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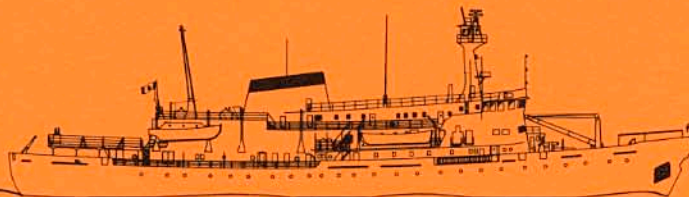
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DATA REPORT  
PHYSICAL PROPERTIES PROGRAM  
HUDSON 87028 - HUDSON BAY

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## PREFACE

This report is the first presentation of the physical properties data from the cores obtained during Hudson Cruise 87028, which surveyed areas of Hudson Bay in August 1987. All of the data collected on board is included.

A short comment on each core is included, noting the most interesting features of the cores and the physical properties data, and including some initial interpretation. However, there is substantial work still to be done in the interpretation of this data. In many cases more data will be needed. This compilation is intended as a starting point and hopefully will assist others currently working on the sedimentological data with their interpretations.

## SHIPBOARD PHYSICAL PROPERTIES PROGRAM

Cores were collected on the CSS Hudson during Cruise 87-028 using the AGC wide-barrel (4-inch diameter) piston corer. In general, the coring program went well, with good quality cores recovered. A list of the cores that were studied in the physical properties program, with the sample number and type of core retrieved at the site, are given in Table 1. Figure 1 shows a sketch of Hudson Bay with the approximate core locations.

TABLE 1. Cores Studied for Physical Properties Program

Number	Type of Core
001	piston and trigger weight
004	piston and trigger weight
015	piston and trigger weight
029	gravity
035	gravity
043	piston and trigger weight
047	piston and trigger weight
048	piston and trigger weight
050	trigger weight
068	piston and trigger weight
069	piston and trigger weight
070	piston and trigger weight
071	trigger weight
074	piston and trigger weight
090	piston and trigger weight



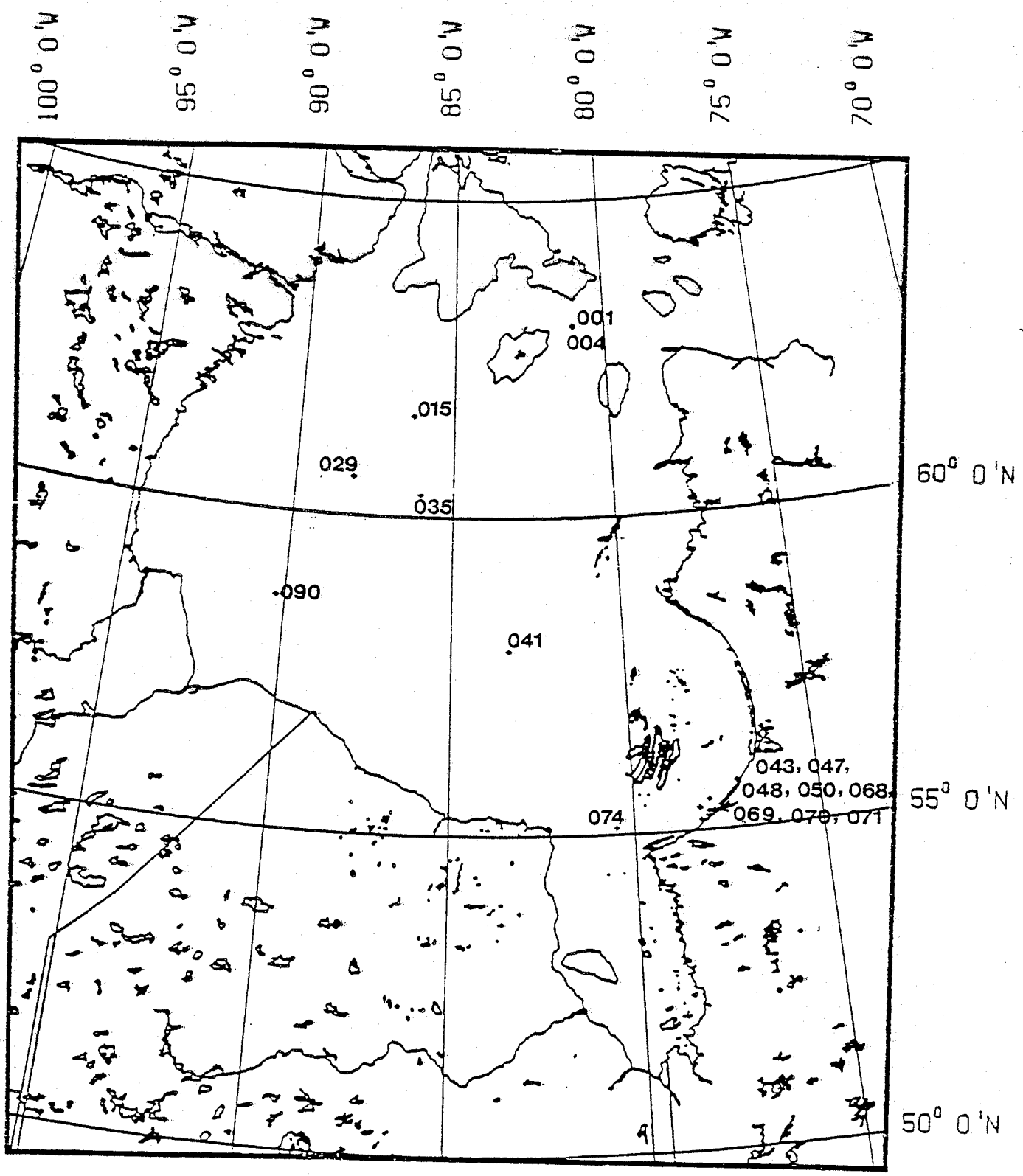


FIGURE 1 - Hudson 87028 Core Locations

The cores were cut into 1.5 m sections in the forward lab, where the ends were capped, taped, and sealed with beeswax. The cores were then carried to the cold storage locker, where they were stored upright until split. All cores collected on 87-028, were split onboard, with a full suite of geotechnical tests performed along with the standard description and photography. Core 090, obtained the final night of the cruise, was stored for three weeks and then split onboard at the beginning of another cruise.

The core liners were cut using the AGC mounted router. Meter tape was placed along both halves of the cores, to assist in identifying downcore depth for subsampling and description. The sediment was then split using piano wire or the electric knife, depending on the type of material encountered.

Once split, the archive half was photographed and described. The working half was immediately covered with plastic film to prevent moisture loss. Physical properties testing was performed on the working half. Dalhousie University's Digital Sound Velocimeter was used to measure vertical and horizontal velocities at intervals of approximately 20 cm. Vane shear measurements were performed in the area between velocimeter sample sites, also at an interval of approximately 20 cm.

Once the undisturbed tests were completed, the working half of the core was subsampled for analysis to be performed at a later date. Bulk density samples (approximately 10 cc) were extracted from the core at the velocimeter sites. Apart from obtaining values of bulk density, sampling at these sites also allows a closer look for any causes of apparent anomalies in the velocimeter data (eg. shells, rocks, sand patches) which may not be apparent on the split surface of the core half.

Subsamples were also taken regularly in all cores (at intervals of approximately 40 cm) for forams and other microfossils.

## SAMPLING AND TESTING METHODS

Samples for water content, bulk density, and salinity were processed at Bedford Institute of Oceanography. In the bulk density analysis, sample volumes were obtained using the AGC's penta-pycnometer. Bulk density is calculated as the ratio of wet mass/wet volume.

Samples were dried in a 110°C oven for 24 hours in the water content determinations. Water content was calculated as a percentage of the dry weight of the sample. A correction for the salt content was applied in calculating the water content values. Noorany's (1984) equation for fluid content was used to make this correction.

Small subsamples were placed in a centrifuge to obtain pore water samples to be used in determination of salinity. Salinity was measured using a refraction meter.

Vane shear tests were performed using the AGC computer-driven motorized miniature vane shear device, a modification of a Wykham-Farrance device. A 1.27-cm vane was rotated at a rate of 60°/minute. After a value of peak undrained strength was obtained, the vane was rotated to remould the sample, and the test was run again to obtain a value of remoulded strength.

Acoustic velocities were measured using Dalhousie University Department of Oceanography's Digital Sound Velocimeter. This device measures the speed of compressional waves by determining the time of transit of a signal between two rigidly fixed piezoelectric transducers embedded in the sediment core. Velocities were measured in both the longitudinal (parallel to the core axis) and transverse (perpendicular to the core axis) directions. All values of velocity are corrected to temperatures corresponding to those measured or assumed for the sediment in situ. The temperatures used are given with the tables of velocity data for each core. They are also corrected for downcore variations in porosity and salinity.

## RESULTS

In general, the results obtained in the physical properties study were excellent. The measured properties show good correlation with lithology. The data is presented in both tabular and plot form. The plots all have a vertical axis scale of one inch equal to one meter of depth, and horizontal scales are kept the same for each property measured, to allow easy comparison between cores.

### 87028-001

Core 001 is located in Evans Strait, in north Hudson Bay, as shown in Figure 1. Water content, bulk density, salinity, and vane strength data for Piston Core 001 are given in Table 2. Figure 1 shows downcore plots of water content, vane strength, and salinity. A similar table and plots are given in Table 3 and Figure 2 for Trigger Weight Core 001. Table 4 gives the velocity data for Piston Core 001. Figure 3 shows a lithology sketch and downcore plots of bulk density and velocity for Piston Core 001. Figure 4 shows a lithology sketch and plot of bulk density for Trigger Weight Core 001.

Examination of the descriptions and the physical properties data for the piston and trigger weight core indicates that the piston core did not sample at least the upper meter of sediment. The water contents in the trigger weight core are all greater than 80%, down to a depth of 1.08 m, while the water content value at 0.22 m in the piston core is the only one greater than 80%. The value at 0.40 m drops shows a sharp drop to 30.9%.

The bulk density data shows similar behavior, with all the trigger weight values less than 1.6 g/cc down to a measured depth of 1.08 m, and the values in the piston core jumping to 2.00 g/cc at 0.40 m.

The sudden change in the physical properties profiles corresponds to the change in lithology at 0.27 m from an olive gray bioturbated mud to a gray mud with thin laminations. The reddish brown silty mud between 3.7 and 4.6 m depth appears to have a higher water content and corresponding lower bulk density and velocities than the overlying and underlying dark gray clay. Grain size tests are expected to verify the differences in the layers, but it is possible that the clay sequences are draining into the more permeable siltier layer, thus altering the usual consolidation behavior. The sharp change in measured physical properties parameters at 5.6 m corresponds to the occurrence of the pebbly diamict that is present to the end of the core.

TABLE 2 - Physical Properties for Piston Core 87028-001

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/ 1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
0.19	****	****	**	2.6	****
0.22	88.3	1.55	33	****	****
0.40	30.9	2.00	33	7.0	0.0
0.58	24.8	2.09	33	11.3	1.0
0.91	39.0	1.92	32	3.4	0.0
1.88	34.8	1.94	32	****	****
2.01	****	****	**	5.0	0.1
2.08	33.3	1.97	32	****	****
2.20	****	****	**	1.7	1.1
2.38	37.3	1.94	32	****	****
2.50	****	****	**	5.2	0.7
2.68	38.4	1.92	32	****	****
2.80	****	****	**	5.9	0.0
2.88	31.2	1.97	32	****	****
3.02	****	****	**	5.0	0.3
3.08	32.6	1.96	32	****	****
3.20	****	****	**	4.3	1.4
3.28	32.2	1.98	32	****	****
3.49	30.4	2.00	32	****	****
3.60	****	****	**	6.0	0.1
3.68	37.9	1.89	32	****	****
3.81	42.6	1.85	32	6.0	0.0
4.00	****	****	**	6.3	0.4
4.48	40.2	1.88	31	****	****
4.60	****	****	**	8.1	2.6
4.69	29.0	2.00	32	****	****
4.96	32.4	1.96	32	****	****
5.05	****	****	**	5.0	0.4
5.11	46.2	1.82	31	****	****
5.22	****	****	**	8.6	0.6
5.29	42.6	1.86	31	****	****
5.48	30.2	1.99	32	****	****
5.67	14.3	2.29	32	****	****
5.97	22.2	2.14	31	****	****
6.09	****	****	**	5.7	****
6.16	****	****	**	6.3	0.6
6.56	17.0	2.24	30	****	****
6.69	****	****	**	8.2	3.3
6.89	28.9	2.02	31	****	****
7.01	16.3	2.25	32	****	****

# Hudson 87028 - PC001

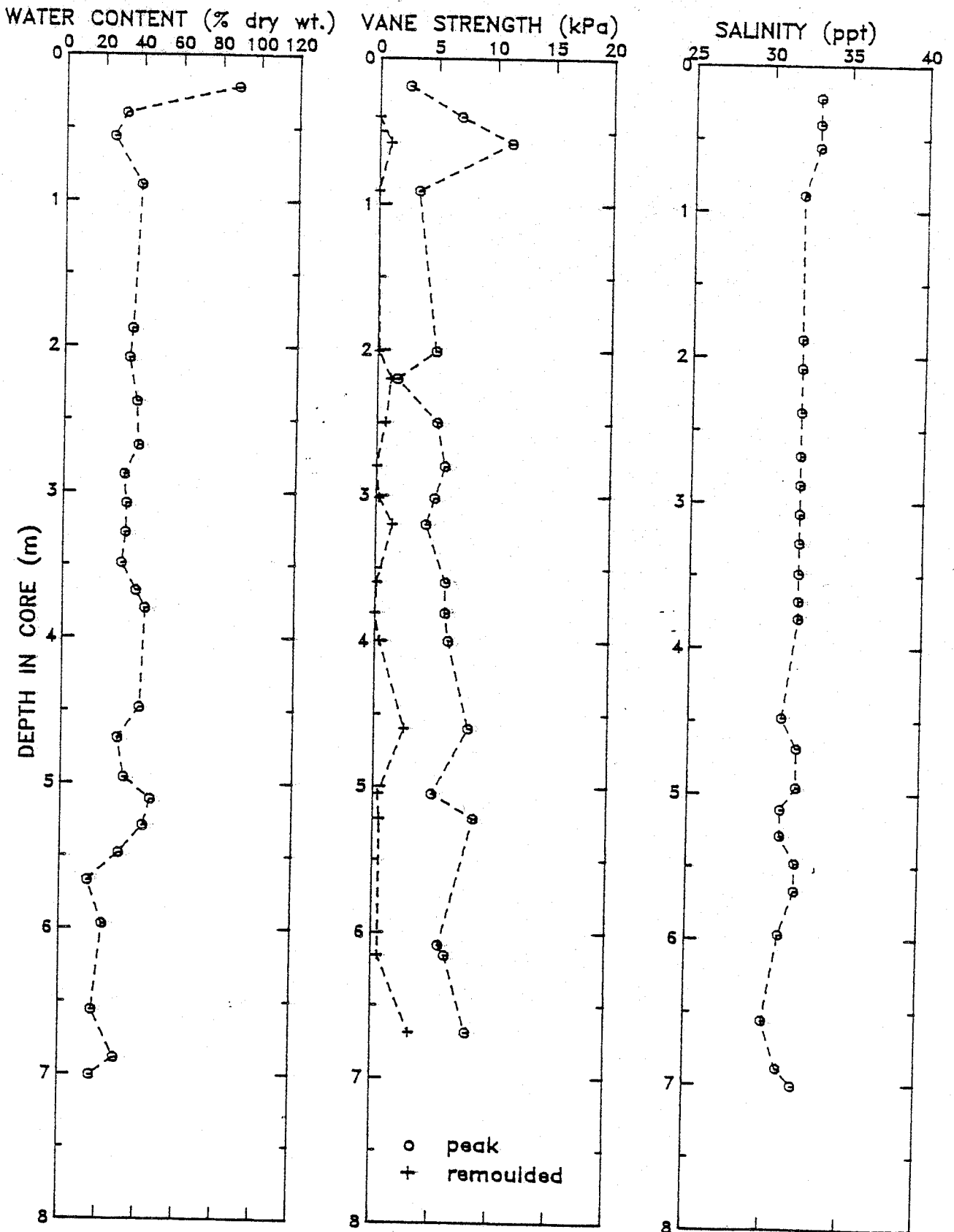


FIGURE 2 - Water Content, Vane Strength, Salinity for PC001

# Hudson 87028 - TWC001

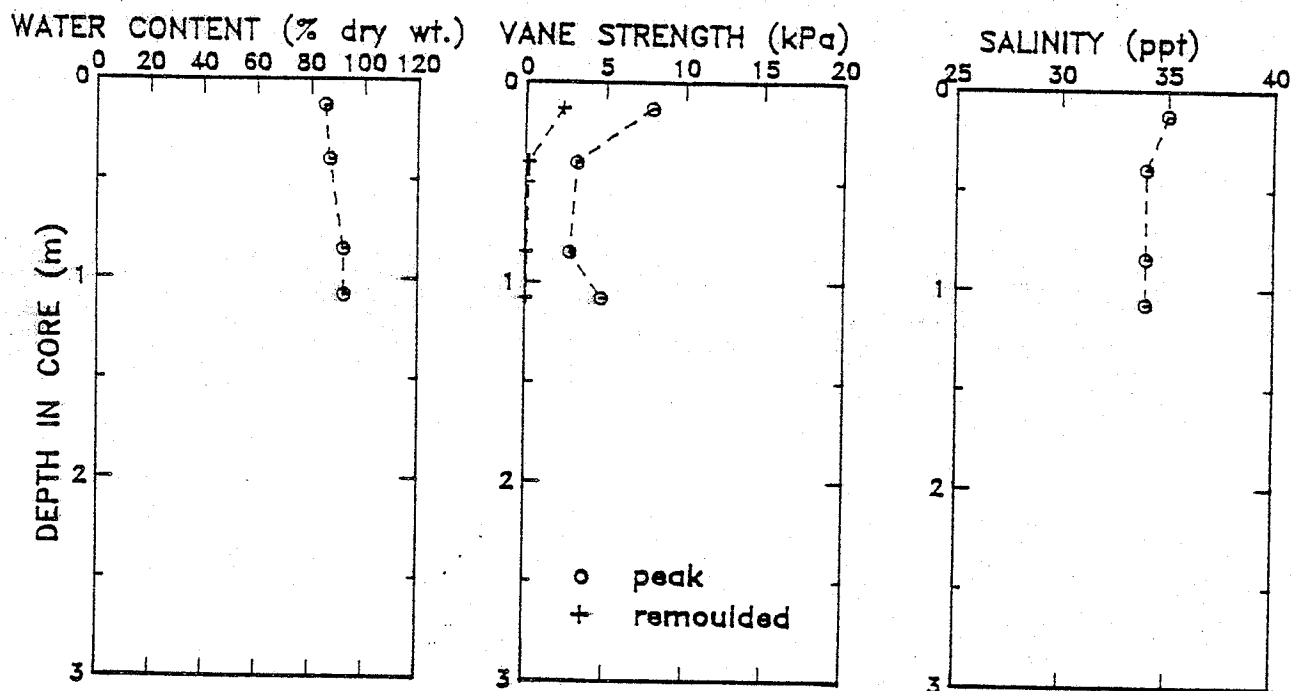


FIGURE 3 - Water Content, Vane Strength, Salinity for TWC001

TABLE 3 - Physical Properties for Trigger Core 87028-001

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
0.13	85.3	1.57	35	7.9	1.1
0.40	87.2	1.56	34	3.2	0.1
0.85	92.3	1.52	34	2.7	0.0
1.08	92.6	1.53	34	4.0	0.0

TABLE 4 - Velocity Data for Piston Core 87028-001

Reference temperature used = 2.4 deg C

Depth (m)	Corrected Velocity (m/s)	
	Longitudinal	Transverse
1.90	1549.	1548.
2.10	1568.	1577.
2.40	1543.	1599.
2.70	1539.	1534.
2.90	1579.	1592.
3.10	1566.	1594.
3.30	1584.	1576.
3.51	1614.	1611.
3.70	1538.	1548.
3.90	1526.	1525.
4.08	1543.	1541.
4.50	1553.	1519.
4.70	1607.	1612.
4.97	1627.	1626.
5.13	1533.	1590.
5.30	1606.	1566.
5.50	1683.	1684.
5.70	1852.	1874.
5.99	1725.	1838.
6.57	1847.	1895.
6.90	1761.	1689.
7.01	1866.	1854.



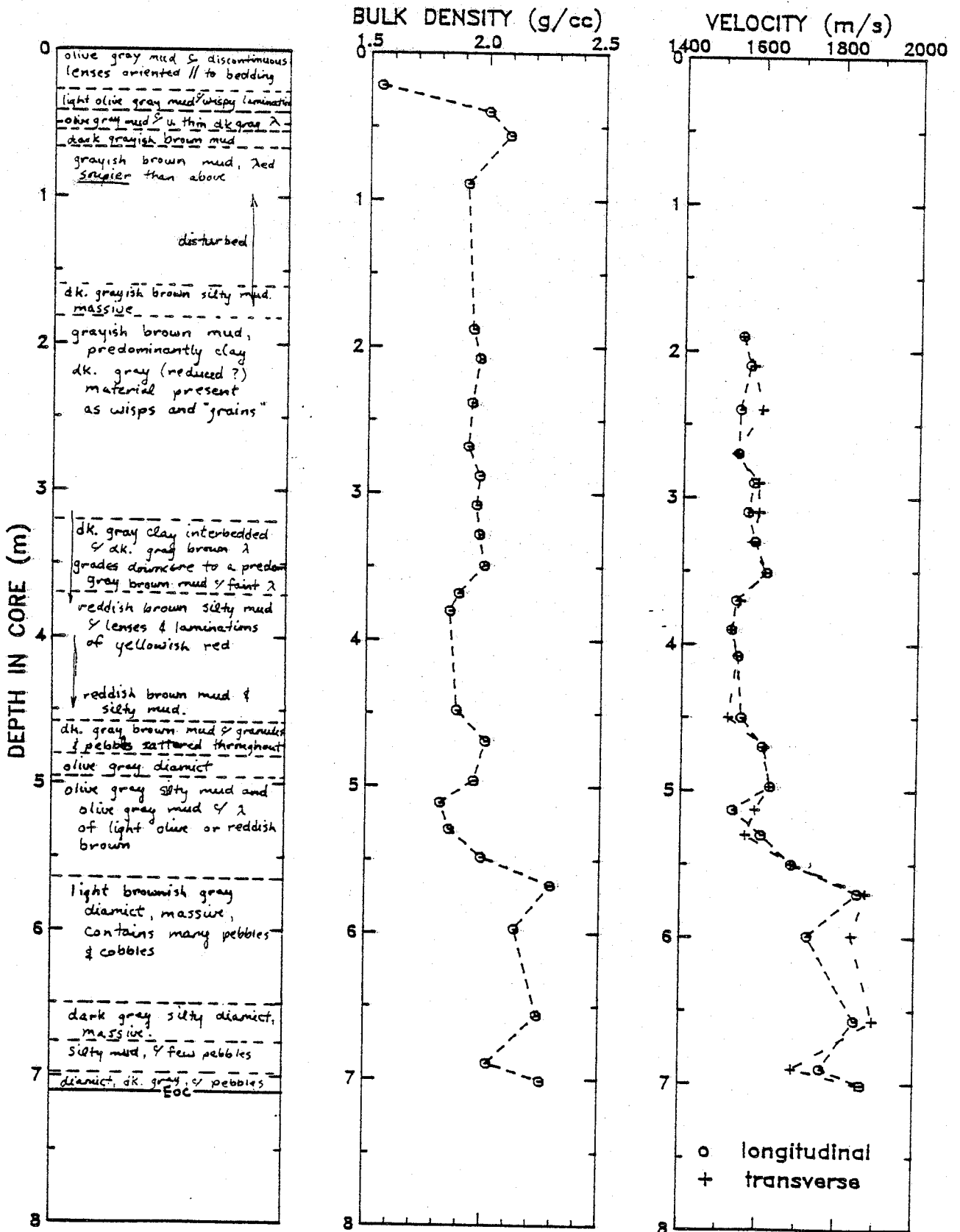


FIGURE 4 - Lithology, Bulk Density, and Velocity for PC001

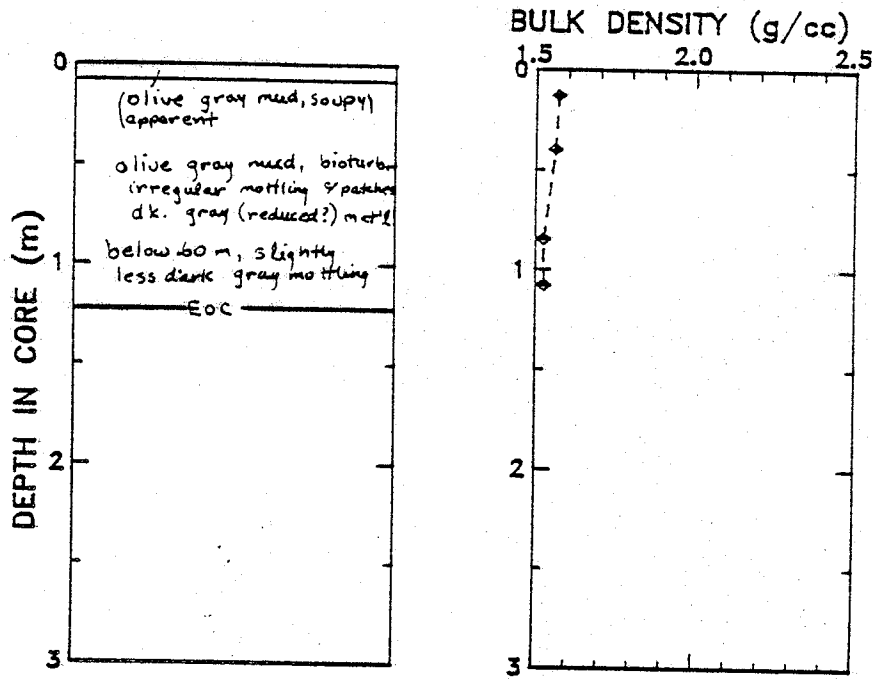


FIGURE 5 - Lithology and Bulk Density for TWC001

87028-004

Core 004 is located very near Core 001, in Evans Strait, in north Hudson Bay, as shown in Figure 1. Physical properties data is presented in Tables 5 and 6 for Piston Core 004 and Trigger Weight Core 004, respectively. The velocity data for Piston Core 004 is presented in Table 7. It is evident from the description (Figures 8 and 9) and the water content data (Figures 6 and 7) and the bulk density data (Figures 8 and 9) that at least one meter of sediment is missing from the top of the piston core. The piston core liner was imploded from approximately 1.30 to 2.50 m, and no physical properties testing was performed in the disturbed sediments in this interval. As at Site 001, the diamict beginning at 3.28 m in Piston Core 004 results in a sharp drop in water content and sharp increases in bulk density and velocity.

