5. SITE 574[1]

Shipboard Scientific Party[2]

HOLES 574, 574A, 574B, 574C

Dates occupied: 574—11 to 13 April 1982
574A—13 to 14 April 1982
574B—15 to 16 April 1982
574C—17 to 19 April 1982

Date departed Hole 574C: 19 April 1982

Time on site: 8.9 days

Position: 04°12.52′N, 133°19.81′W

Water depth (sea level; corrected m, echo-sounding): 4561

Water depth (rig floor; corrected m, echo-sounding): 4571

Bottom felt (m, drill pipe): 4571

Penetration (Hole 574C, m): 532.5

Number of cores: 574—31
574A—23
574B—1
574C—37

Total length of cored section (m): 574—206.5
574A—180.2
574B—19.0
574C—338.0

Total core recovered (m): 574—208.93
574A—180.74
574B—9.45
574C—197.35

Core recovery (%): 574—101
574A—100
574B—50
574C—58

Oldest sediment cored:
Depth sub-bottom (m): 517.5
Nature: Metalliferous, siliceous chalk
Age: latest Eocene
Measured velocity (km/s): 1.8

Basement:
Depth sub-bottom (m): 520
Nature: Basalt

Principal results: Site 574 is located at 4°12.52′N, 133°19.81′W, in 4561 m of water, over an elongate basement trough covered by 0.57 s of flat, acoustically well stratified sediments. The site is just north of the crest of the sediment bulge in the equatorial high-productivity belt, and it is the second of a three-site latitudinal transect along 133°W. The site was drilled to provide detailed documentation of the area's migration across the equator and of Tertiary equatorial Pacific paleoceanography. To this end two holes were drilled with the hydraulic piston corer (HPC) to approximately the same depth (574, 0 to 206.5 m; 574A, 0 to 180.2 m), and two holes were rotary drilled (574B, 185 to 194.5 m; 574C, 194.5 to 525.5 m, i.e., to basement).

The oldest sediments in the sequence recovered are uppermost Eocene (520 m sub-bottom). Except for minor hiatuses, the sequence is continuous from this age through the Quaternary. The bottom cores contain about 60 cm of basalt, placing basement at 520 m sub-bottom. The sedimentary sequence is divided into a basal metalliferous calcareous unit (502.5 to 520.0 m), a calcareous ooze chalk unit in the middle (84.1 to 502.5 m), and a cyclic siliceous calcareous ooze unit at the top (0 to 84.1 m).

All major planktonic microfossils are represented, although the dissolution of the planktonic foraminifers limits their stratigraphic usefulness. Initial data from the foraminifers, diatoms, calcareous nannofossils, and radiolarians indicate that a remarkably complete uppermost Eocene to lowest Oligocene transition was collected near the bottom of Hole 574C (within the metalliferous calcareous sedimentary unit above basement).

The sediment accumulation rate is variable, ranging between 5 and 35 m/m.y.; it is low between 0 and 12 Ma, high between 12 and 23 Ma, and low again between 23 and 34 Ma. The mass accumulation rates are highest (about 3 g/cm^2 per 1000 yr.) in the lower Oligocene and at about 12.5 Ma, with a low of 0.28 g/cm^2 per 1000 yr. occurring between 0 and 5 Ma.

The records of calcium carbonate content and the sediment's physical properties show major fluctuations in the last 12 m.y. They are more uniform in the older part of the section. Natural remanent magnetization (NRM) intensity is broadly correlative to lithology; magnetization is strongest in the upper cyclic siliceous-calcareous unit and the basal metalliferous unit and extremely weak throughout most of the middle, calcareous unit. The analysis of inorganic geochemistry suggests the presence of a diffusional control in the section's upper 150 m and of diagenetic reactions in its lower portion.

BACKGROUND AND OBJECTIVES

The JOIDES Ocean Paleoenvironmental Panel considered Site 574 to have the second highest priority of the sites to be drilled in a latitudinal transect along 133°W across the equatorial high-productivity belt. Presently located 4° north of the equator (Fig. 1), and with a basement age of latest Eocene, the sedimentary section at Site 574 presumably recorded the site's migration from south of the equator into the high-productivity belt, and from there to its present position at the northern boundary of the belt. The operational objective was the same as at all Leg 85 sites: to recover a complete and undisturbed upper Eocene to Quaternary section by using the HPC to core the sediment section twice to the limit of penetration and to rotary drill from that level to basement.

Considerable survey data exist for the region as a result of cruises by Lamont-Doherty Geological Observa-

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[1] Mayer, L., Theyer, F., et al., *Init. Repts. DSDP*, 85: Washington (U.S. Govt. Printing Office).

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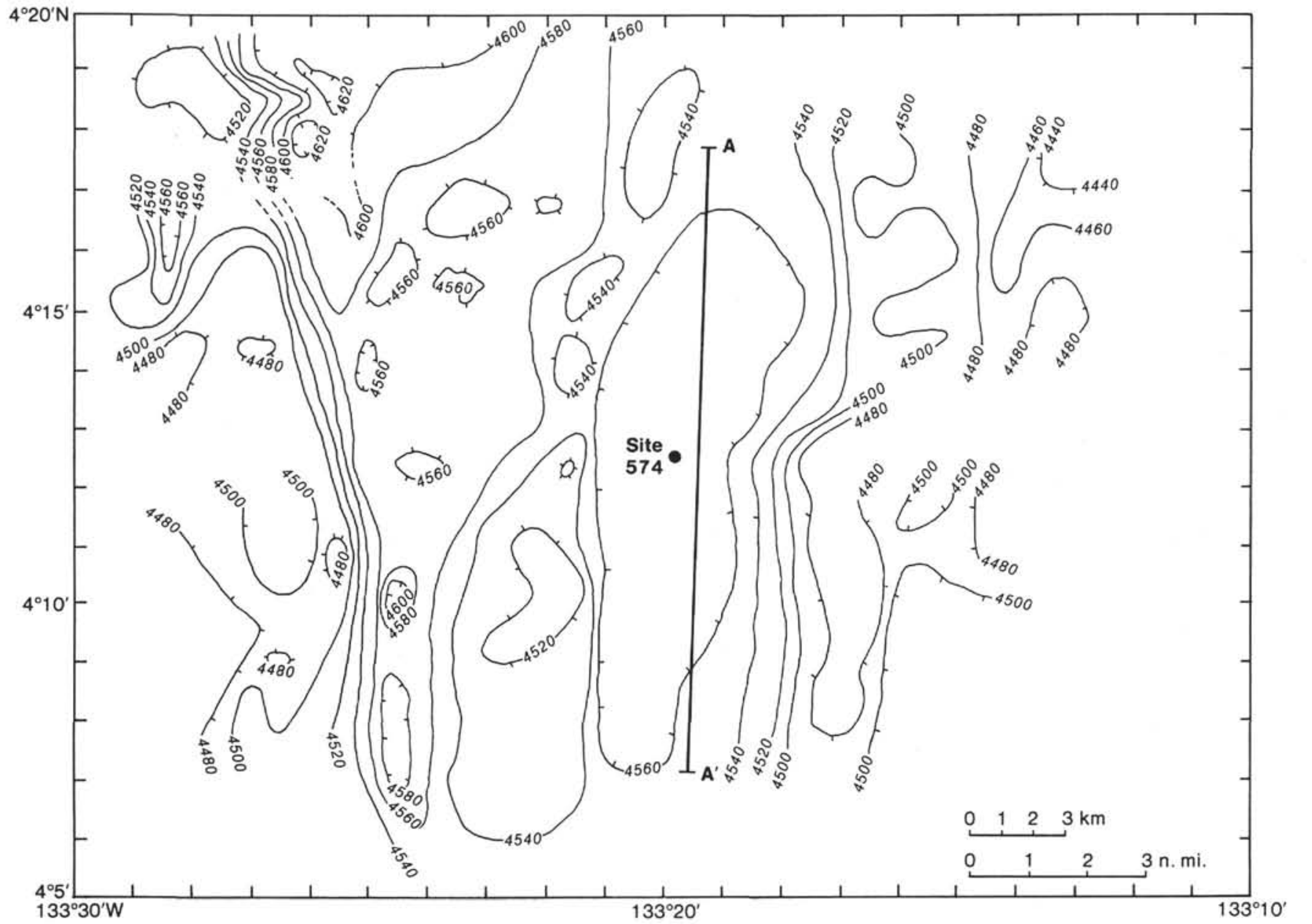

Figure 1. Bathymetry at Site 574 (20-m contour interval). Uncorrected water depth (velocity = 1.5 km/s) is 4553 m. Corrected water depth is 4561 m. Profile A-A′ is the seismic profile shown in Figure 2.

tory's R/V *Conrad* (*Conrad* 15-1, 1971; *Conrad* 20-11, 1977), the Scripps Institution of Oceanography RISE 3 cruise of January 1962, and a recent JOI site survey conducted by the Scripps R/V *Thomas Washington*. The site survey resulted in the acquisition of Seabeam bathymetry (Fig. 1) and single-channel, digitally recorded, water and air gun seismic profiles. In addition, *Challenger* collected air gun seismic profiles en route from Site 573 to 574. Site 574 is in a relatively wide, flat basin with a water depth of about 4560 m. The sediments are flat, acoustically well stratified, and about 0.57 s thick, and they overlie an equally flat depression in the basement (Fig. 2). This basin and its surrounding highs are part of a general pattern of troughs and highs trending virtually north-south.

The closest site previously drilled by DSDP is Site 71 (DSDP Leg 8) which, at 4°28.3′N and 140°19′W, is slightly north and considerably farther west than Site 574. At Site 71 uppermost Eocene to Quaternary sediments were recovered during continuous coring operations. The acoustic basement at Site 71 proved to be semi-indurated chalk and chert; the extrapolated lithospheric age of the region was 39 to 40 Ma.

OPERATIONS

The D/V *Glomar Challenger* arrived in the vicinity of Site 574 1 day after departing Site 573. We steamed on a course of 017° and averaged 9 knots in our 23-hr. transit. During this time we collected continuous seismic profiles (air gun and 3.5 kHz) as well as bathymetric and magnetic data. The valleys and ridges in the region trend north-northwest/south-southeast, so we aimed for a point about 3 n. mi. east of the proposed site so we would approach the site across the grain of the bathymetry. Our target was a broad (2 n. mi. wide) flat region in about 4550 m of water where approximately 0.6 s of sediment fills an elongate basement trough (Figs. 1 and 2).

We entered the area surveyed by the R/V *Thomas Washington* at around 0720Z on 11 April. We had difficulty matching the Seabeam bathymetry with the bathymetric data we were collecting until, after about 40 min. of steaming, we found we could match the general bathymetric trends by rotating the Seabeam chart several degrees and shifting it several minutes. Even with this offset only the relative bathymetric relationships matched up, not the absolute depth values. The depths indicated

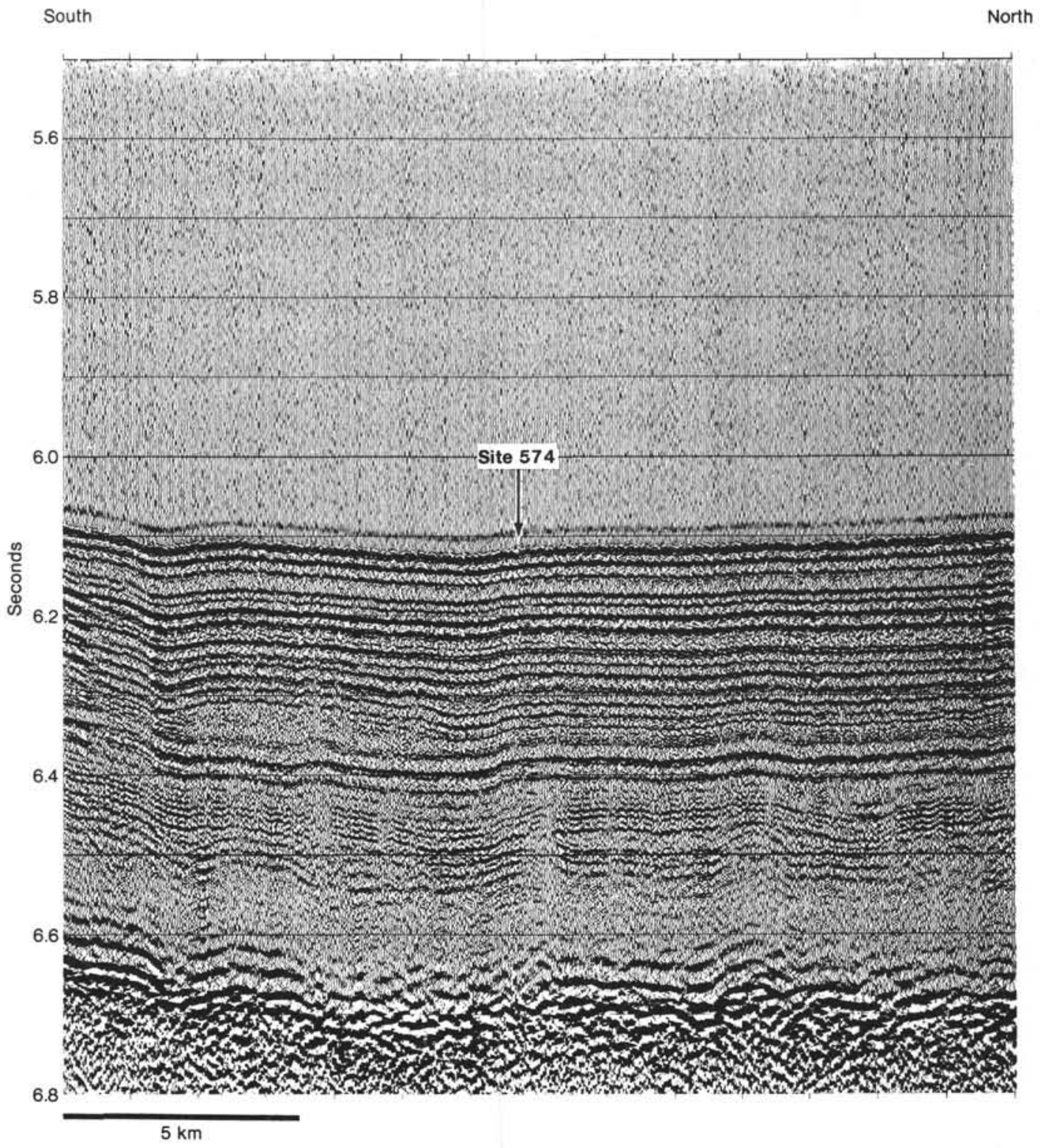

Figure 2. Seismic profile near Site 574 (from Shipley et al., this volume).

by the Seabeam bathymetry were consistently 10 to 30 m deeper than those we were measuring.

At 0755Z we began to travel along our westerly line, steaming 272° and aiming for our target position of 04° 12.5′N, 133°19.9′W. We quickly located ourselves relative to the bathymetry and the subsurface structure, and at 0810Z we crossed the proposed drill site. We continued several nautical miles past the site, turned to a point 1 n. mi. due north of it, and at 0852Z turned south on our final pass over the proposed site. At 0905Z, 11 April, we dropped the beacon and then continued 1 n. mi. south beyond the site to complete the presite survey. We pulled the geophysical gear and returned to the beacon, now officially Site 574.

Drill pipe run-in began at 1010Z on 11 April (Table 1). The first hydraulic piston core, which was on deck at 2115Z, established the mudline at 4571 m from the rig floor. The drilling in Hole 574 continued smoothly with the 9.5-m variable-length HPC. The pullout forces necessary for Cores 8 and 9 were 15,000 and 20,000 lb., respectively, but the pullout force for the next three cores was negligible. The pullout force for Core 13 was substantial again, however (more than 30,000 lb.), and the core had to be "washed over" to free it up. At this point we decided to switch to the 5-m HPC. Coring once again proceeded smoothly until Core 29, which required 10,000 lb. of pullout force. Cores 30 and 31 offered little resistance to pullout, but Core 32 stayed in the hole even after the exertion of 75,000 lb. of pullout force. This core, at 206.5 m sub-bottom, marked the end of the drilling in Hole 574. Recovery for the hole was close to 100%, and disturbance was minimal. The biggest problem from an operational standpoint was that many of the core liners shattered, a problem that seemed to occur during the coring of relatively hard intervals.

We began to drill Hole 574A with the 9.5-m variable-length HPC. Coring continued smoothly all the way to the bottom of the hole (at 180.2 m sub-bottom). We

Table 1. Coring summary, Site 574.

Core	Date (Apr. 1982)	Local time (hr.)	Depth from drill floor (m)	Depth below seafloor (m)	Length cored (m)	Length recovered (m)	Recovery (%)
Hole 574							
1	11	1315	4571.0–4575.5	0.0–4.5	4.5	4.55	100+
2	11	1415	4575.5–4585.0	4.5–14.0	9.5	9.64	100+
3	11	1540	4585.0–4594.5	14.0–23.5	9.5	9.56	100+
4	11	1653	4594.5–4604.0	23.5–33.0	9.5	9.69	100+
5	11	1805	4604.0–4613.5	33.0–42.5	9.5	9.62	100+
6	11	1925	4613.5–4623.0	42.5–52.0	9.5	9.57	100+
7	11	2095	4623.0–4632.0	52.0–61.0	9.0	8.99	99.8
8	11	2210	4632.0–4641.5	61.0–70.5	9.5	9.58	100+
9	11	2335	4641.5–4651.0	70.5–80.0	9.5	9.53	100+
10	12	0100	4651.0–4660.5	80.0–89.5	9.5	9.33	98+
11	12	0202	4660.5–4669.6	89.5–98.6	9.1	9.12	100+
12	12	0311	4669.6–4679.1	98.6–108.1	9.5	9.60	100+
13	12	0425	4679.1–4688.6	108.1–117.6	9.5	9.62	100+
14	12	0556	4688.6–4693.6	117.6–122.6	5.0	4.99	99.8
15	12	0712	4693.6–4698.6	122.6–127.6	5.0	5.62	100+
16	12	0815	4698.6–4703.6	127.6–132.6	5.0	5.03	100+
17	12	0935	4703.6–4708.6	132.6–137.6	5.0	5.00	100+
18	12	1044	4708.6–4713.6	137.6–142.6	5.0	4.66	93
19	12	1155	4713.6–4718.6	142.6–147.6	5.0	5.03	100+
20	12	1315	4718.6–4723.5	147.6–152.5	4.9	4.90	100
21	12	1435	4723.5–4728.5	152.5–157.5	5.0	5.05	100
22	12	1600	4728.5–4733.5	157.5–162.5	5.0	5.09	100+
23	12	1720	4733.5–4738.5	162.5–167.5	5.0	5.05	100+
24	12	1845	4738.5–4743.5	167.5–172.5	5.0	5.11	100+
25	12	2010	4743.5–4748.5	172.5–177.5	5.0	5.59	100+
26	12	2140	4748.5-4753.2	177.5–182.2	4.7	4.77	100+
27	12	2250	4753.2–4758.2	182.2–187.2	5.0	5.0	100
28	12	2350	4758.2–4763.2	187.2–192.2	5.0	5.16	100+
29	13	0100	4763.2–4767.2	192.2–197.2	5.0	5.06	100+
30	13	0230	4767.2–4772.2	197.2–202.2	5.0	5.05	100+
31	13	0345	4772.2–4776.5	202.2–206.5	4.3	4.38	100+
					206.50	208.93	101
Hole 574A							
1	13	0750	4577.2–4577.5	6.0–6.3	0.3	0.33	100
2	13	0900	4577.5–4586.7	6.3–15.5	9.2	9.22	100
3	13	1008	4586.7–4595.1	15.5–23.9	8.4	8.48	100
4	13	1116	4595.1–4604.3	23.9–33.1	9.2	9.29	100
5	13	1230	4604.3–4613.6	33.1–42.4	9.3	9.32	100
6	13	1338	4613.6–4623.1	42.4–51.9	9.5	9.58	100
7	13	1450	4623.1–4632.6	51.9–61.4	9.5	9.42	99
8	13	1550	4632.6–4641.6	61.4–70.4	9.0	9.08	100
9	13	1655	4641.6–4651.1	70.4–79.9	9.5	9.54	100
10	13	1804	4651.0–4660.4	79.9–89.2	9.3	9.31	100
11	13	1920	4660.4–4669.8	89.2–98.7	9.5	9.70	100
12	13	2025	4669.8–4679.4	98.7–108.2	9.5	9.54	100
13	13	2225	4679.4–4684.3	108.2–113.1	4.9	4.92	100
14	13	2335	4684.3–4689.3	113.1–118.1	5.0	5.02	100
15	14	0054	4689.3–4694.0	118.1–122.8	4.7	4.73	100
16	14	0144	4694.0–4699.0	122.8–127.8	5.0	4.30	86
17	14	0253	4699.0–4703.1	127.8–131.9	4.1	4.16	83
18	14	0410	4703.1–4712.6	131.9–141.4	9.5	9.59	100
19	14	0525	4712.6–4722.1	141.4–150.9	9.5	9.56	100
20	14	0635	4722.1–4731.1	150.9–159.9	9.0	9.09	100
21	14	0740	4731.1–4739.6	159.9–168.4	8.5	8.55	100
22	14	0850	4739.6–4749.1	168.4–177.9	9.5	9.71	100
23	14	0954	4749.1–4757.4	177.9–186.2	8.3	8.39	100
					180.2	180.74	100
Hole 574B							
1	15	1330	4756.0–4765.5	185.0–194.5	9.5	9.45	99
Hole 574C							
1	16	2051	4765.5–4775.0	194.5–204.0	9.5	7.75	82
2	16	2235	4775.0–4784.5	204.0–213.5	9.5	9.38	99
3	17	0005	4784.5–4794.0	213.5–223.0	9.5	5.33	56
4	17	0142	4794.0–4803.5	223.0–232.5	9.5	3.73	39
5	17	0310	4803.5–4813.0	232.5–242.0	9.5	6.34	67
6	17	0440	4813.0–4822.5	242.0–251.5	9.5	6.40	67
7	17	0650	4822.5–4832.0	251.5–261.0	9.5	9.63	100
8	17	0735	4832.0–4841.5	261.0–270.5	9.5	4.87	51
9	17	0949	4841.5–4851.0	270.5–280.0	9.5	4.05	43
10	17	1120	4851.0–4860.5	280.0–289.5	9.5	9.57	100
11	17	1300	4860.5–4870.0	289.5–299.0	9.5	4.50	47
12	17	1440	4870.0–4879.5	299.0–308.5	9.5	9.43	99
13	17	1615	4879.5–4889.0	308.5–318.0	9.5	6.50	68
14	17	1807	4889.0–4898.5	318.0–327.5	9.5	3.39	36
15	17	1945	4898.5–4908.0	327.5–337.0	9.5	9.37	99
16	17	2130	4908.0–4917.5	337.0–346.5	9.5	4.9	52
17	17	2310	4917.5–4927.0	346.5–356.0	9.5	7.54	78
18	18	0057	4927.0–4936.5	356.0–365.5	9.5	2.56	27
19	18	0230	4936.5–4946.0	365.5–375.0	9.5	2.74	29
20	18	0410	4946.0–4955.5	375.0–384.5	9.5	9.30	98
21	18	0549	4955.5–4965.0	384.5–394.0	9.4	6.23	66
22	18	0730	4965.0–4974.5	394.0–403.5	9.5	4.90	52
23	18	0908	4974.5–4984.0	403.5–413.0	9.5	8.88	93
24	18	1050	4984.0–4993.5	413.0–422.5	9.5	6.56	69
Hole 574C (Cont.)							
25	18	1245	4993.5-5003.0	422.5–432.0	9.5	2.09	22
26	18	1420	5003.0–5012.5	432.0–441.5	9.5	3.97	42
27	18	1617	5012.5–5022.0	441.5–451.0	9.5	5.46	57
28	18	1750	5022.0–5031.5	451.0–460.5	9.5	0.64	0.07
29	18	1940	5031.5–5041.0	460.5–470.0	9.5	4.83	50
30	18	2135	5041.0–5050.5	470.0–479.5	9.5	4.94	52
31	18	2315	5050.5–5060.0	479.5–489.0	9.5	3.75	39
32	19	0051	5060.0–5069.5	489.0–498.5	9.5	4.27	45
33	19	0230	5069.5–5079.0	498.5–508.0	9.5	7.57	80
34	19	0405	5079.0–5088.5	508.0–517.5	9.5	2.74	29
35	19	0554	5088.5–5091.0	517.5–520.0	2.5	2.82	100
36	19	0750	5091.0–5096.5	520.0–525.5	5.5	0.30	0.05
37	19	1010	5096.5–5103.5	525.5–532.5	7.0	0.30	0.04
					338.00	197.53	58

Table 1. (Continued).

switched to the 5-m HPC for the depth interval in which substantial pullout force had been necessary in Hole 574 (100 to 121 m sub-bottom). We were then able to go back to the 9.5-m corer and continue to 180.2 m sub-bottom without difficulty. Our dwindling supply of coring assemblies prompted us to stop coring well short of the greatest depth reached in Hole 574 (which was 206.5 m). Recovery was once again near 100%, and disturbance was minimal. Occasional shattered liners continued to be the most severe problem.

We were to use the HPC to core to maximum penetration depth twice and then to drill to basement at each site, so we ended Hole 574A and began the pipe trip to switch to rotary drilling. The total time for the (two-way) pipe trip was 26 hr.; the interval was unusually long because of the need to retighten all joint connections in the new pipe. We washed to 185 m, and the first drilled core came on deck at 2130Z on 15 April. Unfortunately, the next wire run returned with the overshot and the top end of the coring assembly but no core barrel. There was no damage to the top assembly, but the core assembly appeared to have backed out of the threaded connection. The first fishing attempt brought the corer within 300 m of the rig floor, but the corer broke loose and went back down the pipe. Subsequent fishing attempts were foiled by liner in the top of the corer. Finally the liner jammed the corer in the pipe, and we were forced to abandon the hole (574B) and trip the pipe to recover the corer.

We completed the second round-trip pipe trip at this site, and the first core from Hole 574C (from 194.5 m sub-bottom) was brought on board at 0451Z, 17 April. The rotary coring continued smoothly; disturbance was serious in the softer sediment in the upper part of the section, and recovery was poor (58%). We used different drilling techniques to try to improve recovery, but nothing seemed to help. The source of the problem appeared to be the alternation between soft and hard sediment. The pumping pressure necessary to keep the hard material from plugging the bit washed away the soft material. The drilling in Hole 574C ended when 1 hr. of drilling at 525.5 m sub-bottom resulted in the recovery of 120 cm of basalt. The drill pipe was tripped, and the bottom-hole assembly was magnafluxed. At 0730Z, 20

April, we departed Site 574, running a brief seismic survey over the beacon.

LITHOSTRATIGRAPHY

Lithostratigraphic Subdivision

We divided the section at Site 574 into four lithologic units on the basis of composition: cyclic siliceous calcareous ooze, calcareous ooze chalk, metalliferous chalk, and basalt. The upper two units are subdivided on the basis of color (Table 2).

Unit I: Cyclic Siliceous Calcareous Ooze (middle Miocene to Quaternary)

Unit I (0 to 84.1 m) is characterized by cyclic changes in the relative abundance of siliceous and calcareous ooze. Biogenic silica constitutes 15 to 60% of the sediment; the remainder is predominantly calcareous material. The unit is subdivided into three subunits that are distinguished primarily by color: upper and lower brown ooze subunits are separated by an intervening green gray ooze subunit.

Subunit IA: Upper Brown Ooze (upper Miocene to Quaternary)

The upper brown ooze subunit (0 to 48.1 m) is composed of 5- to 100-cm intervals of alternating pale to very pale brown (10YR 7/2 to 7/4 to 10YR 8/2 to 8/4), brownish gray (10YR 6/2 to 6/4), and brown (10YR 5/3 to 5/4) to dark brown (10YR 3/2 and 4/3 to 4/4) siliceous nannofossil ooze to calcareous siliceous ooze. Sediment color does not appear to be related to variations in microfossil content. The subunit is usually highly burrow mottled (it includes recognizable Planolites burrows), and the contacts are sharp to gradational over 1 to 10 cm.

The sediments of this subunit are of variable grain size and microfossil content. Both clay- and silt-sized materials are rare to abundant (2 to 88% and 4 to 55%, respectively), and sand-sized material is common to abundant (8 to 75%). Calcareous nannofossils are rare to abundant (1 to 88%), foraminifers are rare to common (1 to 25%), diatoms are common to abundant (5 to 35%), and radiolarians are rare to abundant (1 to 64%). Other constituents that occur in trace to rare (1%) amounts are sponge spicules, silicoflagellates, clay, volcanic glass, and iron oxides.

Table 2. Lithostratigraphy, Site 574.

Lithologic unit	Sub-bottom depth (m)	Unit depth (Hole-Core-Section, level in cm)
I (cyclic siliceous calcareous ooze)		
A (upper brown ooze)	0–48.1	574-1-1,1 to 574-6-4,106 574A-1-1,1 to 574A-6-2,96
B (green gray ooze)	48.1–75.8	574-6-4,106 to 574-9-4,80 574A-6-2,96 to 574A-9-5,20
C (lower brown ooze)	75.8–84.1	574-9-4,80 to 574-10-3,108 574-A-9-5,20 to 574A-10-4,5
II (calcareous ooze chalk)		
A (green white ooze chalk)	84.1–470.2	574-10-3,108 to 574-31,CC 574A-10-4,5 to 574A-23,CC 574B-1-1,1 to 574B-1,CC 574C-1-1,1 to 574C-30-1,24
B (yellow white chalk)	470.2–502.5	574C-30-1,24 to 574C-33-3,100
III (metalliferous chalk)	502.5–520.0 m	574C-33-3,100 to 574C-35,CC
IV (basalt)	520.0–532.5 m	574C-36-1,1 to 574C-37-1,1

Subunit IB: Green Gray Ooze (upper Miocene)

The green gray ooze subunit (48.1 to 75.8 m) separates the upper and lower cyclic brown ooze subunits. Both the upper and lower contacts are sharply defined by a change in sediment color from brown to green. The subunit is composed of intergrading intervals 10 to 100 cm thick of white (N9) and green white (5G 8/1 to 9/1) to very pale green (5G 7/1 to 8/1) siliceous nannofossil ooze and pale green gray (5G 6/2 to 8/2) nannofossil siliceous ooze. Mottling is common but often subtle as the result of the poor contrast in sediment color. Planolites burrows are abundant.

The sediment varies in composition, although it is more uniform than in the adjacent subunits. Clay- and silt-sized materials are common to abundant (10 to 85% and 9 to 60%, respectively), and sand is common (10 to 30%). Calcareous nannofossils are common to abundant (5 to 70%), as are diatoms (8 to 40%) and radiolarians (6 to 50%); foraminifers are rare (0 to 5%). Trace amounts of sponge spicules, silicoflagellates, volcanic glass, and pyrite occur sporadically.

Subunit IC: Lower Brown Ooze (upper Miocene)

The lower brown ooze subunit (75.8 to 84.1 m) is similar in color and composition to Subunit IA. The base of the lower brown ooze is defined by the sharp change in sediment color from brown to the pastel greens, grays, and purples of the underlying calcareous ooze chalk unit. Planolites burrows are common.

The sediments of the subunit are composed of common to abundant clay- (5 to 85%) and silt-sized (5 to 60%) materials and common sand-sized material (5 to 35%). Calcareous nannofossils occur in trace to abundant amounts (up to 80%), diatoms are rare to abundant (3 to 47%), and radiolarians are common to abundant (5 to 50%); foraminifers are virtually absent. Sponge spicules and silicoflagellates consistently occur in amounts up to 1%; volcanic glass, pyrite, and iron oxides occur only sporadically in trace amounts (rarely in greater amounts).

Unit II: Calcareous Ooze Chalk (lower Oligocene to middle Miocene)

Unit II (84.1 to 502.5 m) is composed of calcareous ooze chalk. Siliceous microfossils are usually a common component (5 to 25%). Two subunits are defined on the basis of color: a green white ooze chalk (84.1 to 470.2 m) and a yellow white ooze chalk (470.2 to 502.5 m). The contact between the two subunits is a sharp color change.

Subunit IIA: Green White Ooze Chalk (upper Oligocene to middle Miocene)

The green white ooze chalk subunit (84.1 to 470.2 m) is composed of white (N9) and pale gray (N7 to 8) to green white (5G 5/1 to 9/1) nannofossil to siliceous nannofossil ooze chalk and very pale green gray (5G 7/1) nannofossil ooze chalk. Purple white (5P 8/1 to 9/1), very pale purple (5P 7/1 to 7/2 and 5P 8/2 to 8/4), and purple gray (5P 4/2 to 6/2) sediments are common above 128 m. The darker purples generally occur as small-scale laminations and bands. The purple sediments occur occasionally between 128 and 315 m, and they are absent below.

The sediments of the green white ooze chalk subunit are much less variable than those of the overlying cyclic siliceous calcareous ooze unit. Sand-sized grains are generally rare to common (2 to 15%), silt-sized material is rare to abundant (1 to 60%), and clay-sized material is usually abundant (35 to 95%). Calcareous nannofossils are abundant (65 to 95%), whereas foraminifers are absent to common (0 to 10%, rarely 15%). Diatoms (0 to 15%, rarely to 30%) and radiolarians (1 to 20%, rarely to 40%) are rare to common. Siliceous microfossils rarely constitute more than 20% of the sediment, but they increase in abundance in the basal 20 m of the subunit. Sponge spicules, silicoflagellates, volcanic glass, pyrite, and iron oxides occur in trace amounts.

The transition from calcareous ooze to chalk occurs from 185 to 480 m, primarily within the green white ooze chalk subunit. The transition progresses from the alternation at about 185 m of very stiff ooze (which occurs in regularly occurring intervals 2 to 5 cm thick) and soft ooze (which occurs in intervals 5 to 130 cm thick) to the alternation at about 400 m of chalk (which occurs in intervals 3 to 20 cm thick) and firm ooze (which occurs in intervals 7 to 25 cm thick). Oozes are absent below 480 m, and there is some question as to whether the "ooze" in the lowest 70 m of the transition is actually the result of drilling disturbance.

Subunit IIB: Yellow White Chalk (lower to upper Oligocene)

The yellow white chalk subunit (470.2 to 502.5 m) is composed of uniform yellow white (10YR 8/2 to 9/2) siliceous nannofossil to nannofossil chalk. The siliceous microfossil content is higher than in the overlying green white ooze chalk. The base of Subunit IIB is defined by the first appearance of faintly banded pale brown chalk.

This subunit is composed of common sand- (10 to 15%) and silt-sized grains (5 to 35%) and abundant clay-sized material (60 to 85%). Calcareous nannofossils are abundant (82 to 85%), foraminifers are found in trace to common amounts (10%), diatoms are rare to common (3 to 10%), and radiolarians are found in trace to rare amounts (3%). The subunit appears to be composed entirely of biogenic material.

Unit III: Metalliferous Chalk (upper Eocene to lower Oligocene)

The metalliferous chalk unit (502.5 to 520.0 m) extends from the base of the calcareous ooze chalk unit to basement. The unit is composed of banded and/or highly mottled very pale yellow brown (10YR 8/2 to 8/3, 7/3), light yellowish brown (10YR 6/4 to 7/4), and yellow brown (10YR 5/4) metalliferous siliceous nannofossil chalks. Planolites, Chondrites, Zoophycos, and white halo (rind) burrows are abundant throughout the unit, forming a burrow community as described by Ekdale (1980).

The sediments of this unit are composed of abundant clay material (60 to 80%), common silt material (15 to 30%), and common sand-sized grains (5 to 10%, rarely absent). Calcareous nannofossils are abundant (67 to 98%), foraminifers are absent to rare (0 to 3%), diatoms are absent to common (0 to 15%), and radiolarians are found in trace to common abundances (< 1 to 15%). Of the nonbiogenic components, iron-manganese oxides are generally common (10%, rarely 2%) and pyrite is rare (3 to 5%, rarely trace amounts). Volcanic glass is ubiquitous in trace amounts, although it is more abundant on a macroscopic scale at the base of the unit.

Unit IV: Basalt

We recovered 120 cm (18 pieces) of basalt from Site 574 as we drilled from 520.0 to 532.5 m sub-bottom.

Carbonate Stratigraphy

The Site 574 samples analyzed for physical properties, which were taken at 1.5-m intervals, were also analyzed on board ship for carbonate content by the carbonate bomb method.

The carbonate record (Fig. 3) is similar to that for Site 573: both sites have a late Miocene to Quaternary interval with cyclic high-amplitude carbonate fluctuations and an Eocene to middle Miocene interval with relatively constant carbonate percentages with low-amplitude fluctuations. At Site 574 the interval with cyclic fluctuations extends from the sediment/water interface to 85 m sub-bottom, and the carbonate values range between 10 and 90%. The distinction between the high-carbonate and low-carbonate intervals is clear. Below the interval with cyclic fluctuations, the average carbonate percentage is a relatively constant 90%, with oscillations between 82 and 96%. An abrupt dissolution event occurs at 232 m, but it does not appear to coincide with any major change in lithology.

The change from the older, constant carbonate values to the younger high-amplitude carbonate cycles coincides with the change in lithology at 83.8 m from the calcareous ooze chalk (Unit II) to cyclic siliceous calcareous ooze (Unit I). The change from Unit III to Unit II is visible in the carbonate curve as a pronounced shift from carbonate values near 68% to values above 80%. There are also a number of distinct changes in the sedimentation rate curve for Site 574, and those at 33, 52, 62, and 98 m coincide with carbonate peaks in the high-amplitude cyclic interval. The carbonate data shown in Figure 3 also resemble the Neogene carbonate event stratigraphy of the equatorial Pacific (Dunn, 1981; Dunn and Moore, 1981).

BIOSTRATIGRAPHY

Sediments ranging in age from late Eocene to Quaternary were recovered at Site 574. Figure 4 summarizes the biostratigraphic zonation. An updated version of the biostratigraphic summary is presented in Barron et al. (this volume). The zonal sequence is complete except for the

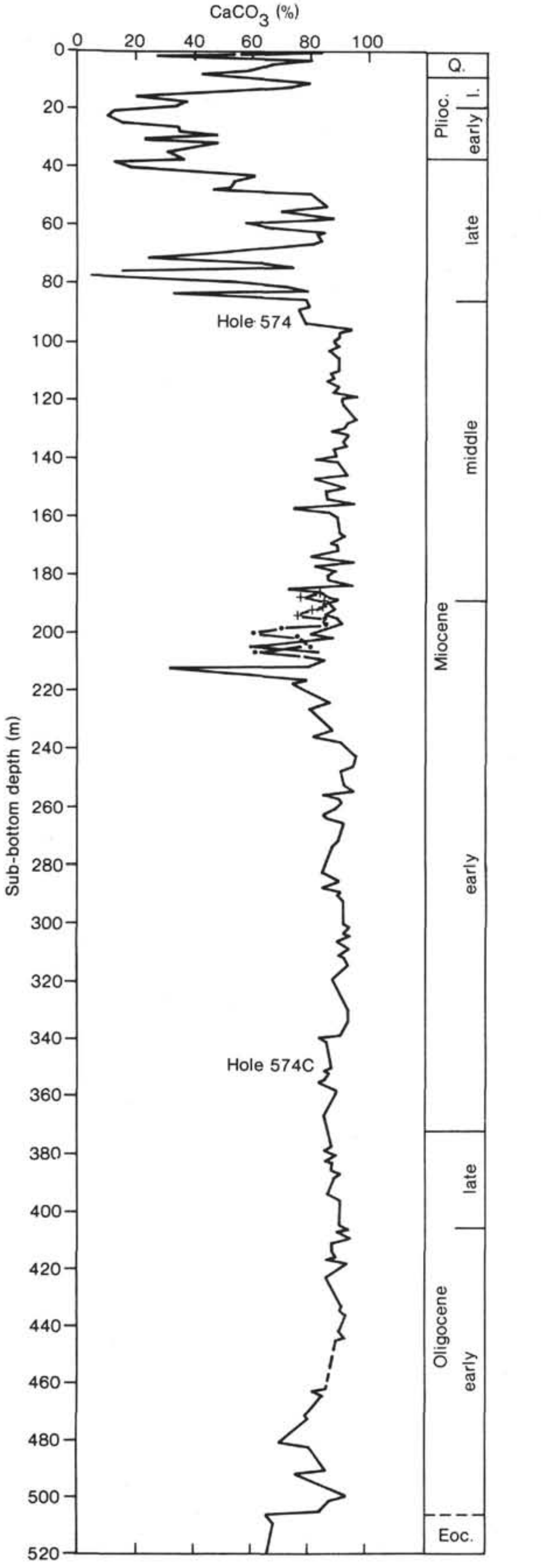

Figure 3. Shipboard carbonate data for Site 574. For interval from 185.0 to 206.5 m, solid line is for Hole 574, pluses mark line for Hole 574B, and dots mark line for Hole 574C.

apparent absence or compression of the lowermost Quaternary and uppermost Pliocene (between Sections 574-1,CC and 574-2,CC).

Siliceous microfossils range from common to abundant throughout most of the section, and preservation is good. There is a decline in diatom abundance and preservation in the upper Oligocene; the upper part of the lower Oligocene; and near the Eocene/Oligocene boundary (in Cores 574C-33 and -34). Core 574C-35 is barren of both diatoms and radiolarians.

The abundance of the calcareous microfossils fluctuates. The foraminifers provide good stratigraphic control only in the lower middle Miocene, the lower part of the lower Miocene, the upper Oligocene, and the 2.5-m interval immediately above the basalt. The nannofossils are usually common to abundant, but many samples contain a high proportion of reworked material.

The most remarkable sequence recovered at Site 574 is an apparently continuous sedimentary sequence across the Eocene/Oligocene boundary. However, the attempt to identify the precise level for the boundary brought to light an interesting problem. According to Hardenbol and Berggren (1978), the Eocene/Oligocene boundary lies at the top of the Priabonian and within the P17 foraminiferal zone at the extinction level of *Hantkenina primitiva* and *Globorotalia cerroazulensis*. The nannofossil zonation of Bukry (1971b) places the Eocene/Oligocene boundary between Zones CP15b and CP16a at the extinction of *Discoaster barbadiensis* and *D. saipanensis*. The radiolarian zonation of Riedel and Sanfilippo (1978) places the Eocene/Oligocene boundary at the evolutionary change from *Lithocyclia aristotelis* group to *L. angusta*, which is accompanied by the extinction of *Lophocyrtris*(?) *jacchia, Lynchnocanoma amphitrite*, and *Dictyoprora pirum* (*Theocampe pirum* in Riedel and Sanfilippo, 1978).[3] The Eocene/Oligocene boundary has not been well defined in the tropics for diatoms. For benthic foraminifers, Miller and Curry (1982), Miller et al. (1985), and Tjalsma and Lohmann (1982) have shown that the last occurrence of *Nuttallides truempyi* coincides with the Eocene/Oligocene boundary as defined by Atlantic Ocean planktonic foraminifers. Thus, these various criteria place the Eocene/Oligocene boundary at slightly different levels in Hole 574C, as noted below.

Eocene/Oligocene Boundary	Remarks
Planktonic foraminifers	
Between Section 574C-34,CC and Sample 574C-35-1, 126–128 cm (sub-bottom depths 510.74 and 518.77 m)	Extinction level of *Hantkenina primitiva* may be influenced by dissolution
Nannofossils	
Between Section 574C-33,CC and 574C-34-2, 93 cm (sub-bottom depths 506.03 and 508.94 m)	Identification of *Discoaster saipanensis* is hampered by overgrowths
Radiolarians	
Between Samples 574C-33-4, 49–51 cm and 574C-33-5, 57–59 cm (sub-bottom depths 503.5 and 505.08 m)	It is inherently difficult to find a boundary defined by the evolutionary transition between two forms that are rather rare (at this site, at least)

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[3] However, see Radiolarians (this chapter).

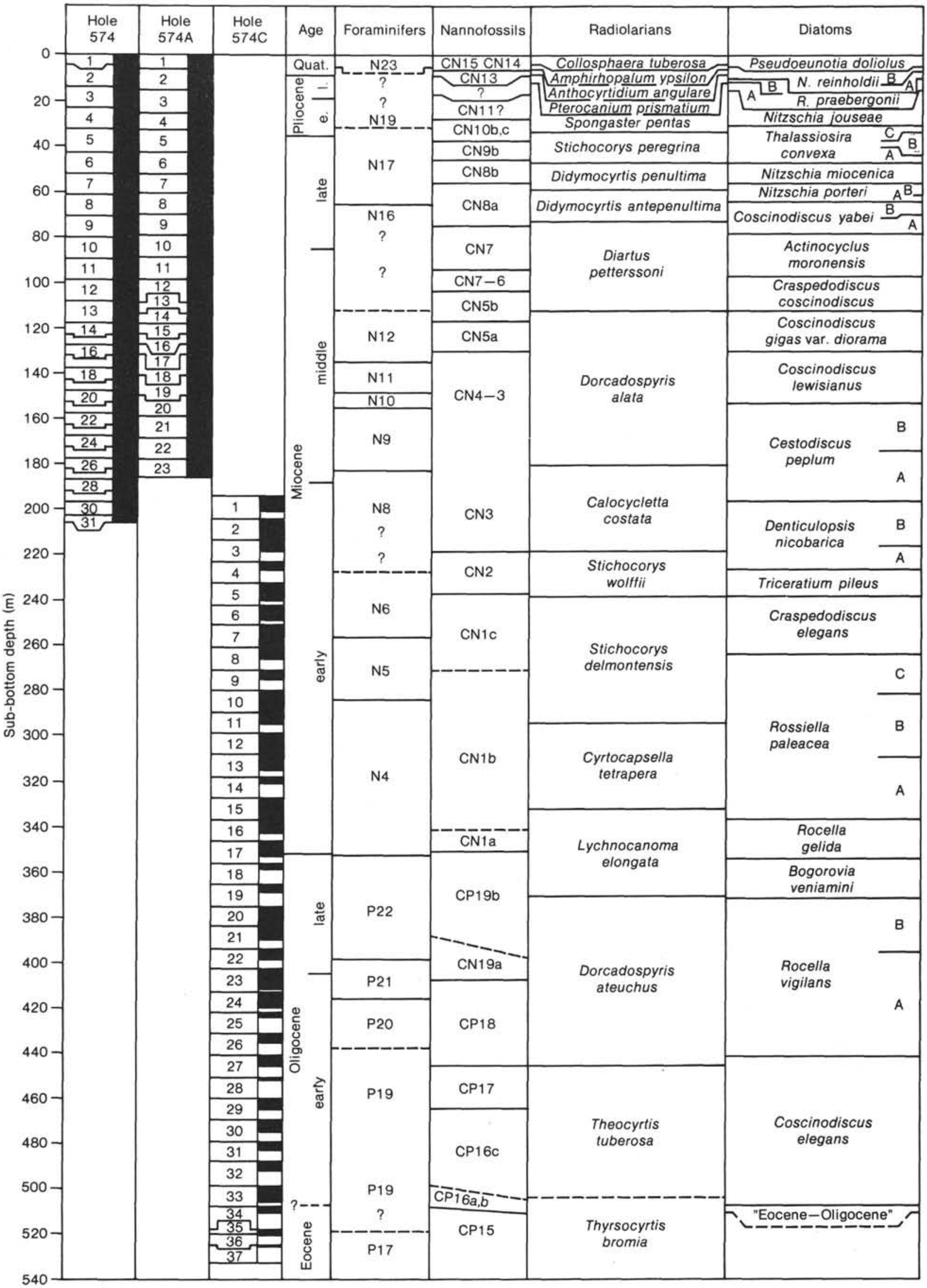

Figure 4. Summary of biostratigraphy at Site 574; position of dashed zonal boundaries is uncertain.

Eocene/Oligocene Boundary	Remarks
Benthic foraminifers	
Between Samples 574C-33-5, 90–92 cm and 574C-33-5, 141–143 cm (sub-bottom depths 505.41 and 505.92 m)	Boundary is placed at the last occurrence of *Nuttallides truempyi*
Diatoms	
Between Sections 574C-33,CC and 574-34,CC (sub-bottom depths 510.74 and 506.03 m)	Boundary is placed at the first appearance of *Coscinodiscus excavatus*

Planktonic Foraminifers

Upper Eocene through Pleistocene planktonic foraminifers are present in the recovered sequence. However, foraminiferal abundance fluctuates so markedly that these fossils provide good stratigraphic control in only three sections of the sequence (from 110 to 190 m, 230 to 440 m, and 517.5 m to the basement at 520 m sub-bottom). In the other intervals the assemblages are sparse, and zonal assignments can be made only by referring to other microfossil groups. The dissolution of planktonic foraminifers is shown in Figure 5.

At least three layers occur in the middle Miocene that contain exclusively reworked Oligocene planktonic foraminiferal faunas. One is approximately 9 m thick (from Sample 574A-17-3, 105–108 cm to Sample 574A-18-7, 27–29 cm); another is 6 m thick (from Sample 574A-21-2, 138–140 cm to Sample 574A-21,CC); and one is 4 m thick (from Sample 574A-22-3, 19–20 cm to Sample 574A-22-4, 141–144 cm). A similar layer is also present in the basal part of Core 574-22. The grain size of the sediments in these layers never exceeds 150 μm, and three species of Oligocene planktonic foraminifers (*Chiloguembelina cubensis, Cassigerinella chipolensis*, and *Globorotalia postcretacea*) make up almost 100% of the sand-sized sediment fraction (grains larger than 63 μm).

The sediment sequence recovered from the two HPC holes at this site yielded evidence of importance to two subjects in planktonic foraminiferal evolution. One is the well known, so-called *Globoratalia fohsi*-lineage. The evolution of *G. fohsi* was rapid in the tropical region during the middle Miocene; it progressed from the small nonkeeled *G. peripheroronda* through the medium-sized *G. praefohsi* to the robust and well keeled *G. fohsi robusta*. These species are zonal markers for Zones N9 through N12 and enable us to establish a precise global correlation. Another subject of stratigraphic significance is the position of the *Orbulina* datum. The first appearance of *Orbulina suturalis* after evolving from its immediate ancestor *Praeorbulina* occurs at the lower/middle Miocene boundary in the European type section and coincides with the foraminiferal zonal boundary between Zones N8 and N9 (Berggren and Van Couvering, 1974). In our section, this datum lies within Cores 574-27 and -26.

Moderately well preserved upper Eocene planktonic foraminiferal assemblages characterize both Sections 574C-35-1 and 574C-35-2. These assemblages, which are assigned to Zone P17, include rare specimens of *Hantkenina primitiva* and *Globorotalia cerroazulensis* but lack species belonging to the genera *Globigerinatheka* and

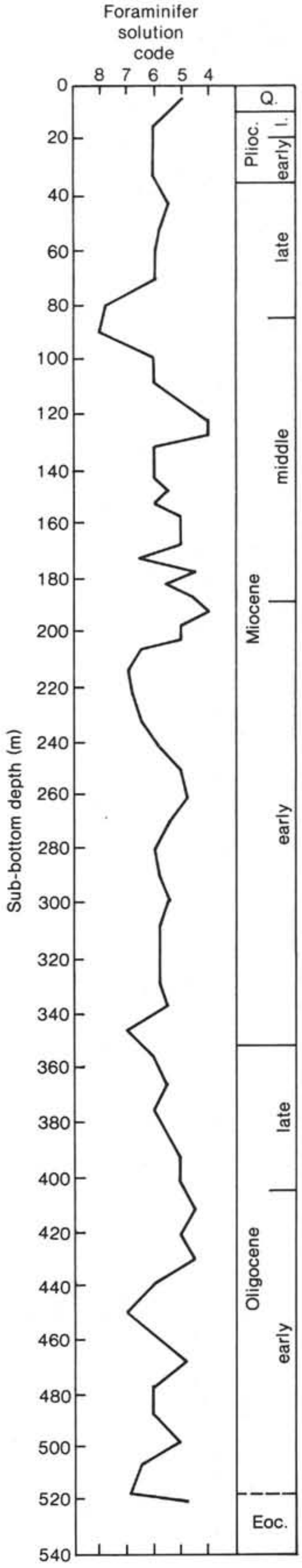

Figure 5. Foraminifer dissolution curve for Site 574; numbers after Berger and von Rad (1972).

Globigerapsis. At Site 573, the Eocene fauna assigned to Zone P16 contained many species belonging to the latter two genera. Because the sediments that contain the Eocene fauna at Site 574 are overlain by a siliceous nannofossil chalk that contains few foraminifers, the Eocene/Oligocene boundary was difficult to identify with foraminiferal evidence. The extinction level of both *H. primitiva* and *G. cerroazulensis* has been regarded as marking the boundary (Hardenbol and Berggren, 1978), and in Hole 574C this level lies between Section 574C-34,CC and Sample 574C-35-1, 126–128 cm. However, the disappearance of these age-diagnostic species may have been hastened by dissolution.

Nannofossils

Nannofossils are usually common to abundant at Site 574. Discoasters are often abundant, but they are rare in the samples where the placoliths are poorly preserved (Sections 574-2,CC, -3,CC, and -10,CC to -16,CC; and Sections 574C-25,CC to -34,CC). The discoasters are overgrown below Zone CN4 (between 574-17,CC and the bottom of the Hole 574C). Nannofossil species occurrence is shown in Figure 6.

Many samples contain a high proportion of reworked nannofossils. Specifically, these are reworked Miocene discoasters in Hole 574 from Sections 574-1,CC through -4,CC; reworked lower Miocene–upper Oligocene placoliths in Hole 574 (from Sections 574-17,CC through -19,CC and in Sections 574-22,CC and -27,CC) and in Hole 574C (Section 574C-1,CC); and reworked lower Oligocene nannofossils in Hole 574C (Sections 574C-3,CC through -9,CC). The upper middle Miocene and Oligocene samples do not show reworking.

Holes 574, 574A, and 574C contain nannofossils from the top of the Eocene to the Pleistocene. All the zones in Bukry's stratigraphy (1971b) are represented at this site.

The upper Pliocene nannofossils (Sections 574-3,CC and -4,CC) are too dissolved to allow the subzones in this period to be clearly differentiated. The problem recurs at the boundary between the middle and upper Miocene, where the main stratigraphic species are absent; the appearance of *Discoaster intercalaris* and *D. perclarus* places the bottom of Zone CN7–6 in Hole 574 between Sections 574-11,CC and -12,CC.

Zones CN4 and CN3 cannot be distinguished at Site 574. *Helicopontosphaera ampliaperta* is absent, and the ratio of long- to short-rayed discoasters (Bukry, 1973) cannot be used to place the boundary between the two zones because it can be used only in the uppermost part of Zone CN4 and the lowermost part of Zone CN3.

In the lowest Miocene (Zone CN1), *Cyclicargolithus abisectus* disappears between Sections 574C-15,CC and 574C-16,CC, and *Sphenolithus ciperoensis* disappears between Sections 574C-16,CC and 574C-17,CC: thus, Subzone CN1a is very short.

In the upper Oligocene sediments, small, stratigraphically useful sphenoliths could be distinguished, although the forms were difficult to identify (as has been the case elsewhere in the tropical latitudes; Bukry, 1971a) and occurred only sporadically.

The Eocene/Oligocene boundary occurs in the deepest sediments at Site 574. *Reticulofenestra samodurovi, Discoaster barbadiensis, D. saipanensis*, and *Cyclicargolithus reticulatus* characterize the upper Eocene Zone CP15b in Hole 574C (between Section 574C-35,CC and 574C-34-2, 93 cm). The lower Oligocene is represented in Section 574C-33,CC by Zone CP16 (Subzones a and b). Between 574C-34-2, 93 cm and Section 574C-33,CC, nannofossils are rare to common but often poorly preserved, and discoasters are overgrown: the age of these samples could not be determined definitively.

Radiolarians

Radiolarians are common and well preserved in most of the material recovered at Site 574. The fauna appears to be less abundant in Cores 574C-33 and -34, although the decline in abundance may result in part from the difficulty of processing the samples. Core 574C-35 is barren of radiolarians. Every radiolarian zone was recognizable down to the early Oligocene *Theocyrtis tuberosa* Zone (Fig. 4). The sequence in Hole 574A was similarly complete.

Hardenbol and Berggren (1978) show the boundary between the *T. tuberosa* and *Thyrsocyrtis bromia* zones to lie within the lower Oligocene (within P19). Goll (1972) also shows this zonal boundary to lie within the lower Oligocene. However, most of those working with radiolarians agree with Riedel and Sanfilippo (1978), who place the zonal boundary coincident with the Eocene/Oligocene boundary.

We place the *Theocyrtis tuberosa/Thyrsocyrtis bromia* zonal boundary for Site 574 tentatively between Samples 574C-33-4, 49–51 cm and 574C-33-5, 57–59 cm. The latter sample contains the last occurrence of *Lithocyclia aristotelis* and species of *Dictyoprora*. Section 574C-33,CC contains several species of *Dictyoprora, L. aristotelis*, and rare specimens of *Lophocyrtis* (?)*jacchia*. *T. bromia* was not observed, but Cores 574C-33 and -34 do contain several previously undescribed forms.

Diatoms

Diatoms are abundant to common, and preservation is generally good, from the Quaternary through the Miocene part of the section at Site 574. Below Core 574C-14 (327 m sub-bottom), abundance and preservation decline; abundance remains low and preservation remains poor through the upper Oligocene and upper part of the lower Oligocene (to Core 28, 460 m). Cores 574C-29 through -32 (lower Oligocene) contain abundant to common diatoms that are well to moderately well preserved. Preservation and abundance decrease downhole again in Cores 33 and 34, and Core 35, which is immediately above the basalt, is barren of diatoms.

The Quaternary through Oligocene section can readily be zoned (Fig. 4), although the upper Oligocene subzones could not be differentiated. The assemblages in Core 34 of Hole 574C lack *Coscinodiscus excavatus* and possess a general late Eocene character (*C. decrescens, Hemiaulus polycystinorum*, and *Melosira architecturalis*), although they lack the Eocene genera *Brightwellia* and *Rylandsia*.

The sequence of diatom datums is straightforward (Barron, this volume), and the Quaternary through middle Miocene sequence is comparable to that at Sites 572

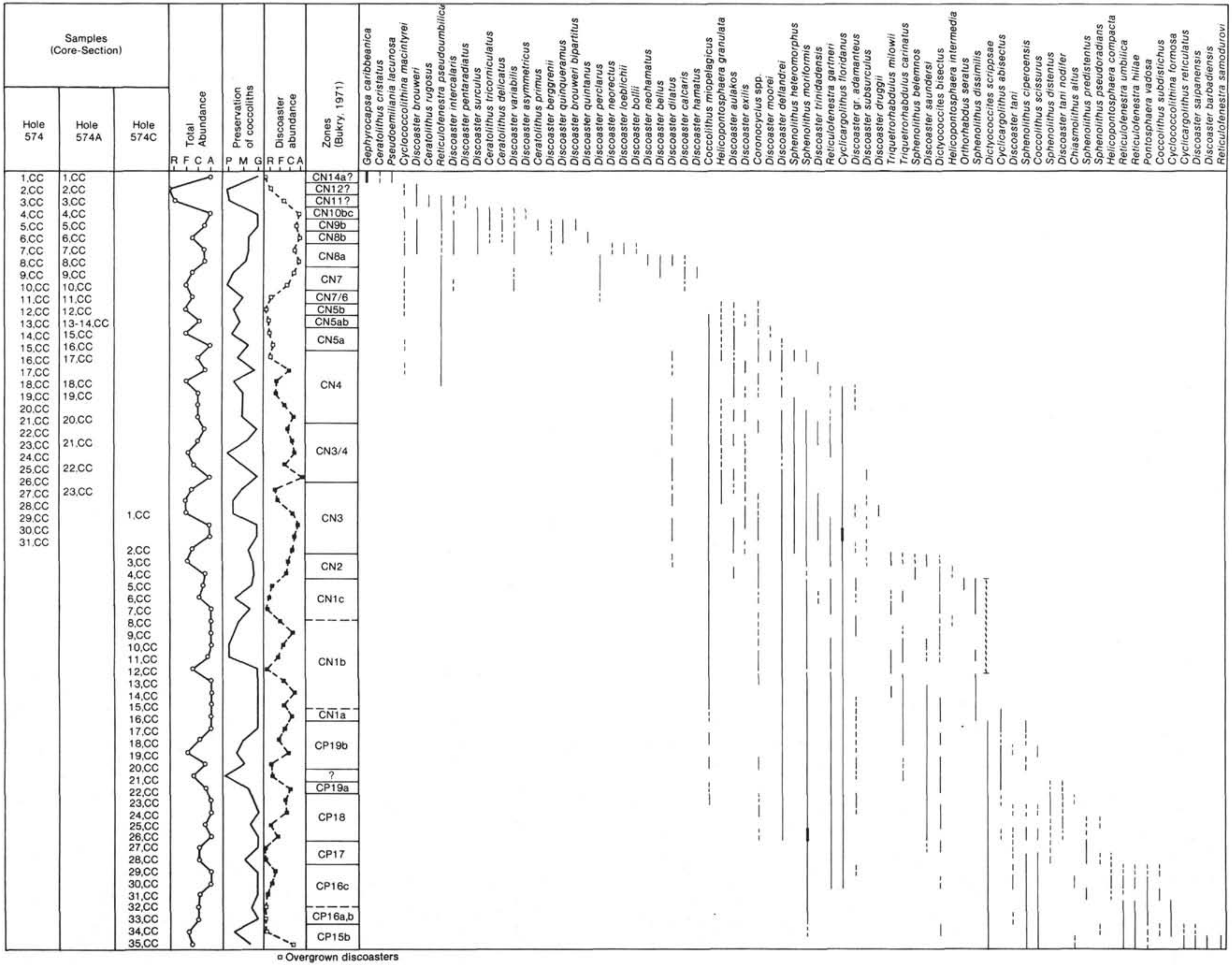

Figure 6. Occurrence of nannofossil species at Site 574; position of dashed zonal boundaries uncertain.

and 573. The diatoms suggest that part of the lower Pleistocene (≈0.8 to 1.5 Ma) may not be represented (there may be a hiatus or it may be greatly compressed). The fauna in the sample at 574-2-2, 130 cm, which contains *Pseudoeunotia doliolus* and *Nitzschia reinholdi* but lacks the silicoflagellate *Mesocena quadrangula*, suggests an age for the sample from 0.65 to 0.8 Ma. The sample at 574-2-3, 80 cm contains *Pseudoeunotia doliolus* and *Rhizosolenia praebergonii* var. *robusta* and is 1.8 to 1.55 m.y. old.

