Fader

SURFICIAL GEOLOGY OF THE CENTRAL GRAND BANKS OF NEWFOUNDLAND, HALIBUT CHANNEL TO WHALE BANK (AND WESTERN GRAND BANK)

by

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Geomarine
HALIFAX & ST. JOHN'S
CANADA

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Ruffman, Alan and Edna Wilson. 1987. Surficial Geology of the central Grand Banks of Newfoundland, Halibut Channel to Whale Bank (and western Grand Bank). Geomarine Associates Ltd., Halifax, Nova Scotia, Project 86-35, Contract Report, DSS Contract No. 23420-6-M719/01-SC for Canada Department of Energy, Mines and Resources, Geological Survey of Canada, Atlantic Geoscience Centre, Dartmouth, Nova Scotia, October 16, Geological Survey of Canada, Open File No. 88-???, 467 pp. in two volumes, 11 map enclosures, generally Mercator Projection.

INTRODUCTION

The Atlantic Geoscience Centre (AGC) of the Geological Survey of Canada (GSC) has been compiling a series of surficial geology maps of the continental shelf of Eastern Canada over the past 15 years beginning with the Yarmouth - Browns Bank Map area in 1972 (Drapeau and King, 1971; 1972). The most recent map was that of the Laurentian Channel and the Western Grand Banks of Newfoundland (Fader et al., 1982; 1984) centered on St. Pierre Bank and the Laurentian Channel. The present study resulted from a contract initiated in 1986 and is intended to extend the compiled surficial mapping to the east of St. Pierre Bank throughout the Central Grand Banks.

The current regional geological studies have been conducted on a systematic basis on Canadian Hydrographic Service Chart 4016 (St. Pierre to St. John's) and Fisheries Chart 8009 (St. Pierre Bank to Whale Bank). The map area (Figure 1) covers an area of about 120,000 sq km (34,870 sq n mi) including the land area or about 96,000 sq km (27,900 sq n mi) including the land area or about 96,000 sq km (27,900 sq n mi) of water area. The final map area is made up of mainly Charts 4016 and 8009 (CHS, 1983d;a) plus a small strip along the east comprised of portions of Charts 8011 and 8010 (CHS, 1983b;c). The project area is between 43°58'N and 47°55'N and from 51°45'W to 55°30'W.

The compilation area has been subject to intensive oil and gas exploration in the late 60's and early 70's with in the order of 21 oil and gas wells drilled between 1967 and 1974. Most were drilled on salt diapirs without any discoveries. Most acreage has been dropped and the only areas of ongoing interest were along the shelf edge and continental slope (Figure 2). Even this interest may shortly evaporate with the recent completion of the Northcor/Amoco et al. Narwhal F-99 well as a plugged and abandoned dry hole having drilled into acoustic basement. The very western part of the area on St. Pierre Bank is frozen for oil and gas exploration in the moratorium area declared by France and Canada as a result of the dispute over the offshore rights of the islands of St. Pierre et Miquelon (Figure 2).

Portions of the study area have come under recent scrutiny with respect to possible pipeline routes from the Hibernia oil discovery to the Island of Newfoundland. Initially, a northern route into Bay Bulls on the Atlantic Coast of the Avalon Peninsula was looked at with a southern route south of the Avalon Peninsula then north into Trepassey Bay also investigated. The southern route was subjected to further geophysical survey work in 1981 with a borehole program run in 1983.

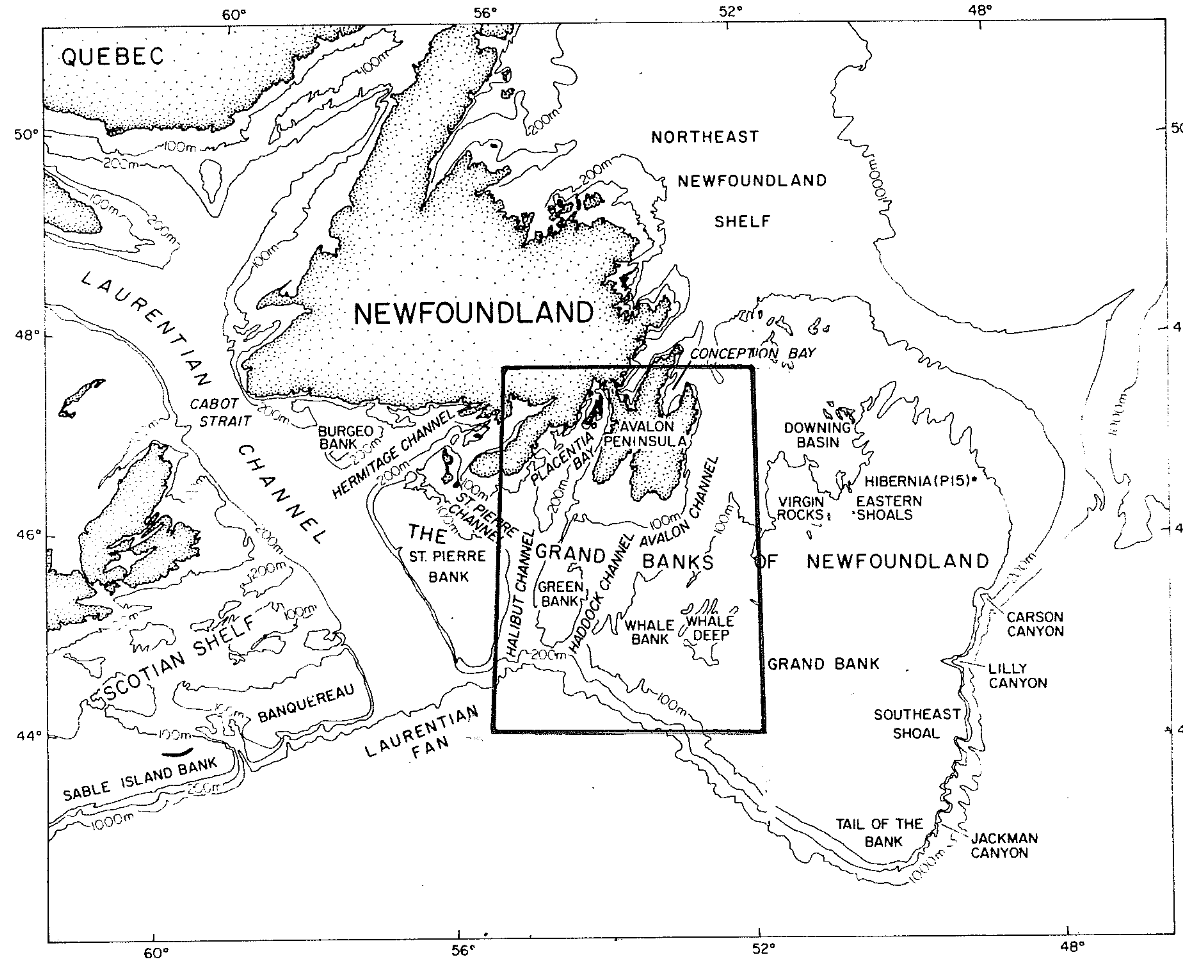
INTRODUCTION (CONTINUED)

Almost all the initial trans-Atlantic telegraph cables terminated in Newfoundland and all crossed the area. Now, all commercial cables crossing the study area are out of use (OOU).

The area is heavily used for fishing with the resource under pressure in places from overuse. This is further compounded by the ongoing Canada-France dispute over St. Pierre et Miquelon's offshore rights. As a result, bottom type is of importance for fish biologists concerned with fish habitat and to fishermen engaged in bottom trawling.

FIGURE 1

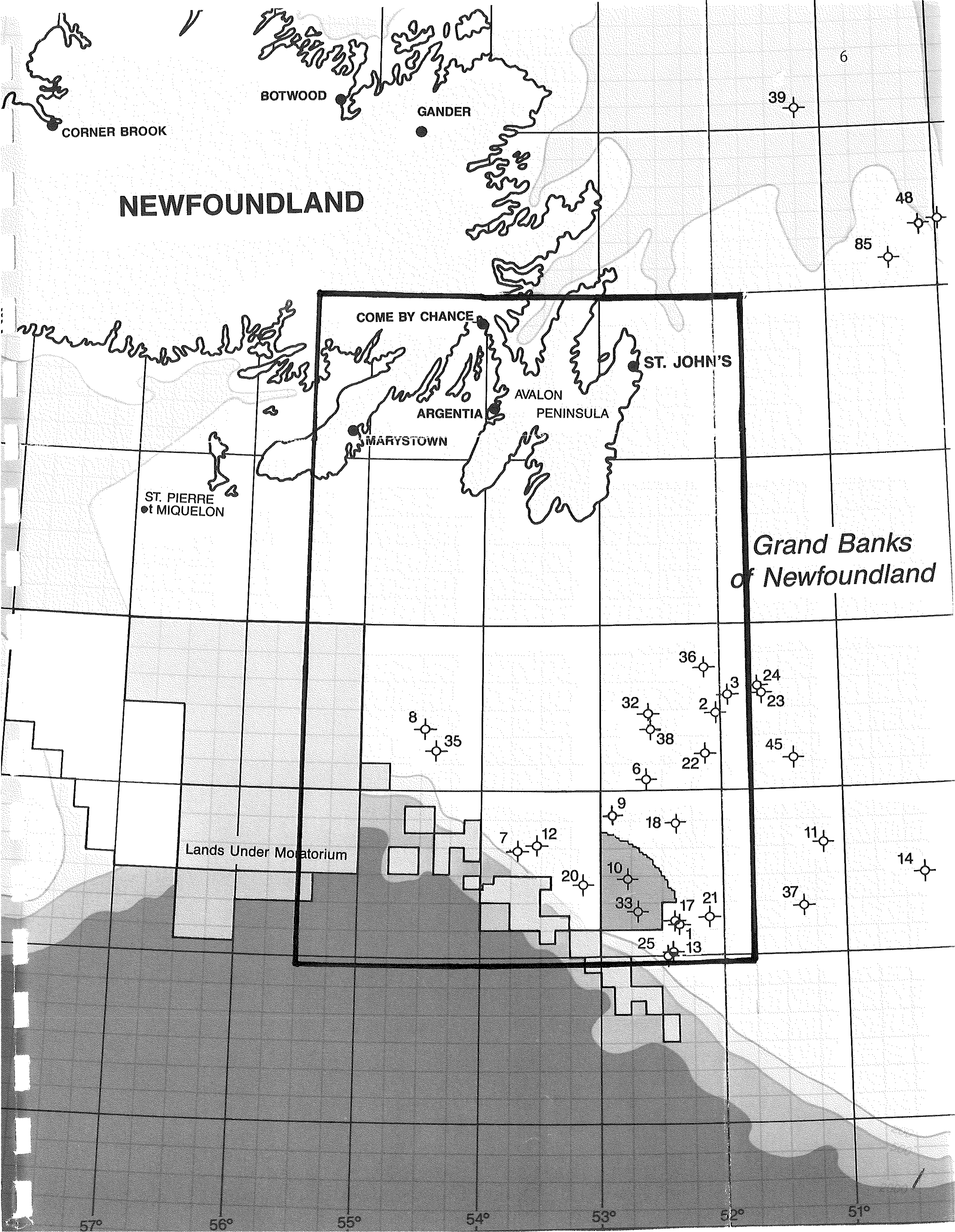
INDEX MAP TO THE STUDY AREA SOUTH OF THE AVALON PENINSULA OF THE ISLAND OF NEWFOUNDLAND. CONTOURS ARE IN METRES.



60°
56°
52°
48°
50°
46°
44°
QUEBEC
NEWFOUNDLAND
NORTHEAST
NEWFOUNDLAND
SHELF
LAURENTIAN
CHANNEL
CABOT
STRAIT
BURGEO
BANK
HERMITAGE CHANNEL
ST PIERRE
CHANNEL
THE
ST. PIERRE
BANK
CONCEPTION BAY
AVALON
PENINSULA
PLACENTIA
BAY
GRAND
BANKS
OF
NEWFOUNDLAND
HALIBUT CHANNEL
GREEN
BANK
HADDOCK CHANNEL
AVALON CHANNEL
WHALE
BANK
WHALE
DEEP
DOWNING
BASIN
HIBERNIA (P15)
VIRGIN
ROCKS
EASTERN
SHOALS
CARSON
CANYON
LILLY
CANYON
GRAND BANK
SOUTHEAST
SHOAL
TAIL OF THE
BANK
JACKMAN
CANYON
SCOTIAN SHELF
BANQUEREAU
SABLE ISLAND BANK
LAURENTIAN
FAN
100m
200m
1000m

FIGURE 2

PORTION OF THE CANADA-NEWFOUNDLAND OFFSHORE PETROLEUM BOARD (1987) MAP OF OIL AND GAS EXPLORATION LAND HOLDINGS OFF SOUTHEAST NEWFOUNDLAND SHOWING THE STUDY AREA WITH A LIST OF WELLS ON THE PAGE FOLLOWING. SCALE IS 1:3,000,000; CONTOURS ARE IN METRES. PERMITS ARE TO JUNE 1, 1987.



6
CORNER BROOK
BOTWOOD
GANDER
NEWFOUNDLAND
39
48
85
COME BY CHANCE
ST. JOHN'S
AVALON
ARGENTIA
PENINSULA
MARYSTOWN
ST. PIERRE
et MIQUELON
Grand Banks
of Newfoundland
36
24
3
23
32
2
8
38
35
45
22
6
9
18
12
7
11
Lands Under Moratorium
14
10
20
37
21
33
17
1
25
13
57°
56°
55°
54°
53°
52°
51°

1	Pan Am Imperial	Tors Cove D-52
2	Pan Am Imperial	Grand Falls H-09
3	Amoco Imperial	Eider M-75
4	Amoco Imperial	Murre G-67
5	Tenneco et al	Leif E-38
6	Amoco Imperial	Gannet O-54
7	Amoco Imperial	Puffin B-90
8	Elf	Hermine E-94
9	Amoco Imperial	Petrel A-62
10	Amoco Imperial	Shearwater J-20
11	Amoco Imperial	Bittern M-62
12	Amoco Imperial	Kittiwake P-11
13	Amoco Imperial	Heron H-73
14	Amoco Imperial	Jaeger A-49
15	Amoco Imperial	Cormorant N-83
16	Mobil Gulf	Adolphus K-41
17	Amoco Imperial	Gull F-72
18	Amoco Imperial	Merganser I-60
19	Mobil Gulf	Adolphus 2K-41
20	Amoco Imperial Skelly	Tern A-68
21	Amoco Imperial Skelly	Mallard M-45
22	Amoco Imperial Skelly	Razorbill F-54
23	Amoco Imperial Skelly	Sandpiper J-77
24	Amoco Imperial Skelly	Sandpiper 2J-77
25	Amoco Imperial Skelly	Heron J-72
26	Amoco Imperial Skelly	Osprey H-84
27	Amoco Imperial Skelly	Egret K-36
28	Eastcan et al	Leif M-48
29	Eastcan et al	Bjarni H-81
30	Amoco Imperial Skelly	Spoonbill C-30
31	Mobil Gulf	Flying Foam I-13
32	Amoco Imperial Skelly	Pelican J-49
33	Amoco Imperial Skelly	Brant P-87
34	Mobil Gulf	Bonnition H-32
35	Elf et al	Emerillon C-56
36	Amoco Imperial Skelly	Coot K-56
37	Amoco Imperial Skelly	Twillick G-49
38	Amoco Imperial Skelly	Carey J-34
39	BP Columbia	Bonavista C-99
40	Eastcan et al	Gudrid H-55
41	Amoco Imperial Skelly	Egret N-46
42	Mobil Gulf	Dominion O-23
43	Amoco Imperial Skelly	Skua E-41
44	Mobil Gulf	Adolphus D-50
45	Amoco Imperial Skelly	Phalarope P-62
46	Eastcan et al	Freydis B-87
47	Eastcan et al	Snorri J-90
48	Mobil Gulf Imperial	Cumberland B-55
49	Eastcan et al	Karlsefni A-13
50	BP Columbia et al	Indian Harbour M-52
51	Eastcan et al	Cartier D-70
52	Eastcan et al	Cabot G-91
53	Eastcan et al	Herjolf M-92
54	Eastcan et al	Verrazano L-77
55	Eastcan et al	Skolp E-07
56	Chevron et al	Hopedale E-33
57	Eastcan et al	Roberval K-92
58	Texaco Shell et al	Blue H-28
59	Esso Voyager	Gabriel C-60
60	Chevron et al	Hibernia P-15
61	BP et al	Hare Bay E-21
62	Eastcan et al	Tyrk P-100
63	Eastcan et al	Bjarni O-82
64	Petro-Canada et al	Gilbert F-53
65	Mobil et al	Hibernia O-35
66	Mobil et al	Ben Nevis I-45
67	Mobil et al	Hibernia B-08
68	Petro-Canada et al	Roberval C-02
69	Chevron et al	South Labrador N-79
70	Petro-Canada et al	Ogmund E-72
71	Petro-Canada et al	North Leif I-05
72	Mobil et al	South Tempest G-88
73	Petro-Canada et al	North Bjarni F-06
74	Mobil et al	Hibernia G-55
75	Mobil et al	Hebron I-13
76	Mobil et al	Hibernia K-18
77	Mobil et al	Sheridan J-87
78	Petro-Canada et al	Rut H-11
79	Mobil et al	Nautilus C-92
80	Petro-Canada et al	Corte Real P-85
81	Mobil et al	West Flying Foam L-23
82	Mobil et al	Hibernia J-34
83	Mobil et al	Bonanza M-71
84	Petro-Canada et al	Pothurst P-19
85	Mobil et al	Linnet E-63
86	Mobil et al	North Dana I-43
87	Mobil et al	Hibernia I-46
88	Mobil et al	Rankin M-36
89	Petro-Canada et al	Pining E-16
90	Canterra et al	South Hopedale L-39
91	Petro-Canada et al	Terra Nova K-08
92	Mobil et al	Hibernia B-27
93	Mobil et al	Hibernia K-14
94	Husky/Bow Valley et al	Trave E-87
95	Mobil et al	Hibernia C-96
96	Husky/Bow Valley et al	Voyager J-18
97	Mobil et al	South Mara C-13
98	Canterra PCI et al	Port Au Port J-97
99	Husky/Bow Valley et al	Archer K-19
100	Husky/Bow Valley et al	Whiterose N-22
101	Petro-Canada et al	West Ben Nevis B-75
102	Petro-Canada et al	Terra Nova K-18
103	Mobil et al	Mara M-54
104	Canterra PCI et al	Beothuk M-05
105	Husky/Bow Valley et al	Conquest K-09
106	Husky/Bow Valley et al	North Ben Nevis P-93
107	Husky/Bow Valley et al	Panther P-52
108	Petro-Canada et al	North Trinity H-71
109	Esso PAREX et al	Baccalieu I-78
110	Mobil et al	Mercury K-76
111	BP Beau et al	Baie Verte J-57
112	Husky/Bow Valley et al	Whiterose J-49
113	Petro-Canada et al	Terra Nova K-07
114	Canterra PCI et al	Terra Nova K-17
115	Petro-Canada et al	Gambo N-70
116	Petro-Canada et al	Terra Nova I-97
117	Husky/Bow Valley et al	Whiterose L-61
118	Husky/Bow Valley et al	North Ben Nevis M-61
119	Gulf et al	Mara E-30
120	Husky/Bow Valley et al	Fortune G-57
121	Canterra PCI	St. George J-55
122	Petro-Canada	Lancaster G-70
123	Esso PAREX et al	Kyle L-11
124	Husky/Bow Valley et al	Golconda C-64
125	Husky/Bow Valley et al	Bonne Bay C-73

Land Holders

- Amoco Canada Petroleum Co. Ltd.
- Esso Resources Canada Limited
- Gulf Canada Resources Inc.
- Mobil Oil Canada Ltd.
- Canterra Energy Ltd.
- Petro-Canada Inc.
- Labrador Group
- Shell Canada Resources Ltd.
- Texaco Canada Resources Ltd.

○ Drilling

Suspended Well

Dry and Abandoned

Abandoned with Oil Shows

● Oil Well (Abandoned Suspended)

Abandoned Oil and Gas Well

Gas Well (Abandoned Suspended)

PREVIOUS WORK

Grand Banks

Warren Upham (1894) may have been the first to write on the glacial origin of the sediments of the Grand Banks. The Russians published some of the first modern work on the surficial geology of the general area in the work of Nesis (1962), Avilov (1965), Grabovskiy (1966), Litvin and Rvachev (1962; 1963), Rvachev (1968) and Gevork'Yan and Kachanov (1976). Five samples in the area are listed in Litvin and Rvachev (1963) (Appendix 16) and textural data is illustrated in Avilov (1965) and Grabovskiy (1966). In 1971 The Soviet Geophysical Committee published an Atlantic-wide compilation including the Grand Banks of Newfoundland; the study was based on widely-spaced samples and illustrated on small scale maps (1971).

Doug Loring was the first Canadian researcher to study the sediments of the Canadian east coast offshore. He ran four cruises in 1961 on CNAV SACKVILLE, with an EDO Mark V Precision Depth Recorder (PDR) that operated at 12 kHz and up to 800 watts. Cruises S-56 and S-60 surveyed in the Gulf of St. Lawrence, S-59 surveyed off Nova Scotia and cruise S-58 from August 21 to September 17, 1961 surveyed into Placentia Bay, off St. John's, in Conception Bay and into Trinity Bay (Figure 3); This was the first Canadian bottom survey work in the project area.

D. H. Loring published his results in the Fisheries Research Board of Canada Manuscript Report Series as No. 107 (1962a). A somewhat expanded version that included the Gulf of Maine area was published shortly thereafterwards but was classified by the Canadian Navy as a "Confidential" document (1962b); this restriction has since been lifted. These two documents contained the first ever published maps of the surficial geology of Canada's east coast continental shelf and showed the way for the later systematic work of Lewis H. King that began with the Scotian Shelf map of King (1970a;b).

Loring's Grand Banks map shows the Placentia Clay and Downing Silt deposits of Placentia Bay, Conception Bay and Trinity Bay to be 20 to 50 feet thick (Figure 4). He also shows a "soft sedimentary" layer over 50 feet thick in St. Mary's Bay (Figure 4); It is not certain how he deduced this from just the SACKVILLE S-58 data since his track plot (Figure 3) shows no apparent data in St. Mary's Bay on the cruise.

R. M. (Mike) McMullen was an early appointee to the Bedford Institute of Oceanography and began to work on the sediments of the Grand Banks using samples gathered by the Canadian Hydrographic Service and various fisheries cruises. He apparently did grain size analysis and heavy mineral analysis (McMullen, 1966); he also looked

FIGURE 3

D. H. LORING'S (1962) INDEX MAP TO THE TRACK AND SAMPLES OF THE CNAV SACKVILLE S-58 CRUISE. THE CNAV SACKVILLE OBTAINED CONTINUOUS 12 KHZ PROFILES FROM AN EDO PRECISION DEPTH RECORDER (PDR) AND OBTAINED 13 OR 14 BOTTOM SAMPLES IN THE PROJECT AREA; THE SAMPLES ARE SHOWN AS BLACK DOTS ALONG TRACK AND ARE NUMBERED SEQUENTIALLY.

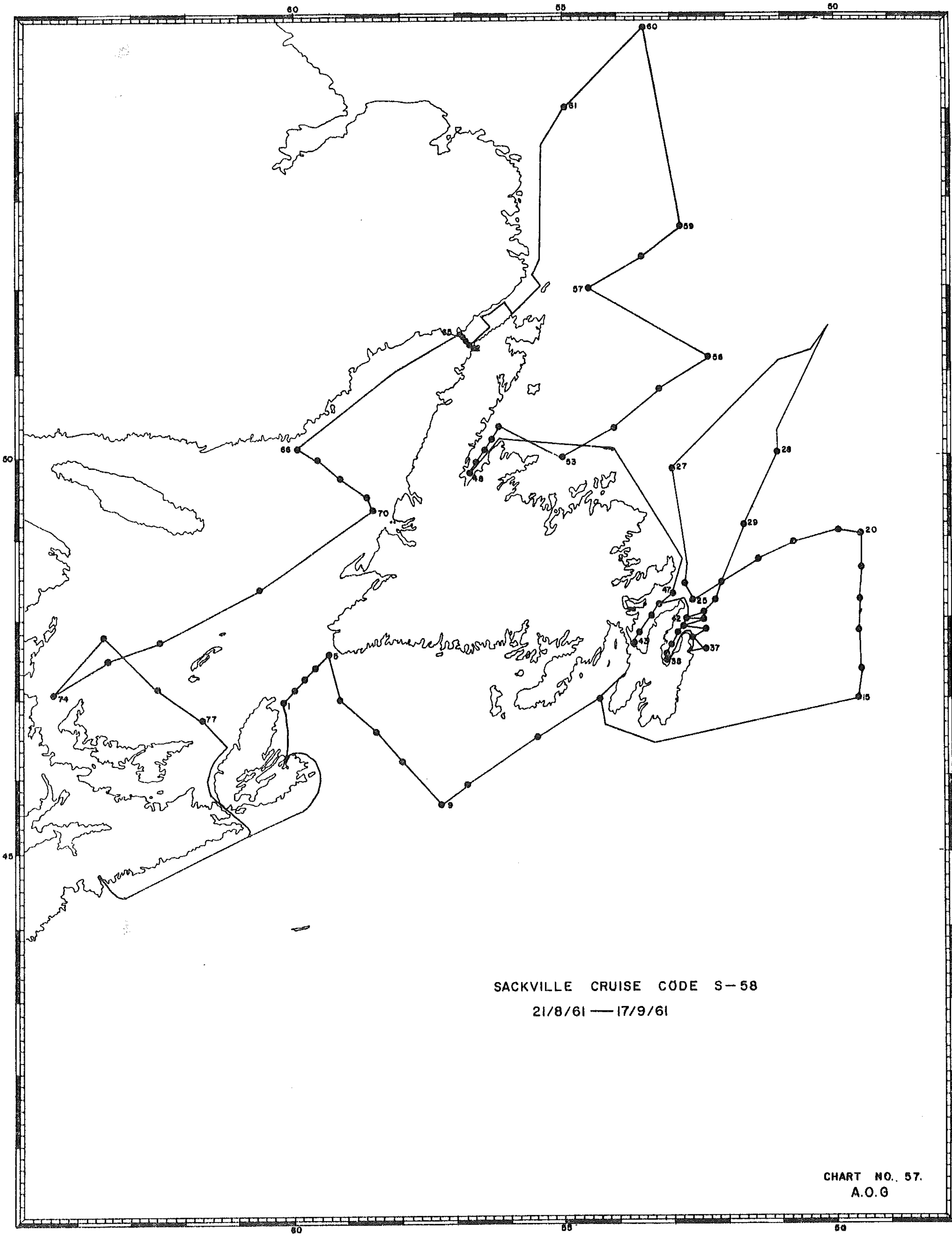
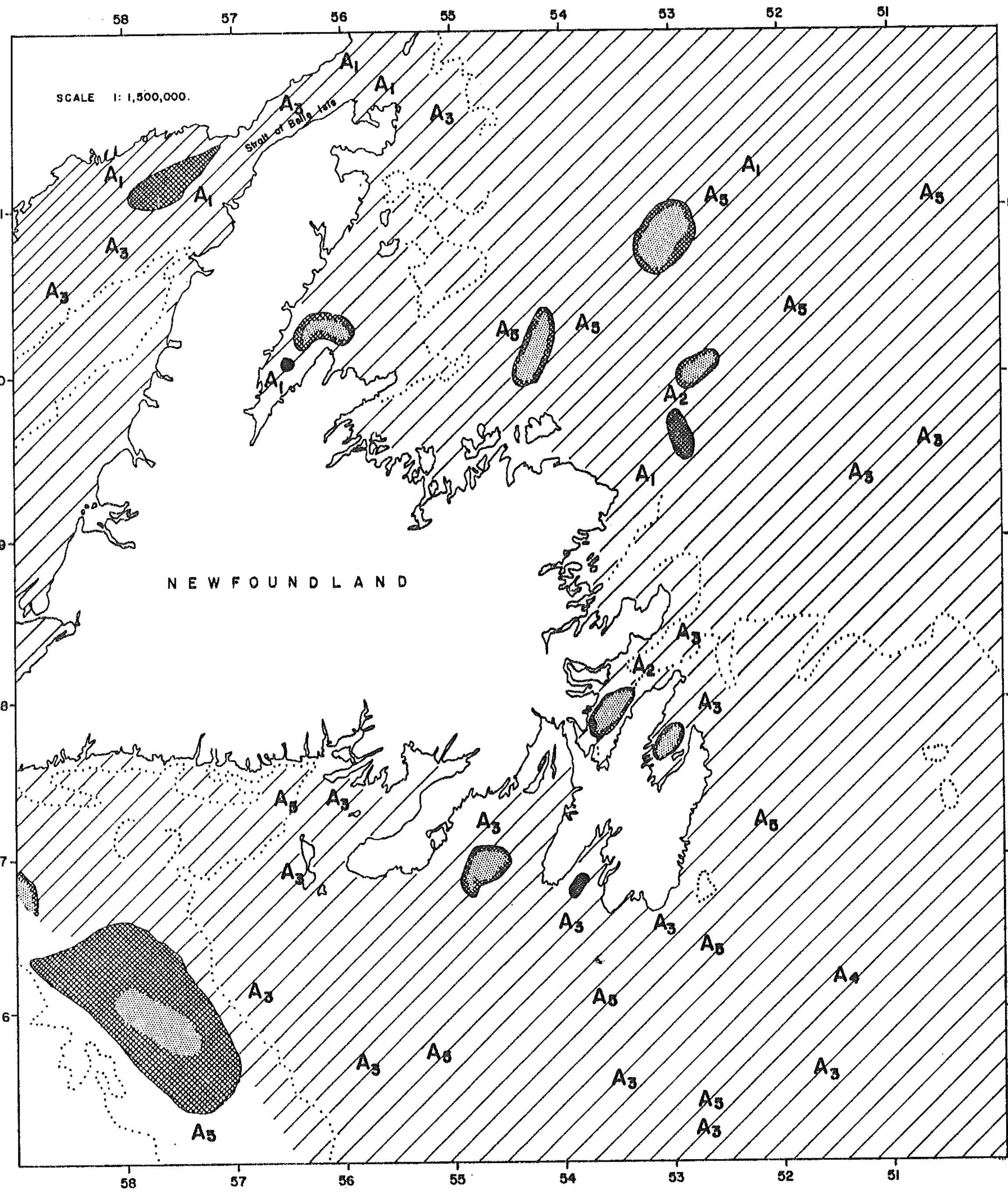

60
55
50
60
61
59
57
56
65
66
70
53
48
50
27
28
29
20
47
25
42
43
37
38
15
74
77
8
1
9
45
60
55
50
SACKVILLE CRUISE CODE S-58
21/8/61 — 17/9/61
CHART NO. 57.
A.O.G

FIGURE 4

LORING'S (1962a,b) ISOPACH MAP OF THE "DISTRIBUTION OF THE SOFT SEDIMENTARY LAYER ON THE NEWFOUNDLAND SHELF" AS MAPPED BY AN EDO, PDR ECHOSOUNDER. HIS LEGEND APPEARED ON HIS FIGURE 4 IN THE TWO PAPERS. THE WIDELY-CROSSHATCHED,MAJORITY OF THE OCEAN FLOOR, WHICH HE CALLED [ACOUSTICALLY] "HARD BOTTOM" HAS THE FOLLOWING BOTTOM TYPES: A1 = ROCKY AND JAGGED; A2 = ISOLATED PEAKS; A3 = MAINLY ROCKS AND GRAVEL; A4 = SANDY MATERIAL; A5 = COMPACTED SEDIMENTS. THE SHADED AREAS REPRESENT THE "SOFT SEDIMENTARY LAYER" WHICH WERE PENETRATED BY THE PDR: SOLID BLACK = GREATER THAN 50 FT; LIGHT GRAY = 20 TO 50 FT THICKNESS; LIGHT BLACK CROSSHATCHED AREA = LESS THAN 20 FT IN THICKNESS. THE 100 FM LINE IS SHOWN AS A FAINT DOTTED LINE.


SCALE 1: 1,500,000.
NEWFOUNDLAND
Strait of Belle Isle
58
57
56
55
54
53
52
51
51
50
49
48
47
46
A1
A2
A3
A4
A5

PREVIOUS WORK (CONTINUED)

Grand Banks (continued)

at foraminiferal distribution (Sen Gupta, 1967; Sen Gupta and McMullen, 1969).

Their map on p. 476 of their paper shows at least four of their samples were in the present study area having been obtained in 1964 (#2471, 2813) or in 1967 (#5818, 5789) (Figure 5). They also present a sedimentary facies map (1969) of the present study area south of about 45° 15'N (Figure 6) and clearly McMullen had many more samples further west in the study area; we have not seen an index map or list of positions, etc. The map of Figure 6 from Sen Gupta and McMullen's 1969 paper is the first published sedimentary facies map of the southern portion of the present study area.

Memorial University Work

Most of the early Canadian work on the surficial sediments of the study area tended to be two-dimensional and was not able to look at the sediments in section via the means of high resolution profilers; much of it also tended to be relatively nearshore. Roger Slatt of Memorial University of Newfoundland collected samples in Conception Bay in 1972 and the previous year John H. Allen on DAWSON 71-021 collected samples in the same area as well as in the area to the east of the Avalon Peninsula (Allen, 1971).

Slatt published several papers on the Conception Bay work and on related glacial till work on the Avalon Peninsula (Slatt, 1972; 1974b; 1974c; Slatt and Sasseville, 1975; Slatt and Gardiner, 1976). He also published on his sampling elsewhere on the shelf (Slatt, 1975; Piper and Slatt, 1975; Slatt and Sasseville, 1976; Slatt and Lew, 1973) as well as in the Avalon Channel east of the Avalon Peninsula (Figure 7) (Slatt, 1973; 1974a; 1977; Slatt _et al_., 1972), as did Muller and Milliman (1973). The latter authors published on samples collected by Amoco Production Company and Imperial Oil Ltd. in their Areas A, B, C and D in the southeast of the present study area (Enclosure 6) and interpreted their results as follows:

> "The fact that this regressive sediment has remained relatively rich in carbonate, however, indicates the general lack of glacial or fluvial sediment influx. Not only did the glaciers not extend sufficiently far south, but detritus from their melt waters did not mask the biogenic components."

This was in opposition to Sen Gupta and McMullen (1969).

FIGURE 5

SEN GUPTA AND McMULLEN'S FIGURE 1 (1969) STATION LOCATION MAP FOR THEIR FORAMINIFERAL STUDY. THE LARGER DASHED AREA ON THE INDEX MAP SHOWS THE EXTENT OF McMULLEN'S SAMPLE NET FOR THE SEDIMENT TEXTURE MAP SHOWN IN THEIR FOLLOWING FIGURE AND IN FIGURE 6 HERE. THE DARK LINES TO THE NORTHWEST SHOW THE SOUTHEASTERNMOST LIMITS OF THE PRESENT STUDY AREA.

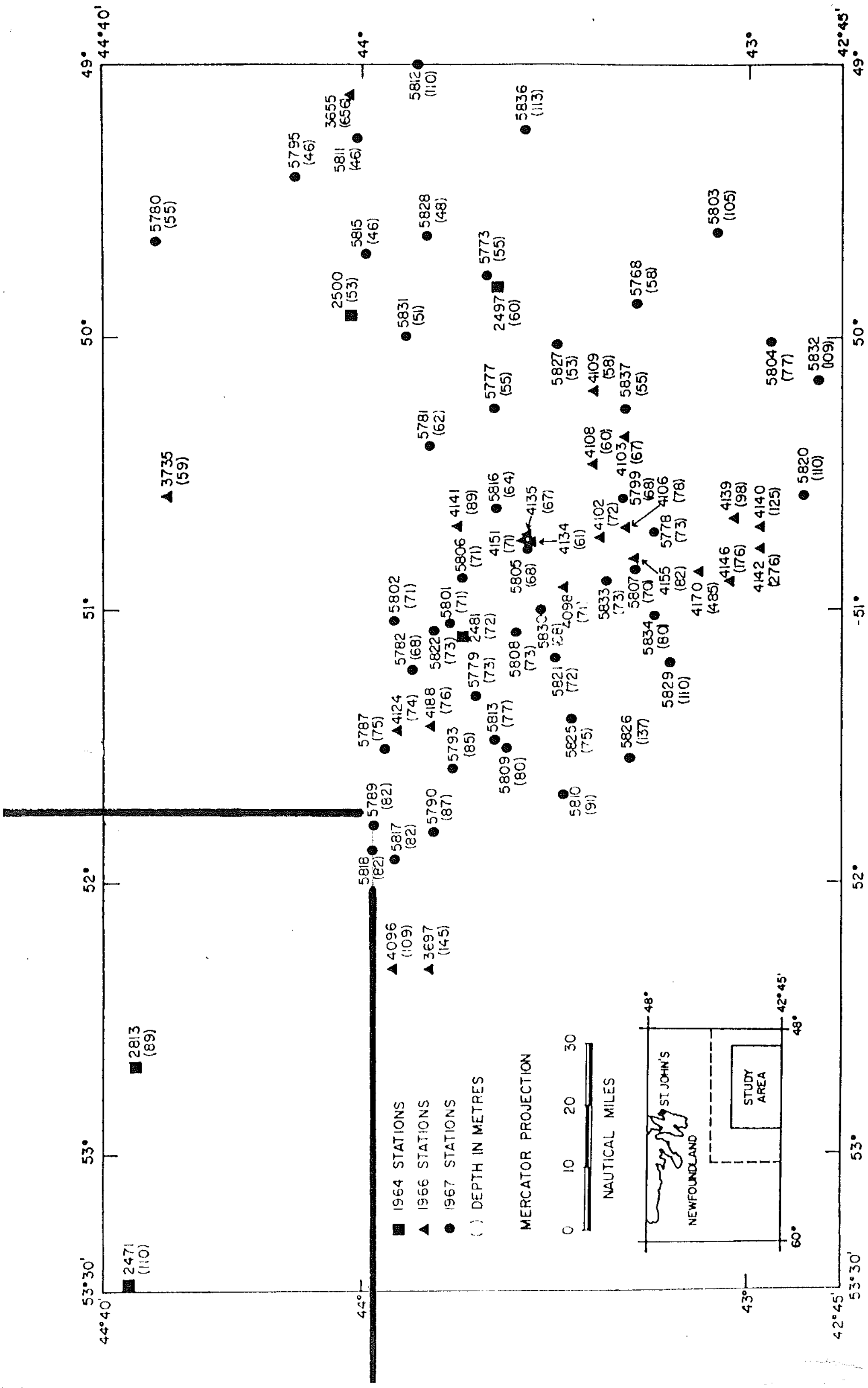

1964 STATIONS
1966 STATIONS
1967 STATIONS
( ) DEPTH IN METRES
MERCATOR PROJECTION
0 10 20 30
NAUTICAL MILES
ST JOHN'S
NEWFOUNDLAND
STUDY AREA
49°
50°
51°
52°
53°
53°30'
44°40'
44°
43°
42°45'

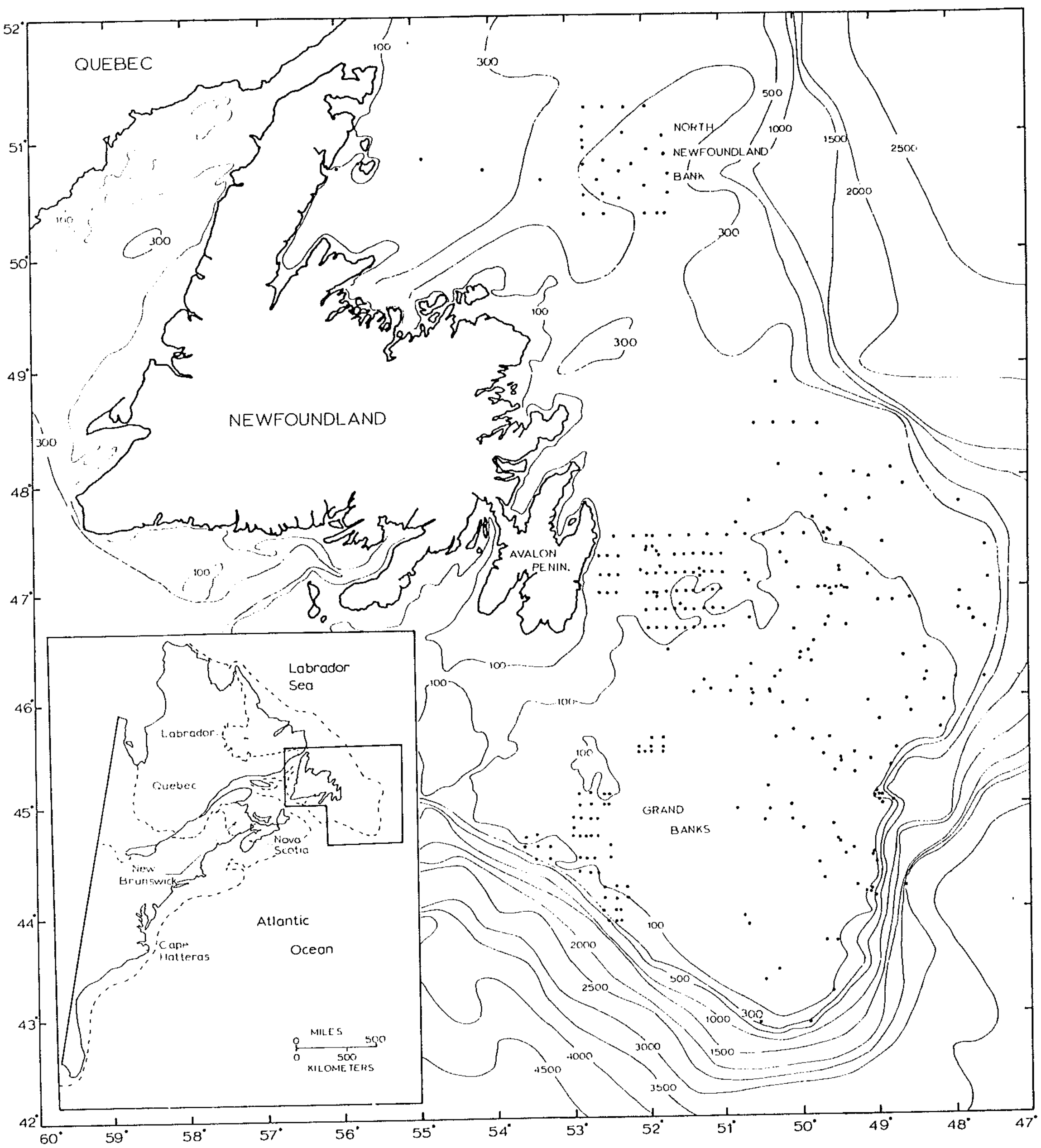
FIGURE 6

McMULLEN'S SEDIMENT TEXTURE MAP AS SHOWN IN SEN GUPTA AND McMULLEN'S FIGURE 2 (1969). THE BOUNDARY OF THE MAPPED AREA IS DETERMINED BY THE LIMITS OF McMULLEN'S THEN-AVAILABLE SAMPLES. THE DARK LINES MARK THE SOUTHERN LIMITS OF THE PRESENT STUDY AREA. McMULLEN'S SAMPLES OR HIS ANALYSES APPARENTLY DID NOT CATCH THE TAIL OF THE BANKS MUD IN THE STUDY AREA THOUGH IT DOES SHOW UP TO THE SOUTHEAST JUST SOUTHEAST OF THE AREA.


GRAVEL
SANDY GRAVEL
GRAVELLY SAND
SAND
MUDDY SAND
SANDY MUD
MUD
0 10 20 30
NAUTICAL MILES

FIGURE 7

ROGER SLATT'S (1974a) SAMPLE GRID OFF THE EAST COAST OF NEWFOUNDLAND ON THE GRAND BANKS. THE SAMPLES SOUTH OF THE AVALON PENINSULA ARE THOSE GATHERED BY THE PAN AMERICAN PETROLEUM CORPORATION IN 1969.


QUEBEC
NEWFOUNDLAND
NORTH NEWFOUNDLAND BANK
AVALON PENIN.
GRAND BANKS
Labrador Sea
Labrador
Quebec
Nova Scotia
New Brunswick
Cape Hatteras
Atlantic Ocean
MILES
KILOMETERS
52°
51°
50°
49°
48°
47°
46°
45°
44°
43°
42°
60°
59°
58°
57°
56°
55°
54°
53°
52°
51°
50°
49°
48°
47°

PREVIOUS WORK (CONTINUED)

Conception Bay

In Conception Bay, Slatt (1974b) presented the first detailed contoured map of bathymetry with his 74 samples. Figure 8 presents this map enlarged to 1:350,000 to match the scales of this report's Enclosures (Slatt, 1974b). Slatt also presented small maps of the distribution of gravel, very fine sand and mud in Conception Bay (Figure 9) as well a map of the distribution of textural types after the classification of Folk (1954). Figures 10 and 11 here present the textural map and a map of the gravel/sand/mud distribution in Conception Bay both enlarged to 1:350,000 to match the scale of this report's Enclosures.

Figure 8, the bathymetry map, also shows the 74 Slatt sample locations. We have failed to locate a list of precise coordinates, the grain size analysis, or the actual samples of Slatt's 1972 RITA MAXWELL cruise in Conception Bay despite considerable effort in this regard. At least 9 of the 74 sample locations given in Slatt (1974b) were gathered the previous year by Dr. John H. Allen on the DAWSON 71-021 cruise in 1971; Slatt is therefore presumed to have collected 65 bottom samples in 1972. The 65 Slatt 1972 sample locations were added from Figure 8 to the index map of bottom samples in Enclosure 6 despite the lack of sample numbers or other data being in the files.

Slatt (1974b) had little seismic profiling data in Conception Bay, if any, and he does not discuss the third dimension to any degree. We have, however, used his small map D on p. 824 of his paper in an enlarged form (Figure 11) to infer the probable surficial formations found in Conception Bay; the bathymetry map of Figure 8 and one line of Huntec profiling data from HUDSON 80-010 were also used. These formations have been used on the 1:350,000 Surficial Geology Map of Enclosure 1 and in the hand-colored version also supplied.

FIGURE 8

CONTOURED BATHYMETRY MAP OF CONCEPTION BAY, NEWFOUNDLAND PRODUCED BY SLATT (1974b). CONTOURS ARE IN METRES. THIS COPY HAS BEEN ENLARGED TO CLOSE TO 1:350,000 TO MATCH THE COMPILATION SCALE OF THE ENCLOSURES IN THE REPORT. SLATT'S 74 BOTTOM SAMPLE STATIONS SHOW AS BLACK DOTS. THE ARROWS INDICATE THE INFERRED DIRECTION OF THE LAST GLACIAL ICE FLOW AS TAKEN FROM HENDERSON (1960).

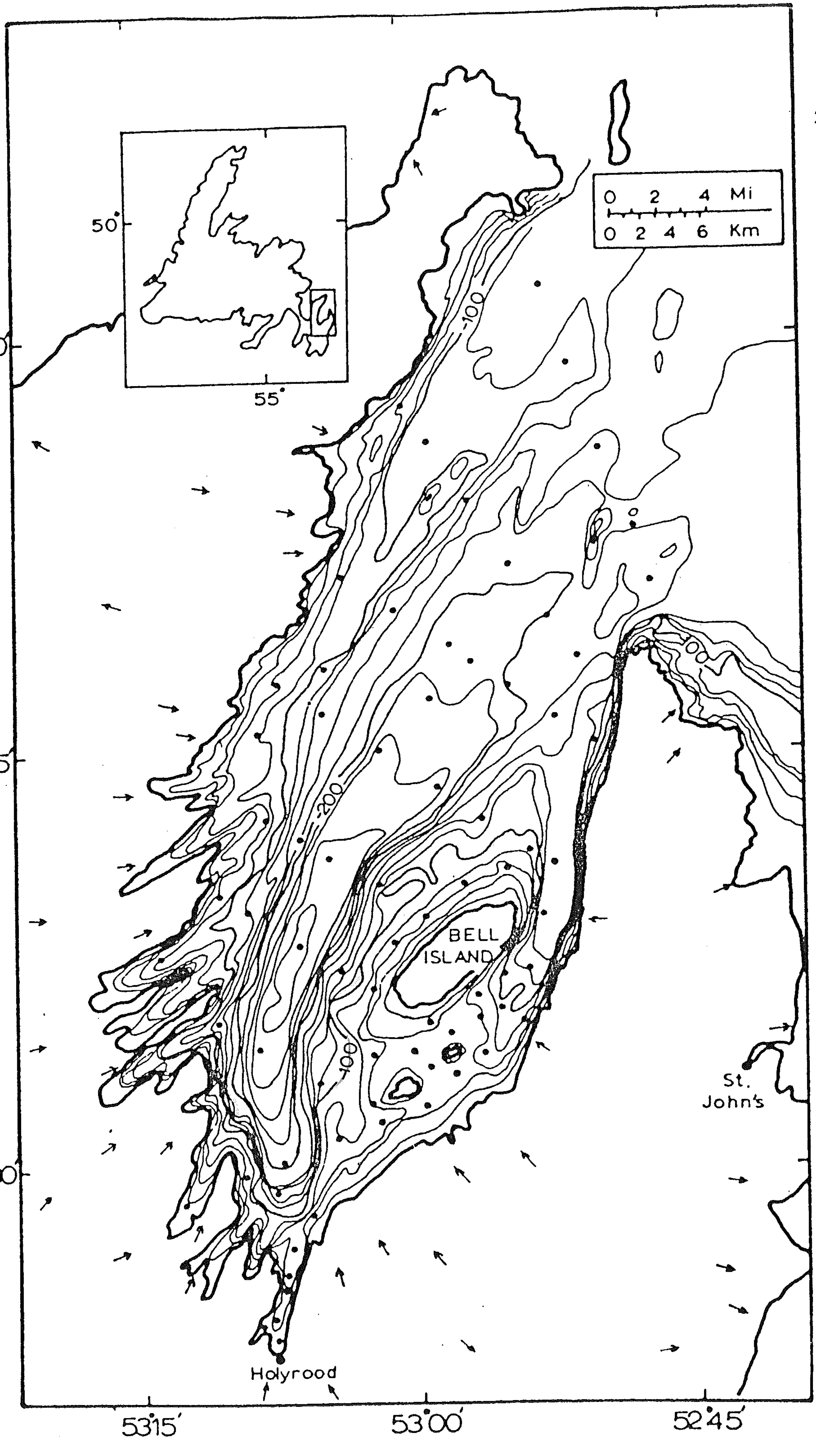

50°
55°
48°00'
47°45'
47°30'
53°15'
53°00'
52°45'
0 2 4 Mi
0 2 4 6 Km
100
200
BELL ISLAND
St. John's
Holyrood

FIGURE 9

CONCEPTION BAY DISTRIBUTION OF GRAVEL (A), VERY FINE SAND (B), MUD (C) AND OF ALL THREE POPULATIONS SUPERIMPOSED (D) AS TAKEN DIRECTLY FROM SLATT (1974b).

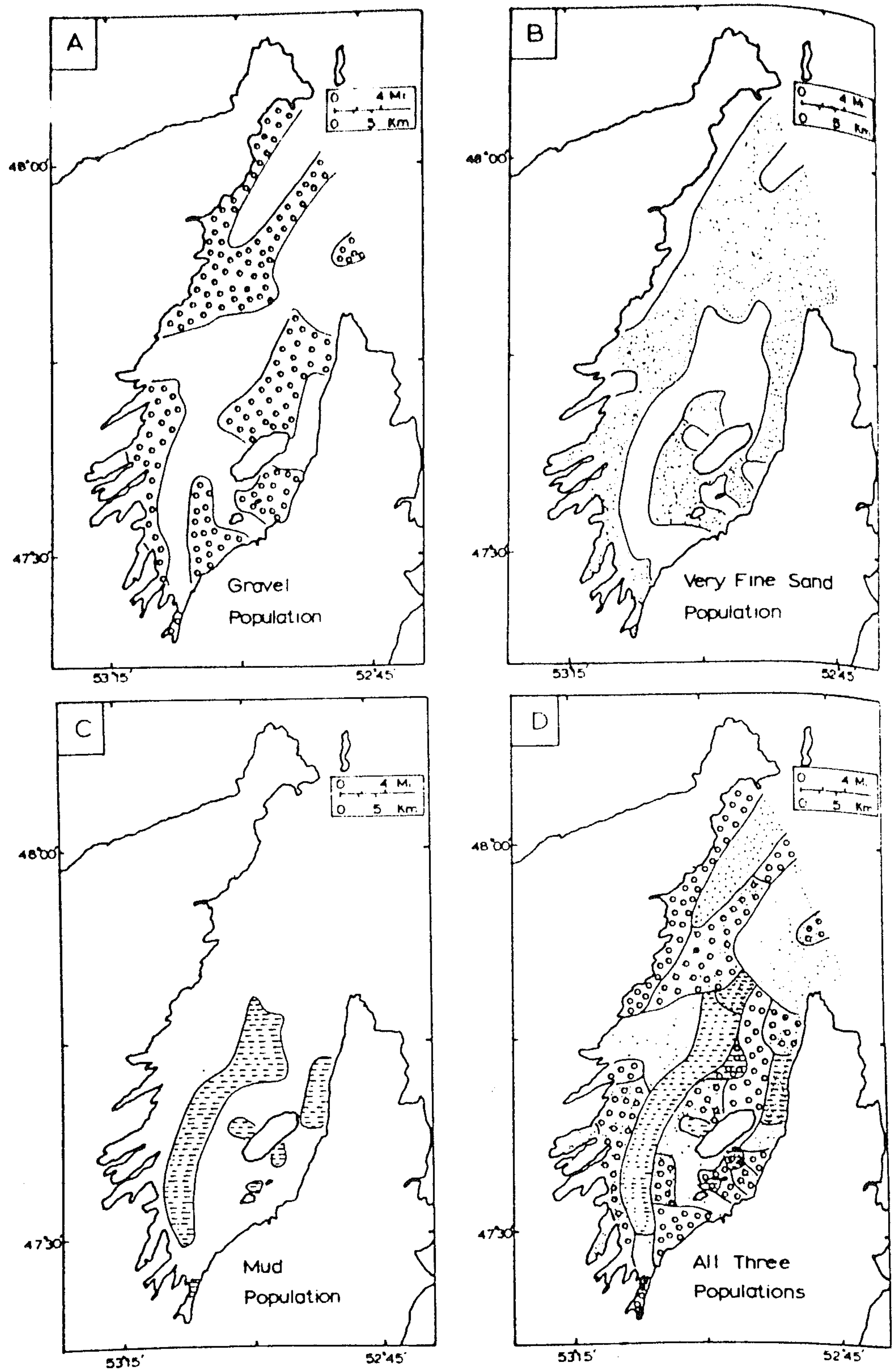

A
0 4 Mi
0 5 Km
48°00'
47°30'
Gravel
Population
53°15'
52°45'
B
Very Fine Sand
Population
C
Mud
Population
D
All Three
Populations

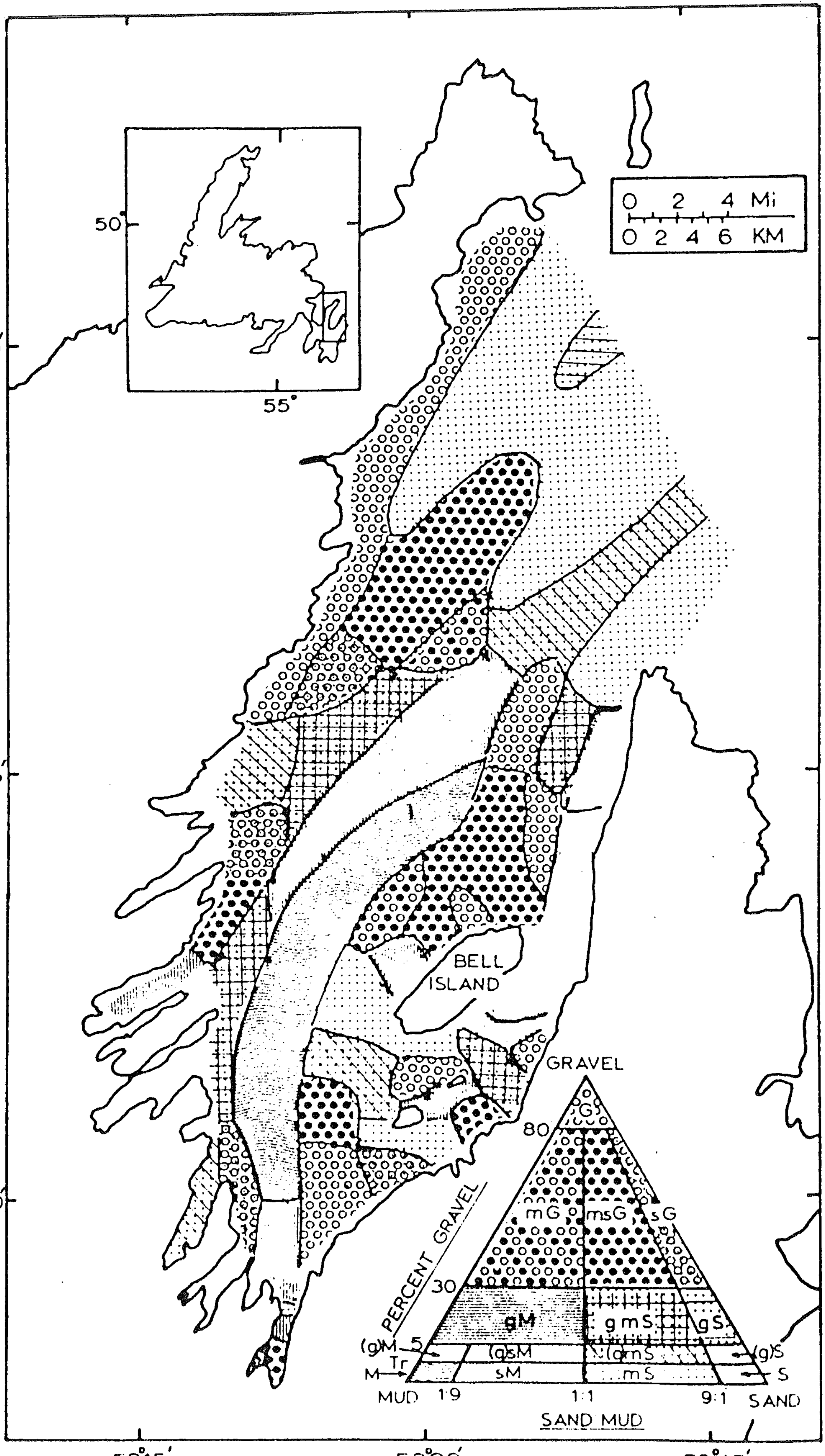
FIGURE 10

DISTRIBUTION OF SEDIMENT TEXTURAL TYPES IN CONCEPTION BAY TAKEN FROM SLATT (1974b) AND ENLARGED TO 1:350,000 TO MATCH THE SCALE OF THIS REPORT'S ENCLOSURES. THE CLASSIFICATION IS AFTER FOLK (1954):

G=gravel, mG=muddy ground, msG=muddy sandy gravel, sG=sandy gravel, gM=gravelly mud, gmS=gravelly muddy sand, gS=gravelly sand, (g)sM=slightly gravelly sandy mud (g)mS=slightly gravelly muddy sand, (g)S=slightly gravelly sand, M=mud, sM=sandy mud, mS=muddy sand and S=sand.

FIGURE 10

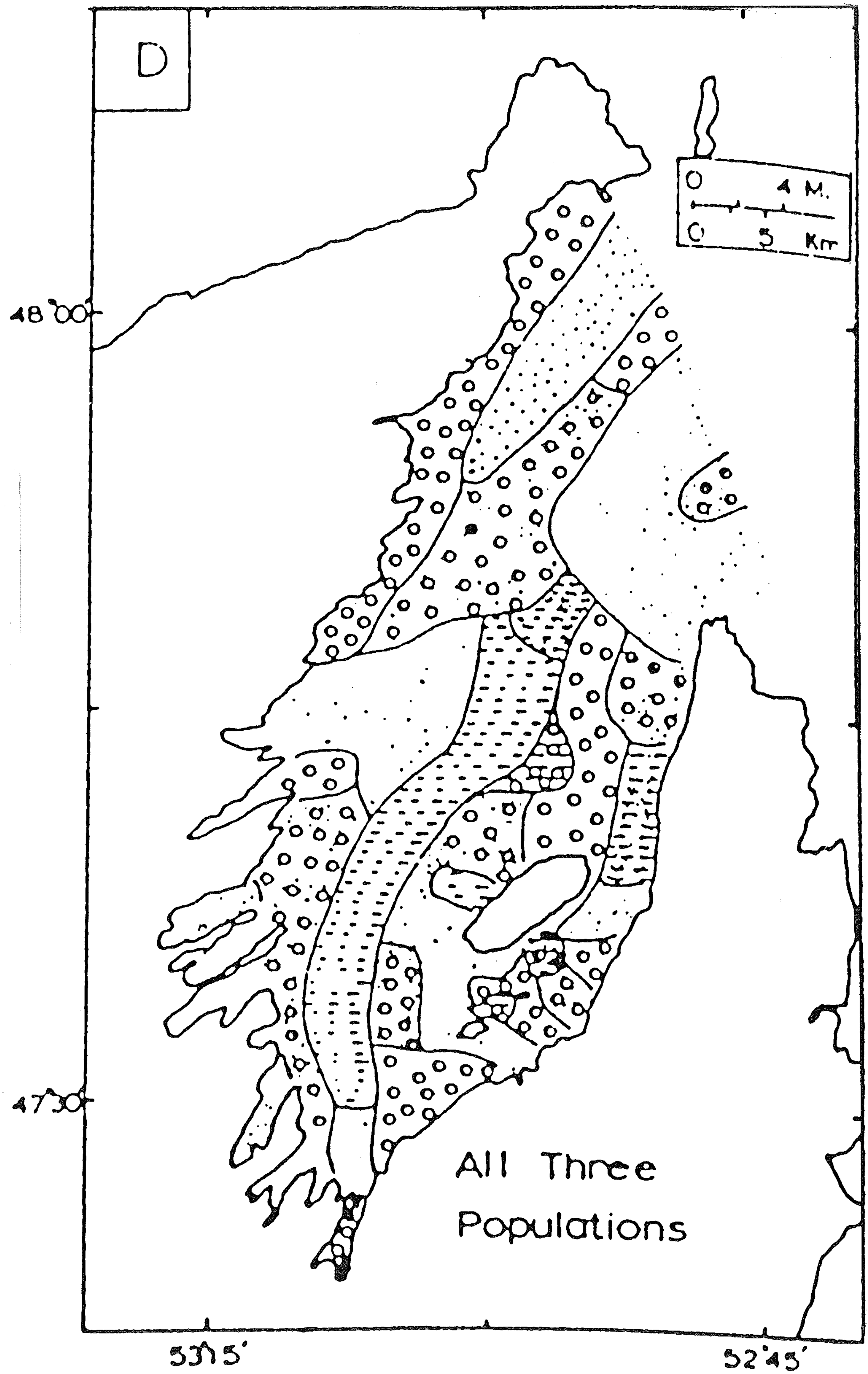
DISTRIBUTION OF SEDIMENT TEXTURAL TYPES IN CONCEPTION BAY TAKEN FROM SLATT (1974b) AND ENLARGED TO 1:350,000 TO MATCH THE SCALE OF THIS REPORT'S ENCLOSURES. THE CLASSIFICATION IS AFTER FOLK (1954):
G=gravel, mG=muddy ground, msG=muddy sandy gravel, sG=sandy gravel, gM=gravelly mud, gmS=gravelly muddy sand, gS=gravelly sand, (g)sM=slightly gravelly sandy mud (g)mS=slightly gravelly muddy sand, (g)S=slightly gravelly sand, M=mud, sM=sandy mud, mS=muddy sand and S=sand.



0 2 4 Mi
0 2 4 6 KM
50°
55°
48°00'
47°45'
47°30'
53°15'
53°00'
52°45'
BELL ISLAND
GRAVEL
G
80
mG
msG
sG
PERCENT GRAVEL
30
gM
gmS
gS
(g)M
5
(g)sM
(g)mS
(g)S
Tr
M
sM
mS
S
MUD
1:9
1:1
9:1
SAND
SAND MUD

FIGURE 11

SLATT'S (1974b) MAP OF THE DISTRIBUTION OF GRAVEL (CIRCLES), VERY FINE SAND (DOTS), AND MUD (DASHES), IN CONCEPTION BAY ENLARGED TO 1:350,000 TO MATCH THE ENCLOSURE SCALES OF THE REPORT. SEE FIGURE 9 FOR THE INDIVIDUAL DISTRIBUTIONS.


