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INTRODUCTION

This brief report summarizes the data collected on the distribution and composition of the sediments of South Bay, Lake Huron. The investigation was initiated in 1969 as part of a comparative study of the composition of the sediments from each of the Great Lakes. South Bay was chosen as a sedimentary environment relatively unaffected by man's influence (Kemp et al., 1972).

In order to select a suitable core sampling location, a preliminary survey of the sediment distribution was made in 1969. A location near the deepest sounding was chosen as being representative of South Bay and was sampled in 1970. A further survey of the nearshore zone was carried out in 1972 in order to furnish more data on the sediment distribution of this complex portion of the bay.

ACKNOWLEDGEMENTS

We would like to thank the staff of the Ontario Ministry of Natural Resources Station at South Baymouth for their assistance and hospitality throughout all phases of this study. In particular we are very grateful for the help received when our boats or snowmobiles broke down and for the use of laboratory space at the station. We would also like to thank L. Mansey for the bottom fauna counts, A. Nauwerck for the microscopic examination of the sediment core and J. Reckahn for valuable comments. Finally we would like to thank Dr. P.G. Sly, Chief, Process Research Division, for permission to publish this material.

SAMPLING

The initial surface sediment sampling and acoustic profiling was carried out in August 1969 in the Canadian Department of Energy Mines and Resources vessel C.S.L. LeMoyne. Samples were collected at the intersections of a 1 km grid based on the Universal Transverse Mercator (UTM) coordinate system (Figure 1., Table 1.).

Surficial lake bottom samples were collected with a Shipek grab sampler (Thomas et al., 1973). Eh and pH measurements were made at a depth of 1.5 cm below the sediment surface in each Shipek bucket. The topmost 3 cm of sediment was sub-sampled at each station for textural and geochemical analysis. The sediment from a separate Shipek bucket was washed through a nylon mesh sieve (40 mesh). The benthic organisms retained on the sieve were counted in the laboratories at C.C.I.W. Full details of the procedures are given in Thomas et al. (1973).

Echo sounding was carried out with a Kelvin Hughes MS 26 B sounder, operating at 14.25 kHz. The gross distribution of the major sedimentary units was mapped on the basis of east to west echo sounding profiles at 1 km intervals along each of the sample stations. In addition a number of northeast to southwest profiles were run to map the sedimentary units.

Coring at station I-12 was carried out in May 1970. Cores were collected with a triple Benthos gravity corer (Kemp et al., 1971). The cores were sub-sampled within 2 hours of collection. Full details of the procedures are given in Kemp et al., (1971, 1972).

Further surface sediment samples were collected in September 1972. Shipek samples were obtained on a series of transects from the shoreline out towards deep water around South Bay. The samples were described aboard ship and the results used in compilation of a detailed sediment distribution map.

LABORATORY METHODS

Details of the laboratory methods used may be found in Kemp et al. (1972), Thomas et al. (1973) and Kemp and Thomas, 1976.

SEDIMENT DISTRIBUTION AND TEXTURAL PROPERTIES

As in Lake Huron proper, three major units of surficial deposits are recognized in South Bay on the basis of the echo sounding and the sampling: (1) glacial till and bedrock; (2) glaciolacustrine clay; and (3) postglacial muds (Thomas et al., 1973). Sand is a fourth and very minor unit in South Bay, being only observed in a few shallow water locations. The gross sediment distribution map is shown in Figure 2.

The postglacial muds occur in two continuous basins of deposition corresponding to the deeper portions of the Inner and Outer Basins (Figure 2). These basins are separated by a sill at the Narrows. The sill and the nearshore zone are composed of glaciolacustrine clay, till or bedrock.

Glaciolacustrine sediment also surfaced at a number of locations within the zone of postglacial mud in the Inner Basin (Figure 2). These outcroppings occur at locations where the bottom relief is steepest. The absence of modern sediment at these locations may indicate the presence of relatively strong bottom currents. Bedrock overlain by cobbles occurs in the vicinity of Glycerine Rock.

The pattern of deposition is simple with a natural superposition of sediment units reflecting the glacial and postglacial history of South Bay. This pattern can be seen in the transect along the axis of South Bay and the transects normal to the axis of the Inner and Outer Basins (Figure 3).

Figure 4 shows the detailed surficial sediment distribution map of South Bay, based on the visual description of the contents of each Shipek grab sample. As may be seen by a comparison of Figures 2 and 4, glaciolacustrine clay is frequently overlain by sandy mud, sand or gravel, while the till or bedrock surfaces are usually covered with sand, gravel, cobbles or boulders.

The sediment particle size distribution is shown in Figure 5 and is listed in Table 2. Unfortunately, gravel, which was observed at some of the shallow water stations, was excluded from the analyses. The results in Table 2 give the relative percentages of sand, silt and clay. Clay- and silt-sized materials predominate in the deeper offshore postglacial muds in the Inner Basin, while sand- and silt-sized materials dominate the nearshore zone and the sill. The sand and silt content of the modern muds is higher in the Outer Basin and the northeast portion of the Inner Basin and Roberts Bay and reflects the higher energy conditions in these shallow water zones.

RATES OF SEDIMENTATION AND SOURCES OF SEDIMENT

Sedimentation rates were determined at station I-12 from a ^{14}C date of 4260 years B.P. at 141.5 cm and from pollen analyses. A modern sedimentation rate of 150 $g.m.^{-2}$ $yr.^{-1}$ (or 0.6 mm. $yr.^{-1}$) is calculated from the location of the Ambrosia horizon at 6.0 cm (Kemp et al., 1972). A sedimentation rate of 0.3 mm. $yr.^{-1}$ from the ^{14}C date indicates that sedimentation was slower prior to the clearing of the land on the island around 100 years ago. It is calculated that 7650 metric tons of fine-grained sediment is being deposited annually over the area of postglacial mud distribution as depicted in Figure 2, assuming that the muds are accumulating at 0.6 mm. $yr.^{-1}$ over the whole area. The fine-grained sediment must originate primarily from river inputs as bedrock, cobbles or boulders and are the dominating shoreline materials around South Bay.

SEDIMENT GEOCHEMISTRY

The distribution of organic matter in the surface sediments is given in Table 2 and illustrated in Figure 6. The distribution follows the same trend as grain size with the highest organic matter values in the fine-grained sediments. Carbonates are low in the surficial sediments except at some of the shallow water locations in Roberts Bay and in the northeast portion of the Inner Basin (Figure 7, Table 2). These high values may be due to the presence of ground up shell materials in the sediment (visible shells were removed from the samples prior to analysis) or to carbonate minerals from the tills.

As in Lake Huron (Thomas et al., 1973), sediment Eh is most positive in the nearshore zone and most negative in the organic rich postglacial muds (Figure 8, Table 2). Sediment pH is generally between 7.0 and 7.5 (Figure 9, Table 2). Lower pH values in the nearshore zone and on the sill may be due to the presence of weeds which were found throughout South Bay in water depths less than 15 meters. As may be seen in the core results later, both pH and Eh change markedly near the sediment-water interface.

Analysis of a surface sediment-sample from station I-12 shows that the surficial materials are composed of 49% by weight of clay minerals (illite 30%, chlorite 9% and kaolinite 9%), 43% quartz and feldspars (mainly quartz), 6% organic matter and 2% calcium carbonate. The composition of the sediment is similar to that found in Lake Huron

(Thomas et al., 1973) and the Lower Great Lakes (Kemp et al., 1972).

The distribution of pH, Eh, C, N, P and S in the core from station I-12 is shown in Figure 10. The results have been discussed at length by Kemp et al. (1972). The above data together with the concentrations of major and trace elements in the core are given in Tables 3, 4 and 5. The elemental data are discussed in a recent publication by Kemp and Thomas (1976).

The findings show that the South Bay sediments are relatively uncontaminated as compared to other locations in the Great Lakes. High surficial concentrations of Mn and P (Tables 3 and 4) are mainly due to upward migration of these elements in the pore waters. The small decrease in organic carbon and nitrogen in the core (Table 3) may be ascribed to diagenesis of the organic matter. Slightly higher concentrations of Pb, Zn, Ni, Cr and Cu in the surface sediments are probably due to atmospheric inputs of these elements (Kemp and Thomas, 1976).

Station I-12 was visited in May, July and October 1970. No discernible differences could be found in organic carbon, carbonate carbon, pH and Eh values, to those shown in Table 3, on any occasion. This result indicates a seasonal uniformity for these parameters in the offshore postglacial muds.

SEDIMENT BIOLOGY

Benthic organisms were determined in the Shipek samples collected in 1969 (Table 6). Chironomidae, Amphipoda and Oligochaeta were the dominant fauna, with lesser numbers of Gastropoda, Ephemeroptera, Pelecypoda, Tipulidae and Nematoda. The low numbers of some of the nearshore stations are due to the hard nature of the bottom and the difficulty in retrieving a full Shipek bucket. It should be noted that the Shipek sampler is not the best for bottom faunal analysis (Flannagan, 1970). The total numbers of benthic fauna in the surficial sediments of South Bay are less than those reported for Lake Huron using similar sampling techniques (Thomas et al., 1973).

