region.

Fine-grained sediments of the Eirik Drift are transported to the site by bottom-flowing contour currents. These sediments are highly bioturbated, which commonly destroys the sediment fabric and structure usually associated with current deposition (Chough and Hesse, 1985).

With the exception of *in-situ* deposition, such as bacterial magnetite (Kirschvink and Chang, 1984; Petersen et al., 1986), magnetic minerals are deposited on the seafloor by the same processes that control the deposition of other terrigenous minerals. Thus, one can use the flux and particle size of magnetic minerals at Site 646 as proxy indicators of changing terrigenous sedimentary flux.

The use of rock-magnetic techniques to elucidate sedimentary processes is relatively new to oceanographic studies. Robinson (1986) and Bloemendal et al. (1988) demonstrated that downcore variations in rock-magnetic parameters correlate with oxygen-isotope stratigraphy of upper Quaternary sediments from the mid-North Atlantic and equatorial eastern Atlantic, respectively. We have applied the techniques of Bloemendal et al. (1988) to samples cored with the advanced piston corer (APC) from ODP Site 646.

METHODS

Time Control

To compare the various types of data used here directly with the planktonic foraminferal oxygen-isotope curve of Site 646 (Aksu et al., this volume), we used only results from those samples within the same core sections sampled by Aksu et al. (this volume) (Table 1).

To develop an age model for Site 646, we identified 45 events (Imbrie et al., 1986; Prell et al., 1987) within the oxygen-isotope record (Aksu et al., this volume). This oxygen-isotope record is based on the planktonic foraminifer *Neogloboquadrina pachyderma* (sinistral). We assigned ages based on correlation of the 45 events with the SPECMAP oxygen-isotope master curve of Imbrie et al. (1984) (Table 2). We then assigned ages to individual samples by linearly interpolating sample depths between these 45 tie-points; values of the parameters used in this study then were linearly interpolated to equal intervals of time (2000 yr).

[1] Srivastava, S. P., Arthur, M., Clement, B., et al., 1989. *Proc. ODP, Sci. Results*, 105: College Station, TX (Ocean Drilling Program).

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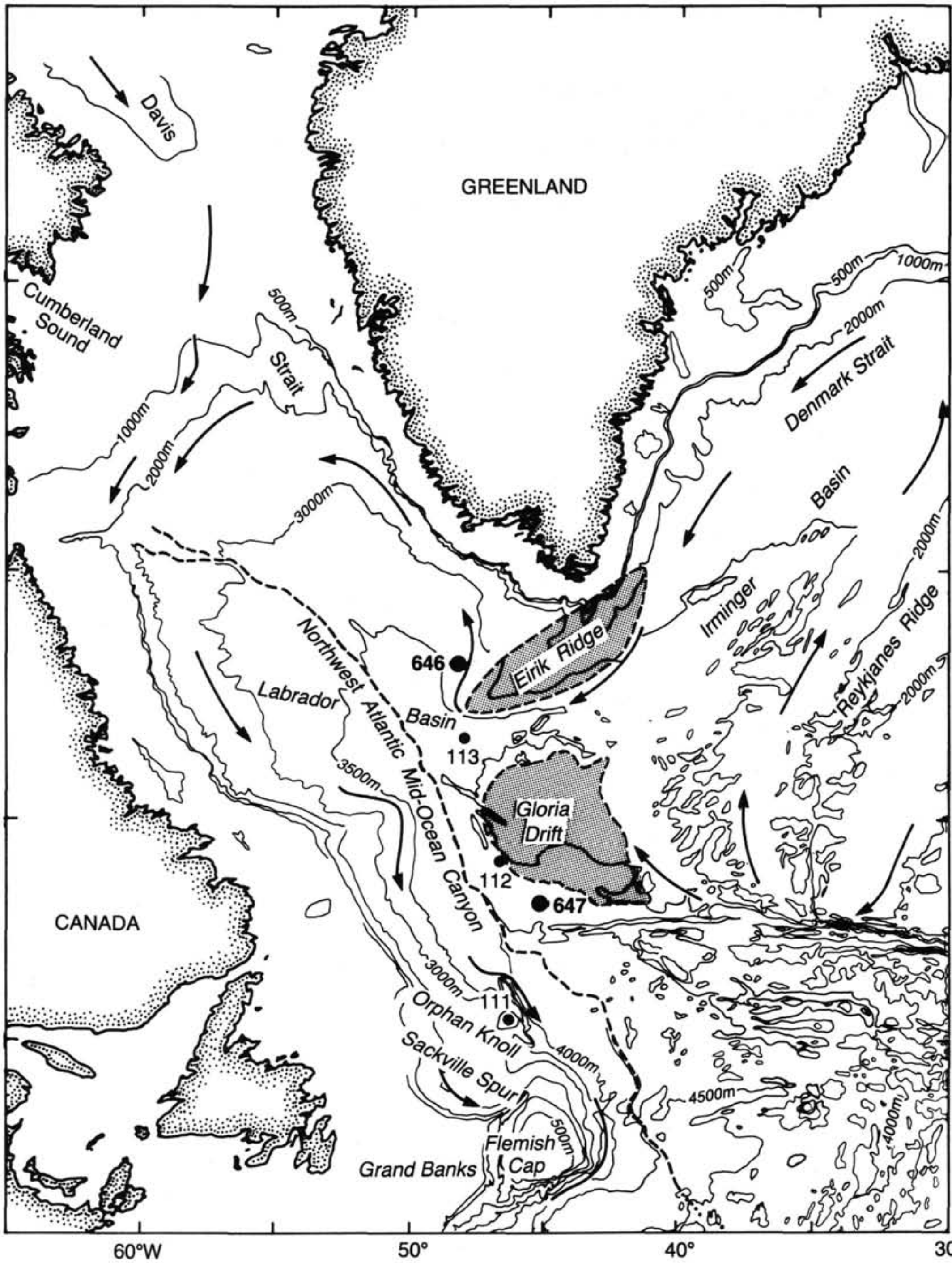

Figure 1. Location map of Site 646.

Sedimentation Rate (S)

Sedimentation rates were calculated by the equation:

$$S = \frac{(D_1 - D_2)}{(A_1 - A_2)}$$

where D_1 and D_2 are consecutive depths, and A_1 and A_2 are consecutive ages for the 45 events identified from the Site 646 oxygen-isotope record. The sedimentation rate was then converted to bulk-sediment accumulation rate (BAR) by the equation:

$$BAR = S\,\{B - [(P/100) \times 1.01]\},$$

where 1.01 is the density of seawater, B is the wet bulk density, and P is the percent of porosity. Bulk density and porosity were determined for each age interval by interpolating between data points given in the "Site 646" chapter (Srivastava, Arthur et al., 1987). Because of the low sampling density of physical property data, all values were honored.

Rock-Magnetic Parameters

The methods for determining rock-magnetic parameters are described in Hall and King (this volume), and values for rock magnetic data are

Table 1. Intervals cores used in this study and top and bottom ages, based on interpolation between events given in Table 2.

Core/section interval (cm)	Depth (mbsf)	Age (k.y.)
105-646A-1H-1, 0	0	0
646A-1H-4, 50	5.00	49.66
646B-1H-4, 100	5.00	49.66
646B-1H-6, 150	8.50	87.29
646B-2H-3, 50	8.00	75.80
646B-2H-6, 70	12.70	141.86
646A-2H-2, 100	12.70	141.86
646A-2H-7, 45	19.65	228.94
646B-3H-4, 120	20.30	235.78
646B-3H-7, 50	24.10	263.94
646A-3H-4, 0	24.50	267.26
646A-3H-6, 30	27.80	318.82
646B-4H-1, 120	27.20	310.92
646B-4H-5, 50	32.50	382.39
646A-4H-2, 120	32.50	382.39
646A-4H-6, 150	38.80	455.38
646A-5H-1, 0	39.30	463.47
646A-5H-6, 150	48.30	596.00
646B-5H-3, 0	39.00	458.61
646B-5H-3, 30	39.30	463.47
646A-6H-1, 0	50.00	610.00
646A-6H-6, 150	59.00	694.33
646B-6H-4, 30	48.81	600.00
646B-6H-6, 150	53.01	637.24
646A-7H-1, 0	59.60	699.11
646A-7H-7, 60	69.20	790.79
646A-8H-1, 0	69.30	791.64
646A-8H-4, 120	75.00	840.00

given in Appendix A. Mass magnetic susceptibility (X) is proportional to the concentration of magnetic minerals per unit sediment mass. X usually reflects changes in terrigenous flux and pelagic dilution (e.g., biogenic $CaCO_3$). We also express magnetic mineral concentration as an accumulation rate using the equation:

$$K_{ar} = k \times S,$$

where K_{ar} represents the magnetic mineral accumulation rate and k is the volume magnetic susceptibility. The volume of each sample is 5 cm^3.

X_{ARM} is the magnetic anhysteretic susceptibility, which is also proportional to the concentration of magnetic minerals per unit mass; however, this value is more grain-size dependent than X. The ratio X_{ARM}/X expresses relative variations of particle size of magnetic minerals. The larger the X_{ARM}/X, the smaller the particle size; we interpret low values of X_{ARM}/X at Site 646 as reflecting the winnowing of the finer-grained sediment fractions by stronger bottom currents.

$CaCO_3$ and Planktonic Foraminifer Accumulation Rates

Carbonate concentration, expressed as percent of $CaCO_3$ was determined by the coulometric technique (Huffman, 1977) (Appendix B). Ninety-eight of the samples used for carbonate analyses also were used for rock-magnetic measurements.

The percent of $CaCO_3$ was converted to carbonate accumulation rate by the equation:

$$CaCO_{3ar} = (\% \ CaCO_3/100) \times BAR,$$

where $CaCO_{3ar}$ is the carbonate accumulation rate.

Planktonic foraminiferal concentration (Aksu et al., this volume) is expressed as numbers per gram and converted to planktonic foraminifer accumulation rate (Pf_{ar}) by multiplying by BAR. We used these two parameters to indicate pelagic flux.

Statistical Analyses

Cross-correlation analyses were used to determine the degree of correlation and the lag time between the various parameters and oxygen-isotope time series. Spectral analyses (Fast Fourier Transform [FFT] using Bloomfield's [1976] computer program) were applied to the rock-magnetic and accumulation-rate time series to detect the concentration of variance at earth orbital frequencies (Hays et al., 1976). For this report, we concentrate only on those periodicities that result from well-established orbital parameters: precession (18 and 23 k.y.), obliquity (41 k.y.), and eccentricity (100 and 413 k.y.). Both unsmoothed and smoothed (using modified Daniell smoothing [Bloomfield, 1976]) curves of spectral density are given. The spectral routine we used cannot eliminate spurious effects, such as side-lobe leakage or ringing; however, these can be reduced by smoothing. To test the reliability of the spectral routine, we included analysis of the SPECMAP oxygen-isotope data, the spectral characteristics of which are well known (Imbrie et al., 1982).

Table 2. Depths of oxygen-isotope events from Site 646.

Event	Depth (mbsf)	Age (k.y.)
1.00	0	0
1.10	1.00	6
2.20	2.50	19
3.10	3.40	28
3.30	5.30	53
4.20	7.53	65
5.30	9.20	99
5.50	10.01	122
6.20	12.10	135
6.50	15.40	171
6.60	16.30	183
7.10	16.60	194
7.30	17.30	216
7.40	19.60	228
7.50	20.50	238
8.20	22.30	249
8.30	23.70	257
8.40	24.71	269
8.50	25.99	287
8.60	26.35	299
9.10	27.13	310
9.20	27.89	320
9.30	29.00	331
10.20	29.90	341
11.10	32.70	368
11.30	33.92	405
11.40	35.90	416
12.10	36.30	425
12.20	37.48	434
12.31	38.24	443
13.12	41.00	491
13.20	43.10	513
14.20	45.70	538
14.30	45.90	552
15.10	47.10	574
15.30	48.30	596
15.50	50.85	617
16.22	52.10	628
17.10	56.04	668
18.22	59.30	697
18.30	60.20	711
19.10	64.14	731
20.23	65.15	750
21.10	66.00	774
21.30	68.40	784

RESULTS

Figure 2 shows the location of tie-points between the Site 646 oxygen- isotope record and the SPECMAP master curve, which is an indicator of variations in global ice volume. Oxygen-isotope ratios from planktonic foraminfers reflect not only changes in ice volume, but also more local changes in surface-water salinity and temperature. However, despite this potential source of error, the good correlation between the oxygen-isotope data, and the SPECMAP master curve (correlation coefficient = 0.811; Table 3) suggests to us that good time control has been achieved. The resulting age-depth model is shown in Figure 3.

Variations in sedimentation rate and K_{ar} are shown in Figure 4. Sedimentation rate lags behind the oxygen-isotope record by

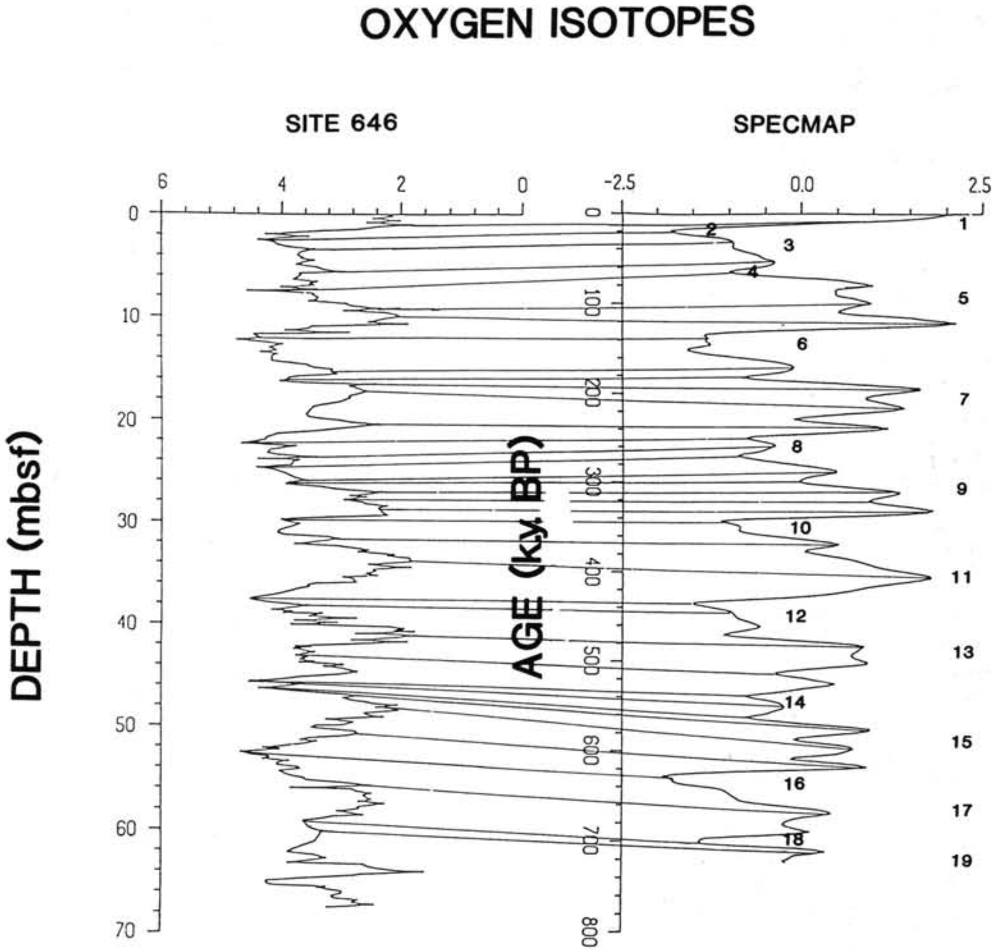

Figure 2. Comparison of Site 646 oxygen-isotope record and the SPECMAP master curve. Tie-points shown are also given in Table 1. Numbers on the right side of the figure are the oxygen-isotope stages.

4 k.y. from oxygen-isotope stage 21 to stage 11, and 18 k.y. from stage 11 to stage 1 (Table 3). K_{ar} mimics the sedimentation-rate curve.

A change in character of sedimentation occurred approximately 400 k.y. BP. This change in sedimentation is suggested by changes in physical properties, rock-magnetic parameters, and accumulation rates ($[CaCO_3]_{ar}$ and Pf_{ar}). When plotted as a function of depth, bulk density (porosity) increases (decreases) monotonically (Srivastava, Arthur, et al., 1987). However, when plotted as a function of time, bulk density and porosity vary in a cyclic manner downsite, having lower and higher values, respectively, from 400 k.y. to 0 k.y. than from 782 k.y. to 400 k.y. (Fig. 5). Because there is no significant change in bulk sediment grain size or mineralogy (Dadey, pers. comm., 1988), we suggest that the distinct change in physical properties at approximately 400 k.y. probably results from changes in the character of sedimentation.

X and X_{ARM}/X (Fig. 6) do not lag the SPECMAP record from oxygen-isotope stages 21 to 11, but lag the SPECMAP record by 8 k.y. and 14 k.y., respectively, from stages 11 to 1. $CaCO_{3ar}$ and Pf_{ar} (Fig. 7) do not lag the SPECMAP record from the oxygen-isotope stages 21 to 11 curve, but lag by 6 k.y. and 8 k.y. respectively, from oxygen-isotope stages 11 to 1 (Table 3). Thus, the parameters we discuss here are in phase (i.e., 0 k.y. lag) with changes in ice volume from stages 21 to 11, and are out of phase from stages 11 to 1. We separated the sequence into

Table 3: Results of cross-correlation analyses of parameters for samples from Site 646 discussed in the text and the SPECMAP oxygen-isotope curve.

Parameter	Age sequence (k.y.)	Correlation coefficient	Lag (k.y.)
Age-depth		0.999	
Oxygen data-SPECMAP		0.811	
Sedimentation rate-SPECMAP	0–780	0.232	10
	0–394	0.313	18
	394–780	0.348	4
X_{ARM}/X-SPECMAP	0–782	−0.395	10
	0–392	−0.504	14
	392–782	−0.304	0
X-SPECMAP	0–782	0.176	8
	0–392	0.316	8
	392–782	0.103	0
K_{ar}-SPECMAP	0–780	0.232	10
	0–392	0.313	18
	392–780	0.339	6
Pf_{ar}-SPECMAP	0–782	−0.203	8
	0–392	−0.282	8
	392–782	0.055	0
$CACO_{3ar}$-SPECMAP	0–782	0.219	0
	0–392	−0.093	8
	392–782	0.528	0

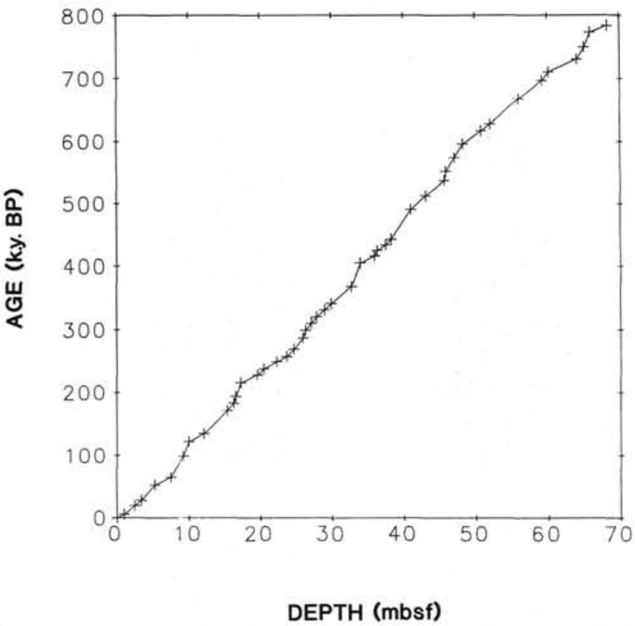

Figure 3. Age vs. depth model for Site 646, determined from 45 tie-points.

two time series for spectral analysis: 782–392 k.y. and 392–0 k.y. because of the observed phase shift.

Spectral Analyses

Spectral analysis of the SPECMAP oxygen-isotope data (Fig. 8) shows a dominant periodicity of 102 k.y., which is within the eccentricity band, at about 100 k.y.

Spectral analyses of X (Fig. 9) reflect both short- and long-period variations in orbital parameters. In the 782 to 392 k.y. time series, the obliquity signal is much stronger than the precessional signal. However, a periodicity close to the precessional band is seen as a significant component from 392–0 k.y. The eccentricity cycle is prominent during both time slices.

Spectral analyses of K_{ar} and sedimentation rate show the same periodicities. Thus, we present only the spectral analyses of K_{ar} to represent both. K_{ar} (Fig. 10) reflects the same dominant periodicity in both the upper and lower portions of the time series: eccentricity.

The spectral pattern of X_{ARM}/X from 782 to 392 k.y. is dominated by a nominal 73-k.y. periodicity. However, the spectral pattern of X_{ARM}/X (Fig. 11) is dominated by about a 100-k.y. cycle in the upper 392 k.y.

The spectral analyses of Pf_{ar} and $(CaCO_3)_{ar}$ (Figs. 12 and 13) show periodicities related to obliquity and precession from stages 21 to 11, and periodicities within the eccentricity and precessional bands from stages 11 to 1.

DISCUSSION

The shift in parameters at approximately 400 k.y. BP suggests an overall change in sedimentation style. From oxygen-isotope stages 21 to 11, the differences in lag between sedimentation-rate and accumulation-rate parameters (Pf_{ar} and $CaCO_{3ar}$) and X and K_{ar} are negligible. All of the parameters are in phase with changes in ice volume from oxygen-isotope stages 11 to 21.