The bulk density and velocity profiles from Piston Core 001 (Figure 4) and Piston Core 004 (Figure 8) compare favorably, as do the water content profiles shown in Figures 2 and 6. Unfortunately, the disturbance in Core 004 does not allow comparison of the interval from 1.30 to 2.50 m in Core 004. However, below this interval, the steady increase in bulk density to a value of 2.3 g/cc just below the boundary between overlying laminated clay and silts and underlying massive diamict occurs identically in both cores.

The high value of 2.3 g/cc is occurs at 5.67 m in Core 001 and at 3.29 m in Core 004. The other data verifies that the top of Piston Core 004 corresponds approximately to Piston Core 001 at 2.4 m. The question arises as to whether this is the result of the upper sediment sequences at Core Site 004 not being sampled by the piston corer, or whether the difference represents an actual difference between the sediment sequences at the two core sites. A study of the seismic data may help in clarifying this discrepancy.

The difference in salinity between the two cores are not easily explained. The values obtained for salinity in Piston Core 004 are lower over several intervals than those measured in the same sediments in Core 001. This is particularly evident in the samples taken at 2.60, 2.85, and 3.10 m in Core 004, where the salinities were measured to be 28 parts per thousand, as compared to values of 31 or 32 parts per thousand in what appear to be the corresponding sediments between 5.00 and 5.50 m in Piston Core 001. This indicates some fresh water input in Core 004, but it is difficult to say whether this is a real phenomenon, or whether it is the result of some coring or sampling irregularity.

TABLE 5 - Physical Properties for Piston Core 87028-004

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/ 1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
0.45	40.4	1.88	32	4.0	0.3
0.64	36.2	1.93	32	3.2	0.0
0.89	36.3	1.91	31	4.2	0.9
1.07	30.1	2.00	30	4.0	0.4
1.15	34.6	1.95	32	7.1	0.1
1.29	****	****	**	5.2	0.0
2.60	50.2	1.78	28	****	****
2.74	****	****	**	9.0	0.9
2.85	38.9	1.88	28	****	****
3.00	****	****	**	5.9	0.6
3.10	30.1	2.00	28	****	****
3.29	14.4	2.30	30	****	****
3.41	20.3	2.18	30	****	****
3.50	****	****	**	8.0	0.0
3.59	16.3	2.10	31	****	****
3.76	****	****	**	10.9	0.3
4.02	20.3	2.18	29	****	****
4.23	22.3	2.12	28	****	****
4.40	****	****	**	8.6	0.1
4.50	16.7	2.22	28	****	****
4.62	****	****	**	7.9	0.1
4.72	18.1	2.20	29	****	****
5.13	14.0	2.32	27	****	****

# Hudson 87028 - PC004

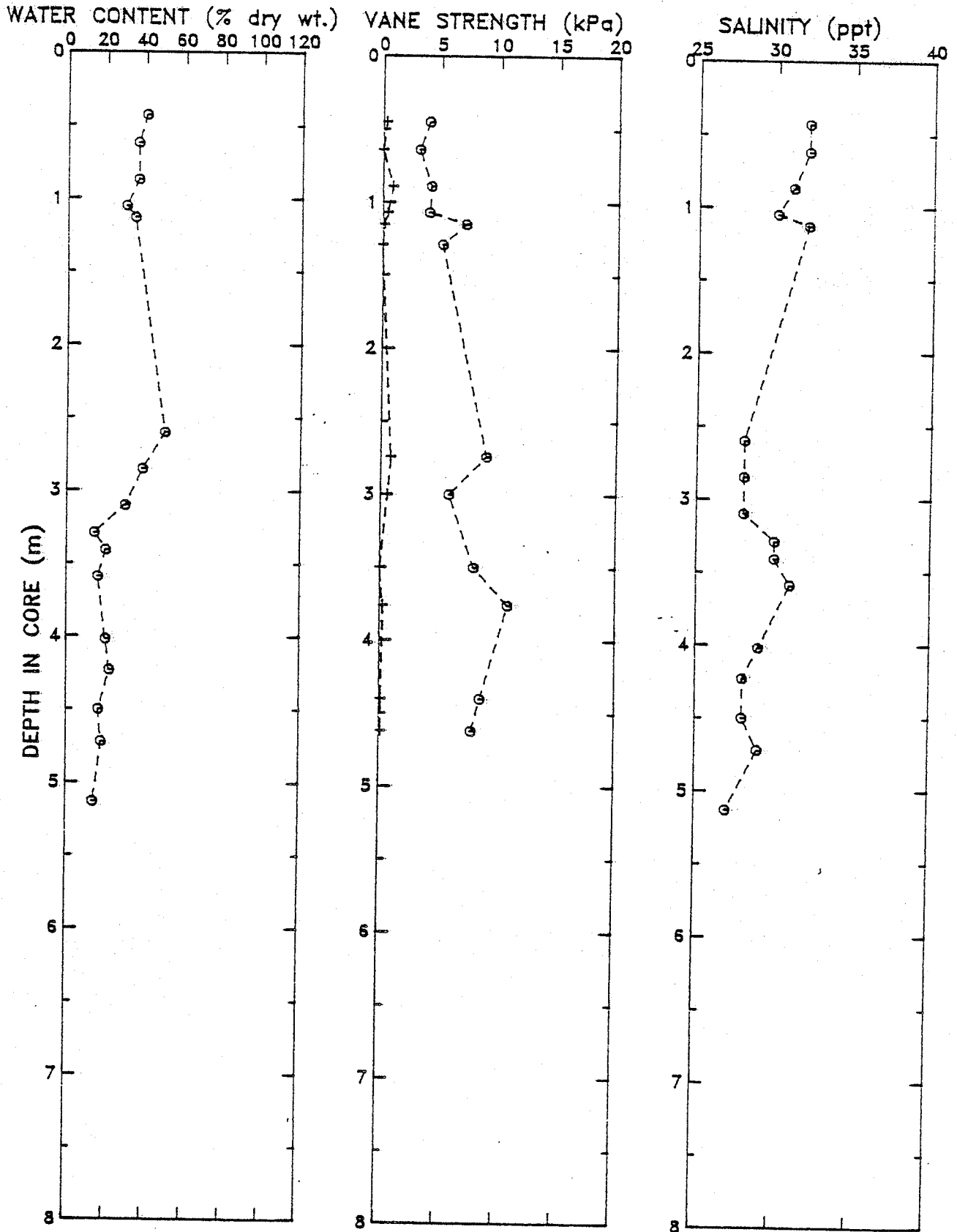


FIGURE 6 - Water Content, Vane Strength, Salinity for PC004

## Hudson 87028 - TWC004

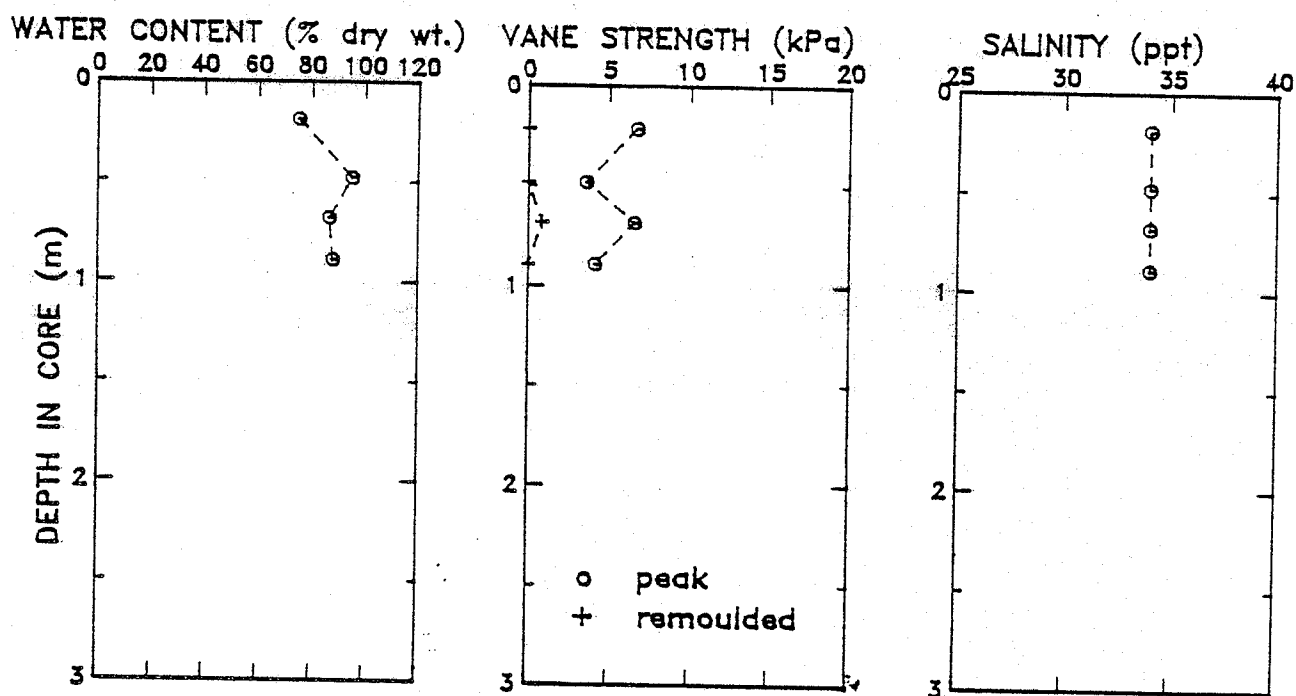


FIGURE 7 - Water Content, Vane Strength, Salinity for TWC004

TABLE 6 - Physical Properties for Trigger Core 87028-004

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/ 1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
0.21	75.2	1.61	34	6.7	0.0
0.48	95.4	1.53	34	3.6	0.0
0.68	86.8	1.54	34	6.6	0.9
0.89	88.3	1.54	34	4.2	0.0

TABLE 7 - Velocity Data for Piston Core 87028-004

Reference temperature used = 2.4 deg C

Depth (m)	Corrected Velocity (m/s)	
	Longitudinal	Transverse
0.25	1619.	1622.
0.79	1537.	1515.
1.23	1512.	1552.
2.62	1532.	1565.
2.87	1607.	1513.
3.11	1677.	1631.
3.42	1785.	1786.
3.60	1757.	1830.
4.03	1748.	1805.
4.25	1675.	1737.
4.50	1837.	1868.
4.75	1764.	1806.

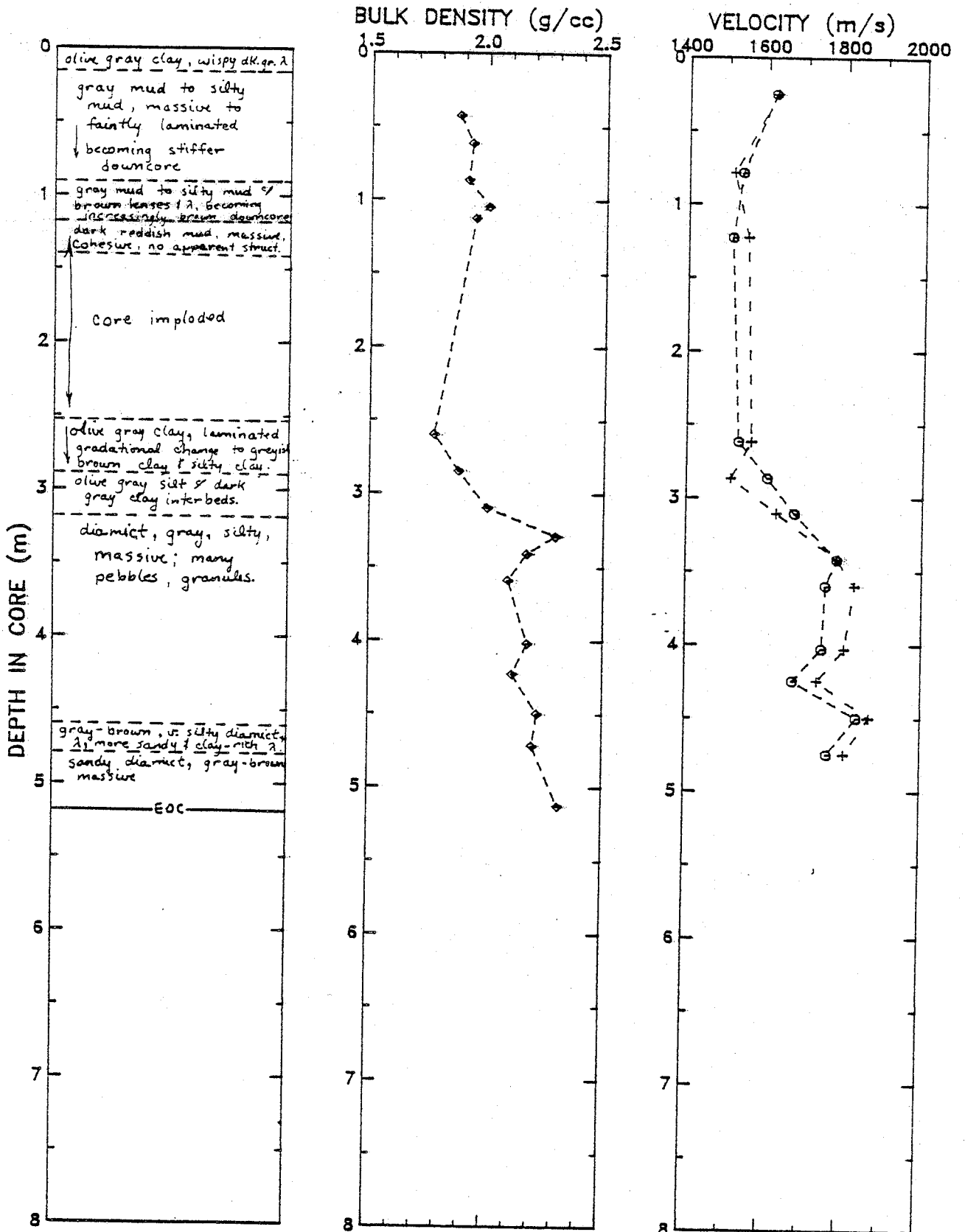


FIGURE 8 - Lithology, Bulk Density, Velocity for PC004



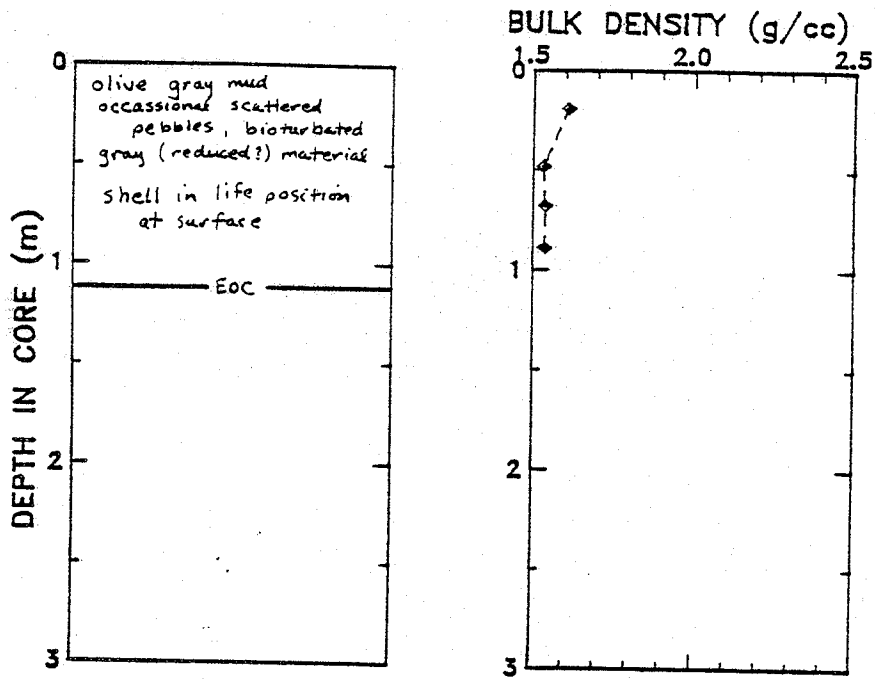


FIGURE 9 - Lithology, Bulk Density for TWC004

87028-015

Core Site 015 is located in north Hudson Bay, as shown in Figure 1. Figures 10 and 11 show water content, vane strength, and salinity profiles for Piston Core 015 and Trigger Weight Core 015, respectively. This data is also presented in Tables 8 and 9,, respectively. Figure 12 and 13 show a lithology sketch and bulk density and velocity profiles for Piston Core 015 and Trigger Weight Core 015, respectively, with the velocity data also presented in Table 10 and Table 11.

As with Cores 001 and 004, it is obvious that Piston Core 015 did not collect some of the upper sediment. Projections of the water content and bulk density profiles (assuming a straight-line trend) for the trigger weight core indicate that 1.5 m or more are missing from the top of the piston core.

The physical properties in Piston Core 015 are comparable in magnitude with those observed in the coarse diamict of Cores 001 and 004. The velocities in Piston Core 015 are even slightly higher, ranging from 1905 to 2030 m/s. The high bulk densities and velocities and low water contents in the relatively fine grained sediments in the piston core imply some consolidation (loading) of these sediments.

# Hudson 87028 - PC015

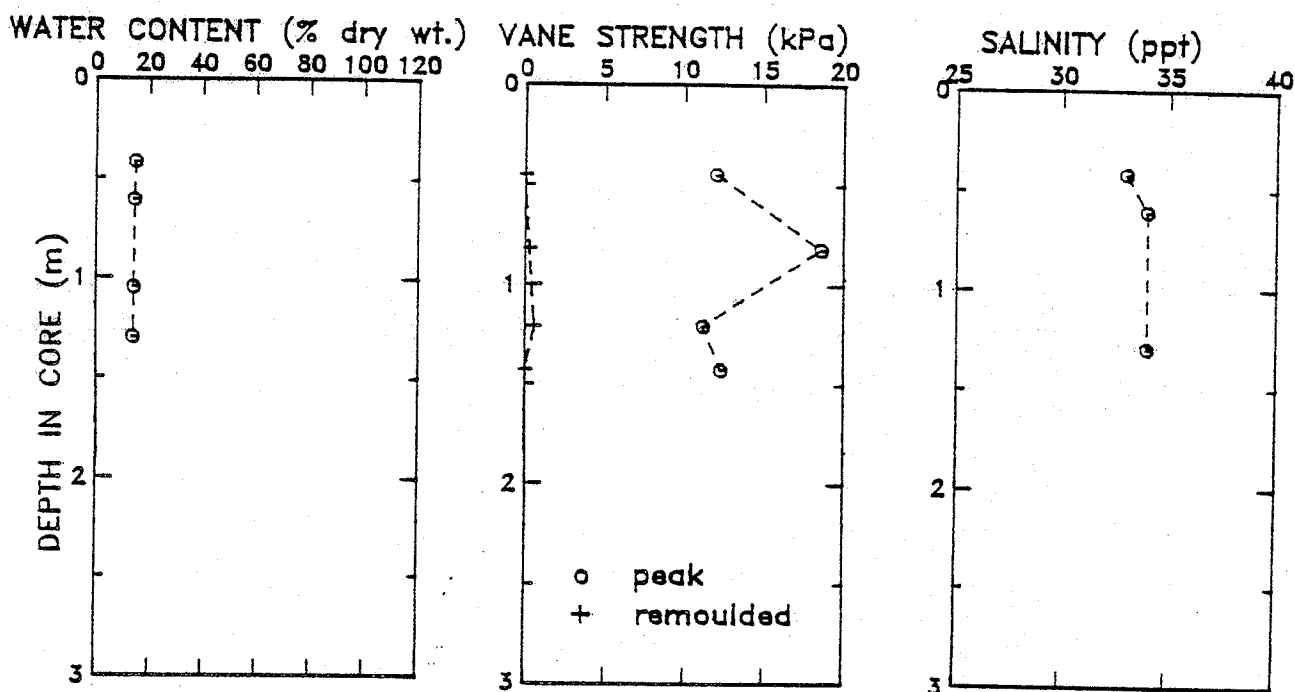


FIGURE 10 - Water Content, Vane Strength, Salinity for PC015

TABLE 8 - Physical Properties for Piston Core 87028-015

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
0.42	14.7	2.28	33	****	****
0.45	****	****	**	12.0	0.0
0.61	14.4	2.30	34	****	****
0.82	****	****	**	18.6	0.3
1.05	14.1	2.31	**	****	****
1.21	****	****	**	11.2	0.6
1.30	13.9	2.29	34	****	****
1.43	****	****	**	12.3	0.0

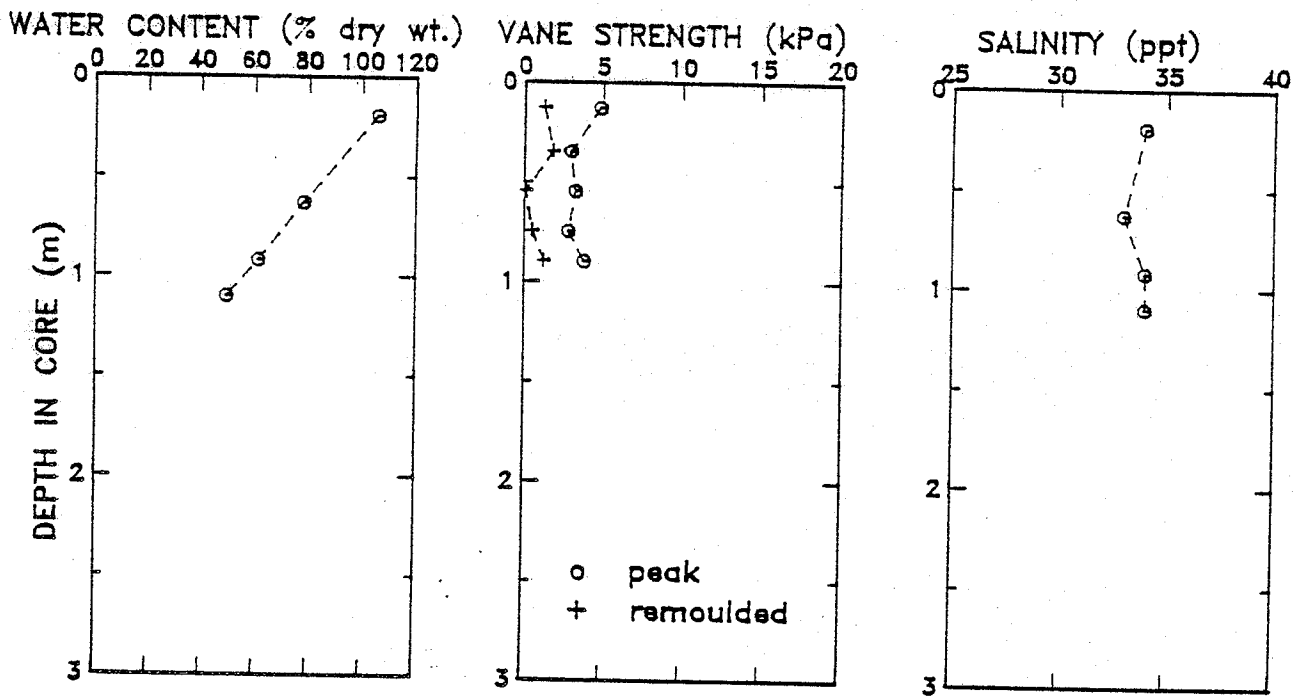


FIGURE 11 - Water Content, Vane Strength, Salinity for TWC015.