A sediment core from station I-12 was examined microscopically. The organic fraction in the surface sediments (0-3 cm) consisted of unrecognizable organic debris, fecal pellets from plankton or bottom animals, together with fine allochthonous particles and diatom fragments. Dead diatoms were abundant in the surface sediments with centric forms dominating. Table 7 lists the composition of diatoms in the oxidized surficial sediments. Only a few living diatoms (*Melosira distans*) were observed.

In the reduced sediment zone below 3 cm depth, there was clearly an oxygen-free situation. The sediment contained many colourless organisms, such as sulphur bacteria (*Beggiatoa* and *Macromonas*) and blue algae (*Gomphosphaera aponina*). Cysts of planktonic forms (*Peridinium*) were also observed.

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FIGURE 1. Station locations and bathymetry of South Bay, Lake Huron. Dashed line A-A', D-D' and J-J' show echo sounding tracks which are depicted in Figure 3.

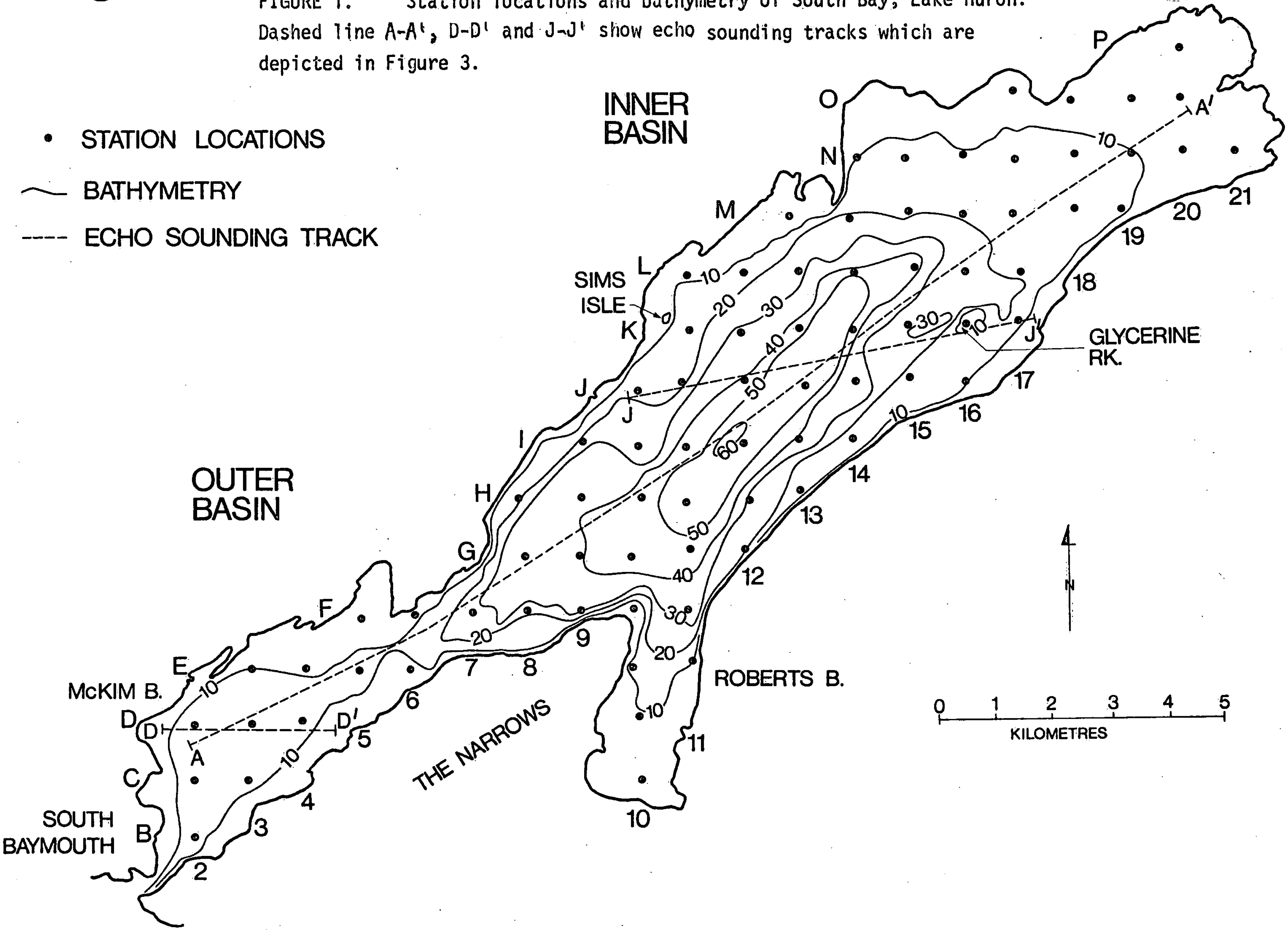


FIGURE 2. Gross surficial sediment distribution in South Bay, Lake Huron.

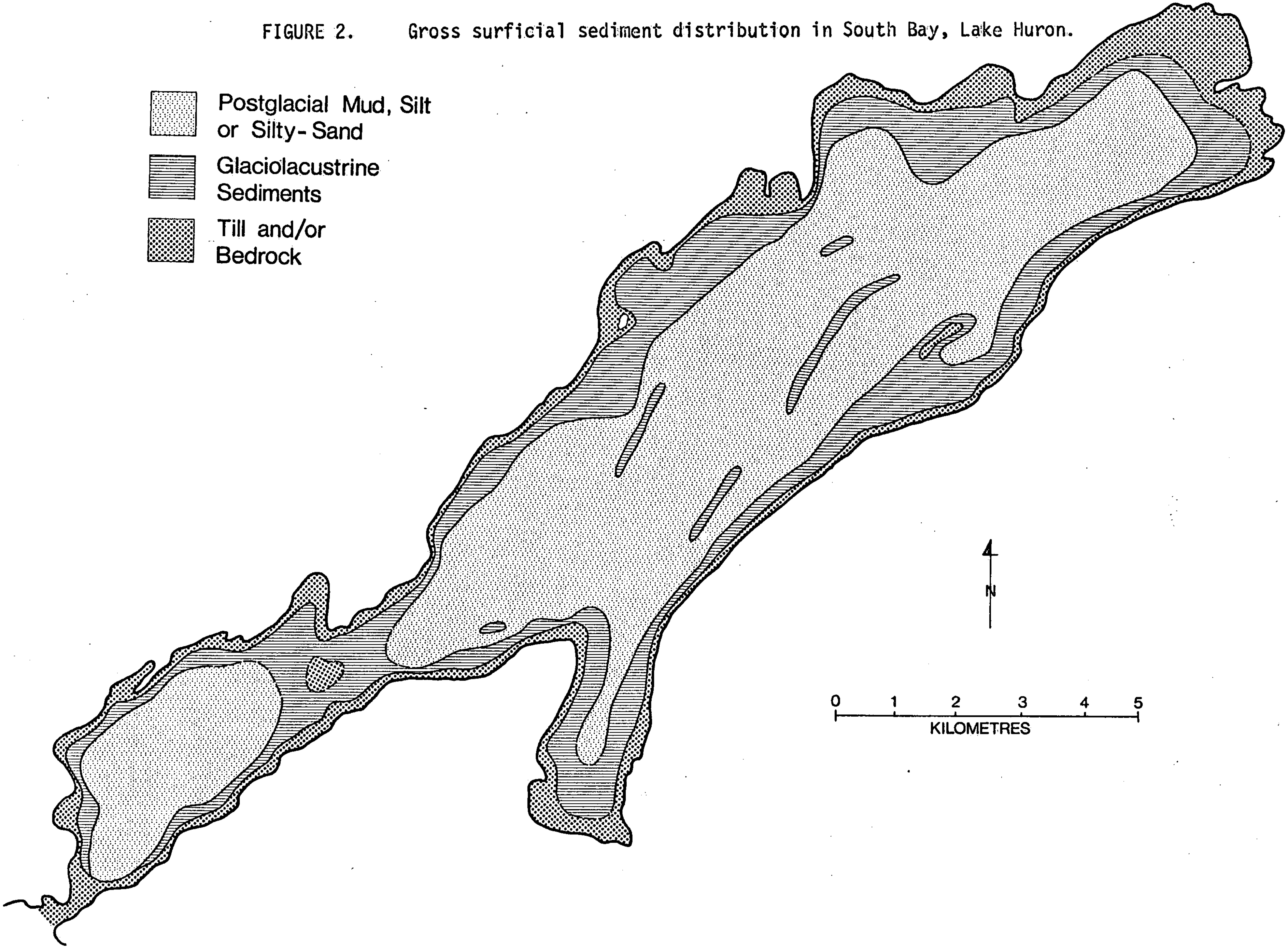


FIGURE 3. Cross-sections along echo sounding transects in South Bay, Lake Huron.