From oxygen-isotope stages 11 to 1, there is a significant difference in the lags of sedimentation-rate (about 18 k.y.) and accumulation-rate parameters (Pf_{ar} and $[CaCO_3]_{ar}$) (about 8 k.y.) relative to the SPECMAP oxygen-isotope curve. This lag difference is also seen with X (about 8 k.y.) and K_{ar} (about 18 k.y.).

On the basis of the comparable lag differences, we might expect to see a direct relationship between the amount of carbonate and magnetic mineral concentration. Unlike Robinson (1986) and Bloemendal et al. (1988), we found no significant negative correlation between percentage of $CaCO_3$ and susceptibility (Fig. 14). However, the carbonate fraction at Site 646 is composed of both biogenic and detrital components (Srivastava, Arthur, et al., 1987), and our analytical methods cannot differentiate between the two types of carbonate. X is partly determined by the concentration of detrital carbonate and will be further diluted by the addition of biogenic carbonate. The effect of sedimentation of carbonate from different sources and processes is to mask a direct relationship between carbonate and magnetic mineral concentration.

The change in lag time for K_{ar} and X_{ARM}/X relative to the SPECMAP record suggests that whereas the period of bottom-current activity remains the same throughout the record, its phase with respect to ice volume changes at approximately 400 k.y. BP. The negative correlation coefficient between X_{ARM}/X and oxygen isotopes further suggests that finer-grained magnetic minerals are deposited during glacial periods. This result is the opposite of that found by Robinson (1986) and Bloemendal et al. (1988). Robinson concluded that the pattern of magnetic mineral grain-size changes observed at his sites largely resulted from the deposition of coarse-grained magnetic minerals during glacials via ice rafting. Bloemendal et al. concluded that their magnetic grain-size changes resulted from eolian transport of relatively coarse-grained minerals during glacials in combination with a flux of fine-grained magnetic material during interglacials of either fluvial or *in-situ* biogenic origin. At Site 646, we interpret X_{ARM}/X variations to reflect changes in intensity of bottom currents, which are negligible or nonexistent during glacials (Ruddiman and McIntyre, 1981). Therefore, minima in bottom-current activity occur in phase with glacial maxima from oxygen-isotope stages 21 to 11, whereas they lag behind glacial maxima by 14 k.y. from oxygen-isotope stages 11 to 1.

Spectral analyses suggest that the obliquity signal (about 41 k.y.) is significant for controlling planktonic foraminiferal flux and magnetic mineral concentration and flux from stages 21 to 11, but it is insignificant from stages 11 to 1 (Figs. 9 and 11). Thus, we attribute the change in the style of sedimentation observed at Site 646 to the decreasing influence of the obliquity forced environmental parameters at about 400 k.y.

We cannot explain all of the peaks we see in our spectral analyses. However, the 34-k.y. periodicity of $CaCO_{3ar}$ found from oxygen-isotope stage 11 to oxygen-isotope stage 1 is near the 31-k.y. periodicity reported by Pisias and Rea (1988) for sea-surface temperatures of the central equatorial Pacific. Pisias and Rea suggested that this signal may be real, and possibly a reinforcement of the precessional and obliquity signals. The cause of the 73-k.y. periodicity of X_{ARM}/X from oxygen-isotope stage 21 to oxygen-isotope stage 11 is unknown. However, the 73-k.y. periodicity is near the difference in tone between obliquity and eccentricity: $1/41 - 1/100 = 1/69$.

A change in the significance of orbital frequencies for oxygen isotopes has been noted previously to occur near the stage 22/21 boundary, when the dominant signal changes from obliquity to eccentricity (Williams et al., 1981). Ruddiman et al. (1986) attributed this shift to the influence of the uplift of the Sierra Nevada mountain range and the Himalyas. These uplifts during the late Pliocene-early Pleistocene could have resulted in a more meridional upper atmospheric circulation that would bring polar air farther south, thus quickening the pace of glacial growth (Ruddiman et al., 1986).

Jansen et al. (1986) reported evidence of a long-term 350 to 400 k.y. cycle in sedimentation patterns on a global basis. They attributed this long-term change to the about 413-k.y. periodic-

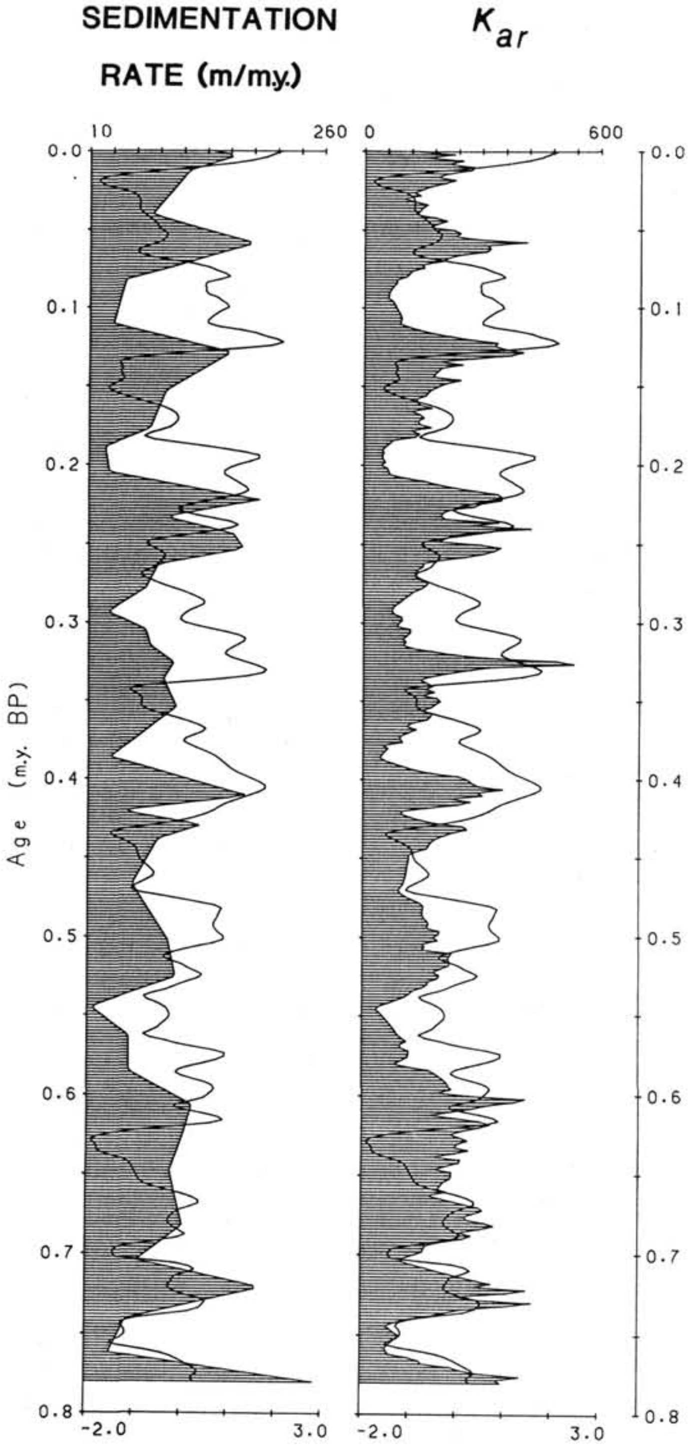

Figure 4. Sedimentation rate and K_{ar} vs. age.

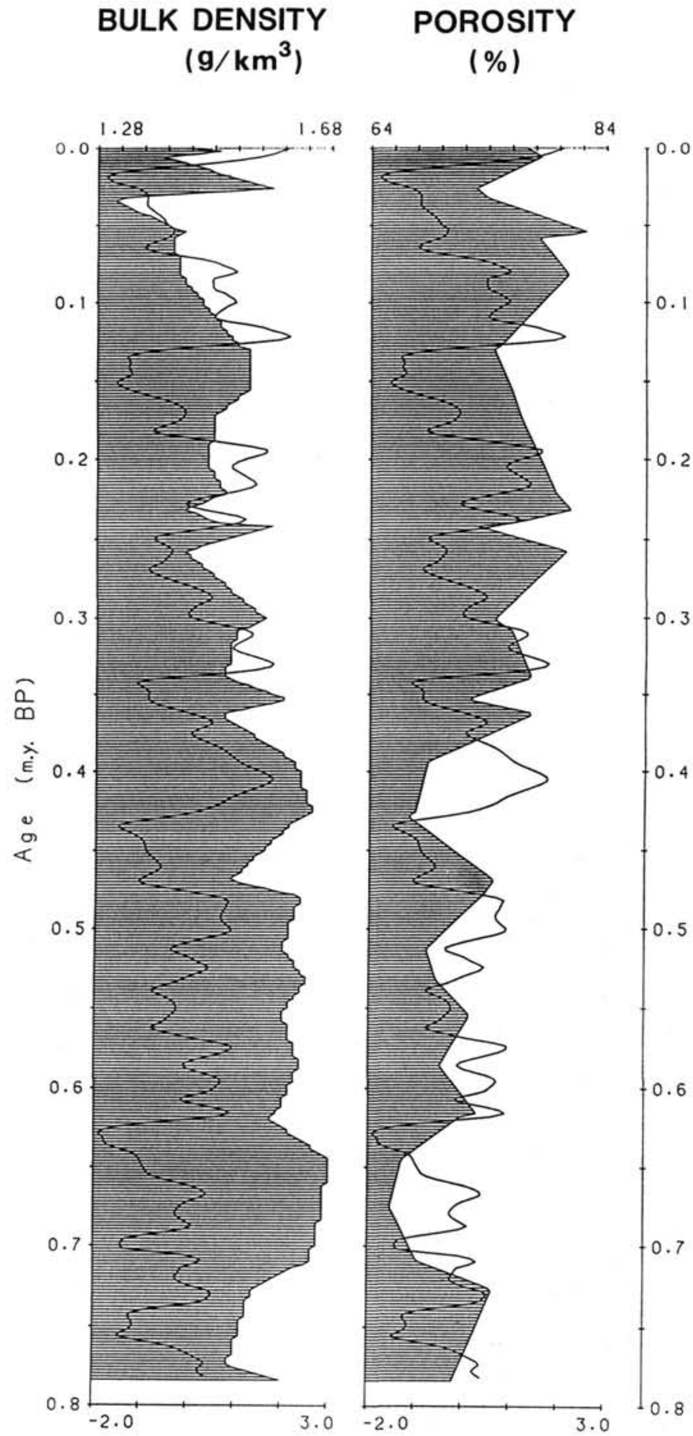

Figure 5. Bulk density and porosity vs. age.

ity associated with the eccentricity signal. From our analyses, we suggest that this signal may alter the timing of pelagic deposition at Site 646, as deduced from variations in the sediment parameters discussed in this study.

CONCLUSIONS

From our analyses, we conclude that peak bottom-current activity, terrigenous flux, and pelagic flux changed from being in phase with maximum interglacials to lagging ice volume at approximately 400 k.y. BP. This change is indicated by:

1. The change in lag time with respect to the SPECMAP oxygen-isotope curve of X_{ARM}/X (used to indicate relative changes in bottom-current intensity) and K_{ar} (used as an indicator of terrigenous flux) from 0 k.y. for both parameters, during stages 21 to 11, to 14 and 18 k.y., respectively, during stages 11 to 1.
2. The change in lag time, with respect to the SPECMAP oxygen-isotope curve, of magnetic mineral concentration (X), $CaCO_{3ar}$, and Pf_{ar}, used as indicators of pelagic flux, from 0 k.y. during stages 21 to 11 to 8 k.y. during stages 11 to 1 for each parameter.

3. Reduced power of the about 41-k.y. obliquity signal in the Pf_{ar}, K_{ar}, and X records during stages 11 to 1.

ACKNOWLEDGMENTS

The University of Rhode Island authors were supported by JOI USSAC P.O. Nos. 76322 and 70760 for Leg 105. A. E. Aksu was supported by NSERC Grant A6896. We thank Sheila Rieg for her assistance in analytical work and Mark Wimbush for his assistance with interpreting the spectral results. We thank Paula Weiss, Alan Spies, and Jeffrey Corbin for assistance during sampling at the ODP East Coast Repository.

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Date of acceptance: 29 September 1988
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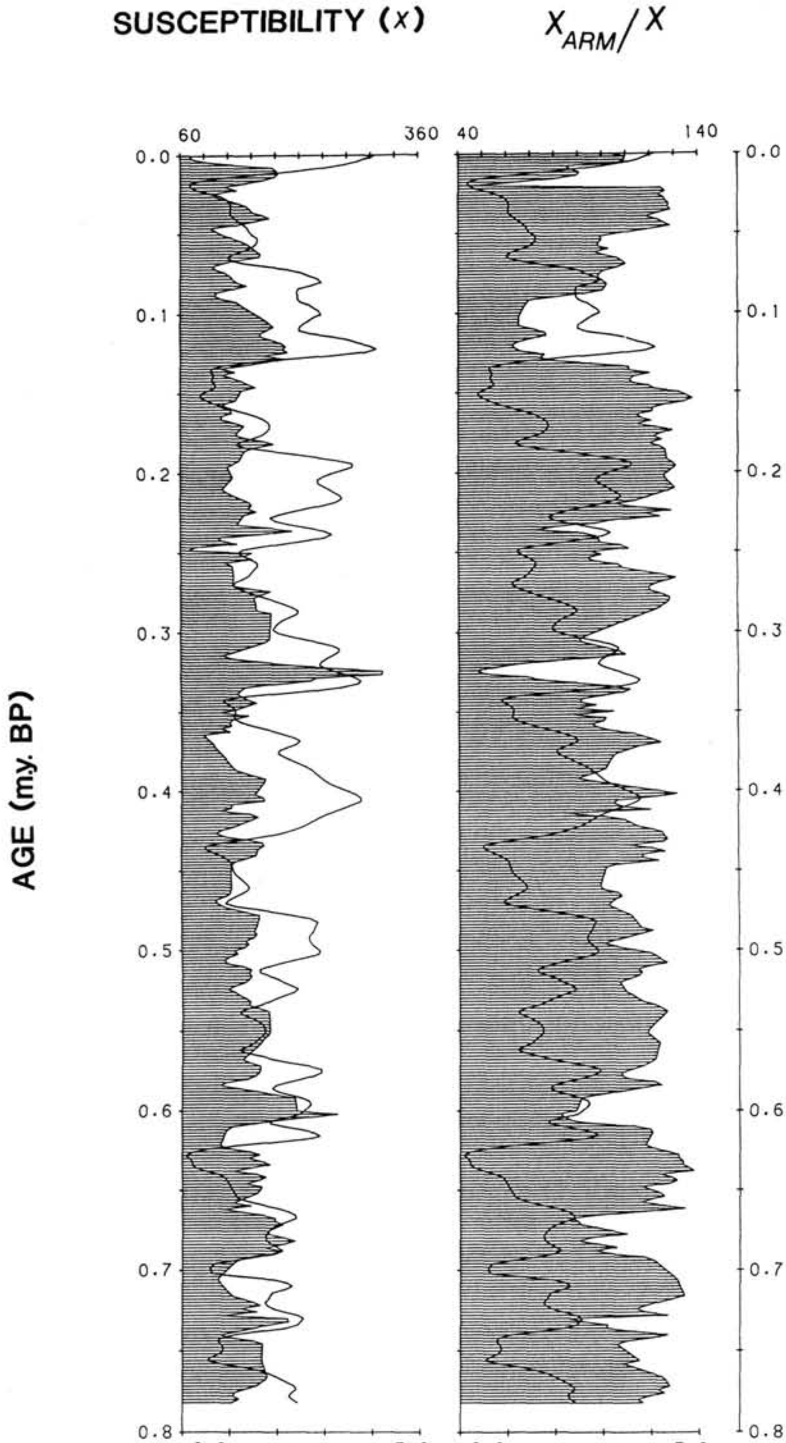


Figure 6. X and X_{ARM}/X vs. age.

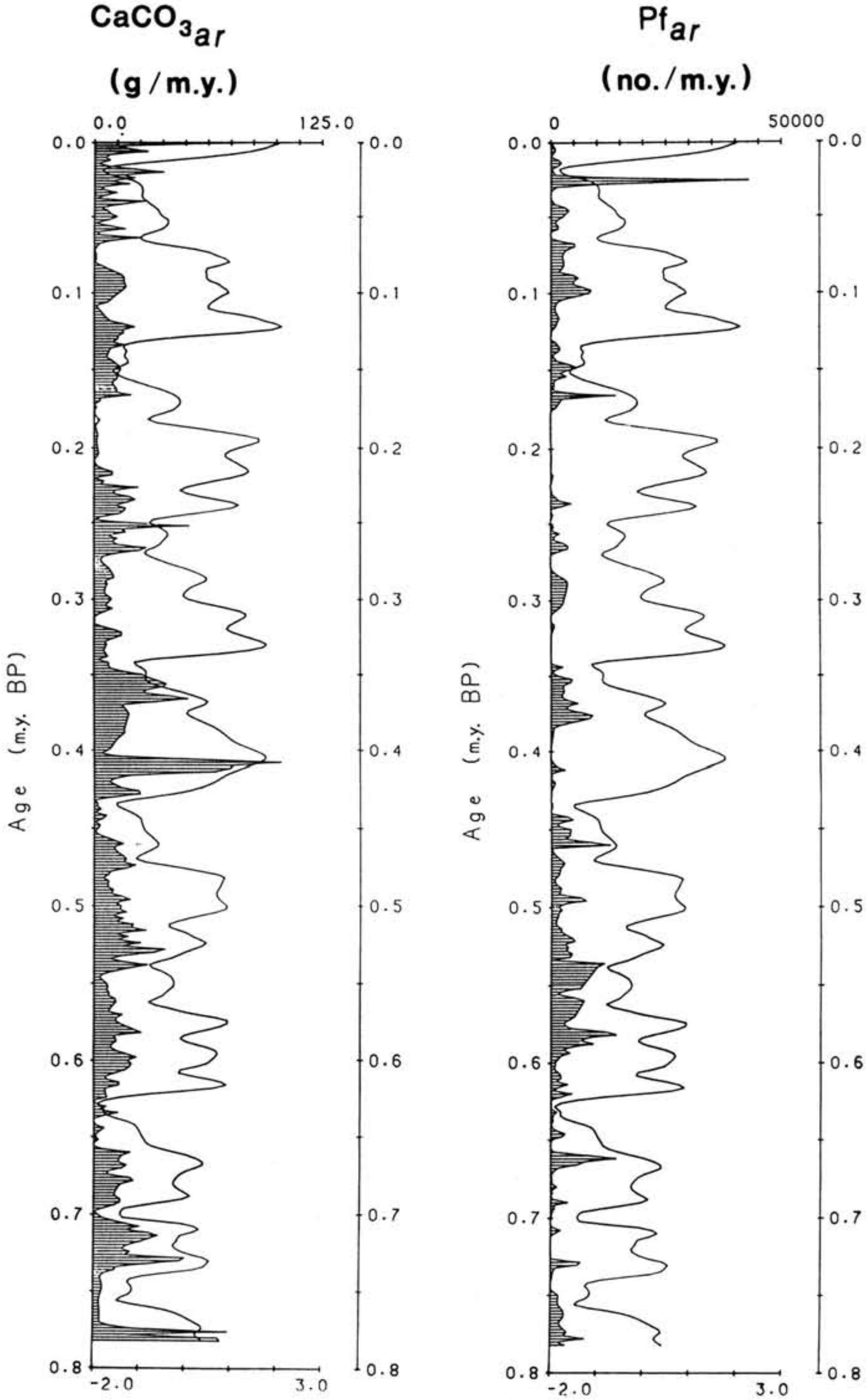


Figure 7. $CaCO_{3ar}$ and Pf_{ar} vs. age.

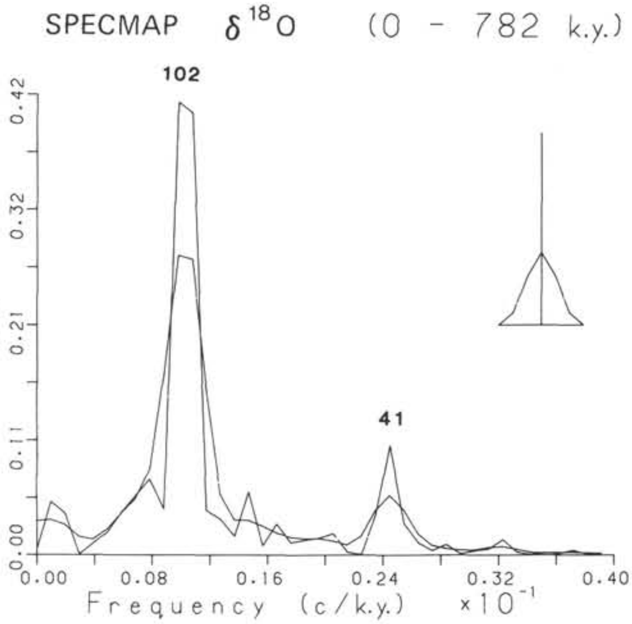
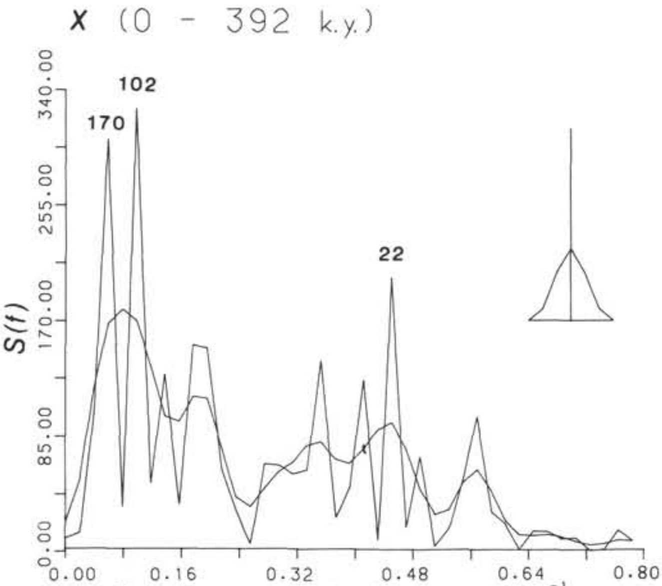


Figure 8. Spectral analyses of SPECMAP master oxygen-isotope curve. Numbers in figure represent periodicity in thousand years. The bell to the right represents the size of the Daniell smoothing window.



