APPENDIX II. INTERSTITIAL WATER STUDIES ON SMALL CORE SAMPLES, LEGS 16, 17, AND 18[1]

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ABSTRACT

Legs 16, 17, and 18 encountered three groups of sediment types: rapidly deposited biogenic deposits, showing marked changes in interstitial calcium, magnesium, and strontium; slowly deposited biogenic deposits, showing little variability in pore fluids other than elevated silica concentrations; and terrigenous deposits. The latter showed the usual loss of sulfate and combination of diagenetic reactions culminating in loss of Na^+, K^+, Mg^{++}, with variable changes in Ca^{++}. Very high barium concentrations (to 59 mg/kg) occurred at Site 178 (Leg 18).

INTRODUCTION

A total of 315 sediment samples from Legs 16, 17, and 18 were squeezed for interstitial water. Of these, 107 were selected for a comprehensive analysis of the major inorganic constituents (Tables 1 and 2). This represents a departure from the practice, employed for Legs 1 through 14, of analyzing every pore water sample collected. Emphasis has been placed on the continental margin sites with more than 60 percent of the samples selected for analysis coming from Leg 18. Analytical methods were identical to those outlined in earlier volumes of this series. We wish to thank Wen Chang, James O'Neill, and Irene Uhlitzsch for performing the analyses and data reduction.

RESULTS

Sites drilled on Legs 16, 17, and 18 can be grouped into three categories, each exhibiting a characteristic pore water behavior. These are (1) rapidly deposited, open-ocean biogenic sediments; (2) slowly deposited unreactive biogenic sediments, and (3) continental margin sediments principally of terrigenous origins. All three types have been described and discussed in previous reports in this series.

Site 157 (Leg 16) is a typical example of the first type. An enrichment of Ca^{++} relative to surface ocean water is accompanied by depletion of Mg^{++} and reduction of $SO_4^{=}$. Sites 158, 164, 165, 167, 170, 173, and 177 also belong in this category. Calcium enrichments range from 1.3 to 3.2 times the open-ocean surface water concentrations, whereas Mg^{++} and $SO_4^{=}$ show slight (<10%) to moderate (40-50%) depletions. Strontium concentrations, relative to ocean water, are enriched to some extent at all of these locations. Sites 164, 165, 170, and 173 exhibit enrichments of 10 to 70 percent; whereas Sites 157,158, and 167 show 4- to 8-fold increases. Two of the three sites in the high Sr^{++} category (157 and 158) correlate with the largest Ca^{++} enrichments and Mg^{++} depletions. This correspondence has been noted previously and interpreted as reflecting carbonate recrystallization (Manheim and Sayles, 1971).

Most of the sites drilled on Leg 16 (159 through 163) along with Sites 166 and 171 from Leg 17 belong to the second category listed above. A minimum of samples (usually top, middle, and near the bottom of the hole) were analyzed to establish that the major constituents of pore fluids exhibit insignificant or marginally significant changes with depth and location. These cores are typical of previously analyzed samples from other pelagic areas of the Pacific (see Initial Reports of the Deep Sea Drilling Project, Volumes V through IX). Only at Site 163 is there slight evidence of reactivity.

Eight of 23 sites reported here belong to the continental margin category. Terrigenous muds and silts predominate at all of these sites. Analyses are concentrated at four sites (155, 174, 178, and 180) where many samples, reasonably distributed with depth were available. Continental margin sediments typically show severe and sometimes total reduction of $SO_4^{=}$; a depletion of Ca^{++} in the upper part of the deposits giving way to enrichment at depth; and depletion of both K^+ and Mg^{++}. The top 440 meters were not cored at Site 155. Pore fluids were obtained from the first nine cores which cover an 87 meter interval. Sites 174 and 178 were cored and sampled to depths greater than 700 meters; Site 180, to 456 meters. Sulfate, depleted by about 10 percent in the topmost samples from Sites 174, 178, and 180, drops sharply in the first 90 meters. Below this level depletion is nearly complete, within analytical uncertainty in most samples. Calcium depletion in the uppermost samples is followed at depth by gradual enrichment at two sites (174 and 180). Mg^{++} and K^+ are depleted at all four sites.

Site 177 is unusual inasmuch as the pore fluids behave chemically like the type 1 biogenic group while the sediments contain a significant proportion of terrigenous material. The rather mild concentration changes probably reflect a relatively slow deposition rate (for terrigenous

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sediments). Site 178 is also somewhat unusual in that strong depletion of $SO_4^{=}$ in the upper portion of the hole is not accompanied by Ca^{++} loss as is the case at Sites 174 and 180. Rather, enrichment is seen at 82 meters. The concurrent loss of Mg^{++} is large and quite typical of terrigenous sediment deposits.

The unusually low Na^{+} and Cl^{-} values of Sample 155-6-4, while suspect, do not appear to result from either storage of the pore fluid or manipulation during analysis. Shipboard and shore laboratory salinities agree within the limits of uncertainty of the refractometer readings (±0.2%). Unexplained sudden variations of this type have in the past tended to be artifacts of some type. In this case it seems possible that the squeezed fluid or natural sediment has somehow been freshened artifically.

Cation values, particularly K^{+}, for Sample 180-11(CC) show abrupt departure from more or less smooth trends with depth. These deviations may be artifacts of sample collection and processing (of unknown type) since this was a core catcher sample and only 1 ml of water was extracted after nearly 1 hour of squeezing.

Among the trace constituents, barium displays particularly large concentrations in interstital waters from Site 178. Toward the base of the section, in hard olive gray muds 690 meters below the sea floor, values as high as 59 ppm occur. As seen in Figure 1, barium and sulfate concentrations in the interstitial waters of Site 178 generally vary in opposite directions, as one might expect from the limiting effect of $BaSO_4$ solubility. However, at depth the molecular product of $[Ba]\ [SO_4]$ far exceeds the value given by Li et al. (in press) for the apparent solubility product of $BaSO_4$ ($[Ba^{++}]\ [SO_4^{=}] = 1.1 \times 10^{-8}$ gmole/l at 1°C and 500 bars). This phenomenon was first noted from studying DSDP interstitial water data. It was attributed to the existence of organic complexes of barium; especially good sources of Ba^{++} are diatoms of the *Chaetoceros* and *Rhizosolenia* types.

Silica concentrations show good correlation with lithology. The highest values, approaching 40 mg/kg Si or even higher, occur in biogenic oozes of Site 157, on the Carnegie Ridge off Equador; at the base of Site 158, Cocos Ridge; and in a nearly pure diatomite at the base of Site 173, on the continental slope off Cape Mendocino (California). Notwithstanding the presence of amorphous silica of diatom origin, clayey sediments in the northeast Pacific generally showed considerably lower silica concentrations. In such sediments the apparent solubility of amorphous silica may be reduced by surface absorption of metal ions (e.g., Mg^{++}, K^{+} Na^{+}) to form authigenic silicates (Hurd, 1972).

REFERENCES

Hurd, D. C., 1972. Interactions of Biogenic Opal, Sediment and Seawater in the Central Equatorial Pacific. Hawaii Inst. Geophys. Univ. Hawaii. 72-22. 81.