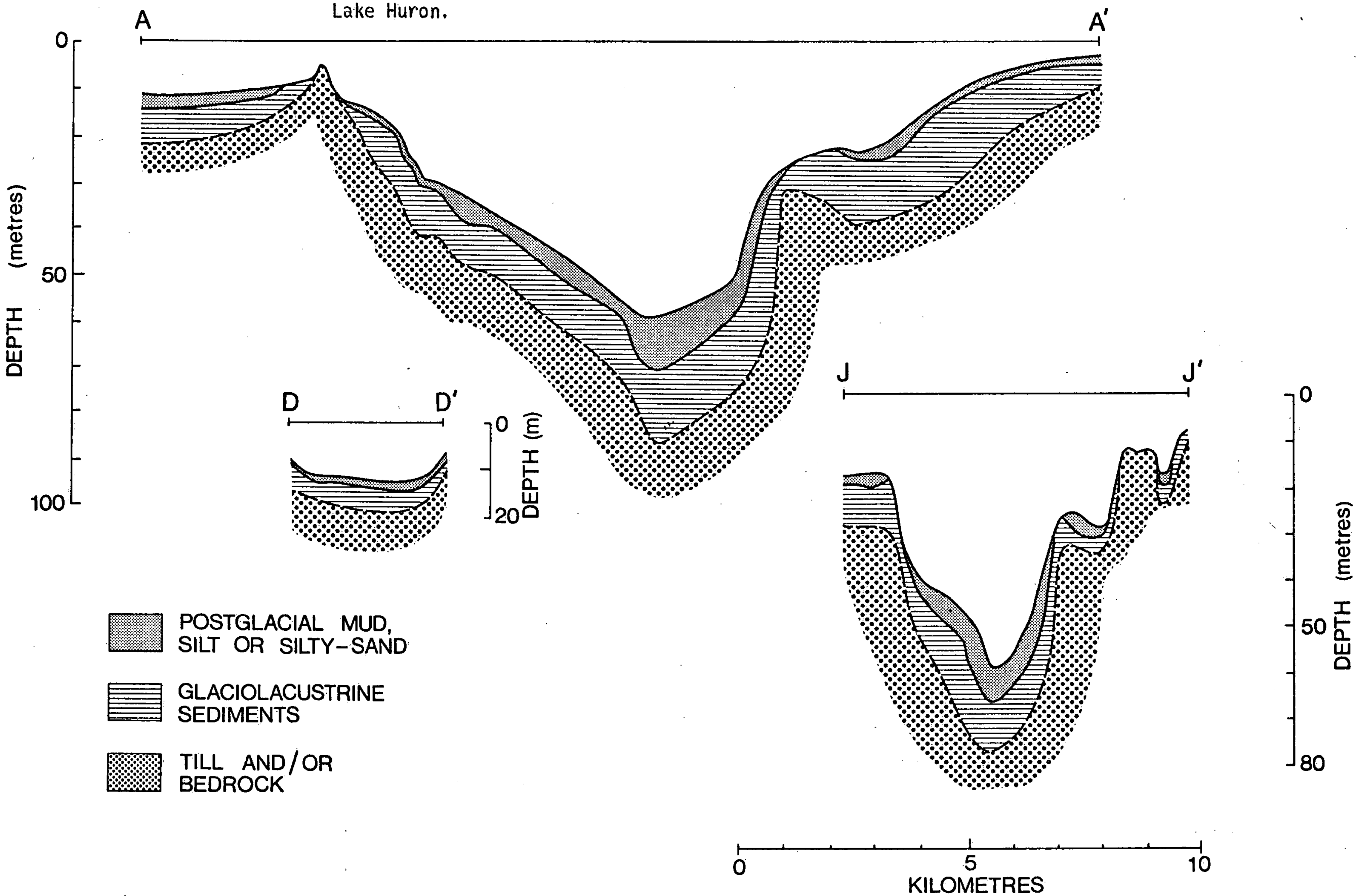


FIGURE 4. Detailed distribution map of the surface sediments (0-12 cm) in South Bay, Lake Huron (ms/gc or s/gc represent a layer of muddy sand or sand overlying glacial clay).

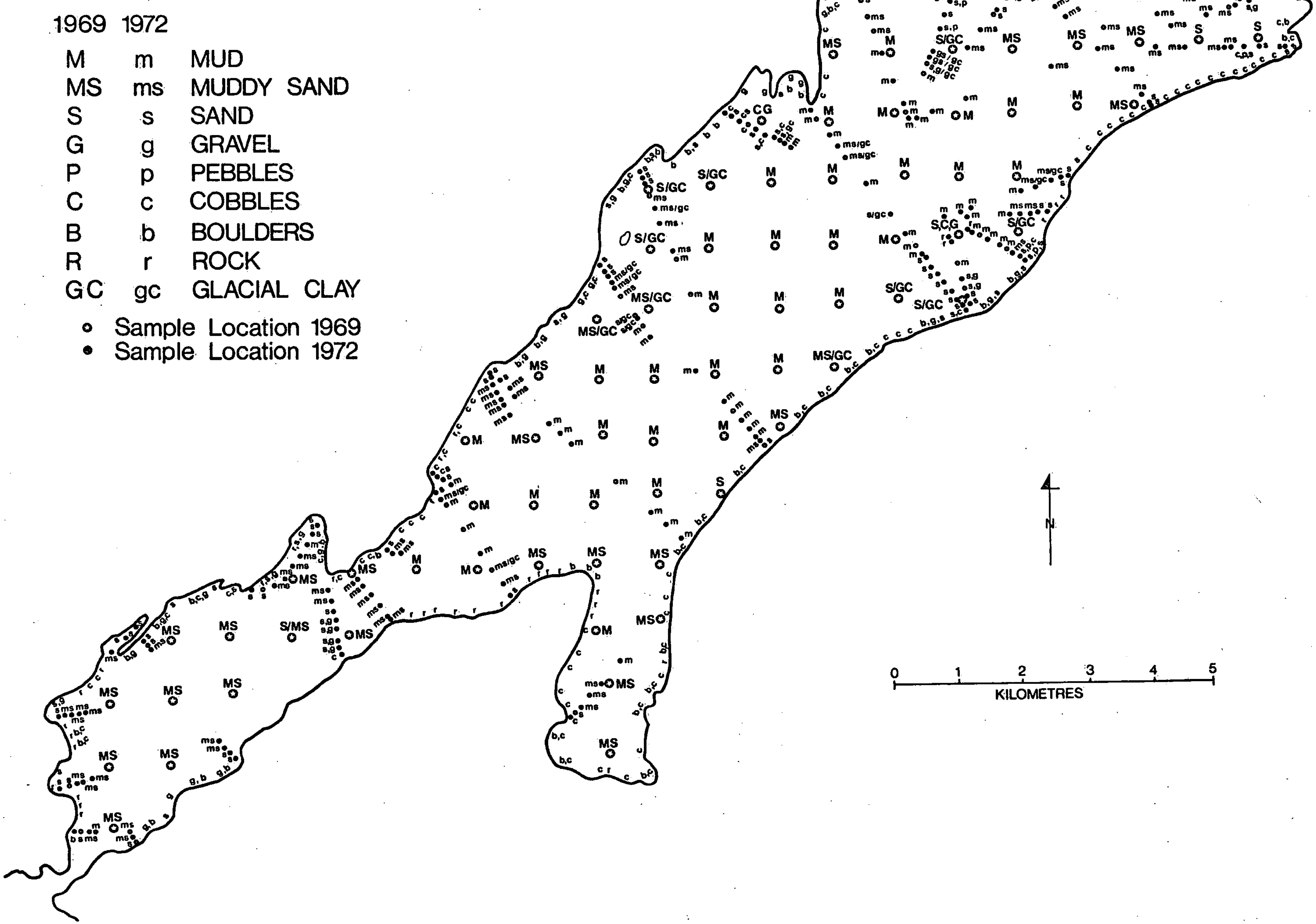


FIGURE 5. Sediment particle size distribution of the surficial sediments (0-3 cm) of South Bay, Lake Huron (Gravel excluded).

