13. SITE 668[1]

Shipboard Scientific Party[2]

HOLE 668A

Date occupied: 13 April 1986, 2130 UTC

Date departed: 14 April 1986, 0730 UTC

Time on hole: 10 hr

Position: 4°46.12′N, 20°55.62′W

Water depth (sea level; corrected m, echo-sounding): 2693.5

Water depth (rig floor; corrected m, echo-sounding): 2704.0

Bottom felt (rig floor; m, drill pipe measurement): 2700.5

Distance between rig floor and sea level (m): 10.5

Total depth (rig floor, m): 2709.3

Penetration (m): 8.8

Number of cores (including cores with no recovery): 1

Total length of cored section (m): 8.8

Total core recovered (m): 8.8

Core recovery (%): 100

Oldest sediment cored:
Depth (mbsf): 8.8
Nature: calcareous nannofossil ooze
Age: Pleistocene

HOLE 668B

Date occupied: 14 April 1986, 1917 UTC

Date departed: 14 April 1986, 2225 UTC

Time on hole: 3.1 hr

Position: 4°46.23′N, 20°55.62′W

Water depth (sea level; corrected m, echo-sounding): 2693.5

Water depth (rig floor; corrected m, echo-sounding): 2703.8

Bottom felt (rig floor; m, drill pipe measurement): 2703.6

Distance between rig floor and sea level (m): 10.5

Total depth (rig floor, m): 2734.8

Penetration (m): 31.2

Number of cores (including cores with no recovery): 4

Total length of cored section (m): 31.2

Total core recovered (m): 31.3

Core recovery (%): 100

Oldest sediment cored:
Depth (mbsf): 31.2
Nature: calcareous nannofossil ooze
Age: latest Pliocene

Principal results: Site 668 is located in the eastern equatorial Atlantic at 4°46.12′N, 20°55.62′W, at a water depth of 2690 m on the relatively flat crest of the Sierra Leone Rise (Fig. 1). The site is situated in a region of well-stratified, moderately reflective acoustical layering that ranges in character from relatively flat-lying to hummocky rolling sediment waves. Our primary objective was to obtain a relatively shallow-water Pliocene to Holocene sequence for use as part of a depth transect to study deep-water isolation in the eastern equatorial Atlantic. A secondary objective was to use this set of cores to monitor long-term fluxes in $CaCO_3$ from surface waters, along with $CaCO_3$ dissolution and downslope redistribution. We also planned to core a single, deeper hole to retrieve a long Neogene sequence for biostratigraphic and paleomagnetic studies.

Operational problems, followed by the illness of a crew member, kept us from reaching most of our primary objectives at this site. We retrieved one 8.8-m mud-line core from Hole 668A, which was occupied from 2130 UTC on 13 April to 0730 UTC, 14 April 1986, a total of 10 hr. (All times are Universal Time Coordinated, formerly GMT, Greenwich Mean Time.) From Hole 668B, we retrieved four advanced piston corer (APC) cores, totaling 31.2 m in length with 100% recovery. Hole 668B was occupied from 1917 to 2225 on 14 April 1986.

The sediments recovered were calcareous nannofossil ooze and varied from muddy nannofossil ooze to muddy foraminifer-nannofossil ooze to mud-bearing, foraminifer-bearing nannofossil ooze. Secondary components included clay (5%–30%), quartz (0%–12%), and opal (0%–5%). Paleomagnetic stratigraphy defined the Matuyama/Brunhes chron boundary and the top and bottom of the Olduvai subchron. Nannofossils and planktonic foraminifers provided several biostratigraphic datums. Preservation of calcareous fossils was good, but few diatoms were observed. Deposition rates averaged 12 to 17 m/m.y. in the uppermost Pliocene to Holocene sequence (0–2.0 Ma).

Too few shipboard analyses were performed (e.g., only five $CaCO_3$ analyses) to detect significant trends at Site 668. From both the lithology and the state of preservation, the overall sediment sequence is characteristic of a low-productivity, surface-water environment and a deep-water regime not heavily undersaturated with $CaCO_3$.

BACKGROUND AND SCIENTIFIC OBJECTIVES

Site 668 (target Site Eq-3) was the shallowest of the sites that make up the depth transect on the southern margin of the Sierra

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[1] Ruddiman, W., Sarnthein, M., Baldauf, J., et al., 1988. *Proc., Init. Repts. (Pt. A), ODP*, 108.

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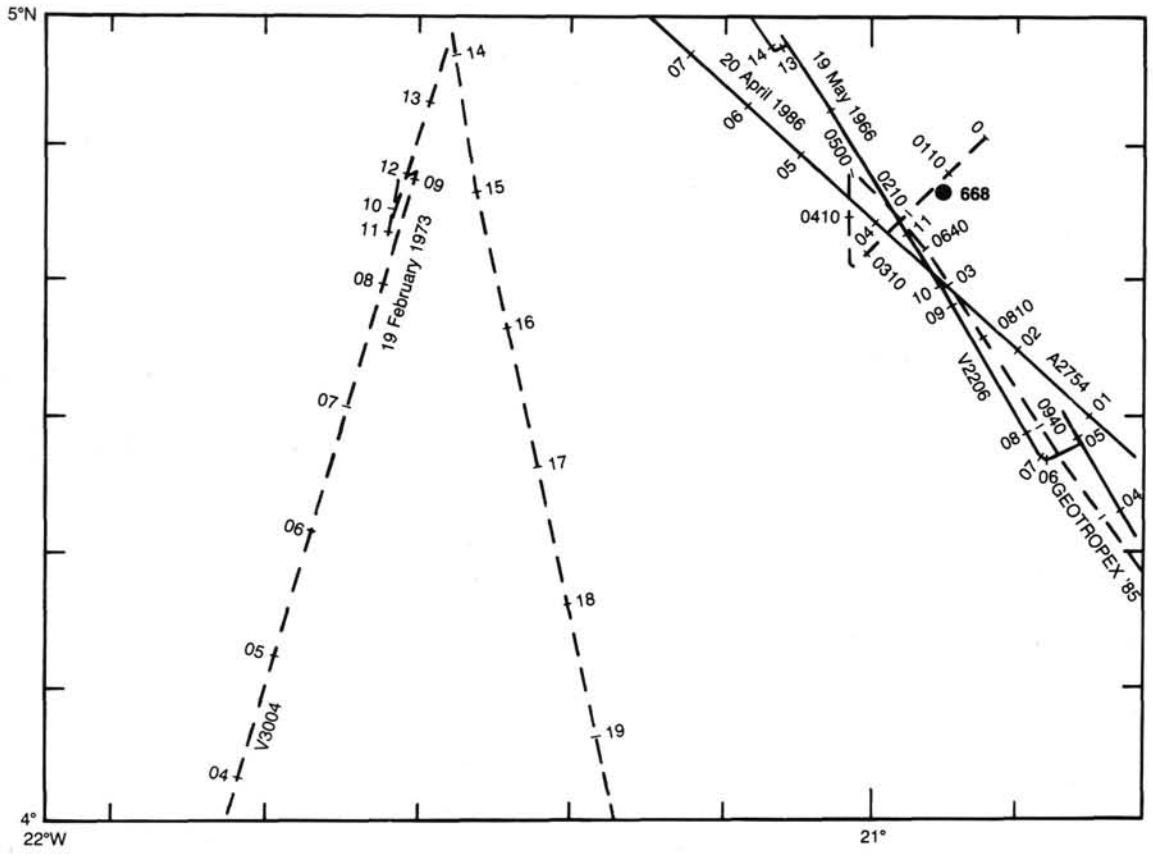


Figure 1. Seismic track lines near Site 668.

Leone Rise (Fig. 2; "Background and Scientific Objectives" section, Site 665 chapter). The nearest drill site was DSDP Site 366, where extensive recovery of rotary-drilled sediment provided a good stratigraphic basis for predicting downhole ages and lithologies. We planned two major types of objectives at Site 668, one as part of the four-core depth transect of Sites 665 to 668 and the other focusing on broader paleoceanographic objectives, especially the deeper Neogene section planned for this site.

Our depth-related objectives were as follows:

1. To determine the late Neogene history of relative isolation of eastern Atlantic deep waters, based on depletion of $\delta^{13}C$ and on the organic-carbon content. For this purpose, Site 668 was chosen as a shallow control core at a bathymetric level unaffected by the partial deep-water isolation.
2. To assess late Neogene changes in (1) the flux of $CaCO_3$ from the surface waters, (2) dissolution of $CaCO_3$ by deep waters, and (3) redistribution of all sediment components by bottom currents.

Broader paleoenvironmental objectives at Site 668 were the following:

1. To measure late Neogene fluxes of eolian dust and freshwater diatoms as indicators of continental source-area aridity and of wind strength.
2. To monitor changes in surface-water temperature during the Pliocene and Pleistocene using planktonic foraminifers and other indicators.
3. To obtain a high-quality, undissolved reference section of $CaCO_3$-rich equatorial sediments for detailed biostratigraphic and paleomagnetic studies.

