5. SITE 622[1]

Shipboard Scientific Party[2]

HOLE 622

Date occupied: 29 October 1983, 0445 LCT

Date departed: 30 October 1983, 2345 LCT

Time on hole: 1 day, 19 hr.

Position: 26°41.41′N, 88°28.82′W

Water depth (sea level; corrected m, echo-sounding): 2491

Water depth (rig floor; corrected m, echo-sounding): 2501

Bottom felt (m, drill pipe): 2495

Penetration (m): 208.0

Number of cores: 26

Total length of cored section (m): 132.7

Total core recovered (m): 100.17

Core recovery (%): 75

Oldest sediment cored:
Depth sub-bottom (m): 208
Nature: Clay
Age: Pleistocene (Ericson Zone Y)
Measured velocity (km/s): N/A

Basement: N/A

HOLE 622A

Date occupied: 31 October 1983, 0130 LCT

Date departed: 31 October 1983, 0734 LCT

Time on hole: 6 hr.

Position: 26°41.41′N, 88°28.82′W

Water depth (sea level; corrected m, echo-sounding): 2491

Water depth (rig floor; corrected m, echo-sounding): 2501

Bottom felt (m, drill pipe): 2495.5

Penetration (m): 5.6

Number of cores: 1

Total length of cored section (m): 5.6

Total core recovered (m): 5.55

Core recovery (%): 99

Oldest sediment cored:
Depth sub-bottom (m): 5.6
Nature: Clay
Age: Pleistocene (Ericson Zone Y)
Measured velocity (km/s): N/A

Basement: N/A

BACKGROUND AND OBJECTIVES

Site 622 is located on the concave side of the meander bend ("point bar") of the sinuous channel in the middle fan area. Its initial position was on the seismic line through Sites 617, 621, and 620, but interference of beacons forced us to move downfan one meander belt and place Site 622 in the same environmental setting.

Background and objectives for Site 622 are identical to those for Site 621 (see Site 621 chapter, this volume). In addition, this site was designed to support the interpretation that the channel was migratory in nature and that a "fluvial" comparison between thalweg and point bar has validity for the deep-sea fan channel.

OPERATIONS

Hole 622

The proposed drill site was located just across the submarine channel from Site 621. The proximity of the beacons for Sites 617 and 621 (both frequencies) was a matter of concern. The drilling vessel was therefore moved to the proposed location and allowed to drift in a "listening" mode. Both beacon signals were detected easily, and it was decided that the risk of interference with a new beacon was too great to attempt operations. An alternate site was selected at an analogous position on the downcurrent bend in the channel. This was sufficiently far from the Site 621 beacon, and a new 13.5-kHz beacon was launched at 0445 hr. Difficulty was again experienced in finding an acceptable positioning "combination" because of strong current and wind forces at high angles, and the pipe trip did not begin until 0630 hr.

[1] Bouma, A. H., Coleman, J. M., Meyer, A. W., et al., *Init. Repts. DSDP*, 96: Washington (U.S. Govt. Printing Office).

[2] Addresses: Arnold H. Bouma (Co-Chief Scientist), Gulf Research and Development Company, P.O. Box 37048, Houston, TX 77236, (present address: Chevron Oil Field Research Company, P.O. Box 36506, Houston, TX 77236); James M. Coleman (Co-Chief Scientist), Coastal Studies Institute, Louisiana State University, Baton Rouge, LA 70803; Audrey W. Meyer (Shipboard Science Representative), Deep Sea Drilling Project, Scripps Institution of Oceanography, La Jolla, CA 92093, (present address: Ocean Drilling Program, 500 University Drive West, Texas A&M University, College Station, TX 77843); James Brooks, Department of Oceanography, Texas A&M University, College Station, TX 77843; William R. Bryant, Department of Oceanography, Texas A&M University, College Station, TX 77843; Richard Constans, Paleontology Section, Chevron U.S.A. Inc., 935 Gravier Street, New Orleans, LA 70112; Michel Cremer, Département de Géologie et Océanographie, Université de Bordeaux I, Avenue des Facultés, 33405 Talence Cedex, France; Laurence I. Droz, Laboratoire de Géodynamique Sous-Marine, 06230 Villefranche-sur-Mer, France; Toshio Ishizuka, Ocean Research Institute, University of Tokyo, Tokyo 164, Japan; Mahlon C. Kennicutt II, Department of Oceanography, Texas A&M University, College Station, TX 77843; Barry Kohl, Chevron U.S.A. Inc., 935 Gravier Street, New Orleans, LA 70112; William R. Normark, Pacific Branch of Marine Geology, U.S. Geological Survey (MS-999), 345 Middlefield Road, Menlo Park, CA 94025; Suzanne O'Connell, Lamont-Doherty Geological Observatory of Columbia University, Palisades, NY 10964, (present address: Ocean Drilling Program, 500 University Drive West, Texas A&M University, College Station, TX 77843); Mary Parker, Department of Geology, Florida State University, Tallahassee, FL 32306, (present address: AMOCO Production Company, P.O. Box 50879, New Orleans, LA 70150); Kevin T. Pickering, Department of Earth Sciences, University of London, Goldsmith's College, London SE14 6NW, United Kingdom, (present address: Department of Geology, University of Leicester, Leicester LE1 7RH, United Kingdom); Claudia Schroeder, Department of Geology, Dalhousie University, Halifax, Nova Scotia B3H 3J5, Canada; Charles E. Stelting, Gulf Research and Development Company, P.O. Box 37048, Houston, TX 77236, (present address: Chevron Oil Field Research Company, P.O. Box 36506, Houston, TX 77236); Dorrik A. V. Stow, University of Edinburgh, Edinburgh EH9 3JW, Scotland, United Kingdom, (present address: Geology Department, University of Nottingham, Nottingham NG7 2RD, United Kingdom); William E. Sweet, Mineral Management Service, P.O. Box 7944, Metairie, LA 77010; Andreas Wetzel, Geologisches Palaeontologisches Institut der Universität, Sigwartstrasse 10, D7400 Tübingen, Federal Republic of Germany; and Jean K. Whelan, Chemistry Department, Woods Hole Oceanographic Institution, Woods Hole, MA 02543.

The initial piston core established the water depth at 2495 m (Table 1). A considerable sea had built during prolonged windy conditions, and the resultant vessel motion had an adverse effect on coring operations. Coring progressed through a sediment section similar to that of Site 621, but penetration and core recovery were both decreased from the previous site. Partial failure of the corer's shear pins because of surge during descent resulted in reduced actuation pressures (therefore less penetration). There were also indications that more core was being lost during retrieval than in calm-weather operations. Sandy strata first appeared at about 95 m below the seafloor and increased in number downhole; gravel and coarse sand (as found in Hole 621) were encountered near the bottom of the hole. Penetration was terminated at 2703 m pipe depth with the objectives achieved and the technical depth limit reached.

A well log was again desired to "fill in" the portions of the section not recovered. Preparations were made and the long-spaced sonic/gamma ray/caliper (LSS/GR/CAL) tool was deployed. Some hole obstructions were hit in the lower 40 m of the hole, but the sonde was lowered to just 3 m from total depth without undue difficulty. A good set of logs was recorded and the tool was pulled into the pipe with no problem. The tool was then run back to bottom for a repeat run. As the upper caliper module was pulled into the bit the second time, it became firmly stuck and tool could not be moved up or down. The tool was finally freed after the cable pull had been increased to dangerously near weak-point failure tension at the cable head. When the sonde assembly had been recovered, one caliper leaf spring was found to be broken off.

The logging equipment was then rigged down and the bit was pulled clear of the seafloor.

Table 1. Site 622 coring summary.

Core[a]	Date (Oct. 1983)	Time	Depth from drill floor (m)	Depth below seafloor (m)	Length cored (m)	Length recovered (m)	Amount recovered (%)
Hole 622							
1H	29	1206	2495.0–2498.5	0.0–3.5	3.5	3.45	99
2H	29	1310	2498.5–2508.1	3.5–13.1	9.6	4.64	48
3H	29	1440	2508.1–2517.7	13.1–22.7	9.6	0.00	0
4H	29	1535	2517.7–2527.2	22.7–32.2	9.5	5.86	62
5H	29	1640	2527.2–2536.7	32.2–41.7	9.5	5.23	55
6H	29	1740	2536.7–2546.2	41.7–51.2	9.5	5.99	63
7H	29	1825	2546.2–2555.8	51.2–60.8	9.6	3.82	40
8H	29	1925	2555.8–2559.6	60.8–64.6	3.8	3.82	100
Wash	29		2559.6–2565.4	64.6–70.4	—	—	—
9H	29	2030	2565.4–2569.1	70.4–74.1	3.7	3.65	99
Wash	29		2569.1–2584.4	74.1–89.4	—	—	—
10H	29	2320	2584.4–2590.4	89.4–95.4	6.0	5.47	91
Wash	29		2590.4–2593.9	95.4–98.9	—	—	—
11H	30	0020	2593.9–2599.4	98.9–104.4	5.5	5.35	97
Wash	30		2599.4–2603.5	104.4–108.5	—	—	—
12H	30	0121	2603.5–2607.3	108.5–112.3	3.8	3.72	98
13H	30	0221	2607.3–2612.3	112.3–117.3	5.0	5.49	100
14H	30	0315	2612.3–2618.3	117.3–123.3	6.0	5.81	97
15H	30	0410	2618.3–2625.9	123.3–130.9	7.6	7.69	100
Wash	30		2625.9–2627.9	130.9–132.9	—	—	—
16H	30	0510	2627.9–2632.6	132.9–137.6	4.7	4.61	98
Wash	30		2632.6–2637.5	137.6–142.5	—	—	—
17H	30	0620	2637.5–2641.2	142.5–146.2	3.7	3.65	99
Wash	30		2641.2–2647.1	146.2–152.1	—	—	—
18H	30	0720	2647.1–2652.6	152.1–157.6	5.5	5.5	100
Wash	30		2652.6–2656.7	157.6–161.7	—	—	—
19H	30	0825	2656.7–2658.7	161.7–163.7	2.0	1.98	99
Wash	30		2658.7–2665.0	163.7–170.0	—	—	—
20H	30	0920	2665.0–2667.0	170.0–172.0	2.0	2.00	100
21H	30	1018	2667.0–2669.7	172.0–174.7	2.7	2.68	99
22H	30	1107	2669.7–2672.7	174.7–177.7	3.0	3.02	100
23H	30	1205	2672.7–2676.0	177.7–181.0	3.3	3.17	96
Wash	30		2676.0–2682.3	181.0–187.3	—	—	—
24H	30	1345	2682.3–2683.3	187.3–188.3	1.0	0.92	92
Wash	30		2683.3–2691.9	188.3–196.9	—	—	—
25H	30	1440	2691.9–2692.9	196.9–197.9	1.0	1.09	100
26H	30	1527	2692.9–2694.5	197.9–199.5	1.6	1.56	98
Wash	30		2694.5–2703.0	199.5–208.0	—	—	—
					132.7	100.17	75
Hole 622A							
1H	31	0127	2495.4–2501.0	0.0–5.6	5.6	5.55	99

[a]H following core number indicates hydraulic piston core.

Hole 622A

Because the first few meters of sediment were of great interest to the paleontologists, a repeat of the "mud line" core was requested. The vessel was offset 30 m to the south-southeast and the power sub and variable length hydraulic piston corer (VLHPC) were redeployed. The corer was "shot" from 2491.5 to 2501.0 m and a 5.6-m core of excellent quality was recovered. The drill string was then recovered, and the vessel headed south at 0734 hr., 31 October.

SEISMIC STRATIGRAPHY AND ACOUSTIC FACIES

Site 622 is located in the inner bend of a meander, close to the channel margin. The site survey conducted in December 1982 also covered this site. The same type of data as those used for Site 621 (see Site 621 chapter, this volume) were available for this site (Fig. 1).

Seismic Stratigraphy

The same seismic units identified at Site 621 occur at Site 622. The units are separated by the three reflector horizons highlighted in the strike-oriented seismic reflection profile shown in Figure 2.

Generally, the correlation between the observed lithologies and the seismic facies at Site 622 is very good. For a detailed description of the lithofacies, see the lithostratigraphy section in this chapter. Seismic Unit 1 extends from the seafloor to Reflector A at about 90 m sub-bottom (115 ms) and is characterized by short, discontinuous subparallel reflectors. This unit consists almost entirely of finely laminated clays and muds. Seismic Unit 2 is bounded by Reflectors A and B (90–131 m sub-bottom; 115–166 ms). The seismic signature of this unit is similar to Unit 1 in the upper part, but is semitransparent in the lower part. This section of the core consists of silt-laminated muds; the change in seismic signature within the unit probably results from the observed increase in silt laminae and beds downward in the section. Seismic Unit 3 lies between Reflectors B and C and is typified by semitransparent reflections with little lateral continuity. This unit extends from 131 to 184 m sub-bottom (166–230 ms) and corresponds to the recovered silty mud and sand and silt facies. Seismic Unit 4 consists of high-amplitude reflectors; minimal recovery within the very uppermost part of this unit revealed silty muds and pebbly muds.