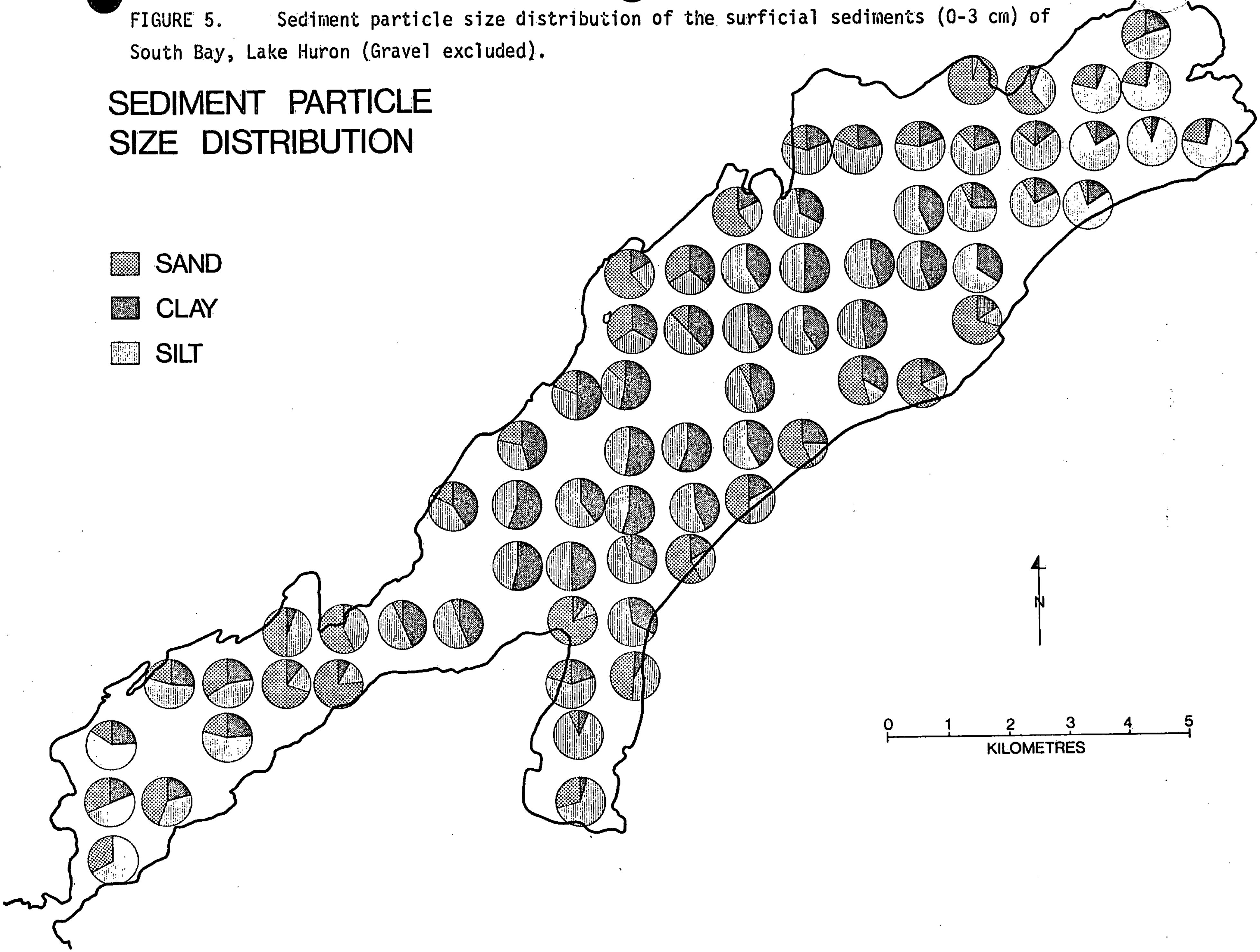


FIGURE 6. Distribution of organic matter in the surficial sediments of South Bay, Lake Huron.

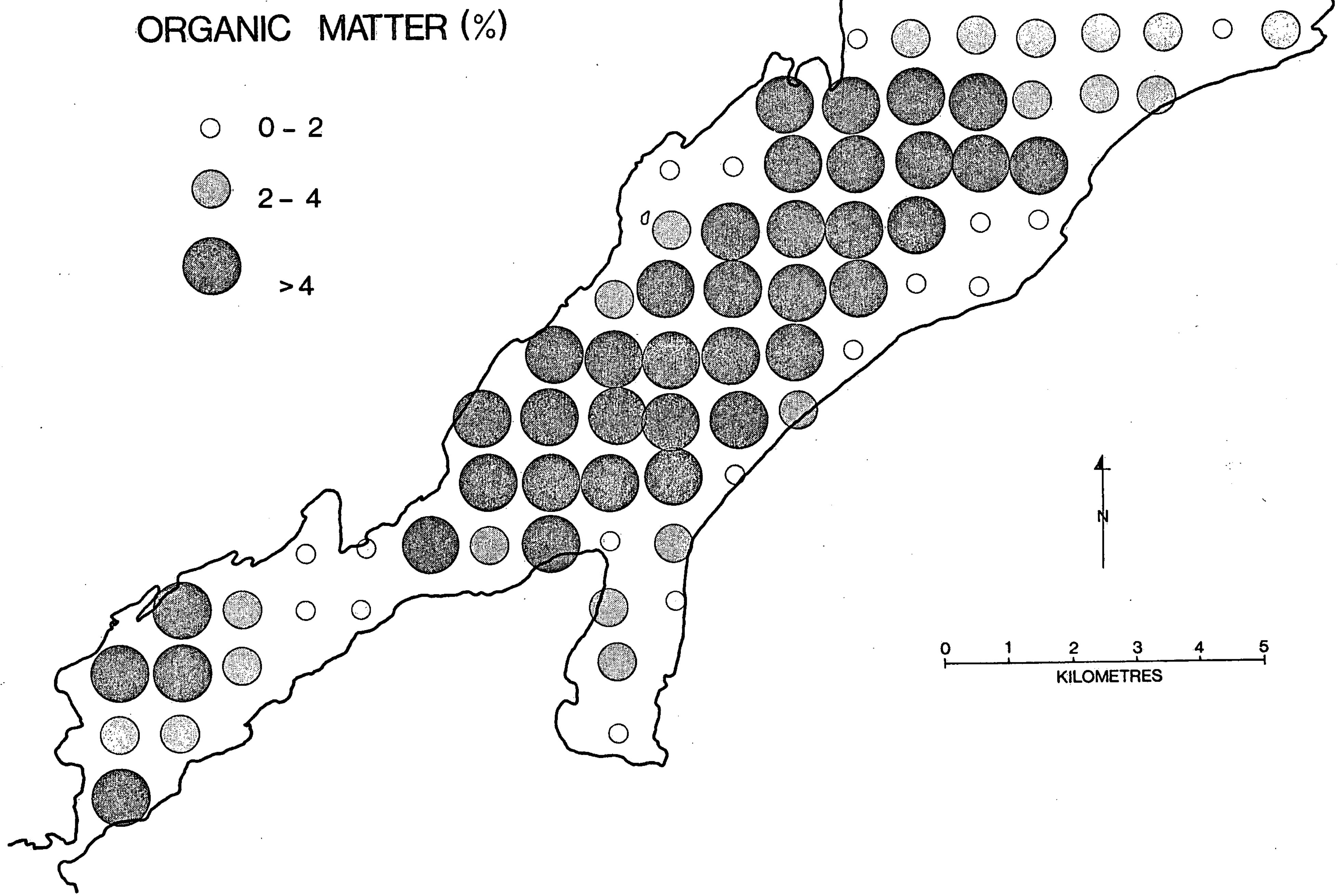


FIGURE 7. Distribution of carbonates in the surficial sediments of South Bay, Lake Huron.

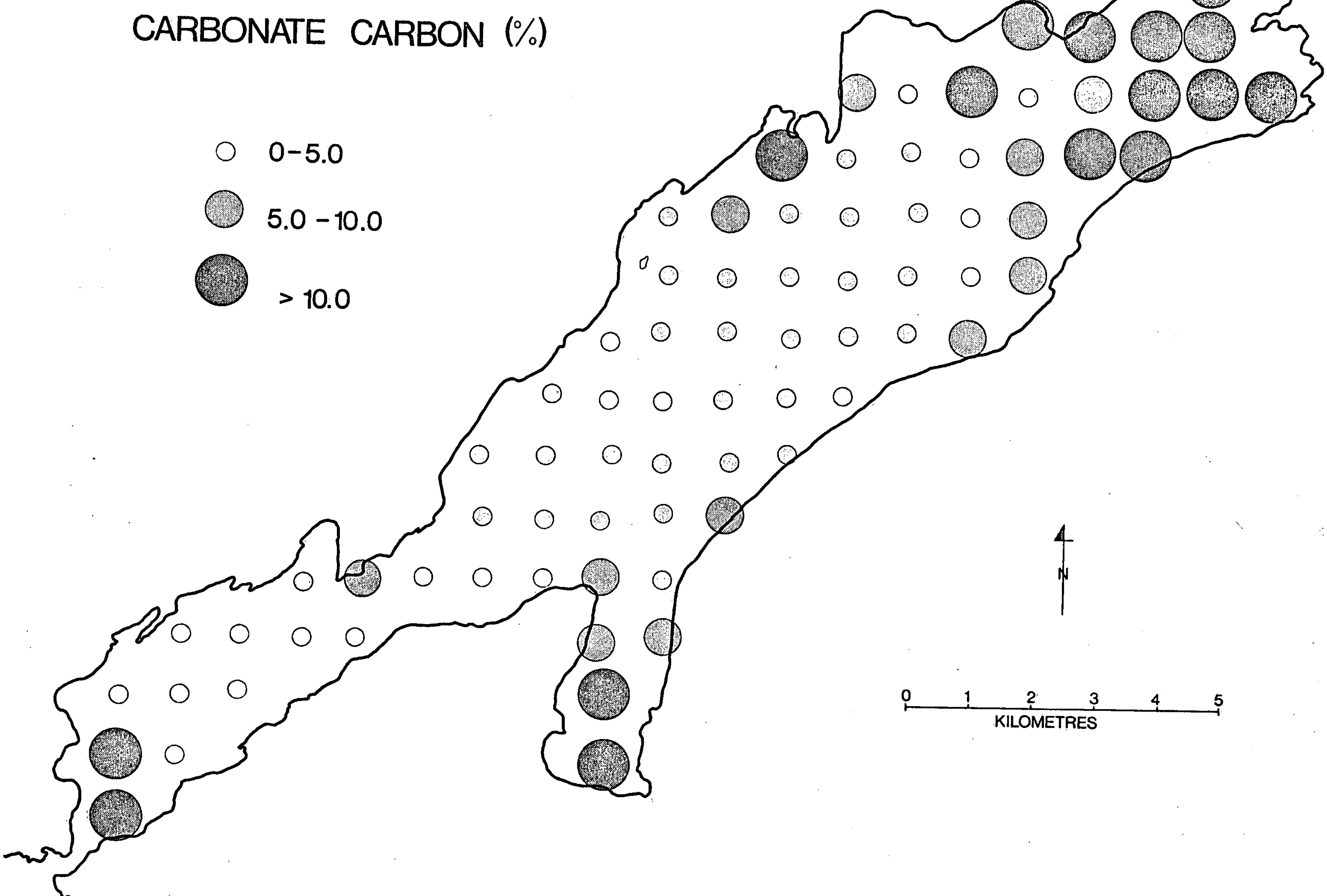


FIGURE 8. Distribution of Eh in the surficial sediments of South Bay, Lake Huron.