Geologic and Topographic Setting

Site 668 is located in the eastern equatorial Atlantic on the southwest margin of the relatively flat crest of the Sierra Leone Rise (Fig. 1; see also Fig. 2, Site 665 chapter). Air-gun records from this region indicate a little more than 1 s of sediments above acoustic basement (Figs. 2 and 3). Layering is well-stratified and moderately reflective and ranges from relatively flat-lying sediment to hummocky, rolling layers that thin and thicken over short lateral distances. Site 668 was chosen at a point where the upper 0.3 s of sediment was particularly thick. The echogram character from this region indicates standing sediment waves, with average amplitudes of up to 10 m and average wavelengths of about 1 nmi. The origin of the sediment waves and hummocky sub-bottom layering cannot be determined solely from these records, but it probably involves focusing of near-bottom energy on this shallow topographic feature, causing moderate redistribution of sediments.

The basement at Site 668 is Cretaceous (about 80 Ma), based on the age surmised for Site 366. The sediments in the upper 150 to 200 m are middle Miocene to Holocene nannofossil oozes and marls, with possible Miocene unconformities.

OPERATIONS

After departing Site 667, we steamed at 13 kt to a way point at 4°44′N, 21°00′W, which was reached at 1307 UTC on 13

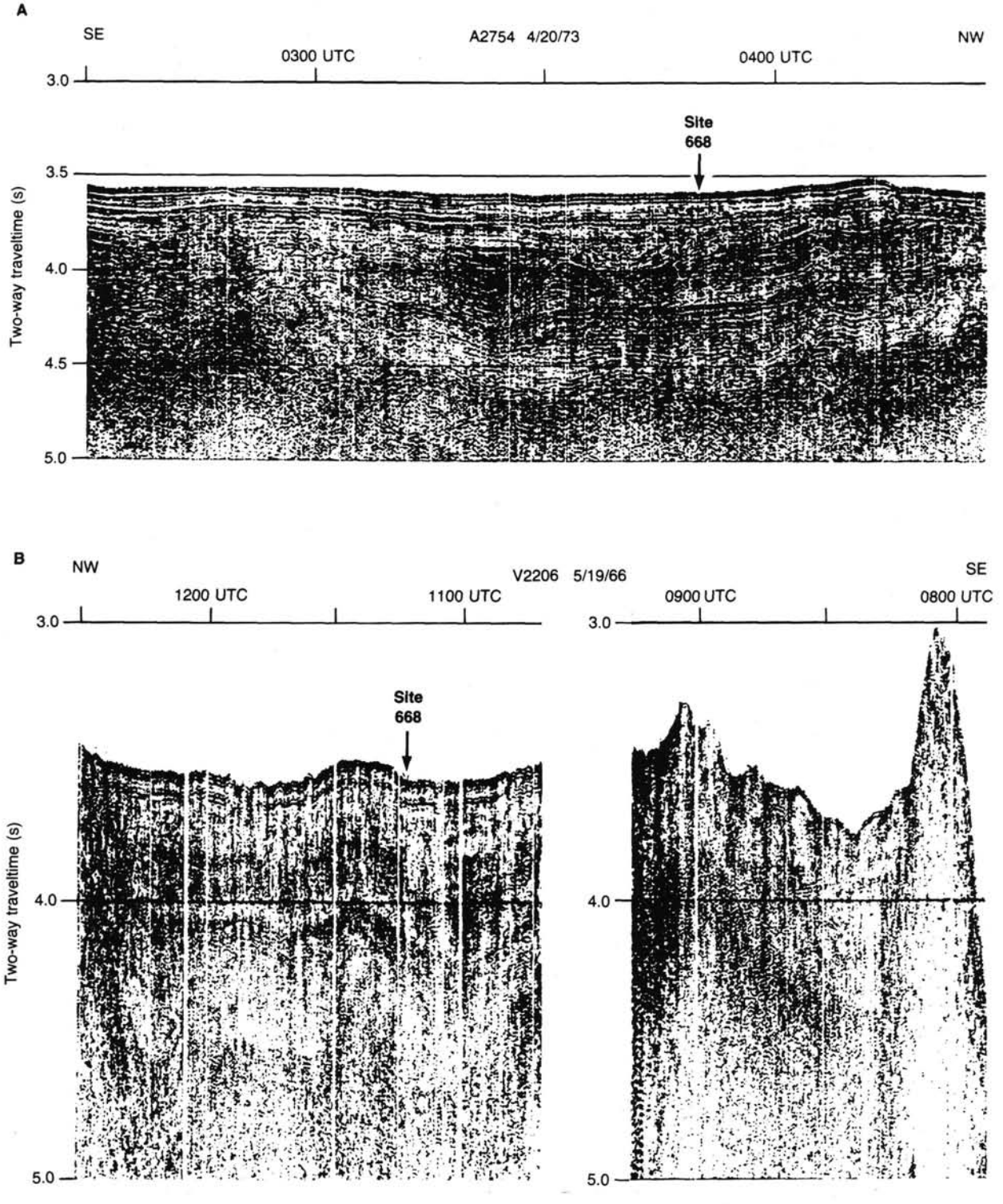


Figure 2. Seismic-reflection records near Site 668. *A* = cruise A2754. *B* = cruise V2206.

April 1986. We slowed to 5 kt and streamed out our geophysical gear (80-in.^{3} water guns and a magnetometer) on a course of 072°. Reaching a second way point at 4°48.3′N, 20°51.5′W at 1507, we turned to a course of 242° and headed back toward the site location at 4°46.12′N, 20°55.62′W. We crossed over the site location, dropped a beacon at 1600, pulled in our geophysical gear, and then returned, with a stop over the beacon at 1700 on 13 April.

From 1700 to 2130 on 13 April, we ran drill pipe into Hole 668A. First, we retrieved a water core. On our second attempt, we spudded in with a mud-line core, but the sand line parted. Between 2315 on 13 April and 0030 on 14 April, we fished for the broken wire and for Core 108-668A-1H with a wire-line spear. Finally, we were forced to pull out of the hole to recover the core barrel because the wire was broken in two places. We pulled out of the hole from 0730 until 1130 on 14 April.

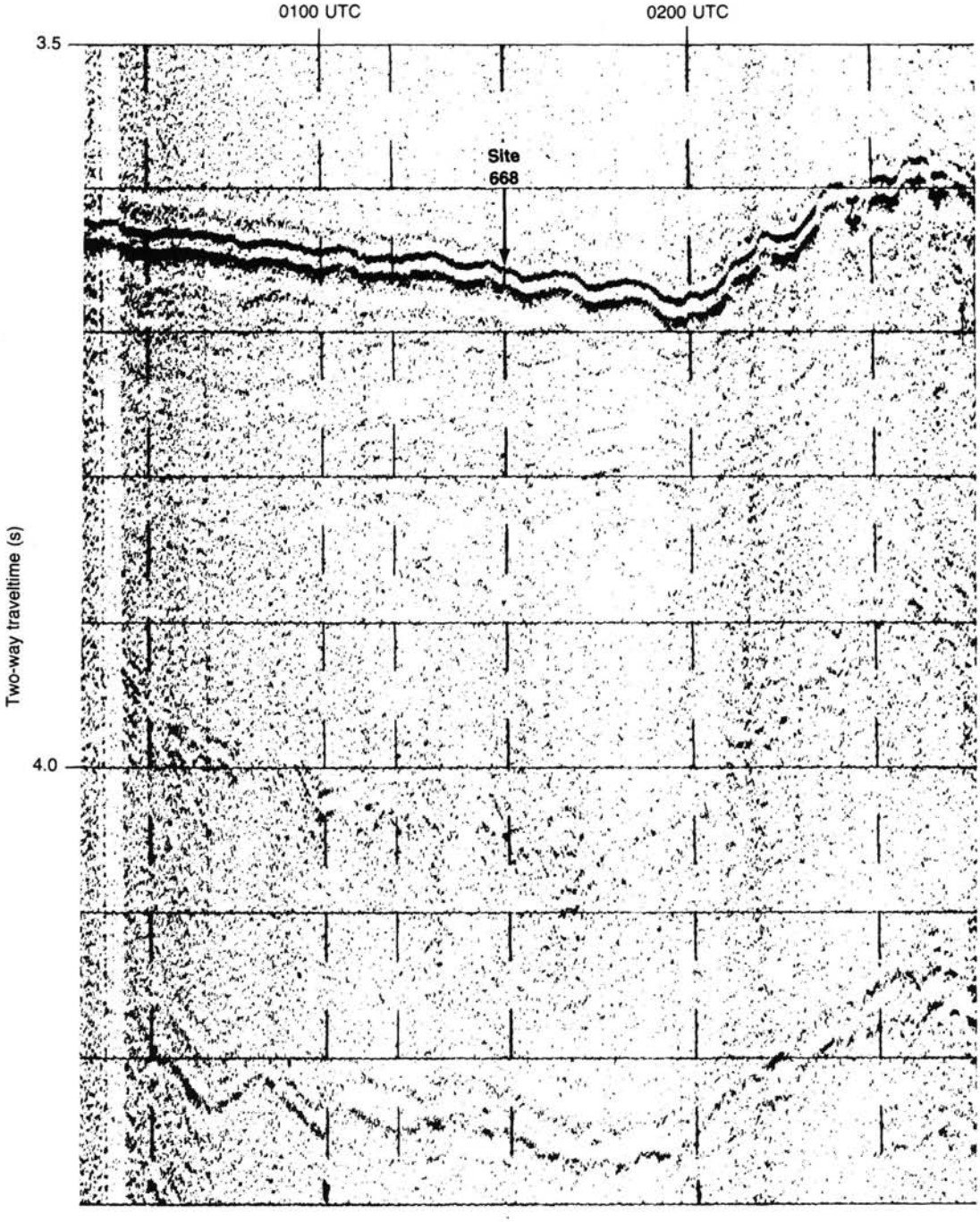


Figure 3. High-resolution, seismic-reflection record near Site 668 from GEOTROPEX'85.