Li, Y. H., Ku, T. L., Mathieu, G. and Wolgemuth, K., in press. Barium in the Indian Antarctic Ocean south of Australia. Earth Planet. Sci. Letters.

Manheim, F. T. and Sayles, F. L., 1971. Interstitial water studies on small core samples, Leg 8. *In* Tracey, J. I. Jr., et al, Sutton, G. H., 1971. Initial Reports of the Deep Sea Drilling Project, Volume VIII. Washington (U. S. Government Printing Office). 856.

TABLE 1
Major Constituents of Pore Fluids, Legs 16, 17, and 18. Values in g/kg (‰) Except as Noted

Sample Designation	Depth (m)	Age	Description	Na[a]	Na[b]	K	Ca	Mg	Total Cations (meq/kg)	Cl	SO_4	Alk. (meq/kg)	HCO_3[c]	Total Anions (meq/kg)	Sum[d]	Salinity[e]	H_2O[f] (‰)	pH[f]
LEG 16																		
			Hole 155 (06°07.4'N, 81°02.6'W, water depth 2752 m, Panama Basin)															
Surface ocean water				9.1	8.9	0.32	0.35	1.07	500	16.3	2.27	2.6	0.16	509	29.6	29.7	–	–
155-1-6	442	Upper Miocene	Olive and light olive gray marl, mottled.	9.9	10.0	0.17	1.07	0.23	513	18.0	<0.01	0.5	0.03	507	29.4	29.7	–	8.2
2-6	451	Upper Miocene	Medium greenish gray mudstone.	10.0	9.8	0.15	1.16	0.25	507	18.1	0.04	0.4	0.03	519	29.7	29.7	–	7.3
3-6	460	Upper Miocene	Varicolored olive gray marly clay.	10.5	10.5	0.14	1.23	0.22	539	19.0	0.05	1.4	0.08	538	31.2	31.4	–	8.5
4-6	469	Upper Miocene	Olive gray claystone, massive, waxy.	10.4	10.5	0.14	1.26	0.22	540	18.9	0.10	0.7	0.04	536	31.1	30.5	–	8.4
5-6	478	Upper Miocene	Olive gray claystone	10.1	10.1	0.13	1.34	0.21	529	18.6	0.04	0.7	0.04	528	30.5	30.8	–	8.4
6-4	484	Middle Miocene	Greenish gray and dusky yellow green marl with olive gray pyritic mottles.	9.3	9.4	0.10	1.38	0.29	503	17.4	0.27	1.3	0.08	499	28.8	29.4	–	7.7
7-2	490	Middle Miocene	Light olive gray dolomitic chalk, well indurated.	10.5	10.5	0.15	1.24	0.20	540	19.0	0.18	0.6	0.04	540	31.3	31.4	–	8.5
8(CC)	506	Middle Miocene	Yellowish to light olive gray chalk-marl.	10.1	10.2	0.16	1.36	0.32	540	18.5	0.67	0.4	0.02	536	31.1	30.8	–	7.5
9(CC)	515	Middle Miocene	Light gray chalk ooze.	10.6	10.7	0.16	1.38	0.28	559	19.3	0.58	0.1	0.01	560	32.3	33.0	–	7.4
			Hole 157 (01°45.7'W, water depth 2591 m, Carnegie Ridge)															
157-16-6	144	Upper Pliocene	Pale olive nanno chalk ooze, mottled, H_2S odor.	10.9	10.7	0.38	0.40	1.22	593	19.6	2.24	4.6	0.28	604	35.0	35.2	–	7.2
36-3	327	Upper Miocene	Light greenish gray to yellowish gray nanno chalk, mottles.	10.7	10.5	0.32	0.74	0.97	579	19.3	2.10	3.3	0.20	591	34.3	34.7	–	7.1
39-1	346	Upper Miocene	Yellowish gray to pale olive nanno chalk, mottled and burrowed.	10.8	10.5	0.27	1.07	0.76	578	19.3	2.24	0.9	0.06	592	34.5	34.4	–	7.1
			Hole 158 (0.6°37.4'N, 85°14.2'W, water depth 1953 m, Cocos Ridge)															
158-2-5	15	Pleistocene	Grayish to dusky yellow green foram-nanno chalk ooze.	10.8	10.7	0.44	0.46	1.17	594	19.4	2.49	3.0	0.18	601	34.9	35.2	52	7.4
13-5	114	Upper Miocene	Medium greenish gray nanno chalk ooze, forams and rads abundant, light olive gray mottling.	10.7	10.5	0.38	0.91	0.90	584	19.6	1.89	1.2	0.08	592	34.5	34.7	–	7.2
33-2	293	Middle Miocene	Grayish to dusky yellow green nanno chalk with forams, nannos, rads, and silicoflagellates.	10.2	10.0	0.29	1.33	0.80	576	19.2	1.99	0.4	0.03	583	33.8	34.4	38	7.1
			Hole 159 (12°19.9'N, 122°17.3'W, water depth 4484 m, midway between Clipperton and Clarion fracture zones)															
159-2-6	16	Upper Miocene	Dark to dusky yellowish brown clay.	10.8	10.6	0.48	0.40	1.23	595	19.3	2.69	3.0	0.18	604	35.1	35.2	65	7.4
12-5	105	Lower Miocene	Brown nanno marl ooze with mottling.	10.8	10.5	0.44	0.41	1.22	589	19.3	2.51	2.3	0.14	600	34.8	34.9	–	7.5
			Hole 160 (11°42.3'N, 130°52.8'W, water depth 4940 m, midway between Clipperton and Clarion fracture zones)															
160-2-4	14	?	Medium brown and grayish orange zeolitic clay.	10.6	10.5	0.46	0.40	1.24	589	19.2	2.52	2.8	0.17	596	34.6	34.6	–	7.4
6-5	51	Upper Oligocene	Pale yellowish orange nanno chalk ooze.	10.9	10.6	0.43	0.40	1.28	597	19.5	2.65	2.4	0.14	607	35.3	35.2	45	7.4