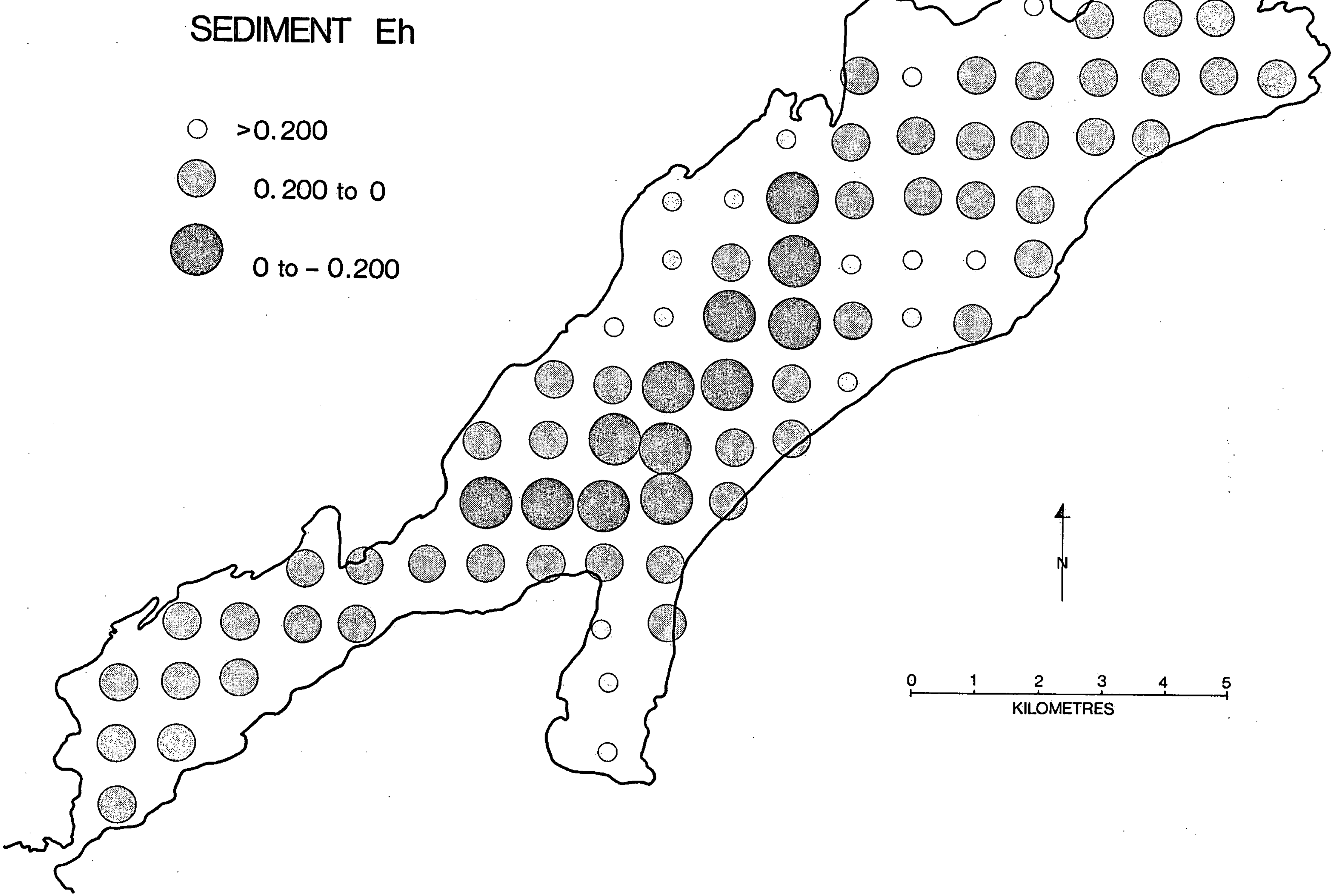
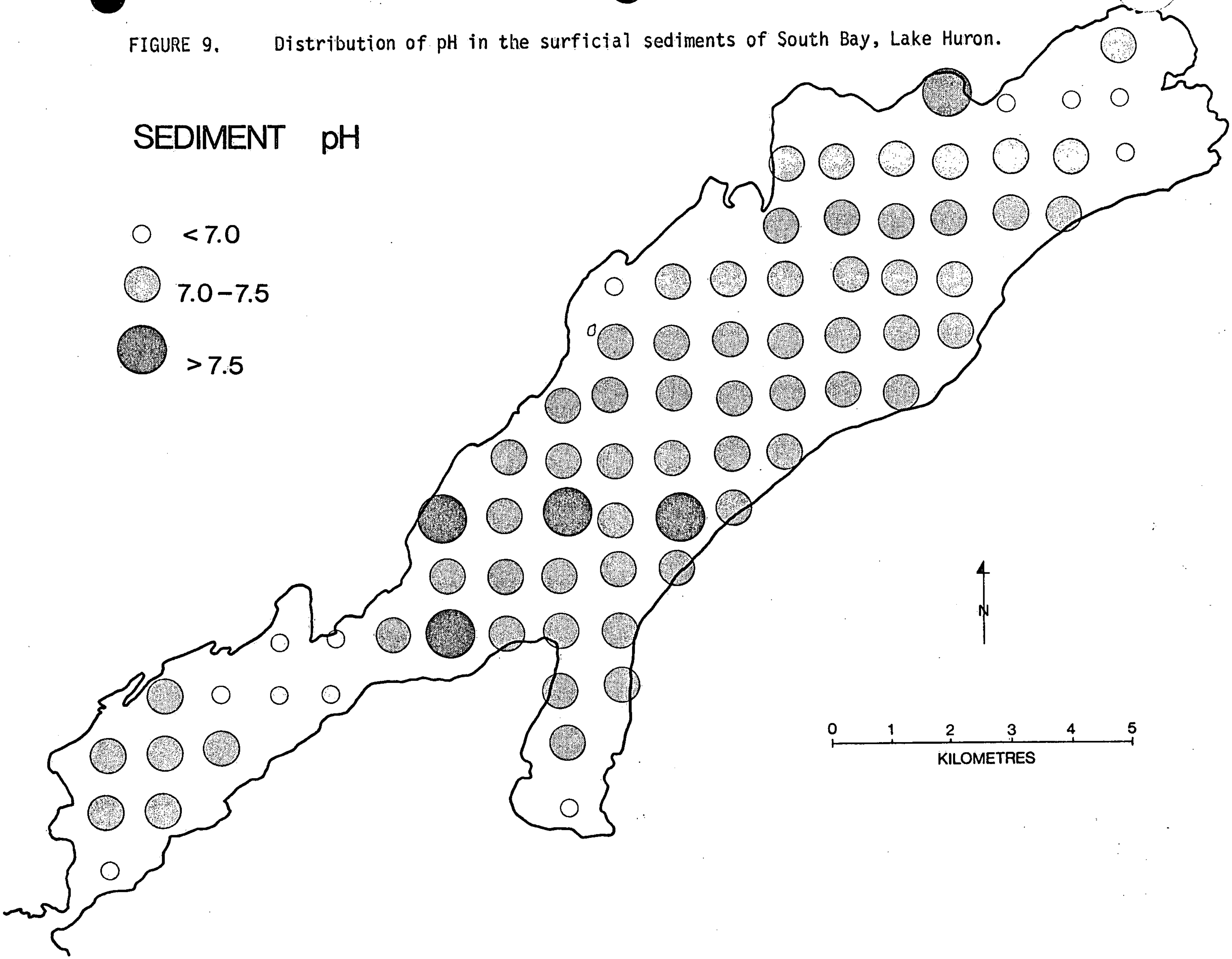


FIGURE 9. Distribution of pH in the surficial sediments of South Bay, Lake Huron.