D
0 4 M.
0 5 Km
48°00'
47°30'
53°15'
52°45'
All Three
Populations

PREVIOUS WORK (CONTINUED)

Placentia Bay

Memorial University's Department of Geology initiated a similar intensive sampling effort in northern Placentia Bay in the early 70's (1973 - 1975) after the Conception Bay program. Charles F. Stehman and Joan D. Willey were responsible for an oceanographic program (Willey, 1975) and for a bottom Shipek grab sampling program. Willey produced a paper on the geochemistry of the sediments (1976) and Stehman worked up the textures of the sediments (1976). Stehman produced a later unpublished manuscript on the carbonate content of the samples (1981) which he has kindly provided to this study (Charles F. Stehman, Box 278, Law Engineering Testing Company, Wilmington, North Carolina, 28402, personal communication, 1987).

Stehman produced a detailed bathymetry map of northern Placentia Bay by contouring the original CHS field sheet data. This map has only ever been published as a 3 in - high figure in Stehman's 1976 paper on the work. He kindly relocated the original and provided it to the project to ensure that a copy would be archived in Canada. This has been included as Enclosure 5. He also provided a photographic copy of the bathymetry map at close to the 1:350,000 scale of the Enclosures of this report and this is included here as Figure 12.

Stehman's paper included a diagram of his stations with no sample number identification. This was rectified by reference to Willey's (1975) map, to Stehman's map in his unpublished note (1981) and to a list of sample station coordinates which Stehman was able to provide. Stehman's location map has been enlarged to 1:350,000 (Figure 13) to match the Enclosures of the report, modified to show No. 87 in its correct location and to show the four Paradise Sound samples; an adjustment of exactly 2 minutes in latitude was made to the listed coordinates of No. 92 to place it in the axis of the Paradise Sound (see listing in Appendix 16 and sample locations plotted on Enclosure 6).

Stehman has sample locations Numbered 1-105 and P1-P8, but there are actually only 94 sample locations since some stations were oceanographic stations only.

Stehman located and provided to the project his original sheets of raw grain size data for the samples 1 to 105 with the exception of No. 98, which was missing. He also provided the original plots of grain size curves, percentage gravel, sand, silt and clay plus skewness, kurtosis, and standard deviation for samples 1 to 85. He also located a box of the residues from the grain size analysis,

FIGURE 12

BATHYMETRY MAP OF NORTHERN PLACENTIA BAY BY CHARLES F. STEHMAN (1976) REDUCED FROM THE ORIGINAL TO FIT THE 1:350,000 SCALE OF THIS REPORT'S ENCLOSURES. CONTOURS ARE IN METRES. THIS MAP WAS FOUND IN ITS ORIGINAL WITH THE ORIGINAL AUTHOR IN THE UNITED STATES AND WAS COPIED TO ENSURE THAT THE DETAILED MAP WILL BE ARCHIVED IN CANADA (C. F. STEHMAN, PERSONAL COMMUNICATION, 1987) AND WAS THEREFORE ADDED TO THIS REPORT AS ENCLOSURE 5.

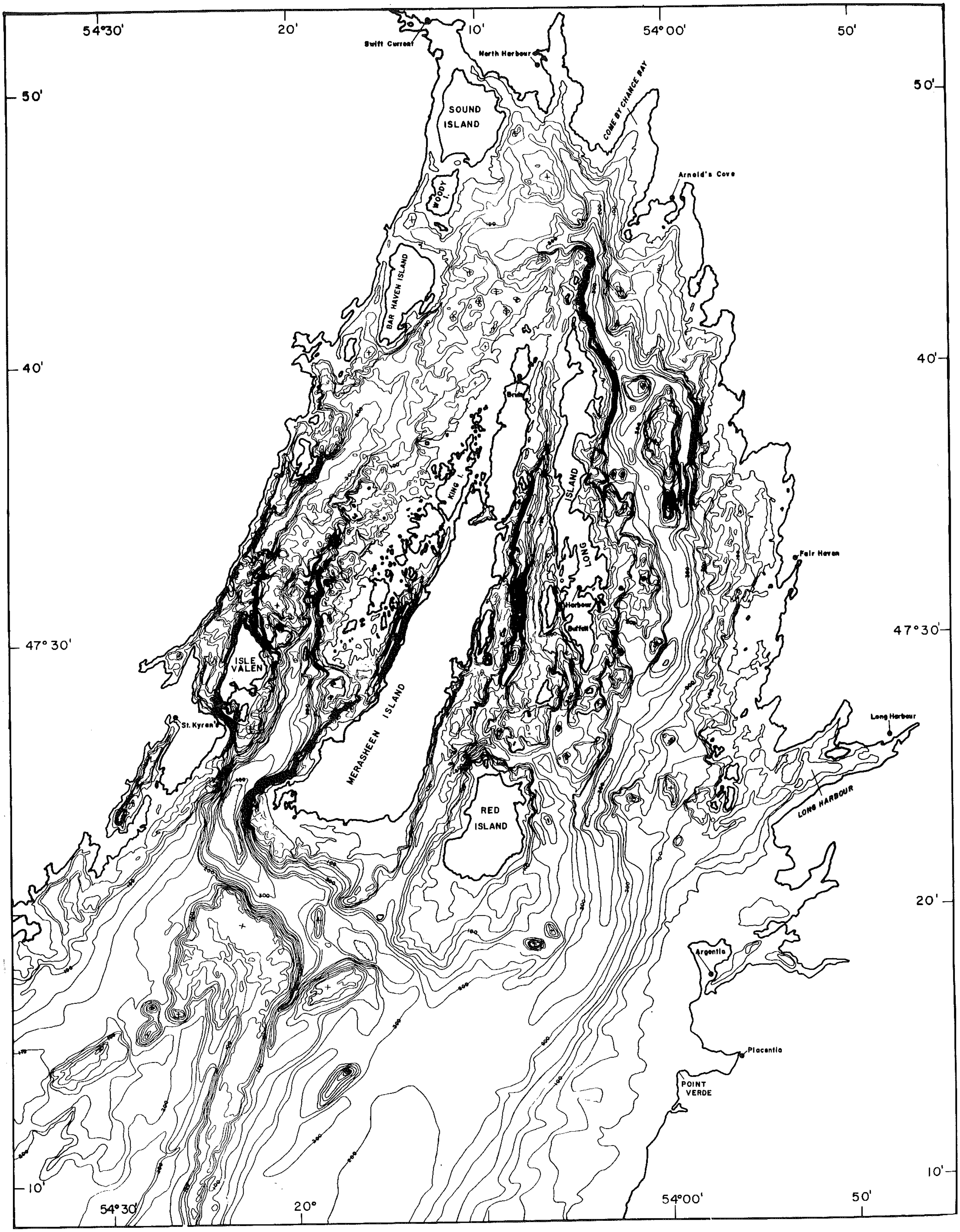
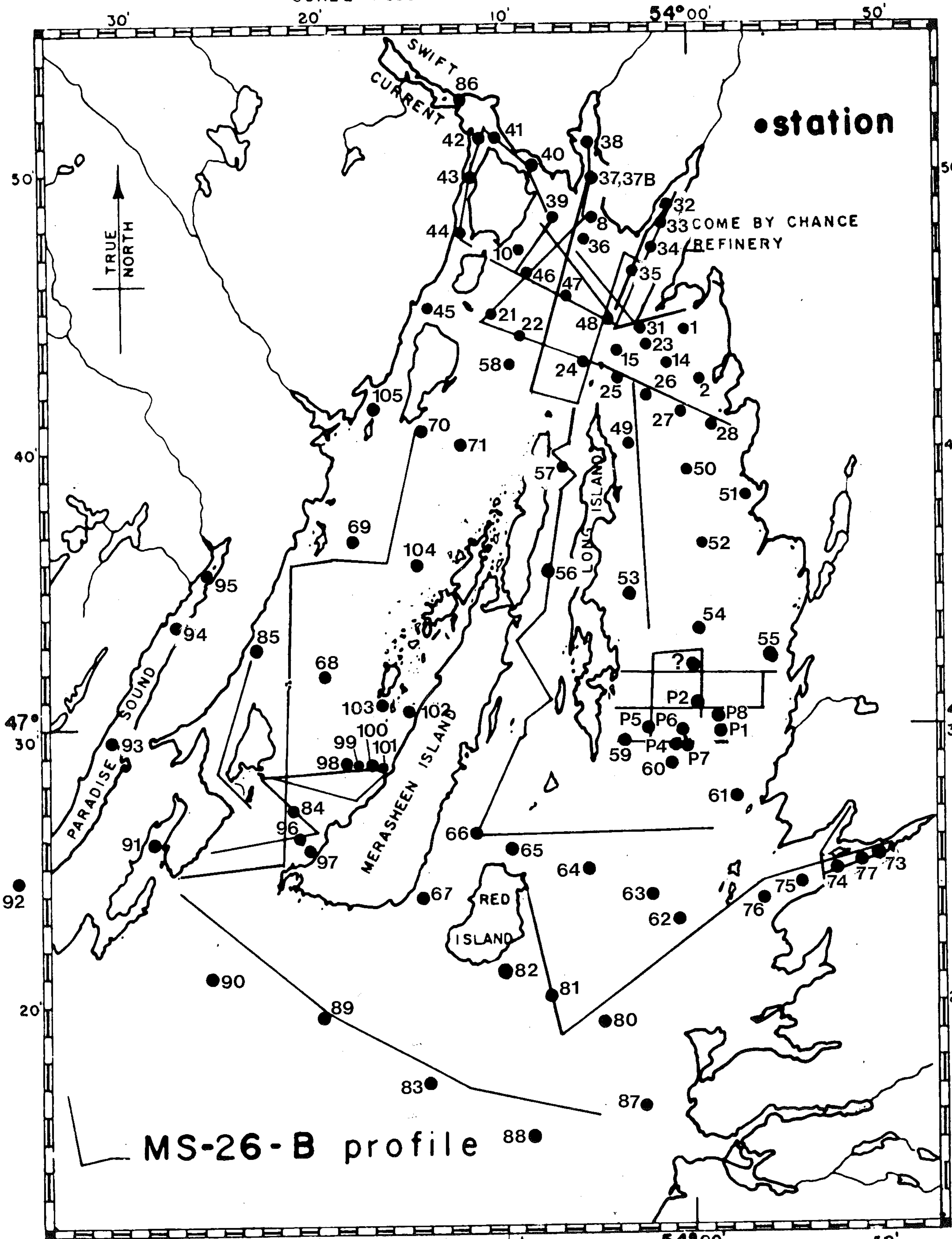

54°30'
20'
10'
54°00'
50'
50'
40'
47°30'
20'
10'
20°
Swift Current
North Harbour
SOUND ISLAND
WOODY I.
COME BY CHANCE BAY
Arnold's Cove
BAR HAVEN ISLAND
KING I.
LONG ISLAND
Harbour Buffett
Fair Haven
ISLE VALEN
St. Kyran's
MERASHEEN ISLAND
RED ISLAND
Long Harbour
LONG HARBOUR
Argentia
Placentia
POINT VERDE

FIGURE 13

INDEX MAP TO STEHMAN'S NORTH PLACENTIA BAY SAMPLES ENLARGED BACK TO ITS ORIGINAL 1:350,000 SIZE FROM STEHMAN (1976). SAMPLE LOCATIONS HAVE BEEN NUMBERED AND NO. 87 HAS BEEN CORRECTED IN LOCATION AS WELL AS ADDING NOS. 92 to 95 IN PARIDISE SOUND. STEHMAN SHOWS LINES OF MS-26B 12 kHz ECHOSOUNDER DATA WHICH HE GATHERED. THESE DATA HAVE NEVER BEEN WRITTEN UP OR INTERPRETED IN THE SUBSURFACE; THEY HAVE RECENTLY BEEN RELOCATED.

NORTH PLACENTIA BAY

SCALE 1:350 000



PREVIOUS WORK (CONTINUED)

Placentia Bay (Continued)

which he has also submitted for archival in the AGC Sample Repository (Charles F. Stehman, personal communication, 1987). The list of positions, the pan weight raw data, the grain size curves, the size fraction percentages and the sample residues have been provided to the AGC Sample Repository for permanent archiving.

When Roger Slatt left Memorial University in 1976, he sent all his leftover, unprocessed, Conception Bay samples (marked CON) and all Stehman's left-over, unprocessed, Placentia Bay samples (marked PLA) in clearly marked Mason jars to Dr. David Piper, then at Dalhousie's Department of Geology. Charles Stehman, then at Saint Mary's University, clearly remembers seeing these jars in sectioned cardboard boxes put safely into Geological Curation at Dalhousie however, in 1987 Alan Ruffman had a total lack of success in running these to ground; they may have been destroyed but this cannot be confirmed.

All available data on the Placentia Bay samples has also been integrated into the large table of Apendix 16. Thus, effectively, the Placentia Bay sample program has been recovered; while we did relocate Roger Slatt, he was unable to provide any further data on his 1972 Conception Bay samples.

Stehman's sedimentary facies map of Placentia Bay was enlarged to 1:350,000 to match the scale of the Enclosures in this report (Figure 14). As in Conception Bay, we used this diagram of sedimentary facies along with the detailed bathymetry to assist us in extending the surficial geological units to the head of Placentia Bay on Enclosure 1.

In his unpublished manuscript (1981) on calcium carbonate in the bottom samples of northern Placentia Bay, Charles Stehman evaluated the weight % of calcium carbonate in the -2.5 phi (8mm) to +4.0 phi (0.06mm) fraction (Figure 15) and assessed the insoluble residues (Figure 16). Carbonate contents were generally between 6 and 20 weight percent with three samples greater than 20% (Figure 15). His manuscript suggests that "Placentia Bay carbonate texture is useful in differentiating between sedimentogically active and passive substrates", though, "it remains undefined, however as to what framework is associated with activity and inactivity" (Stehman, 1981; personal communication, 1987).

FIGURE 14

STEHMAN'S (1976) SEDIMENTARY FACIES MAP OF NORTHERN PLACENTIA BAY ENLARGED TO 1:350,000 DEVELOPED FROM AN ANALYSIS OF THE GRAB SAMPLE DATA AND THE MS-26B ECHOSOUNDER DATA. AT THIS SCALE THE MAP MATCHES THE SCALE OF THE ENCLOSURES OF THIS REPORT.

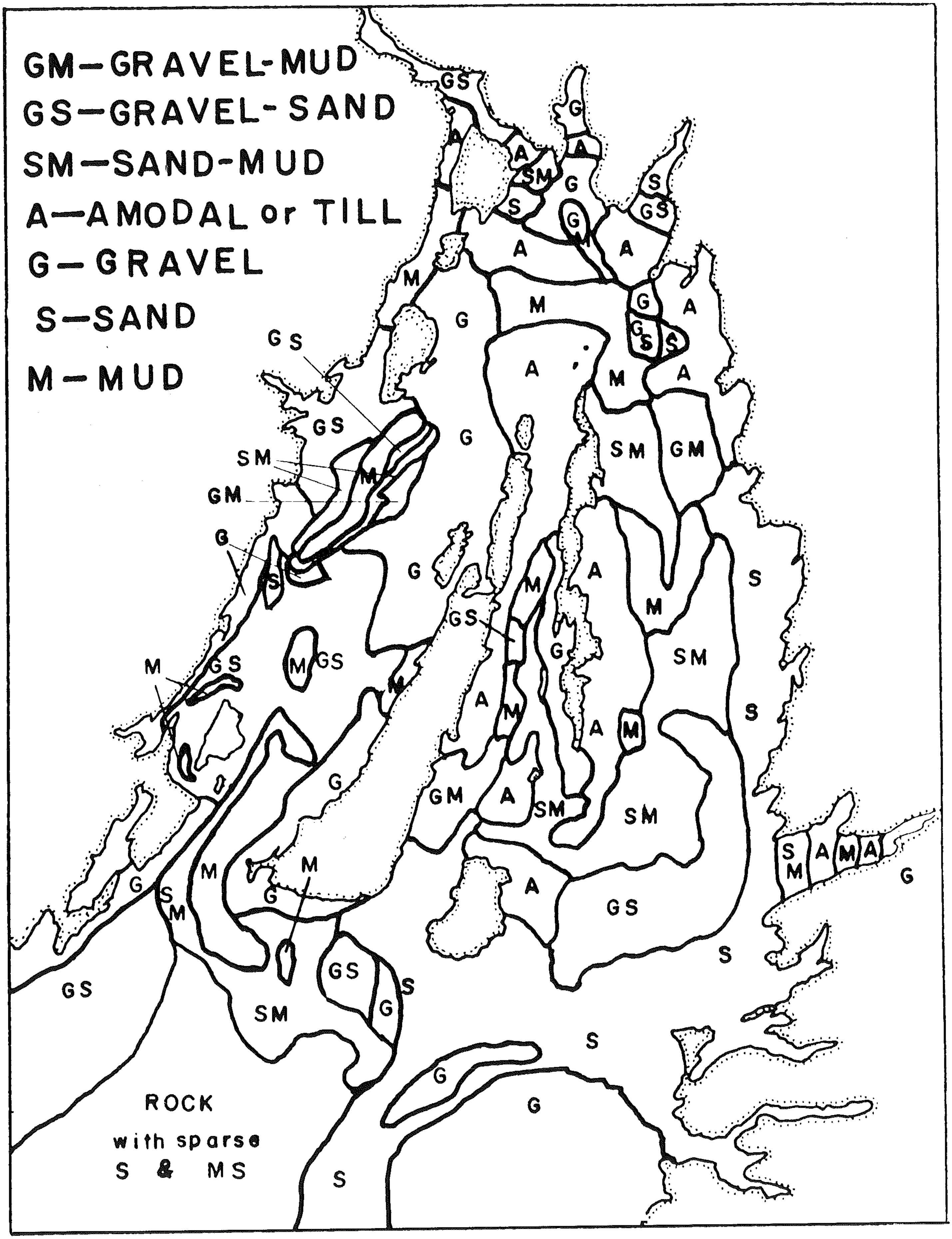

GM—GRAVEL-MUD
GS—GRAVEL-SAND
SM—SAND-MUD
A—AMODAL or TILL
G—GRAVEL
S—SAND
M—MUD
ROCK
with sparse
S & MS

FIGURE 15

LOCATION OF SAMPLES AND THEIR WEIGHT PERCENT CALCIUM CARBONATE CONTENT IN THE -2.5 phi TO +4.0 phi FRACTION FOR STEHMAN'S (1981) SHIPEK GRAB SAMPLES IN NORTHERN PLACENTIA BAY. SAMPLES WITH 5% OR LESS CALCIUM CARBONATE WERE ELIMINATED BY STEHMAN (1981) FROM FURTHER TESTS.

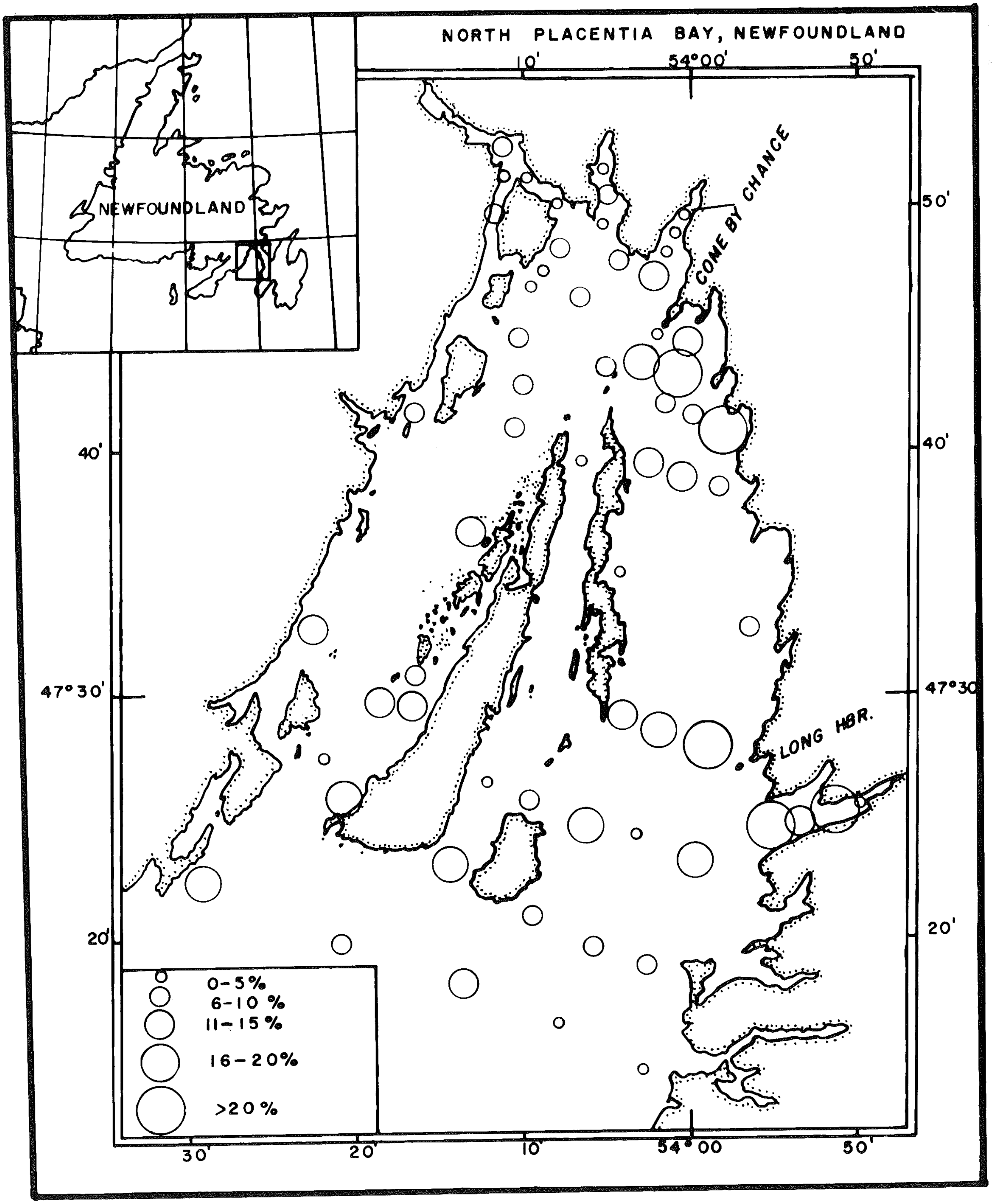
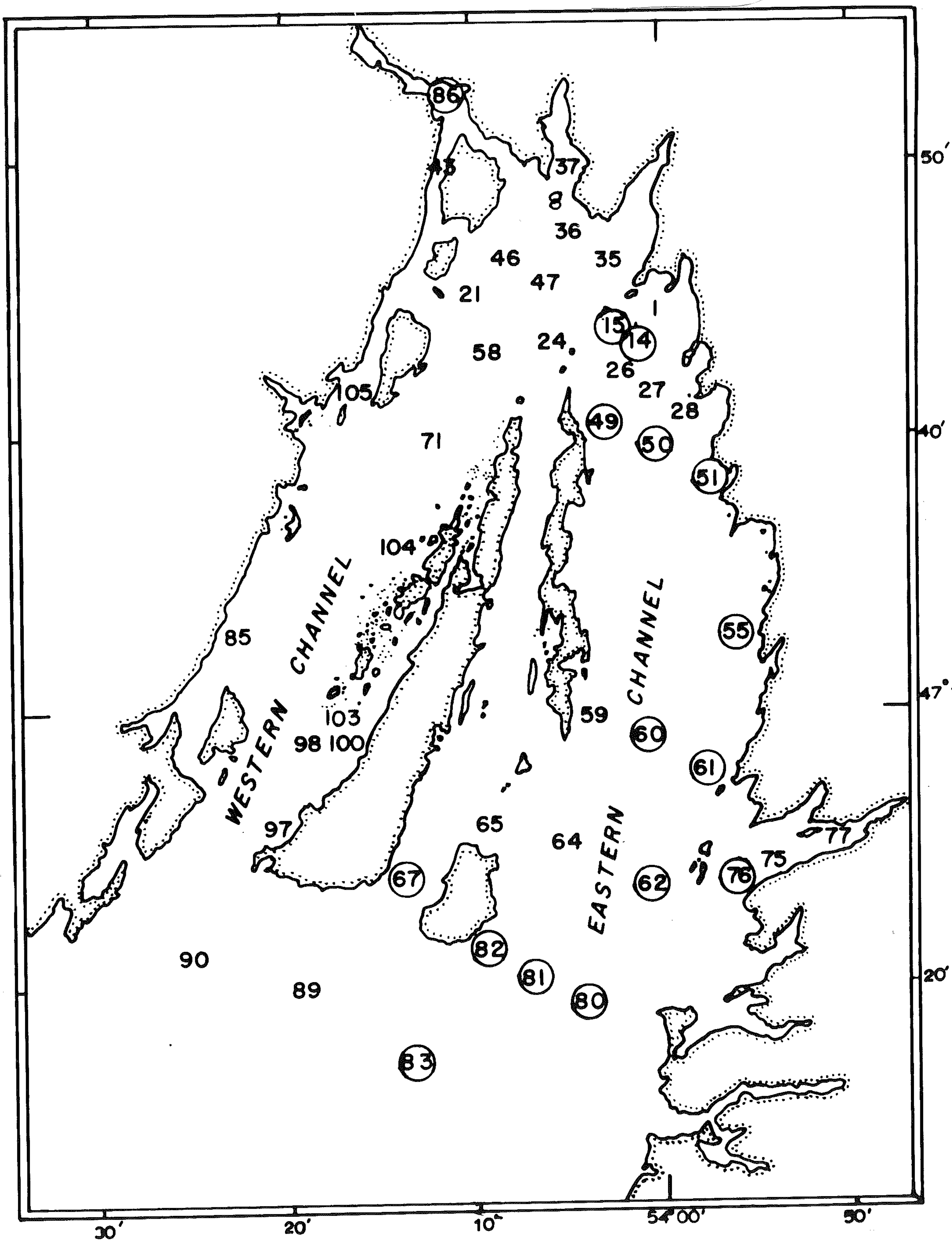

NORTH PLACENTIA BAY, NEWFOUNDLAND
NEWFOUNDLAND
10'
54°00'
50'
40'
47°30'
20'
30'
20'
10'
54°00
50'
COME BY CHANCE
LONG HBR.
0-5%
6-10 %
11-15 %
16-20%
>20 %

FIGURE 16

LOCATION OF SAMPLES USED IN STEHMAN'S 1981 ANALYSIS AFTER ELIMINATING SAMPLES WITH 5% OR LESS CALCIUM CARBONATE CONTENT BY WEIGHT. THE CIRCLED SAMPLES HAVE SIMILAR INSOLUBLE RESIDUE AND CALCIUM CARBONATE TEXTURES; THESE SAMPLES ARE CONCENTRATED IN THE EASTERN CHANNEL AREA AND ARE INTERPRETED BY STEHMAN TO INDICATE THAT EASTERN AND WESTERN CHANNELS HAVE QUITE DIFFERENT MODERN SEDIMENTOLOGICAL REGIMES.


86
45
37
8
36
46
35
47
21
1
15
14
24
58
26
27
28
105
49
50
71
51
104
WESTERN CHANNEL
EASTERN CHANNEL
85
55
103
59
60
98 100
61
97
65
64
77
75
67
62
76
82
90
81
89
80
83
50′
40′
47°30′
20′
30′
20′
10′
54°00′
50′

PREVIOUS WORK (CONTINUED)

Atlantic Geoscience Centre Mapping

The Atlantic Geoscience Centre ran a major cruise of SACKVILLE in 1969 (cruise 69-041) which included some airgun lines in the project area (Enclosure 10). Alan Grant (1972), interpreted the results of this cruise in a major review paper. He defined the contact between the coastal plain sediments and the Avalon Platform rocks south of the Avalon Peninsula and did the first bedrock map of the area east of the Avalon Peninsula (his Figure 9), commented on the glacial overdeepening of the Avalon Channel (p. 1412 Grant, 1972) and estimated glacial 'drift' thicknesses offshore from the Avalon Peninsula.

In the mid 1960's, the Atlantic Geoscience Centre at the Bedford Institute of Oceanography began its surficial geology mapping program. Lewis H. King built on the earlier work of D. H. Loring and R. M. McMullen with the use of the 12 kHz echosounder (King, 1967) and began to use high resolution profilers to give the third dimension to the surficial geological studies. The glaciomarine nature of much of the Scotian Shelf sediments was established and a seismostratigraphy developed. A series of map units were developed and the units mapped by seismic profilers and echosounders were calibrated by bottom sampling, coring and seafloor photographs. The Halifax to Sable Island sheet was the first of a series of reports and maps on surficial geology that have mapped all the Scotian Shelf and the Bay of Fundy (King. 1970a;b).

The most recently compiled and published surficial geology sheet in the Atlantic Geoscience Centre (AGC) series was the sheet immediately to the west of the project area centered on St. Pierre Bank and eastern Banquereau (Fader _et al_., 1982; 1984). This sheet overlaps onto the present project area by 30 minutes of longitude. This sheet immediately to the west continued to use the surficial formation names developed on the Scotian Shelf. Thus, one sees on the map (1984) the names Sable Island Sand and Gravel, Sambro Sand, etc. When King and Fader published their GSC Bulletin 363 two years later (1986) on the Wisconsin Glaciation of the Atlantic Continental Shelf of Southeast Canada, they continued with the same surficial formation names on the Newfoundland Shelf as those used on the Scotian Shelf.

However, one change was introduced on the St. Pierre Bank sheet (Fader _et al_., 1982; 1984); The Scotian Shelf Drift became the Scotian Shelf - Newfoundland Shelf Drift. When Fader _et al_., (1986) put their series of maps of the Hibernia area on open file in early 1986 a full suite of new formation names specific to the Grand Banks-

PREVIOUS WORK (CONTINUED)

Atlantic Geoscience Centre Mapping (continued)

Newfoundland Shelf were introduced. Fader and Miller (1986a) in their table 62-1 listed the correlation of the surficial formations between the Scotian, Newfoundland and Labrador shelves; the Newfoundland Shelf Drift became the Grand Banks Drift.

In this report, we use the surficial formation name Grand Banks Drift and those equivalent names suggested for the Grand Banks by Gordon Fader and Bob Miller (1986a). The table below lists the equivalent names:

<u>Scotian Shelf</u>	Grand Banks <u>Newfoundland Shelf</u>
	Tail of the Bank Mud
LaHave Clay	Placentia Clay
Sable Island Sand and Gravel	Grand Banks Sand and Gravel
Sambro Sand	Adolphus Sand
Emerald Silt	Downing Silt
Scotian Shelf Drift	Grand Banks Drift

The AGC mapping of the surficial geology of the Grand Banks in the project area began with the HUDSON 73-006 cruise that carried sidescan sonar. Another cruise followed in 1975 then a major cruise was carried out in 1978 in Placentia Bay (Dunsiger <u>et</u> <u>al</u>., 1981).

The discovery of the Hibernia field in 1979 and the consideration of a pipeline to the island of Newfoundland focused the interest in the surficial geology of the project area off the Avalon Peninsula and on to the east. King and Fader (1981) addressed a possible pipeline route east of the Avalon Peninsula. In the same year, Fader and King (1981) wrote a preliminary review of the surficial geology of the Grand Banks east of the Avalon Peninsula.

King <u>et</u> <u>al</u>. (1986) capped their work on the bedrock of the project area with their bedrock geology map in the 1986 paper (Figure 17). The 1986 map of King <u>et</u> <u>al</u>. represented the first major refinement to the initial bedrock map of Alan Grant (1972-Figures 9 and 16). A further refinement of the bedrock map east of the Avalon Peninsula was recently made by Durling <u>et</u> <u>al</u>. (1987). The Cambrian to ?Devonian rocks of King <u>et</u> <u>al</u>. (1986) in Figure 17 have been further subdivided into Ordovician, Silurian and Devonian sequences on the basis of continuous seismic profiling calibrated by short drillholes (Figure 18). They present a structural trends map (Figure 19). The same authors also present a formline structural map of the offshore Avalon Platform area that clearly shows the Devonian? red bed outlier lying unconformally on the underlying conformable Silurian - Ordovician sequence.

FIGURE 17

KING *ET AL*'S. (1986) BEDROCK GEOLOGY MAP IN THE VICINITY OF THE AVALON PENINSULA INCLUDING ALL OF THE PRESENT STUDY AREA. THIS MAP SUPPLANTS ALL EARLIER PUBLISHED INTERPRETATIONS (eg. SANFORD *ET AL*. 1974). THE AREA EAST OF THE AVALON PENINSULA HAS BEEN FURTHER DETAILED IN DURLING *ET AL*. (1987).

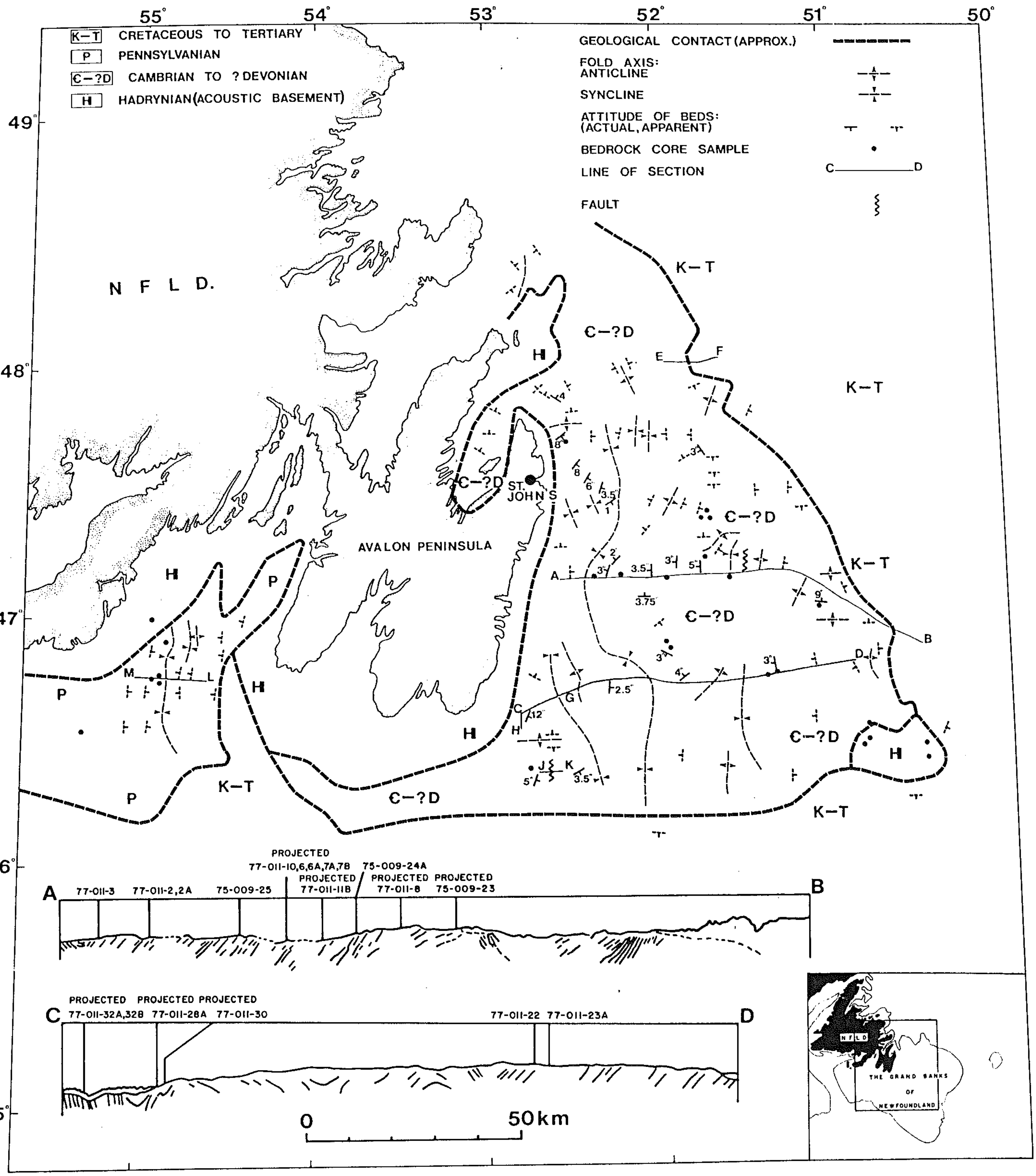

55°
54°
53°
52°
51°
50°
49°
48°
47°
46°
45°
K–T CRETACEOUS TO TERTIARY
P PENNSYLVANIAN
Є–?D CAMBRIAN TO ?DEVONIAN
H HADRYNIAN (ACOUSTIC BASEMENT)
GEOLOGICAL CONTACT (APPROX.)
FOLD AXIS: ANTICLINE
SYNCLINE
ATTITUDE OF BEDS: (ACTUAL, APPARENT)
BEDROCK CORE SAMPLE
LINE OF SECTION
FAULT
N F L D.
AVALON PENINSULA
ST. JOHN'S
PROJECTED
77-011-10,6,6A,7A,7B
75-009-24A
PROJECTED
PROJECTED
PROJECTED
77-011-3
77-011-2,2A
75-009-25
77-011-11B
77-011-8
75-009-23
PROJECTED PROJECTED PROJECTED
77-011-32A,32B
77-011-28A
77-011-30
77-011-22
77-011-23A
0
50km
THE GRAND BANKS OF NEWFOUNDLAND

FIGURE 18

DURLING *ET AL*'S. (1987) BEDROCK GEOLOGY MAP OF THE AVALON PLATFORM EAST OF THE AVALON PENINSULA. THE NORTHEASTERN LIMITS OF THE PROJECT AREA ARE OUTLINED (LEGEND VERY SLIGHTLY REVISED FROM THE ORIGINAL). THE MAP IS ANNOTATED WITH THE AGE RANGES OF THE FOSSIL ASSEMBLAGES RECOVERED FROM THE ROCK DRILL CORE SAMPLES. THE DRILLHOLES ARE LISTED IN APPENDIX 16 AND ARE SLIGHTLY CORRECTED FROM TABLE 1 IN DURLING *ET AL*. (1987).

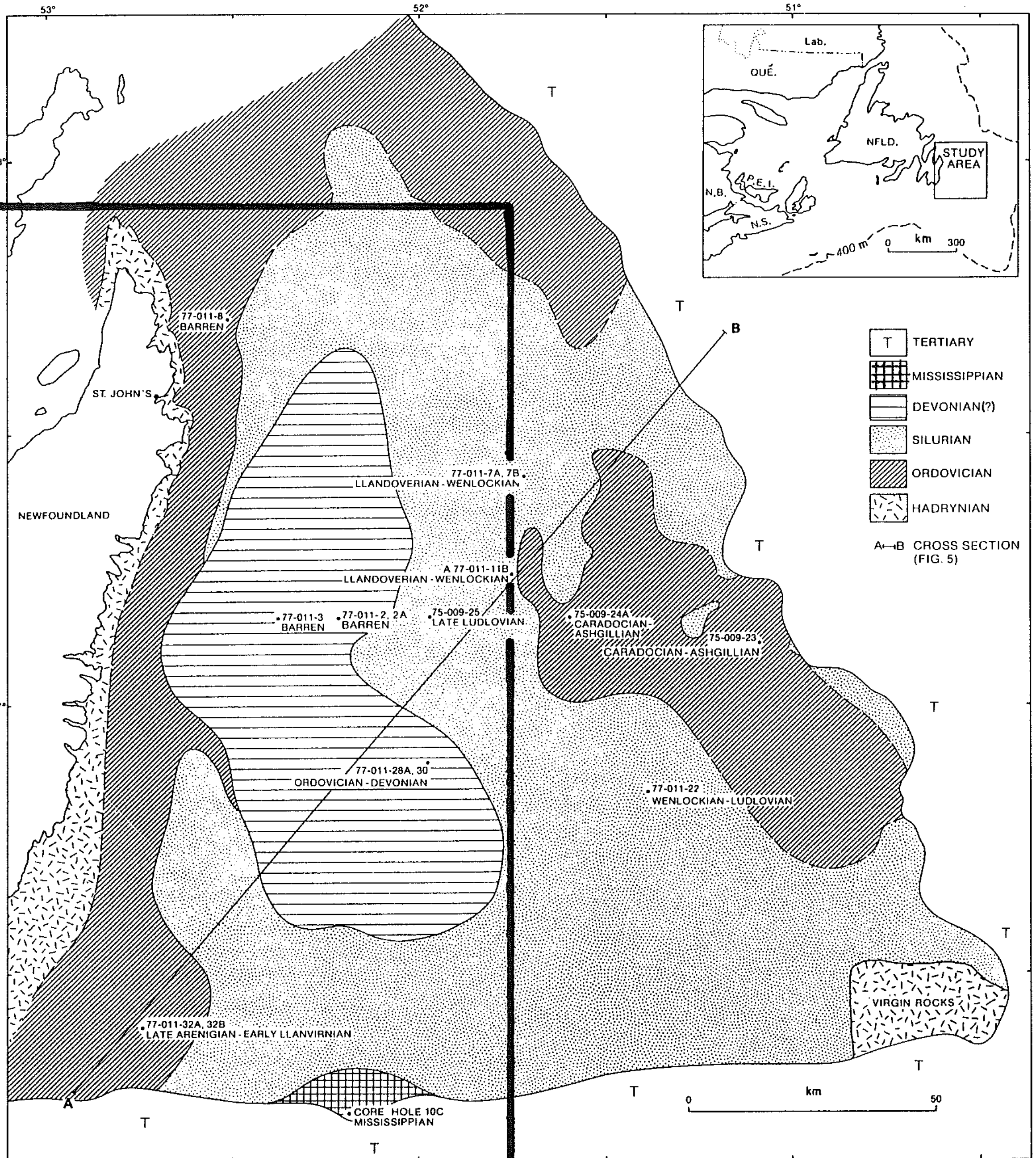
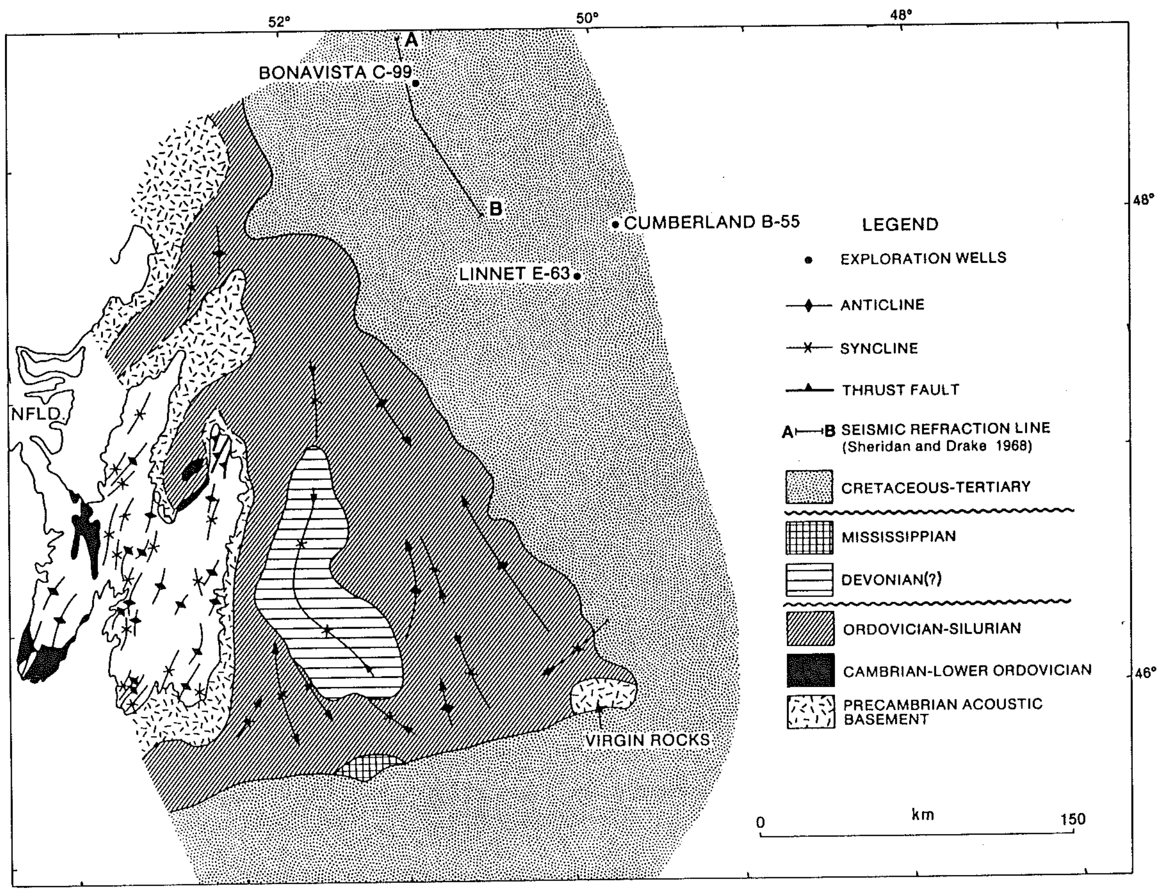

53°
52°
51°
48°
47°
Lab.
QUÉ.
NFLD.
STUDY AREA
P.E.I.
N.B.
N.S.
400 m
0 km 300
T
TERTIARY
MISSISSIPPIAN
DEVONIAN(?)
SILURIAN
ORDOVICIAN
HADRYNIAN
A—B CROSS SECTION (FIG. 5)
B
A
77-011-8
BARREN
ST. JOHN'S
NEWFOUNDLAND
77-011-7A, 7B
LLANDOVERIAN - WENLOCKIAN
A 77-011-11B
LLANDOVERIAN - WENLOCKIAN
77-011-3
BARREN
77-011-2, 2A
BARREN
75-009-25
LATE LUDLOVIAN
75-009-24A
CARADOCIAN-
ASHGILLIAN
75-009-23
CARADOCIAN - ASHGILLIAN
77-011-28A, 30
ORDOVICIAN - DEVONIAN
77-011-22
WENLOCKIAN - LUDLOVIAN
77-011-32A, 32B
LATE ARENIGIAN - EARLY LLANVIRNIAN
CORE HOLE 10C
MISSISSIPPIAN
VIRGIN ROCKS
0 km 50

FIGURE 19

SLIGHTLY REVISED STRUCTURAL MAP OF KING _ET AL._ (1986). THE DEVONIAN? OUTLIER EAST OF THE AVALON PENINSULA LIES PRESERVED ALONG THE AXIS OF A GENTLE SYNCLINE.



52°
50°
48°
48°
46°
A
B
BONAVISTA C-99
CUMBERLAND B-55
LINNET E-63
NFLD.
VIRGIN ROCKS
LEGEND
EXPLORATION WELLS
ANTICLINE
SYNCLINE
THRUST FAULT
A B SEISMIC REFRACTION LINE (Sheridan and Drake 1968)
CRETACEOUS-TERTIARY
MISSISSIPPIAN
DEVONIAN(?)
ORDOVICIAN-SILURIAN
CAMBRIAN-LOWER ORDOVICIAN
PRECAMBRIAN ACOUSTIC BASEMENT
0 km 150

PREVIOUS WORK (CONTINUED)

Atlantic Geoscience Centre Mapping (continued)

Iceberg scour on the Grand Banks began to get more attention with the discovery of Hibernia and with the consideration of a pipeline to shore. Steve d'Apollonia and Mike Lewis began to assess the distribution of ice-disturbed seabed and issued a GSC Open File Report in 1981 that assessed data in the project area in the Avalon Channel, including a line of POLARIS V 1980 data which we have been unable to include on our index maps to tracks or analysis.

Fader and Miller (1986a) presented a broad review of the AGC reconnaissance survey work on the surficial geology of the Grand Banks early in 1986. At the 3rd Canadian Conference on Marine Geotechnical Engineering in St. John's, Newfoundland June 11 - 13, 1986 they further reviewed the work to date. Their generalized regional map showed the project area along with the whole of the Grand Banks to the east (Figure 20). The 1986 Current Research paper (Fader and Miller, 1986a) presented a blow up of the project area, including the Tail of the Bank (Figure 21). These two maps in Figures 20 and 21 are the first publication of the interpretation that a shelf-edge "Tail of the Bank Mud" deposit lies all along the southwest edge of the Grand Banks and continues into the project area (Figure 21).

The maps also show an area of buried glacial and subaerial channels covering much of Whale Bank and Green Bank to the west (Figure 21). These channels are lying in a highly-disected Tertiary bedrock surface, are 3 to 5 km in width and are cut up to 150 m below the Tertiary bedrock surface (Figure 22). The continuity or true pattern of these channels are not known in that a detailed closely spaced grid of profiling lines has not been run over the buried channel zone. The channels are filled with glacial sediments. Fader and Miller (1986a;b) suggest that the channels may connect to shelf edge canyons and may be analogous to features seen in the Sable Island area.

These same papers of Miller et al. (1983), Fader et al. (1981) and Fader and Miller (1986a;b) present more detail on the "megaflute" zone in Placentia Bay first briefly reported on in Dunsiger et al. (1981). Fader and Miller (1986b) reported on these current scour features (p. 24):

> "The most dramatic of the scour features which occur on mud bottoms are "megaflutes". First discovered in Placentia Bay, Newfoundland, they are 200 m long, triangular, flute-shaped, large erosional features which occur in a bank 3-4 km wide and extend over 100 km along the eastern flank of the

FIGURE 20

FADER AND MILLER'S (1986b) REGIONAL MAP OF THE GRAND BANKS OF NEWFOUNDLAND SHOWING GENERAL GEOLOGICAL CHARACTERISTICS WHICH MAY BE OF SIGNIFICANCE TO OFFSHORE DEVELOPMENT.

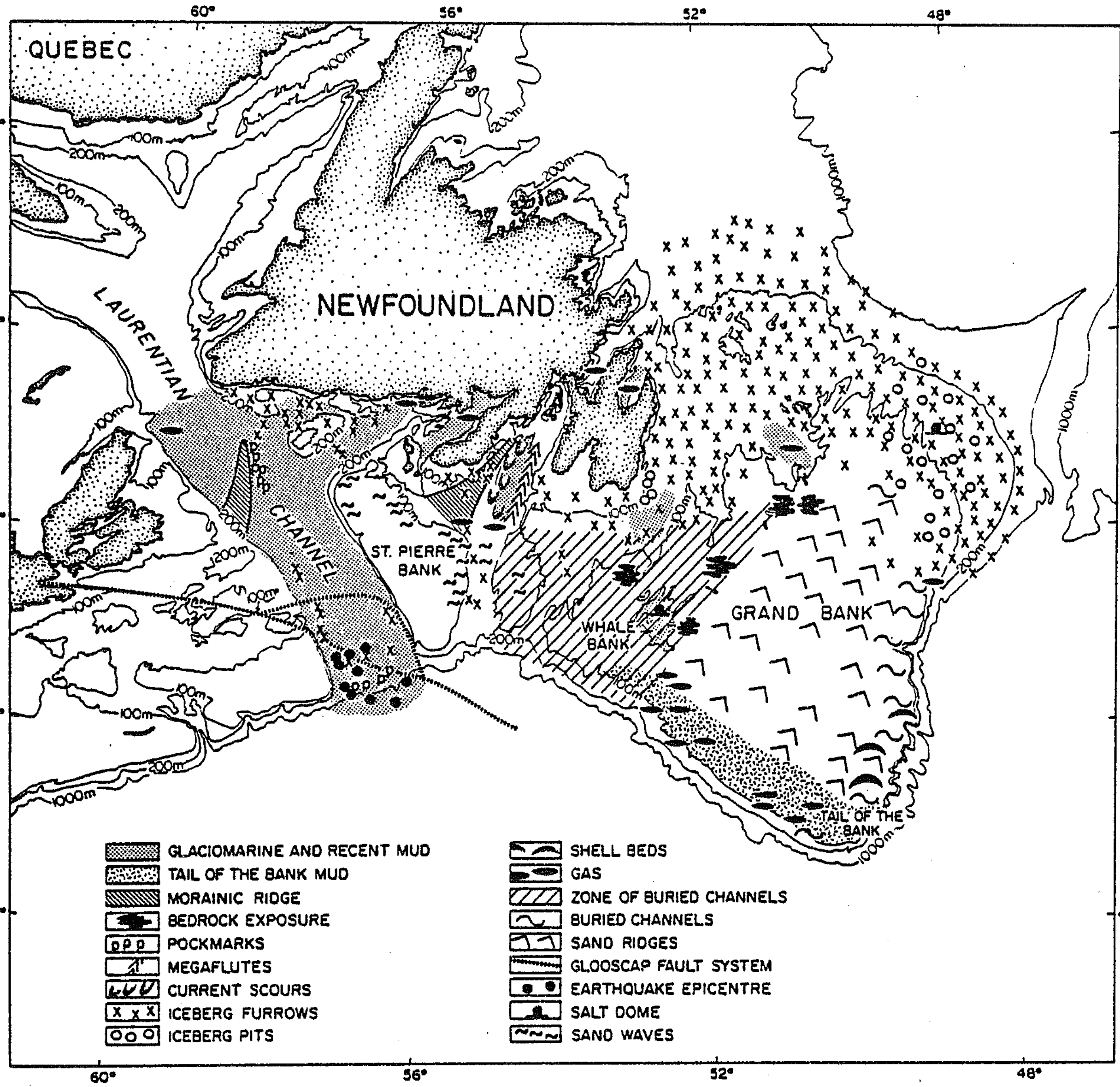

QUEBEC
NEWFOUNDLAND
LAURENTIAN
CHANNEL
ST. PIERRE BANK
WHALE BANK
GRAND BANK
TAIL OF THE BANK
60°
56°
52°
48°
50°
46°
44°
42°
100m
200m
1000m
GLACIOMARINE AND RECENT MUD
TAIL OF THE BANK MUD
MORAINIC RIDGE
BEDROCK EXPOSURE
POCKMARKS
MEGAFLUTES
CURRENT SCOURS
ICEBERG FURROWS
ICEBERG PITS
SHELL BEDS
GAS
ZONE OF BURIED CHANNELS
BURIED CHANNELS
SAND RIDGES
GLOOSCAP FAULT SYSTEM
EARTHQUAKE EPICENTRE
SALT DOME
SAND WAVES

FIGURE 21

DETAIL OF FADER AND MILLER'S (1986a) MAP IN THE PREVIOUS FIGURE IN THE PRESENT PROJECT AREA. THE SOUTHEAST LIMITS TO THE PROJECT AREA ARE SHOWN.

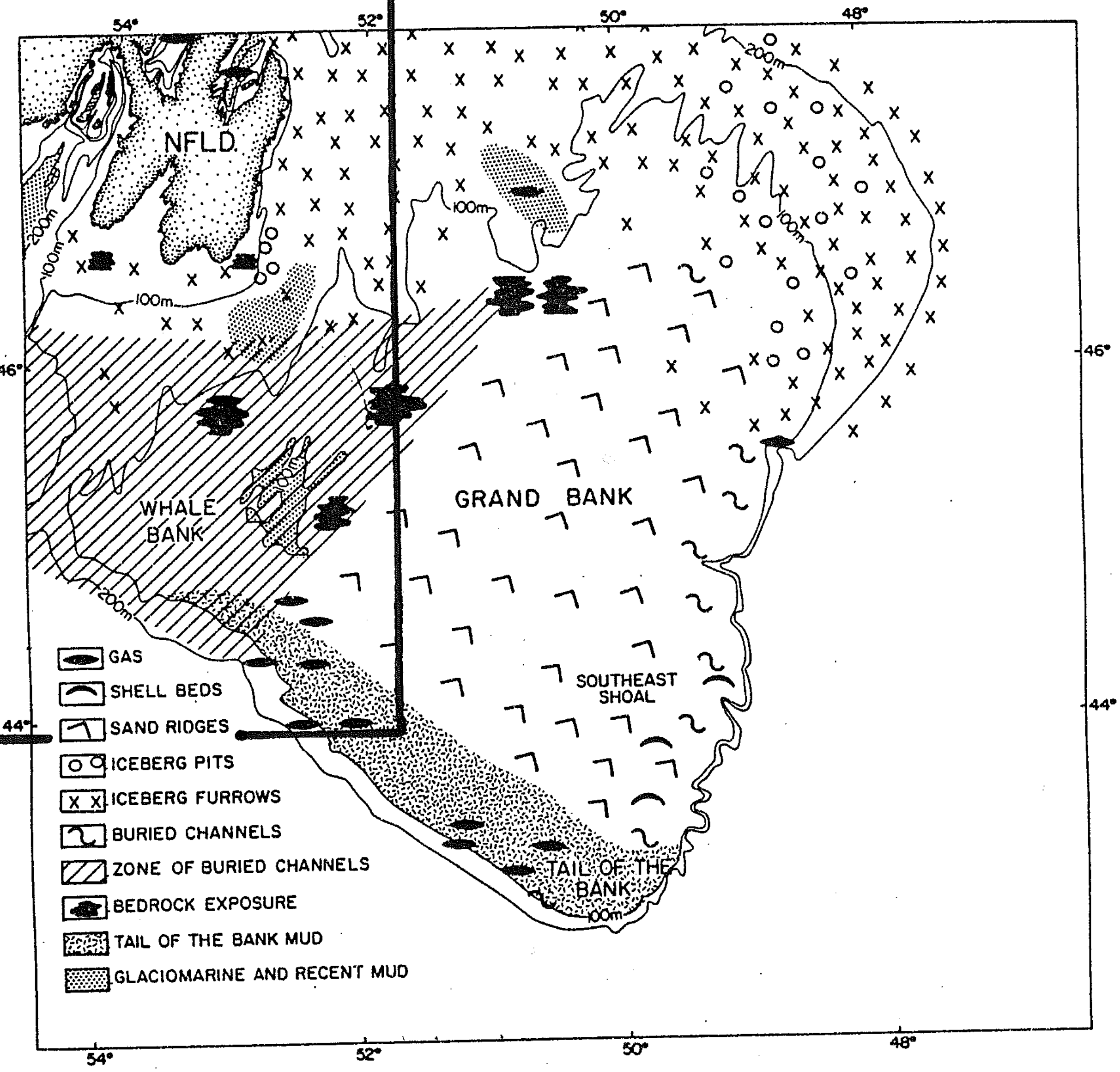
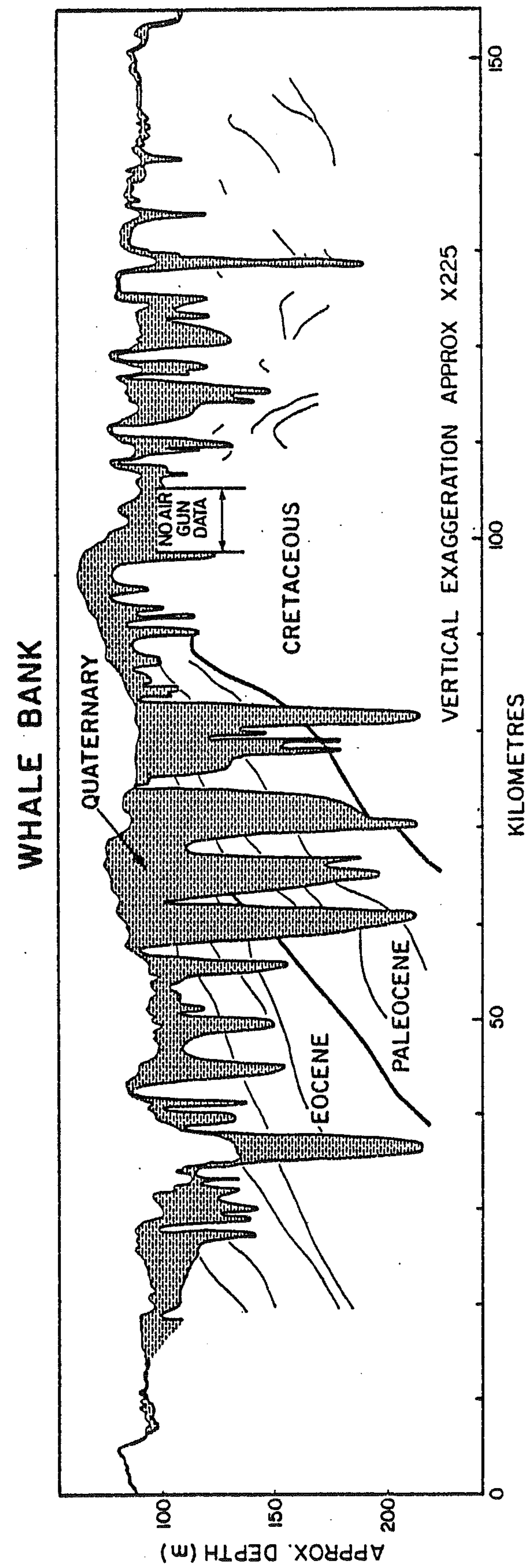

54°
52°
50°
48°
46°
44°
NFLD.
WHALE BANK
GRAND BANK
SOUTHEAST SHOAL
TAIL OF THE BANK
100m
200m
GAS
SHELL BEDS
SAND RIDGES
ICEBERG PITS
ICEBERG FURROWS
BURIED CHANNELS
ZONE OF BURIED CHANNELS
BEDROCK EXPOSURE
TAIL OF THE BANK MUD
GLACIOMARINE AND RECENT MUD

FIGURE 22

FADER AND MILLER (1986a;b) INTERPRETED AIRGUN SEISMIC REFLECTION PROFILE FROM WHALE BANK SHOWING A HIGHLY INCISED TERTIARY BEDROCK SURFACE. THE GLACIAL OR SUBAERIAL CHANNELS ARE INFILLED WITH GLACIAL SEDIMENTS.


WHALE BANK
QUATERNARY
CRETACEOUS
NO AIR GUN DATA
EOCENE
PALEOCENE
VERTICAL EXAGGERATION APPROX X225
KILOMETRES
0
50
100
150
APPROX. DEPTH (m)
100
150
200

bay (Fig. 23). In the same bay, to the west of the megaflute zone, are numerous, isolated, oval-shaped scour depressions which extend to a depth of approximately 3 m, and are up to 50 m in length (Syvitski et al, 1983). The megaflutes appear to be enhanced and enlarged by localized inward slumping. It is not clear from present studies of the megaflutes whether they are presently being formed or if they are relict. We suggest that their formation may have been associated with the 1929 Grand Banks earthquake and the resulting tsunami. Other slumps of soft sediment on the Grand Banks have not at present been observed."

Fader and Miller (1986b) also published preliminary work on the disbribution of lag gravel deposits and associated lag boulders that lie on the southern and southwestern Grand Banks (p.28):

"As a result of interpretation of sidescan sonograms together with submersible observations, we have attempted to estimate the number of boulders larger than 0.5 m (the resolution of the systems) which are distributed across the southern area of Grand Bank. Figure 24 shows that the boulders are widespread and occur in densities of up to 1400/sq km with local densities as high as 5000/sq km. Their apparent absence from the Tail of the Bank area and parts of central Grand Bank may be the result of burial from sand ridges on the central bank, and the Tail of the Bank Mud deposit. This population represents the net accumulation of Quaternary boulders for Grand Bank. Rocks are subrounded in shape, in contrast to the population of boulders found in the deeper non-transgressed areas such as Avalon Channel where boulders are angular-subangular. The lithogy is difficult to determine because of the density of organic growth on their surfaces. However, large volume samples, show a predominance of Avalon Peninsula and adjacent offshore Paleozoic bedrock affinities. From submersible observations it is evident that there are at least as many boulders in the substrate which slightly protrude from the seabed which would not show on sidescan sonar.

Areas of lag gravel are often only one clast thick but can extend to several metres. Size of the gravel material is highly variable. Large areas may consist of 0.5 m boulders or pebble size sediments. Where large boulders occur in fields, the seismic data often indicates deposits of glacial till in

FIGURE 23

FADER AND MILLER'S (1986b) FIGURE 10 ON PAGE 25 OF THEIR REVIEW. THE FIGURE SHOWS A PORTION OF ONE SIDE OF A SIDESCAN SONOGRAM ACROSS AN AREA OF MEGAFLUTES IN PLACENTIA BAY PER THE AUTHOR'S CAPTION (INCLUDED WITH FIGURE ON NEXT PAGE).