TABLE 1 – *Continued*

Sample Designation	Depth (m)	Age	Description	Na[a]	Na[b]	K	Ca	Mg	Total Cations (meq/kg)	Cl	SO_4	Alk. (meq/kg)	HCO_3[c]	Total Anions (meq/kg)	Sum[d]	Salinity[e]	H_2O[f] (‰)	pH[f]
Holes 161 and 161A(10°40.3′N, 139°57.2′W, water depth 4939 m, midway between Clipperton and Clarion fracture zones)																		
161-9-4	76	Upper Oligocene	White nanno chalk ooze, very thin beds of yellowish gray nanno chalk ooze.	10.8	10.6	0.43	0.40	1.25	594	19.5	2.41	1.6	0.10	601	34.9	35.2	35	7.5
161A-11-4	214	Upper Eocene	Dark yellowish brown clay and ferruginous aggregates (intense burrowing and mottling.	10.8	10.6	0.44	0.41	1.21	592	19.4	2.55	2.8	0.17	603	35.0	34.9	50	7.5
Hole 162 (14°52.2′N, 140°02.6′W, water depth 4854 m, 80 km south of Clarion Fracture Zone)																		
Surface ocean water				10.6	10.4	0.38	0.40	1.26	587	19.0	2.60	2.1	0.13	591	34.4	34.4	–	–
162-7-6	61	Upper Eocene	Medium brown rad ooze, ferruginous, clayey, slightly mottled.	10.9	10.7	0.43	0.42	1.27	603	19.6	2.69	2.9	0.18	612	35.5	35.8	71	7.6
8-6	70	Middle Eocene	Yellowish brown nanno-rad chalk ooze, slight mottling.	10.9	10.7	0.43	0.41	1.25	600	19.6	2.66	0.7	0.04	608	35.5	35.5	58	7.6
17-3	147	Middle Eocene	Yellowish brown ferruginous clay.	10.7	10.5	0.42	0.40	1.21	588	19.2	2.52	1.3	0.08	594	34.5	34.6	–	7.4
Holes 163 and 163A (11°14.7′N, 150°17.5′W, water depth 5320 m, 200 km south of Clarion Fracture Zone)																		
163-2-4	5	Upper Oligocene	Medium brown zeolitic radiolarian clay.	10.7	10.5	0.44	0.39	1.23	591	19.2	2.65	1.9	0.11	600	34.7	35.2	70	7.3
163A-1-4	144	?	Dark yellowish brown zeolitic clay with with very pale yellow mottles.	10.7	10.4	0.44	0.40	1.26	587	19.3	2.51	2.6	0.16	598	34.8	34.9	49	7.4
163-23-6	241	Upper Campanian	Varicolored nanno chalk.	10.6	10.4	0.41	0.47	1.16	578	19.1	2.16	2.7	0.17	586	34.1	34.1	27	7.4
LEG 17																		
Hole 164 (13°12.1′N, 161°31.0′W, water depth 5485 m, Clarion-Molokai block)																		
Surface ocean water				10.6	10.5	0.38	0.41	1.28	592	19.1	2.67	2.7	0.16	597	34.6	34.9	–	–
164-1-6	43	Lower Miocene	Very dark grayish brown zeolitic clay; very soft, disturbed.	10.7	10.6	0.48	0.39	1.22	591	19.1	2.60	2.9	0.18	597	34.7	35.2	–	7.3
3-2	52	Lower Oligocene	Dark reddish brown to dark brown zeolitic clay; radiolarian rich.	10.8	10.6	0.50	0.40	1.22	593	19.3	2.55	2.9	0.18	602	35.0	35.2	–	7.2
7-2	86	Upper Cretaceous ?	Dark brown, dark yellowish brown, and grayish orange zeolitic clay; sample probably contaminated by drilling mud.	9.8	9.5	0.42	0.48	1.04	532	17.6	2.28	4.1	0.25	548	31.9	32.4	48	7.4
10-3	115	Santonian-Campanian (?)	Dark yellowish brown, brownish black, and grayish orange zeolitic clay; stiff and plastic	10.7	10.6	0.47	0.58	1.18	589	19.4	2.45	3.0	0.18	601	35.0	35.2	44	7.3
19-4	200	Upper Cretaceous (?)	Grayish red, yellowish brown, and brown zeolitic clay; porcelaneous chert and claystone fragments.	10.6	10.4	0.40	0.66	1.14	587	19.2	2.52	3.3	0.20	598	34.7	35.2	–	–
Hole 165A (08°10.7′N, 164°51.6′W, water depth 5053 m, Line Island seamount chain)																		
165A-6-5	134	Early Oligocene	White foram-nanno micrite and ooze.	10.8	10.5	0.42	0.51	1.18	591	19.6	2.30	3.8	0.23	603	35.0	35.2	–	7.3
12-5	225	Middle Eocene	White turbiditic nanno-rad ooze, and light yellowish brown rad ooze; distorted beds, alternating.	10.8	10.6	0.39	0.53	1.19	596	19.6	2.33	3.1	0.19	604	35.0	35.2	52	7.4

TABLE 1 – *Continued*

Sample Designation	Depth (m)	Age	Description	Na[a]	Na[b]	K	Ca	Mg	Total Cations (meq/kg)	Cl	SO_4	Alk. (meq/kg)	HCO_3[c]	Total Anions (meq/kg)	Sum[d]	Salinity[e]	H_2O[f] (‰)	pH[f]
Hole 166 (03°45.7′N, 175°04.8′W, water depth 4962 m, central Pacific basin, west of Line Islands)																		
Surface ocean water				10.8	10.6	0.38	0.41	1.29	597	19.4	2.57	2.6	0.16	603	35.0	35.5	–	–
166-9-6	174	Late Oligocene	Dark yellowish brown rad ooze.	10.9	10.7	0.43	0.43	1.26	603	19.5	2.67	4.1	0.25	609	35.4	35.8	72	7.4
20-5	227	Albian (?)	Brown and grayish brown pelagic mud.	10.9	10.6	0.36	0.42	1.24	593	19.4	2.62	1.9	0.11	604	35.0	35.2	–	–
Hole 167 (07°04.1′N, 176°49.5′W, water depth 3176 m, Magellan Rise)																		
167-10-6	268	Late Oligocene	White to off white (green and purple) foram-nanno ooze to chalk.	11.0	10.8	0.36	0.62	1.09	597	19.8	2.29	3.4	0.21	608	35.4	35.8	35	–
28-2	556	Late Eocene	Greenish white nanno-rad chalk.	11.1	10.9	0.33	0.71	1.07	605	20.0	2.34	1.9	0.12	614	35.7	36.0	27	7.3
Hole 170 (11°48.0′N, 177°37.0′E, water depth 5792 m, Clarion-Molokai block)																		
170-6-4	107	Middle to Early Campanian	Brown zeolitic calcareous clay to pinkish white zeolitic nanno chalk.	10.7	10.4	0.39	0.68	1.10	587	19.5	2.23	3.3	0.20	599	34.8	34.9	44	7.3
Hole 171 (19°07.9′N, 169°27.6′W, water depth 2295 m)																		
171-8-5	132	Middle Eocene	Yellowish gray to white foram-nanno chalk	10.9	10.7	0.40	0.41	1.28	601	19.6	2.67	2.4	0.15	611	35.4	35.5	–	7.6
19-6	262	Maestrichtian	Very light gray foram-nanno chalk	10.8	10.6	0.43	0.43	1.25	597	19.5	2.61	3.2	0.20	606	35.2	35.5	34	7.4
LEG 18																		
Hole 173 (39°57.7′N, 125°27.1′W, water depth 2927 m, continental slope off Cape Mendocino)																		
173-15-4	134	Upper Miocene	Grayish olive green mud about 60% clay, 30% silt.	10.4	10.7	0.38	0.90	0.95	597	19.4	1.48	4.7	0.28	584	33.8	35.8	51	7.6
17-3	151	Upper-Middle Miocene	Light olive diatomite about 70% diatoms.	10.7	10.6	0.33	0.91	0.95	593	19.4	2.23	3.8	0.23	599	34.8	35.5	53	7.6
29-2	264	boundary																
29-2	264	Lower Miocene	Grayish olive diatomite about 95% diatoms.	10.8	10.5	0.27	1.00	0.92	590	19.3	2.41	4.7	0.28	600	35.0	34.9	52	7.6
Holes 174 and 174A (44°53.4′N, 125°20.8′W, water depth 2815 m, Astoria Submarine Fan)																		
Surface ocean water				9.9	9.9	0.36	0.38	1.20	599	18.0	2.43	2.2	0.13	559	32.4	33.0	–	8.3
174-1-1	2	Upper Pleistocene	Olive gray mud interbedded with fine sand.	10.7	10.7	0.44	0.40	1.23	559	19.2	2.59	4.1	0.25	600	34.8	35.2	66	7.8
174A-1-5	35	Upper Pleistocene	Olive gray mud with sand laminae.	10.7	10.5	0.31	0.40	1.27	590	19.5	1.86	7.9	0.48	596	34.5	34.6	20	7.7
2-4	44	Upper Pleistocene	Olive gray mud with silt laminae.	11.2	10.7	0.34	0.48	1.26	602	19.5	1.84	17.1	1.04	625	35.7	35.5	34	7.9
6-4	82	Upper Pleistocene	Dark greenish gray mud interbedded with fine sand.	10.8	10.8	0.37	0.24	1.02	576	19.7	0.04	21.7	1.32	578	33.5	33.8	36	8.1
7-3	88	Upper Pleistocene	Dark greenish gray to olive gray mud in graded beds with sand and silt.	11.2	10.8	0.36	0.24	0.95	570	19.7	0.66	15.4	0.94	585	34.0	33.3	29	8.1
11-6	130	Upper Pleistocene	Dark greenish gray mud.	11.0	10.8	0.33	0.23	0.84	560	19.6	0.01	11.2	0.68	565	32.7	33.0	31	8.2
13-4	146	Upper Pleistocene	Olive gray mud in graded beds with sand and silt.	11.0	10.8	0.34	0.22	0.82	558	19.7	0.02	10.4	0.63	567	32.7	33.0	24	8.4
15-5	167	Upper Pleistocene	Fine sand, poorly sorted.	11.0	11.0	0.31	0.24	0.81	565	19.6	<0.01	12.3	0.75	565	32.7	32.7	31	8.4
17-3	183	Upper Pleistocene	Olive gray mud interbedded with silt and muddy silt.	11.2	11.1	0.30	0.22	0.73	560	19.6	0.08	7.9	0.48	564	32.6	32.7	26	8.5