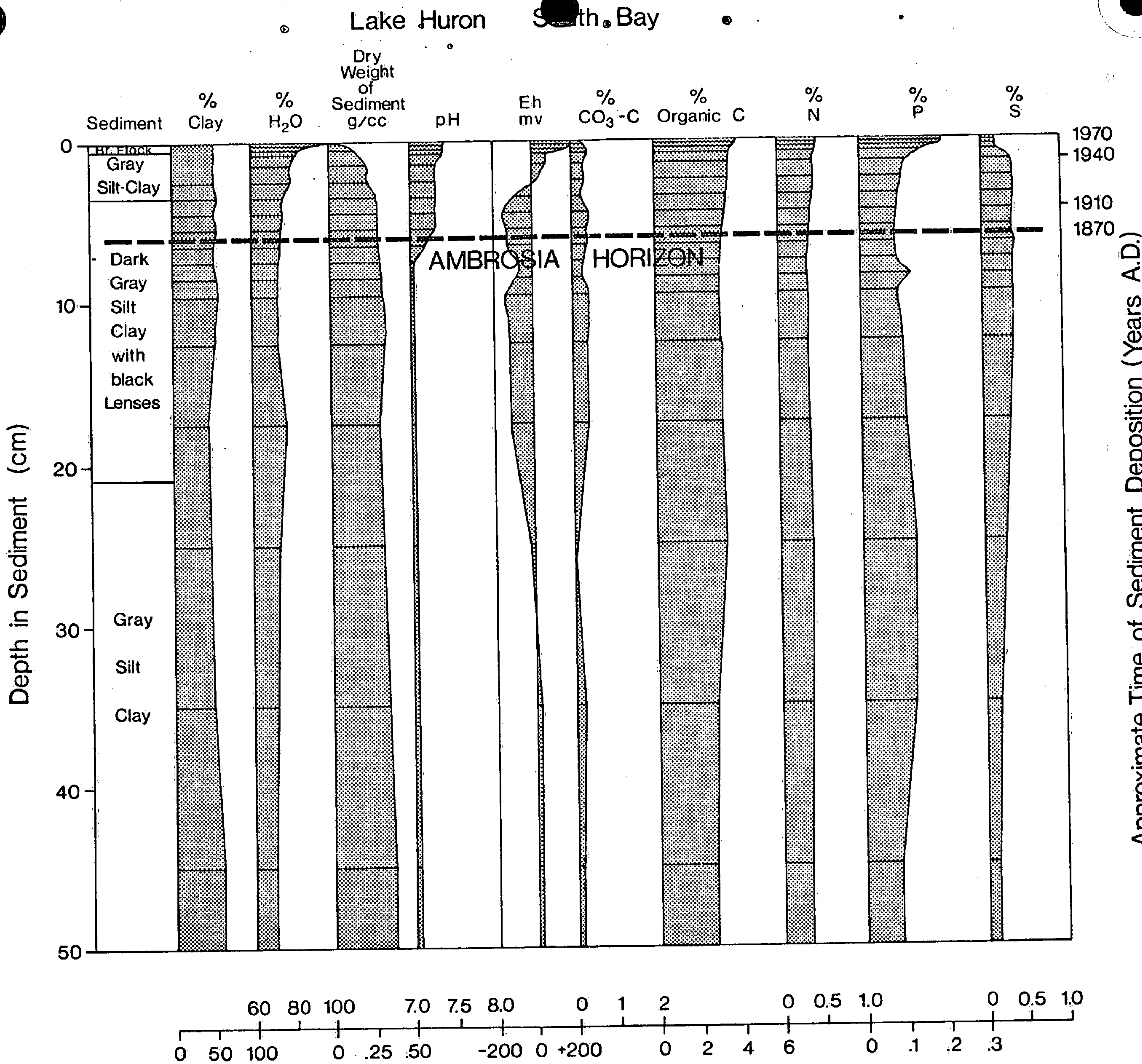


FIGURE 10. Chemical and physical properties of a core from Station I-12 in South Bay, Lake Huron.

TABLE 1. Station numbers, station locations and water depths in South Bay, Lake Huron.

Station Number	Station Location Lat. N.	Station Location Long. W.	Water Depth m
B-2	45° 33.9'	82° 0.0'	10
C-2	45° 34.4'	82° 0.0'	15
C-3	45° 34.4'	81° 59.2'	13
C-10	45° 34.4'	81° 53.8'	4
D-2	45° 35.0'	82° 0.0'	14
D-3	45° 35.0'	81° 59.2'	13
D-4	45° 35.0'	81° 58.4'	13
D-10	45° 35.0'	81° 53.8'	18
E-3	45° 35.5'	81° 59.2'	12
E-4	45° 35.5'	81° 58.4'	10
E-5	45° 35.5'	81° 57.7'	12
E-6	45° 35.5'	81° 56.9'	10
E-10	45° 35.6'	81° 53.9'	15
E-11	45° 35.6'	81° 53.1'	10
F-5	45° 36.1'	81° 57.7'	7
F-6	45° 36.1'	81° 56.9'	5
F-7	45° 36.1'	81° 56.1'	23
F-8	45° 36.1'	81° 55.4'	22
F-9	45° 36.1'	81° 54.6'	36
F-10	45° 36.1'	81° 53.9'	9
F-11	45° 36.1'	81° 53.1'	35
G-8	45° 36.7'	81° 55.4'	36
G-9	45° 36.7'	81° 54.6'	41
G-10	45° 36.7'	81° 53.9'	46
G-11	45° 36.8'	81° 53.1'	45
G-12	45° 36.8'	81° 52.3'	17
H-8	45° 37.2'	81° 54.7'	25
H-9	45° 37.2'	81° 54.7'	35

H-10	45^{o} 37.2'	81^{o} 53.8'	44
H-11	45^{o} 37.2'	81^{o} 53.1'	54
H-12	45^{o} 37.2'	81^{o} 52.2'	25
H-13	45^{o} 37.3'	81^{o} 51.5'	16
I-9	45^{o} 37.7'	81^{o} 54.7'	31
I-10	45^{o} 37.6'	81^{o} 53.9'	25
I-11	45^{o} 37.6'	81^{o} 53.1'	46
I-12	45^{o} 37.8'	81^{o} 52.3'	54
I-13	45^{o} 37.8'	81^{o} 51.5'	40
I-14	45^{o} 37.8'	81^{o} 50.8'	16
J-10	45^{o} 38.2'	81^{o} 53.9'	20
J-11	45^{o} 38.3'	81^{o} 53.2'	20
J-12	45^{o} 38.3'	81^{o} 52.3'	40
J-13	45^{o} 38.2'	81^{o} 51.4'	55
J-14	45^{o} 38.3'	81^{o} 50.8'	34
J-15	45^{o} 38.4'	81^{o} 50.0'	16
J-16	45^{o} 38.3'	81^{o} 49.7'	14
K-11	45^{o} 38.9'	81^{o} 53.1'	15
K-12	45^{o} 38.9'	81^{o} 52.4'	32
K-13	45^{o} 38.9'	81^{o} 51.6'	51
K-14	45^{o} 38.9'	81^{o} 50.8'	52
K-15	45^{o} 38.9'	81^{o} 50.0'	24
K-16	45^{o} 38.9'	81^{o} 49.3'	10
K-17	45^{o} 38.9'	81^{o} 48.5'	14
L-11	45^{o} 39.4'	81^{o} 53.1'	9
L-12	45^{o} 39.4'	81^{o} 52.4'	13
L-13	45^{o} 39.4'	81^{o} 51.6'	28
L-14	45^{o} 39.4'	81^{o} 50.8'	45
L-15	45^{o} 39.4'	81^{o} 50.1'	44
L-16	45^{o} 39.4'	81^{o} 49.3'	24
L-17	45^{o} 39.4'	81^{o} 48.5'	20
M-13	45^{o} 39.9'	81^{o} 51.6'	5
M-14	45^{o} 39.9'	81^{o} 50.8'	23
M-15	45^{o} 39.9'	81^{o} 50.1'	24
M-16	45^{o} 39.9'	81^{o} 49.3'	18
M-17	45^{o} 39.9'	81^{o} 48.6'	16

M-18	45^{o} 39.9'	81^{o} 47.8'	14
M-19	45^{o} 39.9'	81^{o} 47.2'	12
N-14	45^{o} 40.5'	81^{o} 50.7'	10
N-15	45^{o} 40.5'	81^{o} 50.1'	13
N-16	45^{o} 40.5'	81^{o} 49.3'	14
N-17	45^{o} 40.5'	81^{o} 48.5'	14
N-18	45^{o} 40.5'	81^{o} 47.8'	12
N-19	45^{o} 40.5'	81^{o} 47.0'	10
N-20	45^{o} 40.5'	81^{o} 46.2'	8
N-21	45^{o} 40.5'	81^{o} 45.5'	4
O-17	45^{o} 41.2'	81^{o} 48.5'	3
O-18	45^{o} 41.0'	81^{o} 47.8'	8
O-19	45^{o} 41.0'	81^{o} 47.0'	8
O-20	45^{o} 41.0'	81^{o} 46.2'	6
P-20	45^{o} 41.6'	81^{o} 46.2'	3

TABLE 2. Sediment description, Eh, pH, organic matter and calcium carbonate content and sediment texture of surface samples (0-3 cm) from South Bay, Lake Huron (percentages refer to dry weight of sediment).