A lower upper Miocene hiatus at 70.5 m sub-bottom (base of Core 8 of both Holes 574 and 574A) is marked by the close stratigraphic proximity of the first appearance datum of *Coscinodiscus yabei* var. *elliptica* (9.8 Ma) (which occurs in Sample 574-9-1, 9–10 cm and in Core 574-9 above the core catcher) and the last appearance datum of *Coscinodiscus vetustissimus* var. *javanicus* (10.7 Ma) (which also occurs in Sample 574A-9-1, 9–10 cm and in Core 574-9 above the core catcher). Samples in the lower parts of Core 8 of both Holes 574 and 574A contain mixed assemblages of older (*C. temperei* var. *delicata, Denticulopsis hustedtii*, and *Actinocyclus ellipticus* var. *"oval"*) and younger (*Thalassiosira burckliana* and *Nitzschia cylindrica*) diatoms.

This hiatus occurs in an interval in which hiatuses in the eastern Pacific, including Site 77 (Barron, 1981a) and Site 573, are widespread (Keller and Barron, 1983). Hiatuses of this age are also present in the middle-latitude eastern North Pacific (Barron, 1981b), the central North Pacific (Keller, 1980), and the Southern Ocean (Ciesielski et al., 1982), and they have been related to the increased production of Antarctic Bottom Water associated with polar cooling. A more detailed discussion is presented in Barron et al. (this volume).

Benthic Foraminifers

Benthic foraminifers are extremely rare or absent in Samples 574-2,CC through -10,CC (i.e., in the Quaternary, Pliocene, and upper Miocene). They are generally rare in the rest of the cores. Preservation is variable; fragmentation is common in the lower 20 m of the cored interval. The diversity of the section is high (about 50 species per 200 specimens). Diversity does not decrease downhole, and it shows no apparent relation to lithology or dissolution (as indicated by the planktonic foraminifers).

The main constituents of the fauna are *Epistominella exigua* in the Miocene; *Nuttallides umbonifera* and species of *Pullenia, Gyroidinoides, Oridorsalis*, and *Cibicidoides* throughout the section; and species of *Stilostomella* and *Pleurostomella* from the lower Miocene downward. The relative abundance of the species fluctuates. The abundance of *Cibicidoides* species is relatively low from the upper Oligocene through the lower Miocene. The Oligocene species of *Cibicidoides* (e.g., *C. grimsdalei, C. laurisae, C. mexicanus*) are gradually replaced by a more modern assemblage which includes *C. kullenbergi* and *C. wuellerstorfi*) during the early Miocene. *Uvigerina graciliformis* peaks in abundance (it forms up to 30% of the assemblage in Section 574-10,CC) in samples that show extreme dissolution of planktonic foraminifers. *E. exigua* is known to be resistant to dissolution (e.g., Douglas and Woodruff, 1981), and it peaks in abundance in samples in which the planktonic foraminifers are strongly dissolved. Thus, the scarcity or absence of the species below the Oligocene/Miocene boundary is probably not the result of dissolution. Species of *Stilostomella* and *Pleurostomella* become more abundant from the lower Miocene downward. *Pleurostomella* is especially abundant in the lower Miocene. Again, the decrease in abundance in *Pleurostomella* and *Stilostomella* species in the lower middle Miocene is about coeval with or slightly earlier than important changes in benthic foraminifers on the Ontong-Java Plateau (Woodruff and Douglas, 1981). *Bolivina striatula* is present between 15.5 and 18.7 Ma. At Site 574 the changes from an Oligocene benthic fauna to a more modern association occur gradually (from the uppermost Oligocene through the lower Miocene).

The changes in the fauna at the Eocene/Oligocene boundary are not great. The abundance of the most common species (*Cibicidoides, Gyroidinoides, Oridorsalis, Globocassidulina*) remains relatively unchanged, in accordance with observations by Corliss (1981) and Miller et al. (1985). *Nuttallides truempyi* has its last occurrence in Sample 574C-33-5, 141–143 cm. Several other rare species have their last occurrence slightly later (e.g., *Alabamina dissonata* in Sample 574C-33-5, 71–73 cm; *Osangularia mexicana* in Sample 574C-33-5, 90–92 cm). *Gyroidinoides planulatus* has its last appearance in Sample 574C-34-1, 71–73 cm (before the last appearance of *N. truempyi*). *Cibicidoides laurisae* first occurs in Section 574C-32,CC. *O. mexicana* is, according to Douglas (1973), limited to the Eocene in the Pacific. *A. dissonata* was used as an Eocene marker species by Douglas (1973), Proto Decima and Bolli (1978), and Schnitker (1979). However, Miller and Curry (1982), Miller et al. (1985), and Tjalsma and Lohmann (1982) state that *N. truempyi* is the most reliable marker of the Eocene/Oligocene boundary. Thus, several events that have been described as occurring at the Eocene/Oligocene boundary occur in the benthic foraminiferal assemblages at Site 574, but they occur at slightly different levels.

SEDIMENT ACCUMULATION RATES

The age–depth curve for Site 574 is shown in Figure 7, which summarizes the sedimentation rate data in Table 3. The sedimentation rates through the Oligocene section of Site 574 average 12 m/m.y., with the rate beginning to increase at 22.9 Ma and reaching a high of 32 m/m.y. in the early Miocene (15 to 20 Ma). Across the early/middle Miocene boundary, there is a short interval (13.6 to 15.9 Ma) with a lower sedimentation rate; this interval is followed by the interval with the highest sedimentation rate observed at Site 574. This maximum rate lasts through most of the middle Miocene (12.4 to 13.6 Ma; Table 3). After the middle Miocene maximum, the rate decreases sharply, and except for a short interval of increased rate between 5 and 6.2 Ma, the rate remains low into the youngest sediments recovered. For further discussion see Barron et al. (this volume).

Mass accumulation rates at Site 574 were calculated by using the onboard physical properties measurements and from the sedimentation rates given in Table 3. Car-

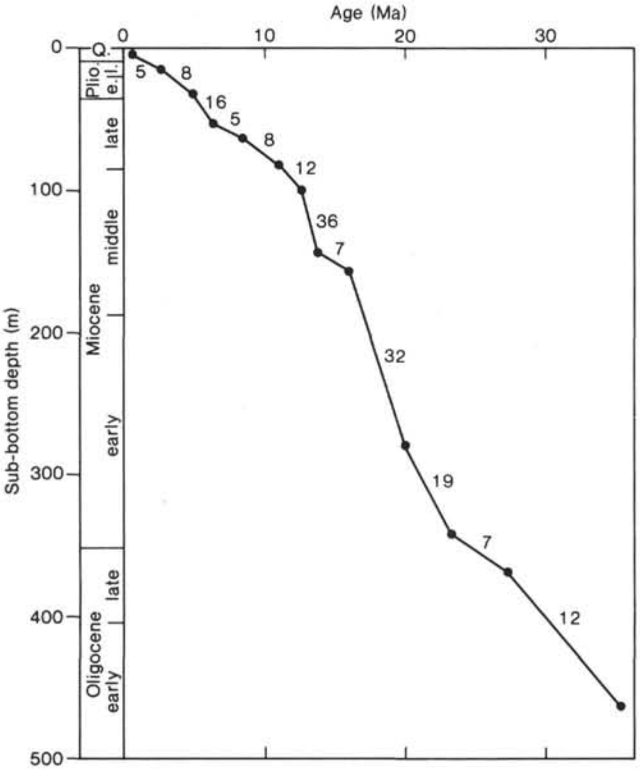

Figure 7. Age versus depth-in-hole based on biodatums at Site 574. Average sedimentation rates in m/m.y.

Table 3. Sedimentation rates, carbonate and noncarbonate mass accumulation rates at Site 574.

Sub-bottom depth (m)	Age (Ma)	Sedimentation rate (m/m.y.)	Mean dry bulk density (g/cm^3)	Mean $CaCO_3$ (%)	Mean mass accumulation rate ([g/cm^2]/1000 yr.)		
					Total	$CaCO_3$	Non $CaCO_3$
4	0.6						
		5.0	0.53	64	0.27	0.17	0.10
15	2.8						
		8.2	0.35	29	0.29	0.08	0.21
33	5.0						
		15.8	0.49	51	0.77	0.39	0.38
52	6.2						
		4.8	0.74	74	0.36	0.26	0.09
62	8.3						
		7.6	0.58	56	0.44	0.27	0.19
81	10.9						
		12.0	0.79	79	0.95	0.75	0.20
99	12.4						
		35.8	1.00	90	3.6	3.24	0.36
142	13.6						
		6.5	0.99	87	0.64	0.56	0.08
157	15.9						
		32.4	1.03	82	3.33	2.74	0.56
280	19.7						
		19.1	1.20	90	2.29	2.07	0.22
341	22.9						
		7.2	1.22	87	0.88	0.76	0.12
369	26.8						
		12.3	1.3	88	1.6	1.41	0.19
464	34.7						

bonate bomb analyses were used to calculate the mass accumulation rates for the carbonate and noncarbonate sediment fractions. See Theyer et al. (this volume) for further discussion.

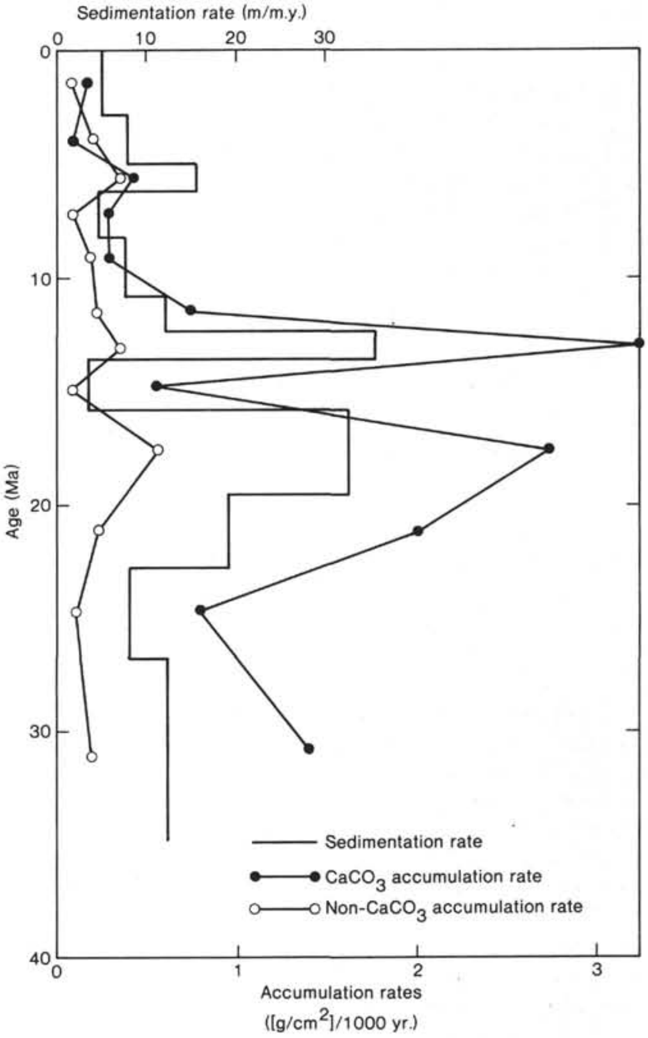

Figure 8. Sedimentation rate and average mass accumulation rates for carbonate and carbonate-free sediments at Site 574.

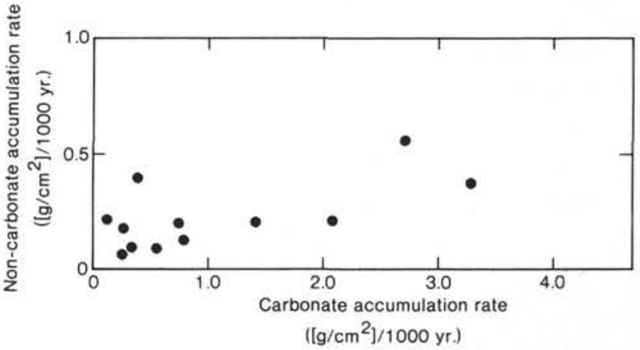

Figure 9. Carbonate versus carbonate-free mass accumulation rates at Site 574.

Sedimentation rate and the mass accumulation rates are plotted versus time in Figure 8. There are two important differences between the pattern of sedimentation for Site 574 and the patterns for Sites 572 and 573: (1) there is a positive correlation between sedimentation rate and carbonate accumulation rate at Site 574, whereas the correlation is negative at Site 572 and essentially zero at Site 573; and (2) the relationship between carbonate and noncarbonate mass accumulation rate is not as clearly linear at Site 574 as at Sites 572 and 573 (Fig. 9). However, the data plotted in Figure 9 have a correlation coefficient of 0.7, and the regression equation has a slope of 0.1, half the value for the data from Site 573 overall and equal to the value for data from Site 573 for the Oligocene. The data at Site 574 and the difference between that site and Sites 572 and 573 suggest that sediment accumulation is more strongly affected by the accumulation of carbonate than at Sites 572 and 573.

The sedimentation rate curve for Site 574 (Fig. 7), unlike that for Site 573, gives no clear indication of the presence of hiatuses. The hiatus suggested by diatom stratigraphy at about 10 Ma occurs within an interval of relatively low sedimentation rate, and the low rate may result in whole or in part from short intervals of nondeposition during this time period. The possible hiatus at 23 Ma at Site 573 occurs in an interval at Site 574 of low sedimentation rate; thus, this interval may represent a time of regional decrease in sediment accumulation. The zone of equatorial high productivity during the early Miocene was very narrow, and Site 573 is nearer the margin of the zone than Site 574, so a regional reduction in sediment accumulation might be expressed at Site 573 as a hiatus.

PHYSICAL PROPERTIES

The physical properties measured for this site include wet-bulk density (ρ_b), sonic velocity (V_p), formation factor (F), thermal conductivity (K), and shear strength. Measurements were made at regular intervals within the HPC-cored sections except where the sediment was disturbed. In the rotary-cored sections, measurements were limited to selected, undisturbed parts of the core rather than at regular intervals. The Introduction (this volume) discusses the data collection techniques and procedures and gives pertinent references. A complete listing of numerical data is given in the Appendix (this volume).

Figures 10 through 15 show the various physical properties plotted against depth. Wet-bulk density (Fig. 10) is highly variable near the top of the section (1.2 to 1.4 g/cm^3). At 90 m this range increases in mean value somewhat but is still variable. Just below 90 m there is a shift in densities to values around 1.6 g/cm^3. The data are less variable and remain at values near 1.6 g/cm^3 until a depth of around 220 m, where there is another fairly abrupt shift to values over 1.7 g/cm^3. Density remains between 1.7 and 1.8 g/cm^3 for about 200 m and then falls again at a layer of high-porosity material near basement.

Porosity (Fig. 11) shows many of the same trends as wet-bulk density and can be divided into a variable zone 90 m deep with porosities in excess of 80%; a less variable zone from 90 to 220 m with values near 60%; and a deep zone, in which porosity gradually decreases to a minimum at 440 m of about 45%. Below 440 m porosity increases as the result of an increase in the silica content of the lowermost sediments; the open structure of radiolarian tests tends to produce higher porosity values than the calcareous nannofossils, which pack more densely. Values of formation factor (Fig. 12) show the same trends, increasing from around 1.5 in the upper section to near 3.0 below 220 m. The induration of the sediments prohibited measurements of formation factor in the lowermost high-porosity zone.

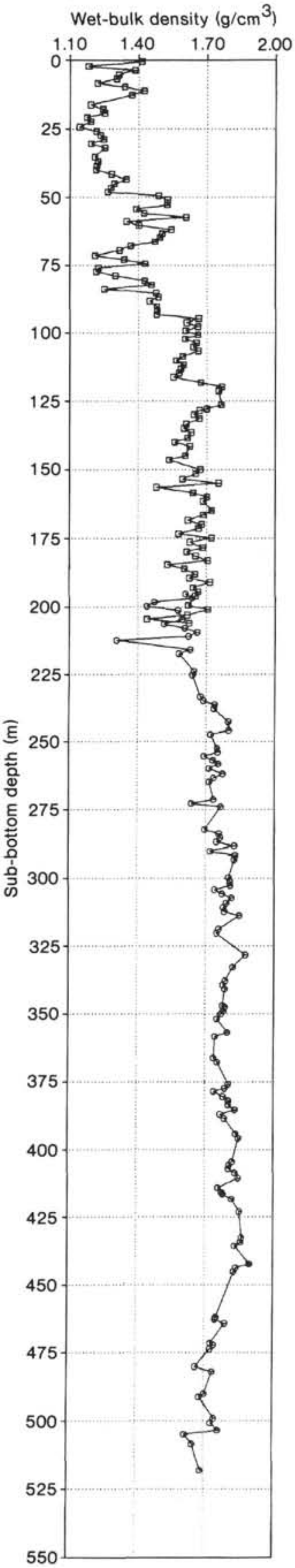

Figure 10. Wet-bulk density versus depth for Site 574.

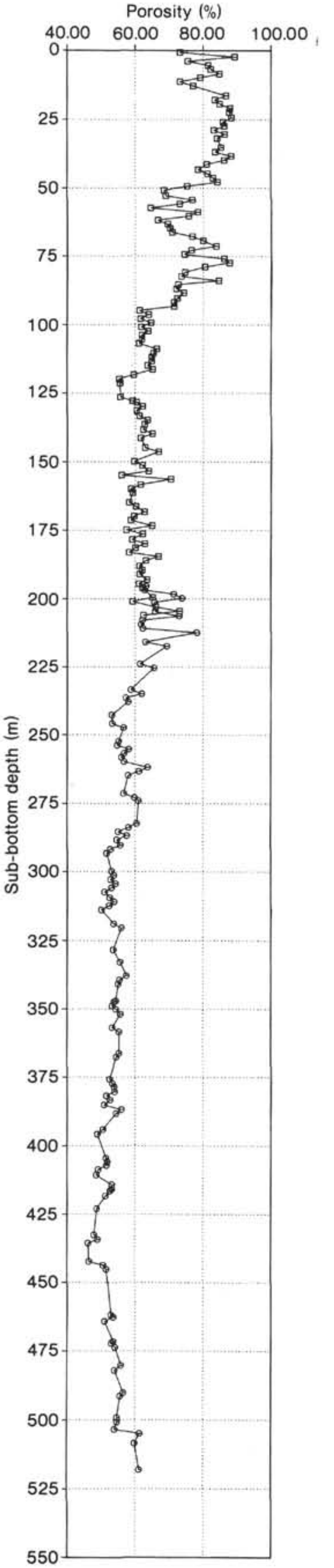

Figure 11. Porosity versus depth for Site 574.

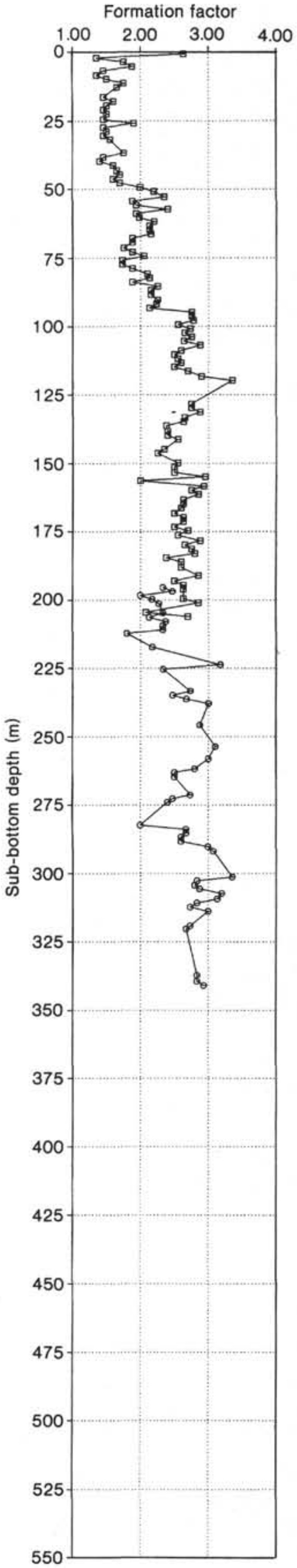

Figure 12. Formation factor (horizontal) versus depth for Site 574.

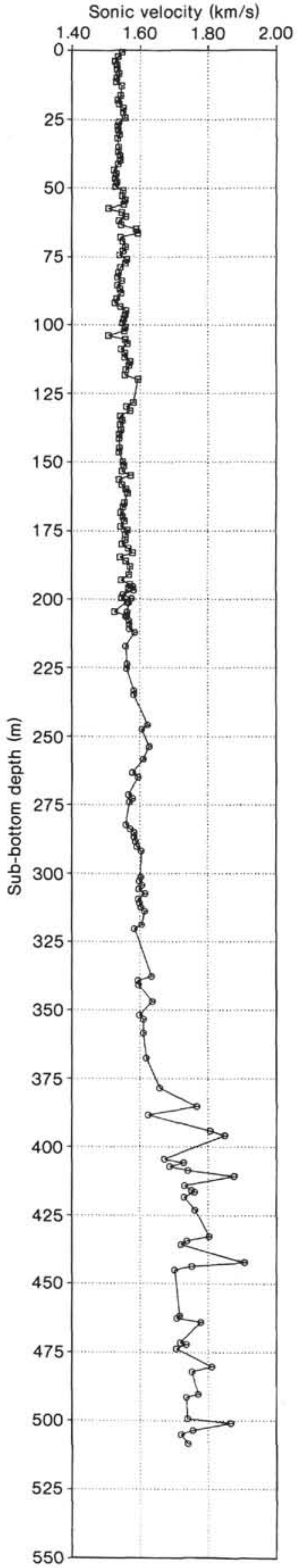

Figure 13. Sonic velocity versus depth for Site 574.

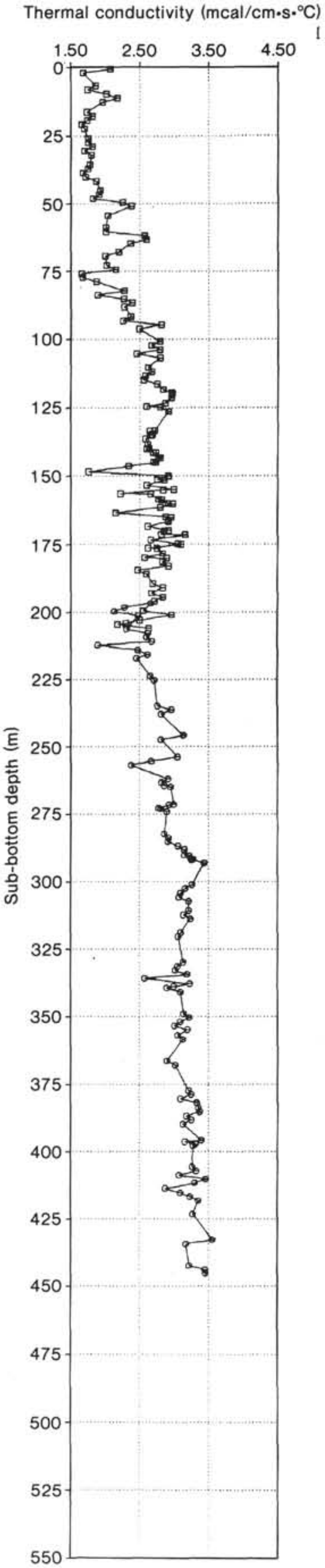

Figure 14. Thermal conductivity versus depth for Site 574.

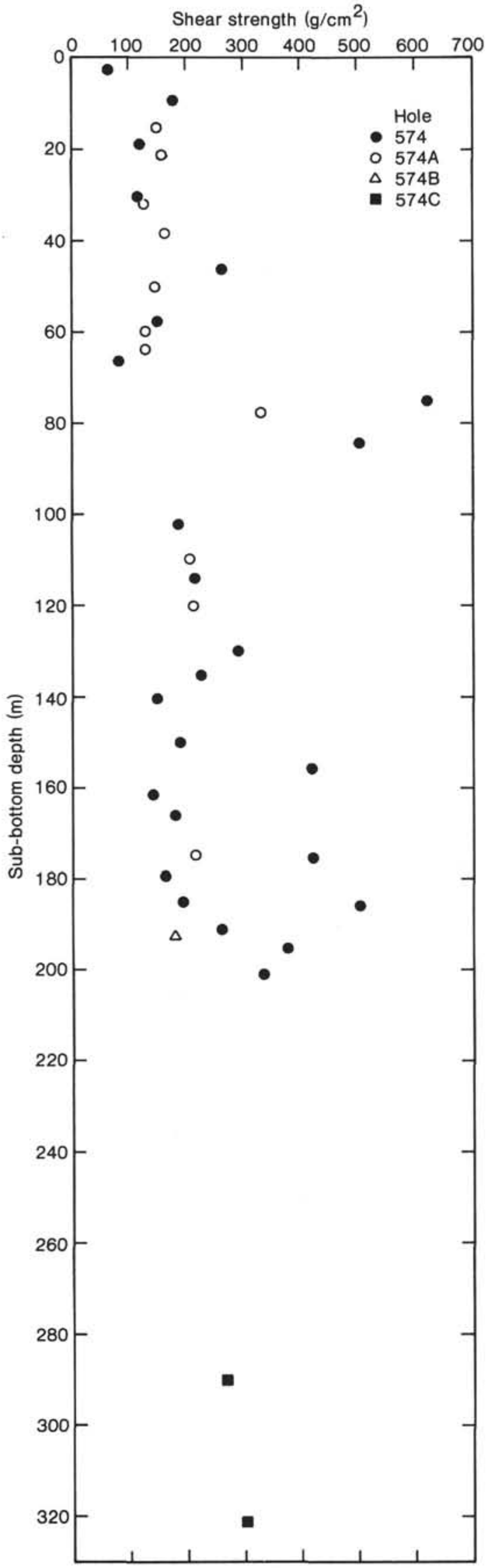

Figure 15. Shear strength versus depth for Site 574.

Thermal conductivity increases from values around 1.9 mcal/cm·s·°C to about 2.5 mcal/cm·s·°C in the interval between 50 and 90 m; values increase to about 3.4 mcal/cm·s·°C between 220 and 290 m (Fig. 14).

Shear strength (Fig. 15) is between 100 and 200 g/cm² at depths less than 70 m, exhibits several rather high values near 80 m, and then settles into the range from 200 to 300 g/cm² to a depth of 200 m. Two measurements near 300 m depth indicate a very small increase to values somewhat greater than 300 g/cm².

PALEOMAGNETISM

The magnetic properties of the upper 50 to 60 m of Holes 574 and 574A are reasonably good and permit polarity changes (as evidenced by 180° changes in the measured declination) to be distinguished. The untreated NRM_0 data, however, do not allow the identification of a specific reversal sequence. No AF demagnetization was carried out on board (see Weinreich and Theyer, this volume). The Kuster orientation device worked reasonably well and yielded readable slides in 80% of the cores.

At Site 573 the color of the sediment changed from brown to gray; this color change also occurred in Holes 574 and 574A. The change was again accompanied by a decrease by a factor of at least 10 in NRM_0 intensities. In general, Hole 574C shows very low intensities (about 1×10^{-7} G), although in the lower part (below 370 m), the variations in intensity are greater (sometimes up to 5.6×10^{-6} G). As in Hole 573B, the strongest intensity occurs in the dark brown sediment overlying the basalt; the values measured at Site 574 of 1.7×10^{-5} G are similar to the intensities of the metalliferous sediments of Hole 573B.

The variation of the NRM_0 intensities in the upper 60 to 80 m appears to be caused mainly by the variation of carbonate content. Between 80 and 200 m, however, the carbonate content is high and nearly constant, and NRM_0 intensities are low but variable. The variations in NRM_0 intensities in this part of the section may be due to changes in sedimentation rate. Low sedimentation rate appears to be accompanied by higher intensities, and high sedimentation rate seems to be accompanied by low intensities.

INTERSTITIAL-WATER CHEMISTRY

The profiles of magnesium and strontium and to a lesser extent calcium and alkalinity are roughly linear to sub-bottom depths of 150 to 175 m (Fig. 16). Calcium, strontium, and alkalinity gradually increase, whereas magnesium concentration steadily decreases. Reversals in these trends begin from 300 to 350 m sub-bottom and continue to the base of the section. Chlorinity shows a gradual steady increase and then abruptly decreases.

Large variations occur in the lowermost 150 m. Calcium and alkalinity show abrupt changes to very low values near 430 m sub-bottom. All profiles except pH and strontium contain abrupt concentration decreases in the deepest sample, but there is no evidence for contamination by surface seawater for the deeper samples. The fluctuations are probably related to diagenesis, which is influenced by differences in age, sediment accumulation rate, and sediment composition (especially in the metal-

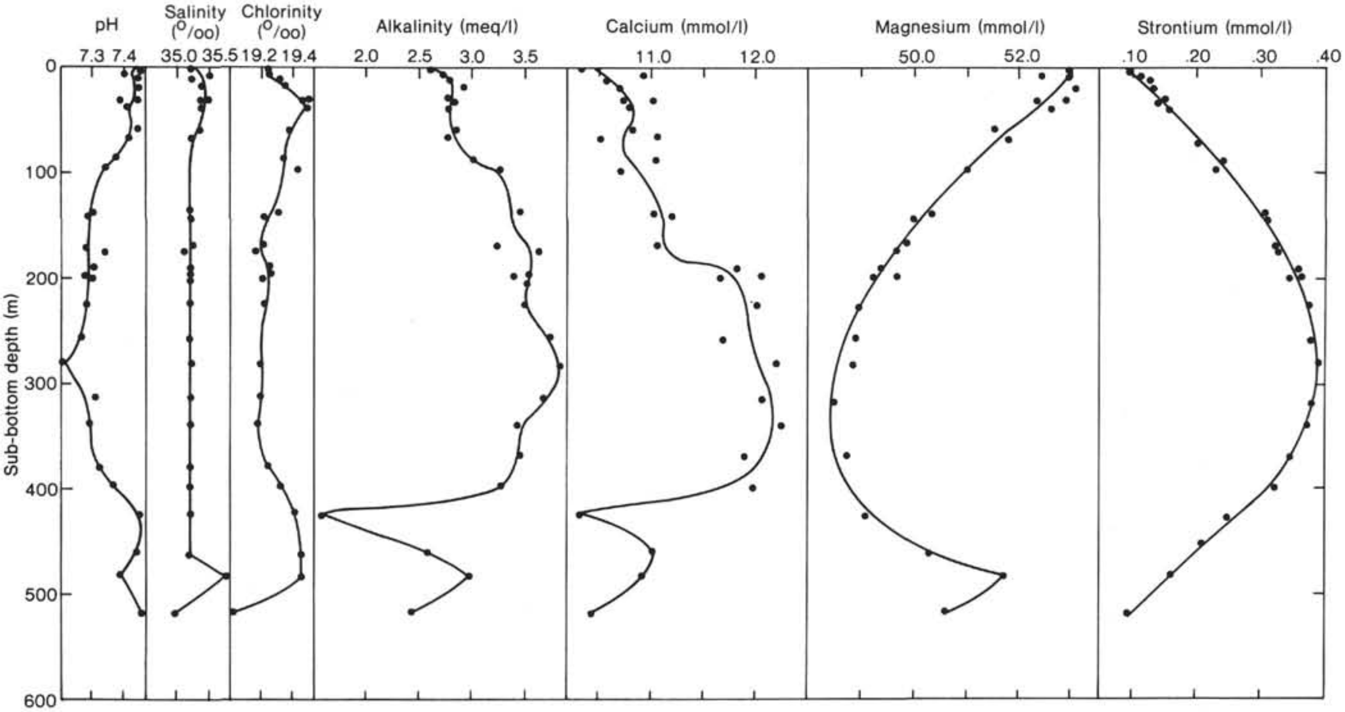

Figure 16. Interstitial-water geochemistry, Site 574.

liferous sediments that occur from 502 to 520 m sub-bottom).

Calcite recrystallization is indicated by the downhole increases in strontium; the values reach a maximum near 300 m sub-bottom. The overall profile is very smooth; it does not show the abrupt changes in the lower 150 m of section found for the other chemical species.

SUMMARY AND CONCLUSIONS

Site 574, located at 4°12.52′N, 133°19.81′W in 4550 m of water, is the second site in a three-site north-south transect across the equatorial high-productivity zone. The drill site, near the crest of the equatorial sediment bulge, was selected to provide a sedimentary record of the migration of this site across the equator as well as to permit recovery of the Eocene/Oligocene boundary. Three holes were drilled at Site 574. The coring may be summarized as follows.

In *Hole 574*, 32 hydraulic piston cores resulted in 206.5 m of penetration, and recovery was nearly 100%. In *Hole 574A*, 23 hydraulic piston cores were obtained. Penetration was 180.2 m, and recovery was nearly 100%. *Hole 574B* represented one rotary-drilled core recovered from 185 to 194.5 m sub-bottom. The corer was lost, and the pipe had to be tripped to recover it. In *Hole 574C*, 37 cores were recovered by rotary drilling from 194.5 to 525.5 m sub-bottom, where basalt was encountered. Recovery for this hole was 58%.

The sedimentary section at Site 574 was divided into three lithologic units on the basis of sediment composition. Unit I (0 to 84.1 m; upper Miocene to Quaternary) is cyclic siliceous calcareous ooze. It is characterized by cyclic variations in the relative abundance of siliceous and calcareous microfossils and thus ranges from siliceous nannofossil to calcareous siliceous ooze. The unit is subdivided into three subunits, primarily by color: an upper brown ooze subunit, a green gray ooze subunit, and a lower brown ooze subunit.

Unit II (84.1 to 502.5 m; lower Oligocene to upper Miocene) is calcareous ooze chalk. The components of this predominantly calcareous unit range from siliceous nannofossil to nannofossil ooze and chalk. Two subunits are recognized on the basis of color, a green white chalk subunit (83.8 to 470.2) and a yellow white chalk subunit (470.2 to 502.5 m). A gradual transition from ooze to chalk occurs in the green white subunit between about 185 and 480 m sub-bottom.

Unit III (502.5 to 520.0 m; upper Eocene to lower Oligocene) is metalliferous chalk. More specifically, it is a yellow brown siliceous nannofossil chalk with common iron-manganese oxides. This unit directly overlies basaltic basement.

The carbonate content curve for Site 574 is similar to that for Site 573. The upper (upper Miocene to Quaternary) 85 m of the section is characterized by high-amplitude, high-frequency fluctuations in carbonate content. The sediments deposited from the Eocene to the middle Miocene show high carbonate content with little variation.

All the major microfossil groups are represented at Site 574, and the section from the uppermost Eocene to the Quaternary is fairly complete. Siliceous microfossils are abundant and well preserved in most of the section. There is, however, a decline in diatom abundance and preservation in the upper Oligocene, the upper part of the lower Oligocene, and near the Eocene/Oligocene boundary. Planktonic foraminiferal abundances fluctuate and provide good stratigraphic control only in the lower middle Miocene. Calcareous nannofossils are common to abundant throughout the section. Both the foraminifers and the nannofossils indicate that there are at least three zones of reworked Oligocene microfossils in the middle Miocene sediments.

Several of the events recorded in the Site 574 sediments are of stratigraphic significance. The planktonic foraminifers reveal the *Globorotalia fohsi* lineage and the *Orbulina* datum. The transition from the uppermost Eocene to the lowermost Oligocene is remarkably complete. The transition occurs in the metalliferous unit (502.5 to 520.0 m) directly above basement; the criteria for each microfossil group differ, and the precise location of the boundary varies accordingly. The apparently continuous sequence offers an unusual opportunity to study the Eocene/Oligocene boundary. The Oligocene/Miocene boundary occurs in Core 574C-17 (≈350 m), and the Miocene/Pliocene boundary occurs in Core 574-5 at approximately 35 m sub-bottom. The diatom stratigraphy suggests hiatuses in the lower Pleistocene (≈0.8 to 1.5 Ma) and the lower upper Miocene (9.1 to 10.8 Ma), whereas the sedimentation rate curves indicate these to be times of decreased sedimentation.

The sedimentation rate at Site 574 is moderate; it averages 12 m/m.y. during the Oligocene and increases to 32 m/m.y. in the early Miocene (15 to 20 Ma). There is a short interval of low sedimentation rate (13.6 to 15.9 Ma), which is followed by a middle Miocene interval (12.4 to 13.6 Ma) with a relatively high (about 36 m/m.y.) rate. After the middle Miocene, the sedimentation rate decreases sharply (to about 12 m/m.y.), and except for a short interval of increased rate (about 16 m/m.y.) between 5 and 6.2 Ma, remains low into the youngest sediments recovered. The sedimentation rate and calcium carbonate curves for Site 574, unlike those for Sites 572 and 573, show positive correlation. Carbonate and noncarbonate mass accumulation rates continue to exhibit a linear relationship, but the regression has a much lower slope than at Sites 572 and 573. These data suggest that sediment accumulation is more strongly affected by the accumulation of carbonate than at the previous Leg 85 sites. (See also Theyer et al., this volume.)

Paleomagnetic studies at Site 574 were once again hampered by the extremely low NRM intensities that characterize much of the section, but the shipboard analyses produced interesting results nonetheless. Polarity reversals could be identified in lithologic Unit I (the cyclic calcareous siliceous ooze), where NRM intensities are an order of magnitude higher than in the rest of the section (except for the metalliferous sediments). In the part of section where NRM intensities are highest (about 0 to 80 m), the correlation between carbonate content and NRM intensity is extremely good, low carbonate content corresponding to high intensity. Below 80 m sub-bottom the carbonate content increases and shows little variation, and the NRM intensities decrease and appear to vary as a function of sedimentation rate (higher intensity is accompanied by lower sedimentation rate). The NRM intensities increase again in the metalliferous sediments at the base of the section.

Shipboard analyses of interstitial water reveal linear trends for alkalinity, calcium, and magnesium in the upper 150 m. Departures from linearity in this interval may be a function of changes in diffusion coefficients, which are suggested by variations in formation factor (see Physical Properties). Deeper in the section, variations in alkalinity, calcium, and magnesium are influenced by sedimentation rate, depth of burial, and compositional changes, and are probably indicative of diagenetic processes. High alkalinity values are associated with high sedimentation rate and sulfate reduction; low alkalinity occurs in intervals where calcium is at a minimum and there is an increase in the amount of chalk, indicating possible calcite precipitation. Most intriguing are the changes in the geochemical parameters associated with the metalliferous sediments at the base of the section (Jarvis, this volume).

Physical property measurements (wet-bulk density, sonic velocity, thermal conductivity, and formation factor) show an upper zone of large-amplitude variations (0 to 90 m), which is underlain by an interval of fairly consistent values (90 to 220 m), the mean of which is offset from that of the upper interval. Below about 220 m there is another major shift in mean values that appears to be associated with the beginning of chalk formation. In the lowermost part of Site 574 (420 to 510 m), unlike the previous sites, saturated wet-bulk and grain densities decrease (porosity increases). This unexpected result is associated with the abundance of siliceous microfossils in this interval.

The seismic section of Site 574 is characterized by numerous closely spaced reflectors that vary in strength and character. As in other Leg 85 sediments, variations in sonic velocity are minimal until about 380 m sub-bottom; thus, impedance contrasts above that depth are a function of changes in wet-bulk density only. The reflection pattern in the upper 0.1 s correlates extremely well with the density cycles in the upper 80 m of the section. Below this level several individual reflectors can be correlated with shifts in wet-bulk density, but the reflectors may also be interference composites. Acoustic basement correlates with a zone of rapid velocity and density excursions (deeper than about 400 m) and probably does not represent basalt (see Mayer et al., this volume).

By interpolating the migration tracks (van Andel et al., 1975) of nearby drill sites, a rough estimate of the paleodepths and latitudes of Site 574 can be made. The crust upon which Site 574 sits was generated 37 to 39 Ma at about 5°S and in water about 3000 m deep. The presence of a metalliferous chalk in contact with basalt is consistent with our present understanding of ridgecrest processes. Despite the shallow depth, the lower Oligocene sedimentation rate was fairly low, a result of the site's distance from the equator (the equatorial productivity zone was narrow during this time) and the generally decreased sedimentation rate (van Andel et al., 1975). The foraminiferal dissolution index during this interval is moderate to high. The deepening of the site with time is not apparent from the carbonate or noncarbonate mass accumulation rate curves. In fact, $CaCO_3$ content increases in the first few million years of the site's existence, probably as the result of the oceanwide tendency of carbonate to increase from the Eocene to the Oligocene.

Sonic velocity (Fig. 13) exhibits fairly uniform values throughout most of the core. Values are near 1.50 km/s at the top and generally increase with increasing depth to 1.60 km/s by a depth of 240 m. Below about 360 m the velocities increase and become more variable, an effect of the differing amount of lithification near the basement.

The Miocene part of the section is characterized by generally higher carbonate and noncarbonate mass accumulation rates and high, fairly constant carbonate values. The dissolution index is moderate and fairly stable. The carbonate and noncarbonate mass accumulation rates increase and decrease together, with carbonate accumulating faster than noncarbonate (unlike the carbonate at Site 572, which accumulates slower than noncarbonate). These data are indicative of moderate productivity that increases as the site migrates under the equatorial high-productivity zone.

At approximately 15.9 Ma there is a sharp drop in the carbonate and noncarbonate mass accumulation rates. The dissolution index does not increase steeply. Van Andel et al. (1975) show a distinct peak in sedimentation rates at this time, but our dates are based on a different time scale.

After this decrease there is a sharp increase in both the carbonate and noncarbonate mass accumulation rates that corresponds to the crossing of the equator (which took place from 13.6 to 12.4 Ma). Dissolution is moderate to low during this interval. After the equatorial crossing we see a sharp and then a slower but steady decrease in carbonate and noncarbonate accumulation rates with minor fluctuations. There are two periods (6.2 to 8.3 Ma and 10.9 to 12.4 Ma) in which the abundance of diatoms that are indicative of upwelling increases. At Site 572, the presence of these upwelling diatoms is associated with enhanced dissolution. At Site 574, however, it is associated with decreased dissolution of carbonate. The contrast is further evidence that, whereas sedimentation at Site 572 is characterized by extremely high productivity and biogenous silica, the sedimentation at Site 573 and 574 is characterized by lower productivity and is dominated by calcareous components.

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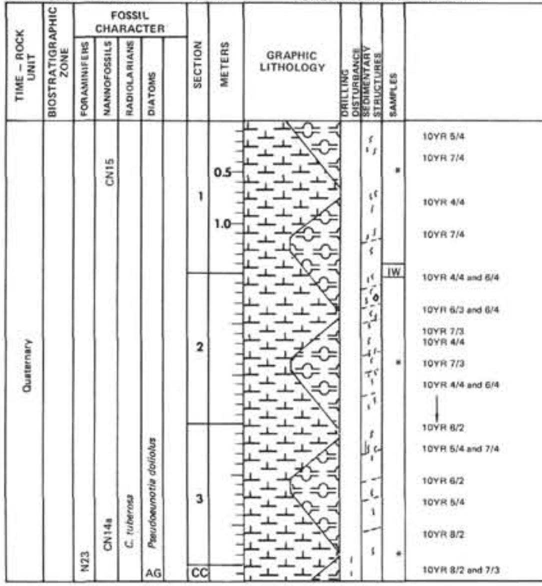
SITE 574 HOLE CORE 1 CORED INTERVAL 0.0–4.5 m



LITHOLOGIC DESCRIPTION

UPPER BROWN OOZE (SUBUNIT IA):

Alternating pale brown (10YR 7/3 and 7/4) and grayish brown (10YR 4/4 and 5/4) foram nanno ooze to calcareous rad diatom ooze. All highly mottled with mottling most visible at color changes.

Note: Due to the apparent lack of correlation between the observed variation in sediment color and composition in the variegated brown oozes of the uppermost section, the graphic lithology of the first 5 cores is a stylized representation of the inferred continuous compositional variation in those sediments.

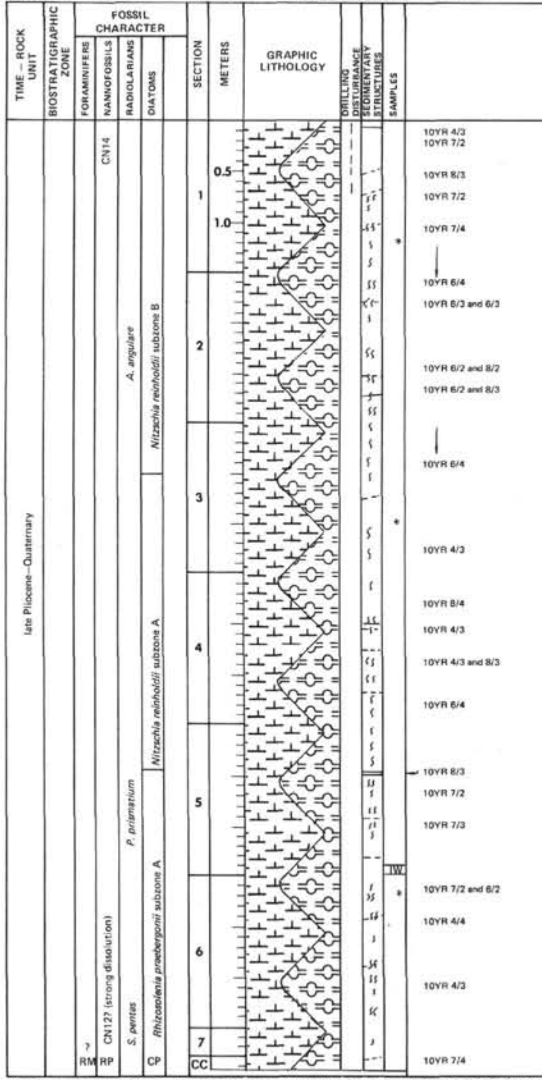
SMEAR SLIDE SUMMARY (%):

	1, 50	2, 90	3, 130
Texture:			
Sand	18	55	8
Silt	7	40	4
Clay	75	5	88
Composition:			
Clay	1	Tr	–
Volcanic glass	–	Tr	–
Carbonate unspec.	25	40	2
Foraminifers	15	3	9
Calc. nannofossils	50	1	88
Diatoms	6	24	Tr
Radiolarians	3	30	1
Sponge spicules	–	1	Tr
Fe-oxides	Tr	1	Tr

NOTE: Graphic lithologies represent average compositions derived from smear slides and do not always reflect the detailed alternation of sediment types. Major lithologic boundaries are shown but gradational contacts, small-scale cyclicity and ooze-chalk alternations are represented schematically. Color changes approximate to lithologic changes.

Hole 574, Core 1
CARBONATE BOMB:
1, 64 cm = 84%
2, 75 cm = 28%
3, 74 cm = 80%

SITE 574 HOLE CORE 2 CORED INTERVAL 4.5–14.0 m



LITHOLOGIC DESCRIPTION

UPPER BROWN OOZE (SUBUNIT IA):

Highly variable mottled brown coloration. Alternating intervals of very pale brown (10YR 7/2–7/4 and 8/2–8/4), brownish gray (10YR 6/2–6/4), and dark brown (10YR 4/3 and 4/4) foram diatom rad to rad nanno oozes. Intervals 1.5 to 3.5 m thick and extensively mottled.

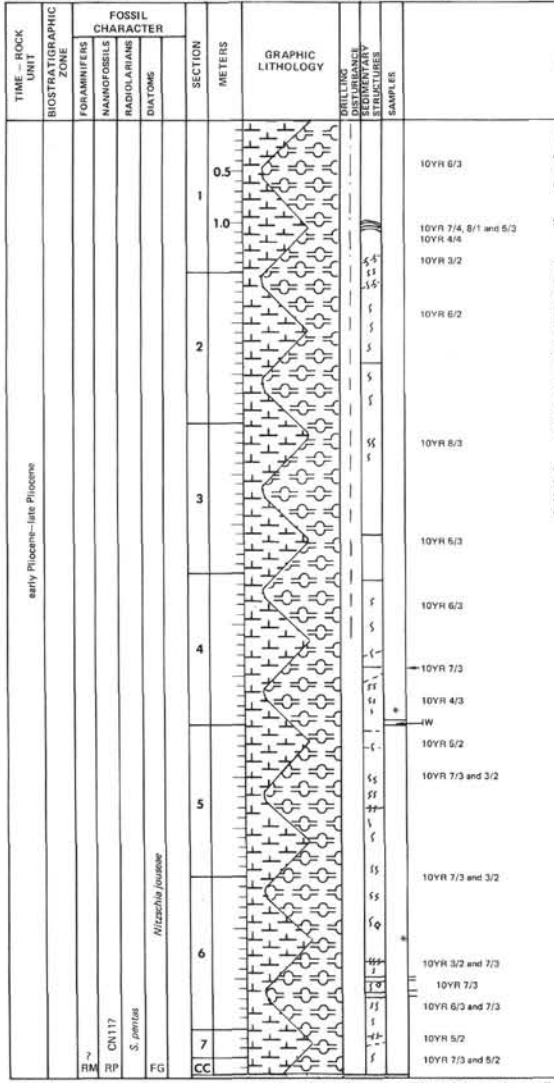
SMEAR SLIDE SUMMARY (%):

	1, 120	3, 100	6, 20
Texture:			
Sand	55	75	20
Silt	40	20	50
Clay	5	5	30
Composition:			
Volcanic glass	1	Tr	–
Carbonate unspec.	29	19	60
Foraminifers	3	15	9
Calc. nannofossils	1	1	12
Diatoms	35	20	5
Radiolarians	30	45	12
Sponge spicules	Tr	Tr	Tr
Silicoflagellates	1	Tr	1
Fe-oxides	–	–	1

CARBONATE BOMB:
1, 75 cm = 65%
2, 75 cm = 59%
3, 96 cm = 43%
4, 75 cm = 67%
5, 75 cm = 79%
6, 75 cm = 72%

NOTE: Graphic lithologies represent average compositions derived from smear slides and do not always reflect the detailed alternation of sediment types. Major lithologic boundaries are shown but gradational contacts, small-scale cyclicity and ooze-chalk alternations are represented schematically. Color changes approximate to lithologic changes.

SITE 574 HOLE CORE 3 CORED INTERVAL 14.0–23.5 m



LITHOLOGIC DESCRIPTION

UPPER BROWN OOZE (SUBUNIT IA):
Interbedded pale brown (10YR 7/3, 8/3 and 6/2) and darker brown (10YR 4/3–6/3, and 3/2) calcareous diatom rad oozes. Both mottled with each other, the dark intervals usually more highly mottled.

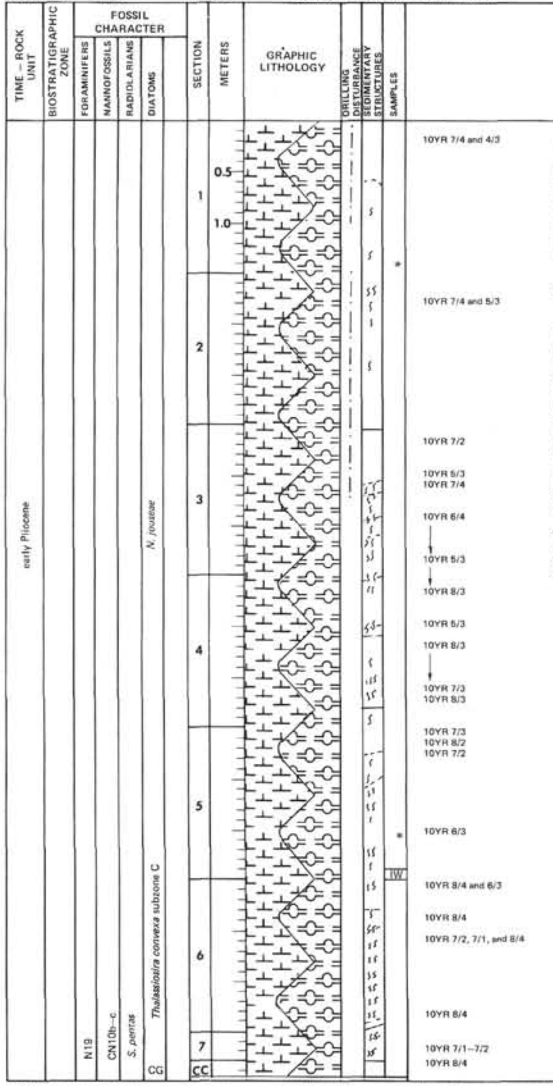
SMEAR SLIDE SUMMARY (%):

	4, 135	6, 60
Texture:		
Sand	65	70
Silt	33	28
Clay	2	2
Composition:		
Volcanic glass	–	Tr
Carbonate unspec.	15	15
Foraminifers	5	Tr
Diatoms	18	20
Radiolarians	60	64
Sponge spicules	Tr	Tr
Silicoflagellates	1	Tr
Fe-oxides	1	–

CARBONATE BOMB:
2, 75 cm = 21%
3, 75 cm = 38%
4, 75 cm = 35%
5, 75 cm = 13%
6, 75 cm = 11%

NOTE: Graphic lithologies represent average compositions derived from smear slides and do not always reflect the detailed alternation of sediment types. Major lithologic boundaries are shown but gradational contacts, small-scale cyclicity and ooze-chalk alternations are represented schematically. Color changes approximate to lithologic changes.

SITE 574 HOLE CORE 4 CORED INTERVAL 23.5–33.0 m



LITHOLOGIC DESCRIPTION

UPPER BROWN OOZE (SUBUNIT IA):

Upper 3 meters of pale brown (10YR 7/4) calcareous rad diatom ooze mottled with darker brown (10YR 4/3–5/3) is underlain by interbedded pale brown (10YR 6/3–8/3 and 8/4), gray brown (10YR 7/1–7/2 and 8/2), and dark brown (10YR 5/3 and 6/4) oozes; lighter color apparently indicative of more calcareous material. Beds 10 cm to 1 m and usually highly mottled.

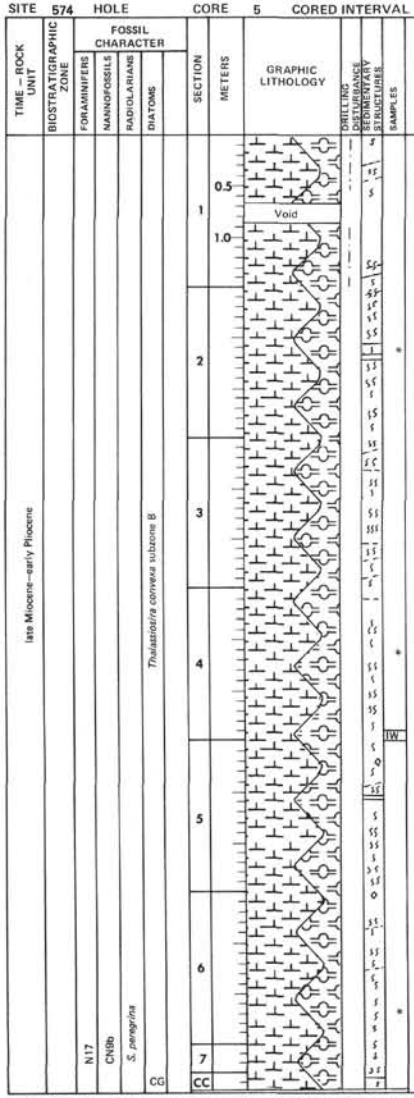
SMEAR SLIDE SUMMARY (%):

	1, 140	5, 105
Texture:		
Sand	60	30
Silt	30	40
Clay	10	30
Composition:		
Volcanic glass	Tr	Tr
Carbonate unspec.	25	40
Foraminifers	9	2
Calc. nannofossils	9	15
Diatoms	32	20
Radiolarians	25	23
Sponge spicules	Tr	Tr
Silicoflagellates	Tr	Tr

CARBONATE BOMB:
1, 75 cm = 15%
2, 75 cm = 35%
3, 75 cm = 35%
4, 75 cm = 48%
5, 75 cm = 24%
6, 75 cm = 49%

NOTE: Graphic lithologies represent average compositions derived from smear slides and do not always reflect the detailed alternation of sediment types. Major lithologic boundaries are shown but gradational contacts, small-scale cyclicity and ooze-chalk alternations are represented schematically. Color changes approximate to lithologic changes.

SITE 574 HOLE CORE 5 CORED INTERVAL 33.0–42.5 m



LITHOLOGIC DESCRIPTION

10YR 8/2
10YR 7/2
10YR 7/4
10YR 8/4
10YR 5/4
10YR 8/4
10YR 6/3 and 8/4
10YR 6/3
10YR 8/4
10YR 8/4, 7/4 and 3/2
10YR 4/2 and 8/3
10YR 8/4
10YR 6/2–4/2
10YR 8/4 and 8/2
10YR 8/3
10YR 8/2
↑
10YR 8/4
10YR 7/2
10YR 8/4 and 8/2
10YR 8/2–8/4, 7/2 and 7/4
10YR 8/2, 6/4, and 7/4
10YR 8/2

UPPER BROWN OOZE (SUBUNIT IA):
Pale brown (10YR 8/2–8/4) diatom nanno oozes interbedded with gray brown (10YR 7/2–7/4) and brown (10YR 6/3 and 3/2–4/2) rad diatom calcareous oozes. Upper 4.6 m most highly variable though mottled throughout.

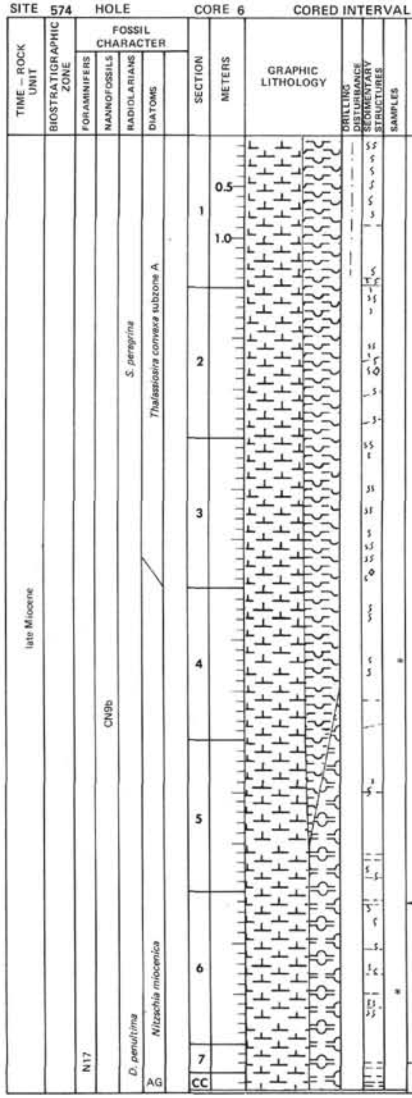
SMEAR SLIDE SUMMARY (%):

	2, 63	4, 65	6, 120
Texture:			
Sand	35	45	15
Silt	55	40	15
Clay	10	15	70
Composition:			
Volcanic glass	–	Tr	–
Carbonate unspec.	38	35	37
Foraminifers	1	Tr	5
Calc. nannofossils	5	5	35
Diatoms	30	25	15
Radiolarians	25	35	8
Sponge spicules	Tr	Tr	Tr
Fe-oxides	1	–	–

CARBONATE BOMB:
2, 60 cm = 31%
3, 75 cm = 36%
4, 75 cm = 13%
5, 75 cm = 19%
6, 75 cm = 45%

NOTE: Graphic lithologies represent average compositions derived from smear slides and do not always reflect the detailed alternation of sediment types. Major lithologic boundaries are shown but gradational contacts, small-scale cyclicity and ooze-chalk alternations are represented schematically. Color changes approximate to lithologic changes.

SITE 574 HOLE CORE 6 CORED INTERVAL 42.5–52.0 m



LITHOLOGIC DESCRIPTION

10YR 8/4 and 8/2
10YR 7/1 and 8/2
10YR 6/2
10YR 8/2
10YR 8/4
10YR 8/2
10YR 8/2–8/4
5GY 7/1
5BG 9/1
N9–5BG 8/1–9/1
5Y 7/2 and 5G 8/1
5G 8/1
5G 9/1
5P 7/2
N9
5G 9/1
N9
5G 8/1
N9
5B 9/1 and N9

UPPER BROWN OOZE (SUBUNIT IA) (0.0–5.6 m): diatom nanno ooze.