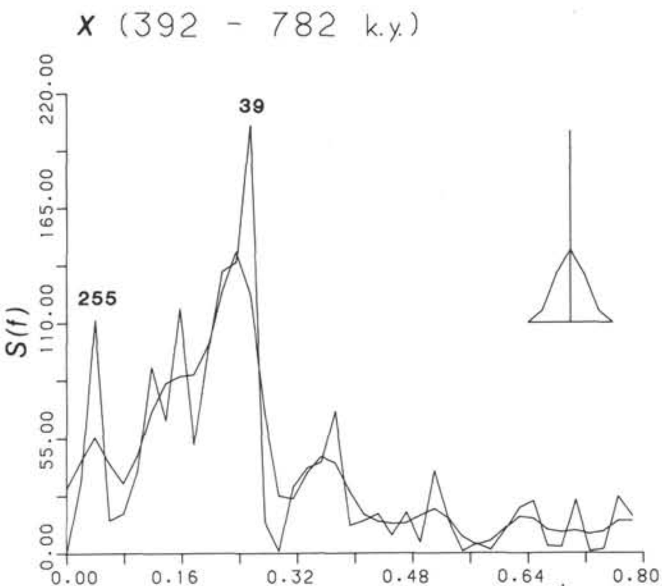


Figure 9. Spectral analyses of data discussed in text.

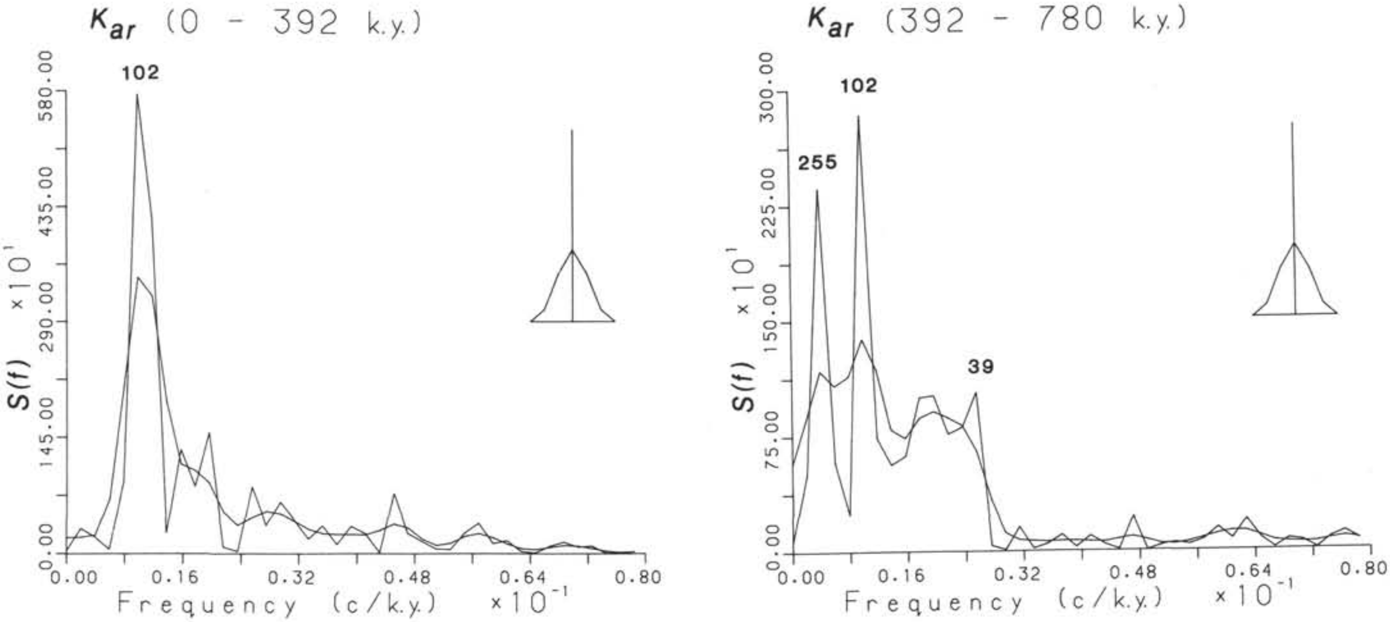


Figure 10. Spectral analyses of data discussed in text.

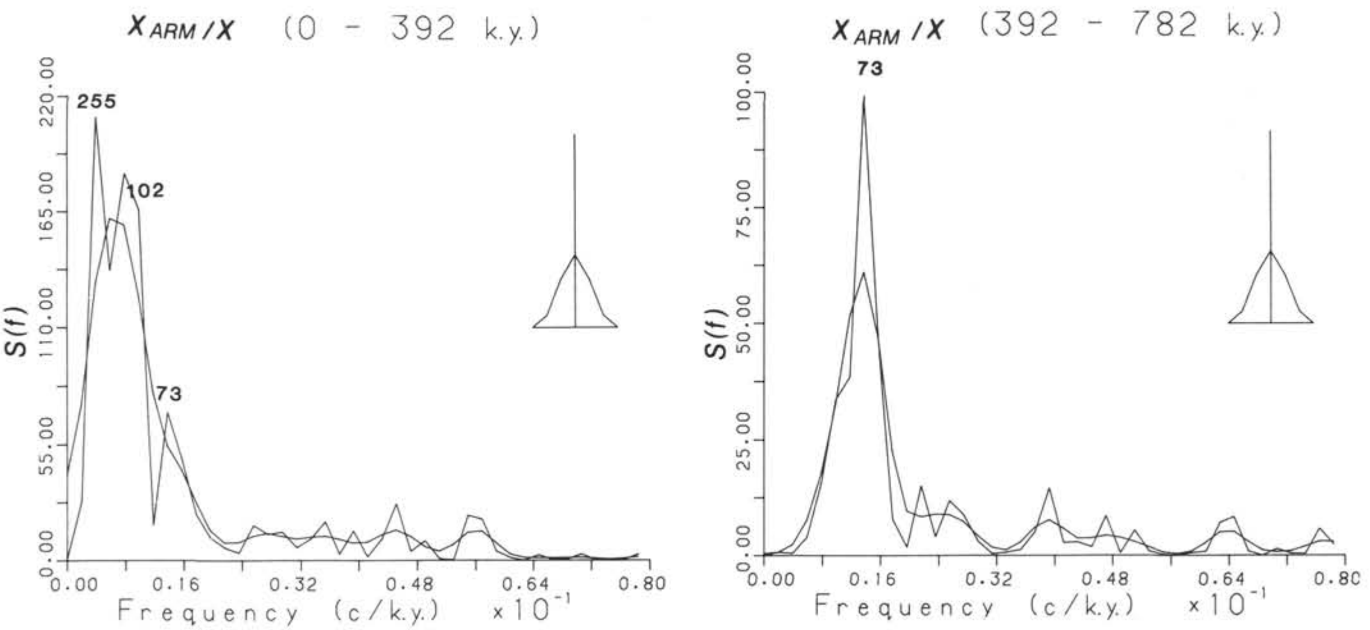


Figure 11. Spectral analyses of data discussed in text.

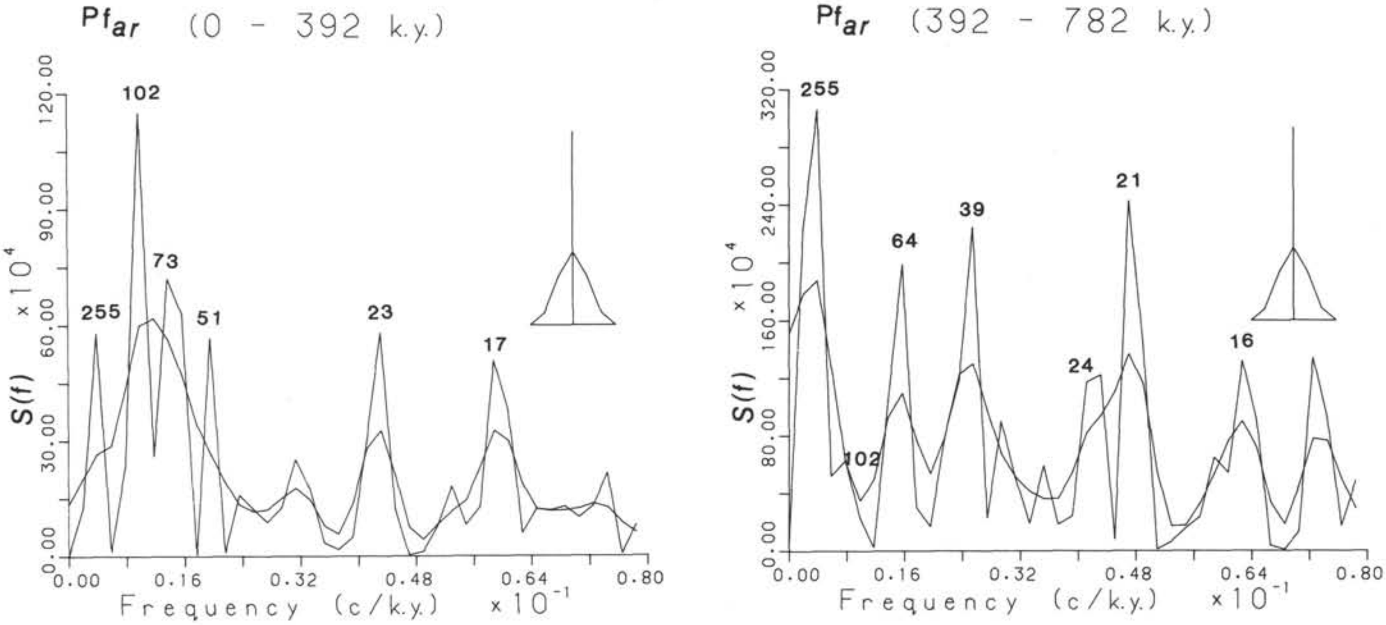


Figure 12. Spectral analyses of data discussed in text.

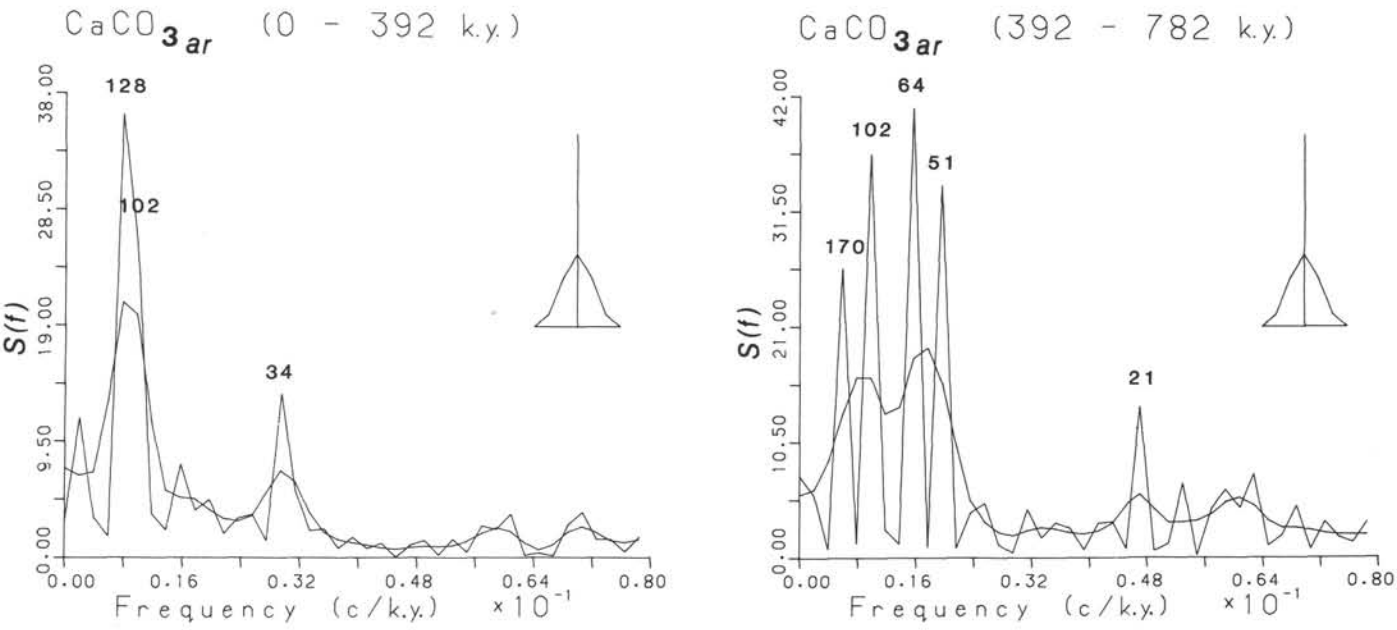


Figure 13. Spectral analyses of data discussed in text.

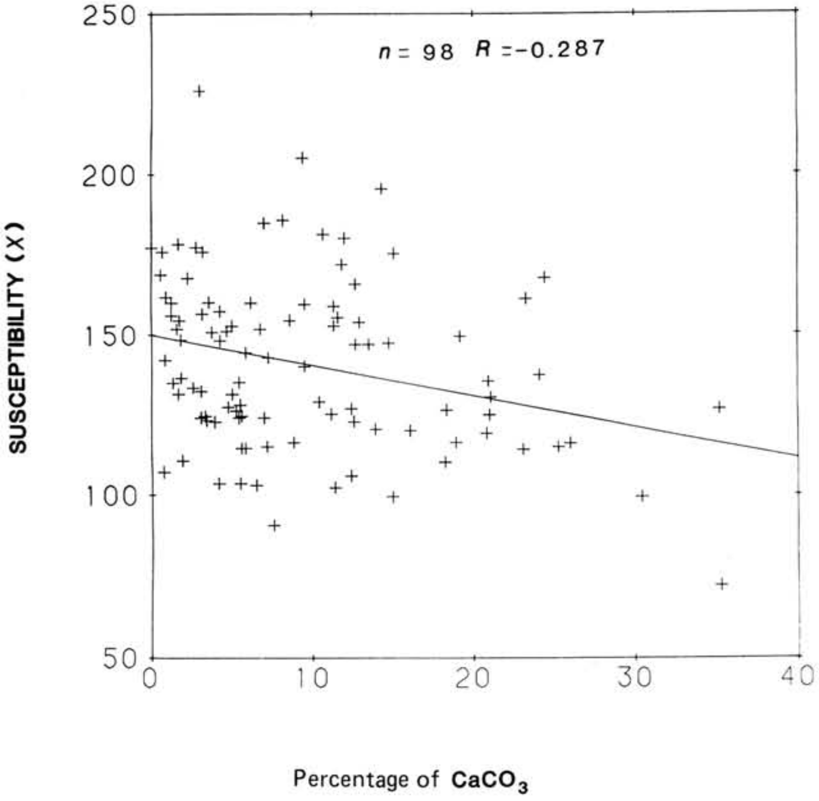


Figure 14: X vs. percentage of $CaCO_3$.

Appendix A
Percentages of $CaCO_3$, TOC, Nitrogen, and C/N ratio for Site 646.

Core, section depth (cm)				Depth (mbsf)	$CaCO_3$ (%)	TOC (%)	N (%)	C/N (%)
646A*	1H	1	0	0.00	35.25			
646A	1H	1	45	0.45	39.00	0.89	0.08	10.60
646A*	1H	1	92	0.92	26.00			
646A*	1H	1	127	1.27	7.00			
646A*	1H	2	7	1.57	8.17			
646A*	1H	2	53	2.03	2.75			
646A*	1H	2	110	2.60	25.25			
646A*	1H	3	5	3.05	6.50			
646A*	1H	3	46	3.46	18.33			
646A	1H	3	74	3.74	5.83			
646A*	1H	3	106	4.06	1.58			
646A*	1H	3	128	4.28	0.00			
646A*	1H	4	19	4.69	7.00			
646A	2H	1	74	5.74	6.92			
646A	2H	2	85	7.35	6.00			
646A	2H	2	122	7.72	7.00	0.42	0.03	15.05
646A	2H	3	20	8.20	11.00	0.54	0.03	19.29
646A	2H	3	59	8.59	9.00	0.47	0.03	16.61
646A	2H	3	74	8.74	10.00			
646A	2H	3	101	9.01	7.00	0.42	0.04	11.32
646A	2H	3	140	9.40	9.00	0.49	0.03	15.76
646A*	2H	4	15	9.65	11.42			
646A	2H	4	30	9.80	17.00	0.27	0.03	8.06
646A	2H	4	69	10.19	3.00	0.32	0.04	8.33
646A*	2H	4	97	10.47	1.67			
646A	2H	4	110	10.60	0.00	0.31	0.05	6.87
646A*	2H	4	134	10.84	0.58			
646A*	2H	5	15	11.15	0.83			
646A*	2H	5	34	11.34	5.42			
646A*	2H	5	67	11.67	5.25			
646A	2H	5	74	11.74	6.00			
646A*	2H	5	94	11.94	1.92			
646A*	2H	6	4	12.54	4.25			
646A*	2H	6	57	13.07	3.58			
646A*	2H	6	92	13.42	5.00			
646A*	2H	6	113	13.63	1.25			
646A*	2H	6	147	13.97	11.33			
646A*	2H	7	0	14.00	9.50			
646A	3H	1	108	17.58	3.00			
646A	3H	2	100	19.00	8.00	0.34	0.03	11.18
646A	3H	2	136	19.36	24.00	0.35	0.03	12.46
646A	3H	3	30	19.80	8.00	0.23	0.03	8.36
646A	3H	3	70	20.20	12.00	0.24	0.03	8.59
646A	3H	3	74	20.24	13.00			
646A	3H	3	110	20.60	8.00	0.22	0.03	7.26
646A*	3H	3	137	20.87	12.42			
646A	3H	3	149	20.99	29.00	0.37	0.03	10.82
646A	3H	4	3	21.03	40.00			
646A	3H	4	18	21.18	11.00			
646A*	3H	4	34	21.34	11.17			
646A	3H	4	36	21.36	6.00	0.34	0.04	8.06
646A*	3H	4	53	21.53	3.17			
646A	3H	4	82	21.82	6.00	0.29	0.03	9.09
646A*	3H	4	105	22.05	8.58			
646A	3H	4	116	22.16	9.00	0.37	0.04	9.51
646A*	3H	4	146	22.46	11.58			

Appendix A (continued)

Core, section depth (cm)				Depth (mbsf)	$CaCO_3$ (%)	TOC (%)	N (%)	C/N (%)
646A	3H	5	6	22.56	15.00	0.36	0.04	10.00
646A	3H	5	46	22.96	7.00	0.27	0.03	8.60
646A	3H	5	48	22.98	7.25			
646A	3H	5	83	23.33	10.00	0.20	0.03	7.62
646A	4H	1	140	27.60	13.83			
646A	4H	2	6	27.76	26.00	0.22	0.03	7.99
646A*	4H	2	42	28.12	20.83			
646A	4H	2	46	28.16	33.00	0.33	0.03	11.46
646A	4H	2	85	28.55	27.00	0.25	0.03	8.87
646A	4H	2	122	28.92	34.00	0.31	0.03	10.69
646A*	4H	2	146	29.16	30.42			
646A	4H	3	15	29.35	39.00	0.23	0.03	7.44
646A	4H	3	55	29.75	33.00	0.37	0.03	11.49
646A*	4H	3	70	29.90	24.42			
646A	4H	3	75	29.95	22.58			
646A	4H	3	94	30.14	17.00	0.33	0.03	11.00
646A*	4H	3	105	30.25	3.75			
646A	4H	3	135	30.55	19.00	0.48	0.04	12.06
646A*	4H	4	0	30.70	35.17			
646A	4H	4	25	30.95	36.00	0.31	0.03	10.37
646A	4H	4	65	31.35	22.00	0.35	0.03	11.04
646A	4H	4	105	31.75	29.00	0.23	0.02	9.31
646A	4H	4	146	32.16	16.00	0.31	0.03	9.75
646A*	4H	5	1	32.21	11.33			
646A*	4H	5	20	32.40	13.50			
646A*	4H	5	41	32.61	16.08			
646A	4H	5	74	32.94	17.00	0.58	0.05	11.74
646A	4H	5	75	32.95	14.92			
646A	4H	5	116	33.36	5.00	0.26	0.03	8.47
646A*	4H	5	132	33.52	0.67			
646A	4H	6	5	33.75	0.00	0.39	0.05	8.46
646A*	4H	6	25	33.95	2.25			
646A	4H	6	46	34.16	4.00	0.23	0.03	7.03
646A*	4H	6	60	34.30	1.25			
646A	4H	6	87	34.57	6.00	0.28	0.03	8.59
646A*	4H	6	100	34.70	4.75			
646A*	4H	6	113	34.83	3.92			
646A	4H	6	125	34.95	4.00	0.23	0.03	7.40
646A*	5H	1	0	35.80	12.58			
646A*	5H	1	20	36.00	13.92			
646A*	5H	1	60	36.40	18.25			
646A	5H	1	88	36.68	7.00	0.34	0.05	7.56
646A	5H	1	99	36.79	11.17			
646A	5H	1	125	37.05	9.00	0.41	0.05	8.12
646A	5H	2	1	37.31	8.00	0.34	0.04	8.34
646A	5H	2	17	37.47	10.00	0.41	0.04	9.51
646A	5H	2	44	37.74	2.00	0.37	0.04	8.40
646A	5H	2	55	37.85	21.00	0.25	0.03	9.09
646A	5H	2	82	38.12	4.00	0.36	0.04	9.03
646A	5H	2	94	38.24	13.00	0.33	0.04	7.52
646A	5H	2	120	38.50	6.00	0.27	0.03	8.21
646A	5H	2	136	38.66	16.00	0.37	0.05	8.28
646A	5H	3	8	38.88	4.00	0.35	0.05	6.70
646A	5H	3	25	39.05	12.00	0.50	0.06	8.56
646A	5H	3	50	39.30	7.00	0.42	0.04	9.72
646A	5H	3	66	39.46	15.00	0.52	0.06	8.93
646A	5H	3	79	39.59	12.17			