We then began running pipe into Hole 668B from 1130 to 1800 on 14 April, and, at the same time, offset 15 m to the south. We spudded in at 1917, and the mud-line core (108-668B-1H) came on board at 2000. We recovered three more APC cores (Table 1), orienting Cores 108-668B-3H and -668B-4H. The last core at this hole (Core 108-668B-4H) came on board at 2225.

At this point, illness of a member of the scientific crew forced us to end coring of Hole 668B and the scientific portion of Leg 108. We pulled out of the hole from 2225 on 14 April until 0445 on 15 April. With the drill string on board, we got under way for Dakar at 0445 on 15 April. Some 3840 m of sedi-

Table 1. Site 668 coring summary (drilling depths).

Core no.	Date (April 1986)	Time (UTC)	Depths (mbsf)	Length cored (m)	Length recovered (m)	Recovery (%)
108-668A-1H	14	1430	0–8.8	8.8	8.8	99.9
108-668B-1H	14	2000	0–2.7	2.7	2.7	98.1
108-668B-2H	14	2034	2.7–12.2	9.5	9.7	102.0
108-668B-3H	14	2130	12.2–21.7	9.5	9.5	99.5
108-668B-4H	14	2225	21.7–31.2	9.5	9.4	99.1

H = hydraulic piston. UTC = Universal Time Coordinated.

ment was on board, and although we had not totally fulfilled everyone's dreams, we recovered riches enough for all.

LITHOSTRATIGRAPHY AND SEDIMENTOLOGY

Unit I

Core 108-668A-1H; depth, 0–8.8 mbsf; age, late Pleistocene.
Cores 108-668B-1H through -668B-4H, CC; depth, 0–31.2 mbsf; age, late Pliocene to Holocene.

Site 668 consists of one unit, with interbedded layers of foraminifer-bearing, muddy nannofossil ooze; mud-bearing, foraminifer-bearing nannofossil ooze; and muddy foraminifer-nannofossil ooze. The upper 12 m of this unit is generally brown to light yellowish brown. Below 12 mbsf, colors are generally light gray, light olive gray, or olive.

Foraminifer concentrations vary from approximately 5% to greater than 40%. Calcareous nannofossil concentrations vary from 50% to 75%. The noncarbonate fraction is principally clay (5% to 30%), with minor amounts of quartz (up to 12%) and accessory minerals (5%). Biogenic opal is present in trace amounts up to 5%.

Depositional Environment

The sediments deposited at Site 668 are typical of carbonate oozes deposited in low-productivity environments. Sediments are rich in foraminifers and nannofossils and poor in diatoms and radiolarians. The clay, quartz, and accessory minerals deposited at this site probably are eolian material derived from northern Africa. The change in color at about 12 mbsf probably reflects the late Pleistocene increase in eolian material that occurred in response to changes in North African aridity.

BIOSTRATIGRAPHY

The four cores recovered from Site 668 show abundant, well-preserved planktonic foraminifers and nannofossils but contain diatoms only in the uppermost cores of each hole (Fig. 4). The fauna and flora indicate tropical conditions, with little evidence of reworking in any of the studied samples.

Calcareous Nannofossils

The uppermost Pliocene through Holocene nannofossil assemblages at Site 668 show good preservation and contain three reliable species events that were determined using light-microscopy techniques. The extinction of *Pseudoemiliania lacunosa* occurs between Samples 108-668B-2H-4, 130 cm, and -668B-2H-5, 130 cm. Hole 668A is represented by a single core, of which the core-catcher sample represents a level above the extinction of *P. lacunosa*. *Helicosphaera sellii* was observed in Sample 108-668B-4H-1, 110 cm, but it was not accompanied by *Calcidiscus macintyrei*. This latter species has its last occurrence (*LO*) in Sample 108-668B-4H-2, 130 cm. Discoasters are present only in Section 108-668B-4H-6. The *Discoaster triradiatus* acme interval was observed up to Sample 108-668B-4H-6, 90 cm. This level approximates the Zone NN18/NN19 boundary.

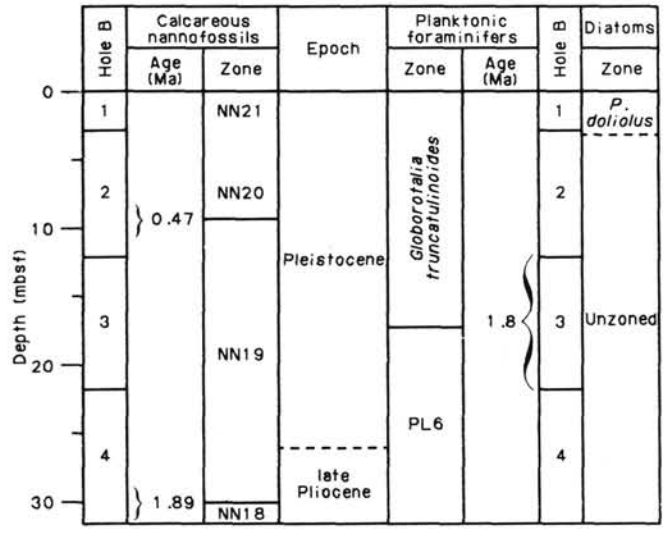


Figure 4. Zonal assignments for cores recovered from Hole 668B.

Planktonic Foraminifers

Planktonic foraminifers are abundant and well-preserved at Site 668. One core recovered from Hole 668A (108-668A-1H) and two of the four recovered from Hole 668B (108-668B-1H and -668B-2H) were assigned to the Pleistocene *Globorotalia truncatulinoides* Zone. Two cores (108-668B-3H and -668B-4H) were assigned to the late Pliocene PL6 zone. The overlap in the ranges of *G. truncatulinoides* and *Globigerinoides obliquus* was identified in Sample 108-668B-3H, CC. All samples are tropical in nature and contain abundant *Globigerinoides ruber, Globigerinoides trilobus*, and *Neogloboquadrina dutertrei. Globorotalia tumida* is abundant only in Sample 108-668A-1H, CC of Hole 668A.

Benthic Foraminifers

Benthic foraminifers occur in all core-catcher samples examined from Hole 668B. Samples 108-668B-1H, CC through -668B-4H, CC contain common, well-preserved specimens. The characteristic species of this assemblage are *Globocassidulina subglobosa, Oridorsalis tener, Planulina wuellerstorfi*, and *Uvigerina peregrina*. Common *Hoeglundina elegans* are found only in Sample 108-668B-1H, CC. Uvigerinids are common throughout the samples examined. In addition, a few specimens of two species of *Melonis* occur in Sample 108-668B-4H, CC.

Diatoms

Few diatoms were encountered in Samples 108-668A-1H, CC and -668B-1H, CC. Sample preservation is poor. The presence of *Pseudoeunotia doliolus* without *Nitzschia reinholdii* in Sample 108-668A-1H, CC suggests an age of less than 0.65 Ma; however, the sparseness of this assemblage makes this age assignment only tentative. A single unidentifiable diatom fragment was seen in Sample 108-668B-2H, CC; Samples 108-668B-3H, CC and -668B-4H, CC were barren of diatoms.

PALEOMAGNETISM

Magnetostratigraphy

The single core from Hole 668A arrived on deck in such a mangled state that magnetic studies were not appropriate.

All four cores from Hole 668B were measured at 3-cm intervals. Data from Cores 108-668B-3H and -668B-4H were corrected for core orientation using the multishot photographic device. Data from the core tops and disturbed intervals were not considered satisfactory and were deleted. One discrete sample per core section was measured; results agree well with those of the continuous measurements and indicate high stability of magnetic remanence.

We plot data from the archive halves of Hole 668B in Figure 5. Correlation with the geomagnetic polarity time scale is given on the right of the figure. The Matuyama/Brunhes and Jaramillo boundaries were missing from the record.