TABLE 9 - Physical Properties for Trigger Core 87028-015

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
0.19	106.0	1.48	34	3.4	0.1
0.63	78.3	1.58	33	2.6	1.3
0.92	61.4	1.69	34	2.4	0.6
1.10	49.6	1.80	34	4.2	0.0
1.24	30.1	2.02	34	****	****

# Hudson 87028 - PC015

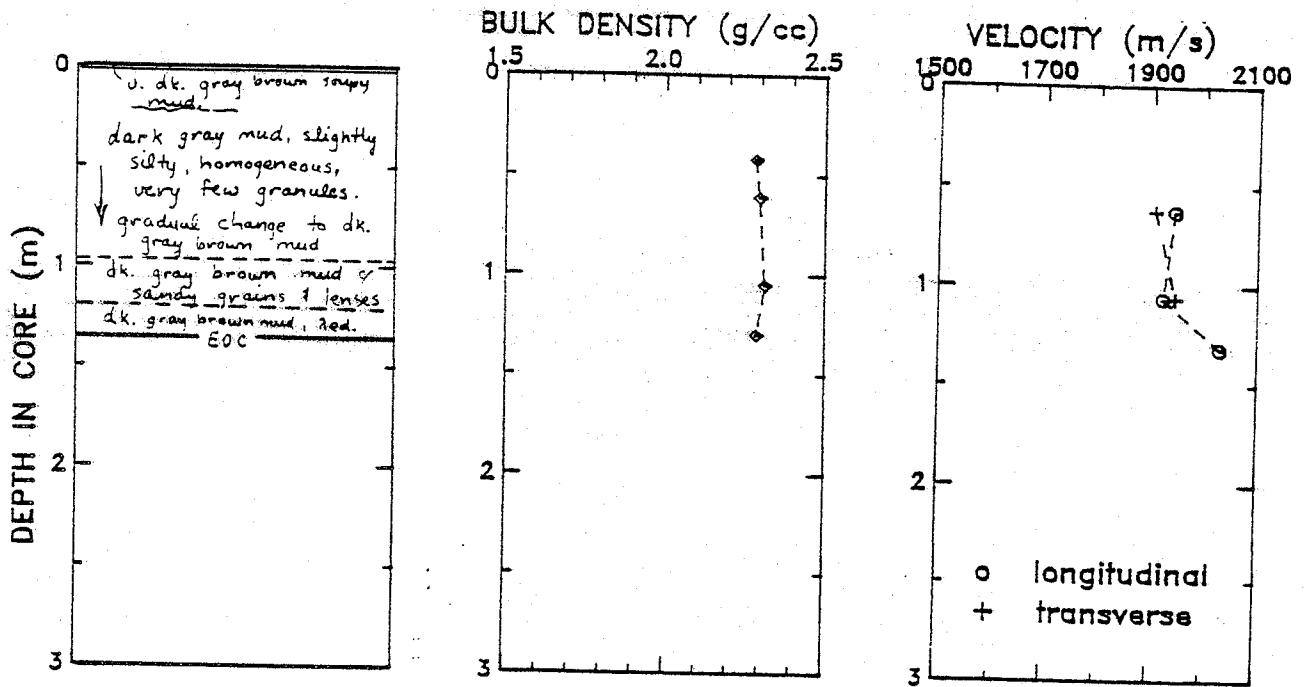


FIGURE 12 - Lithology, Bulk Density, Velocity for PC015

TABLE 10 - Velocity Data for Piston Core 87028-015

Reference temperature use = 2.8 deg C

Depth (m)	Corrected Velocity (m/s)	
	Longitudinal	Transverse
0.63	1943.	1905.
1.07	1921.	1945.
1.32	2030.	*****

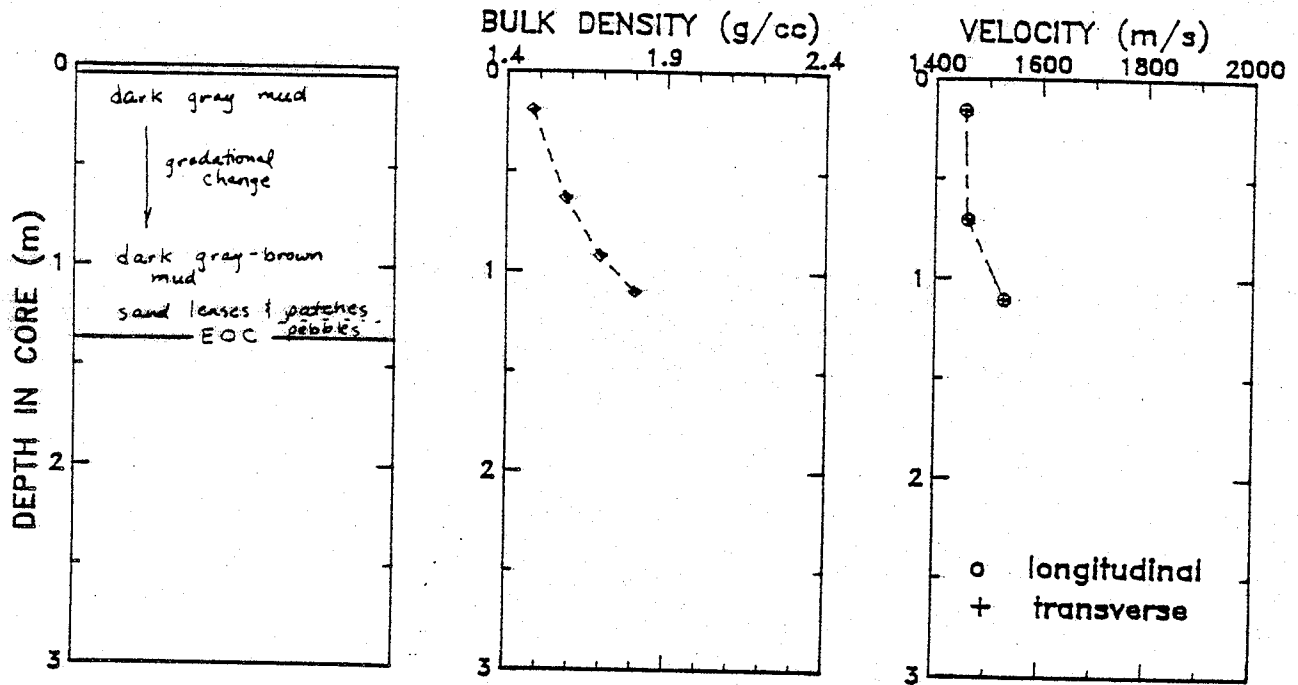


FIGURE 13 - Lithology, Bulk Density, Velocity for TWC015

TABLE 11 - Velocity Data for Trigger Core 87028-015

Reference temperature used = 2.8 deg C

Depth (m)	Corrected Velocity (m/s)	
	Longitudinal	Transverse
0.16	1455.	1461.
0.71	1461.	1459.
1.11	1531.	1502.

87028-029

Core Site 029 is located slightly southwest of Core Site 015, as shown in Figure 1. The physical properties data for Gravity Core 029 are presented in Table 12 and 13 and Figures 14 and 15. The water contents are the highest observed in this study. The bulk density profile increases quickly below 0.55 m, corresponding to a decrease in water content at the same depth. There is a gradual change to brown clay at approximately 0.90 m. Near the bottom of the core (0.98 m) there is a gray brown sandy mud with some granules and pebbles. Again, a difference in loading and consolidation conditions likely causes the differences observed in physical properties in the stiffer sediments below 0.55 m.

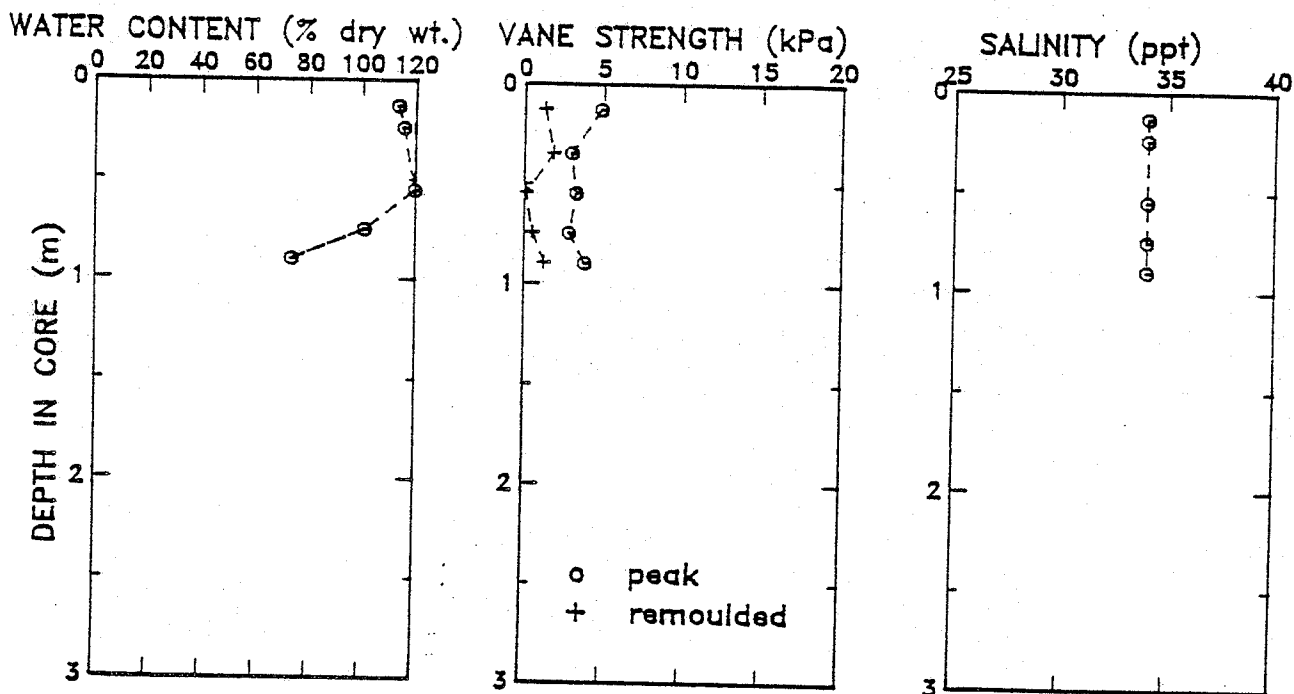


FIGURE 14 - Water Content, Vane Strength, Salinity for GC029

TABLE 12 - Physical Properties for Gravity Core 87028-029

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
0.13	113.4	1.48	34	4.9	1.3
0.24	115.6	1.47	34	****	****
0.35	*****	****	**	3.0	1.9
0.55	120.4	1.46	34	3.3	0.1
0.75	101.0	1.52	34	2.8	0.6
0.90	73.5	1.64	34	3.9	1.3



# Hudson 87028 - GC029

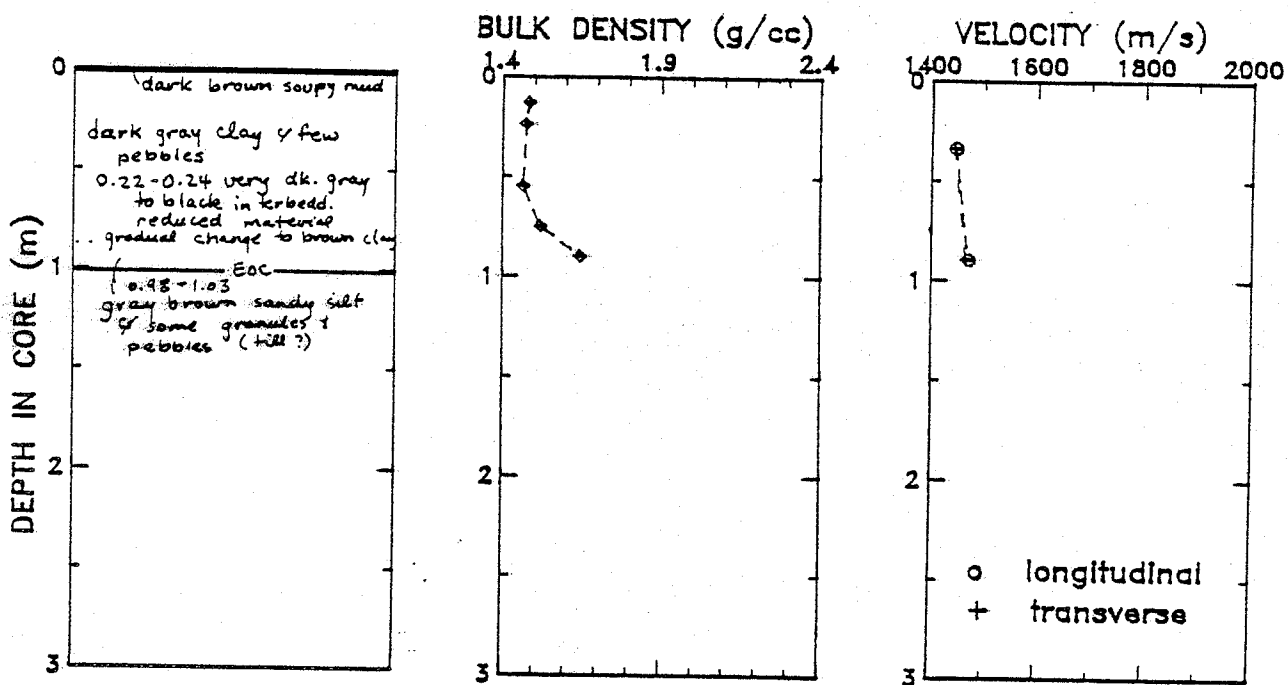


FIGURE 15 - Lithology, Bulk Density, Velocity for GC029

TABLE 13 - Velocity Data for Gravity Core 87028-029

Reference temperature used = 2.8 deg C

Depth (m)	Corrected Velocity (m/s)	
	Longitudinal	Transverse
0.34	1447.	1445.
0.90	1471.	1466.

87028-035

Gravity Core 035 is located south of Core Site 015, as shown in Figure 1. Profiles of the physical properties data for Gravity Core 035 are shown in Figures 16 and 17, with the data also presented in Tables 14 and 15.

The bulk density values near the surface appear to be high in comparison to those in the surface sediments in other cores, in which bulk densities greater than 1.8 g/cc were generally not reached until approximately one meter depth. The water content data shows the same trend, being lower than values usually obtained near the surface. This may indicate that the corer did not sample some of the upper sediments, or, that in this area, the soft unconsolidated sediment cover is not as thick.

In general, the trends in physical properties in Gravity Core 035 can be seen to reflect the lithology. For example, the thin sandy layer between 0.13 and 0.22 m results in a higher bulk density and velocity at 0.19 m. The spike in the velocity profile at 0.68 m was caused by the presence of a limestone pebble in the path of the transducer.

## Hudson 87028 - GC035

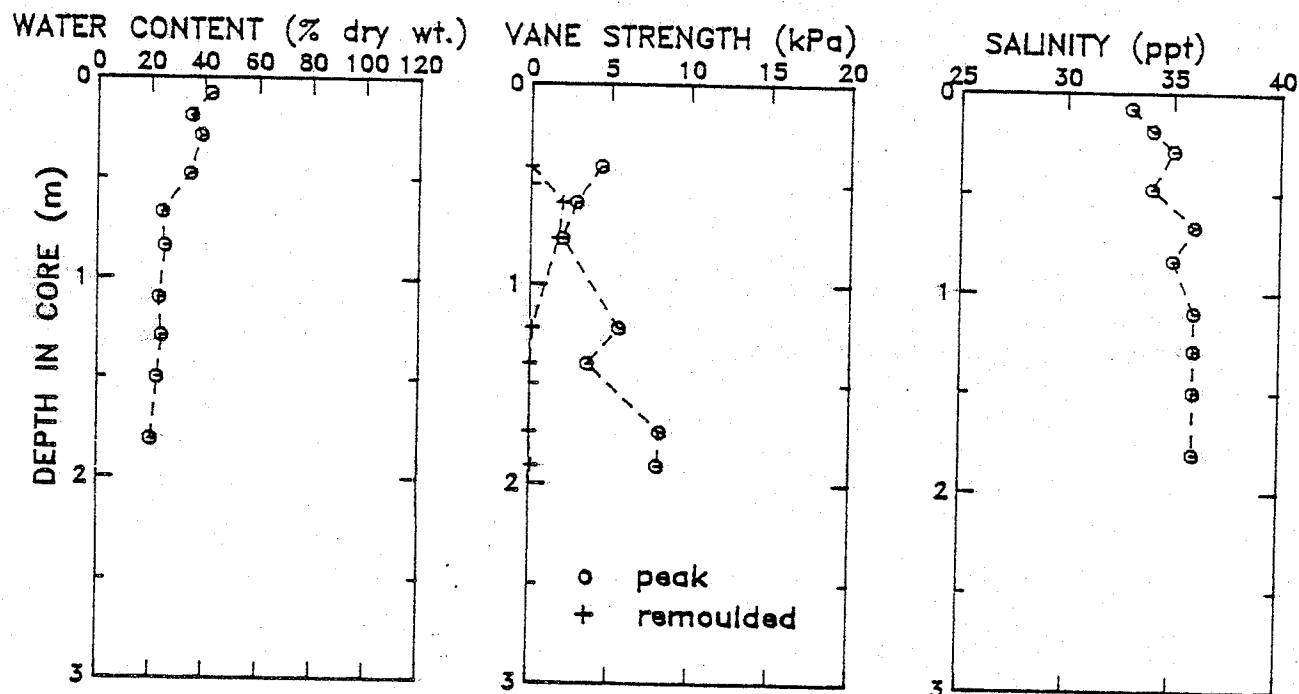


FIGURE 16 - Water Content, Vane Strength, Salinity for GC035

TABLE 14 - Physical Properties for Gravity Core 87028-035

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
0.08	42.3	1.86	33	****	****
0.19	35.0	1.96	34	****	****
0.29	38.7	1.92	35	****	****
0.41	****	****	**	4.4	0.0
0.48	34.6	1.96	34	****	****
0.59	****	****	**	2.9	2.0
0.67	24.2	2.10	36	****	****
0.77	****	****	**	2.0	1.7
0.84	25.2	2.09	35	****	****
1.10	23.0	2.13	36	****	****
1.22	****	****	**	5.6	0.1
1.29	24.0	2.11	36	****	****
1.40	****	****	**	3.6	0.0
1.50	22.2	2.12	36	****	****
1.74	****	****	**	8.2	0.0
1.81	20.0	2.18	36	****	****
1.91	****	****	**	8.0	0.1

# Hudson 87028 - GC035

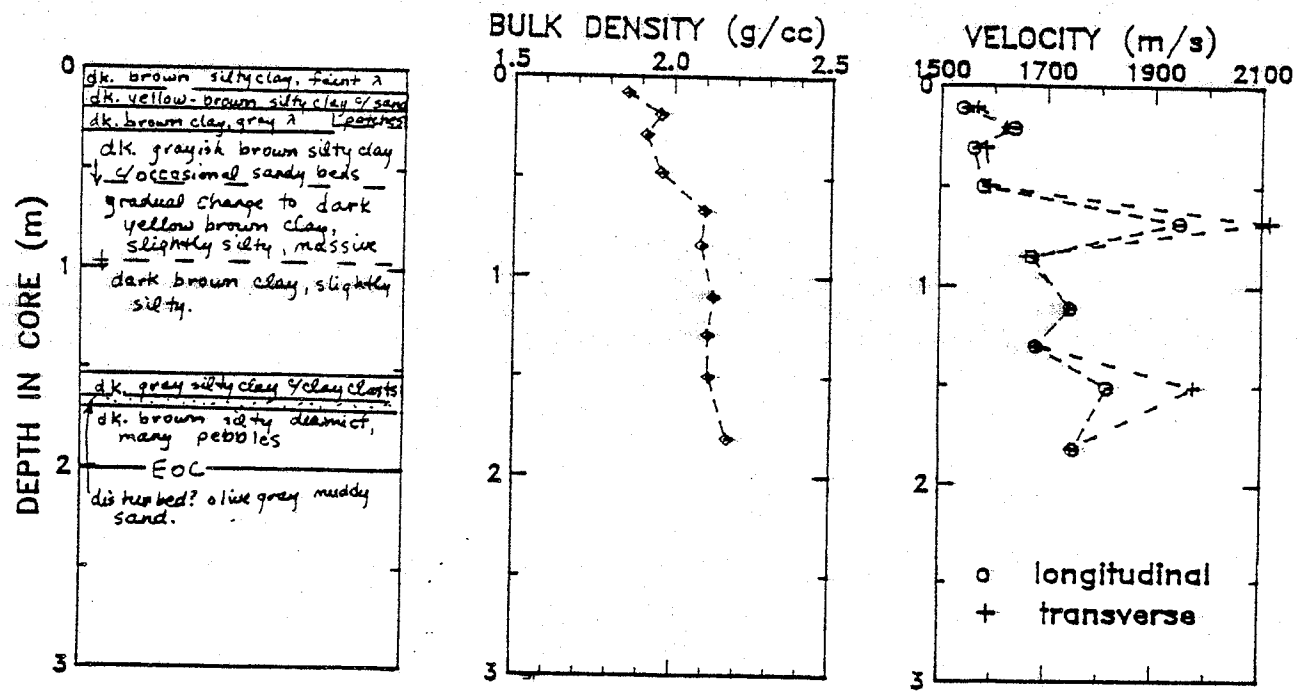


FIGURE 17 - Lithology, Bulk Density, Velocity for GC035

TABLE 15 - Velocity Data for Gravity Core 87028-035

Reference temperature used = 2.8 deg C

Depth (m)	Corrected Velocity (m/s)	
	Longitudinal	Transverse
0.11	1541.	1569.
0.21	1639.	1623.
0.31	1562.	1586.
0.50	1581.	1593.
0.68	1947.	2108.
0.85	1674.	1661.
1.11	1745.	1744.
1.30	1681.	1681.
1.51	1814.	1975.
1.82	1752.	1748.

87028-043

Core Site 043 is located at the mouth of Great Whale River, as shown in Figure 1. Tables 16 and 17 present the physical properties data for Piston Core 043 and Trigger Weight Core 043, respectively, with profiles of water content, vane strength, and salinity data for each core shown in Figures 18 and 19. The velocity data for Piston Core 043 is given in Table 18, and shown in Figure 20, along with bulk density and lithology. Figure 21 shows a lithology sketch and bulk density profile for Trigger Weight Core 043.

The core consists of uniform, bioturbated olive gray, slightly silty clay down to approximately 2 m, and this is reflected in the physical properties profiles over this interval. One point of interest is the slightly higher bulk density and lower water content measured near the surface in Piston Core 043. The expected trend in a normally consolidating sequence is of increasing bulk density and decreasing water content with increasing depth, and indeed, this is the trend observed between approximately 1 m and 3.3 m. However, the trend observed in the sediments above 1 m in the piston core may indicate that the soft upper sediments have been compacted in the coring process, thus altering their expected profiles.

The vane strength measurement in a heavily bioturbated zone at 1.43 m resulted in a much higher peak strength than in surrounding sediments. Some variation in the profiles between 2 and 3 m is likely caused by the slightly different grain sizes and constituents of the alternating layers in this interval. There is an apparent shift in the profiles that occurs at approximately 3.75 m and continues to the bottom of the core, likely reflecting a more consolidated sequence.

TABLE 16 - Physical Properties for Piston Core 87028-043

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/ 1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
0.18	81.0	1.60	33	****	****
0.27	****	****	**	6.7	0.0
0.32	89.5	1.56	33	****	****
0.38	****	****	**	6.0	0.0
0.45	91.5	1.54	33	****	****
0.55	****	****	**	6.0	0.0
0.63	94.1	1.54	33	****	****
0.79	****	****	**	3.7	0.1
0.86	102.5	1.51	34	****	****
0.96	****	****	**	4.9	1.0
1.03	96.5	1.53	34	****	****
1.13	****	****	**	6.3	1.3
1.25	104.4	1.50	34	****	****
1.28	****	****	**	5.3	2.6
1.34	97.7	1.53	33	****	****
1.43	****	****	**	10.9	3.7
1.49	95.2	1.54	34	****	****
1.57	****	****	**	6.7	0.0
1.63	95.6	1.53	33	****	****
1.77	****	****	**	7.9	0.3
1.88	84.1	1.58	33	****	****
1.98	****	****	**	9.0	0.6
2.02	63.7	1.70	34	****	****
2.25	89.2	1.57	33	****	****
2.33	****	****	**	6.9	0.0
2.39	99.6	1.53	32	****	****
2.54	81.6	1.58	32	****	****
2.66	****	****	**	8.7	0.0
2.70	57.2	1.73	32	****	****
2.76	****	****	**	10.4	0.1
2.85	73.9	1.63	32	****	****
3.00	74.5	1.63	32	****	****
3.30	64.3	1.68	33	****	****
3.50	51.4	1.78	33	****	****
3.82	29.2	2.02	33	****	****
3.95	****	****	**	5.2	0.4
4.07	27.4	2.04	33	****	****
4.21	****	****	**	4.4	1.9
4.29	25.5	2.07	33	****	****
4.52	30.9	2.01	34	6.0	0.4
4.78	30.4	2.02	34	****	****