TABLE 1 – *Continued*

Sample Designation	Depth (m)	Age	Description	Na[a]	Na[b]	K	Ca	Mg	Total Cations (meq/kg)	Cl	SO_4	Alk. (meq/kg)	HCO_3[c]	Total Anions (meq/kg)	Sum[d]	Salinity[e]	H_2O[f] (‰)	pH[f]
174A-19-3	202	Upper Pleistocene	Graded sand bed, moderately to well sorted.	10.7	10.5	0.33	0.24	0.89	549	18.7	1.21	6.6	0.41	560	32.5	31.9	–	8.4
21-2	222	Upper Pleistocene	Olive gray mud with few silt laminae a and thin sand beds.	11.2	11.1	0.32	0.14	0.79	561	19.6	0.25	11.1	0.68	570	33.0	33.0	27	8.5
29-2	297	Upper Pleistocene	Olive gray to dark greenish gray mud with silt beds.	11.4	11.3	0.41	0.22	0.86	585	19.9	0.06	21.0	1.28	585	34.1	34.1	21	8.4
31-1	315	Upper Pleistocene	Dark greenish gray fissile calcareous mud.	11.4	11.3	0.40	0.22	0.84	582	20.0	0.12	19.3	1.18	587	34.2	34.1	29	8.2
33-2	343	Upper Pleistocene	Dark greenish gray fissile mud.	11.4	11.3	0.43	0.28	0.77	580	20.0	0.09	14.3	0.88	582	33.8	34.1	25	8.4
33-4	375	Lower Pleistocene	Dark greenish gray to olive black fissile mud; very hard.	11.1	11.0	0.38	0.39	0.74	568	19.9	0.07	10.4	0.64	574	33.2	33.3	–	–
35-1	410	Lower Pleistocene	Dark greenish gray to olive black fissile mud; very hard.	11.2	11.1	0.32	0.55	0.72	577	20.3	0.09	8.2	0.50	582	33.7	34.1	–	–
37-3	508	Pliocene	Dark greenish gray to olive black mud; 8-20 cm beds; very firm.	10.3	10.3	0.14	1.43	0.68	579	20.3	0.22	1.9	0.12	578	33.2	33.8	–	8.4
40-4	765	Pliocene	Dark greenish gray calcareous mudstone.	10.4	10.4	0.08	1.59	0.36	565	19.7	0.13	2.1	0.13	562	32.4	32.7	–	8.1
			Hole 175 (44°50.2′N, 125°14.5′W, water depth 1999 m, lower continental slope off central Oregon)															
175-10-5	87	Upper Pleistocene	Dark greenish gray mud.	10.8	10.6	0.43	0.13	1.06	563	19.2	0.11	29.3	1.79	574	33.5	33.3	32	8.1
18-4	162	Lower Pleistocene	Greenish gray mud.	10.9	10.5	0.40	0.18	1.07	564	19.2	1.05	15.9	0.97	579	33.8	33.8	–	8.4
			Hole 176 (45°56.0′N, 124°37.0′W, water depth 193 m, outer edge of continental shelf, northern Oregon)															
176-1-4	5	Pleistocene	Light olive gray mud	10.5	10.2	0.40	0.21	1.03	550	18.6	1.02	13.0	0.79	559	32.6	33.0	31	8.0
3-6	13	Pleistocene	Dark greenish gray mud, carbonate rich.	10.5	10.3	0.46	0.08	0.84	535	18.6	0.17	15.0	0.92	542	31.6	31.4	–	8.5
5-6	22	Pleistocene	Dark greenish gray mud.	10.4	10.0	0.43	0.10	0.78	515	18.3	0.01	13.9	0.85	531	30.9	30.2	–	8.3
			Hole 177A (50°28.2′N, 130°12.3′W, water depth 2006 m, NW end of Paul Revere Ridge)															
177A-1-2	10	Pleistocene	Olive gray to dark greenish gray coarse mud; carbonate-bearing.	11.0	10.6	0.43	0.38	1.12	585	19.8	1.66	9.5	0.58	602	35.0	34.9	35	7.8
5-5	52	Pliocene	Dark greenish gray mud; massive, firm, slightly mottled.	10.8	10.7	0.43	0.50	1.07	589	20.2	0.86	6.0	0.37	595	34.2	35.2	35	8.1
14-6	210	Lower Pliocene	Dark greenish gray mud; carbonate-bearing.	10.8	10.6	0.14	1.14	0.82	591	19.8	1.93	1.2	0.07	599	34.7	35.5	21	7.6
19-1	252	Lower Pliocene	Dark greenish gray coarse mud; very compact, slightly mottled.	10.5	10.4	0.21	1.26	0.70	580	19.2	1.84	2.3	0.14	581	33.8	34.4	23	8.1
			Hole 178 (56°57.4′N, 147°07.9′W, water depth 4218 m, Alaskan Abyssal Plain)															
Surface ocean water			xxxx x	10.1	9.9	0.36	0.38	1.20	556	18.1	2.42	3.7	0.23	566	32.8	33.0	–	8.4
178-2-3	9	Upper Pleistocene	Olive gray diatom ooze; mud-rich.	10.7	10.7	0.39	0.44	1.11	588	19.5	1.48	7.3	0.45	588	34.1	34.9	30	7.9
6-4	46	Upper Pleistocene	Dark greenish gray mud with a few silt laminae.	10.8	10.8	0.38	0.42	1.00	582	19.6	1.06	11.1	0.68	585	33.9	34.1	30	8.3
10-3	82	Upper Pleistocene	Medium dark gray and dark greenish gray mud.	10.7	10.6	0.33	0.46	0.92	570	19.5	0.72	7.1	0.43	571	33.1	33.6	28	8.1