Station Number	Sediment Description	Eh mv	pH	Organic Matter %	Calcium Carbonate %	Sediment Texture: Sand %	Silt %	Clay %
B-2	Black silty sand	+.030	6.9	4.38	16.74	30.6	68.5	1.0
C-2	Dark gray silty sand	+.060	—	3.92	11.41	29.7	55.8	14.5
C-3	Dark gray sandy silt	+.070	7.4	2.99	3.58	41.5	43.3	15.2
C-10	Gray silty sand	+.330	6.9	1.66	11.82	31.2	63.1	5.7
D-2	Dark gray silt	+.100	7.2	4.98	2.41	12.2	66.8	21.0
D-3	Dark gray sandy silt	+.110	7.1	5.48	1.49	—	—	—
D-4	Dark gray silty sand	+.090	7.2	3.73	1.74	16.4	62.6	20.9
D-10	Dark gray sandy silt	+.210	7.2	3.19	11.16	6.6	85.9	7.5
E-3	Dark gray silty sand	+.110	7.1	4.00	1.58	13.6	61.6	24.8
E-4	Dark gray sandy silt	+.180	6.8	3.80	0.74	35.8	43.8	20.4
E-5	Sand/clayey sand	+.130	7.0	0.89	0.99	71.9	23.0	5.0
E-6	Dark gray sandy silt	+.160	6.9	1.22	3.58	79.9	14.6	5.5
E-10	Dark gray silty clay	+.315	7.3	3.16	6.24	20.3	60.8	18.6
E-11	Dark gray sandy silt	+.150	7.0	1.16	5.83	48.2	43.9	7.9
F-5	Dark gray silty sand	+.180	6.6	1.37	1.58	49.7	44.4	5.9
F-6	Dark gray silty sand	+.090	6.8	1.44	10.99	63.2	32.7	4.1
F-7	Dark gray silty clay	+.030	7.4	4.48	1.41	8.5	49.5	42.0

F-8	Dark gray silty clay	+.060	7.7	3.92	1.74	40.5	56.1	42.9
F-9	Dark gray silty clay	+.110	7.3	5.36	3.83	—	—	—
F-10	Dark gray silty sand	+.130	7.0	0.94	5.83	81.0	13.6	5.4
F-11	Dark gray sandy silt	+.130	7.4	5.45	3.99	0	65.1	35.3
G-8	Dark gray silty clay	-.020	7.2	6.27	1.58	—	—	—
G-9	Dark gray silty clay	-.170	7.3	6.07	1.41	1.2	45.1	53.7
G-10	Dark gray silty clay	-.070	7.1	6.19	0.83	0	51.5	49.8
G-11	Dark gray silty clay	-.140	7.0	5.95	0.16	3.6	61.2	35.2
G-12	Gray sand	+.170	7.4	1.77	6.74	61.6	22.9	15.5
H-8	Dark gray silty clay	+.095	7.5	4.21	0.16	15.6	40.7	43.6
H-9	Dark gray sandy clay	+.100	7.3	5.69	3.99	0	43.2	57.3
H-10	Dark gray silty clay	-.080	7.5	5.68	4.83	0.6	61.1	38.3
H-11	Dark gray silty clay	-.160	7.3	6.48	3.41	1.9	42.0	56.1
H-12	Dark gray silty clay	+.100	7.5	4.97	0	0	56.5	45.3
H-13	Dark gray sandy clay	+.165	7.3	2.18	3.88	50.6	30.6	18.8
I-9	Dark gray sandy clay	+.020	7.2	4.97	1.74	18.1	37.7	44.2
I-10	Dark gray silty clay	+.110	7.3	5.26	3.99	—	—	—
I-11	Dark gray silty clay	-.085	7.2	5.43	3.58	0	48.6	52.4
I-12	Dark gray silty clay	-.050	7.3	6.19	2.32	0	45.1	55.0
I-13	Dark gray silty clay	+.050	7.1	5.72	0.16	0	61.0	40.2
I-14	Gray sand/glacial clay	+.332	7.2	1.23	2.16	60.4	16.3	23.2
J-10	Brown clayey sand/glacial clay	—	7.1	3.42	0.91	19.5	31.4	49.1
J-11	Gray clayey sand/glacial clay	+.464	7.0	—	—	14.0	31.1	55.0
J-12	Dark gray silty clay	-.010	7.3	5.38	1.08	—	—	—
J-13	Dark gray silty clay	-.255	7.3	5.33	3.74	10.5	46.3	43.2
J-14	Dark gray silty clay	+.020	7.4	5.71	2.16	—	—	—
J-15	Brown sand/glacial clay	+.250	7.4	1.72	2.16	53.4	12.8	33.7

J-16	Brown sand and gravel/glacial clay	+.130	7.2	1.13	9.91	66.0	17.4	16.6
K-11	Brown sand/glacial clay	——	7.4	2.23	1.91	35.3	27.5	37.2
K-12	Dark gray silty clay	——	7.3	5.72	0.16	9.1	50.1	40.8
K-13	Dark gray silty clay	0	7.3	5.53	0.17	0	60.4	41.8
K-14	Dark gray silty clay	+.220	7.3	5.38	2.16	1.0	63.1	35.8
K-15	Dark gray silty clay	+.300	7.3	5.40	1.83	0	53.4	47.7
K-16	Cobbles, sand and gravel	——	——	——	——	——	——	——
K-17	Dark gray sand/glacial clay	+.140	7.3	1.61	6.33	70.9	19.2	10.0
L-11	Brown sand/glacial clay	+.350	6.8	1.37	2.74	64.6	22.3	13.1
L-12	Brown sand/glacial clay	+.450	7.3	1.78	5.16	33.4	30.0	36.7
L-13	Dark gray silty clay	0	7.2	5.05	1.58	0.9	60.0	39.1
L-14	Dark gray silty clay	+.025	7.2	4.93	3.33	0	50.7	50.3
L-15	Dark gray silty clay	+.060	7.2	5.55	0.99	0	57.4	43.3
L-16	Dark gray silty clay	+.125	7.3	5.12	1.24	0	59.0	44.2
L-17	Dark gray silty clay	+.130	7.2	4.21	6.66	0.5	67.9	31.6
M-13	Cobbles, gravel, till	——	——	4.54	36.65	61.1	27.1	11.8
M-14	Dark gray silty clay	+.120	7.3	4.16	3.74	2.4	63.8	33.8
M-15	Dark gray silty clay	+.095	7.3	4.90	3.33	——	——	——
M-16	Dark gray silty clay	+.100	7.2	4.59	3.24	0	56.3	45.5
M-17	Dark gray silty clay	+.100	7.2	3.68	6.74	5.1	68.4	26.4
M-18	Dark gray silty clay	+.095	7.2	3.21	11.32	4.9	76.6	18.4
M-19	Dark gray sandy clay	+.120	7.4	3.02	17.74	2.8	85.5	11.6
N-14	Gray clayey silt	+.130	7.3	1.96	8.33	15.5	67.6	16.9
N-15	Dark gray silty clay	+.240	7.3	2.16	2.49	15.0	64.9	20.1
N-16	Gray sand/glacial clay	+.130	7.4	2.18	6.41	19.3	64.4	16.3
N-17	Dark gray silt	+.130	7.1	2.15	3.24	11.9	72.7	15.4
N-18	Dark gray silt	+.085	7.1	2.08	6.83	9.4	80.9	9.7

N-19	Gray sandy clay	+.145	7.0	2.30	13.99	3.3	85.0	11.6
N-20	Dark gray sand	+.140	6.7	1.80	20.77	4.1	90.9	5.0
N-21	Dark gray sand	——	——	2.15	14.74	16.9	79.7	3.4
0-17	Sand, cobbles, gravel/glacial clay	+.315	7.7	3.38	15.82	90.0	8.6	1.1
0-18	Dark gray silty sand	+.165	6.7	1.77	2.02	57.8	36.8	6.2
0-19	Dark gray sand/glacial clay	+.140	6.8	1.56	13.32	18.8	77.0	4.2
0-20	Dark gray sand	+.115	6.8	2.28	16.57	20.0	77.4	2.6
P-20	Dark gray sand	+.170	7.1	2.82	13.57	28.8	55.9	15.2

TABLE 3. Sediment description, water content, Eh, pH, organic matter and calcium carbonate content and sediment texture of a core from station I-12 in South Bay, Lake Huron (Concentration expressed as percent dry weight of sediment).

Sediment Depth Interval cm	Sediment Description	Water Content %	Eh mv	pH	Organic Matter %	Calcium Carbonate %	Sediment Texture Sand %	Silt %	Clay %
0 - 0.3	Brown flock	90.6	+.235	7.4	6.89	1.92	—	—	—
0.3 - 0.6	Light gray ooze	83.4	+.195	7.4	6.43	2.50	—	—	—
0.6 - 1.0	Light gray ooze	81.8	+.065	7.4	6.15	2.83	—	—	—
1 - 2	Gray silt clay	79.2	+.055	7.3	6.17	1.83	—	—	—
2 - 3	Dark gray silt clay	78.9	+.030	7.3	6.02	2.67	0	46	54
3 - 4	Very dark gray silt clay	75.2	-.100	7.3	5.95	1.83	1	44	55
4 - 5	" "	75.7	-.150	7.3	5.78	3.32	2	46	52
5 - 6	" "	74.9	-.125	7.3	5.61	2.58	2	41	57
6 - 7	" "	73.9	-.125	7.2	5.32	2.83	1	46	53
7 - 8	" "	73.6	-.065	7.0	5.36	2.25	0	47	54
8 - 9	" "	73.5	-.080	7.0	5.22	2.25	3	42	55
9 - 10	" "	72.7	-.145	7.0	5.20	3.33	2	41	57
10 - 15	" "	72.2	-.110	7.0	5.51	2.75	1	47	52
15 - 20	" "	75.6	-.110	7.0	5.42	2.83	1	56	43
20 - 30	Gray silt clay	73.1	-.020	7.0	5.81	0.58	1	52	47
30 - 40	Gray silt clay	72.4	+.025	7.0	4.91	1.67	0	50	50
40 - 50	Gray silt clay	70.0	+.005	6.9	4.52	1.00	0	40	60
50 - 60	Gray silt clay	68.3	-.005	6.9	4.78	1.17	0	40	61

TABLE 4. Major elements in a core from station I-12 in South Bay, Lake Huron (Concentrations in percent dry weight of sediment).