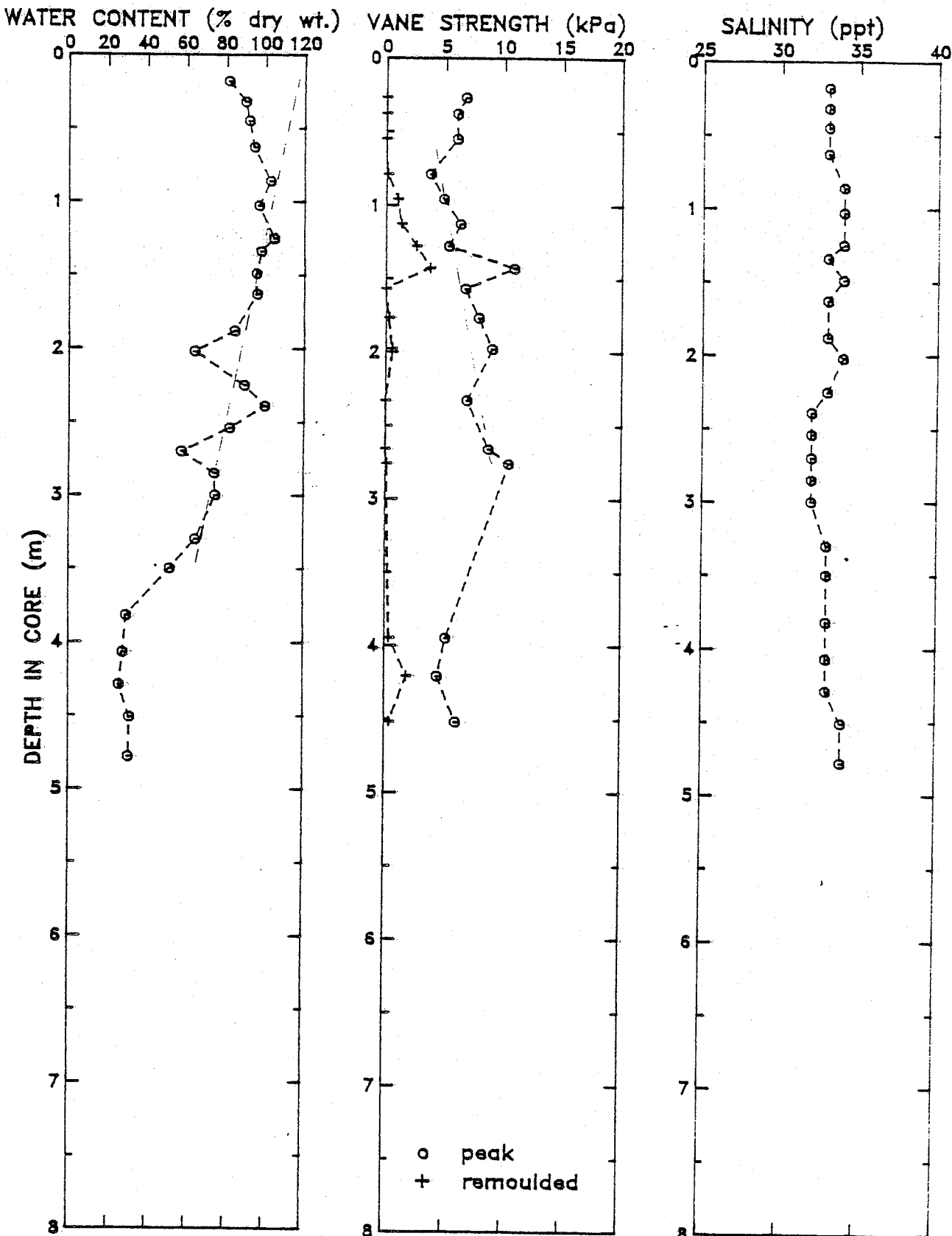


FIGURE 18 - Water Content, Vane Strength, Salinity for PC043

Hudson 87028 - TWC043

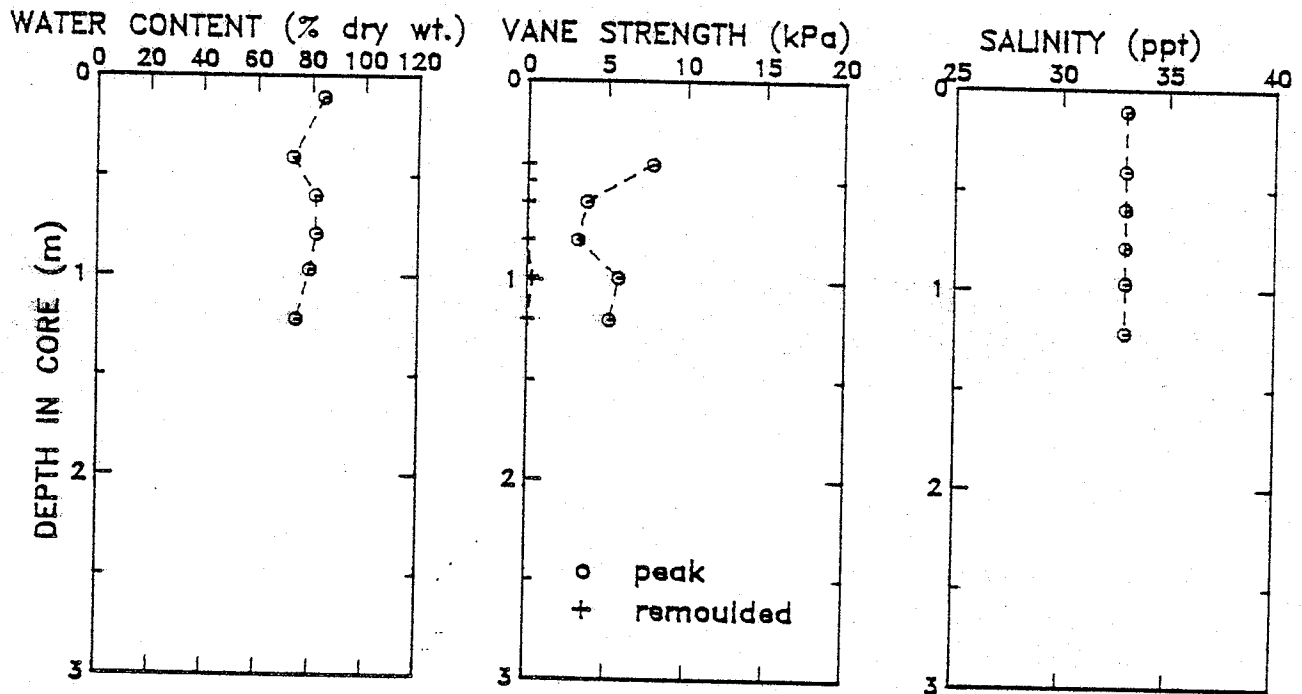


FIGURE 19 - Water Content, Vane Strength, Salinity for TWC043

TABLE 17 - Physical Properties for Trigger Core 87028-043

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
0.11	84.6	1.58	33	****	****
0.42	73.2	1.65	33	7.9	0.0
0.61	81.7	1.58	33	3.7	0.0
0.80	82.0	1.60	33	3.2	0.0
0.99	79.5	1.61	33	5.7	0.3
1.20	****	****	**	5.2	0.0
1.22	74.6	1.64	33	****	****



TABLE 18 - Velocity Data for Piston Core 87028-043

Reference temperature used = 3.9 deg C

Depth (m)	Corrected Velocity (m/s)	
	Longitudinal	Transverse
0.20	1458.	1463.
0.46	1453.	1454.
0.86	1446.	1449.
1.05	1447.	1451.
1.21	1446.	1448.
1.35	1452.	1451.
1.50	1448.	1451.
1.64	1451.	1453.
1.90	1452.	1456.
2.07	1497.	1551.
2.25	1450.	1450.
2.41	1438.	1438.
2.55	1452.	1455.
2.85	1478.	1470.
3.00	1481.	1485.
3.16	1476.	1478.
3.31	1476.	1506.
3.53	1502.	1521.
3.82	1628.	1637.
4.08	1579.	1708.
4.30	1618.	1678.
4.79	1617.	1632.

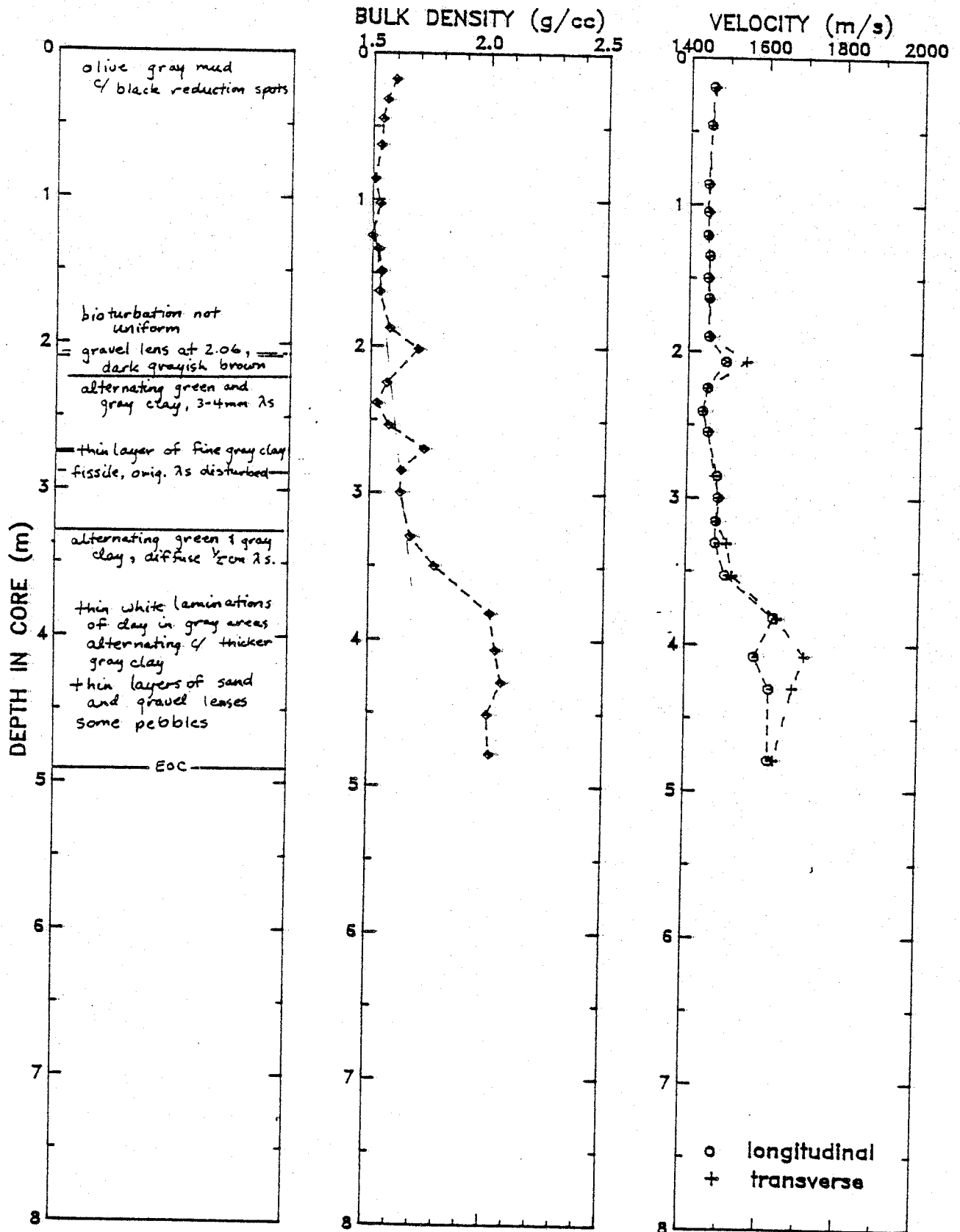


FIGURE 20 - Lithology, Bulk Density, Velocity for PC043

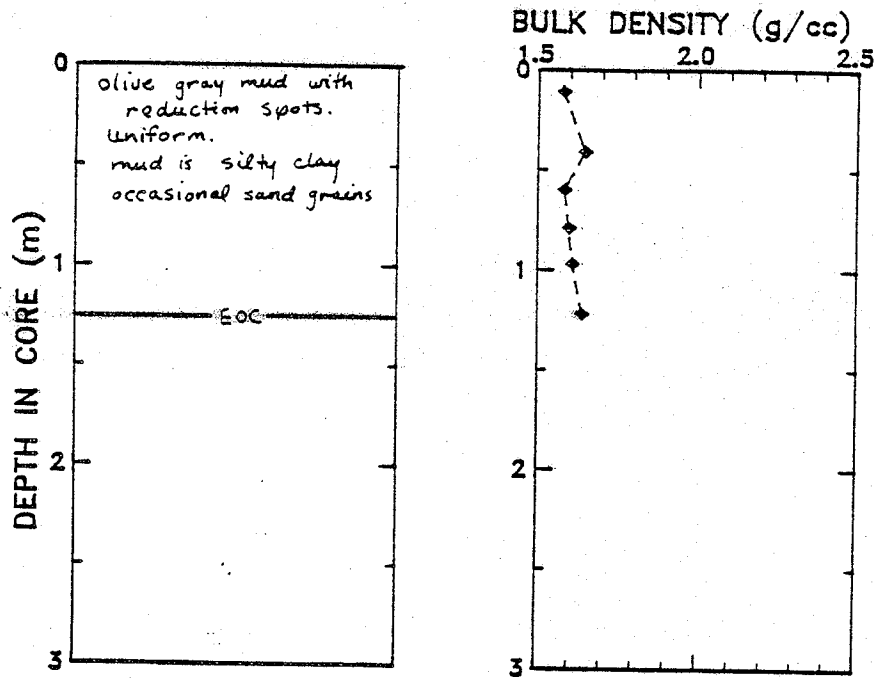


FIGURE 21 - Lithology, Bulk Density for TWC043

87028-047

Core Site 047 is also located at the mouth of Great Whale River. Figures 22 and 24 and Tables 19 and 21 present the physical properties data for Piston Core 047. Figures 23 and 25 and Table 20 present the data for Trigger Weight Core 047.

The most interesting feature of Piston Core 047 is the presence of a zone, from 2.50 to 2.62 m, of completely deformed clay, broken up into clasts and giving a "cottage cheese" appearance. The clasts are subangular and range in size from a few millimeters to 1 cm. The original laminations, as seen in overlying and underlying undeformed sequences, can be seen in this zone despite the disturbance. This type of "cottage cheese" texture has been seen in clay-rich sediments that have frozen. Unfortunately, not much data was obtained in this core, and no conclusions can be drawn on the basis of the physical properties data.

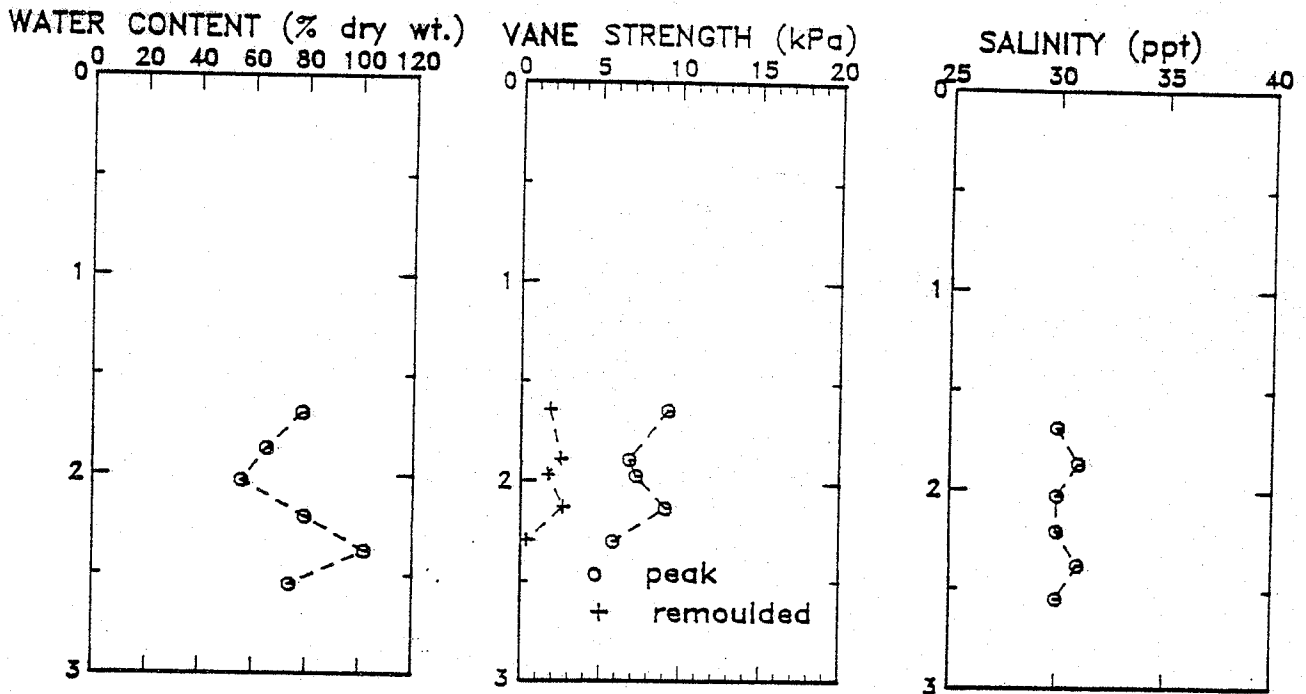


FIGURE 22 - Water Content, Vane Strength, Salinity for PC047

TABLE 19 - Physical Properties for Piston Core 87028-047

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
1.69	78.6	1.58	30	****	****
1.89	65.2	1.66	31	6.9	2.6
1.97	****	****	**	7.3	1.7
2.03	55.7	1.73	30	****	****
2.13	****	****	**	9.2	2.7
2.21	79.6	1.59	30	****	****
2.30	****	****	**	5.9	0.4
2.38	101.9	1.50	31	****	****
2.55	73.9	1.61	30	****	****

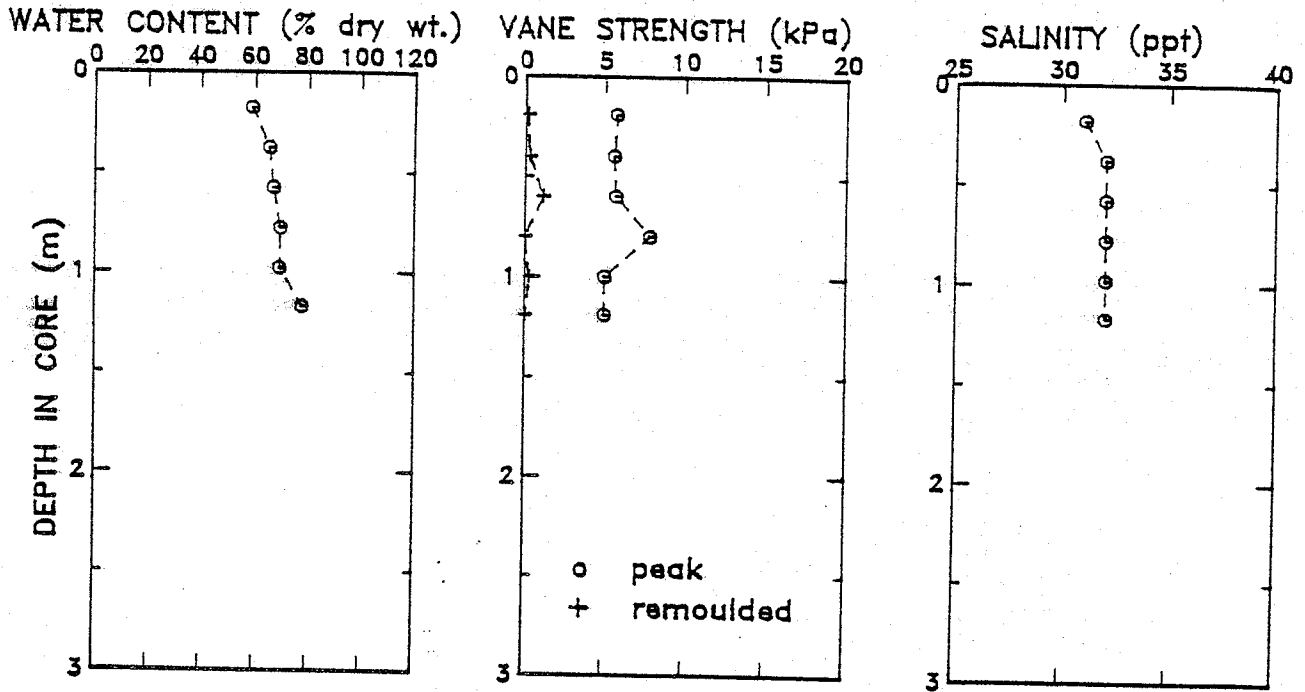


FIGURE 23 - Water Content, Vane Strength, Salinity for TWC047

TABLE 20 - Physical Properties for Trigger Core 87028-047

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
0.19	59.0	1.71	31	5.7	0.1
0.40	65.6	1.67	32	5.6	0.3
0.60	67.2	1.67	32	5.7	1.1
0.80	69.7	1.65	32	7.8	0.0
1.00	69.5	1.63	32	5.0	0.3
1.19	77.8	1.60	32	5.0	0.0

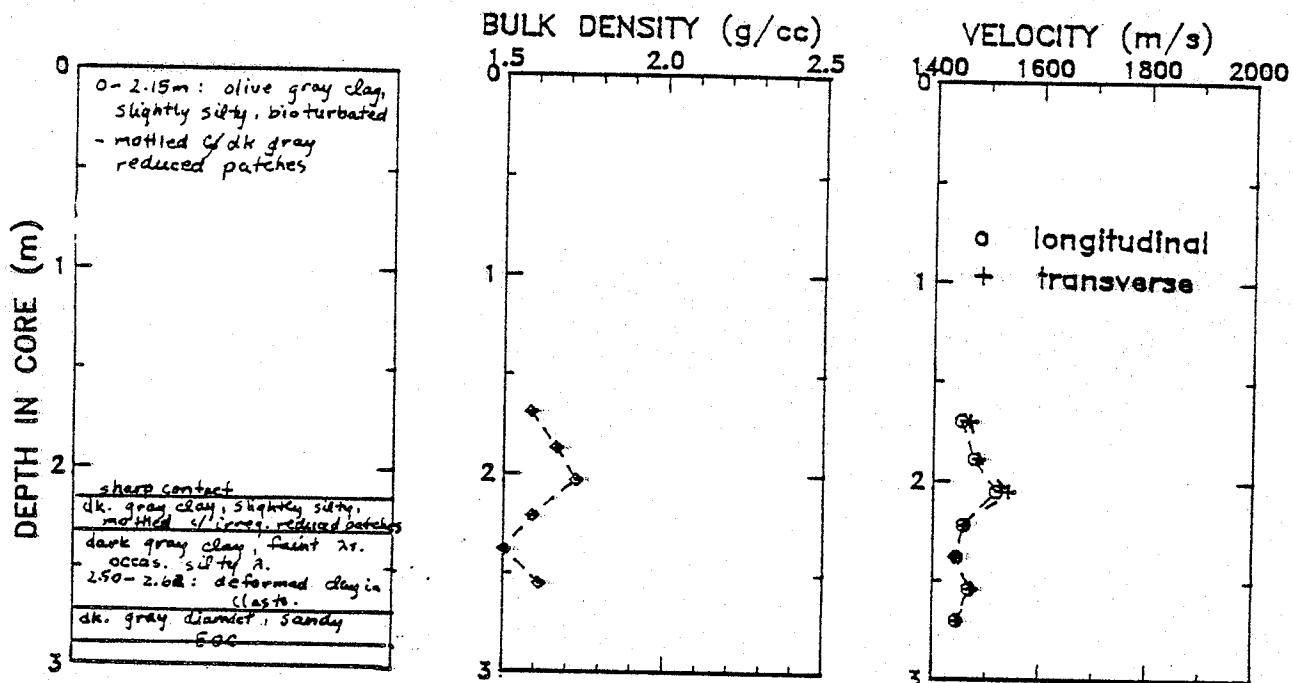


FIGURE 24 - Lithology, Bulk Density, Velocity for PC047

TABLE 21 - Velocity Data for Piston Core 87028-047

Reference temperature used = 3.9 deg C

Depth (m)	Corrected Velocity (m/s)	
	Longitudinal	Transverse
1.70	1452.	1469.
1.89	1477.	1485.
2.05	1518.	1542.
2.22	1456.	1458.
2.38	1443.	1439.
2.54	1468.	1473.
2.70	1444.	1446.

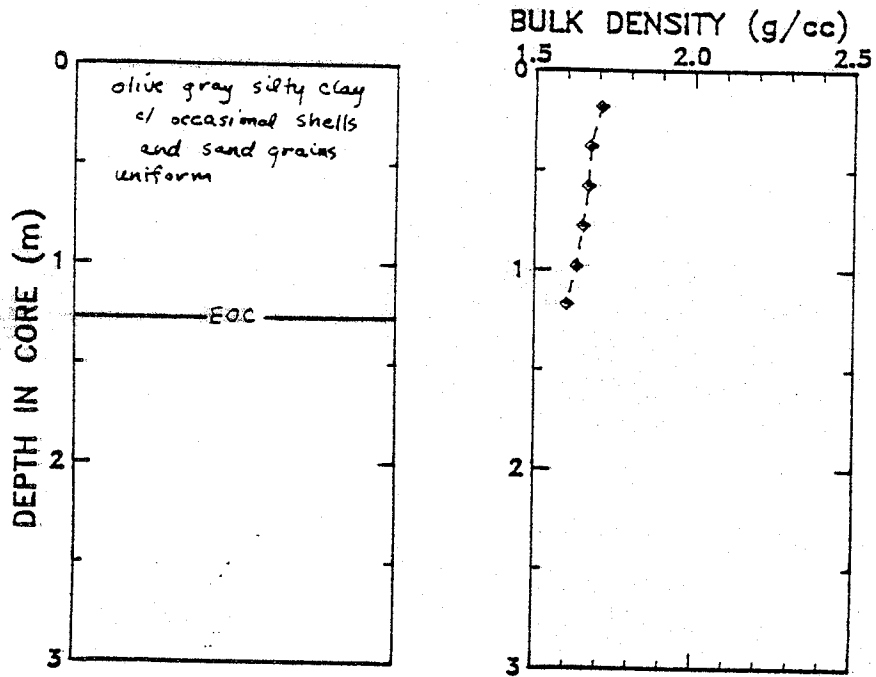


FIGURE 25 - Lithology, Bulk Density for TWC047



87028-048

Core Site 048 is also located in the Great Whale River area, in Manitousuk Sound. Figures 26 and 27 show downcore profiles of water content, vane strength and salinity for Piston Core 048 and Trigger Weight Core 048, respectively. The data is also presented in Tables 22 and 23. Table 24 presents the velocity data for Piston Core 048, and Figure 28 shows a lithology sketch, and bulk density and velocity profiles for the piston core. Lithology and bulk density profile for the trigger weight core are shown in Figure 29.

The sediment in Trigger Weight Core 048 and in the upper meter of Piston Core 048 is bioturbated olive gray silty clay, with values of bulk density and water content comparable to those found in similar sediments in Trigger Weight Core 047. The base of this unit forms what appears to be load structures into the massive gray silty clay between 1.05 and 1.20 m. The top of this boundary is noted in a sharp drop in bulk density to 1.52 g/cc from the values of 1.72 to 1.75 g/cc observed through the overlying bioturbated sediment. There is also a drop in shear strength and a sharp jump in water content associated with this boundary.

From 1.22 to 1.69 m there are rhythmically laminated sequences of gray clays and silty clays, accounting for some variation in the downcore profiles. Near the bottom of the core, the bulk densities and velocities increase quickly, while the water contents show a sharp drop. This type of change in the properties has been seen in other cores just above the occurrence of a diamict (till?).