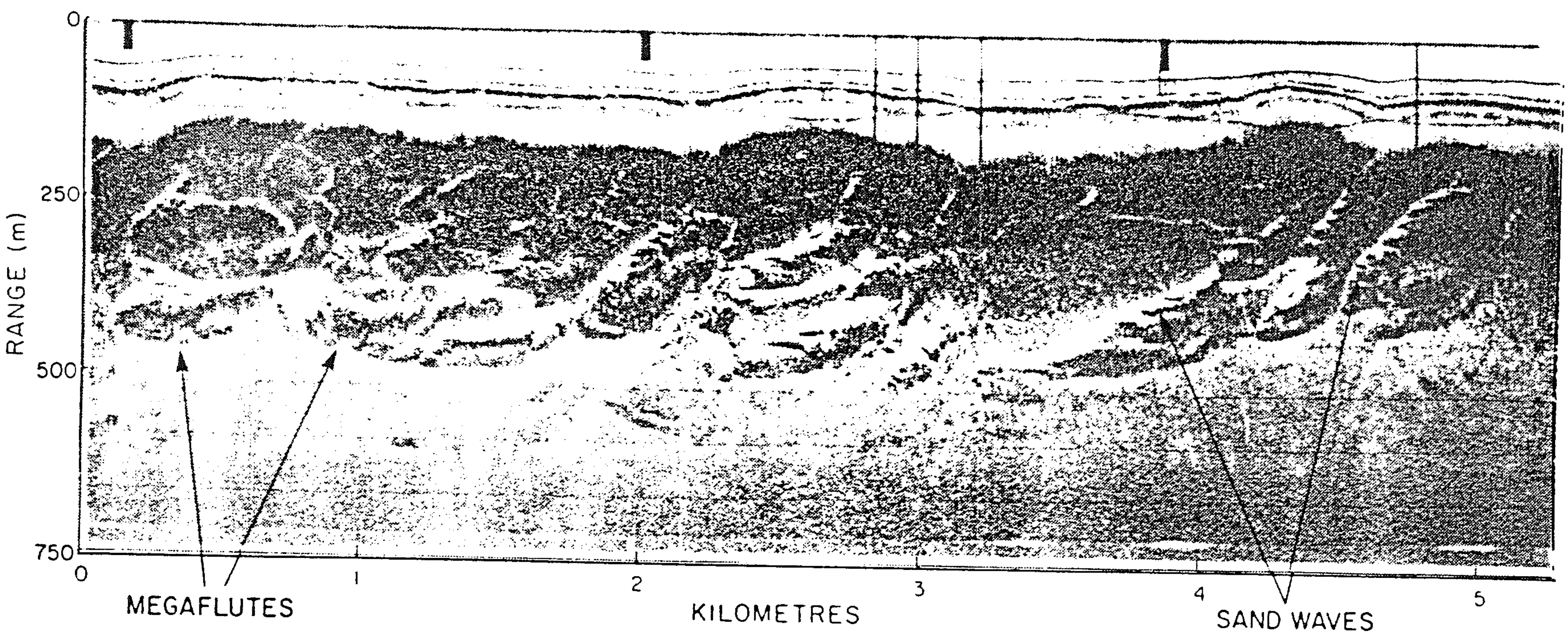
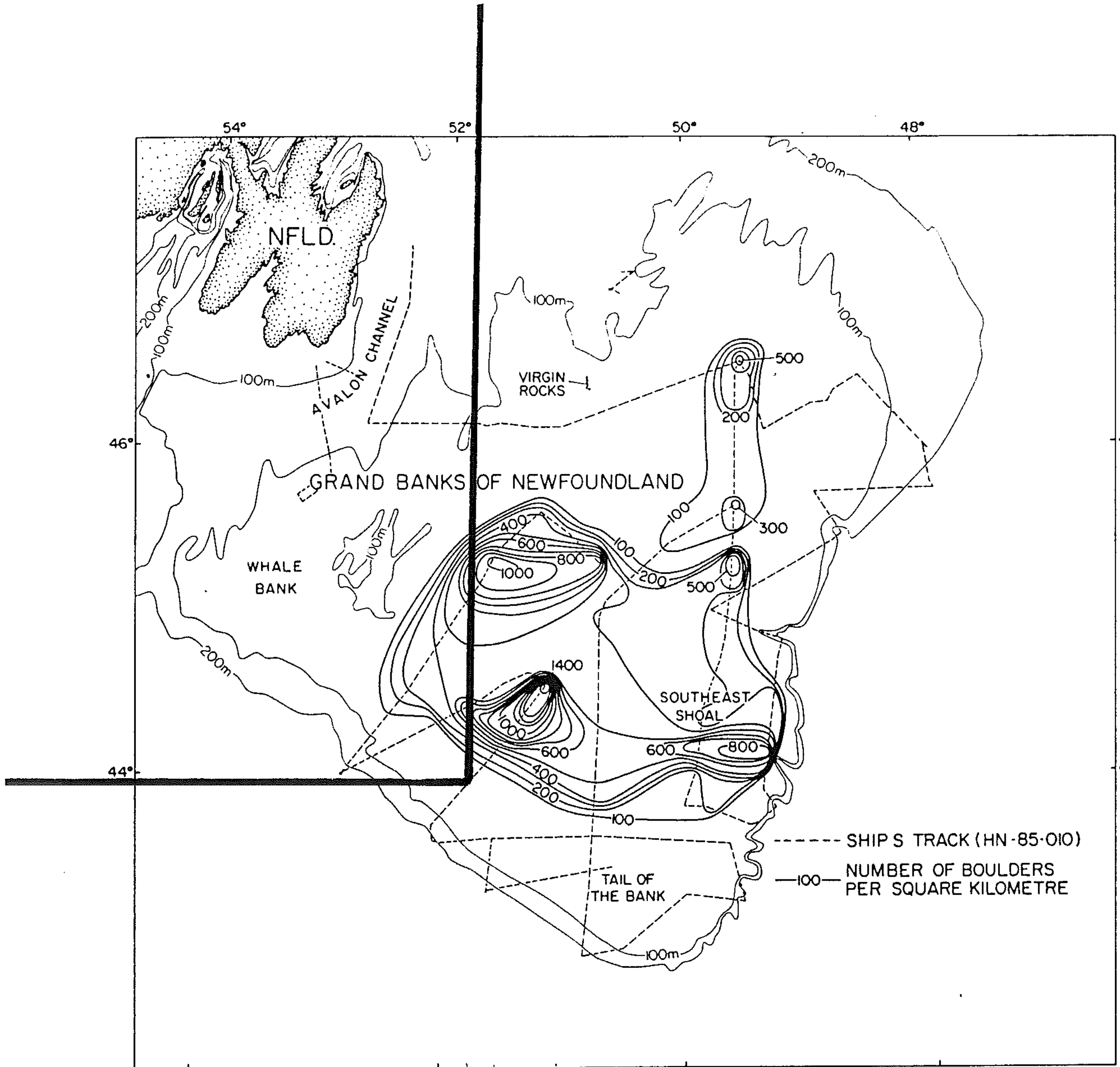


Figure 10 Sidescan sonogram across an area of megaflutes in Placentia Bay. Note the characteristic V-shaped flute structure. The magaflutes point up the bay which indicates their formation under scour conditions from north to south. In the western side of the occurrence in Placentia Bay the megaflutes are isolated but toward the east, they coalesce into a complex pattern.

FIGURE 24

FADER AND MILLER'S (1986b) FIGURE 12 FROM PAGE 27 OF THEIR REVIEW SHOWING THEIR PRELIMINARY WORK ON THE DISTRIBUTION OF BOULDERS LARGER THAN 0.5 m ON THE SOUTHERN GRAND BANKS INCLUDING THE PROJECT AREA. BOULDERS ARE LYING EXPOSED ON THE SEAFLOOR OR PARTLY BURIED IN SUBSTRATE. THEY ARE ROUNDED TO SUBROUNDED AS A RESULT OF HAVING HAD AN ACTIVE, OPEN-OCEAN, BEACH ZONE PASS THROUGH THE AREA DURING THE MOST RECENT TRANSGRESSION. THIS LARGE POPULATION OF BOULDERS IS INTERPRETED TO HAVE BEEN DEPOSITED LARGELY BY GLACIERS ADVANCING ACROSS THE GRAND BANKS OF NEWFOUNDLAND AND NOT FROM ICE RAFTING BY ICEBERGS.

FADER AND MILLER (1986b) INTERPRET THAT THE LACK OF BOULDERS ON THE TAIL OF THE BANK MAY INDICATE THAT THEY ARE BURIED BY THE TAIL OF THE BANK MUD DEPOSIT; THE LACK MAY ALSO INDICATE THAT THE AREA SOUTH OF 43°50'N WAS NEVER COVERED BY FLOWING GROUNDED GLACIAL ICE.


54°
52°
50°
48°
46°
44°
NFLD.
200m
100m
AVALON CHANNEL
VIRGIN ROCKS
GRAND BANKS OF NEWFOUNDLAND
WHALE BANK
SOUTHEAST SHOAL
TAIL OF THE BANK
500
200
300
100
400
600
800
1000
1400
SHIP S TRACK (HN-85-010)
—100— NUMBER OF BOULDERS PER SQUARE KILOMETRE

PREVIOUS WORK (CONTINUED)

Atlantic Geoscience Centre Mapping (continued)

the subsurface. The gravel may serve as sources of aggregate for use in seabed berms for iceberg scour protection of hydrocarbon development facilities."

The offshore work continued in 1987 with an AGC borehole cruise to the Grand Banks; data from any 1987 AGC cruises in the project area, in general, are not included in this compilation.

Don Forbes at the Atlantic Geoscience Centre has done coastal and very nearshore work at sites all around the Avalon Peninsula (Forbes, 1984). His paper reports on work in the silled basin of St. Mary's Harbour and a vibracoring and profiling/sidescan program immediately offshore of Holyrood Pond (Forbes' Figure 2.5A, B; 1984). A similar program was run off Mutton Bay at the head of Trepassey Bay (Forbes' Figures 2.8 and 2.9; 1984).

Recent and Ongoing University Work

Widmer (1950) suggested that Wisconsinan glacial ice advanced onto the Grand Banks to lay down moraines as did Dietrich (1965). Widmer (1950) further suggested that Placentia and Fortune Bays were glacial lakes during a late Wisconsinan advance. Jenness (1960) reported on the glaciation of eastern Newfoundland and suggested an Avalon icecap. Henderson (1972) suggested that a seperate Avalon icecap diverted the main eastward-flowing icecap to the northeast and southwest down Trinity and Placentia Bays respectively. Grant (1971; 1975) in writing on glacial features on the Burin Peninsula, suggested a glacial centre in Placentia Bay with Late Wisconsin ice moving mainly north and west over the Burin. In 1976 Grant altered his suggested chronology somewhat and his 1977 map shows an older Winconsin(?) ice dome southeast of the Burin Peninsula.

McMaster University initiated a major study of the glacial features of the Burin Peninsula which resulted in C.M. Tucker's Ph. D. thesis (1976, 1979). Tucker and McCann (1980) then wrote a major review paper of the area's Quaternary events in 1980. They put forward four glacial events from pre(?)-Wisconsinan to late-Wisconsinan in age. Their third event involved ice flowing from offshore across the Burin from southeast to northwest.

Memorial University of Newfoundland's Department of Geological Sciences has developed a greater marine geological interest in recent years. This has resulted in a number of cruises under the

PREVIOUS WORK (CONTINUED)

Recent and Ongoing University Work (continued)

auspices of the Newfoundland Institute of Cold Ocean Studies (NICOS). One student has completed a B.Sc. Honours thesis on samples from Fortune Bay (Ewan Cumming) and has continued on to an M.Sc. in marine geology working on NICOS cores. Catherine Troke is working on a B.Sc. Honours thesis on cores from the project area in Trinity Bay and bays to the north; Nathanial Ostrom is working on a B.Sc. Honours thesis on material from Trinity Bay and Bonavista Bay. Kalidas Pulchan has begun an M.Sc. thesis on material from Fortune Bay and Bay D'Espoir.

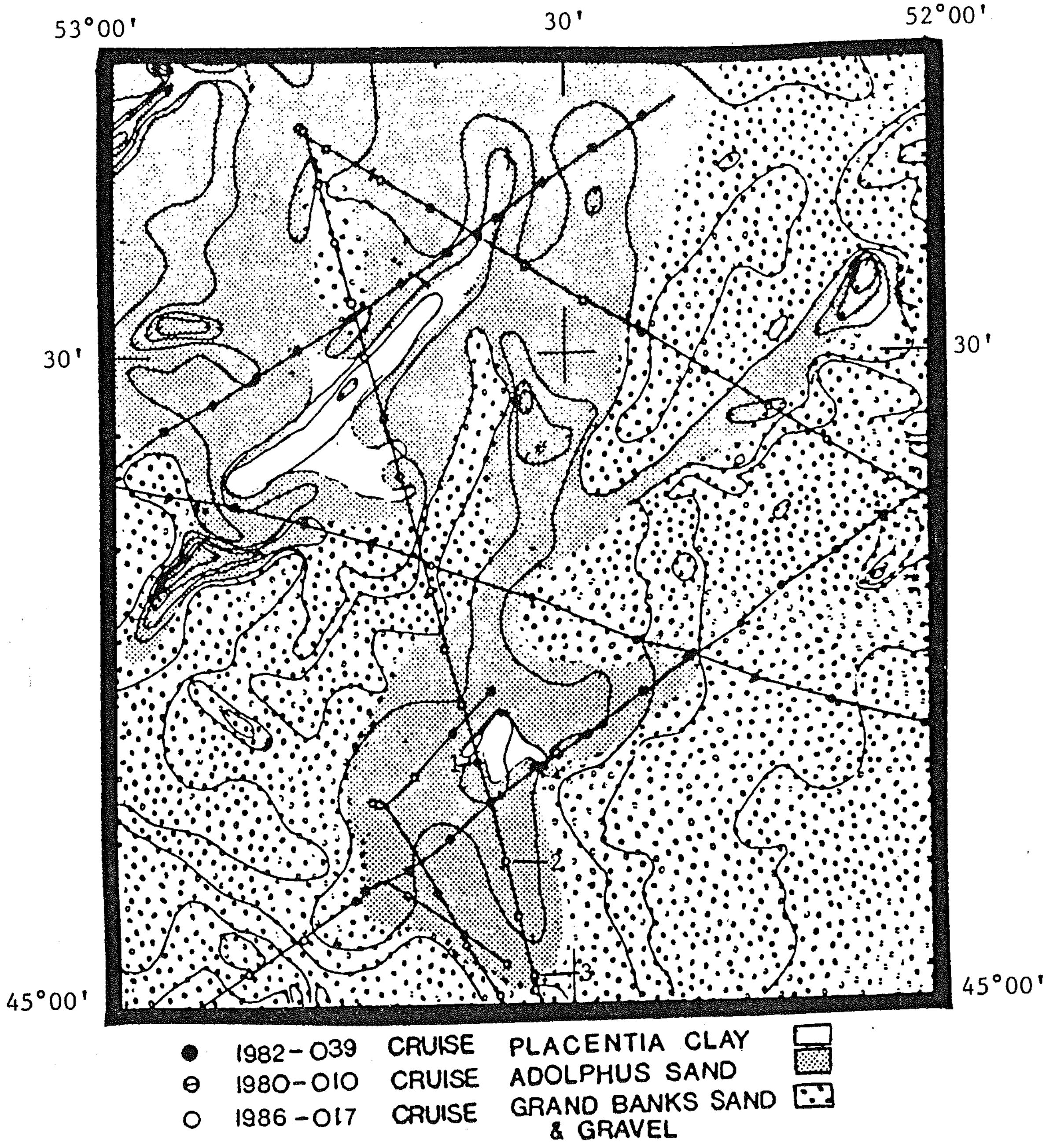
Richard McCallum of the Dalhousie University Department of Geology, completed a B.Sc. Honours thesis on western Grand Banks in 1985. He used AGC data and compiled an area from the Avalon Peninsula east to Downing Basin and his thesis contains a map of surficial geology of the area using the Scotian Shelf names for the surficial geology units as Fader et al. (1982; 1984) did on St. Pierre Bank to the west. McCallum showed the Avalon Channel as floored by Grand Banks Drift with Grand Banks Sand and Gravel to the southeast on the east side of Avalon Channel. Our Surficial Geology Map in Enclosure 1 generally reflects McCallum's findings (1985).

John Burns at Saint Mary's University in Halifax has completed a March, 1987 Honours B.Sc.thesis on the Quaternary of Whale Deep in the project area. He has done some work on benthoic foraminifera, on grain size analysis of cores and grabs and has interpreted the sidescan sonar and Huntec DTB data on 6 lines over Whale Deep. He has produced an interpreted surficial formation map of a small portion of the project area (Figure 25). His map is similar to this report's map presented in Enclosure 1 and the coloured version also submitted.

One other thesis is in progress in the project area. Mr. Eric LeGresley of Queens University is working on an M.Sc. thesis under the direction of Bob Dalrymple in the Department of Geological Sciences. LeGresley's thesis concerns bedforms and sediment transport over a wide area of the southwestern Grand Banks including Green Bank, Whale Bank and St. Pierre Bank.

FIGURE 25

JOHN BURNS (1987) MAP OF SURFICIAL GEOLOGY OF WHALE DEEP SUPERIMPOSED ON THE BATHYMETRY MAP DERIVED FROM CHART 4016; CONTOURS ARE IN FATHOMS.



53°00'
30'
52°00'
30'
30'
2
3
45°00'
45°00'
1982-039 CRUISE
1980-010 CRUISE
1986-017 CRUISE
PLACENTIA CLAY
ADOLPHUS SAND
GRAND BANKS SAND & GRAVEL

PREVIOUS WORK (CONTINUED)

Private Company Work

Most of the viable petroleum acreage in the project area was originally held by the Pan American Petroleum Corporation (Pan Am) which in 1971 became known as the Amoco Production Company worldwide and its Canadian division became known as Amoco Canada Production Company Ltd. (Amoco). Pan Am took up its Grand Banks acreage in 1964 and began that year a 10-year scientific and exploration program on the Grand Banks that covered much of the project area.

In 1964, Chris P.M. Heath of Pan Am ran a "soft sediment sampling program" on the company's acreage. A Van Veen sampler collected samples on 135 of 180 attempts. The report of this program has not been seen (Heath, 1964) and the samples are not shown on Enclosure 6 or in Appendix 16. In 1965, Pan Am ran a dredging and Ewing piston coring program east of the area on the Eastern Shoal area and at the shelf edge on the Tail of the Bank (Swift, 1966). There were 30 stations in this program run by H. Peter Nicholson of the company. The 1965 dredge hauls and piston cores were all east of the project area.

1965 also saw the D/V CALDRILL core hole program operated by Pan Am and Imperial Oil Enterprises Ltd. (1965). The CALDRILL obtained twelve boreholes in the project area with certain holes having electrical logs and other tests run (Appendix 16). This program provided the first calibration of the offshore deep seismic programs that were just gearing-up at the time. Pan Am and Imperial Oil Enterprises Ltd. drilled the first offshore wells on Grand Banks in 1966 at the Grand Falls H-09 and Tors Cove D-52 locations; both were dry holes.

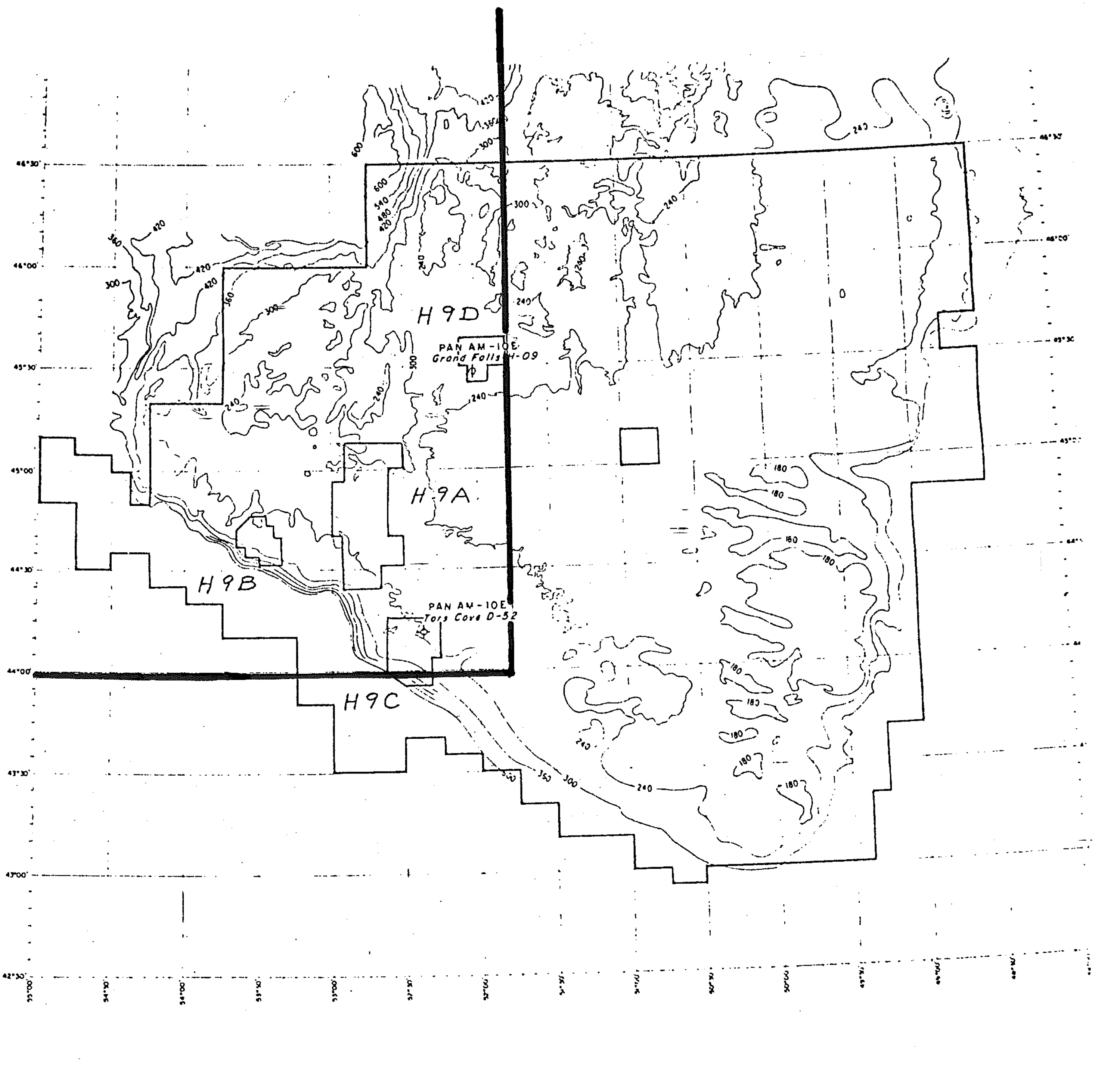
In 1969, Pan Am launched what was truly a most ambitious piston core program on four areas all of which were in the project area (Figure 26). This piston core program is virtually unknown in the scientific community yet involved $495,000 in 1969 dollars, a full 5 months of M/V THERON ship-time and a ponderous 3160 piston cores! A brief 1969 write up on the program has been recovered, courtesy of Jim H. Swift of Amoco and is reproduced in Appendix 18 to ensure that this program gets the credit due it.

The program was mainly run for geochemical purposes and the piston cores were extruded then only sampled at the top, twice in the middle and at the bottom. The subsamples were then sealed and sent off to Horvitz Research Laboratories in Houston. The rest of the core then went back over the side of the vessel. Eventually, the Horvitz

FIGURE 26

SWIFT'S (1969) INDEX MAP TO THE PAN AMERICAN PETROLEUM CORPORATION'S 1969 M/V THERON PISTON CORING PROGRAM SHOWING THE FOUR DENSELY SAMPLED AREAS ALL OF WHICH LIE INSIDE THE PROJECT AREA. 3160 PISTON CORES WERE COLLECTED IN THE FOUR AREAS OVER THE FIVE-MONTH PROGRAM. THE BROAD DARK LINES SHOW THE SOUTHEASTERNMOST LIMITS TO THE PRESENT PROJECT AREA.

AREAS H9C AND H9B STRADDLE THE AREAS WHERE THE TAIL OF THE BANK MUD DEPOSIT IS FOUND AND A CAREFUL ANALYSIS OF THE GRAIN SIZE RESULTS OF THESE PAN AM PISTON CORES MAY ASSIST IN DEFINING ITS NATURE AND LIMITS.


H9D
H9A
H9B
H9C
PAN AM-10E
Grand Falls H-09
PAN AM-10E
Tors Cove D-52
600
540
480
420
360
300
240
180

PREVIOUS WORK (CONTINUED)

Private Company Work (continued)

crew on board were taking, sampling and discarding an average of 46 piston cores per day in the last 10 days of the program. Cores were often 4 ft long (a 6 ft barrel was used). For August - September and the 10 days of October M/V THERON averaged 24.6 piston cores (for 92 days); only one sampling crew was used by Horvitz on a 12 hour shift (Swift, 1969).

A look at the index map to the program (Figure 26) and realizing that the 1969 piston cores were taken on a 4000 ft (1219 m) orthoganal grid one realizes that a truly marvelous scientific opportunity was lost. While Horvitz did record sample no., time, water depth, a visual description done by non-geologists and the subsample intervals, which effectively gave the core length to the nearest foot, clearly a lot more from a sedimentological point of view might have been done . The four areas piston cored by Pan Am represent about 10% of the bank areas in the project area south of the Avalon Peninsula.

At Horvitz Laboratories, the samples processed were passed through a 63 micron 250 mesh sieve so that the finer material alone could be analyzed for gas content. (Jim H. Swift, Amoco, Personal communication, 1987). The size fractions of sand and clay then were recorded (along with shell) and a series of contoured maps for the four areas were made showing the percentage sand and pebbles at a 1:96,000 scale (Swift, 1970). Jim Swift kindly provided copies of the four sample location maps and the four contoured percentage of sand and pebbles maps. It is not clear how much value these maps will be but the copies provided by Mr. Swift are retained in the project file.

Sixteen 1.0 to 1.7 m-long piston cores from Areas H9A(10 cores), H9B(7 cores) and H9C(2 cores) were sent to Geocon Limited in Rexdale, Ontario for assessment. Geocon's report (1969) can be found in the Canadian Oil and Gas Lands Administration (COGLA) files. Other raw samples may yet still be archived at Amoco's Oklahoma Research Centre, Jim Swift was to check on this.

While Horvitz Research Laboratories' final report (1969) on the Soil Gas Program has not been seen in its entirety, Amoco was prepared to make the grain size data sheets (less the hydrocarbon concentrations) available to AGC along with the onboard visual description sheets. A draft letter of request was provided to Dr. David Piper in this regard and his office is addressing the recovery of these data.

PREVIOUS WORK (CONTINUED)

Private Company Work (continued)

Amoco has much earlier, provided Roger M. Slatt, formerly at Memorial University of Newfoundland, with about 60 surficial (top of core) samples and Slatt (1973, 1974a, 1977) has reported on these as have Muller and Milliman (1973). It is believed that the above authors only dealt with the surficial top of core samples from Pan Am's cores and did not have access to samples deeper in the core. Slatt suggested that the late Wisconsin ice sheet did not extend eastward more than 150 km from shore and that the gravel-sand boundary which he maps (1974a) does not represent the seaward limit of the Wisconsin ice sheet. Slatt only concedes that the inner shelf was glaciated in the project area and hedges with respect to the outer areas.

Pan Am, renamed as Amoco, restarted its hydrocarbon drilling program in 1971 with a long series of wells named after seabirds. The "bird holes" were generally drilled on diapiric salt structures and all were plugged and abandoned as dry holes by the time the program ended in 1974. We list these in the long data table of Appendix 16.

With the first wells drilled from the SEDCO I in 1971, Amoco commissioned boreholes to be drilled by a Failing 1500 drilling rig working through an 8 inch hole cut in the pipe deck of the semisubmersible drilling unit. McClelland Engineers, Inc. of Houston operated the two to three day-long holes as they had the previous year for Shell Oil Canada Ltd. off Nova Scotia. Boreholes of 17.2, 56.7 and 37.6 m were obtained at the Eider, Murre and Puffin locations in June, September and October respectively (McClelland Engineers, Inc., 1971a;b;c;Scott,1971). These boreholes are also entered in Appendix 16 and on Enclosure 6.

With the failure of the "bird holes" in 1974, virtually all drilling ceased on the Grand Banks for about five years. Chevron Canada same back in 1979 and on a farm-in from Mobil Oil Canada Ltd. drilled Hibernia P-15 on the Eastern Grand Banks. While this discovery prompted no further drilling in the project area, it stirred interest in the surficial geology of parts of the area off the Avalon Peninsula.

After the Hibernia discovery in the fall of 1979, and through the winter of 1980, Mobil Oil Canada Ltd. initiated an intense series of wellsite surveys to prepare for new drilling on the eastern Grand Banks. The survey programs took up again in the summer of 1980 with the POLARIS V and the joint involvement of Memorial University's

PREVIOUS WORK (CONTINUED)

Private Company Work (continued)

Centre for Cold Ocean Resources Engineering (C-CORE) and the Atlantic Geoscience Centre (Amos and Barrie, 1980). During the second phase of this joint program, POLARIS V towed a Huntec DTS, high resolution, profiler and ORE sidescan along both a possible "northern" pipeline route into the Bay Bulls area (Nov. 2-3, 1980) and along a possible "southern" pipeline route south of the Avalon Peninsula then into the Trepassey Bay area on December 8-9, 1980 (C-CORE, 1980). An atlas Deso 10 echosounder was also used on these lines (Figure 27).

Peter Simpkin of Geomarine Associates (Newfoundland and Labrador) Ltd. interpreted the geology and depths to acoustic basement along these two lines (1981a;b) and Chris Lynas of C-CORE made up composite sections along the routes using Simpkin's work and that of King and Fader's (1981) Open File Report 723 which had just been issued.

These two POLARIS V tracks (Figure 27) have not been added to the project area track plot on Enclosure 7 and have not been used in preparing Enclosures 1 and 2 in that full scale plots are not available at AGC to our knowledge and nor are the raw data rolls. We believe the sidescan and Huntec data are public and are available to AGC from C-CORE (or possibly Mobil) and these data should be incorporated at a later time.

Peter Simpkin (1981a;b) and Chris Lynas show extremely thin overburden on the shoreward approaches to the coast across the Avalon Channel. Simpkin pictures the Huntec data (but not the sidescan data) in several spots along the routes. While it is clear that the 1980 POLARIS V Huntec data is mapping a glaciomarine section in places C-CORE and Geomarine did not interpret the section in terms of the seismostratigraphic units long-since developed on the Scotian Shelf or newly-mapped on St. Pierre Bank (Fader *et al.*, 1982;1984). These data, if retrieved, will be useful to the subsurface interpretation in this area.

The "northern" route into Bay Bulls was clearly unsuitable for a pipeline that had to be buried for protection from iceberg scouring. Mobil Oil Canada Ltd., under the direction of their Dallas office, continued the investigation of a southern route. They issued a mid-1981 a call for a survey of the southern approaches to the Avalon Peninsula (Figure 28). This 964 km survey was done by a consortium comprised of Geonautics Ltd. of St. John's and d'Appolonia Consulting Engineers, Inc. of Houston. The survey was comprised of

FIGURE 27

REDUCED INDEX MAP TO THE WESTERN PORTION OF THE 1980 POLARIS V SURVEY LINES ALONG THE 'NORTHERN' AND 'SOUTHERN' PROPOSED PIPELINE ROUTES. THE VERTICAL DASHED LINE AT 51°45'W MARKS THE EASTERN LIMIT OF THE PROJECT AREA. THUS, ALL OF LINES 10001 AND 10002 AND THE WESTERN TWO-FIFTHS OF LINE 8101 LIE IN THE PROJECT AREA. THESE DATA ARE HELD BY C-CORE (OR MOBIL OIL CANADA LTD) IN ST. JOHN'S, NEWFOUNDLAND.

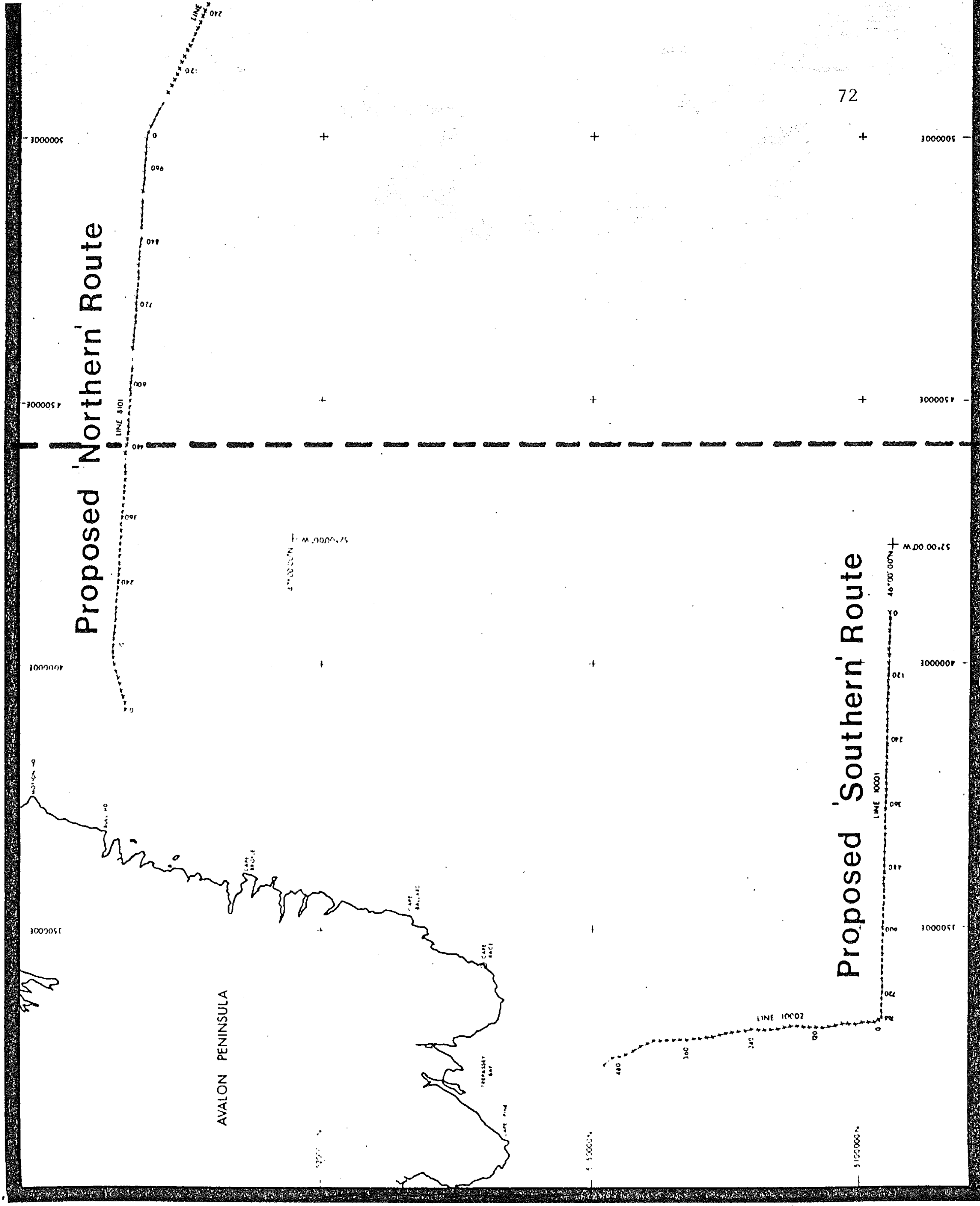
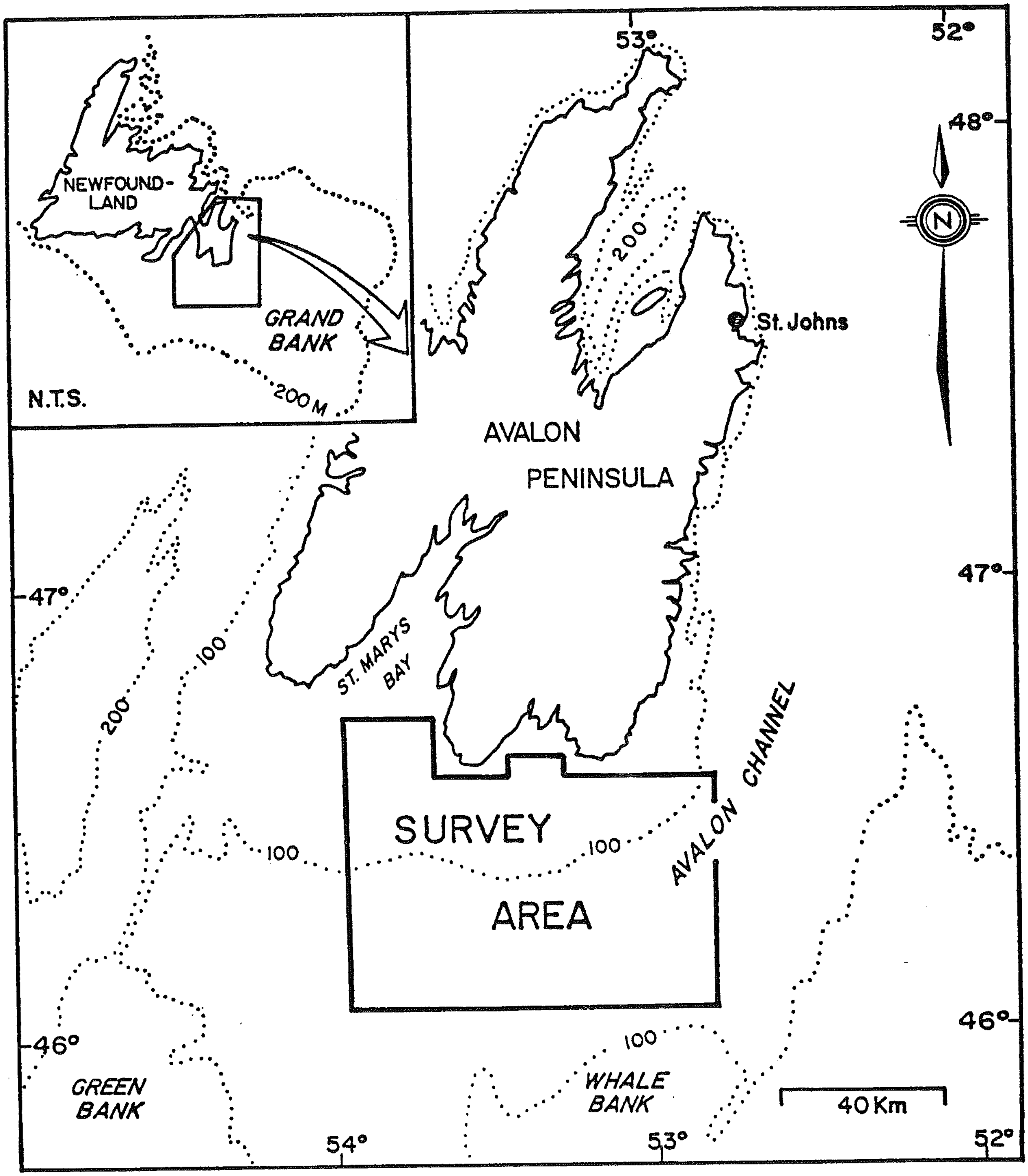

Proposed 'Northern' Route
LINE 8101
Proposed 'Southern' Route
LINE 10001
LINE 10002
AVALON PENINSULA

FIGURE 28

INDEX MAP TO THE AREA OF MOBIL OIL CANADA LTD'S 1981 SEABED SURVEY PROGRAM SOUTH OF THE AVALON PENINSULA. THE SURVEY WAS RUN TO INVESTIGATE THE LANDING POINT OF A POSSIBLE PIPELINE ROUTE FROM HIBERNIA TO TREPASSEY BAY. THE PROGRAM WAS RUN FOR MOBIL OIL CANADA LTD. BY GEONAUTICS/D'APOLLONIA CONSULTING ENGINEERS (1982) AND ALL LINES LIE IN THE PROJECT AREA.



LOCATION MAP

PREVIOUS WORK (CONTINUED)

Private Company Work (continued)

some 11 lines run by M/V FOGO ISLE prependicular to the axis of the Avalon Channel and 3 tie lines (Figure 29). Excellent data was obtained from a Huntec DTS, sparker and sidescan sonar. A sampling program was also run on Phase II from M/V RAVENSTURM but the loss of the Aimers Mclean vibracorer after 6 cores and the non-performance of the prototype C-CORE corer weakened this part of the September 12 - October 14, 1981 program. The full field program, analysis and reports were budgeted at $1,300,000 (COGLA Project No. 8640-M3-74E) and produced reports by Marinav Corporation (1981) and by the Geonautics/d'Appolonia consortium (1982).

Mobil Oil Canada Ltd. via Jim Ransom in St. John's kindly made the 1981 survey data available to the project, along with the positioning data of Marinav (1981). A sizeable portion of the Geonautics/d'Appolonia final report (1982) and certain interpretative maps were also provided to the Scientific Authority for the project. Mobil also made the raw Huntec and sidescan sonar data available.

Geonautics/d'Appolonia mapped the bathymetry (their Figure 6) overburden thickness (their Figure 22) seabed roughness and bedrock geology (their Figure 8), and the surficial geology along with the seabed features (their Enclosure map 3 and reduced Figure 9, which we reproduce here as Figure 30 in this report altered to 1:350,000 to match the scale of our compiled maps).

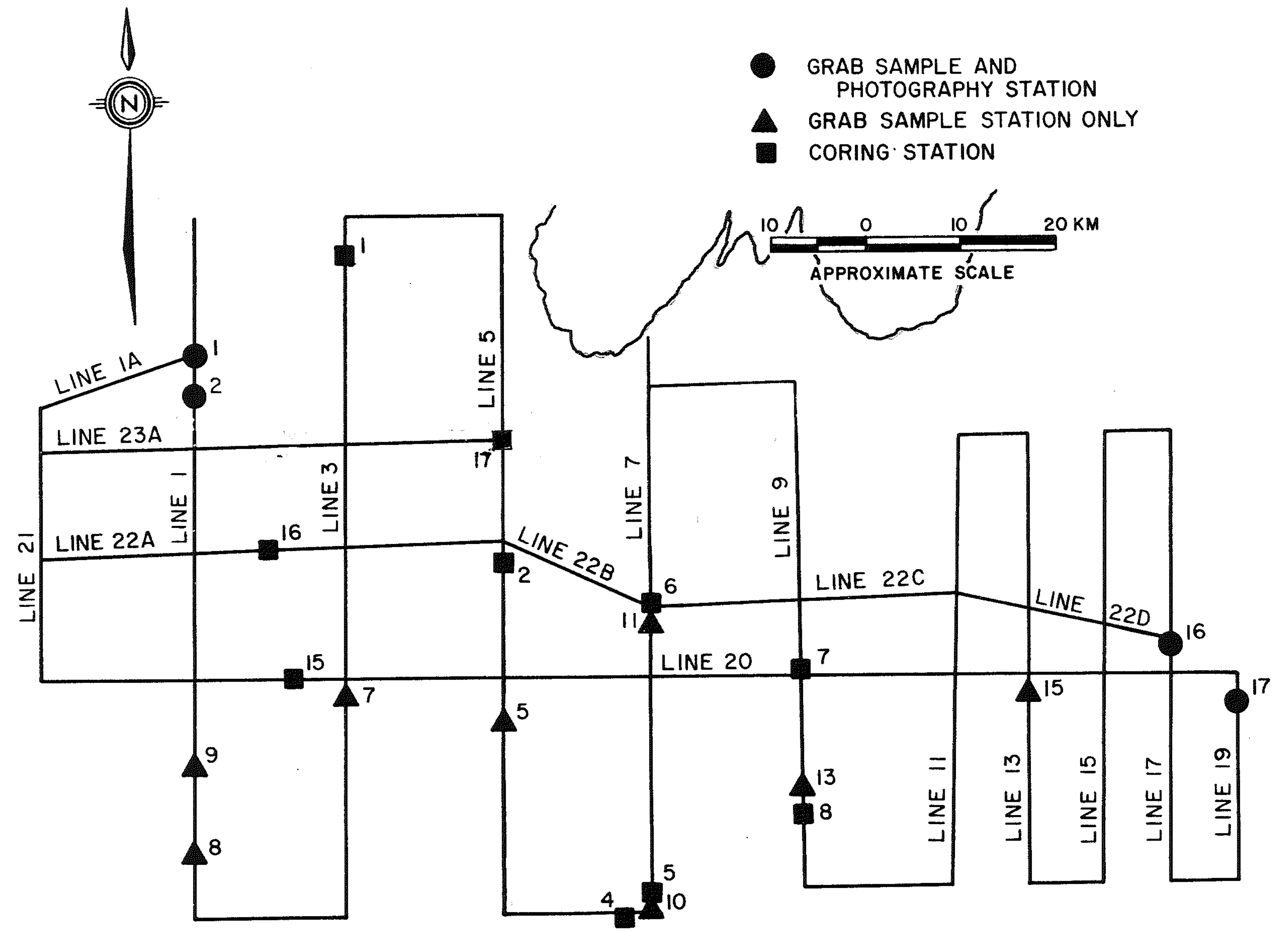
Five surficial units were mapped, but no correlation was made with the seismostratigraphic units developed by AGC on the Scotian Shelf and on St. Pierre Bank (Fader et al., 1982; 1984). We believe a correlation can be made using their description of the units on pages 5-4 to 5-9 of the Geonautics/d'Appolonia (1982) report per the table below:

Unit	Description of Geonautics/d'Appolonia	AGC Unit
Unit 5	Clayey silt with minor sand	Downing Silt
Unit 4A	Sand and Gravel (50%+ sand)	Grand Banks Sand and Gravel
Unit 4B	Sand and Gravel (50%+ gravel)	Grand Banks Sand and Gravel
Unit 3	Hard clayey till overlain by mostly silty sand	Adolphus sand (below about 100 m)
Unit 2	Hard clayey till overlain by sand and gravel	as above except to east in the Avalon Channel where Grand Banks Drift is exposed
Unit 1	Bedrock at or close to the surface	generally below 100 m. overlain by a veneer of Adolphus Sand

FIGURE 29

GENERALIZED TRACK AND STATION PLOT FOR THE 1981 M/V FOGO ISLE SEABED SURVEY RUN FOR MOBIL OIL CANADA LTD. BY GEONAUTICS/D'APPOLONIA CONSULTING ENGINEERS (1982); THE POSITIONING ALONG THE LINES WAS PROVIDED BY MARINAV CORPORATION (1981). THIS DIAGRAM HAS BEEN MODIFIED TO ADD THE SOUTHERN COASTLINE OF THE AVALON PENINSULA WITH TREPASSEY BAY DUE NORTH OF LINES 7 AND 9. IT HAS ALSO BEEN MODIFIED TO SHOW CORING STATION 17 IN THE CORRECT LOCATION (2 ATTEMPTS - NO CORE RECOVERED). CORING STATION 16 ALSO HAD 3 ATTEMPTS WITH NO RECOVERY. THE C-CORE DRILL LATER HAD SOME RECOVERY AT CORING STATION 16 (CORE "C-CORE"). THE VIBRACORE WAS LOST AT STATION 4 (NO RECOVERY OF CORE).

NOTE: THIS DIAGRAM ONLY SHOWS STATION NUMBERS; IT DOES NOT SHOW VIBRACORE NUMBERS OR GRAB SAMPLE NUMBERS. ENCLOSURE 6 SHOWS SAMPLE NUMBERS AND APPENDIX 16 SHOWS BOTH STATION AND SAMPLE NUMBERS.



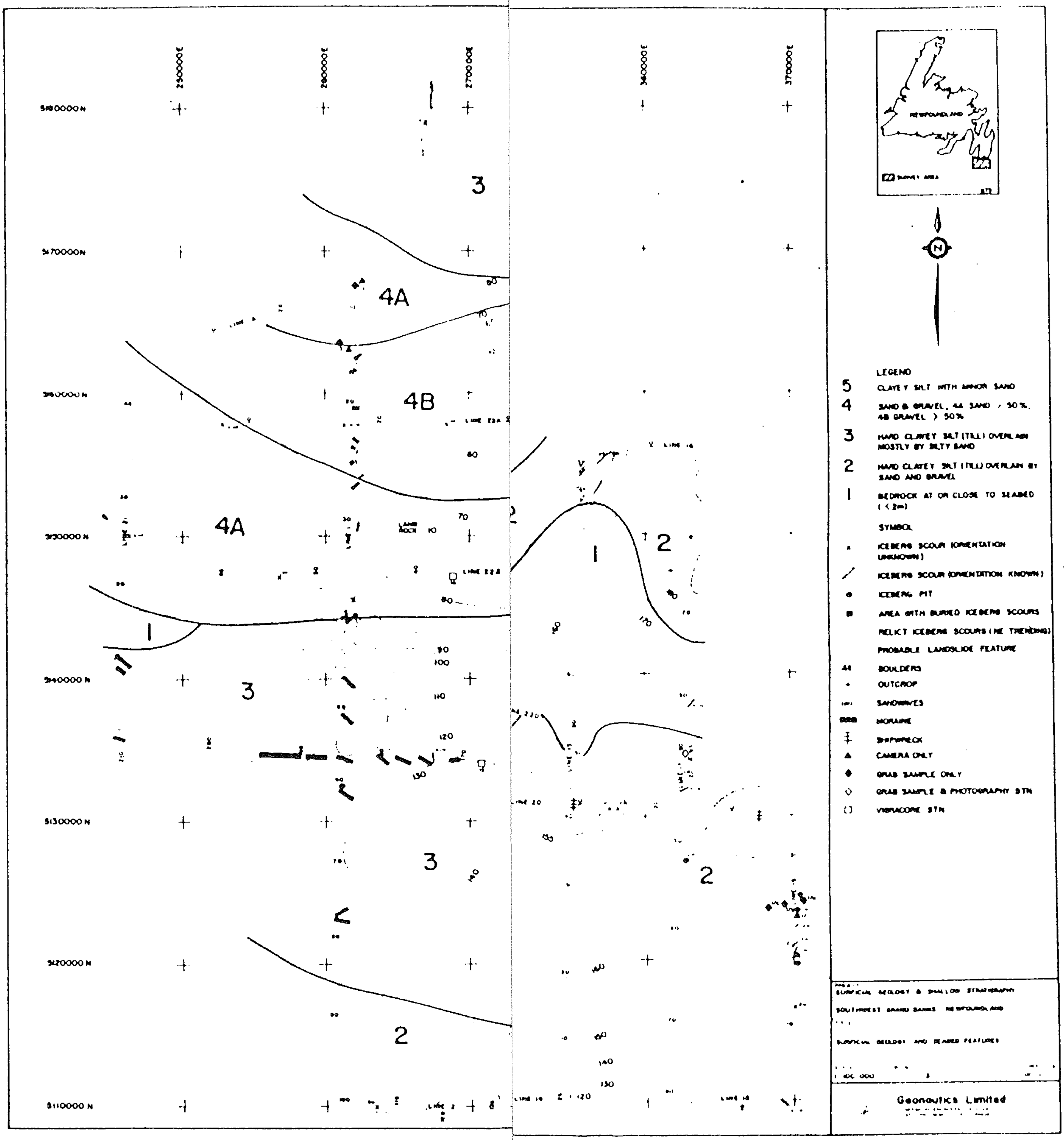
SURVEY GRID INCLUDING GRAB SAMPLE, BOTTOM PHOTOGRAPHY AND CORING STATIONS.

FIGURE 30

REDUCED VERSION OF GEONAUTICS/D'APPOLONIA CONSULTING ENGINEERS, INC.'S (1982) FIGURE 9 SHOWING THE SURFICIAL GEOLOGY AND SEABED FEATURES MAP FOR THEIR 1981 SURVEY AREA SOUTH OF TREPASSEY BAY. THIS COPY HAS BEEN ENLARGED FROM THE GEONAUTICS/D'APPOLONIA FIGURE 9 TO MATCH THE 1:350,000 SCALE OF THIS REPORT'S ENCLOSURES 1 AND 2.

LEGEND OF GEONAUTICS/D'APPOLONIA

5 - CLAYEY SILT WITH MINOR SAND
4 - SAND AND GRAVEL; 4a sand more than 50%
4b gravel more than 50%
3 - HARD CLAYEY SILT (TILL) OVERLAIN MOSTLY BY SILTY SAND
2 - HARD CLAYEY SILT (TILL) OVERLAIN BY SAND AND GRAVEL
1 - BEDROCK AT OR CLOSE TO THE SEABED (LESS THAN 2 M OVERBURDEN THICKNESS)


250000E
260000E
270000E
360000E
370000E
5180000N
5170000N
5160000N
5150000N
5140000N
5130000N
5120000N
5110000N
NEWFOUNDLAND
SURVEY AREA
N
3
4A
4B
4A
1
2
3
3
2
1
2
2
LINE 22A
LINE 16
LINE 20
LAND ROCK
LEGEND
5 CLAYEY SILT WITH MINOR SAND
4 SAND & GRAVEL, 4A SAND > 50%, 4B GRAVEL > 50%
3 HARD CLAYEY SILT (TILL) OVERLAIN MOSTLY BY SILTY SAND
2 HARD CLAYEY SILT (TILL) OVERLAIN BY SAND AND GRAVEL
1 BEDROCK AT OR CLOSE TO SEABED (< 2m)
SYMBOL
ICEBERG SCOUR (ORIENTATION UNKNOWN)
ICEBERG SCOUR (ORIENTATION KNOWN)
ICEBERG PIT
AREA WITH BURIED ICEBERG SCOURS
RELICT ICEBERG SCOURS (NE TRENDING)
PROBABLE LANDSLIDE FEATURE
BOULDERS
OUTCROP
SANDWAVES
MORAINE
SHIPWRECK
CAMERA ONLY
GRAB SAMPLE ONLY
GRAB SAMPLE & PHOTOGRAPHY STN
VIBRACORE STN
SURFICIAL GEOLOGY & SHALLOW STRATIGRAPHY
SOUTHWEST GRAND BANKS NEWFOUNDLAND
SURFICIAL GEOLOGY AND SEABED FEATURES
Geonautics Limited

PREVIOUS WORK (CONTINUED)

Private Company Work (continued)

When one compares the Mobil report's map in Figure 30 to our surficial geology map, there is reasonable agreement. We have not separately designated an area of outcrop (Unit 1 above) but when Figure 30 is compared to our Seabed Features in Enclosure 2, there is a correlation between the area of patchy outcrop we mapped (Edna Wilson) on the Mobil data and Unit 1 on Figure 30 here.

M/V FOGO ISLE did not proceed far enough north on Line 3 into St. Mary's Bay to map the Placentia Clay, but they did cross the Downing Silt (Unit 5). The only real difference between the two interpretations is just south of this occurence of Downing Silt where Geonautics/d'Appolonia (1982) mapped a unit (3) which we elsewhere interpret to be Adolphus Sand; here we interpreted the deposit to be Grand Banks Sand and Gravel. Unit 3 or Adolphus Sand at the south end of St. Mary's Bay may be the correct interpretation and a revision to Enclosure 1 may be in order in this area to reflect Figure 30.

Two years after the M/V FOGO ISLE survey south of the Avalon Peninsula Mobil Oil Canada Ltd. commissioned a major borehole program at the Hibernia platform site. As part of the program, the D/V PHOLAS did boreholes along the route of the proposed southern pipeline route. Six of the boreholes fell in the project area. The Atlantic Geoscience Centre was permitted to have the D/V PHOLAS boreholes fully logged by geologists during the cruise and these data are available in a C-CORE contract publication 84-17 (1984), which is available from C-CORE's Ocean Engineering Information Centre, but is not yet on the G.S.C. open files. The positions of the D/V PHOLAS boreholes were added to the compiled index map of Enclosure 6 and to Appendix 16.

Certain other commercially-motivated nearshore surveys may have been run close to the Avalon coast to support proposed development projects. For example, it is known that NORDCO Ltd. has some test sidescan data run in Conception Bay between Little Bell and Bell Islands, mainly over some WWII wrecks. The sidescan data has no positioning data associated with it. We suspect that high resolution nearshore data has been run in the past at proposed, or now-built, port facilities at Marystown, Spanish Room, Come By Chance and possibly at Freshwater Bay, just outside St. John's Harbour entrance. An indexing and compilation of such data is presently underway for the Canada Department of Energy, Mines and Resources, Mineral Policy Division by Earth and Ocean Research Ltd. Their report should be accessed for nearshore data; the due date is March 31, 1988. This report has not used any nearshore survey data.

PHYSIOGRAPHY

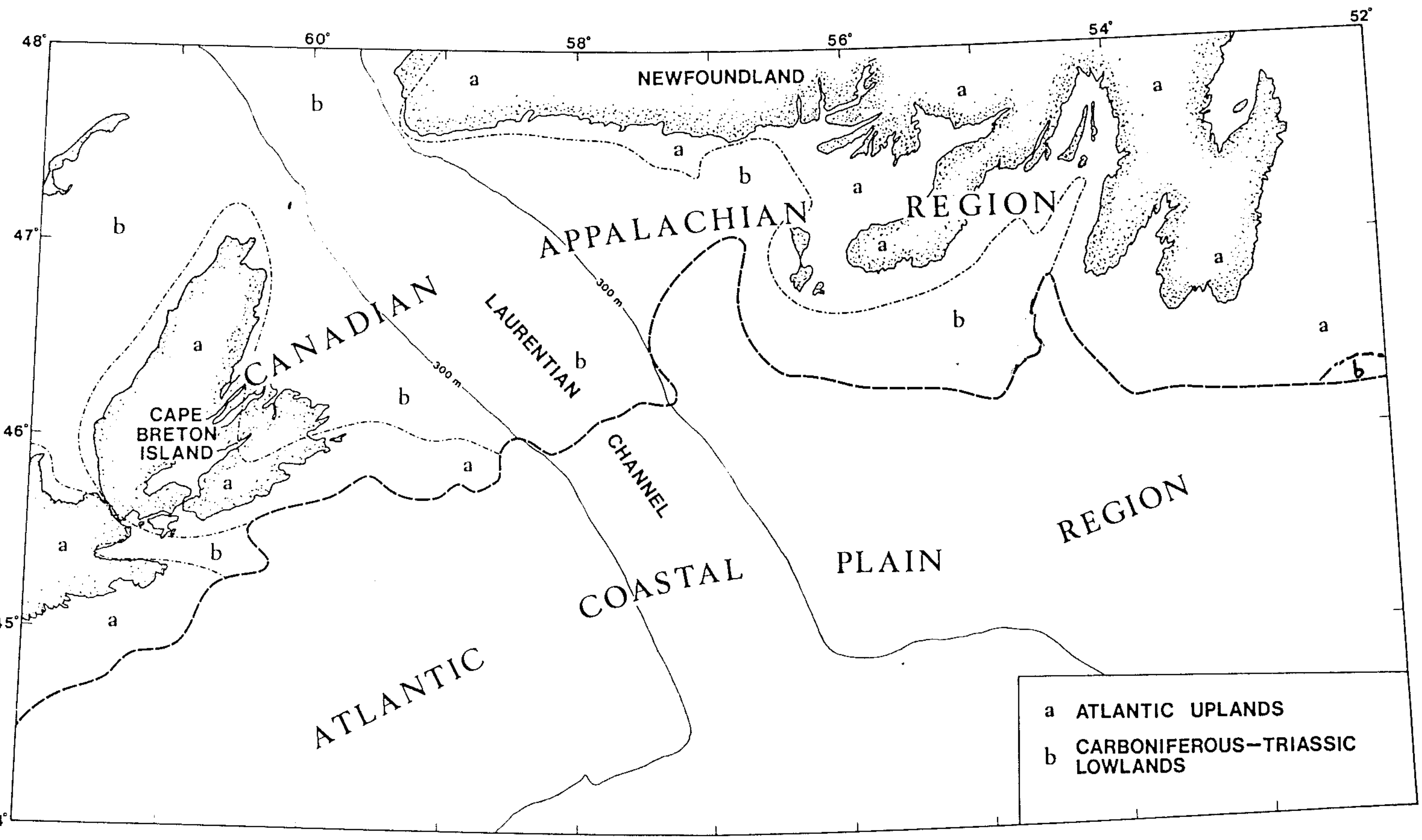
Williams et al. (1972) divide the study area into two broad physiographic regions being the nearshore Canadian Appalachian Region and the offshore submerged Atlantic Coastal Plain (Figure 31). The Canadian Appalacian Region is further subdivided into the Atlantic Uplands and the Carboniferous-Triassic Lowlands; these are shown on Fader et al's. (1982) figure modified after Williams et al. (1972) and here seen as Figure 31.

The Atlantic Uplands area encompasses all the onshore regions in our map area and extends offshore in the areas of rough topography to include the Avalon Channel, Conception and Trinity Bays on the north and Trepassey, St. Mary's and a portion of Placentia Bay on the south. Part of Placentia Bay is believed to be underlain by Pennsylvanian rocks (King et al., 1986) and this section of the area is included in the Carboniferous - Triassic Lowlands division. Indeed the axial lows of Western Channel and the main part of Placentia Bay itself have been excavated by glacial ice eroding the Pennsylvanian rocks. On the western end of one of the HUDSON 78-012 sidescan sonar lines in Placentia Bay one is able to almost see the contact between the older Hadrynian basement rocks to the northwest and the overlying Pennsylvanian sedimentary strata offshore to the southeast; this point is shown on the Seabed Features Map (Enclosure 2).

The Atlantic Coastal Plain (Figure 31) is generally underlain by the softer Mesozoic and Cenozoic sediments. King et al. (1986) have mapped the northern edge of the coastal plain sediments as a contact travelling east-west across the area at about 46° 15'N with a major reentrant protruding north into Placentia Bay (Figures 17 and 31).

FIGURE 31

PHYSIOGRAPHIC SUBDIVISIONS OF THE STUDY AREA TAKEN FROM FADER ET AL. (1982) (MODIFIED AFTER WILLIAMS ET AL., 1972). FADER ET AL'S. FIGURE HAS BEEN SLIGHTLY MODIFIED HERE TO MATCH KING ET AL. (1986) TO THE WEST AND TO REFLECT DURLING ET AL'S. REFINEMENT TO THE BEDROCK GEOLOGY MAP OF KING ET AL. (1986) IN THE VERY SOUTHEAST.



48°
60°
58°
56°
54°
52°
47°
46°
45°
44°
NEWFOUNDLAND
CAPE BRETON ISLAND
CANADIAN
APPALACHIAN
REGION
LAURENTIAN
CHANNEL
300 m
ATLANTIC
COASTAL
PLAIN
REGION
a ATLANTIC UPLANDS
b CARBONIFEROUS–TRIASSIC LOWLANDS

BATHYMETRY

Early Surveys

Most of the project area did not have any systematic hydrographic survey work until the mid to late 50's. Most of the Canadian Hydrographic Service's (CHS) energies were devoted to the mapping (or remapping) of the nearshore and numerous ports and harbours of Newfoundland after it joined the Canadian confederation in 1948. Thus, the nearshore index map to CHS field sheets shows a preponderence of dates in the early 50's (Figure 32). The index map also, in effect, shows the bathymetric data which might be able to serve the geologist in analyzing the seafloor.

CHS is able to provide a complete computerized printout of available surveys for any particular geographic area. We submitted our geographic limits in the Fall of 1986 and recieved a ponderous printout that is almost overkill (Appendix 19). It includes every survey that is in, or partly in, our large area and includes every document, field book, field sheet, etc., etc.

The CSS KAKPUSKASING did the early offshore surveys with the advent of various Decca chains or portable positioning systems. The offshore surveys began in 1957 and ran through to 1963 or 1966 further offshore (Figures 32 and 33). Unfortunately for geologists, none of the older CHS echo-sounding records were retained once the bathymetry values were digitized (scaled) and transcribed onto the surveys' final field sheets and the chart was issued. Thus, these excellent, lower frequency (12 kHz), echosounder data are lost to the modern geologist seeking to map the surficial geology.

There are possibly three exceptions. In 1972 CSS KAPUSKASING mapped St. Mary's Bay and Trepassey Bay on Field sheets 4390, 4391 (and 4392 inshore) (Figure 32). A low-frequency, 12 kHz, echosounder was used and these data which do survive can be reviewed to assist one to classify the bottom in places. Bottom sampling was also carried out. The KAPUSKASING 72-014 data is briefly discussed later.

Similarly, in 1970 CSS KAPUSKASING on cruise 70-018 mapped Ballard Bank on Field Sheet 4280. Low-frequency echo sounding and bottom sampling were carried out. These data are discussed later in the report.

There are virtually no other CHS data on Figure 32 or 33 which are both from a low-frequency echosounder and are retained in archival storage by CHS. Thus, the real potential of the raw low-frequency echosounder data over the soft clays and muds in the deeper parts of Trinity Bay, Conception Bay, Placentia Bay, Western and Eastern Channels and for much of St. Mary's Bay is now lost.