TABLE 1 – *Continued*

Sample Designation	Depth (m)	Age	Description	Na[a]	Na[b]	K	Ca	Mg	Total Cations (meq/kg)	Cl	SO_4	Alk. (meq/kg)	HCO_3[c]	Total Anions (meq/kg)	Sum[d]	Salinity[e]	H_2O[f] (‰)	pH[f]
178-15-2	125	Upper Pleistocene	Dark greenish gray mud with trace to 20% diatoms.	10.6	10.7	0.32	0.61	0.79	569	19.4	0.43	8.2	0.50	565	32.6	32.7	36	8.4
19-1	160	Upper Pleistocene	Medium dark gray mud.	10.6	10.5	0.28	0.67	0.72	557	19.3	0.40	5.4	0.33	559	32.3	32.4	23	8.4
23-3	198	Pleistocene (?)	Olive gray and dark greenish gray mud; 65% clay, 35% silt.	10.6	10.6	0.26	0.75	0.61	556	19.4	0.14	4.5	0.28	556	32.0	32.4	40	8.8
27-1	230	Pliocene	Olive gray mud with a few silt laminae.	10.6	10.5	0.21	0.70	0.66	553	19.2	0.47	3.1	0.19	556	32.0	31.9	23	8.1
29-5	255	Pliocene	Olive gray mud with silt laminae.	10.6	10.5	0.21	0.66	0.62	544	19.2	0.29	3.2	0.19	551	31.8	31.4	25	8.5
31-2	298	Pliocene	Dark greenish gray mud; 20-30% diatoms.	10.4	10.3	0.26	0.52	0.80	547	19.0	0.59	4.1	0.25	551	31.8	32.4	37	8.2
33-3	318	Lower Pliocene	Olive gray, olive black, and dark greenish gray fine mud.	10.6	10.5	0.28	0.62	0.73	554	19.2	0.27	11.3	0.69	560	32.4	32.7	–	8.6
37-4	358	Middle Miocene	Green gray muddy diatomite interbedded with olive gray diatom mud.	10.5	10.6	0.29	0.61	0.74	558	19.4	0.16	7.5	0.46	557	32.2	32.7	44	8.2
47-1	506	Middle Miocene	Dark greenish gray mud; very hard.	10.5	10.5	0.17	0.92	0.63	558	19.4	0.04	9.9	0.60	559	32.3	32.2	24	8.3
50-1	629	Middle Miocene	Olive gray and dark greenish gray mud; 65% clay, 35% silt.	10.7	10.6	0.18	1.09	0.46	559	19.7	0.04	2.5	0.15	560	32.3	32.2	30	9.0
52-2	690	Middle Miocene	Olive gray mud; hard; 60% clay, 40% silt.	10.8	10.7	0.23	1.01	0.42	557	19.6	0.06	5.2	0.32	559	32.4	31.9	40	8.3
53-2	718	Middle Miocene	Olive gray and dark greenish gray mud; hard.	10.8	10.8	0.26	1.03	0.44	564	19.7	0.10	4.8	0.29	562	32.6	33.0	27	8.3
			Hole 179 (56°24.5′N, 145°59.3′W, water depth 3781 m, Alaskan Abyssal Plain)															
179-5-2	34	Pleistocene	Greenish gray sandy mud; soft.	10.9	10.7	0.41	0.48	1.23	601	19.4	2.68	4.4	0.27	609	35.4	36.0	37	7.7
11-3	92	Pleistocene	Black gravel tuff.	10.8	10.6	0.45	0.41	1.21	591	19.3	2.59	3.2	0.19	602	35.0	35.2	47	7.5
			Hole 180 (57°21.8′N, 147°51.4′W, water depth 4923 m, Eastern Aleutian Trench)															
Surface ocean water				10.1	10.0	0.36	0.39	1.20	560	18.2	2.53	2.2	0.14	567	32.9	32.7	–	8.4
180-1-3	3	Holocene	Dark greenish gray mud with interbedded graded coarse silts.	10.8	10.7	0.38	0.42	1.29	603	19.4	2.20	13.8	0.84	608	35.3	35.5	27	7.9
2-4	14	Holocene	Gray mud with thin interbedding of coarse and medium silts.	10.9	10.9	0.30	0.42	1.36	612	19.8	1.71	22.9	1.40	616	35.9	36.3	30	7.7
4-3	32	Holocene	Fine gray mud interbedded with coarse and medium silts.	10.9	10.8	0.32	0.29	1.34	601	19.8	1.14	24.3	1.48	606	35.3	35.5	27	7.7
8-5	72	Holocene	Gray mud with a few thin beds of graded medium silts.	10.9	10.8	0.30	0.36	1.26	600	19.8	0.65	29.1	1.78	602	35.0	35.8	26	8.0
11(CC)	124	Holocene	Gray mud and medium silt.	–	10.7	0.49	0.14	1.09	575	19.8	–	—	–	–	–	–	–	8.2
12-2	146	Holocene	Gray mud with thin beds and laminae of silt.	10.7	10.7	0.29	0.24	1.21	584	19.6	0.04	27.9	1.70	583	33.8	34.4	24	8.0
13(CC)	180	Pleistocene	Gray mud.	10.8	10.8	0.24	0.25	1.18	583	19.7	0.08	30.9	1.88	587	34.1	35.5	–	8.0
15-3	245	Pleistocene	Gray mud with interbedding of graded silts.	11.3	11.1	0.32	0.13	1.19	595	20.0	0.29	34.9	2.13	604	35.4	34.1	–	8.2
17-3	266	Pleistocene	Dark greenish gray diatom-bearing mud.	11.1	10.8	0.32	0.22	1.19	585	19.5	0.10	31.2	1.91	582	34.3	34.6	22	8.2
18-4	276	Pleistocene	Gray and dark greenish gray mud with interbedding of graded silts and very fine sand.	11.0	10.8	0.32	0.23	1.21	587	19.7	(<0.01)	41.2	2.51	597	35.0	35.2	50	8.1