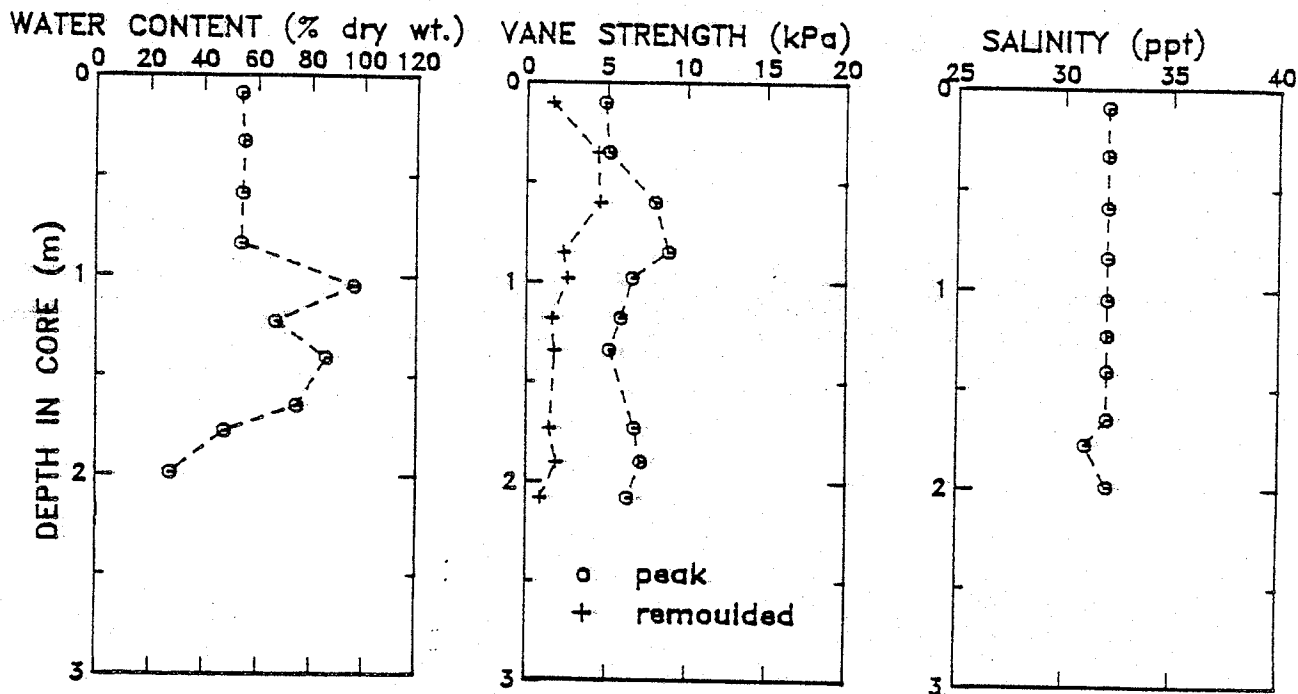


FIGURE 26 - Water Content, Vane Strength, Salinity for PC048

TABLE 22 - Physical Properties for Piston Core 87028-048

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
0.10	53.8	1.75	32	4.9	1.6
0.35	54.8	1.75	32	5.2	4.4
0.60	54.2	1.72	32	8.0	4.6
0.85	53.8	1.74	32	8.9	2.3
0.98	****	****	**	6.6	2.6
1.05	96.1	1.52	32	****	****
1.18	****	****	**	5.9	1.6
1.23	66.6	1.66	32	****	****
1.34	****	****	**	5.2	1.7
1.41	85.7	1.55	32	****	****
1.65	74.5	1.62	32	****	****
1.73	****	****	**	6.7	1.4
1.78	47.6	1.78	31	****	****
1.90	****	****	**	7.2	1.9
1.99	27.4	2.04	32	****	****
2.08	****	****	**	6.3	0.9

# Hudson 87028 - TWC048

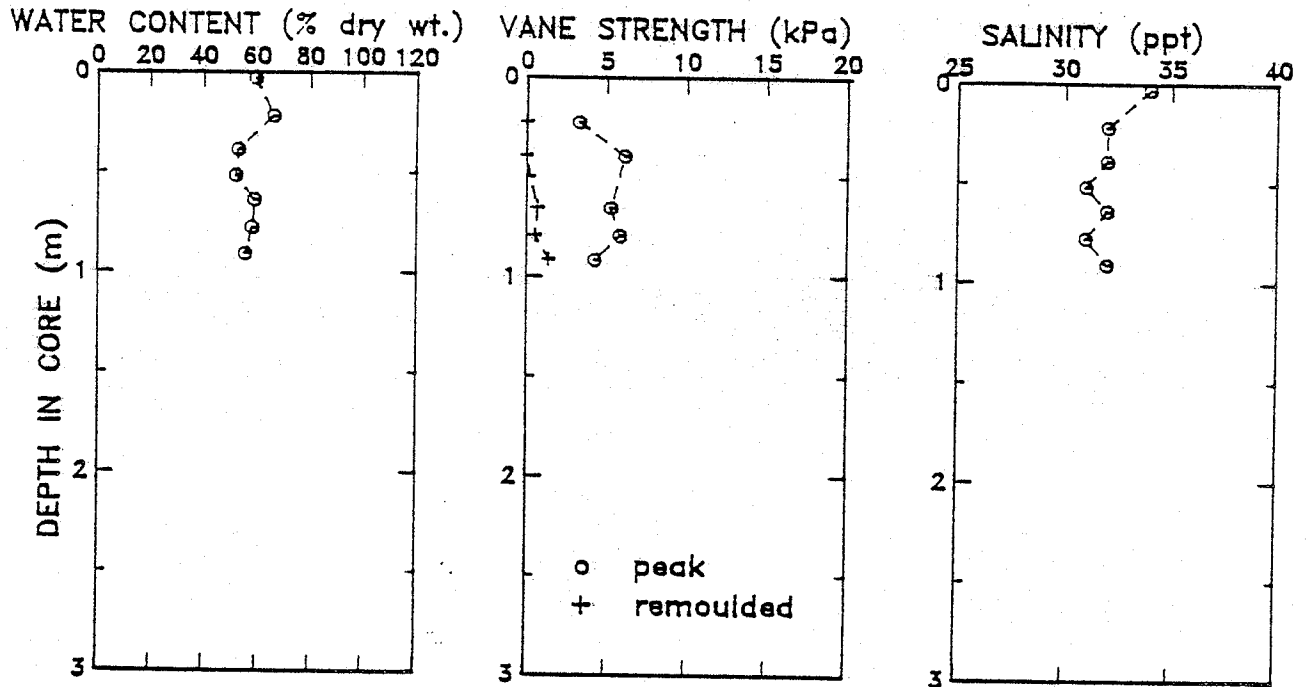


FIGURE 27 - Water Content, Vane Strength, Salinity for TWC048

TABLE 23 - Physical Properties for Trigger Core 87028-048

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
0.03	59.6	1.72	34	****	****
0.23	66.3	1.66	32	3.3	0.0
0.40	53.0	1.76	32	6.2	0.0
0.53	52.3	1.76	31	****	****
0.66	59.2	1.72	32	5.3	0.7
0.80	58.3	1.71	31	5.9	0.6
0.92	55.8	1.74	32	4.3	1.4

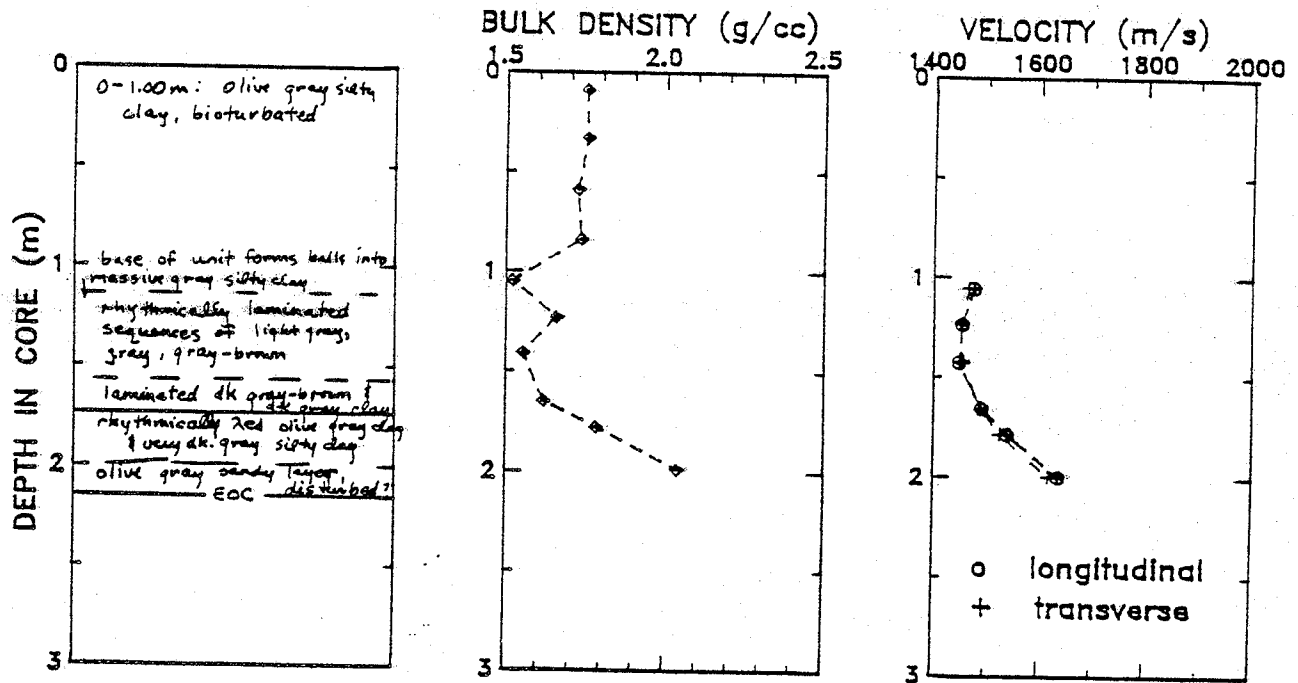


FIGURE 28 - Lithology, Bulk Density, Velocity for PC048

TABLE 24 - Velocity Data for Piston Core 87028-048

Reference temperature used = 3.9 deg C

Depth (m)	Corrected Velocity (m/s)	
	Longitudinal	Transverse
1.06	1476.	1464.
1.24	1453.	1450.
1.43	1448.	1454.
1.66	1491.	1486.
1.79	1540.	1524.
2.00	1636.	1616.

# Hudson 87028 - TWC048

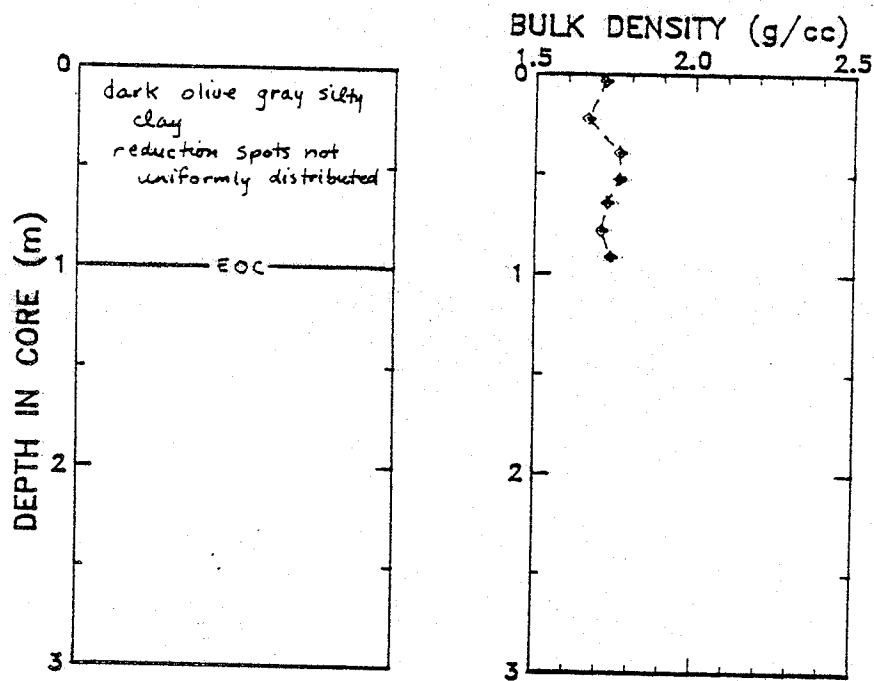


FIGURE 29 - Lithology, Bulk Density for TWC048

87028-050

Core Site 050 was also located in Manitounuk Sound. There was no recovery in the piston core. Figures 30 and 31 show downcore profiles of the physical properties data, which is also presented in Table 25.

The measurements were taken in olive gray silty clay with occasional reduction spots. No notes were found on why the water content and bulk density values at 0.32 m are anomalies, and the description did not provide any clues. The core itself should be examined again, and grain size tests may also help in the determination. The vane strength measurement at 0.73 was taken in a layer of light gray clay clasts in a dark gray matrix.

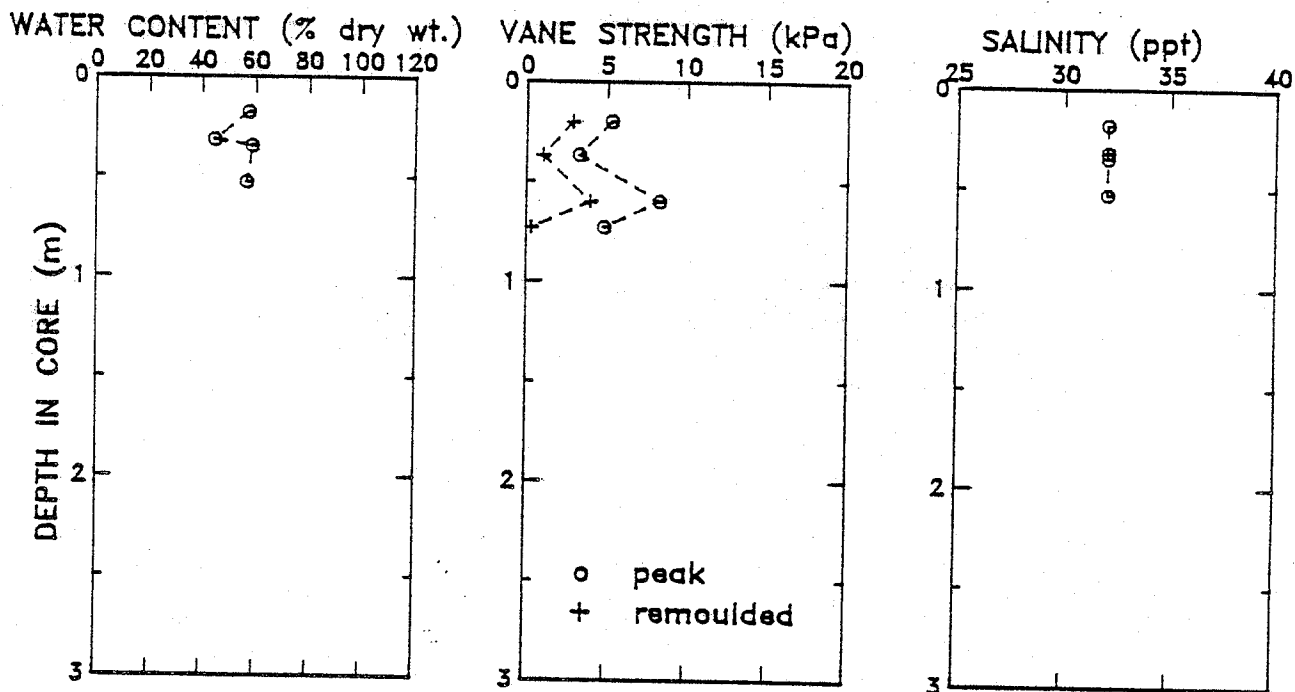


FIGURE 30 - Water Content, Vane Strength, Salinity for TWC050

TABLE 25 - Physical Properties for Trigger Core 87028-050

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
0.20	57.4	1.73	32	5.3	2.9
0.32	44.7	1.83	32	****	****
0.37	58.8	1.72	32	3.3	1.0
0.53	56.8	1.72	32	****	****
0.60	****	****	**	8.3	4.0
0.73	****	****	**	4.9	0.3

# Hudson 87028 - TWC050

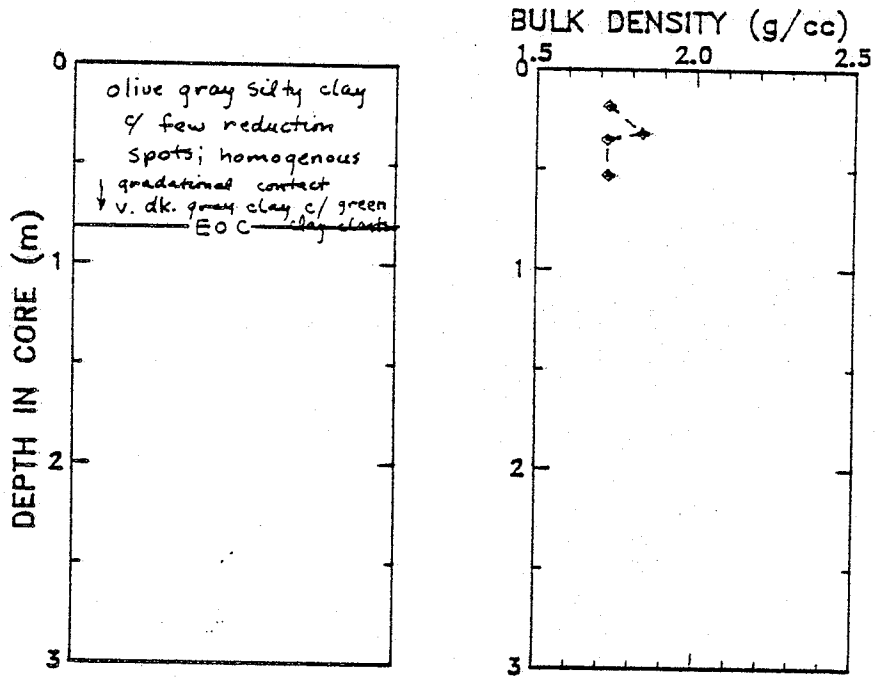


FIGURE 31 - Lithology, Bulk Density for TWC050



87028-068

Core Site 068 is located near the mouth of Great Whale River. Tables 26 and 27 present the physical properties data for Piston Core 068 and Trigger Weight Core 068, respectively, with the data shown in Figures 32 and 33. Table 28 presents the velocity data for Piston Core 068, with Figure 34 showing a lithology sketch and downcore bulk density and velocity profiles for Piston Core 068 and Figure 35 showing a lithology sketch and bulk density profile for Trigger Weight Core 068.

The section between 2.80 and 3.60 m was heavily cracked during splitting, and thus velocity and vane shear tests were not performed. The entire core is described as a bioturbated olive gray slightly silty clay. There was some horizontal cracking from 4.60 m to the bottom of the core which was attributed to gas. However, the received signal in the velocity test is usually severely affected by gas in the sediments, and this did not appear to happen here.

The physical properties profiles are relatively featureless. The variations in shear strength may be the result of the bioturbation. It was seen in Piston Core 043 that the strengths in burrows and in more heavily bioturbated zones can be different than those in the matrix.

In a normally consolidating sequence, as has been previously discussed, the expected trends would be of decreasing water content and increasing bulk density with increasing depth of burial and subsequent consolidation. This is not observed in the profiles for Piston Core 068, where the values remain almost constant to the bottom of the core. This indicates that the sediments may be underconsolidated, likely as the result of the extremely high sedimentation rates expected at this site.

TABLE 26 - Physical Properties for Piston Core 87028-068

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/ 1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
0.02	70.0	1.63	32	****	****
0.19	68.7	1.64	32	****	****
0.30	****	****	**	5.4	0.0
0.10	****	****	**	6.7	3.3
0.38	72.6	1.64	32	****	****
0.50	****	****	**	6.3	0.4
0.58	69.2	1.66	32	****	****
0.70	****	****	**	6.6	5.7
0.79	67.6	1.67	32	****	****
0.90	****	****	**	8.3	2.9
0.99	67.8	1.66	32	****	****
1.09	****	****	**	7.2	0.4
1.18	67.7	1.67	32	****	****
1.40	****	****	**	7.2	7.0
1.48	68.4	1.66	32	****	****
1.60	****	****	**	7.9	2.7
1.68	69.3	1.66	32	****	****
1.80	****	****	**	7.7	0.1
1.89	67.2	1.66	32	****	****
2.00	****	****	**	7.7	2.2
2.09	68.8	1.66	32	****	****
2.20	****	****	**	8.7	1.3
2.29	69.1	1.65	32	****	****
2.40	****	****	**	8.4	0.1
2.49	67.2	1.67	32	****	****
2.60	****	****	**	8.7	0.0
2.67	66.7	1.65	32	****	****
3.33	70.3	1.64	32	****	****
3.55	68.9	1.65	32	****	****
3.77	69.1	1.64	32	****	****
3.87	****	****	**	12.7	3.0
3.95	69.7	1.63	32	****	****
4.05	****	****	**	10.4	0.9
4.12	67.2	1.66	32	****	****
4.25	****	****	**	9.6	2.6
4.40	****	****	**	10.2	0.0
4.49	70.4	1.65	32	****	****
4.72	****	****	**	10.6	5.0
4.81	69.8	1.64	32	****	****
4.90	****	****	**	11.4	0.0
4.96	72.6	1.62	32	****	****
5.10	****	****	**	15.4	2.0
5.22	69.5	1.64	32	****	****

TABLE 26 - Physical Properties for Piston Core 87028-068  
(continued)

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/ 1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
5.31	****	****	**	12.7	1.0
5.38	77.8	1.60	32	****	****
5.48	****	****	**	12.3	2.4
5.56	75.9	1.61	32	****	****
5.65	****	****	**	12.9	0.1
5.71	77.0	1.60	32	****	****
5.80	****	****	**	14.4	0.0
5.86	72.0	1.63	32	****	****

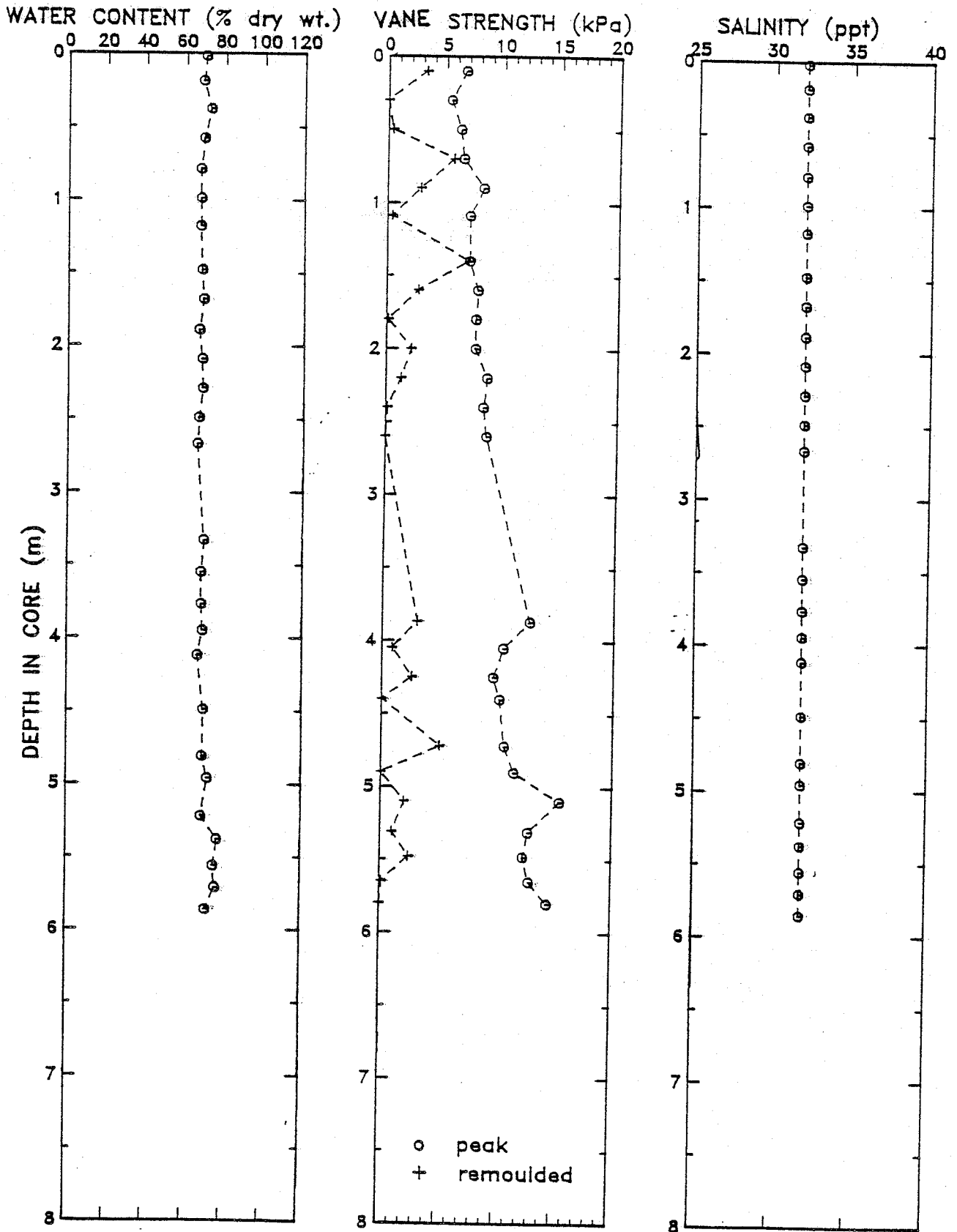


FIGURE 32 - Water Content, Vane Strength, Salinity for PC068

# Hudson 87028 - TWC068

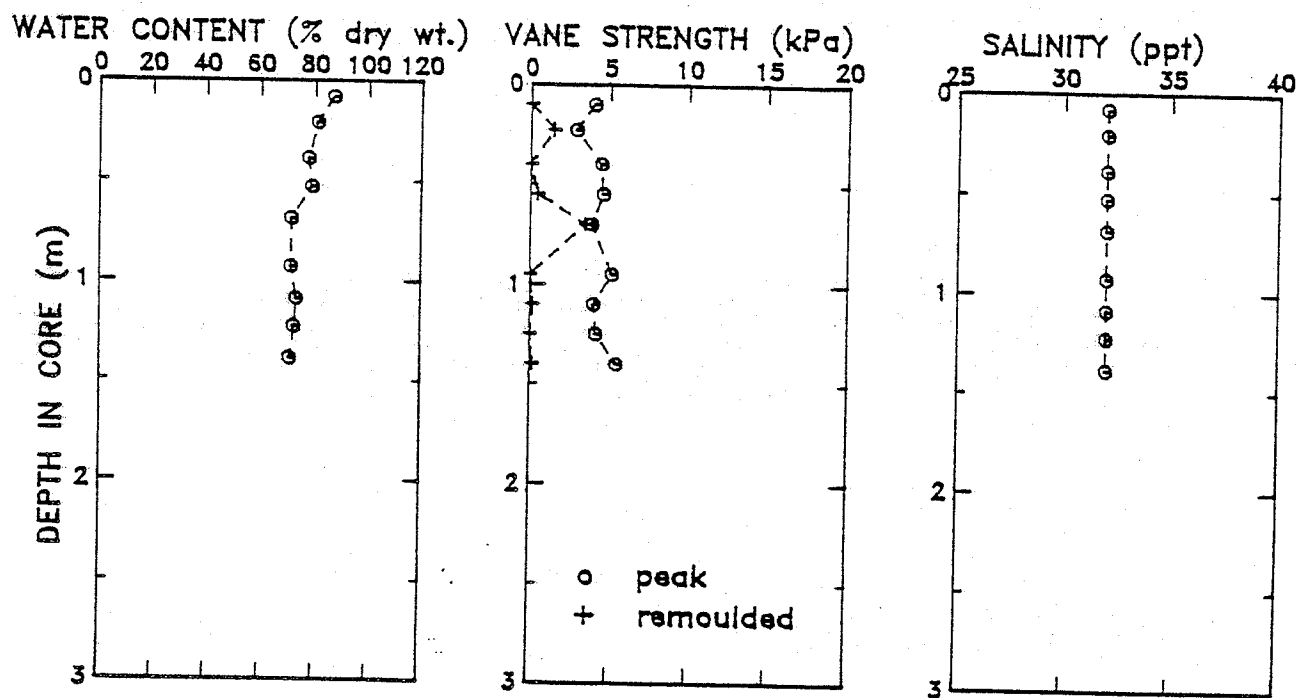


FIGURE 33 - Water Content, Vane Strength, Salinity for TWC068

TABLE 27 - Physical Properties for Trigger Core 87028-068

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
0.10	87.3	1.56	32	4.0	0.0
0.23	81.2	1.59	32	2.9	1.4
0.40	77.9	1.59	32	4.4	0.0
0.55	79.1	1.58	32	4.6	0.4
0.70	71.5	1.63	32	3.9	3.4
0.95	71.4	1.62	32	5.2	0.0
1.10	73.4	1.60	32	4.0	0.1
1.25	72.5	1.62	32	4.2	0.0
1.40	71.0	1.62	32	5.4	0.1

TABLE 28 - Velocity Data for Piston Core 87028-068

Reference temperature used = 3.9 deg C

Depth (m)	Corrected Velocity (m/s)	
	Longitudinal	Transverse
0.20	1472.	1480.
0.40	1472.	1475.
0.60	1474.	1472.
0.80	1473.	1476.
1.00	1480.	1477.
1.19	1474.	1477.
1.50	1472.	1476.
1.70	1475.	1475.
1.90	1476.	1475.
2.10	1475.	1477.
2.30	1475.	1479.
2.50	1476.	1476.
2.68	1479.	1476.
3.78	1472.	1464.
3.96	1472.	1476.
4.13	1474.	1463.
4.32	1467.	1463.
4.50	1459.	1466.
4.82	1453.	1465.
4.98	1461.	1457.
5.23	1477.	1468.
5.40	1466.	1450.
5.57	1466.	1457.
5.73	1452.	1450.
5.88	1460.	1450.