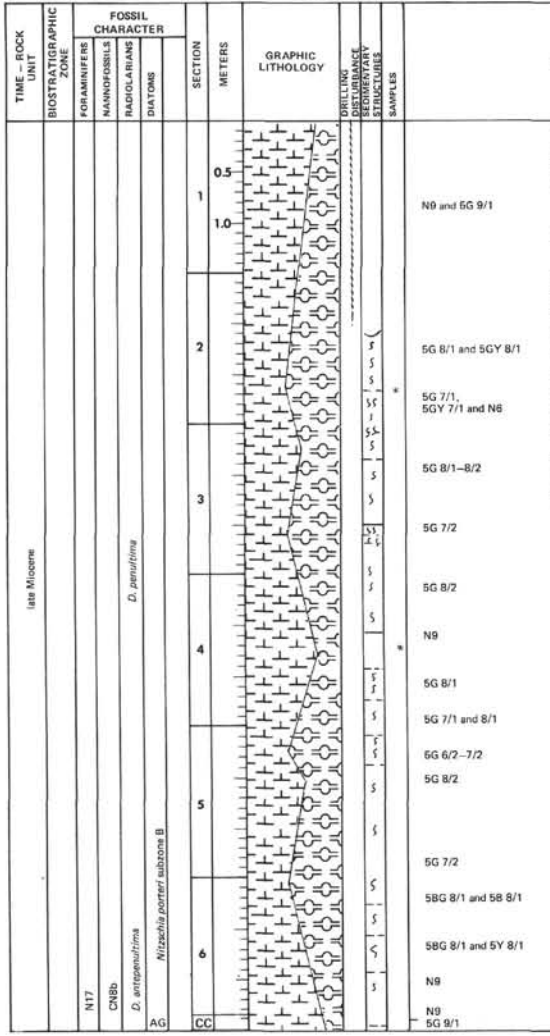
GREEN GRAY OOZE (SUBUNIT IB) (5.6–9.5 m): About 1.5 m of dominantly blue-green white (N9–9/1) diatom nanno ooze overlying interbedded white (N9) and green white (5G 8/1–9/1) diatom rad nanno oozes mottled indistinctly.

SMEAR SLIDE SUMMARY (%):

	4, 70	6, 100
Texture:		
Sand	10	30
Silt	45	15
Clay	45	55
Composition:		
Foraminifers	3	5
Calc. nannofossils	60	65
Diatoms	30	10
Radiolarians	7	20
Sponge spicules	Tr	Tr
Silicoflagellates	Tr	Tr

CARBONATE BOMB:
1, 75 cm = 61%
2, 75 cm = 54%
3, 75 cm = 53%
4, 75 cm = 47%
5, 75 cm = 80%
6, 75 cm = 83%

SITE 574 HOLE CORE 7 CORED INTERVAL 52.0–61.0 m



LITHOLOGIC DESCRIPTION

GREEN GRAY OOZE (SUBUNIT IB):

Dominantly very pale green (5G 7/1–9/1 and 8/2) and pale green gray (5G 6/2–7/2) nanno diatom rad oozes interbedded with lesser amounts of white (N9) diatom rad nanno ooze. Mottled throughout.

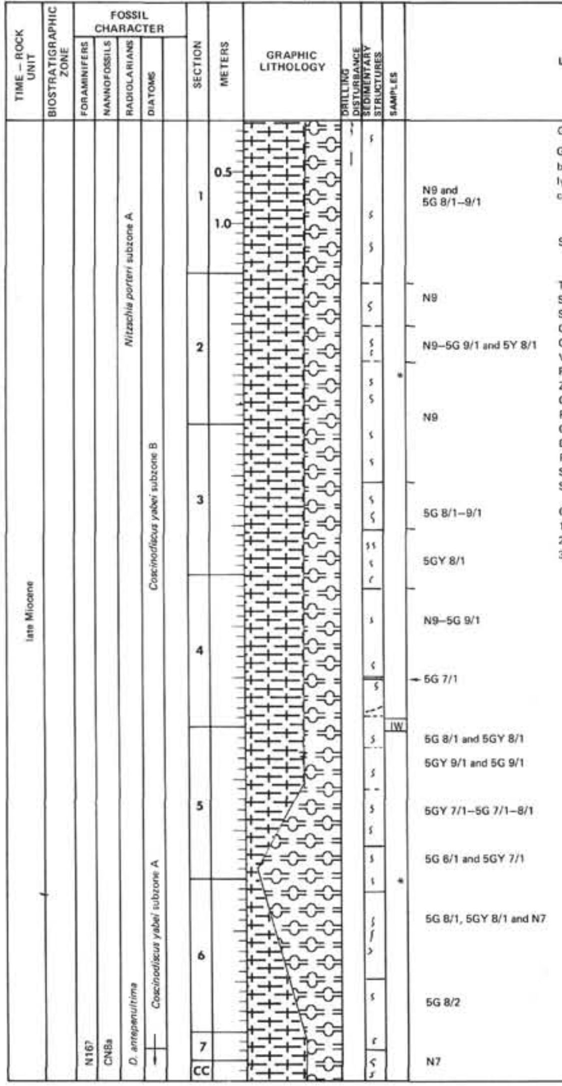
SMEAR SLIDE SUMMARY (%):

	2, 115	4, 75
Texture:		
Sand	20	15
Silt	45	40
Clay	35	45
Composition:		
Carbonate unspec.	15	20
Foraminifers	5	5
Calc. nannofossils	25	50
Diatoms	25	10
Radiolarians	30	15
Sponge spicules	Tr	Tr
Silicoflagellates	Tr	–

CARBONATE BOMB:

1, 75 cm = 86%	4, 75 cm = 88%
2, 75 cm = 70%	5, 75 cm = 59%
3, 75 cm = 74%	6, 75 cm = 67%

SITE 574 HOLE CORE 8 CORED INTERVAL 61.0–70.5 m



LITHOLOGIC DESCRIPTION

GREEN GRAY OOZE (SUBUNIT IB):

Green white (5G 8/1–9/1) rad diatom nanno ooze interbedded with white (N9) ooze in the upper 4 m and overlying light green gray (5G 8/1–8/1 and 5GY 7/1–8/1) calcareous diatom rad ooze. Mottled throughout.

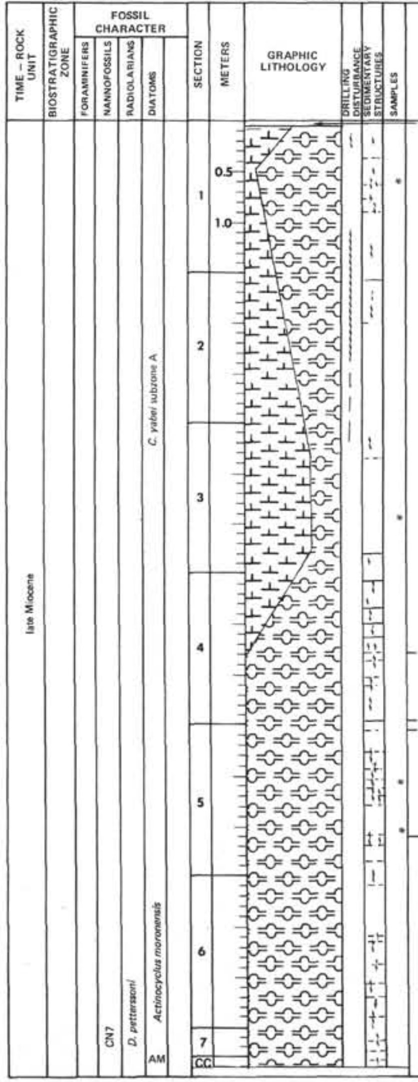
SMEAR SLIDE SUMMARY (%):

	2, 100	6, 5
Texture:		
Sand	15	30
Silt	40	60
Clay	45	10
Composition:		
Volcanic glass	–	Tr
Pyrite	–	Tr
Zeolite	–	1
Carbonate unspec.	10	10
Foraminifers	3	–
Calc. nannofossils	50	5
Diatoms	25	40
Radiolarians	10	45
Sponge spicules	–	Tr
Silicoflagellates	2	Tr

CARBONATE BOMB:

1, 75 cm = 85%	4, 75 cm = 81%
2, 75 cm = 83%	5, 75 cm = 66%
3, 75 cm = 84%	6, 75 cm = 52%

SITE 574 HOLE CORE 9 CORED INTERVAL 70.5–80.0 m



LITHOLOGIC DESCRIPTION

GREEN GRAY OOZE (SUBUNIT IB) (0.0–5.3 m):

Upper 5.3 m of interbedded intervals of mottled green white (5G 8/1–9/1) diatom rad nanno ooze and light green gray (5G 7/1–7/2) to green gray (5G 6/1–6/2) nanno diatom rad oozes.

LOWER BROWN OOZE (SUBUNIT IC) (5.3–9.5 m): Transitional over 80 cm to a section of interbedded intervals of medium to very pale shades of highly mottled yellowish brown gray (2.5Y 4/2–8/2) to yellowish brown (2.5Y 5/4–9/4) diatom rad oozes.

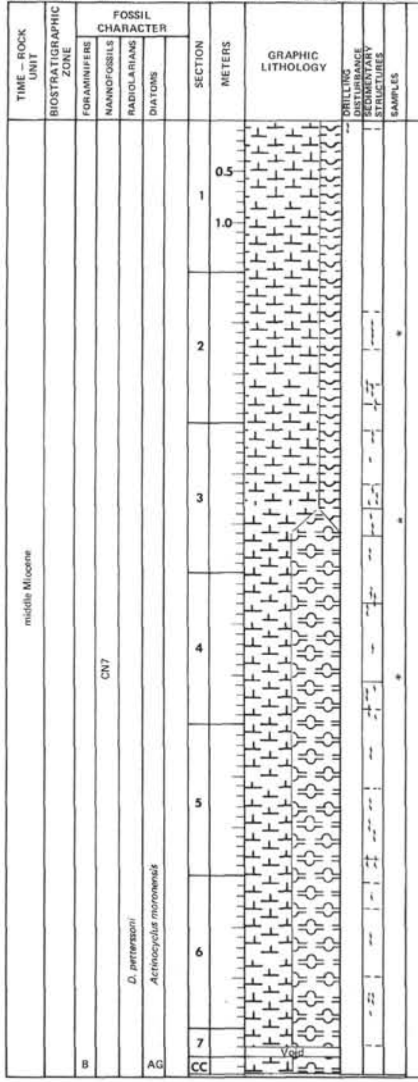
SMEAR SLIDE SUMMARY (%):

	1, 60	3, 75	5, 60	5, 103
Texture:				
Sand	30	15	35	35
Silt	60	30	60	55
Clay	10	55	5	10
Composition:				
Volcanic glass	–	–	Tr	–
Pyrite	–	–	–	5
Carbonate unspec.	5	–	1	Tr
Calc. nannofossils	10	70	Tr	Tr
Diatoms	35	15	47	40
Radiolarians	50	15	50	40
Sponge spicules	1	Tr	1	1
Silicoflagellates	Tr	Tr	Tr	1
Fe-oxides	–	–	–	10

CARBONATE BOMB:

1, 75 cm = 24%
2, 75 cm = 63%
3, 75 cm = 73%
4, 75 cm = 15%
5, 75 cm = 4%
6, 75 cm = 48%

SITE 574 HOLE CORE 10 CORED INTERVAL 80.0–89.5 m



LITHOLOGIC DESCRIPTION

LOWER BROWN OOZE (SUBUNIT IC) (0.0–4.1 m):

Mottled upper section of 3.8 m of interbedded very pale yellowish brown gray (2.5Y 8/2–9/2) and light to very pale yellowish brown (2.5Y 6/4–7/4) diatom nanno ooze. Transitional over about 30 cm to underlying sediments.

GREEN WHITE OOZE/CHALK (SUBUNIT IIA) (4.1–9.5 m):

Mottled very pale green gray (5GY 7/1–9/1) diatom rad nanno ooze underlain by very pale blue (5B 7/1–8/1) and very pale blue-green gray (5BG 7/1–8/1) oozes.

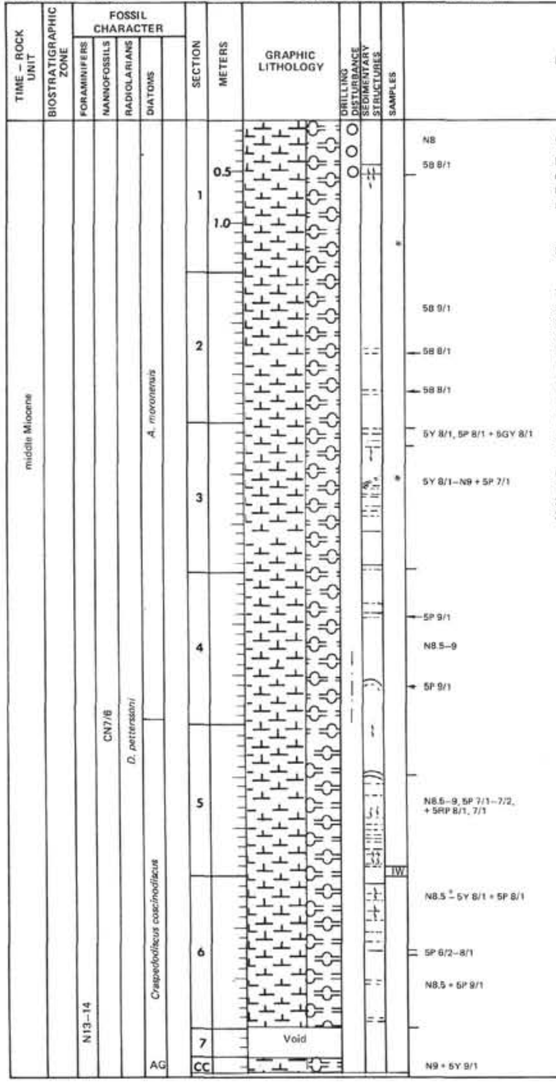
SMEAR SLIDE SUMMARY (%):

	2, 60	3, 96	4, 103
Texture:			
Sand	5	25	30
Silt	50	50	45
Clay	45	25	25
Composition:			
Calc. nannofossils	80	30	50
Diatoms	15	40	20
Radiolarians	5	30	30
Sponge spicules	Tr	Tr	Tr
Silicoflagellates	Tr	Tr	Tr
Fe-oxides	–	Tr	–

CARBONATE BOMB:

1, 75 cm = 73%
2, 75 cm = 79%
3, 75 cm = 33%
4, 75 cm = 79%
5, 75 cm = 80%
6, 75 cm = 76%

SITE 574 HOLE CORE 11 CORED INTERVAL 89.5–98.6 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Dominantly white (N8–9) to blue white (5B 9/1) rad diatom nanno to diatom nanno oozes with 10 to 100 cm banded intervals containing very pale purple (5P 7/1–9/1) and minor very pale yellow (5Y 8/1–9/1) oozes.

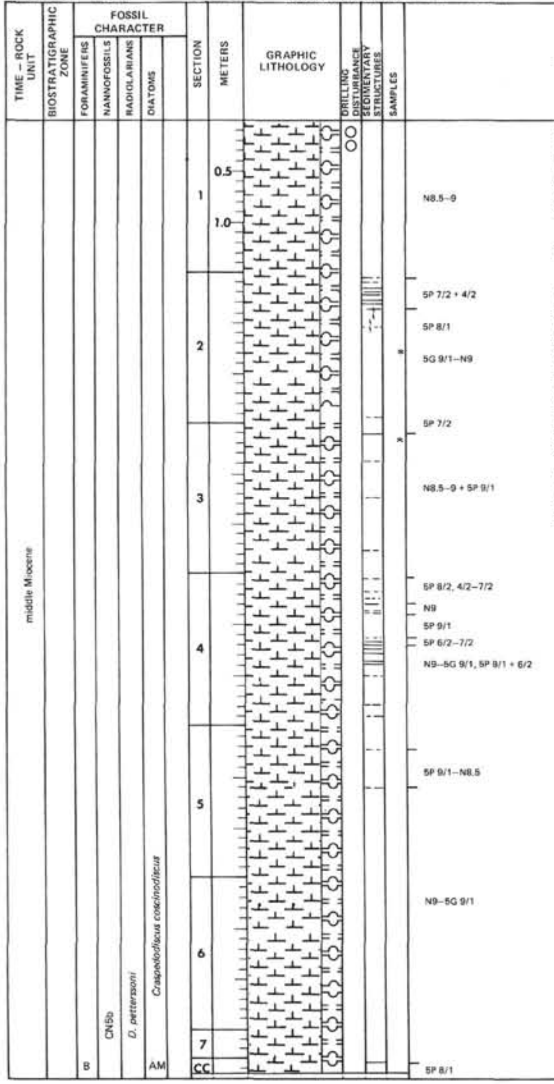
SMEAR SLIDE SUMMARY (%):

	1, 120	3, 53
Texture:		
Sand	15	5
Silt	40	40
Clay	45	55
Composition:		
Pyrite	Tr	–
Foraminifers	2	1
Calc. nannofossils	68	64
Diatoms	15	30
Radiolarians	15	5
Sponge spicules	Tr	Tr
Silicoflagellates	Tr	1

CARBONATE BOMB:

1, 75 cm = 77% 4, 75 cm = 94%
2, 75 cm = 78% 5, 75 cm = 90%
3, 75 cm = 79% 6, 75 cm = 90%

SITE 574 HOLE CORE 12 CORED INTERVAL 98.6–108.1 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Dominantly white (N8.5–9) to green white (5G 8/1–9/1) and purple white (5P 8/1–9/1) rad diatom nanno oozes containing 10 to 30 cm intervals laminated or banded with very pale purple very gray (5P 7/2–8/2) to grayish purple (5P 4/2–6/2).

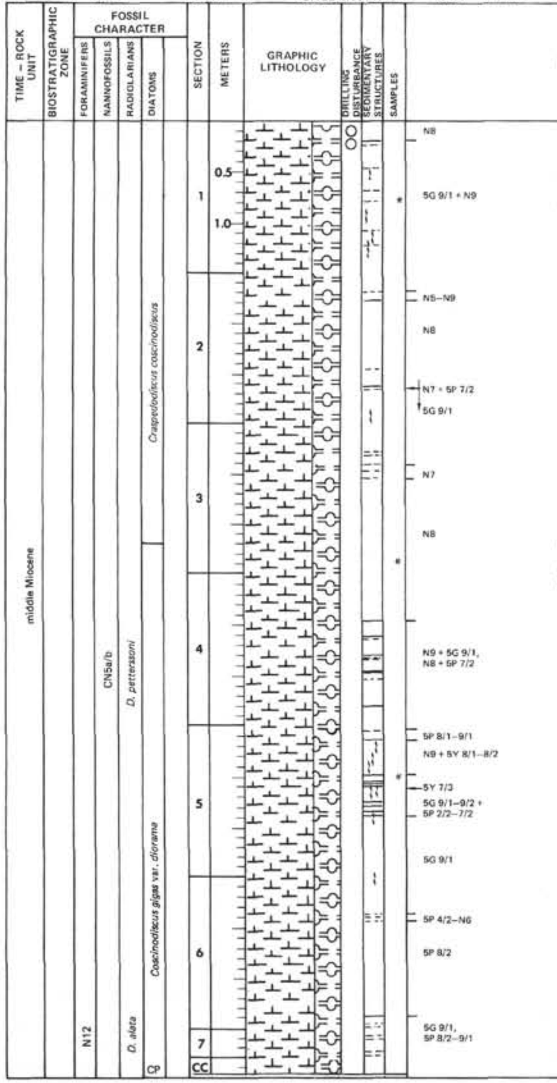
SMEAR SLIDE SUMMARY (%):

	2, 80	3, 20
Texture:		
Sand	15	15
Silt	40	40
Clay	45	45
Composition:		
Carbonate unspec.	–	5
Foraminifers	Tr	1
Calc. nannofossils	80	69
Diatoms	10	15
Radiolarians	10	10
Sponge spicules	Tr	–
Silicoflagellates	Tr	Tr

CARBONATE BOMB:

1, 75 cm = 89% 4, 75 cm = 89%
2, 75 cm = 90% 5, 75 cm = 90%
3, 75 cm = 87% 6, 75 cm = 90%

SITE 574 HOLE CORE 13 CORED INTERVAL 108.1–117.6 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Dominantly white (N8–9) to green white (5G 9/1) rad diatom nanno oozes containing 10 to 40 cm intervals laminated or banded with grayish purple (5P 4/2–6/2), very pale purple gray (5P 7/2–8/2), and purple white (5P 8/1–9/1). Minor mottling.

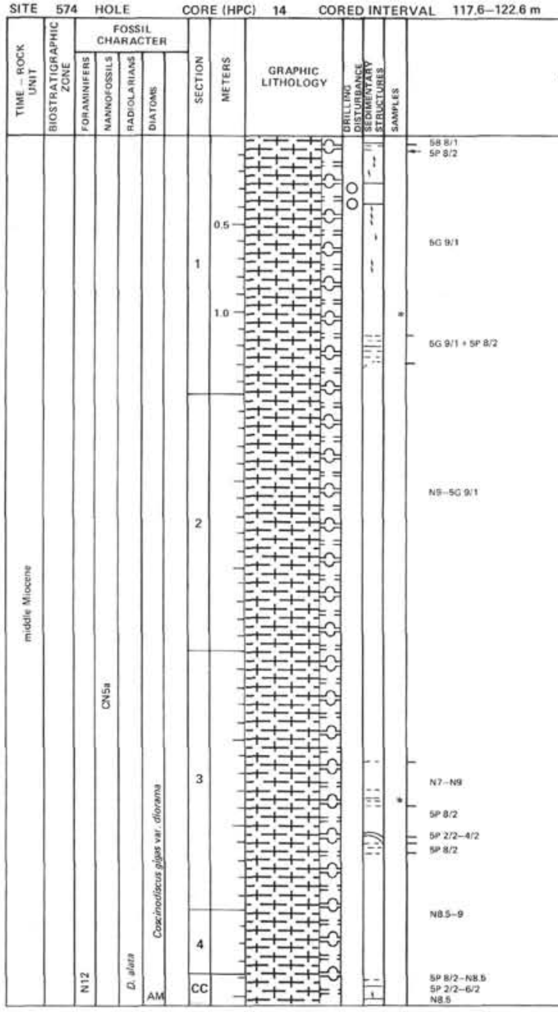
SMEAR SLIDE SUMMARY (%):

	1, 80	3, 140	5, 54 M
Texture:			
Sand	15	15	2
Silt	40	45	78
Clay	45	40	20
Composition:			
Clay	–	–	1
Volcanic glass	–	–	Tr
Pyrite	Tr	–	–
Carbonate unspec.	5	–	–
Foraminifers	1	Tr	Tr
Calc. nannofossils	69	70	20
Diatoms	15	20	74
Radiolarians	10	10	5
Sponge spicules	–	Tr	–
Silicoflagellates	Tr	Tr	Tr
Fe-oxides	–	–	Tr

CARBONATE BOMB:

1, 75 cm = 90%
2, 75 cm = 87%
3, 75 cm = 88%
4, 75 cm = 86%
5, 75 cm = 90%
6, 75 cm = 88%

SITE 574 HOLE CORE (HPC) 14 CORED INTERVAL 117.6–122.6 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

White (N8.5–9) to green white (5G 9/1) rad diatom foram nanno oozes containing a few 10 to 20 cm intervals laminated or banded with dusky purple (5P 2/2–4/2) to light purple gray (5P 6/2–8/2). Minor mottling.

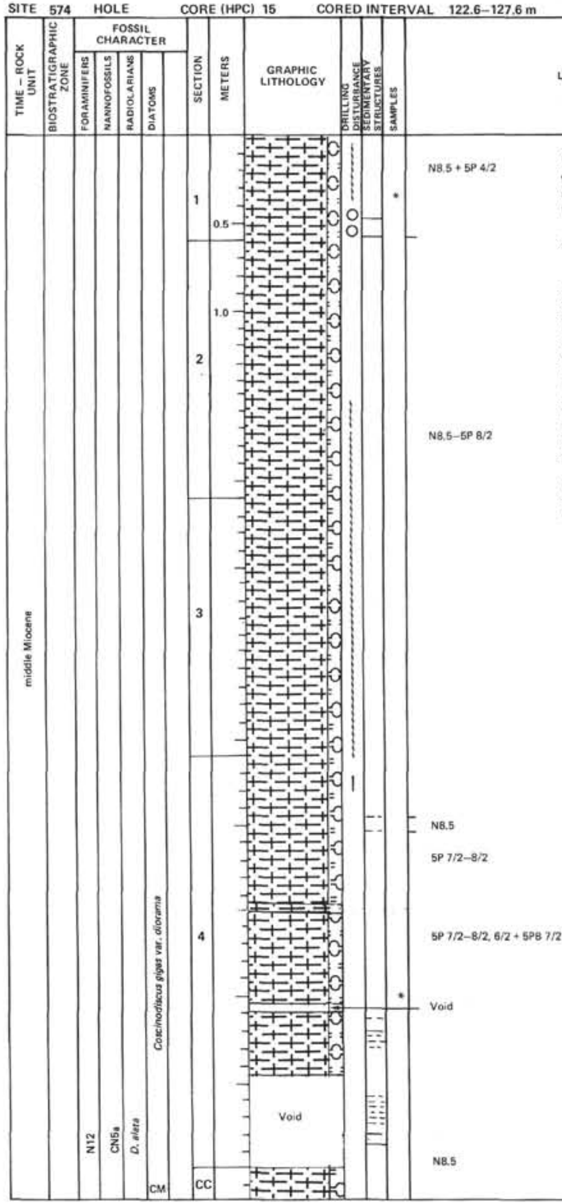
SMEAR SLIDE SUMMARY (%):

	1, 100	3, 84
Texture:		
Sand	20	35
Silt	40	30
Clay	40	35
Composition:		
Volcanic glass	–	Tr
Pyrite	–	5
Foraminifers	15	35
Calc. nannofossils	65	52
Diatoms	10	3
Radiolarians	10	5
Sponge spicules	Tr	Tr
Silicoflagellates	Tr	–

CARBONATE BOMB:

1, 75 cm = 96%
2, 75 cm = 91%
3, 75 cm = 92%

SITE 574 HOLE CORE (HPC) 15 CORED INTERVAL 122.6–127.6 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

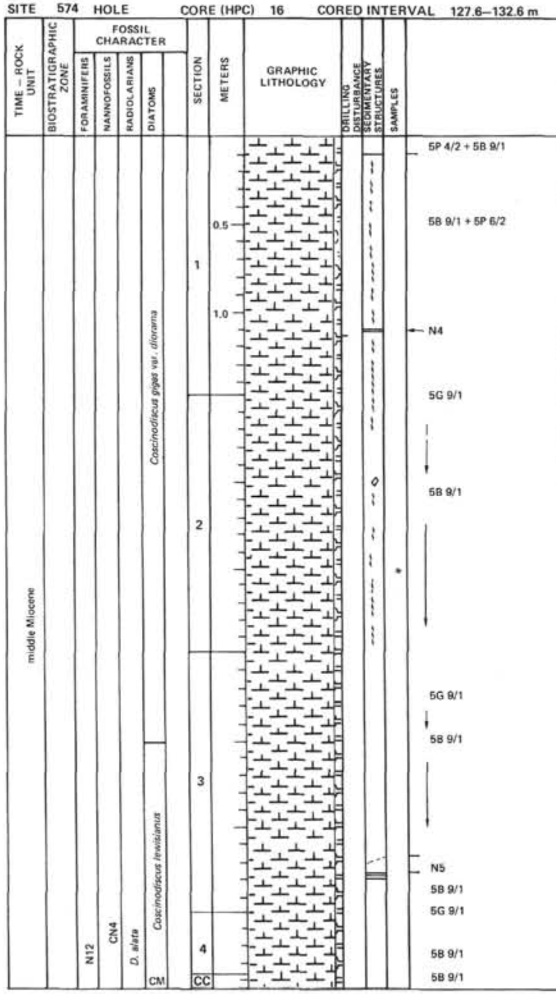
White (N8.5) and very pale purple (5P 7/2–8/2) rad foram nanno oozes with minor bands of light grayish purple (5P 4/2 and 6/2) foram rad diatom nanno ooze.

SMEAR SLIDE SUMMARY (%).

	1, 35	4, 50
Texture:		
Sand	25	15
Silt	15	40
Clay	60	45
Composition:		
Volcanic glass	Tr	–
Pyrite	Tr	–
Foraminifers	15	10
Calc. nannofossils	72	60
Diatoms	3	20
Radiolarians	10	10
Sponge spicules	–	Tr
Silicoflagellates	–	Tr

CARBONATE BOMB:
3, 75 cm = 96%
4, 75 cm = 93%

SITE 574 HOLE CORE (HPC) 16 CORED INTERVAL 127.6–132.6 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

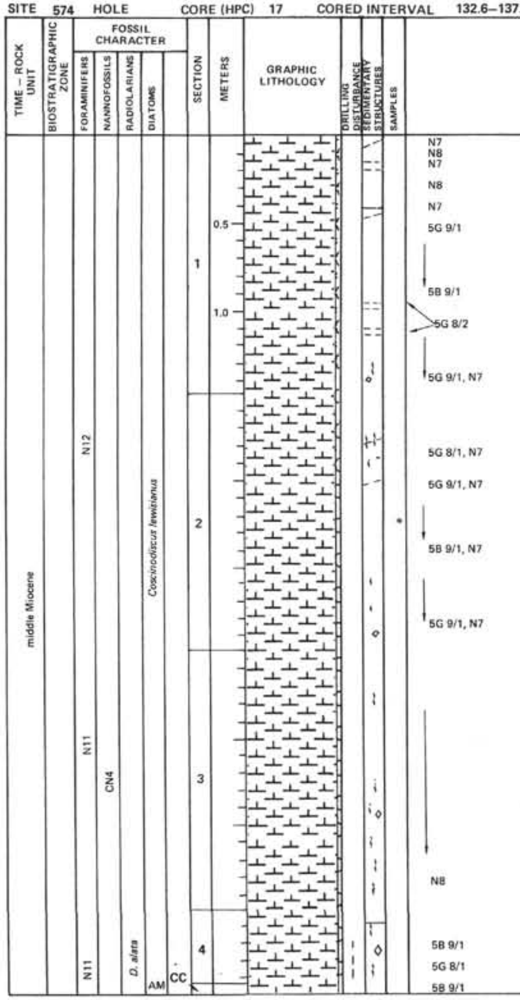
Dominantly blue white (5B 9/1) and green white (5G 9/1) nanno ooze with minor laminated bands of dark gray (N4 and N5). Subtle mottling in upper 3 meters with pale purple (5P 4/2 and 6/2).

SMEAR SLIDE SUMMARY (%):

	2, 100
Texture:	
Sand	7
Silt	3
Clay	90
Composition:	
Pyrite	Tr
Carbonate unspec.	2
Foraminifers	Tr
Calc. nannofossils	90
Diatoms	2
Radiolarians	6
Silicoflagellates	Tr

CARBONATE BOMB:
1, 75 cm = 92%
2, 75 cm = 89%
3, 75 cm = 93%

SITE 574 HOLE CORE (HPC) 17 CORED INTERVAL 132.6–137.6 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

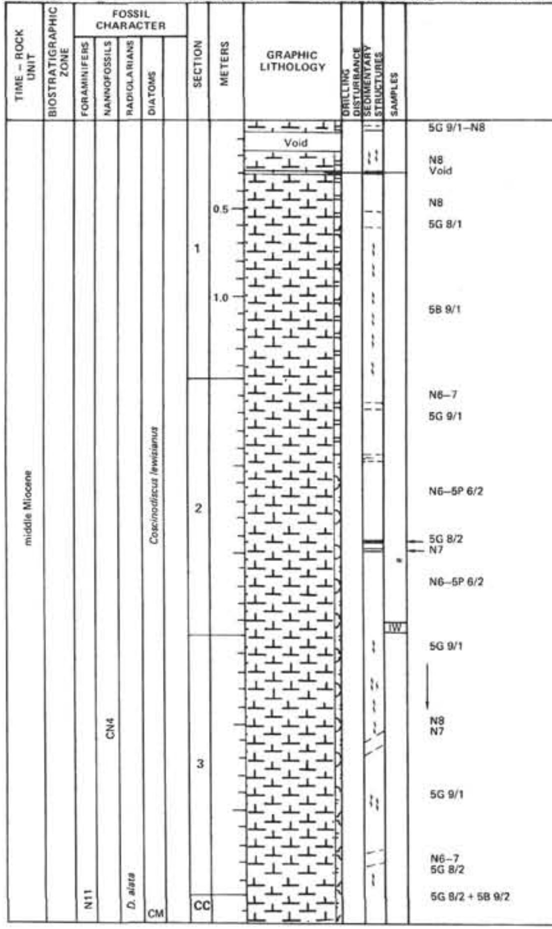
Dominantly intergrading blue white (5B 9/1) and green white (5G 9/1) nanno ooze mottled with pale gray (N7). Burrows also filled with pale gray.

SMEAR SLIDE SUMMARY (%):

	2, 74
Texture:	
Sand	5
Silt	5
Clay	90
Composition:	
Carbonate unspec.	3
Foraminifers	2
Calc. nannofossils	90
Diatoms	2
Radiolarians	3
Silicoflagellates	Tr

CARBONATE BOMB:
1, 75 cm = 92%
2, 75 cm = 93%
3, 75 cm = 88%

SITE 574 HOLE CORE (HPC) 18 CORED INTERVAL 137.6–142.6 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

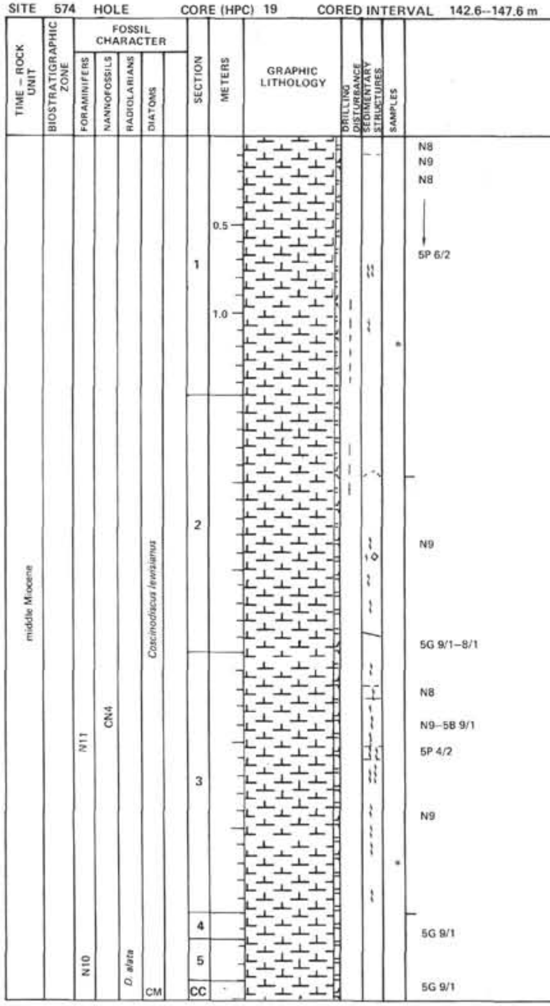
Dominantly green white (5G 9/1), with lesser amounts of blue white (5B 9/1), gray (N6–N8), and pale purple (5P 6/2) nanno oozes. Mottling and color changes subtle.

SMEAR SLIDE SUMMARY (%):

	2, 105
Texture:	
Sand	6
Silt	4
Clay	90
Composition:	
Pyrite	Tr
Carbonate unspec.	17
Foraminifers	1
Calc. nannofossils	75
Diatoms	2
Radiolarians	5
Silicoflagellates	Tr

CARBONATE BOMB:
1, 75 cm = 89%
2, 75 cm = 82%
3, 75 cm = 90%

SITE 574 HOLE CORE (HPC) 19 CORED INTERVAL 142.6–147.6 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Nanno oozes: 2 m of very pale purple (5P 6/2) underlain by white (N9) and green white (5G 9/1) which contain gray (N8), blue white (5B 9/1), and pale purple (5P 4/2) bands. Mottling subtle, usually of pale gray (N7).

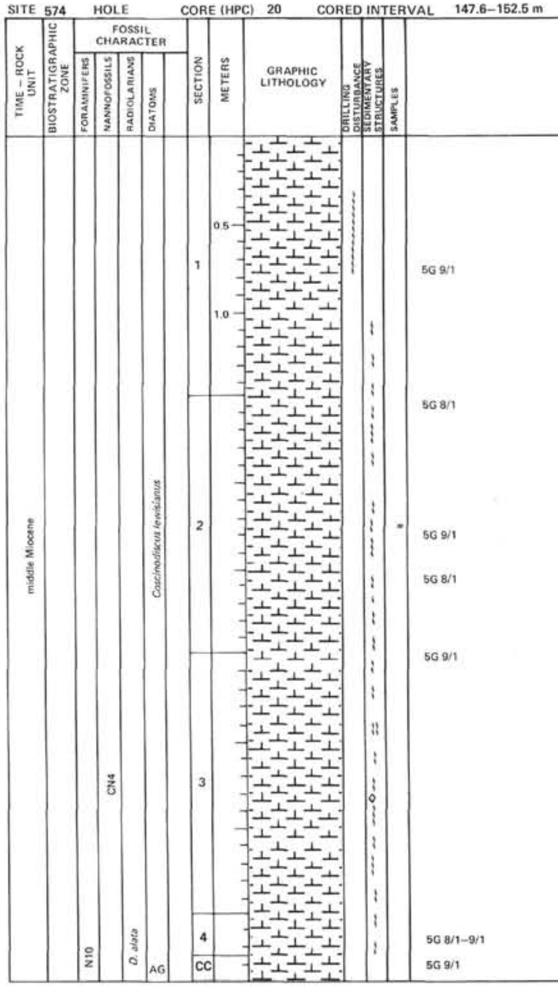
Note: Lower end of core liner broken during extraction from core barrel.

SMEAR SLIDE SUMMARY (%):

	1, 120	3, 120
Texture:		
Sand	4	4
Silt	6	6
Clay	90	90
Composition:		
Pyrite	Tr	—
Carbonate unspec.	25	40
Foraminifers	2	3
Calc. nannofossils	65	53
Diatoms	3	1
Radiolarians	5	3
Silicoflagellates	Tr	Tr

CARBONATE BOMB:
2, 75 cm = 93%
3, 75 cm = 82%

SITE 574 HOLE CORE (HPC) 20 CORED INTERVAL 147.6–152.5 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

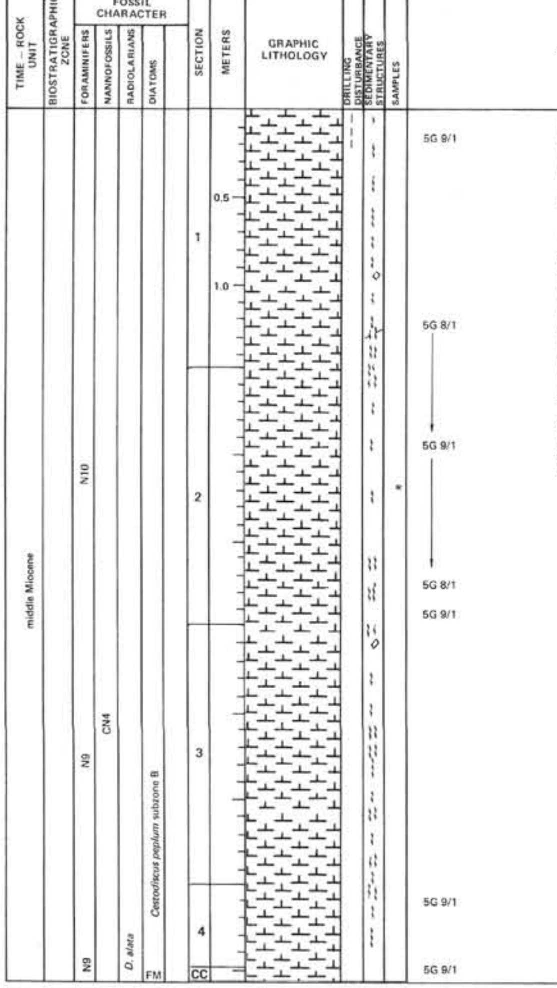
Fairly uniform green white (5G 8/1–9/1) nanno ooze mottled with very pale gray (N7).

SMEAR SLIDE SUMMARY (%):

	2, 75
Texture:	
Sand	3
Silt	2
Clay	95
Composition:	
Carbonate unspec.	11
Foraminifers	2
Calc. nannofossils	85
Diatoms	Tr
Radiolarians	2
Silicoflagellates	Tr

CARBONATE BOMB:
2, 75 cm = 92%
3, 75 cm = 86%

SITE 574 HOLE CORE (HPC) 21 CORED INTERVAL 152.5–157.5 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

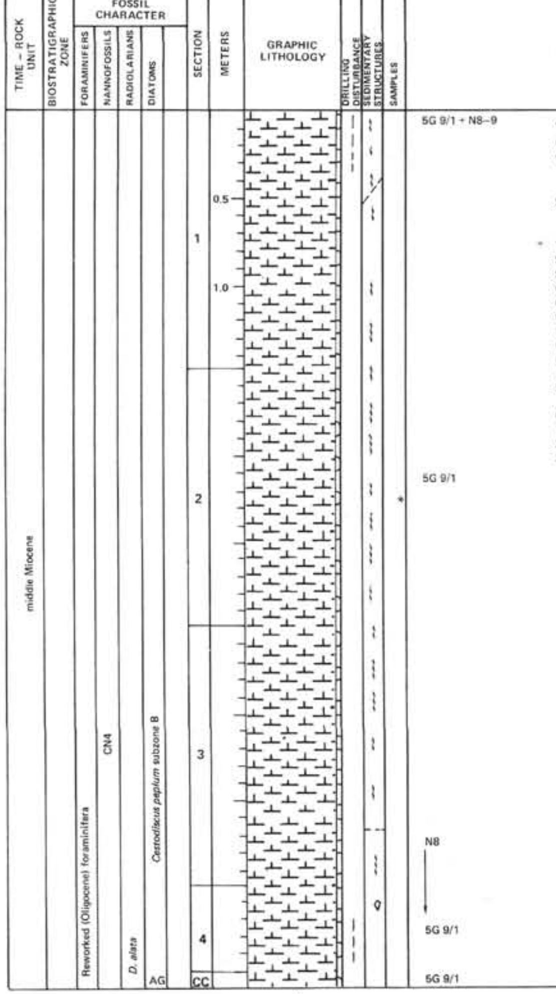
Green white (5G 8/1–9/1) nanno ooze mottled most obviously in the darker (5G 8/1) sections by the lighter (9/1) material.

SMEAR SLIDE SUMMARY (%):

	2, 70
Texture:	
Sand	2
Silt	2
Clay	96
Composition:	
Pyrite	Tr
Carbonate unspec.	33
Foraminifers	1
Calc. nannofossils	65
Diatoms	Tr
Radiolarians	1
Silicoflagellates	Tr

CARBONATE BOMB:
1, 75 cm = 86%
2, 75 cm = 95%
3,CC = 75%

SITE 574 HOLE CORE (HPC) 22 CORED INTERVAL 157.5–162.5 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

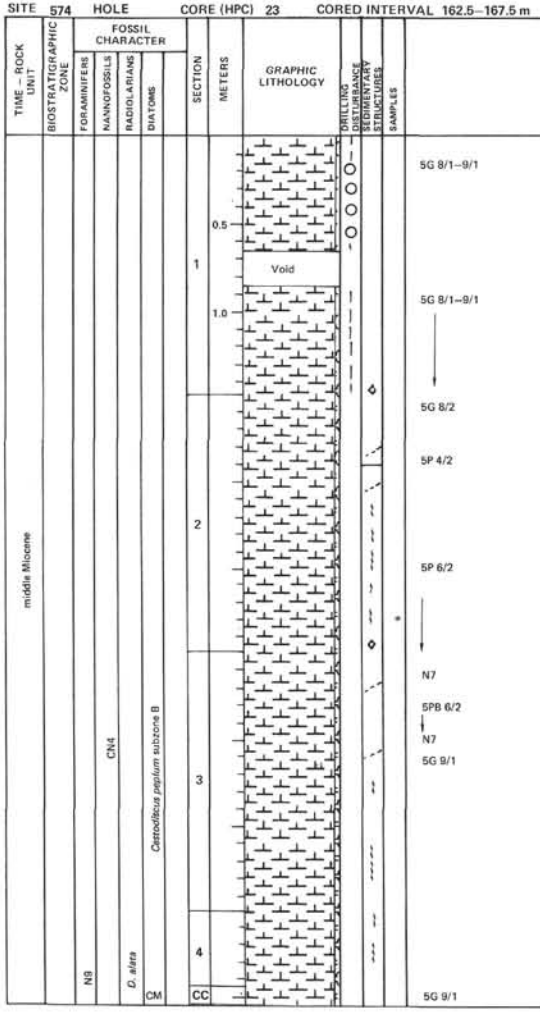
Green white (5G 9/1) nanno ooze very weakly mottled by very pale gray (N8–N9).

SMEAR SLIDE SUMMARY (%):

	2, 75
Texture:	
Sand	2
Silt	3
Clay	95
Composition:	
Carbonate unspec.	70
Foraminifers	2
Calc. nannofossils	25
Diatoms	2
Radiolarians	1
Silicoflagellates	Tr

CARBONATE BOMB:
1, 75 cm = 87%
2, 75 cm = 90%
3, 75 cm = 90%

SITE 574 HOLE CORE (HPC) 23 CORED INTERVAL 162.5–167.5 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

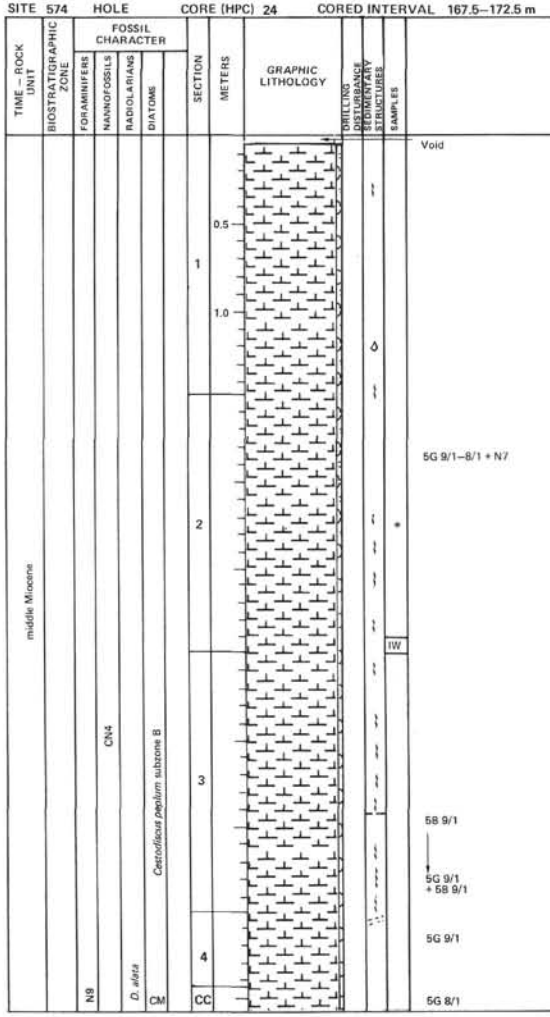
About 1.8 m of light purple (5P 4/2 and 6/2) to pale gray (N7) nanno ooze overlain by 1.6 m and underlain by 1.4 m of green white (5G 8/1–9/1) ooze of the same composition. Mottling apparent only below 2 m.

SMEAR SLIDE SUMMARY (%):

	2, 130
Texture:	
Sand	3
Silt	2
Clay	95
Composition:	
Pyrite	Tr
Carbonate unspec.	14
Foraminifers	2
Calc. nannofossils	80
Diatoms	1
Radiolarians	3
Silicoflagellates	Tr

CARBONATE BOMB:
2, 75 cm = 91%
3, 75 cm = 92%

SITE 574 HOLE CORE (HPC) 24 CORED INTERVAL 167.5–172.5 m



LITHOLOGIC DESCRIPTION

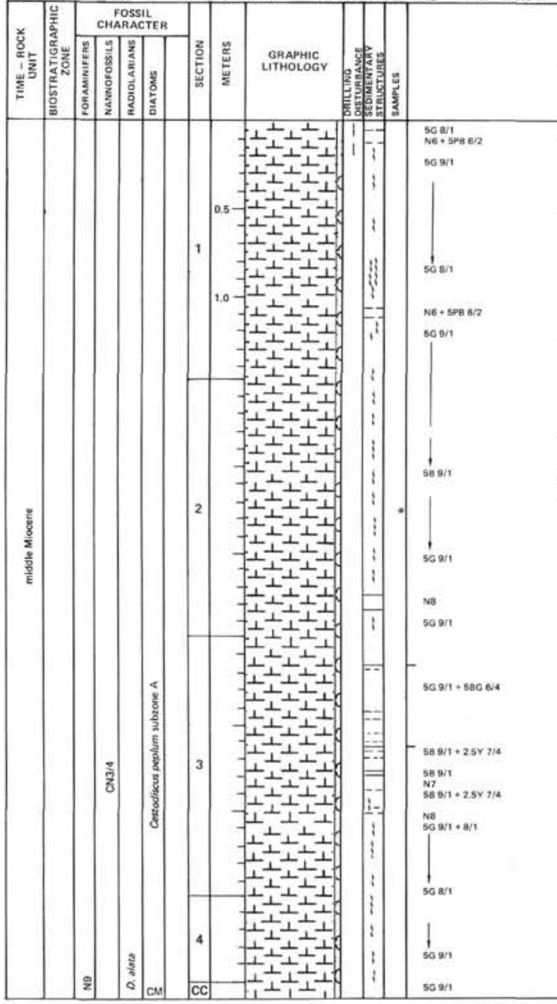
GREEN WHITE OOZE/CHALK (SUBUNIT IIA):
Dominantly green white (5G 9/1–8/1) nanno ooze with minor subtle pale gray (N7) streaking; minor blue white (5B 9/1) ooze from 3.9 to 4.6 m.

SMEAR SLIDE SUMMARY (%):

	2, 75
Texture:	
Sand	8
Silt	2
Clay	90
Composition:	
Pyrite	Tr
Carbonate unspec.	75
Foraminifers	5
Calc. nannofossils	13
Diatoms	2
Radiolarians	5
Sponge spicules	Tr
Silicoflagellates	Tr

CARBONATE BOMB:
1, 75 cm = 88%
2, 75 cm = 90%
3, 75 cm = 90%

SITE 574 HOLE CORE (HPC) 25 CORED INTERVAL 172.5–177.5 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

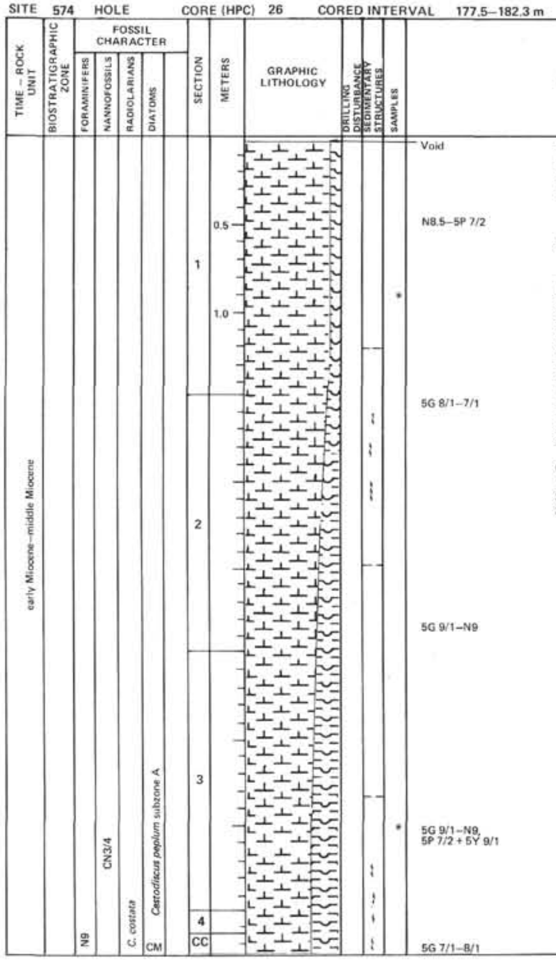
Dominantly green white (5G 8/1–9/1) nanno ooze with lesser amounts of blue white (5B 9/1), and minor light gray (N6–N8), pale yellow (2.5Y 7/4) and blue green (5BG 6/4) oozes from 3.1 to 4 m. Mottled in the green white sections.

SMEAR SLIDE SUMMARY (%):

	2, 75
Texture:	
Sand	7
Silt	3
Clay	90
Composition:	
Pyrite	Tr
Carbonate unspec.	70
Foraminifers	2
Calc. nannofossils	21
Diatoms	2
Radiolarians	5
Silicoflagellates	Tr

CARBONATE BOMB:
1, 75 cm = 81%
2, 75 cm = 95%
3, 75 cm = 82%

SITE 574 HOLE CORE (HPC) 26 CORED INTERVAL 177.5–182.3 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

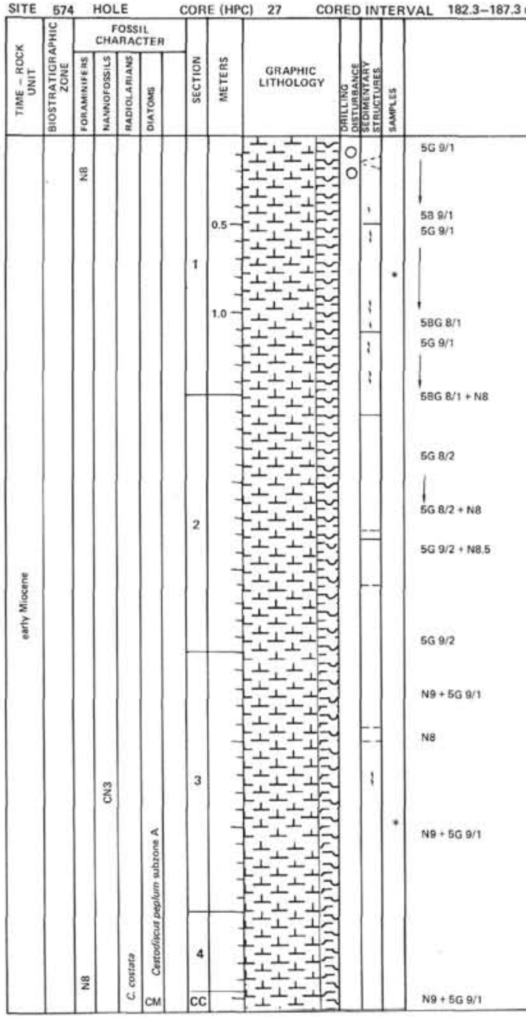
0.9 to 1.3 m intergrading intervals of green white (5G 9/1–N9) to very pale green (5G 7/1–8/1) and very pale purple (5P 7/2) nanno to rad diatom nanno oozes.

SMEAR SLIDE SUMMARY (%):

	1, 90	3, 100
Texture:		
Sand	15	30
Silt	30	35
Clay	55	35
Composition:		
Pyrite	Tr	–
Foraminifers	10	10
Calc. nannofossils	80	60
Diatoms	5	20
Radiolarians	5	10
Sponge spicules	Tr	Tr
Silicoflagellates	Tr	–

CARBONATE BOMB:
1, 75 cm = 89%
2, 75 cm = 87%
3, 75 cm = 87%

SITE 574 HOLE CORE (HPC) 27 CORED INTERVAL 182.3–187.3 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

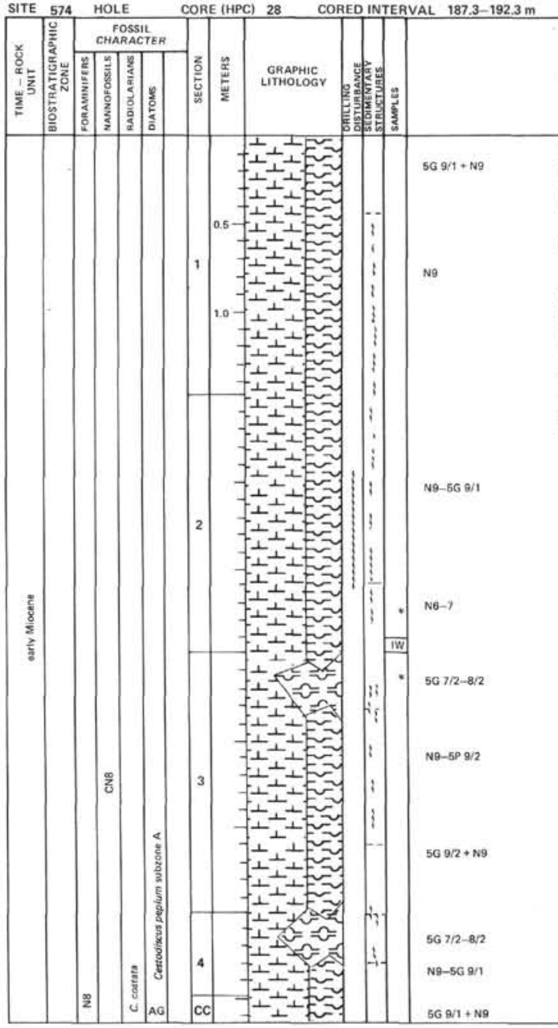
Dominantly green white (5G 9/1) diatom nanno and rad diatom nanno oozes, often grading into very pale shades of blue gray (5BG 8/1) or green gray (5G 8/2–9/2).

SMEAR SLIDE SUMMARY (%):

	1, 80	3, 100
Texture:		
Sand	15	25
Silt	40	35
Clay	45	40
Composition:		
Volcanic glass	Tr	–
Foraminifers	10	5
Calc. nannofossils	75	70
Diatoms	15	15
Radiolarians	5	10
Sponge spicules	–	Tr
Silicoflagellates	–	Tr

CARBONATE BOMB:
1, 75 cm = 95%
2, 75 cm = 73%
3, 75 cm = 85%

SITE 574 HOLE CORE (HPC) 28 CORED INTERVAL 187.3–192.3 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

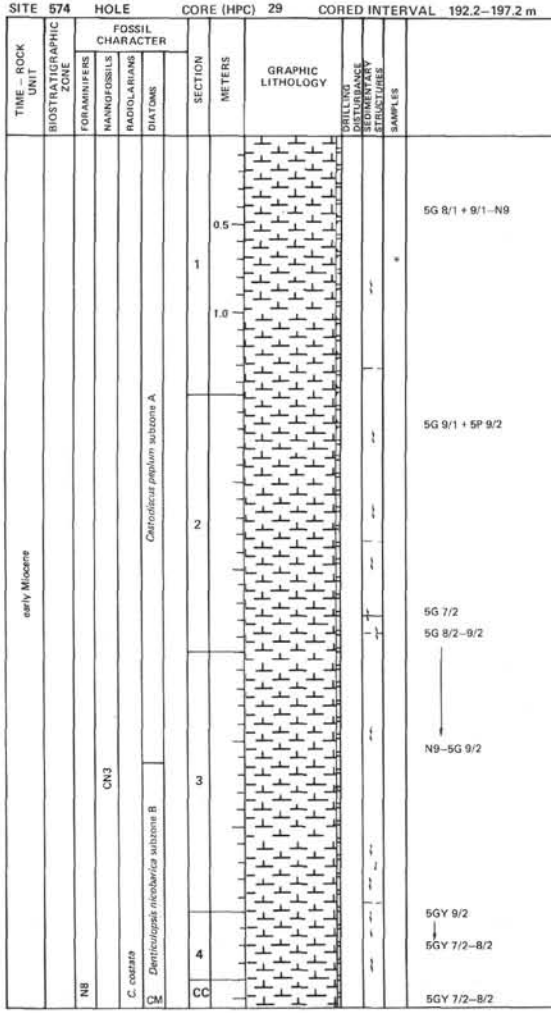
Dominantly white (N9) to green white (5G 9/1) and pale gray (N6–7) diatom nanno oozes interbedded with two 30 cm intervals of pale green gray (5G 7/2–8/2) diatom nanno rad ooze. Mottling common.