FIGURE 32

FOLD OUT INDEX MAP TO CHS'S NEARSHORE FIELD SHEETS IN THE AREA OF SOUTHEAST NEWFOUNDLAND COVERING A PORTION OF THE PROJECT AREA FROM 46°10'N to 48°00'N and 52°00'W to 56°00'W. THIS INDEX MAP IS A PORTION OF CHS INDEX NO. 2A, STATUS OF SURVEYS, AT A SCALE OF 1:720,240, MERCATOR PROJECTION AND AVAILABLE AT TECHNICAL RECORDS AT CHS/BIO. THE SHADED AREA IS THE AREA COVERED BY THE OFFSHORE SHEETS SEEN IN THE FOLLOWING TWO INDEX MAPS.

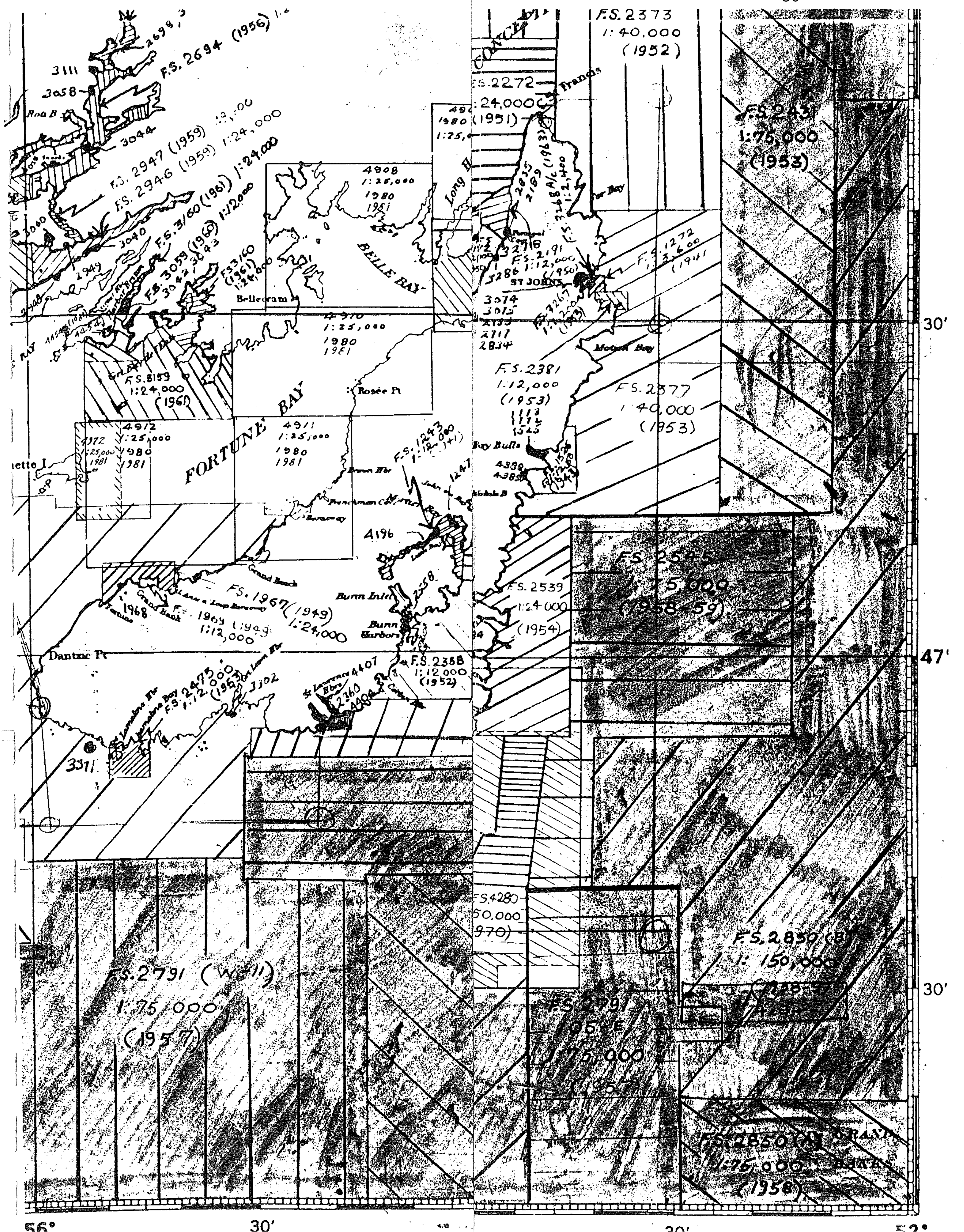
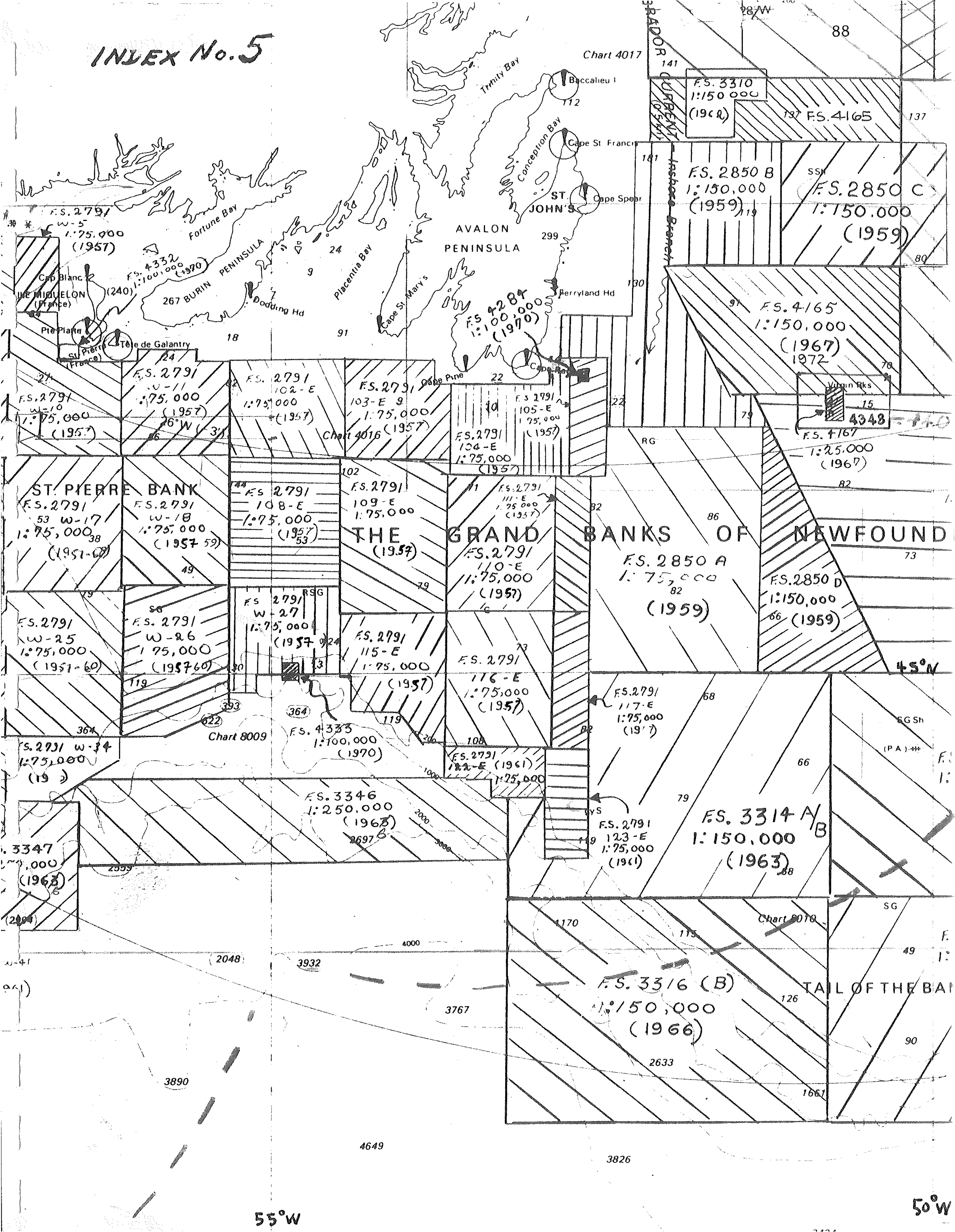

F.S. 2373
1: 40,000
(1952)
F.S. 2694 (1956)
3111
3058
3044
F.S. 2947 (1959)
F.S. 2946 (1959) 1:24,000
F.S. 3160 (1961) 1:12,000
3040
F.S. 3059 (1961)
3042 3043
F.S. 3160
(1961)
1:24,000
2949
F.S. 2272
1:24,000
(1951)
1980
(1952)
4908
1:25,000
1980
1981
BELLE BAY
Long H
St Francis
F.S. 2431
1:75,000
(1953)
Belleoram
4910
1:25,000
1980
1981
2815
2189
F.S. 3268 A/c (1963)
1:2,400
Portugal Cove
2216
F.S. 2191
1:12,000
(1950)
3286
ST JOHNS
F.S. 1272
1:3,600
(1941)
3074
3075
2133
2711
2834
F.S. 3267
Motion Bay
F.S. 8159
1:24,000
(1961)
FORTUNE BAY
Rosée Pt
F.S. 2381
1:12,000
(1953)
1113
1112
1545
F.S. 2377
1:40,000
(1953)
4912
1:25,000
1980
1981
4972
1:25,000
1981
4911
1:35,000
1980
1981
F.S. 1243
1:12,000
(1941)
1247
Bay Bulls
4388
4389
Mobile B
Brown Hbr
Frenchman Cove
4196
Grand Beach
F.S. 2545
1:75,000
(1958-59)
F.S. 2539
1:24,000
(1954)
F.S. 1967 (1949)
1:24,000
Burin Inlet
1968
Grand Bank
Fortune
F.S. 1969 (1949)
1:12,000
Burin Harbors
2358
Dantzic Pt
F.S. 2388
1:12,000
(1952)
F.S. 2475
1:12,000
(1953)
3302
St Lawrence Hbr
4407
2360
4404
3311
F.S. 4280
1:50,000
(1970)
F.S. 2850 (B)
1:150,000
F.S. 2791 (W-II)
1:75,000
(1957)
F.S. 2791
(1957) E
1:75,000
(1957)
F.S. 2850 (A) GRAND BANKS
1:75,000
(1958)
30'
47°
30'
56°
30'
30'

FIGURE 33

INDEX MAP TO CHS'S OFFSHORE FIELD SHEETS ON A PORTION OF CHART L-4001 AT 1:3,500,000(22°30'N) IN THE AREA SOUTH OF THE BURIN PENINSULA AND OFF THE AVALON PENINSULA GIVING THE FIELD SHEET NUMBER, SCALE AND YEAR OF THE SURVEY. THIS MAP IS A PORTION OF CHS INDEX SHEET NO. 5, STATUS OF SURVEYS, AVAILABLE AT TECHNICAL RECORDS AT CHS/BIO. THIS INDEX MAP SHOWS GENERALLY THE OLDER CHS DATA. THE FOLLOWING INDEX MAP SHOWS THE NEW SERIES OF OFFSHORE INDEX MAPS (FIGURE 34).


INDEX No. 5
Chart 4017
Baccalieu I
Trinity Bay
Conception Bay
Cape St Francis
Cape Spear
ST. JOHN'S
AVALON
PENINSULA
Fortune Bay
BURIN PENINSULA
Placentia Bay
Cape St Mary's
Dodding Hd
Ferryland Hd
Cape Pine
Cape Race
Cap Blanc
ILE MIQUELON (France)
Pte Plate
St Pierre (France)
Tête de Galantry
Virgin Rks
LABRADOR CURRENT
Inshore Branch
F.S. 3310 1:150 000 (1962)
F.S. 4165
F.S. 2850 B 1:150,000 (1959)
F.S. 2850 C 1:150.000 (1959)
F.S. 4165 1:150,000 (1967) 1972
F.S. 4348
F.S. 4167 1:25,000 (1967)
F.S. 2791 W-5 1:75,000 (1957)
F.S. 4332 1:100,000 (1970)
F.S. 4284 1:100,000 (1970)
F.S. 2791 W-10 1:75,000 (1957)
F.S. 2791 W-11 1:75,000 (1957)
F.S. 2791 102-E 1:75,000 (1957)
F.S. 2791 103-E 1:75,000 (1957)
F.S. 2791 104-E 1:75,000 (1957)
F.S. 2791 105-E 1:75,000 (1957)
Chart 4016
ST. PIERRE BANK
F.S. 2791 W-17 1:75,000 (1951-60)
F.S. 2791 W-18 1:75,000 (1957 59)
F.S. 2791 108-E 1:75,000 (1957)
F.S. 2791 109-E 1:75,000
F.S. 2791 111-E 1:75,000 (1957)
THE GRAND BANKS OF NEWFOUND
(1957)
F.S. 2791 110-E 1:75,000 (1957)
F.S. 2850 A 1:75,000 (1959)
F.S. 2850 D 1:150,000 (1959)
F.S. 2791 W-25 1:75,000 (1951-60)
F.S. 2791 W-26 1:75,000 (1957 60)
F.S. 2791 W-27 1:75,000 (1957)
F.S. 2791 115-E 1:75,000 (1957)
F.S. 2791 116-E 1:75,000 (1957)
F.S. 2791 117-E 1:75,000 (1957)
45°N
F.S. 4333 1:100,000 (1970)
Chart 8009
F.S. 2791 W-34 1:75,000
F.S. 2791 122-E (1961) 1:75,000
F.S. 3346 1:250,000 (1963)
F.S. 2791 123-E 1:75,000 (1961)
F.S. 3314 A/B 1:150,000 (1963)
.3347
(1963)
Chart 8010
F.S. 3316 (B) 1:150,000 (1966)
TAIL OF THE BA
55°W
50°W

BATHYMETRY (CONTINUED)

Early Surveys (continued)

There is, however, one other bathymetric-like data set which has the potential to serve in bottom analysis. In 1983 Memorial University ran the DAWSON 83-014 cruise into Trepassey Bay and St. Mary's Bay to gather gravity, seismic profiling and bottom sampling data. A 3.5 kHz profiler was operated and a reasonable data set was gathered that would assist in bottom interpretation if assessed (Enclosure 11). This project was unable to get to this data set.

CHS has begun a new series of standardized 1:150,000 offshore field sheets (Figure 34). These, however are of little use to the project in that they, as yet have little data on them. As well, all CHS data is now being gathered with high-frequency echosounders (200 kHz) that give little bottom penetration even over the softest bottoms and therefore are of little direct value to the geologist as mapping tools.

Fisheries Charts

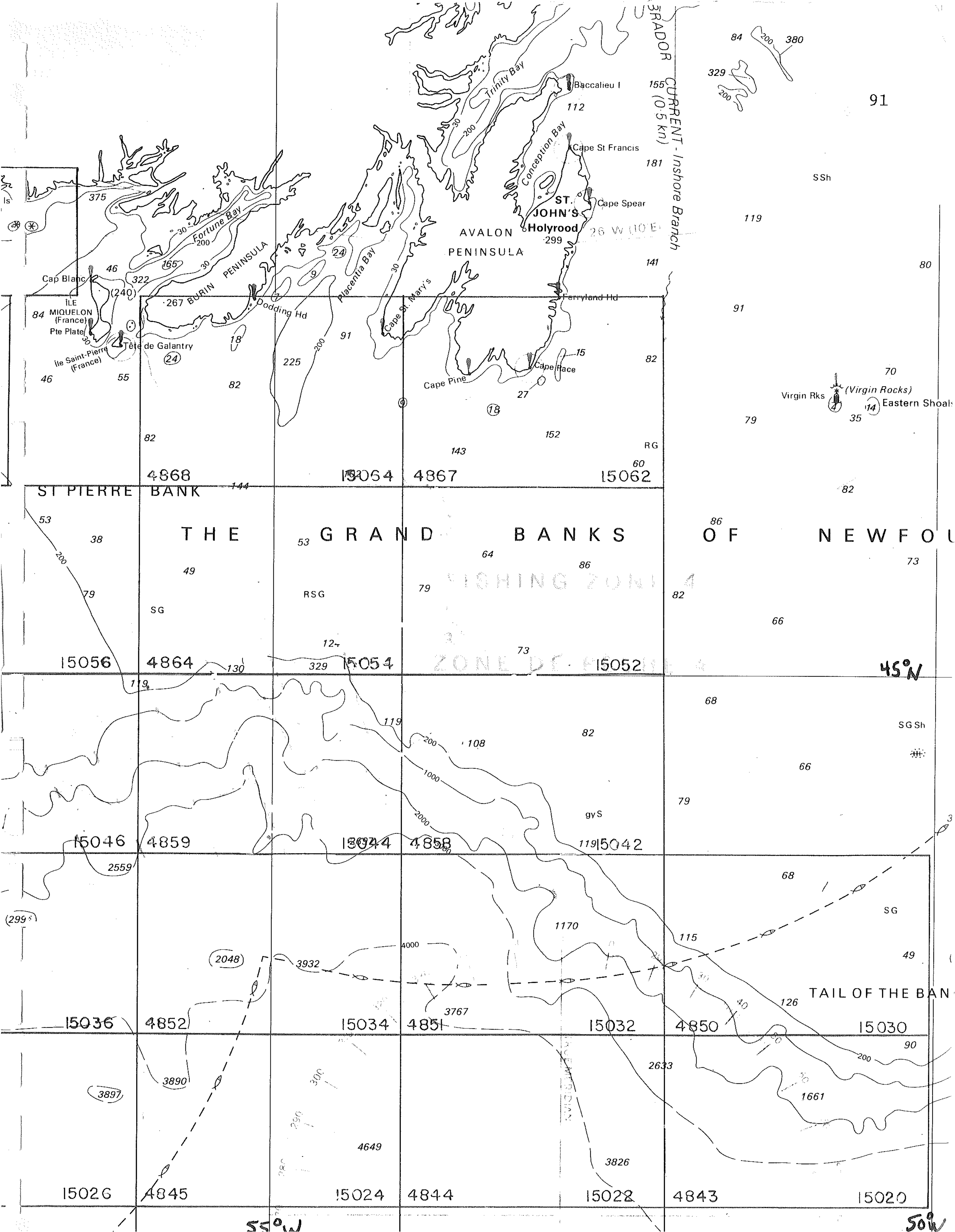
The late 50's to mid 60's hydrographic surveys by CHS were compiled into a series of navigation charts that were first issued in the mid to late 60's and reissued with corrections and additions throughout the 70's. The navigation charts went from Decca lattices to Loran-C lattices over the years but the basic hydrographic data has not changed on the charts. The new CHS series of Fisheries Charts that began to appear in the late 70's, specific to fishermen's needs, carried the same bathymetry derived from the surveys of the late 50's to 60's; it was all in fathoms.

An earlier compiled bathymetric base map was available to the project as it began (Praeg, 1986). Charts 4016, 8009, 8010 and 8011 (Canadian Hydrographic Service, 1983a;b;c;d) had been previously photographed and the negatives carefully combined to make one master negative and reproducible mylar print of the area 43°58'N to 47°55'N and 51°45'W to 55°30'W (Enclosure 3). This bathymetry map had been used by AGC as a master map for tracks and samples and as a base map for cruise planning before this project began. This map area was the area over which Dan Praeg conducted a preliminary indexing of data in preparation for this project (Praeg, 1986). The bathymetry is in fathoms on this map (Enclosure 3).

Thus, the area 43°58'N to 47°55'N and 51°45'W to 55°30'W became the project area for compilation for this contract (Figures 1 and 2). Only occassionally do tracks or sample plots go beyond these limits (Enclosures 6 and 7). The Fisheries Chart bathymetry is the bathymetry used in Burns' (1987) B.Sc. Honours thesis (Figure 25) and will be the bottom topography used for much of Le Gresley's M.Sc. thesis at Queens University.

FIGURE 34

INDEX MAP, COVERING THE SAME AREA AS THE PREVIOUS FIGURE, SHOWING THE CHS'S NEW SERIES OF 1:150,000 OFFSHORE FIELD SHEETS OFF SOUTHEAST NEWFOUNDLAND. THESE SHEETS AS YET HAVE RELATIVELY LITTLE DATA. THE MAP IS A PORTION OF INDEX MAP 2B FOUND IN TECHNICAL RECORDS AT CHS/BIO.


LABRADOR CURRENT - Inshore Branch (0.5 kn)
Baccalieu I
Trinity Bay
Conception Bay
Cape St Francis
Cape Spear
ST. JOHN'S
Holyrood
AVALON PENINSULA
Fortune Bay
BURIN PENINSULA
Placentia Bay
Cape St Mary's
Dodding Hd
Ferryland Hd
Cape Race
Cape Pine
Cap Blanc
ÎLE MIQUELON (France)
Pte Plate
Île Saint-Pierre (France)
Tête de Galantry
Virgin Rks
(Virgin Rocks)
Eastern Shoals
ST PIERRE BANK
THE GRAND BANKS OF NEWFOU
FISHING ZONE 4
ZONE DE PÊCHE 4
TAIL OF THE BAN
SSh
RSG
SG
RG
gyS
SG Sh
45°N
55°W
50°W
4868
15064
4867
15062
15056
4864
15054
15052
15046
4859
15044
4858
15042
15036
4852
15034
4851
15032
4850
15030
15026
4845
15024
4844
15022
4843
15020

BATHYMETRY (CONTINUED)

Natural Resource Maps

Meanwhile, a new series of surveys on the Grand Banks and elsewhere were adding new data offshore and Canada eventually, in the early 70's, began to compile a new series of Natural Resource Maps (NRMs). The new NRMs were not charts, but rather were contoured bathymetry maps intended to serve the scientist, the person planning offshore development and the geologist. The new series of NRMs were contoured by, or under the direction of, a geologist and incorporated a certain textural assessment of the echosounder records where they survived. The NRMs were contoured in metres at a scale of 1:250,000 on a Transverse Mercator Projection and cover areas 1° wide in latitude and 2° in longitude (Figure 35).

The contour interval was closer than found on the earlier Fisheries Charts (generally 10 m) and was at a constant interval through to the shelf edge. In general, the new NRM series were quite superior to the earlier CHS charts in giving a truer and more detailed portrayal of the shape of the ocean floor.

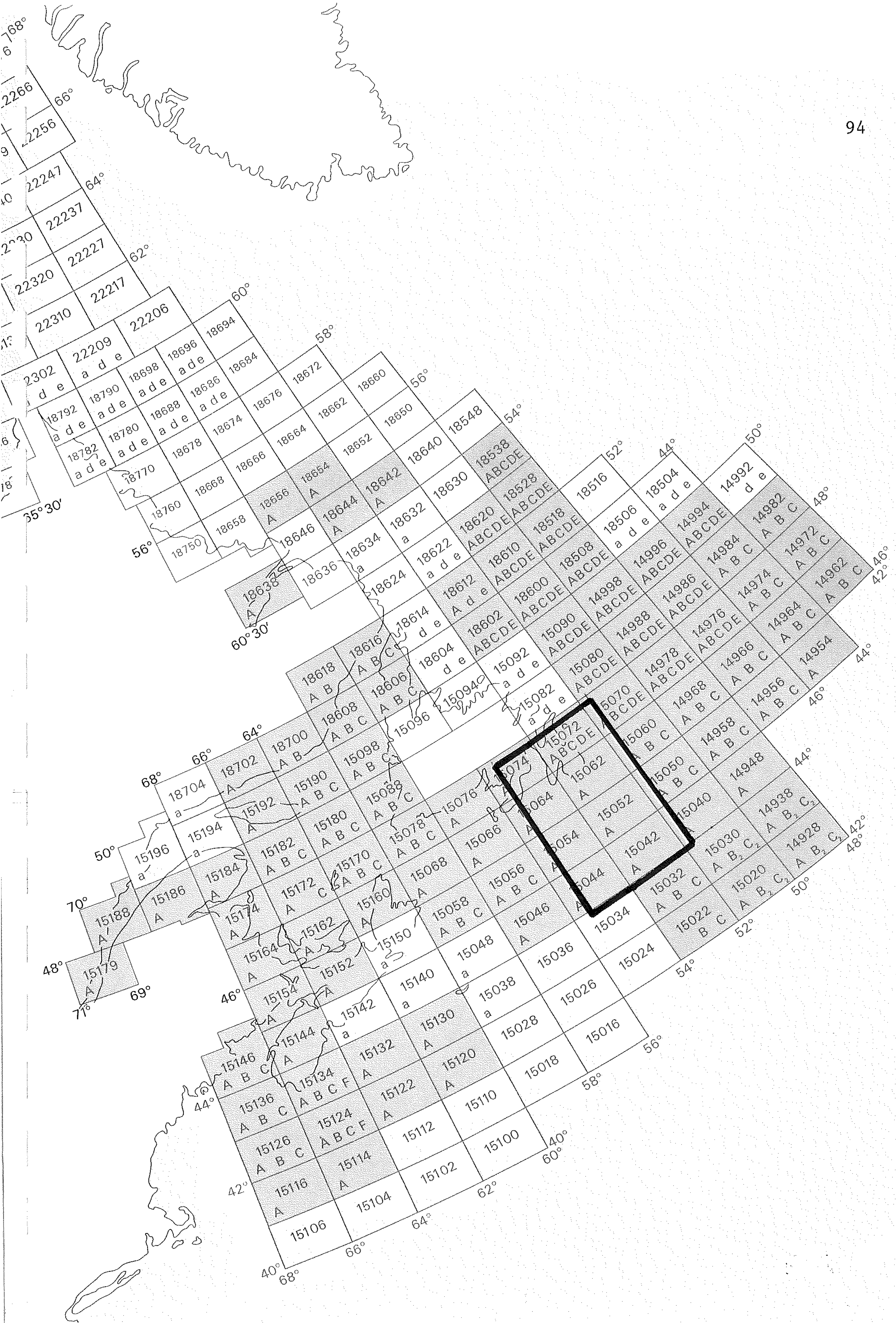
All the study area north of latitude 44°N has been covered by Natural Resource Maps. We do not list them all in the bibliography, but rather list them below and portray them on CHS's index map (Figure 35). The project area requires portions of 15 NRMs. All are published save No. 15034A, which contributes only a two-minute wide strip along the southeasternmost limit in the deepest water (Figure 35).

NATURAL RESOURCE MAPS USED
IN THE COMPILATION

Number	Date Published	Latitudes	Longitudes
15030A	1973	43°-44°	50°-52°
15032A	1973	43°-44°	52°-54°
15034A	not published	43°-44°	54°-56°
15040A	1971	44°-45°	50°-52°
15042A	1973	44°-45°	52°-54°
15044A	1973	44°-45°	54°-56°
15050A	1971	45°-46°	50°-52°
15052A	1972	45°-46°	52°-54°
15054A	1972	45°-46°	54°-56°
15060A	1972	46°-47°	50°-52°
15062A	1977	46°-47°	52°-54°
15064A	1975	46°-47°	54°-56°
15070A	1972	47°-48°	50°-52°
15072A	1975	47°-48°	52°-54°
15074A	1977	47°-48°	54°-56°

FIGURE 35

CHS INDEX MAP TO THE NATURAL RESOURCE MAP SERIES OFF THE EAST COAST. THE PROJECT AREA COVERS AN AREA OF 12 FULL OR PARTIAL NRMs PLUS A SLIGHT SLIVER FROM THE NORTH OF 15032A AND A CORNER OF 15030A. THE ONLY PORTION OF THE PROJECT AREA NOT AVAILABLE ON NRMs IS THE 2 MINUTE-WIDE TOPMOST STRIP FROM NRM 15034A WHICH IS NOT YET PUBLISHED.



22266
22256
22247
22237
22227
22320
22217
22310
22206
22209 a d e
18694
18696 a d e
18698 a d e
18684
18686 a d e
18688 a d e
18790 a d e
18792 a d e
18780 a d e
18782 a d e
18672
18660
18676
18662
18650
18674
18664
18652
18640
18548
18678
18666
18654 A
18642 A
18630
18538 ABCDE
18770
18668
18656 A
18644 A
18632 a
18620 ABCDE
18528 ABCDE
18760
18658
18646
18634 a
18622 a d e
18610 ABCDE
18518 ABCDE
18516
18504 a d e
14992 d e
18750
18636
18624
18612 A d e
18600 ABCDE
18508 ABCDE
18506 a d e
14994 ABCDE
14982 A B C
18638 A
18614 d e
18602 ABCDE
15090 ABCDE
14998 ABCDE
14996 ABCDE
14984 A B C
14972 A B C
18618 A B
18616 A B C
18604 d e
15092 a d e
15080 ABCDE
14988 ABCDE
14986 ABCDE
14974 A B C
14962 A B C
18606 A B C
18608 A B C
15094
15082 a d e
15070 BCDE
14978 ABCDE
14976 ABCDE
14964 A B C
15096
15072 ABCDE
15060 A B C
14968 A B C
14966 A B C
14954 A
18700 A B
15098 A B C
15074
15062 A
15050 A B C
14958 A B C
14956 A B C
18702 A
18704 a
15190 A B C
15088 A B C
15076 A
15064
15052 A
15040
14948 A
15192
15194 a
15196 a
15180 A B C
15078 A B C
15066
15054
15042 A
15030 A B_2 C_2
14938 A B_2 C_2
15182 A B C
15170 A B C
15068 A
15056 A B C
15044
15032 A B C
15020 A B_2 C_2
14928 A B_2 C_2
15184 A
15186 A
15172 A
15160 A
15058 A B C
15046 A
15034
15022 B C
15188 A
15174 A
15162 A
15150 a
15048 a
15036
15024
15179 A
15164 A
15152 A
15140 a
15038 a
15026
15154 A
15142 a
15130 A
15028
15016
15146 A B C
15144 A
15132 A
15120 A
15018
15136 A B C
15134 A B C F
15122 A
15110
15124 A B C F
15112
15100
15126 A B C
15114 A
15102
15116 A
15104
15106
68°
66°
64°
62°
60°
58°
56°
54°
52°
50°
48°
46°
44°
42°
40°
65°30′
60°30′
70°
69°
71°

BATHYMETRY (CONTINUED)

Natural Resource Maps (continued)

John Warren and David Monahan of CHS in Ottawa were approached to obtain the 1:250,000 autopositives of each of the 14 available NRMs. These were then shot down to exactly reduce each sheet from 1:250,000 to 1:350,000 along the central 30' latitude line. The reduced 1:350,000 autopositive copies were then mounted on the Fisheries Chart master mosaic and were mosaiced together and then taped to produce the contoured bathymetry master in metres seen in Enclosure 4.

Each NRM is produced as a Transverse Mercator Projection sheet thus, on mosaicing, the adjacent sheets do not match exactly and slight under and overlaps occur when compared to the mosaic made from the Fisheries Charts (Enclosure 3). The distortions were distributed equally over the mosaic so as to minimize the error at any particular point. A mosaic of the coloured paper maps of the NRM maps,at 1:250,000, was also made to serve as a visual wall guide to the bathymetry when compiling data and writing the report.

If the bathymetry master in metres of Enclosure 4 is eventually used as the base for a published surficial geology map for this project area, then CHS should be approached to reduce the NRM mosaic to 1:350,000 without the distortions inherent to our method. This probably can be done using an anamorphic lens or can be done with certainty if the sheets and contours can be put into a digital form and replotted on the Mercator Projection. A more suitable reproducible acetate for an open file can be made from Enclosure 4 by making a high contrast, contact, copy on a large flat-bed camera such as the Institute may have or such as found at Norman Wade and Atlantic Air Survey locally.

For display purposes, the project area is also available on the 1:1,000,000 National Earth Science Series of coloured bathymetry maps. This new series is designed to replace the original compiled sheet 802 and incorporates the latest, contoured bathymetry (in metres) from the NRMs. The project area is covered on the Burin Peninsula sheet and on the St. John's sheet (Canadian Hydrographic Service, 1984; 1983e).

Comparison of Bathymetry Maps

One may lay the bathymetry map in metres (Enclosure 4) over the earlier-contoured map in fathoms (Enclosure 3) to compare the two. The most obvious difference is the detail; the map in metres has a 10-m contour interval whereas the map in fathoms has a 10-fm (18.3-m) contour interval. The increase in detail on the map in metres is

BATHYMETRY (CONTINUED)

Comparison of Bathymetry Maps (continued)

particularly evident in areas like St. Mary's Bay, along the western margin of the Avalon Channel, east of the Burin Peninsula, in Whale Deep and at the north end of Haddock Channel.

A significant improvement is seen in the map in metres along the shelf edge and slope in the south of the project area. This comes not so much from an increase in detail, but rather from a more sensitive contouring of the hydrographic data. The map in fathoms (Enclosure 3) showed a whole series of isolated highs at about the 200 fathom contour that do not seem natural. The recontoured NRMs in metres (Enclosure 4) show a much more likely continental shelf edge incised by a series of shelf-edge canyons.

Similarly, Whale Deep shows a significant detailing in the NRM-derived map (Enclosure 4). On the Fisheries Charts (Enclosure 3) Whale Deep showed as one basin dropping down from shelf depths of about 45 fm (82 m) to lows of up to 62 fm (113 m). The NRMs' contours in metres show Whale Deep to be a series of two main lows that are somewhat dendritic in shape and up to 120 to 130 m deep, plus a series of 10 or 11 small isolated lows scattered about mainly to the northwest and northeast of the two main lows. Whale Deep is seen on the detail of Enclosure 4 to be in fact "Whale Deeps".

It is the authors view that the bathymetry map in metres is superior to the map in fathoms, both because of the increase in detail seen in the 10-metre contours and because the contours were regenerated using some geological input directly from the original field sheets, occasionally making use of original records and some more recent data. Enclosure 4 also shows the detail of Trinity Bay, whereas Enclosure 3 does not. We would recommend that the final surficial geology maps issued for this area use the bathymetry in metres reprojected onto the Mercator Projection of the chosen 1:350,000 scale common to the Fisheries Charts of the project area. For this report, we include both maps in Enclosures 3 and 4 and have found the Fisheries Chart mosaic of Enclosure 3 more useful for its place names, etc. and Enclosure 4 in metres more useful for its detail when constructing the geological contacts on Enclosure 1.

Description and Review of Bathymetry

The project area in the nearshore is comprised of the large, deeply-incised bays that serve to almost isolate the Avalon Peninsula as an island (Trinity Bay and Placentia Bay) and their two counterparts that cut deeply into the Avalon from the north and south

BATHYMETRY (CONTINUED)

Description and Review of Bathymetry (continued)

(Conception Bay and St. Mary's Bay) The head of Fortune Bay is also included in the area. The offshore portion of the project area is comprised of the well-developed Avalon (marginal) Channel that encircles the Avalon Peninsula on the east and the south plus 4 main offshore banks or portions of banks generally separated by well-developed channels or, in one case, by a failed channel.

Trinity Bay and Conception Bay both open to the north northeast and appear to have been overdeepened by moving glacial ice. Trinity Bay reaches depths of just over 560 m water depth at the north edge of the map area (Enclosure 4) while Conception Bay reaches depths of 290 m west of Bell Island (Figure 8 - Enclosure 4). Conception Bay shows a well-developed sill at its mouth, typical of glacial fjords, while Trinity Bay has a less-developed sill. Similarly, the head of Fortune Bay and Belle Bay, to the northwest off of Fortune Bay, show overdeepening typical of glaciated fjords. Water in Belle Bay reaches depths of 500 m while Fortune Bay, in the project area, reaches depths of just over 350 m (Enclosure 4). Off the map area, to the west, Fortune Bay has a fairly well-developed sill.

St. Mary's Bay is the smallest of the coastal fjords but shows the typical characteristics of a fjord with over-deepening to depths of about 210 m and a second lessor arm extending to the northeast in towards St. Mary's Harbour. St. Mary's Bay fjord has a sill at its mouth. Trepassey Bay, to the east of St. Mary's Bay, shows none of the characteristics of a fjord and has not been over-deepened; it has no sill at its mouth.

Placentia Bay has the most complex morphology with three main channels in the northern part separating Merasheen Island and Long Island from each other and from the main island of Newfoundland. In the northern portion of Placentia Bay, depths reach 450 m at the south end of Western Channel, over 350 m in Central Channel and up to 400 m in Eastern Channel.

Placentia Bay, in effect, has two sills. The northernmost is at about latitude 47°10'N in the vicinity of White Sail Bank, Merasheen Bank and Bennett Bank. However, the main axis of the overdeepened portion of Placentia Bay picks up to the southeast of these bedrock-controlled banks and continues offshore farther than any of the other fjords mentioned above. The axial low of Placentia Bay continues right into Halibut Channel (Enclosure 4) and essentially onto the shelf edge and into a shelf-edge canyon head. There is a modest shoaling to 130 m in Halibut Channel at 45°30'N which could be considered the second sill of the Placentia Bay fjord.

Description and Review of Bathymetry (continued)

The sill depths of Belle Bay, Fortune Bay, Placentia Bay (northern portion), St. Mary's Bay, Conception Bay and Trinity Bay are about 110, 105, circa 150, 105, circa 150 and circa 120 m respectively. Both Halibut and Haddock Channels show "sills" or mid-channel shoaler areas of 130 m and 115 m respectively.

The well-developed Avalon marginal channel almost encircles the crystalline rocks of the Avalon Peninsula and marks the boundary between the crystalline rocks of the onshore regimes and the softer bedded rocks of the Tertiary or Devonian-Silurian sequences farther offshore to the south and east respectively. The Avalon Channel appears to be a typical marginal channel, as defined by O. Holtedahl (1950, 1970), E. Holtedahl (1958) and by Holtedahl and Holtedahl (1961) and as found all around the eastern coast of Canada where the glaciers have passed from the hard crystalline onshore rocks onto the softer, bedded rocks found offshore. Alan Grant (1972) has earlier made this observation with respect to the Avalon Channel and interpreted that it had been infilled with 50 m of glacial drift south of Trepassey Bay.

The Avalon Channel is 30-40 km wide and passes down the east side of the Avalon Peninsula, reaching 190 m in Cordelia Deeps and 200 m east of Ballard and Buffet Banks. It then sweeps around to the west and forms an east-west low about 160 m deep south of the Avalon Peninsula. Its analogue, the St. Pierre Channel, continues westward off the map area south of the Burin Peninsula; it too is a glacially-enhanced marginal channel after Holtedahl (1958).

If such an interpretation is correct, then one may safely assume that glacial ice of sufficient thickness to excavate bedrock extended at least out to the eastern edge of the Avalon Channel east of the Avalon Peninsula and to the southern edge of the Avalon and St. Pierre (marginal) Channels south of the main island of Newfoundland. Halibut and Haddock Channels look like very broad 'transverse troughs' excavated by broad outlet glaciers both in their geometric arrangement and in that they have a low sill about two-thirds of the way along their length to the south.

Similarly, the reentrant in the 100 m contour at 52°45'W along with the overdeepening by some 10 to 40 m of the several and various lows of Whale Deep(s) all together suggest that this area was over-ridden by, and excavated by, moving glacial ice. The reentrant and lows of Whale Deep(s) suggest a failed or underdeveloped glacial in the 100 m outlet channel that never devloped a full linearity perhaps because of bedrock control.

BATHYMETRY (CONTINUED)

Description and Review of Bathymetry (continued)

Thus, a morphological analysis alone suggests that virtually all of the shelf-depth offshore areas of the project area were overridden by, and eroded by, moving glacial ice at one time. Grant (1972) came to the same conclusion. This conclusion is confirmed by an analysis of the seismostratigraphy of the surficial units.

OCEAN CIRCULATION

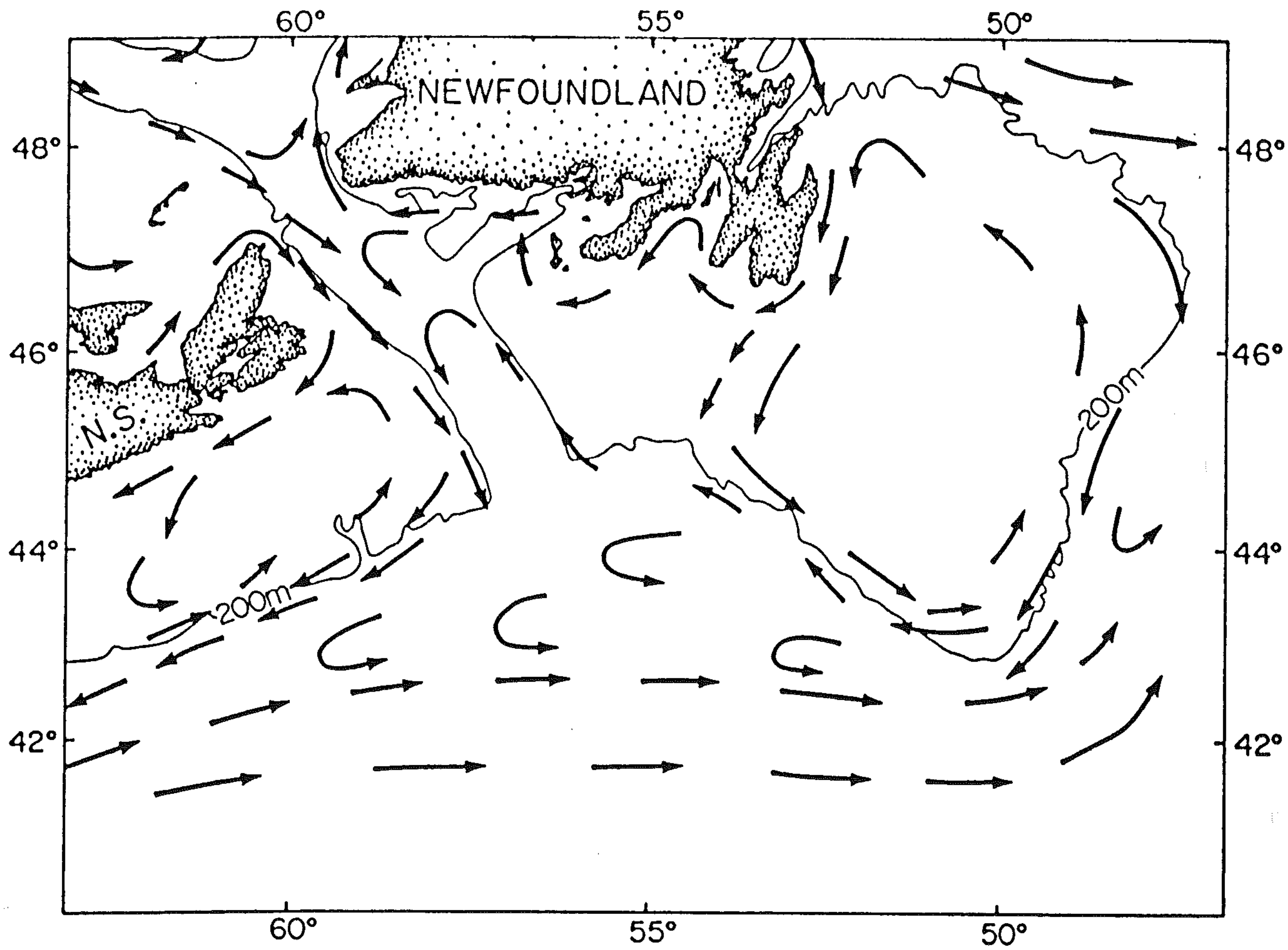
Dinsmore's generalized ocean circulation pattern is shown in Figure 36 (Dinsmore, 1972). The Labrador Current has the greatest effect to the east of the Avalon Peninsula flowing southward along the axis of the Avalon Channel. A branch of the Labrador current then continues west, south of the Avalon Peninsula and generally counterclockwise in Placentia Bay with other branches streaming south southwest over Whale Bank and along Halibut Channel. Leim _et al_. (1957) and Hachey (1961) also review the general oceanography of the adjacent area. Flows along the south coast of Newfoundland are generally thought to be less than 0.5 m/s. The tidal component can be significant and can locally reverse the generalized flow. Wind-derived currents can also disrupt the generalized flow.

Willey (1975) found low salinities in the Western Channel of the northern portion of Placentia Bay when compared to the Eastern Channel and, confirmed Hodder _et al_'s. (1972) counterclockwise, April-June 1969, circulation. Their work was done as a result of a serious elemental Phosphorous pollution problem in Long Harbour on the east side of Placentia Bay. Willey (1975) noted however that the Newfoundland Sailing Directions of 1974 (Canadian Hydrographic Service, 1974) reports one can have either clockwise or counterclockwise circulation in Placentia Bay and that erratic currents up to 2 to 3 kt (10-15 cm/s) can occasionally occur depending on the wind.

Trites (1969) measured currents of about 2.6 cm/s in this northern area near Long Harbour on the eastern part of Placentia Bay; the tidal range was 1.6 m. Lawrence _et al_. (1973) measured currents in the vicinity of Come-By-Chance Bay at several depths during the summer of 1968 and 1972 and in the winter of 1972 (Willey, 1975). They found variable currents of less than 2.6 cm/s with the same 1.6 m tidal range.

FIGURE 36

GENERALIZED PATTERN OF OCEAN CIRCULATION FOR THE GRAND BANKS OF NEWFOUNDLAND AND SCOTIAN SHELF FROM DINSMORE (1972).


60°
55°
50°
NEWFOUNDLAND
48°
46°
44°
42°
N.S.
200m
200m
60°
55°
50°

DATABASE AVAILABLE FOR THE COMPILATION

Underway Geophysical Data

Many of these data have been earlier referred to in the above review of previous work. Most of the geophysical data available are from the Atlantic Geoscience Centre at the Bedford Institute of Oceanography; almost all the available bottom sampling information is from AGC cruises. Table 1 lists the AGC cruises which gathered relevant data in the project area.

Often the earlier cruises were mainly for potential field data and bathymetry was the only other data gathered with occasionally airgun (eg. SACKVILLE 69-041). Sidescan sonar was not used on an AGC cruise in the project area until 1973 on HUDSON 73-006 (Table 1). The deep-towed, Huntec, high-resolution, seismic profiler was not used until 1975 on HUDSON 75-009.

In later years the use of the BIO vessels for potential field mapping has dropped off significantly and one can see increased time being made available to tools like sidescan sonar and high resolution profiling (Table 1).

We include a series of Appendices 1-15 that list the geophysical data in the AGC archives that cover the project area and we present four day/time track plots in Enclosures 8 to 11 that cover four of these data sets. Thus Appendices 1 and 2, 3 and 4, 5 and 6 along with 8 plus Enclosures 8,9,10 and 11 cover the available cruises with sidescan sonar (and in one case SEAMARC), Huntec deep-towed boomer or sparker (and in one case NSRF deep-towed V-fin sparker), airgun (and in one case Dalhousie's Eggerton sparker) and 3.5 kHz profiler data, respectively. The Enclosures serve as working index maps to the available, relevant, underway geophysical data. These enclosures and Enclosure 7 (below) do not show tracks with just bathymetry or with just potential field data.

Enclosure 7 is a compiled day/time track map of all tracks of all underway geophysical lines in the project area with sidescan, Huntec or NSRF, airgun or sparker and 3.5 kHz profiler data without distinguishing what data were gathered along the line; the portion of Trinity Bay in the project area was also included. Other appendices gather all the reflection profiling data on one list (Appendix 7), all cruises with echosounding data (Appendix 9), BRUTIV data (only one cruise, HUDSON 84-024, Appendix 10), magnetic data (Appendix 11), gravity data (Appendix 12), high-resolution, multichannel, digital seismic refraction data (only one cruise, DAWSON 81-044, Appendix 13)

TABLE 1

LIST OF CRUISES IN THE AGC DATABASE FOR WHICH THERE ARE UNDERWAY GEOPHYSICAL DATA IN THE PROJECT AREA INCLUDING BATHYMETRY

VESSEL	CRUISE NO.	A.G.C. DATA BASE FILE NUMBER	DATA TYPES GATHERED
KAPUSKASING	1957-60	---	BS
BAFFIN	63-005	077	12
BAFFIN	63-006	?	BS
BAFFIN	64-018	087	12
HUDSON	65-006	020	12
HUDSON	65-024	049	12
BAFFIN	66-008	025	12, BS
HUDSON	66-019	017	12
BAFFIN	67-014	032	12, BS
HUDSON	68-006	034	12
HUDSON	68-022	057	12
SACKVILLE	69-041	090	AG, 12
HUDSON	69-050	081	12
KAPUSKASING	70-018	?	12(CHS), BS
DAWSON	70-028	046	12
BAFFIN	71-017	122	12, BS
DAWSON	71-021	?	BS
HUDSON	71-037	174	AG, 12
DAWSON	72-009	039	AG,12,BS, Simrad sonar
KAPUSKASING	72-014	?	33(CHS), BS
MINNA	72-015	030	12
HUDSON	72-021	016	AG, 12
HUDSON	72-025	018	12
HUDSON	73-006	054	S, AG, 12, BS
DAWSON	73-015	?	BS
MINNA	73-019	113	12
DAWSON	73-034	108	12
SACKVILLE	74-019	035	12
MINNA	74-023	107	12
HUDSON	75-009(Ph. 1)	124	S, H, AG, 12, BS
HUDSON	76-029	023	12
HUDSON	77-011	040	S, H, AG, 12, BS
HUDSON	77-014	041	12
HUDSON	78-008	042	H, S?, BS
HUDSON	78-012	044	S,H,AG,BS,12(MS 26B)
HUDSON	78-020	043	12
HUDSON	78-023	056	S, H, AG, 12, BS
HUDSON	79-011	102	S, H, AG, 12, BS
HUDSON	79-013	101	12
BAFFIN	79-015	120	12
HUDSON	80-010	099	S, H AG, 12
BAFFIN	80-014	?	BS
DAWSON	80-030	062	Sp, 3.5, 12, BS

TABLE 1 (CONTINUED)

VESSEL	CRUISE NO.	A.G.C. DATA BASE FILE NUMBER	DATA TYPES GATHERED
BAFFIN	81-012	073	S, 3.5
DAWSON	81-019	?	BS
DAWSON	81-044	089	3.5, MCHR, 12
HUDSON	81-045	111	S, H, AG, BS
PANDORA II	81-054	154	H, BS
DAWSON	82-013	?	BS
BAFFIN	82-039	094	S, H, AG
DAWSON	83-014	132	S, H, 3.5, BS
HUDSON	83-017	137	SEAMARC, 3.5, 12, BS
QUEST	83-013(83-110)	135	AG, 12, 3.5?
DAWSON	84-003	139	S(VFIN), VFIN, 3.5, BS
HUDSON	84-021	150	AG, REFR, 12
HUDSON	84-024	143	S, H, AG, BR, 12, BS
HUDSON	84-040	149	12
BAFFIN	84-044	145	12
DAWSON	84-050	?	BS
HUDSON	85-001	156	H, AG, 12
HUDSON	85-005	159	S, H, AG, 12, BS
BAFFIN	85-009	?	BS
BAFFIN	85-022B	?	BS
HUDSON	85-025	180	12
DAWSON	85-037	155	H
PANDORA II	85-057	170	S, 3.5?, 12, BS
PANDORA II	85-059	168	3.5?, 12
HUDSON	86-013	166	3.5?, 12, BS
HUDSON	86-017	163	S, H, AG, 12, BS
HUDSON	86-018	164	H, 12, BS
DAWSON	86-026	?	AG, 3.5, BS
BALDER CHALLENGER	87-400	?	BS

KEY TO TABLE

S	= Sidescan sonar data
S(VFIN)	= Sidescan sonar data from a deep-towed NSRF V-FIN
H	= Huntec deep-towed boomer or sparker
AG	= Airgun seismic reflection data
VFIN	= NSRF deep-towed V-fin sparker data
Sp	= Sparker seismic reflection data
3.5	= 3.5 kHz profiler data
12	= A general term AGC tends to use for echosounding data Much of the data is 12 kHz and can at times be MS 26B data
12(CHS)	= MS 26B 12kHz data archived with CHS at BIO
33(CHS)	= Edo bathymetry data, 30-33 kHz; with CHS at BIO
MCHR	= Multichannel reflection data
REFR	= Refraction data
SEAMARC	= SEAMARC sidescan data
BR	= BRUTIV data
BS	= Bottom sampling data including bottom photo on occasion

DATABASE AVAILABLE FOR THE COMPILATION (CONTINUED)

Underway Geophysical Data (continued)

and refraction and ocean bottom seismometer (OBS) data (Appendices 14 and 15 respectively).

The appendices, while complete for AGC-held data to the end of 1986, do not show the commercially-gathered, oil company, deep seismic, data nor do we include an index map. These data are probably not relevant to a study of the glaciomarine section except perhaps in the case of certain deeply-eroded channels or to confirm one's interpretation of the nature of the bedrock below the Pleistocene or Quarternary section. The Eastern Petroleum Group (EPC) of AGC maintains a series of index maps to public deep seismic data (Figure 37). Data for the project area are found on the St. Pierre, Avalon, Green Bank and Grand Banks index maps of EPG. (Figure 37).

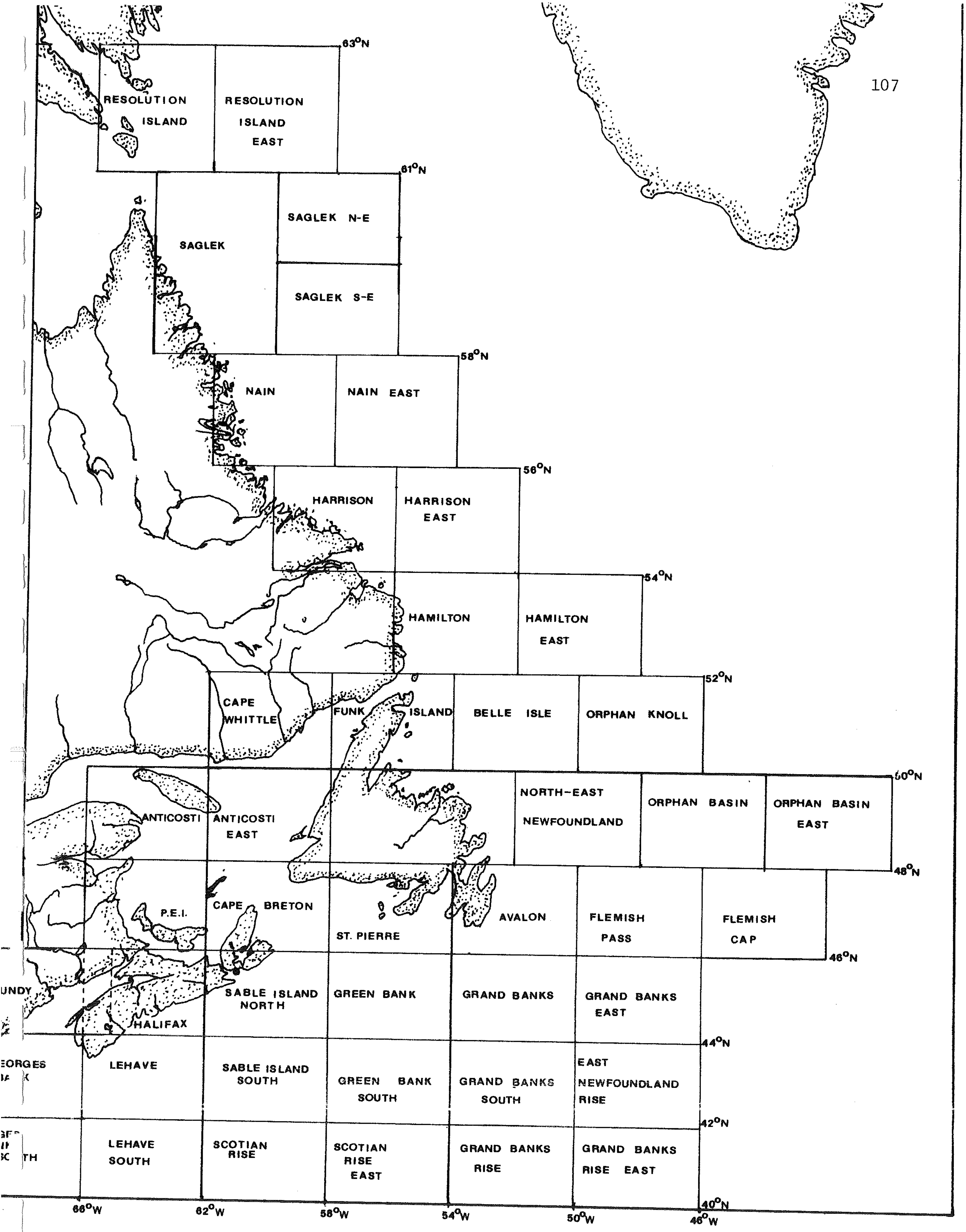
Certain other oil company, high resolution, geophysical data have been gathered for engineering purposes in the project area and certain of these data are available. We have earlier mentioned that Mobil Oil Canada Ltd. have made their 1981 Geonautics/d'Appolonia Engineering Consulting Engineers, Inc. sidescan, airgun and Huntec data available south of the Avalon Peninsula (Figure 29). These tracks were added to Enclosure 7. Similarly two lines of POLARIS V 1980 data traversing the Avalon Channel along proposed pipeline routes (Figure 27) were gathered by C-CORE/MOBIL (sidescan sonar data only; no Huntec or airgun). These data were not recovered for the project and do not appear on the enclosures but should be publically available.

There was no requirement for pre-drilling wellsite surveys when Pan Am, Amoco and Elf drilled their many "bird holes" in the late 60's and early 70's. Thus the only well in the project area that has a wellsite survey is the 1987 deep-water, Northcor et al., Narwhal F-99 well (Enclosure 6). The 1985 Narwhal wellsite survey was done by McElhanney Services and is not yet public. Wellsite survey data become public 2 years after the rig release date or on the dropping of the acreage. The 1987 Narwhal F-99 well was a dry hole having drilled into acoustic basement.

It is not known if other oil company, high resolution, profiling data exists in the project area. Similarly, as earlier mentioned, we did not search out any nearshore survey data if it exists. The Earth and Ocean Research Ltd. compilation of the nearshore survey and sampling data, which is currently underway, may show the availability of such data in the project area.

FIGURE 37

INDEX MAP TO THE EASTERN PETROLEUM GROUP'S INDEX MAPS OF DEEP SEISMIC DATA. EPG IS FOUND AT THE ATLANTIC GEOSCIENCE CENTRE AT BIO. DEEP SEISMIC DATA GENERALLY BECOME PUBLIC 5 YEARS AND 6 MONTHS AFTER THE COMPLETION OF A SEISMIC PROGRAM.


63°N
RESOLUTION ISLAND
RESOLUTION ISLAND EAST
61°N
SAGLEK
SAGLEK N-E
SAGLEK S-E
58°N
NAIN
NAIN EAST
56°N
HARRISON
HARRISON EAST
54°N
HAMILTON
HAMILTON EAST
52°N
CAPE WHITTLE
FUNK ISLAND
BELLE ISLE
ORPHAN KNOLL
50°N
ANTICOSTI
ANTICOSTI EAST
NORTH-EAST NEWFOUNDLAND
ORPHAN BASIN
ORPHAN BASIN EAST
48°N
P.E.I.
CAPE BRETON
ST. PIERRE
AVALON
FLEMISH PASS
FLEMISH CAP
46°N
UNDY
HALIFAX
SABLE ISLAND NORTH
GREEN BANK
GRAND BANKS
GRAND BANKS EAST
44°N
EORGES
LEHAVE
SABLE ISLAND SOUTH
GREEN BANK SOUTH
GRAND BANKS SOUTH
EAST NEWFOUNDLAND RISE
42°N
TH
LEHAVE SOUTH
SCOTIAN RISE
SCOTIAN RISE EAST
GRAND BANKS RISE
GRAND BANKS RISE EAST
40°N
66°W
62°W
58°W
54°W
50°W
46°W

DATABASE AVAILABLE FOR THE COMPILATION (CONTINUED)

Underway Geophysical Data (continued)

There is one other source of geophysical (and sampling) data in the area. Since 1971 Memorial University of Newfoundland has had access to BIO shiptime for biological, oceanographic, iceberg and geological field work generally in the waters off Newfoundland (Table 2).

The first four cruises in the 1970's each produced a good cruise report and the data types gathered, sample locations, etc. are recoverable and known. These were the cruises run by the Ocean Engineering Group at Memorial (DAWSON 71-021, 72-022, 73-015 under John H. Allen and HUDSON 78-012 which was a joint cruise with Gordon B. Fader of AGC and G. Ross Peters of Memorial).

Later Memorial University cruises are not so well documented. They have been run since 1982 by the Newfoundland Institute for Cold Ocean Science (NICOS) often under the direction of Dick Haedrich and there are virtually no formal cruise reports available (Table 2). One must rely upon the rather cursory standard "cruise summary", or on personal contacts, to know what data were gathered and its track location, sample location or archive location. A sequencial list of all cruise reports for all cruises which gathered data in the project area follows the references at the end of the text. A copy of each cruise report is found in the project file at AGC in Gordon Fader's office.

AGC and BIO have no firm policy for cruise report requirements, data submission and data archival requirements imposed on outside users of shiptime. This has resulted in a rather poor documentation of the vessels' use (generally DAWSON) for at least six of the nine 1982 - 1986 NICOS cruises off Newfoundland (Table 2); the case is not so severe for those NICOS cruises which gathered purely geophysical data or which were joint with AGC (cruise reports exist for DAWSON 83-014, 84-020 and 85-022B).

No underway geophysical data are available at AGC from Memorial cruises save from DAWSON 83-014; we have been totally unable to recover the Conception Bay and/or Avalon Channel bottom sampling station data (10 grab samples) from DAWSON 82-013. Likewise we have no sample data recovered from the NICOS DAWSON 85-022A cruise which collected 5 bottom photo stations, 42 Van Veen grabs, and 5 gravity cores in the Bay d'Espoir, Fortune Bay and Belle Bay areas. We really have little idea where DAWSON 82-012 worked or of the data which she gathered from the material on file at BIO; Dick Haedrich has not yet answered an inquiry sent in late 1986 or subsequent phone calls.

TABLE 2

MEMORIAL UNIVERSITY CRUISES
THAT GATHERED DATA IN THE PROJECT AREA

VESSEL	CRUISE NO. (CHIEF SCIENTIST)	AGC DATABASE FILE NO.	DATA TYPES GATHERED	COMPLETE CRUISE REPORT?
DAWSON	71-021 (J.H. Allen)	No data, no no.	Ocean, Ice, BS	YES
DAWSON	72-022 (J.H. Allen)	No data, no no.	not in proj. area Ocean, Ice, BS	YES
DAWSON	73-015 (J.H. Allen)	No data, no no.	Ocean, Ice, BS	YES
HUDSON	78-012 (G.R. Peters & G.B. Fader)	044	S, H, AG, BS	YES
DAWSON**	82-012 (Dick Haedrich & Alex Hay)	No data, no no.	Ocean, Biol, BS	NO
DAWSON**	82-013 (Hugh Miller)	No data, no no.	Gravity, BS*	PARTIAL
DAWSON**	83-014 (Hugh Miller & Don Forbes)	132	3.5 kHz, S, H, BS, Gravity	YES
HUDSON**	83-043 (Alex Hay)	No data, no no.	Ocean	NO
DAWSON**	84-020 (Hugh Miller & Alex Hay)	No data, no no.	Gravity, Ocean	YES
DAWSON**	84-050 (Grant Gardner & Alex Hay)	No data, no no.	Ocean, Biol, BS	NO
DAWSON**	85-022A (Dick Haedrich)	No data, no no.	Ocean, Biol, BS*	NO
DAWSON**	85-022B (Jim Wright)	No data, no no.	Ocean, Biol, 12 kHz, BS	YES
DAWSON**	86-026 (Hugh Miller leg 1 & Dick Haedrich, leg 2)	No data, no no.	AG, 3.5 kHz, Gravity, BS, Ocean, Biol	NO
RITA MAXWELL	1972 Conception Bay (Roger Slatt)	Not applicable Non-Bio vessel	BS	NO
RITA MAXWELL	1973, 1974, 1975 Placentia Bay (Joan Willey and Charles Stehman)	Not applicable Non-Bio vessel	BS, Ocean 12 kHz	NO

KEY TO TABLE

Ocean	= Physical oceanographic data	3.5 kHz	= 3.5 kHz profiler
Ice	= Iceberg data	Biol	= Biological data
BS	= Bottom sampling	S	= Sidescan sonar data
BS*	= Bottom sampling in the project area for which we have been unable to locate positional data or sample descriptions etc.	H	= Huntec deep-towed profiler data
		AG	= Airgun data
		**	= NICOS cruise
12 kHz	= MS 26B echosounder		

DATABASE AVAILABLE FOR THE COMPILATION (CONTINUED)

Bottom Sampling Data

Dan Praeg (1986) had made up an initial index map on the Fisheries Chart base map and as well he had extended the relevant sample positions from Geomarine's 1984 Grand Banks seabed sample compilation. Praeg had begun a new table of seabed sampling data specific to the project area and he had prepared additional hand-written pages for the table for a few Russian samples (of doubtful value?), for DAWSON 71-021, for DAWSON 72-009, for HUDSON 78-023, for BAFFIN 81-019 (CHS cruise), for PANDORA II 81-054 and for later cruises not caught in the Geomarine (1984) compilation such as DAWSON 83-014 and HUDSON 83-017, 84-024 and 85-005; he also added all the commercial oil wells to the table and the 1983 D/V PHOLAS boreholes. Praeg thus had summed his tables' parts to indicate 559 samples in the project area (including grab samples and cores); Praeg's table used about 57 pages.