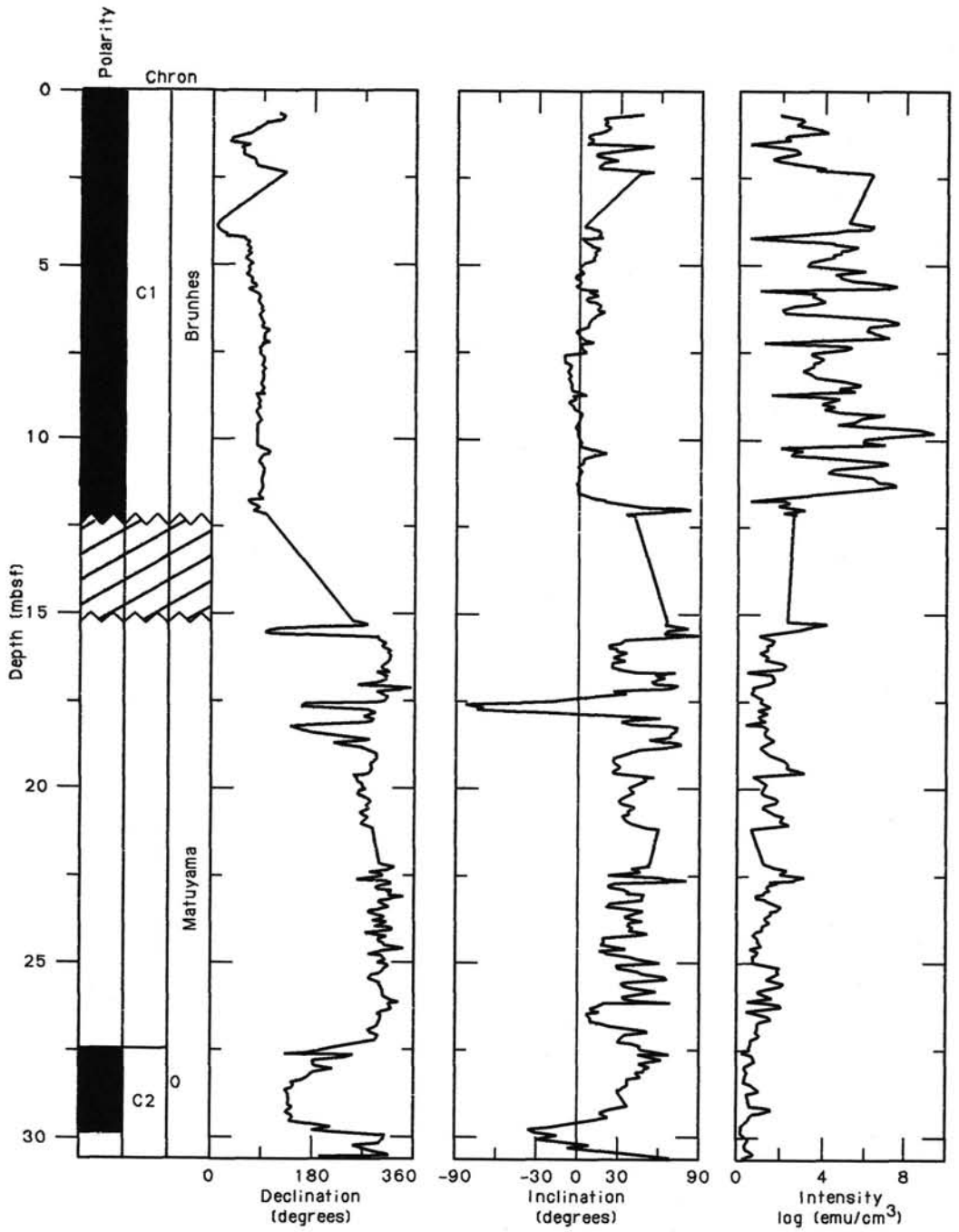


Figure 5. Results of the continuous core measurements from Hole 668B.

Magnetic Susceptibility

Whole cores were measured for volume susceptibility at 3-cm intervals throughout Holes 666A (Core 108-668A-1H) and 668B (Cores 108-668B-1H through -668B-4H). Preliminary assessment suggests that many of the features in the susceptibility record of about the uppermost 20 mbsf at Site 667 also occur at Site 668.

SEDIMENT-ACCUMULATION RATES

Sediment-accumulation rates for Hole 668B were calculated using three nannofossil datums and three paleomagnetic datums. The resulting curve (Fig. 6 and Table 2) has three components: (1) a rate of 17 m/m.y. from 0 to 0.73 Ma (0–13.35 m), (2) a rate of 15 m/m.y. from 0.73 to 1.66 Ma (13.4–27.25 m), and (3) a rate of 12 m/m.y. from 1.66 Ma to 1.88 Ma (27.25–29.95 m). This curve fits all the datums. The LO of *G. obliquus* was not used because of its unreliability at earlier Leg 108 sites.

INORGANIC GEOCHEMISTRY

One interstitial-water sample was squeezed from Hole 668B. Values for pH and alkalinity were measured in conjunction using a Metrohm 605 pH-meter, followed by titration with 0.1N HCl, and salinities were measured using an optical refractometer. Cl^-, Ca^{2+}, and Mg^{2+} concentrations were determined by the titrations described in Gieskes and Peretsman (1986). SO_4^{2-} analyses were performed by ion chromatography using a Dionex 2120i instrument. Results from all analyses are presented in Table 3.

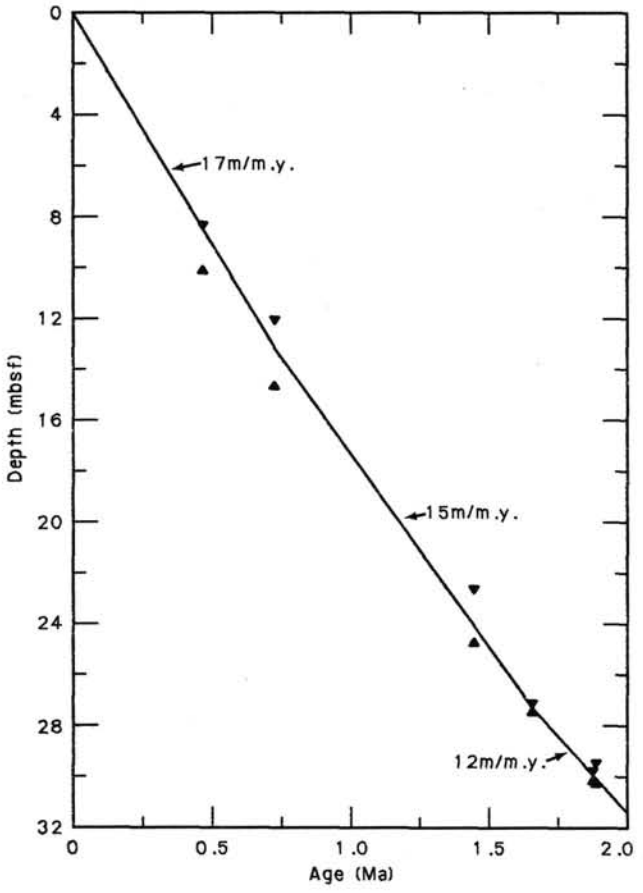


Figure 6. Sediment-accumulation rates for Hole 668B.

ORGANIC GEOCHEMISTRY

From Hole 668B, only five samples were recovered (from Core 108-668B-1H) for determining carbonate and organic-carbon contents. The inorganic-carbon (IC) content was measured using the Coulometrics Carbon Dioxide Coulometer. The total-carbon (TC) content was obtained by means of the Perkin Elmer 240C Elemental Analyzer. The total-organic-carbon (TOC) content was calculated by difference. Analytical methods are discussed, and data presented in the Appendix (this volume). TOC values are low and vary from 0% to 0.33%. The carbonate content fluctuates between 55% and 81%.

PHYSICAL PROPERTIES

Techniques used for shipboard physical-property measurements at Site 668 are outlined in the "Introduction and Explanatory Notes" (this volume). Index properties and vane shear strength were measured only for the four cores from Hole 668B. Data for this short hole are shown in Table 4 and are plotted in Figures 7 through 9. All five cores from this site were logged continuously using the *P*-wave logger (PWL) and the GRAPE.

Table 2. Depth and age estimates of biostratigraphic and magnetostratigraphic indicators used to establish accumulation rates for Hole 668B.

Datum	Depth (mbsf)	Age (Ma)
LO *Pseudoemiliania lacunosa*	8.5–10.0	0.47
Brunhes/Matuyama	12.2–14.5	0.73
LO *Calcidiscus macintyrei*	22.8–24.6	1.45
Matuyama/Olduvai	27.2–27.3	1.66
Olduvai/Matuyama	29.9–30.0	1.88
LO *Discoaster brouweri*	29.6–30.1	1.89

LO = last occurrence.

Table 3. Results of inorganic-chemistry analyses conducted for Site 668.

Core/ section	pH	Alkalinity (mmol/L)	Salinity (‰)	Chlorinity (mmol/L)	SO_4^{2-} (mmol/L)	Mg^{2+} (mmol/L)	Ca^{2+} (mmol/L)
1-1	7.60	3.34	34.0	560	27.85	50.77	11.41

Table 4. Index-properties and vane-shear-strength data for Hole 668B.

Core/ section	Interval (cm)	Depth (mbsf)	Grain density (cm^3)	Wet-water content (%)	Dry-water content (%)	Wet-bulk density (g/cm^3)	Dry-bulk density (g/cm^3)	Porosity (%)	Vane shear strength (kPa)
1-1	121	1.20	2.67	49.54	98.18	1.48	0.78	72.22	4.80
2-1	121	3.90	2.50	55.40	124.20	1.39	0.67	75.53	22.00
2-2	121	5.40	2.52	53.08	113.11	1.41	0.70	73.86	15.00
2-3	121	6.90	2.48	52.64	111.13	1.41	0.72	73.25	21.00
2-4	121	8.40	2.61	47.94	92.08	1.49	0.83	70.38	19.00
2-5	121	9.90	2.61	50.22	100.88	1.46	0.78	72.29	28.00
2-6	121	11.40	2.47	49.44	97.80	1.45	0.78	70.55	22.00
3-1	121	13.40	2.33	53.68	115.91	1.38	0.68	72.80	20.00
3-3	121	14.90	2.56	50.40	101.63	1.45	0.77	72.05	27.00
3-4	121	16.40	2.63	48.40	93.78	1.49	0.81	70.92	22.00
3-5	121	17.90	2.53	46.85	88.14	1.49	0.84	68.80	16.00
3-6	121	19.40	2.65	47.24	89.52	1.51	0.85	70.13	24.00
4-1	121	22.90	2.53	42.20	73.00	1.56	0.95	64.61	25.00
4-2	121	24.40	2.51	47.63	90.94	1.48	0.82	69.36	15.00
4-3	121	25.90	2.51	46.82	88.04	1.49	0.84	68.60	18.00
4-4	121	27.40	2.67	43.25	76.22	1.57	0.94	66.84	18.00
4-5	96	28.65	2.51	44.60	80.51	1.52	0.89	66.68	28.00
4-6	121	30.40	2.54	42.90	75.14	1.55	0.92	65.39	25.00

Figure 10 gives the PWL record of Core 108-668B-3H to illustrate the cyclic nature of the sedimentation, as revealed by *P*-wave velocity fluctuations of from 1540 to 1570 m/s.