TABLE 1 – *Continued*

Sample Designation	Depth (m)	Age	Description	Na[a]	Na[b]	K	Ca	Mg	Total Cations (meq/kg)	Cl	SO_4	Alk. (meq/kg)	HCO_3[c]	Total Anions (meq/kg)	Sum[d]	Salinity[e]	H_2O[f] (‰)	pH[f]
180-19-2	348	Pleistocene	Gray mud with interbedding of graded silts and very fine sand.	10.7	10.8	0.40	0.16	1.14	579	19.6	0.10	22.0	1.34	578	33.4	34.1	21	8.2
20-5	420	Pleistocene	Gray mud with interbedding of graded coarse and medium silts.	10.6	10.6	0.20	0.42	1.02	570	19.7	<0.01	15.6	0.95	573	32.9	34.1	21	8.2
22-6	440	Pleistocene	Gray mud with interbedded silt.	10.6	10.5	0.18	0.40	0.97	563	19.6	0.15	8.5	0.52	564	32.4	33.0	19	8.2
24-4	456	Pleistocene	Gray mud with interbedding of medium and fine silts.	10.4	10.3	0.20	0.45	0.97	556	19.4	0.31	8.1	0.49	562	32.2	33.0	22	8.1
			Hole 181 (57°26.3′N, 148°27.9′W, water depth 3086 m, landward wall of Aleutian Trench)															
181-7-3	60	Pleistocene	Medium gray mud; firm, uniform.	10.3	10.4	0.30	0.24	1.15	568	19.7	0.05	6.0	0.37	562	32.1	33.8	–	8.3
13-5	120	Pleistocene	Medium gray to olive gray diatom-bearing mud; firm to compact; uniform, fine grained.	10.3	10.3	0.25	0.35	1.11	562	19.5	0.07	8.5	0.52	561	32.1	33.8	24	7.9
17-6	159	Pleistocene	Medium gray fine mud; diatom-bearing; firm to stiff.	10.7	10.5	0.23	0.52	0.82	556	19.7	0.06	6.3	0.39	563	32.4	33.0	17	8.1
20-1	177	Pleistocene	Grayish black and greenish black mud; indurated.	10.4	10.4	0.12	1.06	0.50	547	19.2	0.24	3.6	0.22	549	31.7	31.9	–	8.4
			Hole 182 (57°53.0′N, 148°43.0′W, water depth 1419 m, upper continental slope E of Kodiak Island)															
182-1-6	8	Pleistocene	Medium gray mud.	10.6	10.4	0.43	0.21	1.09	565	19.0	1.43	8.8	0.54	573	33.3	33.6	24	8.1

[a]Sodium determined by difference between anions and cations excluding Na.

[b]Sodium determined by atomic absorption analysis.

[c]HCO_3^- is calculated from total alkalinity, assuming this is entirely due to bicarbonate ion.

[d]The sum incorporates the sodium values determined by difference.

[e]Salinity of pore fluids taken from heat sealed sections of plastic pipe prior to subdivision of samples for analysis. Salinity values determined with Goldberg temperature compensated refractometer.

[f]pH and water content are taken from shipboard summaries.

TABLE 2
Minor Constituents of Pore Fluids, Legs 16, 17, and 18. Concentrations in mg/kg (ppm).

Sample Designation	Depth (m)	Age	Description	Sr	Ba	Si (col.)[a]	Si (spec.)[b]
Leg 16							
			Hole 155				
Surface ocean water				7.6	<0.1	<0.1	–
155-1-6	442	Upper Miocene	Olive and light olive gray marl, mottled.	50	16	2.8	–
2-6	451	Upper Miocene	Medium greenish gray mudstone.	57	16	3.4	–
3-6	460	Upper Miocene	Varicolored olive gray marly clay.	62	19	3.7	–
4-6	469	Upper Miocene	Olive gray claystone, massive, waxy.	63	21	7.5	–
5-6	478	Upper Miocene	Olive gray claystone.	72	19	3.6	–
6-4	484	Middle Miocene	Greenish gray and dusky yellow green marl with olive gray pyritic mottles.	76	1.1	3.3	–
7-2	490	Middle Miocene	Light olive gray dolomitic chalk, massive, well indurated.	72	1.7	4.2	–
8(CC)	506	Middle Miocene	Yellowish to light olive gray chalk-marl.	71	0.34	5.1	–
9(CC)	515	Middle Miocene	Light gray chalk ooze.	70	0.43	6.4	–
			Hole 157				
157-16-6	144	Upper Pliocene	Pale olive nanno chalk ooze, mottled, H_2S odor.	13.6	<0.1	36	34
36-3	327	Upper Miocene	Light greenish gray to yellowish gray nanno chalk, mottles.	33	<0.1	49	47
39-1	346	Upper Miocene	Yellowish gray to pale olive nanno chalk, mottled and burrowed.	46	<0.1	35	37
			Hole 158				
158-2-5	15	Pleistocene	Grayish to dusky yellow green foram-nanno chalk ooze.	13	<0.1	18	18
13-5	114	Upper Miocene	Medium greenish gray nanno chalk ooze, forams and rads abundant, light olive gray mottling.	35	<0.1	31	32
33-2	293	Middle Miocene	Grayish to dusky yellow green nanno chalk with forams, nannos, rads, and silicoflagellates.	36	<0.1	36	35
			Hole 159				
159-2-6	16	Upper Miocene	Dark to dusky yellowish brown clay.	8.0	<0.1	17	24
12-5	105	Lower Miocene	Brown nanno marl ooze with mottling.	9.6	<0.1	11	9
			Hole 160				
160-2-4	14	?	Medium brown and grayish orange zeolitic clay.	8.0	<0.1	14	14
6-5	51	Upper Oligocene	Pale yellowish orange nanno chalk ooze.	8.6	<0.1	18	16
			Holes 161 and 161A				
161-9-4	76	Upper Oligocene	White nanno chalk ooze, very thin beds of yellowish gray nanno chalk ooze.	9.2	<0.1	21	18
161A-11-4	214	Upper Eocene	Dark yellowish brown clay and ferruginous aggregates, intense burrowing and mottling.	9.4	<0.1	30	30
			Hole 162				
Surface ocean water				7.8	<0.1	<0.1	<7
162-7-6	61	Upper Eocene	Medium brown rad ooze, ferruginous, clayey, slightly mottled.	8.9	<0.1	23	22
8-6	70	Middle Eocene	Yellowish brown nanno-rad chalk ooze, slight mottling.	8.9	0.10	22	19
17-3	147	Middle Eocene	Yellowish brown ferruginous clay.	7.5	0.11	10	–
			Holes 163 and 163A				
163-2-4	5	Upper Oligocene	Medium brown zeolitic radiolarian clay.	8.0	<0.1	18	–
163A-1-4	144	?	Dark yellowish brown zeolitic clay with very pa pale yellow mottles.	8.0	<0.1	23	21
163-23-6	241	Upper Campanian	Varicolored nanno chalk.	9.6	<0.1	24	22