Appendix A (continued)

Core, section depth (cm)				Depth (mbsf)	$CaCO_3$ (%)	TOC (%)	N (%)	C/N (%)
646A	5H	3	91	39.71	12.00	0.30	0.04	8.10
646A	5H	3	106	39.86	20.00	0.48	0.04	11.01
646A	5H	3	131	40.11	6.00	0.35	0.04	9.74
646A	5H	3	143	40.23	19.00	0.36	0.04	9.13
646A	5H	4	17	40.47	0.00	0.23	0.03	8.43
646A	5H	4	36	40.66	22.00	0.38	0.04	9.78
646A	5H	4	60	40.90	3.00	0.26	0.04	6.11
646A	5H	4	75	41.05	20.00	0.35	0.04	9.44
646A	5H	4	99	41.29	27.00	0.41	0.04	10.65
646A	5H	4	114	41.44	13.00	0.37	0.04	9.48
646A	5H	4	138	41.68	9.00	0.28	0.02	14.06
646A	5H	4	149	41.79	5.00	0.32	0.03	11.05
646A	5H	5	28	42.08	20.00	0.27	0.02	12.44
646A*	5H	5	59	42.39	11.83			
646A	5H	5	69	42.49	7.00	0.17	0.01	16.42
646A	5H	5	74	42.54	9.67			
646A*	5H	5	89	42.69	9.50			
646A	5H	5	108	42.88	15.00	0.56	0.04	15.69
646A	5H	5	149	43.29	9.00	0.35	0.03	13.92
646A*	5H	6	0	43.30	20.92			
646A	5H	6	35	43.65	14.00	0.44	0.04	12.04
646A	5H	6	79	44.09	11.00	0.32	0.02	13.12
646A	5H	6	119	44.49	10.00	0.41	0.04	11.19
646A	5H	7	9	44.89	14.00	0.43	0.04	10.77
646A	6H	1	20	45.70	1.00	0.26	0.03	8.45
646A	6H	1	60	46.10	8.00	0.24	0.03	8.73
646A	6H	1	78	46.28	7.17			
646A	6H	1	100	46.50	3.00	0.26	0.03	9.53
646A	6H	1	140	46.90	3.00	0.38	0.04	9.21
646A	6H	2	10	47.10	37.00	0.31	0.01	21.19
646A	6H	2	30	47.30	0.00	0.36	0.03	10.67
646A	6H	2	71	47.71	1.00	0.31	0.03	9.05
646A	6H	2	109	48.09	0.00	0.26	0.03	9.31
646A	6H	2	149	48.49	0.00			
646A	6H	3	43	48.93	0.00	0.34	0.03	10.00
646A	6H	3	74	49.24	4.50			
646A	6H	3	80	49.30	2.70	0.31	0.03	8.92
646A	6H	3	120	49.70	0.00	0.29	0.03	8.86
646A*	6H	3	147	49.97	1.75			
646A	6H	4	10	50.10	0.00	0.39	0.05	8.55
646A	6H	4	50	50.50	0.00	0.26	0.03	8.49
646A*	6H	4	56	50.56	3.33			
646A*	6H	4	75	50.75	12.67			
646A	6H	4	91	50.91	10.00	0.27	0.03	8.32
646A	6H	4	131	51.31	8.00	0.21	0.02	8.80
646A*	6H	5	0	51.50	10.67			
646A	6H	5	20	51.70	10.00	0.33	0.03	10.97
646A	6H	5	63	52.13	1.00	0.24	0.02	12.03
646A	6H	5	90	52.40	12.17			
646A	6H	5	101	52.51	9.00	0.42	0.04	10.43
646A*	6H	5	113	52.63	12.67			
646A	6H	5	141	52.91	8.00	0.42	0.04	10.65
646A	6H	6	31	53.31	7.00	0.33	0.04	9.20
646A	6H	6	70	53.70	6.00	0.36	0.03	11.20
646A	6H	6	113	54.13	9.00	0.45	0.04	11.02
646A	6H	6	149	54.49	6.00	0.37	0.04	9.85
646A	6H	7	35	54.85	0.00	0.19	0.03	7.11

Appendix A (continued)

Core, section depth (cm)				Depth (mbsf)	$CaCO_3$ (%)	TOC (%)	N (%)	C/N (%)
646A	7H	1	5	55.15	5.00	0.37	0.04	9.57
646A	7H	1	45	55.55	27.00	0.47	0.04	11.66
646A	7H	1	49	55.59	15.17			
646A	7H	2	95	57.55	6.00	0.25	0.03	9.42
646A	7H	2	135	57.95	5.00	0.23	0.03	8.72
646A	7H	3	13	58.23	7.00	0.21	0.03	6.93
646A	7H	3	54	58.64	6.00	0.20	0.03	7.60
646A	7H	3	74	58.84	2.83			
646A	7H	3	74	58.84	2.83			
646A	7H	3	94	59.04	17.00	0.26	0.04	7.22
646A	7H	3	94	59.04	17.00	0.26	0.04	7.22
646A	7H	3	138	59.48	16.00	0.23	0.02	10.53
646A	7H	3	138	59.48	16.00	0.23	0.02	10.53
646A*	7H	4	15	59.75	15.08			
646A*	7H	4	33	59.93	14.75			
646A	7H	4	36	59.96	9.00	0.22	0.02	11.32
646A	7H	4	36	59.96	9.00	0.22	0.02	11.32
646A*	7H	4	54	60.14	4.17			
646A	7H	4	75	60.35	6.00	0.31	0.03	9.19
646A	7H	4	75	60.35	6.00	0.31	0.03	9.19
646A	7H	4	115	60.75	7.00	0.20	0.02	8.64
646A	7H	4	115	60.75	7.00	0.20	0.02	8.64
646A*	7H	4	128	60.88	6.17			
646A	7H	5	4	61.14	7.00	0.32	0.03	10.60
646A	7H	5	4	61.14	7.00	0.32	0.03	10.60
646A*	7H	5	36	61.46	6.75			
646A	7H	5	47	61.57	7.00	0.25	0.02	9.98
646A	7H	5	47	61.57	7.00	0.25	0.02	9.98
646A	7H	5	84	61.94	20.00	0.29	0.03	8.58
646A	7H	5	84	61.94	20.00	0.29	0.03	8.58
646A*	7H	5	87	61.97	21.00			
646A	7H	5	125	62.35	5.00	0.36	0.03	12.89
646A	7H	5	125	62.35	5.00	0.36	0.03	12.89
646A*	7H	6	4	62.64	5.83			
646A	7H	6	14	62.74	9.00	0.21	0.03	6.99
646A	7H	6	14	62.74	9.00	0.21	0.03	6.99
646A*	7H	6	44	63.04	24.08			
646A	7H	6	54	63.14	6.00	0.20	0.03	7.60
646A	7H	6	54	63.14	4.00	0.22	0.03	6.90
646A	7H	6	94	63.54	26.00	0.16	0.02	7.28
646A	7H	6	137	63.97	6.00	0.22	0.02	8.90
646A	7H	7	13	64.23	1.25			
646A	7H	7	23	64.33	0.00	0.24	0.02	10.56
646A	7H	7	56	64.66	0.00	0.25	0.03	9.96
646A	8H	1	75	65.55	1.58			
646A	8H	3	75	68.55	2.42			
646A	8H	5	75	71.55	8.08			
646A	9H	1	75	75.15	12.00			
646A	9H	3	75	78.15	30.00			
646A	9H	5	75	81.15	14.00			
646A	10H	1	131	85.41	1.67			
646A	10H	3	73	87.83	4.50			
646A	10H	5	74	90.84	2.08			
646A	11H	1	75	94.55	1.08			
646A	11H	3	75	97.55	4.92			
646A	11H	5	75	100.55	4.17			
646B	1H	1	39	0.39	0.80	0.36	0.03	10.64

Appendix A (continued)

Core, section depth (cm)				Depth (mbsf)	$CaCO_3$ (%)	TOC (%)	N (%)	C/N (%)
646B	1H	1	80	0.80	5.60	0.31	0.02	13.70
646B	1H	1	88	0.88	5.60			
646B	1H	1	120	1.20	3.00	0.30	0.03	11.85
646B	1H	2	8	1.58	0.00	0.40	0.03	13.36
646B	1H	2	50	2.00	3.00	0.37	0.04	10.40
646B	1H	2	90	2.40	1.00	0.35	0.04	9.14
646B	1H	2	130	2.80	8.00	0.43	0.04	11.07
646B	1H	3	20	3.20	8.00	0.41	0.04	10.20
646B*	1H	3	51	3.51	15.00			
646B	1H	3	60	3.60	11.00	0.56	0.04	12.65
646B	1H	3	70	3.70	6.00			
646B	1H	3	100	4.00	3.00	0.36	0.03	10.43
646B	1H	3	140	4.40	15.00	0.24	0.02	10.50
646B	1H	4	30	4.80	29.00	0.29	0.02	12.32
646B*	1H	4	60	5.10	3.08			
646B*	1H	4	82	5.32	7.58			
646B*	1H	4	116	5.66	8.83			
646B*	1H	5	10	6.10	10.42			
646B*	1H	5	50	6.50	5.00			
646B	1H	5	75	6.75	6.67			
646B*	1H	5	94	6.94	1.83			
646B	1H	5	120	7.20	0.00	0.46	0.05	9.29
646B*	1H	5	148	7.48	0.92			
646B*	1H	6	60	8.10	5.58			
646B	1H	6	90	8.40	1.30	0.48	0.04	11.69
646B	1H	6	130	8.80	12.70	0.30	0.03	9.93
646B*	1H	6	137	8.87	5.83			
646B	2H	1	60	9.60	11.80	0.38	0.04	8.90
646B	2H	1	100	10.00	0.00	0.40	0.04	9.18
646B	2H	1	113	10.13	0.00			
646B	2H	1	140	10.40	4.00	0.34	0.04	8.30
646B	2H	2	30	10.80	0.00	0.50	0.05	10.66
646B	2H	2	70	11.20	7.00	0.47	0.04	10.64
646B	2H	2	110	11.60	10.00	0.34	0.04	9.37
646B	2H	3	0	12.00	10.00	0.25	0.03	8.90
646B	2H	3	39	12.39	0.00	0.39	0.05	8.40
646B*	2H	3	50	12.50	1.33			
646B*	2H	3	70	12.70	1.83			
646B	2H	3	79	12.79	0.00	0.51	0.06	9.25
646B	2H	3	84	12.84	5.00			
646B*	2H	3	90	12.90	7.17			
646B	2H	3	121	13.21	25.00	0.44	0.04	11.58
646B*	2H	3	130	13.30	23.08			
646B	2H	4	9	13.59	26.00	0.30	0.03	11.68
646B*	2H	4	30	13.80	23.25			
646B	2H	4	50	14.00	12.00	0.43	0.03	15.44
646B*	2H	4	51	14.01	1.67			
646B	2H	4	90	14.40	18.00	0.28	0.02	12.23
646B	3H	1	2	14.42	5.00	0.54	0.04	12.70
646B	2H	4	130	14.80	6.40	0.38	0.04	10.19
646B	3H	1	42	14.82	2.00			
646B	2H	5	20	15.20	35.00	0.27	0.03	10.58
646B	3H	1	82	15.22	0.00	0.39	0.04	9.05
646B	3H	1	93	15.33	0.00			
646B	2H	5	60	15.60	0.00	0.30	0.03	10.88
646B	3H	1	122	15.62	0.00	0.44	0.05	8.69
646B	2H	5	67	15.67	7.00			

Appendix A (continued)

Core, section depth (cm)				Depth (mbsf)	$CaCO_3$ (%)	TOC (%)	N (%)	C/N (%)
646B	2H	5	100	16.00	3.00	0.39	0.04	10.24
646B	3H	2	12	16.02	3.00	0.53	0.05	10.51
646B*	3H	2	20	16.10	5.42			
646B	2H	5	140	16.40	7.00	0.27	0.03	9.32
646B	3H	2	52	16.42	3.00	0.48	0.05	8.76
646B*	3H	2	60	16.50	3.42			
646B	2H	6	30	16.80	6.00	0.27	0.04	6.44
646B	3H	2	92	16.82	0.00	0.61	0.06	10.91
646B*	3H	2	120	17.10	4.67			
646B*	2H	6	60	17.10	3.08			
646B	3H	2	132	17.22	1.00	0.45	0.04	11.11
646B*	3H	3	20	17.60	3.17			
646B	3H	3	22	17.62	0.00	0.46	0.04	10.39
646B	3H	3	62	18.02	0.00	0.27	0.03	8.56
646B	3H	3	74	18.14	0.00			
646B	3H	3	102	18.42	0.00			
646B	3H	3	142	18.82	0.00	0.33	0.03	10.07
646B	3H	4	32	19.22	4.00	0.27	0.03	8.04
646B*	3H	4	40	19.30	5.50			
646B*	3H	4	60	19.50	5.58			
646B	3H	4	72	19.62	9.00	0.39	0.04	10.59
646B*	3H	4	100	19.90	21.08			
646B	3H	4	112	20.02	12.00	0.32	0.03	11.06
646B*	3H	4	122	20.12	14.33			
646B	3H	5	2	20.42	3.00	0.35	0.03	11.15
646B	3H	5	42	20.82	12.00	0.41	0.04	10.48
646B	3H	5	58	20.98	8.00			
646B	3H	5	87	21.27	6.00	0.29	0.03	11.18
646B*	3H	5	100	21.40	2.58			
646B	3H	6	7	21.97	0.00	0.39	0.05	7.26
646B	3H	6	47	22.37	2.00			
646B	3H	6	87	22.77	3.00	0.27	0.03	8.59
646B	3H	6	127	23.17	3.00	0.25	0.03	7.97
646B	3H	7	17	23.57	5.00	0.26	0.03	9.26
646B*	3H	7	40	23.80	12.42			
646B	4H	1	2	24.12	8.00	0.47	0.03	13.85
646B*	4H	1	33	24.43	12.00			
646B	4H	1	40	24.50	12.00	0.34	0.03	10.38
646B	4H	1	50	24.60	8.30			
646B*	4H	1	73	24.83	5.50			
646B	4H	1	80	24.90	1.00	0.41	0.04	10.62
646B*	4H	1	93	25.03	7.25			
646B	4H	1	120	25.30	0.00			
646B*	4H	2	0	25.60	0.75			
646B	4H	2	9	25.69	0.00	0.47	0.05	10.08
646B	4H	2	50	26.10	10.00	0.23	0.02	10.32
646B	4H	2	91	26.51	10.00	0.29	0.03	10.19
646B*	4H	2	110	26.70	3.00			
646B	4H	2	130	26.90	5.00	0.34	0.03	10.39
646B	4H	3	29	27.39	4.00	0.30	0.03	9.68
646B	4H	3	70	27.80	6.00			
646B	4H	3	74	27.84	0.00			
646B	4H	3	109	28.19	7.00	0.26	0.03	9.10
646B*	4H	3	126	28.36	4.25			
646B	4H	4	1	28.61	7.00	0.24	0.03	8.70
646B	4H	4	40	29.00	19.00	0.28	0.03	10.05
646B*	4H	4	50	29.10	19.17			

Appendix A (continued)

Core, section depth (cm)				Depth (mbsf)	$CaCO_3$ (%)	TOC (%)	N (%)	C/N (%)
646B	4H	4	80	29.40	29.00	0.24	0.03	8.65
646B	4H	4	120	29.80	24.00	0.39	0.03	11.69
646B*	4H	4	130	29.90	18.92			
646B	4H	5	10	30.20	17.00	0.27	0.03	8.01
646B	4H	5	25	30.35	25.42			
646B	5H	1	0	33.80	9.00			
646B	5H	1	40	34.20	12.00	0.57	0.06	10.01
646B	5H	1	74	34.54	11.30			
646B	5H	1	80	34.60	16.00	0.50	0.05	10.82
646B	5H	1	120	35.00	0.00	0.59	0.03	20.62
646B	5H	2	10	35.40	0.00	0.41	0.03	12.89
646B	5H	2	51	35.81	0.00	0.38	0.03	12.24
646B	5H	2	91	36.21	0.00	0.47	0.04	11.24
646B	5H	2	131	36.61	0.00	0.24	0.02	11.56
646B	5H	3	29	37.09	22.00	0.43	0.03	17.16
646B	5H	3	70	37.50	19.00	0.55	0.03	16.72
646B	5H	3	74	37.54	22.00			
646B	5H	3	110	37.90	32.00	0.53	0.02	21.43
646B	5H	3	149	38.29	5.00	0.55	0.04	14.66
646B	6H	1	95	44.35	14.00	0.92	0.05	19.50
646B	6H	1	99	44.39	10.20			
646B	6H	1	145	44.85	6.00	0.56	0.04	14.30
646B	6H	2	30	45.20	10.00	0.90	0.05	19.50
646B	6H	2	71	45.61	9.00	0.24	0.03	7.52
646B	6H	2	110	46.00	11.00	0.22	0.03	7.86
646B	6H	3	1	46.41	13.00	0.27	0.03	10.40
646B	6H	3	53	46.93	30.00	0.28	0.03	10.65
646B	6H	3	75	47.15	14.00			
646B	6H	3	91	47.31	14.00	0.24	0.02	11.34
646B	6H	3	130	47.70	13.00	0.18	0.02	8.23
646B	6H	4	19	48.09	10.00	0.24	0.03	9.40
646B*	6H	4	30	48.20	9.42			
646B	6H	4	58	48.48	11.00	0.38	0.03	12.24
646B	6H	4	100	48.90	9.00	0.19	0.02	8.41
646B	6H	5	29	49.69	7.00	0.33	0.04	8.80
646B*	6H	5	60	50.00	12.92			
646B	6H	5	70	50.10	8.00	0.23	0.03	9.00
646B	6H	5	75	50.15	6.90			
646B	6H	5	110	50.50	4.00	0.22	0.03	7.21
646B	6H	5	149	50.89	8.00	0.35	0.03	10.42
646B	6H	6	40	51.30	0.00	0.37	0.04	9.57
646B	6H	6	80	51.70	5.00	0.40	0.03	14.50
646B	6H	6	120	52.10	10.00	0.31	0.04	8.67
646B	9H	1	85	73.25	13.00			
646B	9H	3	69	76.09	0.00			
646B	9H	5	74	79.14	0.00			
646B	10H	1	95	82.95	11.00			
646B	10H	3	74	85.74	17.00			
646B	10H	5	74	88.74	6.00			
646B	11H	1	104	92.74	1.10			
646B	11H	3	74	95.44	0.00			
646B	11H	5	69	98.39	0.00			
646B	12H	1	71	102.11	5.20			
646B	12H	3	62	105.02	5.00			
646B	12H	5	87	108.27	10.00			
646B	13H	1	75	111.85	16.00			
646B	13H	3	75	114.85	6.00			

Appendix A (continued)

Core, section depth (cm)				Depth (mbsf)	$CaCO_3$ (%)	TOC (%)	N (%)	C/N (%)
646B	13H	5	75	117.85	15.00			
646B	14H	1	75	121.55	10.00			
646B	14H	3	71	124.51	0.00			
646B	14H	5	76	127.56	7.30			
646B	16X	1	28	140.38	10.92			
646B	17X	1	10	149.90	16.68			
646B	18X	1	129	160.39	0.00			
646B	18X	3	75	162.85	0.00			
646B	20X	1	74	179.24	10.00			
646B	20X	3	75	182.25	5.00			
646B	20X	5	69	185.19	21.00			
646B	21X	1	98	189.18	0.00			
646B	21X	3	60	191.80	0.00			
646B	21X	4	70	193.40	0.00			
646B	22X	1	90	198.70	0.00			
646B	22X	6	75	206.05	0.00			
646B	23X	1	73	208.23	0.00			
646B	23X	2	69	209.69	9.00			
646B	23X	3	73	211.23	0.00			
646B	26X	1	84	236.94	6.40			
646B	26X	3	83	239.93	8.00			
646B	26X	5	75	242.85	0.00			
646B	29X	1	71	266.01	0.00			
646B	29X	5	77	272.07	9.00			
646B	30X	1	72	275.72	12.00			
646B	30X	3	79	278.79	0.30			
646B	30X	5	81	281.81	0.00			
646B	31X	1	76	285.46	7.00			
646B	31X	3	76	288.46	9.00			
646B	31X	5	56	291.26	0.80			
646B	32X	1	74	295.14	0.00			
646B	32X	3	60	298.00	1.00			
646B	33X	2	96	306.56	4.10			
646B	33X	4	104	309.64	0.00			
646B	35X	2	75	325.65	3.40			
646B	36X	3	91	337.01	5.00			
646B	36X	5	77	339.87	0.00			
646B	37X	1	69	343.49	3.00			
646B	37X	3	85	346.65	13.00			
646B	37X	5	71	349.51	3.00			
646B	38X	1	30	352.70	8.00			
646B	38X	3	68	356.08	3.60			
646B	38X	5	84	359.24	12.00			
646B	39X	1	70	362.70	18.00			
646B	39X	3	70	365.70	3.00			
646B	39X	5	70	368.70	6.00			
646B	40X	1	75	372.45	8.17			
646B	40X	3	85	375.55	4.00			
646B	40X	6	101	380.21	12.00			
646B	41X	2	79	383.59	21.00			
646B	41X	4	76	386.56	9.00			
646B	42X	2	94	393.44	3.00			
646B	42X	5	98	397.98	15.00			
646B	43X	3	36	404.06	8.60			
646B	46X	1	67	430.47	8.80			
646B	47X	1	64	440.14	15.00			
646B	48X	1	100	450.10	28.00			

Appendix A (continued)

Core, section depth (cm)				Depth (mbsf)	$CaCO_3$ (%)	TOC (%)	N (%)	C/N (%)
646B	49X	2	50	460.80	25.00			
646B	50X	3	33	471.83	21.00			
646B	51X	1	124	479.34	1.70			
646B	55X	2	98	518.98	4.00			
646B	56X	1	139	528.09	4.58			
646B	57X	3	76	539.56	7.00			
646B	58X	1	146	546.96	0.00			
646B	60X	2	25	566.15	0.00			
646B	61X	1	127	575.27	0.00			
646B	62X	1	54	584.14	21.67			
646B	65X	1	140	613.90	7.00			
646B	65X	4	143	618.43	16.00			
646B	66X	3	28	625.48	6.50			
646B	67X	2	38	633.68	0.00			
646B	68X	2	107	643.87	4.60			
646B	69X	1	105	651.95	22.58			
646B	71X	1	118	671.38	5.00			
646B	71X	5	95	677.15	4.00			
646B	73X	1	94	690.24	19.00			
646B	73X	2	66	691.46	33.00			
646B	74X	3	59	702.59	4.00			
646B	75X	2	50	710.60	0.50			
646B	75X	4	96	714.06	0.00			
646B	76X	2	93	720.73	1.10			
646B	77X	4	133	733.73	4.00			
646B	78X	2	1	739.21	0.60			
646B	79X	1	128	748.68	0.00			

TOC = total organic carbon; C/N = ratio of carbon to nitrogen.
Samples with * also were measured for magnetic susceptibility.