SEISMIC STRATIGRAPHY

Coring at Site 668 was delayed initially by operational problems and was terminated prematurely by the illness of a member of the scientific crew. The deepest depth reached was 31.2 mbsf in Hole 668B. Acoustic returns from the equivalent depth range in the sediment column are artifacts of the water-gun signals. Thus, no meaningful correlation of seismic units with lithologic units was possible.

REFERENCES

Gieskes, J. M., and Peretsman, G., 1986. Water chemistry procedures aboard *JOIDES Resolution*. ODP Technical Note No. 5.

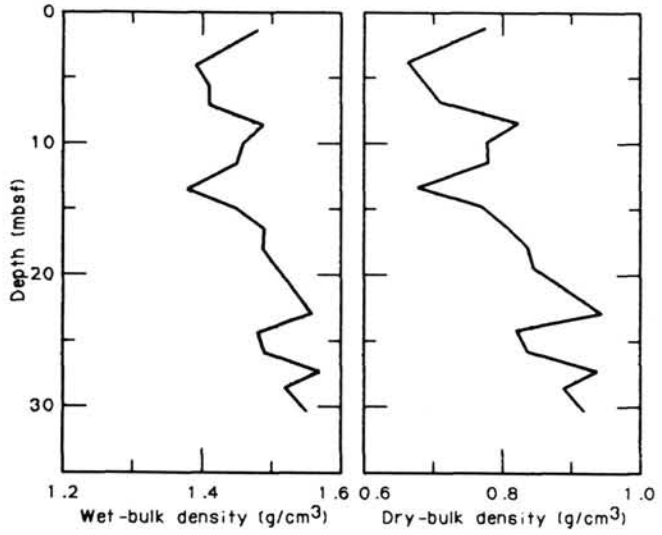


Figure 7. Wet- and dry-bulk-density profiles for Hole 668B.

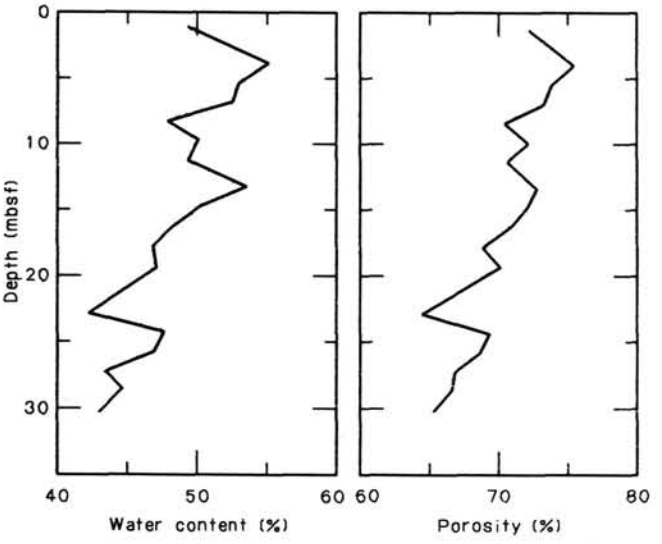


Figure 8. Water-content and porosity profiles for Hole 668B.

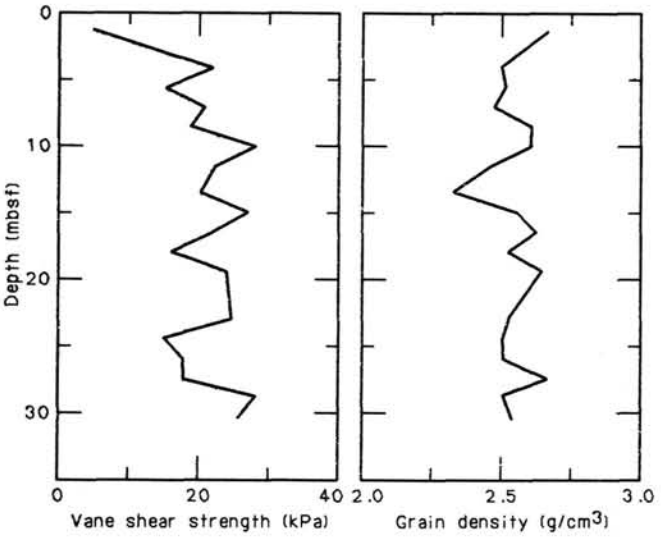


Figure 9. Vane-shear-strength and grain-density profiles for Hole 668B.

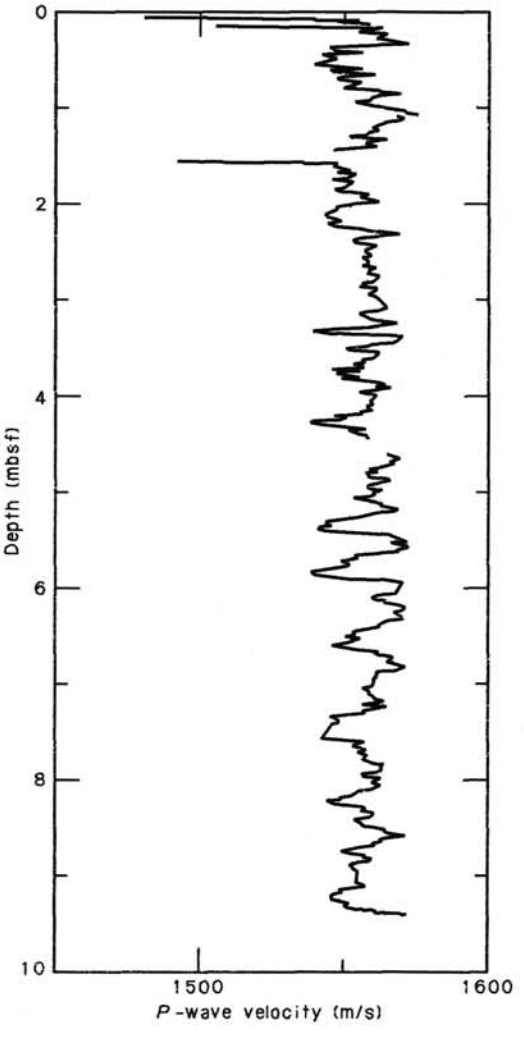
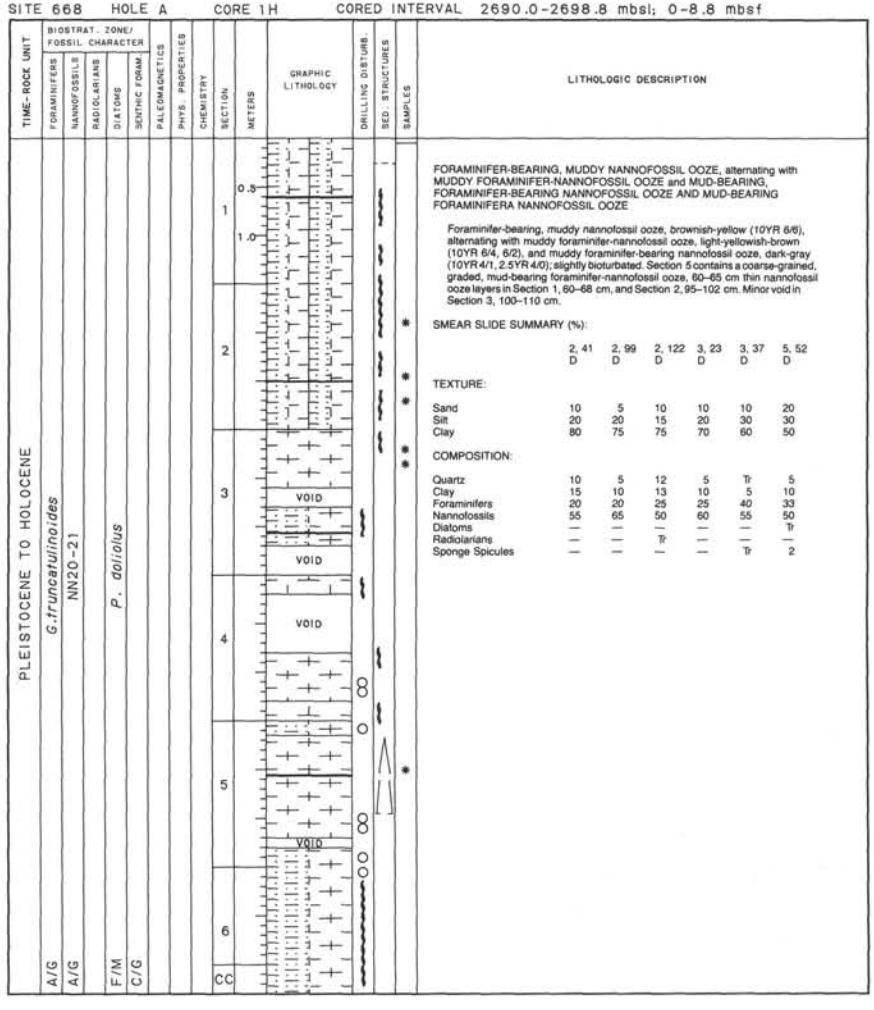


Figure 10. *P*-wave-velocity profile for Core 108-668B-3H.