TABLE 2 – *Continued*

Sample Designation	Depth (m)	Age	Description	Sr	Ba	Si (col.)[a]	Si (spec.)[b]
Leg 17							
			Hole 164				
Surface ocean water				8.6	<0.05	<0.1	<7
164-1-6	43	Lower Miocene Low	Very dark grayish brown zeolitic clay; very soft, disturbed.	8.3	<0.05	15	15
3-2	52	Lower Oligocene	Dark reddish brown to dark brown zeolitic clay; radiolarian-rich.	8.2	<0.05	22	21
7-2	86	Upper Cretaceous	Dark brown, dark yellowish brown, and grayish orange zeolitic clay; sample probably contaminated by drilling mud.	8.8	<0.05	21	20
10-3	115	Santonian-Campanian (?)	Dark yellowish brown, brownish black, and grayish orange zeolitic clay; stiff and plastic.	9.3	<0.1	22	20
19-4	200	Upper Cretaceous (?)	Grayish red, yellowish brown, and brown zeolitic clay; porcelaneous chert and claystone fragments.	9.7	<0.1	31	22
			Hole 165A				
165A-6-5	134	Early Oligocene	White foram-nanno micrite and ooze.	11.9	0.10	31	33
12-5	225	Middle Eocene	White turbiditic nanno-rad ooze, and light yellowish brown rad ooze; distorted beds, alternating.	13.0	0.13	33	33
			Hole 166				
Surface ocean water				8.7	<0.1	5.0	<7
166-9-6	174	Late Oligocene	Dark yellowing brown rad ooze	8.3	<0.1	24	21
20-5	227	Albian (?)	Brown and grayish brown pelagic mud.	8.3	<0.1	18	23
			Hole 167				
167-10-6	268	Late Oligocene	White to off white (green and purple) foram-nanno ooze to chalk.	63	<0.21	27	22
28-2	556	Late Eocene	Greenish white nanno-rad chalk.	50	<0.1	33	30
			Hole 170				
170-6-4	107	Middle to Early Campanian	Brown zeolitic calcareous clay to pinkish white zeolitic nanno chalk.	11.8	–	25	23
			Hole 171				
171-8-5	132	Middle Eocene	Yellowish gray to white foram-nanno chalk.	8.6	<0.1	17	16
19-6	262	Maestrichtian	Very light gray foram-nanno chalk.	8.2	0.1	18	19
Leg 18							
			Hole 173				
173-15-4	134	Upper Miocene	Grayish olive green mud about 60% clay, 30% silt.	10.8	0.1	29	–
17-3	151	Upper-Middle Miocene boundary	Light olive diatomite about 70% diatoms.	10.7	0.1	29	30
29-2	264	Lower Miocene	Grayish olive diatomite about 95% diatoms.	10.9	<0.1	36	38
			Holes 174 and 174A				
Surface ocean water				7.7	<0.1	<0.1	<7
174-1-1	2	Upper Pleistocene	Olive gray mud interbedded with fine sand.	10	0.03	16	13
174A-1-5	35	Upper Pleistocene	Olive gray mud with sand laminae.	11.9	0.06	12	13
2-4	44	Upper Pleistocene	Olive gray mud with silt laminae.	11.9	0.2	13	19
6-4	82	Upper Pleistocene	Dark greenish gray mud interbedded with fine sand.	13	3	12	14
7-3	88	Upper Pleistocene	Dark greenish gray to olive gray mud in graded beds with sand and silt.	11	1.3	8.6	13
11-6	130	Upper Pleistocene	Dark greenish gray mud.	12	9.1	14	–
13-4	146	Upper Pleistocene	Olive gray mud in graded beds with sand and silt.	11	2.0	7.1	8
15-5	167	Upper Pleistocene	Fine sand, poorly sorted.	12	3.5	8.5	–
17-3	183	Upper Pleistocene	Olive gray mud interbedded with silt and muddy silt.	12	2.2	8.1	8
19-3	202	Upper Pleistocene	Graded sand bed, moderately to well sorted.	10.1	1.6	6.6	8
21-2	222	Upper Pleistocene	Olive gray mud with few silt laminae and thin sand beds.	10.3	3.0	8.5	9

TABLE 2 – *Continued*

Sample Designation	Depth (m)	Age	Description	Sr	Ba	Si (col.)[a]	Si (spec.)[b]
29-2	297	Upper Pleistocene	Olive gray to dark greenish gray mud with silt beds.	11.5	18	11	17
31-1	315	Upper Pleistocene	Dark greenish gray fissile calcareous mud.	12	22	16	17
33-2	343	Upper Pleistocene	Dark greenish gray fissile mud.	12	16	12	14
34-4	375	Lower Pleistocene	Dark greenish gray to olive black fissile mud; very hard.	12.5	13	14	12
35-1	410	Lower Pleistocene	Dark greenish gray to olive black fissile mud; very hard.	10.5	11	14	–
37-3	508	Pliocene	Dark greenish gray to olive black mud; 8-20 cm beds; very firm.	7.8	1.6	5.6	<7
40-4	765	Pliocene	Dark greenish gray calcareous mudstone.	12.2	6.9	4.2	<7
			Hole 175				
175-10-5	87	Upper Pleistocene	Dark greenish gray mud.	9.9	17	20	20
18-4	162	Lower Pleistocene	Greenish gray mud.	8.7	0.33	16	26
			Hole 176				
176-1-4	5	Pleistocene	Light olive gray mud.	7.1	0.16	16	22
3-6	13	Pleistocene	Dark greenish gray mud, carbonate-rich.	7.8	0.64	14	18
5-6	22	Pleistocene	Dark greenish gray mud.	9.1	2.6	19	21
			Hole 177A				
177A-1-2	10	Pleistocene	Olive gray to dark greenish gray coarse mud; carbonate-bearing.	8.6	<0.1	20	22
5-5	52	Pliocene	Dark greenish gray mud; massive, firm, slightly mottled.	9.1	0.15	22	22
14-6	210	Lower Pliocene	Dark greenish gray mud; carbonate-bearing.	11.8	0.27	15	17
19-1	252	Lower Pliocene	Dark greenish gray coarse mud; very compact, slightly mottled.	16.0	0.54	4.5	<7
			Hole 178				
Surface ocean water				–	–	<0.2	–
178-2-3	9	Upper Pleistocene	Olive gray diatom ooze; mud-rich.	10.0	0.1	23	17
6-4	46	Upper Pleistocene	Dark greenish gray mud with a few silt laminae.	10.8	<0.1	20	22
10-3	82	Upper Pleistocene	Medium dark gray and dark greenish gray mud.	8.9	0.13	23	23
15-2	125	Upper Pleistocene	Dark greenish gray mud with trace to 20% diatoms.	10.4	0.2	24	–
19-1	160	Upper Pleistocene	Medium dark gray mud.	11.8	0.40	21	20
23-3	198	Pleistocene (?)	Olive gray and dark greenish gray mud; 65% clay, 35% silt.	13	1.0	13	12
27-1	230	Pliocene	Olive gray mud with a few silt laminae.	14	3.4	11	10
29-5	255	Pliocene	Olive gray mud with silt laminae.	14	11	6.4	8
31-2	298	Pliocene	Dark greenish gray mud; 20-30% diatoms.	13	7.9	19	22
33-3	318	Lower Pliocene	Olive gray, olive black, and dark greenish gray fine mud.	14	21	8.9	9
37-4	358	Middle Miocene	Green gray muddy diatomite interbedded with olive gray diatom mud.	13.6	27	17	24
47-1	506	Middle Miocene	Dark greenish gray mud; very hard.	18	23	6.4	8
50-1	629	Middle Miocene	Olive gray and dark greenish gray mud; 65% clay, 35% silt.	14.8	23	8.2	10
52-2	690	Middle Miocene	Olive gray mud; hard; 60% clay, 40% silt.	16	59	29	35
53-2	718	Middle Miocene	Olive gray and dark greenish gray mud; hard.	20	18	21	–
			Hole 179				
179-5-2	34	Pleistocene	Greenish gray sandy mud; soft.	10	(0.2)	19	20
11-3	92	Pleistocene	Black gravel tuff.	9.2	(0.2)	13	13
			Hole 180				
Surface ocean water				7.8	<0.1	<0.1	<7
180-1-3	3	Holocene	Dark greenish gray mud with interbedded graded coarse silts.	21	<0.1	21	22
2-4	14	Holocene	Gray mud with thin interbedding of coarse and medium silts.	10.9	0.2	18	15
4-3	32	Holocene	Fine gray mud interbedded with coarse and medium silts.	9.1	0.1	21	23
8-5	72	Holocene	Gray mud with a few thin beds of graded medium silts.	9.0	0.3	17	21
11(CC)	124	Holocene	Gray mud and medium silt.	–	–	–	–