Appendix B
Rock-magnetic data collected for Site 646

Core, section depth (cm)	Depth (mbsf)	Mass (g)	X $(10^{-6}m^3/kg)$	X_{ARM} $(10^{-6}m^3/kg)$	X_{ARM}/X	SIRM (mA/m·kg)	HIRM (mA/m·kg)	S
646A 1H 1 0	0.00	6.88	71.94	7518.33	104.50	29.89	5.99	0.997
646A 1H 1 10	0.10	6.14	79.18	8739.95	110.38	31.05	111.74	0.956
646A 1H 1 47	0.47	6.11	72.37	7882.50	108.91	28.26	73.66	0.968
646A 1H 1 92	0.92	6.98	116.09	12886.06	111.00	43.95	73.80	0.977
646A 1H 1 110	1.10	6.98	145.43	14494.75	99.67	50.24	56.24	0.984
646A 1H 1 127	1.27	7.09	184.63	14916.44	80.79	58.86	65.70	0.984
646A 1H 1 148	1.48	6.89	180.69	15809.82	87.50	59.71	80.62	0.981
646A 1H 1 148	1.48	7.30	176.22	15752.05	89.39	60.13	74.04	0.982
646A 1H 2 7	1.57	7.21	185.74	16968.16	91.35	64.49	94.14	0.979
646A 1H 2 53	2.03	6.40	177.25	15795.58	89.11	51.60	71.41	0.982
646A 1H 2 110	2.60	8.88	114.88	5351.23	46.58	22.08	25.83	0.979
646A 1H 2 130	2.80	6.87	131.11	16336.92	124.60	41.60	36.49	0.988
646A 1H 2 142	2.92	6.64	110.49	15291.06	138.39	36.15	92.77	0.966
646A 1H 2 142	2.92	7.08	111.97	15375.61	137.32	39.26	97.47	0.965
646A 1H 3 5	3.05	7.54	102.97	12305.35	119.51	34.05	19.12	0.992
646A 1H 3 30	3.30	6.79	103.43	13053.67	126.21	33.66	78.75	0.968
646A 1H 3 46	3.46	6.85	126.18	15843.63	125.57	44.59	101.76	0.969
646A 1H 3 77	3.77	6.48	147.54	18983.42	128.67	52.49	131.15	0.968
646A 1H 3 89	3.89	6.07	147.57	18717.14	126.84	48.64	130.57	0.967
646A 1H 3 106	4.06	6.26	151.92	19689.50	129.61	53.16	157.39	0.963
646A 1H 3 128	4.28	6.44	177.13	20362.88	114.96	60.20	167.55	0.964
646A 1H 3 128	4.28	6.72	177.04	20802.49	117.50	64.64	152.96	0.968
646A 1H 4 5	4.55	6.74	138.12	17391.63	125.92	52.59	82.95	0.979
646A 1H 4 19	4.69	6.86	123.80	15518.31	125.35	48.49	82.12	0.977
646A 1H 4 25	4.75	6.10	94.74	12223.21	129.02	34.90	158.94	0.944
646A 1H 4 25	4.75	6.41	96.43	12505.00	129.68	37.02	127.04	0.956
646A 2H 1 0	5.00	7.35	179.13	14841.88	82.86	62.80	97.62	0.977
646A 2H 1 17	5.17	5.82	162.54	14546.31	89.49	43.49	118.17	0.968
646A 2H 1 36	5.36	7.09	185.16	16513.63	89.18	60.32	100.15	0.976
646A 2H 1 63	5.63	4.81	189.62	16780.89	88.50	41.18	117.66	0.973
646A 2H 1 77	5.77	6.82	192.31	16531.89	85.96	57.59	107.51	0.975
646A 2H 1 92	5.92	6.92	173.92	16087.66	92.50	56.58	92.60	0.977
646A 2H 1 115	6.15	7.24	164.32	17754.87	108.05	53.64	72.07	0.981
646A 2H 1 115	6.15	6.81	165.66	17572.26	106.07	51.57	80.27	0.979
646A 2H 2 0	6.50	6.76	124.51	14094.91	113.20	38.33	68.49	0.976
646A 2H 2 18	6.68	6.30	103.29	14261.19	138.06	30.18	52.23	0.978
646A 2H 2 35	6.85	6.73	107.15	14431.37	134.69	32.41	53.77	0.978
646A 2H 2 57	7.07	6.95	136.84	17337.23	126.70	50.39	92.22	0.975
646A 2H 2 115	7.65	6.38	107.12	17083.06	159.48	31.49	107.03	0.957
646A 2H 2 137	7.87	7.42	152.21	17230.02	113.20	45.57	86.01	0.972
646A 2H 2 137	7.87	7.17	162.07	19575.21	120.78	46.89	96.84	0.970
646A 2H 3 0	8.00	7.32	138.16	16093.83	116.49	43.70	71.73	0.976
646A 2H 3 28	8.28	6.89	135.11	17880.77	132.34	45.97	165.61	0.950
646A 2H 3 71	8.71	7.02	129.03	17914.89	138.84	45.45	152.33	0.953
646A 2H 3 96	8.96	7.01	105.20	13489.88	128.23	33.04	72.35	0.969
646A 2H 3 113	9.13	6.69	119.43	14186.78	118.79	34.52	92.55	0.964
646A 2H 3 135	9.35	6.52	134.88	16951.71	125.68	44.88	124.64	0.964
646A 2H 3 135	9.35	7.19	126.33	15364.90	121.63	44.14	101.04	0.967
646A 2H 4 0	9.50	6.91	118.17	13991.52	118.40	40.65	27.71	0.991
646A 2H 4 15	9.65	6.22	102.20	11069.82	108.32	29.16	24.73	0.989
646A 2H 4 34	9.84	7.19	121.78	15242.07	125.16	45.91	51.48	0.984
646A 2H 4 57	10.07	6.60	141.62	16011.31	113.06	53.82	88.59	0.978
646A 2H 4 97	10.47	7.22	131.20	17276.31	131.68	50.30	84.16	0.976
646A 2H 4 115	10.65	6.36	128.99	15402.48	119.41	40.48	55.79	0.982
646A 2H 4 134	10.84	6.81	168.80	21132.65	125.20	62.23	86.27	0.981
646A 2H 4 134	10.84	7.45	162.39	20515.33	126.33	66.05	89.40	0.980

Appendix B (continued)

Core, section depth (cm)	Depth (mbsf)	Mass (g)	X ($10^{-6}m^3/kg$)	X_{ARM} ($10^{-6}m^3/kg$)	X_{ARM}/X	SIRM (mA/m·kg)	HIRM (mA/m·kg)	S
646A 2H 5 3	11.03	7.03	178.35	21323.72	119.56	69.31	106.77	0.978
646A 2H 5 15	11.15	7.12	142.04	17900.25	126.02	54.62	99.05	0.974
646A 2H 5 34	11.34	6.89	135.11	17166.20	127.05	51.31	97.96	0.974
646A 2H 5 45	11.45	7.13	118.76	15595.69	131.32	48.78	97.55	0.971
646A 2H 5 67	11.67	6.85	125.99	15788.98	125.31	50.04	120.16	0.967
646A 2H 5 94	11.94	6.19	110.61	14493.92	131.04	41.35	117.94	0.965
646A 2H 5 94	11.94	6.73	112.93	14598.44	129.26	45.50	117.05	0.965
646A 2H 6 4	12.54	5.57	148.18	16798.53	113.36	44.65	110.49	0.972
646A 2H 6 34	12.84	6.69	148.73	15682.67	105.45	54.01	127.85	0.968
646A 2H 6 57	13.07	6.51	160.17	17108.97	106.82	57.36	115.84	0.974
646A 2H 6 92	13.42	5.90	131.16	15906.23	121.27	36.74	74.62	0.976
646A 2H 6 113	13.63	6.18	156.12	20152.14	129.08	50.01	102.24	0.975
646A 2H 6 147	13.97	5.13	152.81	18650.27	122.05	37.96	88.57	0.976
646A 2H 6 147	13.97	5.89	140.99	16699.16	118.45	39.74	75.69	0.978
646A 2H 7 0	14.00	6.46	140.02	16422.67	117.29	42.88	74.95	0.977
646A 2H 7 20	14.20	6.54	141.76	17924.10	126.44	47.24	91.07	0.975
646A 2H 7 31	14.31	6.24	137.51	17111.80	124.44	43.41	88.31	0.975
646A 2H 7 31	14.31	5.85	138.08	17799.25	128.90	40.84	98.71	0.972
646A 3H 1 26	16.76	7.56	197.08	15903.24	80.69	72.28	22.91	0.995
646A 3H 1 68	17.18	7.89	181.04	18089.53	99.92	67.21	49.35	0.988
646A 3H 1 84	17.34	7.16	215.99	18950.72	87.74	68.44	70.03	0.985
646A 3H 1 120	17.70	8.48	125.04	11905.49	95.22	44.39	57.50	0.978
646A 3H 1 146	17.96	6.58	114.55	14477.78	126.38	34.03	54.60	0.979
646A 3H 1 146	17.96	6.66	106.20	13515.78	127.27	32.05	55.80	0.977
646A 3H 2 7	18.07	6.30	112.27	13843.62	123.31	31.08	66.48	0.973
646A 3H 2 28	18.28	6.91	107.45	15132.65	140.84	33.92	64.13	0.974
646A 3H 2 66	18.66	6.55	85.93	12342.25	143.64	27.10	56.77	0.973
646A 3H 2 97	18.97	6.75	156.34	19768.10	126.45	51.99	97.00	0.975
646A 3H 2 132	19.32	7.88	128.98	14553.41	112.84	44.52	80.03	0.972
646A 3H 3 8	19.58	6.27	157.09	19199.87	122.23	45.05	114.04	0.968
646A 3H 3 46	19.96	7.22	142.68	15443.91	108.24	40.99	87.12	0.969
646A 3H 3 72	20.22	6.79	122.48	16380.13	133.73	42.85	61.35	0.981
646A 3H 3 107	20.57	6.48	145.02	18761.44	129.38	51.67	162.04	0.959
646A 3H 3 137	20.87	6.76	126.56	16196.92	127.98	46.77	126.81	0.963
646A 3H 3 137	20.87	6.11	127.48	16980.77	133.20	42.22	142.03	0.959
646A 3H 4 34	21.34	6.73	124.88	14951.06	119.72	47.93	74.07	0.979
646A 3H 4 53	21.53	6.67	175.92	20927.16	118.96	60.69	137.52	0.970
646A 3H 4 85	21.85	6.47	152.23	19515.66	128.20	48.80	42.78	0.989
646A 3H 4 105	22.05	6.32	154.65	19818.04	128.15	50.48	30.21	0.992
646A 3H 4 146	22.46	6.36	155.45	19036.61	122.46	54.50	47.00	0.989
646A 3H 4 146	22.46	7.22	161.99	19510.64	120.44	65.42	58.20	0.987
646A 3H 5 0	22.50	6.37	173.95	20928.03	120.31	61.45	67.68	0.986
646A 3H 5 78	23.28	5.17	172.53	15291.34	88.63	46.88	74.87	0.983
646A 4H 1 4	26.24	6.68	146.50	17690.06	120.75	47.03	38.41	0.989
646A 4H 1 20	26.40	6.01	134.62	17612.81	130.84	40.59	49.50	0.985
646A 4H 1 44	26.64	6.64	112.57	12742.55	113.19	35.01	48.16	0.982
646A 4H 1 70	26.90	7.03	110.80	12684.58	114.49	38.95	48.58	0.982
646A 4H 1 90	27.10	6.97	125.81	14014.33	111.39	41.24	74.24	0.975
646A 4H 1 108	27.28	7.06	117.09	13059.67	111.54	38.12	45.17	0.983
646A 4H 1 146	27.66	6.72	143.76	17503.07	121.75	46.14	29.02	0.992
646A 4H 1 146	27.66	7.07	143.75	17631.83	122.65	49.26	51.30	0.985
646A 4H 2 0	27.70	6.22	121.59	16064.65	132.12	39.46	17.32	0.995
646A 4H 2 20	27.90	6.04	113.36	14540.63	128.27	37.61	48.13	0.985
646A 4H 2 42	28.12	7.01	119.18	14494.91	121.63	45.28	47.11	0.985
646A 4H 2 79	28.49	6.82	137.42	15377.29	111.90	46.22	49.84	0.985
646A 4H 2 100	28.70	6.68	103.44	13185.50	127.47	32.36	27.29	0.989
646A 4H 2 146	29.16	6.55	99.35	12402.85	124.84	32.98	34.66	0.986

Appendix B (continued)

Core, section depth (cm)				Depth (mbsf)	Mass (g)	X ($10^{-6}m^3/kg$)	X_{ARM} ($10^{-6}m^3/kg$)	X_{ARM}/X	SIRM (mA/m·kg)	HIRM (mA/m·kg)	S
646A	4H	2	146	29.16	7.18	100.26	12587.13	125.55	36.54	38.92	0.985
646A	4H	3	0	29.20	6.26	100.14	11766.10	117.49	31.35	66.01	0.974
646A	4H	3	20	29.40	6.72	111.61	11702.67	104.86	36.31	45.27	0.983
646A	4H	3	51	29.71	6.84	128.75	13041.27	101.29	42.50	21.64	0.993
646A	4H	3	70	29.90	7.30	167.62	14930.30	89.07	57.40	82.57	0.979
646A	4H	3	105	30.25	6.81	150.90	20319.84	134.66	50.19	26.16	0.993
646A	4H	3	122	30.42	7.19	179.27	18904.50	105.45	63.00	102.16	0.977
646A	4H	3	144	30.64	6.92	139.06	14971.53	107.66	48.82	96.70	0.973
646A	4H	3	144	30.64	6.53	150.45	15938.81	105.94	48.73	113.65	0.970
646A	4H	4	0	30.70	7.87	126.43	13108.59	103.69	50.29	94.57	0.970
646A	4H	4	28	30.98	6.75	119.86	12603.76	105.16	41.89	99.67	0.968
646A	4H	4	51	31.21	7.02	124.73	13463.15	107.94	44.92	101.87	0.968
646A	4H	4	80	31.50	6.28	101.02	13128.54	129.96	36.06	100.13	0.965
646A	4H	4	119	31.89	7.11	142.94	11698.44	81.84	42.43	84.83	0.972
646A	4H	4	148	32.18	7.13	162.81	15747.57	96.73	53.46	97.52	0.974
646A	4H	4	148	32.18	7.28	167.91	16352.71	97.39	56.12	111.10	0.971
646A	4H	5	1	32.21	7.37	158.87	15500.16	97.57	54.11	89.66	0.976
646A	4H	5	19	32.39	7.25	146.94	16066.71	109.34	48.03	80.55	0.976
646A	4H	5	41	32.61	6.69	119.99	13877.31	115.65	34.13	53.43	0.979
646A	4H	5	56	32.76	7.53	98.10	12505.26	127.47	32.36	42.37	0.980
646A	4H	5	80	33.00	7.24	115.04	13679.07	118.90	35.89	51.92	0.979
646A	4H	5	100	33.20	6.83	112.75	15051.83	133.49	37.64	91.97	0.967
646A	4H	5	132	33.52	7.06	175.81	21125.46	120.16	59.34	66.45	0.984
646A	4H	5	132	33.52	7.41	167.84	20102.88	119.77	57.01	108.01	0.972
646A	4H	6	0	33.70	6.91	156.17	20208.68	129.40	49.15	63.12	0.982
646A	4H	6	25	33.95	6.28	167.84	16763.35	99.88	50.30	32.55	0.992
646A	4H	6	42	34.12	7.20	148.49	20145.17	135.67	49.89	81.13	0.977
646A	4H	6	60	34.30	6.48	160.14	18921.19	118.16	44.65	31.19	0.991
646A	4H	6	79	34.49	7.11	147.18	16840.71	114.42	43.59	36.78	0.988
646A	4H	6	100	34.70	6.01	127.09	15721.49	123.70	35.71	42.35	0.986
646A	4H	6	113	34.83	6.65	122.61	12821.82	104.58	36.75	65.58	0.976
646A	4H	6	113	34.83	6.47	121.94	12433.50	101.96	33.93	45.74	0.983
646A	5H	1	0	35.80	7.26	122.69	12101.45	98.64	43.98	14.88	0.995
646A	5H	1	20	36.00	7.55	120.47	13191.14	109.50	49.32	80.52	0.975
646A	5H	1	40	36.20	7.55	100.67	10585.49	105.15	37.63	48.33	0.981
646A	5H	1	60	36.40	7.20	110.10	11257.89	102.25	40.90	82.70	0.971
646A	5H	1	96	36.76	7.02	158.91	17783.90	111.91	63.78	104.46	0.977
646A	5H	1	148	37.28	6.24	152.61	17794.30	116.60	56.53	130.66	0.971
646A	5H	1	148	37.28	7.40	153.98	18254.45	118.55	69.38	116.13	0.975
646A	5H	3	0	37.30	6.91	115.45	14016.29	121.41	59.70	119.33	0.972
646A	5H	3	20	37.50	7.43	111.93	14077.28	125.77	67.02	143.75	0.968
646A	5H	3	40	37.89	6.43	120.94	15425.69	127.55	53.17	127.17	0.969
646A	5H	3	60	38.02	7.70	151.08	17283.82	114.40	64.61	98.08	0.977
646A	5H	3	84	38.40	7.82	142.82	16384.51	114.72	47.64	81.39	0.973
646A	5H	3	100	38.61	7.51	147.04	17477.53	118.86	52.84	201.39	0.943
646A	5H	3	130	38.61	7.56	148.89	16177.45	108.65	47.12	154.60	0.950
646A	5H	3	130	38.80	7.44	145.72	16316.46	111.97	40.53	97.43	0.964
646A	5H	2	0	39.00	6.55	150.18	18344.78	122.15	44.23	170.00	0.950
646A	5H	2	20	39.20	6.60	156.27	17670.17	113.07	44.08	198.06	0.941
646A	5H	2	59	39.40	6.85	134.25	13714.19	102.16	62.23	225.56	0.950
646A	5H	2	72	39.64	7.73	149.84	15005.66	100.14	59.94	210.26	0.946
646A	5H	2	110	39.80	7.89	123.08	14153.15	114.99	61.68	193.92	0.950
646A	5H	2	131	40.10	7.64	133.69	16307.16	121.98	63.95	85.64	0.980
646A	5H	2	131	40.10	7.34	127.00	15844.89	124.77	63.23	234.45	0.946
646A	5H	4	0	40.30	7.65	141.39	15116.76	106.91	65.13	238.06	0.944
646A	5H	4	20	40.50	6.74	130.29	14034.56	107.72	51.88	224.78	0.942
646A	5H	4	39	40.69	7.71	115.36	12551.41	108.80	50.58	73.19	0.978

Appendix B (continued)