SITE 668 HOLE A CORE 1H CORED INTERVAL 2690.0-2698.8 mbsl; 0-8.8 mbsf



LITHOLOGIC DESCRIPTION

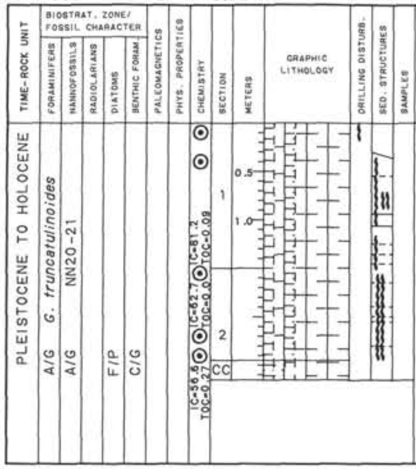
FORAMINIFER-BEARING, MUDDY NANNOFOSSIL OOZE, alternating with MUDDY FORAMINIFER-NANNOFOSSIL OOZE and MUD-BEARING, FORAMINIFER-BEARING NANNOFOSSIL OOZE AND MUD-BEARING FORAMINIFERA NANNOFOSSIL OOZE

Foraminifer-bearing, muddy nannofossil ooze, brownish-yellow (10YR 6/6), alternating with muddy foraminifer-nannofossil ooze, light-yellowish-brown (10YR 6/4, 6/2), and muddy foraminifer-bearing nannofossil ooze, dark-gray (10YR 4/1, 2.5YR 4/0); slightly bioturbated. Section 5 contains a coarse-grained, graded, mud-bearing foraminifer-nannofossil ooze, 60–65 cm thin nannofossil ooze layers in Section 1, 60–66 cm, and Section 2, 95–102 cm. Minor void in Section 3, 100–110 cm.

SMEAR SLIDE SUMMARY (%):

	2, 41 D	2, 99 D	2, 122 D	3, 23 D	3, 37 D	5, 52 D
TEXTURE:						
Sand	10	5	10	10	10	20
Silt	20	20	15	20	30	30
Clay	80	75	75	70	60	50
COMPOSITION:						
Quartz	10	5	12	5	Tr	5
Clay	15	10	13	10	5	10
Foraminifers	20	20	25	25	40	33
Nannofossils	55	65	50	60	55	50
Diatoms	—	—	—	—	—	Tr
Radiolarians	—	—	Tr	—	—	—
Sponge Spicules	—	—	—	—	Tr	2

SITE 668 HOLE B CORE 1H CORED INTERVAL 2693.1-2695.8 mbsl; 0-2.70 mbsf



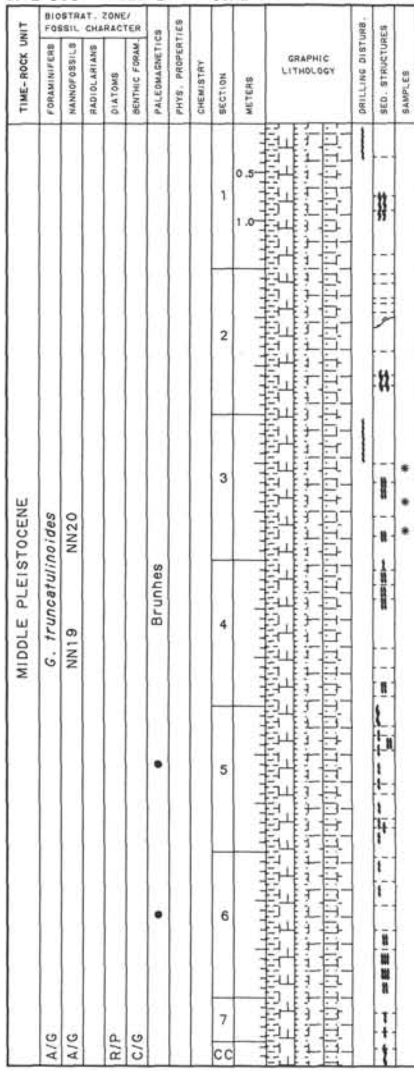
LITHOLOGIC DESCRIPTION

FORAMINIFER-BEARING, MUDDY NANNOFOSSIL OOZE, alternating with MUDDY FORAMINIFER-NANNOFOSSIL OOZE and MUDDY, FORAMINIFER-BEARING NANNOFOSSIL OOZE

Foraminifer-bearing, muddy nannofossil ooze, brownish-yellow (10YR 6/6), alternating with muddy foraminifer-nannofossil ooze, light-yellowish-brown (10YR 6/4, 6/2), and muddy, foraminifer-bearing nannofossil ooze, dark-gray (10YR 4/1, 2.5YR 4/0); slightly to moderately bioturbated.

Chemistry: IC here refers to weight % $CaCO_3$.

SITE 668 HOLE B CORE 2H CORED INTERVAL 2695.8-2705.3 mbsl; 2.7-12.2 mbsf



LITHOLOGIC DESCRIPTION

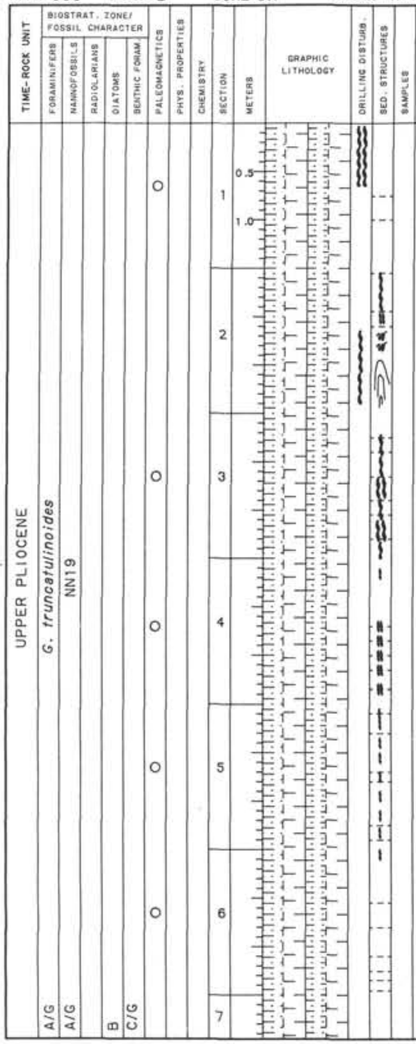
CLAYEY NANNOFOSSIL OOZE, alternating with FORAMINIFER-BEARING, MUDDY NANNOFOSSIL OOZE and MUDDY FORAMINIFER-NANNOFOSSIL OOZE

Clayey nannofossil ooze, pale-brown (10YR 6/3), alternating with foraminifer-bearing, muddy nannofossil ooze, light-yellowish-brown (10YR 6/4), and muddy foraminifer-nannofossil ooze, light-gray (10YR 7/2); moderate bioturbation. Sharp contact with graded bedding in Section 2, 65 cm.

SMEAR SLIDE SUMMARY (%):

	3, 60 D	3, 90 D	3, 130 D
TEXTURE:			
Sand	20	10	5
Silt	15	15	15
Clay	65	75	80
COMPOSITION:			
Clay	20	25	25
Accessory Minerals	5	5	5
Foraminifers	25	10	5
Nannofossils	50	55	70
Diatoms	—	5	—

SITE 668 HOLE B CORE 3H CORED INTERVAL 2705.3-2714.8 mbsl; 12.2-21.7 mbsf

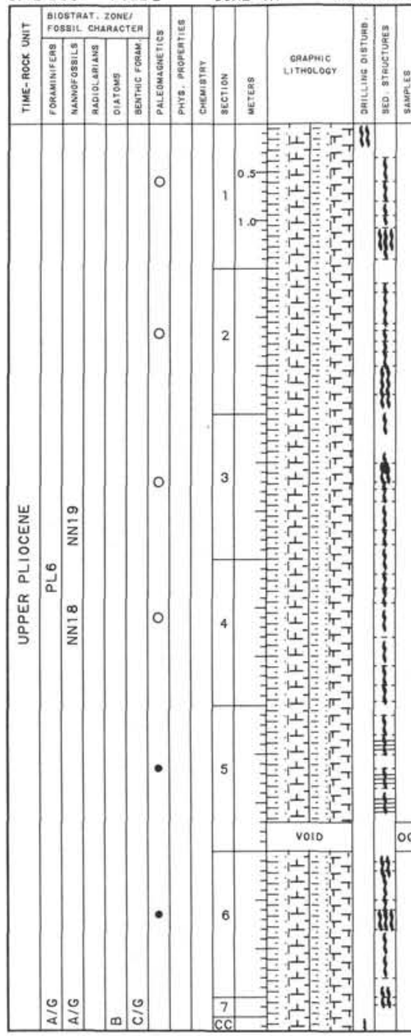


LITHOLOGIC DESCRIPTION

FORAMINIFER-BEARING, *MUDDY NANNOFOSSIL OOZE*, alternating with MUDDY FORAMINIFER-NANNOFOSSIL OOZE

Foraminifer-bearing, muddy nannofossil ooze, light-olive-gray (5Y 6/2) or olive (5Y 5/3, 5/4), alternating with muddy foraminifer-nannofossil ooze, light-gray (5Y 7/1, 7/2); moderate bioturbation. Flow-in in Section 2, 60 cm, through Section 3, 21 cm.