We adopted the table format used by Geomarine (1984) with some slight expansion in content, and continued the development of the Praeg table specific to the project area. The result is Appendix 16. The continued development of this table the search for missing cruises and missing data, continued revisions to the table, additions to it, corrections to it and the production of the table took by far and away the majority of the time spent on this written report, it took the majority of the word processing time and probably consumed a quarter of time of the senior author on the project over the past year. Correcting, revising and adding to the map of the bottom stations (Enclosure 6) took a sizeable portion of the drafting time as well.

All in all, we certainly had no idea how much time the massive table in Appendix 16 would take when we set out to update and expand it.

Praeg's table was some 57 pages covering 559 samples exclusive of bottom photo stations. The table in Appendix 16 was originally done on 11 x 17 in paper and Xerox-reduced to fit the 8.5 x 11 in page-size of this report. The new table runs to about 80 pages and encompasses 4480 samples being more than 1109 grab samples of various types, 3287 cores of various types, 60 drillholes, 24 boreholes and the table includes a further 63 camera stations with more than 632 frames. There are also 25 oil wells in the area and the results of 6 PISCES dives and one BRUTIV run are available for study. The contents of Appendix 16 are summarized in Table 3 in the text here.

The increase from Praeg's (1986) 559 samples to 4480 is somewhat deceptive. The core total of 3287 includes 3160 piston cores

VESSEL & CRUISE NO.

KAPUSKASING 1957, 1958
1959, 1960
SEVASTOPOL 14, 17, 1959/
SACKVILLE S-58, 1961
BAFFIN 63-006
SACKVILLE S-70, 1963
PAN AM 1964
CALDRILL 1965
BAFFIN 66-008
PAN AM/IOE 1966
A.T. CAMERON 1967
BAFFIN 67-014
THERON 1969
FISHERIES COLLECTION 197
KAPUSKASING 70-018
BAFFIN 71-017
SEDCO I 1971
DAWSON 71-021
DAWSON 72-009
RITA MAXWELL 1972
KAPUSKASING 72-014
HUDSON 73-006
DAWSON 73-015
RITA MAXWELL 1973/74/75

ELF OIL 1971
AMOCO IOE 1971/72/73
AMOCO *et al*. 1973-74
ELF *et al*. 1973-74
HUDSON 75-009
HUDSON 77-011
HUDSON 78-008
HUDSON 78-012
HUDSON 79-011
MOBIL/MACLAREN 1980 MMP
BAFFIN 80-014
DAWSON 80-030
BAFFIN 81-019
FOGO ISLE 1981

VESSEL & CRUISE NO.

RAVENSTURM 1981
HUDSON 81-045
PANDORA II 81-054

DAWSON 83-013
PHOLAS 1983
DAWSON 83-014
HUDSON 83-017
DAWSON 84-003
HUDSON 84-024
DAWSON 84-050
DAWSON 85-005
BAFFIN 85-009 (PHASE 2)
DAWSON 85-022A
DAWSON 85-022B
PANDORA II 85-057

HUDSON 86-013
HUDSON 86-017
HUDSON 86-018
DAWSON 86-026
BALDER CHALLENGER 1987
NORTHCOR et al. 1987

TOTALS

DATABASE AVAILABLE FOR THE COMPILATION (CONTINUED)

Bottom Sampling Data (continued)

of Pan Am taken from the THERON in 1969; only 125 of these have data in Appendix 16 from Roger Slatt's work and 16 from the Geocon (1969) report, though, depending on Dr.Piper's success further data on all 3160 cores could come to reside in AGC's files.* We only show the 125 samples which Slatt had and the 16 cores analyzed by Geocon (1969) on the Enclosure 6 index map to bottom sample data.

Similarly, the number of grab samples in the total is inflated somewhat by including for example the 115+ CHS samples shown on the charts covering the project area (Enclosure 6) and including other early CHS cruises for which the visual descriptions have not yet been located. The details of each vessel's samples seen in Table 3 can be found to its fullest detail in Appendix 16.

To construct and add to Appendix 16 the collection of cruise reports in the project file was greatly expanded; the full list of cruise reports follows the Reference list at the end of the report. Hardy et al. (1985 and 1986) and Hardy and Fisher (1987) were checked and various plots and printouts from the SID sample database were obtained. We carefully crosschecked the SID maps to Appendix 16, the cruise report lists to Appendix 16 and Appendix 16 to the final Enclosure 6 index map. A, not insignificant number, of errors were found both in Geomarine's earlier compilation (1984) and in Praeg's new table (1986). As well, SID itself was found to have circa 30 positional and other errors and others were found in the tables of King et al. (1986) and Durling et al. (1987). Lists of the errors found were passed to Steve Hart of the AGC Sample Repository staff to allow him to assess the findings and to alter SID once satisfied, Gordon Fader was made aware of any errors noted in the drillholes of the tables in King et al. (1986) and in Durling et al. (1987).

In constructing the Enclosure 6 index map to bottom samples, it was initially presumed that one could just copy the map of Praeg (1986) and build on it. A 1:350,000 plot was then obtained from the SID data base and we presumed that with Praeg's map overlaid the new samples would be evident and easily added to the map i.e. the new 1986

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* Note added in proof: These core sheets for all 3160 cores (less any hydrocarbon gas data) now reside at AGC (Iris Hardy, personal communication, 1987).

DATABASE AVAILABLE FOR THE COMPILATION (CONTINUED)

Bottom Sampling Data (continued)

sample data from cruises such as HUDSON 86-017. Such was not the case. The exercise was carried out, but enough discrepencies were apparent that each cruise had to be seperated and all samples checked. Revisions to Praeg's map and to the SID data base had to be made to arrive at Enclosure 6; these took a great deal of time to do carefully.

Figure 38 included here is a reduced copy of a plot of all bottom samples obtained from the SID data base. This plot shows none of the sample points for which AGC does not hold an actual physical sample in its inventory. As a result, none of Slatt's 125 Pan Am top-of-core samples from the 1969 program, none of the Geocon cores, none of Mobil's 1983 D/V PHOLAS boreholes or their 1981 Geonautics/d'Appolonia cores and grabs or their 1980 transect samples show. Similarly, the Pan Am/Imperial coreholes of 1965 and the Amoco boreholes of 1971 do not show. Nor do the 1972 RITA MAXWELL samples in Conception Bay or those she took in Placentia Bay in 1973, 1974 and 1975 for Roger Slatt and Charles Stehman respectively. Certain other NICOS cruise samples also do not show on the map generated from the SID digital inventory again because SID has no provision for a file unless AGC also holds the sample. We also found the HUDSON 78-008 drill holes were missing in Geomarine (1984), in Praeg (1986) and in SID.

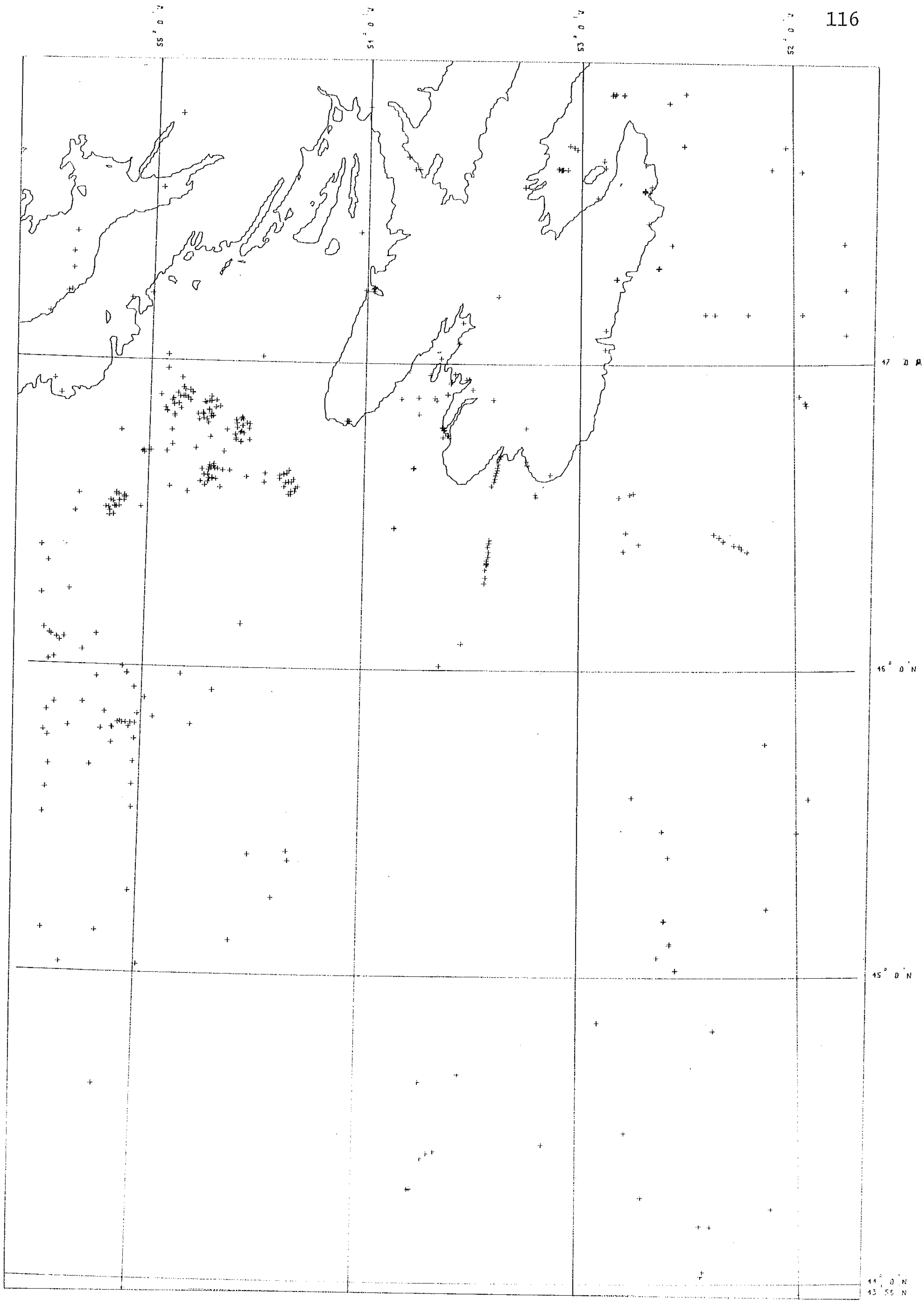
We would recommend that a parallel inventory file be developed in SID to allow the inventory to hold non-BIO/AGC bottom data and to allow this to be plotted and manipulated.

We would also recommend that SID plotting routines be developed that would allow a composite map to be drawn of several cruises' samples in a study area (which can now be done) but would also code the plotted symbol with a unique number that can be directly related to a printed out full SID entry for the sample. Our experience over the past year has been that SID is not yet quite to the stage of producing camera or report-ready index maps or printouts that are on 8.5 x 11 in paper. Appendix 17 is the current mid-1987 printout from SID for the project area. In certain cases, the printout was manually set up to reformat it to fit on 8.5 x 11 in paper for the Appendix.

While the long table in Appendix 16 and the index map of Enclosure 6 are quite complete and positively show the results of the many hours of our labour, the job is not yet quite done. One should attempt to retrieve data from at least two NICOS cruises and several CHS cruises. The ten DAWSON 82-013 samples should be recoverable via Professor Hugh Miller or NICOS. DAWSON 82-012 may also have bottom sampling data in the project area; DAWSON 85-022A does have data in Fortune Bay; both should be recovered from NICOS via Dick Haedrich.

FIGURE 38

COMPUTER PLOT OF ALL AGC SAMPLES FILED IN THE SID COMPUTER INVENTORY OF BOTTOM SAMPLE DATA IN THE PROJECT AREA. THE SAMPLES AND CAMERA STATIONS SHOW AS VERY SMALL + SIGNS OFFSHORE. THE SID FILE DOES NOT HOLD ANY OF THE NON-BIO-GATHERED SAMPLES UNLESS AN ACTUAL SAMPLE IS HELD BY AGC; THERE IS AT PRESENT NO PROVISION FOR LISTING POSITION AND TEXTURAL ANALYSIS DATA UNLESS AN ACTUAL SAMPLE IS ALSO IN THE INVENTORY. THE SAMPLE NET ON ENCLOSURE 6 IS A MUCH MORE ACCURATE PORTRAYAL OF THE FULL SAMPLE SUITE AVAILABLE.



55° 0' W
54° 0' W
53° 0' W
52° 0' W
46° 0' N
45° 0' N
13 55 N

DATABASE AVAILABLE FOR THE COMPILATION (CONTINUED)

Bottom Sampling Data (continued)

Doug Loring may be able to recover the positional and other data from the SACKVILLE S-58 cruise in the project area in 1961 (Loring 1962a,b). If Amoco Petroleum has supplied the additional data on the 1969 THERON piston cores, then these data should be entered into SID. Jim Swift also thought that Amoco's research centre in Oklahoma might still hold some of the 1969 samples and an effort should be made to recover these - especially those that might be from the Tail of the Bank Mud.

The 19 Field Sheets from the 1957, 1958, 1959 and 1960 KAPUSKASING cruises in the area should be found and the positions of the noted samples digitized from the sheets and these positions plus the noted visual descriptions entered into the data base. In the case of BAFFIN 63-006, 66-008 and 67-014 the Miscellaneous Sounding Notes should be located and the sample's calculated positions entered into the data base along with the visual descriptions, depths, times, etc.

The 1967 CAMERON sample data may be more difficult to run down; no effort has been made to date; the log book has not been recovered from the Public Archives of Canada. There are also 12 samples from BAFFIN 71-017 that should be positioned from the Miscellaneous Notes in the CHS file. If the Miscellaneous Notes from the above 4 BAFFIN cruises cannot be found, then positions of the samples should be digitized from the field sheets and the visual descriptions entered as noted on the field sheets. The Miscellaneous Notes from KAPUSKASING 72-014 on St. Mary's and Trepassey Bays have been recovered and a copy rests in the cruise report file for the project area; Iris Hardy of the data section was also given a copy. The KAPUSKASING 72-014 sample positions should be converted to geographic coordinates and the visual description data along with the depths, times, etc. should be entered into the data base.

While the exercise of recovering the CHS sample data, CAMERON data or early SACKVILLE data may appear onerous in the apparent absence of archived samples, it should be remembered that once done for any particular CHS cruise or vessel the data will probably serve several future compilations of surficial geology sheets similar to the present project area. It would be our recommendation that CHS standing orders be altered in the future to ensure, that after each CHS cruise where bottom samples have been collected, CHS submits to the AGC/GSC a fieldsheet with the samples plotted, a listing of the geographic coordinates, depths, etc., documentation sheets and the samples themselves.

COMPILATION PROCEDURES

Dan Praeg (1986) had prepared a fairly complete vessel track map of the available BIO cruises. To this we added the 1981 Mobil Oil Canada Ltd. survey south of Trepassey Bay (Enclosure 7) and certain other portions of cruises which were found to be missing once the AGC data base was accessed to produce the bases for Enclosures 8, 9, 10 and 11 showing sidescan, Huntec, airgun and sparker and 3.5 kHz data respectively. Enclosure 7 is believed to be complete to the end of 1986.

Two maps were built by first using the data from those cruises which had both sidescan sonar data and Huntec deep-towed boomer (or sparker) profiler data (Enclosures 8 and 9); only rarely did we use the available airgun, sparker or 3.5 kHz data. There were some lines along which only sidescan or only Huntec data were available. These lines were used as secondary sources once the basic maps had taken shape.

Finally, in Trinity Bay, after some searching the AGC 3.5 kHz and Eggerton sparker data were located via Susan Merchant in the data section and integrated with the bathymetry map in the area (Enclosure 4) to produce the interpretation seen on Enclosure 1. Similarly, the maps of sediment texture of Roger Slatt (1974c) in Conception Bay (Figures 9, 10 and 11) were integrated with HUDSON 80-010 and the detailed bathymetry (Figure 8) contours to produce an interpretation for Conception Bay. Northern Placentia Bay had a similar sediment texture map (Figure 14) of Charles Stehman (1976) but no available seismic profiling data and the textural data combined with the bathymetric data (Figure 12) gave the interpretation of Enclosure 1. In St. Mary's Bay, Mobil's interpreted surficial geology map from their Geonautics/d'Appolonia (1982) survey (Figure 30) was compared to our own interpretation and to the available bathymetry (Enclosure 4) to produce the final interpretation of Enclosure 1.

In working with the sidescan - Huntec data initially, each linear series of tracks or adjacent series of tracks was interpreted as a package on a seperate piece of plastic overlay. Thus, any particular cruise across the area may be found on two or three overlays. Earlier work by Gordon Fader and Bob Miller of AGC had produced two such overlays for Placentia Bay for the HUDSON 78-012 and the HUDSON 79-011 cruises. These two overlays were compared and integrated as part of this project.

As each cruise was completed, the interpreted overlays were transferred to a large, full-sized, overlay map that was to become the Seabed Features map of Enclosure 2.

COMPILATION PROCEDURES (CONTINUED)

Similarly, a paper copy of this map was maintained with the interpreted surficial formations coloured. The final Surficial Geology Map was then made by overlaying the coloured map on the bathymetry map in metres (Enclosure 4) and drawing geological boundaries. Reference was made in this process to Burns (1987) thesis covering Whale Deep(s), to Fader et al's. (1982, 1984) map of St. Pierre Bank and a portion of Fortune Bay immediately along the western margin and to the earlier-interpreted, cruise-by-cruise strips; only occasionally were the sample data integrated.

In problem areas, the original sidescan and Huntec data were again referred to. Over all, the detailed bathymetry of the compiled Natural Resource Maps (Enclosure 4) was used as a guide to the geological boundaries.

When all the cruises were interpreted and placed on the Seabed Features Map (Enclosure 2), the near-complete Enclosure 2 was laid over the various index maps to tracks to see which cruises may have been missed. This resulted in a last-moment recovery of data from cruises 78-023, 81-045, 83-014, 80-010 (in Conception Bay) and 80-030 (in Trinity Bay). The only sidescan or Huntec data we knowingly were unable to find are the two C-CORE lines along the "northern" and "southern" proposed pipeline routes (Figure 27) and a line of NSRF V-fin and sidescan in northern Halibut Channel reported by Piper (1984) on the DAWSON 84-003 cruise.

All geological boundaries are shown as dashed lines indicating that they are approximate in their location. While the identification of the surficial geological formations recognized is really quite precise, the resolution of the seismic tools involved does not let one precisely say when the thickness of a formation reaches zero. Often the choices become somewhat arbitrary.

This is especially so in Trinity Bay where only 3.5 kHz and sparker data are available from cruise 80-030 (incidentally, these two sets of data rolls which are archived with the AGC data section are mislabled and the data types are reversed). The 3.5 kHz profiler data was of a low quality (at least was quite noisy) and it was not clear from either the sparker or 3.5 kHz profiles where one might draw the boundary between Placentia Clay and Downing Silt. The choice was made quite arbitrarily on the basis of the slope of the surface of the sea floor with the boundary being drawn at the outer edge of the clearly flat-lying (ponded?) transparent sediment. Catherine Troke reports (personal communication, 1987) that her one core that is at the top of our map area (Enclosure 6) only sampled Holocene sediments and never reached into the Pleistocene (based on Carbon 13 and Nitrogen 15 measurements).

COMPILATION PROCEDURES (CONTINUED)

We found no Huntec data for Trinity Bay; we don't believe there is any and clearly some reconnaissance lines are needed here. However, DAWSON 86-026 did go into Trinity Bay and onto our map sheet, but NICOS and Hugh Miller, the chief scientist involved, have produced no cruise report as yet and no track plots of the survey lines exist at AGC as far as we know. The lack of NICOS cruise reports, track plots or even index maps has proved to be a frustration in this project. Were they available, then we would be able to show further seismic profile lines in Conception Bay, Fortune Bay, Trinity Bay and possibly elsewhere off the Avalon Peninsula; there also have been additional bottom samples gathered on DAWSON 82-013 in Conception Bay but again there is a total absence of information available from NICOS/Memorial University.

Interpretation of CHS Echograms and DAWSON 83-014 3.5 kHz data

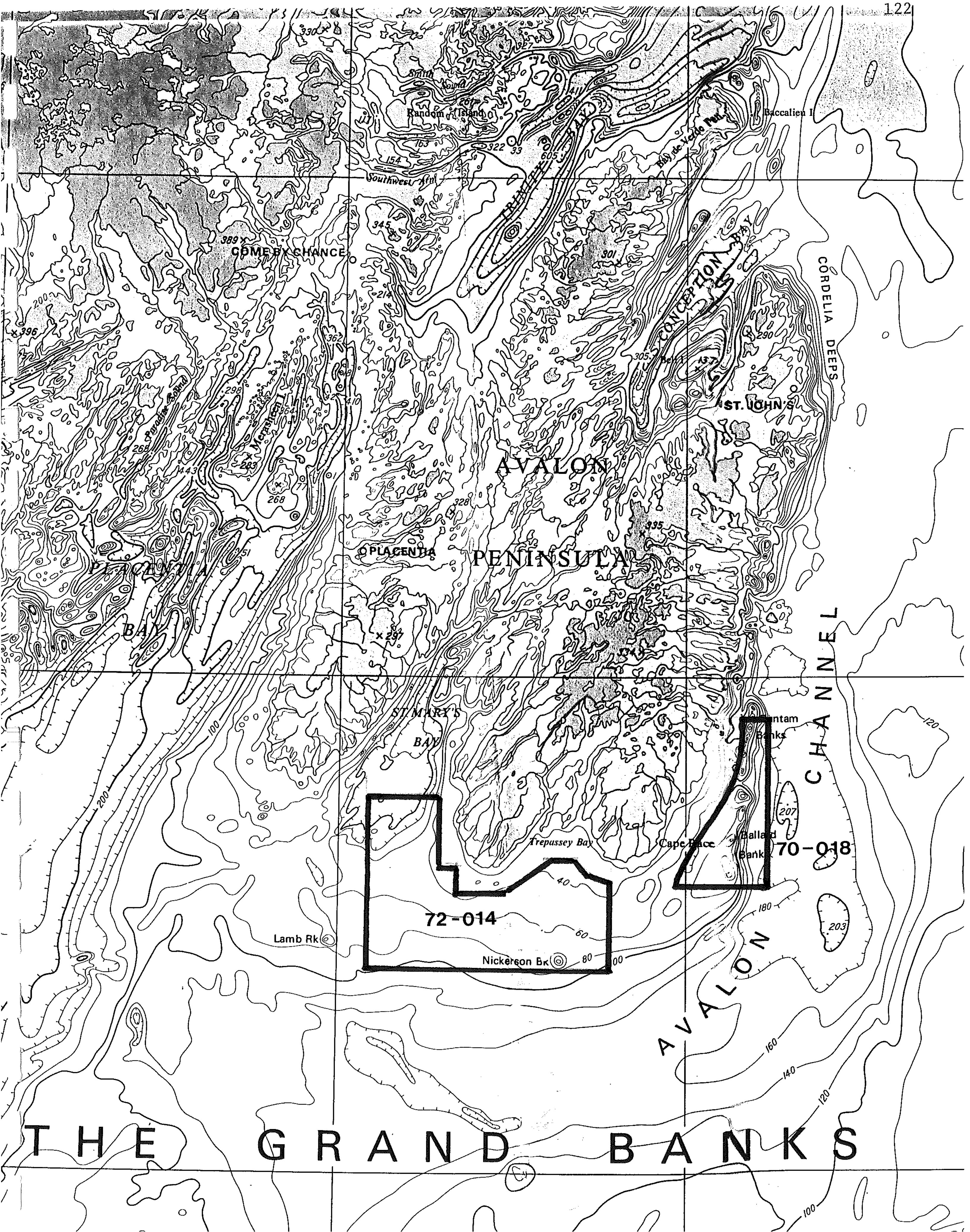
The two areas for which low frequency CHS echograms survive are from the KAPUSKASING 70-018 cruise on Ballard Bank and part of Bantam Bank and the KAPUSKASING 72-014 cruise in the Trepassey Bay approaches and in southeastern St. Mary's Bay (Figure 39). The data from cruise 70-018 on Ballard-Bantam Bank has been fully assessed in this contract; the data for 72-014 has only been partly addressed.

KAPUSKASING 70-018 was under the direction of Chief Hydrographer Dick D. LeLievve; the data was mapped onto field sheet 4280 at a scale of 1:50,000. Three "Boat Boards" or track and fix plots are available. One covers the main east-west survey lines over all of Ballard Bank; Boat Board #2 covers shorter east-west infill lines that cover just the shallower axial regions of Ballard and Bantam Banks along the easternmost drop into the Avalon Channel and the third covers north-south check lines. Our interpretation was done on the lines on Boat Board #2 and 'Shoal Boat Board 4280' and interpreted copies of these two are found in the project file drawer; the field sheets (showing the bottom samples) are found folded in the project file. This cruise has one other Field Sheet 4333 that shows an area of Green Bank; this field sheet and its sounding data were not used in this interpretation.

Each record along each line was examined and areas of obvious rugged outcrop were mapped in colour directly onto a paper copy of Boat Board #2 (Figure 40). As well, topographic lows (Figure 41) and marked 'shoulders' (Figure 42) reflecting probable bedrock control were mapped. This supposition is possibly confirmed by the consistent probable bedrock trends that emerge from the two shoulders and two lows mapped and found on Boat Board #2 (see original working sheet of

FIGURE 39

PORTION OF NATURAL RESOURCE MAP 801 AT A SCALE OF 1:1,000,000 SHOWING THE AREA COVERED BY THE KAPUSKASING'S 70-018 AND 72-014 CHS SURVEYS. THESE SURVEYS ARE THE ONLY CHS SURVEYS WHICH USED LOW FREQUENCY 12 kHz MS 26B ECHOSOUNDERS AND FOR WHICH THE DATA SURVIVES.



Random Island
Baccalieu I
Southwest Arm
TRINITY BAY
Bay de Verde Pen
COME BY CHANCE
CONCEPTION BAY
CORDELIA DEEPS
Bell I
ST. JOHN'S
Paradise Sound
Merasheen I
AVALON
PLACENTIA
PENINSULA
PLACENTIA BAY
ST. MARY'S BAY
Trepassey Bay
Cape Race
Ballard Bank
70-018
72-014
Lamb Rk
Nickerson Bk
AVALON CHANNEL
THE GRAND BANKS

FIGURE 40

WEST TO EAST PORTION OF THE KAPUSKASING 70-018 MS 26B ECHOSOUNDING RECORD FROM FIXES 83 TO 87 ACROSS THE MIDDLE OF BALLARD BANK. THREE PRONOUNCED PEAKS OF CAMBRO-ORDOVICIAN OUTCROP JUT THROUGH THE VENEER OF GRAND BANKS SAND AND GRAND TO THE WEST. THE AVALON CHANNEL WHICH IS FLOORED BY GRAND BANKS DRIFT IS TO THE EAST. THE FULL SCALE IS 0-120 FATHOMS. LINE 83-87 IS 4.0 KM LONG.

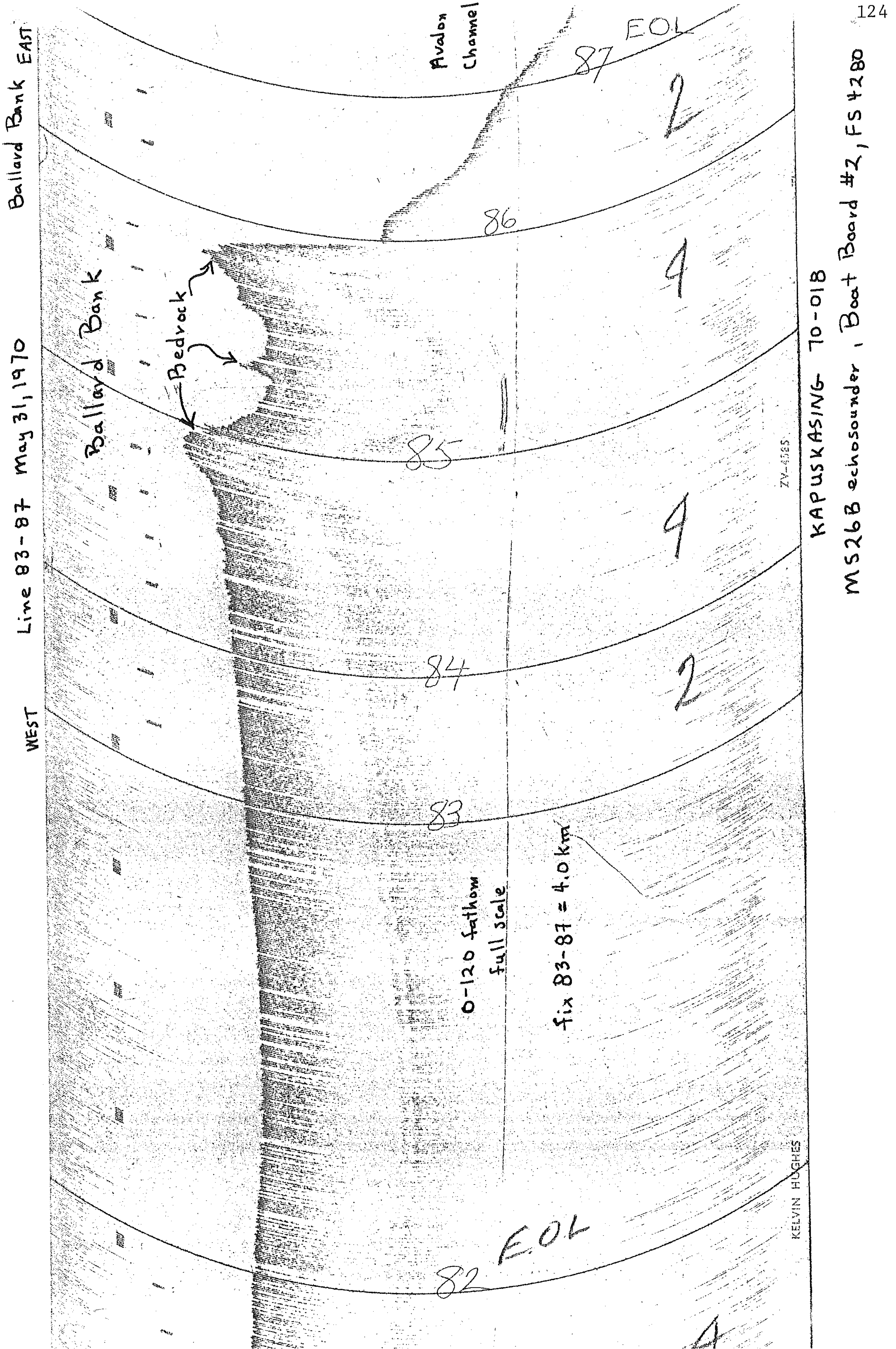
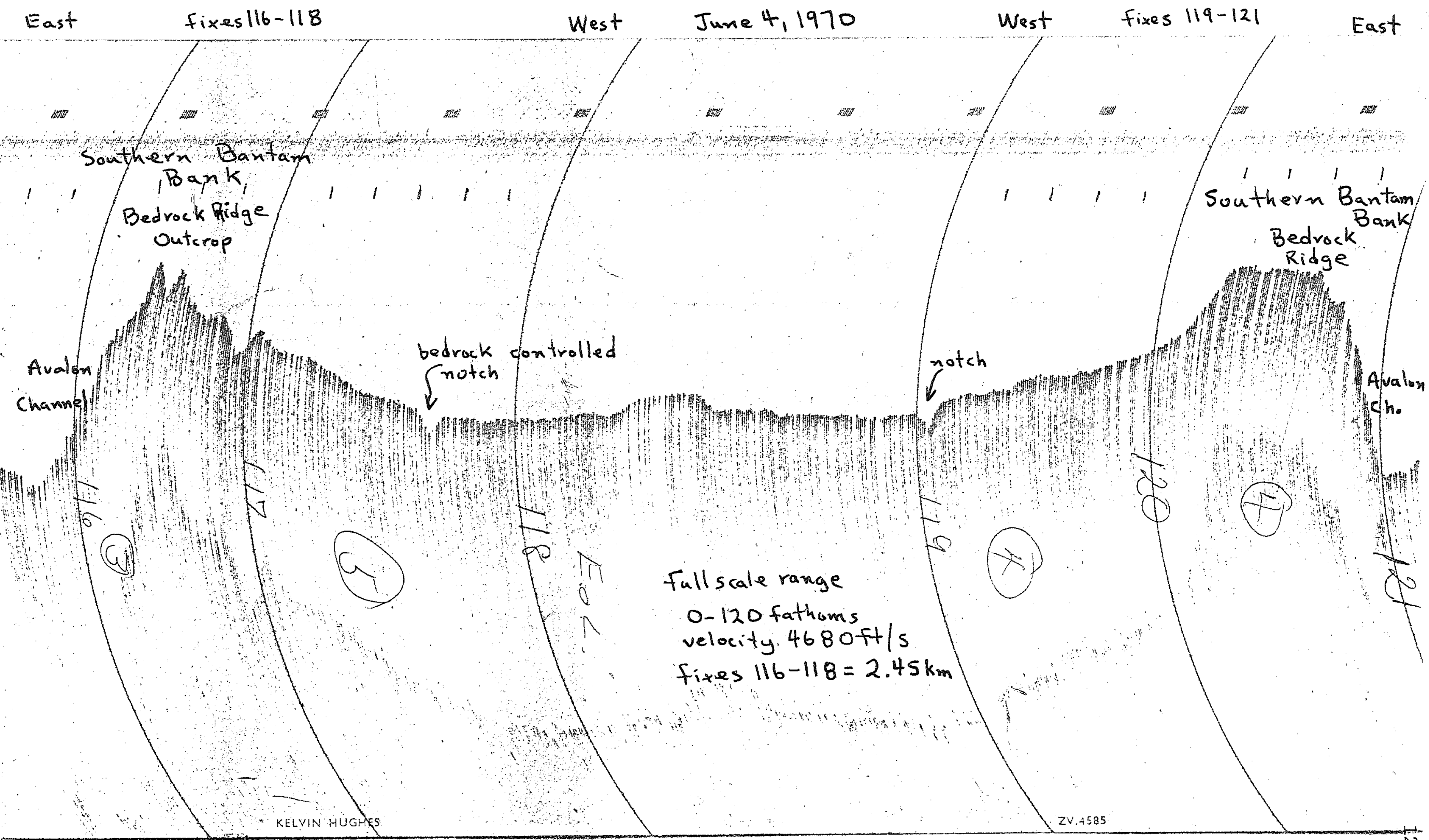

Ballard Bank EAST
Line 83-87 May 31, 1970
WEST
Ballard Bank
Bedrock
Avalon Channel
EOL
87
86
85
84
83
82
EOL
2
4
4
2
4
0-120 fathom full scale
fix 83-87 = 4.0 km
KAPUSKASING 70-018
MS26B echosounder, Boat Board #2, FS 4280
KELVIN HUGHES

FIGURE 41

THE EAST TO WEST, AND IMMEDIATELY ADJACENT TO THE SOUTH, THE WEST TO EAST, PORTIONS OF THE KAPUSKASING 70-018 MS 26B ECHOSOUNDING RECORD FROM FIXES 116 TO 118 AND 119 TO 121 RESPECTIVELY ACROSS THE SOUTHERN PART OF BANTAM BANK. THE DISTINCT NOTCHES WEST OF THE BEDROCK HIGH ARE BELIEVED TO REFLECT BEDROCK CONTROL IN AN AREA PROBABLY COVERED WITH A VERY THIN VENEER OF LAG GRAND BANKS SAND AND GRAVEL. THE FULL SCALE IS 0-120 FATHOMS. LINE 116-118 IS 2.45 KM LONG.



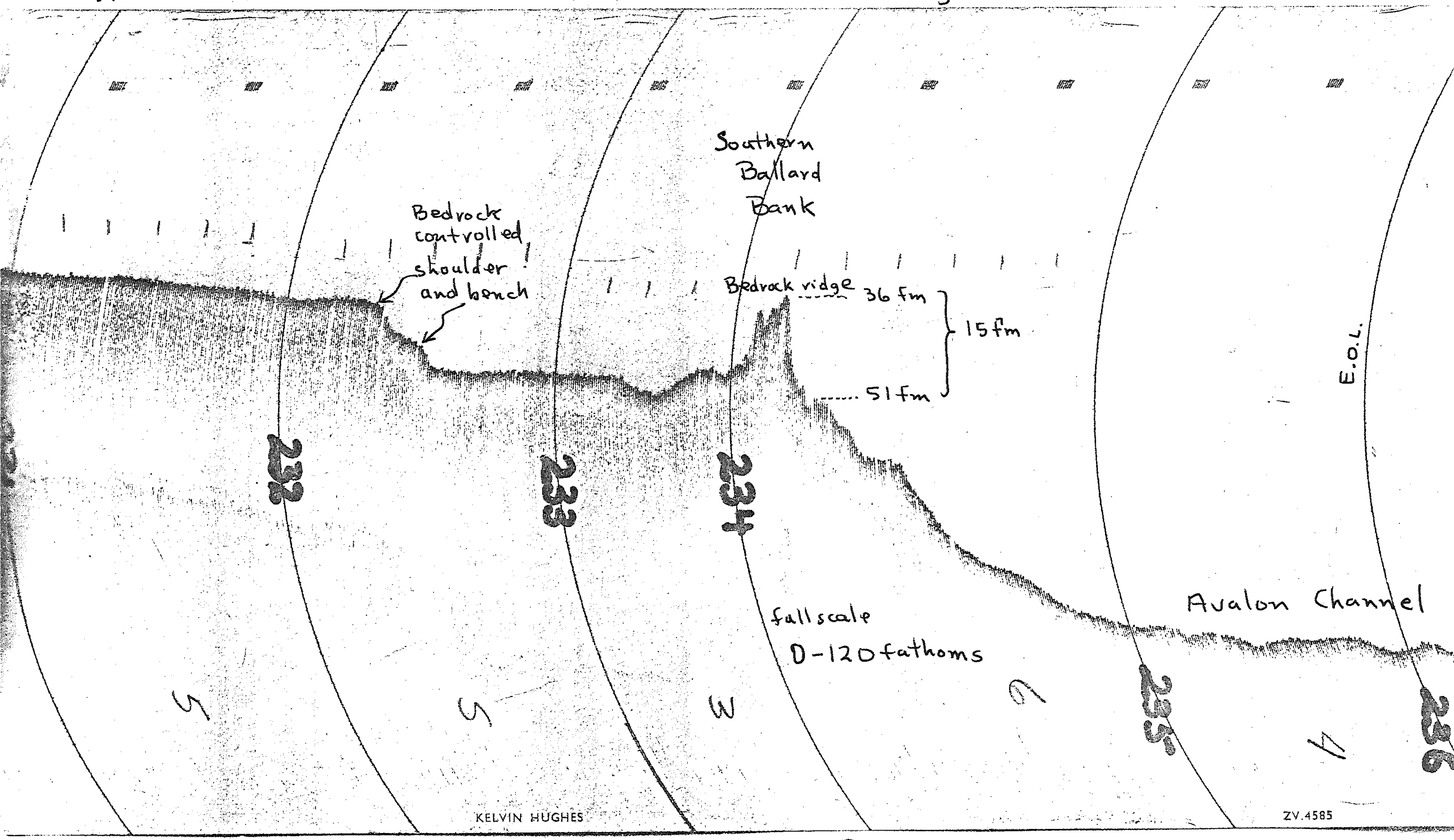
KAPUSKASING 70-018

MS 26B echosounder, Boat Board #2, FS4280

FIGURE 42

WEST TO EAST PORTION OF THE KAPUSKASING 70-018 MS 26B ECHOSOUNDER RECORD FROM FIXES 231 TO 236 ACROSS THE SOUTHERN PORTION OF BALLARD BANK. BEDROCK CLEARLY OUTCROPS ALONG THE AXIS OF BALLARD BANK TO THE EAST OF FIX 234. THE TOPOGRAPHIC LOW TO THE WEST AND THE TWO SHOULDERS MARKING THE LOW'S WESTERN MARGIN ARE BELIEVED TO BE BEDROCK CONTROLLED. THE SHOULDERS OR BENCHES ON 3 TO 6 ADJACENT LINES YIELD BEDROCK STRIKES OF 041° AND 043°.

WEST Fixes 231-236 May 30, 1970 EAST



KAPUSKASING 70-018

MS 26B echosounder, Boat Board #2, F.S. 4280

COMPILATION PROCEDURES (CONTINUED)

Interpretation of CHS Echograms and DAWSON 83-014 3.5 kHz data (continued)

Boat Board #2 in the project file drawer at AGC). The two shoulders on the south suggest a bedrock strike of 041° to 043°. In the centre and north of Ballard Bank and on southern Bantam Bank bedrock strikes of 030° or 035° are suggested; in another spot, a ridge of outcrop highs suggests a strike of 028°.

The MS 26B echosounder only shows one very small area of penetration about 12.5 km west of the axis of the southern part of Ballard Bank at latitude 46° 34'N. This probable Holocene mud patch in a local topographic low is only 2 km long and 500 m wide on a NNE-SSW trend; it was considered almost too small for the regional map of Enclosure 1 but has been added to the map. This local low appears on the bathymetry map of Enclosure 4 as a long linear, NNE-SSW trending reentrant of the 80 m contour and this low may well contain a larger area of Holocene mud, but we have no data to confirm this and only the mud patch shown is presently interpreted. The outcrop area, and clearly bedrock-controlled part of Ballard-Bantam Banks, were shown on Enclosure 1 as an area of Cambro-Ordovician outcrop.

The KAPUSKASING 72-014 survey in Trepassey Bay and south-eastern St. Mary's Bay was under the direction of E.J. Comeau as chief hydrographer. The data was mapped onto Field Sheets 4390 (western sheet-southeast St. Mary's Bay) and 4391 (eastern sheet - Trepassey Bay approaches) at a scale of 1:50,000. The Boat Boards and MS 26B 12 kHz echosounder data were located via CHS technical records at BIO. These remain in Gordon Fader's office at AGC.

Unfortunately, interpretation of the records began on Field Sheet 4391 off Trepassey Bay. Only about one-fifth of the westernmost lines on that Boat Board (23 lines) were completed before time ran out on the project. The lines on FS 4390 have not been done.

There was no penetration on any of the 23 lines examined and all the area mapped is probably best mapped as Grand Banks Sand and Gravel. We would expect the northwesternmost corner of the KAPUS-KASING 72-014 echosounder data in St. Mary's Bay will show quite reasonable penetration below about 100 m (Figure 39) and these data will assist in the refinement of the placement of the geological boundaries around the Placentia Clay and Downing Silt formations. As it is, the boundaries drawn on Enclosure 1 have been drawn without the benefit of the MS 26B echosounder data. These data should be integrated.

COMPILATION PROCEDURES (CONTINUED)

Interpretation of CHS Echograms and DAWSON 83-014 3.5 kHz data (continued)

As well, in the area of St. Mary's Bay - Trepassey Bay, there is a 3.5 kHz data set from the DAWSON 83-014 cruise (Enclosure 11). These data have not been examined and will also assist in mapping the glaciomarine formations of St. Mary's Bay. Enclosure 7 does not show the full set of the detailed 3.5 kHz lines, but rather only shows the limit of the 3.5 kHz lines; Enclosure 11 shows all the DAWSON 83-014 3.5 kHz profiler lines available.

The mapping of the surficial formations resulted in the surficial geological map of Enclosure 1 and the Seabed Features map of Enclosure 2. A coloured Surficial Geology Map is also supplied on mylar. This coloured version of the Surficial Geology Map is actually not on Enclosure 1, but rather was made on an earlier version of Enclosure 2 with the geological boundaries identical to Enclosure 1 added; this occurred because of the timing of drafting and the final October 16, 1987 deadline and will make no difference to its use and interpretation.

SURFICIAL FORMATIONS

King and Fader (1986) in their major review of the Wisconsinan glaciation of the continental shelf reviewed the five surficial formations which they initially acoustically recognised and mapped on the Scotian Shelf using low-frequency echosounders, airguns and Huntec profilers. These same formations were used by Fader _et al_. (1982; 1984) on St. Pierre Bank with one name change. Fader _et al_. (1986) issued the Geonautics compilation of the Hibernia area to Open File and completely revised the Scotian Shelf names to names specific to the Grand Banks. The new names first appeared in Fader and Miller (1986a). This report uses the revised names plus two other formation names, one of which (Tail of the Bank Mud) was introduced by Fader and Miller in 1986 (1986a;b).

The brief description of the formations below is taken mainly from King and Fader (1986) and Fader _et al_. (1982; 1984). The main formations are the Grand Banks Drift, the Downing Silt, the Adolphus Sand, the Placentia Clay and the Grand Banks Sand and Gravel; these formations are glacial till, proglacial silt, sublittoral sand, recent mud and time-equivalent, basal, transgressive sand and gravel. The two less-widespread formations are both Recent in age and are known as the Halibut Mud and the Tail of the Bank (sandy) Mud.

SURFICIAL FORMATIONS (CONTINUED)

Fader and Miller (1986a) reviewed their current estimates of the low stand of sea level (p. 604):

> In the Hibernia area of Grand Bank, the depth of the low sea level stand occurred at approximately 100 m (Fader *et al.*, 1986). It is difficult to define precisely the minimum sea level position because of the low gradients of the shelf in this area. In the Avalon Channel area and western Placentia Bay we interpret the low sea level stand at 90 m (Fader *et al.*, 1982). This differential warping may result from the presence of late glacial ice on the adjacent land areas which delayed the rebound of the nearshore zone.

We have generally used 100 m as the depth of the low stand in the south and 90 m in the area of Placentia Bay and Avalon Channel in this report.

Grand Banks Drift (Scotia Shelf Drift equivalent)

The base of the surficial succession, where present, is formed by glacial drift (or till) laid down directly by glacial ice. The glacial till can occur as a thin, at times discontinuous, blanket of ground moraine, as infillings in old subaerial or subice channels eroded into bedrock or till can occur as thick morainal ridges.

The till is poorly sorted with varying amounts of sand, silt, clay and pebbles, cobbles or boulders. The coarse rock fragments in the till which have not been subjected to a transgressive beach zone are subrounded to angular. Photos of the seafloor comprised of an exposed till surface show many boulders and cobbles embedded in a sandy muddy matrix.

At times, floating ice sheets may have laid down till while in contact with the seafloor around the edges of basins (such as Placentia Bay). This can lead to the interfingering of the till with the deeper water Emerald Silt Formation. These wedge-like, linear "till tongues" may be found around the periphery of a basin and are believed to mark the grounded edges of a floating ice shelf.

The till is often acoustically opaque to the lower power seismic profiling tools. One must increase the power (and decrease the resolution) by moving to small airguns or sparkers. Till does not show coherent internal reflections and its surface may be rough and undulating.

Till is found in the project area along the Avalon (marginal) Channel and to the east towards Downing Basin and Virgin Rocks and the

SURFICIAL FORMATIONS (CONTINUED)

Grand Banks Drift (Scotian Shelf Drift equivalent)(continued)

Eastern Shoal. The till was interpreted to follow the axis of the Avalon Channel to the south and west to where it grades into the Adolphus Sand south of Trepassey Bay (Enclosure 1).

Similarly, till was interpreted by Fader et al. (1982; 1984) south of the Burin Peninsula in the St. Pierre (marginal) Channel and the Burin Moraine was identified (Enclosure 1). This till has been continued northward on Enclosure 1 along the western side of Placentia Bay to where it is terminated somewhat arbitrarily at about 47°10'N.

There are no acoustic data north of 47° 02'N in Placentia Bay. In the northern part of Placentia Bay, we generally accepted Charles Stehman's (1976) designation of 'amodal' till (Figure 14) in the absence of acoustic profiling data; Stehman has a few 12 kHz profiles, but these were not available for inspection.

In Conception Bay, we had one line of Huntec data available and partly on the basis of this line and using Slatt's (1974b) facies diagram (Figures 10 and 11), we initially designated till northeast of Bell Island than changed our mind to call all the non-silt or clay areas Adolphus Sand (or Grand Banks Sand and Gravel shallower than about 90 m water depth). The 'contact' between Grand Banks Drift and Adolphus Sand north of Cape St. Francis is purely arbitrary and should be subject to further assessment.

Two patches of Grand Banks Drift were interpreted to show through on the axies of Halibut and Haddock Channels towards their southern ends (Enclosure 1). The interpretation of till at the mouth of Haddock Channel was made on pretty poor data and may be a somewhat arbitrary choice that will change with better survey data.

Piper (1984) in his cruise report on DAWSON 84-003 gave the 'preliminary scientific interpretation' that the "outer Halibut Channel is floored with extensive till with few surface features", and notes that "the occurrence of grounded till at 500 m off Halibut Channel points to very thick Wisconsinan ice flowing south from Newfoundland". Piper based these conclusions on NSRF V-fin profiler data and sidescan sonar data. These data have not been examined in this project. Piper's interpretation is in agreement with the Grand Banks Drift we interpreted just south of the mouth of Halibut Channel (Enclosure 1). Piper's interpretation was noted at the mouth of Halibut Channel on Enclosure 1 in the area of the DAWSON 84-003 profiler-sidescan lines.

SURFICIAL FORMATIONS (CONTINUED)

Grand Banks Drift (Scotian Shelf Drift equivalent)(continued)

No till was interpreted to outcrop on Whale Bank or in Whale Deep(s). No till was seen on the banks south of 45°N. The till may have local patches of Adolphus Sand developed on it which are too small to map. This is probably the case south of the Avalon Peninsula on the 1981 Mobil Oil survey lines.

Downing Silt (Emerald Silt equivalent)

The Downing Silt is a proglacial silt that overlies the glacial till and can in places interfinger with the till as till tongues around the margins of the basins. The Emerald Silt is a well-stratified, easily-profiled sequence. The reflections are continuous, coherent, smooth and parallel and are closely spaced, often only 0.3 m apart. While particular reflectors may be weaker or stronger, they are laterally consistent over large distances of 10s of kilometres despite changes in depth of occurrence. King and Fader (1986) distinguish between Facies A, B and C on the Scotian Shelf; we have not studied these facies in this report. The reflectors in the Downing Silt often parallel the underlying morphology of the till surface.

King and Fader (1986) interpret the Emerald Silt on the Scotian Shelf, and by inference therefore interpret the Downing Silt on the Newfoundland Shelf, to have been deposited from a floating iceshelf in front of a grounded ice sheet. Thus, the closely-spaced, near-basin-wide reflectors are a record of slight changes in melt rate, oceanographic changes, ice advances or still stands. The banding may even reflect seasonal changes much like varves found in onshore sequences have been interpreted to reflect daily melt/sedimentation cycles in proglacial lakes.

The Downing Silt is easily identified on a Huntec or NSRF deep-towed reflection profiles, but is much less identifiable on airgun or sparker/boomer profiles with their lowered resolution. The overlying Placentia Clay is acoustically transparent and shows none of the closely-spaced stratification seen in the Downing Silt.

The Downing Silt was mapped by Fader et al. (1982; 1984) in Fortune Bay and has been mapped by this project in Placentia Bay confirming earlier inhouse work by the marine geologists at AGC. Again, Stehman's (1976) facies maps were used in northern Placentia Bay to interpret Downing Silt to flank the Eastern and Western Channels (Enclosure 1). The Central Channel was interpreted to be Downing

SURFICIAL FORMATIONS (CONTINUED)

Downing Silt (Emerald Silt equivalent)(continued)

Silt rather than Placentia Clay based only on Stehman's (1976) sedimentary facies map. Northern Placentia Bay could profit from some traversing with a Huntec or NSRF deep-towed profiler to resolve the formations as presently mapped on Enclosure 1.

The one line of HUDSON 80-010 Huntec data allowed the stratified sequences of Downing Silt to be identified in Conception Bay then to be interpreted throughout the Bay on the basis of bathymetry and using Slatt's (1974b) sedimentary facies map (Enclosure 1). In Trinity Bay Downing Silt versus Placentia Clay could not be distinguished on the basis of the noisy 3.5 kHz and low-frequency sparker line available; the division was made on the basis of the slope of the bottom with the assumption that the 'ponded' Placentia Clay would have an absolutely horizontal water-sediment interface (Enclosure 1).

In St. Mary's Bay, there was one line of data stretching into the southern part of the Bay (Enclosure 7). The time available did not permit the available DAWSON 83-014 lines of 3.5 kHz profiler or the KAPUSKASING 72-014 lines of 12 kHz echosounder data to be used in St. Mary's Bay. Instead, the interpretation was extended north from the one line of 1981 Mobil data using the detailed bathymetry of Enclosure 4. The 3.5 and 12 kHz data should be integrated with the bathymetry to refine the mapping of the Downing Silt and Placentia Clay in this area on Enclosure 1.

Downing Silt was also mapped in the various arms of Whale Deep(s). Where acoustic data were lacking, the correlation between lines were done on the basis of bathymetry (Enclosure 1). It was also in the area of Whale Deep(s) where we were most consistently able to interpret an area of Downing Silt overlain by Grand Banks Sand and Gravel; there is one other area south of St. Mary's Bay. These areas are shown on Enclosure 1 and were shaded on the coloured mylar map to show a darker shade of the yellow used for the Grand Banks Sand and Gravel.

Adolphus Sand (Sambro Sand equivalent)

The Adolphus Sand is a sand that has formed sublittorally below the maximum extent of the marine terrace at circa 100 m on the outer Grand Banks and at circa 90 m on the inner shelf versus 115-120 m on the Scotian Shelf (Fader _et al_. 1982; 1984). The Adolphus Sand was not formed at the shoreline, but rather below the Pleistocene shoreline that was once at about 90 to 100 m in the project area.

SURFICIAL FORMATIONS (CONTINUED)

ADOLPHUS SAND

~~Downing Silt (Emerald Silt equivalent)(continued)~~

The formation represents sublittoral modification of till and Downing Silt. It is a sand formation containing some silt- to clay-sized particles and some gravel. Fader et al. (1982; 1984) distinguished between Adolphus Sand with less than 10% gravel, and more than 10% gravel, on the map sheet to the west. This may be possible as well in the project area once the sample grainsize data are fully available and integrated. The Adolphus Sand samples can be distinguished from Grand Banks Sand and Gravel samples because the latter has had all the silt and clay fraction winnowed out by having passed through an active, open-ocean, beach zone.

Acoustically the Adolphus Sand is identified as a quite thin veneer overlying the Grand Banks Drift or Emerald Silt. Often it is very thin and samples or reflectivity measurements from a Huntec profiler are needed to identify it. Generally the boundary between the Adolphus Sand and the Grand Banks Sand and Gravel occurs at the level of the marine terrace at about the 90-100 m contour except south and east of the Burin Peninsula (Fader et al., 1982; 1984).

In the map area the Adolphus Sand generally fringes the bank and certain nearshore bays. It is interpreted to floor much of Halibut and Haddock Channels and the Avalon Channel south of the Avalon Peninsula. It flanks the till on the north along the northern side of the St. Pierre Channel and is interpreted to extend into northern Placentia Bay. Some of the areas of Adolphus Sand in Trinity Bay, Conception Bay and northern Placentia Bay must be considered speculative at this time and deserve to be checked with Huntec or NSRF deep-towed profiler data (or against Memorial University data gathered from 1982 to 1986 if one can even locate it or its track plots!). Likewise the presently-interpreted lack of Adolphus Sand in St. Mary's Bay may fall by the wayside once the grainsize data from samples or the 12 and 3.5 kHz data can be integrated.

Adolphus Sand is also interpreted to be present in the two main sections of Whale Deep(s). Whale Deep(s) could well profit from a rectalinear grid of closely-spaced seismic lines to fully detail their geology.

Placentia Clay (LaHave Clay equivalent)

The Placentia Clay and the Grand Banks Sand and Gravel are time equivalent formations. The Placentia Clay was laid down in the deep basins as a winnowed pelagic mud the Grand Banks Sand and Gravel was formed at the shoreline by a transgressing active, open-ocean,

SURFICIAL FORMATIONS (CONTINUED)

Adolphus Sand (Sambro Sand equivalent)(continued)

beach. It is believed by Fader and King (1986) that the rising sea-levels over the past 14,000 - 15,000 years carried the active beach zone from 90-100 m below present sealevel and transgressed the beach zone all across the shelf to the present shoreline seen all around the Avalon Peninsula, Placentia Bay and the Burin Peninsula. During the transgression all the silt and clay fractions have been removed leaving behind the formation which is now called the Grand Banks Sand and Gravel.

The fines were all moved basinward and have rained down as a pelagic silty-clay sequence that can have 62% clay, 30% silt and 8% sand-sized particles. The Placentia Clay is acoustically transparent to seismic profilers, seldom has any coherent reflections in it and is generally flat on its upper surface. It can be mapped on 12 kHz echograms where available. Its acoustic transparency allows it to be consistently identified and distinguished from the underlying Downing Silt.

The surface of the Placentia Clay can form pockmarks and in Placentia Bay shows ovoid scour depressions that may be related to the megaflute formation process. The Placentia Clay tends to have an increased coarser fraction in the deep bays that incise the south coast of Newfoundland, adjacent to the moraines, and near the marine limit when compared to the type section of the LaHave Clay in the open-ocean LaHave and Emerald Basins on the Scotian Slope.

Placentia Clay is found in all the deep, fjord-like, bays and in a large area of the deep part of Placentia Bay. We have interpreted the muds mapped by Charles Stehman (1976) in the Eastern and Western Channels of northern Placentia Bay (Figure 14) to also be Placentia Clay.

In northern St. Mary's Bay, Fortune Bay and in the isolated, very deep, portions of northwestern Fortune Bay called Belle Bay the extent of the Placentia Clay was essentially interpreted on the basis of the detailed bathymetry seen on Enclosure 4. In Conception Bay one line of HUDSON 80-010 data was used with the bathymetry and Slatt's (1974b) sedimentary facies map (Figures 10 and 11). In Trinity Bay the one line of 3.5 kHz and sparker data from DAWSON 80-030 were not sufficient to allow the Placentia Clay to be mapped conclusively. The part of the transparent section with an absolutely flat water-sediment interface was taken as the maximum extent of the Placentia Clay.

The deeper holes of Whale Deep(s) are interpreted to have Placentia Clay deposits. In the case of six of the very small basins this was done on the basis of bathymetry alone (as seen on Enclosure 4) without the benefit of seismic or sidescan sonar profiles.

SURFICIAL FORMATIONS (CONTINUED)

Grand Banks Sand and Gravel (Sable Island Sand and Gravel equivalent)

This formation is a basal transgressive formation formed in water depths less than 90-100 m above the marine terrace. The transgressive sand and gravel formation has had all the silt- and clay-sized fraction winnowed out by its passage through an open-ocean beach zone. In other areas the Grand Banks Sand and Gravel has been subdivided into areas of more than, and less than, 50% gravel; the fine fraction (silt and clay) is absent.

In many places the formation is essentially a lag deposit left as the beach zone passed through; it is in this lag one might expect to find certain economic zones of heavy minerals if they exist. In many places the rising sealevels have completely removed the till that once formed a thin veneer over bedrock. Often in the nearshore areas bedrock knobs and ridges stand out as outcrops sticking through the surficial lag. The morphology of the seafloor in these areas is mainly controlled by the underlying bedrock.

The Grand Banks Sand and Gravel is generally opaque to acoustic profiling but the formation shows up well on sidescan sonar profiles. The gravel and cobble clasts of the Grand Banks Sand and Gravel are generally well-rounded and well-sorted from being in an active beach zone. Calibration of the acoustic interpretation of this formation by sampling provides an important test especially near the 90-100 m marine terrace.

The formation is time-transgressive with that lying at 90-100 m being the oldest (14-15,000 years BP) and the youngest being at the present day beaches along the Avalon and Burin coastlines. The formation is a time-equivalent to the Placentia Clay; the silty-clay formation having been dependent upon the trasgression to generate further winnowed silty-clay for transport to the deeper basins.

The Grand Banks Sand and Gravel is found everywhere in the project area flanking the coastline out to 90-100 m. The formation also blankets the shallowest and transgressed portions of the outer banks; St. Pierre Bank, Green Bank; Whale Bank and Western Grand Bank. While the edges of Fortune Bay have not had the Grand Banks Sand and Gravel formation specifically mapped one may presume it is present above 90-100 m and some approximate boundaries were added to Enclosure 1.

SURFICIAL FORMATIONS (CONTINUED)

Grand Banks Sand and Gravel (Sable Island Sand and Gravel equivalent)(continued)

The Grand Banks Sand and Gravel formation is also shown on Enclosure 1 as linking Green Bank to the Avalon Peninsula across the westernmost end of the Avalon Channel. The morphology in this region suggests that the eastern margin of Halibut Channel has been built up possibly by a large lateral moraine thus partly blocking the axial low of the Avalon Channel. The Grand Banks Sand and Gravel thus developed in this area when sealevel transgressed and reworked, not a till or Downing Silt, but rather a lateral moraine.

We would propose the name 'Comus Ridge' for this topographic ridge joining Green Bank to the Avalon Platform named after the HMS COMUS which foundered in St. Shotts bight on October 24, 1816 and which was again seen on the floor of St. Shotts harbour during the withdrawal of the tsunami of June 27, 1864. Thus if the examination of the subsurface data were to confirm the suggestion of a lateral moraine the moraine logically could be desginated the Comus (Lateral) Moraine. There also is at least a morphological hint of an equivalent feature on the opposite side of the northern Halibut Channel at the eastern end of St. Pierre Channel.

Tail of the Bank Mud

This formation is a time-equivalent to at least the uppermost part of the Placentia Clay and is believed to be Holocene in age. It was first named by Fader and Miller (1986a) on their Figure 62.6 and on pages 595 and 604 and again in their paper at the 3rd Marine Geotechnical Conference (1986b). They describe it as (p. 595), "A unique sediment section extending from the Tail of the Bank area west to Whale Bank, is a continuous seaward thinckening[sic] wedge up to 30 m thick, of glacial sediments overlain by muddy sand (Fig. 62.6)." (our Figure 21). Thus what they call the 'Tail of the Bank Mud' is best described as a muddy sand. Fader and Miller (1986b) again show the 'Tail of the Bank Mud' in their figure (Figure 20 here) but do not discuss it further.

While Fader and Miller (1986a;b) were the first to name this formation they were not the first to recognize or to sample it. Litvin and Rvachev (1963) clearly show that the R/V SEVASTOPOL sampled it on 2 lines with a "bottom sampling tube" and possibly by a Sigsbee trawl or "commercial trawl". Their map in their figure 6 shows the distribution of bottom deposits for the southeastern Grand Banks. The map clearly shows a muddy sand bordering the Tail of the Bank on the

COMPILATION PROCEDURES (CONTINUED)

Tail of the Bank Mud (continued)

southwest from The Tail of the Bank northwest to Whale Bank (Figure 43). Avilov (1964) pictures the same edge-of-bank formation on the southwest side of the Tail of the Bank as sandy silt.

We earlier showed Sen Gupta and McMullen's (1969) sedimentary facies map on the southern part of the Grand Banks. They too showed a muddy sand (based on 8 or 9 samples) on the outer southwestern edge of the Grand Banks stretching from The Tail of the Bank to the very southeastern corner of the present project area (Figure 6). They described their 'third area' as, "the finer sediment is almost entirely enclosed in a long (ca. 100 miles (160 km)), relatively narrow (ca. 25 miles (40 km)) band, approximately parallel to the southwest edge of the Banks. In this area the Banks are virtually flat, so that the band of finer sediment is not related to topography". This "band" is the newly-designated 'Tail of the Bank Mud'.

Acoustically the Tail of the Bank Mud formation looks like a mud. It is transparent to the Huntec deep-towed boomer and forms a clear sharp boundary on the sidescan with the Grand Banks Sand and Gravel which it overlies. It shows no internal reflectors and thickens gradually seaward and has been seen up to 30 m thick (Fader and Miller, 1986a). Thus while it sedimentologically is a "muddy sand" (Fader and Miller, 1986a; Sen Gupta and McMullen, 1969; Litvin and Rvachev, 1963) acoustically the sediment is transparent like a 'mud' hence the name 'Tail of the Bank Mud' of Fader and Miller (1986a). In retrospect this name may be a misleading name if numerous grain size analyses still prove that the formation is a 'sand' as opposed to a silt or a mud.