Core, section depth (cm)	Depth (mbsf)	Mass (g)	X ($10^{-6}m^3/kg$)	X_{ARM} ($10^{-6}m^3/kg$)	X_{ARM}/X	SIRM (mA/m·kg)	HIRM (mA/m·kg)	S
646A 5H 4 59	40.89	8.04	126.25	13734.41	108.78	53.98	185.80	0.945
646A 5H 4 80	41.10	6.87	130.20	14537.75	111.66	49.46	213.07	0.941
646A 5H 4 99	41.29	6.74	139.23	15817.40	113.60	50.17	214.63	0.942
646A 5H 4 124	41.54	7.36	145.94	16848.17	115.45	52.24	180.23	0.949
646A 5H 4 145	41.75	6.38	149.45	18056.39	120.82	47.13	60.62	0.984
646A 5H 4 145	41.75	6.46	143.32	16958.63	118.32	45.21	174.47	0.950
646A 5H 5 0	41.80	6.96	144.94	17731.08	122.33	51.14	174.52	0.952
646A 5H 5 40	42.20	6.99	169.66	21497.51	126.71	60.72	48.04	0.989
646A 5H 5 59	42.39	7.04	171.85	20302.70	118.14	66.45	300.39	0.936
646A 5H 5 89	42.69	6.65	159.63	19595.16	122.75	54.63	205.82	0.950
646A 5H 5 89	42.69	7.05	161.45	19987.70	123.80	58.06	212.90	0.948
646A 5H 6 0	43.30	6.52	135.26	16456.52	121.66	48.21	175.66	0.952
646A 5H 6 20	43.50	6.85	160.11	18662.29	116.56	59.38	132.88	0.969
646A 5H 6 40	43.70	7.04	158.11	17063.66	107.93	52.47	85.43	0.977
646A 5H 6 60	43.90	7.30	149.38	16077.13	107.63	50.13	36.95	0.989
646A 5H 6 80	44.10	7.47	98.89	12632.94	127.75	40.48	50.03	0.982
646A 5H 6 126	44.56	7.38	196.78	18178.97	92.38	68.93	55.82	0.988
646A 5H 6 126	44.56	6.87	202.25	18421.44	91.08	66.73	51.79	0.989
646A 6H 1 0	45.50	7.83	123.38	13938.32	112.97	49.43	74.21	0.976
646A 6H 1 30	45.80	6.65	115.24	13954.55	121.09	41.18	44.99	0.985
646A 6H 2 2	47.02	7.54	107.13	12557.48	117.21	34.49	39.49	0.983
646A 6H 2 55	47.55	6.86	163.72	21516.29	131.42	57.95	48.80	0.988
646A 6H 2 74	47.74	7.25	139.66	18298.22	131.02	47.42	54.30	0.983
646A 6H 2 117	48.17	7.30	172.44	23244.30	134.80	59.27	37.42	0.991
646A 6H 2 117	48.17	7.94	173.41	23016.06	132.73	65.87	48.11	0.988
646A 6H 3 10	48.60	7.02	122.76	16917.92	137.81	41.32	43.93	0.985
646A 6H 3 34	48.84	8.18	163.26	19500.01	119.44	56.76	58.77	0.983
646A 6H 3 55	49.05	6.97	166.36	22117.04	132.94	50.86	32.46	0.991
646A 6H 3 88	49.38	6.75	139.59	17738.51	127.08	43.51	44.74	0.986
646A 6H 3 108	49.58	7.36	161.13	18649.63	115.74	50.85	37.47	0.989
646A 6H 3 147	49.97	7.32	154.46	19105.26	123.69	55.56	66.34	0.983
646A 6H 3 147	49.97	7.31	149.52	18455.82	123.44	53.00	37.90	0.990
646A 6H 4 0	50.00	7.09	153.27	19818.06	129.30	51.16	12.97	0.996
646A 6H 4 56	50.56	7.67	124.32	14374.19	115.62	44.39	51.01	0.982
646A 6H 4 75	50.75	7.21	146.89	18356.87	124.97	53.40	96.93	0.974
646A 6H 4 96	50.96	7.24	111.92	15051.26	134.48	43.97	74.98	0.975
646A 6H 5 0	51.50	6.74	181.17	15341.17	84.68	56.39	94.97	0.977
646A 6H 5 17	51.67	8.06	163.19	14960.19	91.67	62.31	95.75	0.975
646A 6H 5 37	51.87	7.76	192.33	16682.32	86.74	68.58	86.46	0.980
646A 6H 5 94	52.44	7.15	167.80	17351.27	103.41	57.86	11.09	0.997
646A 6H 5 113	52.63	7.11	165.74	18534.66	111.83	57.27	5.60	0.999
646A 6H 5 113	52.63	7.53	167.17	18716.26	111.96	61.14	14.83	0.996
646A 6H 6 0	53.00	7.66	196.64	17268.79	87.82	62.49	70.39	0.983
646A 6H 6 17	53.17	7.34	205.22	18680.25	91.03	61.21	46.37	0.989
646A 6H 6 57	53.57	7.23	164.55	17403.23	105.76	55.30	62.82	0.984
646A 6H 6 89	53.89	7.77	192.89	17860.05	92.59	61.74	40.13	0.990
646A 6H 6 116	54.16	7.91	149.93	17239.01	114.98	54.42	10.19	0.997
646A 6H 6 116	54.16	6.71	148.28	17100.03	115.32	44.41	2.87	0.999
646A 6H 7 0	54.50	7.30	128.04	15518.17	121.20	41.49	5.78	0.998
646A 7H 1 0	55.10	7.93	132.44	16556.78	125.01	51.77	46.75	0.986
646A 7H 1 26	55.36	7.53	103.94	13562.00	130.48	36.95	57.62	0.977
646A 7H 2 10	56.70	6.94	123.82	16571.11	133.83	40.41	70.59	0.976
646A 7H 2 125	57.85	5.96	161.88	19050.28	117.68	47.85	88.88	0.978
646A 7H 3 5	58.15	6.89	99.74	11743.77	117.75	32.05	43.44	0.981
646A 7H 3 25	58.35	6.81	162.89	17972.76	110.34	56.53	77.61	0.981
646A 7H 3 44	58.54	6.73	173.04	19177.99	110.83	62.26	107.08	0.977
646A 7H 3 87	58.97	6.89	103.93	14010.18	134.80	38.92	78.91	0.972

Appendix B (continued)

Core, section depth (cm)	Depth (mbsf)	Mass (g)	X $(10^{-6}m^3/kg)$	X_{ARM} $(10^{-6}m^3/kg)$	X_{ARM}/X	SIRM (mA/m·kg)	HIRM (mA/m·kg)	S
646A 7H 3 105	59.15	7.16	117.91	13713.82	116.31	41.88	66.00	0.977
646A 7H 3 145	59.55	8.20	219.54	16269.15	74.10	72.09	45.12	0.990
646A 7H 3 145	59.55	7.43	220.65	17242.00	78.14	64.54	40.59	0.991
646A 7H 4 15	59.75	7.32	175.23	17853.44	101.89	59.69	52.82	0.987
646A 7H 4 33	59.93	8.22	147.33	14870.73	100.93	53.65	42.41	0.987
646A 7H 4 54	60.14	6.17	103.64	13439.16	129.67	26.04	42.02	0.980
646A 7H 4 78	60.38	6.87	161.65	16886.84	104.46	43.66	50.17	0.984
646A 7H 4 128	60.88	5.03	160.09	18455.85	115.28	34.62	68.00	0.980
646A 7H 4 128	60.88	6.62	159.79	16841.54	105.40	48.80	62.39	0.983
646A 7H 5 14	61.24	5.92	168.28	21126.11	125.54	50.31	86.91	0.980
646A 7H 5 36	61.46	7.40	151.77	19368.97	127.62	63.14	112.73	0.974
646A 7H 5 54	61.64	6.76	132.32	15860.74	119.87	48.82	143.77	0.960
646A 7H 5 66	61.76	6.76	136.04	15922.25	117.05	49.62	86.35	0.976
646A 7H 5 87	61.97	5.48	124.71	15744.78	126.25	33.37	113.93	0.963
646A 7H 5 106	62.16	6.35	141.46	15435.44	109.12	43.68	113.88	0.967
646A 7H 5 106	62.16	6.82	140.00	15141.32	108.16	47.77	96.65	0.972
646A 7H 6 4	62.64	6.91	114.54	14408.88	125.80	39.17	65.24	0.977
646A 7H 6 44	63.04	7.67	137.26	15129.59	110.23	45.19	63.82	0.978
646A 7H 6 65	63.25	6.08	107.03	13931.71	130.16	33.02	77.39	0.972
646A 7H 6 86	63.46	5.73	125.41	14175.59	113.03	32.88	99.26	0.965
646A 7H 6 113	63.73	6.92	188.99	18903.22	100.02	60.00	98.91	0.977
646A 7H 6 142	64.02	7.35	191.95	14897.45	77.61	57.14	73.82	0.981
646A 7H 6 142	64.02	7.58	215.46	14908.65	69.20	65.34	80.85	0.981
646A 7H 7 0	64.82	7.41	114.78	13065.67	113.83	41.60	72.13	0.974
646A 8H 1 37	65.17	7.10	94.84	13139.11	138.54	31.97	50.65	0.978
646A 8H 1 79	65.59	7.30	139.22	17350.45	124.62	52.84	84.87	0.977
646A 8H 1 102	65.82	7.23	164.20	19364.28	117.93	60.72	102.73	0.976
646A 8H 1 115	65.95	7.20	162.97	18313.79	112.38	53.89	95.46	0.974
646A 8H 1 115	65.95	7.52	151.86	18590.79	122.42	56.53	98.46	0.974
646A 8H 2 7	66.37	7.26	103.13	12255.15	118.83	33.16	54.84	0.976
646A 8H 2 59	66.89	7.05	151.11	16756.83	110.89	49.24	73.18	0.979
646A 8H 2 126	67.56	6.56	215.25	25161.82	116.89	78.25	167.06	0.972
646A 8H 2 145	67.75	7.06	231.50	25197.34	108.84	85.24	165.86	0.973
646A 8H 2 145	67.75	7.35	231.60	25182.03	108.73	88.73	134.28	0.978
646A 8H 3 5	67.85	6.89	175.04	16311.42	93.19	48.15	89.37	0.974
646A 8H 3 20	68.00	6.68	159.86	18816.20	117.71	55.37	116.85	0.972
646A 8H 3 57	68.37	6.96	121.12	14905.48	123.07	45.34	78.68	0.976
646A 8H 3 101	68.81	7.17	131.94	15855.78	120.18	52.95	145.30	0.961
646A 8H 3 146	69.26	6.90	178.25	15093.40	84.68	57.10	149.64	0.964
646A 8H 3 146	69.26	7.37	178.98	15045.04	84.06	61.74	134.30	0.968
646A 8H 4 6	69.36	7.57	177.57	14428.32	81.25	57.08	119.20	0.968
646A 8H 4 46	69.76	8.12	237.02	17129.68	72.27	79.00	143.92	0.970
646A 8H 4 76	70.06	7.54	138.46	16209.86	117.07	53.03	115.70	0.967
646A 8H 4 90	70.20	6.65	157.55	16348.28	103.76	49.53	112.49	0.970
646A 8H 4 107	70.37	5.32	172.62	16263.18	94.21	37.37	52.86	0.985
646A 8H 4 107	70.37	4.82	163.94	16521.24	100.77	35.77	72.13	0.981
646A 8H 5 0	70.80	6.63	162.39	21621.68	133.15	59.79	101.71	0.977
646A 8H 5 34	71.14	7.74	117.67	13728.53	116.66	46.28	73.14	0.976
646A 8H 5 90	71.70	7.69	111.09	11360.12	102.26	54.15	72.39	0.979
646A 8H 5 113	71.93	6.59	154.60	20075.34	129.85	56.49	122.79	0.971
646A 8H 5 145	72.25	6.07	184.61	22735.21	123.15	58.50	138.31	0.971
646A 8H 5 145	72.25	6.11	187.11	22833.27	122.03	58.79	97.08	0.980
646A 9H 1 11	74.51	7.25	125.11	15560.39	124.38	55.50	154.06	0.960
646A 9H 1 42	74.82	7.68	125.30	13569.80	108.30	52.10	90.47	0.973
646A 9H 1 69	75.09	8.59	126.21	12272.07	97.23	56.13	135.50	0.959
646A 9H 1 93	75.33	7.84	142.93	16742.83	117.14	55.25	115.65	0.967
646A 9H 1 116	75.56	7.57	168.94	21408.40	126.72	68.14	93.02	0.979

Appendix B (continued)

Core, section depth (cm)	Depth (mbsf)	Mass (g)	X ($10^{-6}m^3/kg$)	X_{ARM} ($10^{-6}m^3/kg$)	X_{ARM}/X	SIRM (mA/m·kg)	HIRM (mA/m·kg)	S
646A 9H 1 146	75.86	7.69	178.56	24288.87	136.03	77.70	91.16	0.982
646A 9H 1 146	75.86	6.60	184.44	24755.79	134.22	65.77	89.45	0.982
646A 9H 2 0	75.90	7.10	176.41	23829.89	135.08	69.62	99.83	0.980
646A 9H 2 20	76.10	7.09	210.86	28642.68	135.84	86.11	136.84	0.977
646A 9H 2 62	76.52	6.27	142.86	19193.46	134.35	47.28	83.00	0.978
646A 9H 2 84	76.74	7.85	111.22	14310.57	128.66	41.36	62.74	0.976
646A 9H 2 101	76.91	7.16	120.89	15889.50	131.44	41.61	68.20	0.977
646A 9H 2 120	77.10	6.88	119.97	15628.29	130.27	42.87	85.63	0.973
646A 9H 2 140	77.30	7.25	111.07	12558.48	113.07	37.76	71.10	0.973
646A 9H 2 140	77.30	7.68	114.67	13023.29	113.57	41.47	80.13	0.970
646A 9H 3 0	77.40	7.79	114.82	12355.75	107.61	41.42	77.55	0.971
646A 9H 3 23	77.63	7.28	173.95	13854.30	79.65	45.77	77.19	0.975
646A 9H 3 40	77.80	7.34	137.95	17099.12	123.95	56.58	85.00	0.978
646A 9H 3 60	78.00	7.74	202.24	17518.31	86.62	64.67	99.69	0.976
646A 9H 3 85	78.25	7.49	107.85	11747.99	108.93	32.86	56.07	0.974
646A 9H 3 141	78.81	7.69	167.12	16492.74	98.69	62.78	135.51	0.967
646A 9H 3 141	78.81	8.00	173.84	16785.49	96.56	66.69	147.46	0.965
646A 9H 4 5	78.95	7.57	168.44	16657.76	98.89	61.06	127.12	0.968
646A 9H 4 20	79.10	8.52	187.26	16991.94	90.74	79.04	120.51	0.974
646A 9H 4 41	79.31	7.44	158.55	15836.91	99.88	57.48	78.33	0.980
646A 9H 4 61	79.51	8.10	145.48	15855.98	108.99	62.92	98.21	0.975
646A 9H 4 84	79.74	7.23	138.14	17254.15	124.90	51.41	73.92	0.979
646A 9H 4 101	79.91	7.42	111.74	15950.71	142.74	44.19	55.49	0.981
646A 9H 4 120	80.10	4.79	110.15	14769.83	134.08	25.13	53.67	0.980
646A 9H 4 120	80.10	7.25	117.66	15610.81	132.68	43.16	53.81	0.982
646A 9H 5 0	80.40	7.72	141.74	18137.64	127.97	48.30	44.86	0.986
646A 9H 5 33	80.73	7.17	153.66	20821.51	135.50	59.57	86.90	0.979
646A 9H 5 56	80.96	7.15	123.87	17410.83	140.56	49.70	104.56	0.970
646A 9H 5 77	81.17	6.80	123.60	17374.56	140.58	46.86	102.99	0.970
646A 10H 1 0	84.10	7.57	103.39	11346.80	109.75	37.98	35.90	0.986
646A 10H 2 40	85.60	7.03	118.66	9771.84	82.35	27.10	23.22	0.988
646A 10H 2 80	86.06	7.10	132.17	14651.79	110.85	49.75	60.35	0.983
646A 10H 2 100	86.20	7.08	141.24	15455.53	109.43	54.14	66.81	0.983
646A 10H 2 120	86.40	6.94	129.07	12463.41	96.57	39.80	59.16	0.979
646A 10H 2 146	86.51	7.17	113.54	11348.44	99.95	42.13	123.54	0.958
646A 10H 2 0	86.60	7.61	122.82	14142.49	115.15	50.65	105.88	0.968
646A 10H 2 46	86.80	7.14	121.05	12178.89	100.61	35.64	47.36	0.981
646A 10H 2 91	87.03	6.66	160.71	16553.49	103.00	56.09	104.67	0.975
646A 10H 3 0	87.10	6.77	156.43	15292.86	97.76	59.67	148.18	0.966
646A 10H 3 46	87.56	5.79	183.78	17963.96	97.75	60.01	156.06	0.970
646A 10H 3 134	88.44	4.62	178.92	20110.29	112.40	37.27	102.21	0.975
646A 10H 3 134	88.44	7.23	166.98	19633.78	117.58	60.62	105.87	0.975
646A 10H 4 3	88.63	7.77	126.60	14954.76	118.13	46.54	49.88	0.983
646A 10H 4 46	89.06	7.43	197.83	21997.10	111.19	71.35	32.54	0.993
646A 10H 4 94	89.54	7.17	179.77	19812.45	110.21	58.73	27.50	0.993
646A 10H 4 138	89.98	7.55	152.42	15774.24	103.49	47.38	19.53	0.994
646A 10H 4 138	89.98	7.75	151.56	16797.70	110.83	51.12	21.25	0.994
646A 10H 5 0	90.10	6.91	194.71	23374.11	120.04	70.83	47.87	0.991
646A 10H 5 26	90.36	6.79	167.26	20484.60	122.47	57.57	45.71	0.989
646A 10H 5 69	90.79	7.21	165.01	17684.82	107.18	55.39	44.69	0.988
646A 10H 5 146	91.56	8.09	197.84	19315.37	97.63	72.33	29.23	0.993
646A 10H 5 146	91.56	8.45	189.11	18658.08	98.66	72.36	30.35	0.993
646A 10H 6 5	91.65	6.28	118.23	15131.06	127.98	33.22	24.93	0.991
646A 10H 6 34	91.94	7.54	156.62	17121.07	109.32	54.26	36.34	0.990
646A 10H 6 109	92.69	6.54	189.59	21354.72	112.63	60.66	109.66	0.976
646A 10H 6 129	92.89	7.30	164.87	15240.87	92.44	45.91	30.71	0.990
646A 11H 1 11	93.91	7.44	120.73	15719.90	130.21	45.00	45.74	0.985

Appendix B (continued)

Core, section depth (cm)	Depth (mbsf)	Mass (g)	X ($10^{-6}m^3/kg$)	X_{ARM} ($10^{-6}m^3/kg$)	X_{ARM}/X	SIRM (mA/m·kg)	HIRM (mA/m·kg)	S
646A 11H 1 30	94.10	7.70	126.12	16221.04	128.62	48.05	45.96	0.985
646A 11H 1 52	94.32	7.13	164.92	18085.69	109.66	75.00	105.01	0.980
646A 11H 1 80	94.60	7.05	202.79	19383.98	95.59	71.27	76.91	0.985
646A 11H 1 120	95.00	6.41	182.27	19127.03	104.94	58.85	92.20	0.980
646A 11H 2 0	95.30	6.94	115.85	14642.74	126.39	36.14	36.37	0.986
646A 11H 2 29	95.59	7.55	139.27	16912.38	121.43	53.64	79.65	0.978
646A 11H 2 80	96.10	7.68	129.06	16460.56	127.54	43.68	36.32	0.987
646A 11H 2 98	96.28	8.12	189.22	17756.27	93.84	56.26	27.60	0.992
646A 11H 2 131	96.61	8.17	100.72	8443.69	83.84	27.14	20.84	0.987
646A 11H 2 131	96.61	7.50	94.47	8966.83	94.91	25.71	7.96	0.995
646A 11H 3 3	96.83	7.33	193.50	18742.76	96.86	71.66	156.41	0.968
646A 11H 3 35	97.15	6.92	161.76	18512.72	114.45	59.50	160.72	0.963
646A 11H 3 68	97.48	7.06	161.39	16041.79	99.39	60.14	147.89	0.965
646A 11H 3 116	97.96	4.20	201.30	16795.59	83.43	41.33	197.55	0.960
646A 11H 3 116	97.96	4.51	211.14	18178.48	86.09	44.64	205.09	0.959
646A 11H 4 0	98.30	6.48	119.62	13024.23	108.88	38.18	111.95	0.962
646A 11H 4 28	98.58	6.87	132.03	15836.46	119.95	44.27	106.32	0.967
646A 11H 4 75	99.05	7.24	127.71	15906.88	124.55	48.97	123.66	0.963
646A 11H 4 116	99.46	7.71	223.56	25889.83	115.81	98.19	340.27	0.947
646A 11H 4 139	99.69	4.91	220.30	25298.85	114.84	56.93	201.99	0.965
646A 11H 4 139	99.69	6.21	194.21	24272.73	124.98	70.44	181.69	0.968
646A 11H 5 0	99.80	7.28	189.13	21167.76	111.92	75.90	87.27	0.983
646A 11H 5 26	100.06	7.46	142.97	19731.20	138.01	53.62	113.62	0.968
646A 11H 5 60	100.40	7.82	127.88	14619.13	114.32	45.76	101.22	0.965
646A 11H 5 113	100.93	7.22	123.89	13129.53	105.98	44.08	161.28	0.947
646A 11H 5 113	100.93	5.03	129.62	13899.77	107.23	33.72	227.71	0.932
646A 11H 6 0	101.30	7.85	198.12	17756.78	89.62	83.41	278.42	0.948
646A 11H 6 85	102.15	8.74	228.40	17340.71	75.92	98.24	334.59	0.940
646A 11H 6 117	102.47	7.81	153.94	15230.28	98.94	58.85	113.15	0.970
646B 1H 1 0	0.00	6.67	152.37	10130.64	66.49	47.13	98.04	0.972
646B 1H 1 10	0.10	6.86	118.12	11004.92	93.17	38.23	104.75	0.962
646B 1H 1 28	0.28	3.40	121.56	10214.68	84.03	16.54	66.44	0.973
646B 1H 1 50	0.50	7.51	110.24	9951.56	90.27	37.45	51.18	0.979
646B 1H 1 70	0.70	6.52	123.89	12736.03	102.80	36.87	77.55	0.973
646B 1H 1 90	0.90	6.10	93.29	13494.73	144.65	33.00	94.80	0.965
646B 1H 1 110	1.10	6.44	87.00	9713.55	111.65	40.20	113.31	0.964
646B 1H 1 130	1.30	7.02	119.19	10114.50	84.86	51.63	99.25	0.973
646B 1H 1 145	1.45	6.94	90.51	11360.11	125.51	43.02	106.83	0.966
646B 1H 1 145	1.45	6.95	87.13	10708.04	122.90	40.14	110.10	0.962
646B 1H 2 0	1.50	7.34	93.96	11068.63	117.80	45.53	67.14	0.978
646B 1H 2 20	1.70	7.23	89.66	11391.15	127.05	43.71	105.16	0.965
646B 1H 2 40	1.90	5.74	98.93	11118.53	112.39	24.89	81.23	0.963
646B 1H 2 64	2.14	8.06	120.95	8120.94	67.14	33.58	31.37	0.985
646B 1H 2 80	2.30	6.82	129.86	13672.84	105.29	43.29	60.24	0.981
646B 1H 2 100	2.50	6.12	132.61	14509.64	109.42	40.48	74.09	0.978
646B 1H 2 140	2.90	7.48	125.80	12605.31	100.20	42.98	43.22	0.985
646B 1H 2 140	2.90	6.53	122.17	11992.20	98.16	36.18	44.82	0.984
646B 1H 3 0	3.00	7.06	111.04	11562.95	104.14	36.64	61.44	0.976
646B 1H 3 10	3.10	6.13	97.55	11236.44	115.18	30.78	66.08	0.974
646B 1H 3 30	3.30	5.67	90.18	9961.85	110.47	25.14	36.01	0.984
646B 1H 3 51	3.51	7.29	99.43	9965.12	100.22	34.61	56.34	0.976
646B 1H 3 72	3.72	6.88	74.68	7949.63	106.44	23.49	43.01	0.975
646B 1H 3 90	3.90	7.41	92.91	9247.66	99.54	30.01	4.01	0.998
646B 1H 3 110	4.10	7.60	124.64	11657.13	93.53	41.49	85.43	0.969
646B 1H 3 130	4.30	6.19	100.87	11701.89	116.01	34.05	81.65	0.970
646B 1H 3 130	4.30	6.33	110.74	12738.85	115.03	37.79	90.67	0.970
646B 1H 3 148	4.48	7.01	127.24	13444.72	105.66	47.62	47.95	0.986