SMEAR SLIDE SUMMARY (%):

	2, 125	3, 15
Texture:		
Sand	10	40
Silt	40	35
Clay	50	25
Composition:		
Foraminifers	4	1
Calc. nannofossils	64	30
Diatoms	25	18
Radiolarians	8	50
Sponge spicules	Tr	1
Silicoflagellates	Tr	Tr

CARBONATE BOMB:
1, 75 cm = 89%
2, 75 cm = 87%
3, 75 cm = 89%

SITE 574 HOLE CORE (HPC) 29 CORED INTERVAL 192.2–197.2 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

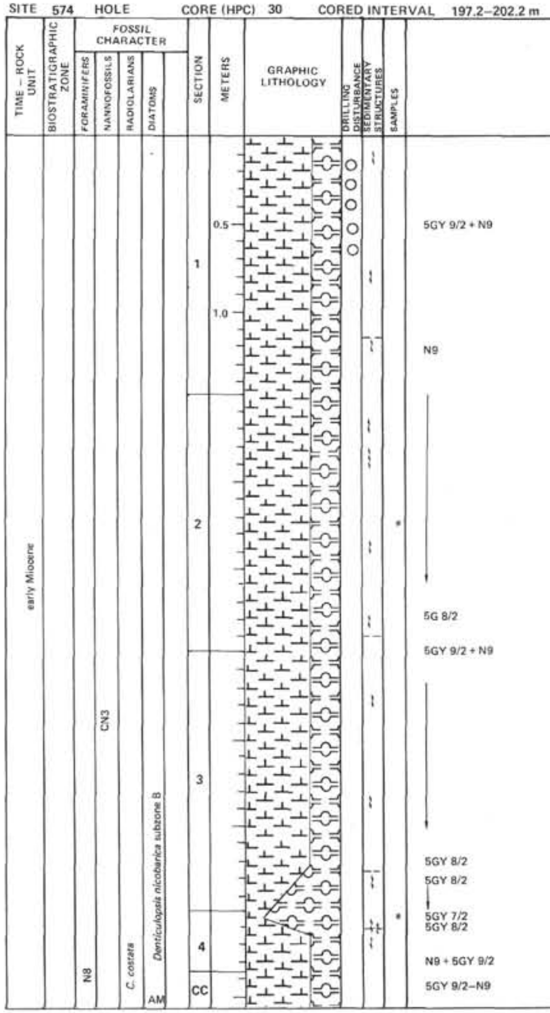
Green white (5G 8/1–9/1) to pale green gray (5G 7/2–9/2 and 5GY 7/2–9/2) nanno oozes. Minor mottling.

SMEAR SLIDE SUMMARY (%):

	1, 70
Texture:	
Sand	5
Silt	40
Clay	55
Composition:	
Volcanic glass	Tr
Foraminifers	5
Calc. nannofossils	91
Diatoms	1
Radiolarians	3
Sponge spicules	Tr

CARBONATE BOMB:
1, 75 cm = 86%
2, 75 cm = 90%
3, 75 cm = 91%

SITE 574 HOLE CORE (HPC) 30 CORED INTERVAL 197.2–202.2 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

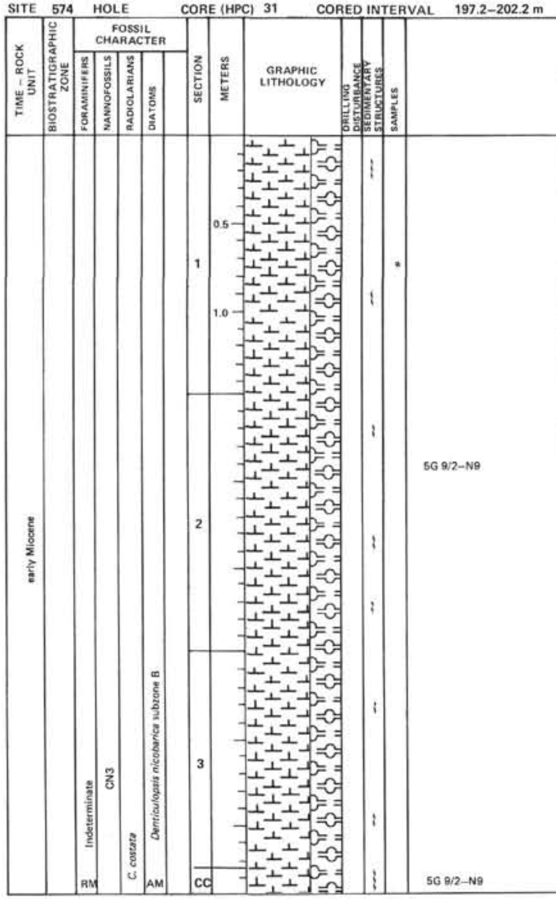
White (N9) to pale green gray (5GY 8/2–9/2) rad diatom nanno to diatom nanno oozes with one 40 cm interval grading to light green gray (5GY 7/1) diatom nanno rad ooze. Slight mottling throughout.

SMEAR SLIDE SUMMARY (%):

	2, 75	4, 5
Texture:		
Sand	20	40
Silt	45	50
Clay	35	10
Composition:		
Carbonate unspec.	–	5
Foraminifers	10	–
Calc. nannofossils	60	15
Diatoms	20	10
Radiolarians	10	70
Sponge spicules	–	Tr

CARBONATE BOMB:
2, 75 cm = 81%
3, 75 cm = 89%

SITE 574 HOLE CORE (HPC) 31 CORED INTERVAL 197.2–202.2 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Uniform very pale green gray (5G 9/2–N9) rad diatom nanno ooze with minor mottling.

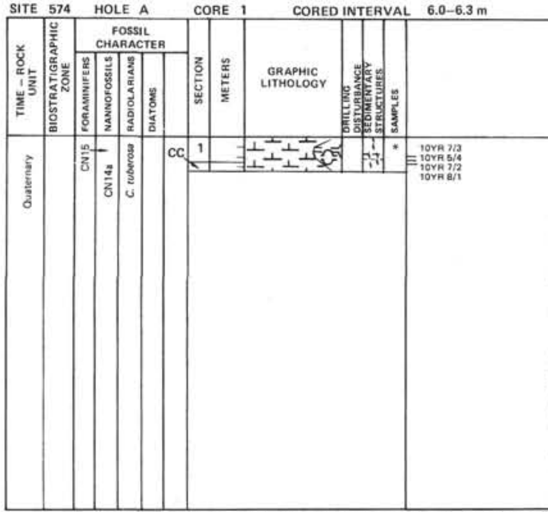
SMEAR SLIDE SUMMARY (%):

	1, 75
Texture:	
Sand	20
Silt	40
Clay	40
Composition:	
Pyrite	Tr
Calc. nannofossils	70
Diatoms	20
Radiolarians	10

CARBONATE BOMB:

1, 75 cm = 78%
2, 75 cm = 61%
3, 75 cm = 84%

SITE 574 HOLE A CORE 1 CORED INTERVAL 6.0–6.3 m



LITHOLOGIC DESCRIPTION

UPPER BROWN OOZE (SUBUNIT IA):

Yellowish brown (10YR 5/4) and pale brown gray (10YR 7/2–7/3) foram nanno ooze.

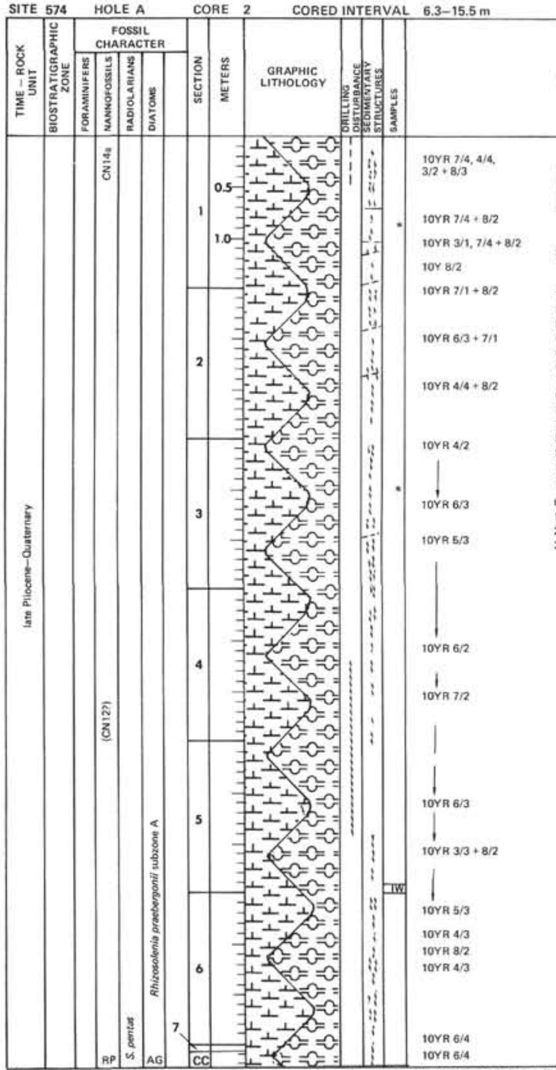
Note: Due to the apparent lack of correlation between the observed variation in sediment color and composition in the variegated brown oozes of the uppermost section, the graphic lithology of the next 5 cores is a stylized representation of the inferred continuous compositional variation in those sediments.

SMEAR SLIDE SUMMARY (%):

	1, 10
Texture:	
Sand	15
Silt	25
Clay	60
Composition:	
Pyrite	5
Foraminifers	15
Calc. nannofossils	65
Diatoms	5
Radiolarians	5
Fe-oxides	5

NOTE: Graphic lithologies represent average compositions derived from smear slides and do not always reflect the detailed alternation of sediment types. Major lithologic boundaries are shown but gradational contacts, small-scale cyclicity and ooze-chalk alternations are represented schematically. Color changes approximate to lithologic changes.

SITE 574 HOLE A CORE 2 CORED INTERVAL 6.3–15.5 m



LITHOLOGIC DESCRIPTION

UPPER BROWN OOZE (SUBUNIT IA):

Alternating intervals of highly mottled very pale brown (10YR 7/1–7/4 and 8/2–8/4), brownish gray (10YR 6/2–6/4), and dark brown (10YR 3/3–5/3) calcareous rad to diatom rad foram oozes.

SMEAR SLIDE SUMMARY (%):

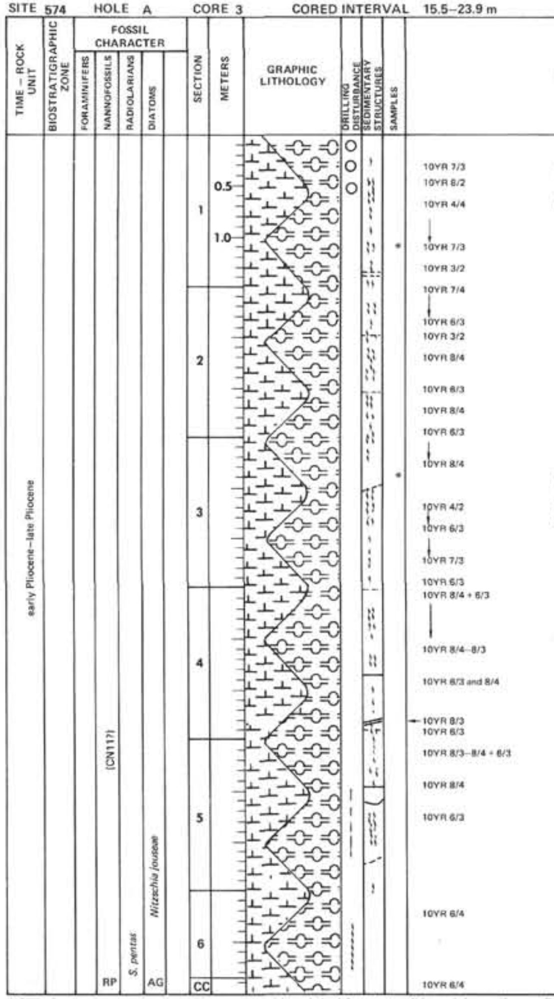
	1, 90	3, 50
Texture:		
Sand	65	45
Silt	20	40
Clay	15	15
Composition:		
Carbonate unspec.	26	42
Foraminifers	8	25
Calc. nannofossils	9	2
Diatoms	9	12
Radiolarians	45	18
Sponge spicules	1	–
Silicoflagellates	2	Tr
Fish remains	Tr	–
Fe-oxides	–	1

CARBONATE BOMB:

1, 75 cm = 60%
2, 75 cm = 73%
3, 75 cm = 45%
4, 75 cm = 77%
5, 75 cm = 72%
6, 75 cm = 55%

NOTE: Graphic lithologies represent average compositions derived from smear slides and do not always reflect the detailed alternation of sediment types. Major lithologic boundaries are shown but gradational contacts, small-scale cyclicity and ooze-chalk alternations are represented schematically. Color changes approximate to lithologic changes.

SITE 574 HOLE A CORE 3 CORED INTERVAL 15.5–23.9 m



LITHOLOGIC DESCRIPTION

UPPER BROWN OOZE (SUBUNIT IA):

Alternating intervals of highly mottled very pale brown (10YR 7/3–7/4 and 8/3–8/4), light brown (10YR 6/3–6/4) and dark brown (10YR 3/2, 4/2 and 4/4) rad nanno to calcareous diatom rad oozes.

SMEAR SLIDE SUMMARY (%):

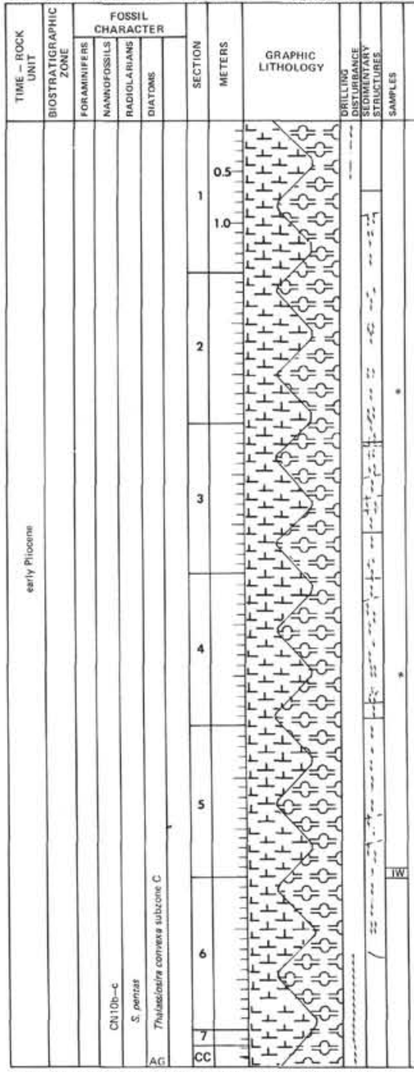
	1, 115	3, 40
Texture:		
Sand	30	50
Silt	45	40
Clay	25	10
Composition:		
Pyrite	1	Tr
Carbonate unspec.	55	18
Foraminifers	2	1
Calc. nannofossils	12	6
Diatoms	8	30
Radiolarians	22	40
Sponge spicules	Tr	Tr
Silicoflagellates	Tr	Tr

CARBONATE BOMB:

1, 73 cm = 25%
2, 75 cm = 15%
3, 73 cm = 14%
4, 75 cm = 31%
5, 73 cm = 27%

NOTE: Graphic lithologies represent average compositions derived from smear slides and do not always reflect the detailed alternation of sediment types. Major lithologic boundaries are shown but gradational contacts, small-scale cyclicity and ooze-chalk alternations are represented schematically. Color changes approximate to lithologic changes.

SITE 574 HOLE A CORE 4 CORED INTERVAL 23.9–33.1 m



10YR 6/3
10YR 6/3
10YR 4/2 + 8/3
10YR 6/3
10YR 4/2
10YR 8/4
10YR 8/2
10YR 6/3
10YR 8/3–8/2
10YR 8/4
10YR 6/3
10YR 8/4–8/3
10YR 6/3
10YR 6/2
10YR 8/4 + 8/3
10YR 5/3
10YR 6/3
10YR 5/3
10YR 8/4 - 8/3
10YR 7/2
10YR 6/3
10YR 7/2
10YR 6/3
10YR 8/4 + 8/2
10YR 5/3
10YR 7/2
10YR 8/4
10YR 8/2
10YR 6/3
10YR 6/3

LITHOLOGIC DESCRIPTION

UPPER BROWN OOZE (SUBUNIT IA):

Alternating intervals of highly mottled very pale brown (10YR 7/2 and 8/2–8/4), light brownish gray (10YR 6/3 and 6/4), and dark brown (10YR 4/2 and 5/3) rad diatom calcareous to rad nanno oozes.

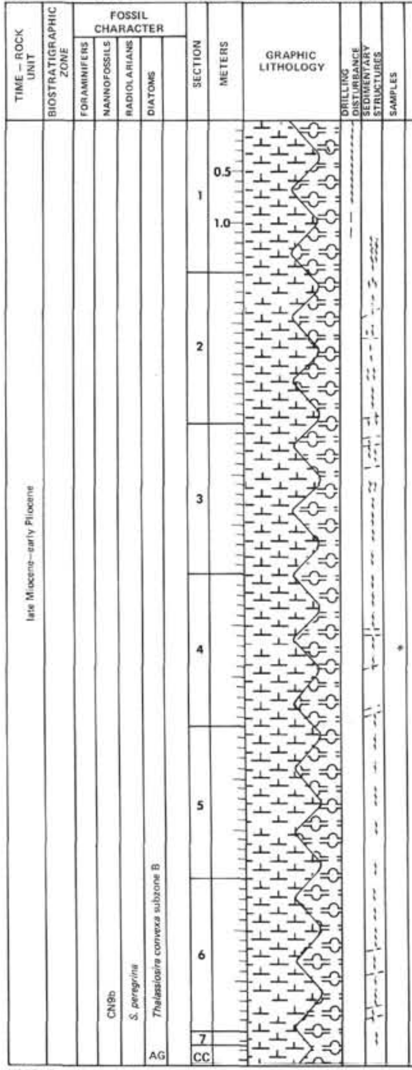
SMEAR SLIDE SUMMARY (%):

	2, 120	4, 100
Texture:		
Sand	35	15
Silt	45	25
Clay	20	60
Composition:		
Volcanic glass	Tr	–
Carbonate unspec.	37	40
Foraminifers	1	4
Calc. nannofossils	7	35
Diatoms	30	8
Radiolarians	25	12
Sponge spicules	Tr	Tr
Silicoflagellates	Tr	Tr
Fish remains	–	Tr
Fe-oxides	–	1

CARBONATE BOMB:
1, 75 cm = 23%
2, 75 cm = 55%
3, 75 cm = 36%
4, 75 cm = 39%
5, 75 cm = 52%

NOTE: Graphic lithologies represent average compositions derived from smear slides and do not always reflect the detailed alternation of sediment types. Major lithologic boundaries are shown but gradational contacts, small-scale cyclicity and ooze-chalk alternations are represented schematically. Color changes approximate to lithologic changes.

SITE 574 HOLE A CORE 5 CORED INTERVAL 33.1–42.4 m



10YR 7/3
10YR 5/3
10YR 8/4 + 6/2
10YR 7/3
2.5Y 5/2
10YR 8/4
10YR 7/4 +
2.5Y 5/2
10YR 7/2
10YR 8/4
10YR 6/2, 7/4 + 3/2
10YR 8/3
10YR 7/4
10YR 7/3
10YR 7/4
10YR 8/4
10YR 7/4
2.5Y 5/2
10YR 8/4
10YR 7/4
2.5Y 7/2
10YR 8/2–8/4
10YR 7/2
10YR 8/4
10YR 8/2
10YR 7/2
10YR 8/2
10YR 8/2

LITHOLOGIC DESCRIPTION

UPPER BROWN OOZE (SUBUNIT IA):

Alternating intervals of mottled very pale brown (10YR 7/2–7/4 and 8/2–8/4), light brownish gray (10YR 6/2 and 2.5Y 5/2), and dark brown (10YR 3/2 and 5/3) rad diatom calcareous to rad nanno oozes.

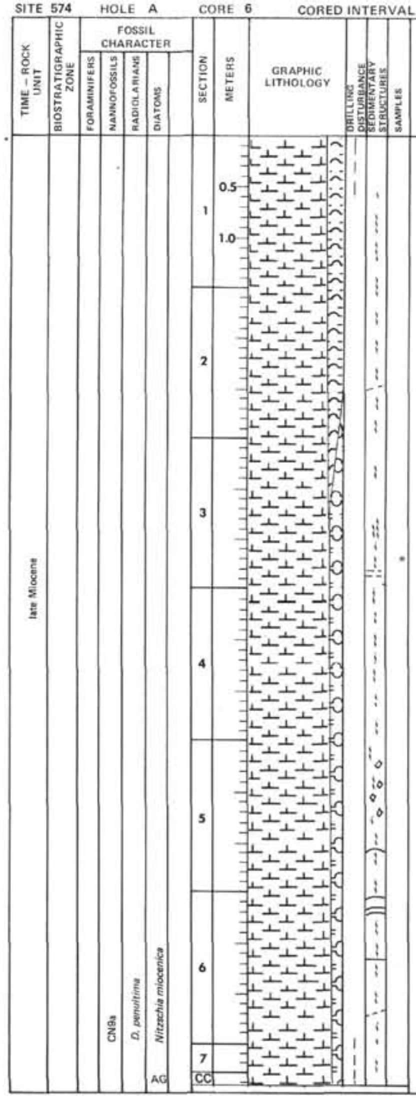
SMEAR SLIDE SUMMARY (%):

	4, 75
Texture:	
Sand	15
Silt	10
Clay	75
Composition:	
Carbonate unspec.	18
Foraminifers	1
Calc. nannofossils	.60
Diatoms	9
Radiolarians	12
Sponge spicules	Tr
Silicoflagellates	Tr

CARBONATE BOMB:
1, 75 cm = 25%
3, 75 cm = 12%
5, 75 cm = 49%

NOTE: Graphic lithologies represent average compositions derived from smear slides and do not always reflect the detailed alternation of sediment types. Major lithologic boundaries are shown but gradational contacts, small-scale cyclicity and ooze-chalk alternations are represented schematically. Color changes approximate to lithologic changes.

SITE 574 HOLE A CORE 6 CORED INTERVAL 42.4–51.9 m



LITHOLOGIC DESCRIPTION

10YR 8/4

10YR 8/2 + 8/4

5G 9/1

5BG 7/1

5B 7/1 + 5Y 7/1

5G 8/1–9/1

N8

5G 8/1 + 9/1

5G 8/1

N8
5G 9/1

5B 9/1

5G 9/1 + N8

5G 9/1

5B 8/1

5P 4/2

5G 9/1–5B 9/1

UPPER BROWN OOZE (SUBUNIT IA) (0.0–2.5 m): mottled pale brown (10YR 8/2–8/4) rad nanno ooze.

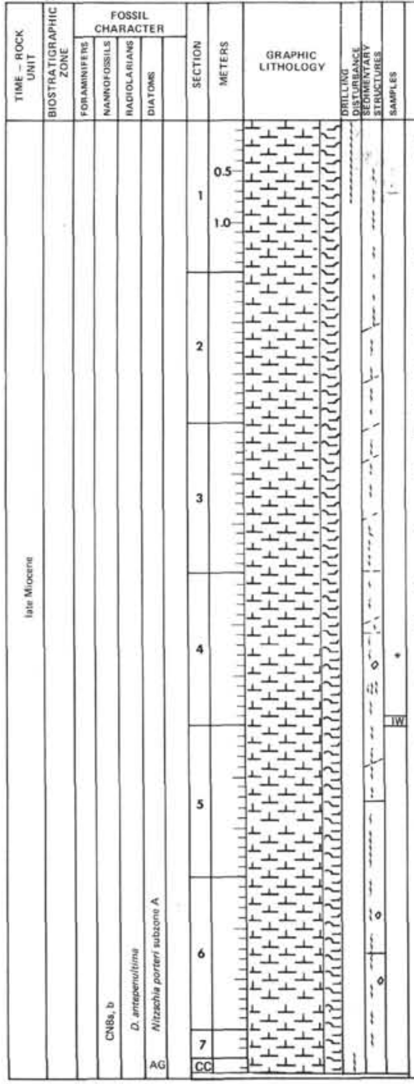
GREEN GRAY OOZE (SUBUNIT IB) (2.5–9.5 m): About 1.5 m of blue-green white (5BG 7/1) to blue white (5B 7/1) mottled ooze which grades downward into mottled green white (5G 8/1–9/1) siliceous nanno ooze.

SMEAR SLIDE SUMMARY (%):

	3, 120
Texture:	
Sand	6
Silt	9
Clay	85
Composition:	
Pyrite	Tr
Carbonate unspec.	25
Foraminifers	1
Calc. nannofossils	60
Diatoms	8
Radiolarians	6
Silicoflagellates	Tr

CARBONATE BOMB:
1, 75 cm = 43%
3, 75 cm = 76%
5, 75 cm = 83%

SITE 574 HOLE A CORE 7 CORED INTERVAL 51.9–61.4 m



LITHOLOGIC DESCRIPTION

Downhole contamination

5G 8/1 + N6

5GY 7/1

5G 8/1

5GY 7/1

5G 8/1

5G 7/1

5G 8/1

5G 9/1

5G 8/1

5G 7/1

5G 8/1

5G 7/1 + 7/2

N7–5G 8/1

5G 9/1 + 5Y 7/1

5G 8/1 + 5Y 7/1

5G 9/1

5G 8/1–9/1

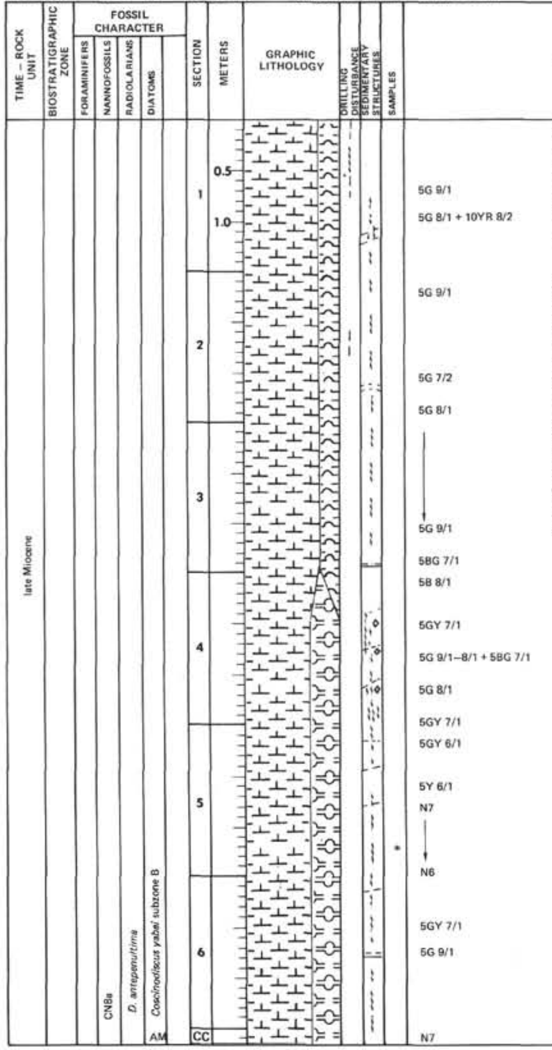
GREEN GRAY OOZE (SUBUNIT IB):
Intergrading intervals of mottled light green gray (5GY 7/1 and 5G 7/1–7/2) and green white (5G 8/1–9/1) rad nanno ooze with some mottles of yellow white (5Y 7/1) low in the core.

SMEAR SLIDE SUMMARY (%):

	4, 80
Texture:	
Sand	15
Silt	10
Clay	75
Composition:	
Pyrite	Tr
Carbonate unspec.	40
Foraminifers	Tr
Calc. nannofossils	40
Diatoms	8
Radiolarians	12
Sponge spicules	Tr
Silicoflagellates	Tr

CARBONATE BOMB:
1, 75 cm = 58%
2, 75 cm = 66%
3, 75 cm = 73%
5, 75 cm = 76%
6, 75 cm = 82%

SITE 574 HOLE A CORE 8 CORED INTERVAL 61.4–70.4 m



LITHOLOGIC DESCRIPTION

GREEN GRAY OOZE (SUBUNIT IB):

Upper 4.5 m of mottled, dominantly green white (5G 8/1–9/1) rad nanno ooze underlain by highly mottled diatom rad nanno oozes of blue white (5B 8/1), blue-green gray (5BG 7/1), light green gray (5GY 6/1–7/1), and pale gray (N6–7).

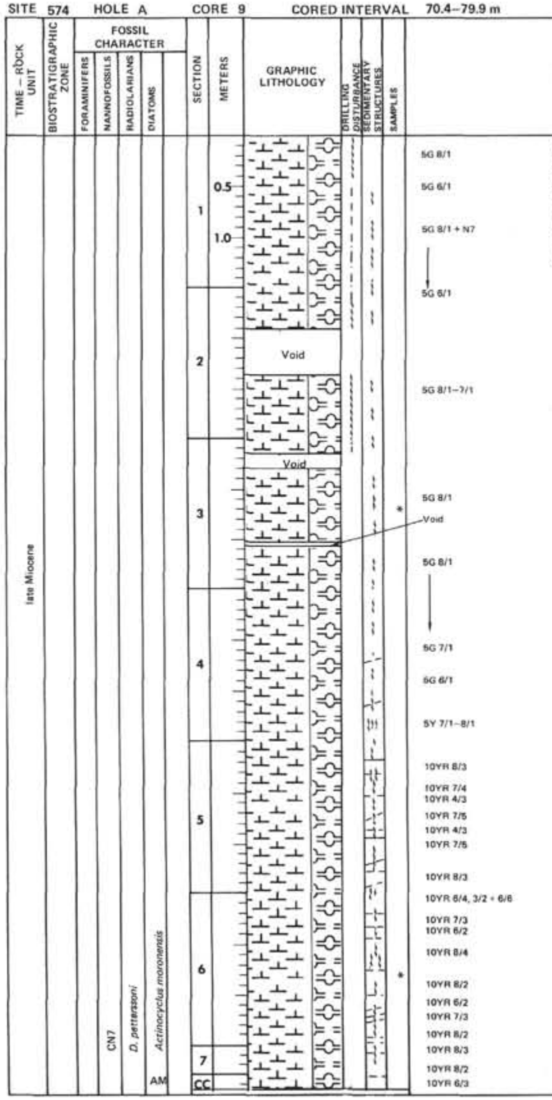
SMEAR SLIDE SUMMARY (%):

	5, 120
Texture:	
Sand	20
Silt	10
Clay	70
Composition:	
Volcanic glass	Tr
Pyrite	Tr
Carbonate unspec.	55
Foraminifers	Tr
Calc. nannofossils	15
Diatoms	12
Radiolarians	18
Sponge spicules	Tr
Silicoflagellates	Tr

CARBONATE BOMB:

1, 75 cm = 85%	4, 75 cm = 89%
2, 75 cm = 90%	5, 75 cm = 45%
3, 75 cm = 81%	6, 75 cm = 47%

SITE 574 HOLE A CORE 9 CORED INTERVAL 70.4–79.9 m



LITHOLOGIC DESCRIPTION

GREEN GRAY OOZE (SUBUNIT IB) (0.0–5.6 m): mottled light green gray (5G 6/1–7/1) to green white (5G 8/1) diatom rad nanno oozes.

LOWER BROWN OOZE (SUBUNIT IC) (5.6–9.5 m): Transitional over about 50 cm to an underlying section of interbedded and mottled very pale brown (10YR 7/3–7/5 and 8/2–8/4), light brownish gray (10YR 6/2–6/4) and dark brown (10YR 4/3) oozes of the same composition.

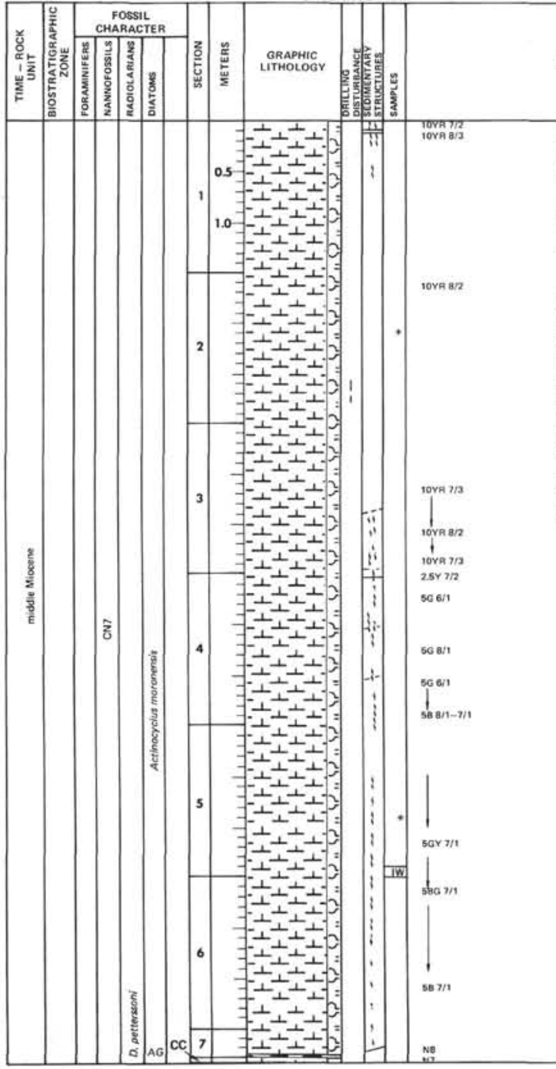
SMEAR SLIDE SUMMARY (%):

	3, 70	6, 80
Texture:		
Sand	20	20
Silt	15	15
Clay	65	65
Composition:		
Carbonate unspec.	12	12
Foraminifers	Tr	–
Calc. nannofossils	55	55
Diatoms	15	15
Radiolarians	18	18
Sponge spicules	Tr	Tr
Silicoflagellates	Tr	Tr

CARBONATE BOMB:

1, 75 cm = 20%	5, 75 cm = 2%
3, 75 cm = 59%	6, 75 cm = 47%
4, 75 cm = 22%	

SITE 574 HOLE A CORE 10 CORED INTERVAL 79.9–89.2 m



LITHOLOGIC DESCRIPTION

LOWER BROWN OOZE (SUBUNIT IC) (0.0–4.6 m): relatively uniform, very pale brown (10YR 8/2) siliceous nanno ooze.

GREEN WHITE OOZE/CHALK (SUBUNIT IIA) (4.6–9.3 m):

Mottled very pale green gray (5G 6/1 and 8/1 and 5BG 7/1) to light blue gray (5B 7/1–8/1) oozes of the same composition.

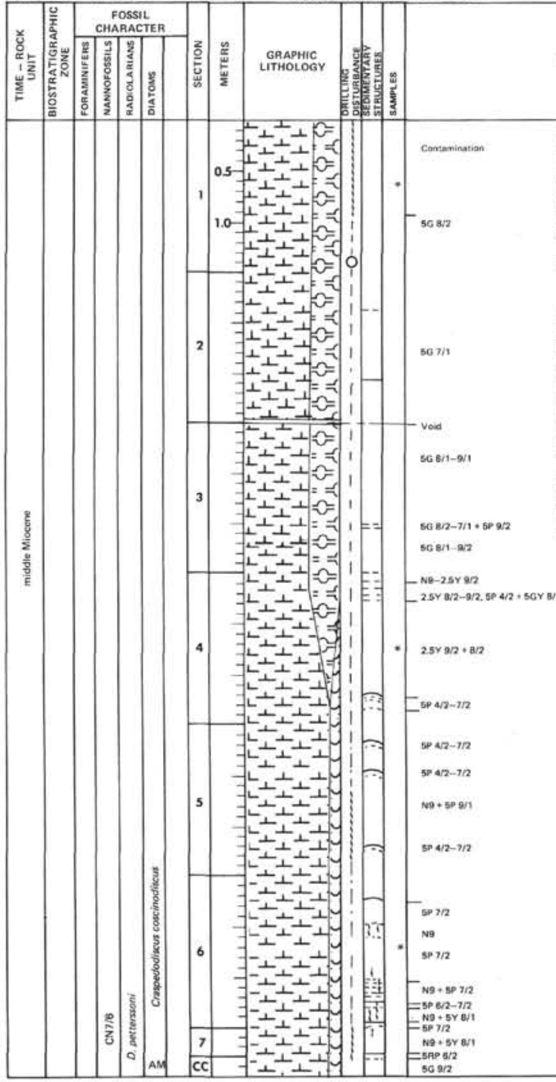
SMEAR SLIDE SUMMARY (%):

	2, 60	5, 90
Texture:		
Sand	10	10
Silt	5	5
Clay	85	85
Composition:		
Pyrite	–	Tr
Carbonate unspec.	8	14
Calc. nannofossils	80	75
Diatoms	3	3
Radiolarians	9	8
Sponge spicules	Tr	Tr
Silicoflagellates	Tr	Tr

CARBONATE BOMB:

1, 75 cm = 73%
2, 75 cm = 76%
3, 75 cm = 42%
4, 75 cm = 72%
5, 75 cm = 71%
6, 75 cm = 86%

SITE 574 HOLE A CORE 11 CORED INTERVAL 89.2–98.7 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Upper 4.5 m uniform green white (5G 8/1–9/1) rad diatom nanno oozes. Transitional over about 1.2 m through an interval of dominantly very pale yellow gray (2.5Y 8/2–9/2) diatom nanno ooze to the underlying white (N9) and purple white (5P 9/1) nanno oozes. The latter frequently contains 5 to 25 cm bands of grayish purple (5P 4/2) to very pale purple (5P 7/2).

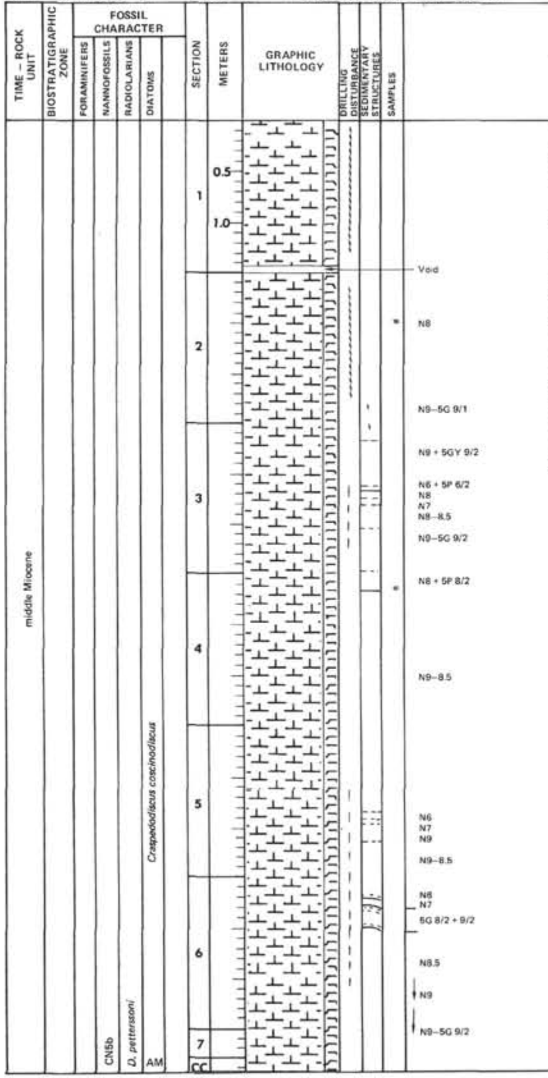
SMEAR SLIDE SUMMARY (%):

	1, 66	4, 75	6, 70
Texture:			
Sand	20	3	2
Silt	30	40	35
Clay	50	57	63
Composition:			
Foraminifers	–	Tr	Tr
Calc. nannofossils	70	77	90
Diatoms	15	20	7
Radiolarians	15	3	2
Sponge spicules	Tr	Tr	–
Silicoflagellates	Tr	Tr	Tr

CARBONATE BOMB:

1, 75 cm = 73%
2, 75 cm = 57%
3, 75 cm = 76%
4, 75 cm = 71%
5, 75 cm = 90%
6, 75 cm = 93%
7, 29 cm = 90%

SITE 574 HOLE A CORE 12 CORED INTERVAL 98.7–108.5 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

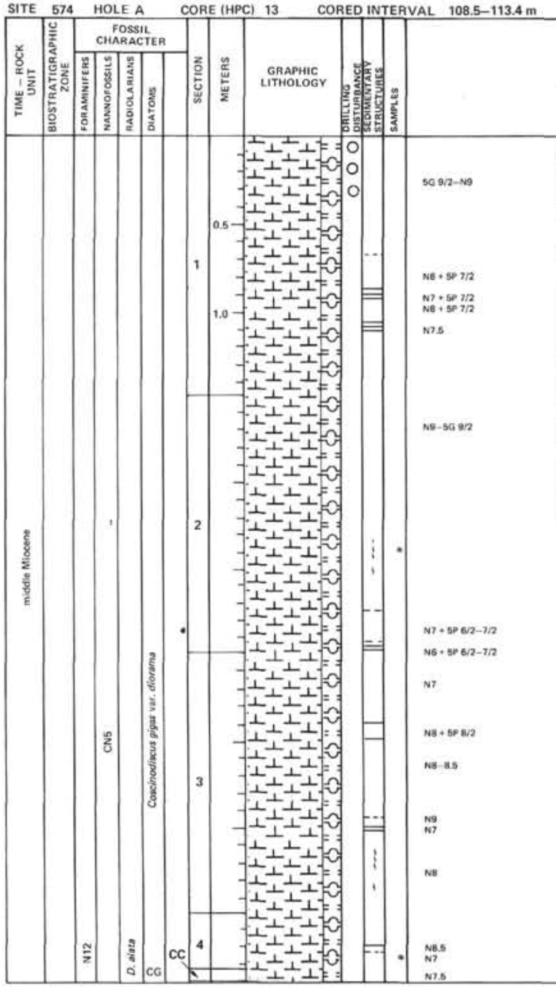
White (N8–9) to green white (5G 9/1–9/2) diatom nanno to nanno oozes occasionally banded with light gray (N6–7) and pale purple (5P 6/2 and 8/2).

SMEAR SLIDE SUMMARY (%):

	2, 50	4, 15
Texture:		
Sand	2	10
Silt	35	35
Clay	63	55
Composition:		
Foraminifers	–	Tr
Calc. nannofossils	80	80
Diatoms	7	15
Radiolarians	2	5
Sponge spicules	Tr	Tr
Silicoflagellates	1	Tr

CARBONATE BOMB:
1, 75 cm = 87%
2, 75 cm = 91%
3, 75 cm = 88%
4, 75 cm = 87%
5, 75 cm = 80%
6, 75 cm = 86%

SITE 574 HOLE A CORE (HPC) 13 CORED INTERVAL 108.5–113.4 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

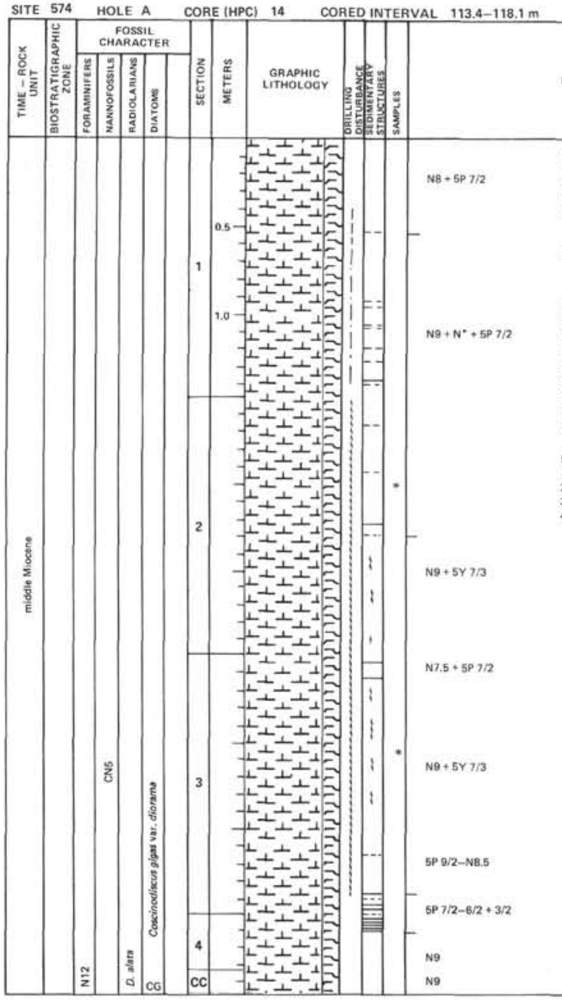
Dominantly pale gray (N7–8), and white (N9) to green white (5G 9/2) rad diatom nanno oozes occasionally laminated or banded with pale purple (5P 6/2–8/2). Mottling minor.

SMEAR SLIDE SUMMARY (%):

	2, 90	4, 26
Texture:		
Sand	10	20
Silt	45	45
Clay	45	35
Composition:		
Foraminifers	Tr	5
Calc. nannofossils	80	65
Diatoms	10	15
Radiolarians	10	15
Sponge spicules	Tr	–
Silicoflagellates	Tr	–

CARBONATE BOMB:
1, 72 cm = 89%
2, 75 cm = 85%
3, 72 cm = 84%
4, 9 cm = 83%

SITE 574 HOLE A CORE (HPC) 14 CORED INTERVAL 113.4–118.1 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

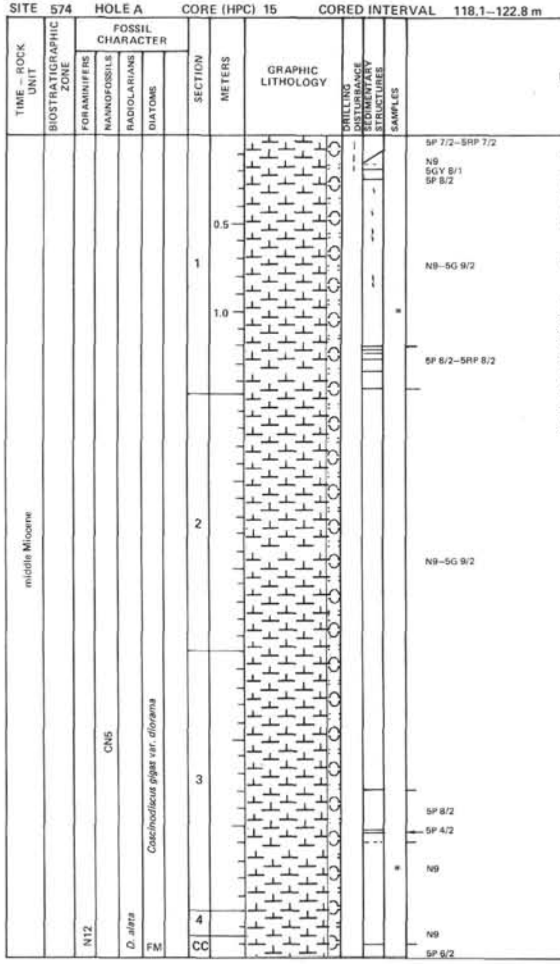
White (N9) diatom nanno ooze occasionally banded with light to very pale purple (5P 6/2–9/2) and mottled with pale yellow (5Y 7/3) between 2.2 and 4.1 m.

SMEAR SLIDE SUMMARY (%):

	2, 50	3, 55
Texture:		
Sand	10	15
Silt	45	40
Clay	45	45
Composition:		
Foraminifers	5	7
Calc. nannofossils	75	65
Diatoms	15	20
Radiolarians	5	8
Silicoflagellates	Tr	—

CARBONATE BOMB:
1, 75 cm = 90%
2, 75 cm = 81%
3, 75 cm = 80%
4, 9 cm = 89%

SITE 574 HOLE A CORE (HPC) 15 CORED INTERVAL 118.1–122.8 m



LITHOLOGIC DESCRIPTION

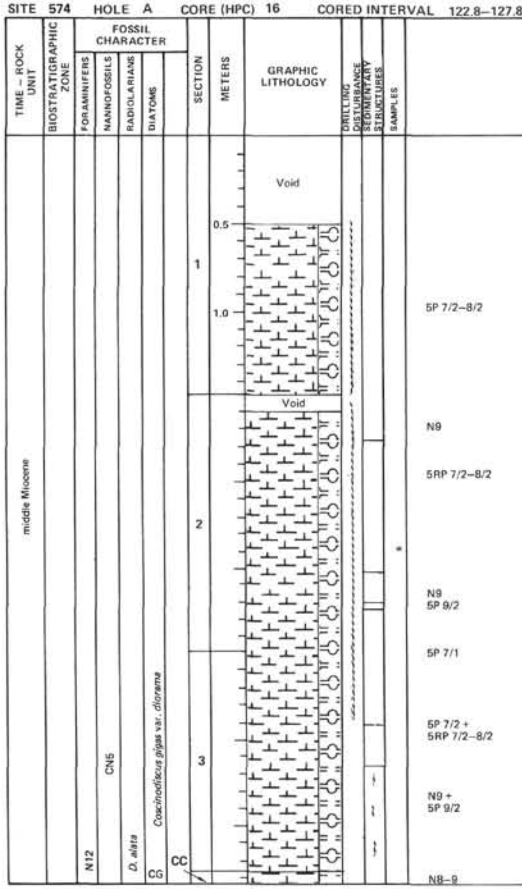
GREEN GRAY OOZE/CHALK (SUBUNIT IIA):

White (N9) to green white (5G 9/2) diatom nanno to nanno oozes occasionally laminated or banded with pale purple (5P 7/2–8/2) to pale red purple (5RP 7/2–8/2). Minor mottling.

SMEAR SLIDE SUMMARY (%):

	1, 100	3, 125
Texture:		
Sand	10	5
Silt	30	35
Clay	60	60
Composition:		
Foraminifers	10	5
Calc. nannofossils	70	85
Diatoms	15	5
Radiolarians	5	5
Silicoflagellates	Tr	Tr

SITE 574 HOLE A CORE (HPC) 16 CORED INTERVAL 122.8–127.8 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

White (N9), very pale purple (5P 7/2–8/2), and very pale red purple (5RP 7/2–8/2) rad diatom nanno ooze.

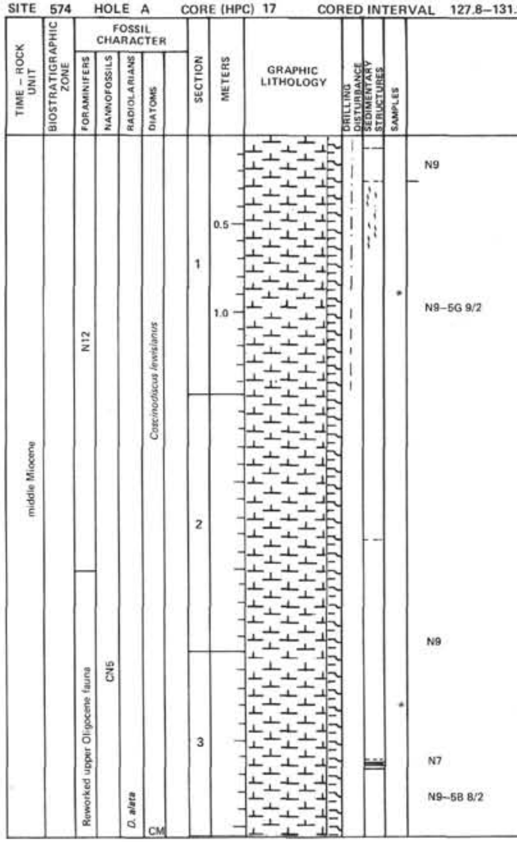
Warning: Material transferred from broken core liner; not necessarily in correct stratigraphic sequence.

SMEAR SLIDE SUMMARY (%):

	2, 90
Texture:	
Sand	10
Silt	40
Clay	50
Composition:	
Foraminifers	5
Calc. nannofossils	70
Diatoms	15
Radiolarians	10
Silicoflagellates	Tr

CARBONATE BOMB:
1, 75 cm = 89%
2, 75 cm = 91%
3, 75 cm = 91%

SITE 574 HOLE A CORE (HPC) 17 CORED INTERVAL 127.8–131.9 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

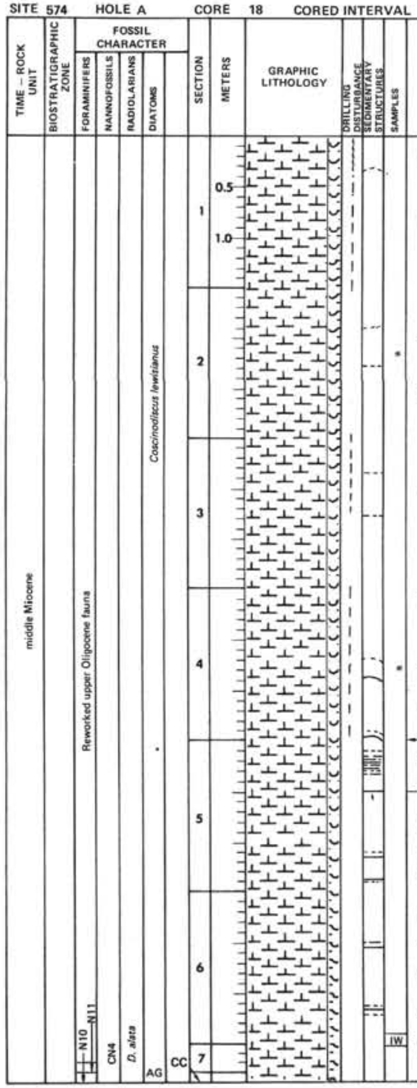
Dominantly white (N9) to green white (5G 9/2) diatom nanno to nanno oozes with some mottling in the uppermost 65 cm.

SMEAR SLIDE SUMMARY (%):

	1, 90	3, 30
Texture:		
Sand	5	3
Silt	40	40
Clay	55	57
Composition:		
Foraminifers	2	3
Calc. nannofossils	83	88
Diatoms	10	7
Radiolarians	5	2
Sponge spicules	Tr	–
Silicoflagellates	Tr	–

CARBONATE BOMB:
1, 75 cm = 85%
2, 75 cm = 90%
3, 75 cm = 88%

SITE 574 HOLE A CORE 18 CORED INTERVAL 131.9–141.4 m



LITHOLOGIC DESCRIPTION

N9
N9–5BG 9/1
5BG 8/1
N9–5BG 9/1
N8.5–9
N9
N7 + 5P 7/2
N9
N7 + 5P 7/2
N9, N7 + 5G 8/2
N9
N7.5 + 5P 7/2
N9
N8
N9
N7
N9
N7
N9

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Dominantly white (N9) diatom nanno to foram nanno oozes tinted blue-green white (5BG 9/1) in the upper 3.3 m and banded with 5 to 50 cm laminated intervals of pale gray (N7) and pale purple (5P 7/2) below 5.2 m.

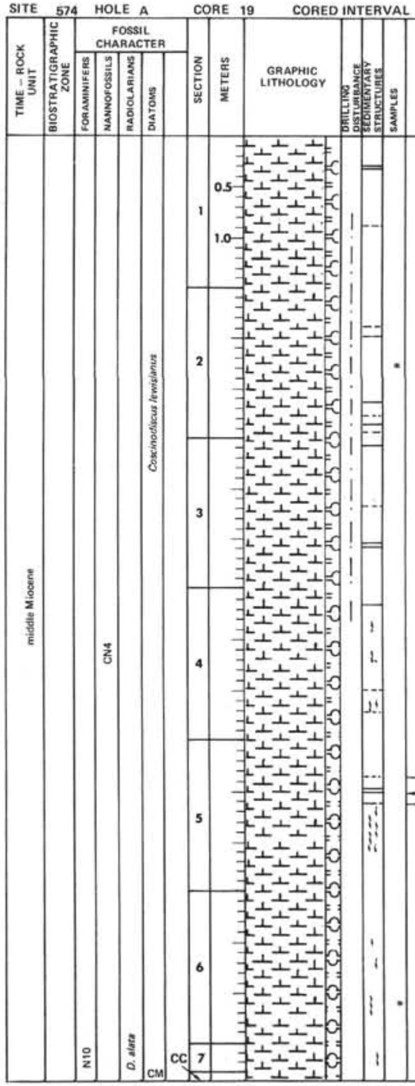
SMEAR SLIDE SUMMARY (%):

	2, 70	4, 80
Texture:		
Sand	5	10
Silt	35	40
Clay	60	50
Composition:		
Carbonate unspec.	5	–
Foraminifers	2	10
Calc. nannofossils	73	80
Diatoms	15	8
Radiolarians	5	2
Sponge spicules	Tr	Tr
Silicoflagellates	Tr	Tr

CARBONATE BOMB:

1, 75 cm = 89%
2, 75 cm = 90%
3, 75 cm = 90%
4, 75 cm = 94%
5, 75 cm = 86%
6, 75 cm = 94%
7, 25 cm = 88%

SITE 574 HOLE A CORE 19 CORED INTERVAL 141.4–150.9 m



LITHOLOGIC DESCRIPTION

N9 + 5G 9/1, 5Y 9/1
N8
5P 8/2
N9–8
N7 + 5P 7/2
N8.5
5P 7/2
N8.5
5P 7/2
N8.5
N9 + 5RP 9/1
N9 + 5RP 9/2
N7 + 5RP 6/2
N8 +
5RP 7/2
N9
N8.5 + 5RP 8/2
N9
N7 + 5P 7/2
N4 + 5P 2/2
N9 + 5Y 7/2–9/2

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Dominantly white (N8–9) rad diatom foram nanno to nanno oozes which, in the upper 6.6 m, are tinted purple white (5P 9/1) and red purple white (5RP 9/1–9/2), and frequently banded with 5 to 50 cm intervals of pale gray (N7) with pale to very pale purple (5P 7/2–8/2) or light to very pale red purple (5RP 6/2–8/2). Below 6.6 m they are mottled with very pale yellow (5Y 7/2–9/2).

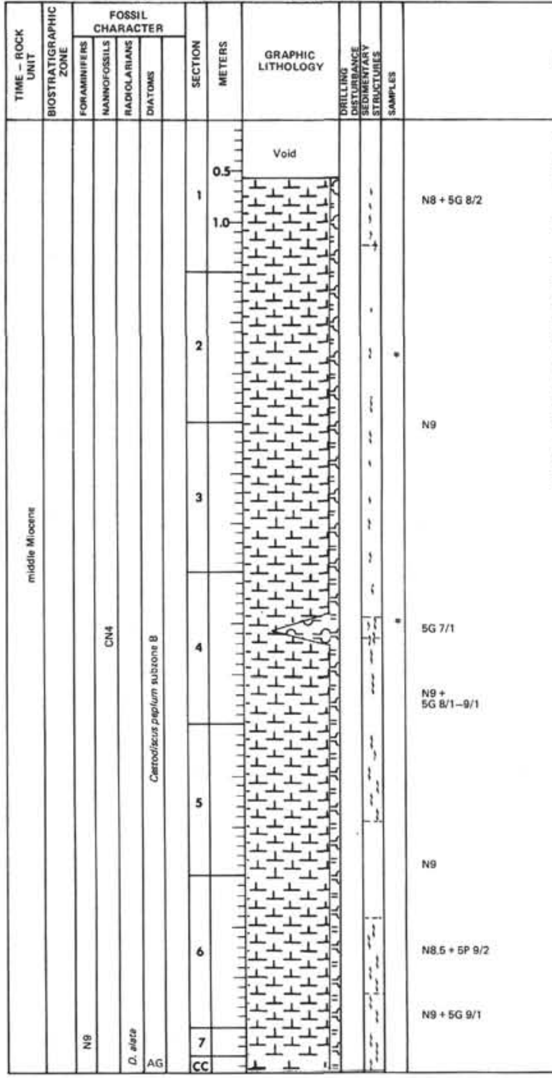
SMEAR SLIDE SUMMARY (%):

	2, 80	6, 110
Texture:		
Sand	15	5
Silt	45	40
Clay	40	55
Composition:		
Foraminifers	15	6
Calc. nannofossils	68	82
Diatoms	10	8
Radiolarians	10	4
Sponge spicules	Tr	Tr
Silicoflagellates	Tr	–

CARBONATE BOMB:

1, 75 cm = 86%
2, 75 cm = 96%
3, 75 cm = 87%
4, 75 cm = 84%
5, 75 cm = 84%
6, 75 cm = 93%
7, 25 cm = 91%

SITE 574 HOLE A CORE 20 CORED INTERVAL 150.9–159.9 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Dominantly mottled white (N8–9) and green white (5G 8/1–9/1) nanno oozes; one 30 cm interval of mottled light green gray (5G 7/1) nanno diatom rad ooze.