The Canadian Hydrographic Service also mapped this formation in its routine bottom sampling program during the early KAPUSKASING, offshore surveys and later BAFFIN work. The sample index map shows about 115 CHS bottom samples with CHS's visual descriptions; visual descriptions are usually done in field by hydrographers not by geologists. It is not known if the samples survive. On this map (Enclosure 6) four samples near the shelf edge in 100, 50, 50 and 65 fm are reported as 'mud, mud, sandy mud, and mud', respectively with two samples in the very southeast corner at 45 and 52 fm as, 'muddy sand and sandy, mud,' respectively (there are three intervening shelf-edge samples shown as, 'gravelly sand').

The formation was mapped on six lines of the AGC sidescan-seismic profiler data set and is shown somewhat arbitrarily to be wedging out near the mouth of Haddock Channel on Enclosure 1. Its

FIGURE 43

LITVIN AND RVACHEV'S (1963) FIGURE 6 SHOWING THE 'DISTRIBUTION OF BOTTOM DEPOSITS' ON THE GRAND BANKS. THE BOTTOM DEPOSIT TYPES PER THE LEGEND TYPES PICTURED ON THE MAP ARE:

1- sand	8- boulders
2- muddy sand	9- stones and rocks
3- sandy mud	10- shells & shell fragments
4- mud	11- corals
5- loamy mud	12- sponge
6- ancient clay	13- rhizopods
7- pebbles & gravel	14- isobaths

WHILE THE PATTERN IS NOT ABSOLUTELY CLEAR CLOSE EXAMINATION OF THE FIGURE SHOWS A LONG LINEAR MUDDY SAND DEPOSIT FLANKING THE SOUTHWEST SIDE OF THE TAIL OF THE BANK. THIS HAS BEEN CALLED THE 'TAIL OF THE BANK MUD' BY FADER AND MILLER (1986a;b).

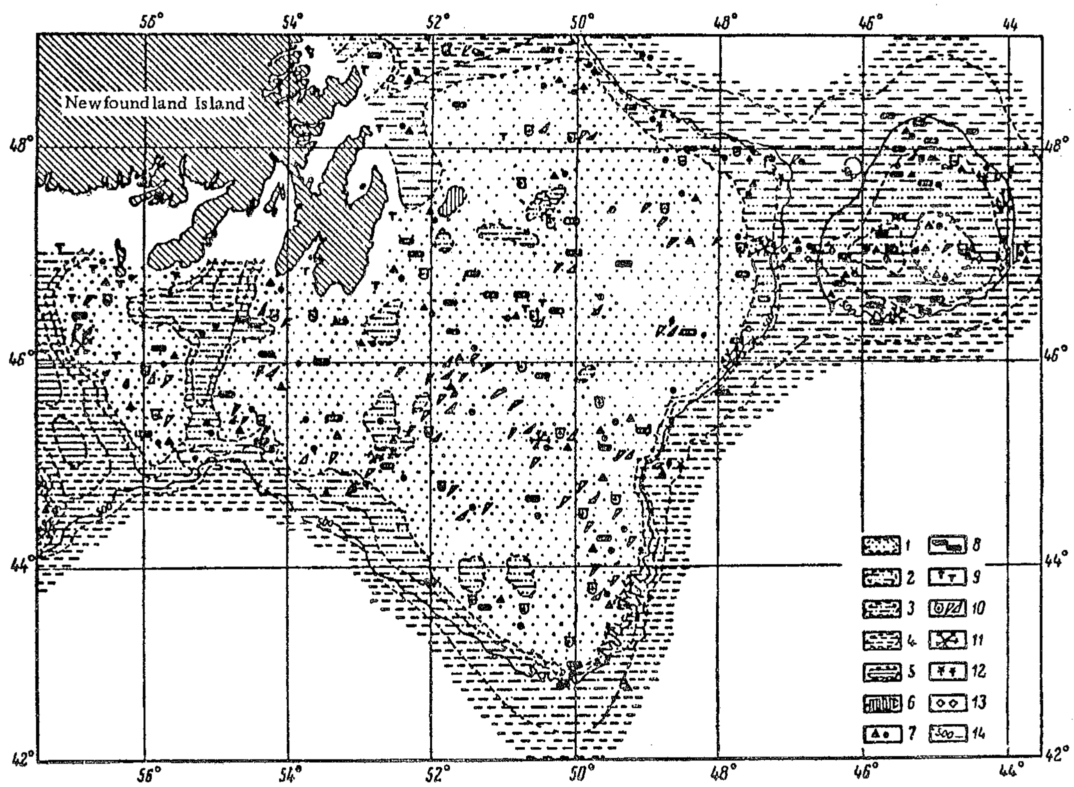


FIGURE 6. Distribution of bottom deposits in North Newfoundland Bank area
1-sand; 2-muddy sand; 3-sandy mud; 4-mud; 5-loamy mud; 6-ancient clay; 7-pebbles and gravel; 8-boulders; 9-stones and rocks; 10-shells and shell fragments; 11-corals; 12-sponge; 13-Rhizopoda; 14-isobaths.

COMPILATION PROCEDURES (CONTINUED)

Tail of the Bank Mud (continued)

seaward edge was also arbitrarily drawn at about 3-400 m at the limit of our map area. The Tail of the Bank Mud is seen to slightly thin over a very slight, (Recent?), uplifted, topographic high over a shelf-edge salt diapir at about 44°42'N, 53°37'W.

Amoco's Areas B and C (Swift, 1969, Appendix 18) straddle the Tail of the Bank Mud and the D/V CALDRILL's Borehole 17 (and possibly 27 and 25) (Enclosure 6) were in the formation (Pan Am, 1965). So was the 1971 Puffin borehole No 3 (Al location) put down by McClelland Engineers, Inc. (1971) for Amoco (Enclosure 6).

Unfortunately, the available copy of the Puffin borehole report contained no geological log of the hole and no pictorial log of the strata encountered (Plate 2 is missing). The hole went to 123.5 ft (37.6 m) and one is only able to get a generalized summary at this point. The top 'stratum I' was 61 ft of "gray fine sand", the next 26 ft section was gray silty fine sand, the next 25 ft section was hard gray clay and the last 11.5 ft section was gray fine sand, (McClelland Engineers, Inc., 1971). The missing plate should be recovered.

The D/V CALDRILL corehole No. 17 in Area C is not particularly conclusive either. Hole No. 17's first core was between 30 and 40 ft and recovered but 0.5 ft very fine to fine-grained unconsolidated sand. A gamma log was run, but is not available. Corehole No. 27 was further offshore at the southwest corner of Area C in 723 m water depth and drilled to 395 m below the seafloor. Its first core was at 120 to 130 ft and recovered 5 ft 3 in of clay. (Pan Am, 1965). Corehole No. 25 was spudded in even deeper water (1069.6 m) and its first core between 98 and 108 ft was also clay.

The Geocon (1969) report on the 16 cores, which they analysed from the massive Amoco piston coring program, may yield some data on the Tail of the Bank Mud formation. Cores in Area A (H9A), J54, 061 and P61 all contained 15 to 18 inches of air or water at the top of the core and 1.5 to 3 in of "grey organic silt" over fine to medium sand with shells. Similarly, in Area C (H9C) cores N23 and L23 each had air and water at the top of the core and 1 to 2 in of grey organic silt over "grey weakly-cemented fine sand".

In Area B (H9B) cores H10 and 019 have 1-2 in of light grey silt on top of "fine to medium weakly-cemented sand and shells" while piston core 015 has 54 in of:

"weakly cemented organic silty fine sand and traces of shells".

COMPILATION PROCEDURES (CONTINUED)

Tail of the Bank Mud (continued)

The above results are not clear. We are inclined to dismiss the organic silt we found as a very light veneer of organic silt and to suggest that the Tail of the Bank Mud must be the material described as "weakly cemented organic silty fine sand and traces of shells". Clearly, the Tail of the Bank Mud deserves more work; the shells mentioned above in several of Amoco's cores may yield a date.

On p. 604 of their paper, Fader and Miller (1986a) further comment on the Tail of the Bank Mud and use it to postulate a late glacial ice dome on the Tail of the Bank that delayed isostatic rebound:

> The Tail of the Bank mud deposit (Fig. 62.6) is a regionally continuous glaciomarine section of 30 m thickness, which occurs in water depths as shallow as 55 m along the entire southwestern edge of Grand Bank. If a post-glacial low stand of sea level occurred below the depth of occurrence of this section, it would be expected that it would largely be eroded in the subsequent transgressing sea, as is the case along the flanks of most of the bank areas of the Scotian Shelf (King and Fader, 1985). Its preservation in water depths as shallow as 55 m suggests that the sediments were not transgressed, and that the low sea level stand in this area is less. In order to account for the shallow distribution of these glacial sediments and the small amount of relative sea level lowering, we propose a large late glacial ice dome for delaying isostatic rebound of the Tail of the Bank region. Cores through the glacial section collected on the Hudson 85-005 cruise will be analysed to substantiate this hypothesis.

This suggestion was repeated in Fader and Miller (1986b).

Another interpretation of the Tail of the Bank Mud deposit is to interpret it as a post-transgression deposit laid down after the beach zone has transgressed the area. Thus, the Tail of the Bank Mud would be Recent in age and deposited quite remote from any melting ice fronts and thus is not a glaciomarine deposit.

Halibut Channel Mud

A small patch of accoustically transparent mud was mapped in the axis of Halibut Channel at 46°N at 160-180 m water depth. Its accoustic character somewhat resembles the Downing Silt; the surface

COMPILATION PROCEDURES (CONTINUED)

Halibut Channel Mud (continued)

can show pockmarks and reflectors are at times enhanced by gas. The deposit is about 45 km long and 15 km wide (Enclosure 1) and overlies all other formations. It is clearly seen overlying Downing Silt (Plates 1A and 1B) and probably overlies the Adolphus Sand. It overlies buried sandwaves though some of the sandwaves still outcrop (Plates 1A and 1B).

The Halibut Channel Mud is clearly a time equivalent to the upper Placentia Clay, but is shown as a different formation because of its possible later and very different recent origin. The Halibut Channel Mud could possibly be remobilized Placentia Clay which may have come about because of a one-time catastrophic event. Fader and Miller (1986b) suggest that the creation of the megaflutes (and associated ovoid scour marks immediately to the west) may have been as a result of a rapid flushing of water out of Placentia Bay from north to south as the energy from the Nov. 18, 1929 tsunami was disapated. If this suggestion proves correct, then the Halibut Channel Mud could well be the final resting place of the remobilized Placentia Clay material and was laid down just 58 years ago. This is clearly a speculative idea and deserves more assessment.

SEABED FEATURES

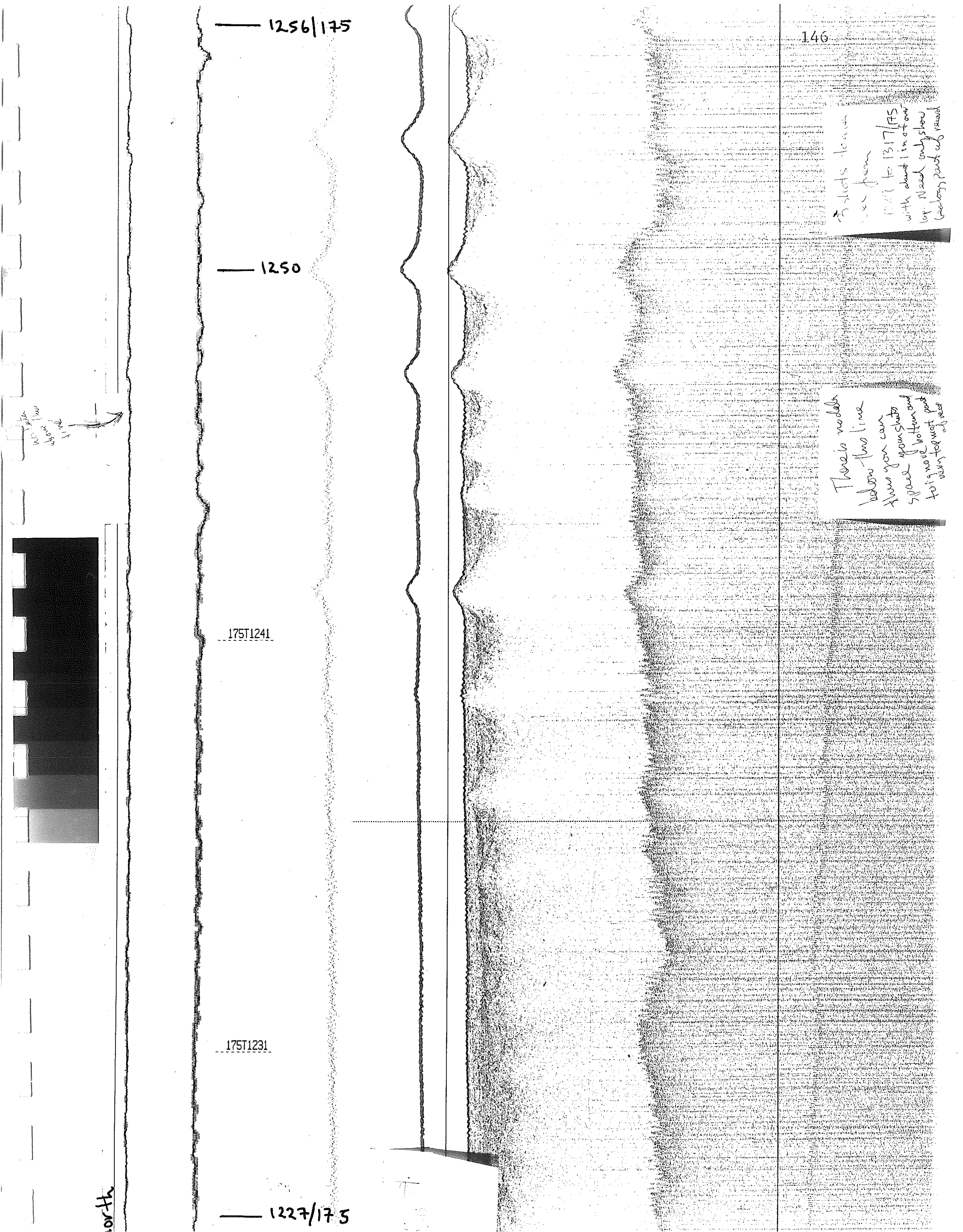
Seabed features were mapped using the sidescan sonar data with occassional reference to the Huntec or other profiler data. They were mapped on the various cruise/line overlays using essentially the same legend used on the map sheet to the west (Fader et al., 1982; 1984).

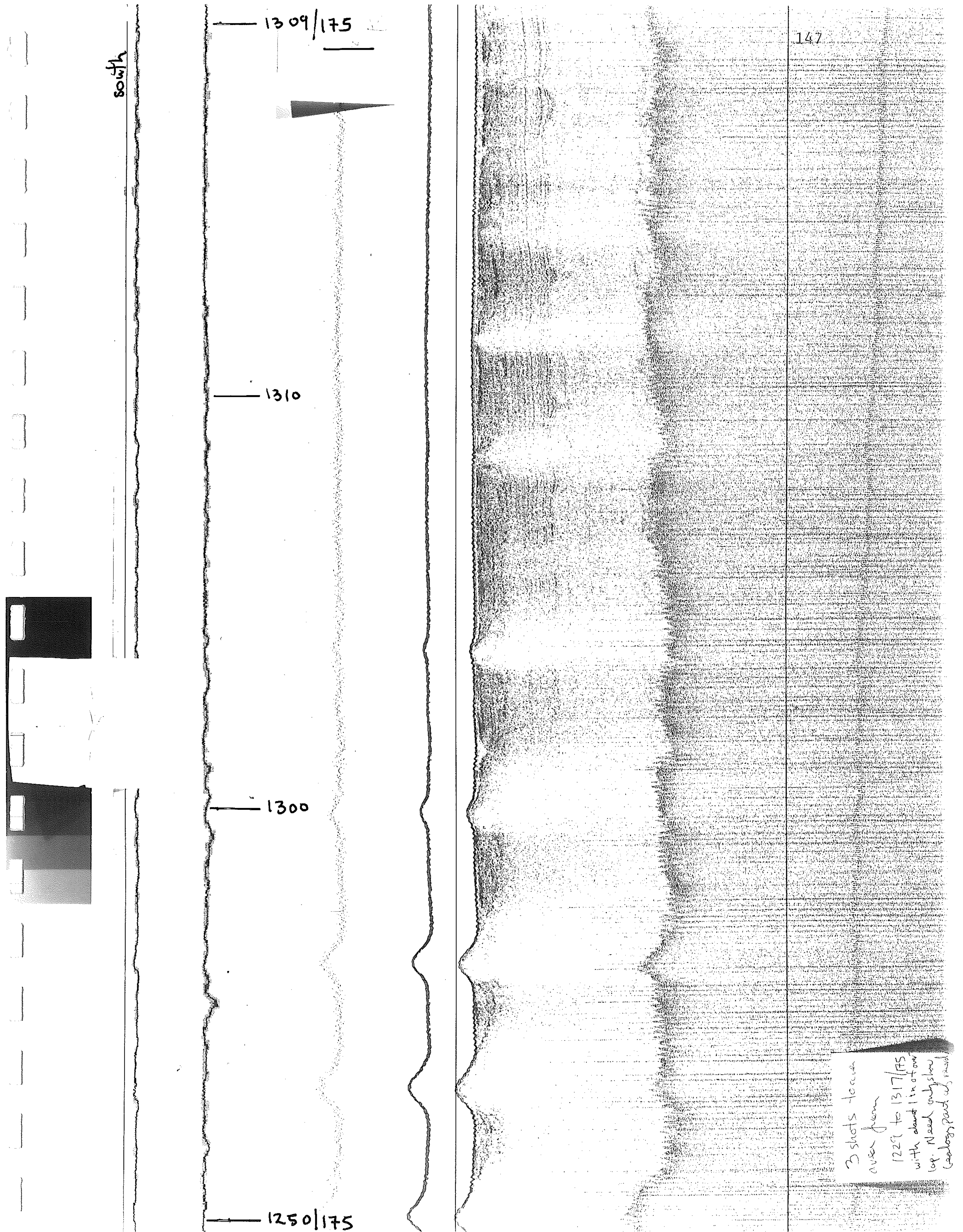
Our legend has incorporated additional symbols suggested by the scientific authority for megaflutes and the ovoid current scour depressions found to the west on the Placentia Clay (Enclosure 2). Where the bottom sediment type was mainly sand or mainly gravel, a pattern was added to the map. Where a pattern on the line is missing, it means that there are no features seen and the sediment type is mud or silt (eg. central Placentia Bay) or that there were no sidescan data for that line. Enclosure 2, the Seabed Features Map, should be overlaid on the sidescan track plot (Enclosure 8) to verify where there was data or not; all lines with sidescan shown on Enclosure 8 have been mapped.

Each cruise/line segment was transferred to one compiled map to build the Seabed Features Map of Enclosure 2. This map is intended to be used as an overlay on the coloured surficial geology map of Enclosure 1 to be most useful.

PLATE 1, (1A, 1B)

A SEQUENCE OF TWO PHOTOGRAPHS OF IMMEDIATELY ADJACENT PORTIONS OF THE HUNTEC DTS INTERNAL PHONE RECORD FROM 1227/175 TO 1319/175 ON ROLL #9 OF THE HUDSON 86-017 CRUISE IN HALIBUT CHANNEL. THE LINE PASSES FROM NORTH TO SOUTH IN AN AREA BLANKETED BY THE HALIBUT CHANNEL MUD FORMATION. IT IS SHOWN HERE AS A THIN VENEER BLANKETING THE DOWNING SILT TO THE NORTH AND SOUTH AND COVERING THE BURIED SANDWAVES; FOUR OR FIVE OF THE SANDWAVES OUTCROP FROM 1247 TO 1300 AND MAY, IN FACT, HAVE NO VENEER OF THE HALIBUT CHANNEL MUD OVER THEM.


146
1256/175
1250
175T1241
175T1231
1227/175
There is noise
below this line
thus you can
space your shots



south
1309/175
147
1310
1300
1250/175
3 shots to occur
over from
1229 to 1317/175

SEABED FEATURES (CONTINUED)

Megaflutes and Current Scour Depressions

These features were first mapped on the HUDSON 78-012 cruise in Placentia Bay and the bottom was interpreted "to have been eroded by strong currents". These features were later inspected by Gordon Fader and Bob Miller on a PISCES IV dive from the PANDORA II 81-054 cruise (Syvitski, et al., 1983). The cruise report by Fader reported on the east to west transect of the megaflute field. Fader and Miller (1986b) report on and picture the megaflutes (Figure 23, see report earlier in the text).

Enclosure 2 consolidates the megaflute observations made on two cruises and the observations of the isolated, ovoid, current scour depressions seen just to the west of the 3 to 4 km-wide band of megaflutes.

Fader and Miller (1986b) suggest that the megaflutes may have been formed on November 18, 1929 when water piled up by the several pulses of a tsunami that resulted from a magnitude 7.2 earthquake on the Laurentian Slope, ran out of Placentia Bay. The orientation of the 200 m long, triangular, flute-shaped megaflutes suggest that they were formed by a north-to-south-moving bottom current. The orientation of the ovoid current scour depressiions is parallel to the orientation of the megaflutes (Enclosure 2).

Iceberg Scours and Pits

The project area is an area of transition from modern iceberg scouring processes to a population of relict or degraded iceberg scours to the south. Iceberg scours and pits are found generally north of 45°N latitude in the project area. Most scours are degraded and occassionally the furrows are infilled with rippled sand. Iceberg scours and pits are found in Adolphus Sand, Grand Banks Drift and in Grand Banks Sand and Gravel though they are less common in the latter formation.

The area of most frequent modern scouring was found to be in the Avalon Channel and on its flanks east of the Avalon Peninsula and to the south where the Avalon Channel changes direction (Enclosure 2) as well as in northern Haddock Channel. Scours in the Avalon Channel area were generally fresh. A sequence of 3 photos (Plates 2A, B, C) picture the sidescan sonar line along one of the SSW-NNE HUDSON 85-025 lines running from a slightly shallower part of the Avalon Channel into a somewhat deeper low with increased clay content (Downing Silt) in the bottom sediment. The increased clay content in the Downing Silt allows the modern iceberg scours to be held longer without degradation and they appear fresh (Plate 2B and 2C).

SEABED FEATURES (CONTINUED)

Iceberg Scours and Pits (continued)

In the shallower areas on the first plate, the scours are narrower and increase in width to the right on the next two photos, reflecting both, an increase in the bergs' ability to scour into the sediment with increased clay content, and, to a lesser extent, the increased size and draft of the scouring bergs in the deeper water. The furrows of the iceberg scours range from 2 to 5 m in depth.

The largest iceberg scour is found in the southern Avalon Channel (see site of the PANDORA II 85-057 PISCES IV dive no. 1634 on Enclosure 6). This scour which occurs in Grand Banks Drift is 200 m in width, is oriented NE-SW, and has a depth of 6 to 7 m below the general seafloor and a berm height of 6 m to either side. This feature known as "superfurrow" was examined by Gordon Fader on a PISCES IV dive in 1985 (dive no. 1634).

The bottom of the scour was found to be generally flat with an absence of ice rafted clasts. In contrast, the berms were made up of large piles of boulders up to 5 m in diameter. Some appear to have rolled down to the base of the berm as the ice indentor ploughed through. The sidescan sonogram and the parallel Huntec record over 'superfurrow' were pictured by Fader and Miller (1986b) and they report that the iceberg scour is 3 times larger than any of the nearby scours and is one of the largest iceberg scour marks to be found on the Grand Banks of Newfoundland.

What may be buried iceberg scours are found beneath a thin veneer of sand in an area off the northeast flank of Green Bank.

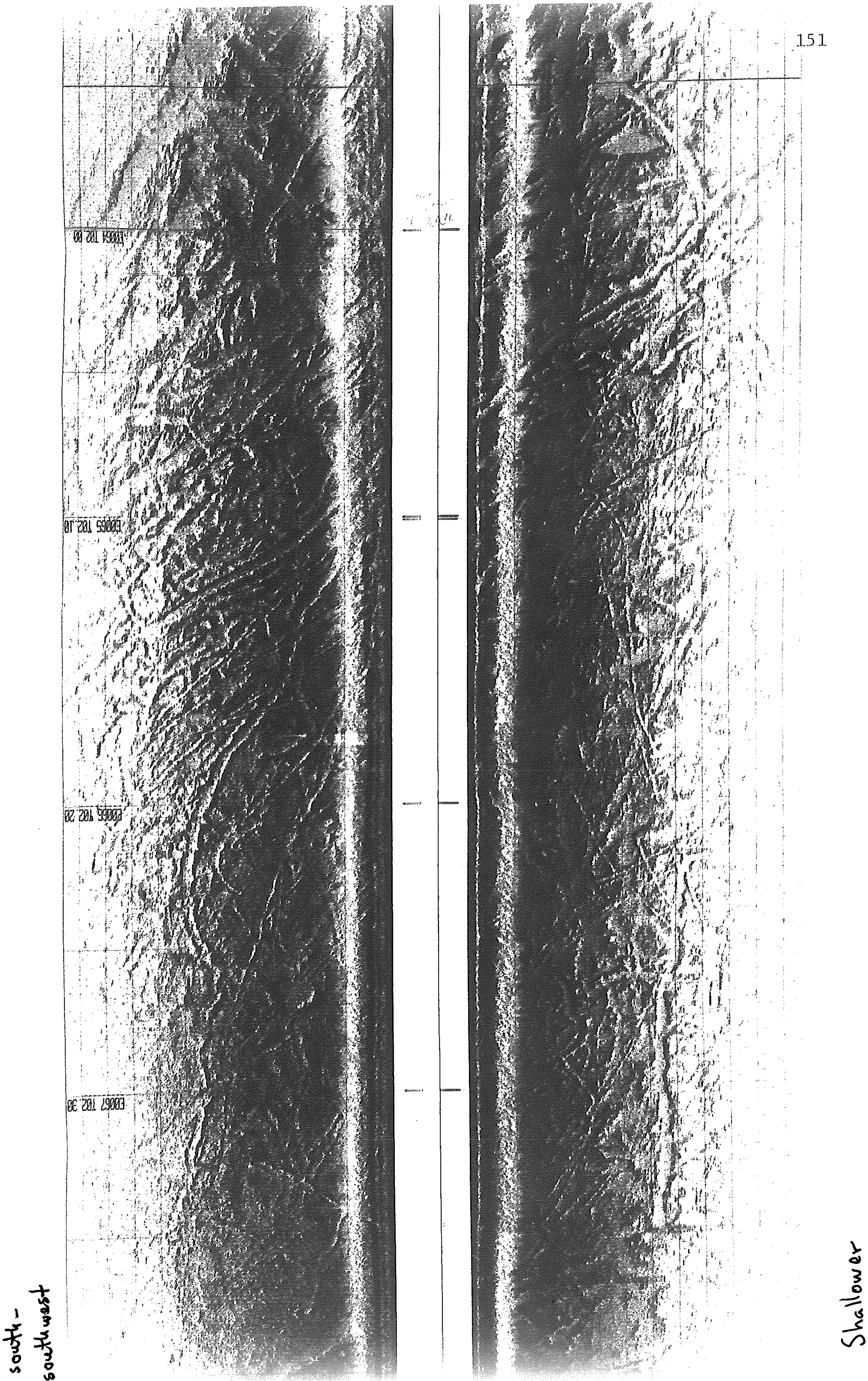
Iceberg pits are believed to be caused when the seabed sediments fail beneath a grounded iceberg. They can occur in the area as isolated features or in fields and at times the sediment type or more importantly the depth to bedrock dictates the tendency for pits to form. Pits tend to form (and to be preserved) in Grand Banks Drift.

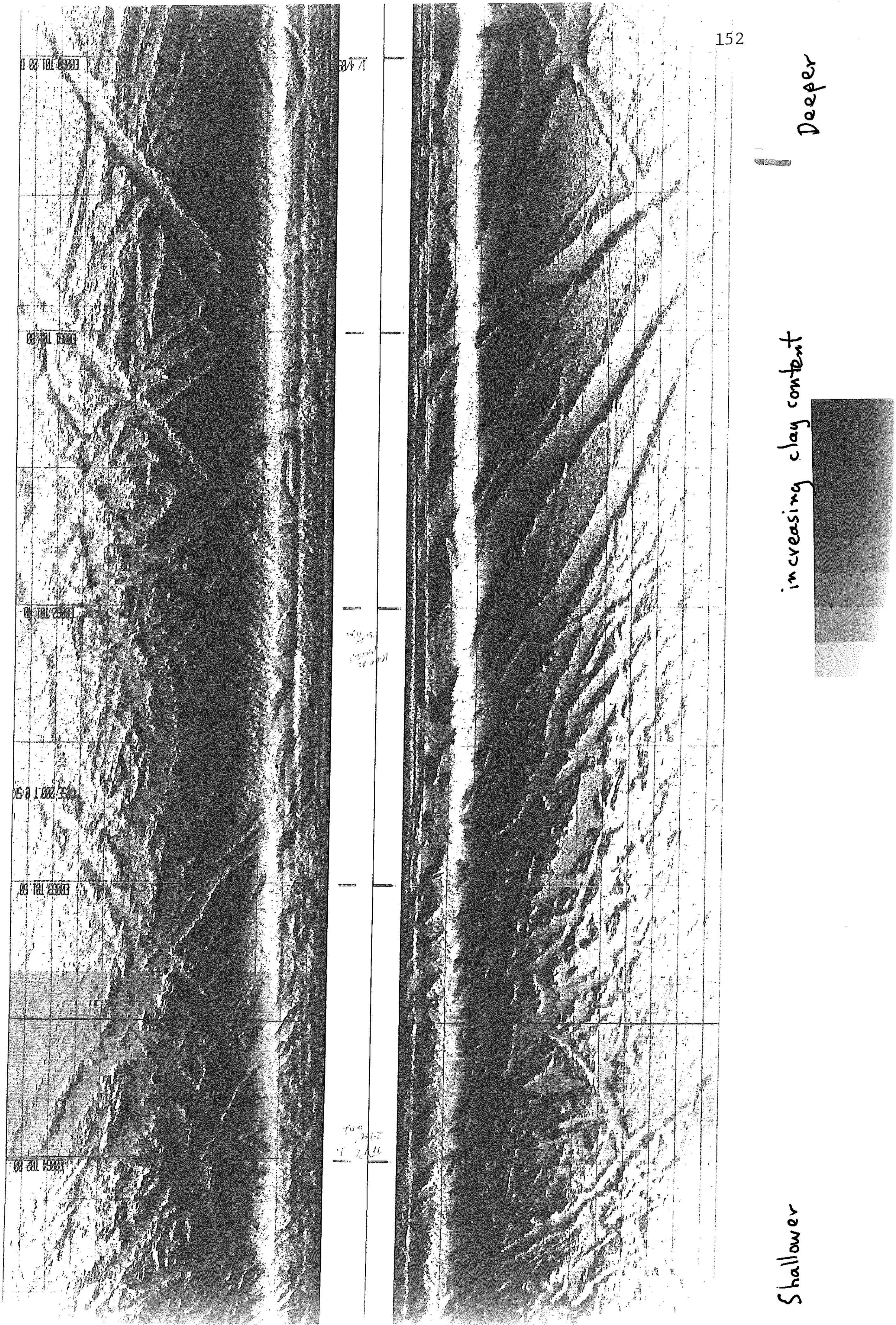
The eastern flank of the Avalon Channel has an area where pits predominate and there are virtually no iceberg scours. Bedrock is very close to the seafloor in this area. Pits range from 1 to 5 metres in depth; the largest iceberg pit reported in the project area is 8 m in depth (HUDSON 86-017 cruise report, G.B.J. Fader).

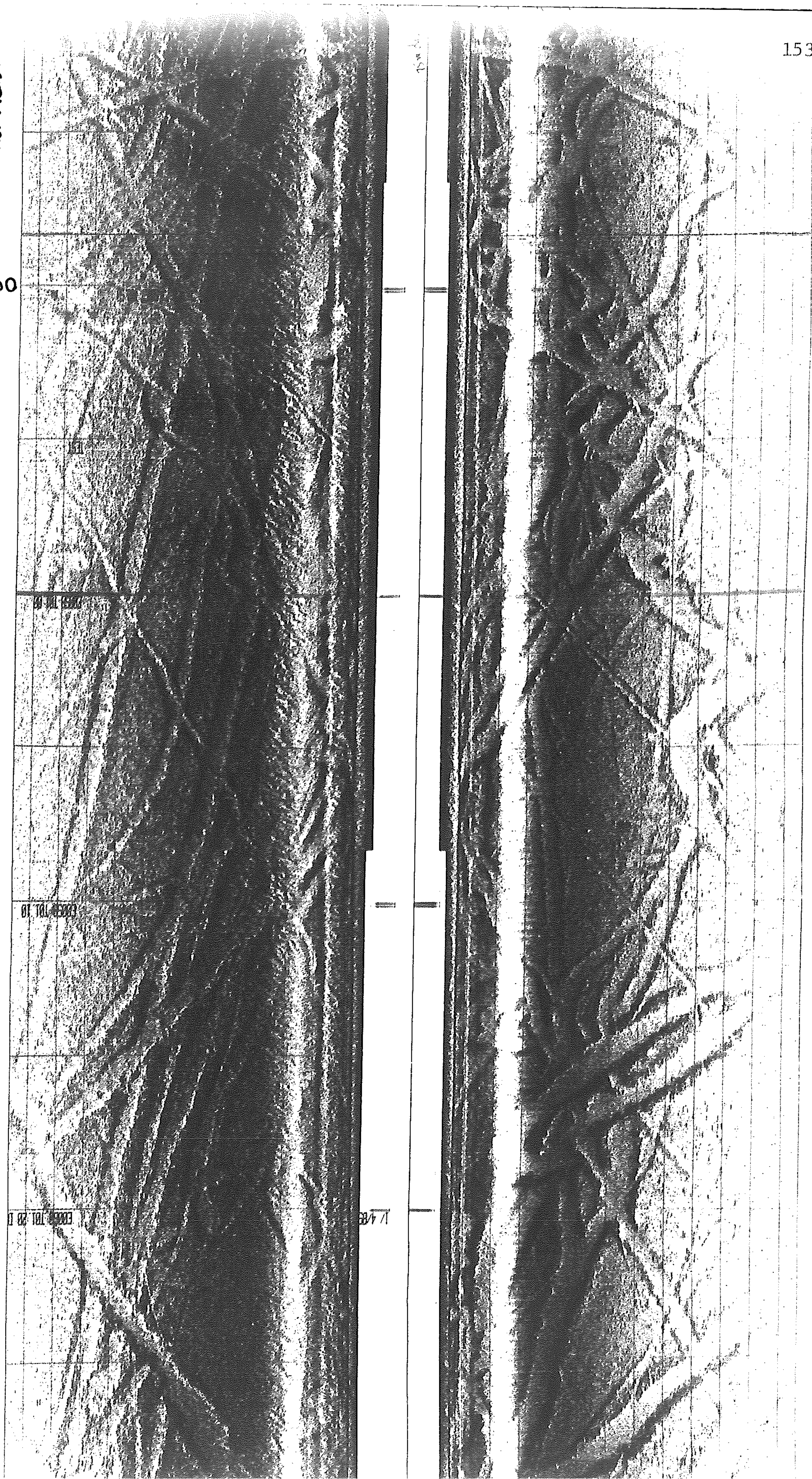
The 1981 Mobil Oil Canada Ltd. survey south of the Avalon Peninsula was reported on by Geonautics/d'Appolonia (1982). They reported on and mapped iceberg scours and iceberg pits onto their seabed features map (Figure 30). We have reexamined the raw data rolls that were kindly provided by Mobil and these interpretations appear on our Seabed Features Map of Enclosure 2.

PLATE 2 (2A, 2B, 2C)

THREE OVERLAPPING PHOTOS OF ADJACENT PORTIONS OF A SSW-NNE HUDSON 85-005 SIDESCAN SONOGRAM IN THE AVALON CHANNEL FROM 0042 TO 0240/091 (NNE TO SSW) SHOWING A HEAVILY ICEBERG-SCOURED SEAFLOOR. THE SEAFLOOR IS SLIGHTLY SHALLOWER TO THE SOUTH-SOUTHWEST AND DEEPENS BY ABOUT 10 M TO THE NORTH-NORTHEAST; THE CLAY CONTENT OF THE BOTTOM SEDIMENTS INCREASES IN THE DEEPER WATER. THUS, THE LARGER MORE LINEAR ICEBERG SCOURS IN THE DEEPER WATER (3rd PHOTO) ARE BETTER PRESERVED IN THE AREA MAPPED AS DOWNING SILT. THE SIDESCAN IS ON A 1000 M RANGE (50 M/DIVISION).


E0064 T02 00
E0065 T02 10
E0066 T02 20
E0067 T02 30
south-southwest
Shallower


Deeper
increasing clay content
Shallower


north-
northeast
160/0500
Deeper
increased clay content

SEABED FEATURES (CONTINUED)

Pockmarks

Pockmarks, in their simplest form, are cone-shaped depressions which occur and are preserved on muddy seafloors. It is believed that they are formed from the venting of hydrocarbon gases thus they are generally only found over areas of Mezozoic or Cenozoic bedrock in which such gases can be formed and thus vented.

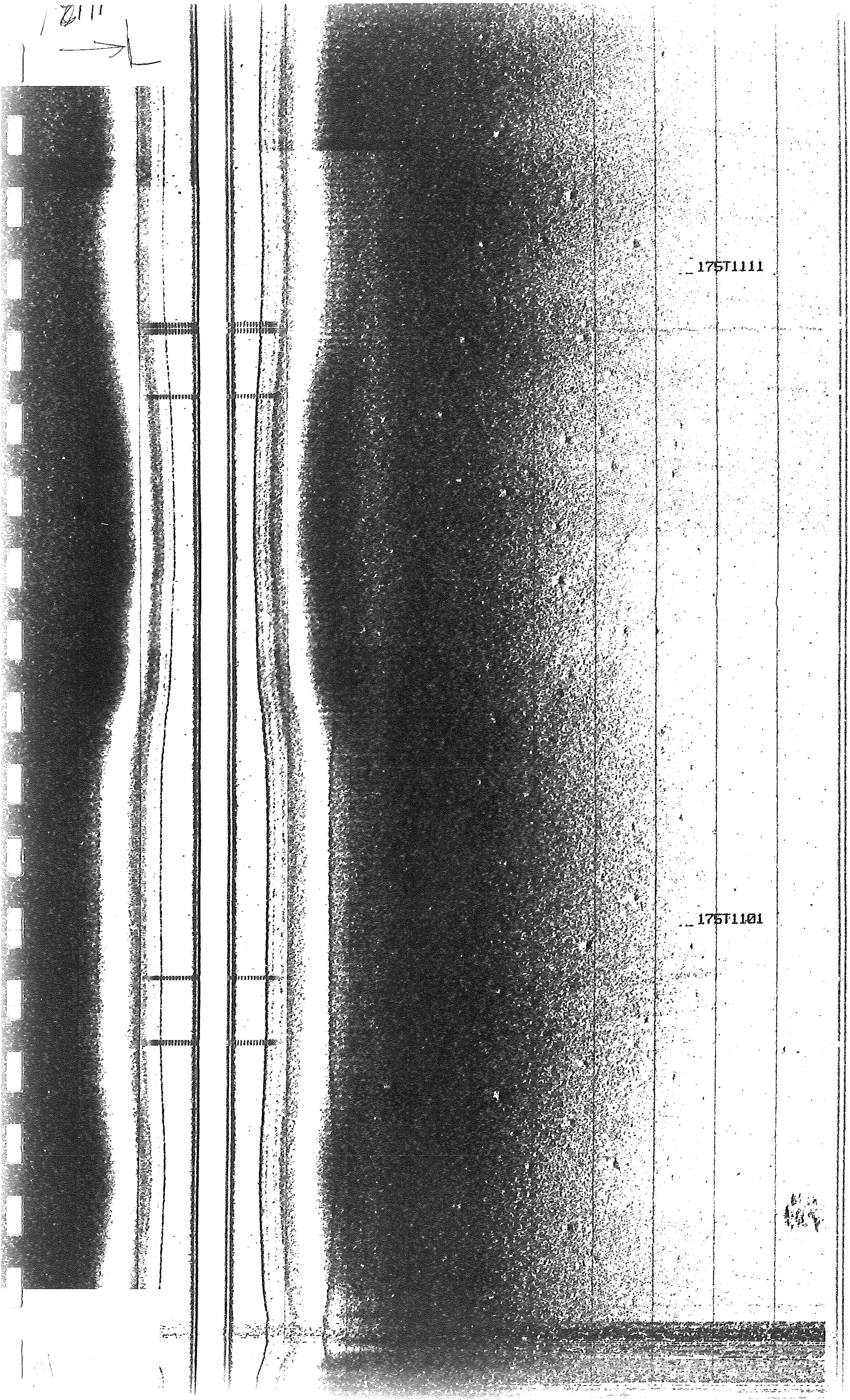
In the project area pockmarks were only found in northern Halibut Channel (Enclosure 2) and are seen on the ocean floor comprised of the youngest unit (Halibut Channel Mud), or of Adolphus Sand or Downing Silt (Enclosure 1 and 2). They range in size from 2 to 10 metres in diameter and up to 1 metre in depth. (Plate 3 over Halibut Channel Mud).

In the same area the subbottom profiler records show areas highlighted on the records (bright spots) by gas - charged sediments. In places buried pockmarks also appear on the profiler records in this area below the field of small (active?) pockmarks. Where pockmarks appear small and are dense they can be confused with boulders lying on the seafloor on the BIO sidescan records.

PLATE 3

PHOTOGRAPH OF A PORTION OF THE STARBOARD SIDE OF THE HUDSON 86-017 SIDESCAN SONOGRAM FROM 1056 TO 1113/175 (NORTH TO SOUTH) SHOWING A FIELD OF SMALL POCKMARKS DEVELOPED IN THE HALIBUT CHANNEL MUD FORMATION. SCALE LINES ARE 15 M APART.

south



north

SEABED FEATURES (CONTINUED)

Sandridges, Sandwaves, Megaripples

Sandy ocean floors in the project area can develop sandridges in certain areas. These are almost easier recognized on the echograms or profiler records rather than on the sidescan sonograms because they are so broad and have low relief. Relief is less than 10 m with wavelengths up to 4 km. The sandridges as a morphological feature are relatively stable.

In general it is difficult to determine the orientation of sandridges. To do this a carefully positioned, closely-spaced, series of bathymetry lines or profiler lines must be done and tide corrections applied. Ideally the resulting bathymetry should be contoured at a close interval to detail the true morphology of the sandridges and the orientation of the field - and the lateral changes in orientation that may occur as one moves from one oceanographic regime to another.

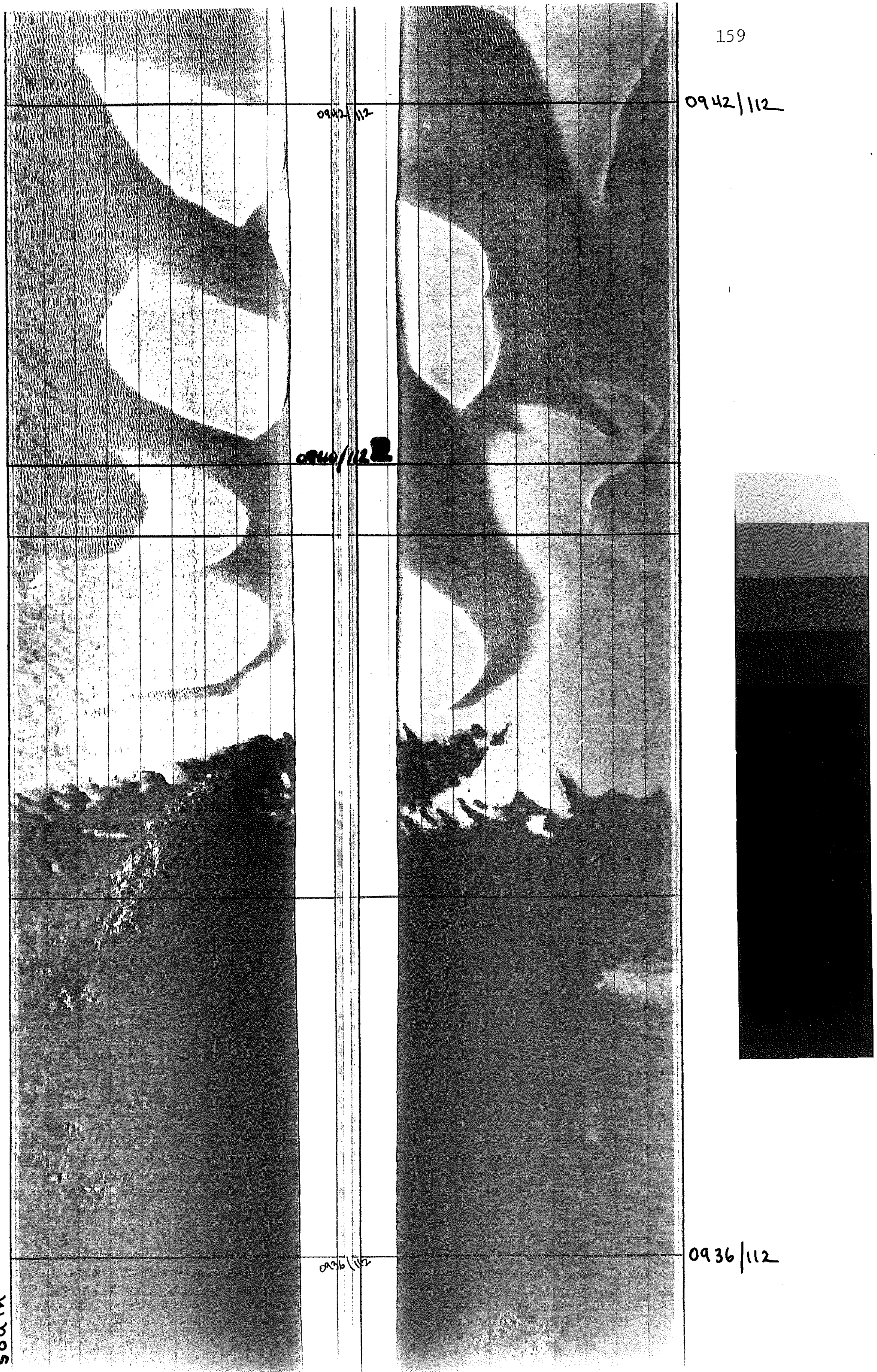
Smaller bedforms are generally developed on the flanks of the sandridges and it is the mobility and the sediment transport within the smaller bedforms that defines the overall slow rate of migration (or degradation) of the broader sandridges. The smaller bedforms can be sandwaves or three-dimensional megaripples, sand ribbons down to the smallest ripple marks. Areas of sandwaves and megaripples are shown on the Seabed Features map of Enclosure 2. Plate 4 shows two adjacent parts of a sidescan sonogram from the HUDSON 85-005 cruise on north-central Whale Bank in an area of the Grand Banks Sand and Gravel formation. The line passes from south to north off of an area of mainly gravel across a sharp transition of broad linguoid sand patches. Some of the patches are essentially white and featureless on the sidescan record; others are megarippled and show darker on the sidescan record. Plate 5 is the parallel Huntec record over a longer section of the same 85-005 line. A different reflectivity is recorded over the featureless sand patches (lower reflectivity) than over the megarippled sand areas (higher reflectivity).

Green Bank seems to be the focus of a significant amount of the sediment transport in the project area. This is reflected in the concentration of bedforms in the area (Enclosure 2). The bank area encircling Whale Deep(s) is also an area of denser bedforms indicating a focus of sediment transport.

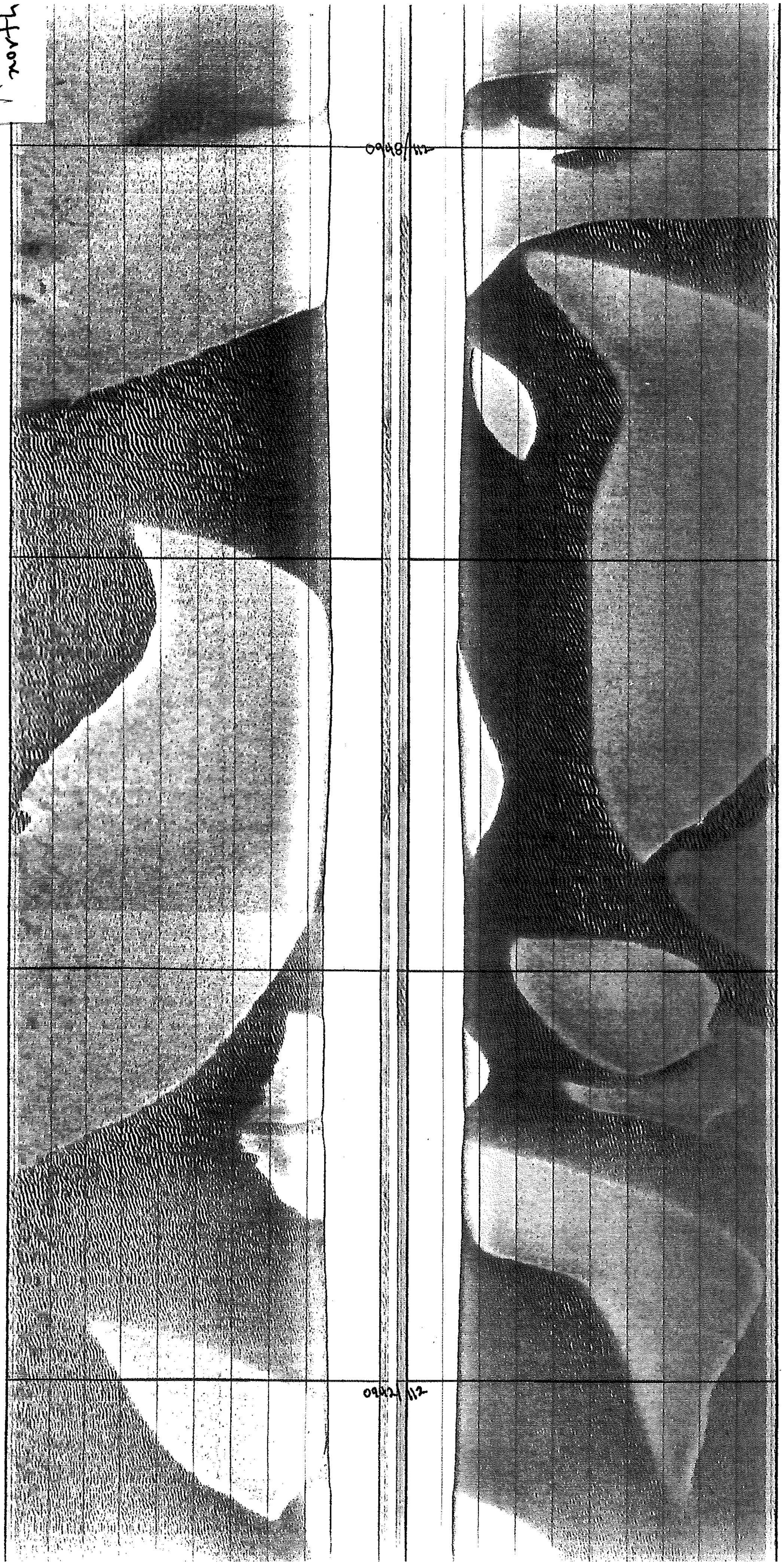
PLATE 4 (4A, 4B)

TWO PHOTOGRAPHS OF ADJACENT PORTIONS OF THE HUDSON 85-005 SIDESCAN SONOGRAM FROM 0936 TO 0948/112 ALONG A SOUTH TO NORTH LINE IN THE NORTH CENTRAL PART OF WHALE BANK. THE RECORD SEQUENCE SHOWS A SHARP TRANSITION FROM AN AREA OF GRAVEL INTO AREAS OF LINGUOID SAND PATCHES. SOME OF THE SAND PATCHES ARE FEATURELESS AND SHOW AS WHITE AREAS ON THE SIDESCAN RECORD; AREAS OF MEGARIPPLED SAND SHOW AS DARKER AREAS. THE RECORD SCALE IS 350 M FULL RANGE (150 M PER SIDE; 15 M/DIVISION).

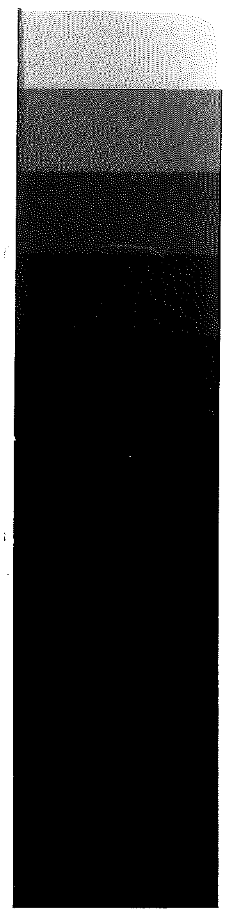
0942



09
north



0948/112



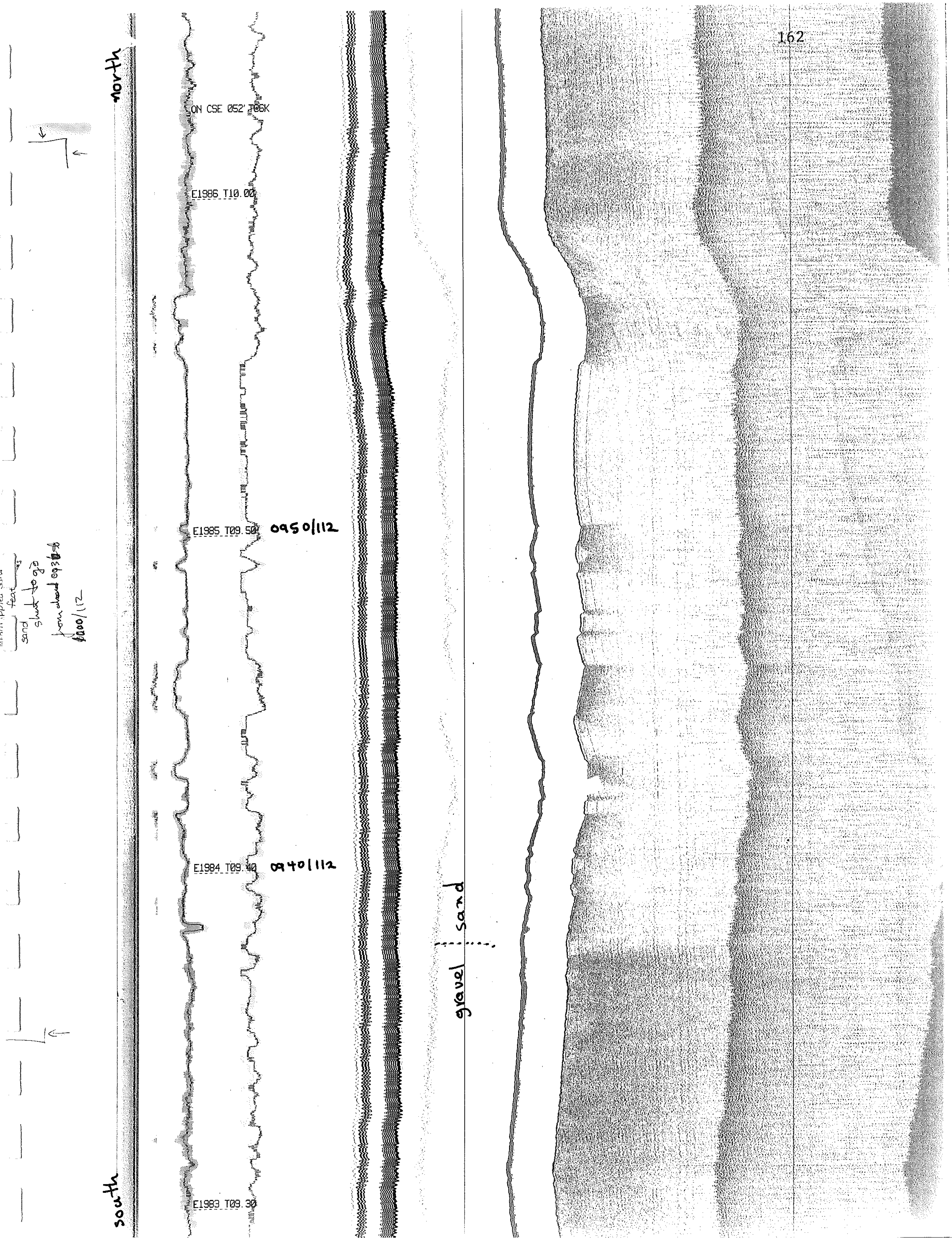
0942/112

0942

south

PLATE 5

PHOTOGRAPH OF A PORTION OF THE HUDSON 85-005 HUNTEC RECORD SHOWING THE CHANGES IN REFLECTIVITY WHEN PASSING FROM AN AREA OF GRAVEL ONTO SAND AND THE VARIATIONS OVER THE SAND DEPENDING UPON WHETHER IT IS FEATURELESS OR MEGARIPPLED.


north
south
ON CSE 052' T06K
E1986 T10.00
E1985 T09.50
0950/112
E1984 T09.40
0940/112
E1983 T09.30
gravel
sand
sand
shut to go
0900/112

SEABED FEATURES (CONTINUED)

Trochoidal Sandwaves and Other Bedforms

Green Bank is the only area where trochoidal sandwaves are developed. A series of about a dozen trochoidal sandwaves from 0.5 to 1.0 metres in height are developed on the flank of a broad sandridge. All are oriented in a WNW-ESE direction. They show as a series of low, straight linear ridges on a sidescan sonogram (Plate 6). Larger trochoidal sandwaves up to 5.0 m in height show as relatively sharp 'cuspate' features as seen over a longer portion of the Huntec record on Green Bank (Plate 7) including the above segment of the sidescan line (HUDSON 80-010 from 2216 to 2234/117).

Plate 8 was included to show some additional unidentified bedforms just to the west of the trochoidal features above. These narrow, arcuate, to stretched-out, irregular features show as light areas on Plate 8. There was some suggestion that they might be shell beds however in the absence of any groundtruth data we have designated them as bedforms especially since they fall on Green Bank where there is considerable evidence of active sediment transport from the surfit of other bedforms present.

These features in Plate 8 are reminisent of the 'skewed-W' bedforms mapped on the eastern Grand Banks and in the Hibernia area (Fader and Miller, 1986a; Figures 62.10 and 62.11, p. 599). In the Hibernia area these bedforms are known to be comprised of very thin veneers of sand being moved across lag deposits of mainly gravel of the Grand Banks Sand and Gravel formation.

PLATE 6

PHOTOGRAPH OF A PORTION OF THE HUDSON 80-010 SIDESCAN SONAR RECORD FROM A LINE ON GREEN BANK ORIENTED WSW TO ENE FROM 2154 TO 2228/117 SHOWING A SERIES OF TROCHOIDAL SANDWAVES ALL ORIENTED WNW-ESE. THE TROCHOIDAL SANDWAVES HAVE A RELIEF OF 0.5 TO 1.0 METRES. THE SIDESCAN HAS A RANGE OF 750 M TO EITHER SIDE OR 1500 M FULL SWATH.

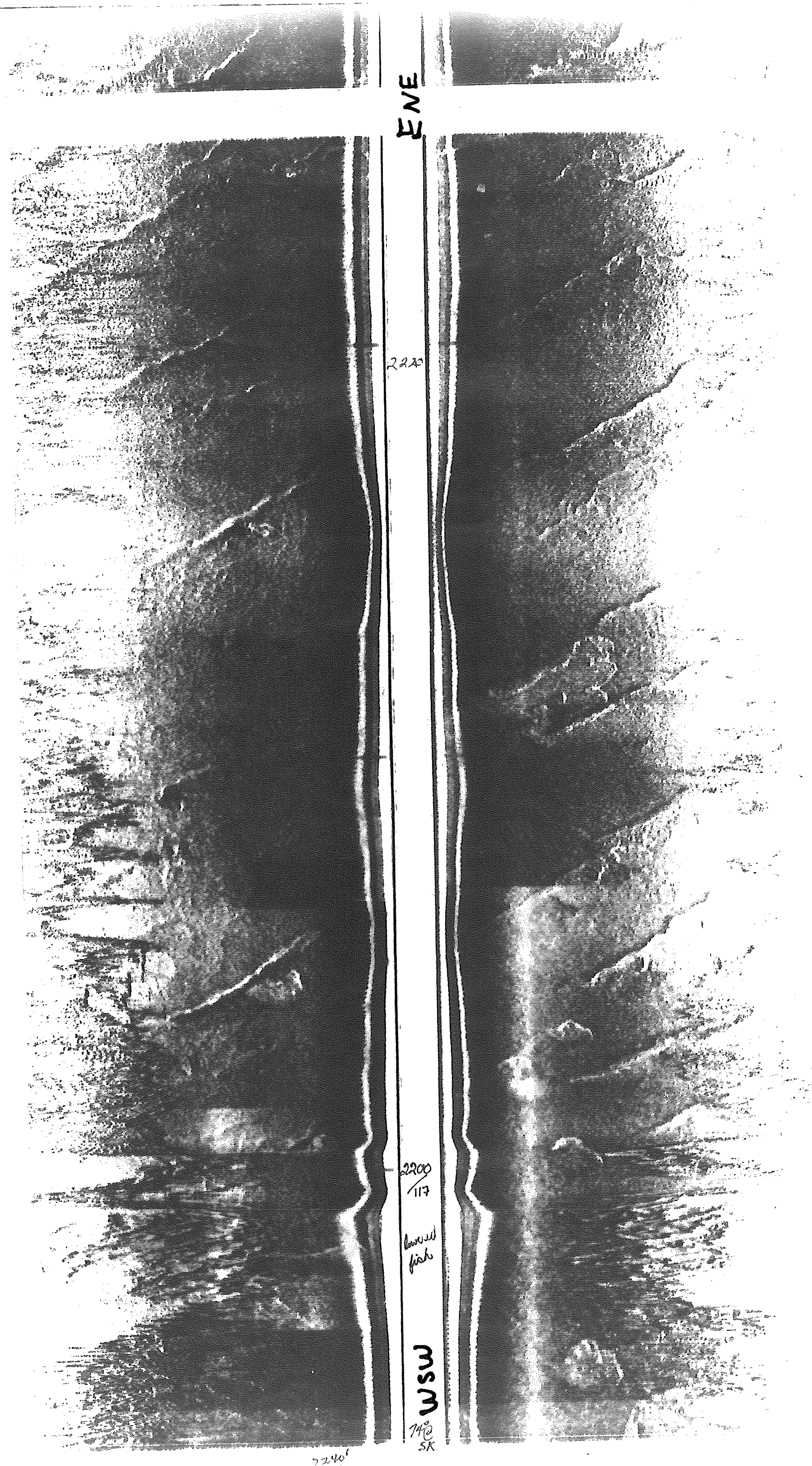

ENE
2220
2200
117
lowered fish
WSW
14°C
5K
2240'

PLATE 7

A PHOTOGRAPH OF A LONGER PORTION OF THE HUNTEC DTS PROFILER RECORD OVER THE TROCHOIDAL SANDWAVES ON GREEN BANK. THE HUDSON 80-010 LINE ORIENTED FROM WSW TO ENE FROM 2216 TO 2234/117 CROSSES SEVERAL PROMINENT FEATURES THAT SHOW SIGNIFICANT RELIEF. THE TROCHOIDAL SANDWAVES SEEN IN THE PREVIOUS PLATE'S SIDESCAN SONAR RECORD SHOW BARELY PERCEPTIBLE RELIEF ON THE HUNTEC RECORD HERE.