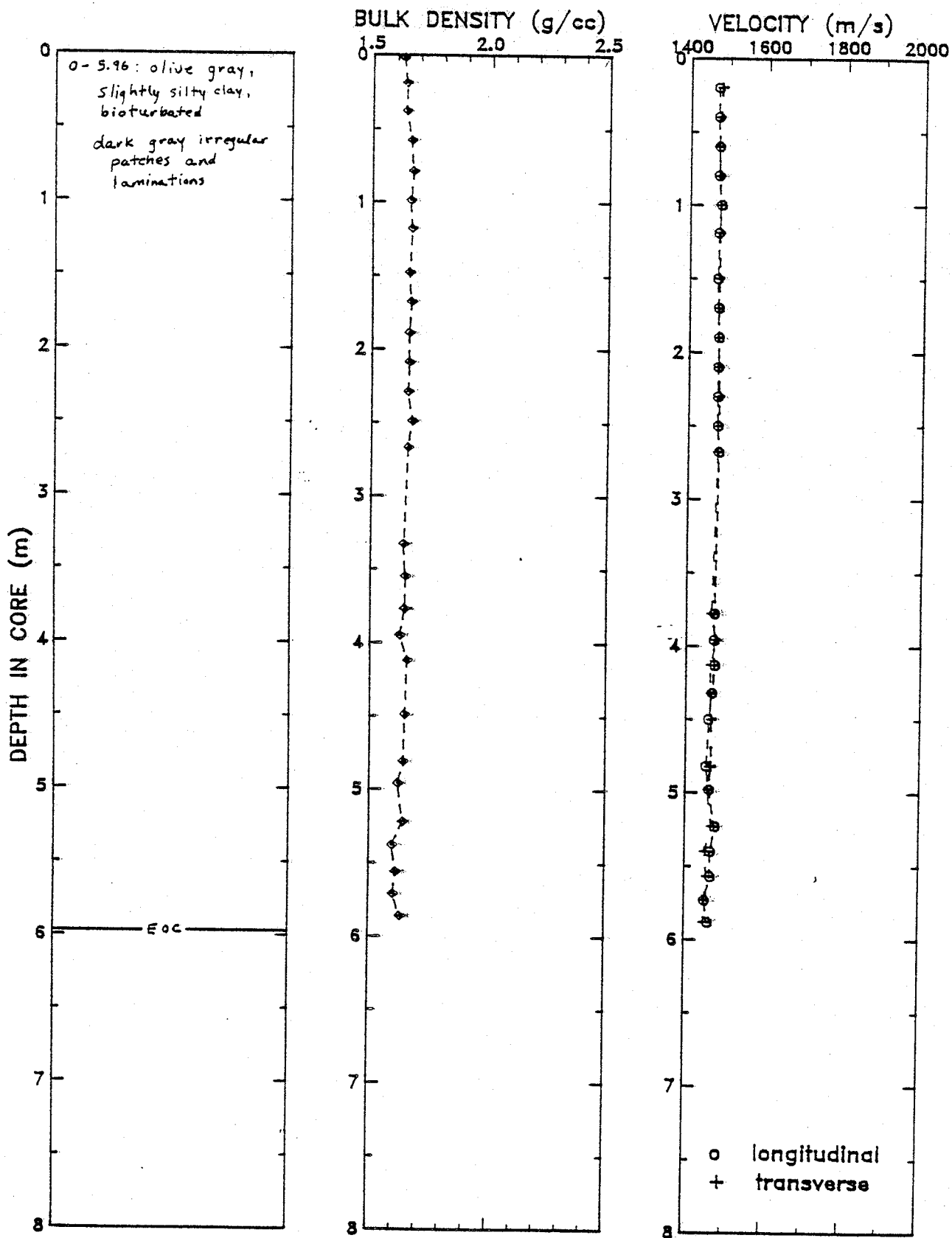


FIGURE 34 - Lithology, Bulk Density, Velocity for PC068

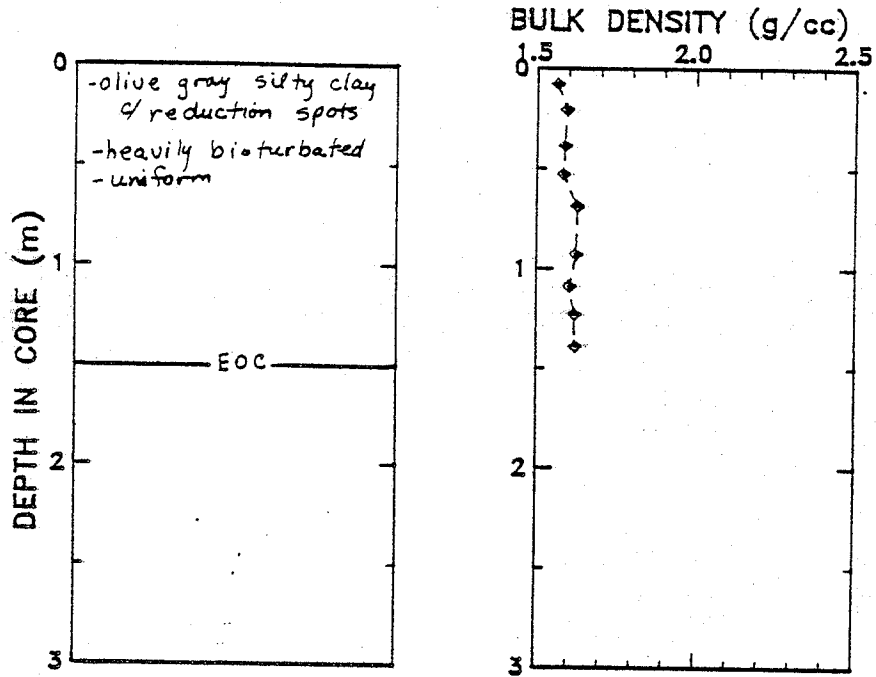


FIGURE 35 - Lithology, Bulk Density for TWC068



87028-069

Core Site 069 is located at Great Whale River. Figures 36 and 37 show water content, vane strength, and salinity profiles for Piston Core 069 and Trigger Weight Core 069, respectively. The data is also presented in Tables 29 and 30. Table 31 contains the velocity data for the piston core, and Figure 38 shows a lithology sketch and bulk density and velocity profiles for the piston core. Figure 39 is a lithology sketch and bulk density profile for the trigger weight core.

The trigger weight core and the upper 5.5 m of the piston core are bioturbated olive gray slightly silty clay, as found at Core Site 068. Above 1 m, the bulk density and water content profiles again indicate that the sediments may have been compacted during coring. Just above 5 m there is a change noted by increases in bulk density and vane peak strength, and a decrease in water content. This is not explained by the descriptions, so a closer examination of the core and the results of the grain size tests will be needed.

The sediments in the remainder of the core consist predominantly of zones of the "cottage cheese" structure of clay clasts as seen in Piston Core 047. It was suspected that these sediments reflect times of increased fresh water input, that subsequently might have frozen more readily, but this is not indicated in the salinity data. Again, a closer look at the stratigraphy and grain size and other data may assist in the interpretation.

TABLE 29 - Physical Properties for Piston Core 87028-069

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/ 1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
0.15	80.2	1.60	32	6.2	0.4
0.35	82.6	1.58	32	7.9	1.0
0.55	87.8	1.56	32	6.2	1.4
0.80	90.6	1.54	32	7.4	0.3
1.04	97.8	1.53	32	5.6	1.6
1.30	89.8	1.55	32	8.2	5.2
1.55	93.3	1.54	32	6.7	0.0
1.80	93.6	1.53	32	9.2	0.3
2.05	90.0	1.55	32	6.2	5.9
2.30	94.6	1.54	31	7.2	0.0
2.56	91.0	1.55	31	8.4	1.6
2.80	86.8	1.56	32	7.7	2.0
3.05	89.0	1.57	32	10.3	0.1
3.30	93.2	1.53	32	7.9	0.2
3.55	94.5	1.54	32	9.6	1.3
3.85	94.6	1.54	32	10.4	3.3
4.10	92.8	1.55	32	10.3	1.4
4.14	96.8	1.52	32	****	****
4.35	****	****	**	9.4	1.0
4.60	90.6	1.56	32	10.2	2.7
4.85	89.8	1.56	32	14.0	1.0
5.10	78.6	1.62	32	13.4	1.7
5.40	****	****	**	12.4	1.4
5.45	60.2	1.71	32	****	****
5.59	****	1.74	32	****	****
5.70	****	****	**	6.3	1.1
5.80	53.0	1.77	32	****	****
5.92	****	****	**	8.4	1.2
5.98	97.2	1.54	32	****	****
6.05	****	****	**	4.7	0.1
6.10	65.3	1.67	32	****	****
6.33	****	1.78	32	****	****
6.45	****	****	**	10.9	4.9
6.52	47.0	1.81	32	****	****
6.62	****	****	**	13.3	5.2
6.70	43.2	1.86	32	****	****
6.79	****	****	**	15.0	2.9
6.86	69.1	1.65	32	****	****
7.03	77.2	1.61	32	****	****

# Hudson 87028 - PC069

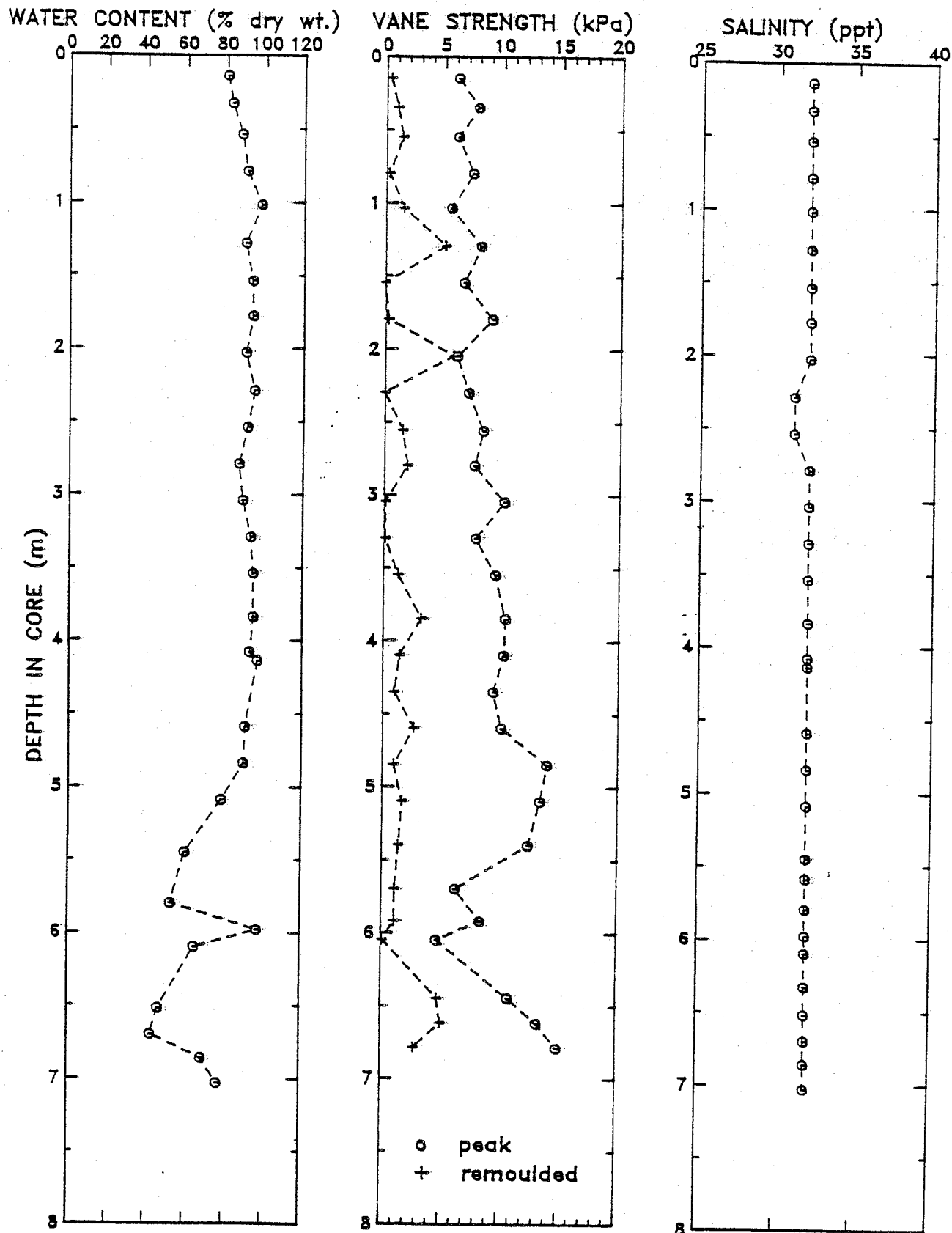


FIGURE 36 - Water Content, Vane Strength, Salinity for PC069

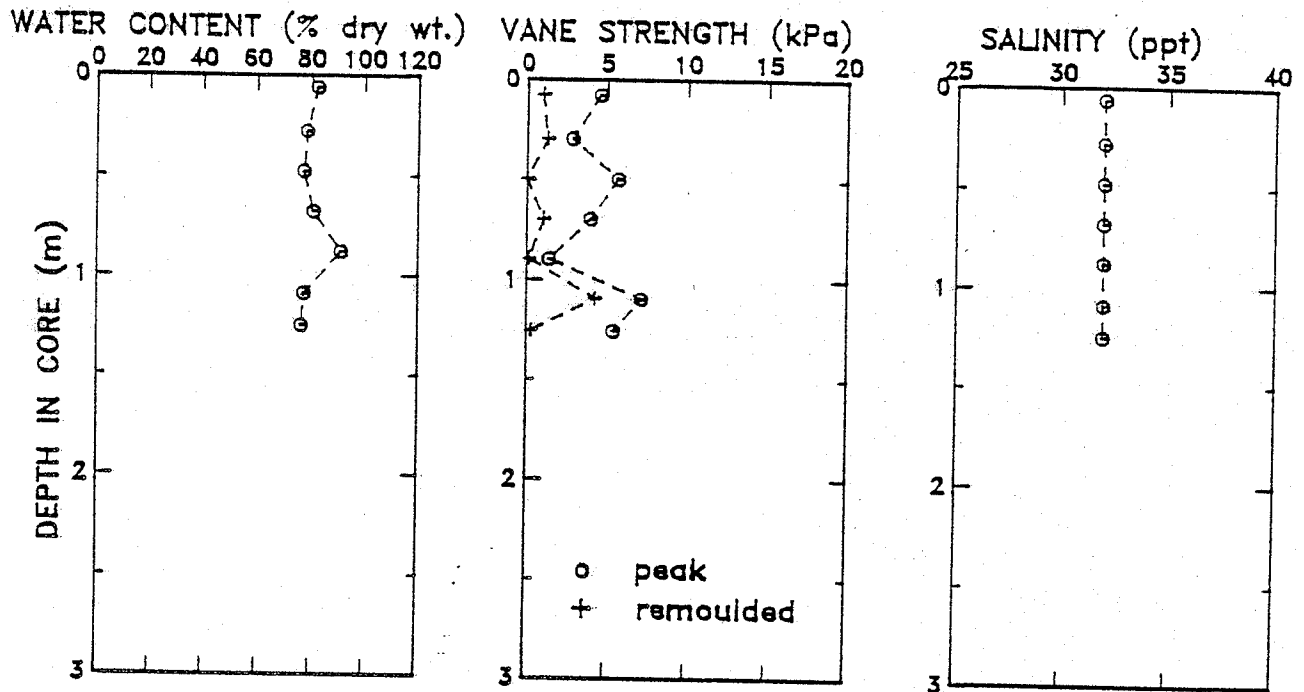


FIGURE 37 - Water Content, Vane Strength, Salinity for TWC069

TABLE 30 - Physical Properties for Trigger Core 87028-069

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
0.08	82.4	1.57	32	4.6	1.0
0.30	78.5	1.58	32	2.9	1.3
0.50	77.4	1.59	32	5.7	0.0
0.70	81.0	1.58	32	4.0	1.1
0.90	91.4	1.53	32	1.4	0.1
1.10	77.4	1.59	32	7.2	4.3
1.26	76.5	1.60	32	5.4	0.3

TABLE 31 - Velocity Data for Piston Core 87028-069

Reference temperature used = 3.9 deg C

Depth (m)	Corrected Velocity (m/s)	
	Longitudinal	Transverse
5.47	1500.	1495.
5.60	1575.	1495.
5.82	1592.	1771.
5.98	1445.	1443.
6.11	1489.	1467.
6.35	1515.	1474.
6.53	1521.	1535.
6.70	1507.	1648.
6.86	1476.	1450.
7.05	1459.	1468.

# Hudson 87028 - PC069

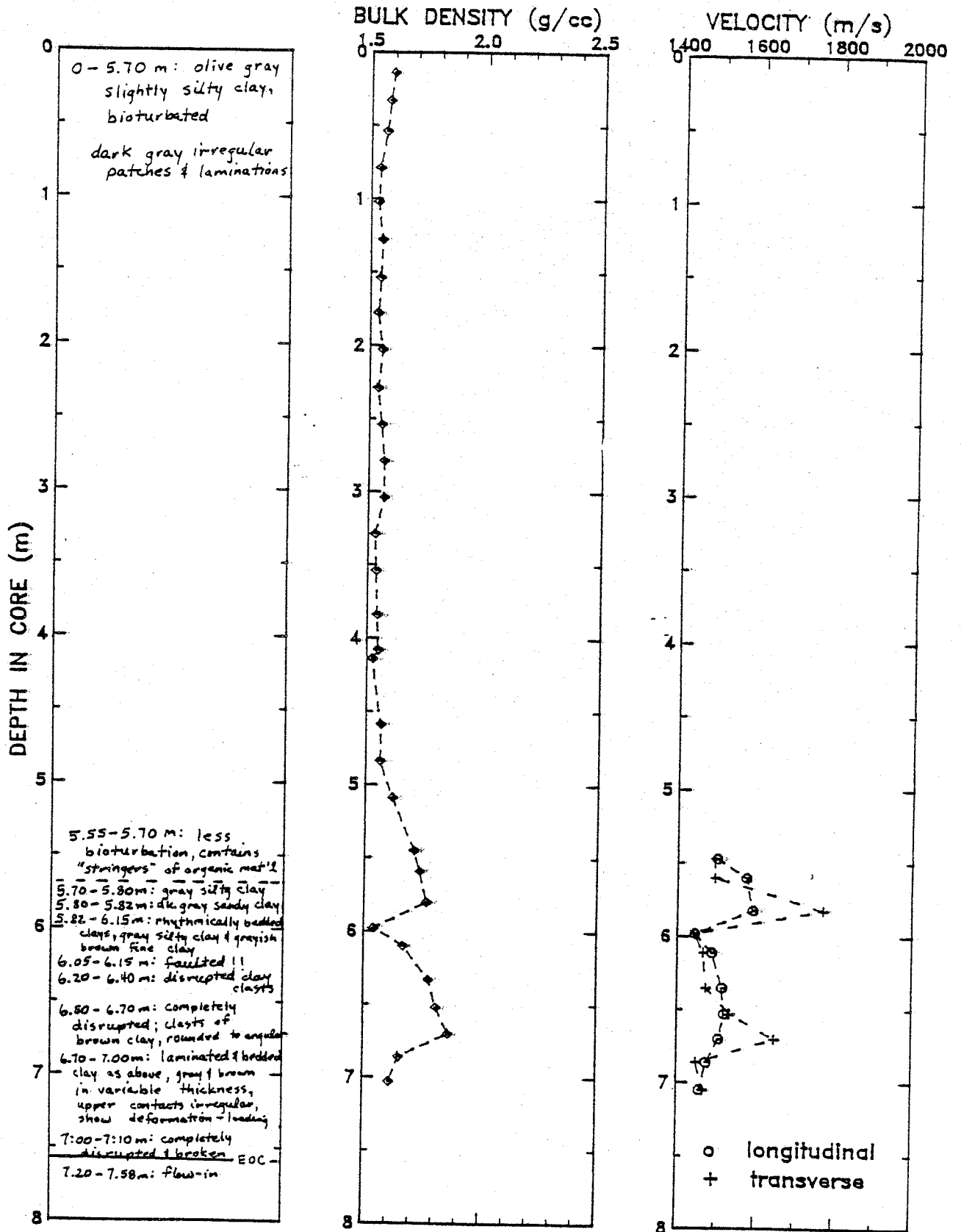


FIGURE 38 - Lithology, Bulk Density, Velocity for PC069

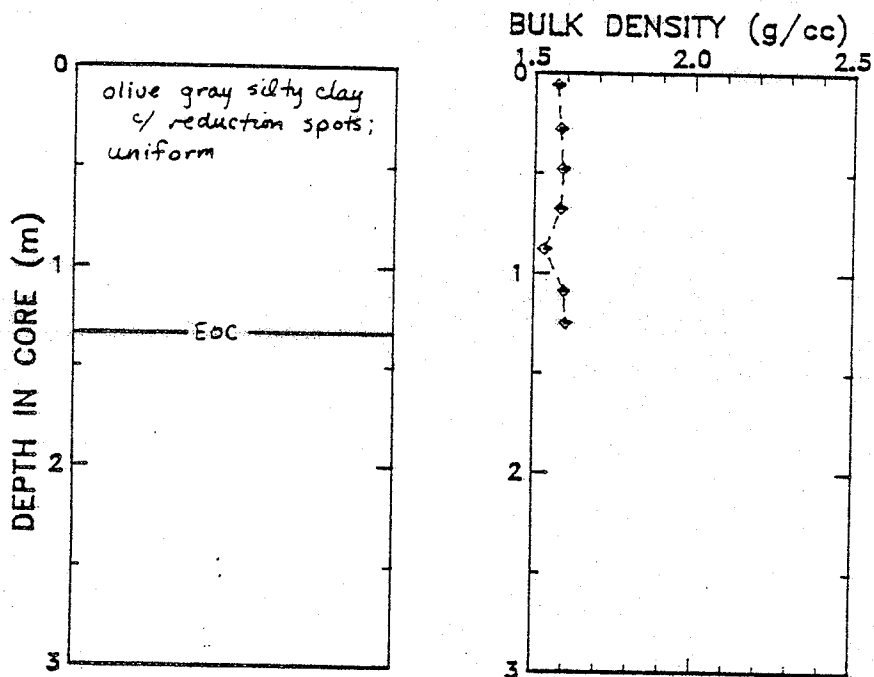


FIGURE 39 - Lithology, Bulk Density for TWC069

87028-070

Core Site 070 is located in the Great Whale River Area (Figure 1). Figures 40 and 41 show water content, vane strength, and salinity profiles for Piston Core 070 and Trigger Weight Core 070, respectively. The data is also presented in Tables 32 and 33. Table 34 contains the velocity data and Figure 42 shows lithology, and bulk density and velocity profiles for the piston core. Figure 43 shows a lithology sketch and bulk density profile for the trigger weight core.