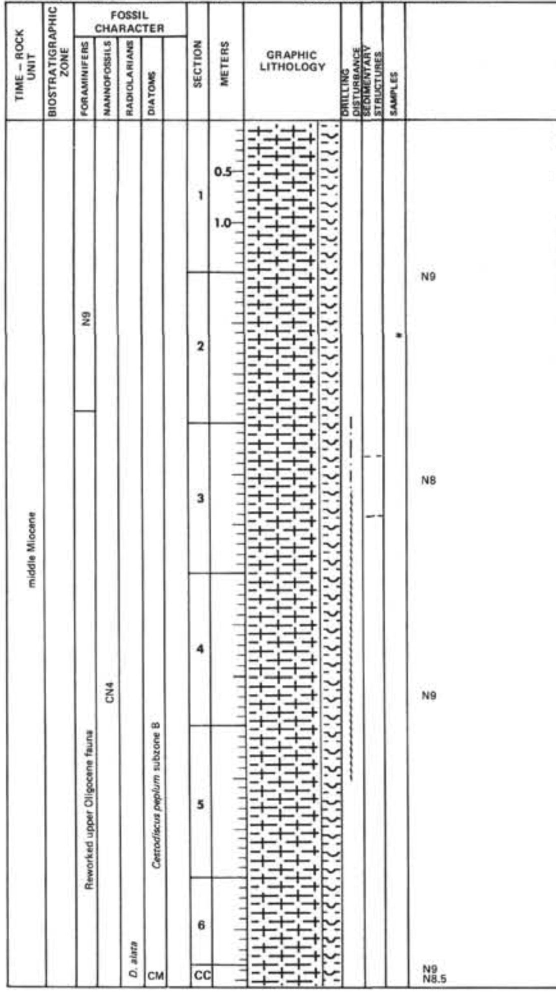
SMEAR SLIDE SUMMARY (%):

	2, 85	4, 50
Texture:		
Sand	10	30
Silt	50	35
Clay	40	35
Composition:		
Pyrite	–	Tr
Foraminifers	10	–
Calc. nannofossils	80	30
Diatoms	5	30
Radiolarians	5	40
Sponge spicules	Tr	Tr
Silicoflagellates	–	Tr

CARBONATE BOMB:

1, 75 cm = 85%
3, 75 cm = 88%
5, 75 cm = 79%
7, 25 cm = 91%

SITE 574 HOLE A CORE 21 CORED INTERVAL 159.9–168.4 m



LITHOLOGIC DESCRIPTION

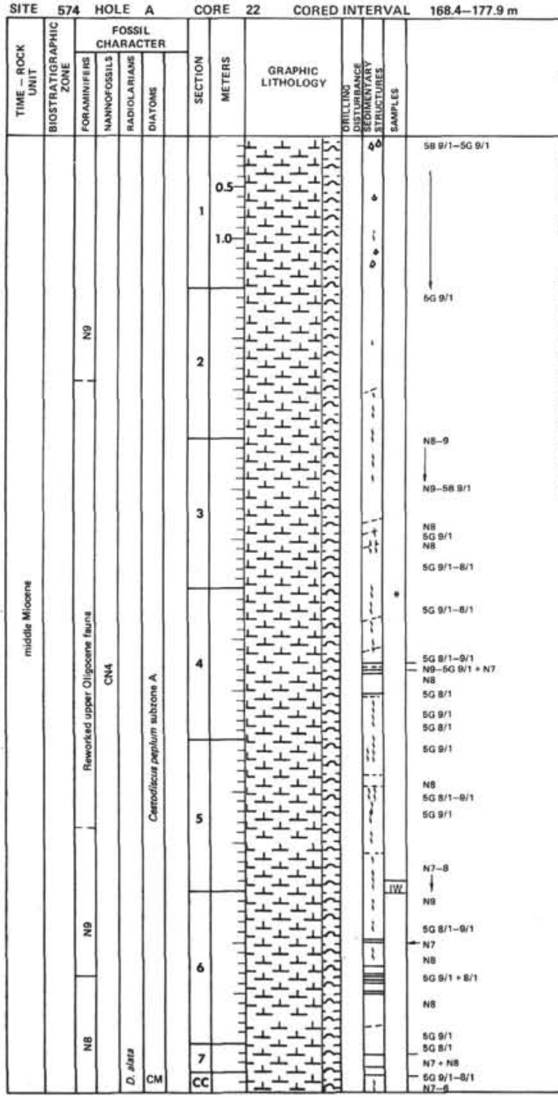
GREEN WHITE OOZE/CHALK (SUBUNIT IIA):
Very uniform white (N8–N9) foram diatom nanno ooze.

SMEAR SLIDE SUMMARY (%):

	2, 70
Texture:	
Sand	5
Silt	45
Clay	50
Composition:	
Pyrite	Tr
Foraminifers	10
Calc. nannofossils	70
Diatoms	15
Radiolarians	5
Sponge spicules	Tr
Silicoflagellates	Tr

CARBONATE BOMB:
1, 75 cm = 89%
3, 75 cm = 88%
5, 75 cm = 87%

SITE 574 HOLE A CORE 22 CORED INTERVAL 168.4–177.9 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Intergrading intervals of mottled, dominantly green white (5G 8/1–9/1) and pale gray (N7–8) rad nanno ooze. Banded in a couple 10 to 30 cm laminated intervals.

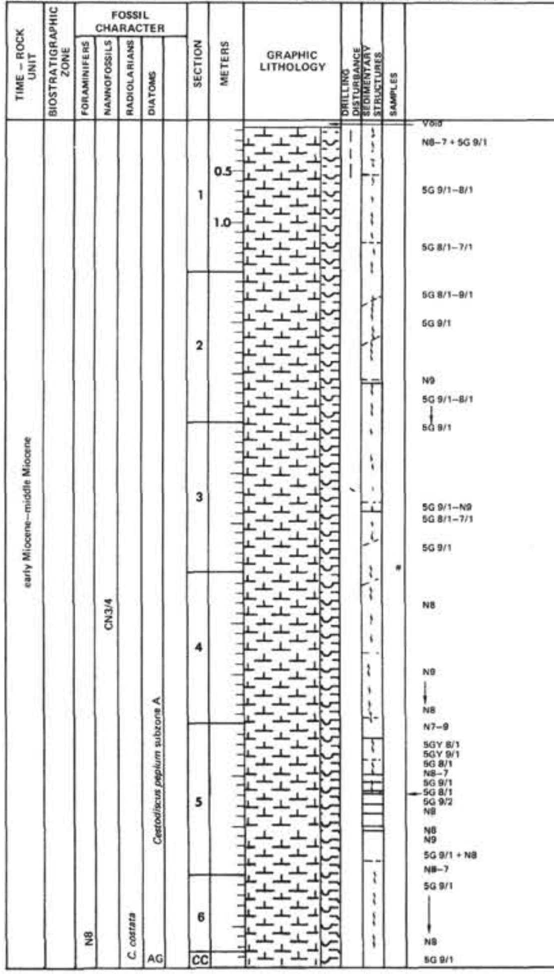
SMEAR SLIDE SUMMARY (%):

	4, 10
Texture:	
Sand	15
Silt	5
Clay	80
Composition:	
Pyrite	Tr
Carbonate unspec.	8
Calc. nannofossils	70
Diatoms	4
Radiolarians	18
Sponge spicules	Tr
Silicoflagellates	Tr

CARBONATE BOMB:

1, 75 cm = 93%	4, 75 cm = 90%
2, 75 cm = 92%	5, 75 cm = 90%
3, 75 cm = 92%	6, 75 cm = 96%

SITE 574 HOLE A CORE 23 CORED INTERVAL 177.9–186.2 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Intergrading intervals of mottled light green gray (5G 7/1–8/1) and green white (5G 8/1–9/1) to pale gray (N7–N8) and white (N9) diatom nanno oozes. Minor banding from about 6.1 to 6.8 m.

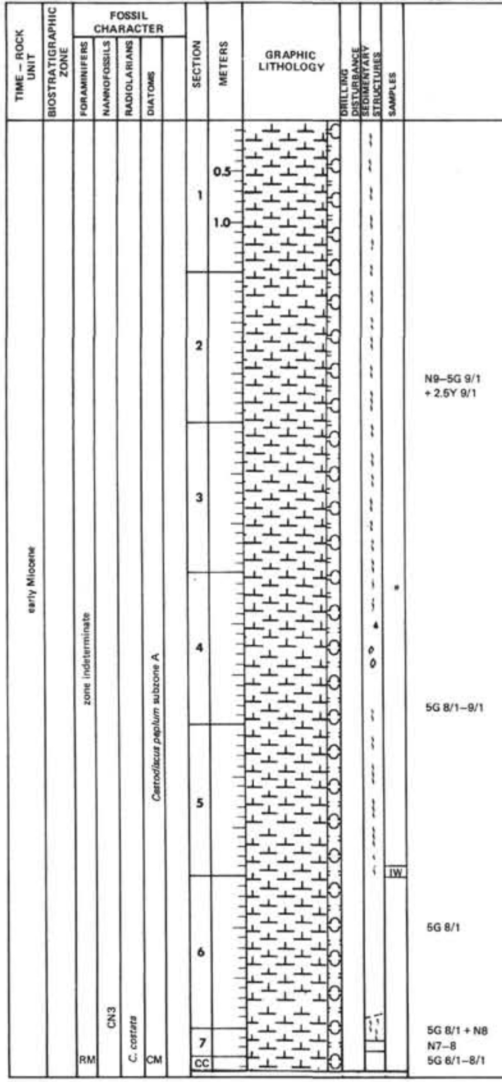
SMEAR SLIDE SUMMARY (%):

	3, 145
Texture:	
Sand	10
Silt	10
Clay	80
Composition:	
Pyrite	Tr
Carbonate unspec.	34
Foraminifers	1
Calc. nannofossils	45
Diatoms	12
Radiolarians	8
Sponge spicules	Tr
Silicoflagellates	Tr

CARBONATE BOMB:

1, 75 cm = 87%	4, 75 cm = 88%
2, 75 cm = 93%	5, 75 cm = 83%
3, 75 cm = 88%	6, 75 cm = 82%

SITE 574 HOLE B CORE 1 CORED INTERVAL 185.0–194.5 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Lightly mottled very pale green gray (5G 8/1) to green white (5G 9/1–N9) siliceous nanno ooze; semi-indurated 5–10 cm sections at intervals of 10–20 cm.

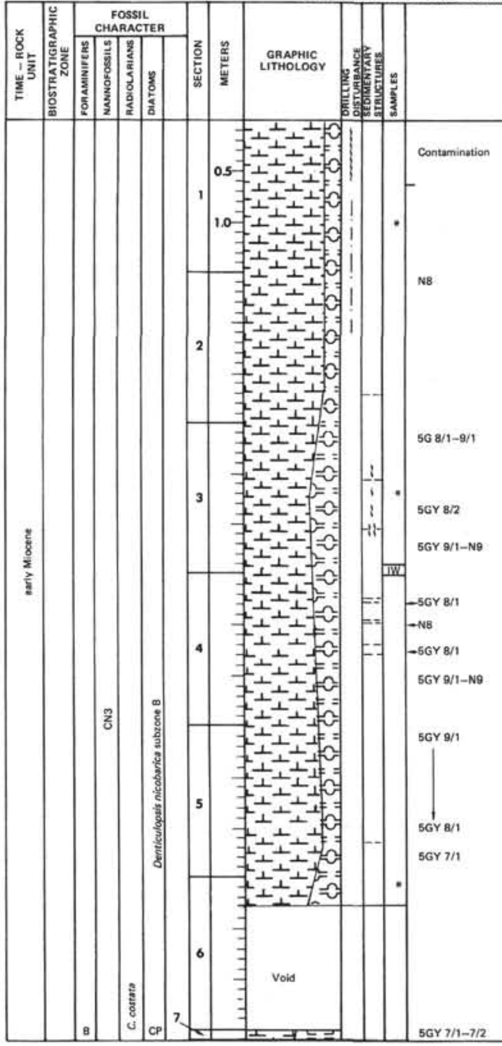
SMEAR SLIDE SUMMARY (%):

	4, 20
Texture:	
Sand	7
Silt	8
Clay	85
Composition:	
Carbonate unspec.	35
Foraminifers	1
Calc. nannofossils	50
Diatoms	9
Radiolarians	5
Sponge spicules	Tr
Silicoflagellates	Tr
Fish remains	Tr

CARBONATE BOMB:

1, 75 cm = 84%
2, 75 cm = 77%
3, 75 cm = 87%
4, 75 cm = 85%
5, 75 cm = 81%
6, 75 cm = 75%

SITE 574 HOLE C CORE 1 CORED INTERVAL 194.5–204.0 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Green white (5G 9/1–N9) to pale gray (N8) diatom nanno ooze and pale green gray (5G 7/1–8/1 and 8/2) rad nanno to rad diatom nanno oozes. Minor mottling apparent in soft ooze; 2 to 5 cm intervals of semi-indurated ooze every 5 to 150 cm.

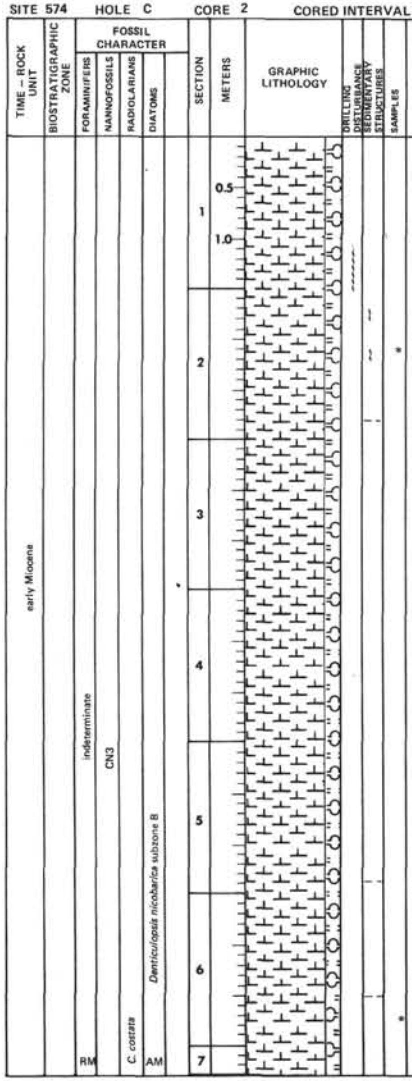
SMEAR SLIDE SUMMARY (%):

	1, 100	3, 70	6, 10
Texture:			
Sand	5	5	5
Silt	35	45	50
Clay	60	50	45
Composition:			
Pyrite	Tr	Tr	–
Carbonate unspec.	–	20	25
Foraminifers	8	–	Tr
Calc. nannofossils	70	50	45
Diatoms	10	5	15
Radiolarians	5	20	15
Sponge spicules	Tr	Tr	Tr
Silicoflagellates	2	–	Tr

CARBONATE BOMB:

1, 90 cm = 86%
2, 75 cm = 86%
3, 75 cm = 70%
4, 75 cm = 61%
5, 75 cm = 76%

SITE 574 HOLE C CORE 2 CORED INTERVAL 204.0–213.5 m



LITHOLOGIC DESCRIPTION

5GY 8/1–9/1

5GY 8/1

5GY 9/1

5GY 8/1–9/1

5GY 7/1

5GY 6/1

5GY 8/1–9/1

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Light green gray (5GY 6/1–7/1) to green white (5GY 8/1–9/1) siliceous nanno to diatom nanno oozes. Two to 5 cm sections of semi-indurated ooze at 5–130 cm intervals. Minor mottling.

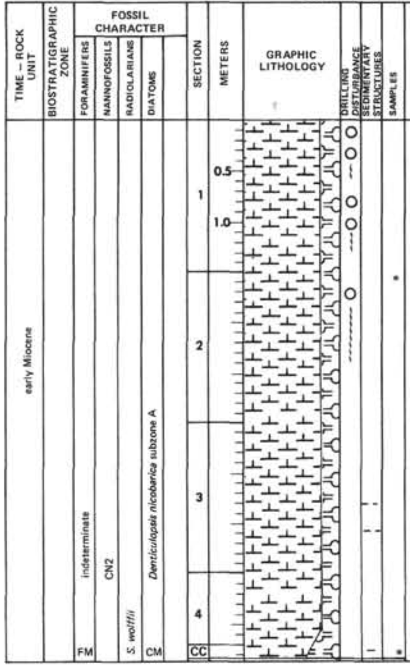
SMEAR SLIDE SUMMARY (%):

	2, 60	6, 128
Texture:		
Sand	10	5
Silt	50	50
Clay	40	45
Composition:		
Foraminifers	Tr	Tr
Calc. nannofossils	80	88
Diatoms	5	8
Radiolarians	15	4
Sponge spicules	Tr	Tr
Silicoflagellates	–	Tr

CARBONATE BOMB:

1, 70 cm = 80%	4, 75 cm = 85%
2, 75 cm = 63%	5, 75 cm = 80%
3, 75 cm = 79%	6, 75 cm = 32%

SITE 574 HOLE C CORE 3 CORED INTERVAL 213.5–223.0 m



LITHOLOGIC DESCRIPTION

5GY 9/1

5GY 9/1

5GY 8/1–9/1

5GY 7/1

5GY 8/1–9/1

5G 8/1–9/1
5G 7/1

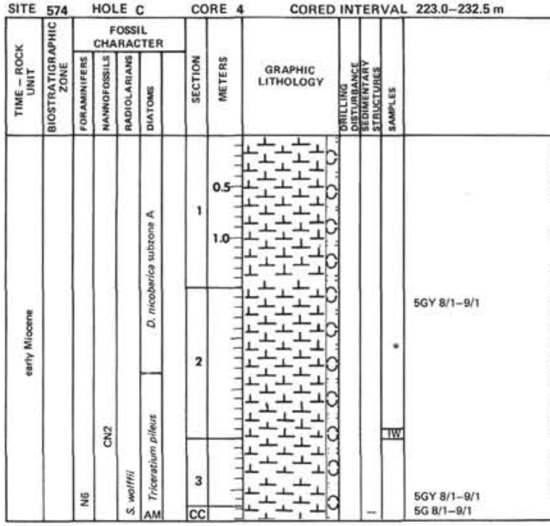
GREEN WHITE OOZE/CHALK (SUBUNIT IIA):
Light green gray (5GY 7/1) to green white (5GY 8/1–9/1) rad diatom nanno ooze with 2 to 5 cm sections of well-indurated ooze at intervals of 5 to 90 cm.

SMEAR SLIDE SUMMARY (%):

	2, 10	CC, 8
Texture:		
Sand	5	10
Silt	40	55
Clay	55	35
Composition:		
Foraminifers	Tr	–
Calc. nannofossils	80	65
Diatoms	10	20
Radiolarians	10	15
Sponge spicules	Tr	Tr
Silicoflagellates	Tr	–

CARBONATE BOMB:
2, 75 cm = 80%
3, 75 cm = 74%

SITE 574 HOLE C CORE 4 CORED INTERVAL 223.0–232.5 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Uniform green white (5GY 8/1–9/1) siliceous nanno ooze with 2 to 5 cm sections of well-indurated ooze at intervals of 5 to 110 cm.

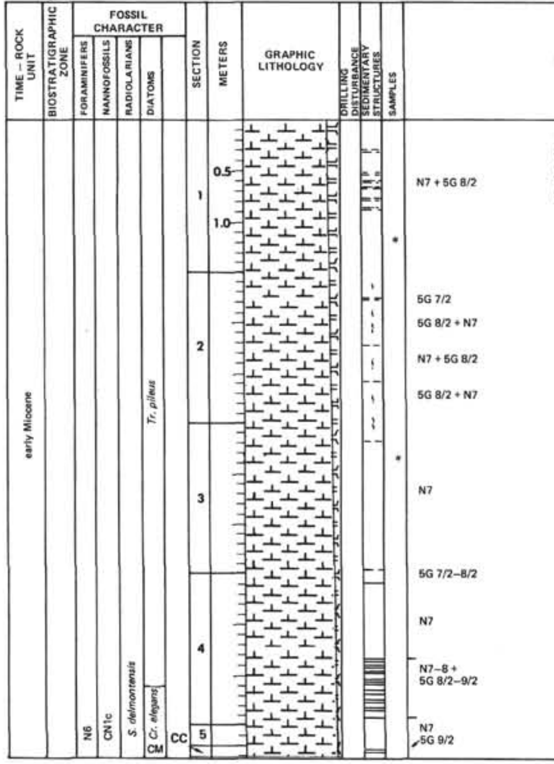
SMEAR SLIDE SUMMARY (%):

	2, 60
Texture:	
Sand	5
Silt	60
Clay	35
Composition:	
Carbonate unspec.	5
Foraminifers	Tr
Calc. nannofossils	85
Diatoms	3
Radiolarians	7
Sponge spicules	Tr
Silicoflagellates	Tr

CARBONATE BOMB:

1, 75 cm = 87%
2, 75 cm = 81%

SITE 574 HOLE C CORE 5 CORED INTERVAL 232.5–242.0 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Dominantly light gray (N7) siliceous nanno to nanno oozes occasionally mottled or banded with pale green gray (5G 7/2–9/2). Two to 5 cm sections of well-indurated ooze at intervals of 5 to 80 cm.

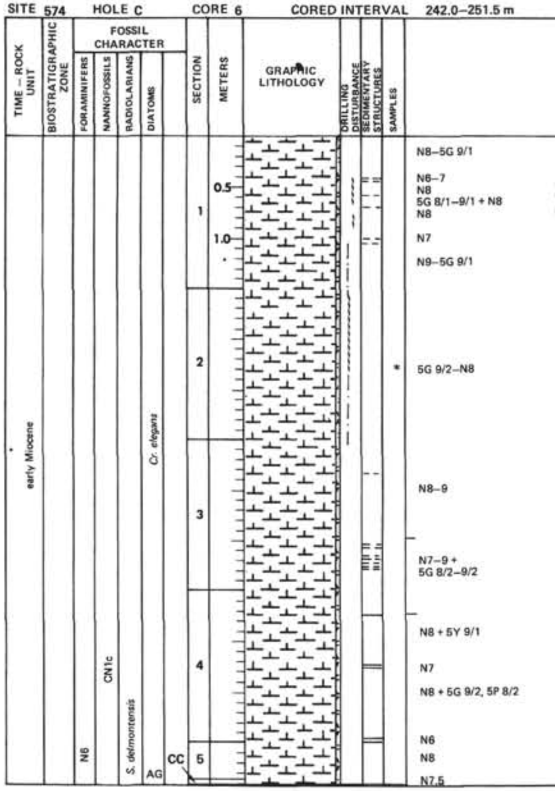
SMEAR SLIDE SUMMARY (%):

	1, 117	4, 37
Texture:		
Sand	2	5
Silt	55	30
Clay	43	65
Composition:		
Foraminifers	2	2
Calc. nannofossils	85	92
Diatoms	8	3
Radiolarians	5	3
Sponge spicules	–	Tr

CARBONATE BOMB:

1, 75 cm = 88%
2, 75 cm = 82%
3, 75 cm = 89%
4, 75 cm = 92%

SITE 574 HOLE C CORE 6 CORED INTERVAL 242.0–251.5 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Light gray (N6–7) to white (N8–9) nanno ooze occasionally banded with pale green gray (5G 8/2–9/2) and green white (5G 8/1–9/1). In undisturbed intervals, 2 to 5 cm sections of well-indurated ooze every 5 to 30 cm.

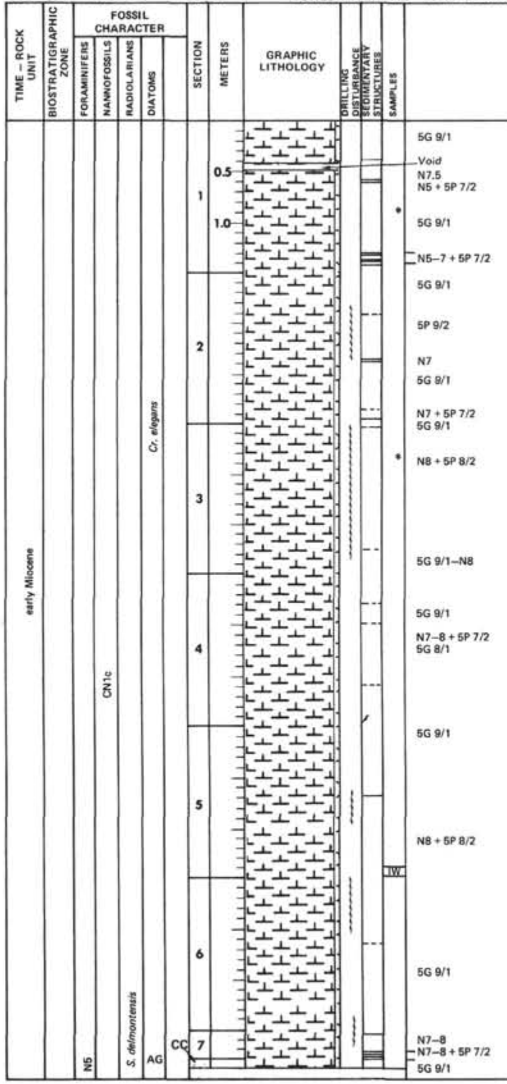
SMEAR SLIDE SUMMARY (%):

	2, 80
Texture:	
Sand	3
Silt	30
Clay	67
Composition:	
Volcanic glass	Tr
Pyrite	Tr
Foraminifers	5
Calc. nannofossils	91
Diatoms	1
Radiolarians	3

CARBONATE BOMB:

1, 65 cm = 96%
3, 75 cm = 95%
4, 75 cm = 91%

SITE 574 HOLE C CORE 7 CORED INTERVAL 251.5–261.0 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Dominantly pale gray (N7–8) to green white (5G 9/1) nanno oozes with some intervals containing very pale purple (5P 7/2–9/2) which are usually quite deformed and have only soft ooze. Elsewhere 2 to 5 cm sections of well-indurated ooze occur every 5 to 30 cm.

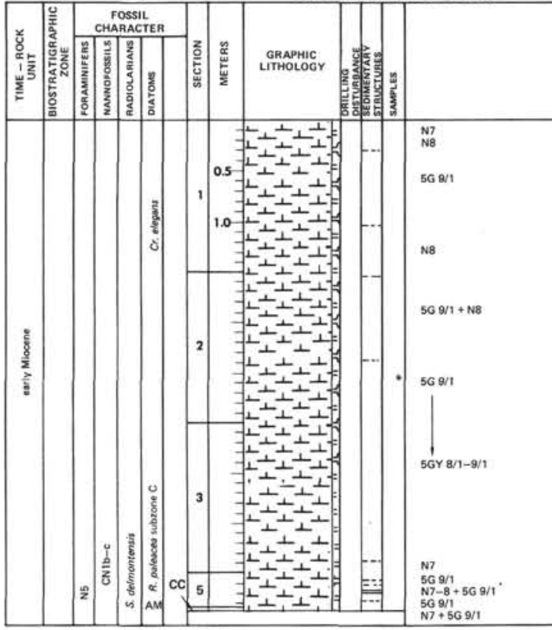
SMEAR SLIDE SUMMARY (%):

	1, 90	3, 30
Texture:		
Sand	5	2
Silt	40	35
Clay	55	63
Composition:		
Carbonate unspec.	–	1
Foraminifers	5	3
Calc. nannofossils	90	89
Diatoms	2	5
Radiolarians	3	2
Sponge spicules	Tr	Tr

CARBONATE BOMB:

1, 75 cm = 92%
2, 75 cm = 95%
3, 75 cm = 85%
4, 75 cm = 90%
5, 65 cm = 91%
6, 75 cm = 90%

SITE 574 HOLE C CORE 8 CORED INTERVAL 261.0–270.5 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Pale gray (N7–8) to green white (5G 9/1 and 5GY 8/1–9/1) nanno ooze. Two to 5 cm sections of very stiff ooze at intervals of 2 to 30 cm underlain by continuous section of same below about 2.3 m.

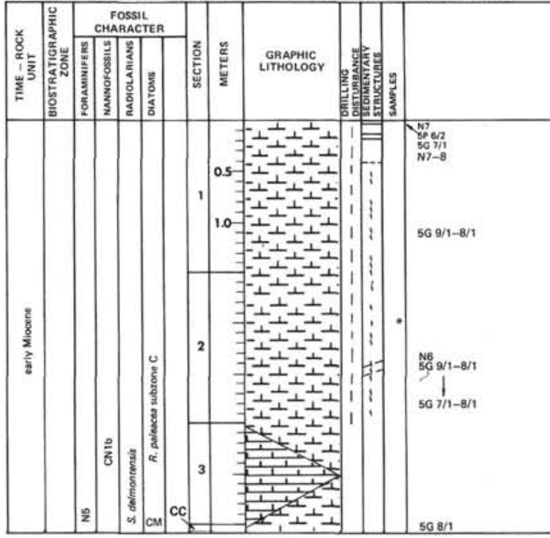
SMEAR SLIDE SUMMARY (%):

	2, 110
Texture:	
Sand	2
Silt	40
Clay	58
Composition:	
Carbonate unspec.	2
Foraminifers	5
Calc. nannofossils	85
Diatoms	3
Radiolarians	5
Sponge spicules	Tr

CARBONATE BOMB:

1, 75 cm = 85%
2, 75 cm = 86%
3, 75 cm = 92%

SITE 574 HOLE C CORE 9 CORED INTERVAL 270.5–280.0 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Dominantly faintly mottled green white (5G 8/1–9/1) to pale green gray (5G 7/1–8/1) nanno ooze. Two to 5 cm sections of very stiff ooze at intervals of 5 to 30 cm above 3 m; continuous very stiff ooze below 3 m.

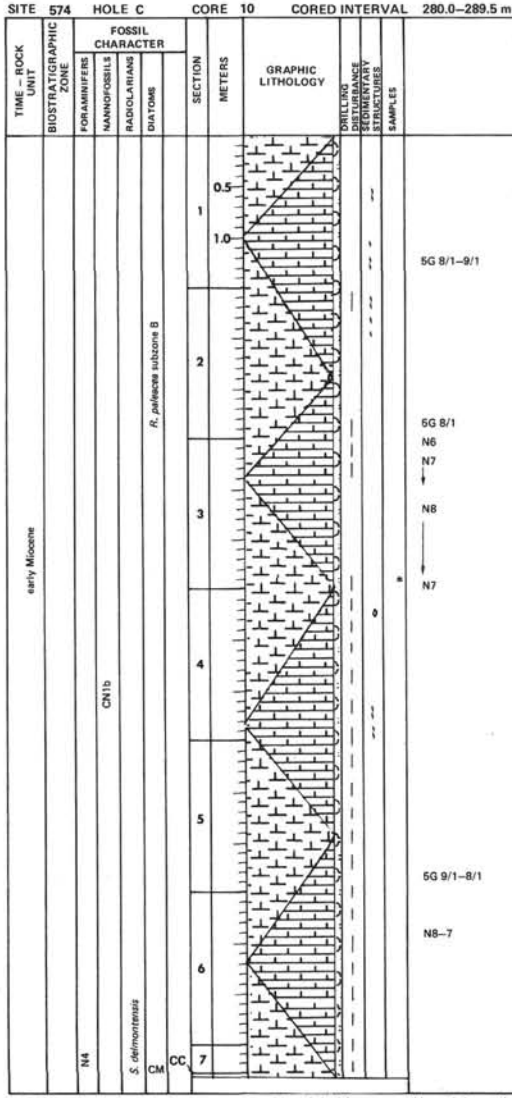
SMEAR SLIDE SUMMARY (%):

	2, 50
Texture:	
Sand	4
Silt	1
Clay	95
Composition:	
Pyrite	Tr
Carbonate unspec.	5
Foraminifers	3
Calc. nannofossils	90
Diatoms	Tr
Radiolarians	2
Sponge spicules	Tr

CARBONATE BOMB:

1, 75 cm = 90%
2, 75 cm = 88%
3, 52 cm = 88%

SITE 574 HOLE C CORE 10 CORED INTERVAL 280.0–289.5 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Green white (5G 8/1–9/1) and light gray (N6–8) nanno ooze/chalk. Two to 5 cm sections of very stiff ooze grading to soft chalk at intervals of 5 to 60 cm. Minor mottling.

SMEAR SLIDE SUMMARY (%):

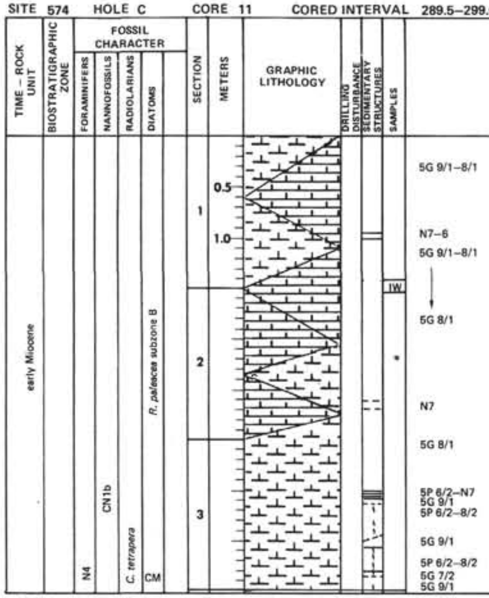
	3, 140
Texture:	
Sand	4
Silt	1
Clay	95
Composition:	
Pyrite	Tr
Carbonate unspec.	9
Foraminifers	1
Calc. nannofossils	85
Diatoms	Tr
Radiolarians	5
Sponge spicules	Tr
Silicoflagellates	Tr

CARBONATE BOMB:

2, 75 cm = 85%
3, 75 cm = 89%
4, 75 cm = 90%
5, 77 cm = 85%
6, 75 cm = 91%

NOTE: Graphic lithologies represent average compositions derived from smear slides and do not always reflect the detailed alternation of sediment types. Major lithologic boundaries are shown but gradational contacts, small-scale cyclicity and ooze-chalk alternations are represented schematically. Color changes approximate to lithologic changes.

SITE 574 HOLE C CORE 11 CORED INTERVAL 289.5–299.0 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Dominantly green white (5G 8/1–9/1) nanno ooze/chalk, with two 8 cm bands of light gray (N6–7) above 3.5 m and strongly laminated or banded by mottled pale purple (5P 6/2–8/2) below. Upper 1.5 m of chalk underlain by stiff ooze with 2 to 5 cm sections of chalk at 15 to 30 cm intervals and finally by 1.5 m of very stiff ooze.

SMEAR SLIDE SUMMARY (%):

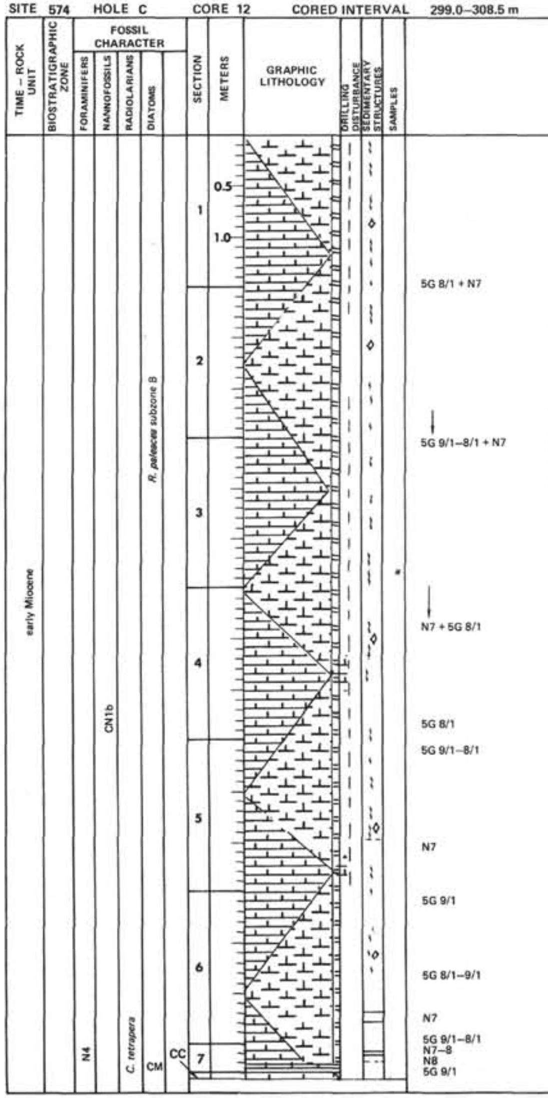
	2, 70
Texture:	
Sand	1
Silt	4
Clay	95
Composition:	
Pyrite	Tr
Carbonate unspec.	16
Foraminifers	2
Calc. nannofossils	80
Diatoms	Tr
Radiolarians	2
Sponge spicules	Tr

CARBONATE BOMB:

1, 75 cm = 90%
2, 75 cm = 92%
3, 75 cm = 92%

NOTE: Graphic lithologies represent average compositions derived from smear slides and do not always reflect the detailed alternation of sediment types. Major lithologic boundaries are shown but gradational contacts, small-scale cyclicity and ooze-chalk alternations are represented schematically. Color changes approximate to lithologic changes.

SITE 574 HOLE C CORE 12 CORED INTERVAL 299.0–308.5 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

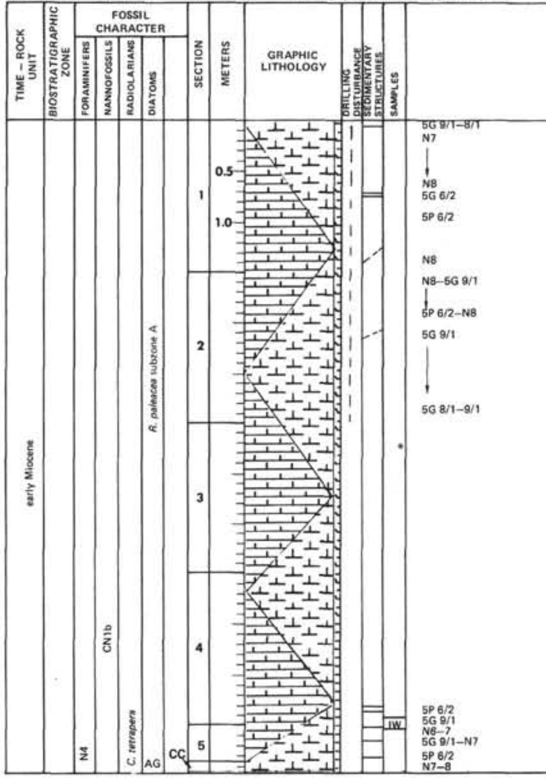
Dominantly green white (5G 8/1–9/1) nanno ooze mottled by light gray (N7–8) and containing 2 to 5 cm sections of very stiff ooze at intervals of 5 to 30 cm.

SMEAR SLIDE SUMMARY (%):

	3, 135
Texture:	
Sand	10
Silt	10
Clay	80
Composition:	
Pyrite	Tr
Carbonate unspec.	15
Foraminifers	9
Calc. nannofossils	70
Radiolarians	6
Sponge spicules	Tr

CARBONATE BOMB:
2, 75 cm = 94%
3, 75 cm = 93%
4, 75 cm = 94%
5, 75 cm = 90%
6, 75 cm = 93%

SITE 574 HOLE C CORE 13 CORED INTERVAL 308.5–318.0 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

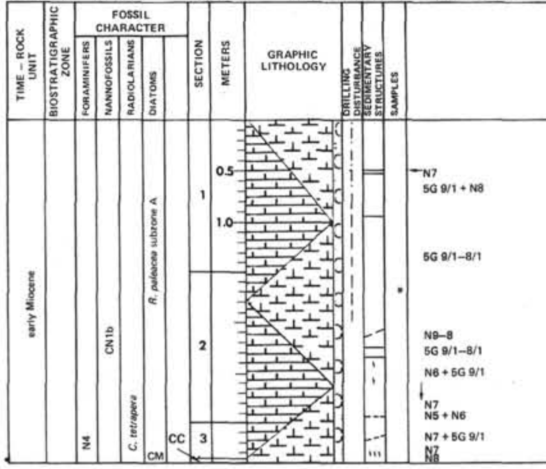
Light gray (N7–8) to green white (5G 8/1–9/1) and pale purple (5P 6/2) nanno oozes with 3 to 5 cm sections of very stiff ooze at intervals of 10 to 50 cm.

SMEAR SLIDE SUMMARY (%):

	3, 25
Texture:	
Sand	10
Silt	5
Clay	85
Composition:	
Pyrite	Tr
Carbonate unspec.	10
Foraminifers	8
Calc. nannofossils	75
Radiolarians	7
Sponge spicules	Tr

CARBONATE BOMB:
1, 75 cm = 94%
2, 75 cm = 91%
3, 75 cm = 93%
4, 75 cm = 94%

SITE 574 HOLE C CORE 14 CORED INTERVAL 318.0–327.5 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

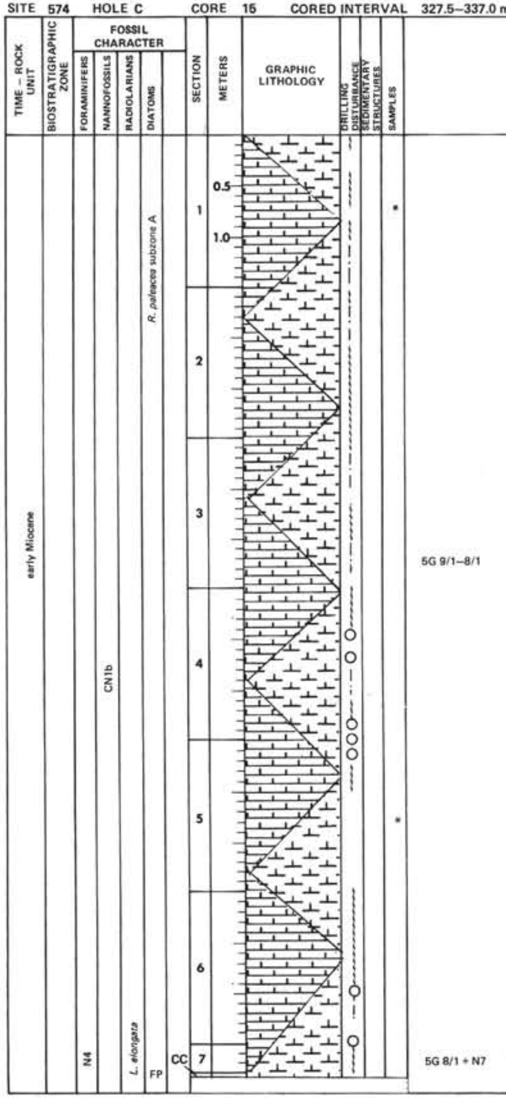
Medium to light gray (N5–7) and white (N8–9) to green white (5G 8/1–9/1) nanno oozes with three 5 cm sections of very stiff ooze about 30 cm apart in the undisturbed lower interval. Minor mottling.

SMEAR SLIDE SUMMARY (%):

	2, 20
Texture:	
Sand	10
Silt	15
Clay	75
Composition:	
Pyrite	Tr
Carbonate unspec.	35
Foraminifers	1
Calc. nannofossils	55
Diatoms	2
Radiolarians	7
Sponge spicules	Tr

Hole 574C, Core 14
CARBONATE BOMB:
1, 90 cm = 89%
2, 84 cm = 90%

SITE 574 HOLE C CORE 15 CORED INTERVAL 327.5–337.0 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

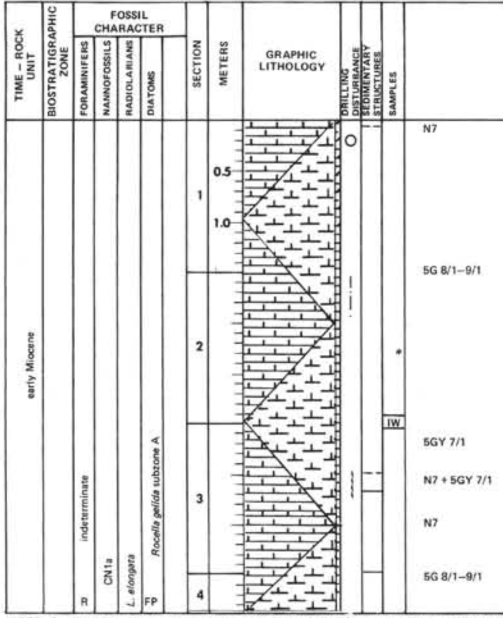
Highly disturbed core of green white (5G 9/1–8/1) nanno ooze with 2 to 5 cm sections of very stiff ooze every 5 to 30 cm in undisturbed intervals.

SMEAR SLIDE SUMMARY (%):

	1, 75	5, 80
Texture:		
Sand	2	2
Silt	35	40
Clay	63	58
Composition:		
Pyrite	Tr	Tr
Carbonate unspec.	15	15
Foraminifers	5	5
Calc. nannofossils	75	77
Diatoms	1	1
Radiolarians	4	2
Sponge spicules	Tr	Tr

CARBONATE BOMB:
1, 75 cm = 94%
4, 75 cm = 94%

SITE 574 HOLE C CORE 16 CORED INTERVAL 337.0–346.5 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Green white (5G 8/1–9/1) nanno ooze/chalk with minor light gray (N7) and pale green gray (5GY 7/1). Two to 5 cm sections of soft chalk at intervals of 5 to 35 cm.

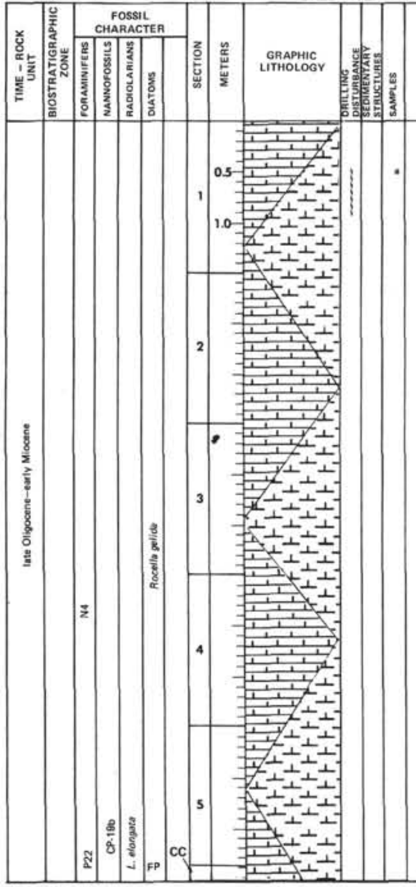
SMEAR SLIDE SUMMARY (%):

	2, 80
Texture:	
Sand	2
Silt	30
Clay	68
Composition:	
Volcanic glass	Tr
Pyrite	Tr
Carbonate unspec.	15
Foraminifers	5
Calc. nannofossils	75
Diatoms	Tr
Radiolarians	5
Sponge spicules	Tr

CARBONATE BOMB:
1, 80 cm = 91%
2, 75 cm = 84%
3, 75 cm = 86%

NOTE: Graphic lithologies represent average compositions derived from smear slides and do not always reflect the detailed alternation of sediment types. Major lithologic boundaries are shown but gradational contacts, small-scale cyclicity and ooze-chalk alternations are represented schematically. Color changes approximate to lithologic changes.

SITE 574 **HOLE** C **CORE** 17 **CORED INTERVAL** 346.5–356.0 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):
Uniform green white (5G 9/1–8/1) nanno ooze/chalk with 2 to 5 cm sections of chalk at 5 to 30 cm intervals in firm ooze.

SMEAR SLIDE SUMMARY (%):

	1, 50
Texture:	
Sand	Tr
Silt	45
Clay	55
Composition:	
Carbonate unspec.	20
Foraminifers	3
Calc. nannofossils	76
Diatoms	Tr
Radiolarians	1

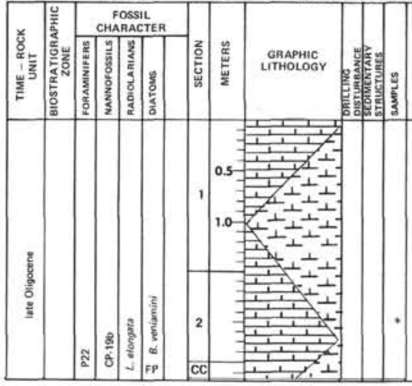
CARBONATE BOMB:
1, 50 cm = 88%
1, 75 cm = 86%
2, 75 cm = 87%
3, 55 cm = 86%
4, 75 cm = 84%

5G 9/1–8/1

5G 8/1–9/1

NOTE: Graphic lithologies represent average compositions derived from smear slides and do not always reflect the detailed alternation of sediment types. Major lithologic boundaries are shown but gradational contacts, small-scale cyclicity and ooze-chalk alternations are represented schematically. Color changes approximate to lithologic changes.

SITE 574 **HOLE** C **CORE** 18 **CORED INTERVAL** 356.0–365.5 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):
Uniform green white (5G 8/1–9/1) nanno ooze/chalk with 2 to 5 cm sections of chalk at intervals of 5 to 30 cm.

SMEAR SLIDE SUMMARY (%):

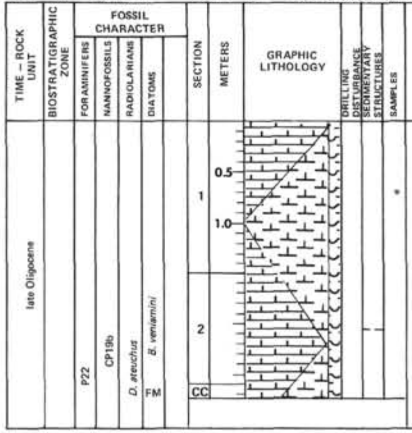
	2, 50
Texture:	
Sand	Tr
Silt	30
Clay	70
Composition:	
Carbonate unspec.	5
Foraminifers	3
Calc. nannofossils	90
Radiolarians	2

Hole 574C, Core 18
CARBONATE BOMB:
1, 75 cm = 88%
2, 75 cm = 90%

5G 8/1–9/1

5G 8/1–9/1

SITE 574 **HOLE** C **CORE** 19 **CORED INTERVAL** 365.5–375.0 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):
Two m of uniform green white (5G 8/1–9/1) diatom nanno ooze/chalk underlain by 74 cm of very pale green gray (5G 8/1–8/2). Three to 8 cm sections of chalk every 5 to 40 cm.

SMEAR SLIDE SUMMARY (%):

	1, 75
Texture:	
Sand	5
Silt	40
Clay	55
Composition:	
Carbonate unspec.	5
Foraminifers	2
Calc. nannofossils	80
Diatoms	10
Radiolarians	3
Sponge spicules	Tr

Hole 574C, Core 19
CARBONATE BOMB:
1, 65 cm = 86%
2, 70 cm = 86%

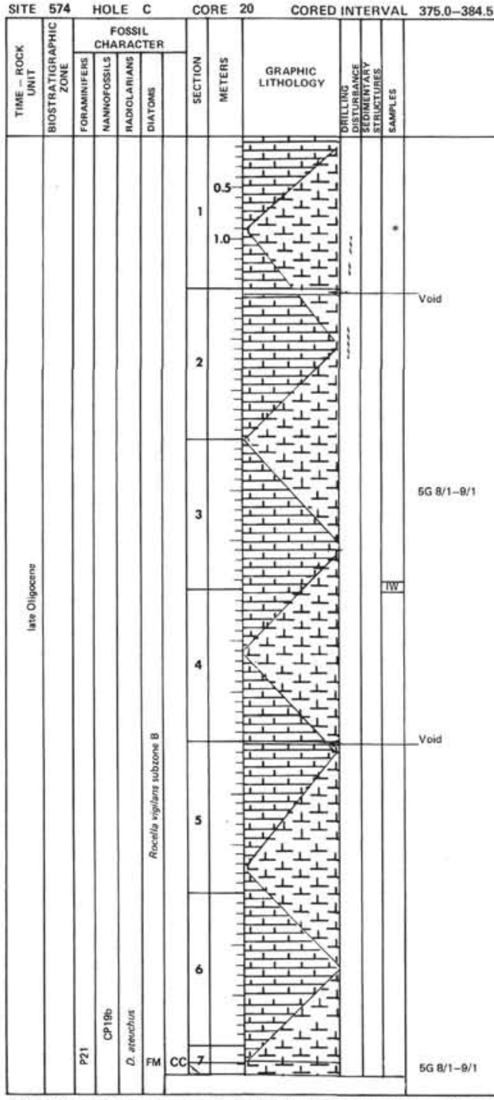
5G 8/1–9/1

5G 8/1–8/2

5G 8/2

NOTE: Graphic lithologies represent average compositions derived from smear slides and do not always reflect the detailed alternation of sediment types. Major lithologic boundaries are shown but gradational contacts, small-scale cyclicity and ooze-chalk alternations are represented schematically. Color changes approximate to lithologic changes.

SITE 574 HOLE C CORE 20 CORED INTERVAL 375.0–384.5 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):
Uniform green white (5G 8/1–9/1) nanno ooze/chalk with 2 to 8 cm sections of chalk at intervals of 5 to 30 cm.

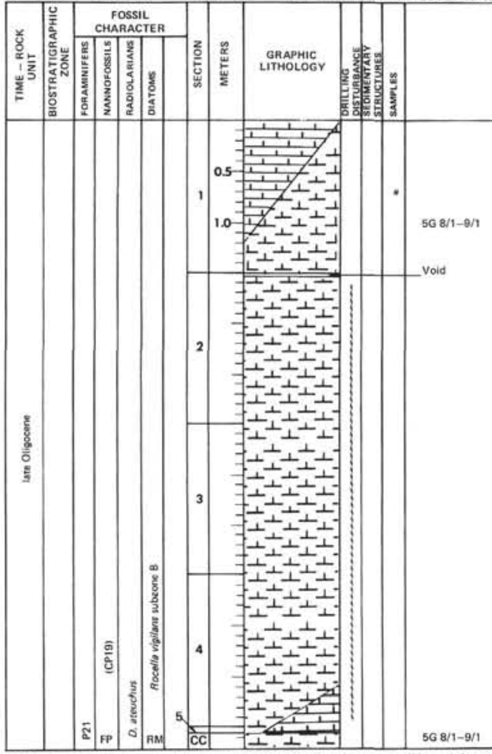
SMEAR SLIDE SUMMARY (%):

	1, 90	3, 140
Texture:		
Sand	2	2
Silt	35	40
Clay	63	58
Composition:		
Pyrite	Tr	10
Foraminifers	3	1
Calc. nannofossils	94	81
Diatoms	1	5
Radiolarians	2	3
Sponge spicules	Tr	Tr

CARBONATE BOMB:
1, 75 cm = 88% 4, 75 cm = 89%
2, 85 cm = 88% 5, 80 cm = 86%
3, 55 cm = 86% 6, 80 cm = 88%

NOTE: Graphic lithologies represent average compositions derived from smear slides and do not always reflect the detailed alternation of sediment types. Major lithologic boundaries are shown but gradational contacts, small-scale cyclicity and ooze-chalk alternations are represented schematically. Color changes approximate to lithologic changes.

SITE 574 HOLE C CORE 21 CORED INTERVAL 384.5–394.0 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):
Uniform green white (5G 8/1–9/1) nanno ooze/chalk with 5 to 25 cm chalk sections every 5 to 20 cm in the undisturbed intervals.

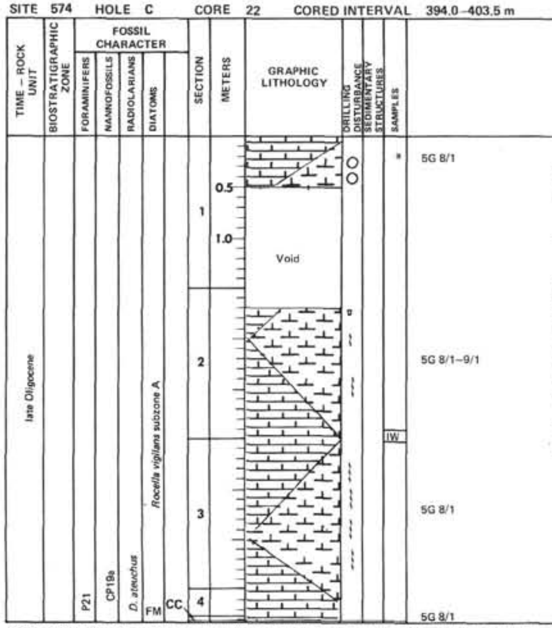
SMEAR SLIDE SUMMARY (%):

	1, 75
Texture:	
Sand	2
Silt	25
Clay	73
Composition:	
Pyrite	Tr
Foraminifers	5
Calc. nannofossils	93
Diatoms	Tr
Radiolarians	2
Sponge spicules	Tr

CARBONATE BOMB:
1, 66 cm = 88%
2, 85 cm = 91%
3, 75 cm = 89%

NOTE: Graphic lithologies represent average compositions derived from smear slides and do not always reflect the detailed alternation of sediment types. Major lithologic boundaries are shown but gradational contacts, small-scale cyclicity and ooze-chalk alternations are represented schematically. Color changes approximate to lithologic changes.

SITE 574 HOLE C CORE 22 CORED INTERVAL 394.0–403.5 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Green white (5G 8/1–9/1) nanno chalk/ooze with 3 to 20 cm sections of highly deformed to soupy ooze at intervals of 7 to 25 cm in a dominantly chalk core.

SMEAR SLIDE SUMMARY (%):

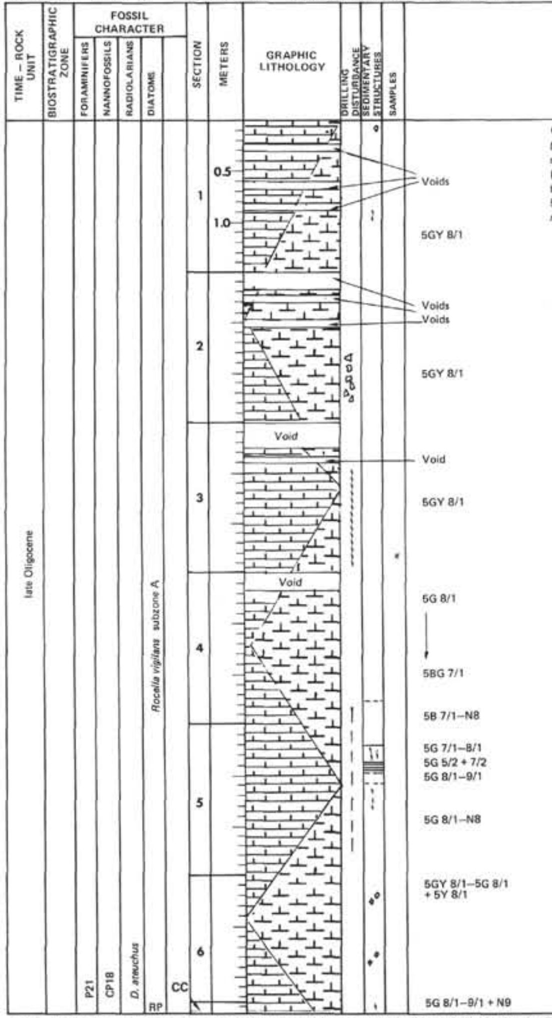
	1, 20
Texture:	
Sand	1
Silt	30
Clay	69
Composition:	
Foraminifers	3
Calc. nannofossils	96
Radiolarians	1
Sponge spicules	Tr

CARBONATE BOMB:

1, 15 cm = 87%
2, 35 cm = 91%

NOTE: Graphic lithologies represent average compositions derived from smear slides and do not always reflect the detailed alternation of sediment types. Major lithologic boundaries are shown but gradational contacts, small-scale cyclicity and ooze-chalk alternations are represented schematically. Color changes approximate to lithologic changes.

SITE 574 HOLE C CORE 23 CORED INTERVAL 403.5–413.0 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Dominantly green white (5GY 8/1 and 5G 8/1–9/1) nanno chalk/ooze with a 1 to 1.5 m interval of pale blue (5B 7/1) and pale blue gray (5BG 7/1) with minor finely banded or laminated green gray (5G 5/2 and 7/2). Two to 50 cm sections of firm ooze every 2 to 40 cm. Minor mottling.

SMEAR SLIDE SUMMARY (%):

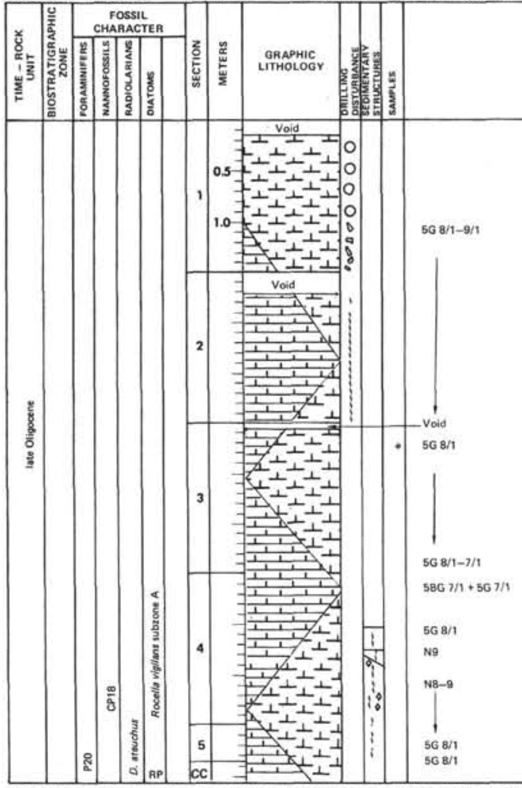
	3, 135
Texture:	
Sand	5
Silt	5
Clay	90
Composition:	
Pyrite	Tr
Carbonate unspec.	21
Foraminifers	8
Calc. nannofossils	70
Radiolarians	Tr
Sponge spicules	1

CARBONATE BOMB:

1, 94 cm = 91%
2, 90 cm = 94%
3, 65 cm = 90%
4, 63 cm = 94%
5, 121 cm = 89%

NOTE: Graphic lithologies represent average compositions derived from smear slides and do not always reflect the detailed alternation of sediment types. Major lithologic boundaries are shown but gradational contacts, small-scale cyclicity and ooze-chalk alternations are represented schematically. Color changes approximate to lithologic changes.

SITE 574 HOLE C CORE 24 CORED INTERVAL 413.0–422.5 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Dominantly green white (5G 8/1–9/1) nanno chalk/ooze; soupy to highly disturbed in the upper 3 m. Below 3 m, 5 to 10 cm sections of chalk at intervals of 10 to 25 cm, and below 5 m continuous mottled chalk.