Sediment Depth Interval cm	Si	Al	Fe	Ca	Mg	K	Na	Mn	N	Ti	P	S
0 - 0.3	27.4	6.7	4.85	1.07	1.46	2.89	0.87	0.50	0.485	0.33	0.21	0.10
0.3 - 0.6	27.5	6.9	4.75	1.00	1.57	2.91	0.91	0.25	0.483	0.34	0.21	0.16
0.6 - 1.0	28.0	6.9	4.22	1.00	1.34	3.01	0.75	0.15	0.457	0.33	0.17	0.17
1 - 2	28.2	7.1	4.11	1.00	1.44	3.05	1.09	0.11	0.438	0.35	0.15	0.32
2 - 3	27.9	7.3	4.05	1.01	1.38	3.04	0.90	0.10	0.427	0.35	0.14	0.38
3 - 4	28.4	7.4	4.02	1.04	1.40	3.00	0.95	0.10	0.401	0.35	0.14	0.40
4 - 5	28.6	7.2	3.97	1.12	1.43	3.01	0.89	0.10	0.391	0.35	0.14	0.38
5 - 6	28.4	7.3	3.98	1.10	1.46	3.01	0.93	0.10	0.387	0.35	0.14	0.36
6 - 7	28.6	7.3	4.02	1.09	1.42	3.05	0.98	0.10	0.359	0.35	0.13	0.39
7 - 8	28.5	7.3	4.36	1.07	1.40	3.04	0.84	0.10	0.352	0.35	0.13	0.37
8 - 9	28.4	7.5	4.08	1.08	1.43	3.08	0.99	0.10	0.341	0.36	0.14	0.36
9 - 10	28.4	7.4	4.07	1.07	1.48	3.05	1.02	0.10	0.367	0.36	0.14	0.37
10 - 15	28.4	7.4	4.11	1.02	1.42	3.05	0.95	0.10	0.348	0.36	0.14	0.35
15 - 20	28.1	7.2	4.36	0.93	1.36	3.01	0.96	0.11	0.371	0.35	0.14	0.33
20 - 30	27.9	7.1	4.36	0.90	1.38	3.01	0.85	0.14	0.371	0.35	0.17	0.24
30 - 40	28.1	7.2	4.76	0.84	1.39	3.06	0.91	0.14	0.344	0.36	0.16	0.15
40 - 50	27.7	7.8	4.61	0.71	1.36	3.27	0.88	0.11	0.320	0.37	0.14	0.13
50 - 60	——	——	——	——	——	——	——	——	0.330	——	——	——

TABLE 5. Trace elements in a core from station I-12 in South Bay, Lake Huron (Concentrations in μg/g dry weight of sediment).

Sediment Depth Interval cm	Hg	Pb	Cu	Zn	Ni	Cr	Co	Cd	Be	V	Sr
0 - 0.3	0.285	109	43	154	114	179	17	1.6	0.9	63	141
0.3 - 0.6	0.322	106	44	155	107	149	15	1.5	1.1	76	142
0.6 - 1.0	0.285	105	43	152	97	133	17	1.7	1.7	88	121
1 - 2	0.291	101	41	155	96	117	17	1.5	0.8	75	155
2 - 3	0.290	97	43	150	91	123	19	1.6	0.7	54	111
3 - 4	0.322	95	44	154	82	88	19	1.7	1.0	55	147
4 - 5	0.234	85	36	141	82	82	17	1.5	0.8	57	122
5 - 6	0.266	81	37	142	79	93	20	1.7	1.0	64	120
6 - 7	0.211	72	37	135	74	51	18	1.7	0.6	98	135
7 - 8	0.235	68	31	123	76	80	19	1.3	0.9	85	123
8 - 9	0.349	58	31	117	76	97	19	1.3	1.0	63	110
9 - 10	0.254	57	36	115	74	100	19	1.6	1.0	42	110
10 - 15	0.490	46	31	103	70	94	20	1.4	1.2	39	108
15 - 20	0.222	37	27	86	69	84	16	0.6	0.6	30	105
20 - 30	0.323	34	25	78	74	105	19	1.0	1.0	76	78
30 - 40	0.172	—	—	—	—	—	—	—	—	—	—
40 - 50	0.346	22	27	71	80	133	19	0.5	1.2	66	71

TABLE 6. Numbers of organisms per square meter at each sample station in South Bay, Lake Huron.

Station Numbers	Chironomidae	Oligochaeta	Amphipoda	Gastropoda	Ephemeroptera	Pelecypoda	Tipulidae	Nematoda
B-2	625	375	0	0	0	0	0	0
C-2	200	175	0	0	0	0	0	0
C-3	300	200	0	0	0	0	0	0
D-2	125	0	0	0	0	0	0	0
D-3	75	25	25	0	0	0	0	0
D-4	150	0	100	0	0	0	0	75
D-10	200	300	0	150	50	100	0	0
E-3	25	0	0	0	0	75	0	50
E-4	125	25	0	0	0	0	0	0
E-5	325	250	0	375	25	0	0	0
E-6	125	0	75	0	0	0	100	0
E-10	300	0	0	0	0	125	0	50
E-11	150	0	0	75	150	75	0	75
F-5	200	0	50	125	0	75	25	0
F-6	125	0	0	75	125	0	25	0
F-7	25	0	225	0	0	0	0	0
F-8	25	0	0	0	0	0	0	0
F-9	150	200	100	0	0	0	0	0
F-10	0	0	25	0	0	0	0	0
F-11	200	300	525	0	0	0	0	0

G-8	225	100	175	0	0	0	0	0
G-9	125	625	450	0	0	0	0	0
G-10	125	325	300	450	50	125	0	0
G-11	100	125	150	0	0	0	0	0
G-12	0	25	0	0	0	0	0	0
H-8	75	175	150	0	0	0	0	0
H-9	200	150	225	0	0	0	0	0
H-10	125	300	300	0	0	0	0	0
H-11	100	125	550	0	0	0	0	0
H-12	75	150	125	0	0	0	0	0
H-13	0	0	25	0	0	0	0	0
I-9	875	300	175	0	0	0	0	0
I-10	300	200	125	0	0	0	0	0
I-11	25	200	300	0	0	0	0	0
I-12	75	175	125	0	0	0	0	0
I-13	200	225	300	0	0	0	0	0
I-14	0	0	0	0	0	0	0	0
J-10	125	375	75	0	0	0	0	0
J-11	0	0	0	0	0	0	0	0
J-12	75	75	100	0	0	0	0	0
J-13	175	375	700	0	0	0	0	0
J-14	150	400	125	0	0	0	0	0
J-15	0	0	0	0	0	0	0	0
J-16	25	0	0	0	0	0	0	0
K-11	50	0	0	0	0	0	0	0
K-12	200	200	300	0	0	50	0	0
K-13	225	375	375	0	0	0	0	0

K-14	550	525	200	0	0	0	0	0
K-15	400	150	175	0	0	0	0	0
K-16	0	0	0	0	0	0	0	0
K-17	0	75	0	0	0	150	0	0
L-11	0	100	0	0	0	0	0	0
L-12	50	0	0	0	0	0	0	0
L-13	125	225	300	75	0	0	0	0
L-14	125	150	1250	0	0	0	0	0
L-15	625	0	375	0	0	0	0	0
L-16	300	375	750	0	0	0	0	0
L-17	250	0	250	0	0	0	0	0
M-14	100	300	150	0	0	0	0	0
M-15	75	125	50	0	0	0	0	0
M-16	25	200	0	0	0	0	0	0
M-17	125	75	175	0	0	0	0	0
M-18	0	375	100	175	0	50	0	0
M-19	50	0	0	200	125	100	0	0
N-14	75	125	0	150	25	50	0	0
N-15	125	0	0	75	0	0	0	0
N-16	50	0	0	125	75	250	0	0
N-17	50	0	0	50	50	75	0	0
N-18	125	200	0	125	75	150	0	0
N-19	0	250	0	200	75	0	0	0
N-20	0	0	75	50	0	0	0	0
N-21	0	0	0	0	0	0	0	0
0-17	0	0	0	0	0	0	0	0
0-18	0	0	0	75	0	0	0	0
0-19	0	0	0	75	0	0	25	0
P-20	0	0	0	300	0	0	0	0

TABLE 7. The composition of the diatom remains in the surficial sediment at station I-12 (250 diatoms counted).

Diatom	Percentage of total counts
Stephanodiscus tenuis *Cyclotella ocellata* *Cyclotella stelligera*	40
Fragilaria crotonensis *Fragilaria hollandii*	15
Asterionella formosa *Asterionella gracillima*	12
Stephanodiscus niagarae *Stephanodiscus fae*	10
Cyclotella comta *Cyclotella fae*	8
Tabellaria fenestrata	2
Melosira distans	2
Synedra acus *Synedra fae*	2
Amphora ovalis	1
Melosira islandica ssp. *helvetica*	1
Surirella angustata	1
Synedra ulna v. danica	1
Cymbella prostrata	1