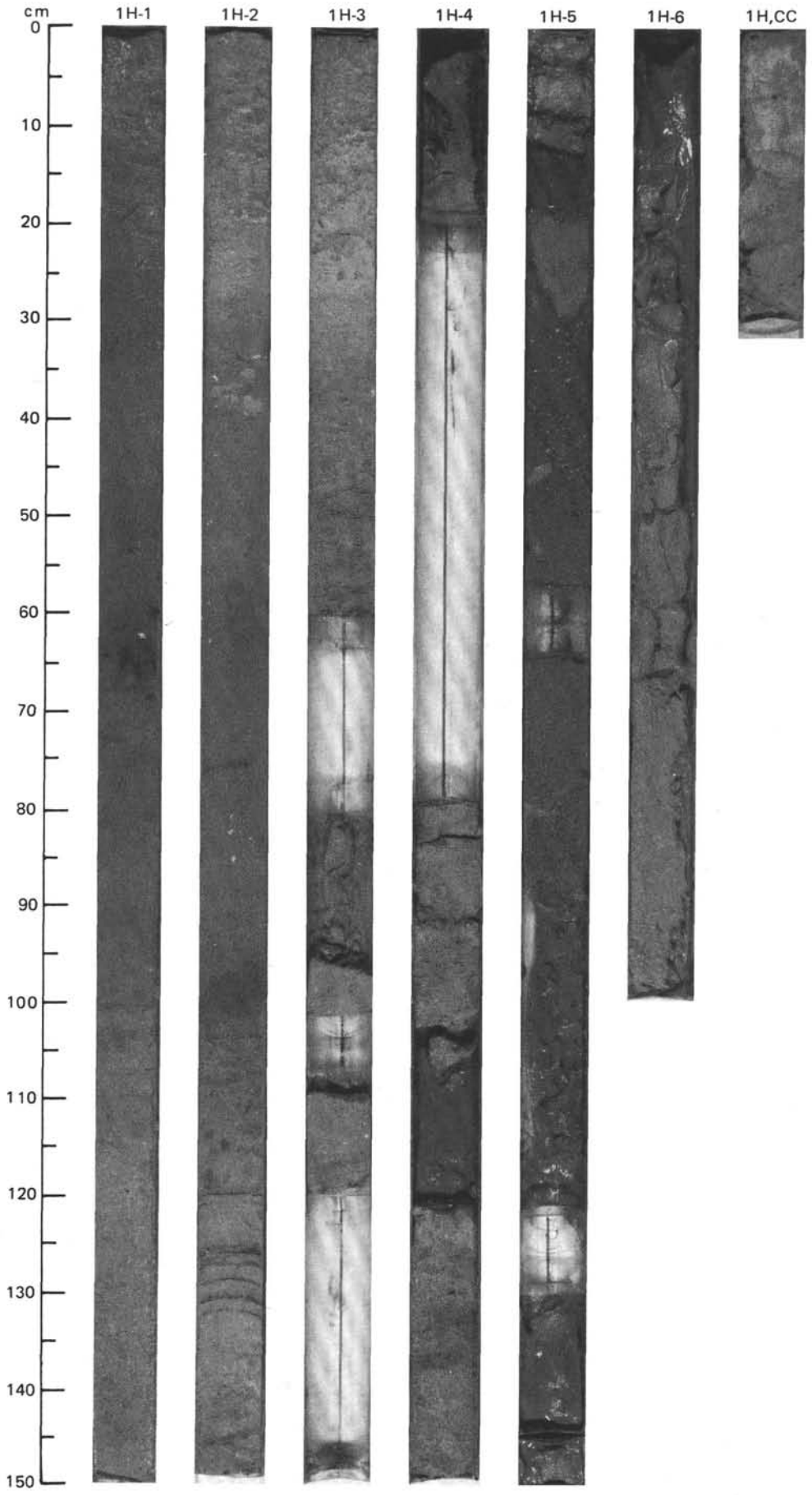
SITE 668 HOLE B CORE 4H CORED INTERVAL 2714.8-2724.3 mbsl; 21.7-31.2 mbsf



LITHOLOGIC DESCRIPTION

FORAMINIFER-BEARING, *MUDDY NANNOFOSSIL OOZE*, *alternating with* MUDDY FORAMINIFER-NANNOFOSSIL OOZE

Foraminifer-bearing, muddy nannofossil ooze, gray (5Y 6/1) or light-gray (5Y 7/2), alternating with muddy foraminifer-nannofossil ooze, white (5Y 8/1) and light-gray (5Y 7/1); moderate bioturbation; green and purple laminations in Section 5.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1H-2
1H-3
1H-4
1H-5
1H-6
1H,CC
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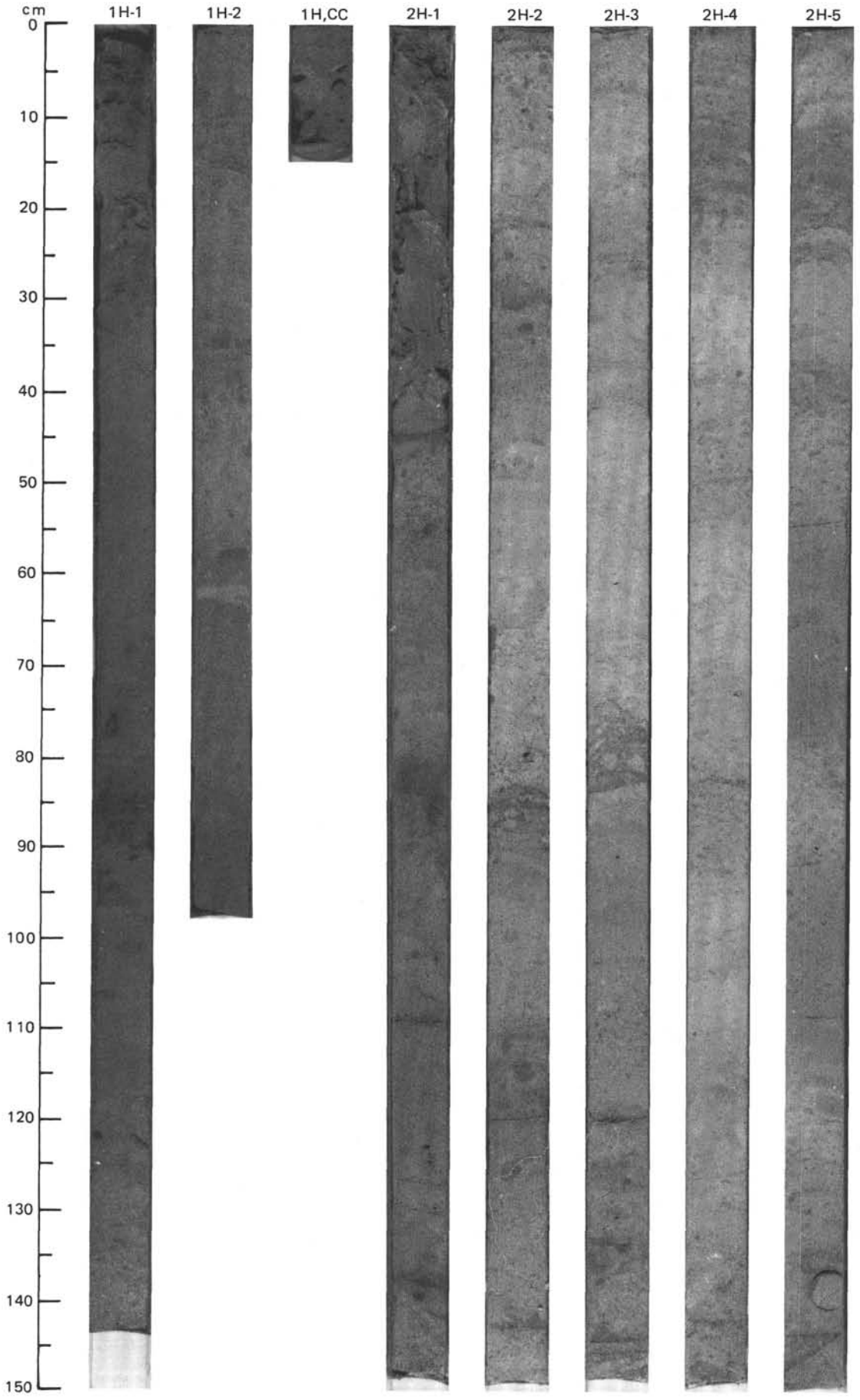
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150