Acoustic Facies

The *Conrad* 3.5-kHz profile (Fig. 3) shows that the channel at Site 622 is 3 km wide and has a 15- to 35-m

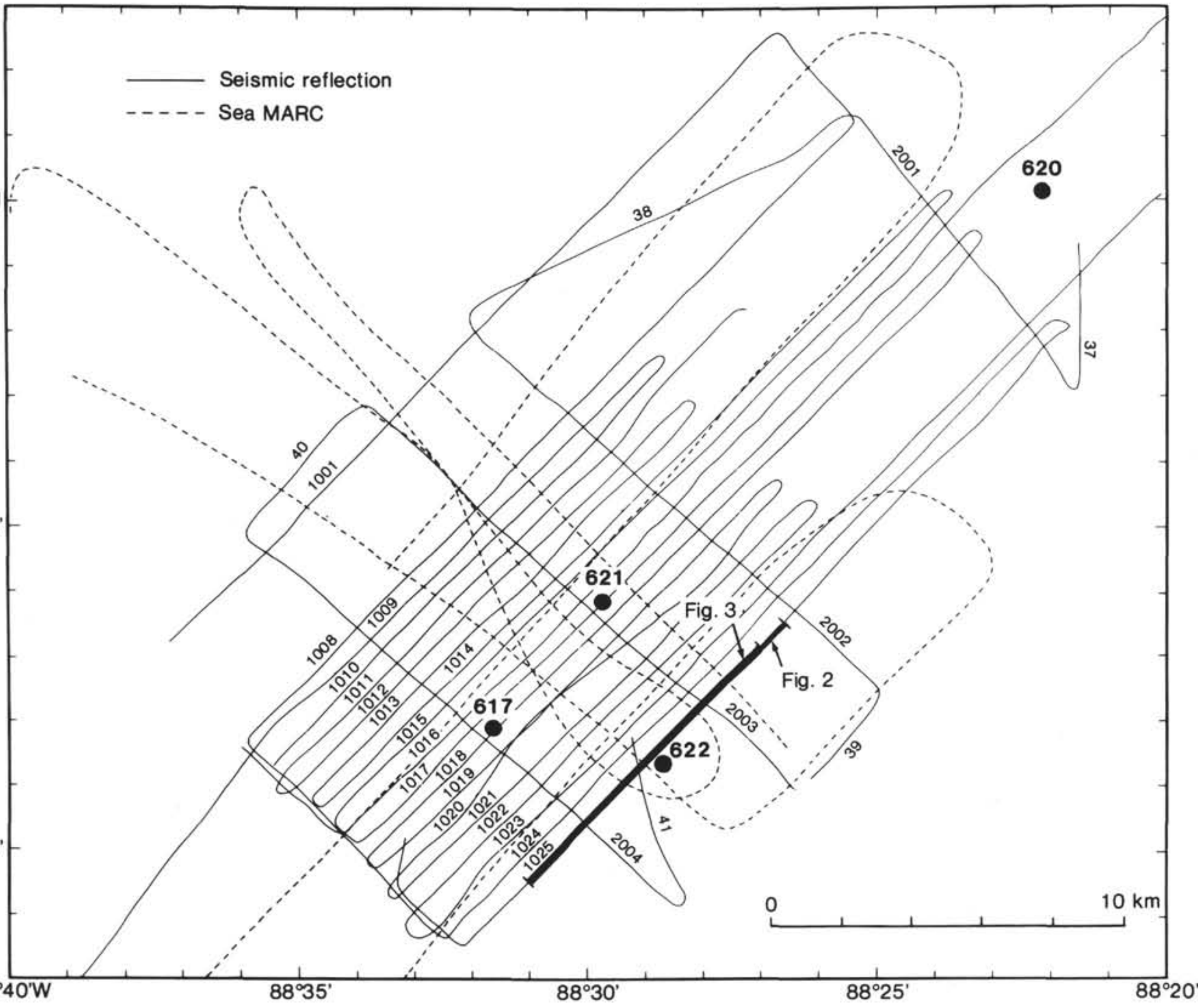

Figure 1. Map showing *Conrad* site survey tracklines in midfan area with locations of midfan sites. Location of Figures 2 and 3 are indicated with heavy lines.

levee crest to floor relief. The channel is filled with at least 60 m of acoustically transparent material and has a smooth upper surface.

Several weak and steeply dipping reflectors extend from the channel margin toward the channel axis/floor. Two of these reflectors were cored at Site 622; they occur at 12 m (15 ms) and 28 m (37 ms) sub-bottom. Sediments were not recovered at the depth of the upper reflector. At 28 m sub-bottom, there is an isolated 3-cm-thick layer of color-banded silty sediment, containing abundant lignite. These are the only visible changes over several meters of homogeneous mud.

Conclusions

1. Generally, the seismic stratigraphy at Sites 622 and 621 is similar, however, the lithofacies to seismic facies correlation at this site is better. Together, the downward coarsening trend revealed in the cores and the seismic facies distribution are supportive of channel migration.
2. The correlation between shallow, 3.5-kHz reflectors and lithologic boundaries is poor to moderate.

BIOSTRATIGRAPHY AND SEDIMENTATION RATES

Biostratigraphy

The section penetrated in Hole 622 is Quaternary, correlating with the planktonic foraminifer Zone N23 and the calcareous nannofossil Zone NN21. The interval includes the Holocene (Ericson Zone Z; Ericson and Wollin, 1968) and the late Wisconsin glacial (Ericson Zone Y) (Fig. 4). The warm interstadial of the Wisconsin glacial (Ericson Zone X or *Globorotalia flexuosa* Zone) was not encountered to a total depth of 208 m.

Ericson Zone Y contains a displaced foraminiferal fauna in the upper part along with common shallow neritic benthic foraminifers. Pleistocene foraminifers and calcareous nannofossils are very rare in the lower portion, however, there are common occurrences of reworked Cretaceous foraminifers.

Foraminifers

Foraminifers from Holes 622 and 622A are Quaternary, Zone N23 (Blow, 1969). A warm-water high-diver-

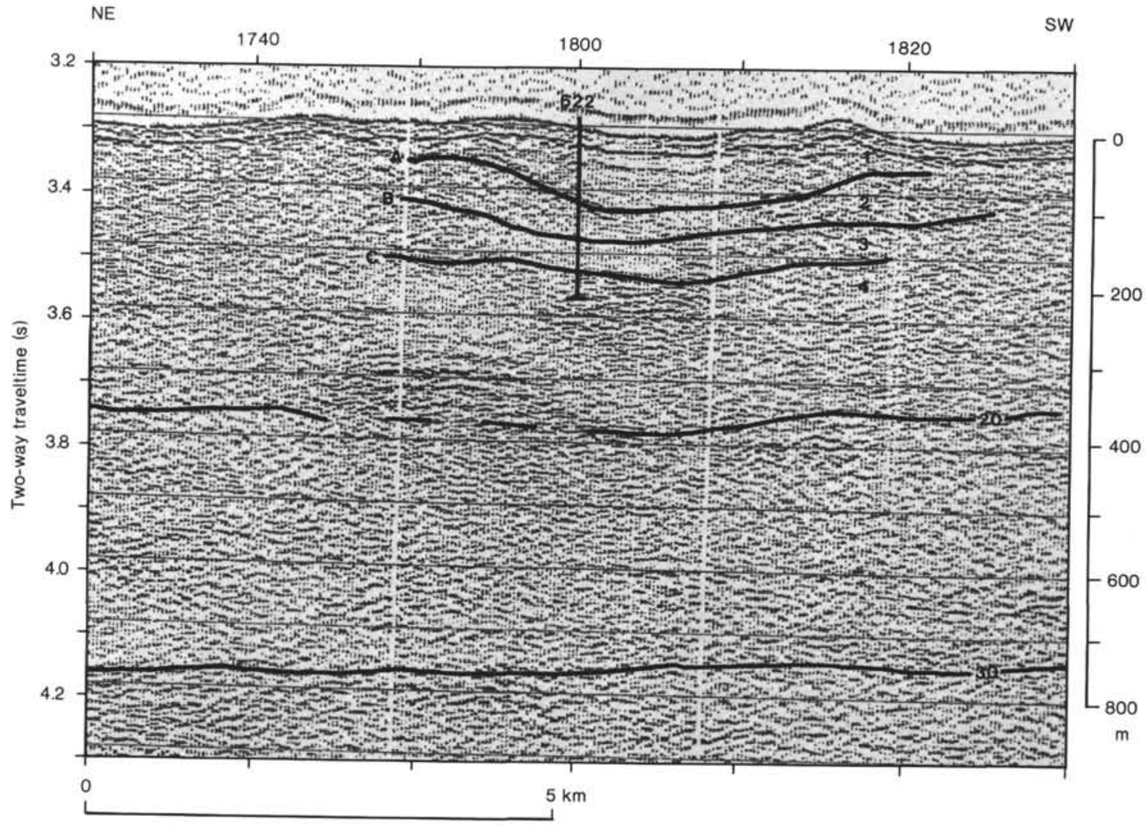

Figure 2. Water-gun seismic reflection profile (*Conrad*, Line 1025) near Site 622 showing major channel-fill reflectors (A – C), seismic units (1–4), and regional Horizons "20 and 30." (See Fig. 1 for location.)

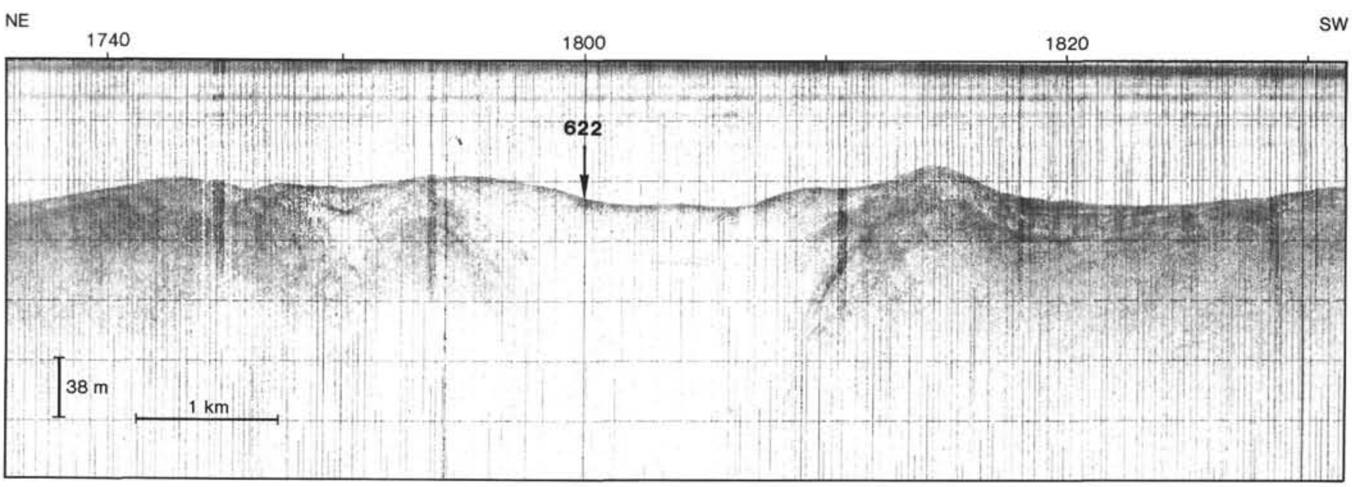

Figure 3. 3.5-kHz sub-bottom profile (*Conrad*, Line 1025), near Site 622. (See Fig. 1 for location.)

sity planktonic foraminiferal ooze occurs in the upper portion of Cores 622-1 and 622A-1. This Holocene (Ericson Zone Z) fauna contains abundant *Globorotalia menardii* and common *G. tumida*, along with the associated bathyal foraminifers *Cibicides wuellerstorfi* and *C. kullenbergi*.

The remainder of the hole is late Wisconsin glacial (Ericson Zone Y). The interval from Cores 622-2 through 622-9 is composed of homogeneous mud with poorly sorted dispersed sand and silt. Shallow-water (neritic) benthic foraminifers such as *Ammonia beccarii, Elphidium* spp., and miliolids dominate the fauna. The common occurrences of these taxa and the exclusion of normal bathyal species implies a rapid deposition of reworked shallow-water sediments at this site. A high sedimentation rate is also supported by the very rare occurrences of planktonic foraminifers.

There is an increase in planktonic foraminiferal abundance in Cores 622-10 through 622-16, which suggests a decrease in sedimentation rate for this interval. Benthic

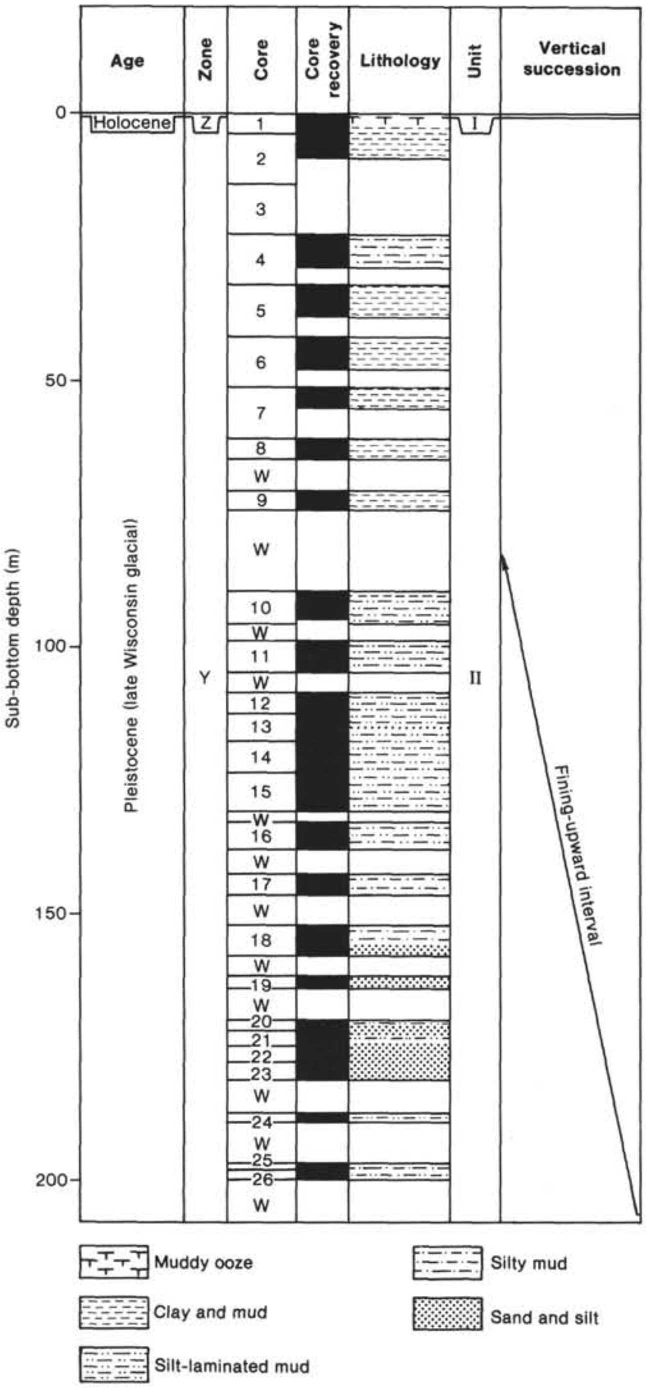

Figure 4. Lithostratigraphic summary for Site 622 showing age, core recovery, graphic lithology, and lithologic units. W = washed interval (see Table 1).

foraminifers are very rare as are the occurrences of the cool-water planktonic foraminifer *G. inflata*.

Cores 622-17 through 622-26 are composed of mud with interbedded sand and silt laminae. The Pleistocene foraminiferal fauna is very poorly developed in this interval, however, there are common reworked Cretaceous foraminifers.