Appendix B (continued)

Core, section depth (cm)	Depth (mbsf)	Mass (g)	X ($10^{-6}m^3/kg$)	X_{ARM} ($10^{-6}m^3/kg$)	X_{ARM}/X	SIRM (mA/m·kg)	HIRM (mA/m·kg)	S
646B 1H 4 0	4.50	6.26	114.19	10989.32	96.24	37.80	89.32	0.970
646B 1H 4 20	4.70	6.73	114.80	12103.98	105.43	41.22	32.03	0.990
646B 1H 4 40	4.90	7.39	122.06	11890.98	97.42	48.58	37.38	0.989
646B 1H 4 60	5.10	7.02	123.84	12340.01	99.65	42.68	42.95	0.986
646B 1H 4 82	5.32	6.66	90.54	9885.01	109.18	37.61	85.44	0.970
646B 1H 4 116	5.66	6.99	116.28	11973.31	102.97	48.20	63.58	0.982
646B 1H 4 116	5.66	7.19	112.87	11518.13	102.04	48.36	62.09	0.982
646B 1H 4 138	5.88	7.36	145.26	13804.93	95.04	61.75	72.97	0.983
646B 1H 5 10	6.10	6.60	128.67	13558.51	105.37	47.19	67.61	0.981
646B 1H 5 30	6.30	5.88	142.08	14247.04	100.28	46.00	77.99	0.980
646B 1H 5 50	6.50	5.83	152.78	14515.55	95.01	48.74	83.47	0.980
646B 1H 5 94	6.94	6.28	148.43	15010.96	101.13	52.71	94.55	0.977
646B 1H 5 110	7.10	7.33	155.28	15983.22	102.93	62.95	88.45	0.979
646B 1H 5 130	7.30	6.49	146.15	15381.80	105.25	52.68	91.49	0.977
646B 1H 5 130	7.30	6.04	147.26	15379.67	104.44	48.12	92.74	0.977
646B 1H 5 148	7.48	6.08	161.79	15651.65	96.74	55.06	181.42	0.960
646B 1H 6 20	7.70	6.91	171.26	16407.11	95.80	64.06	176.41	0.962
646B 1H 6 36	7.86	6.59	158.61	16145.60	101.80	57.91	180.97	0.959
646B 1H 6 60	8.10	6.38	124.25	13351.04	107.45	45.41	161.24	0.955
646B 1H 6 80	8.30	6.57	96.18	10609.17	110.30	39.26	163.73	0.945
646B 1H 6 100	8.50	5.98	118.91	11795.39	99.20	37.95	161.45	0.949
646B 1H 6 120	8.70	6.52	127.55	12510.60	98.08	41.31	115.58	0.964
646B 1H 6 120	8.70	6.41	123.86	12298.43	99.29	39.29	113.29	0.963
646B 1H 6 137	8.87	6.03	144.38	14778.29	102.36	46.82	162.48	0.958
646B 2H 1 0	9.00	7.09	155.93	10384.88	66.60	52.18	84.14	0.977
646B 2H 1 20	9.20	6.64	115.60	10576.89	91.50	43.81	2.90	0.999
646B 2H 1 40	9.40	6.90	119.98	10497.00	87.49	46.68	70.09	0.979
646B 2H 1 60	9.60	6.98	127.61	10289.94	80.64	46.25	51.07	0.985
646B 2H 1 80	9.80	6.88	140.05	13012.51	92.91	54.32	45.40	0.989
646B 2H 1 102	10.02	5.30	120.41	12674.22	105.26	34.57	142.52	0.956
646B 2H 1 120	10.20	5.81	131.03	13514.65	103.14	40.39	138.93	0.960
646B 2H 1 145	10.45	6.05	148.26	15660.95	105.63	49.87	176.83	0.957
646B 2H 1 145	10.45	6.78	147.86	15241.21	103.08	56.75	175.83	0.958
646B 2H 2 0	10.50	5.82	162.11	16165.02	99.72	52.62	205.46	0.955
646B 2H 2 20	10.70	7.14	164.86	16290.84	98.81	66.25	206.94	0.955
646B 2H 2 40	10.90	6.35	163.81	15748.82	96.14	56.70	204.60	0.954
646B 2H 2 60	11.10	6.54	134.27	14535.02	108.25	51.31	198.99	0.949
646B 2H 2 90	11.40	7.14	102.05	10814.58	105.97	45.68	184.51	0.942
646B 2H 2 110	11.60	5.59	101.58	10801.32	106.33	34.32	191.26	0.938
646B 2H 2 130	11.80	7.10	125.63	12145.41	96.68	46.67	144.71	0.956
646B 2H 2 148	11.98	7.07	128.83	13355.14	103.67	45.91	129.43	0.960
646B 2H 3 10	12.10	6.21	134.53	14111.01	104.89	43.45	156.13	0.955
646B 2H 3 30	12.30	6.30	133.01	14110.63	106.09	45.91	176.78	0.951
646B 2H 3 50	12.50	6.72	134.79	14280.67	105.95	50.67	155.75	0.959
646B 2H 3 70	12.70	6.52	136.42	13500.02	98.96	45.52	188.32	0.946
646B 2H 3 90	12.90	7.20	114.98	12135.15	105.54	47.72	160.32	0.952
646B 2H 3 110	13.10	7.27	99.02	9912.70	100.11	40.90	131.45	0.953
646B 2H 3 130	13.30	6.20	114.08	8546.36	74.92	33.13	121.24	0.955
646B 2H 3 130	13.30	6.77	127.85	8969.89	70.16	39.28	118.08	0.959
646B 2H 4 8	13.58	7.30	143.87	9685.24	67.32	47.81	131.63	0.960
646B 2H 4 30	13.80	7.98	161.21	10538.12	65.37	59.10	119.98	0.968
646B 2H 4 51	14.01	7.34	178.34	11586.71	64.97	59.32	137.55	0.966
646B 2H 4 70	14.20	7.44	156.02	12379.94	79.35	54.01	116.60	0.968
646B 2H 4 91	14.40	6.79	194.83	12079.36	62.00	58.54	178.69	0.959
646B 2H 4 110	14.41	8.05	188.21	12033.93	63.94	67.70	157.03	0.963
646B 2H 4 131	14.50	7.42	190.81	12553.16	65.79	64.58	152.29	0.965
646B 2H 4 131	14.60	8.00	198.65	12898.08	64.93	72.23	137.14	0.970
646B 2H 5 10	14.70	7.75	159.02	12439.46	78.23	58.77	118.33	0.969

Appendix B (continued)

Core, section depth (cm)	Depth (mbsf)	Mass (g)	X ($10^{-6}m^3/kg$)	X_{ARM} ($10^{-6}m^3/kg$)	X_{ARM}/X	SIRM (mA/m·kg)	HIRM (mA/m·kg)	S
646B 2H 5 30	14.81	7.30	182.07	12828.01	70.45	59.21	163.10	0.960
646B 2H 5 50	14.81	6.16	195.17	14606.31	74.84	50.82	175.41	0.957
646B 2H 5 93	14.90	7.06	158.01	13073.87	82.74	53.71	94.72	0.975
646B 2H 5 130	15.10	6.59	122.39	13282.84	108.53	36.80	80.41	0.971
646B 2H 5 130	15.10	6.48	124.66	13591.49	109.03	37.59	79.68	0.973
646B 2H 6 0	15.30	6.51	105.94	11875.82	112.09	30.96	58.04	0.976
646B 2H 6 21	15.50	7.16	131.94	14685.51	111.30	43.21	89.53	0.970
646B 2H 6 41	15.50	5.88	109.60	13361.24	121.90	30.50	114.64	0.956
646B 2H 6 60	15.70	5.97	132.15	14665.67	110.98	34.49	94.93	0.967
646B 3H 1 0	15.70	7.68	151.96	10964.53	72.15	53.09	94.85	0.973
646B 3H 1 10	15.88	7.30	140.43	11647.79	82.94	45.99	24.84	0.992
646B 3H 1 30	15.90	6.31	141.56	13280.35	93.82	51.14	148.22	0.963
646B 3H 1 50	15.93	6.26	158.54	15122.14	95.38	52.33	165.90	0.960
646B 3H 1 70	16.10	6.95	126.35	13789.27	109.13	48.13	135.48	0.961
646B 3H 1 110	16.30	7.34	174.07	17195.65	98.79	71.83	183.57	0.962
646B 3H 1 130	16.30	7.37	131.76	13533.92	102.71	54.60	140.09	0.962
646B 3H 1 130	16.30	6.41	138.76	14144.83	101.94	49.01	147.81	0.961
646B 3H 1 148	16.50	6.97	129.77	13307.39	102.54	51.28	149.62	0.959
646B 3H 2 0	16.50	7.21	130.51	13515.39	103.56	55.03	157.92	0.959
646B 3H 2 20	16.71	6.35	123.85	13029.91	105.21	46.36	155.78	0.957
646B 3H 2 40	16.90	6.36	120.49	12882.81	106.92	45.75	149.81	0.958
646B 3H 2 60	16.91	6.50	123.12	12755.70	103.61	48.22	164.56	0.956
646B 3H 2 100	17.10	7.48	139.40	13483.70	96.73	59.79	162.85	0.959
646B 3H 2 120	17.10	6.58	151.21	14055.27	92.95	55.61	194.31	0.954
646B 3H 2 140	17.30	6.70	160.32	14118.17	88.06	60.30	180.82	0.960
646B 3H 2 140	17.30	6.40	160.57	14391.88	89.63	56.90	164.65	0.963
646B 3H 3 0	17.40	5.98	136.97	12577.10	91.82	45.48	138.64	0.964
646B 3H 3 20	17.60	5.27	156.62	14174.29	90.50	44.86	143.94	0.966
646B 3H 3 40	17.80	6.22	160.77	15733.01	97.86	54.70	148.33	0.966
646B 3H 3 60	18.00	7.36	129.21	11943.38	92.43	49.69	149.73	0.956
646B 3H 3 80	18.20	6.66	147.70	15625.24	105.79	52.31	132.17	0.966
646B 3H 3 100	18.40	6.35	167.77	16945.16	101.00	56.17	131.28	0.970
646B 3H 3 120	18.60	7.42	176.76	17106.76	96.78	70.04	166.38	0.965
646B 3H 3 140	18.80	7.26	152.97	16111.55	105.33	58.53	154.40	0.962
646B 3H 3 140	18.80	6.12	165.86	17226.25	103.86	52.78	190.75	0.956
646B 3H 4 0	18.90	6.99	120.60	13071.44	108.39	44.92	140.17	0.956
646B 3H 4 20	19.10	5.81	143.79	16029.37	111.48	45.20	158.69	0.959
646B 3H 4 40	19.30	6.95	127.80	14158.20	110.79	49.89	153.26	0.957
646B 3H 4 60	19.50	6.66	114.50	12854.81	112.27	44.89	138.00	0.959
646B 3H 4 81	19.71	7.64	133.52	13569.32	101.63	54.50	134.61	0.962
646B 3H 4 100	19.90	7.22	130.15	12503.48	96.07	49.00	136.11	0.960
646B 3H 4 122	20.12	7.93	195.49	13992.09	71.57	71.52	78.27	0.983
646B 3H 4 140	20.30	5.40	204.73	14975.34	73.15	49.22	155.36	0.966
646B 3H 4 140	20.30	7.49	211.67	15252.50	72.06	74.28	171.29	0.965
646B 3H 5 0	20.40	6.59	160.90	14783.52	91.88	51.37	42.61	0.989
646B 3H 5 40	20.80	7.28	94.74	9337.73	98.56	32.36	36.24	0.984
646B 3H 5 100	21.40	7.12	133.22	13155.31	98.75	40.56	19.93	0.993
646B 3H 5 118	21.58	7.32	87.70	9270.05	105.70	31.12	20.31	0.990
646B 3H 6 10	22.00	7.77	59.01	6639.70	112.51	21.34	9.39	0.993
646B 3H 6 30	22.20	6.68	118.29	12471.23	105.43	37.94	36.19	0.987
646B 3H 6 50	22.40	7.21	154.90	14567.81	94.05	54.63	50.50	0.987
646B 3H 6 67	22.57	6.50	126.40	12568.81	99.44	34.50	40.96	0.985
646B 3H 6 95	22.85	6.66	150.72	15073.68	100.01	45.91	54.62	0.984
646B 3H 6 114	23.04	7.28	152.89	14420.49	94.32	45.66	37.21	0.988
646B 3H 6 135	23.25	6.68	142.93	13028.65	91.15	39.28	37.95	0.987
646B 3H 6 135	23.25	6.39	142.54	13268.81	93.09	35.85	27.33	0.990
646B 3H 7 3	23.43	7.60	114.88	11129.17	96.87	40.73	58.95	0.978

Appendix B (continued)

Core, section depth (cm)				Depth (mbsf)	Mass (g)	X ($10^{-6}m^3/kg$)	X_{ARM} ($10^{-6}m^3/kg$)	X_{ARM}/X	SIRM (mA/m·kg)	HIRM (mA/m·kg)	S
646B	3H	7	20	23.60	6.71	123.57	13208.18	106.89	41.87	52.92	0.983
646B	3H	7	40	23.80	6.46	126.02	13335.64	105.82	40.28	34.39	0.989
646B	4H	1	0	24.10	6.27	169.91	17608.78	103.64	57.47	58.52	0.987
646B	4H	1	10	24.20	6.53	181.23	17369.58	95.84	65.40	80.19	0.984
646B	4H	1	33	24.43	6.82	179.97	17407.60	96.73	67.44	110.46	0.978
646B	4H	1	53	24.63	6.71	127.13	12565.25	98.84	43.51	87.86	0.973
646B	4H	1	73	24.83	5.88	103.62	9656.92	93.19	29.70	46.70	0.982
646B	4H	1	93	25.03	5.84	142.84	12433.53	87.05	43.33	113.40	0.969
646B	4H	1	113	25.23	5.55	125.18	12692.29	101.40	37.99	146.39	0.957
646B	4H	1	133	25.43	6.22	122.19	13257.20	108.49	41.68	120.08	0.964
646B	4H	1	133	25.43	5.62	120.93	13322.17	110.16	36.87	99.73	0.970
646B	4H	2	0	25.60	6.00	106.99	11711.06	109.46	37.35	71.57	0.977
646B	4H	2	34	25.94	6.93	181.83	12191.01	67.05	56.68	62.29	0.985
646B	4H	2	53	26.13	6.31	229.95	13296.28	57.82	58.94	101.41	0.978
646B	4H	2	94	26.54	8.69	361.13	15117.88	41.86	140.04	203.49	0.975
646B	4H	2	110	26.70	8.03	226.07	15041.27	66.53	79.58	73.37	0.985
646B	4H	2	132	26.92	6.03	236.26	16510.00	69.88	58.04	43.85	0.991
646B	4H	2	132	26.92	6.96	243.13	16776.77	69.00	72.39	77.55	0.985
646B	4H	3	24	27.34	6.77	142.51	14496.60	101.72	45.08	19.01	0.994
646B	4H	3	47	27.57	5.91	134.98	15220.99	112.76	35.21	17.80	0.994
646B	4H	3	66	27.76	6.93	130.34	14037.54	107.70	39.01	73.14	0.974
646B	4H	3	105	28.15	6.91	146.54	13044.24	89.02	41.90	77.12	0.975
646B	4H	3	126	28.36	6.75	157.45	14352.88	91.16	44.73	74.11	0.978
646B	4H	3	126	28.36	6.91	140.54	13288.40	94.55	45.65	73.67	0.978
646B	4H	3	147	28.57	6.95	142.26	13970.03	98.20	47.64	72.02	0.979
646B	4H	4	10	28.70	6.95	133.04	11474.64	86.25	45.08	37.75	0.988
646B	4H	4	32	28.92	6.61	106.43	11311.47	106.28	35.83	26.38	0.990
646B	4H	4	50	29.10	6.46	149.35	12530.73	83.90	42.51	53.44	0.984
646B	4H	4	70	29.30	7.16	129.31	13106.91	101.36	47.63	64.13	0.981
646B	4H	4	90	29.50	6.65	118.26	12068.61	102.05	42.93	75.53	0.977
646B	4H	4	110	29.70	7.42	127.66	12343.39	96.69	48.51	68.12	0.979
646B	4H	4	130	29.90	7.04	116.35	10796.17	92.79	40.93	65.32	0.978
646B	4H	4	130	29.90	6.11	101.98	9904.88	97.12	30.71	58.17	0.977
646B	4H	5	4	30.14	6.25	131.86	13263.12	100.59	38.05	50.87	0.983
646B	4H	5	21	30.31	5.48	86.43	9633.48	111.46	23.44	43.28	0.980
646B	5H	1	0	33.80	6.89	132.56	11555.39	87.17	45.16	48.79	0.985
646B	5H	1	10	33.90	7.23	128.23	10501.69	81.89	46.31	66.47	0.979
646B	5H	1	30	34.10	7.01	153.76	13779.49	89.61	47.76	58.23	0.983
646B	5H	1	50	34.30	6.43	125.63	12709.35	101.17	36.71	104.74	0.963
646B	5H	1	90	34.70	7.42	114.28	11405.24	99.80	36.81	10.03	0.996
646B	5H	1	90	34.70	6.39	113.05	11322.85	100.16	31.40	86.42	0.965
646B	5H	1	117	34.97	7.16	153.53	15765.28	102.69	53.40	115.61	0.969
646B	5H	1	144	35.24	6.15	149.32	15660.21	104.87	41.88	91.15	0.973
646B	5H	2	14	35.44	7.46	87.57	14165.50	161.76	49.02	78.04	0.976
646B	5H	2	29	35.59	6.36	133.53	14108.87	105.66	39.64	61.97	0.980
646B	5H	2	74	36.04	7.77	136.62	13161.04	96.33	44.35	55.32	0.981
646B	5H	2	90	36.20	6.62	133.03	12231.28	91.94	37.50	63.50	0.978
646B	5H	2	112	36.42	3.00	117.25	13192.63	112.51	17.37	102.58	0.965
646B	5H	2	137	36.67	6.55	132.72	11659.06	87.84	41.30	85.93	0.973
646B	5H	3	0	36.80	6.83	138.32	13414.62	96.98	43.37	106.37	0.966
646B	5H	3	20	37.00	7.07	138.78	12562.46	90.52	47.41	113.30	0.966
646B	5H	3	42	37.22	7.23	121.46	11921.99	98.16	51.56	132.88	0.963
646B	5H	3	60	37.40	6.37	164.87	14290.45	86.67	57.72	162.31	0.964
646B	5H	3	80	37.60	6.39	122.68	10963.86	89.37	38.27	109.62	0.963
646B	5H	3	100	37.80	6.34	97.09	10163.59	104.68	34.00	108.19	0.960
646B	5H	3	120	38.00	6.16	103.60	10255.82	98.99	34.72	136.63	0.952
646B	5H	3	140	38.20	6.73	98.00	11073.01	112.99	41.20	153.02	0.950

Appendix B (continued)