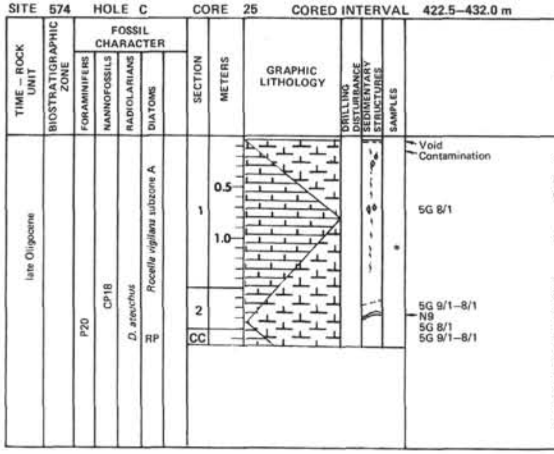
SMEAR SLIDE SUMMARY (%):

	3, 25
Texture:	
Sand	7
Silt	3
Clay	90
Composition:	
Pyrite	Tr
Carbonate unspec.	29
Foraminifers	9
Calc. nannofossils	60
Diatoms	Tr
Radiolarians	1
Sponge spicules	1

CARBONATE BOMB:
1, 120 cm = 89%
2, 134 cm = 90%
3, 48 cm = 87%
4, 77 cm = 93%

NOTE: Graphic lithologies represent average compositions derived from smear slides and do not always reflect the detailed alternation of sediment types. Major lithologic boundaries are shown but gradational contacts, small-scale cyclicity and ooze-chalk alternations are represented schematically. Color changes approximate to lithologic changes.

SITE 574 HOLE C CORE 25 CORED INTERVAL 422.5–432.0 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

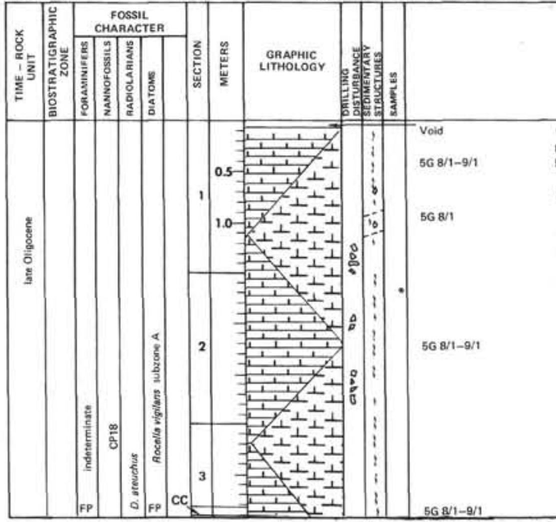
Dominantly mottled very pale green gray (5G 8/1) nanno chalk with several 3 to 30 cm intervals of firm ooze.

SMEAR SLIDE SUMMARY (%):

	1, 115
Texture:	
Sand	7
Silt	3
Clay	90
Composition:	
Pyrite	Tr
Carbonate unspec.	29
Foraminifers	9
Calc. nannofossils	60
Radiolarians	1
Sponge spicules	1

Hole 574C, Core 25
CARBONATE BOMB:
1, 52 cm = 86%

SITE 574 HOLE C CORE 26 CORED INTERVAL 432.0–441.5 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Mottled green white (5G 8/1–9/1) nanno chalk with two 5 to 10 cm intervals of firm ooze from 3 to 3.3 m.

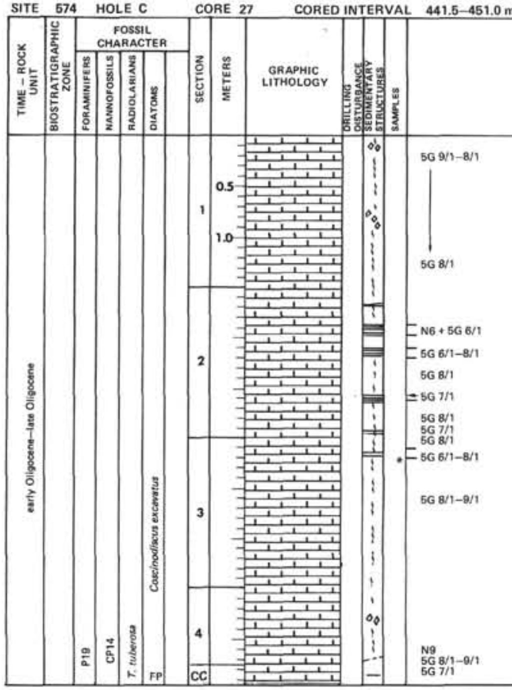
SMEAR SLIDE SUMMARY (%):

	2, 20
Texture:	
Sand	2
Silt	3
Clay	95
Composition:	
Pyrite	Tr
Carbonate unspec.	21
Foraminifers	3
Calc. nannofossils	75
Radiolarians	Tr
Sponge spicules	1

CARBONATE BOMB:
1, 66 cm = 91%
2, 80 cm = 91%
3, 71 cm = 93%

NOTE: Graphic lithologies represent average compositions derived from smear slides and do not always reflect the detailed alternation of sediment types. Major lithologic boundaries are shown but gradational contacts, small-scale cyclicity and ooze-chalk alternations are represented schematically. Color changes approximate to lithologic changes.

SITE 574 HOLE C CORE 27 CORED INTERVAL 441.5–451.0 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

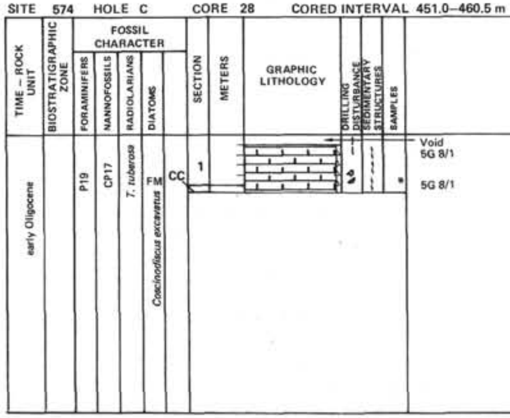
Dominantly mottled green white (5G 8/1–9/1) nanno chalk banded with light to pale green gray (5G 8/1–6/1) between 1.9 and 3.2 m.

SMEAR SLIDE SUMMARY (%):

	3, 27
Texture:	
Sand	5
Silt	2
Clay	93
Composition:	
Pyrite	Tr
Carbonate unspec.	9
Foraminifers	3
Calc. nannofossils	85
Diatoms	1
Radiolarians	2
Sponge spicules	Tr

CARBONATE BOMB:
1, 74 cm = 91%
2, 70 cm = 93%
3, 58 cm = 90%

SITE 574 HOLE C CORE 28 CORED INTERVAL 451.0–460.5 m



LITHOLOGIC DESCRIPTION

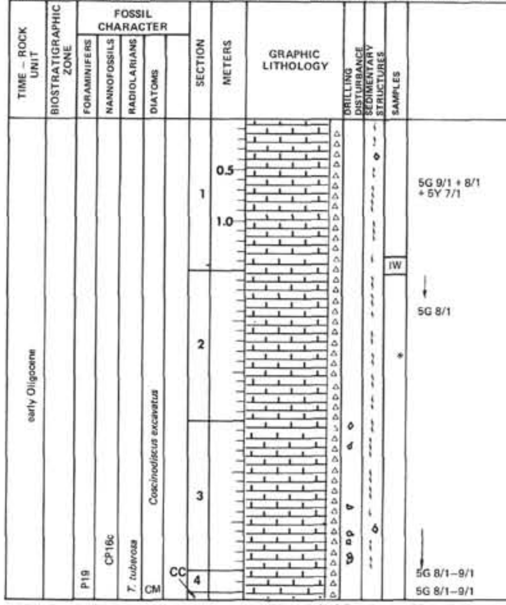
GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Mottled very pale green gray (5G 8/1) nanno chalk.

SMEAR SLIDE SUMMARY (%):

	1, 45
Texture:	
Sand	4
Silt	3
Clay	93
Composition:	
Pyrite	Tr
Carbonate unspec.	60
Foraminifers	1
Calc. nannofossils	34
Diatoms	Tr
Radiolarians	4
Sponge spicules	1

SITE 574 HOLE C CORE 29 CORED INTERVAL 460.5–470.0 m



LITHOLOGIC DESCRIPTION

GREEN WHITE OOZE/CHALK (SUBUNIT IIA):

Mottled very pale green gray (5G 8/1) to green white (5G 9/1) siliceous nanno chalk; several 5 to 10 cm intervals of firm ooze in the lower 2 m.

SMEAR SLIDE SUMMARY (%):

	2, 87
Texture:	
Sand	15
Silt	5
Clay	80
Composition:	
Pyrite	Tr
Carbonate unspec.	14
Foraminifers	1
Calc. nannofossils	70
Diatoms	6
Radiolarians	9
Sponge spicules	Tr

CARBONATE BOMB:
1, 130 cm = 86%
2, 64 cm = 82%
3, 70 cm = 85%

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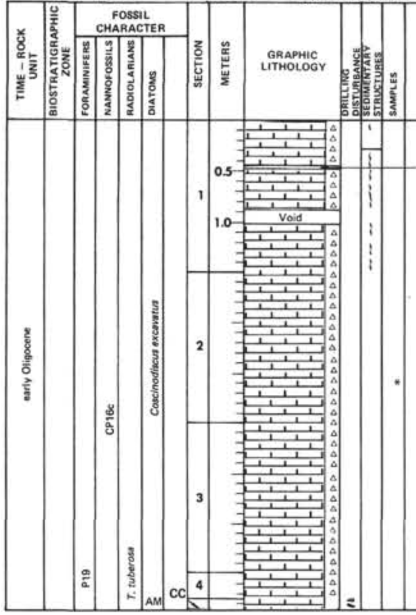
SITE 574 HOLE C CORE 30 CORED INTERVAL 470.0–479.5 m



LITHOLOGIC DESCRIPTION

5G 9/1–8/1

Void

GREEN WHITE OOZE/CHALK (SUBUNIT IIA) (470.0–470.2 m):

Twenty-four cm of mottled green white (5G 9/1–8/1) siliceous nanno chalk.

YELLOW WHITE CHALK (SUBUNIT IIB) (470.2–479.5 m):

Very pale brown (10YR 8/2) siliceous nanno chalk/ooze, mottled in the top 120 cm. Five to 20 cm sections of chalk separated by 5 to 30 cm intervals of ooze.

10YR 8/2

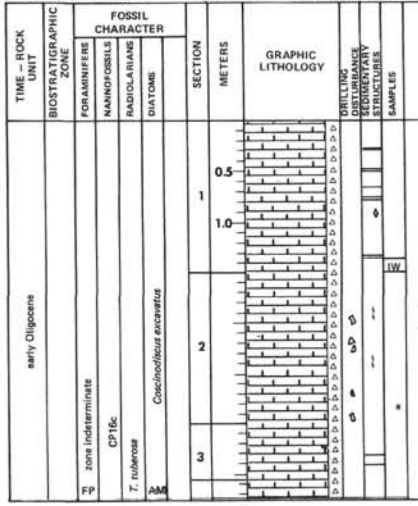
SMEAR SLIDE SUMMARY (%):

	2, 110
Texture:	
Sand	10
Silt	5
Clay	85
Composition:	
Carbonate unspec.	70
Foraminifers	Tr
Calc. nannofossils	15
Diatoms	4
Radiolarians	9
Sponge spicules	1

CARBONATE BOMB:
1, 148 cm = 79%
2, 62 cm = 80%
3, 70 cm = 79%

10YR 8/2

SITE 574 HOLE C CORE 31 CORED INTERVAL 479.5–489.0 m



LITHOLOGIC DESCRIPTION

YELLOW WHITE CHALK (SUBUNIT IIB):

Uniform pale brown (10YR 8/2) diatom nanno chalk with a few intervals of mm-scale banding of yellow white (2.5Y 8/4). Minor mottling.

10YR 8/2 +
2.5Y 8/4

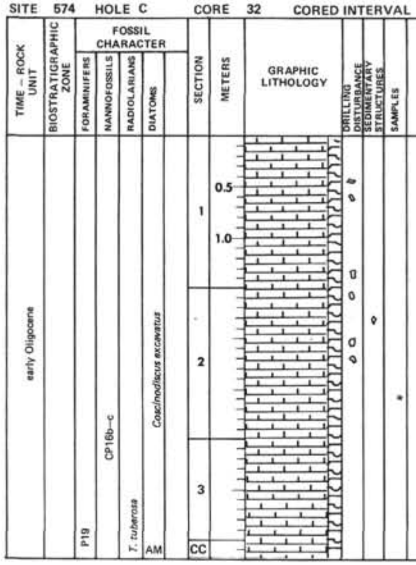
SMEAR SLIDE SUMMARY (%):

	2, 139
Texture:	
Sand	10
Silt	10
Clay	80
Composition:	
Carbonate unspec.	12
Foraminifers	2
Calc. nannofossils	70
Diatoms	12
Radiolarians	3
Sponge spicules	1

CARBONATE BOMB:
1, 70 cm = 71%
2, 105 cm = 80%

10YR 8/2

SITE 574 HOLE C CORE 32 CORED INTERVAL 489.0–498.5 m



LITHOLOGIC DESCRIPTION

YELLOW WHITE CHALK (SUBUNIT IIB):

Uniform yellow white (10YR 9/2) diatom nanno chalk.

SMEAR SLIDE SUMMARY (%):

	2, 110
Texture:	
Sand	5
Silt	15
Clay	80
Composition:	
Foraminifers	5
Calc. nannofossils	82
Diatoms	10
Radiolarians	3
Sponge spicules	Tr

CARBONATE BOMB:
1, 110 cm = 86%
2, 75 cm = 76%

10YR 9/2

10YR 9/2

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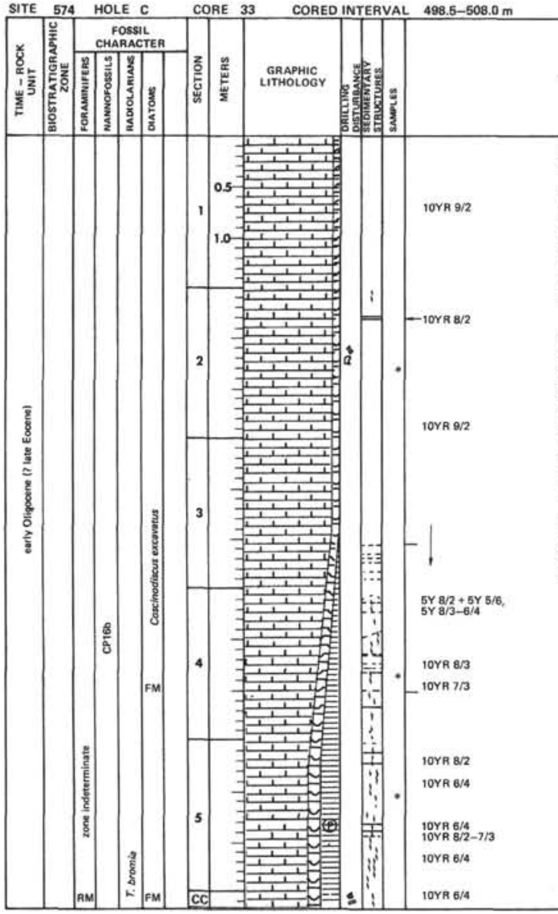
SITE 574 HOLE C CORE 33 CORED INTERVAL 498.5–508.0 m



LITHOLOGIC DESCRIPTION

YELLOW WHITE CHALK (SUBUNIT IIB) (0.0–4.0 m): Four m of yellow white (10YR 9/2) nanno chalk.

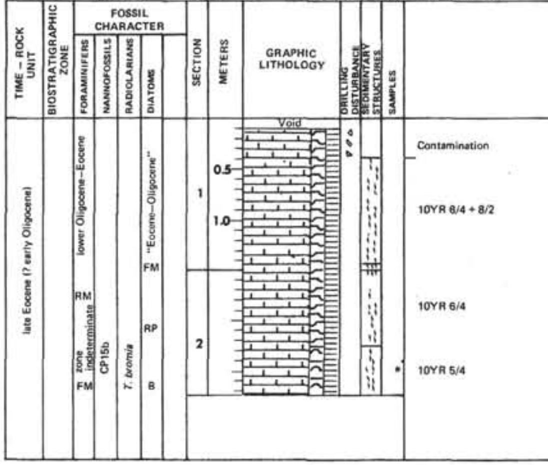
METALLIFEROUS CHALK (UNIT III) (4.0–9.5 m): Mottled and banded dominantly very pale yellow brown (10YR 8/2–8/3 to very pale brown (10YR 7/3) metalliferous *diatom nanno chalk which itself darkens downward* to a light yellowish brown (10YR 6/4). Upper 1 m of metalliferous chalk contains numerous 1 to 3 mm blebs of olive green (5Y 5/6) volcanic glass.

SMEAR SLIDE SUMMARY (%):

	2, 80 D	4, 89 M	5, 60 D
Texture:			
Sand	5	50	10
Silt	35	20	30
Clay	60	30	60
Composition:			
Volcanic glass	–	60	Tr
Pyrite	–	–	5
Foraminifers	10	5	–
Calc. nannofossils	85	34	70
Diatoms	3	–	10
Radiolarians	2	1	5
Fe-oxides	–	–	10

CARBONATE BOMB:
1, 65 cm = 93%
2, 80 cm = 88%
4, 45 cm = 84%
5, 50 cm = 66%

SITE 574 HOLE C CORE 34 CORED INTERVAL 508.0–517.5 m



LITHOLOGIC DESCRIPTION

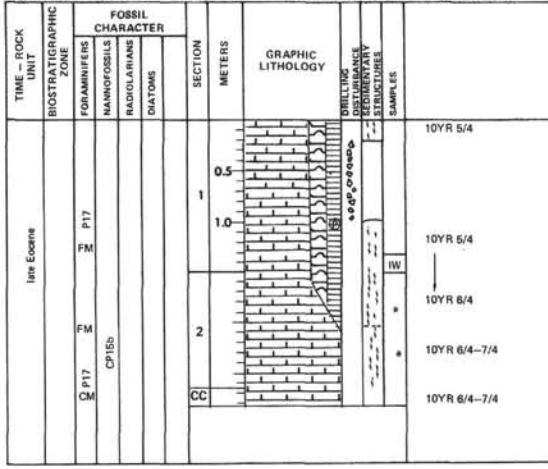
METALLIFEROUS CHALK (UNIT III):
2.3 m of light yellowish brown (10YR 6/4) metalliferous (10YR 5/4) metalliferous rad nanno chalk.
(10YR 8/2) and underlain by mottled yellow brown (10YR 5/4) metalliferous rad nanno chalk.

SMEAR SLIDE SUMMARY (%):

	2, 100
Texture:	
Sand	5
Silt	15
Clay	80
Composition:	
Clay	5
Volcanic glass	Tr
Pyrite	3
Calc. nannofossils	67
Diatoms	Tr
Radiolarians	15
Sponge spicules	Tr
Mn/Fe-oxides	10

Hole 574C, Core 34
CARBONATE BOMB:
1, 43 cm = 68%

SITE 574 HOLE C CORE 35 CORED INTERVAL 517.5–520.0 m



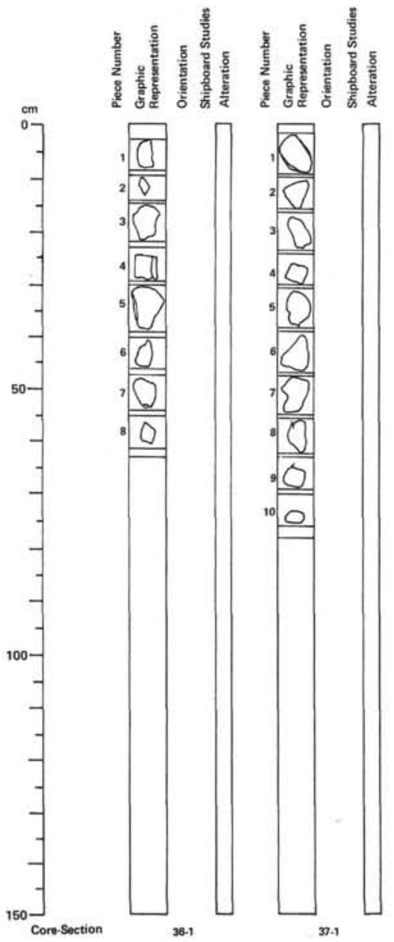
LITHOLOGIC DESCRIPTION

METALLIFEROUS CHALK (UNIT III):
2.1 m of mottled yellow brown (10YR 5/4) metalliferous (10YR 6/4) metalliferous nanno chalk and pale brown (10YR 6/4) metaliferous nanno chalk and pale brown (10YR 6/4–7/4) nanno chalk. Numerous 0.5 mm black (?ferromanganese) micronodules and 0.5 to 1 mm greenish yellow (10Y 6/6) glass shards.

SMEAR SLIDE SUMMARY (%):

	2, 40 D	2, 85 M
Texture:		
Sand	5	0
Silt	25	25
Clay	70	75
Composition:		
Volcanic glass	Tr	Tr
Pyrite	5	Tr
Foraminifers	3	–
Calc. nannofossils	82	98
Diatoms	Tr	–
Radiolarians	Tr	Tr
Fe/Mn-oxides	10	2

Hole 574C, Core 35
CARBONATE BOMB:
1, 72 cm = 66%

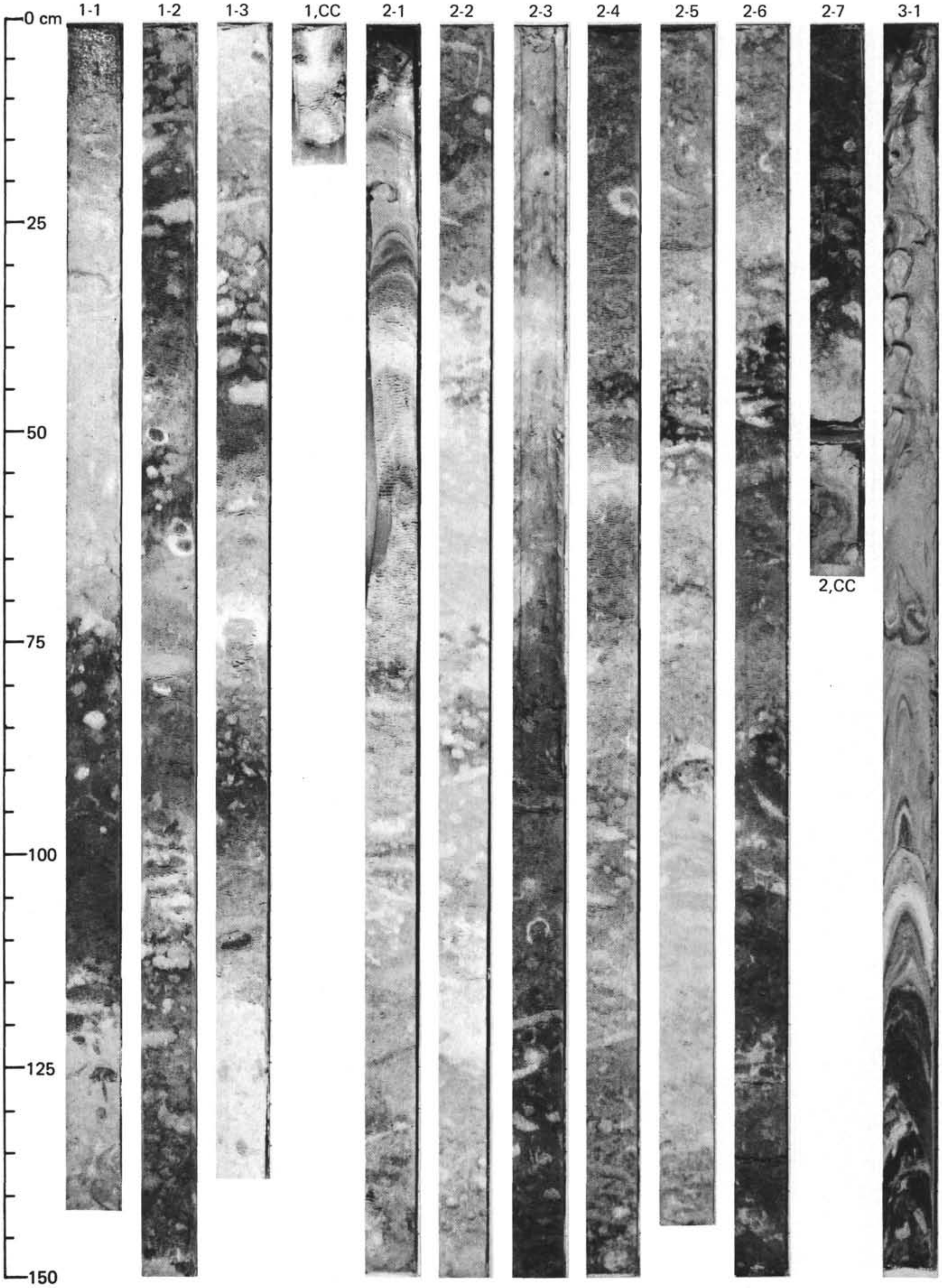


85-574C-36-1 Depth 520.0–525.5 m

BASALT (UNIT IV):
Dark fine-grained basalt.