Calcareous Nannofossils

All cores recovered from this site are interpreted to be in the *Emiliania huxleyi* Zone (NN21 of Martini, 1971). The Holocene foraminiferal ooze at the top of Sections 622-1-1 and 622A-1-1 contains abundant, well-preserved Quaternary calcareous nannofossils. Very small coccoliths, tentatively identified as *E. huxleyi*, dominate the nannofloral assemblage. Below this ooze, the sediment contains few nannofossils and the assemblage is dominated by reworked Cretaceous species. Pleistocene nannofossils are often absent from these Pleistocene cores and, when present, the species are rare. *Gephyrocapsa oceanica* and tentatively identified *E. huxleyi* are the most frequently occurring Pleistocene nannofossils below the pelagic ooze.

Sedimentation Rates

The sedimentation rates are calculated based on two datums. An age of 0.012 Ma is used for the Holocene/Pleistocene boundary (Z/Y zonal boundary); 0.085 Ma is used for the Y/X zonal boundary (see Explanatory Notes, this volume).

A sedimentation rate of 12.5 cm/1000 yr. is computed for the Holocene. This is a minimum rate assuming complete Holocene recovery (Fig. 5).

The Y/X zonal boundary was not encountered. By using a seismic projection to the top of the X Zone (753 m for seismic Horizon "30"; see introductory chapter, this volume), a projected minimum sedimentation rate of 1029.0 cm/1000 yr. is computed for the Y Zone.

These calculations are based on nondecompacted sediment thicknesses.

LITHOSTRATIGRAPHY

Coring at Site 622 in the "point bar" location revealed that the sediments represent a generally fining-upward sequence that starts with gravelliferous material at the base of the hole and ends with fine clays at the top (Fig. 4). The recovered section is divided into two lithologic units (Table 2).

Lithologic Unit I: Muddy Ooze

An 8-cm-thick brown to dark brown marly foraminiferal ooze was observed at the top of the section from 0 to 8 cm sub-bottom. Texturally, the ooze is composed of 15% sand, 50% silt, and 35% clay. Foraminifers comprise 30% of this unit and constitute the entire sand fraction and part of the silt fraction. The rest of the silt fraction is composed of quartz and secondary carbonate.

Lithologic Unit II: Muds, Silts, and Sands

This unit forms about 99% of the drilled section at Site 622 and contains four facies: (1) clays and mud, (2) silt-laminated muds, (3) silty muds, and (4) sands and silts.

Clay and Mud Facies

This facies consists of dark gray, relatively structureless mud with rare, very thin silt laminae. It makes up

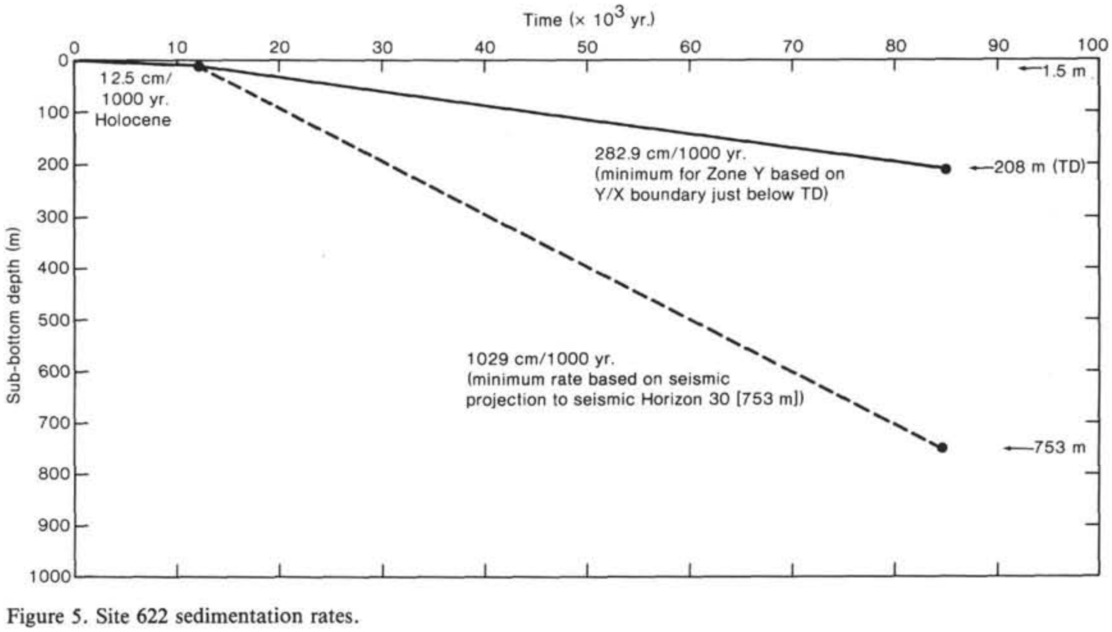

Figure 5. Site 622 sedimentation rates.

Table 2. Lithologic units of Site 622.

Lithologic unit	Sediment	Cored interval	Sub-bottom depth (m)
I	Muddy ooze	622A-1-1, 0–8 cm 622-1-1, 0–4 cm	0–0.08
II	Muds, silts, and sands	622-1-1, 4 cm through 622-26,CC	0.08–208

about 51% of the section and occurs from Sample 622-1-1, 4 cm through Section 622-10-1. This facies is similar to the clays and muds at Site 621 except that quartz, feldspar, and carbonate are the main silt-sized components, and gas disruption is relatively minor at this site. Color banding increases upward from Section 622-10-1 through Sample 622-2-2, 4 cm.

Silt-Laminated Mud Facies

This facies consists of mud with abundant silt laminae and silt beds (Section 622-15-2), occurs in about 27% of the recovered section, and was observed from 90.90 to 137.60 m sub-bottom (Section 622-10-2 through Sample 622-16,CC) (Fig. 6). The frequency of silt laminae and beds increases downward through the facies, from about 25% of the total volume in Section 622-10-4 to about 60% in Section 622-14-3 to 90% in Section 622-16-3. The silt laminae are normally graded. Parallel and low-angle cross-laminae are commonly visible above a scoured and loaded base. Lignite clasts (up to 0.5-cm diameter) are common in the silt layers.

The silt-laminated muds contain 1–7% sand, 30–85% silt, and 30–80% clay. Quartz is the main constituent of the silt- and sand-sized fractions. Planktonic microfauna are more abundant than bathyal fauna in this facies.

Silty Mud Facies

Finely laminated silty muds comprise 9% of the recovered section and occur locally in the lower quarter of the total section. Discrete silty mud units occur between 142.00 and 156.40 m sub-bottom (Section 622-17-1 through Sample 622-18-3, 36 cm) and from 196.90 m sub-bottom to the bottom of the hole at 199.5 m sub-bottom (Section 622-25-1 through Sample 622-26,CC). Silty muds also are interbedded with sandy silts in Core 622-21 (172.00–174.80 m sub-bottom). Pebbles (up to 1.5 cm) are dispersed in a silty mud matrix in Core 622-25.

Typically, concentrations of organic debris emphasize the lamination. The frequency of the very thin to thick laminae range from about 200 per meter to more than 500 per meter. Sedimentary structures most typically observed in this facies are cross-lamination and normal grading.

Texturally, these silty muds are composed of about 10% sand, 70% silt, and 20% clay. Quartz, feldspars, and carbonates are the main constituents of the silt fraction.

Sand and Silt Facies

This coarser-grained facies mainly occurs from 156.40 to 180.85 m sub-bottom (Samples 622-18-3, 136 cm through 622-23,CC). Interpretation of the gamma log suggests that this facies extends from 141.00 to 192.00 m sub-bottom.

The facies characteristically occurs in beds from 2 cm to a maximum 38 cm in thickness. In some cases, the layers have a soupy texture, probably related to coring disturbance (e.g., Core 622-19 and Section 622-23-2). In other layers, very thin to thin parallel laminae are well developed. Some beds show normal grading and have scoured bases.

The sandy silt has average composition of 27% sand, 60% silt, and 13% clay, while the silty sand is 65% sand, 25% silt, and 10% clay. Quartz is the dominant constituent. Feldspar, mica, and altered minerals are the most plentiful accessory minerals.

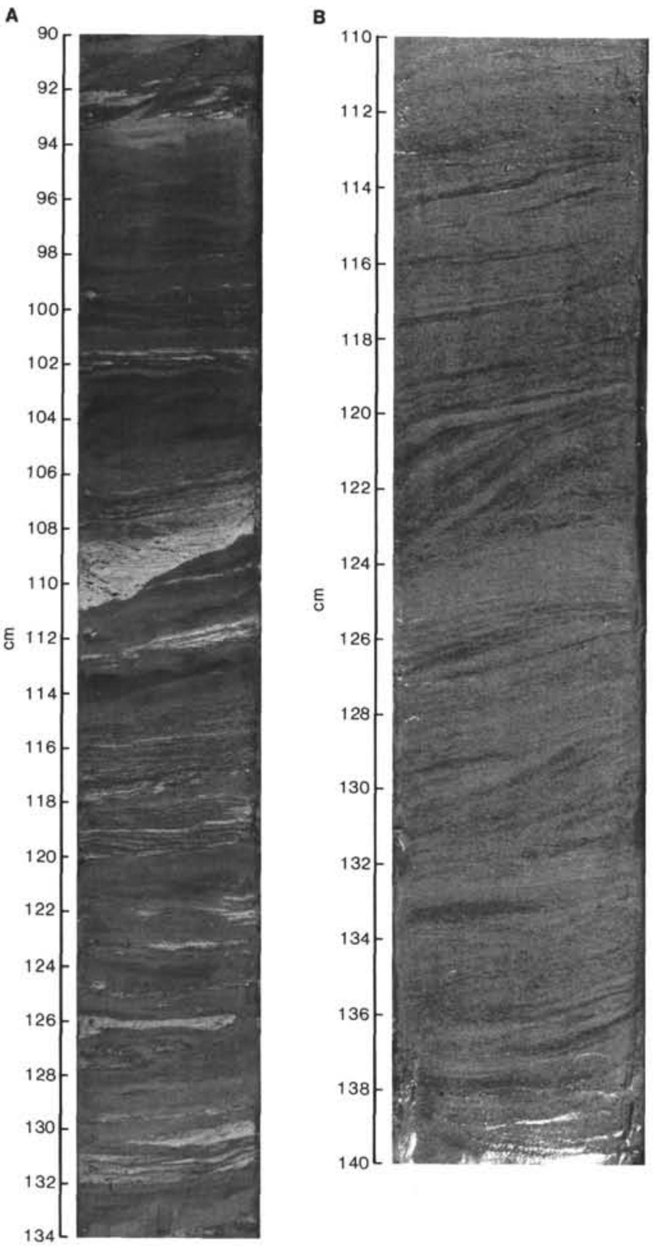

Figure 6. Photographs of characteristic facies in Lithologic Unit II. A. Mud with silt laminae and beds (Sample 622-15-4, 90–134 cm). B. Mud with abundant silt laminae (Sample 622-18-3, 110–140 cm).

Vertical Succession

On the basis of the lithological and wireline logs, one fining-upward interval is defined between 208 and 90 m sub-bottom, containing the following main facies distribution from bottom to top: (1) alterations of silty mud facies and silt-laminated mud facies, together with sand and silt facies, with some gravel and pebbly mud facies at the base (208–187 m sub-bottom); from 197.7 to 196.9 m sub-bottom, dispersed pebbles in silt-laminated mud facies; (2) mainly sand and silt facies (187–156.5 m sub-bottom); (3) silty mud facies and silt-laminated mud facies with some sand and silt facies (156.5–91 m sub-bottom); and (4) clay and mud facies (91–85 m sub-bottom). Above this fining-upward interval, the cores represent mainly clay and mud facies with some silty mud and silt-laminated mud facies.

GEOCHEMISTRY

Organic Geochemistry

No gas was present in most of the sediments from the hole. A release of gas was noted when Section 622-25-1 was split. The gas appeared to be trapped in a sand layer, near a 1-cm black ooze. Thus, Section 622-25-2 was sampled through the core liner at 20 cm after the sealed core tube was upended. Gas chromatograph analysis indicated the gas contained 34 ppm of methane as well as 3900 ppm of carbon dioxide. The small amount of gas pressure present and the low levels of methane in the gas would be characteristic of migration of traces of methane and carbon dioxide (probably of biogenic origin) into this sandy interval.

Inorganic Geochemistry

This site was sampled infrequently (one sample per two cores). Therefore, interpretation of the sparse data is rather difficult (see Presley et al.; Ishizuka, Kawahata, et al., and Ishizuka, Ittekkot, et al.; all this volume). Results of interstitial water analyses are summarized below:

1. The pH value has a range limited from 6.9 to 7.4, except for Core 622-15 (pH 7.65).
2. Total alkalinity values range from 9.0 to 15.0 mEq/L, except for Core 622-11 (6.1 mEq/L). At this site, total alkalinity has two maximal values: 14.0 mEq/L (Core 622-8) and 13.2 mEq/L (Core 622-15).
3. Salinity is constant (32‰) in clay layers, except for Core 622-2 (33.8‰), and is about 33.7‰ in sand layers (Cores 622-17 and 622-23).

PHYSICAL PROPERTIES

The physical properties of Site 622 sediments are similar to those for Site 621 sediments, as expected because of the short distance between these two sites. The sediments at Site 622 suffered from core disturbance in the first core and disruption of their fabric because of gas expansion in subsequent cores between 10 and 50 m and below 90 m sub-bottom. Futhermore, scattering of data in the deeper part of this site is due to changes in sediment composition. Sections containing gravel and coarse sand were not sampled.

Wet-bulk density ranges from a low of 1.62 g/cm^3 to a high of 2.01 g/cm^3 (Fig. 7A).

Wet water content decreases from a seafloor value of 42.4% to 21.1% at the 199-m level (Fig. 7B). Water content decreases at an average rate of 0.107% (0.228%/m).

Porosity of the sediments at Site 622 decreases from a seafloor value of 67.2% at an average rate of 0.130%/m to a value of 41.3% at the 199-m level (Fig. 7D). Most of the sediments have a porosity of approximately 53%.

Void ratio ranges between 2.05 and 0.70. A fairly large variation of void ratio was observed in the 115- to 140-m interval and is attributed to the presence of silt.