cm
1H-1
1H-2
1H,CC
2H-1
2H-2
2H-3
2H-4
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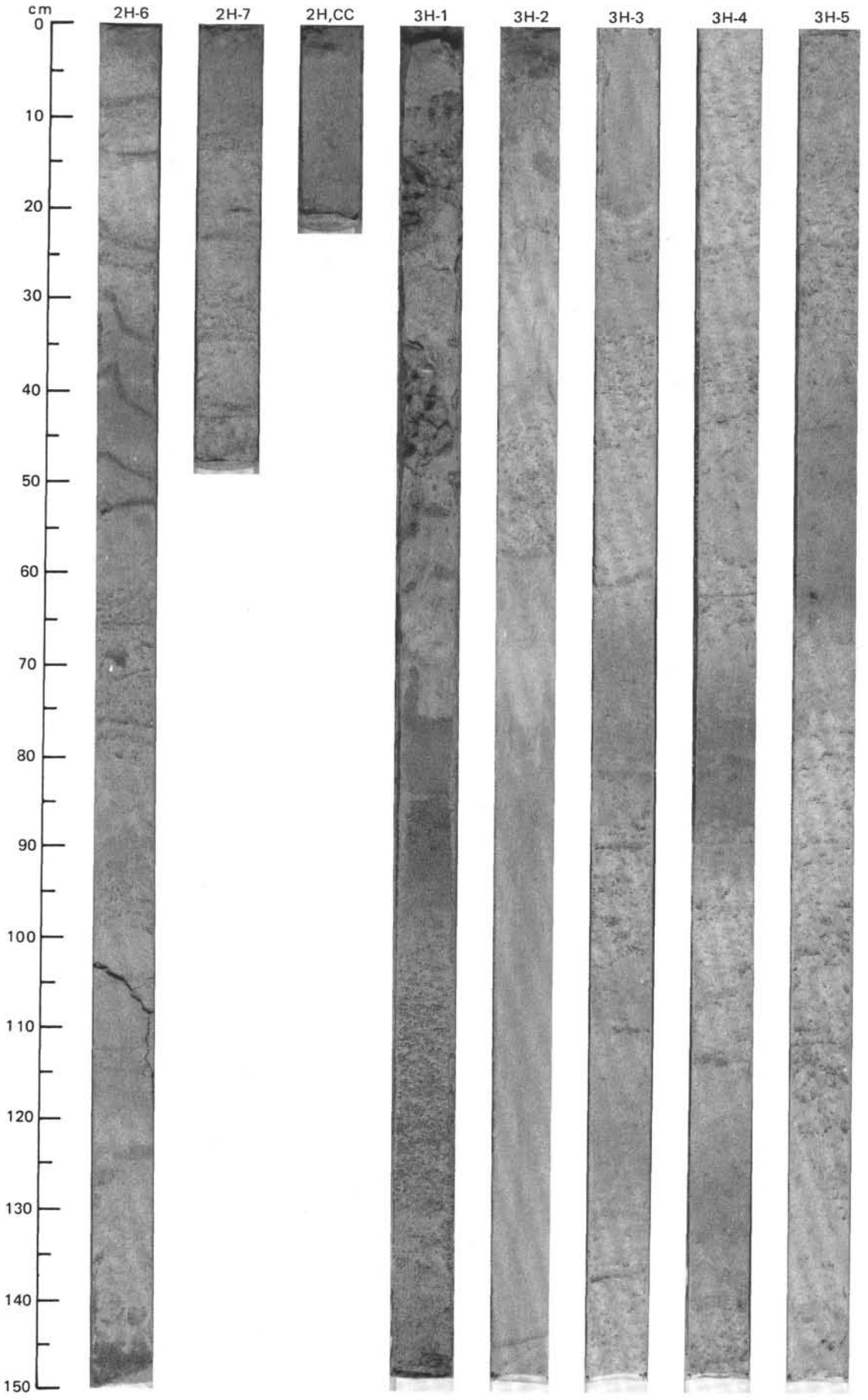
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2H-6
2H-7
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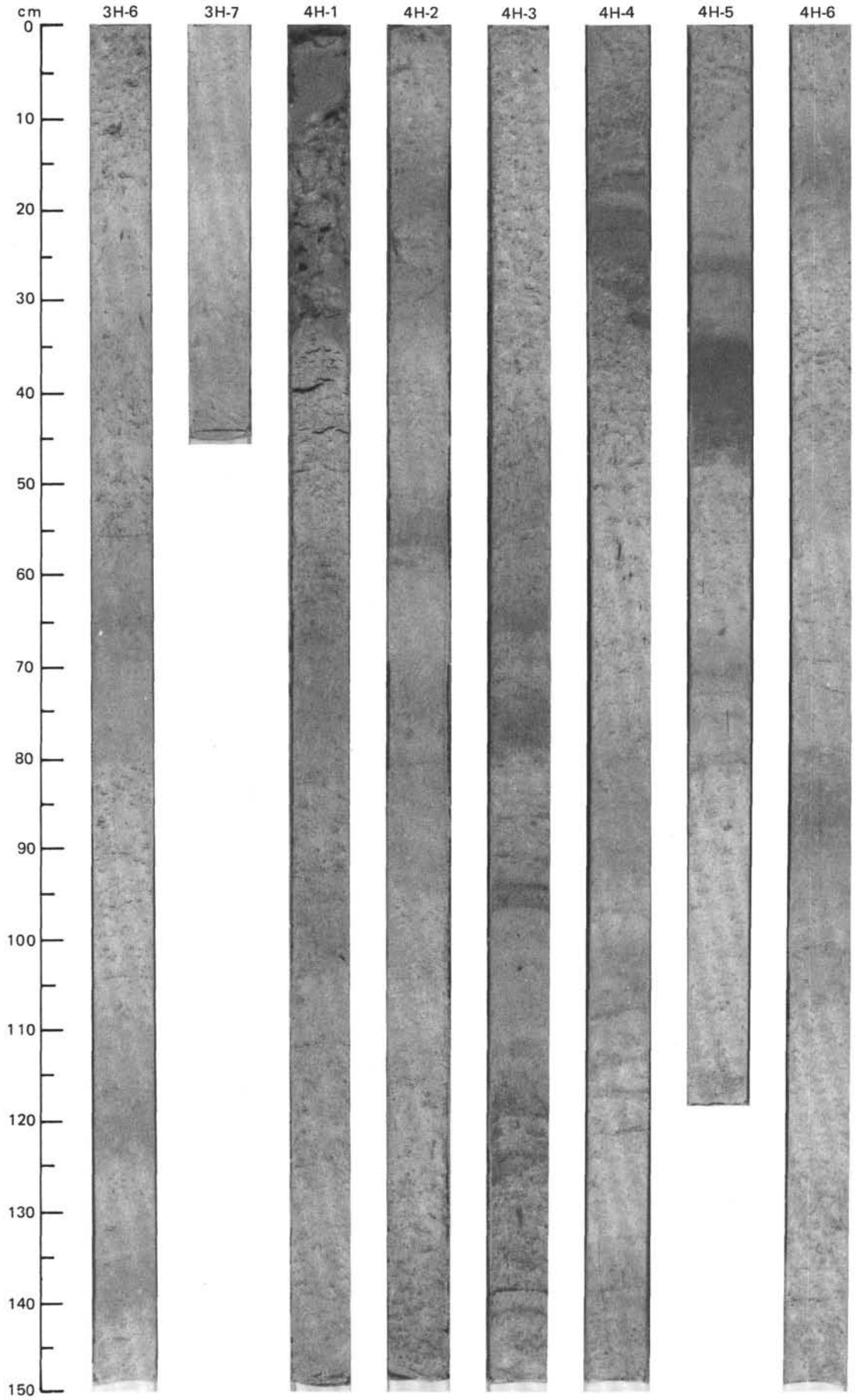
3H-1
3H-2
3H-3
3H-4
3H-5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3H-7
4H-1
4H-2
4H-3
4H-4
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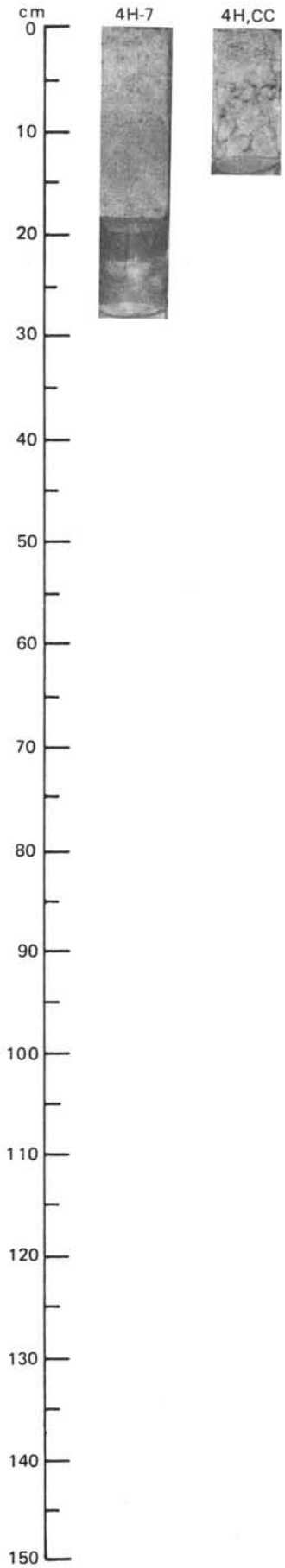
cm
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4H,CC
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