85-574C-37-1 Depth 525.5–532.5 m

BASALT (UNIT IV):
Dark fine-grained basalt.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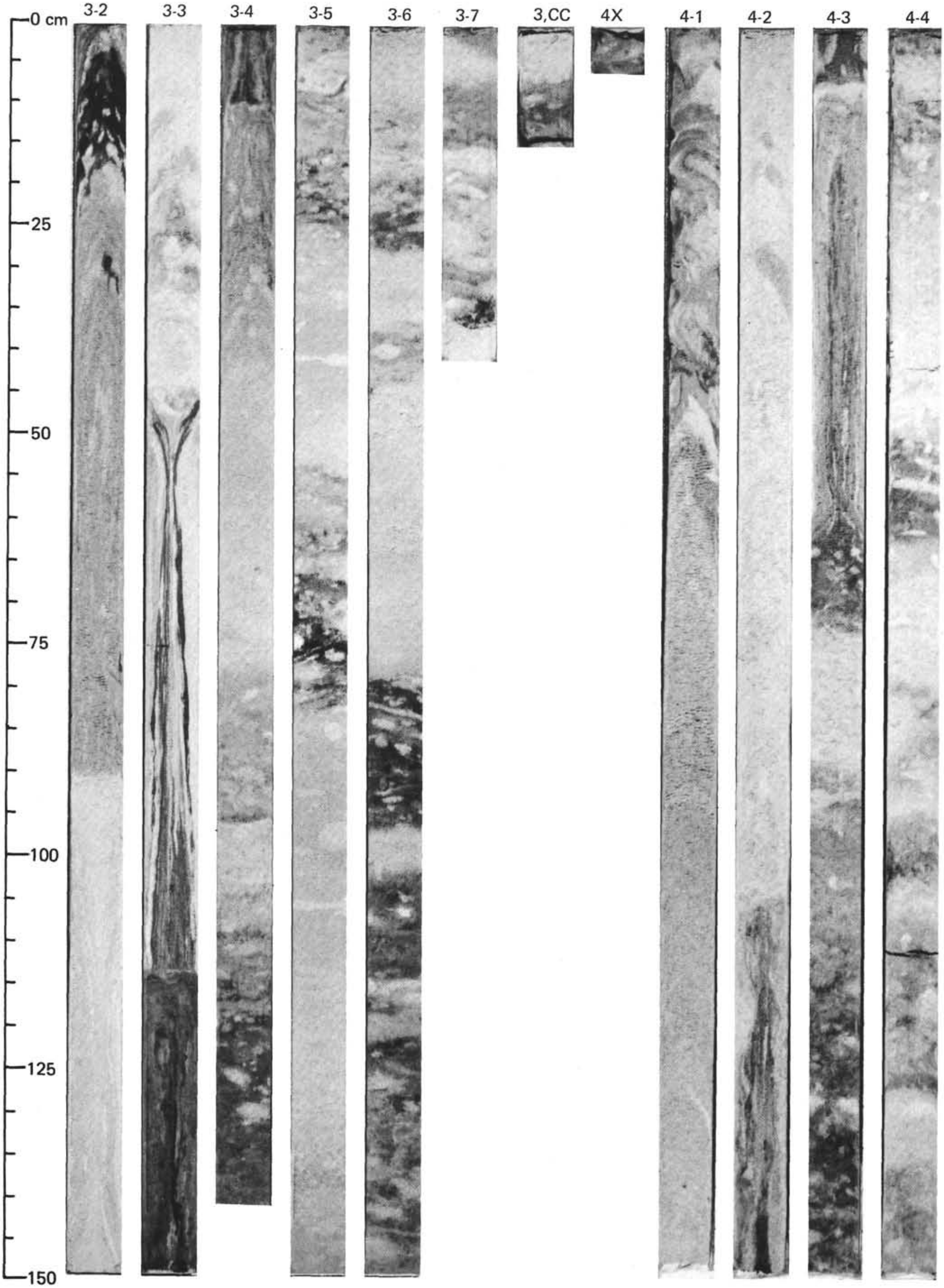
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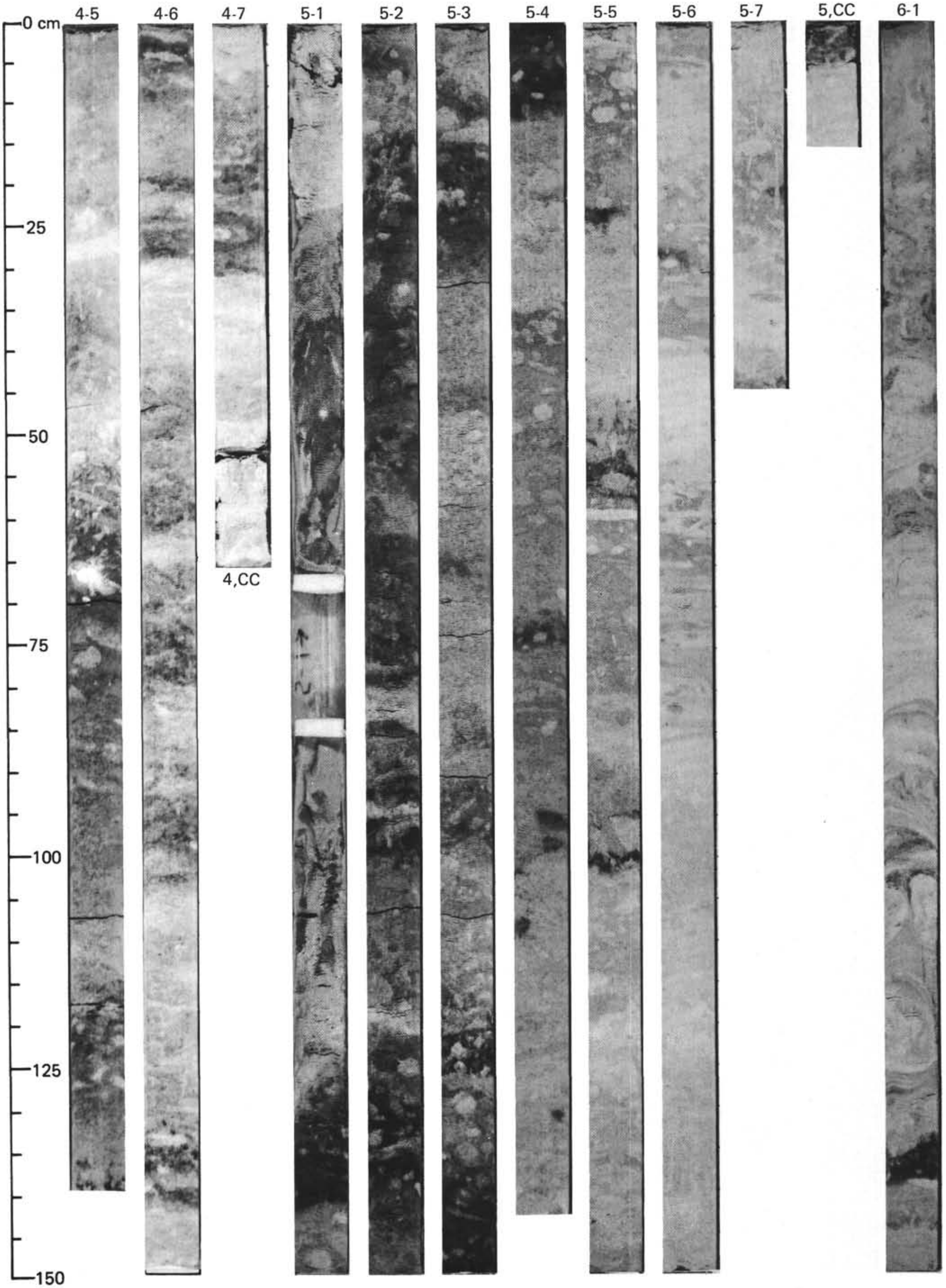
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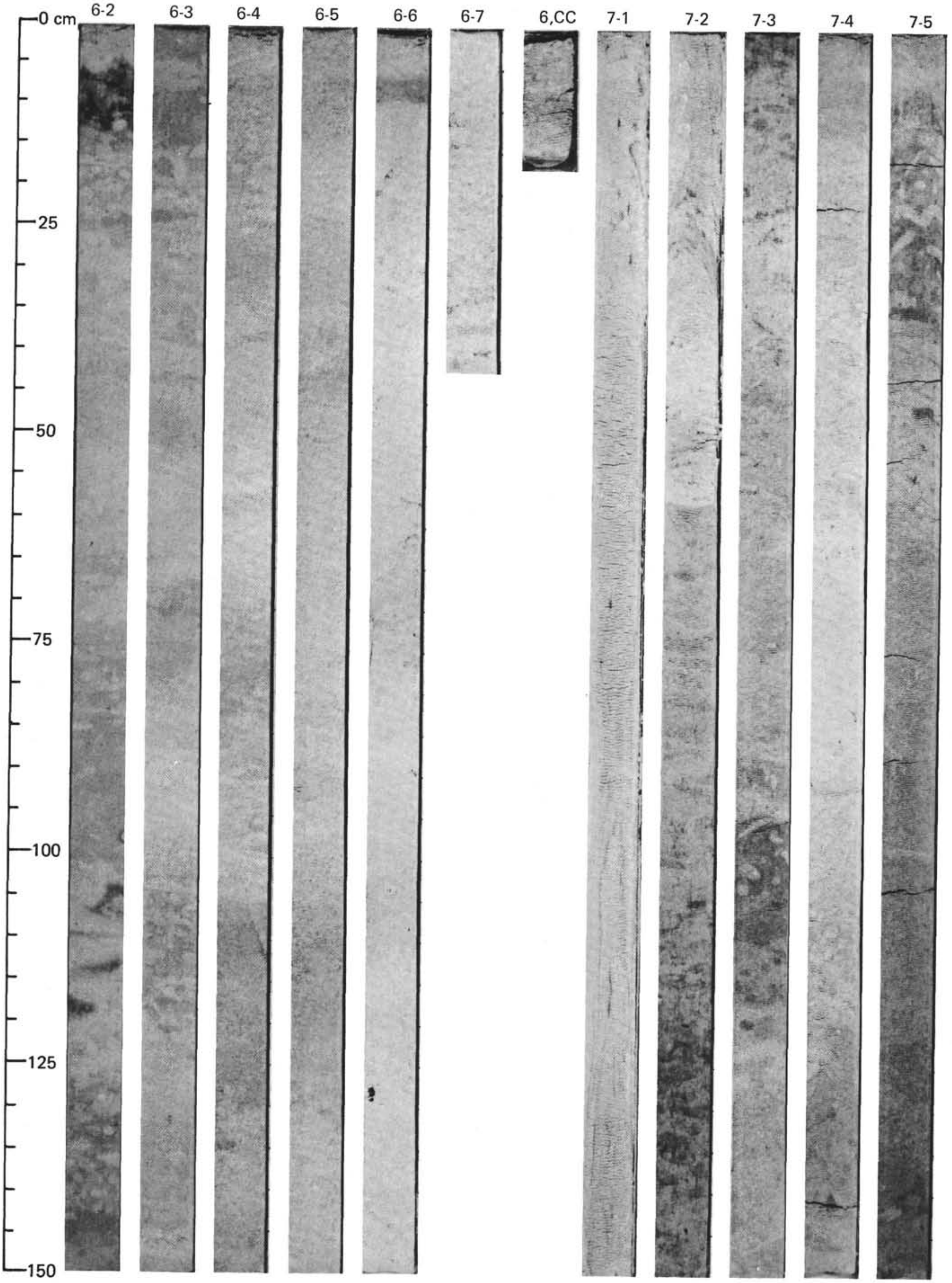
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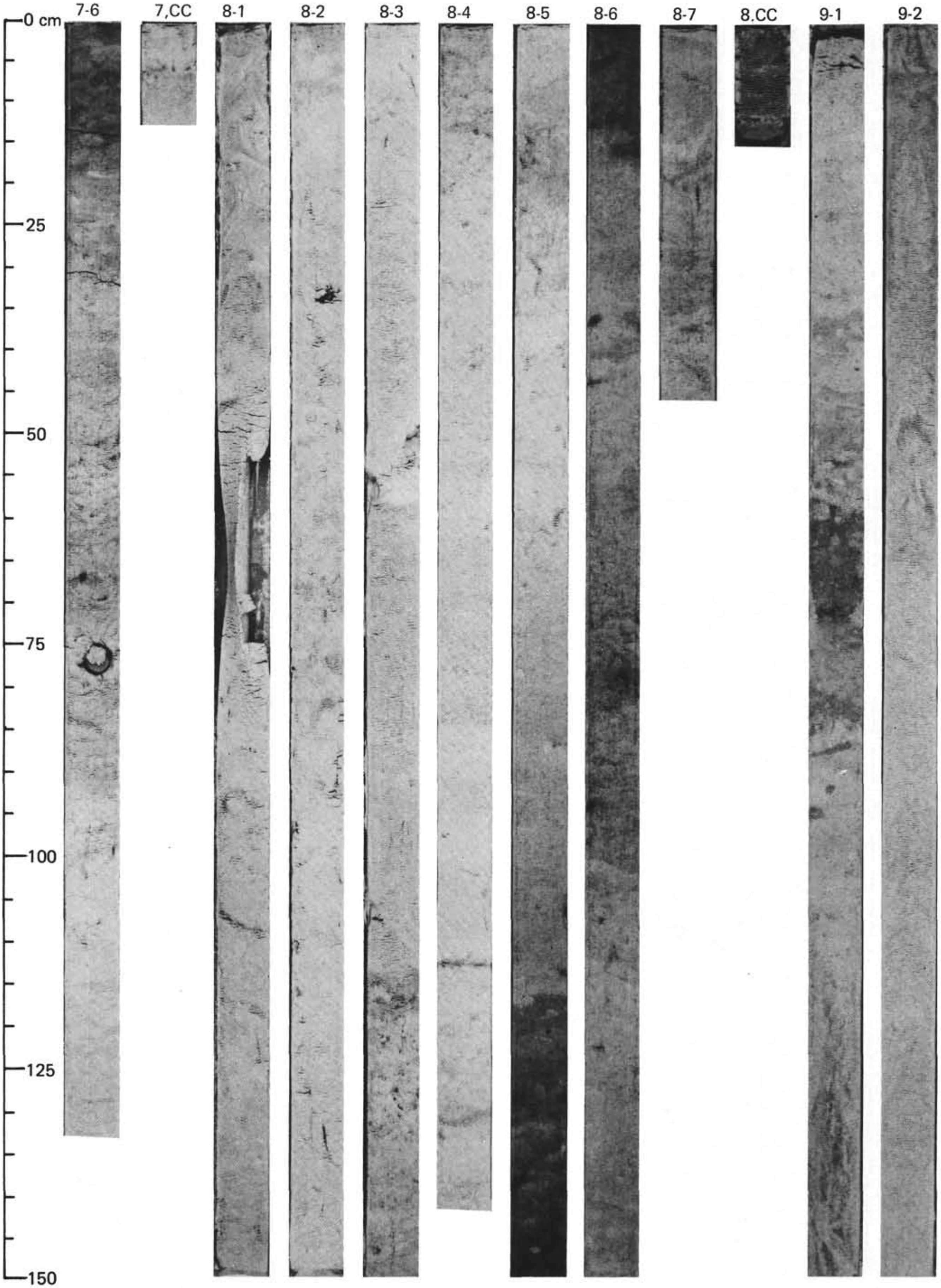
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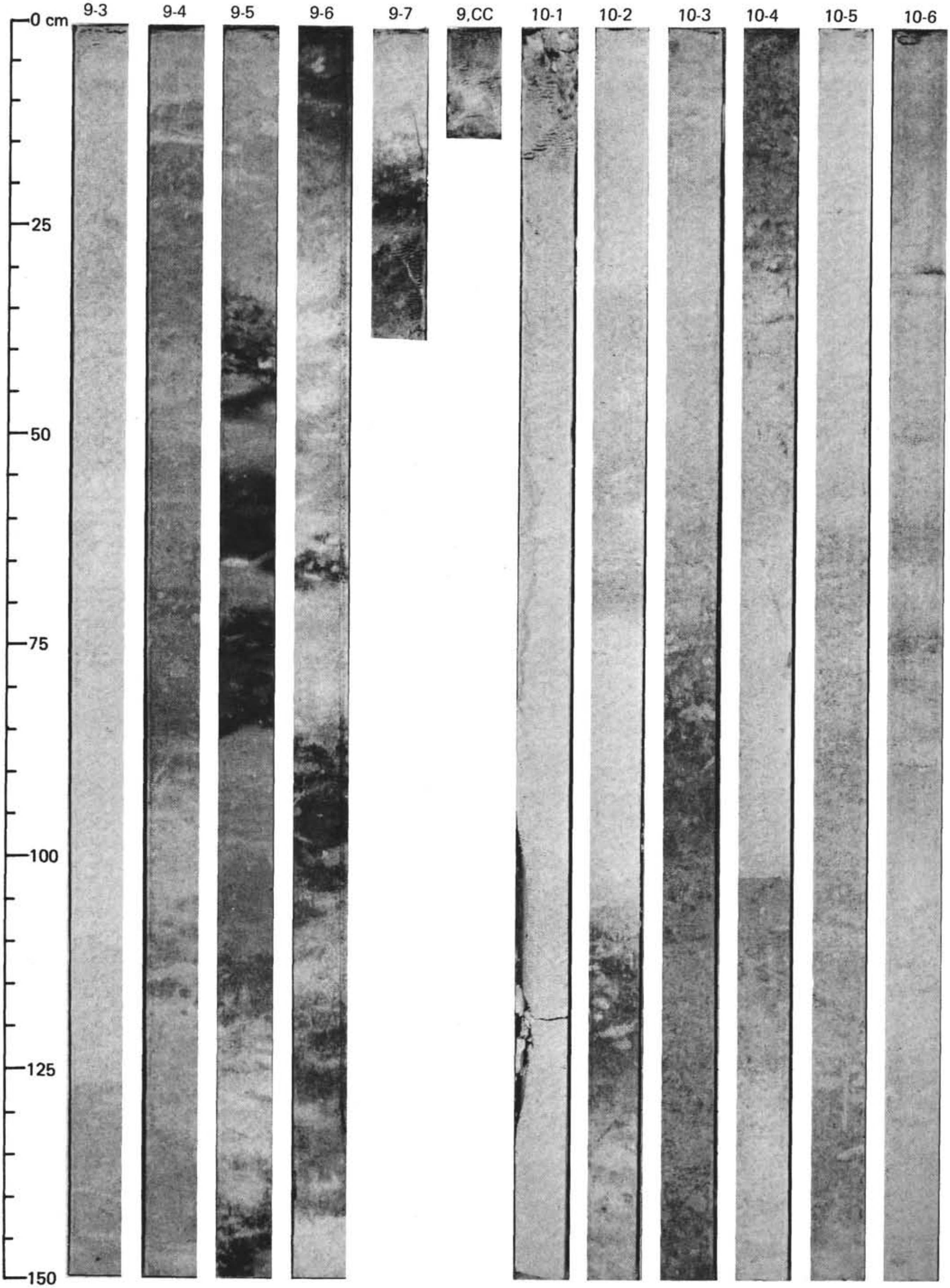
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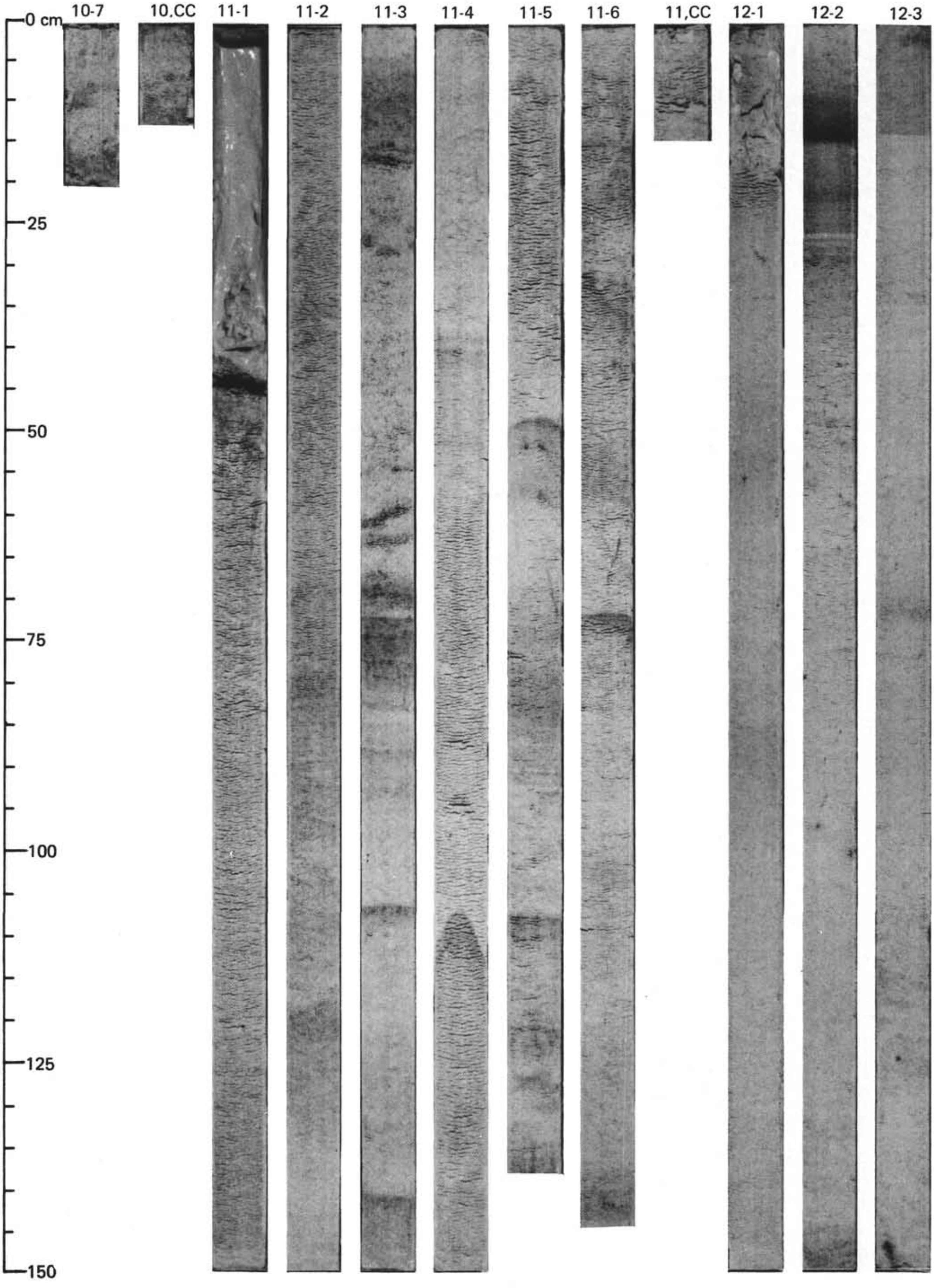
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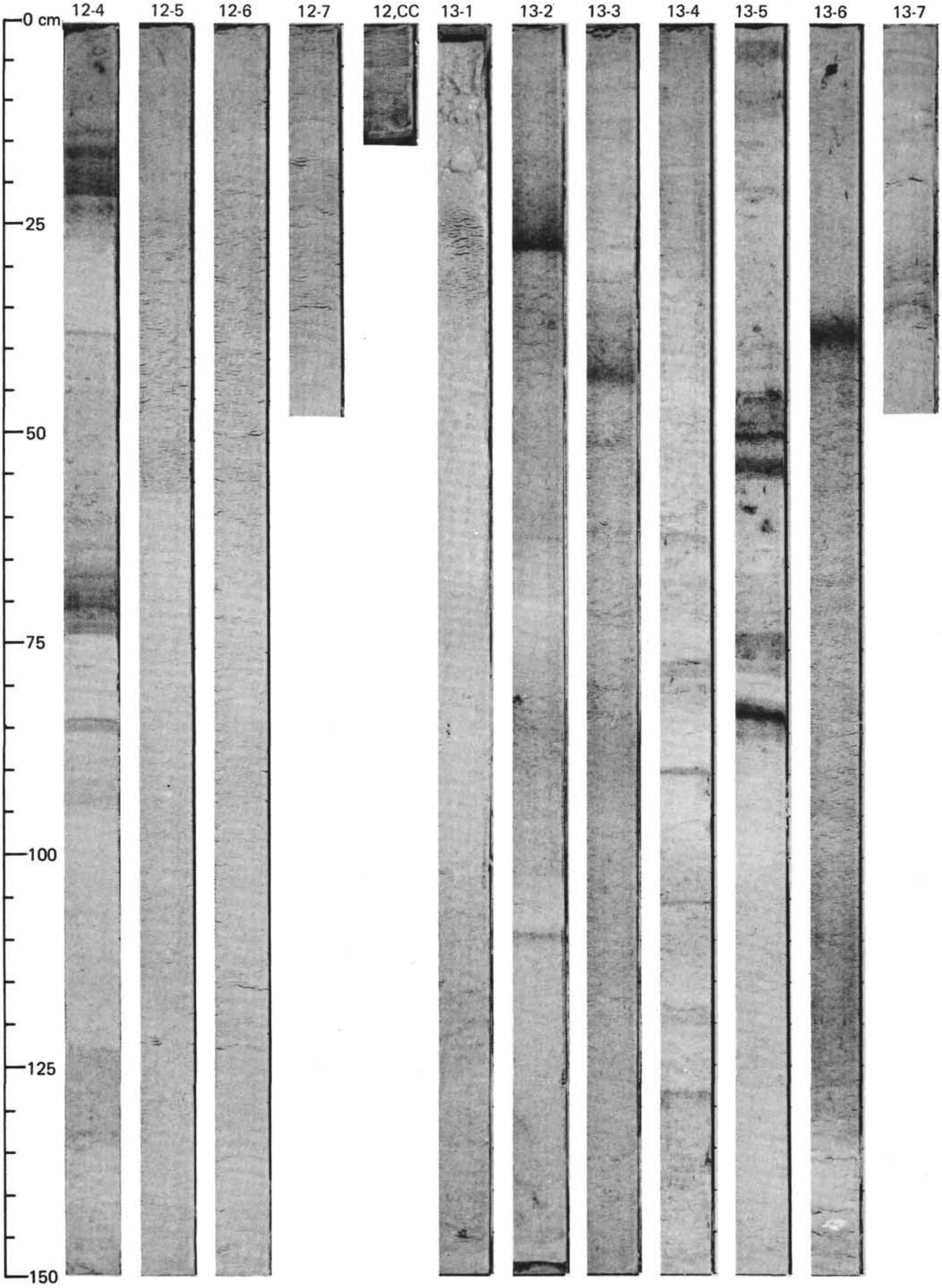
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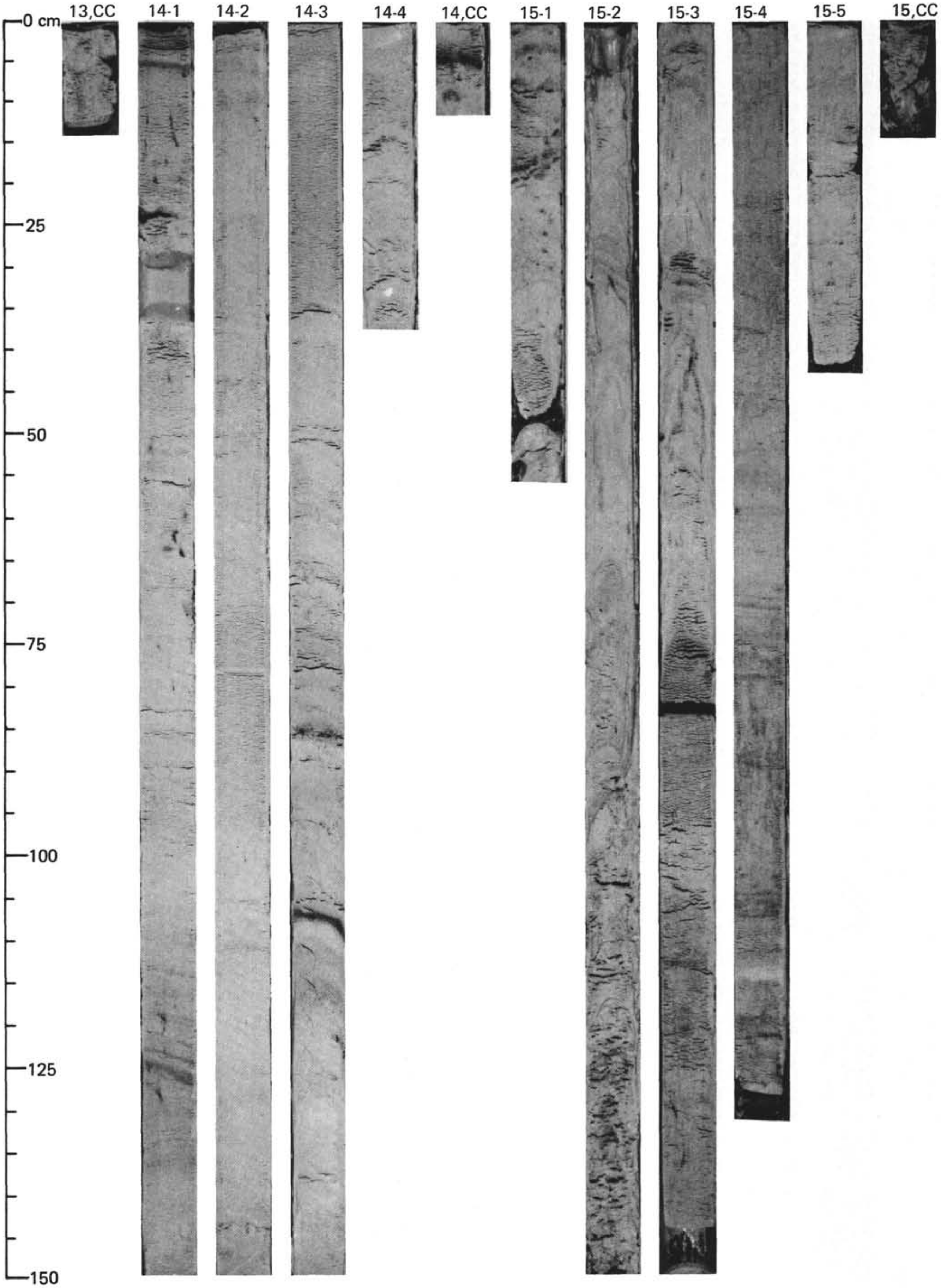
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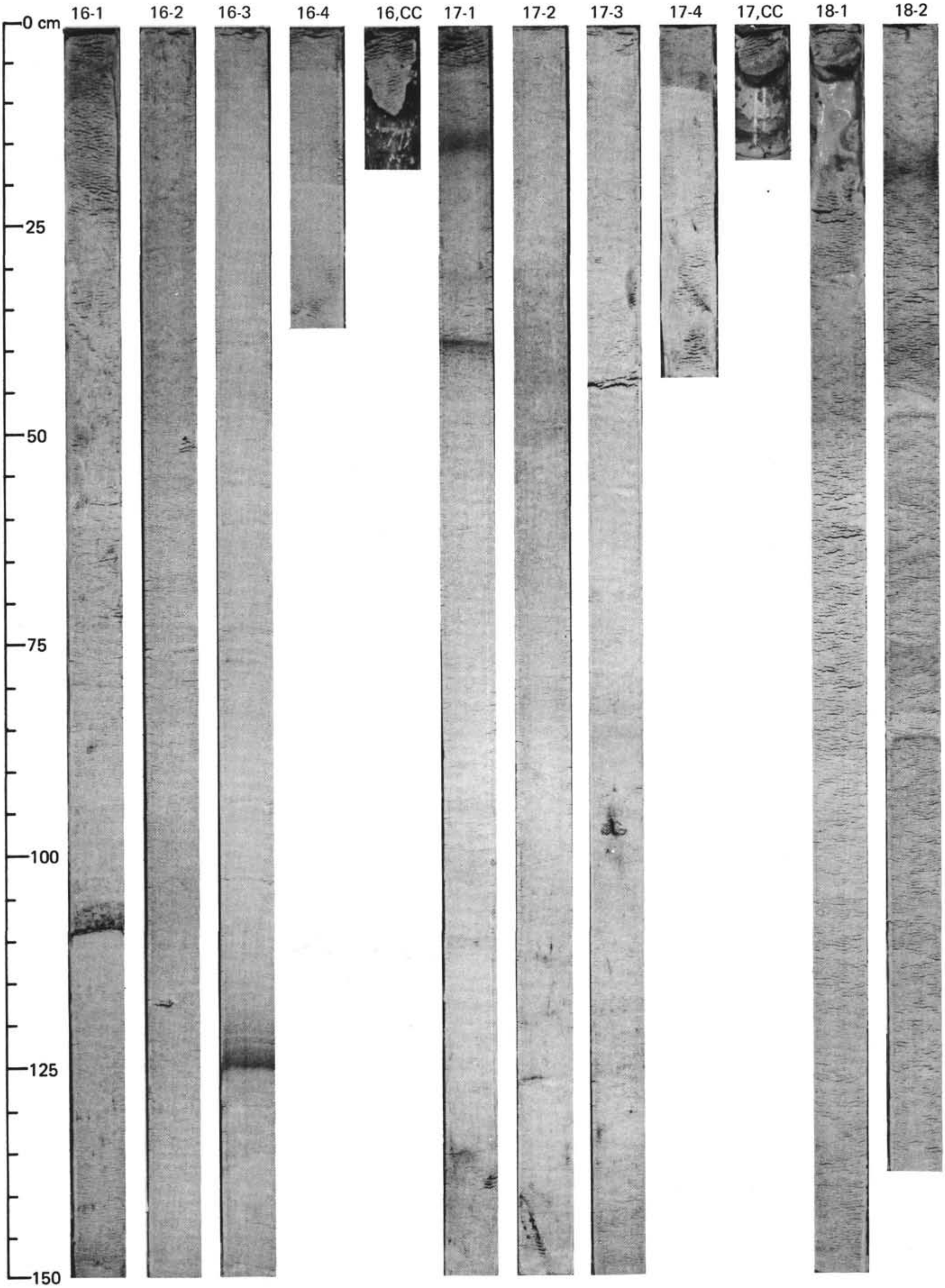
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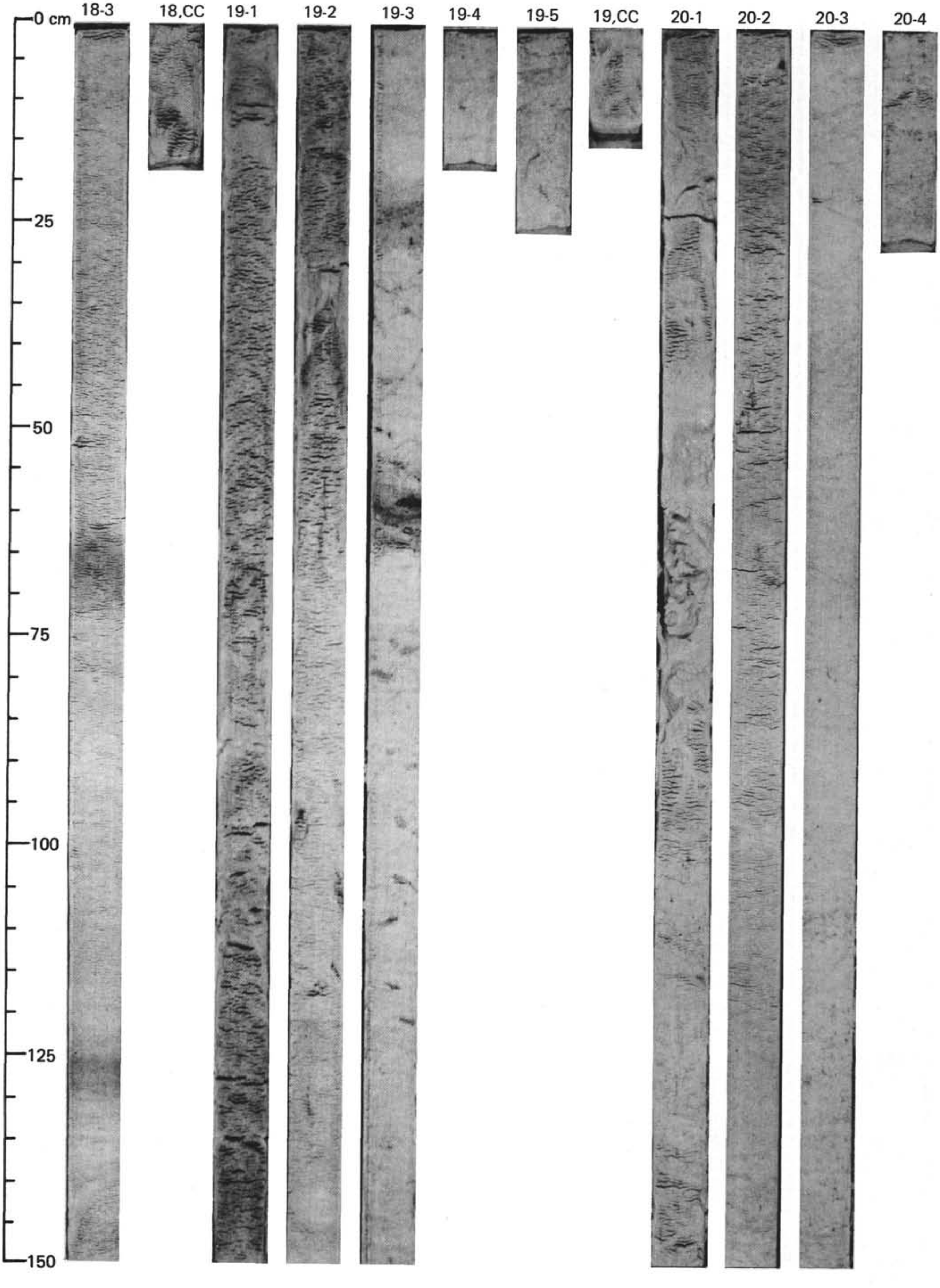
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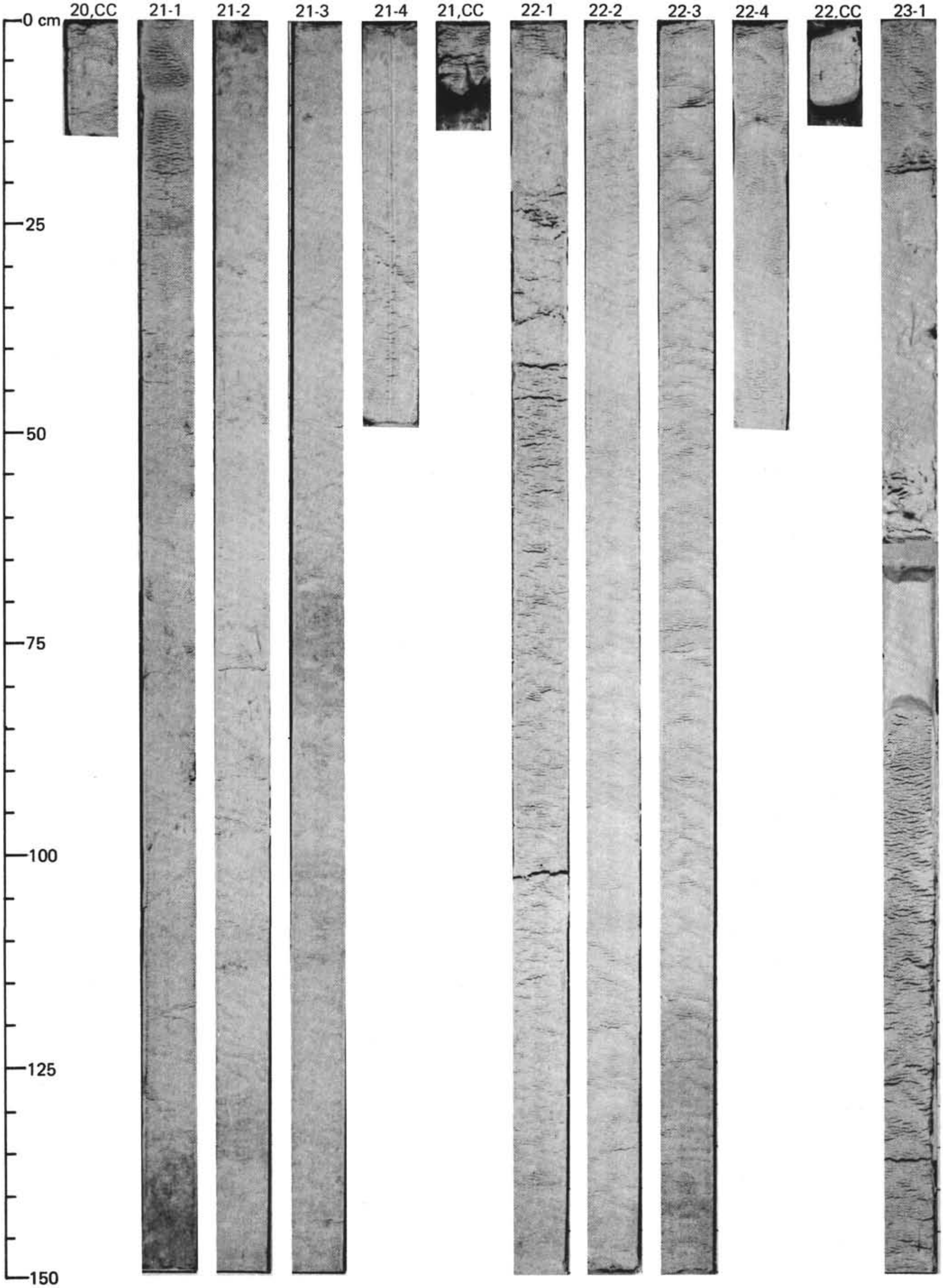
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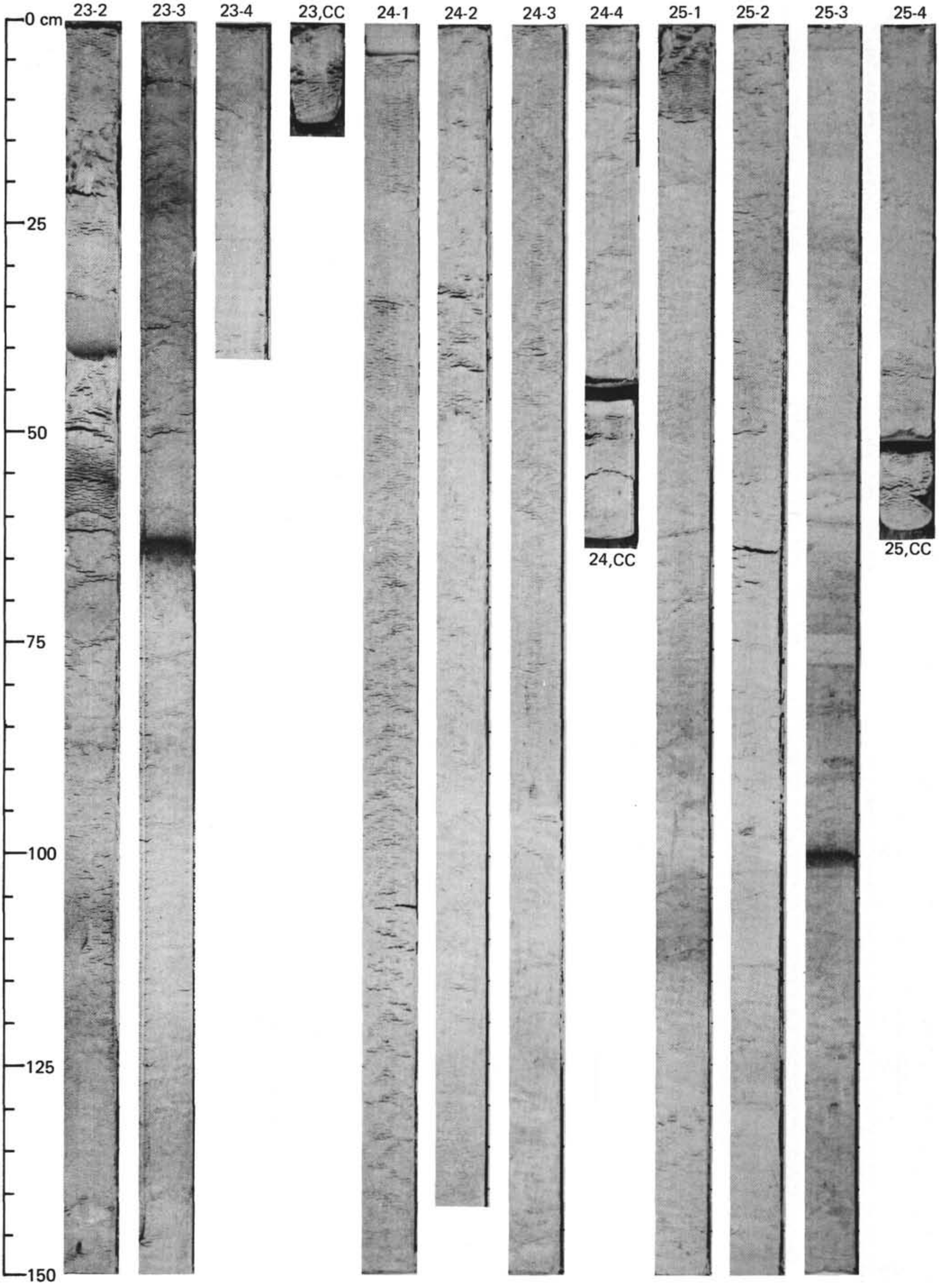
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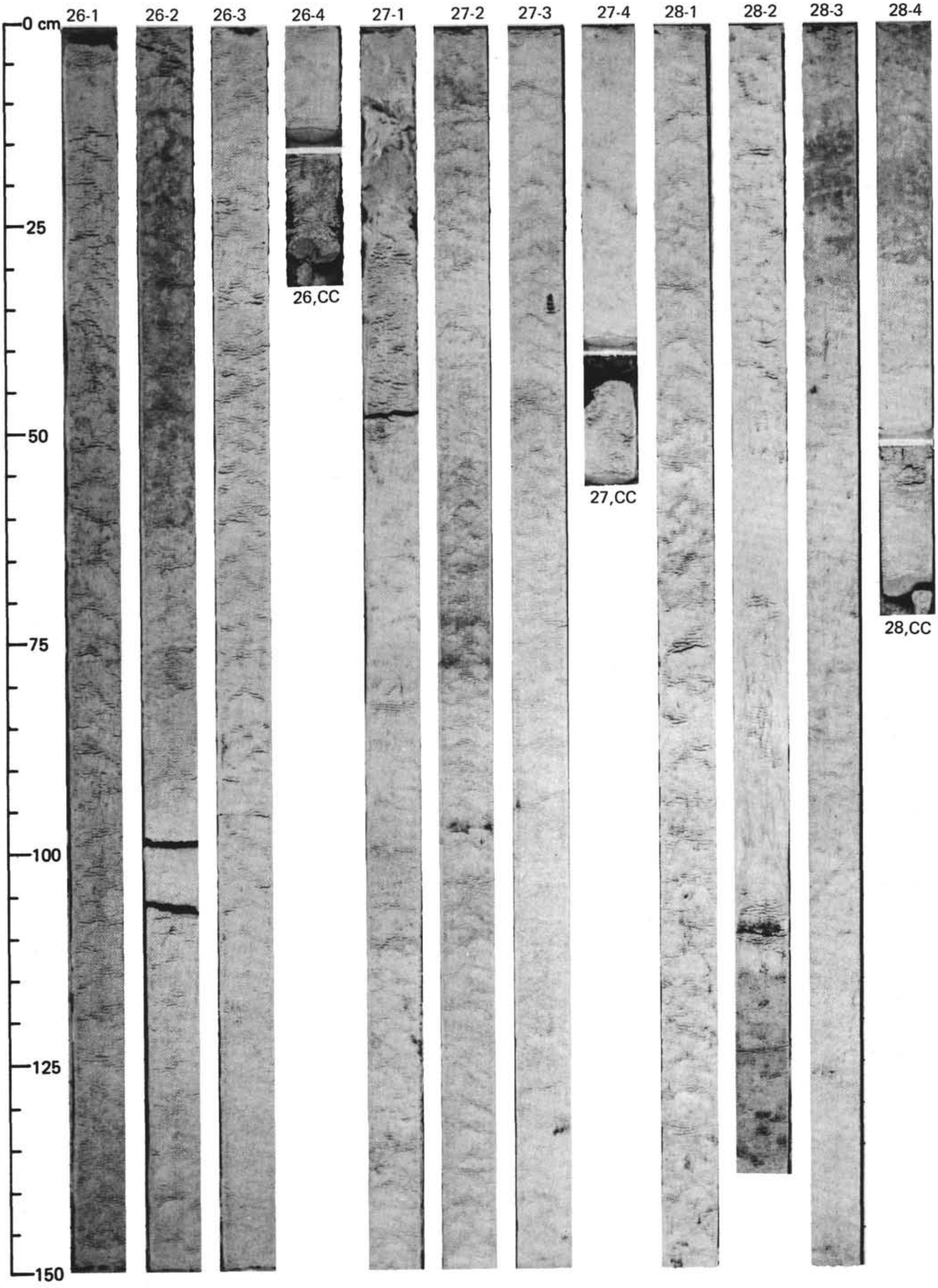
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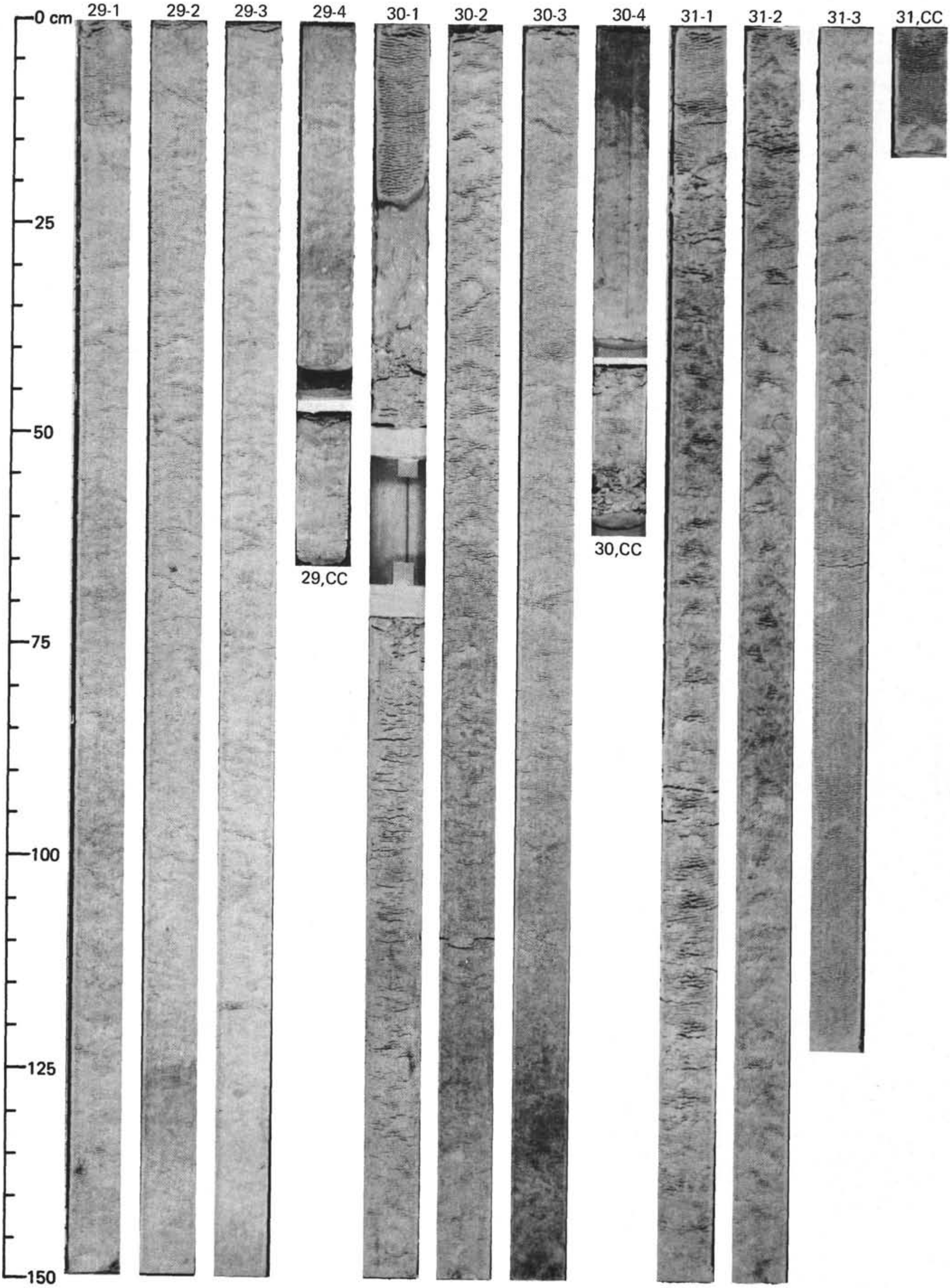
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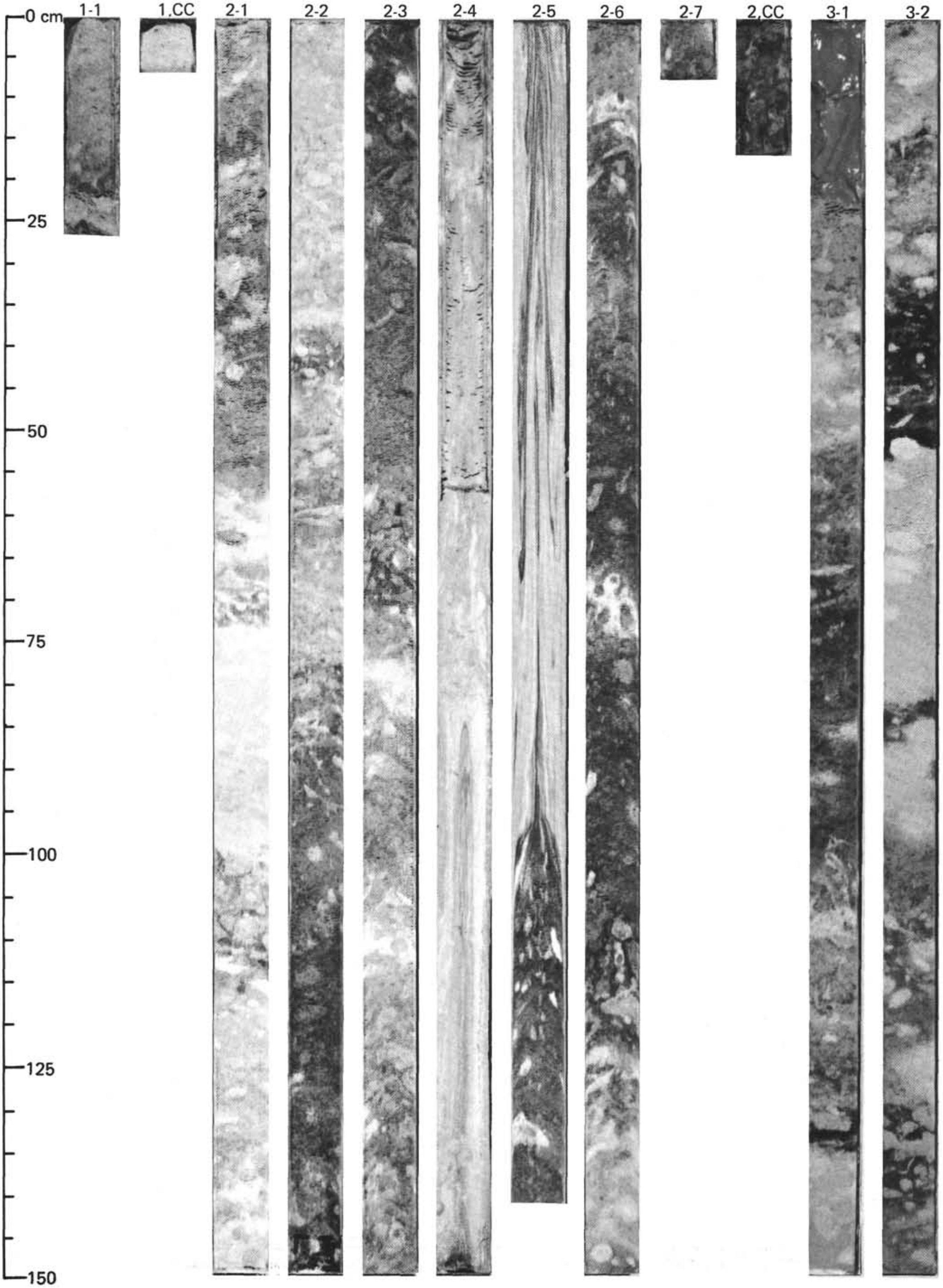
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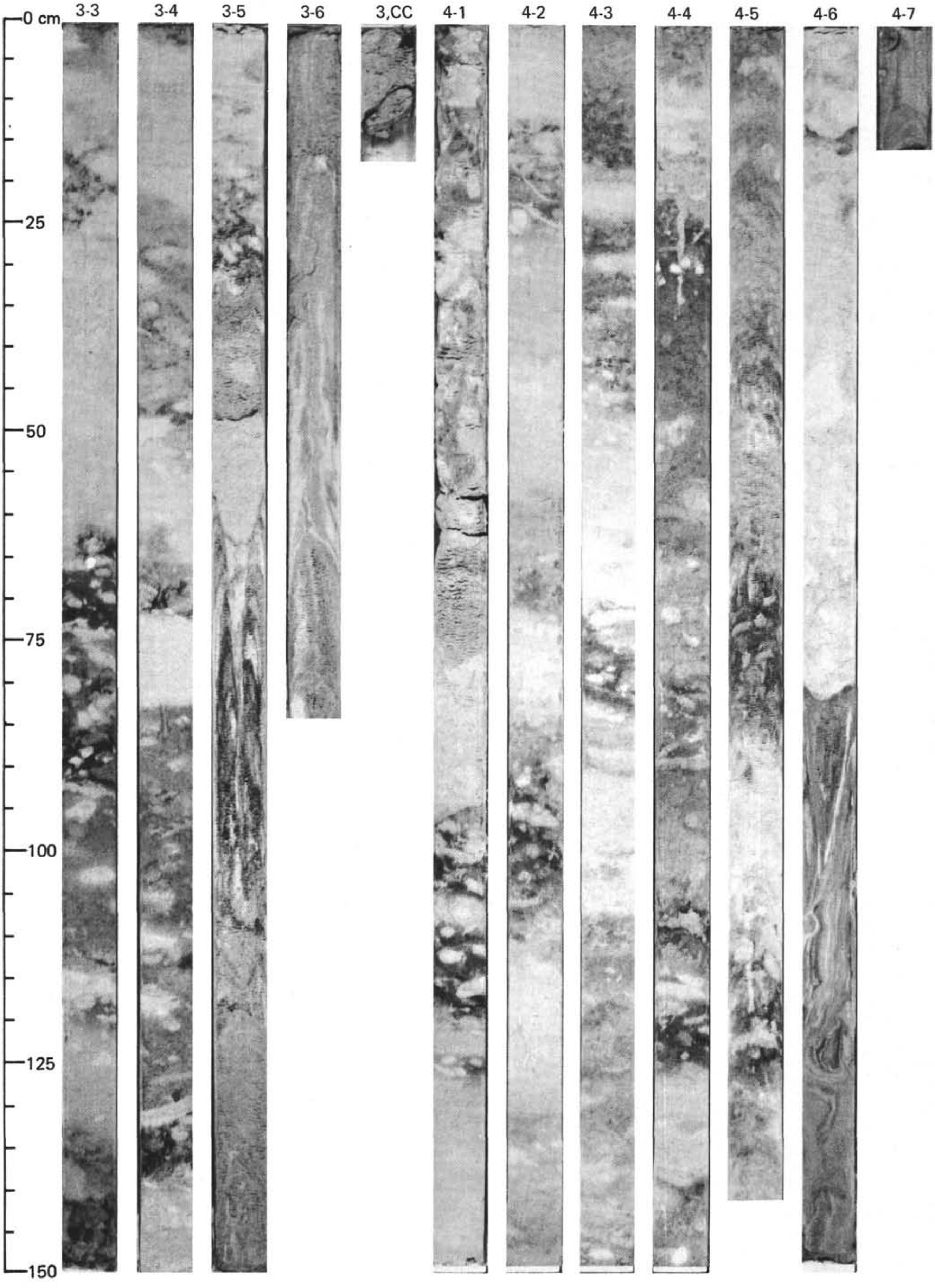
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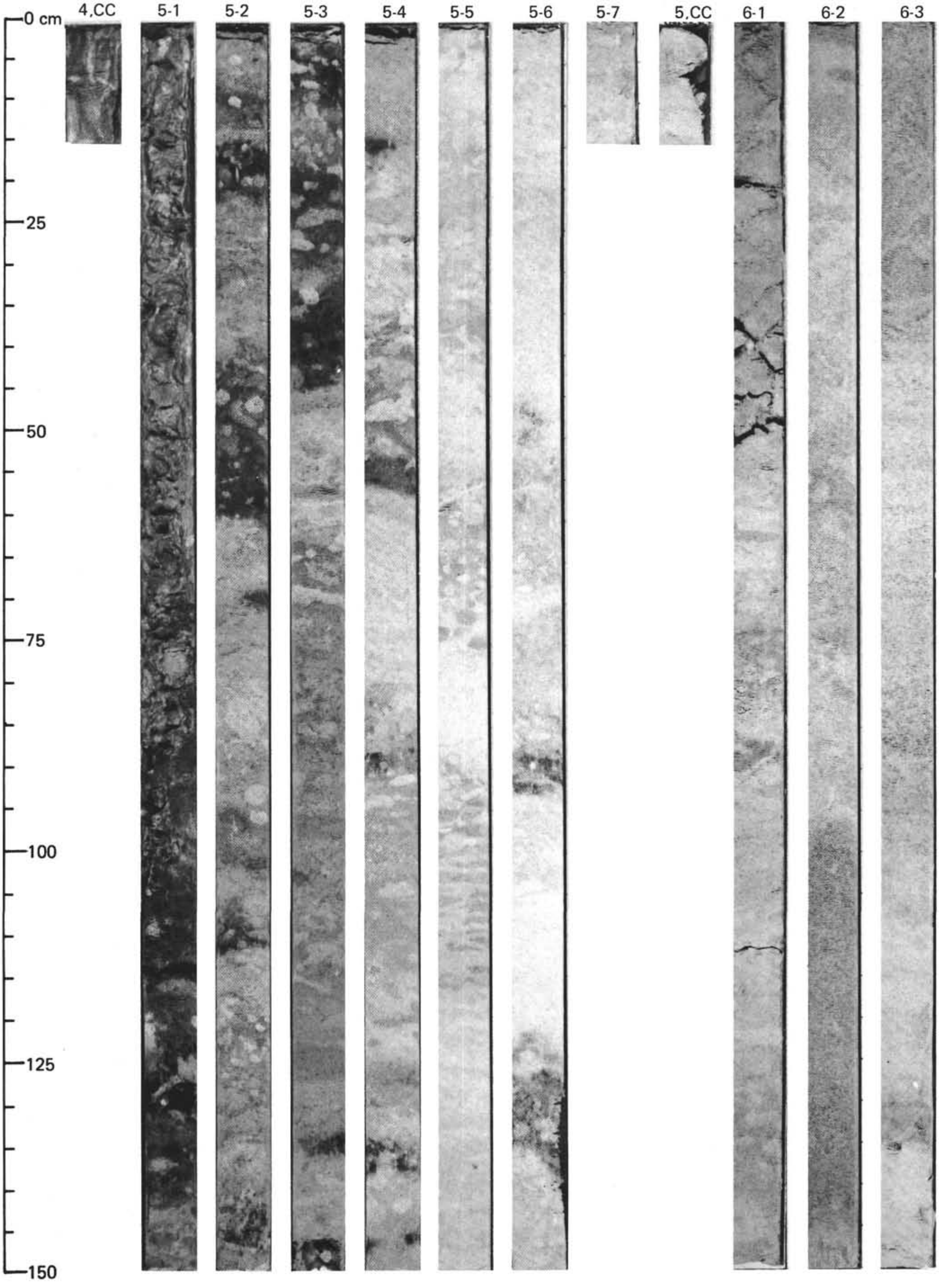
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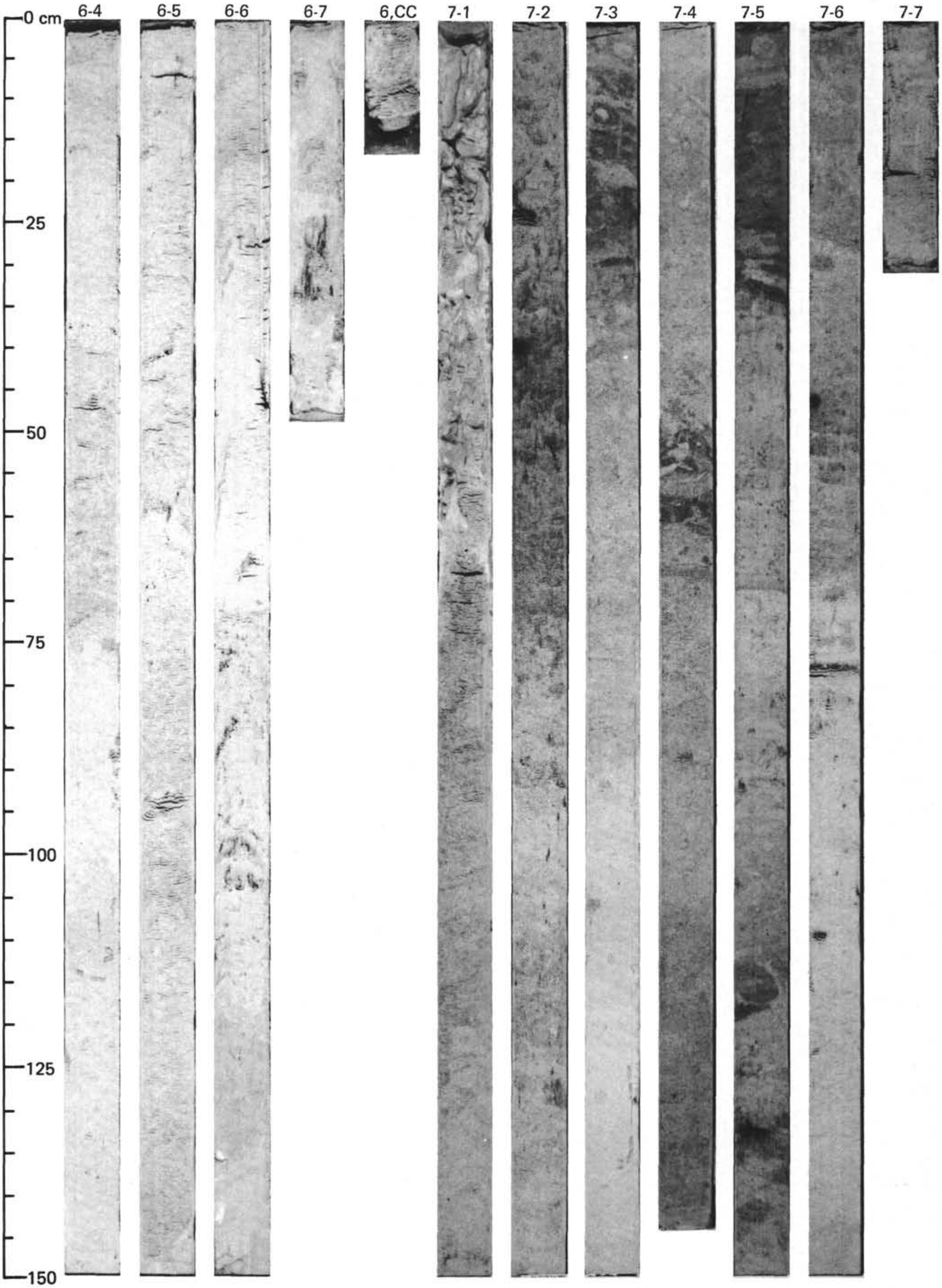
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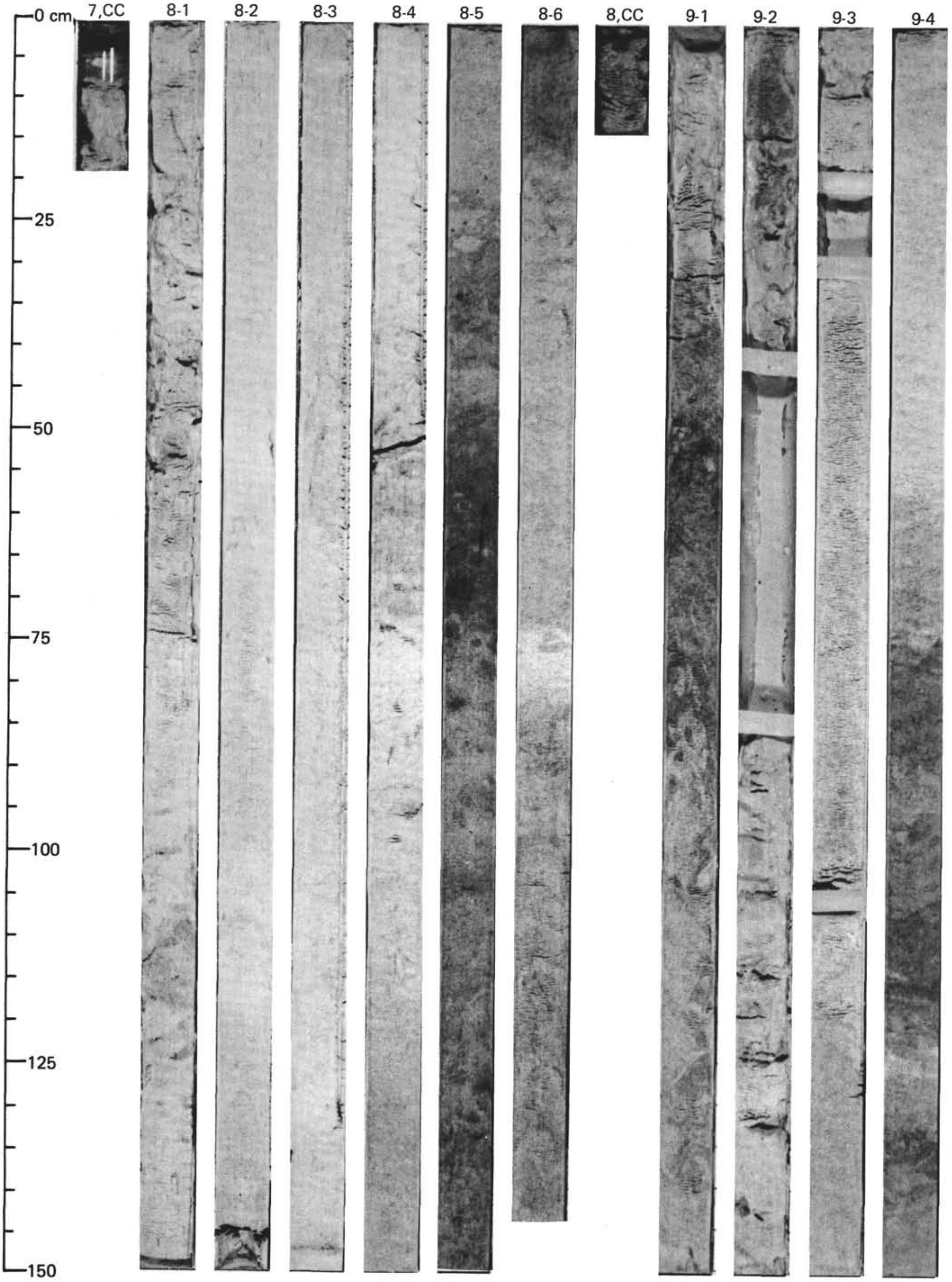
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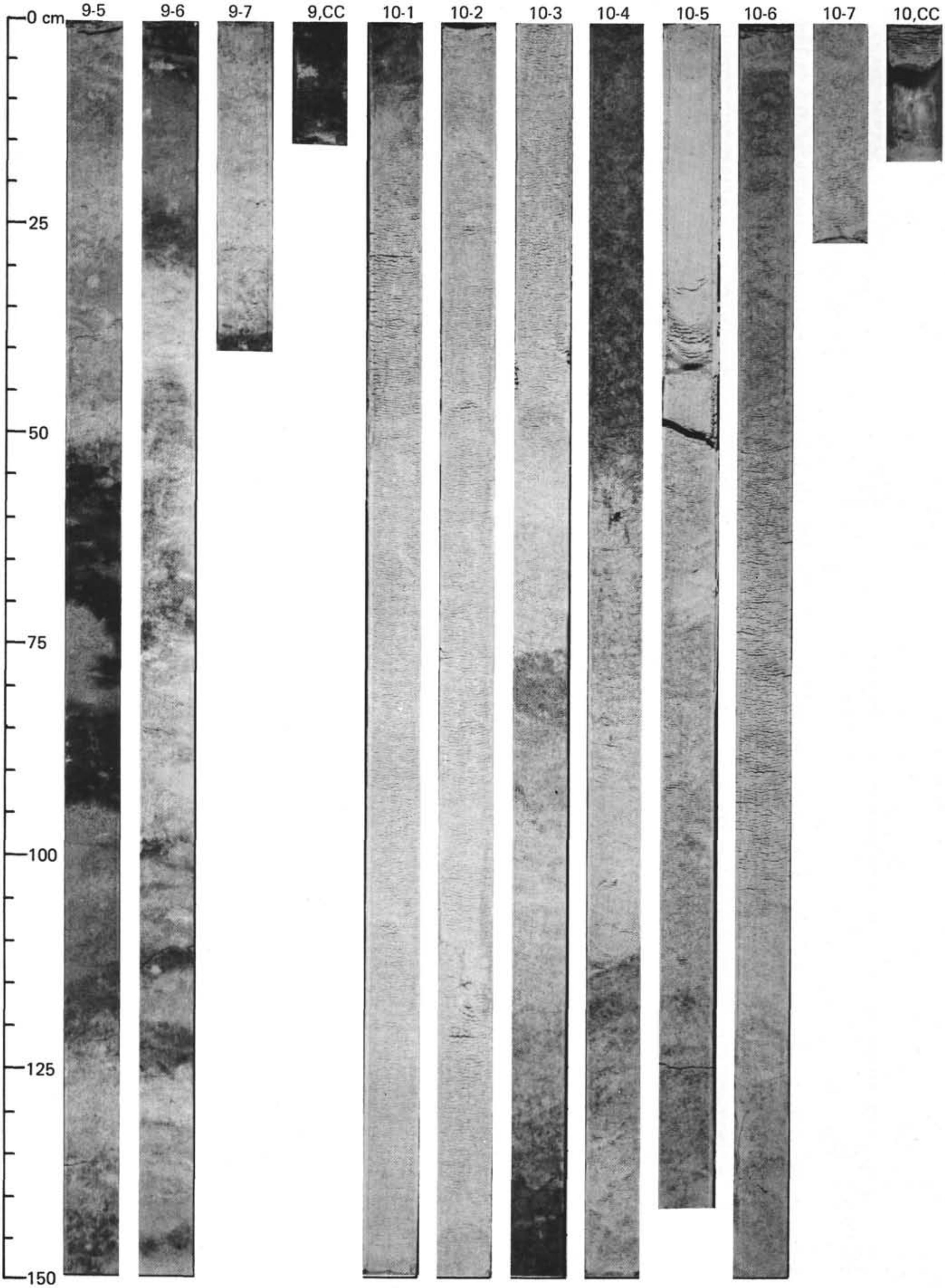
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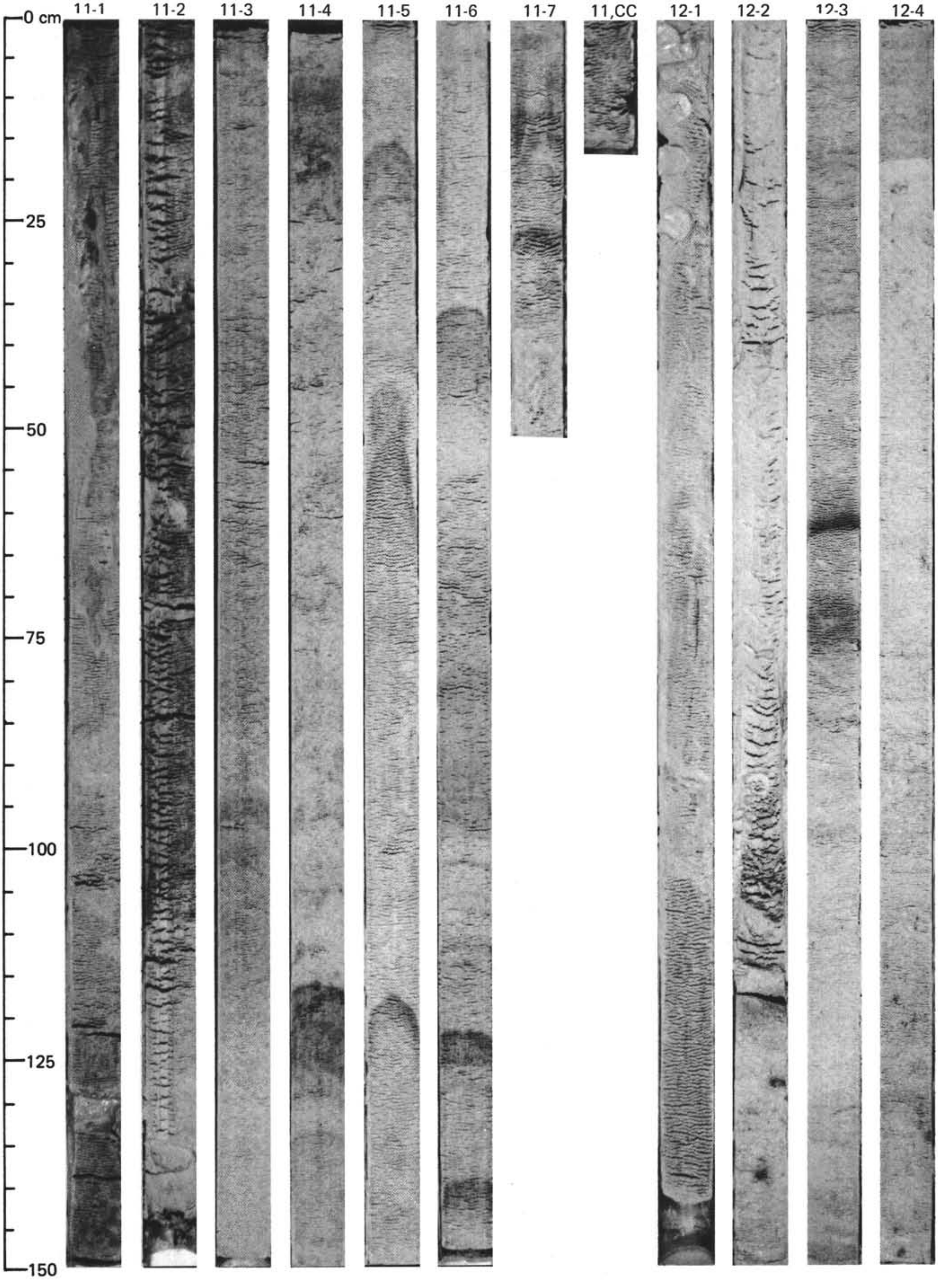