All measured values of undrained shear strength are plotted against depth in Figure 7E. No undrained shear

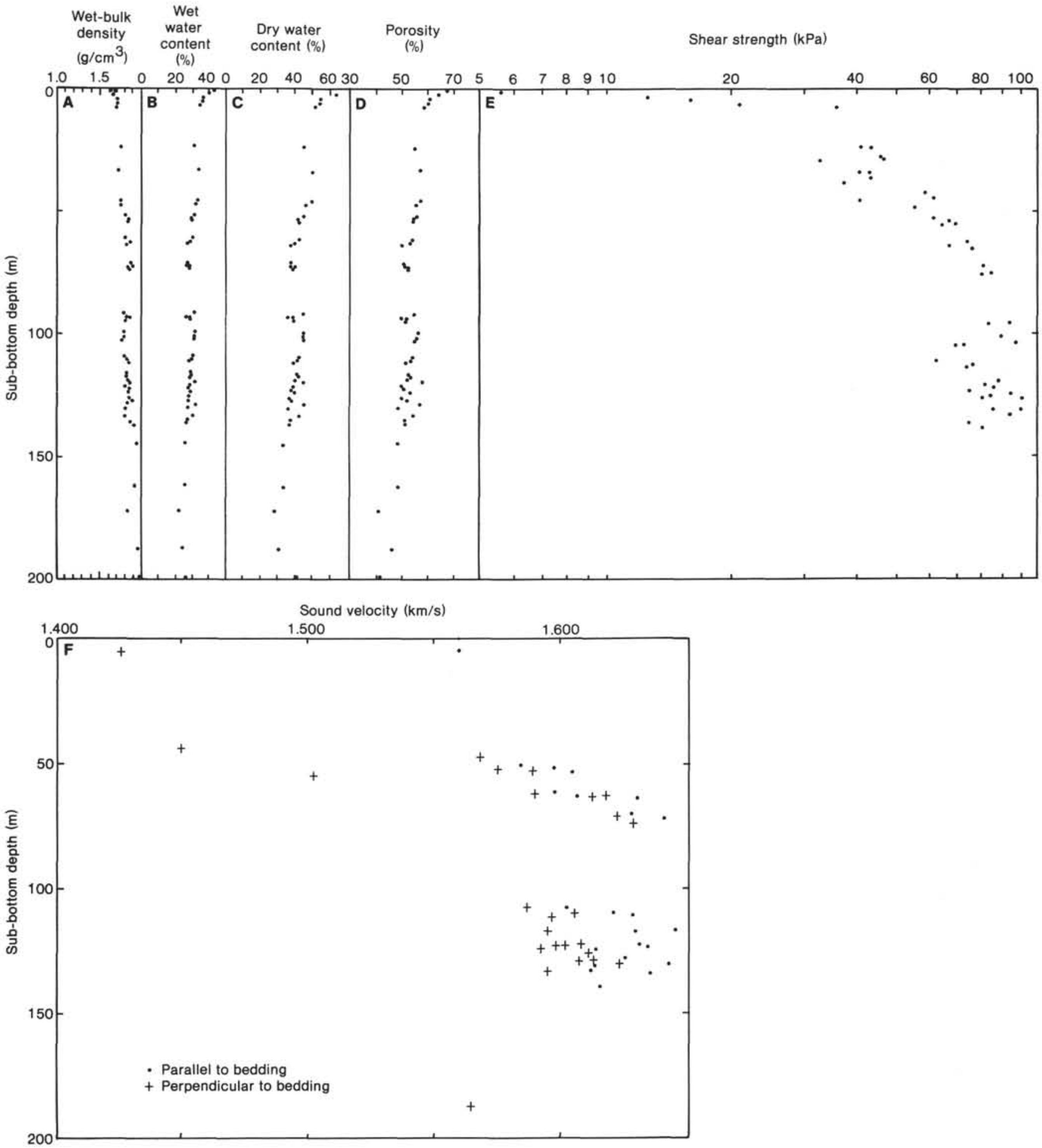

Figure 7. Mass physical properties of Site 622 sediments. A. Wet-bulk density. B. Water content related to weight of wet sediment. C. Water content related to weight of dry sediment. D. Porosity. E. Undrained shear strength. F. Sound velocity.

strength was measured in the 140–190 m interval. The highest undrained shear strength, 0.25 mPa, was measured at 199 m sub-bottom depth. The undrained shear strengths at Site 622 appear to be higher than those measured at Sites 617, 620, and 621. This may be accounted for by the increase in silt content.

The lowest sonic velocity measured was 1.368 km/s and the highest 1.822 km/s. Figure 7F displays the velocity measurements. The velocities measured at Site 622 have the highest average velocity of all sites on Leg 96. There appears to be good agreement between velocities measured at similar depths and there is little scatter in the velocity–depth plot. The acoustic anisotropy is low with the velocities measured parallel to the bedding having a velocity of about 40 m/s higher than those measured perpendicular to the bedding. The observed high velocities may be caused by the amount of silt present.

SUMMARY AND CONCLUSIONS

Site 622 was drilled on the concave side of a sinuous bend of the middle fan channel. Beacon interference did not allow the site to be drilled in the same bend as Site 621, and a site in a similar position was selected on the next bend downstream. The major objective at the site was to determine if channel migration was an active process during the evolution and aggradation of the channel. Cores were obtained to a depth of 199.5 m sub-bottom with the hydraulic piston corer and recovery was rather good to a depth of 160 m, below which recovery decreased. Gamma and sonic well logs were obtained to a depth of 208.0 m and aided in the interpretation of the cored section.

The hole bottomed in coarse-grained sediments, and well-log interpretation indicated possible gravel deposits. Gravel was recovered in a muddy matrix very near the base of the cored section. The overlying coarse-grained sands and silts were about 65 m thick, approximately 35 m thicker at this site than at Site 621, the thalweg site. Sand layers in the interval range in thickness from 1 to 4 m and are separated by sandy silts and silts. The coarser-grained interval grades upward into interbedded silts, clays, and muds. This interval is approximately 47 m thick.

In the interval from 142 to 90 m sub-bottom, a laminated clay and mud unit, containing a bathyal benthic fauna, is present. It is possible that this unit was deposited more slowly than the underlying and overlying units. The upper part of the channel fill, in the interval from 90 m to the seafloor, consists primarily of laminated muds containing a few thin silt stringers.

The major scientific conclusions are

1. The channel fill on the concave side of the channel ("point bar") contains a much thicker section of sandy sediments in the basal part of the cored hole. The pebbly mud unit is at approximately the same elevation in both channel sites, and from the well log interpretation we conclude that this pebbly mud is underlain by coarser-grained sand deposits.

2. The vertical sequences at the two channel sites combined with the interpretations from seismic data indicate that channel migration and aggradation were active processes during the development of the channel. The seismic data show high-amplitude reflectors, the top of which correlate with the gravel deposits, that migrated laterally and climbed vertically in the section.

3. The fine-grained mud and clay fill in the upper part of the channel fill probably represents deposition during the waning phase of the late Wisconsin glacial stage and the Holocene.

4. Sedimentation rates are extremely high: 1029 cm/1000 yr. for the late Wisconsin glacial (Ericson Zone Y) and 12.5 cm/1000 yr. for the Holocene (Ericson Zone Z).

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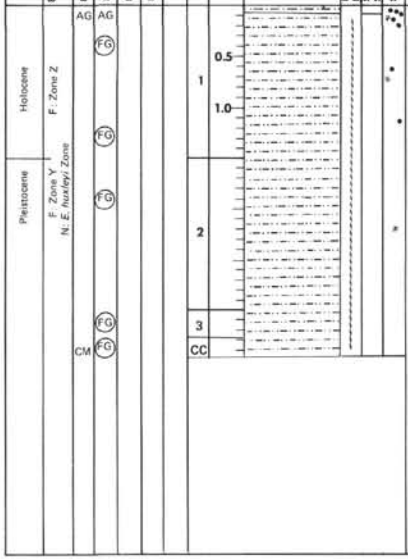
SITE 622 HOLE CORE 1H CORED INTERVAL 2495.0–2498.5 mbsl; 0.0–3.5 mbsf

TIME – ROCK UNIT | BIOSTRATIGRAPHIC ZONE | FOSSIL CHARACTER (FORAMINIFERS, NANNOFOSSILS, RADIOLARIANS, DIATOMS) | SECTION | METERS | GRAPHIC LITHOLOGY | DRILLING DISTURBANCE | SEDIMENTARY STRUCTURES | SAMPLES | LITHOLOGIC DESCRIPTION



Section 1, 0–5 cm: SANDY SILTY MUD (15% sand; 50% silt; 35% clay). Yellowish brown (10YR 5/4).

Section 1, 5 cm–end of core: MUD. Very deformed by drilling. MUD contains many subtle color changes, the most important of which include: Section 1 is dominantly olive gray (5Y 4/2) with major layers and zones of reddish brown (5Y 4/3). Section 2, 3, and Core Catcher are dominantly dark gray (5Y 4/1–10YR 4/1) with major layers and zones of very dark gray (10YR 3/1) and dark brown (7.5YR 4/2).

SMEAR SLIDE SUMMARY (%):

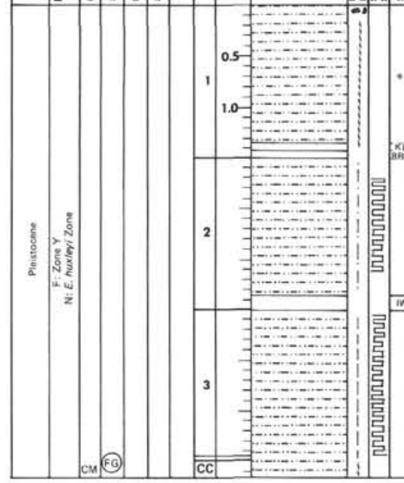
	1, 10 M	1, 70 D	2, 70 D
Texture:			
Sand	T	0	0
Silt	15	40	40
Clay	85	60	60
Composition:			
Quartz	10	30	21
Feldspar	–	–	1
Mica	5	2	4
Heavy minerals	2	2	3
Clay	76	60	60
Pyrite and opaques	T	1	3
Micronodules	T	–	T
Carbonate unspec.	7	5	8
Foraminifers	T	–	–
Sponge spicules	T	T	–

CARBONATE BOMB DATA:

•1, 0–10 cm = 28%
1, 5–6 cm = 13%
1, 9–10 cm = 3%
1, 14–15 cm = 1%
1, 23–24 cm = 3%
1, 62–63 cm = 7%
1, 119–120 cm = 3%

SITE 622 HOLE CORE 2H CORED INTERVAL 2498.5–2508.1 mbsl; 3.5–13.1 mbsf

TIME – ROCK UNIT | BIOSTRATIGRAPHIC ZONE | FOSSIL CHARACTER (FORAMINIFERS, NANNOFOSSILS, RADIOLARIANS, DIATOMS) | SECTION | METERS | GRAPHIC LITHOLOGY | DRILLING DISTURBANCE | SEDIMENTARY STRUCTURES | SAMPLES | LITHOLOGIC DESCRIPTION



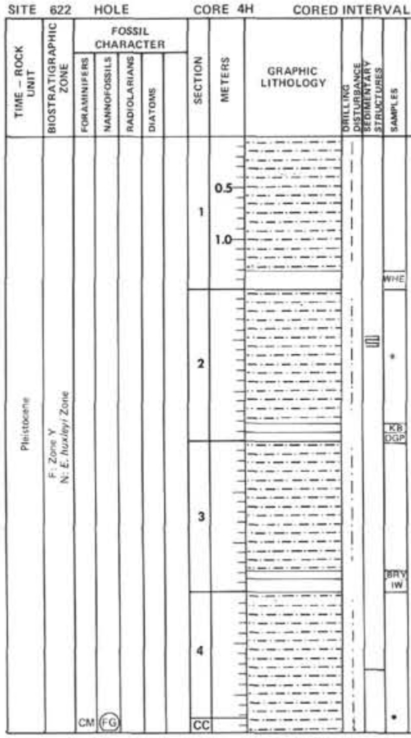
MUD. Dominantly very dark gray (5Y 3/1) with MUD color band laminae of dark gray (5Y 4/1) and black (5Y 2/1). Core disturbance decreases downcore, allowing better preservation of color band laminae.

SMEAR SLIDE SUMMARY (%):

	1, 70 D
Texture:	
Sand	0
Silt	35
Clay	65
Composition:	
Quartz	30
Feldspar	4
Mica	3
Heavy minerals	1
Clay	48
Glauconite	T
Pyrite and opaques	2
Carbonate unspec.	8
Foraminifers	T
Calc. nannofossils	T
Plant debris	4

Note: Core 3H, 2508.1–2517.7 mbsl; 13.1–22.7 mbsf: no recovery.

SITE 622 HOLE CORE 4H CORED INTERVAL 2517.7–2527.2 mbsl; 22.7–32.2 mbsf



LITHOLOGIC DESCRIPTION

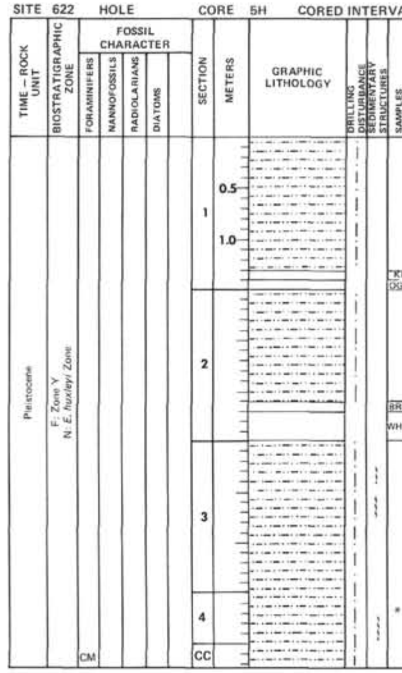
SILTY MUD. Very dark gray (2.5YR 3/0) from top of core to Section 4, 75 cm. Below Section 4, 75 cm dominant color is very dark gray (5Y 3/1). SILTY MUD is dominantly structureless with minor SILT blebs and subtle MUD color bands. MUD color bands are especially prevalent in Section 2, 50–75 cm.

SMEAR SLIDE SUMMARY (%):

	2, 70
	D
Texture:	
Sand	1
Silt	50
Clay	49
Composition:	
Quartz	35
Feldspar	8
Mica	3
Heavy minerals	1
Clay	45
Opaques	1
Carbonate unspec.	5
Foraminifers	T
Calc. nannofossils	1
Plant debris	1

CARBONATE BOMB DATA:
*CC, 0–1 cm = 4%

SITE 622 HOLE CORE 5H CORED INTERVAL 2527.2–2536.7 mbsl; 32.2–41.7 mbsf



LITHOLOGIC DESCRIPTION

MUD. Dark gray (5Y 4/1) and homogeneous with very rare, faint layering and gas cavities.