Core, section depth (cm)	Depth (mbsf)	Mass (g)	X ($10^{-6}m^3/kg$)	X_{ARM} ($10^{-6}m^3/kg$)	X_{ARM}/X	SIRM (mA/m·kg)	HIRM (mA/m·kg)	S
646B 5H 3 140	38.20	6.33	104.99	11671.31	111.17	40.86	167.12	0.948
646B 5H 4 12	38.42	6.07	112.38	11575.59	103.00	41.42	166.25	0.951
646B 6H 1 7	43.47	7.24	118.17	10710.18	90.64	45.28	33.50	0.989
646B 6H 1 20	43.60	7.03	142.60	12084.28	84.74	50.49	41.58	0.988
646B 6H 1 40	43.80	7.44	113.64	10409.92	91.60	43.18	52.47	0.982
646B 6H 1 60	44.00	7.45	163.91	13531.94	82.56	74.21	33.38	0.993
646B 6H 1 80	44.20	7.48	109.00	10262.69	94.15	42.80	34.77	0.988
646B 6H 1 102	44.42	7.48	161.07	15026.00	93.29	59.27	119.00	0.970
646B 6H 1 120	44.60	6.94	137.58	14133.17	102.73	48.82	85.46	0.976
646B 6H 1 140	44.80	7.11	134.29	14901.87	110.97	49.95	77.32	0.978
646B 6H 1 140	44.80	6.20	139.20	15304.95	109.95	44.63	98.15	0.973
646B 6H 2 10	45.00	7.47	160.95	16344.61	101.55	64.08	95.37	0.978
646B 6H 2 30	45.20	7.58	142.53	15522.20	108.90	57.27	95.20	0.975
646B 6H 2 50	45.40	7.30	155.74	15196.53	97.57	57.78	100.53	0.975
646B 6H 2 74	45.64	7.65	175.39	17151.44	97.79	68.84	104.89	0.977
646B 6H 2 90	45.80	7.43	148.29	14944.68	100.78	59.78	112.40	0.972
646B 6H 2 110	46.00	6.64	146.63	14041.40	95.76	52.76	56.08	0.986
646B 6H 2 130	46.20	7.41	175.47	15740.82	89.71	65.72	52.78	0.988
646B 6H 2 130	46.20	6.62	161.49	15260.78	94.50	55.88	51.76	0.988
646B 6H 2 148	46.38	7.44	156.36	15124.85	96.73	57.50	46.68	0.988
646B 6H 3 0	46.40	6.49	140.73	13453.05	95.60	42.38	38.73	0.988
646B 6H 3 10	46.50	6.66	127.14	13424.86	105.59	44.43	62.88	0.981
646B 6H 3 60	47.00	7.49	101.14	9476.29	93.69	39.81	48.72	0.982
646B 6H 3 77	47.17	7.62	221.09	12849.19	58.12	76.69	87.82	0.983
646B 6H 3 100	47.40	8.10	187.67	15087.16	80.39	70.20	69.83	0.984
646B 6H 3 120	47.60	7.58	176.84	13558.39	76.67	71.77	102.32	0.978
646B 6H 3 120	47.60	7.97	177.33	13582.81	76.60	76.36	104.32	0.978
646B 6H 3 140	47.80	7.66	166.30	15633.32	94.01	69.49	84.26	0.981
646B 6H 4 10	48.00	6.73	133.28	12504.57	93.82	43.67	26.66	0.992
646B 6H 4 30	48.20	6.94	205.10	18193.27	88.71	75.95	69.61	0.987
646B 6H 4 50	48.40	7.49	259.31	21327.43	82.25	110.35	574.59	0.922
646B 6H 4 70	48.60	8.10	230.32	18606.61	80.79	104.89	529.12	0.918
646B 6H 4 90	48.80	6.93	194.33	17504.19	90.07	70.19	172.85	0.966
646B 6H 4 110	49.00	7.62	171.46	14192.85	82.78	69.17	201.99	0.955
646B 6H 5 0	49.40	6.36	139.26	13543.74	97.26	43.07	63.82	0.981
646B 6H 5 20	49.60	6.38	114.40	11868.91	103.75	38.96	69.47	0.977
646B 6H 5 60	50.00	7.59	153.93	12571.26	81.67	62.24	68.73	0.983
646B 6H 5 80	50.20	7.27	188.70	15372.25	81.46	71.78	129.27	0.974
646B 6H 5 100	50.40	7.81	184.50	15022.13	81.42	71.52	130.66	0.971
646B 6H 5 100	50.40	7.90	184.94	14895.36	80.54	73.75	137.95	0.970
646B 6H 5 143	50.83	7.11	156.73	15478.24	98.76	53.71	29.85	0.992
646B 6H 6 24	51.14	7.90	148.53	15617.65	105.15	59.37	86.95	0.977
646B 6H 6 45	51.35	7.43	146.26	15379.56	105.15	55.37	92.28	0.975
646B 6H 6 61	51.51	7.55	168.56	18252.35	108.29	65.12	81.10	0.981
646B 6H 6 81	51.71	7.47	154.72	15802.41	102.13	55.80	99.75	0.973
646B 6H 6 100	51.90	7.72	141.74	14850.81	104.78	48.51	63.58	0.980
646B 6H 6 100	51.90	7.72	145.32	16393.82	112.81	53.73	46.20	0.987
646B 6H 6 121	52.11	7.61	172.35	18061.89	104.80	61.63	131.98	0.967
646B 9H 1 20	72.60	6.12	136.71	11714.82	85.69	36.08	73.12	0.975
646B 9H 1 30	72.70	6.67	146.72	14533.50	99.05	52.83	109.93	0.972
646B 9H 1 50	72.90	7.62	128.10	11048.85	86.25	52.00	93.75	0.973
646B 9H 1 89	73.29	8.37	173.06	11790.88	68.13	67.65	54.38	0.987
646B 9H 2 0	73.90	7.73	212.25	14371.66	67.71	75.60	103.25	0.979
646B 9H 2 10	74.00	7.76	190.38	14203.10	74.60	72.13	90.36	0.981
646B 9H 2 75	74.65	5.59	175.52	17503.66	99.72	48.47	85.10	0.980
646B 9H 2 91	74.81	6.72	200.78	21749.18	108.32	80.59	132.23	0.978
646B 9H 2 130	75.20	7.14	167.50	17643.19	105.33	68.41	112.37	0.977

Appendix B (continued)

Core, section depth (cm)	Depth (mbsf)	Mass (g)	X ($10^{-6}m^3/kg$)	X_{ARM} ($10^{-6}m^3/kg$)	X_{ARM}/X	SIRM (mA/m·kg)	HIRM (mA/m·kg)	S
646B 9H 3 0	75.40	7.94	117.56	11142.61	94.78	48.15	76.05	0.975
646B 9H 3 20	75.60	7.68	116.14	11180.90	96.27	44.74	39.75	0.986
646B 9H 3 41	75.81	7.34	134.53	12254.91	91.10	52.38	77.21	0.978
646B 9H 3 60	76.00	7.80	126.27	12407.23	98.26	55.20	64.17	0.982
646B 9H 3 120	76.60	7.60	138.52	14486.74	104.58	56.98	51.28	0.986
646B 9H 3 140	76.80	8.38	139.72	14219.97	101.77	54.87	29.22	0.991
646B 9H 4 0	76.90	7.56	158.86	17351.64	109.22	64.59	56.29	0.987
646B 9H 4 20	77.10	7.53	105.77	11916.32	112.66	46.63	49.54	0.984
646B 9H 4 40	77.30	8.23	101.05	10360.89	102.53	45.47	63.85	0.977
646B 9H 4 80	77.70	7.43	159.44	14228.44	89.24	64.78	119.82	0.973
646B 9H 4 100	77.90	8.21	128.84	11947.22	92.73	47.06	-13.42	1.005
646B 9H 4 120	78.10	7.30	185.86	16781.68	90.29	67.27	55.14	0.988
646B 9H 4 120	78.10	6.51	185.45	17857.91	96.29	61.41	10.19	0.998
646B 9H 4 140	78.30	7.12	146.45	14470.88	98.81	56.55	41.34	0.990
646B 9H 5 10	78.50	7.79	124.34	12573.14	101.12	48.53	-1.87	1.001
646B 9H 5 30	78.70	7.37	172.50	15137.42	87.75	71.84	27.47	0.994
646B 9H 5 68	79.08	7.34	163.28	13914.43	85.22	54.36	37.48	0.990
646B 9H 5 90	79.30	7.31	126.14	12129.22	96.15	55.79	89.40	0.977
646B 9H 5 112	79.52	7.57	166.45	14731.85	88.50	71.72	100.10	0.979
646B 9H 5 112	79.52	6.83	168.12	15247.36	90.69	65.28	161.74	0.966
646B 9H 6 0	79.90	8.05	200.69	15358.78	76.53	87.94	220.33	0.960
646B 9H 6 20	80.10	7.97	123.42	11853.18	96.04	45.80	14.24	0.995
646B 9H 6 40	80.30	7.79	187.56	17902.57	95.45	77.58	38.16	0.992
646B 9H 6 60	80.50	7.12	202.73	18926.62	93.36	77.94	22.25	0.996
646B 9H 6 120	81.10	6.48	205.70	20352.53	98.94	81.01	170.68	0.973
646B 9H 6 120	81.10	6.91	203.62	20127.41	98.85	83.37	128.35	0.979
646B 9H 6 140	81.30	7.25	136.54	13538.04	99.15	48.22	34.66	0.990
646B 9H 7 10	81.50	7.59	97.99	9350.11	95.42	33.50	35.66	0.984
646B 9H 7 30	81.70	7.48	124.28	11196.19	90.09	44.37	7.28	0.998
646B 10H 1 0	82.00	7.35	153.49	10948.80	71.33	51.83	114.33	0.968
646B 10H 1 20	82.20	7.54	71.98	6163.24	85.63	25.23	37.45	0.978
646B 10H 1 40	82.40	7.99	85.53	7433.96	86.91	33.57	39.75	0.981
646B 10H 1 60	82.60	7.55	130.62	11235.97	86.02	48.86	57.21	0.982
646B 11H 3 70	95.40	7.95	141.43	13801.87	97.59	58.49	91.47	0.975
646B 11H 3 90	95.60	6.63	138.70	14544.63	104.86	44.06	38.36	0.988
646B 11H 3 110	95.80	7.79	160.78	14844.28	92.32	77.29	77.08	0.984
646B 11H 3 130	96.00	7.83	184.03	16176.99	87.90	86.29	136.40	0.975
646B 11H 3 130	96.00	8.53	192.64	16200.73	84.10	91.28	177.54	0.967
646B 12H 1 40	101.80	7.82	136.07	15220.12	111.85	53.14	47.61	0.986
646B 12H 1 63	102.03	7.93	119.92	11054.33	92.18	44.75	66.00	0.977
646B 12H 1 81	102.21	7.88	135.83	12508.61	92.09	50.28	41.10	0.987
646B 12H 1 120	102.60	7.29	97.71	8474.99	86.74	30.23	11.26	0.995
646B 12H 1 120	102.60	6.56	107.44	8940.47	83.22	29.31	28.87	0.987
646B 12H 1 140	102.80	7.47	176.42	11805.01	66.92	60.64	84.85	0.979
646B 12H 2 6	102.96	8.85	198.45	13991.43	70.50	91.16	259.63	0.950
646B 12H 2 63	103.53	8.78	94.15	6279.40	66.70	32.88	16.47	0.991
646B 12H 2 105	103.95	7.45	129.00	11325.08	87.79	45.61	24.61	0.992
646B 12H 2 105	103.95	7.17	137.54	11489.98	83.54	46.94	83.03	0.975
646B 12H 2 145	104.35	7.59	166.18	13307.15	80.08	69.02	47.26	0.990
646B 12H 3 0	104.40	7.71	166.69	13440.91	80.63	72.10	61.07	0.987
646B 12H 3 20	104.60	7.55	175.55	15589.37	88.80	79.52	43.20	0.992
646B 12H 3 40	104.80	7.14	164.16	14762.36	89.93	67.59	183.53	0.961
646B 12H 3 60	105.00	8.04	130.32	12222.18	93.79	57.17	96.09	0.973
646B 12H 3 80	105.20	8.25	145.27	15001.07	103.26	67.63	112.21	0.973
646B 12H 3 100	105.40	7.58	213.47	18885.82	88.47	90.84	66.27	0.989
646B 12H 4 10	106.00	7.69	152.42	14804.35	97.13	65.45	123.59	0.971
646B 12H 4 30	106.20	7.50	129.65	13860.13	106.91	50.12	73.22	0.978

Appendix B (continued)

Core, section depth (cm)	Depth (mbsf)	Mass (g)	X ($10^{-6}m^3/kg$)	X_{ARM} ($10^{-6}m^3/kg$)	X_{ARM}/X	SIRM (mA/m·kg)	HIRM (mA/m·kg)	S
646B 12H 4 53	106.43	6.90	142.56	13451.86	94.36	50.29	168.59	0.954
646B 12H 4 68	106.58	7.49	187.52	18689.91	99.67	82.32	135.36	0.975
646B 12H 4 108	106.98	7.86	153.28	17244.30	112.50	69.22	29.73	0.993
646B 12H 4 108	106.98	6.63	154.05	17640.81	114.51	60.31	171.19	0.962
646B 12H 4 130	107.20	7.60	145.79	14704.44	100.86	60.93	67.84	0.983
646B 12H 4 148	107.38	7.87	134.89	13017.44	96.51	58.25	39.61	0.989
646B 12H 5 20	107.60	7.33	135.57	12850.06	94.79	54.59	46.43	0.988
646B 12H 5 40	107.80	7.54	151.95	14033.53	92.35	62.16	60.10	0.985
646B 12H 5 81	108.21	8.03	166.77	14033.74	84.15	70.26	20.40	0.995
646B 12H 5 120	108.60	7.60	105.46	11487.70	108.93	38.01	51.71	0.979
646B 12H 6 4	108.94	7.12	191.97	18510.57	96.42	75.39	127.43	0.976
646B 12H 6 34	109.24	7.36	204.32	18781.24	91.92	79.54	97.96	0.982
646B 12H 6 63	109.53	7.31	225.48	23838.07	105.72	89.80	186.30	0.970
646B 13H 1 10	111.20	6.71	84.25	8617.23	102.28	25.73	-0.93	1.000
646B 13H 1 30	111.40	6.28	85.42	8351.67	97.77	24.81	37.59	0.981
646B 13H 1 52	111.62	7.00	114.14	9264.90	81.17	39.65	95.19	0.966
646B 13H 1 70	111.80	7.84	116.01	10099.93	87.06	41.12	46.49	0.982
646B 13H 1 120	112.30	7.80	116.93	11206.67	95.84	44.66	37.80	0.987
646B 13H 1 140	112.50	7.26	128.74	11863.03	92.15	44.24	45.67	0.985
646B 13H 1 140	112.50	7.11	126.33	11701.09	92.62	43.16	39.62	0.987
646B 13H 2 52	113.12	7.74	114.27	10884.20	95.25	37.77	9.85	0.996
646B 13H 2 80	113.40	8.53	183.66	14657.11	79.81	66.26	19.54	0.995
646B 13H 2 120	113.80	8.33	115.98	11394.91	98.25	39.93	27.65	0.988
646B 13H 2 140	114.00	7.39	96.73	9650.08	99.76	29.44	11.79	0.994
646B 13H 2 140	114.00	8.05	95.20	9593.31	100.77	32.75	35.20	0.983
646B 13H 3 37	114.47	6.63	188.54	15185.28	80.54	67.00	38.64	0.992
646B 13H 3 52	114.62	8.08	169.78	13845.37	81.55	66.77	31.74	0.992
646B 13H 3 70	114.80	7.57	154.84	13427.94	86.72	60.58	52.78	0.987
646B 13H 3 105	115.15	7.63	107.85	9833.74	91.18	38.88	2.50	0.999
646B 13H 3 105	115.15	8.14	105.72	9608.24	90.88	40.11	0.98	1.000
646B 13H 4 0	115.60	7.45	107.92	9360.39	86.73	38.25	17.92	0.993
646B 13H 4 27	115.87	6.52	182.47	19413.40	106.39	66.18	53.99	0.989
646B 13H 4 40	116.00	6.91	173.99	17462.68	100.37	63.91	35.76	0.992
646B 13H 4 60	116.20	7.08	139.82	13797.98	98.68	50.14	40.57	0.989
646B 13H 4 80	116.40	7.74	141.86	14545.11	102.53	56.96	29.63	0.992
646B 13H 4 120	116.80	7.69	126.44	12558.73	99.32	57.28	82.32	0.978
646B 13H 4 140	117.00	7.33	135.05	13184.44	97.62	61.23	126.90	0.970
646B 13H 4 140	117.00	7.45	136.59	12747.97	93.33	60.66	118.96	0.971
646B 13H 5 10	117.20	7.10	135.36	11996.78	88.63	55.05	113.62	0.971
646B 13H 5 51	117.61	6.92	169.74	1669.29	9.83	64.01	105.61	0.977
646B 13H 5 71	117.81	8.09	147.21	12254.26	83.24	55.42	53.49	0.984
646B 13H 5 91	118.01	8.12	111.55	10665.55	95.61	42.01	57.62	0.978
646B 13H 6 10	118.70	7.67	177.88	14920.10	83.88	59.86	42.36	0.989
646B 13H 6 30	118.90	8.03	190.55	16938.21	88.89	63.86	49.26	0.988
646B 13H 6 53	119.13	7.45	184.82	19747.06	106.85	73.15	78.67	0.984
646B 14H 1 10	120.90	8.04	168.60	13555.50	80.40	71.64	57.12	0.987
646B 14H 1 32	121.12	7.51	172.97	14657.51	84.74	71.88	69.71	0.985
646B 14H 1 50	121.30	7.11	151.07	14136.08	93.57	54.87	53.57	0.986
646B 14H 1 70	121.50	8.78	123.48	11554.50	93.57	51.63	27.98	0.990
646B 14H 1 110	121.90	8.18	148.67	15738.23	105.86	62.41	52.70	0.986
646B 14H 1 110	121.90	8.25	146.34	15639.41	106.87	61.37	46.85	0.987
646B 14H 1 130	122.10	7.99	115.57	12476.18	107.96	47.23	44.78	0.985
646B 14H 1 148	122.28	7.83	124.51	13236.20	106.31	50.30	58.07	0.982
646B 14H 2 20	122.50	7.71	149.25	15455.03	103.55	62.15	69.13	0.983
646B 14H 2 41	122.71	7.37	163.30	16810.99	102.95	61.41	82.85	0.980
646B 14H 2 62	122.92	7.86	158.87	14921.62	93.92	65.09	84.78	0.980
646B 14H 2 75	123.05	8.03	150.03	13022.77	86.80	57.15	107.74	0.970

Appendix B (continued)

Core, section depth (cm)	Depth (mbsf)	Mass (g)	X ($10^{-6}m^3/kg$)	X_{ARM} ($10^{-6}m^3/kg$)	X_{ARM}/X	SIRM (mA/m·kg)	HIRM (mA/m·kg)	S
646B 14H 2 104	123.34	8.00	136.46	12471.11	91.39	47.12	45.83	0.984
646B 14H 2 120	123.50	7.84	166.17	16095.30	96.86	62.14	53.65	0.986
646B 14H 2 140	123.70	6.89	130.37	12866.76	98.70	51.73	87.87	0.977
646B 14H 2 140	123.70	6.80	130.43	13092.30	100.38	51.88	129.27	0.966
646B 14H 3 11	123.91	6.81	161.23	12507.10	77.57	48.44	68.98	0.981
646B 14H 3 40	124.20	7.92	201.77	14993.69	74.31	81.98	128.76	0.975
646B 14H 3 79	124.59	7.12	196.56	15046.09	76.55	69.93	74.12	0.985
646B 14H 3 133	125.13	7.57	141.39	12645.79	89.44	58.14	69.84	0.982
646B 14H 4 10	125.40	7.88	178.24	16689.73	93.64	70.68	64.00	0.986
646B 14H 4 30	125.60	7.34	114.67	11931.93	104.05	45.05	41.51	0.986
646B 14H 4 51	125.81	7.04	113.67	11626.85	102.28	42.32	64.15	0.979
646B 14H 4 70	126.00	7.61	110.61	9859.75	89.14	40.55	41.17	0.985
646B 14H 4 90	126.20	7.98	145.94	12275.19	84.11	54.96	56.56	0.984
646B 14H 4 110	126.40	7.34	165.34	15642.42	94.61	61.84	56.53	0.987
646B 14H 4 130	126.60	7.62	140.80	14052.88	99.81	59.52	50.39	0.987
646B 14H 4 130	126.60	7.62	137.17	13629.33	99.36	57.69	45.01	0.988
646B 14H 4 148	126.78	6.35	108.02	11017.09	101.99	40.09	50.22	0.984
646B 14H 5 31	127.11	7.52	132.14	12134.14	91.83	49.12	52.07	0.984
646B 14H 5 52	127.32	6.98	144.89	11991.01	82.76	47.75	32.59	0.990
646B 14H 5 93	127.73	8.07	207.82	15121.92	72.76	72.84	67.60	0.985
646B 14H 5 132	128.12	7.74	193.96	14810.16	76.36	62.41	23.40	0.994
646B 14H 5 132	128.12	7.74	191.85	14974.10	78.05	64.49	13.96	0.997
646B 14H 6 0	128.30	7.49	157.33	14074.21	89.46	50.02	30.13	0.991
646B 14H 6 20	128.50	7.65	160.11	15492.00	96.76	54.63	10.66	0.997
646B 14H 6 45	128.75	7.55	151.59	14057.71	92.74	53.20	34.80	0.990
646B 14H 6 74	129.04	8.09	105.91	10638.17	100.45	35.76	40.24	0.982