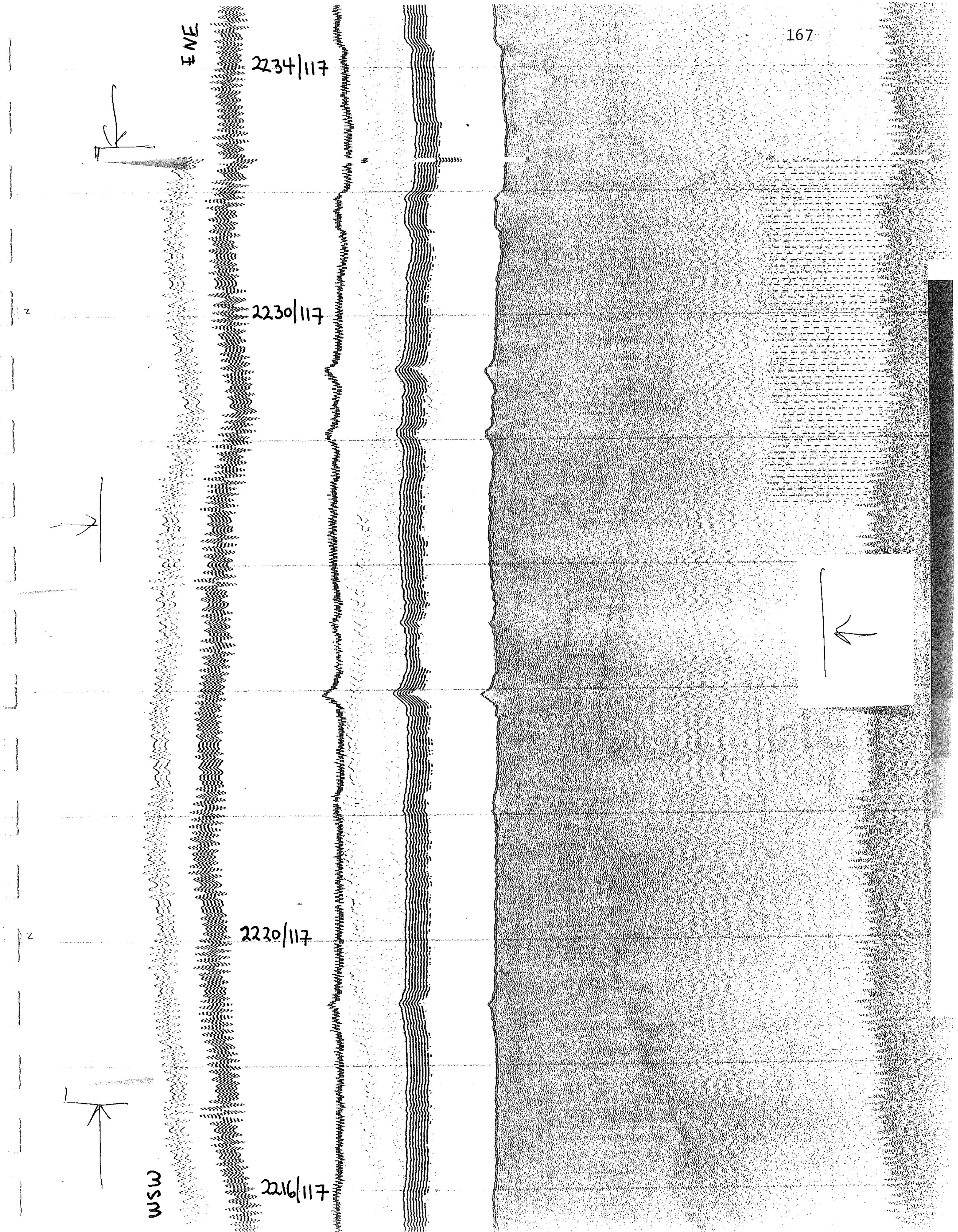
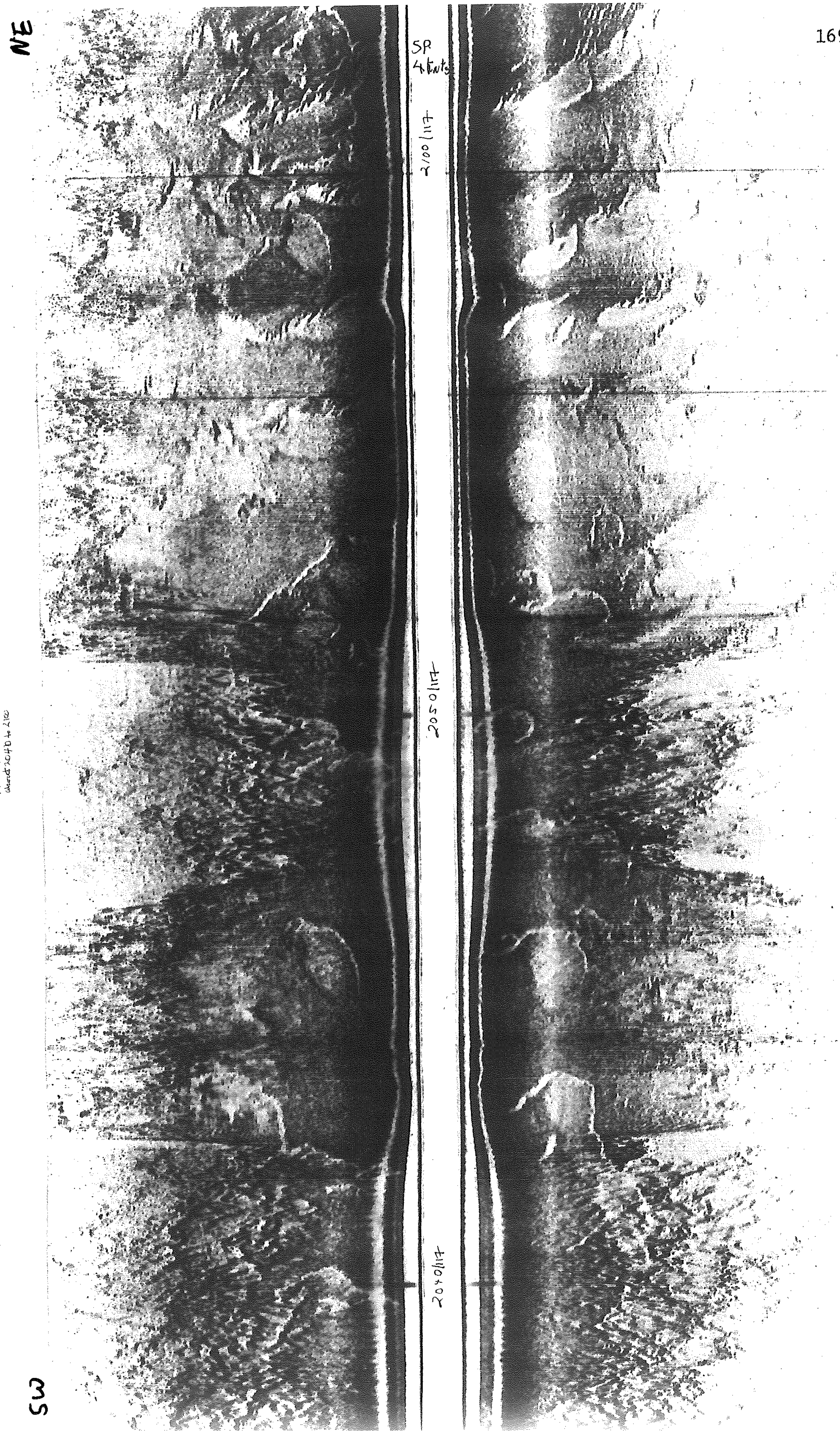

ENE
2234/117
2230/117
2220/117
2216/117
WSW

PLATE 8

A PHOTOGRAPH OF A PORTION OF THE HUDSON 80-010 SIDESCAN SONOGRAM FROM A LINE ON GREEN BANK ORIENTED SW-NE FROM 2038 TO 2102/117 SHOWING A SERIES OF UNIDENTIFIED BEDFORMS. THESE FEATURES ARE SEEN AS A SERIES OF NARROW, ARCUATE TO STRETCHED-OUT, IRREGULAR, LIGHT-COLOURED BEDFORMS(?) ON GREEN BANK WEST OF THE TROCHOIDAL SANDWAVES OF THE PREVIOUS TWO PLATES. THESE SOMEWHAT ILL-DEFINED BEDFORMS ARE REMINISCENT OF THE 'SKEWED-W' BEDFORMS SEEN IN THE HIBERNIA AREA (FADER AND MILLER, 1986a; FIGURE 62.10 AND 62.11, p. 599). THEY HAVE NOT BEEN SAMPLED OR GROUND-TRUTHED BY A PISCES DIVE OR CAMERA WORK. THE SIDESCAN HAS A RANGE OF 750 M TO EITHER SIDE OR A FULL SCALE OF 1500 M.



cut resolution to 50 to show arcuate structures over about 2040 to 2100

SEABED FEATURES (CONTINUED)

Buried Sandwaves

A quite striking zone of buried sandwaves is seen in the north-central part of Halibut Channel on a north to south line of HUDSON 86-017 data (Plate 1). These sandwaves are about 10 m in amplitude and have a wavelength in the order of 200 m. The 3 km long sequence of 14 or so sandwaves are buried to the north and south under up to 5 m of the Halibut Channel Mud and possibly under some Downing Silt; Downing Silt is certainly in filling the swales between a number of the sandwaves. The central 4 or 5 sandwaves in the sequence outcrop at the seafloor as ridges (Plate 1).

Gordon Fader suggested in the HUDSON 86-017 cruise report that; "These features are probably relict, resulting from strong currents which occurred in Halibut Channel at the time of late Pleistocene lowered sea-level when the adjacent banks were emergent". These currents may have been along-channel tidal currents similar to modern day tidal fluxes in the English Channel. The full extent of this buried sandwave field and its detailed geometry has not been mapped and presents an interesting project. The outcropping sand-ridges stand out on a sidescan sonar and the transparent Halibut Channel Mud and Downing Silt allow the features to be mapped in the subsurface by a Huntec or NSRF deep-towed system. These features should not be confused with buried morainal features seen south of the Avalon Peninsula on one of the 1981 Mobil survey lines (Plate 9).

Buried Channels

These were reported on by Miller _et al_. (1983) and by Fader and Miller (1986a;b) and they interpreted the channels to be filled with stratified glaciomarine sediments or occasionally till. On Whale Bank there are a large number of such channels (Figure 22) and similarly in the Whale Deep(s) area where they are infilled with Downing Silt.

This project did not map the buried channels and they are not shown on the Seabed Features Map. However in some areas of Whale Deep(s) the sidescan clearly showed the Grand Banks Sand and Gravel formation on the seafloor but the Huntec profiler clearly showed Downing Silt in the third dimension. Some of these areas may be linear buried channels and some of the interpreted features show on Enclosure 1 where we developed a separate symbol (and colour) for Downing Silt overlain by a thin veneer of Grand Banks Sand and Gravel.

The orientation and true density or extent of the buried channels are not known; even the origin can only be speculated upon at this point. It has been suggested that the channels may have formed

SEABED FEATURES (CONTINUED)

Buried Channels (continued)

under the glacial ice sheet as opposed to being subaerial erosional channels (Gordon Fader and Ron Boyd, personal communication, 1987). Before the origin can be truly addressed an area of the buried channels must be mapped in detail with a systematic grid of subbottom profiling lines. Such a program should also investigate the relationship of the buried channels to present day or buried, older, shelf-edge canyons.

Buried Morainal Ridges

One of the Huntec profiles kindly provided by Mobil Oil Canada Ltd. from their 1981 survey south of the Avalon Peninsula shows a series of at least a dozen buried morainal ridges at the southend at St. Mary's Bay (Plate 9). The two side-by-side photos of the Huntec profile show a portion of the south to north running Line 3. The morainal ridges are 20 to 30 m in height and are spaced about 300 m apart; the orientation is not known.

The ridges are blanketed by, and the swales are infilled by, Downing Silt formation. One of the ridges may just outcrop and its additional height has affected the local seafloor gradients as a result of incomplete burial and leveling by the Downing Silt.

Plate 9 also shows that at least the 5 southernmost ridges have a zone of lower reflectivity from internal reflectors on the north side of the ridges. This implies that the initial Downing Silt material was preferentially deposited on the north side (lee current side?) of the ridges. The Downing Silt strata show some truncation at the seafloor (eg. at fix 113.2) implying a post-depositional erosional cycle by modern ocean currents.

The detailed geometry of the buried morainal ridge field is not known and it is speculative to suggest an origin at this point. It is tempting however to suggest that the morainal ridges may be the result of deposit from, and periodic interaction with, the toe of the outlet glacier that flowed down, and over-deepened, what would have been the St. Mary's fjord during the glacial period. It is not believed that these are lift off moraines as defined by King and Fader (1986; p. 15 and Figure 8).

We also include Plate 10 farther to the south in the axis of the western part of the Avalon Channel which shows a Huntec profile over probable buried morainal ridges in the Grand Banks Drift blanketed by a thin veneer of Downing Silt.

PLATE 9 (9A, 9B)

PHOTOGRAPH OF TWO ADJACIENT PORTIONS OF THE 1981 MOBIL OIL CANADA LTD., NORTH TO SOUTH, HUNTEC DTS PROFILE ON LINE 3 IN THE SOUTHERN ST. MARY'S BAY. THE PROFILE SHOWS ABOUT A DOZEN MORAINAL RIDGES IN THE GRAND BANKS DRIFT UNDER DOWNING SILT; THE SIDE-SCAN IN THE AREA SHOWED A VERY THIN VENEER OF GRAND BANKS SAND AND GRAVEL DEVELOPED ON TOP OF THE DOWNING SILT. THE TWO PHOTOS COVER THE PROFILE FROM FIX 108.7 IN THE SOUTH TO 118.3 IN THE NORTH ON LINE 3 (ENCLOSURE 7). THE RECORD SWEEP IS 0.125 SECONDS LONG (FULL WIDTH). THE RIDGES ARE ABOUT 20-30 M HIGH AND HAVE A WAVELENGTH OF APPROXIMATELY 300 M.

109 — 115.5
by odd shots

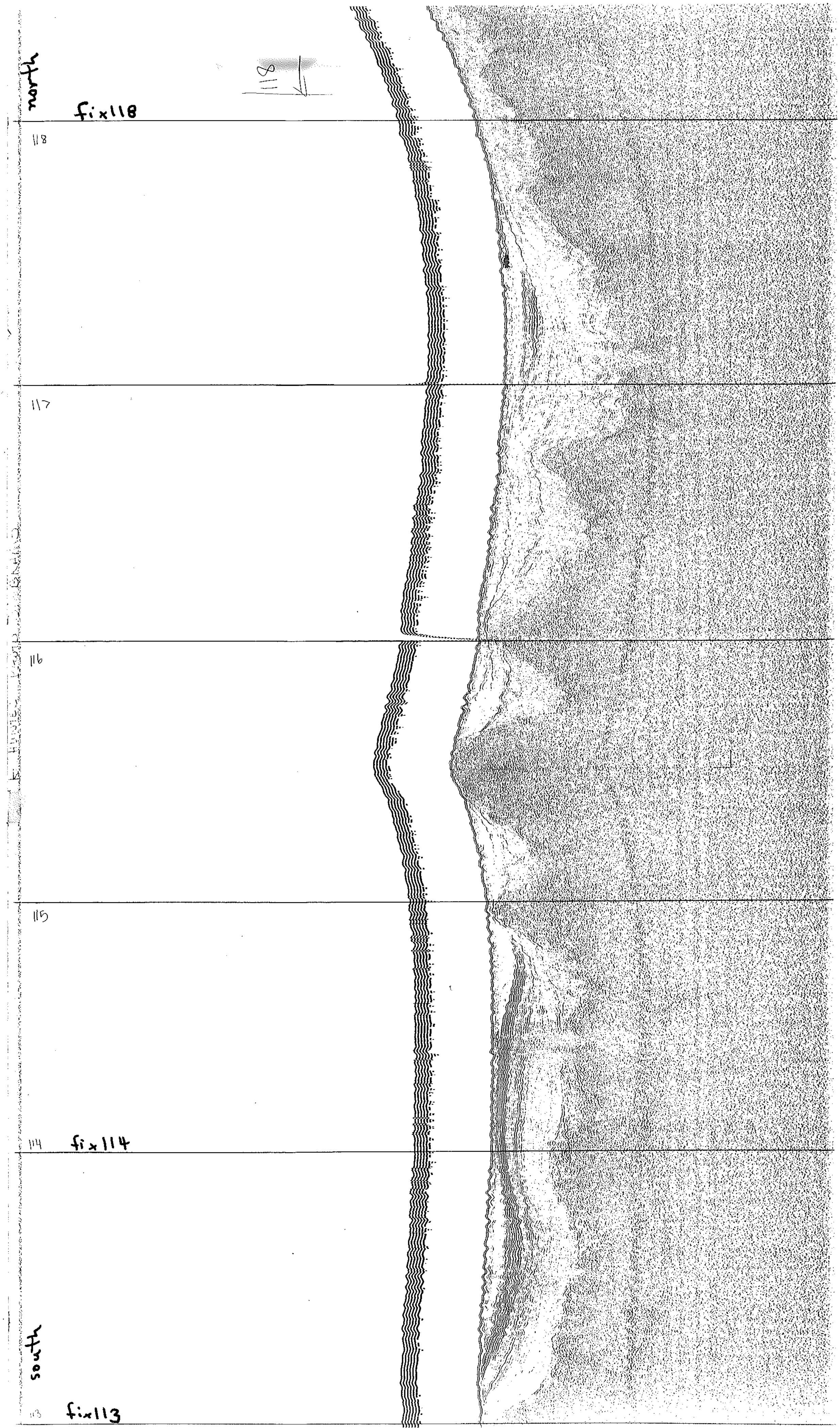
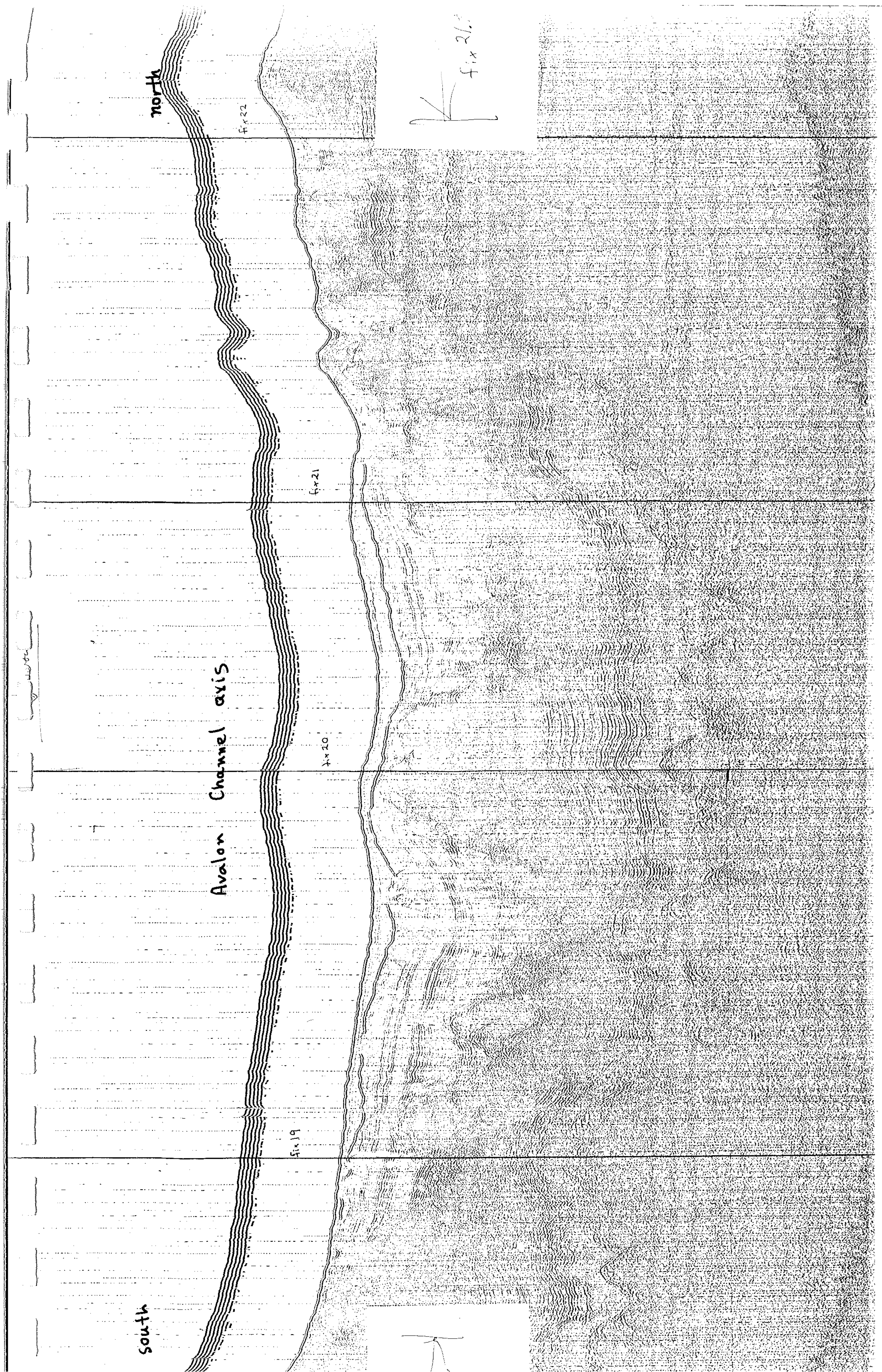

north
fix118
118
117
116
115
114
fix114
south
113
fix113

PLATE 10

PHOTOGRAPH OF A PORTION OF THE NORTH-SOUTH MOBIL OIL CANADA LTD., LINE 3 OF HUNTEC DTS DATA OBTAINED SOUTH OF ST. MARY'S BAY IN THE AXIS OF THE WESTERN PART OF THE AVALON CHANNEL. THE PROFILE COVERS FROM FIX 18.4 IN THE SOUTH TO 22.3 IN THE NORTH ON LINE 3 AND SPANS AN AXIAL TOPOGRAPHIC LOW WITH DOWNING SILT OVERLYING FAINTLY-SEEN, BURIED, MORAINAL RIDGES IN THE GRAND BANKS DRIFT. THIS AREA OF DOWNING SILT IS SHOWN ON ENCLOSURE 1 AS A SOMEWHAT ELONGATED E-W AREA BASED ON THE BATHYMETRY IN METRES OF ENCLOSURE 4. THE RECORD SWEEP IS 0.125 SECONDS LONG (FULL WIDTH).


north
south
Avalon Channel axis
fix 22
fix 21
fix 20
fix 19

SEABED FEATURES (CONTINUED)

Lift-off Moraines

One area of lift-off moraines as portrayed by King and Fader (1986; figures 8, 16b) and as discussed by them in their Bulletin 363 on p. 15 was seen in the northeastern part of Conception Bay. These were seen on a HUDSON 80-010 line. King and Fader (1986; Figure 16b) show two Placentia Bay profiles where lift-off moraines are buried beneath what is now-designated as Downing Silt and Placentia Clay. Quite a number of lift-off moraines are found in the southern part of the Placentia Bay basin. A few others are found at the northern end of Haddock Channel, one spot on northern Whale Bank and in the Whale Deep(s) area. Figure 44 is a portion of King and Fader's (1986) Figure 16a showing the distribution of lift-off moraines on the Grand Banks of Newfoundland.

Shallow Salt Domes

Two of these features were mapped close to the shelf edge in 100 m water depth on the southwest end of two lines of HUDSON 82-039 profiling data at 53°45'W (Enclosure 2). The two locations are about 15 km apart and suggest that there may be a shelf-edge diapiric zone in this area on the southwest edge of Whale Bank.

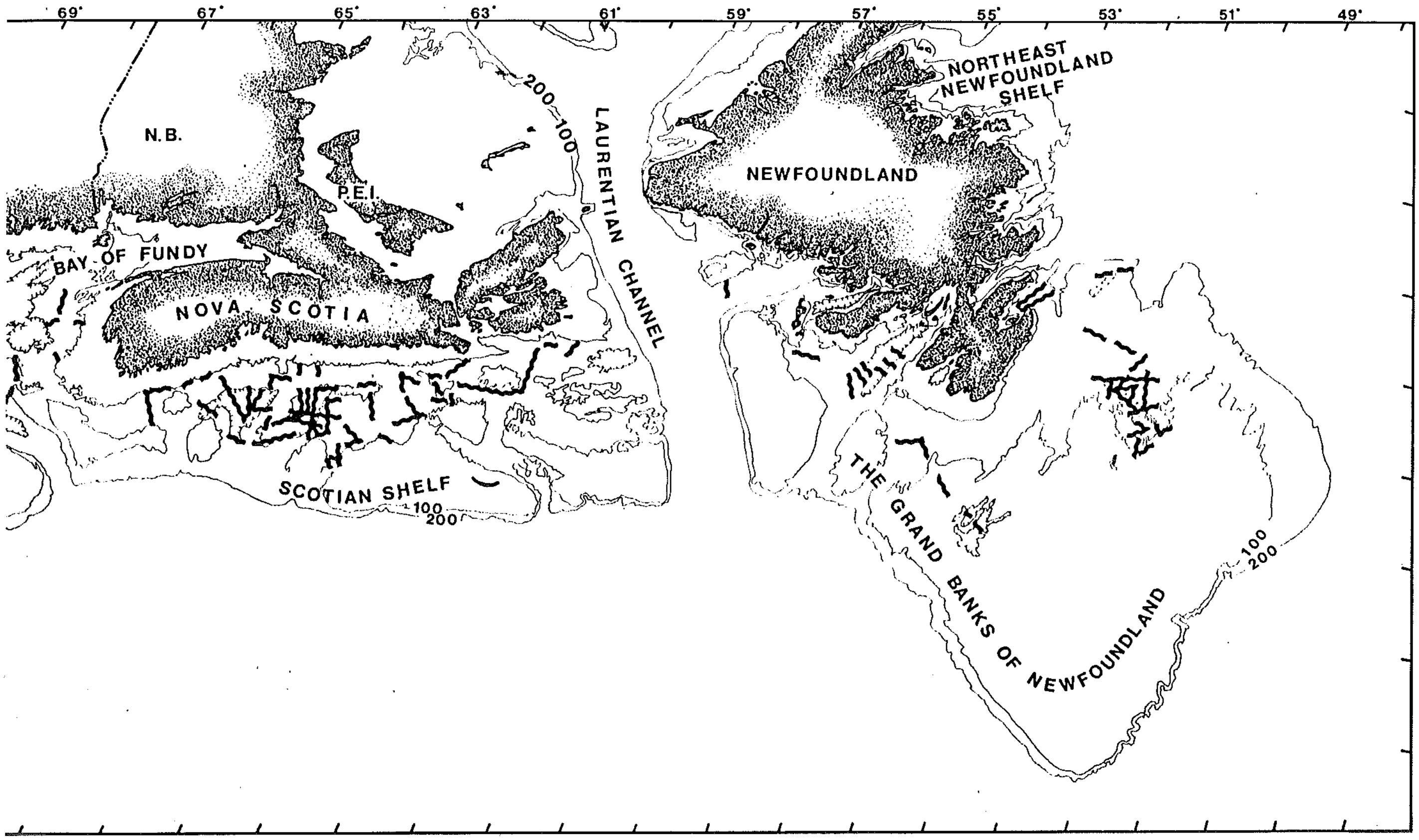
The diapiric zones could just be seen on the Huntec profiler data and on the airgun data. In one case there was a slight topographic high over the diapir and a slight thinning of the overlying quarternary deposit suggesting possible recent uplift of the diapiric structure. The areas of these two diapiric zones are shown on Enclosure 2, the Seabed Features Map.

Triassic Dykes

Papezik _et al_. (1975) first suggested that the extension of the Great Dyke of Nova Scotia crossed the Avalon Peninsula as suggested by the Trans-Avalon Aeromagnetic Lineament (Figure 45). Eventually outcrops were found and a diabase dyke was confirmed (Hodych and Hayatsu, 1980; Papezik and Hodych, 1980). A late Triassic or possibly early Jurassic age was established. The Avalon dyke is known from airborne magnetic data to extend at least 25-30 km offshore into the project area to the northeast of Tors Cove into the Avalon Channel and to extend at least 10 km into St. Mary's Bay to the southwest (Figure 45).

FIGURE 44

PORTION OF KING AND FADER'S (1986) FIGURE 16a ON PAGE 28 OF THEIR BULLETIN 363 SHOWING THE KNOWN DISTRIBUTION OF LIFT-OFF MORAINES ON THE GRAND BANKS OF NEWFOUNDLAND.


69°
67°
65°
63°
61°
59°
57°
55°
53°
51°
49°
N.B.
P.E.I.
BAY OF FUNDY
NOVA SCOTIA
SCOTIAN SHELF
100
200
200
100
LAURENTIAN CHANNEL
NEWFOUNDLAND
NORTHEAST NEWFOUNDLAND SHELF
THE GRAND BANKS OF NEWFOUNDLAND
100
200

SEABED FEATURES (CONTINUED)

Trassic Dykes (continued)

The 1985 airborne magnetic survey of St. Pierre Bank covered portions of Green Bank east to about 54°45'W. This survey mapped two parallel, SW-NE trending dykes that are presumed to be Triassic or early Jurassic in age (personal communication, Bosco Loncarevic, Atlantic Geoscience Centre, 1987) and to reflect breakup geometry somehow. These two dykes diverge slightly and change direction to lie more ENE-WSW at the eastern edge of the 1985 survey (54°45'W). We examined certain of the profiling data and magnetic data along strike to the east of the known dyke aeromagnetic anomalies in an effort to trace the dykes to the east. The 1981 Mobil Oil Canada Ltd. survey was ideally situated to do this.

Unfortunately the magnetic data on the 1981 Mobil survey is virtually useless. The magnetometer fish was trailed far too close to the M/V FOGO ISLE and the effect of the ship's field is dominent and variable. The apparent magnetic trace is very sensitive to noise and real data from geological or other seafloor effects become lost or very difficult to separate out. The apparent magnetic anomalies seen were mapped onto King _et al_'s. (1986) bedrock geology map as a series of black dots (Figure 47); we do not place much faith in them.

Several lines of seismic profiling were briefly examined. One HUDSON 72-009 airgun line showed some suggestions of a hyperbolic reflection such as one might expect over a narrow dyke coming to the surface of the bedrock (Figure 46). The evidence is not convincing however.

King _et al_'s. (1986) offshore bedrock geology map was modified to show both the Trans-Avalon dyke and the two sub-parallel dykes mapped by the St. Pierre airborne program (Figure 47). We also added to the figure the 13 magnetic anomalies and one seismic anomaly mapped but no extension to the east of the two dykes on western Green Bank was attempted.

AGC has since then diverted HUDSON briefly on one of its 1987 transits of the area to run a brief program of north-south sea magnetometer lines on Green Bank. The southernmost of the dykes has clearly been extended another 80 km to the east across Green Bank (personal communication, Bosco Loncarevic, Atlantic Geoscience Centre, 1987), to about 53°30'W (Figure 47).

FIGURE 45

HODYCH AND HAYATSU'S (1980) FIRST FIGURE SHOWING THE LOCATION OF THE TRANS-AVALON AEROMAGNETIC LINEAMENT WHICH HAS BEEN DATED AS A LATE TRIASSIC, OR POSSIBLY AN EARLY JURASSIC, DIABASE DYKE. THE OFFSHORE PORTIONS ARE SEEN ON AVAILABLE AIRBORNE (305 M HEIGHT) MAGNETIC DATA FROM GSC AEROMAGNETIC MAPS G7325 AND G7329 (PAPEZIK *ET AL.*, 1975). THE CONTOUR INTERVAL IS 20 NANOTESLAS (GAMMAS).

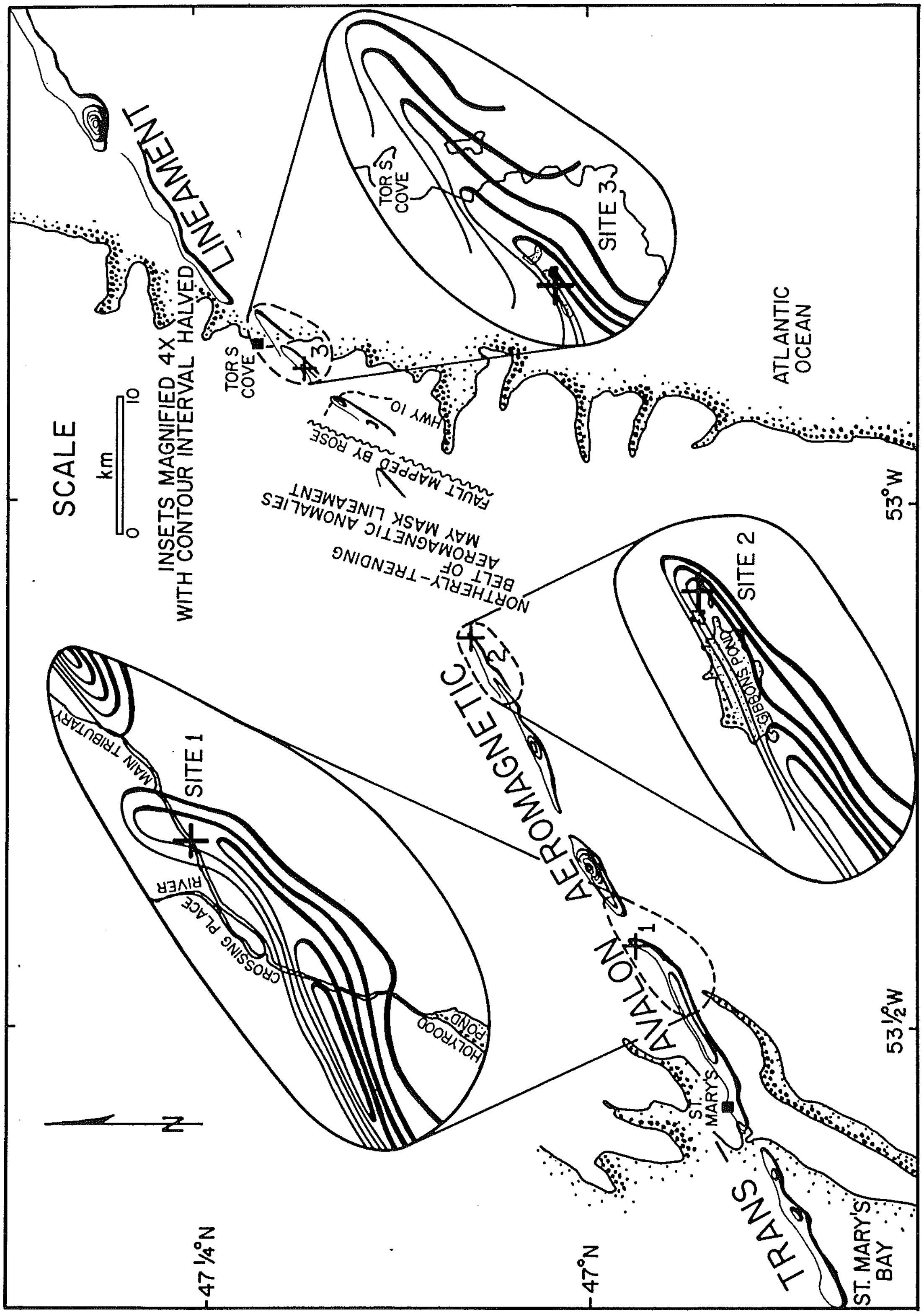

SCALE
km
0
10
INSETS MAGNIFIED 4X WITH CONTOUR INTERVAL HALVED
N
TRANS
AVALON
AEROMAGNETIC
LINEAMENT
SITE 1
MAIN TRIBUTARY
CROSSING PLACE RIVER
HOLYROOD POND
SITE 2
GIBBONS POND
SITE 3
TOR S COVE
ST. MARY'S
ST. MARY'S BAY
NORTHERLY-TRENDING BELT OF AEROMAGNETIC ANOMALIES MAY MASK LINEAMENT
FAULT MAPPED BY ROSE
HWY 10
ATLANTIC OCEAN
47 1/4°N
47°N
53 1/2°W
53°W

FIGURE 46

PORTION OF THE NORTH TO SOUTH HUDSON 72-009 AIRGUN RECORD ON ROLL NO. 6 SHOWING A HYPERBOLIC REFLECTION IN THE BEDROCK JUST BEYOND THE 2230/118 FIX THAT MIGHT INDICATE THE PRESENCE OF A NARROW VERTICAL DYKE INTRUDING TO THE BEDROCK - OVERBURDEN INTERFACE.

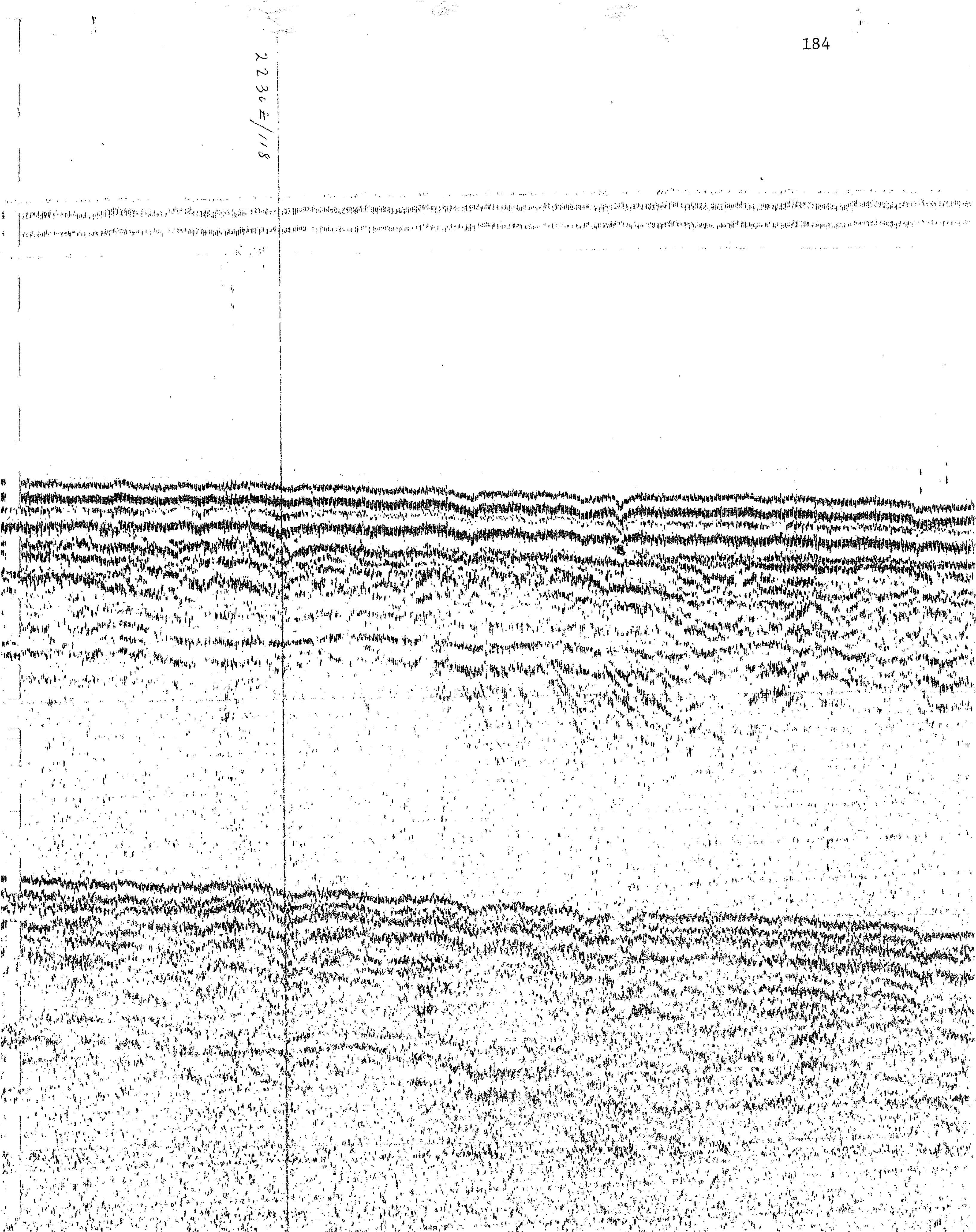
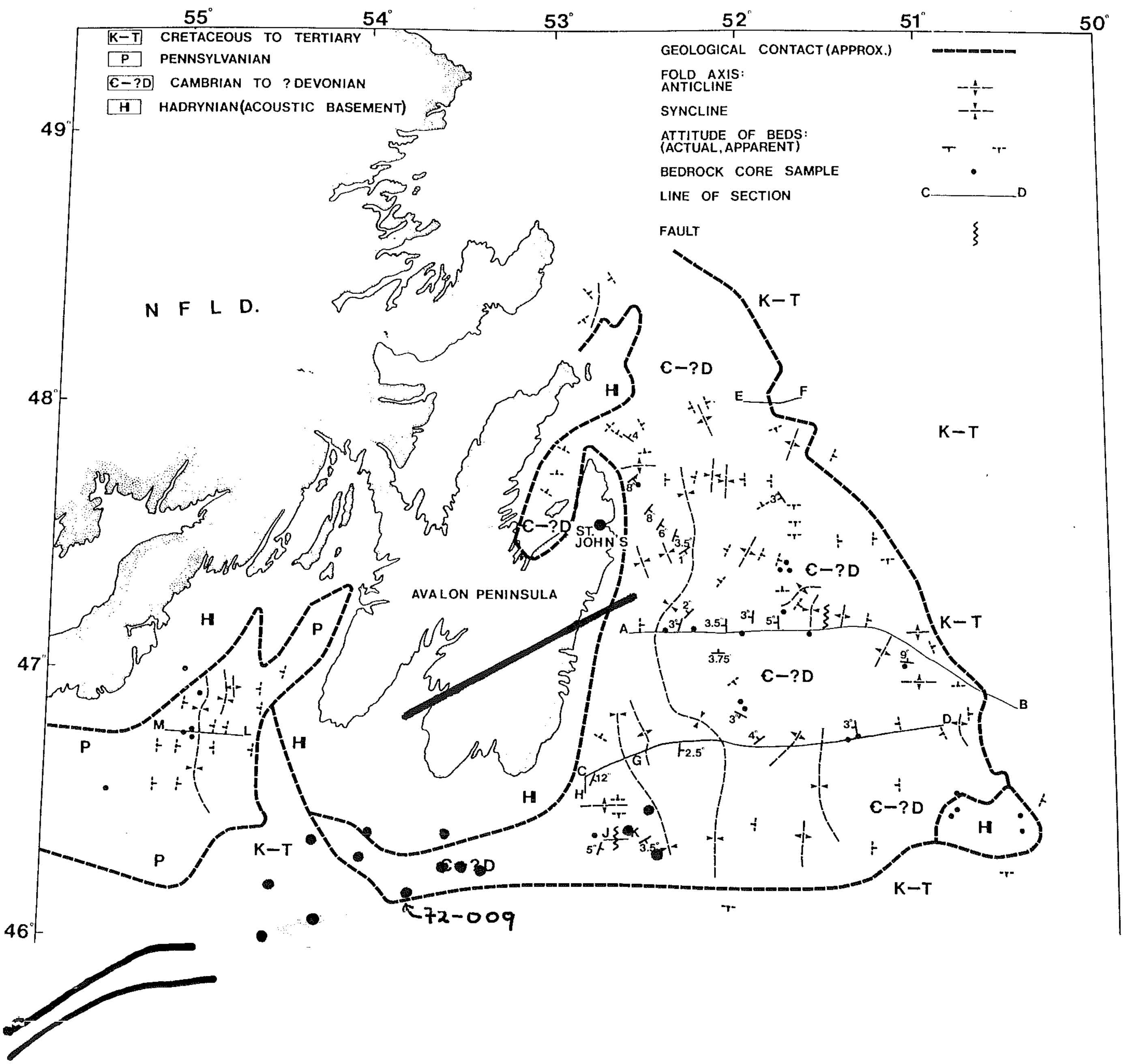

2230Z/118

FIGURE 47

KING *ET AL'S*. (1986) BEDROCK GEOLOGY MAP MODIFIED TO SHOW THE TRANS-AVALON DIABASE DYKE AND THE TWO DYKES MAPPED DURING THE ST. PIERRE BANK SURVEY IN 1985. THE 14 ADDED BLACK DOTS SOUTH OF THE AVALON PENINSULA ARE MAGNETIC ANOMALIES THAT MIGHT POSSIBLY REFLECT THE PRESENCE OF THE DYKE OR IN ONE CASE SHOW THE LOCATION OF A POSSIBLE AIRGUN INDICATION FROM CRUISE 72-009.



55°
54°
53°
52°
51°
50°
49°
48°
47°
46°
K–T CRETACEOUS TO TERTIARY
P PENNSYLVANIAN
Є–?D CAMBRIAN TO ?DEVONIAN
H HADRYNIAN (ACOUSTIC BASEMENT)
GEOLOGICAL CONTACT (APPROX.)
FOLD AXIS: ANTICLINE
SYNCLINE
ATTITUDE OF BEDS: (ACTUAL, APPARENT)
BEDROCK CORE SAMPLE
LINE OF SECTION
FAULT
N F L D.
AVALON PENINSULA
ST. JOHN'S
72-009

SEABED FEATURES (CONTINUED)

Wrecks

The charts used to make up the base map of Enclosure 3 show 5 wrecks in the waters relatively close to the Avalon Peninsula, one south of the Burin Peninsula and one near the shelf edge in the south east quadrant of the project area (Enclosures 3 and 6). During the 1981 Mobil Oil survey south of Trepassey Bay Geonautics/d'Appolonia (1982 interpreted a light "shadow" on the sidescan sonar record from line 15 near the junction with line 20 as that of a wreck (Fix 41.120 to fix 41.170 - see Figure 48). The "shadow" is centered at 46° 21' 11.10"N, 52° 52' 53.49"W about 30 m to the west of the line.

This "shadow" is not entirely convincing and this possible hazard deserves verification before adding it to the charts. The "shadow" has no clear darker causative body evident as one would normally see with a wreck; it could well be a light patch of mud or even very fine sand. The Geonautics/d'Appolonia (1982) report suggests this "wreck" is a "wooden shipwreck" and noted that, "The magnetometer did not show any anomaly over the shipwreck" hence their suggestion that it was wooden. There may have been no magnetic anomaly over the 'shipwreck' because it was nothing more than a small mud patch. We have earlier noted that the magnetometer on this Geonautics/d'Appolonia cruise was improperly towed too close to the vessel and that the data is of very little use.

A second "wreck" was identified on this survey on tie line 20 near the junction with line 17 (Figure 49); and the two "wrecks" show on Figure 30 in an earlier section. The second "wreck" is no more convincing than the first. Geonautics/d'Appolonia do not mention this "wreck" in their report to Mobil Oil. It also shows as a light patch with no darker reflection from a possible causative body (Figure 49).

This "wreck" identified by Geonautics/d'Appolonia (1982) is found from Fix 6.813 to 6.913 and is centered at 46° 18' 49.95"N, 52° 43' 46.95"W about 30 m north of the line (Figure 49). This "shadow" could also be just a patch of mud or fine sand with very low reflectivity and not a "wreck"; it too should be investigated further before placing it on any wreck maps or charts.

There are almost certainly further wrecks in the map area given the World War II loses in the area. We have not consulted or cross-correlated the information on the charts with the Department of Transport lists, the navy's lists or other sources such as fishermen and local knowledge.

FIGURE 48

COPY OF A PORTION OF THE 1981 MOBIL OIL SIDESCAN SONAR RECORD (PORT SIDE) FROM LINE 15 SHOWING WHAT WAS INTERPRETED TO BE A WRECK BY GEONAUTICS/D'AP-POLONIA(1982). THE "SHADOW" ON THE PORT SIDE IS FOUND CENTERED AT 46° 21' 11.10"N, 52° 52' 53.49"W ABOUT 30 M TO THE WEST OF THE LINE. THE RANGE LINES ARE SPACED NOMINALLY 15 M APART.

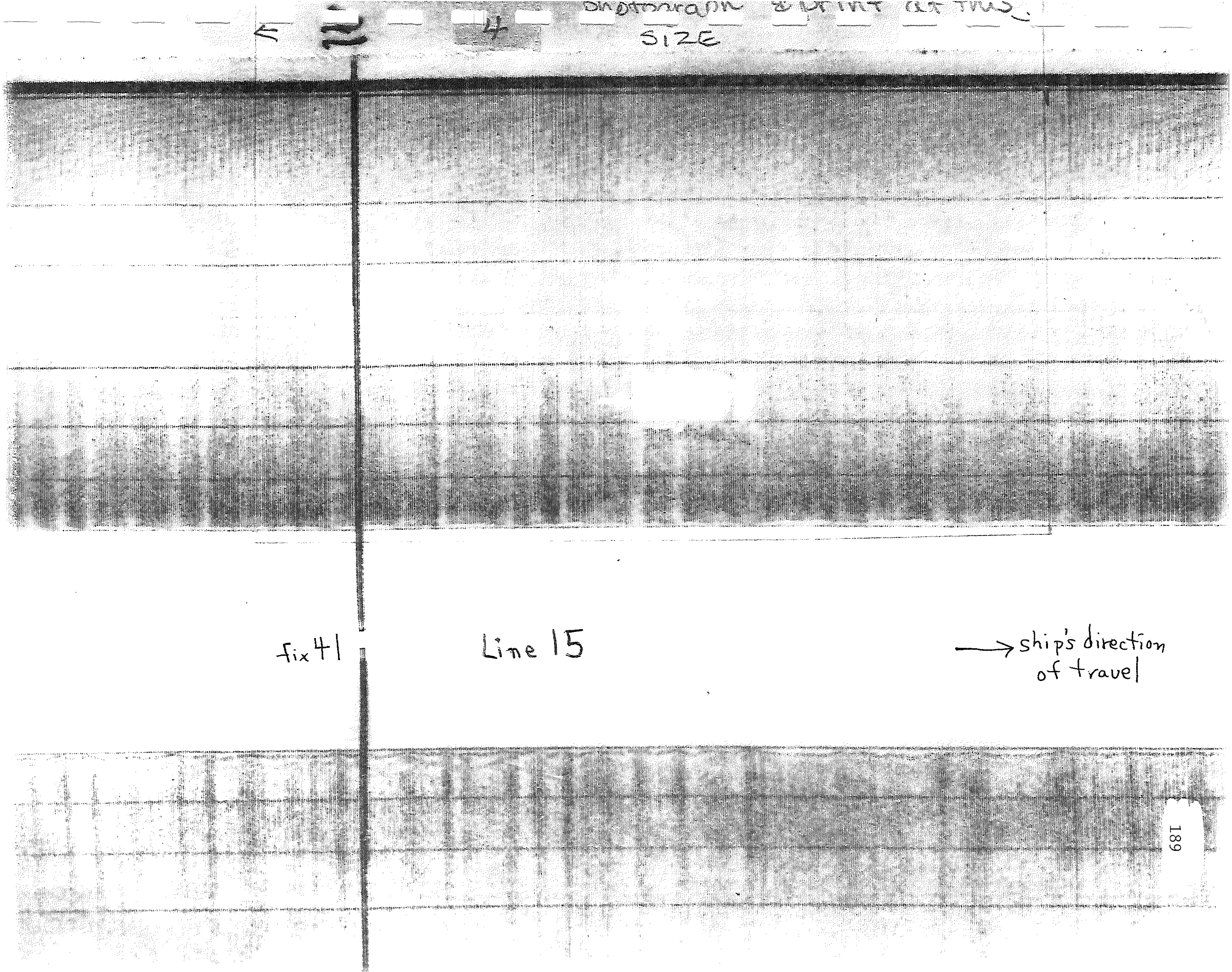
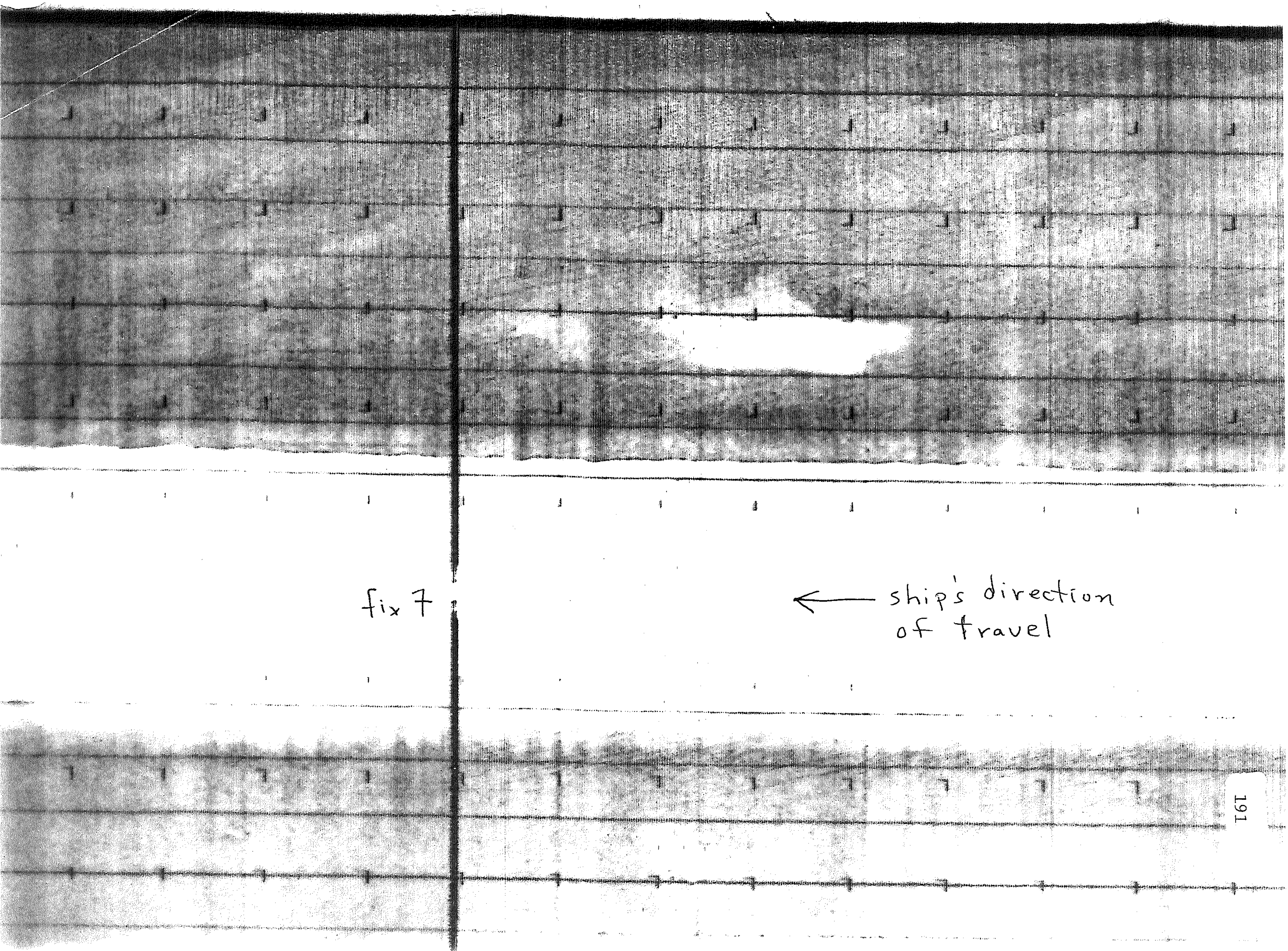

4
SIZE
fix 41
Line 15
ship's direction
of travel

FIGURE 49

COPY OF A PORTION OF THE 1981 MOBIL OIL SIDESCAN SONAR RECORD (STARBOARD SIDE) FROM LINE 20 SHOWING WHAT WAS INTERPRETED TO BE A WRECK BY GEONAUTICS/D'APPOLONIA (1982). THE "SHADOW" ON THE STARBOARD SIDE IS FOUND CENTERED AT 46° 18' 49.95"N, 52° 43' 46.95"W ABOUT 30 M TO THE NORTH OF THE LINE. THE RANGE LINES ARE SPACED NOMINALLY 15 M APART.


fix 7
ship's direction of travel

CONCLUSIONS

Certainly all of the shelf areas north of 45°N in the project area have been glaciated and there is evidence that all the shelf out to the shelf break has been glaciated in this area. A morphological analysis alone indicates that the fjords, the marginal channels and the inter-bank transverse troughs have been glaciated. The widespread occurrence of the proglacial Downing Silt formation in St. Pierre Channel, St. Mary's Bay, Conception Bay, north-central Halibut Channel and in the Whale Deep(s) area indicates a floating glacial iceshelf above and nearby grounded glacial ice. Lift-off moraines in southern Placentia Bay, northeast Conception Bay, northern Haddock Channel and Whale Deep(s) are another indicator of grounded glacial ice. Buried moraines in southern St. Mary's Bay and the possible lateral moraine seen in Comus Ridge are other indicators. The significant field of buried (sub-ice) channels on Whale Bank and around Whale Deep(s) are yet other indications of glaciation.

The same seismostratigraphy established and calibrated on the Scotian Shelf by AGC appears to hold throughout the project area though the formation names applied in this report have been altered to the newly-defined series for the Grand Banks. Two new formation names were introduced for a Holocene mud formation found locally along the axis of northern Halibut Channel (Halibut Channel Mud) and for a shelf-edge Holocene muddy sand deposit that stretches from the Tail of the Bank to Whale Bank along the southwest edge of Grand Bank (Tail of the Bank Mud).

The field of megaflutes and related ovoid current scour depressions in the Placentia Clay along the east side of the deep channel in Placentia Bay appear from their shape to have been cut by a NNE-to-SSW-moving bottom current. There is a possibility that these features were cut on November 18, 1929 during the tsanami that resulted from the 7.2 earthquake that occurred on that date in the Laurentian Slope Seismic Zone (LSP). The Halibut Channel Mud has been suggested as being the fallout from that catastrophic November 18, 1929 event.

Modern day iceberg scouring (and iceberg pitting) can occur anywhere north of 45°N in the area but the most intense scouring occurs in the Avalon Channel through to the north end of Haddock Channel. The most intense area of iceberg pits is found on the east side of the Avalon Channel where the thickness of overburden above bedrock is very thin. A large field of small pockmarks occurs in northern Halibut Channel on the Halibut Channel Mud formation; other gas escape features are seen in the area and as well gasified sediments are seen in the subsurface profiles.

CONCLUSIONS (CONTINUED)

Green Bank and the area around Whale Deep(s) appear to be the most active areas for sediment transport. Numerous bedforms are seen on the sidescan sonograms in these areas. Farther west in Halibut Channel between Green Bank and St. Pierre Bank a zone of buried sandwaves is found beneath a thin veneer of Halibut Channel Mud. These may be relict tidally-formed sandwaves that formed during the low stand of sealevel.

Other researchers at AGC have earlier established that the low stand of sealevel in the project area was at about 90 m in the Placentia Bay area and at about 100 m in the south-eastern part of the project area, Only a limited textural analysis has been carried out to date to assess the low stand and to assist in the adjustment of the formation boundaries on the surficial geology map.

This report and its compiled index maps, surficial geology map and seabed features map can only be considered an interim step to a full analysis of the project area. Textural analysis of all the samples and further work on the subsurface relationships will modify the geological boundaries somewhat but we would expect that the maps of Enclosures 1 and 2 will be closely reflected in any final maps.

RECOMMENDATIONS

The additional samples should be processed for grainsize data and then the textural data may be used to refine the geological boundaries on the Surficial Geology Map (Enclosure 1). Similarly the detailed textural analysis and assessment of clast roundness will allow one to refine the estimated 90 to 100 m maximum depth of the Pleistocene still stand of sealevel.

Every effort should be made to recover geophysical and geological data gathered by the NICOS 1982-1986 cruises in the area to further refine the geological boundaries in the various fjords. BIO should develop a firm requirement for the submission of full cruise reports and for the eventual return and archival of data from cruises on its vessels sponsored by outside, non-BIO, agencies. BIO/AGC offer a continuity that just cannot be found at universities and at other such potential users of shiptime.

The Atlantic Geoscience Centre should consider setting up a data base to hold the results of bottom sampling carried out by non-BIO agencies. The format could be itentical to the SID database used

RECOMMENDATIONS (CONTINUED)

for AGC's own samples, but would hold the data gathered by oil companies during wellsite surveys, pipeline route surveys and environmental assessments, by private consultants and by mining or other resource firms.

There are several areas of the project area which might profit from additional survey data. If NICOS data cannot be recovered or is insufficient then Trinity Bay, Conception Bay, the northern parts of Placentia Bay and the upper parts of Fortune Bay and Belle Bay should have additional Huntec or NSRF V-fin data gathered in them. The buried sandwaves, in the north central Halibut Channel, the buried sub-ice(?) channels of the Whale Bank and Whale Deep(s) area, the buried morainal ridges in southern St. Mary's Bay and the limits of the Tail of the Bank Mud would all profit from additional survey data. These surveys should not be at the reconnaissance level, but rather should be a series of carefully-positioned lines, preferably in a rectalinear grid.

ACKNOWLEDGEMENTS

In a project as broad as this that perforce must cover the work of many cruises and their crews and chief scientists, there is an almost endless list of persons responsible for the data - suffice to say that the ship's and scientific crews, the captains and the chief scientists of all the cruises listed in the cruise report section following the references deserve recognition for their input on cruises in the project area over the past 30 years.

Likewise, the data section of the Atlantic Geoscience Centre and the Library at BIO deserve credit for their archiving of the cruise data. Andy Sherin, Iris Hardy, Lyall Fisher and Susan Merchant all played a role including two different sets of contract personnel in the sediment sample repository at AGC. We would particularly like to recognise Larry Johnson in the Data Section whose facility and readiness to manipulate his data base was most helpful. The Library at BIO is the only real repository of cruise reports and there was an interactive process between the senior author and Betty Sutherland and her staff at the BIO Library to locate, and at times to replace, all the cruise reports that concerned the project area. As a result, the Library has become involved in a process that should lead to a better and more permanent collection of BIO cruise reports. Judith Whittick, the librarian at C-CORE's Ocean Engineering Information Centre at Memorial University of Newfoundland, was helpful to recover Memorial cruise reports.

In chasing sample data, we also had occasion to seek help from Chloe Younger at Dalhousie University's Department of Geology's

ACKNOWLEDGEMENTS (CONTINUED)

Sample Repository and interacted briefly with Professor W. Roger Doyle, Charlie Wall and Tom Duffet at Dalhousie and Jeff M. Clarke who used to be at Dalhousie. Doug Loring, Russ Parrott, Dave McKewon, Mike Lewis and Dave Mosher at AGC assisted in this regard as did Vic Gaudet, Burt Smith and Gary Henderson at CHS at BIO. Graham King and Kirk MacDonald at Technical Records at CHS at BIO were particularly patient as we engaged in the difficult task of running the various older CHS 12 kHz sounding and sampling data sets to ground. In the final throes of the project, Steve Hart of the AGC Sediment Repository contract team was particularly helpful in dealing with problem samples or possible errors in the SID system.

In seeking data from one early SACKVILLE cruise, we profited from the help of Commanders J.M. Barlow and A. Sinclair of C.F.B. Stadacona and Glen Wright of the Directorate of History in DND, Ottawa. Likewise, Frank Chambers, former chief pilot of PISCES IV, provided some logs of dives where documentation at BIO was thin.

Jim Ransom of Mobil Oil Canada Ltd. in St. John's was most cooperative and it was through his efforts that the raw data from the Geonautics/d'Appolonia 1982 cruise were provided for use in the project. He also provided copies of portions of the Geonautics/d'Appolonia interpretative report. Bud Hodgson of Nordco assisted to find a small missing section in the log in the report and to sort out other uncertainties. Professors John Allen, T.R. Chari and J. Ross Peters at Memorial University of Newfoundland were helpful when queries came up re the first phase of Memorial cruises sponsored by the Ocean Engineering Group.

In seeking sample or track data from the second phase of Memorial cruises sponsored by the Newfoundland Institute for Cold Ocean Science (NICOS), we were faced with a near-complete lack of documentation; there are few cruise reports and almost no track plots, etc., etc. There was no response from NICOS itself and we were forced to depend entirely upon personal contacts. To this end, we would like to thank in particular Professor Steve Macko and one of the geology students, Catherine Troke, along with other Honours and M. Sc. students who provided Professor Macko data. Professors Alex Hay, Jim Wright, John Gale, Ali Aksu, Hugh Miller and Elliot Burden also all assisted where they could.

We also spent time seeking the 1972-1975 data from Conception Bay and Placentia Bay. Professors Chris Barnes and Noel James put us in touch with Roger Slatt, now a geochemist at ARCO at Plano, Texas and he assisted, along with the County of Halifax Assessment Department to help us locate the husband and wife team of Charles F. Stehman and Joan Willey. The effort was worth it because they have enabled us to almost fully recover the Placentia Bay data set and to place much of the early data in the AGC data archives. Tony Duarte and David

ACKNOWLEDGEMENTS

Press at the Department of Earth Sciences at Memorial were also consulted in this process.