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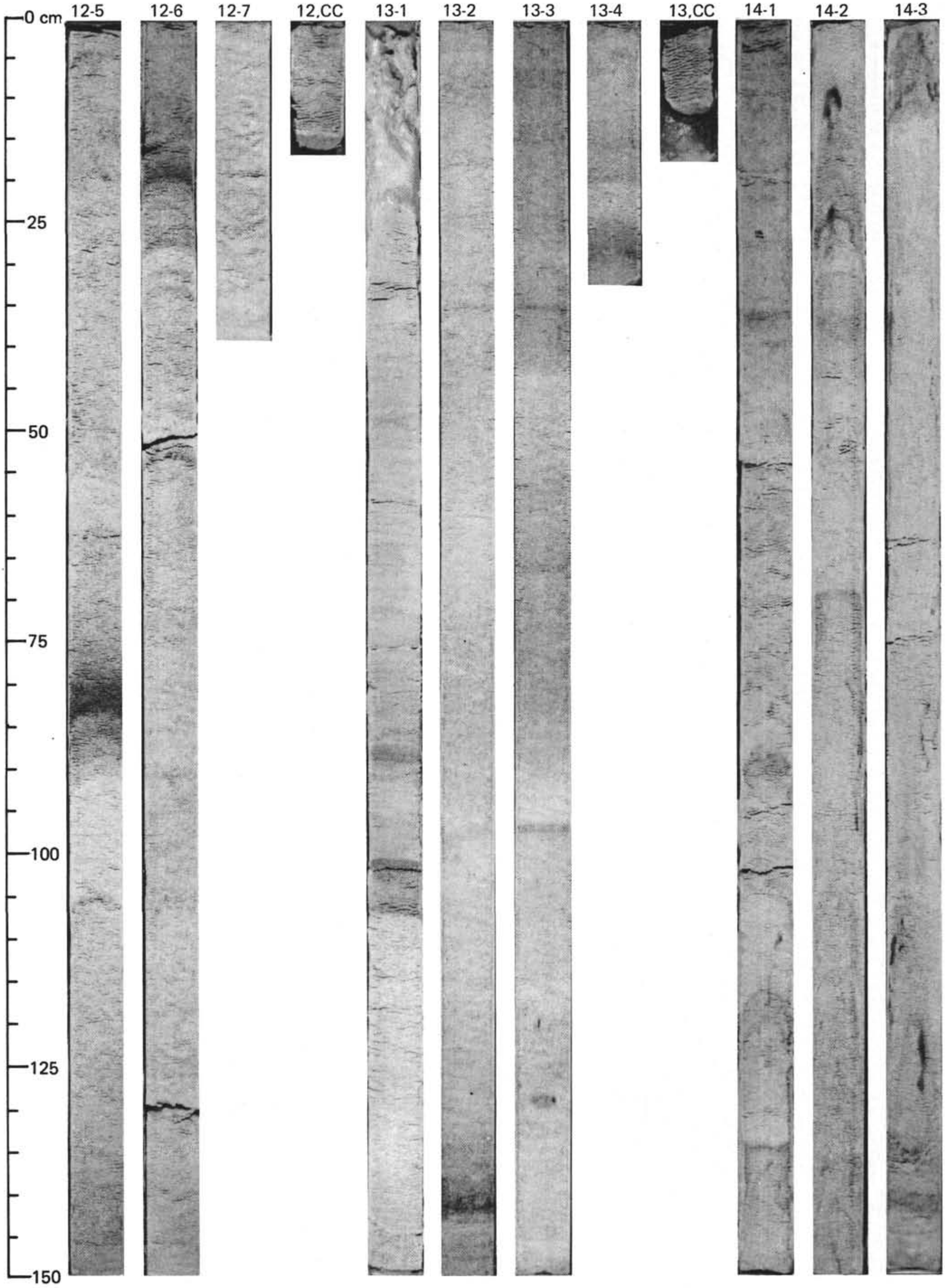
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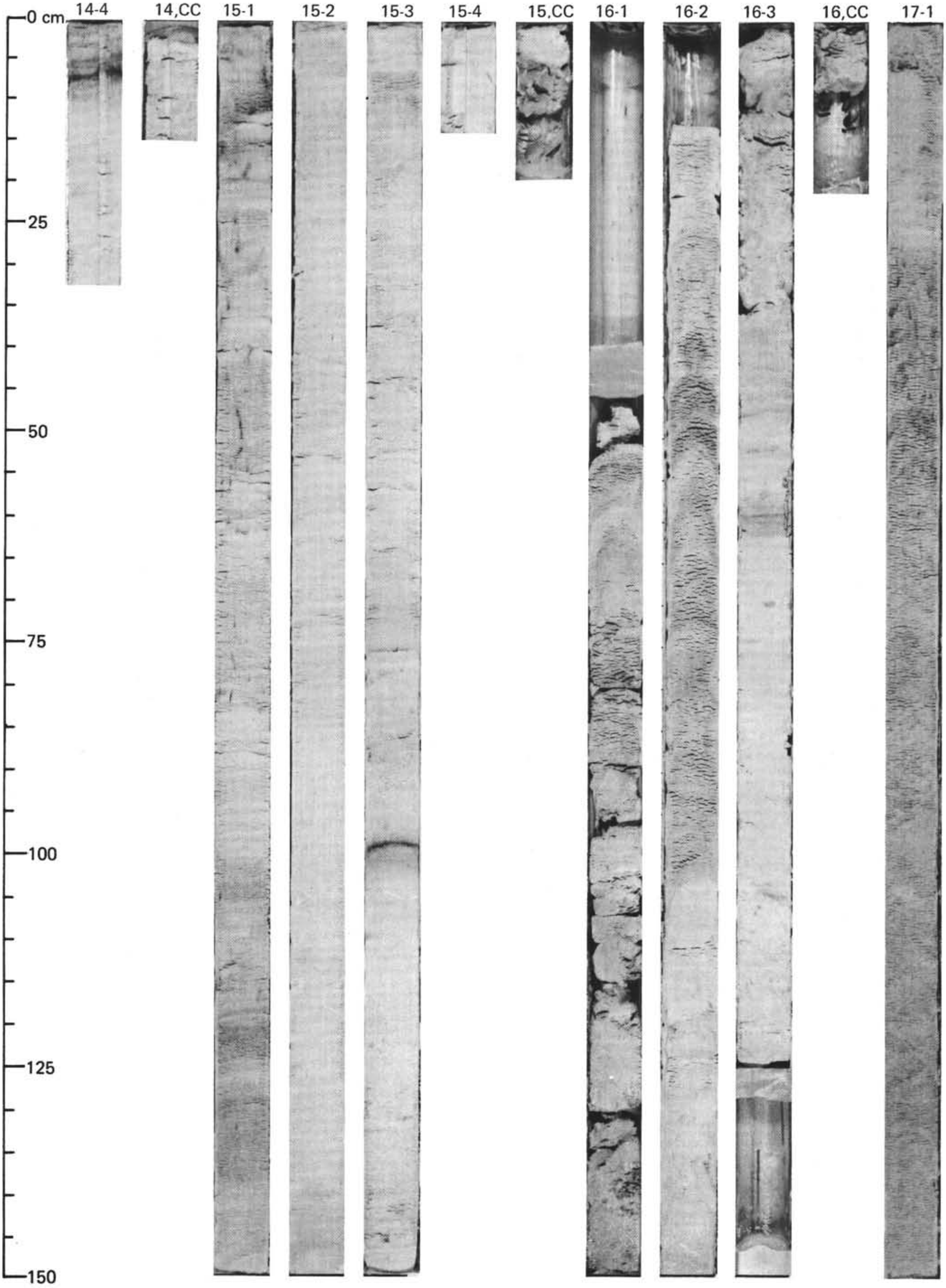
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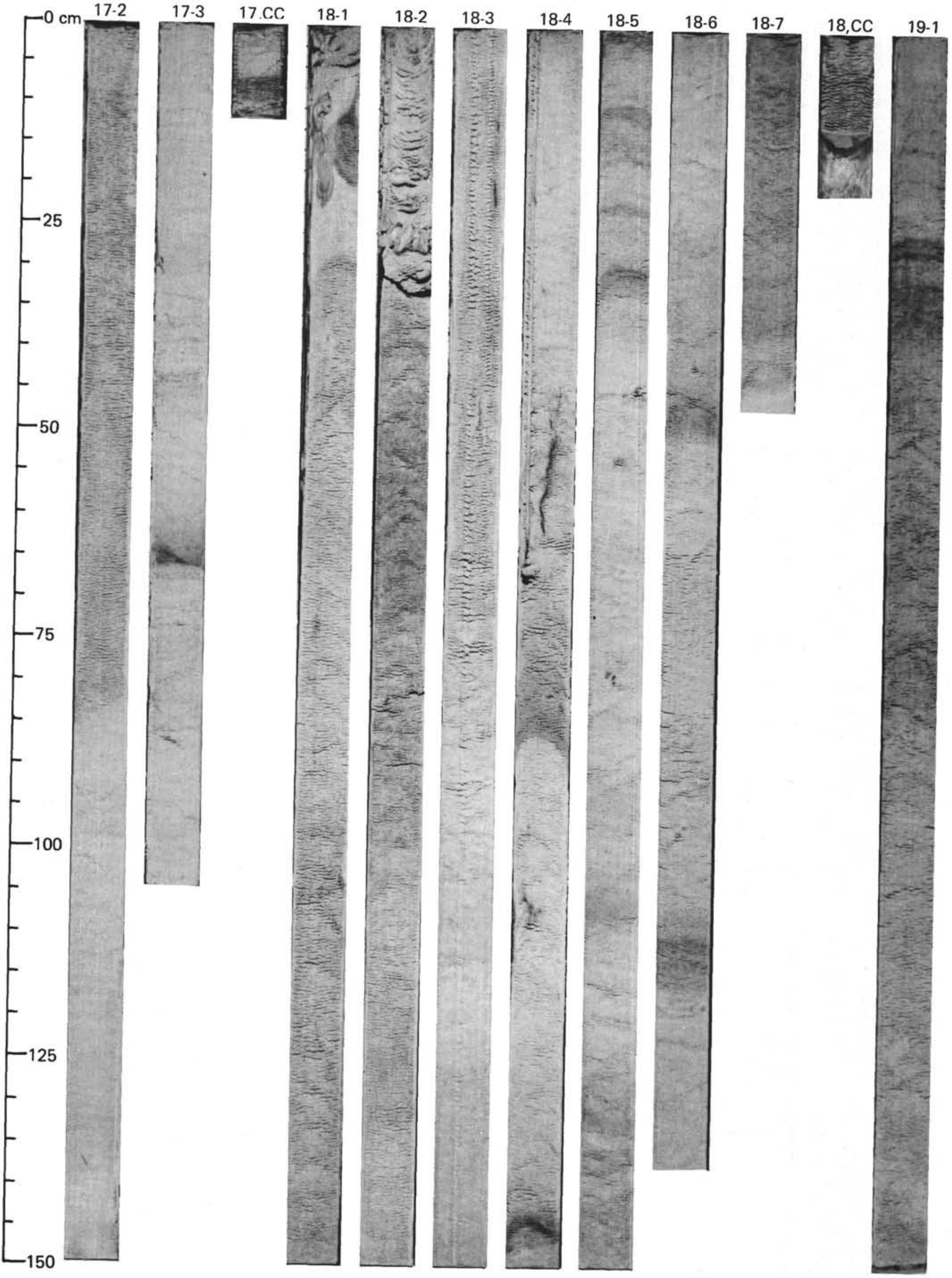
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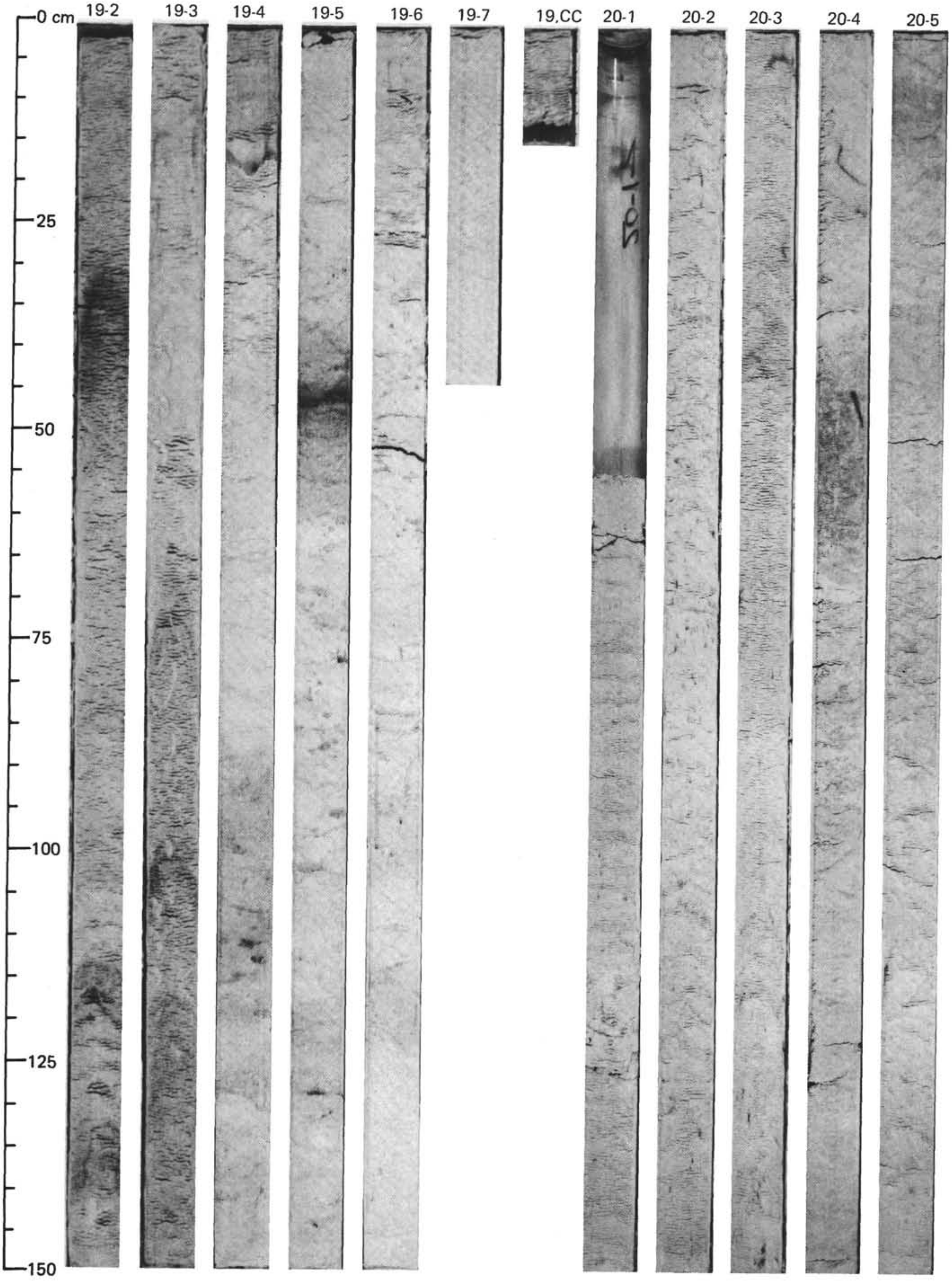
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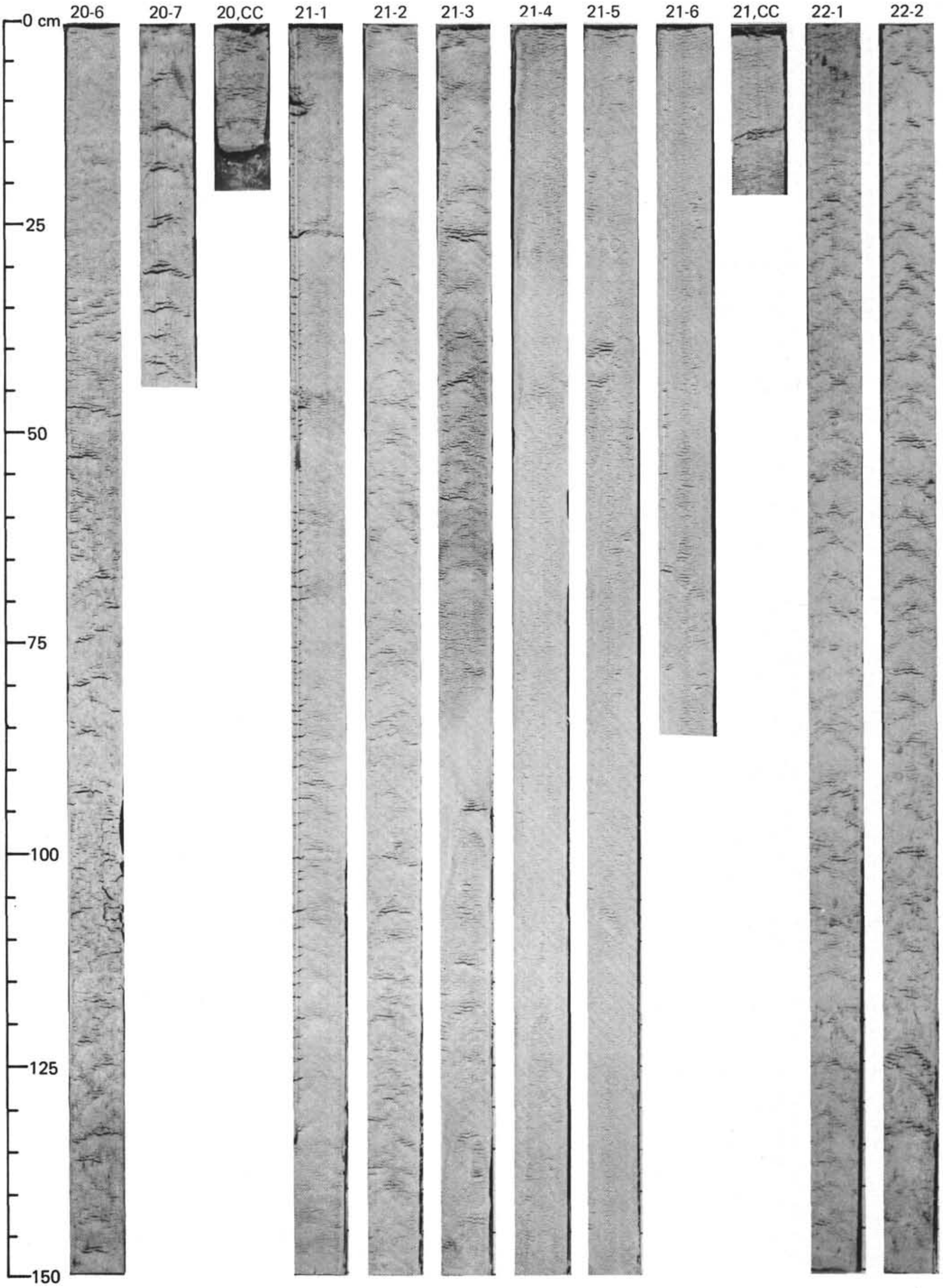
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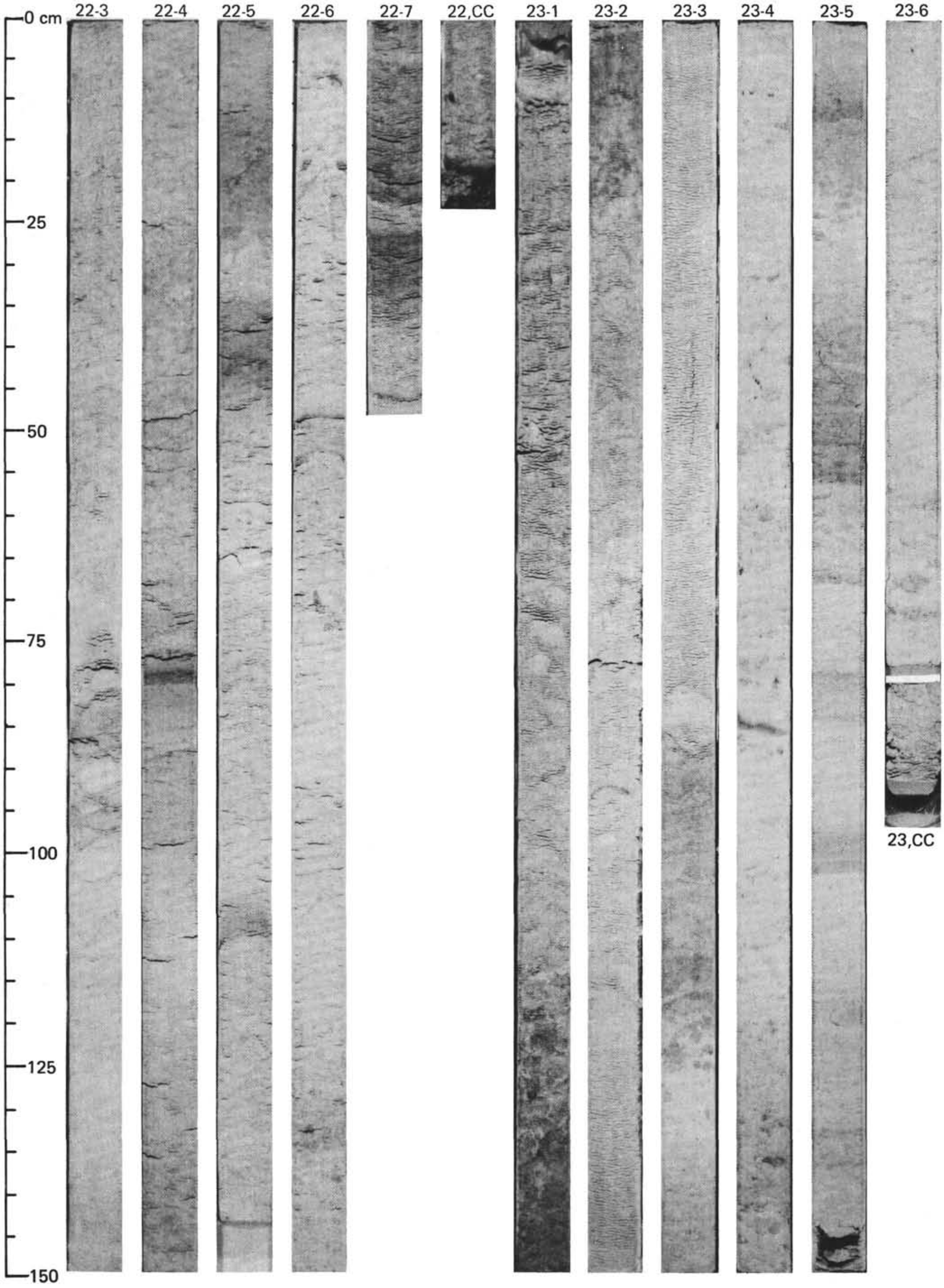
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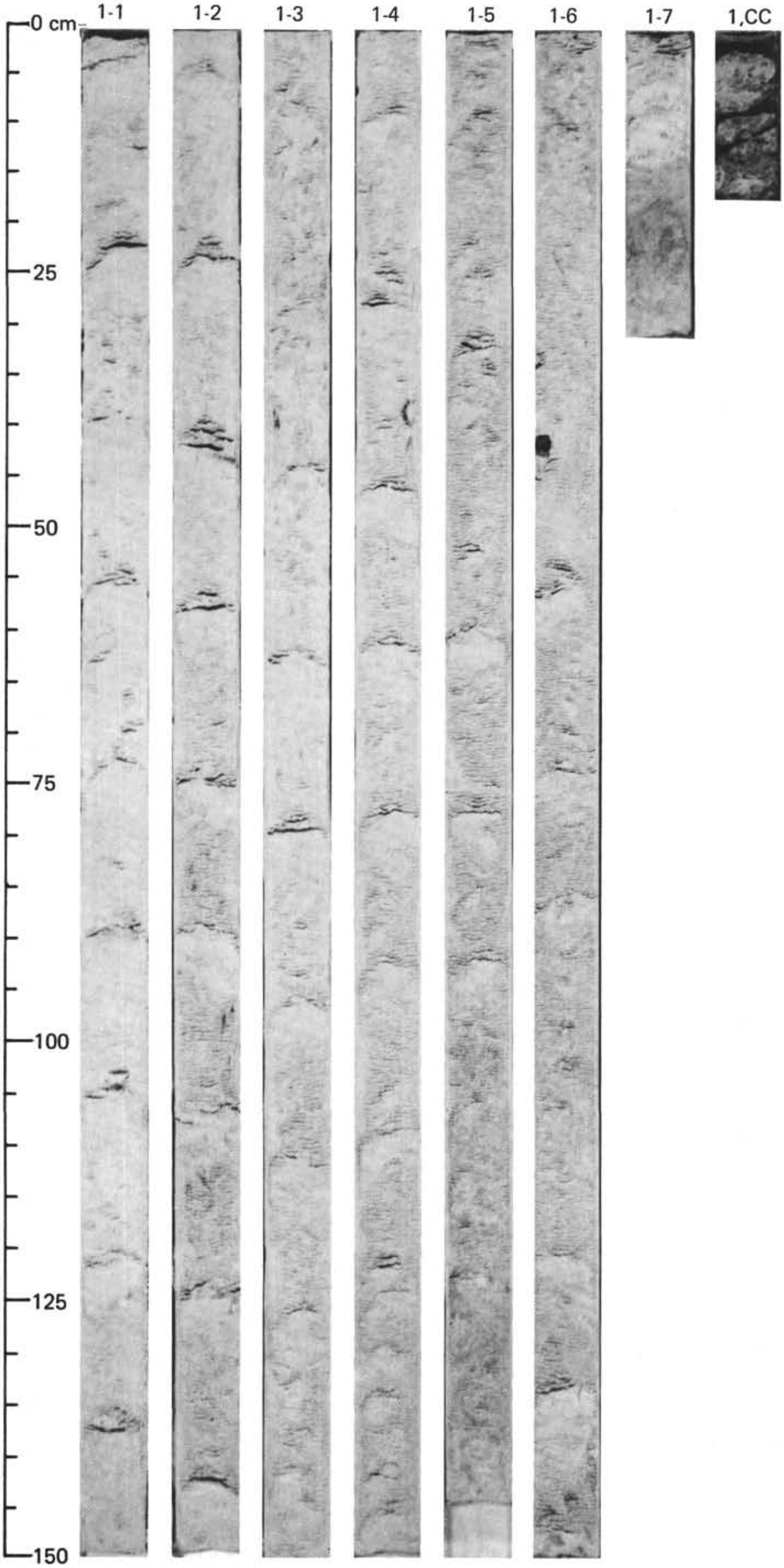
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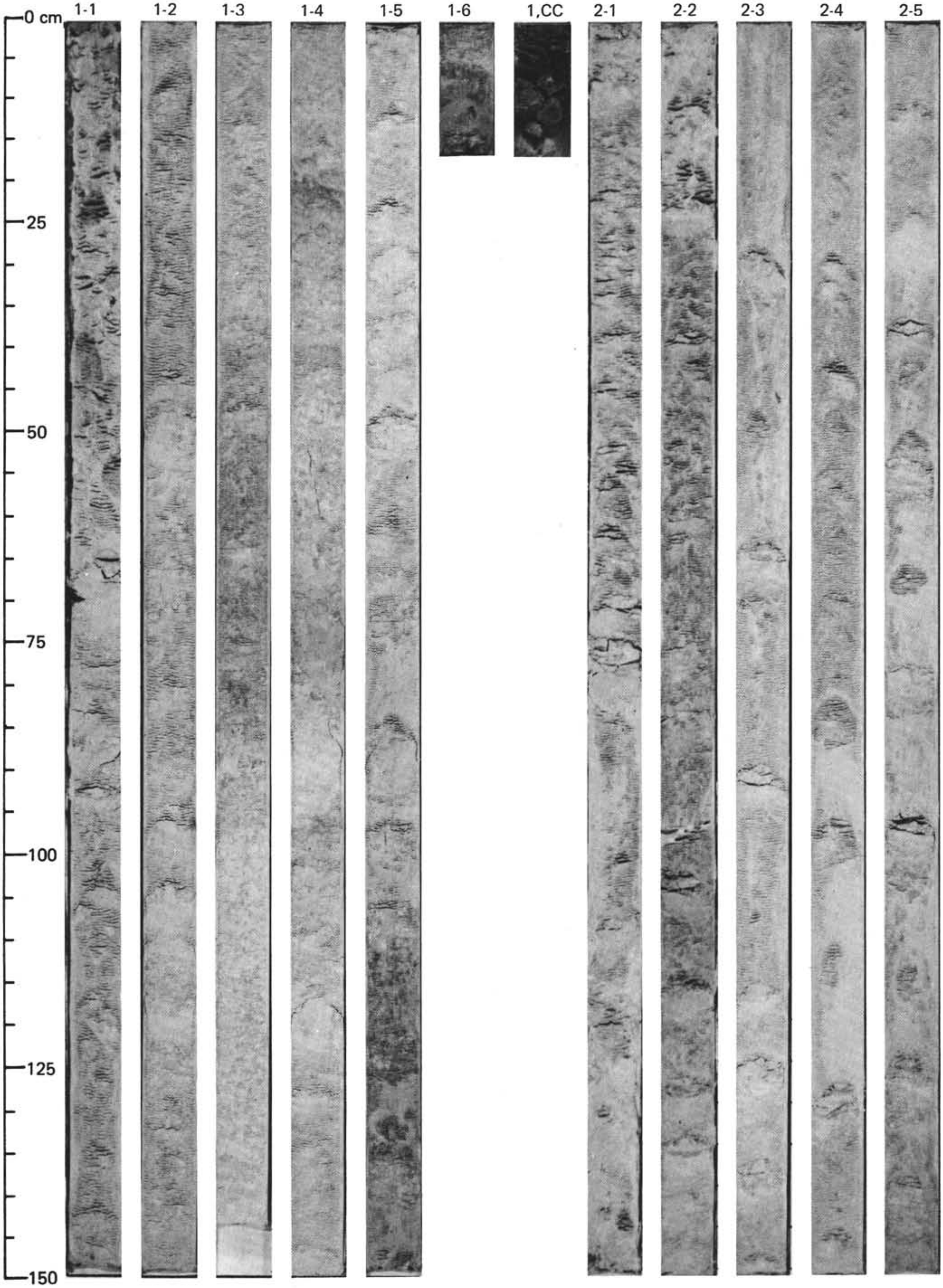
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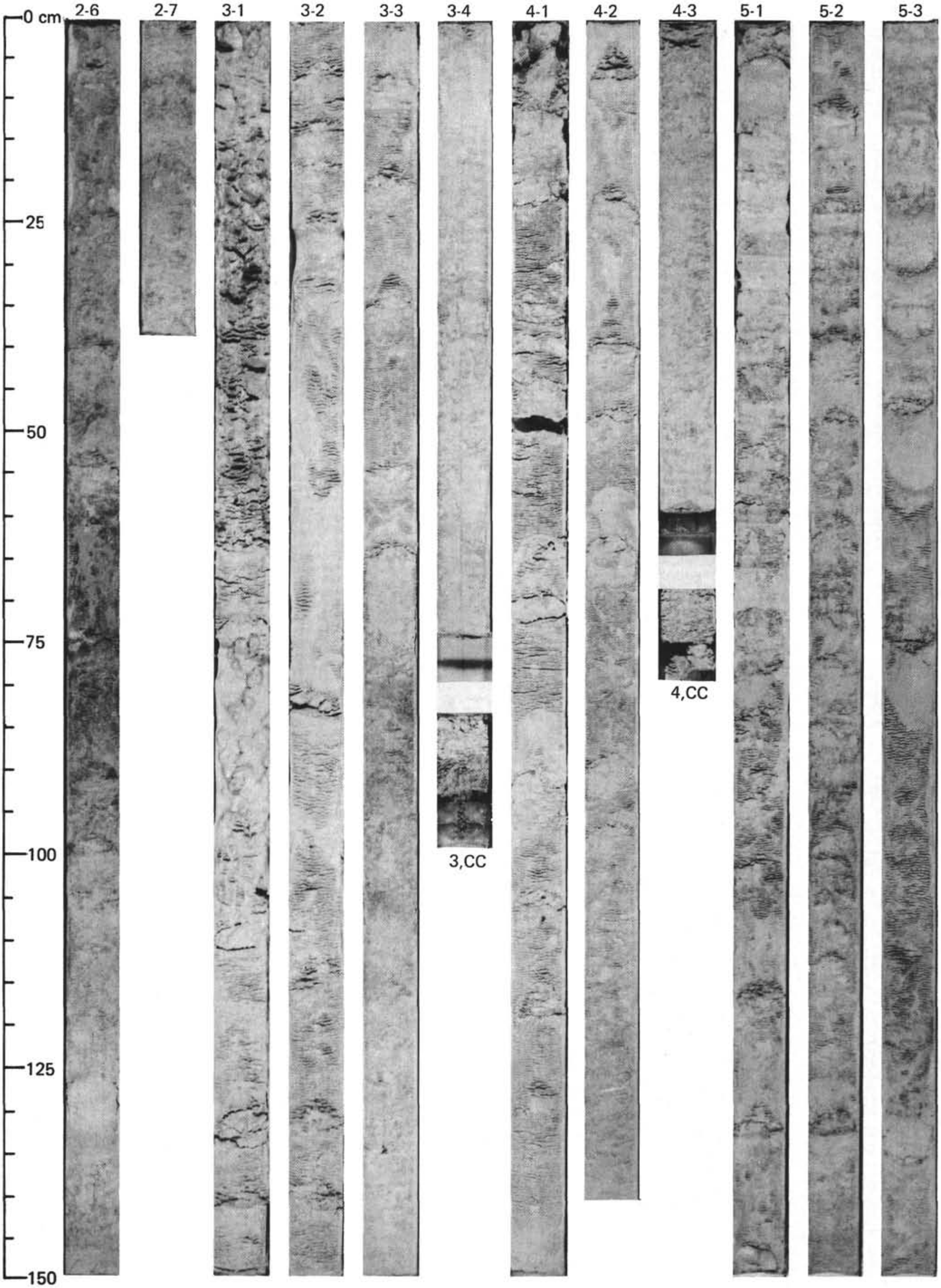
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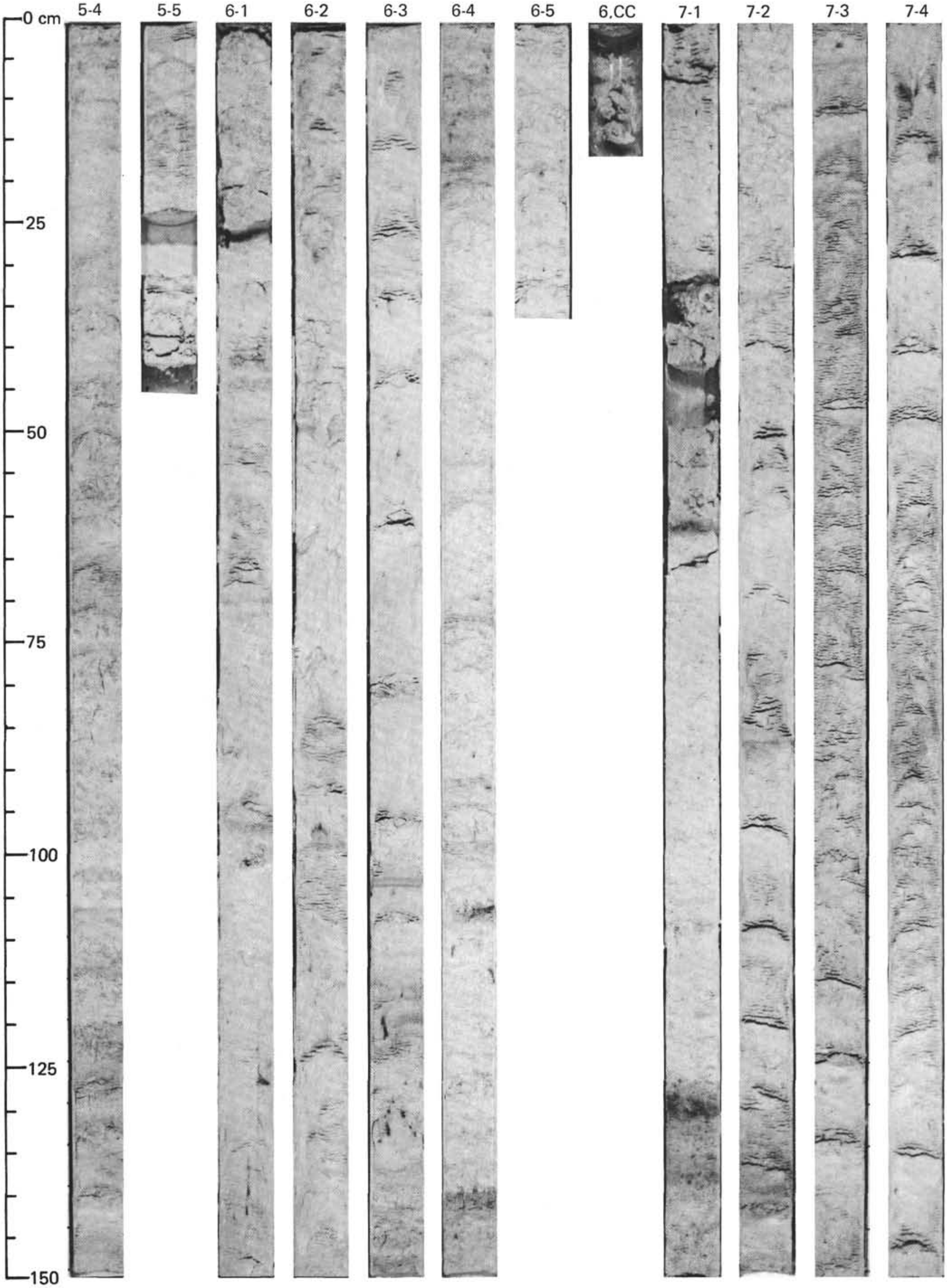
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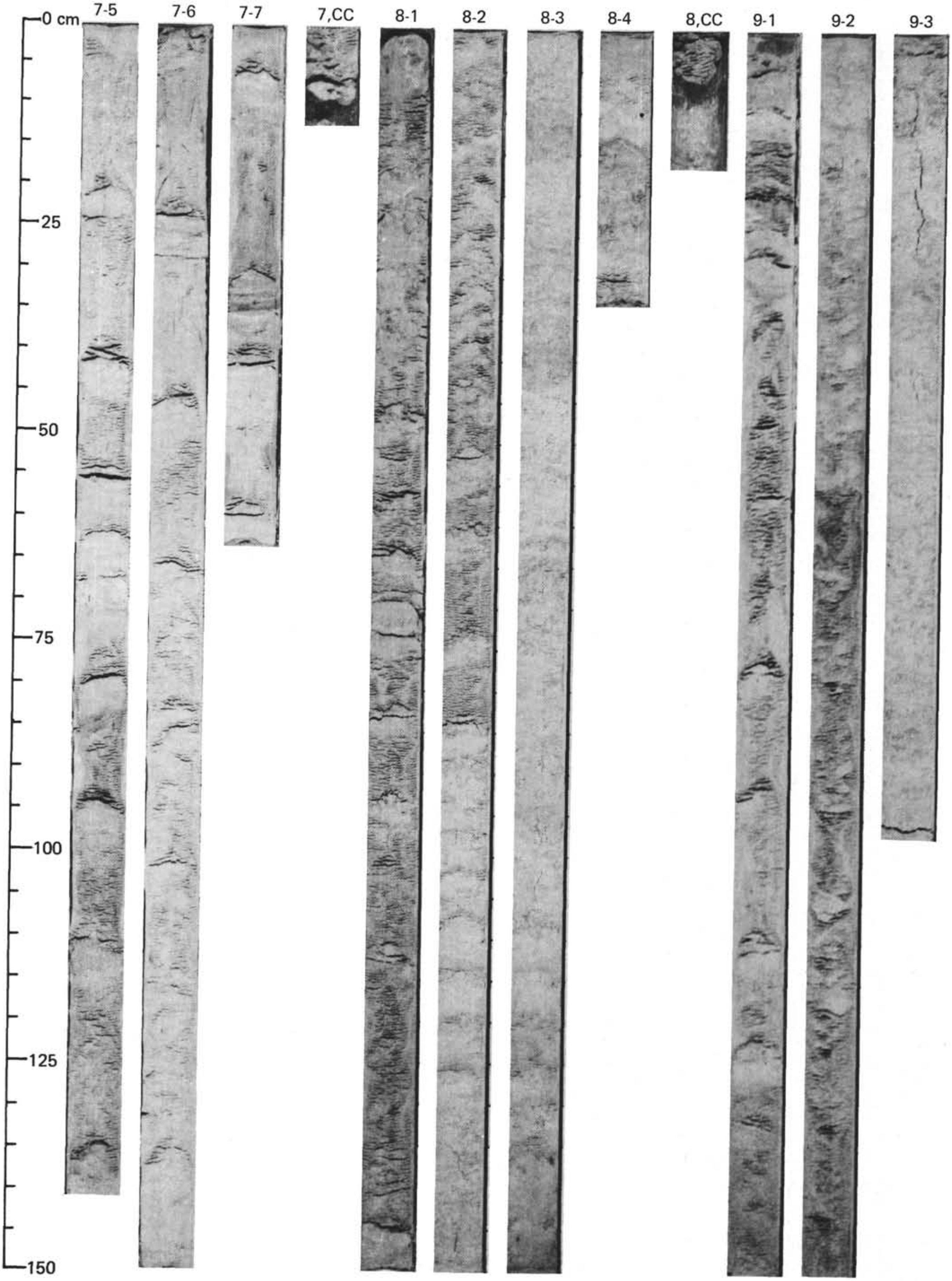
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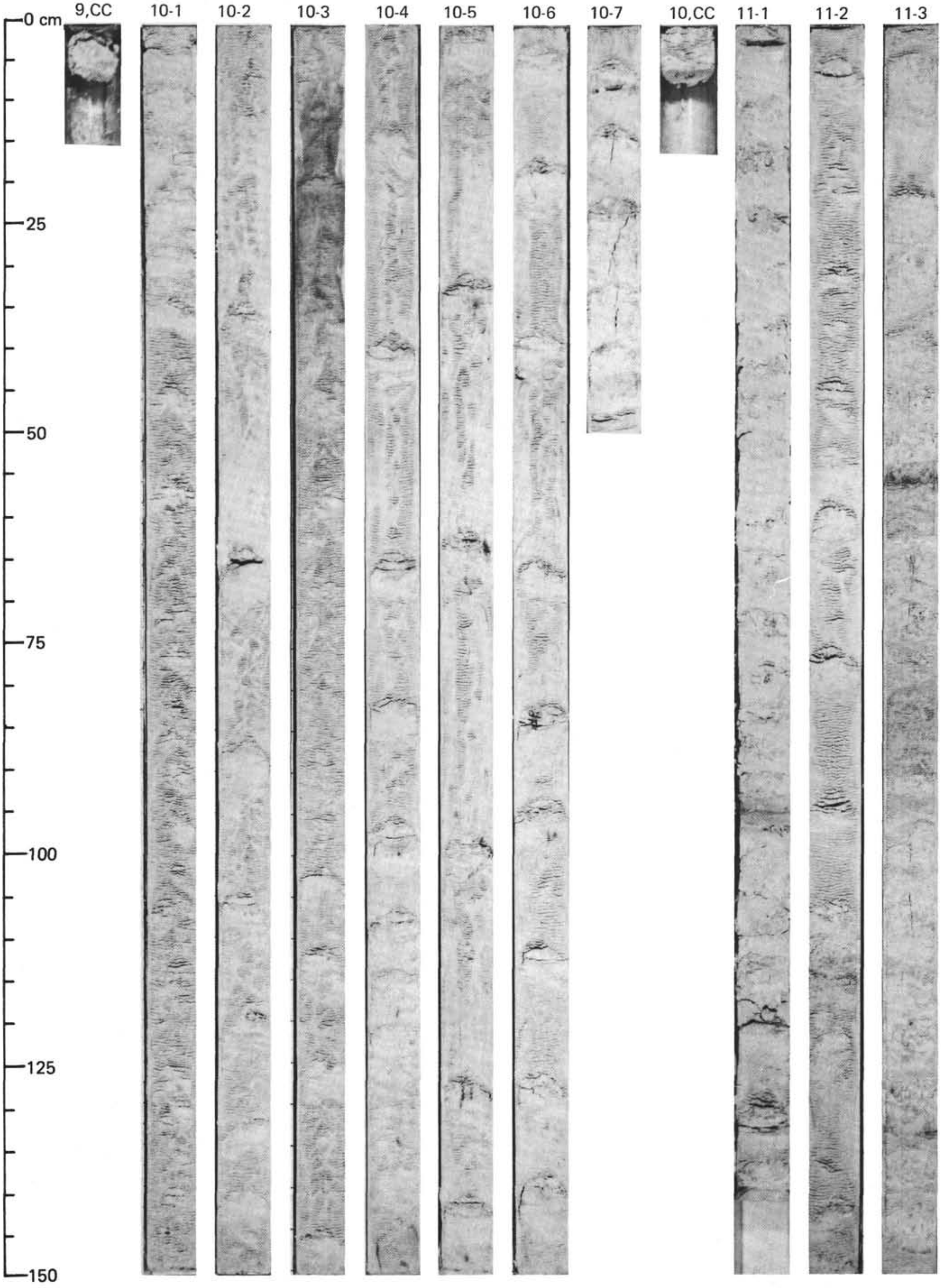
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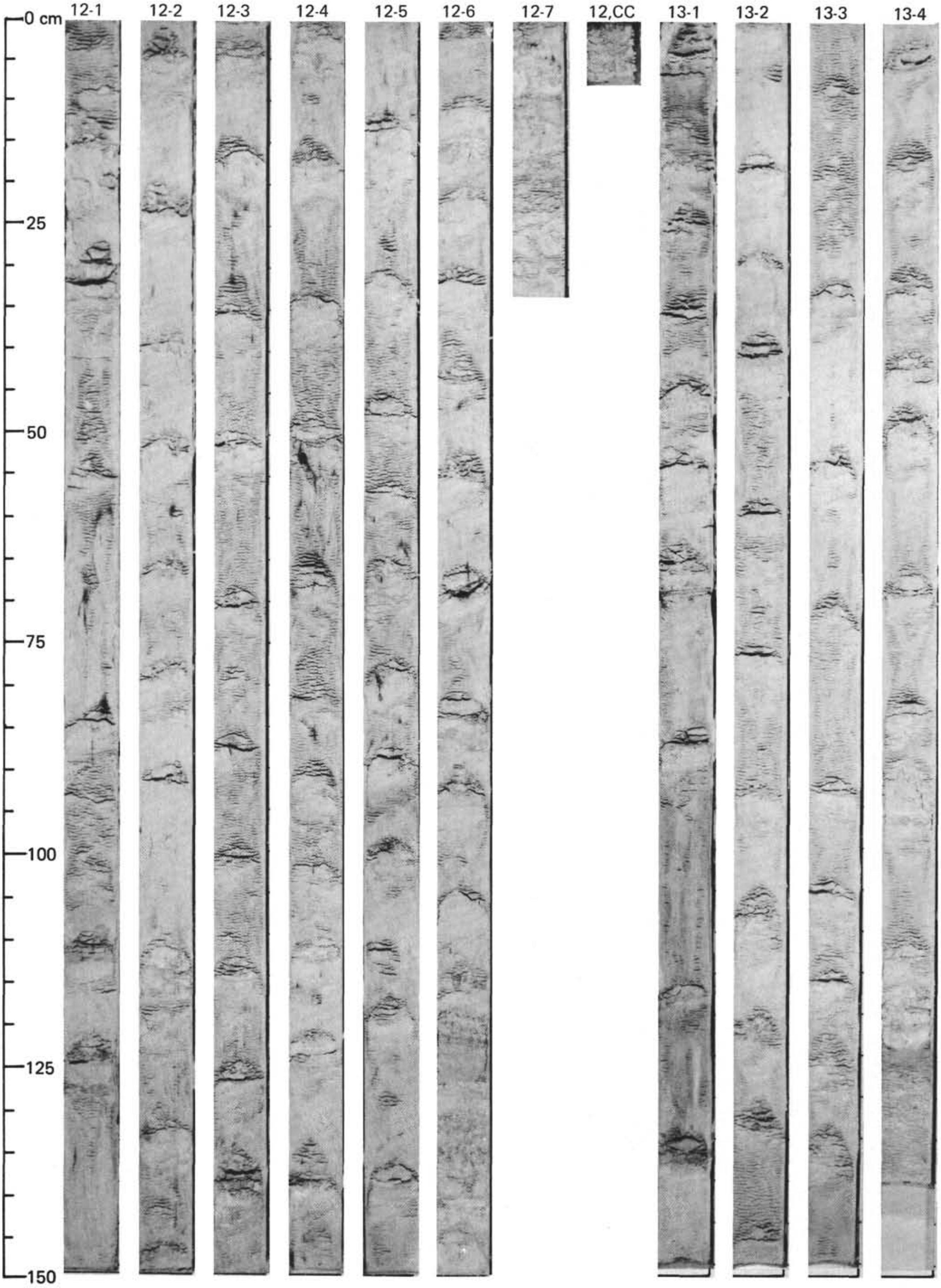
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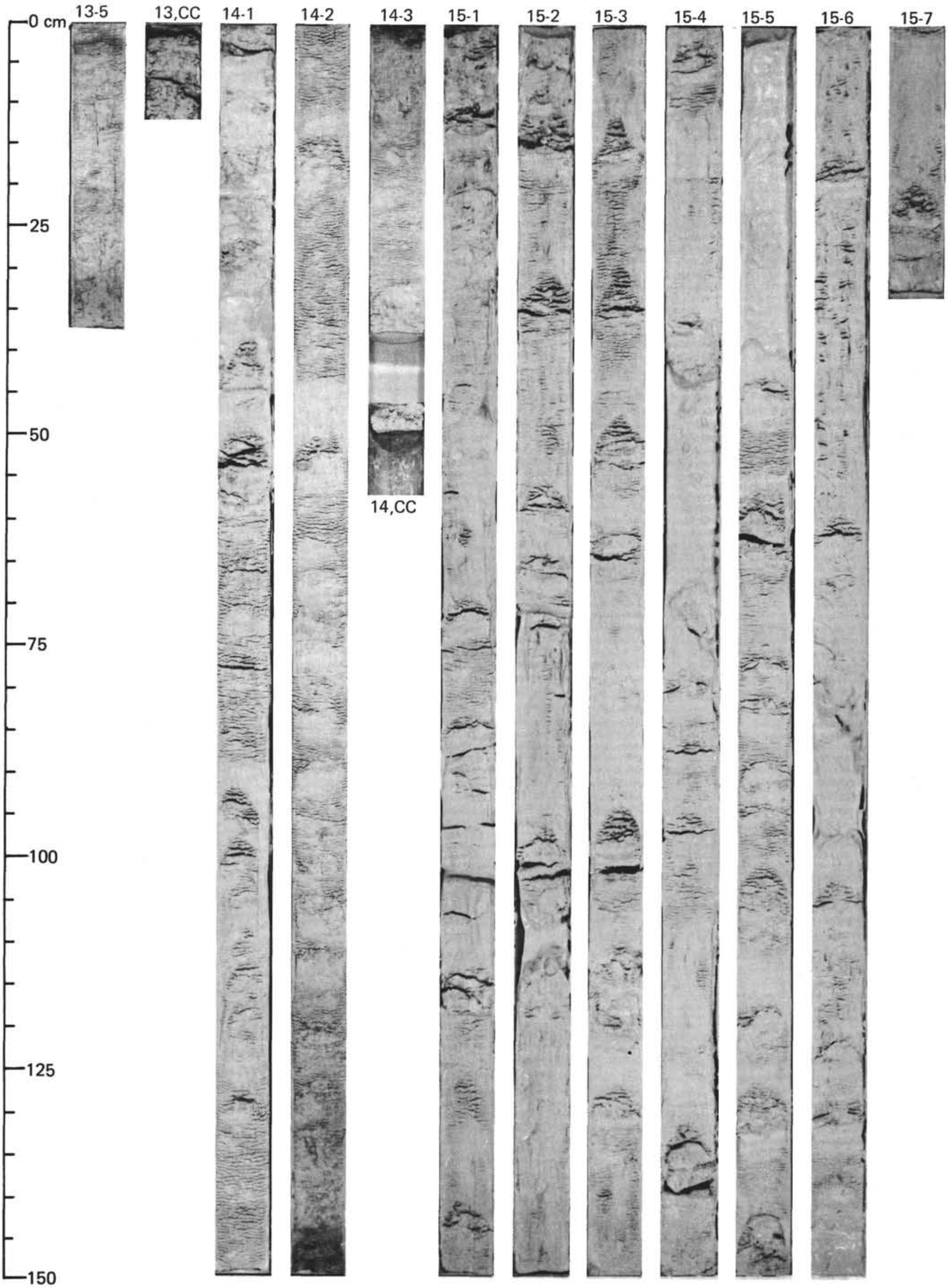
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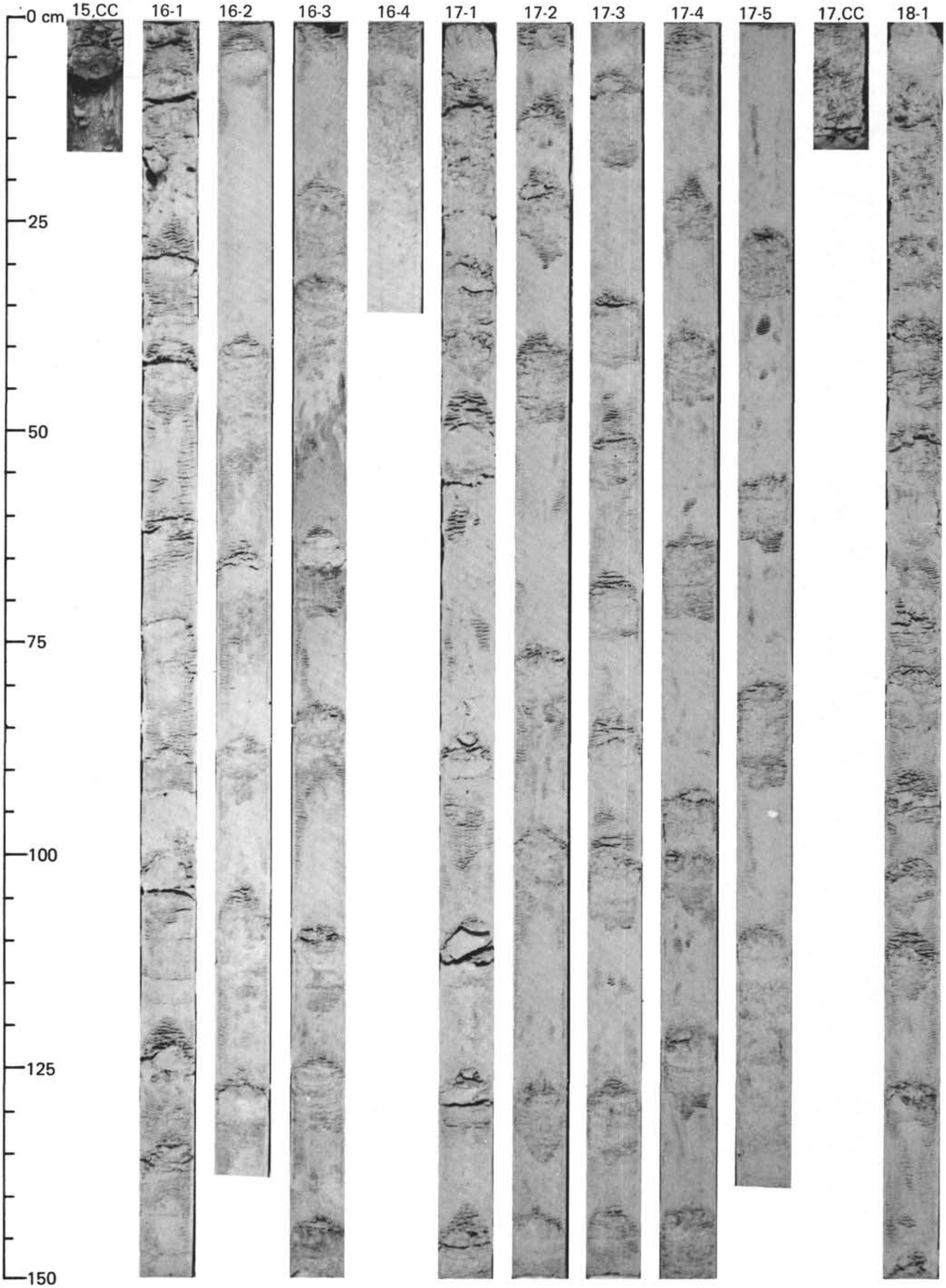
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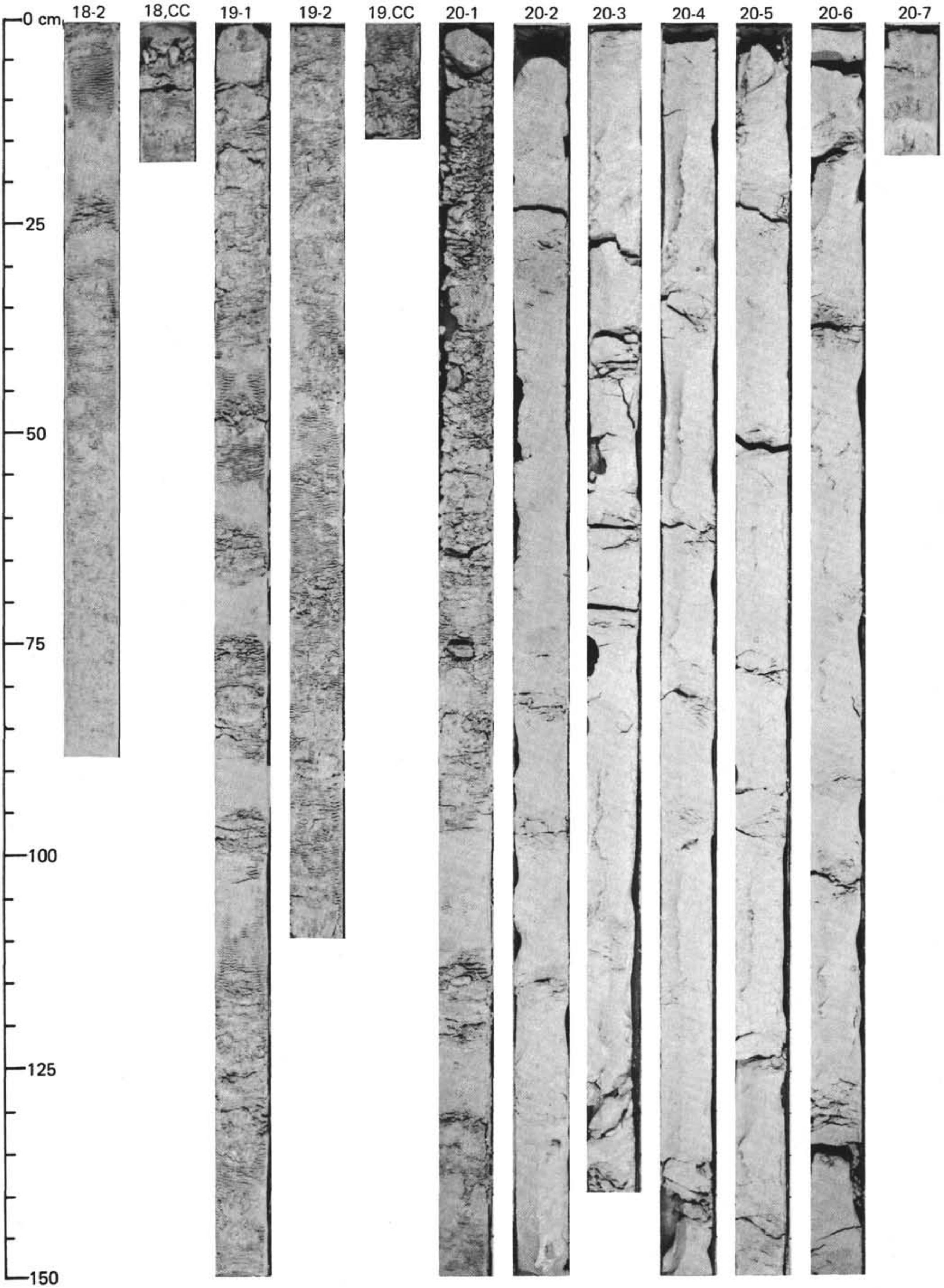
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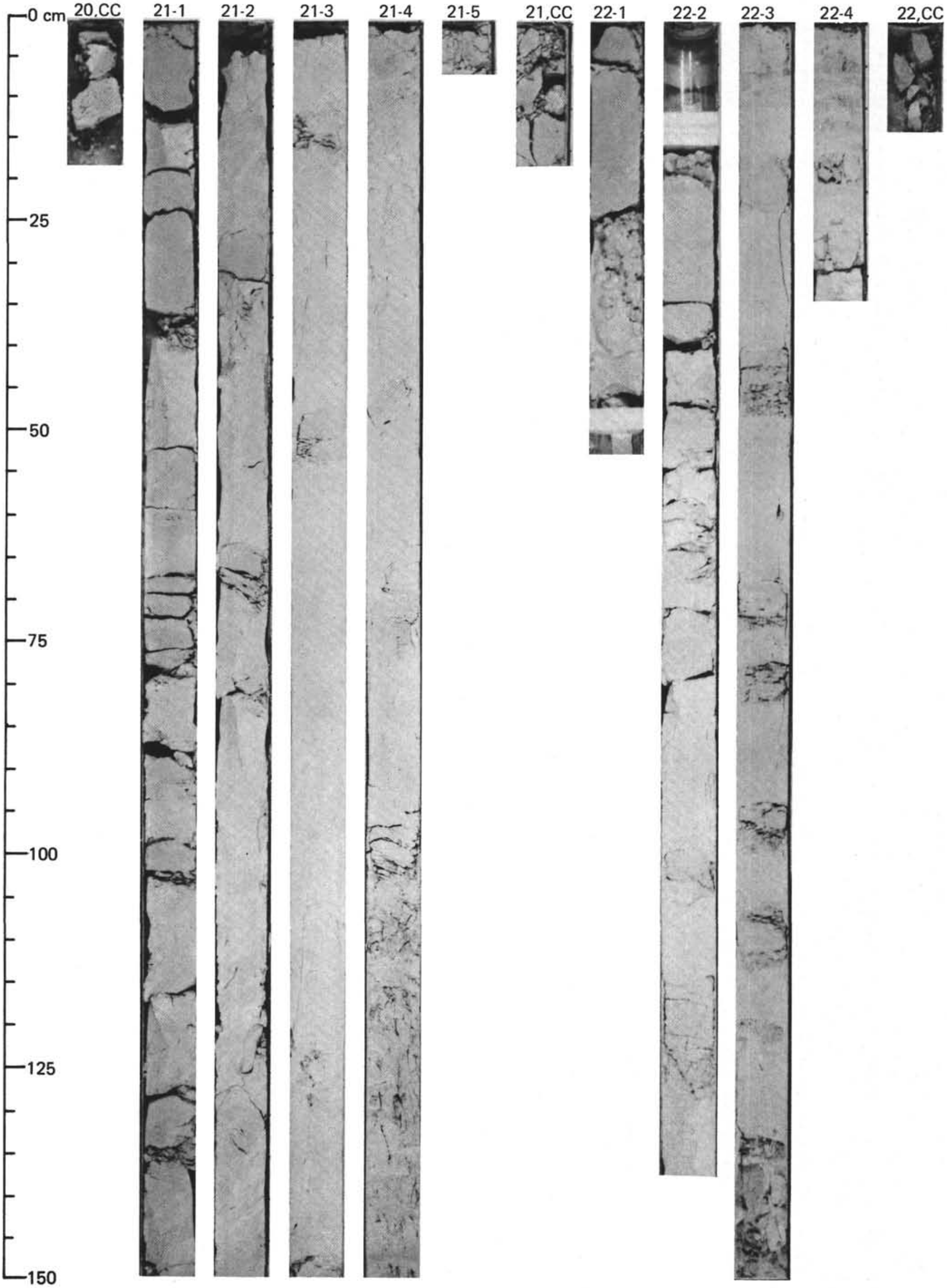
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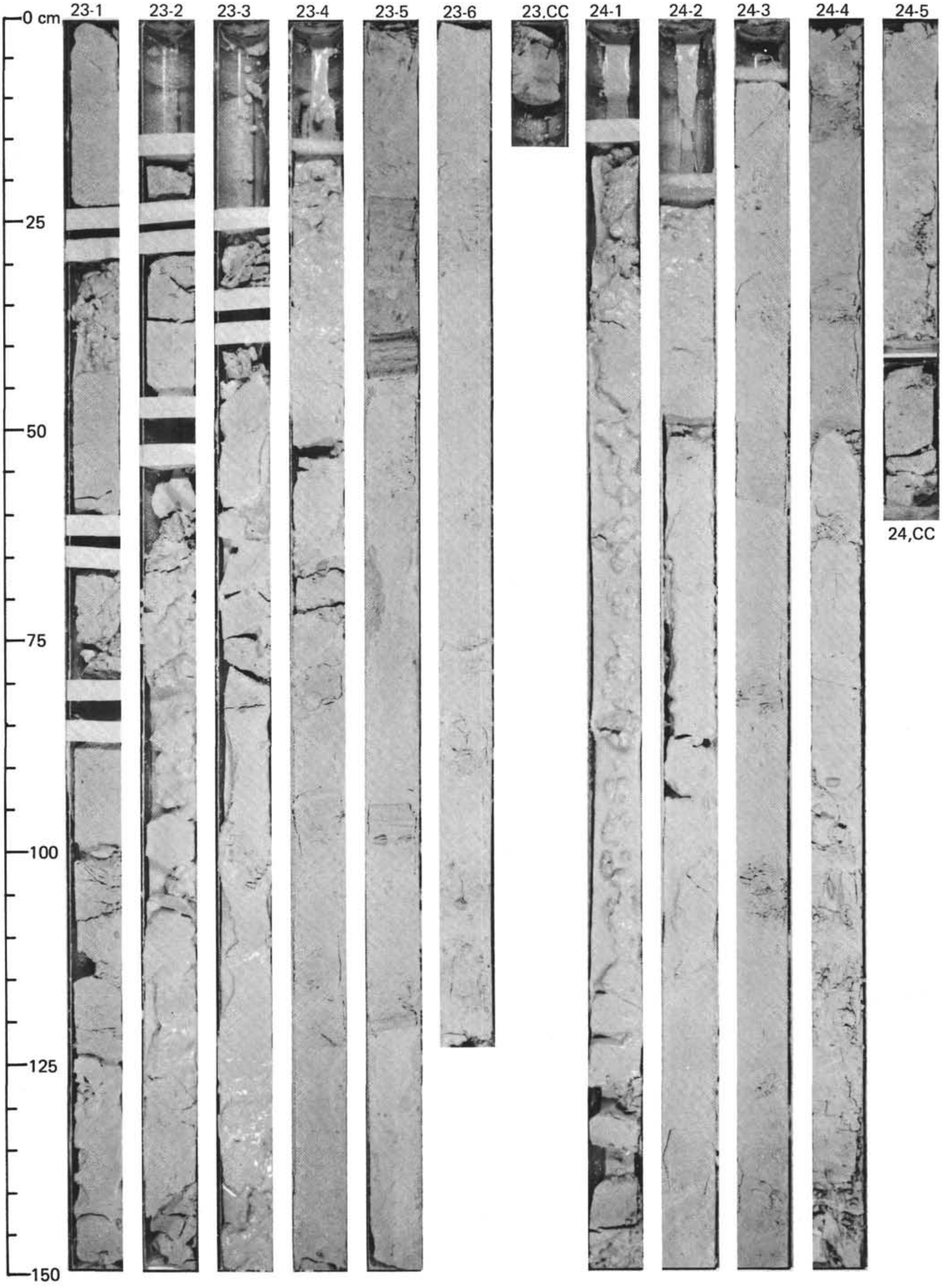
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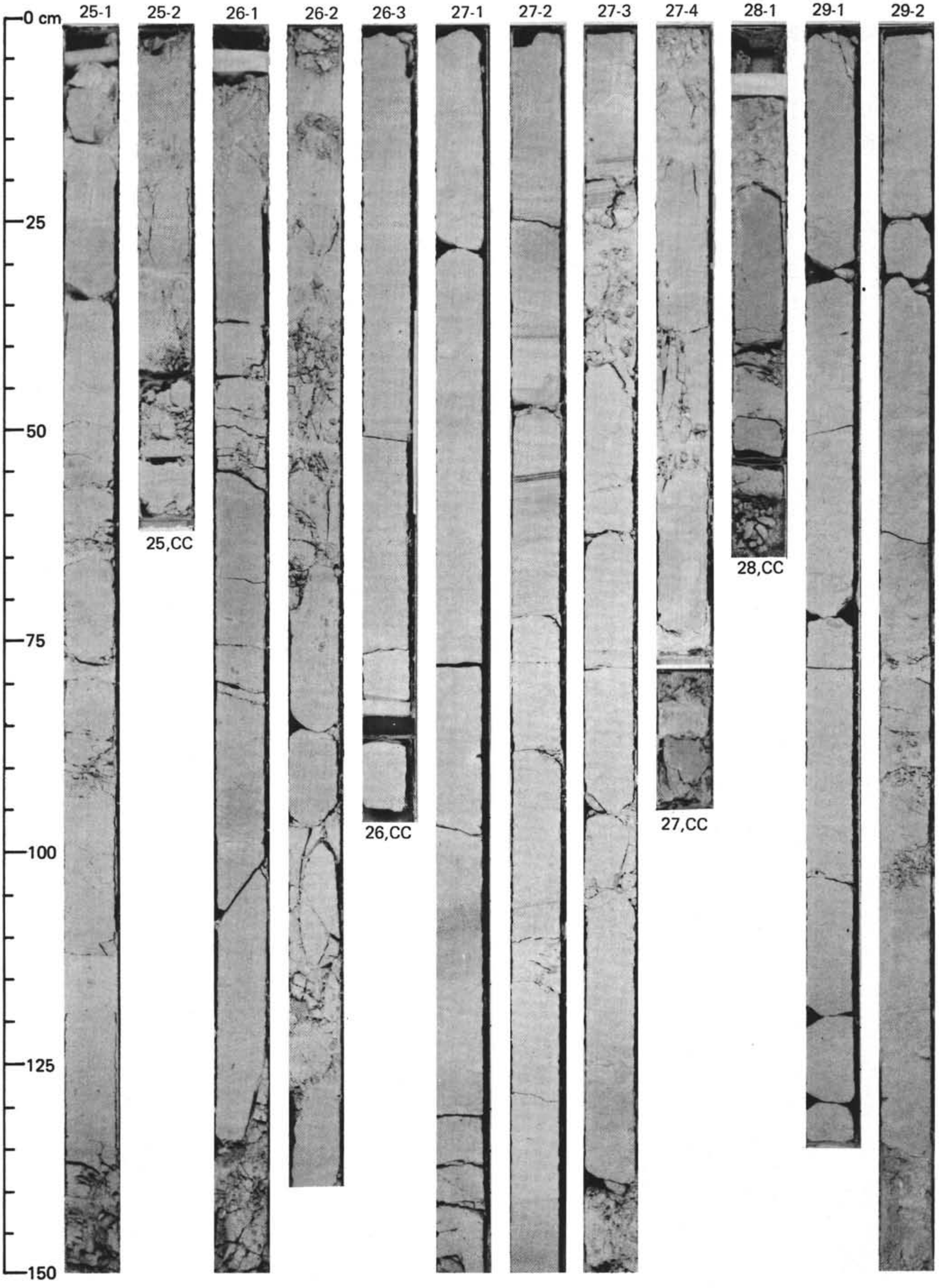
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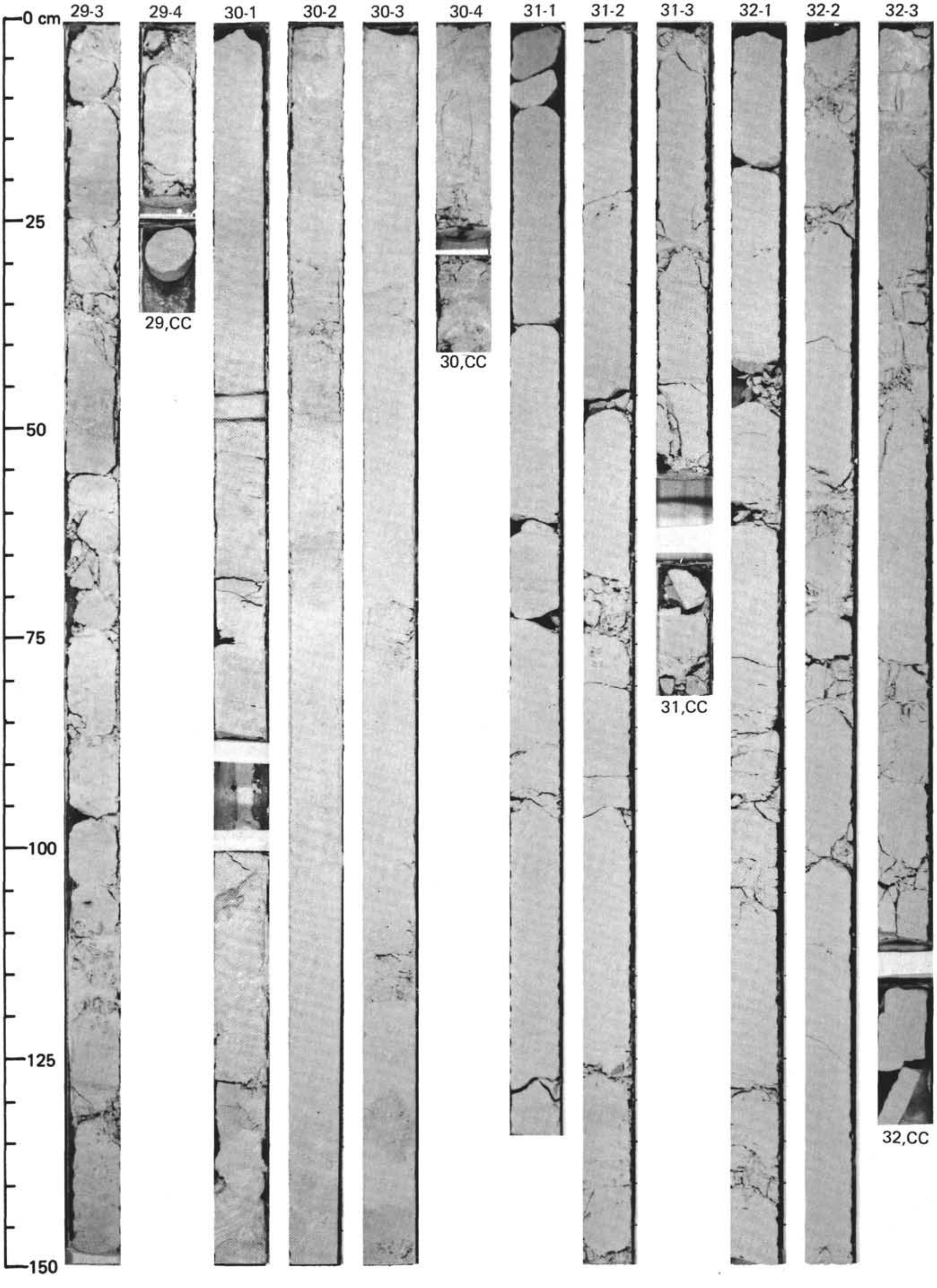
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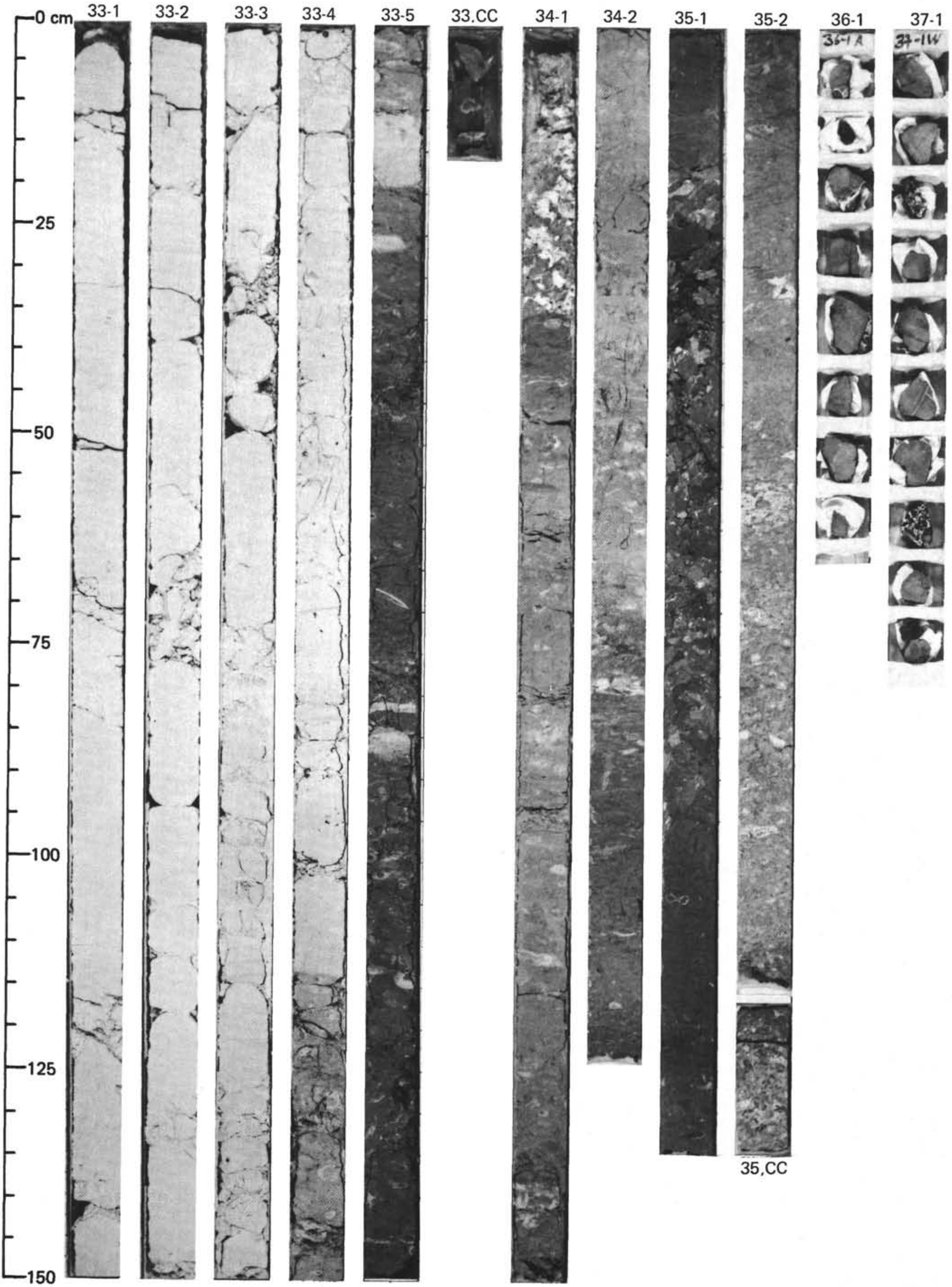
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