SMEAR SLIDE SUMMARY (%):

	4, 20
	D
Texture:	
Sand	0
Silt	35
Clay	65
Composition:	
Quartz	35
Feldspar	6
Mica	4
Heavy minerals	1
Clay	47
Opaques	1
Carbonate unspec.	3
Calc. nannofossils	2
Plant debris	1

SITE 622 HOLE CORE 6H CORED INTERVAL 2536.7–2546.2 mbsl; 41.7–51.2 mbsf

TIME – ROCK UNIT: Pleistocene
BIOSTRATIGRAPHIC ZONE: F: Zone Y; N: *E. huxleyi* Zone
FOSSIL CHARACTER: FORAMINIFERS: CM; NANNOFOSSILS: FG; RADIOLARIANS; DIATOMS
SECTION: 1, 2, 3, 4, CC
METERS: 0.5, 1.0

DRILLING DISTURBANCE / SEDIMENTARY STRUCTURES / SAMPLES: *, WHE, KB, OGP, IW, BRY

LITHOLOGIC DESCRIPTION

MUD. Very dark gray (5Y 3/1). Homogeneous with a few white blebs of crystalline material and minor lignite bits. Section 1, 2, and 3 contain lots of gas bubble "pockets"; Section 4 is much less gas-disturbed.

SMEAR SLIDE SUMMARY (%):

	1, 50 D
Texture:	
Sand	0
Silt	35
Clay	65
Composition:	
Quartz	32
Feldspar	6
Mica	2
Heavy minerals	1
Clay	53
Opaques	1
Carbonate unspec.	3
Foraminifers	T
Calc nannofossils	2
Plant debris	T

SITE 622 HOLE CORE 7H CORED INTERVAL 2546.2–2555.8 mbsl; 51.2–60.8 mbsf

TIME – ROCK UNIT: Pleistocene
BIOSTRATIGRAPHIC ZONE: F: Zone Y; N: *E. huxleyi* Zone
FOSSIL CHARACTER: FORAMINIFERS: CM; NANNOFOSSILS; RADIOLARIANS; DIATOMS
SECTION: 1, 2, 3, CC
METERS: 0.5, 1.0

DRILLING DISTURBANCE / SEDIMENTARY STRUCTURES / SAMPLES: *, KB, WHE, BRY, OGP, •

LITHOLOGIC DESCRIPTION

MUD. Dark greenish gray (5GY 4/1), homogeneous, and very deformed by drilling. Very weak color-banding is present.

SMEAR SLIDE SUMMARY (%):

	1, 50 D
Texture:	
Sand	1
Silt	39
Clay	60
Composition:	
Quartz	29
Mica	5
Heavy minerals	2
Clay	60
Pyrite and opaques	1
Carbonate unspec.	3
Sponge spicules	T
Plant debris	T

CARBONATE BOMB DATA:
•CC, 0–1 cm = 7%

SITE 622 HOLE CORE 8H CORED INTERVAL 2555.8–2559.6 mbsl; 60.8–64.6 mbsf

TIME – ROCK UNIT: Pleistocene
BIOSTRATIGRAPHIC ZONE: F: Zone Y; N: *E. huxleyi* Zone
FOSSIL CHARACTER: FORAMINIFERS: FP; NANNOFOSSILS: FG; RADIOLARIANS; DIATOMS
SECTION: 1, 2, 3, CC
METERS: 0.5, 1.0

DRILLING DISTURBANCE / SEDIMENTARY STRUCTURES / SAMPLES: *, KS, BRY, OGP, IW

LITHOLOGIC DESCRIPTION

MUD. Dark gray (5Y 4/1). Homogeneous with rare, weak color bands. One large wood chip at Section 2, 35 cm.

SMEAR SLIDE SUMMARY (%):

	1, 70 D
Texture:	
Sand	0
Silt	50
Clay	50
Composition:	
Quartz	39
Feldspar	6
Mica	2
Heavy minerals	1
Clay	45
Opaques	1
Carbonate unspec.	3
Foraminifers	T
Calc. nannofossils	1
Radiolarians	T
Sponge spicules	T
Plant debris	2

SITE 622 HOLE CORE 9H CORED INTERVAL 2565.4–2569.1 mbsl; 70.4–74.1 mbsf

TIME – ROCK UNIT: Pleistocene

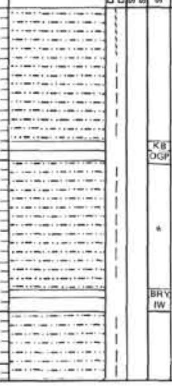
BIOSTRATIGRAPHIC ZONE: F: Zone Y; N: *E. huxleyi* Zone

FOSSIL CHARACTER (FORAMINIFERS, NANNOFOSSILS, RADIOLARIANS, DIATOMS): CM

SECTION: 1, 2, 3, CC

METERS: 0.5, 1.0

GRAPHIC LITHOLOGY / DRILLING DISTURBANCE / SEDIMENTARY STRUCTURES / SAMPLES



LITHOLOGIC DESCRIPTION

MUD. Very dark gray (5Y 3/1) and homogeneous. Core contains very faint gray (slightly lighter or darker than 5Y 3/1) MUD color bands, especially in Section 3.

SMEAR SLIDE SUMMARY (%):

	2, 70
	D
Texture:	
Sand	1
Silt	40
Clay	59
Composition:	
Quartz	28
Mica	5
Heavy minerals	4
Clay	58
Pyrite and opaques	1
Carbonate unspec.	3
Calc. nannofossils	1

SITE 622 HOLE CORE 10H CORED INTERVAL 2584.4–2590.4 mbsl; 89.4–95.4 mbsf

TIME – ROCK UNIT: Pleistocene

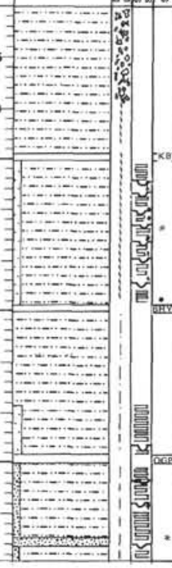
BIOSTRATIGRAPHIC ZONE: F: Zone Y; N: *E. huxleyi* Zone

FOSSIL CHARACTER (FORAMINIFERS, NANNOFOSSILS, RADIOLARIANS, DIATOMS): CM FG

SECTION: 1, 2, 3, 4

METERS: 0.5, 1.0

GRAPHIC LITHOLOGY / DRILLING DISTURBANCE / SEDIMENTARY STRUCTURES / SAMPLES



LITHOLOGIC DESCRIPTION

MUD with SILT and SANDY SILT laminae.

Section 1 and Section 3, 0–90 cm consist of dark gray (5Y 4/1) and very dark gray (10YR 3/1) homogeneous MUD with rare SILT blebs and rare faint light color-bands. Section 1 is 5Y 4/1; Section 3 is 10YR 3/1.

Section 2 and Section 3, 90–140 cm consist of very dark gray (10YR 3/1) MUD with gray, brown, and black color bands and SILT laminae. SILT laminae are normally-graded and have scoured bases. *Iron sulphide* is associated with the SILT laminae.

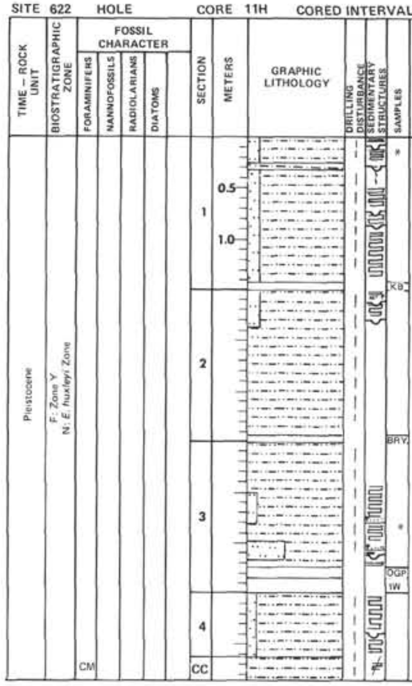
Section 4 is similar to Section 2 and the laminated portions of Section 3, but with SANDY SILT laminae and one 8-cm thick SANDY SILT bed at Section 4, 72–80 cm. Gas bubble "pockets" are common.

SMEAR SLIDE SUMMARY (%):

	2, 70	4, 75
	D	M
Texture:		
Sand	T	20
Silt	50	75
Clay	50	5
Composition:		
Quartz	33	58
Feldspar	2	3
Mica	5	T
Heavy minerals	3	4
Clay	50	10
Glauconite	–	T
Pyrite and opaques	2	–
Micronodules	T	–
Carbonate unspec.	5	–
Foraminifers	–	T
Calc. nannofossils	T	–
Plant debris	T	–
Altered minerals	–	25

CARBONATE BOMB DATA:
*2, 140–142 cm = 3%

SITE 622 HOLE CORE 11H CORED INTERVAL 2593.9–2599.4 mbsl; 98.9–104.4 mbsf



LITHOLOGIC DESCRIPTION

MUD with SILT-laminae and black MUD color bands.

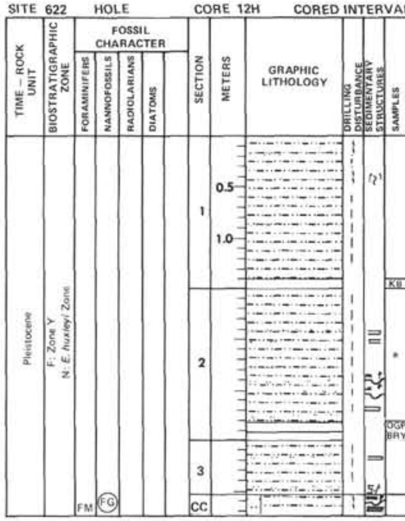
MUD is dominantly very dark gray (10YR 3/1–10YR 3.5/1) with very dark grayish brown (10YR 3/2) oxidation zones and black mud color bands. Entire core is laminated with SILT laminae.

SILT laminae are very dark gray (10YR 3/1), thin (<1 mm to ~2 mm), and have scoured bases. Lamine have included iron sulphides.

SMEAR SLIDE SUMMARY (%):

	1, 20	3, 87
	M	D
Texture:		
Sand	1	0
Silt	84	20
Clay	15	80
Composition:		
Quartz	75	15
Feldspar	3	–
Mica	1	–
Heavy minerals	–	1
Clay	15	80
Volcanic glass	T	–
Opaques	1	–
Carbonate unspec.	5	2
Foraminifers	T	–
Calc. nannofossils	T	–
Altered minerals	–	2

SITE 622 HOLE CORE 12H CORED INTERVAL 2603.5–2607.3 mbsl; 108.5–112.3 mbsf



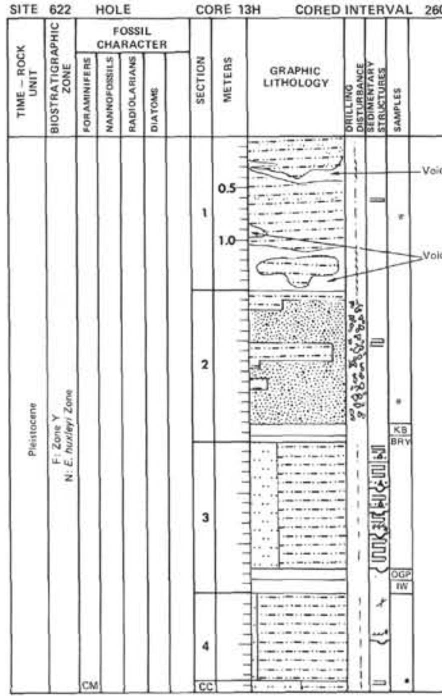
LITHOLOGIC DESCRIPTION

MUD with SILT laminae. MUD is dominantly very dark gray (5Y 3/1) and color-banded with numerous black reduction layers. Several oxidation layers (dark olive gray, 5Y 3/2) occur at the top of Section 2. SILT laminae are thin, and occasionally show scoured bases, grading, and micro-cross-laminations.

SMEAR SLIDE SUMMARY (%):

	2, 70
	D
Texture:	
Sand	0
Silt	30
Clay	70
Composition:	
Quartz	20
Clay	70
Opaques	3
Carbonate unspec.	2
Calc. nannofossils	T
Altered minerals	5

SITE 622 HOLE CORE 13H CORED INTERVAL 2607.3–2612.3 mbsl; 112.3–117.3 mbsf



LITHOLOGIC DESCRIPTION

Section 1: MUD with minor SILT blebs and laminae. Very dark gray (5Y 3/1) and very deformed by drilling.

Section 2: SILTY SAND with common MUD balls. Dark gray (5Y 4/1) and very deformed by drilling.

Section 3–Core Catcher: MUD with SILT laminae and black color bands. Dominantly very dark gray (10YR 3/1). SILT laminae in Section 3 occur in thinning-upward layers.

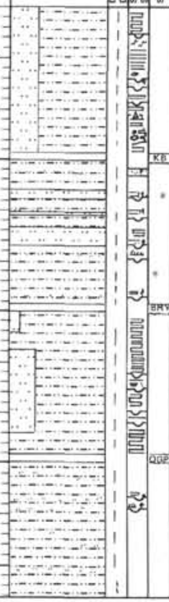
SMEAR SLIDE SUMMARY (%):

	1, 80	2, 110
	D	D
Texture:		
Sand	0	60
Silt	30	30
Clay	70	10
Composition:		
Quartz	25	44
Feldspar	–	2
Mica	1	2
Heavy minerals	2	3
Clay	70	10
Volcanic glass	T	–
Glauconite	–	1
Carbonate unspec.	1	2
Foraminifers	T	T
Calc. nannofossils	1	1
Sponge spicules	T	–
Plant debris	–	1
Altered minerals	–	35

CARBONATE BOMB DATA:
*CC, 2–3 cm = 6%

SITE 622 HOLE CORE 14H CORED INTERVAL 2612.3–2618.3 mbsl; 117.3–123.3 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS
Pleistocene	F: Zone Y N: *E. huxleyi* Zone	CM	FG			1, 2, 3, 4, CC	0.5, 1.0



LITHOLOGIC DESCRIPTION

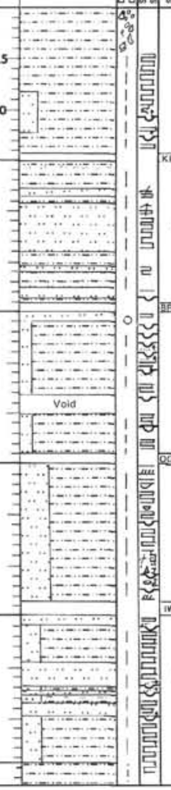
MUD with SILT laminae. MUD is dominantly very dark gray (10YR 3/1) with dark brown (7.5YR 3/2) oxidation zones and black MUD color bands. SILT laminae are thin, and sometimes have scoured bases and appear graded. SILT laminae are dark gray (10YR 4/1).