The descriptions indicate that at least 1 m of sediment is missing from the top of the piston core. The physical properties data suggest that the top of the piston core might correspond with the bottom of the trigger weight core, slightly deeper than 1 m.



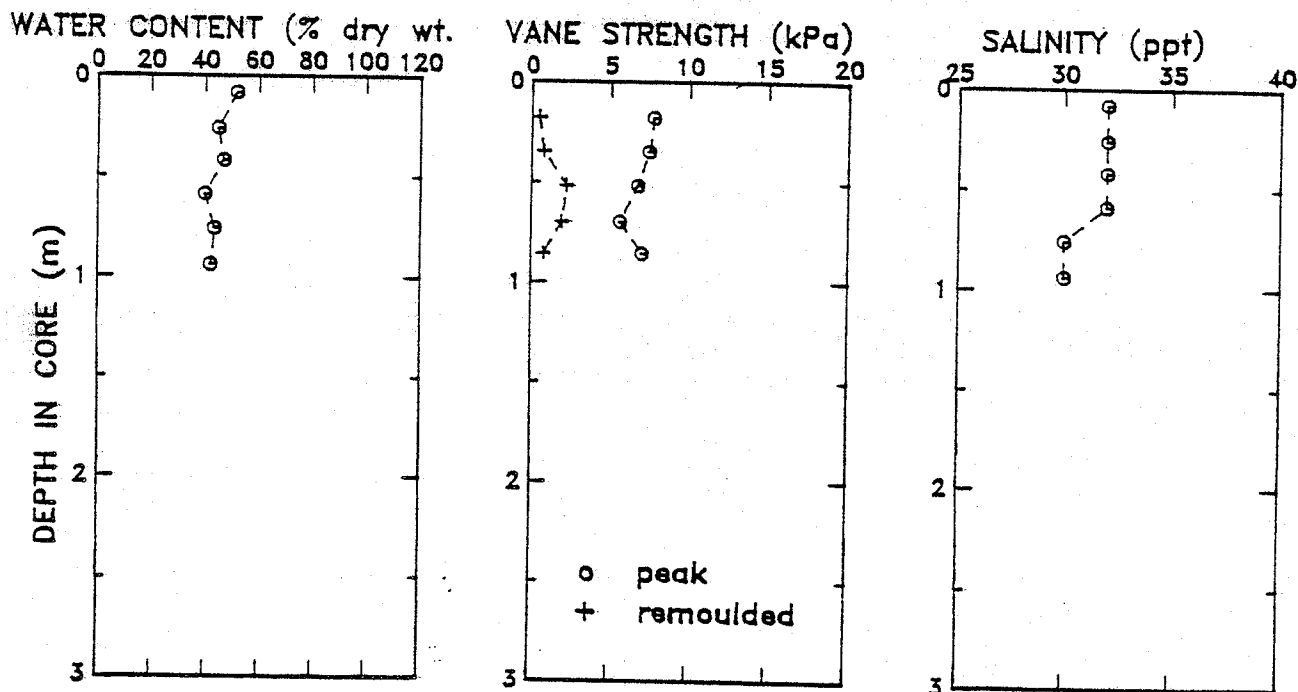


FIGURE 40 - Water Content, Vane Strength, Salinity for PC070

TABLE 32 - Physical Properties for Piston Core 87028-070

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
0.08	51.7	1.75	32	****	****
0.18	****	****	**	7.7	0.4
0.26	44.9	1.80	32	****	****
0.35	****	****	**	7.4	0.7
0.42	46.8	1.80	32	****	****
0.52	****	****	**	6.7	2.2
0.59	39.9	1.87	32	****	****
0.70	****	****	**	5.6	1.9
0.76	43.5	1.84	30	****	****
0.86	****	****	**	7.0	0.7
0.94	42.1	1.84	30	****	****

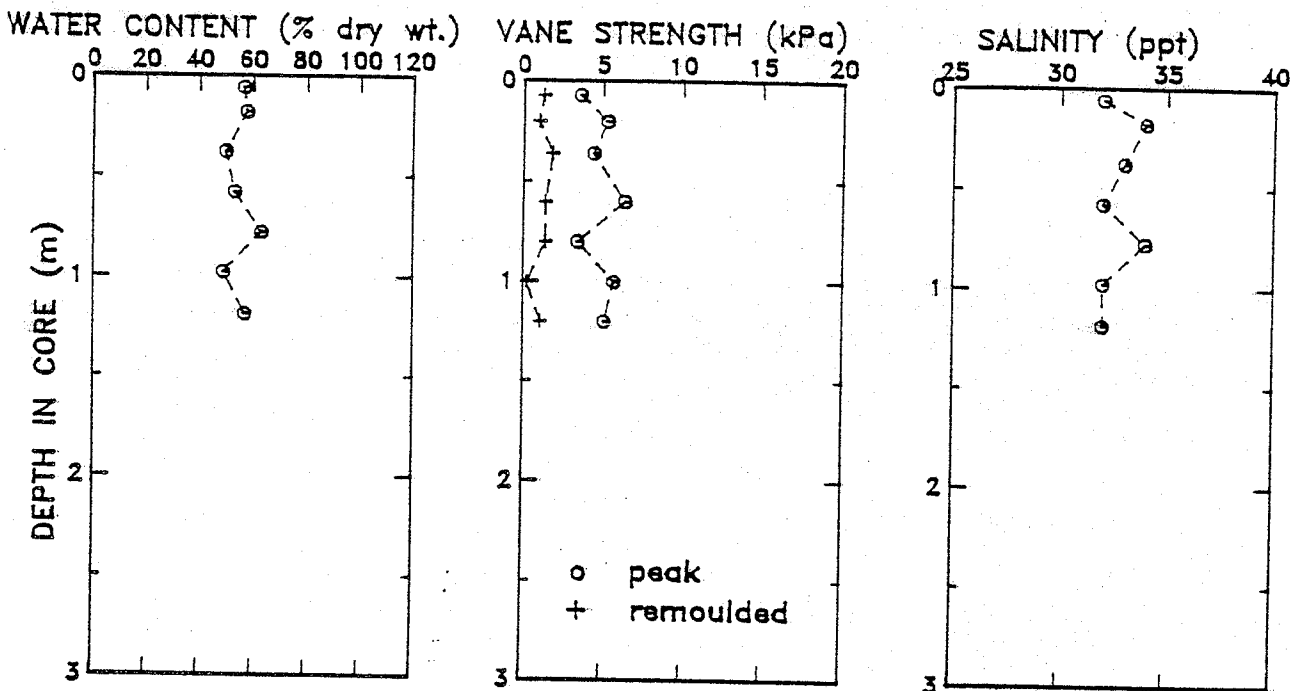


FIGURE 41 - Water Content, Vane Strength, Salinity for TWC070

TABLE 33 - Physical Properties for Trigger Core 87028-070

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
0.07	56.7	1.72	32	3.6	1.3
0.20	57.8	1.70	34	5.3	1.0
0.36	****	****	**	4.4	1.9
0.39	50.0	1.76	33	****	****
0.60	53.3	1.74	32	6.4	1.4
0.80	63.2	1.68	34	3.4	1.4
1.00	49.2	1.78	32	5.7	0.3
1.20	57.2	1.72	32	5.1	1.1

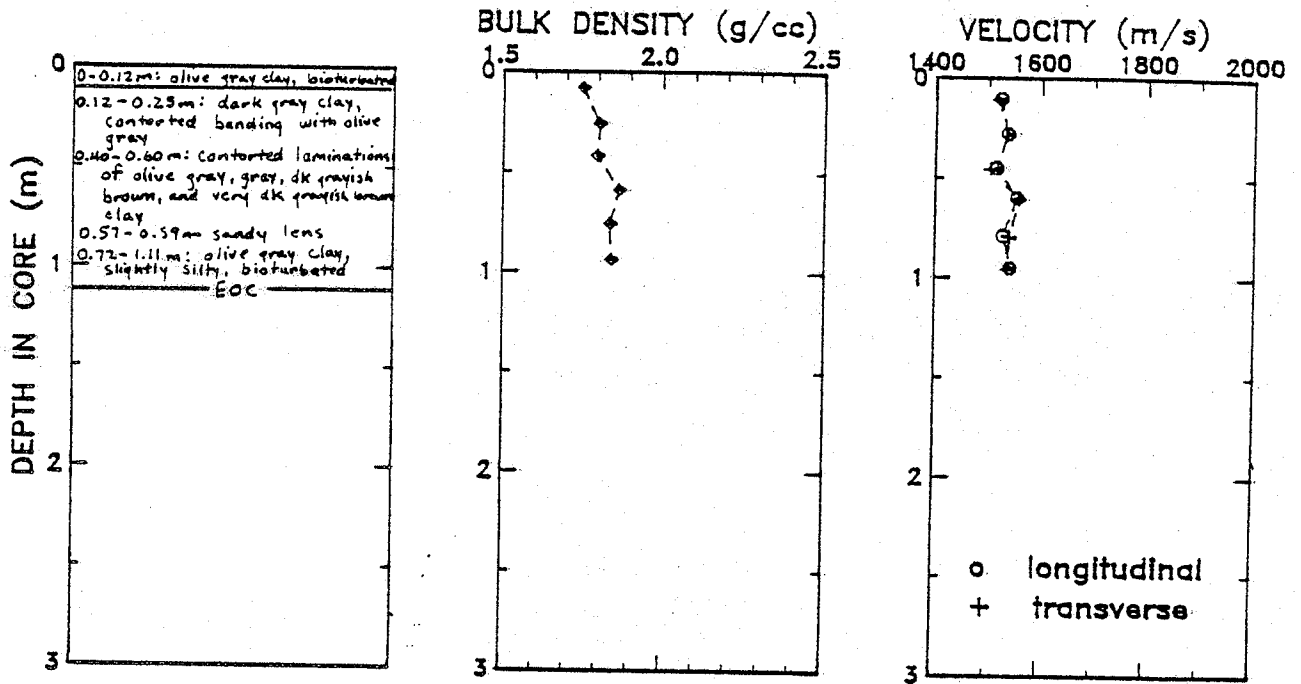


FIGURE 42 - Lithology, Bulk Density, Velocity for PC070

TABLE 34 - Velocity Data for Piston Core 87028-070

Reference temperature used = 3.9 deg C

Depth (m)	Corrected Velocity (m/s)	
	Longitudinal	Transverse
0.10	1522.	1516.
0.28	1536.	1535.
0.45	1515.	1501.
0.60	1554.	1557.
0.79	1528.	1539.
0.95	1541.	1534.

# Hudson 87028 — TWC070

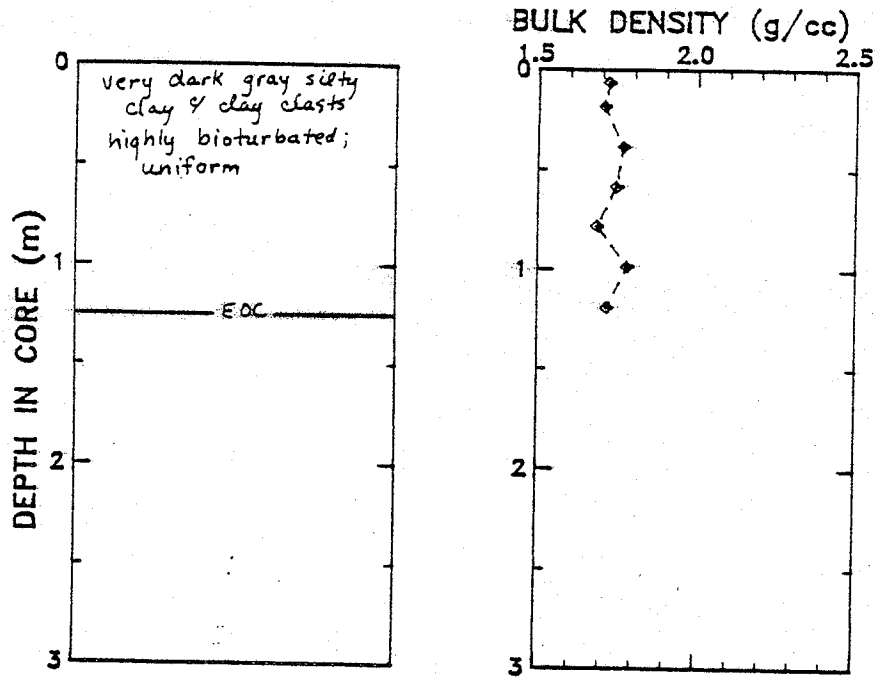


FIGURE 43 - Lithology, Bulk Density for TWC070

87028-071

Core Site 071 was also located at Great Whale River. The piston core was too disturbed for sampling. Figures 44 and 45 show the physical properties data for Trigger Weight Core 071, and the data is also presented in Table 35.

In general, the values are comparable with those seen previously in the bioturbated olive gray silty clay at Great Whale River. The decrease in salinity with depth, however, is an anomaly that can not be explained by the lithologic description, and may have to be verified with more sampling.

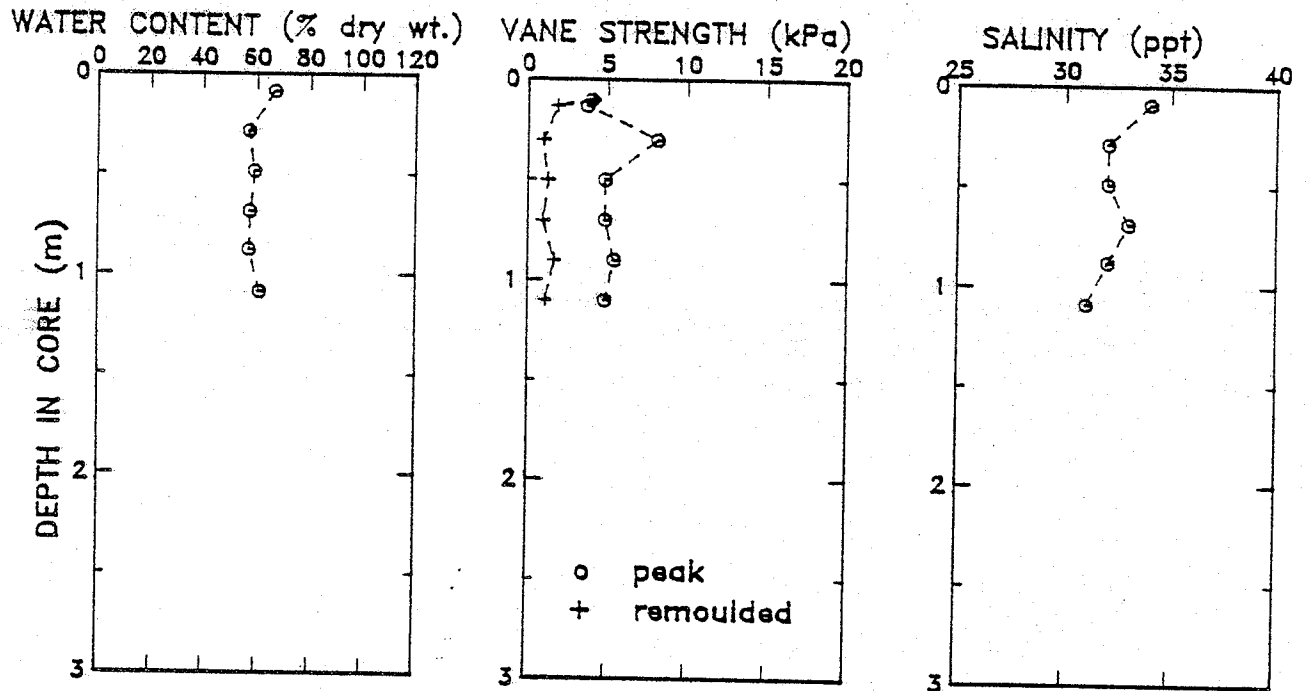


FIGURE 44 - Water Content, Vane Strength, Salinity for TWC071

TABLE 35 - Physical Properties for Trigger Core 87028-071

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
0.10	66.6	1.66	34	4.0	4.1
0.13	****	****	**	3.7	1.9
0.30	56.9	1.73	32	8.2	1.0
0.50	59.0	1.72	32	4.9	1.3
0.70	57.3	1.70	33	4.9	1.0
0.90	57.0	1.70	32	5.4	1.7
1.10	61.0	1.69	31	4.9	1.2

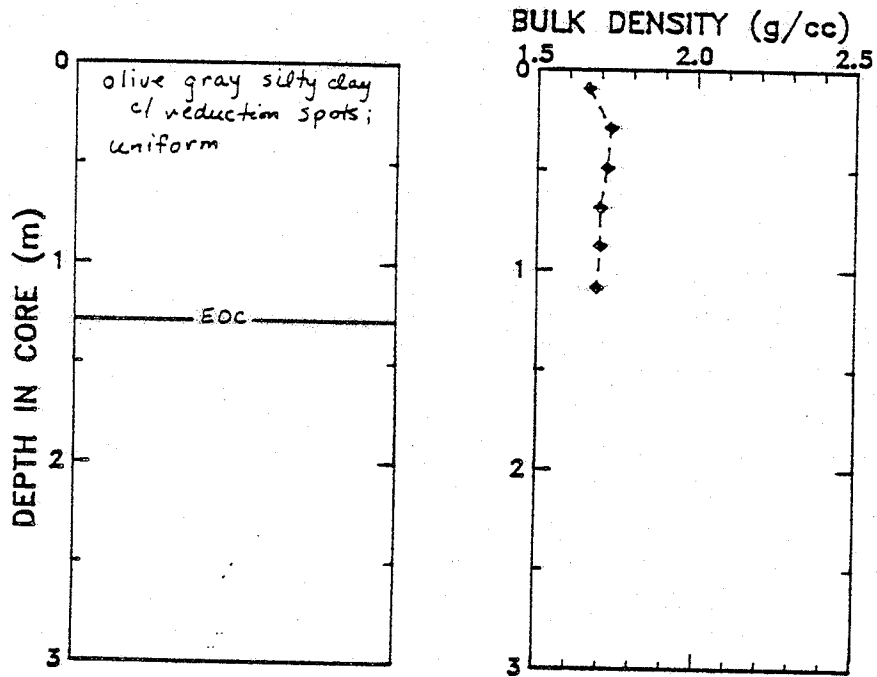


FIGURE 45 - Lithology, Bulk Density for TWC071

87028-074

Core Site 074 is located in southern Hudson Bay, to the west of the Great Whale River Cores and just north of James Bay, as shown in Figure 1. Figures 46 and 47 show the water content, vane strength, and salinity profiles for Piston Core 074 and Trigger Weight Core 074, respectively. This data is also given in Tables 36 and 37. Table 38 presents the velocity data, and Figure 48 shows a lithology sketch and bulk density and velocity profiles for the piston core. A lithology sketch and bulk density profile for the trigger weight core are presented in Figure 49.

The lithologic descriptions and the physical properties profiles indicate that approximately 0.5 m of sediment is missing from the top of Piston Core 074. There are dramatic changes in the profiles for the piston core that correspond to the change in lithology at 0.45 m to a massive sandy clay with granules, and then at 0.51 to a sandy diamict with pebbles.



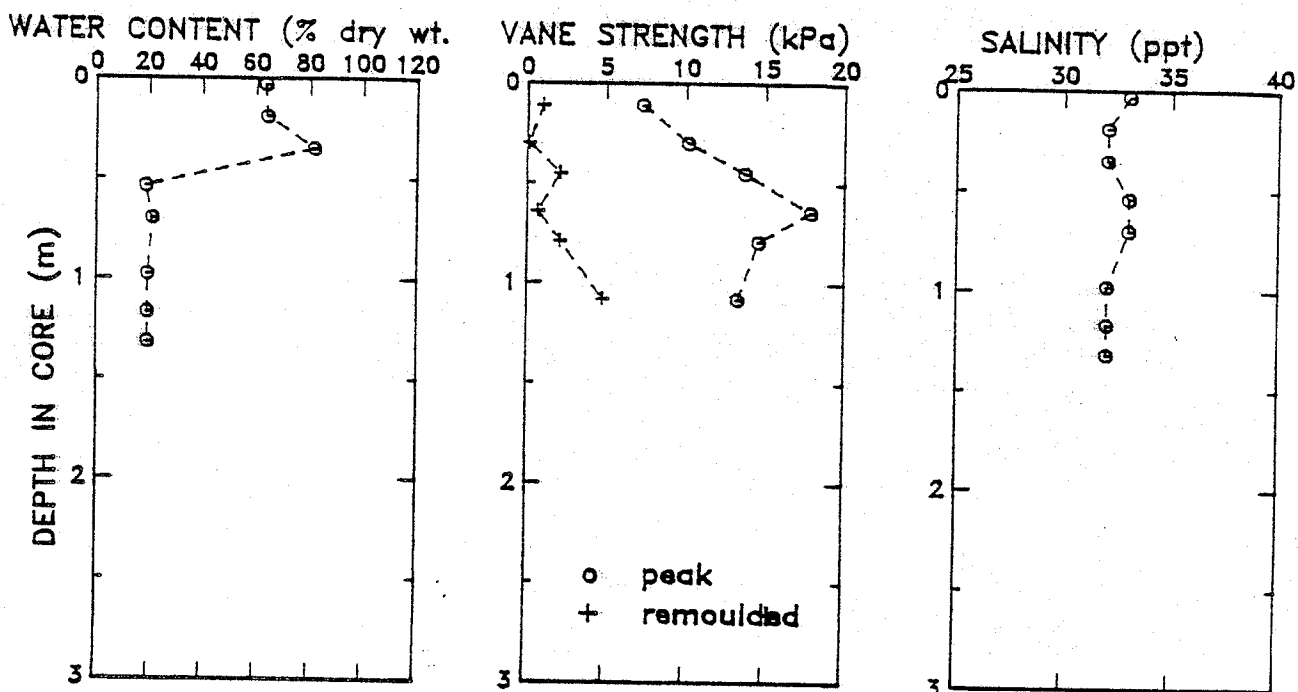


FIGURE 46 - Water Content, Vane Strength, Salinity for PC074

TABLE 36 - Physical Properties for Piston Core 87028-074

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
0.03	63.6	1.69	33	****	****
0.11	****	****	**	7.3	1.0
0.19	64.2	1.69	32	****	****
0.30	****	****	**	10.2	0.1
0.35	81.7	1.59	32	****	****
0.45	****	****	**	13.7	2.2
0.54	18.8	2.20	33	****	****
0.64	****	****	**	17.9	0.7
0.70	21.1	2.16	33	****	****
0.79	****	****	**	14.6	2.2
0.98	19.5	2.18	32	****	****
1.08	****	****	**	13.3	4.9
1.17	19.4	2.18	32	****	****
1.32	19.5	2.19	32	****	****

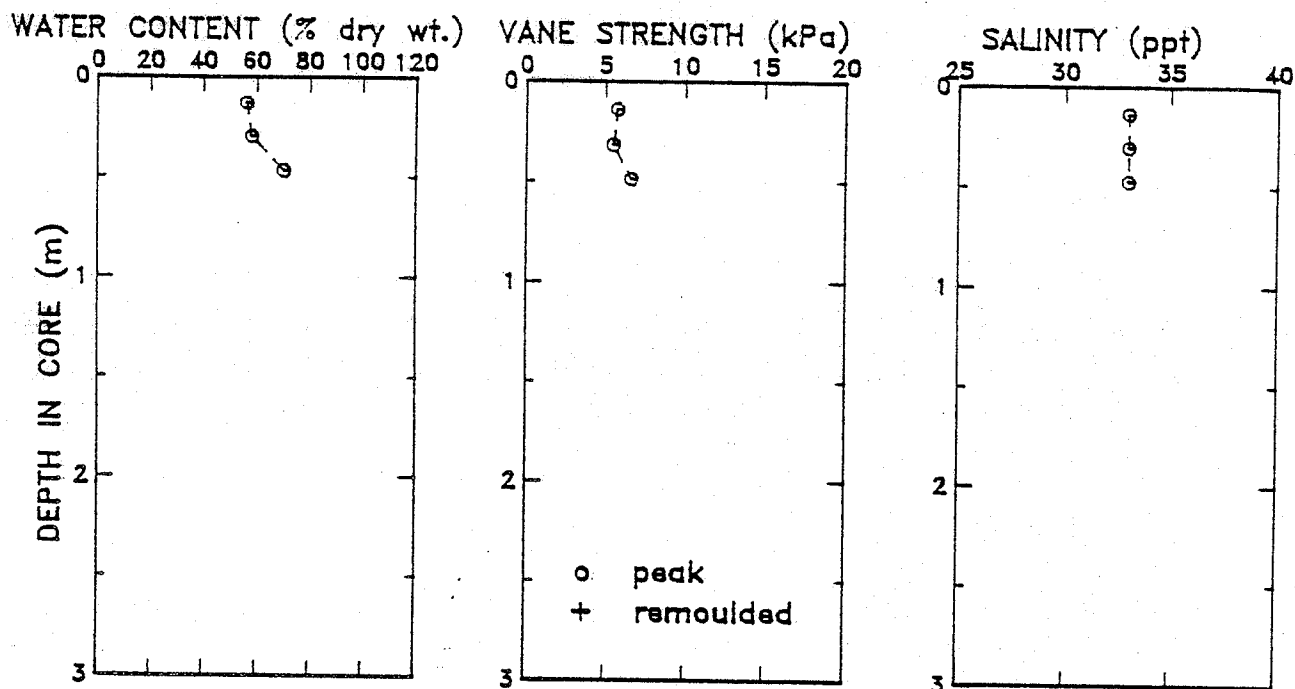


FIGURE 47 - Water Content, Vane Strength, Salinity for TWC074

TABLE 37 - Physical Properties for Trigger Core 87028-074

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
0.14	56.2	1.75	33	5.7	2.3
0.32	58.1	1.73	33	5.4	4.2
0.49	70.2	1.62	33	6.6	1.0

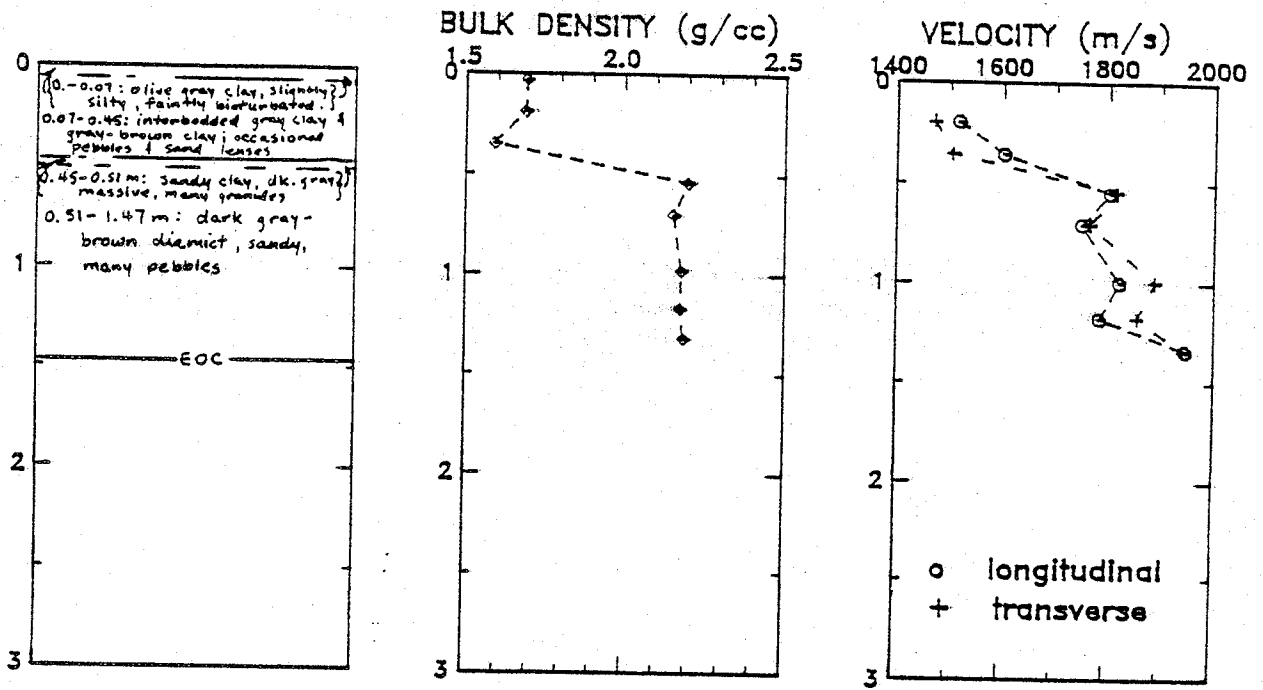


FIGURE 48 - Lithology, Bulk Density, Velocity for PC074

TABLE 38 - Velocity Data for Piston Core 87028-074

Reference temperature used = 3.2 deg C

Depth (m)	Corrected Velocity (m/s)	
	Longitudinal	Transverse
0.20	1518.	1472.
0.36	1603.	1507.
0.55	1804.	1817.
0.71	1751.	1767.
1.00	1823.	1891.
1.18	1786.	1857.
1.34	1948.	1945.