TABLE 2 –*Continued*

Sample Designation	Depth (m)	Age	Description	Sr	Ba	Si (col.)[a]	Si (spec.)[b]
12-2	146	Holocene	Gray mud with thin beds and laminae of silt.	10.6	2.9	20	19
13(CC)	180	Pleistocene	Gray mud.	12	4.7	18	16
15-3	245	Pleistocene	Gray mud with interbedding of graded silts.	11	7	–	17
17-3	266	Pleistocene	Dark greenish gray diatom-bearing mud.	10	5.5	14	–
18-4	276	Pleistocene	Gray and dark greenish gray mud with interbedding of graded silts and very fine sand.	12	10.7	16	16
19-2	348	Pleistocene	Gray mud with interbedding of graded silts and very fine sand.	11	7.6	8.8	12
20-5	420	Pleistocene	Gray mud with interbedding of graded coarse and medium silts.	13	6.5	21	23
22-6	440	Pleistocene	Gray mud with interbedded silt.	13	4.2	13	17
24-4	456	Pleistocene	Gray mud with interbedding of medium and fine silts.	14	11.5	19	20
			Hole 181				
181-7-3	60	Pleistocene	Medium gray mud; firm, uniform.	6.4	2.4	16	17
13-5	120	Pleistocene	Medium gray to olive gray diatom-bearing mud; firm to compact; uniform, fine grained.	12	7.9	25	27
17-6	159	Pleistocene	Medium gray fine mud; diatom-bearing; firm to stiff.	16	13	15	–
20-1	177	Pleistocene	Grayish black and greenish black mud; indurated.	22	23	3.7	<7
			Hole 182				
182-1-6	8	Pleistocene	Medium gray mud.	7.9	0.16	17	22

[a](col.) = Colorimetric determination.
[b](spec.) = Emission spectrographic determination.

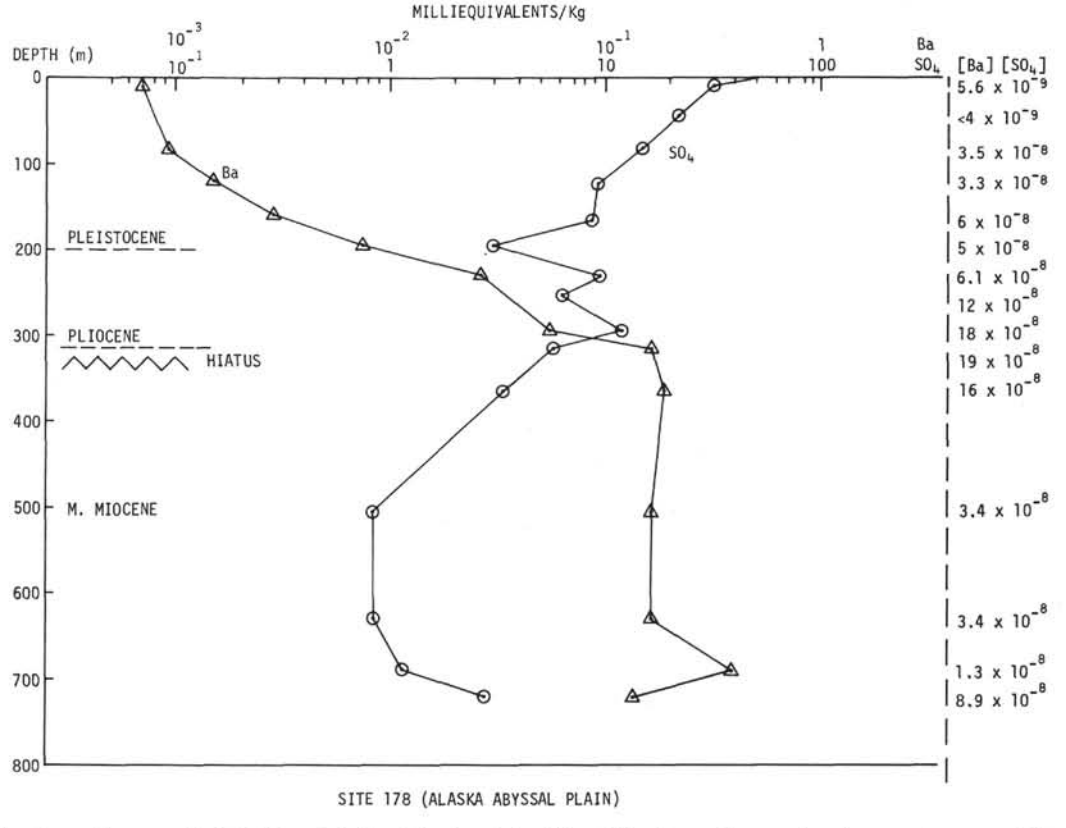

Figure 1. *Distribution of interstitial $SO_4^=$ and Ba^{++} with depth in Site 178. Note that molecular product, on right side of the diagram, utilizes moles/kg, whereas the profiles are given in meq/kg. For the purpose of establishing molar products, molarity (moles/liter) are usually employed, but the difference in units is not significant with respect to the large variation observed here.*