SMEAR SLIDE SUMMARY (%):

	2, 35	2, 115
	M	D
Texture:		
Sand	5	0
Silt	85	40
Clay	10	60
Composition:		
Heavy minerals	–	1
Clay	–	60
Volcanic glass	–	1
Calc. nannofossils	–	1
Fish remains	–	T
Plant debris	–	4
Altered minerals	–	33

SITE 622 HOLE CORE 15H CORED INTERVAL 2618.3–2625.9 mbsl; 123.3–130.9 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS
Pleistocene	F: Zone Y N: *E. huxleyi* Zone	FM				1, 2, 3, 4, 5, CC	0.5, 1.0



LITHOLOGIC DESCRIPTION

MUD with coarse SILT (or very fine SAND) laminae and beds.

MUD is extensively color-banded due to oxidation and black reduction layers. MUD is dominantly very dark gray (10YR 3/1.5); oxidation layers are dark brown (7.5YR 3/2); black bands are 5Y 2.5/1.

SILT laminae are dark gray to gray (5Y 4/1–5Y 5/1). Laminae range from ~1 mm up to thin–thick beds (38 cm maximum). SILTS usually have scoured bases and typically are graded.

SMEAR SLIDE SUMMARY (%):

	5, 58
	D
Texture:	
Sand	7
Silt	85
Clay	8
Composition:	
Quartz	50
Feldspar	T
Mica	T
Heavy minerals	4
Clay	8
Opaques	10
Carbonate unspec.	10
Altered minerals	18

CARBONATE BOMB DATA:

•2, 66–68 cm = 4%

SITE 622 HOLE CORE 16H CORED INTERVAL 2627.9–2632.6 mbsl; 132.9–137.6 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER (FORAMINIFERS, NANNOFOSSILS, RADIOLARIANS, DIATOMS)	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
Pleistocene	F: Zone Y N: *E. huxleyi* Zone	FM FG	1, 2, 3, CC	0.5, 1.0				KB, *, BRY, OGP	see below

SILTY MUD with abundant SILT laminae.

Dominantly very dark gray (10YR 3/1) in Section 1 and 2; dominantly dark gray (10YR 4/1–5Y 4/1) in Section 3 and the Core Catcher.

Core is SILT-laminated below Section 1, 47 cm. Abundance of SILT laminae increase from approximately 50% in Section 1 to ⩾90% in Section 3. SILT laminae in Section 1 and 2 exhibit scoured bases, micro-cross-laminations, and graded bedding; SILT laminae in Section 3 are too thin and too numerous to observe primary sedimentary structures (>300 laminae per meter of core).

SMEAR SLIDE SUMMARY (%):

	2, 74
	D
Texture:	
Sand	T
Silt	70
Clay	30
Composition:	
Quartz	50
Heavy minerals	3
Clay	30
Opaques	2
Carbonate unspec.	4
Calc. nannofossils	1
Altered minerals	10

SITE 622 HOLE CORE 17H CORED INTERVAL 2637.5–2641.2 mbsl; 142.5–146.2 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER (FORAMINIFERS, NANNOFOSSILS, RADIOLARIANS, DIATOMS)	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
Pleistocene	F: Zone Y N: *E. huxleyi* Zone	FM	1, 2, 3, CC	0.5, 1.0	CC given to Paleo.			*, IW	see below

LAMINATED SILTY MUD. Dark olive gray (5Y 3/2). Laminae are very thin (<1 mm) to thin (<1.5 mm). A homogeneous SILTY MUD interval occurs at Section 2, 24–30 cm. Section 3, 60–65 cm consists of MUD with SILT laminae.

SMEAR SLIDE SUMMARY (%):

	1, 80
	D
Texture:	
Sand	10
Silt	70
Clay	20

SITE 622 HOLE CORE 18H CORED INTERVAL 2647.1–2652.6 mbsl; 152.1–157.6 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER (FORAMINIFERS, NANNOFOSSILS, RADIOLARIANS, DIATOMS)	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
Pleistocene	F: Zone Y N: *E. huxleyi* Zone	RM FG	1, 2, 3, 4, CC	0.5, 1.0	CC given to Paleo.			OGP, BRY, KB, *	see below

LAMINATED SILTY MUD (Sections 1–3) and homogeneous SANDY SILT (Section 4).

Section 1–Section 3, 135 cm contain thinly laminated (color-banded), dark gray (5Y 4/1) SILTY MUD. Section 3 includes a thickly-laminated interval at 3–7 cm.

Section 3, 135 cm–Section 4 contains homogeneous, slightly soupy, extremely dark olive gray/black (5Y 2.5/2) SANDY SILT.

SMEAR SLIDE SUMMARY (%):

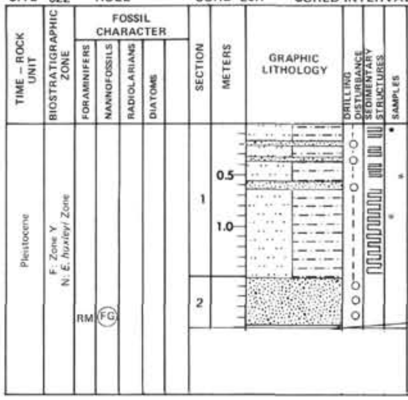
	4, 50
	D
Texture:	
Sand	15
Silt	70
Clay	15
Composition:	
Quartz	60
Feldspar	5
Clay	15
Glauconite	T
Opaques	2
Carbonate unspec.	5
Foraminifers	T
Altered minerals	13

SITE 622 HOLE CORE 19H CORED INTERVAL 2656.7–2658.7 mbsl; 161.7–163.7 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER (FORAMINIFERS, NANNOFOSSILS, RADIOLARIANS, DIATOMS)	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
Pleistocene	F: Zone Y N: *E. huxleyi* Zone	RM	1, 2	0.5, 1.0					see below

SANDY SILT. Dark olive gray (5Y 3/2), soupy, and homogeneous. Layering is suggested by concentration of heavy minerals. In some cases, layer preservation is quite good, but in most cases, heavy minerals have flowed out of depositional position and spread across the core.

SITE 622 HOLE CORE 20H CORED INTERVAL 2665.0–2667.0 mbsl; 170.0–172.0 mbsf



LITHOLOGIC DESCRIPTION

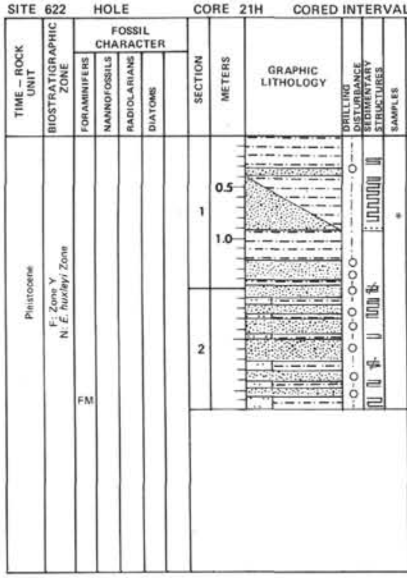
This core contains LAMINATED SILT/SILTY MUD and homogmeous SANDY SILT. Dominant color is dark gray (5Y 4/1). Laminated SILT/SILTY MUD intervals are only slightly deformed by drilling; SANDY SILT intervals are soupy.

SMEAR SLIDE SUMMARY (%):

	1, 59	1, 91
	D	D
Texture:		
Sand	20	15
Silt	70	75
Clay	10	10

CARBONATE BOMB DATA:
*1, 0–1 cm = 5%

SITE 622 HOLE CORE 21H CORED INTERVAL 2667.0–2669.7 mbsl; 172.0–174.7 mbsf



LITHOLOGIC DESCRIPTION

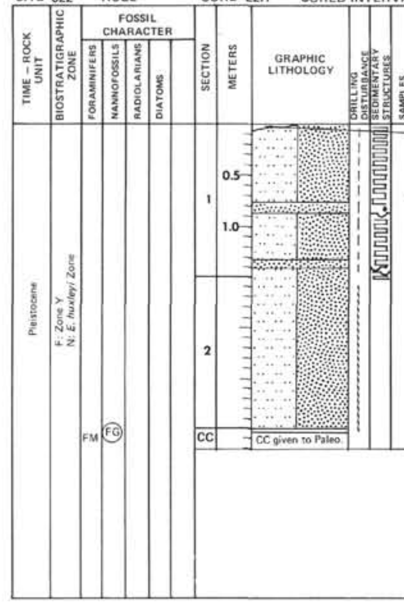
Section 1: Interlayered SILTY MUD/MUDDY SILT and SANDY SILT. Dominant colors are dark gray (5Y 4/1–10YR 4/1) and very dark gray (10YR 3/1). SANDY SILT intervals are soupy. Section 1, 38–90 cm fines upward and contains numerous black laminae. Section 1 also includes minor intervals of very dark grayish brown (10YR 3/2) MUD.

Section 2: Interlayered massive- to thinly-laminated, soupy, SANDY SILT and SILT-laminated SILTY MUD. Dominant color is very dark gray (10YR 3/1).

SMEAR SLIDE SUMMARY (%):

	1, 81
Texture:	
Sand	30
Silt	55
Clay	15
Composition:	
Quartz	50
Feldspar	5
Heavy minerals	5
Clay	15
Glauconite	1
Opaques	3
Carbonate unspec.	1
Foraminifers	T
Altered minerals	20

SITE 622 HOLE CORE 22H CORED INTERVAL 2669.7–2672.7 mbsl; 174.7–177.7 mbsf



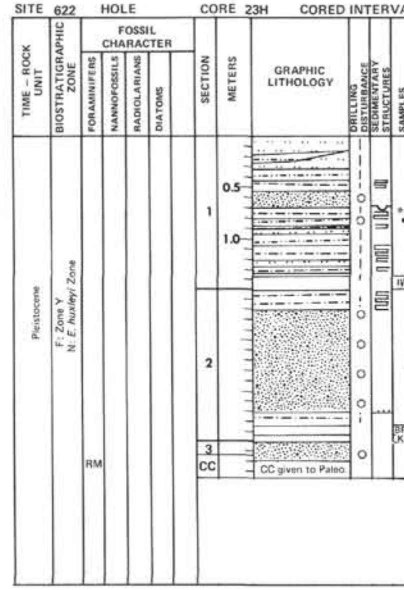
LITHOLOGIC DESCRIPTION

LAMINATED SILTS and SANDS. Entire core consists of thoroughly laminated (parallel, sub-parallel, and cross-laminated) SILTS and very fine-grained SANDS. Some beds are clearly graded; generally laminae are graded on mm-scale from very fine-grained SAND → SILT → red/brown MUD → black/dark MUD. Local high-angle discordances ± truncation of underlying laminae are either depositional or erosional. Section 2 is extremely disrupted by gas expansion and escape structures and does not show sedimentary structures as clearly as Section 1.

SMEAR SLIDE SUMMARY (%):

	1, 70
	D
Texture:	
Sand	30
Silt	60
Clay	10
Composition:	
Quartz	63
Feldspar	5
Mica	5
Heavy minerals	4
Clay	10
Glauconite	T
Pyrite and opaques	2
Carbonate unspec.	8
Foraminifers	T
Calc. nannofossils	T
Plant debris	3

SITE 622 HOLE CORE 23H CORED INTERVAL 2672.7–2676.0 mbsl; 177.7–181.0 mbsf



LITHOLOGIC DESCRIPTION

MUDS, SILTS and SANDY SILTS, and finely-laminated SILTY MUDS.

Dominant color is dark gray (5Y 4/1). Many of the homogeneous SILT and SANDY SILT layers are soupy. Thick SANDY SILT in Section 2 is normally-graded.

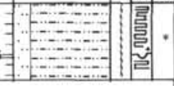
SMEAR SLIDE SUMMARY (%):

	1, 70	2, 75
	D	D
Texture:		
Sand	40	40
Silt	50	40
Clay	10	20
Composition:		
Quartz	72	59
Feldspar	8	9
Mica	3	5
Heavy minerals	1	4
Clay	8	18
Glauconite	–	T
Opeques	2	4
Carbonate unspec.	5	–
Calc. nannofossils	T	T
Plant debris	1	1

CARBONATE BOMB DATA:
*1, 86–88 cm = 7%

SITE 622 HOLE CORE 24H CORED INTERVAL 2682.3–2683.3 mbsl; 187.3–188.3 mbsf

TIME-ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS
Pleistocene	F: Zone Y N: *E. huxleyi* Zone	FM	FG			1 CC	0.5



LITHOLOGIC DESCRIPTION

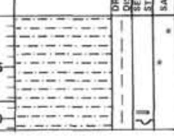
MUD with SILT laminae. Dark gray (5Y 4/1) with minor color-banding of very dark grayish brown (10YR 3/2) MUD at Section 1, 35–42 cm. Entire core has been very deformed by drilling.

SMEAR SLIDE SUMMARY (%):

	1, 35
	D
Texture:	
Sand	0
Silt	30
Clay	70
Composition:	
Quartz	19
Feldspar	2
Mica	1
Heavy minerals	2
Clay	70
Pyrite and opaques	2
Carbonate unspec.	3
Calc. nannofossils	1
Sponge spicules	T
Plant debris	T

SITE 622 HOLE CORE 25H CORED INTERVAL 2691.9–2692.9 mbsl; 196.9–197.9 mbsf

TIME-ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS
Pleistocene	F: Zone Y N: *E. huxleyi* Zone	RM				1 CC	0.5 1.0



LITHOLOGIC DESCRIPTION

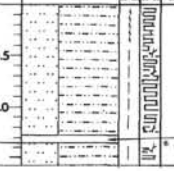
SILTY MUD with minor clay clasts, silt blebs, and pebbles. Dominantly dark gray (5Y 4/1).