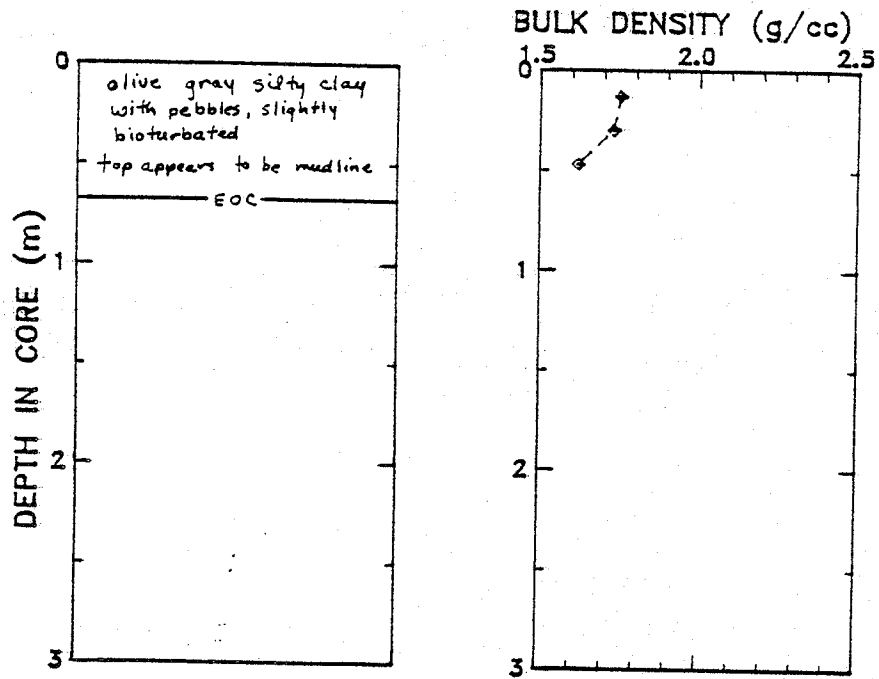


FIGURE 49 - Lithology, Bulk Density for TWC074

87028-090

Core Site 090 is located in western Hudson Bay, as shown in Figure 1. Figures 50 and 51 show water content, vane strength, and salinity profiles for Piston Core 090 and Trigger Weight Core 090, respectively. Tables 39 and 40 also contain the data. The velocity data is presented in Table 41, and Figure 52 shows a lithology sketch and bulk density profile for the piston core. A lithology sketch and bulk density profile for the trigger weight core is shown in Figure 53.

The upper sediments (0 to 3.4 m) in the piston core are olive gray silty clay with abundant sulfide mottles, gradually changing to dark gray, with the abundance of bioturbation gradually decreasing. The physical properties profiles are relatively featureless, with the exception of the vane strength profile. The peak strength profile, however, in spite of some variability, does show a trend of gradually increasing strength with increasing depth. The last measurements taken in each profile reflect the disturbance that occurred during the coring process, and since the remainder of the core is disturbed, no more physical properties measurements were performed.

TABLE 39 - Physical Properties for Piston Core 87028-090

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/ 1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
0.14	77.2	1.61	33	6.9	5.2
0.20	****	****	**	6.6	2.1
0.23	81.1	1.61	33	****	****
0.31	80.2	1.60	32	****	****
0.40	****	****	**	6.9	0.7
0.52	81.3	1.58	33	9.3	1.1
0.63	****	****	**	12.6	0.1
0.73	80.5	1.60	32	****	****
0.84	****	****	**	8.2	2.4
0.95	79.5	1.60	32	****	****
1.06	****	****	**	11.0	0.0
1.15	80.8	1.60	32	****	****
1.25	****	****	**	11.3	0.0
1.33	81.1	1.58	32	****	****
1.45	****	****	**	9.2	0.3
1.55	73.8	1.63	33	****	****
1.68	****	****	**	9.6	3.3
1.81	76.4	1.62	34	****	****
1.92	****	****	**	8.3	5.7
2.15	80.7	1.60	32	****	****
2.26	****	****	**	12.6	5.4
2.34	76.8	1.60	31	****	****
2.47	****	****	**	10.2	3.9
2.53	69.2	1.66	31	****	****
2.66	****	****	**	11.2	2.9
2.74	69.4	1.66	31	****	****
2.86	****	****	**	14.0	1.4
3.02	****	****	**	18.0	10.9
3.09	63.0	1.70	31	****	****
3.22	****	****	**	13.6	4.9
3.32	58.3	1.72	31	****	****
3.42	****	****	**	14.9	4.7
3.76	57.9	1.73	30	****	****
3.90	****	****	**	10.3	1.1
4.05	26.4	2.06	30	****	****

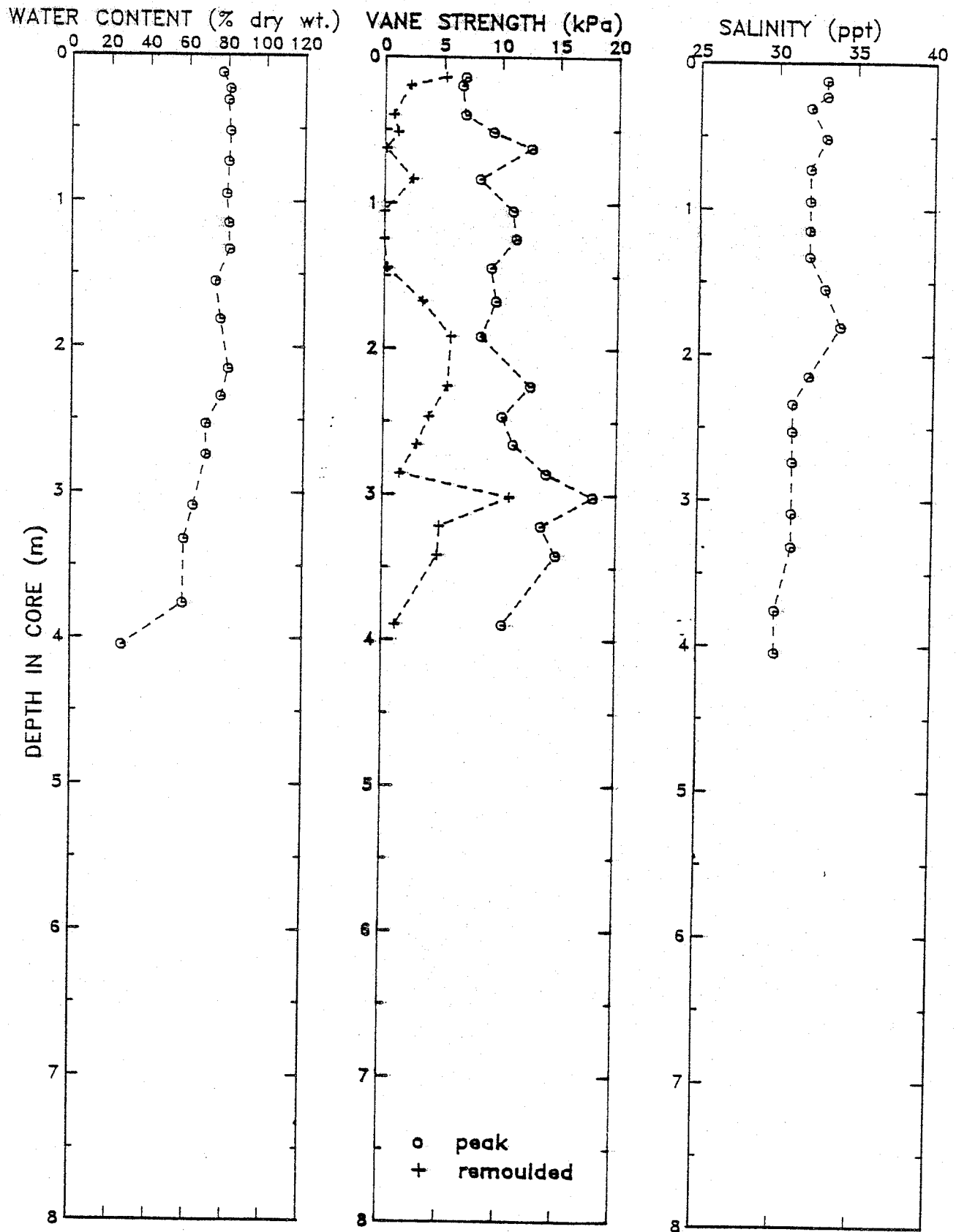


FIGURE 50 - Water Content, Vane Strength, Salinity for PC090

# Hudson 87028 - TWC090

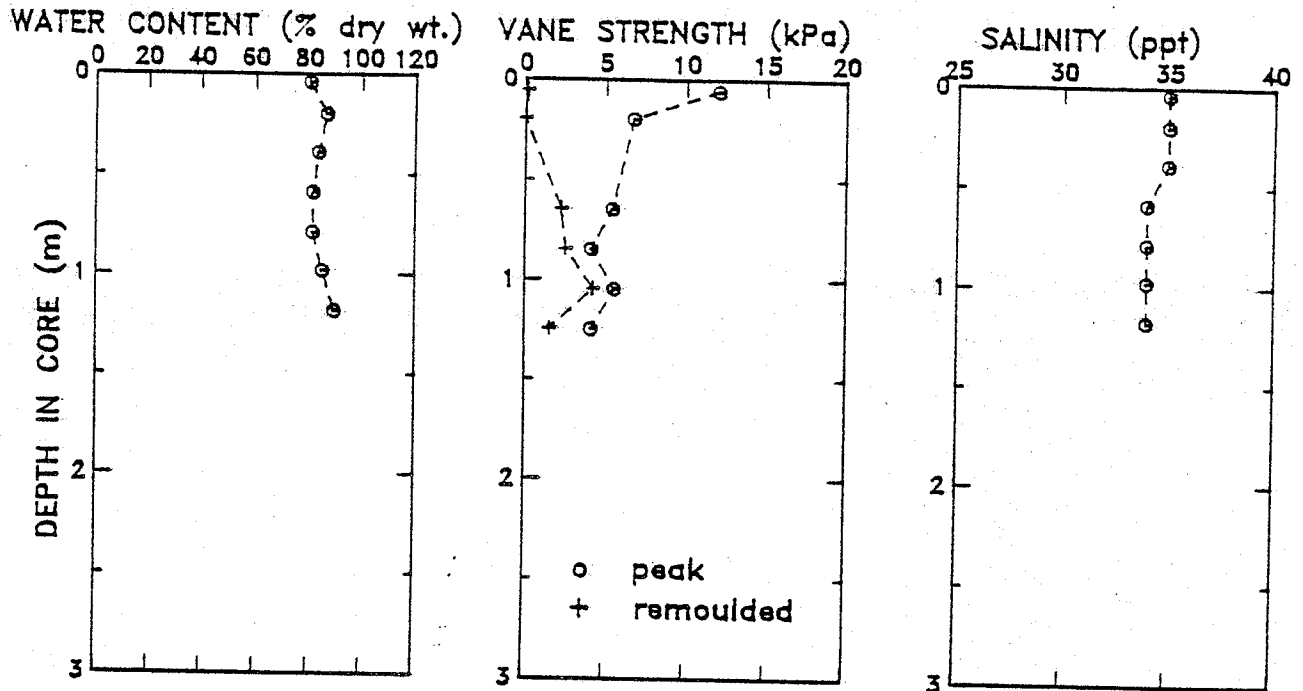


FIGURE 51 - Water Content, Vane Strength, Salinity for TWC090

TABLE 40 - Physical Properties for Trigger Core 87028-090

Subbottom Depth (m)	Water Content (% dry wt)	Bulk Density (g/cc)	Salinity (parts/1000)	Peak Vane Strength (kPa)	Res. Vane Strength (kPa)
0.06	80.4	1.59	35	12.0	0.1
0.20	86.7	1.59	35	6.7	0.0
0.40	83.6	1.57	35	4.9	****
0.59	81.6	1.60	34	****	****
0.65	****	****	**	5.4	2.3
0.79	81.6	1.59	34	****	****
0.85	****	****	**	4.2	2.6
0.98	85.2	1.58	34	****	****
1.05	****	****	**	5.6	4.3
1.18	89.7	1.55	34	****	****
1.25	****	****	**	4.2	1.6



TABLE 41 - Velocity Data for Piston Core 87028-090

Reference temperature used = 3.2 deg C

Depth (m)	Corrected Velocity (m/s)	
	Longitudinal	Transverse
0.32	1458.	1462.
0.75	1456.	1462.
0.95	1456.	1461.
1.15	1456.	1459.
1.35	1456.	1461.
1.55	1461.	1467.
1.80	1459.	1461.
2.16	1455.	1461.
2.35	1458.	1461.
2.55	1465.	1470.
2.75	1464.	1466.
3.10	1465.	1474.
3.32	1466.	1479.
3.77	1472.	1487.

# Hudson 87028 - PC090

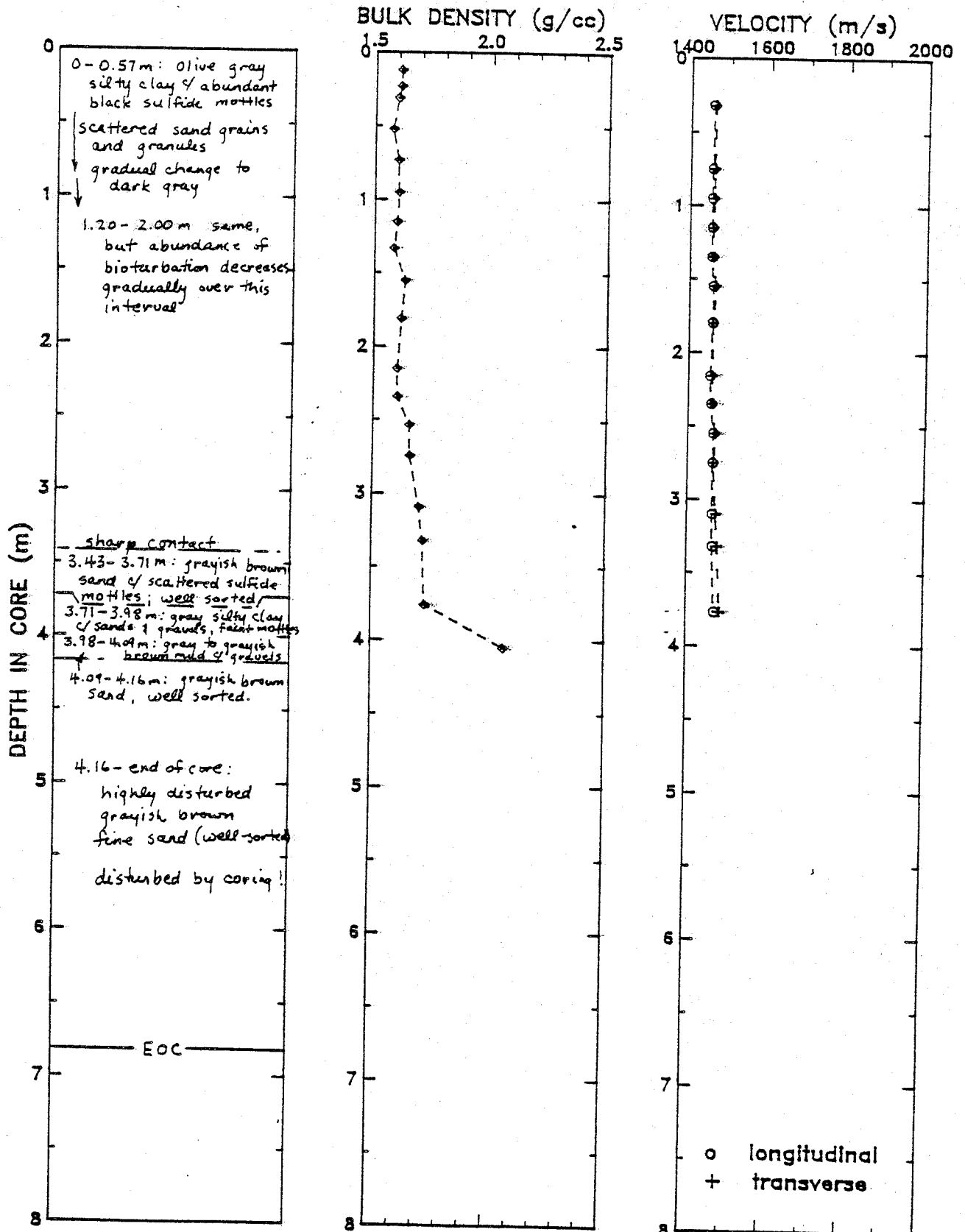


FIGURE 52 - Lithology, Bulk Density, Velocity for PC090

# Hudson 87028 - TWC090

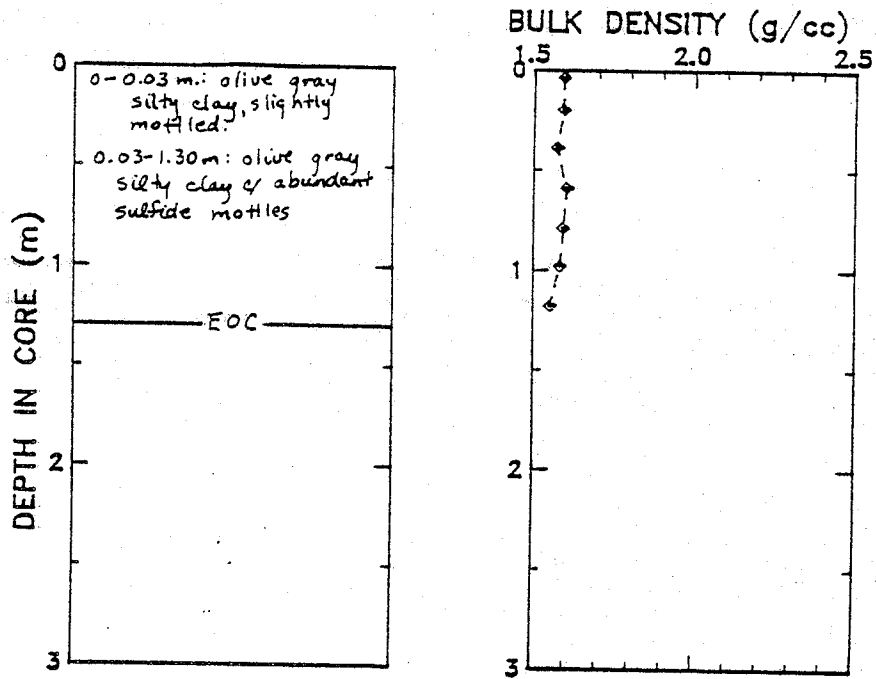


FIGURE 53 - Lithology, Bulk Density for TWC090

## CONCLUSIONS

This preliminary study indicates that the physical properties data provides valuable information regarding what is occurring in the sediment column of these sediments. This excellent suite of data will assist in interpretation of the sedimentological and seismic data.

A more detailed study of the lithologies would help in understanding the anomalies in the data profiles. Grain size samples have recently been taken and that data should also help in answering many questions that arose in looking at the existing physical properties data. After further study, samples may be selected for Atterberg limits testing. The attenuation data (obtained as part of the velocity testing) is currently being processed and may be included in a future report.

## ACKNOWLEDGEMENTS

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INTERVAL	E. EXCA	OTHERS	PLANKT	TOTAL			PERCENT E. EXCA	PERCENT OTHR	PERCENT PLANKT	SAMPLE VOLUME	TESTS ML
				TOTAL	BENTHICS						
3-6	167	461	2	630	628	27	73	0	25	25	
53-56	144	334	0	478	478	30	70	0	15	32	
82-83	136	426	0	562	562	24	76	0	20	28	
102	232	180	0	412	412	56	44	0	20	21	
105-106	193	32	0	225	225	86	14	0	20	11	
126-127	106	3	0	109	109	97	3	0	10	11	

INTERVAL	E. EXCA	OTHERS	PLANKT	TOTAL			PERCENT E. EXCA	PERCENT OTHR	PERCENT PLANKT	SAMPLE VOLUME	TESTS ML
				TOTAL	BENTHICS						
0-1	191	435	0	626	626	31	69	0	25	25	
25-26	103	233	0	336	336	31	69	0	15	22	
30-31	107	348	0	455	455	24	76	0	20	23	
53-54	259	606	0	865	865	30	70	0	20	43	
80-81	146	391	0	537	537	27	73	0	20	27	
105-106	233	62	0	295	295	79	21	0	10	30	
132-133	190	47	0	237	237	80	20	0	25	9	
160-161	51	1	0	52	52	98	2	0	30	2	
185-186	67	15	0	82	82	82	18	0	20	4	
212-213	19	4	0	23	23	83	17	0	20	1	
240-241	23	6	0	29	29	79	21	0	25	1	
275-276	64	6	2	72	70	91	9	3	30	2	
300-301	41	4	0	45	45	91	9	0	25	2	
325-326	19	0	0	19	19	100	0	0	25	1	
350-351	112	6	0	118	118	95	5	0	20	6	
375-376	185	26	6	217	211	88	12	3	25	9	
400-401	57	42	8	107	99	58	42	7	15	7	
455-456	145	401	7	553	546	27	73	1	20	28	
480-481	220	171	0	391	391	56	44	0	25	16	
505-506	266	70	0	336	336	79	21	0	25	13	
530-531	171	557	2	730	728	23	77	0	30	24	
555-556	114	163	14	291	277	41	59	5	25	12	
580-581	113	119	0	232	232	49	51	0	25	9	
605-606	137	173	7	317	310	44	56	2	25	13	
630-631	123	163	7	293	286	43	57	2	20	15	
655-656	139	188	6	333	327	43	57	2	35	10	
680-681	265	297	15	577	562	47	53	3	20	29	
705-706	193	168	7	368	361	53	47	2	25	15	
730-731	99	162	4	265	261	38	62	2	25	11	
755-756	149	177	3	329	326	46	54	1	20	16	
780-781	136	146	2	284	282	48	52	1	20	14	
805-806	111	159	6	276	270	41	59	2	25	11	
830-831	138	166	8	312	304	45	55	3	20	16	
855-856	142	161	9	312	303	47	53	3	25	12	
880-881	123	164	6	293	287	43	57	2	20	15	
930-931	143	202	8	353	345	41	59	2	15	24	
955-956	146	183	6	335	329	44	56	2	20	17	
980-981	141	162	4	307	303	47	53	1	20	15	
1005-1006	156	182	8	346	338	46	54	2	30	12	
1030-1031	108	160	5	273	268	40	60	2	20	14	

# CORE 87033-15

## E. EXCAVATUM AND PLANKTONICS