SMEAR SLIDE SUMMARY (%):

	1, 17	1, 43
	D	M
Texture:		
Sand	2	0
Silt	50	20
Clay	48	80
Composition:		
Quartz	38	20
Feldspar	5	3
Mica	4	2
Heavy minerals	3	—
Clay	37	71
Opaques	2	1
Carbonate unspec.	8	2
Calc. nannofossils	—	1
Plant debris	1	T

SITE 622 HOLE CORE 26H CORED INTERVAL 2692.9–2694.5 mbsl; 197.9–199.5 mbsf

TIME-ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS
Pleistocene	F: Zone Y N: *E. huxleyi* Zone	CP	FG			1 CC	0.5 1.0



LITHOLOGIC DESCRIPTION

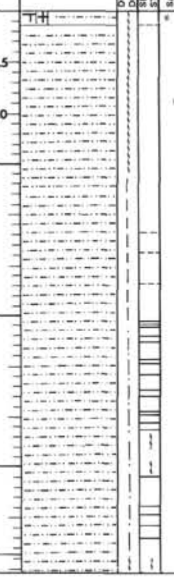
SILT-laminated MUD. SILT laminae are very thin to thin. Laminae frequency is approximately 550 laminae/90 cm. Many of the laminae appear graded.

SMEAR SLIDE SUMMARY (%):

	CC, 3	CC, 5
	M	M
Texture:		
Sand	T	10
Silt	35	85
Clay	65	5
Composition:		
Quartz	—	70
Feldspar	—	4
Mica	—	5
Heavy minerals	—	4
Clay	—	5
Pyrite and opaques	—	2
Carbonate unspec.	—	10
Sponge spicules	—	T

SITE 622 HOLE A CORE 1H CORED INTERVAL 2495.5–2501.0 mbsl; 0.0–5.6 mbsf

TIME-ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS
	N: *E. huxleyi* Zone		AG AG RG FG			1 2 3 4 CC	0.5 1.0



LITHOLOGIC DESCRIPTION

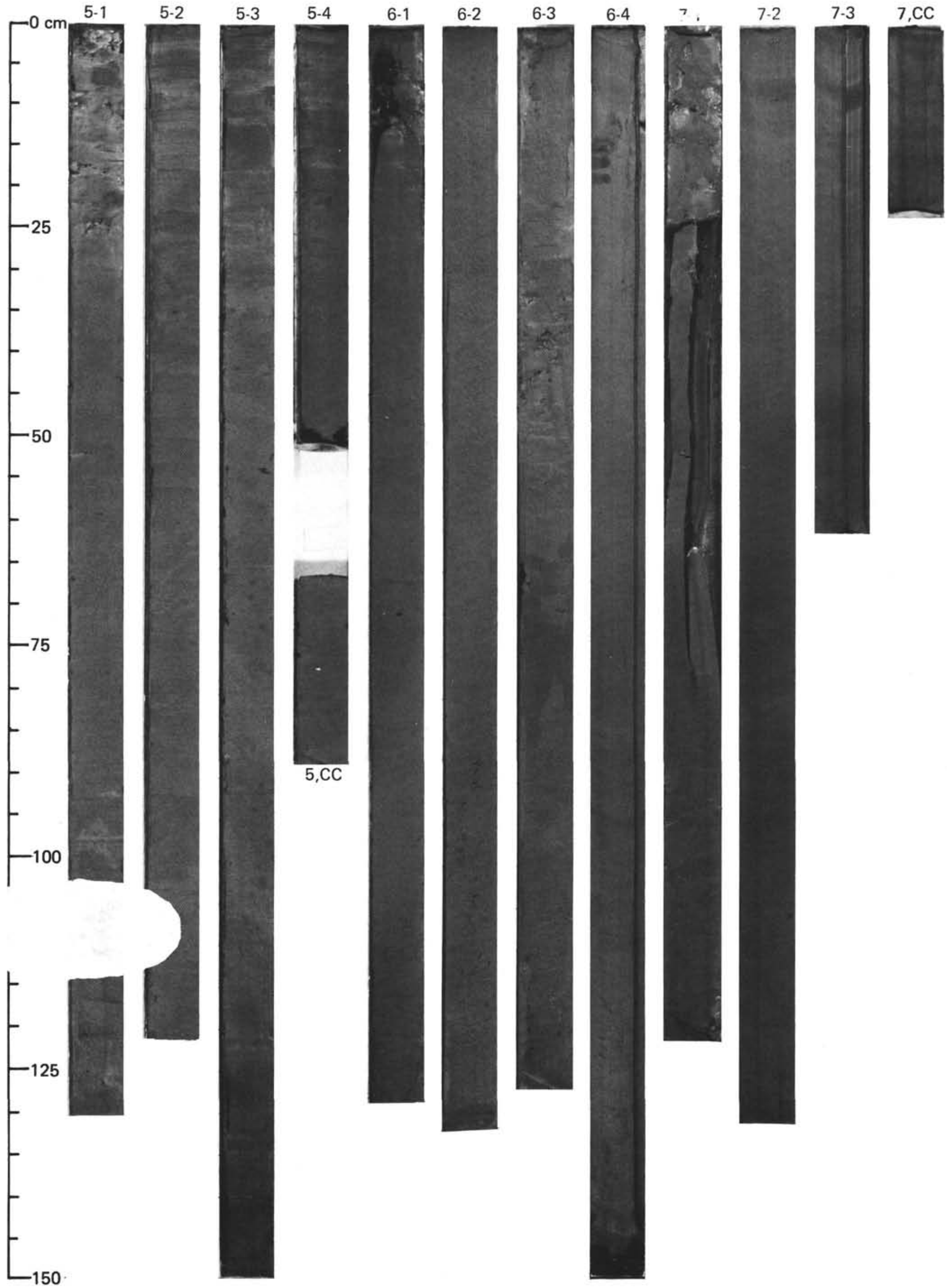
Section 1, 0–10 cm: Olive brown (2.5Y 4/4) MARLY FORAMINIFERAL OOZE.

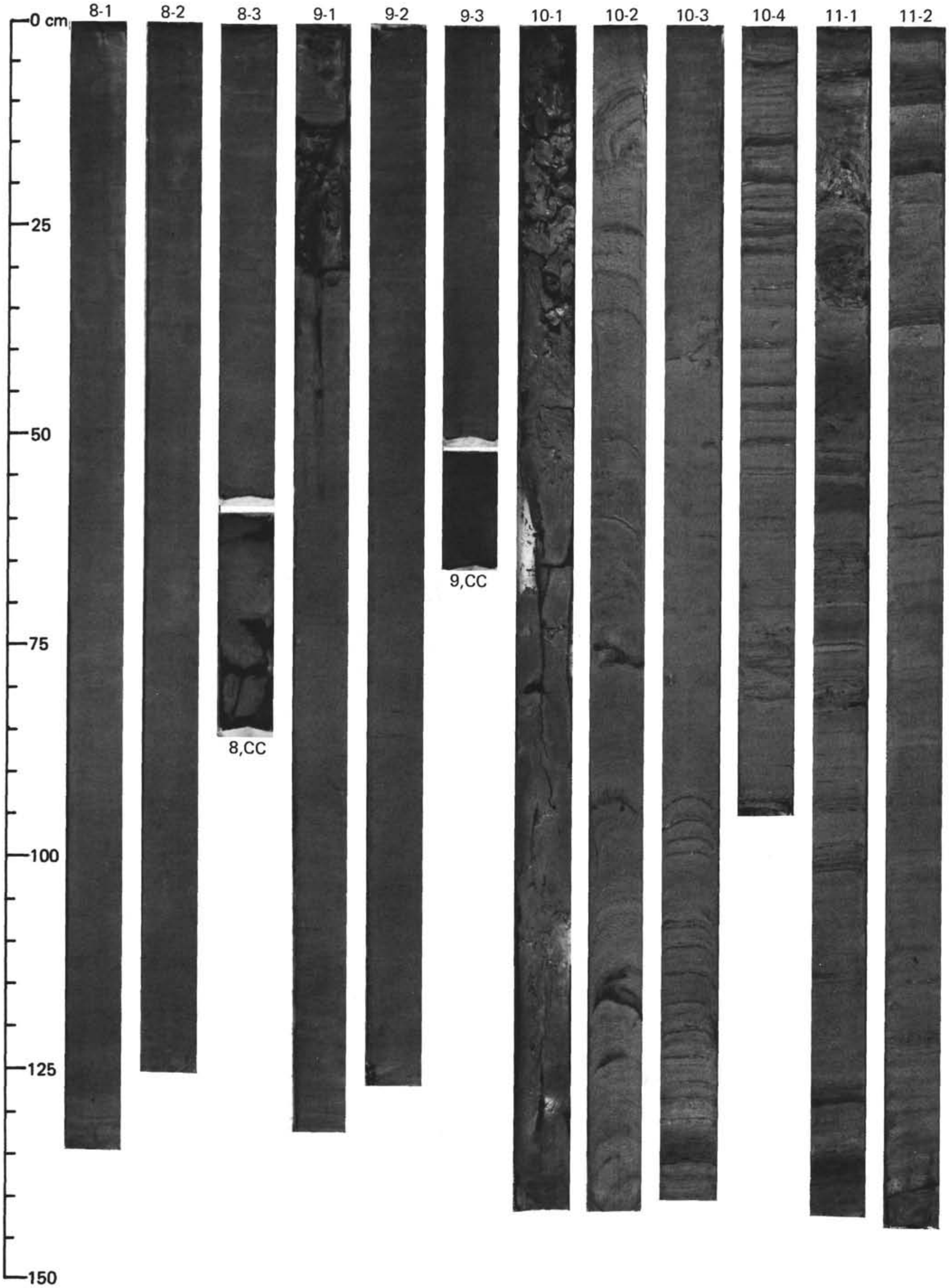
Section 1, 10 cm–Core Catcher: Homogeneous MUD. Dark gray (5Y 4/1) in Section 1 and 2; very dark gray (5Y 3/1) in Section 3, 4, and Core Catcher. Section 2, 3, 4, and Core Catcher contain minor, irregular black color bands of MUD.

SMEAR SLIDE SUMMARY (%):

	1, 3	1, 80
	D	D
Texture:		
Sand	10	0
Silt	30	30
Clay	60	70
Composition:		
Quartz	13	15
Clay	60	70
Carbonate unspec.	7	5
Foraminifers	20	—
Calc. nannofossils	—	T
Altered minerals	—	10


1-1
1-2
1-3
2-1
2-2
2-3
2,CC
3
4-1
4-2
4-3
4-4
0 cm
25
50
75
100
125
150
1,CC
NO RECOVERY
4,CC


0 cm
25
50
75
100
125
150
5-1
5-2
5-3
5-4
6-1
6-2
6-3
6-4
7-2
7-3
7,CC
5,CC


0 cm
25
50
75
100
125
150
8-1
8-2
8-3
8,CC
9-1
9-2
9-3
9,CC
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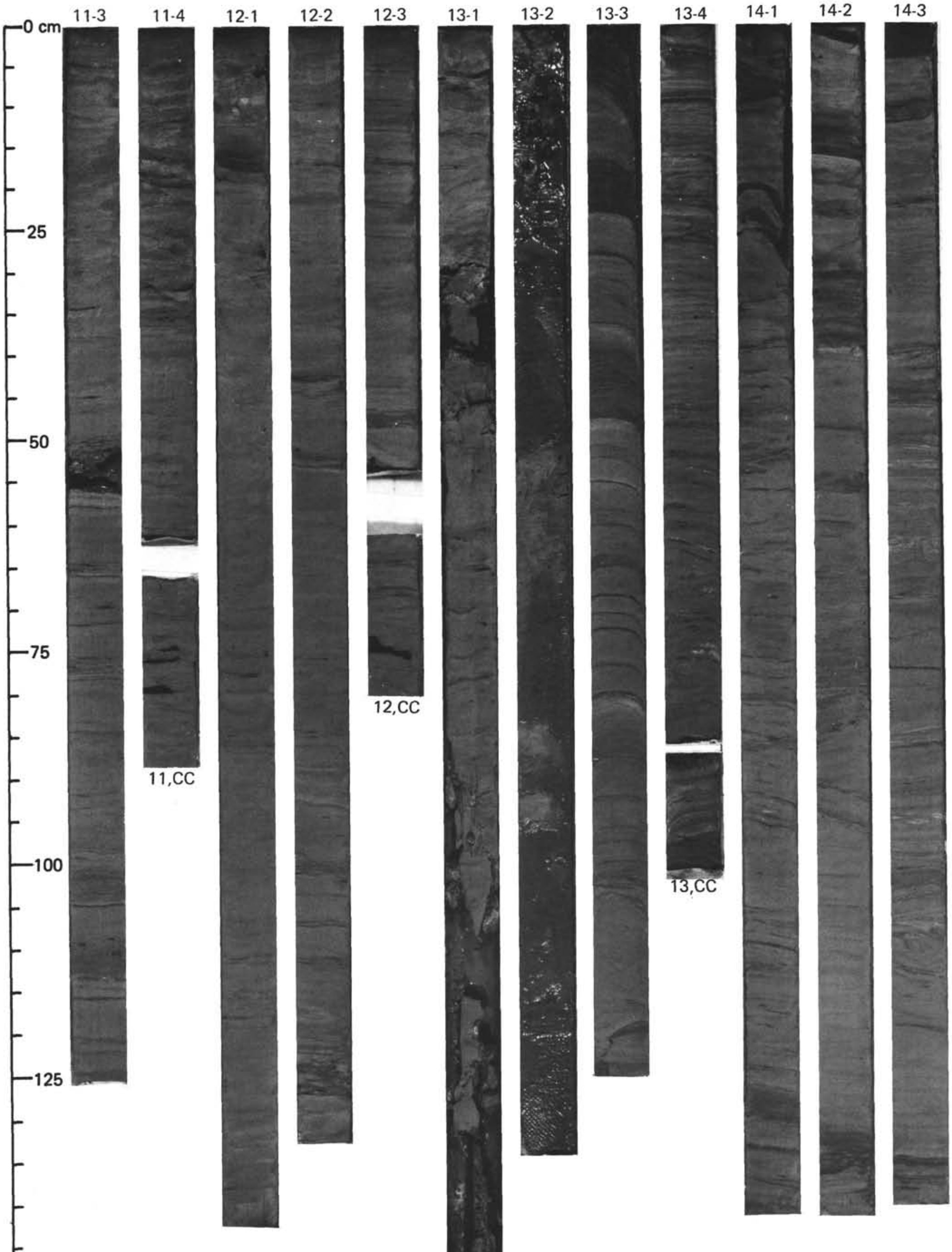
10-3
10-4
11-1
11-2


11-3
11-4
12-1
12-2
12-3
13-1
13-2
13-3
13-4
14-1
14-2
14-3
0 cm
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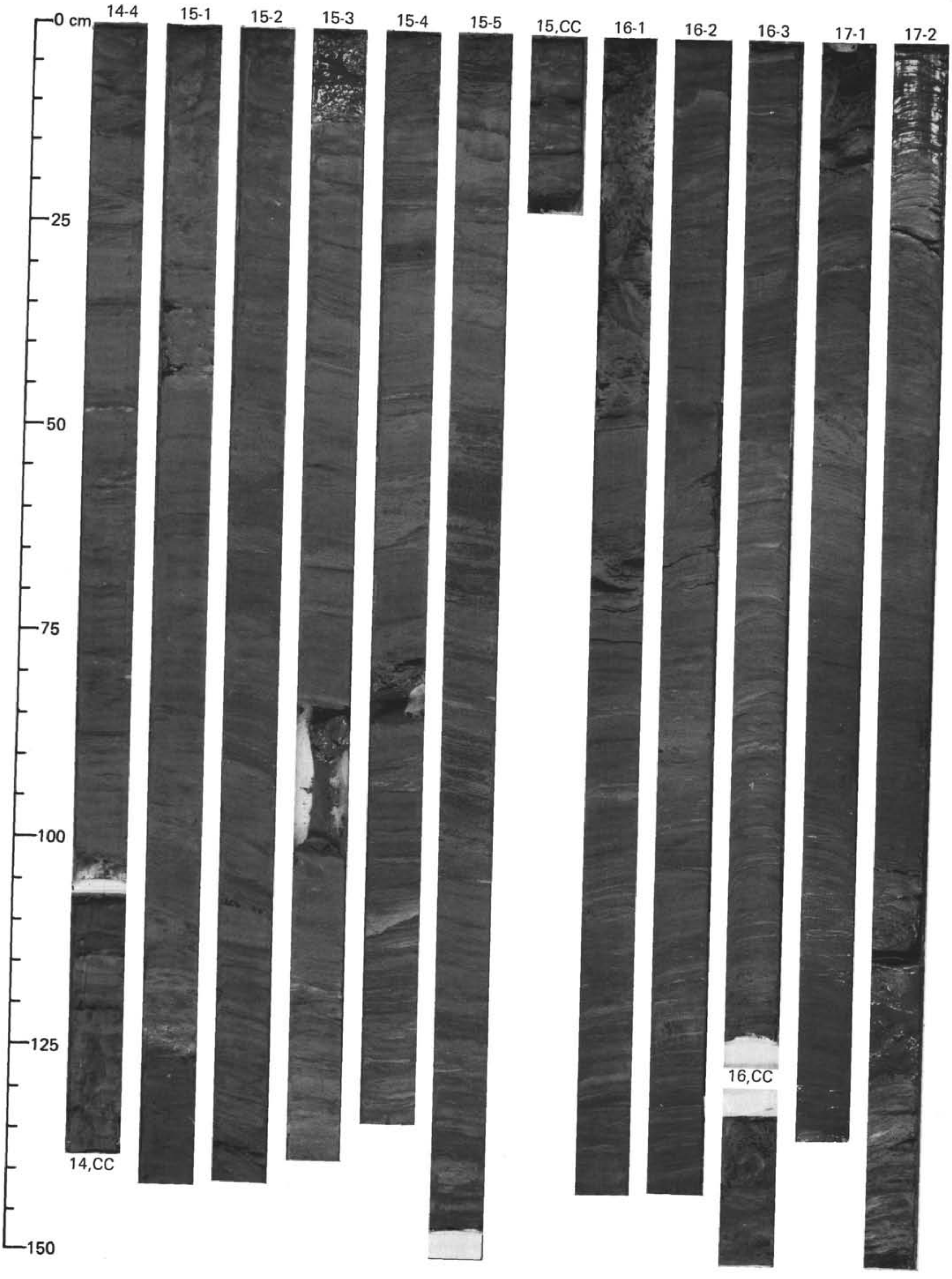
125
150
11,CC
12,CC
13,CC


0 cm
25
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75
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125
150
14-4
15-1
15-2
15-3
15-4
15-5
15,CC
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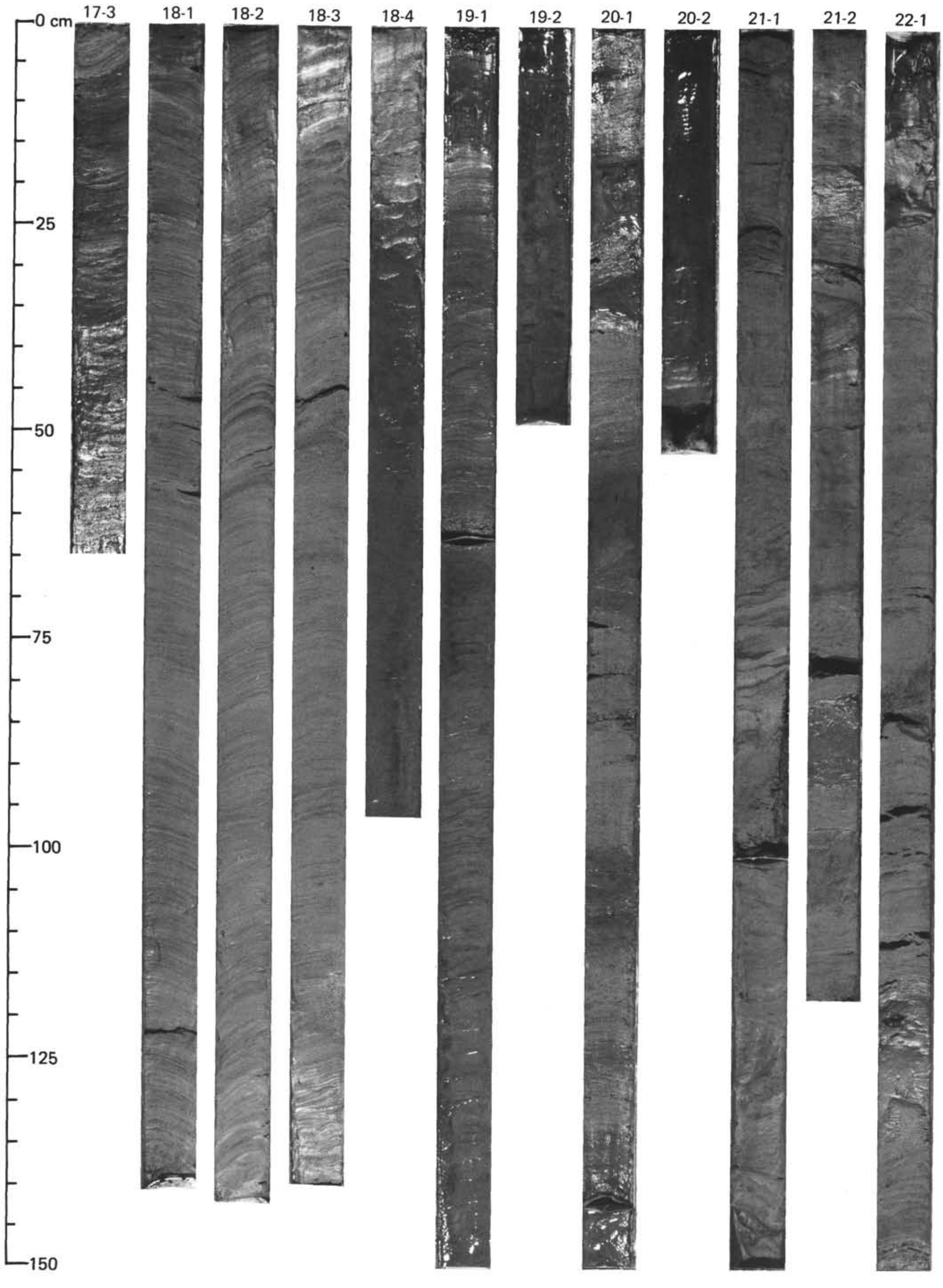
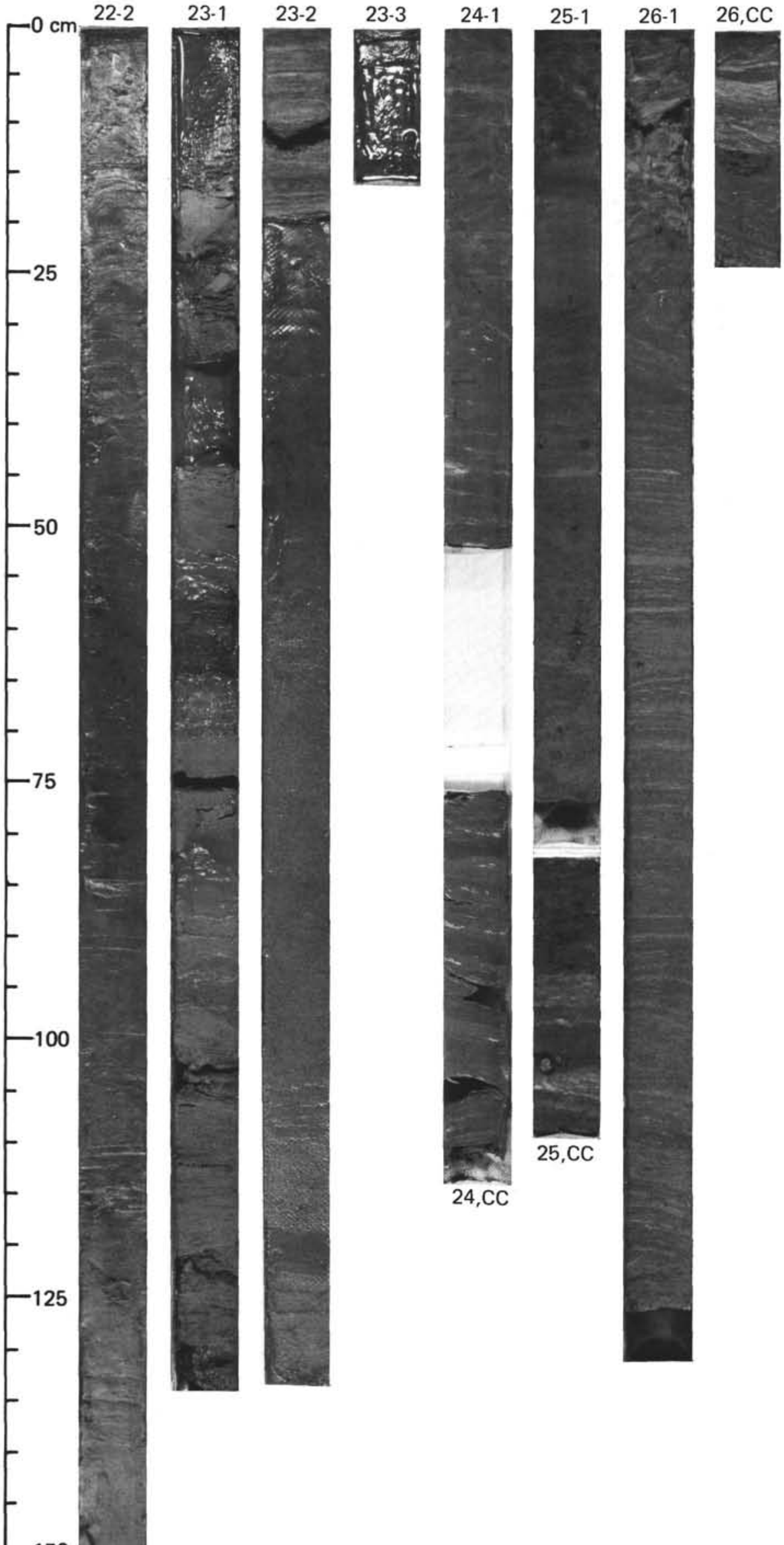
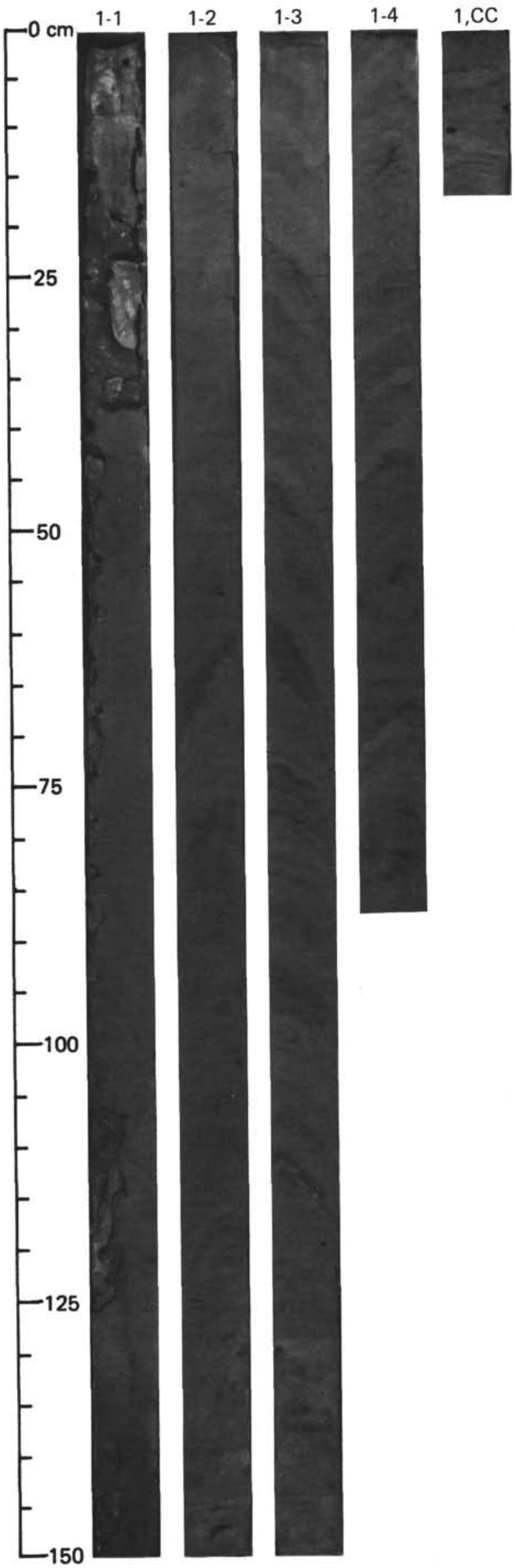
17-2
14,CC
16,CC


0 cm
25
50
75
100
125
150
17-3
18-1
18-2
18-3
18-4
19-1
19-2
20-1
20-2
21-1
21-2
22-1


22-2
23-1
23-2
23-3
24-1
25-1
26-1
26,CC
0 cm
25
50
75
100
125
150
24,CC
25,CC


1-1
1-2
1-3
1-4
1,CC
0 cm
25
50
75
100
125
150