More oil company data were available in the project area than originally suspected. Judith MacIntyre at the Canada-Newfoundland Oil and Gas Board assisted here. However, we hit a gold mine when Jim H. Swift, Regional Geological Supervisor at Amoco Canada Petroleum Company in Calgary responded to our late 1986 letter of inquiry. Mr. Swift was involved from the beginning of the Pan American work on Grand Banks (now Amoco) and he was a storehouse of knowledge about the early programs , whereas there is none of that continuity at COGLA or for that matter at AGC. With Mr. Swift's help, we were able to recover much information on the early corehole and borehole programs and were able to start a process that eventually placed certain data from the full 3160 piston core program of 1969 in the AGC archives. There was no mandatory deposit of data with the Resource Management Branch (now COGLA) in 1969 and Amoco is to be commended for seeing to the safe deposit of these data at AGC in 1987.

We received assistance from Dave Monahan, Dick MacDougall and John Warren of CHS in Ottawa in obtaining autopositive copies of the 14 Natural Resource Maps that covered the project area. The mosaic of NRM's, reduced to 1:350,000 (Enclosure 4), provides the best picture of the bathymetry of the project area to date.

We were dependent on an almost daily basis for assistance in locating and replacing data, logbooks, etc., on Mr. Bob Miller of the Atlantic Geoscience Centre. We shared space with his projects and appreciated his ongoing cooperation and good humour in what is now a smokefree environment. We occassionally shared space and ideas with John Burns of Saint Mary's University and Eric LeGresley of Queens University who were both working on theses concerning aspects of the project area. Dan Praeg who did the first compilation of available data in early 1986, is to be recognised for his assistance in the early part of the project.

The two authors would particularly like to thank Gordon Fader, the Scientific Authority, whose outer office they also shared, for his constant interest and willingness to stop and interact with the interpretations. He is a patient and sympathetic teacher. The senior author would like to recognise Ms. Edna Wilson for her early part in responding to this teaching and reaching the completion of her part of the project promptly. The senior author takes full responsibility for the severe delays that beset the final maps and final report. DSS personnel Mary A. MacLellan and Russ Comeau and AGC's Dr. Michael J. Keen and Dr. David Piper are to be recognised for enduring and dealing with these delays.

ACKNOWLEDGEMENTS (CONTINUED)

The senior author would like to recognise his own staff for completing the final report. Linda O'Shea and Sonya Partridge addressed what turned out to be a massive, oversized and complicated table in Appendix 16 and Gerry Hickman and to a lesser extent Sonya Partridge saw the report into its final form. Francis Kelly did all the drafting and, in a long iterative process, saw Enclosure 6 through all its adjustments, corrections and additions as more bottom sample data kept being turned up.

We owe a debt of gratitude to all the above persons. The long list only demonstrates the thesis of the sociologist Robert K. Merton that we build, "on the shoulders of giants".

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Piper, David J.W. 1981. Cruise Report, DAWSON 81-044, 3-15 December 1981, Scotian Slope and Uppermost Laurentian Fan. Atlantic Geoscience Centre, Geological Survey of Canada; Bedford Institute of Oceanography, Unpublished manuscript, 4 pp. without index maps.

Cruise 81-045, CSS HUDSON
Lewis, C.F.M. 1981. Cruise Summary. Atlantic Geoscience Centre, Bedford Institute of Oceanography, Unpublished manuscript, 5 pp. including 2 pp. Technicians Report, without index map.

Cruise 81-054, M/V PANDORA II (PISCES IV)
Fader, Gordon B. 1981. Cruise Report No. 81-054, M/V PANDORA II (PISCES IV), August 26 - September 8, 1981. Atlantic Geoscience Centre, Bedford Institute of Oceanography, 6 pp. including index map, unnumbered.
Chambers, Frank, et al. 1981. PANDORA II logs, 81-054, PISCES Log Sheets. Unpublished manuscript, 28 pp., unnumbered.

Cruise 82-012, CSS DAWSON
Haedrich, Dick L. 1982. (no cruise report available, no cruise summary available, no index map available, NICOS cruise).

LIST OF BEDFORD INSTITUTE OF OCEANOGRAPHY CRUISE REPORTS OF VESSELS THAT WORKED IN THE PROJECT AREA (CONTINUED)

Cruise 82-012 CSS DAWSON (continued)

Anonymous. 1982. Institute Facility, Sailing Instructions. 1 p. plus memo of April 12, 1982 from R.L. Haedrich, director, Newfoundland Institute for Cold Ocean Science, Memorial University of Newfoundland, St. John's, Newfoundland to A.L. Adams, BIO, 2 pp., without index map to proposed cruise (NICOS cruise).

Cruise 82-013, CSS DAWSON

Miller, Hugh G. 1982. (no cruise report available, no index map available, NICOS cruise).

Miller, Hugh G. 1982. DAWSON cruise, 82-013, Underwater Gravity Survey. Department of Earth Sciences, Memorial University of Newfoundland, St. John's, Newfoundland, June 1, 2 pp. without index map (NICOS cruise).

Cruise 82-039, CSS BAFFIN

Swim, M.G. (Bud). 1982. Cruise Summary. Canadian Hydrographic Service, Bedford Institute of Oceanography, Unpublished manuscript, 6 pp. including index map.

Miller, Robert. 1982. BAFFIN - 82-039 (Phase II), Multidiscipline survey south of Newfoundland. Atlantic Geoscience Centre, Bedford Institute of Oceanography, unpublished manuscript, December 23, 1 p.

Miller, Robert O., Ron Macnab, C.L. Amos and Gordon B. Fader. 1982. Canadian east coast multiparameter survey, 1982, Projects 730081, 730072 and 800036. Atlantic Geoscience Centre, Unpublished manuscript, 9 pp. including abstract index map, unnumbered.

Cruise 83-014, CSS DAWSON

Miller, H.G. 1983. DAWSON Cruise 83-014, Cruise Report. Department of Earth Sciences, Memorial University of Newfoundland, St. John's, Newfoundland, Unpublished manuscript, June 22, 4 pp. plus Huntec ('70) Ltd. report of 15 pp., unnumbered (NICOS cruise).

Belliveau, Michael. 1983. Final Cruise Report No. 1, C3315, CSS DAWSON, June 11-16, 1983. Huntec ('70) Ltd., Dartmouth, Nova Scotia, Report No. H8306-83/C3315/MB, 15 pp., unnumbered (NICOS cruise).

Cruise 83-017, CSS HUDSON

Manchester, K.S., and B.D. Loncarevic. 1983. Cruise Report No. 83-017, CSS HUDSON, Phase I, June 7 - June 21, 1983; Phase II, June 22 - July 5, 1983. Atlantic Geoscience Centre, Bedford Institute of Oceanography, Unpublished manuscript, 19 pp. including index map of Phase II but no index map of Phase I.

LIST OF BEDFORD INSTITUTE OF OCEANOGRAPHY CRUISE REPORTS OF VESSELS THAT WORKED IN THE PROJECT AREA (CONTINUED)

Cruise 83-043, CSS HUDSON
Hay, Alex E. 1983. Cruise Report. Newfoundland Institute for Cold Ocean Sciences. Memorial University of Newfoundland, St. John's, Newfoundland, Unpublished manuscript, 3 pp. including 1 p. 'Cruise Summary' sheet and approximate index map (NICOS cruise).

Cruise 83-013 (originally 83-110) CFAV QUEST
Keen, Charlotte E. 1983. Cruise Report, QUEST 83-110, May 25 - June 7, 1983. Atlantic Geoscience Centre, Bedford Institute of Oceanography, Unpublished manuscript, 34 pp. including index map, partly unnumbered.

Cruise 84-003, CSS DAWSON
Bidgood, Don E. T. 1984. Cruise Report DAWSON 84/003, Atlantic coastal waters. Nova Scotia Research Foundation Corporation, Unpublished manuscript, July, 19 pp. including index maps and 'Report on AGC Component of Cruise 84-003'. by David J.W. Piper, unnumbered.

Cruise 84-020, CSS DAWSON
Miller, Hugh. 1984. Cruise Report, DAWSON Cruise 84-020, Memorial University, June 21 - July 7. Newfoundland Institute for Cold Ocean Science, Memorial University of Newfoundland, Unpublished manuscript, 6 pp. including index map (NICOS cruise).

Cruise 84-021, CSS HUDSON
Keen, Charlotte E. 1984. Cruise Report, HUDSON 84-021. Atlantic Geoscience Centre, Bedford Institute of Oceanography, Unpublished manuscript, 25 pp. including index maps.

Cruise 84-024, CSS HUDSON
Lewis, C.F. Mike. 1984. Cruise Summary. Atlantic Geoscience Centre, Bedford Institute of Oceanography, Unpublished manuscript, 4 pp. including index map.

Cruise 84-040, CSS HUDSON
Piper, David J.W. 1984. Cruise Report, HUDSON 84-040, St. Pierre Slope - Laurentian Fan - Scotian Slope. Atlantic Geoscience Centre, Geological Survey of Canada, Bedford Institute of Oceanography, Unpublished manuscript, 32 pp. including index map and report by Alexander Shor on SEAMARC, mainly unnumbered.

Cruise 84-050, CSS DAWSON
Haedrich, Dick L. 1984. (no cruise report available, no cruise summary available, no index map available, NICOS cruise).

LIST OF BEDFORD INSTITUTE OF OCAENOGRAPHY CRUISE REPORTS OF VESSELS THAT WORKED IN THE PROJECT AREA (CONTINUED)

Cruise 85-001, CSS HUDSON

Piper, David J.W. 1985. Cruise Report, HUDSON 85001. Atlantic Geoscience Cent_e, Bedford Institute of Oceanography, Unpublished manuscript, 8 pp. including index map.

Cruise 85-005, CSS HUDSON

Fader, Gordon B.J. 1985. Cruise Report, 85-005, C.S.S. HUDSON, March 31 - April 24, 1985, Grand Banks of Newfoundland. Atlantic Geoscience Centre, Bedford Institute of Oceanography, Unpublished manuscript, 34 pp. including index map and reports by David L. McKeown.

Fader, Gordon B. 1985. Cruise Summary. Atlantic Geoscience Centre, Bedford Institute of Oceanography, Unpublished manuscript, 9 pp. including index maps and Technician Field Report by J. Cournoyer.

Cruise 85-009, CSS BAFFIN

Henderson, Gary W. 1985. Cruise Summary. Canadian Hydrographic Service, Bedford Institute of Oceanography, Unpublished manuscript, 2 pp. including index map, (no cruise report available).

Cruise 85-022a, CSS DAWSON

Haedrich, Dick L. 1985. (no cruise report available, NICOS cruise).

Haedrich, Dick L. 1985. Cruise Summary. Newfoundland Institute for Cold Ocean Science, Memorial University of Newfoundland, St. John's, Newfoundland, Unpublished manuscript, 2 pp. including approximate index map (NICOS cruise).

Cruise 85-022b, CSS DAWSON

Wright, James. 1985. Cruise Report, CSS DAWSON, 7-12 August, northeast Newfoundland coast. Newfoundland Institute for Cold Ocean Science, Memorial University of Newfoundland, St. John's, Newfoundland, Unpublished manuscript, 10 pp. including index map (NICOS cruise).

Cruise 85-057, M/V PANDORA II (PISCES IV)

Fader, Gordon B.J. 1985. Cruise Report No. 85-057, M/V PANDORA II, PISCES IV, June 30 - July 13, 1985. Atlantic Geoscience Centre, Bedford Institute of Oceanography, Unpublished manuscript, 18 pp. including index map.

Cruise 85-059, M/V PANDORA II (PISCES IV)

Piper, David J.W. 1985. Cruise Report PANDORA 85-059. Atlantic Geoscience Centre, Bedford Institute of Oceanography, Unpublished manuscript, 24 pp. including index map, unnumbered.

Cruise 86-013, CSS HUDSON

Reid, Ian. 1986. Cruise Report, HUDSON 86-013. Atlantic Geoscience Centre, Bedford Institute of Oceanography, Unpublished manus-

LIST OF BEDFORD INSTITUTE OF OCEANOGRAPHY CRUISE REPORTS OF VESSELS THAT WORKED IN THE PROJECT AREA (CONTINUED)

Cruise 86-017, CSS HUDSON

Fader, Gordon B.J. 1986. Cruise Report 86-017, CSS HUDSON, June 19 - June 28, 1986. Atlantic Geoscience Centre, Bedford Institute of Oceanography, 49 pp. including index map and report by Bosko D. Loncarevic entitled 'CIGAL_3_2, Cruise Report HUDSON 86-017'.

Cruise 86-018, CSS HUDSON

Parrott, D. Russ and C.F. Mike Lewis (editors). 1986. Cruise Report HUDSON 86-018, Grand Banks of Newfoundland and Flemish Pass, July 2 - 14, 1986. Atlantic Geoscience Centre, Bedford Institute of Oceanography, Unpublished manuscript, 51 pp. plus appendices and including index maps.

Cruise 86-026, Leg 1, CSS DAWSON

Miller, H. 1986. (no cruise report available, no cruise summary available, no index map available, NICOS cruise).

Miller, H. 1986. Cruise Report, DAWSON Cruise 86-026, Phase 1, August 21-September 2. Newfoundland Institute for Cold Ocean Sciences, Memorial University of Newfoundland, St. John's, Newfoundland, Unpublished manuscript, 2 pp. without index map, not yet submitted to BIO (NICOS cruise).

Cruise 86-026, Leg 2, CSS DAWSON

Haedrich, Dick L. 1986. (no formal cruise report available, no cruise summary available, no index map available, NICOS cruise).

Parsons, Art. 1986. Sailing Instructions. Bedford Institute of Oceanography, Unpublished manuscript, 5 pp. withouth index map (NICOS cruise).

APPENDICES

APPENDIX 1

Chronological list of the BIO cruises in the map area for which there are BIO or Klein sidescan sonar data held by the Atlantic Geoscience Centre plus a printout from the Atlantic Geoscience Centre data base listing the BIO sidescan file for each cruise including the Julian day numbers for which there are data.

APPENDIX 1

CHRONOLOGICAL LIST OF THE BIO CRUISES IN THE MAP AREA FOR WHICH THERE ARE BIO OR KLEIN SIDESCAN DATA

VESSEL	CRUISE NO.	A.G.C. DATA BASE FILE NUMBER
HUDSON	73-006	054
HUDSON	75-009	124
HUDSON	77-011	040
HUDSON	78-012	044
HUDSON	78-023	056
HUDSON	79-011	102
HUDSON	80-010	099
BAFFIN	81-012	073
HUDSON	81-045	111
BAFFIN	82-039	094
DAWSON	83-014	132
HUDSON	83-017	137
DAWSON	84-003	139
HUDSON	84-024	143
HUDSON	85-005	159
PANDORA II	85-057	170
HUDSON	86-017	163

Note: HUDSON 83-017 has SEAMARC sidescan data.
DAWSON 84-003 has NSRF V-fin sidescan data.

SEARCH PARAMETER = B.I.O. SIDESCAN

NO. OF CRUISES BEING SEARCHED = 190

SELECTED AREA

43 DEG 58 MIN - 47 DEG 55 MIN NORTH

51 DEG 45 MIN - 55 DEG 30 MIN WEST

FILE 40 = 77-011 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

149 151 152

FILE 44 = 78-012 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

136 137 138 139 140 141 142 144 145 146
147 148 149

FILE 54 = 73-006 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

186 187 188 189 190 191

FILE 56 = 78-023 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

221

FILE 73 = 81-012 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

146 147

FILE 94 = 82-039 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

335 336 337 338 340 342

FILE 99 = 80-010 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

116 117 118 127 128 129 132

FILE102 = 79-011 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

147 149

FILE111 = 81-045 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

308

FILE124 = 75-009 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

118 127

FILE132 = 83-014 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

164 165 166

FILE139 = 84-003 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

65

FILE143 = 84-024 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

170 171 172 173 174

FILE159 = 85-005 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

90 91 102 103 104 111 112

FILE163 = 86-017 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

170 171 172 173 174 175 176 177 178

FILE170 = 85-057 PANDORA II

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

181 182 187 188

APPENDIX 2

Chronological list of the BIO cruises in the map area for which there are SEAMARC sidescan sonar data held by the Atlantic Geoscience Centre plus a printout from the Atlantic Geoscience Centre data base listing the SEA MARC Sidescan file for each cruise including the Julian day numbers for which there are data.

APPENDIX 2

CHRONOLOGICAL LIST OF THE BIO CRUISES IN THE MAP AREA FOR WHICH THERE ARE SEAMARC SIDESCAN DATA

VESSEL	CRUISE NO.	A.G.C. DATA BASE FILE NUMBER
HUDSON	83-017	137

SEARCH PARAMETER = SEA MARC

NO. OF CRUISES BEING SEARCHED = 190

SELECTED AREA

43 DEG 58 MIN - 47 DEG 55 MIN NORTH

51 DEG 45 MIN - 55 DEG 30 MIN WEST

FILE137 = 83-017 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

171

APPENDIX 3

Chronological list of the BIO cruises in the map area for which there are Huntec deep-towed boomer data held by the Atlantic Geoscience Centre plus a print out from the Atlantic Geoscience Centre data base listing the Huntec file for each cruise including the Julian day numbers for which there are data.

APPENDIX 3

CHRONOLOGICAL LIST OF THE BIO CRUISES IN THE MAP AREA FOR WHICH THERE ARE HUNTEC DEEP TOWED BOOMER DATA

VESSEL	CRUISE NO.	A.G.C. DATA BASE FILE NUMBER
HUDSON	75-009	124
HUDSON	77-011	040
HUDSON	78-008	042
HUDSON	78-012	044
HUDSON	78-023	056
HUDSON	79-011	102
HUDSON	80-010	099
HUDSON	81-045	111
PANDORA II	81-054	154
BAFFIN	82-039	094
DAWSON	83-014	132
HUDSON	84-024	143
HUDSON	85-001	156
HUDSON	85-005	159
DAWSON	85-037	155
HUDSON	86-017	163
HUDSON	86-018	164

SEARCH PARAMETER = HUNTEC DTS

NO. OF CRUISES BEING SEARCHED = 190

SELECTED AREA

43 DEG 58 MIN - 47 DEG 55 MIN NORTH

51 DEG 45 MIN - 55 DEG 30 MIN WEST

FILE 40 = 77-011 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

139 140 141 149 151 152

FILE 42 = 78-008 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

124 125 126 127 128 131

FILE 44 = 78-012 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

136 137 138 139 140 141 142 144 145 146
147 148 149

FILE 56 = 78-023 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

221

FILE 94 = 82-039 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

335 336 337 338 340 342

FILE 99 = 80-010 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

117 118 128 129

FILE102 = 79-011 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

144 145 146 147 148 149

FILE111 = 81-045 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

308

FILE124 = 75-009 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

118 127 143 147 148

FILE132 = 83-014 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

164 165 166

FILE143 = 84-024 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

170 171 172 173 174

FILE154 = 81-054 PANDORA II

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

241

FILE156 = 85-001 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

87

FILE159 = 85-005 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

90 91 102 103 104 109 111 112

FILE163 = 86-017 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

170 171 172 173 174 175 176 177 178

FILE164 = 86-018 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

193

APPENDIX 4

Chronological list of the BIO cruises in the map area for which there are NSRF deep-towed V-fin sparker data held by the Atlantic Geoscience Centre plus a print out from the Atlantic Geoscience Centre data base listing the V-fin file for each cruise including the Julian day numbers for which there are data.

APPENDIX 4

CHRONOLOGICAL LIST OF THE BIO CRUISES IN THE MAP AREA FOR WHICH THERE ARE NSRF V-FIN DEEP-TOWED SPARKER DATA

VESSEL	CRUISE NO.	A.G.C. DATA BASE FILE NUMBER
DAWSON	84-003	139

SEARCH PARAMETER =   V FIN TOWED BODY

NO. OF CRUISES BEING SEARCHED = 190

SELECTED AREA

43 DEG 58 MIN - 47 DEG 55 MIN NORTH

51 DEG 45 MIN - 55 DEG 30 MIN WEST

FILE139 = 84-003 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

64 65

APPENDIX 5

Chronological list of the BIO cruises in the map area for which there are airgun and sparker data held by the Atlantic Geoscience Centre plus a printout from the Atlantic Geoscience Centre database listing the airgun and sparker file for each cruise including the Julian day numbers for which there are data.

APPENDIX 5

CHRONOLOGICAL LIST OF THE BIO CRUISES IN THE MAP AREA FOR WHICH THERE ARE AIRGUN AND SPARKER DATA

VESSEL	CRUISE NO.	A.G.C. DATA BASE FILE NUMBER
SACKVILLE	69-041	090
HUDSON	71-037	174
DAWSON	72-009	039
HUDSON	72-021	016
HUDSON	73-006	054
HUDSON	75-009	124
HUDSON	77-011	040
HUDSON	78-012	044
HUDSON	78-023	056
HUDSON	79-011	102
HUDSON	80-010	099
DAWSON	80-030	062
HUDSON	81-045	111
BAFFIN	82-039	094
QUEST	83-110*	135
HUDSON	84-021	150
HUDSON	84-024	143
HUDSON	85-001	156
HUDSON	85-005	159
HUDSON	86-017	163

Note: There are no boomer or watergun data listed in the map area. DAWSON 80-030 carried the carried the Dalhousie Eggerton sparker.

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* Note: QUEST 83-110 is noted in the official BIO cruise report list as QUEST 83-013.

SEARCH PARAMETER = AIR GUN

NO. OF CRUISES BEING SEARCHED = 190

SELECTED AREA

43 DEG 58 MIN - 47 DEG 55 MIN NORTH

51 DEG 45 MIN - 55 DEG 30 MIN WEST

FILE 16 = 72-021 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

206

FILE 39 = 72-009 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

111 112 113 114 115 116 117 118 119 120
121 122 134

FILE 40 = 77-011 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

137 138 139 140 141 148 149 151 152

FILE 44 = 78-012 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

136 137 138 139

FILE 54 = 73-006 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

186 188 189 190 191

FILE 56 = 78-023 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

221

FILE 90 = 69-041 SACKVILLE

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

197 198 211 217 218

FILE 94 = 82-039 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

335 336 337 338 340 342

FILE 99 = 80-010 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

116 117 118 127 128 129 132

FILE102 = 79-011 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

146 147 148 149

FILE111 = 81-045 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

308

FILE124 = 75-009 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

118 127 128 131 132 143 147 148 150

FILE135 = 83-110 QUEST (QUEST 83-013)

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

153

FILE143 = 84-024 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

170 171 172 173 174

FILE150 = 84-021 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

152

FILE156 = 85-001 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

87

FILE159 = 85-005 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

90 91 102 103 104 111 112

FILE163 = 86-017 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

170 171 172 173 174 175 176 177 178

FILE174 = 71-037 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

326 327

APPENDIX 6

Chronological list of the BIO cruises in the map area for which there are Eggerton sparker data held by the Atlantic Geoscience Centre plus a printout from the Atlantic Geoscience Centre data base listing the sparker file for each cruise including the Julian day numbers for which there are data.

APPENDIX 6

CHRONOLOGICAL LIST OF THE BIO CRUISES IN THE MAP DATA FOR WHICH THERE ARE EGGERTON SPARKER DATA

VESSEL	CRUISE NO.	A.G.C. DATA BASE FILE NUMBER
DAWSON	80-030	062

SEARCH PARAMETER = SPARKER

NO. OF CRUISES BEING SEARCHED = 190

SELECTED AREA

43 DEG 58 MIN - 47 DEG 55 MIN NORTH

51 DEG 45 MIN - 55 DEG 30 MIN WEST

FILE 62 = 80-030 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

267 268 269 271

APPENDIX 7

Chronological list of the BIO cruises in the map area for which there are reflection data in general held by the Atlantic Geoscience Centre plus a printout from the Atlantic Geoscience Centre data base listing the reflection data for each cruise including the Julian day numbers for which there are data.

APPENDIX 7

CHRONOLOGICAL LIST OF THE BIO CRUISES IN THE MAP AREA FOR WHICH THERE ARE REFLECTION DATA

VESSEL	CRUISE NO.	A.G.C. DATA BASE FILE NUMBER
SACKVILLE	69-041	090
HUDSON	71-037	174
DAWSON	72-009	039
HUDSON	72-021	016
HUDSON	73-006	054
HUDSON	75-009	124
HUDSON	77-011	040
HUDSON	78-008	042
HUDSON	78-012	044
HUDSON	78-023	056
HUDSON	79-011	102
HUDSON	80-010	099
DAWSON	80-030	062
DAWSON	81-044	089
HUDSON	81-045	111
PANDORA II	81-054	154
BAFFIN	82-039	094
QUEST	83-110*	135
DAWSON	84-003	139
HUDSON	84-021	150
HUDSON	84-024	143
HUDSON	85-001	156
HUDSON	85-005	159
HUDSON	86-017	163
HUDSON	86-018	164

Note: DAWSON 81-044 gathered multi-channel reflection seismic data.

* Note: QUEST 83-110 is shown in the official BIO Cruise Report list as 83-013.

SEARCH PARAMETER = REFLECTION

NO. OF CRUISES BEING SEARCHED = 190

SELECTED AREA

43 DEG 58 MIN - 47 DEG 55 MIN NORTH

51 DEG 45 MIN - 55 DEG 30 MIN WEST

FILE 16 = 72-021 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

206

FILE 39 = 72-009 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

111 112 113 114 115 116 117 118 119 120
121 122 134

FILE 40 = 77-011 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

137 138 139 140 141 148 149 151 152

FILE 42 = 78-008 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

124 125 126 127 128 131

FILE 44 = 78-012 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

136 137 138 139 140 141 142 144 145 146
147 148 149

FILE 54 = 73-006 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

186 188 189 190 191

FILE 56 = 78-023 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

221

FILE 62 = 80-030 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

267 268 269 271

FILE 89 = 81-044 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

340 341 342

FILE 90 = 69-041 SACKVILLE

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

197 198 211 217 218

FILE 94 = 82-039 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

335 336 337 338 340 342

FILE 99 = 80-010 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

116 117 118 127 128 129 132

FILE102 = 79-011 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

144 145 146 147 148 149

FILE111 = 81-045 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

308

FILE124 = 75-009 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

118 127 128 131 132 143 147 148 150

FILE132 = 83-014 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

164 165 166

FILE135 = 83-110 QUEST (QUEST 83-013)

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

153

FILE139 = 84-003 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

64 65

FILE143 = 84-024 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

170 171 172 173 174

FILE150 = 84-021 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

152

FILE154 = 81-054 PANDORA II

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

241

FILE156 = 85-001 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

87

FILE159 = 85-005 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

90 91 102 103 104 109 111 112

FILE163 = 86-017 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

170 171 172 173 174 175 176 177 178

FILE164 = 86-018 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

193

FILE174 = 71-037 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

326 327

APPENDIX 8

Chronological list of the BIO cruises in the cruise area for which there are 3.5 kHz profiler data held by the Atlantic Geoscience Centre plus a printout from the Atlantic Geoscience Centre database listing the 3.5 kHz file for each cruise including the Julian day numbers for which there are data.

APPENDIX 8

CHRONOLOGICAL LIST OF THE BIO CRUISES IN THE CRUISE AREA FOR WHICH THERE ARE 3.5 KHZ PROFILER DATA

VESSEL	CRUISE NO.	A.G.C. DATA BASE FILE NUMBER
DAWSON	80-030	062
BAFFIN	81-012	073
DAWSON	81-044	089
DAWSON	83-014	132
HUDSON	83-017	137
DAWSON	84-003	139
PANDORA II	85-057	170
PANDORA II	85-059	168
HUDSON	86-013	166

Note: PANDORA II 85-057 3.5 kHz data was apparently collected on days 183-188 and should be available in the project area on Day 187 (July 6, 1985) during the traverse lines in the Avalon Channel. It does show in the AGC printout which follows however this cruise does not show on Enclosure 11.

PANDORA II 85-059 carried a 3.5 kHz profiler; the ship's log notes that it was very noisy and "was not used routinely." It is not known if it operated during the two lines that penetrated the project area. This cruise does show on the AGC printout which follows but does not show on Enclosure 11.

The cruise report of HUDSON 86-013 makes no mention of 3.5 kHz profiler data; the cruise does not show on Enclosure 11 but does show on the following AGC printout.

SEARCH PARAMETER = 3.5 KHZ ACOUSTIC PROFILER

NO. OF CRUISES BEING SEARCHED = 190

SELECTED AREA

43 DEG 58 MIN - 47 DEG 55 MIN NORTH

51 DEG 45 MIN - 55 DEG 30 MIN WEST

FILE 62 = 80-030 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

267 268 269

FILE 73 = 81-012 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

146 147

FILE 89 = 81-044 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

340 341 342

FILE132 = 83-014 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

164 165 166 167 168 169

FILE137 = 83-017 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

171

FILE139 = 84-003 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

64 65

FILE166 = 86-013 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

149

FILE168 = 85-059 PANDORA II

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

207 208

FILE170 = 85-057 PANDORA II

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

187 188

APPENDIX 9

Chronological list of the BIO Cruises in the map area for which there are 12 kHz (generally) bathymetry data held by the Atlantic Geoscience Centre plus a printout from the Atlantic Geoscience Centre data base listing the bathymetry file for each cruise including the Julian day numbers for which there are data.

APPENDIX 9

CHRONOLOGICAL LIST OF THE BIO CRUISES IN THE MAP AREA
FOR WHICH THERE ARE A. G. C.-HELD 12 KHZ (GENERALLY) BATHYMETRY DATA

VESSEL	CRUISE NO.	A.G.C. DATA BASE FILE NUMBER
BAFFIN	63-005	077
BAFFIN	64-018	087
HUDSON	65-006	020
HUDSON	65-024	049
BAFFIN	66-008	025
HUDSON	66-019	017
BAFFIN	67-014	032
HUDSON	68-006	034
HUDSON	68-022	057
SACKVILLE	69-041	090
HUDSON	69-050	081
DAWSON	70-028	046
BAFFIN	71-017	122
HUDSON	71-037	174
DAWSON	72-009	039
MINNA	72-015	030
HUDSON	72-021	016
HUDSON	72-025	018
HUDSON	73-006	054
MINNA	73-019	113
DAWSON	73-034	108
SACKVILLE	74-019	035
MINNA	74-023	107
HUDSON	75-009	124
HUDSON	76-029	023
HUDSON	77-011	040
HUDSON	77-014	041
HUDSON	78-020	043
HUDSON	78-023	056
HUDSON	79-011	102
HUDSON	79-013	101
BAFFIN	79-015	120
HUDSON	80-010	099
DAWSON	80-030	062
DAWSON	81-044	089
HUDSON	83-017	137
QUEST	83-110*	135
DAWSON	84-003	139
HUDSON	84-021	150
HUDSON	84-024	143
HUDSON	84-040	149
BAFFIN	84-044	145

APPENDIX 9 (CONTINUED)

CHRONOLOGICAL LIST OF THE BIO CRUISES IN THE MAP AREA
FOR WHICH THERE ARE A. G. C.-HELD 12 KHZ (GENERALLY) BATHYMETRY DATA

VESSEL	CRUISE NO.	A.G.C. DATA BASE FILE NUMBER
HUDSON	85-001	156
HUDSON	85-005	159
HUDSON	85-025	180
PANDORA II	85-057	170
PANDORA II	85-059	168
HUDSON	86-013	166
HUDSON	86-017	163
HUDSON	86-018	164

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* The official BIO cruise report for this cruise calls it QUEST 83-013

SEARCH PARAMETER = 12 KHZ BATHYMETRY

NO. OF CRUISES BEING SEARCHED = 190

SELECTED AREA

43 DEG 58 MIN - 47 DEG 55 MIN NORTH

51 DEG 45 MIN - 55 DEG 30 MIN WEST

FILE 16 = 72-021 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

206 207

FILE 17 = 66-019 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

202 203 260

FILE 18 = 72-025 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

275 276 301

FILE 20 = 65-006 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

77 78 120

FILE 23 = 76-029 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

265

FILE 25 = 66-008 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

180

FILE 30 = 72-015 MINNA

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

153 154 156 165 173 178 180 195 234

FILE 32 = 67-014 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

171 172 175 186 187 208 209 212 213 236
237 239 260 272 273 278 281 292 293 294

FILE 34 = 68-006 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

26

FILE 35 = 74-019 SACKVILLE

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

158 163 164 171

FILE 39 = 72-009 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

111 112 113 114 115 116 117 118 119 120
121 122 134

FILE 40 = 77-011 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

137 139 140 141 142 148 149 151 152

FILE 41 = 77-014 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

156 157 172 173

FILE 43 = 78-020 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

186

FILE 46 = 70-028 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

210 211

FILE 49 = 65-024 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

267

FILE 54 = 73-006 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

186 187 188 189 190 191

FILE 56 = 78-023 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

221 222

FILE 57 = 68-022 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

162 169 170 171 172 175 258

FILE 62 = 80-030 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

267 268 269 271

FILE 77 = 63-005 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

142 143

FILE 81 = 69-050 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

286

FILE 87 = 64-018 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

216 217

FILE 89 = 81-044 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

340 341 342

FILE 90 = 69-041 SACKVILLE

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

197 198 211 217 218

FILE 99 = 80-010 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

117 118 127 128 129 132

FILE101 = 79-013 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

171

FILE102 = 79-011 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

144 145 146 147 148 149

FILE107 = 74-023 MINNA

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

172 180

FILE108 = 73-034 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

318 319 320 322 324 325 327 329 330 331
332 333

FILE113 = 73-019 MINNA

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

285 286

FILE120 = 79-015 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

260 261 275 276 277 278 280

FILE122 = 71-017 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

124	125	129	130	131	132	135	136	147	169
170	171	172	180	188	189	190	193	215	216
217	230	231	249	253	256	257	258	267	268
276	278	279	280	281	285	296	305	307	

FILE124 = 75-009 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

117	118	127	128	131	132	141	143	147	148
150	154	155	240	243					

FILE135 = 83-110 QUEST (QUEST 83-013)

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

153

FILE137 = 83-017 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

171

FILE139 = 84-003 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

64 65

FILE143 = 84-024 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

170 171 172 173 174

FILE145 = 84-044 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

298 299 300 301 302 303 304 305 306 307
308 310 322 323 324

FILE149 = 84-040 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

281

FILE150 = 84-021 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

152

FILE156 = 85-001 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

87

FILE159 = 85-005 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

90 91 102 103 104 109 111 112

FILE163 = 86-017 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

170 171 172 173 174 175 176 177 178

FILE164 = 86-018 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

193

FILE166 = 86-013 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

149

FILE168 = 85-059 PANDORA II

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

207 208

FILE170 = 85-057 PANDORA II

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

181 182 187 188

FILE174 = 71-037 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

326 327

FILE180 = 85-025 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

232 233

APPENDIX 10

Chronological list of the BIO cruises in the map area for which there are BRUTIV data held by the Atlantic Geoscience Centre plus a printout from the Atlantic Geoscience Centre data base listing the BRUTIV data for each cruise including the Julian day numbers for which there are data.

APPENDIX 10

CHRONOLOGICAL LIST OF THE BIO CRUISES IN THE MAP AREA FOR WHICH THERE ARE BRUTIV DATA

VESSEL	CRUISE NO.	A.G.C. DATA BASE FILE NUMBER
HUDSON	84-024	143

SEARCH PARAMETER = BRUTIV CAMERA SLED

NO. OF CRUISES BEING SEARCHED = 190

SELECTED AREA

43 DEG 58 MIN - 47 DEG 55 MIN NORTH

51 DEG 45 MIN - 55 DEG 30 MIN WEST

FILE143 = 84-024 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

170 171 172 173 174

APPENDIX 11

Chronological list of the BIO cruises in the map area for which there are magnetic data held by the Atlantic Geoscience Centre plus a printout from the Atlantic Geoscience Centre, database listing the magnetic file for each cruise including the Julain day numbers for which there are data.

APPENDIX 11

CHRONOLOGICAL LIST OF THE BIO CRUISES IN THE MAP AREA FOR WHICH THERE ARE MAGNETIC DATA

VESSEL	CRUISE NO.	A.G.C. DATA BASE FILE NUMBER
BAFFIN	63-005	077
BAFFIN	64-018	087
HUDSON	65-006	020
HUDSON	65-024	049
BAFFIN	66-008	025
HUDSON	66-019	017
BAFFIN	67-014	032
HUDSON	68-006	034
HUDSON	68-022	057
BAFFIN	69-002	080
SACKVILLE	69-041	090
HUDSON	69-050	081
DAWSON	70-028	046
BAFFIN	71-017	122
HUDSON	71-022	051
LYNCH	72-XXX	127
DAWSON	72-009	039
MINNA	72-015	030
HUDSON	72-021	016
HUDSON	72-025	018
BAFFIN	73-001	033
HUDSON	73-006	054
MINNA	73-019	113
DAWSON	73-034	108
SACKVILLE	74-019	035
MINNA	74-023	107
HUDSON	75-009	124
HUDSON	76-029	023
HUDSON	77-011	040
HUDSON	77-014	041
HUDSON	78-010	076
HUDSON	78-020	043
HUDSON	78-023	056
HUDSON	79-013	101
BAFFIN	79-015	120
HUDSON	80-010	099
HUDSON	84-044	145

SEARCH PARAMETER = MAGNETICS

NO. OF CRUISES BEING SEARCHED = 190

SELECTED AREA

43 DEG 58 MIN - 47 DEG 55 MIN NORTH

51 DEG 45 MIN - 55 DEG 30 MIN WEST

FILE 16 = 72-021 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

206 207

FILE 17 = 66-019 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

202 203 260

FILE 18 = 72-025 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

275 276 301

FILE 20 = 65-006 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

77 78 120

FILE 23 = 76-029 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

265

FILE 25 = 66-008 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

180

FILE 30 = 72-015 MINNA

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

153 154 156 165 173 178 180 195 234

FILE 32 = 67-014 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

171 172 175 186 187 208 209 212 213 236
237 239 260 272 273 278 281 292 293 294

FILE 33 = 73-001 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

17

FILE 34 = 68-006 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

26

FILE 35 = 74-019 SACKVILLE

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

158 163 164 171

FILE 39 = 72-009 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

111 112 113 114 115 116 117 118 119 120
121 122 134

FILE 40 = 77-011 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

137 138 139 140 141 148 149 151 152

FILE 41 = 77-014 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

156 157

FILE 43 = 78-020 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

186

FILE 46 = 70-028 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

210 211 262 263

FILE 49 = 65-024 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

267

FILE 51 = 71-022 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

167

FILE 54 = 73-006 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

186 187 188 189 190 191

FILE 56 = 78-023 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

221 222

FILE 57 = 68-022 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

162 169 170 171 172 175 258

FILE 76 = 78-016 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

170 171

FILE 77 = 63-005 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

142 143

FILE 80 = 69-002 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

9

FILE 81 = 69-050 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

286 287

FILE 87 = 64-018 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

216 217

FILE 90 = 69-041 SACKVILLE

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

197 198 211 217 218

FILE 99 = 80-010 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

117 118 127 128 129 132

FILE101 = 79-013 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

171

FILE107 = 74-023 MINNA

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

172 173

FILE108 = 73-034 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

318 319 320 322 324 325 327 329 330 331
332 333

FILE113 = 73-019 MINNA

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

285 286

FILE120 = 79-015 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

260 261 275 276 277 278 280

FILE122 = 71-017 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

124	125	129	130	131	132	135	136	147	169
170	171	172	180	188	189	190	193	215	216
217	230	231	249	253	256	257	258	267	268
276	278	279	280	281	285	296	305	307	

FILE124 = 75-009 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

117	118	127	128	131	132	143	148	150	154
155	240	243							

FILE127 = LYNCH

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

233 234

FILE145 = 84-044 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

298	299	300	301	302	303	304	305	306	307
308	310	322	323	324					

APPENDIX 12

Chronological list of the BIO cruises in the map area for which there are gravity data held by the Atlantic Geoscience Centre plus a printout from the Atlantic Geoscience Centre database listing the gravity file for each cruise including the Julian day numbers for which there are data.

APPENDIX 12

CHRONOLOGICAL LIST OF THE BIO CRUISES IN THE MAP AREA FOR WHICH THERE ARE GRAVITY DATA

VESSEL	CRUISE NO.	A.G.C. DATA BASE FILE NUMBER
BAFFIN	64-018	087
HUDSON	65-006	020
HUDSON	65-024	049
BAFFIN	66-008	025
HUDSON	66-019	017
BAFFIN	67-014	032
HUDSON	68-022	057
BAFFIN	69-002	080
HUDSON	69-050	081
BAFFIN	71-017	122
DAWSON	72-009	039
MINNA	72-015	030
HUDSON	72-021	016
HUDSON	72-025	018
BAFFIN	73-001	033
HUDSON	73-006	054
MINNA	73-019	113
DAWSON	73-034	108
MINNA	74-023	107
HUDSON	75-009	124
HUDSON	77-014	041
HUDSON	78-016	076
HUDSON	78-020	043
HUDSON	78-023	056
HUDSON	79-013	101
BAFFIN	84-044	145

Note: All data in the area have been gathered on gravity meter #1, there are no data on gravity meter #2 listed.

SEARCH PARAMETER = GRAVITY 1

NO. OF CRUISES BEING SEARCHED = 190

SELECTED AREA

43 DEG 58 MIN - 47 DEG 55 MIN NORTH

51 DEG 45 MIN - 55 DEG 30 MIN WEST

FILE 16 = 72-021 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

206 207

FILE 17 = 66-019 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

202 203

FILE 18 = 72-025 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

275 276 301

FILE 20 = 65-006 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

77 78 120

FILE 25 = 66-008 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

180

FILE 30 = 72-015 MINNA

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

154 156 165 173 178 180 195 234

FILE 32 = 67-014 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

171 172 175 186 187 208 209 212 213 236
237 239 281 292 293 294

FILE 33 = 73-001 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

17

FILE 39 = 72-009 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

111 112 113 114 115 116 117 118 119 120
121 122 134

FILE 41 = 77-014 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

156 157 172 173

FILE 43 = 78-020 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

186

FILE 49 = 65-024 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

267

FILE 54 = 73-006 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

186 187 188 189 190 191

FILE 56 = 78-023 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

221 222

FILE 57 = 68-022 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

169 170 171 172 175 258

FILE 76 = 78-016 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

170 171

FILE 80 = 69-002 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

9

FILE 81 = 69-050 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

286 287

FILE 87 = 64-018 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

216 217

FILE101 = 79-013 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

171

FILE107 = 74-023 MINNA

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

172 173 180

FILE108 = 73-034 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

318	319	320	322	324	325	327	329	330	331
332	333								

FILE113 = 73-019 MINNA

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

286

FILE122 = 71-017 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

124	125	129	130	132	135	136	147	169	170
171	172	180	188	189	190	193	215	216	217
230	231	249	253	256	257	258	267	268	279
280	285	296	307						

FILE124 = 75-009 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

117	118	127	128	131	132	141	143	147	148
150	154	155	240	243					

FILE145 = 84-044 BAFFIN

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

298	299	300	301	302	303	304	305	306	307
308	310	322	323	324					

APPENDIX 13

Chronological list of the BIO cruises in the map area for which there are digital, multichannel, high resolution, seismic reflection data held by the Atlanic Geoscience Centre plus a printout from the Atlantic Geoscience Centre data base listing the multichannel seismic reflection data for each cruise including the Julian day numbers for which there are data.

APPENDIX 13

CHRONOLOGICAL LIST OF THE BIO CRUISES IN THE MAP AREA FOR WHICH THERE ARE DIGITAL, MULTICHANNEL, HIGH RESOLUTION, SEISMIC REFLECTION DATA.

VESSEL	CRUISE NO.	A.G.C. DATA BASE FILE NUMBER
DAWSON	81-044	089

SEARCH PARAMETER = MULTI-CHANNEL REFLECTION

NO. OF CRUISES BEING SEARCHED = 190

SELECTED AREA

43 DEG 58 MIN - 47 DEG 55 MIN NORTH

51 DEG 45 MIN - 55 DEG 30 MIN WEST

FILE 89 = 81-044 DAWSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

340 341 342

APPENDIX 14

Chronological list of the BIO cruises in the map area for which there are refraction data held by the Atlantic Geoscience Centre plus a printout from the Atlantic Geoscience Centre data base listing the refraction data for each cruise including the Julian day numbers for which there are data.

APPENDIX 14

CHRONOLOGICAL LIST OF THE BIO CRUISES IN THE MAP AREA FOR WHICH THERE ARE REFRACTION DATA

VESSEL	CRUISE NO.	A.G.C. DATA BASE FILE NUMBER
HUDSON	84-021	150

SEARCH PARAMETER = REFRACTION

NO. OF CRUISES BEING SEARCHED = 190

SELECTED AREA

43 DEG 58 MIN - 47 DEG 55 MIN NORTH

51 DEG 45 MIN - 55 DEG 30 MIN WEST

FILE150 = 84-021 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

152

APPENDIX 15

Chronological list of the BIO cruises in the map area for which there are ocean bottom seismometer data held by the Atlantic Geoscience Centre plus a printout from the Atlantic Geoscience Centre data base listing the ocean bottom seismometer file for each cruise including the Julian day numbers for which there are data.

APPENDIX 15

CHRONOLOGICAL LIST OF THE BIO CRUISES IN THE MAP AREA FOR WHICH THERE ARE OCEAN BOTTOM SEISMOMETER DATA

VESSEL	CRUISE NO.	A.G.C. DATA BASE FILE NUMBER
HUDSON	84-021	150

Note: There are no data listed under "Sonobuoy" in the area.

SEARCH PARAMETER =   OCEAN BOTTOM SEISMOMETER

NO. OF CRUISES BEING SEARCHED = 190

SELECTED AREA

43 DEG 58 MIN - 47 DEG 55 MIN NORTH

51 DEG 45 MIN - 55 DEG 30 MIN WEST

FILE150 = 84-021 HUDSON

DATA FROM THE FOLL. DAYS IS IN THE SELECTED AREA

152

APPENDIX 16

TABLE OF ALL KNOWN AND RECOVERABLE BOTTOM STATIONS IN THE AREA 43°58'N TO 47°55'N AND 51°45'W TO 55°30'W FROM 1959 TO 1986 INCLUSIVE

This appendix was drawn in part from Appendix 2 of D. B. Praeg's April 1986 compilation and supplemented greatly, or at times corrected and updated, by reference to the original data in cruise reports, in CHS Miscellaneous Notes and in certain cases by recovering original data from researchers at Memorial University of Newfoundland and in one case from a person now in the United States (Charles F. Stehman, personal communication, 1987).

GR	=	grab, type unspecified
VVGR	=	Van Veen grab
SGR	=	Shipek grab
IKUGR	=	IKU grab
SMGR	=	Smith-McIntyre grab
PGR	=	Pisces IV grab/scoop
UWGR	=	Underway CHS sampler
DG	=	Dredge
SDG	=	Scallop dredge
CO	=	Core, type unspecified
PCO	=	Piston core
HPCO	=	"Horwitz" Piston Core System (used in 1969)
GCO	=	Gravity core
PHCO	=	Phleger Gravity core
TWCO	=	Tripwire core/trigger weight core
RCO	=	Rangaboom core
BCO	=	Box core
CC	=	Core catcher
VCO	=	Vibracore
DRCO	=	Drill Core
BH	=	Bore Hole
CAL-CH	=	D/V CALDRILL corehole
CA	=	Camera, type unspecified
CCA	=	Colour camera station
B&WCA	=	Black and white camera station
PCCA	=	Pisces IV cameras
VIDEO	=	Pisces IV Video cameras
DAL VIDEO	=	Dalhousie Video camera
AOG	=	Atlantic Oceanographic Group
BIO	=	Bedford Institute of Oceanography
AGC	=	Atlantic Geoscience Centre
CHS	=	Canadian Hydrographic Corporation
EPG	=	Eastern Petroleum Group of AGC
MUN	=	Memorial University of Newfoundland
DAL	=	Dalhousie University, Department of Geology
PAN AM	=	Pan American Oil Company
AMOCO	=	Amoco Petroleum Corporation
IOE	=	Imperial Oil Enterprises
IMP	=	Imperial Oil

Coding of Samples in AGC Sample Repository, i.e. AGC 11122.

The letters indicate that the samples are in AGC's sample repository at the Bedford Unstitute of Oceanography, Dartmouth, Nova Scotia. The first three numbers (111) are the bin number and the remaining two are the box number. The boxes are arranged and numbered sequentially in the bins. Access to the AGC Sample Repository is only granted under the supervision of the Curation staff. Contact should be made with Iris Hardy or Andy Sherin.

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
CSS KAPUSKASING 1957, 1958, 1959, 1960 Canadian Hydrographic Service	The final Field Reports of these cruises have not been located and most of the field sheets have not been located. These early surveys are found on the following Field Sheets:						G	Full area south of the Burin and Avalon Peninsulas out to the shelf edge and the area east and southeast of the Avalon Channel.	One can see the CHS visual descriptions annotated on the field sheets if the original Sounding Notes can not be found. The sample locations and the CHS visual descriptions on the 19 field sheets should be digitized and entered into the SID data base. Usually CHS records the electronic fix ranges, water depths, dates, times and visual descriptions in the Miscell-aneous Sounding Notes. If these can be located the additional data can also be entered into the SID data base however Steve MacPhee reported in a Dec. 18/86 letter that such field reports and notes no longer exist in Ottawa.	Miscellaneous Sounding Notes and Final Field Reports for the 1957-60 KAPUSKASING cruises do not exist in CHS Headquarters in Ottawa. The re-quirement for final field re-ports did not commence until about 1963. Thus one must digitize directly from the field sheet maps.	It is not known whether these samples survive but we fear the worst and suspect not.

F.S.	Date	Scale	Samples
2791 W-11	1957	1:75,000	?
2791 E-102	1957	1:75,000	?
2791 E-103	1957	1:75,000	?
2791 E-104	1957	1:75,000	?
2791 E-105	1957	1:75,000	?
2791 W-18	1957,59	1:75,000	?
2791 E-108	1957	1:75,000	?
2791 E-109	1957	1:75,000	?
2791 E-110	1957	1:75,000	?
2791 E-111	1957	1:75,000	?
2791 W-26	1957,60	1:75,000	?
2791 W-27	1957	1:75,000	?
2791 115-E	1957	1:75,000	?
2791 116-E	1957	1:75,000	?
2791 117-E	1957	1:75,000	?
2791 122-E	1957	1:75,000	1
2791 123-E	1957	1:75,000	6
2850A	1959	1:75,000	14
2850B	1959	1:75,000	?

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt	+ Clay	= Mud	Remarks	Curation Information
R/V SEVASTOPOL Cruises 14 and 17 1959/60	2245	47°22.5'	51°47.0'	178			"bottom sampling tube"	Avalon Channel	42.40	31.3	40.0	16.3	12.4	29% mud	Listed with others in Litvin and Rvachev (1963), 22 or so samples shown in area on Fig. 1. Additional Russian textural data is graphically illustrated in: Avilov (1965) Grabovskiy (1966)
	3103	45°15.0'	52°29.2'	83				Whale Deep	35.4	86.6	4.4	1.7	7.3	9% mud	
	3104	45°07.9'	52°40.0'	110				Whale Deep	10.4	52.7	24.4	6.7	16.2	19% mud	
	3109	44°24.1'	53°49.1'	1430				Cont. slope off Whale Bank	0.2	0.7	12.2	25.2	61.9	88% mud	
	3121	45°18.0'	55°10.1'	165				Outer Halibut Channel	0.8	70.8	14.0	3.7	11.5	15% mud	
									Note listed analyses are <u>not</u> % Gravel/Sand/Mud						
CNAV SACKVILLE S-58 Aug. 21-Sept. 17 1961 Douglas H. Loring (AOG)	11	?	?	?			GR or PHCO	S of Burin						Some details of this cruise including a small index map are found in Loring (1962a,b)	It is not known if the samples survive.
	12	?	?	?			GR or PHCO	Placentia Bay							
	13	?	?	?			?	not shown on index map						Sample may not have been taken?	
	14	?	?	?			?	not shown on index map						Sample may not have been taken?	
	32	?	?	?			GR or PHCO	Conception Bay							
	33	?	?	?			GR or PHCO	NNE Cape St. Francis							
	34	?	?	?			GR or PHCO	Conception Bay							
	35	?	?	?			GR or PHCO	NE Cape St. Francis							
	36	?	?	?			GR or PHCO	Off Cape St. Francis to the east							

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age				Remarks	Curation Information
									Gravel	Sand	Silt + Clay	= Mud		
CNAV Sackville S-58 Aug 21 - Sept 17 1961 Douglas H. Loring (AOG)	37	?	?	?			GR or PHCO	Avalon Channel					Some details of this cruise including a small index map are found in Loring (1962a,b)	It is not known if the samples survive.
	38	?	?	?			GR or PHCO	Conception Bay						
	39	?	?	?			GR or PHCO	Conception Bay						
	40	?	?	?			GR or PHCO	Conception Bay						
	41	?	?	?			GR or PHCO	Conception Bay						
	42	?	?	?			GR or PHCO	Conception Bay						
	43	?	?	?			GR or PHCO	S Trinity Bay						
	44	?	?	?			GR or PHCO	S Trinity Bay						
	45	?	?	?			GR or PHCO	Trinity Bay						

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
CSS BAFFIN 63-006 1963 Canadian Hydrographic Service Ralph Wills (CHS)	289 bottom samples taken. About 141 in project area	The annual report of CSS BAFFIN for June 26 to September 20, 1963 reports 289 samples taken on the Tail of the Bank portion of the survey. F.S. 3314A shows about 141 in the project area. The positions in the Sounding Notes should be digitized (or the positions digitized off the FS) and the samples' data entered into the SID data base.					VVGR?	SW Grand Bank	See notation on F.S. 3314A or see visual descriptions in Sounding Notes for Project 45-5 (1963). Visual descriptions are probably listed with depths, dates and times and navigation fixes in the Miscellaneous Sounding Notes (not seen).	Sounding Notes have not been searched out or seen.	It is not known if these samples survive

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
SACKVILLE S-70 1963	21	45°20.5'	55°51.5'	128	072	2330	PHCO	St. Pierre Bank	Jan 8/87 Doyle remembered cores in Whale Deep were darker at the top, ie were more anerobic then his other cores. There are no core descriptions in Doyle's MSC thesis in Dal's Dept. of Biology.	10 cores taken for Doyle and one grab sample; all at same position;	Cores were used by Doyle for his MSC thesis. Cores were destroyed on board and probably none survived. Doyle's MSC looked at heat production in the cores.
M.J. Keen, Chief Scientist, Dalhousie University	21	45°20.5'	55°51.5'	128	072	2300	G	St. Pierre Bank			
W. Roger Doyle Dept. of Biology Dalhousie Univ. (core program)	23	45°30.0'	52°44.0'	183-219	074	1242	PHCO	Whale Deep		5 cores taken for Doyle. Depth range of 100 to 120 fm noted in cruise report for the five cores. Presumeably the boat was drifting	
Pan American Petroleum Corporation 1964	2471	?	?	201	?	?	VVGR?	Whale Bank		Sen Gupta and MacMullen (1969) show a small index map with these two samples	Some of these samples from the 1964 Pan Am program survive in the Dalhousie Dept. of Geology Curation. It is not known if these two samples survive
	2813	?	?	163	?	?	VVGR?	Whale Bank			
D/V CALDRILL 1965 Pan American Petroleum Corporation and Imperial Oil Enterprises Limited	Corehole 1A	45.13111°	53.49111°	83.5			CAL-CH	Central Whale Bank	Visual description in report	Total depth 17.4 m below sea floor, 1 core at 46 m	Report entitled: CORE DESCRIPTION Offshore, Grand Banks, Newfoundland, Core Holes Drilled in 1965
	Corehole 1B	45.13111°	53.49111°	83.5			CAL-CH	Central Whale Bank	Visual description in report	Total depth 42.7 m 3 cores, one empty first core at 21.3 m	
	Corehole 1C	45.13111°	53.49111°	83.5			CAL-CH	Central Whale Bank	Visual description in report	Total depth 52.7 m no recovery	

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
D/V CALDRILL 1965 Pan American Petroleum Corporation and Imperial Oil Enterprises Limited	Corehole 2	45.13389°	52.64944°	101.8			CAL-CH	Northern Whale Deep	Visual description in report	Total Depth 423.7 m 44 core attempts, 5 with no recovery, first core at 13.4 m; Electrolog and gamma logs run	Report entitled: CORE DESCRIPTION Offshore, Grand Banks, Newfoundland, Core Holes Drilled in 1965
	Corehole 3A	45.70861°	53.30944°	75.0			CAL-CH	Northern Whale Bank	Visual description in report	Total Depth 37.8 m 1 core at 28.0 m	
	Corehole 3B	45.70861°	53.30944°	77.7			CAL-CH	Northern Whale Bank	Visual description in report	Total Depth 77.4 m 6 cores, first core at 35.7 m	
	Corehole 3C	45.70861°	53.30944°	?			CAL-CH	Northern Whale Bank	Visual description in report	Total Depth 95.7 m no recovery	
	Corehole 3D	45.70861°	53.30944°	?			CAL-CH	Northern Whale Bank	Visual description in report	Total Depth 26.8 m no recovery	
	Corehole 4	45.52917°	52.36667°	80.8			CAL-CH	Western Grand Bank	Visual description in report	Total Depth 160.9 m 14 core attempts, 12 cores, first core at 34.1 m	
	Corehole 5A?	45.62500°	52.19167°	82.3			CAL-CH	Western Grand Bank	Visual description in report	Total Depth 159.1 m 16 core attempts, one with no recovery and one with doubtful recovery, first core at 14.3 m; Gamma and E-logs run	
	Corehole 5B?	45.62500°	32.19167°	82.3			CAL-CH	Western Grand Bank	Visual description in report	Total Depth ? no recovery	
	Corehole 5C	45.62500°	52.19167°	82.3			CAL-CH	Western Grand Bank	Visual description in report	Total Depth 192 m 7 cores, first core at 65.2 m	
	Corehole 7	45.40778°	51.94417°	79.2			CAL-CH	Western Grand Bank	Visual description in report	Total depth 70.1 m 4 cores, first core at 29.0 m	
	Corehole 9A	44.59528°	53.43806°	110.9			CAL-CH	Southern Whale Bank & Shelf edge	Visual description in report	Total Depth ? no recovery	

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
D/V CALDRILL 1965 Pan American Petroleum Corporation and Imperial Oil Enterprises Limited	Corehole 9B	44.59528°	53.43806°	110.9			CAL-CH	Southern Whale Bank, Shelf edge	Visual description in report	Total depth 454.2 m 15 cores, first core at 57.9 m, gamma log run	
	Corehole 10	46.23333°	52.18333°	73.2			CAL-CH	Western Grand Bank	Visual description in report	Total depth ? no recovery	
	Corehole 10A	46.23333°	52.18333°	73.2			CAL-CH	Western Grand Bank	Visual description in report	Total depth ? no recovery	
	Corehole 10B	46.23333°	52.18333°	73.2			CAL-CH	Western Grand Bank	Visual description in report	Total depth ? no recovery	
	Corehole 10C	46.23333°	52.18333°	73.2			CAL-CH	Western Grand Bank	Visual description in report	Total depth 78.6 m 8 cores, first core at 42.7 m	
	Corehole 10D	46.23333°	52.18333°	73.2			CAL-CH	Western Grand Bank	Visual description in report	Total depth ? no recovery	
	Corehole 17	44.15167°	52.39000°	100.9			CAL-CH	SW Grand Banks at shelf edge	Visual description in report	Total depth 457.2 m 19 core attempts, 17 cores, first core at 9.1 m, gamma log run	
	Corehole 18	44.58333°	51.71667°	72.8			CAL-CH	SW Western Bank	Visual description in report	Total depth 355.1 m 16 core attempts, first core at 37.5 m, no recovery below 219.8 m, 8 cores total	
	Corehole 23	45.63333°	53.55000°	87.2			CAL-CH	NW Whale Bank	Visual description in report	Total depth 336.8 m 13 core attempts, 12 cores, first core above 35 m but depth uncertain	
	Corehole 25	44.36667°	53.45000°	1069.6			CAL-CH	Southern Whale Bank off shelf edge	Visual description in report	Total Depth 373.7 m 13 cores, first core at 29.9 m	
	Corehole 27	43.93333°	52.61667°	723.0			CAL-CH	SW Grand Banks just off SE corner of map area	Visual description in report	Total depth 395.0 m 14 cores, first core at 36.6 m, gamma log run	

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
CSS BAFFIN 66-008 1966 Canadian Hydrographic Service T. Bert Smith (CHS)	412 bottom samples taken. 305 were underway samples. 107 were Van Veen samples. The Field Sheet shows 9 samples in the project area.	BIO Cruise Report No. 145 reports that the May 16 to November 9, 1966 cruise gathered 305 underway samples in depths of less than 110 m on a 5 n mi grid pattern on the Tail of the Bank. "All sizeable samples were bagged and logged for the Marine Geology Unit at BIO." F.S. 3314B shows 9 samples in the project area. It is not known if these 9 were Van Veen or Underway samples. The positions in the Sounding Notes should be digitized (or the positions digitized from the FS) and the samples' data entered into the SID data base.					UWGR or VVGR	SW Grand Bank	See notation on F.S. 3314B or see visual descriptions in Sounding Notes for Project 45-5 (1966). Visual descriptions are probably listed with depths, dates and times, sampler type and navigation fixes in the Miscellaneous Sounding Notes (not seen).	Sounding notes have not been searched out or seen.	It is not known if these samples survive. (See note re BAFFIN 67-014 on the following page).

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
Pan Am-IOE 1966 Pan American Petroleum Corporation and Imperial Oil Enterprises Limited	Tors Cove D-52	44.18722°	52.39500°	89.3			wildcat well	Southwestern Grand Bank shelf edge	Well history and logs available on 3rd floor of AGC in the Eastern Petroleum Group	Total depth 1473 m Well Ref. No. D25	See G. Karg of COGLA at BIO on 3rd floor of AGC
	Grand Falls H-09	45.47194°	52.00083°	78.0			wildcat well	Western Grand Bank	Well history and logs available on 3rd floor of AGC in the Eastern Petroleum Group	Total depth 1600 m Well Ref. No. D26	See G. Karg of COGLA at BIO on 3rd floor of AGC
CGS A.T. CAMERON 1967 St. John's Biological Station, Fisheries Research Board of Canada Barun K. Sen Gupta	5818	?	?	150			VVGR	SW Grand Bank		Sen Gupta and MacMullen (1969) show a small index map with these two samples which fall in the very southeast corner of the project area. Cruise was during July and August.	It is not known whether these samples survive (see note below)
	5789	?	?	150			VVGR	SW Grand Bank			
CSS BAFFIN 67-014 1967 Canadian Hydrographic Service R.L. (Dusty) DeGrasse (CHS) also worked with CSS KAPUSKASING in tandem	From May 22 to October 27, 1967 a total of 640 bottom samples were collected (see CHS cruise report 175). These were taken in all depths less than 60 fm (360 ft; 110 m). These were entered on the six field sheets in use and can also probably be found in the cruise's Miscellaneous Field Notes (Project 45-5). This cruise also gathered magnetic and gravity data. The western limit of the area was 51°30' W thus probably none of the samples are in the project area. However the field sheets have not yet been checked and should be.						VVGR?	Eastern Grand Banks, Flemish Cap	Visual descriptions will be found on the field sheets and in the Miscellaneous Field Notes. It is not presently known if any of McMullen's samples which are listed to the right are in the project area.	R.M. McMullen, formerly of AGC, worked on these samples as well as those of BAFFIN 66-008 and CAMERON 1967. The AGC Sample Repository holds McMullen's samples as below.	

Bin	Box	Year	Comments
58	60	1967	Sieve fractions
58	59	1967	Sieve fractions
104	1,2	66/67	" " , slides
123	6,7,8	66/67	sed. size, slides
124	13,14	66/67	sed. samples
124	15,16	66/67	sed. samples
124	17	66/67	sed. samples
105	57,58	66/64	sed. size, slides
105	59	1966	sed. size, forams
107	17,18	1967	sed. size
107	19,20	1967	sed. size
107	21	1967	sed. size
106	20	1967	Sen Gupta, sed. size

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
M/V THERON 1969 Amoco - IOE Soil gas analysis program; Contractor: Calvin B. Craig (first half) Sam Eaton (second half) of Horvitz Research Laboratories, Houston, Texas.	AB-23 (Area A)	44.90317°	52.99333°	87.8	Program ran from May 10 to Oct. 10, 1969		HPCO	SE Whale Bank	sand	*This was a 1969 program wherein 3160 bottom sediment samples were collected on a 4000 ft orthoganal grid in four areas A, B, C, D. Water samples were also collected for hydrocarbon analysis. Each core was sampled on board at the top, bottom and twice in between and the residuals of all 3160 cores were thrown over board. Roger Slatt at MUN was later provided some of the samples. Roger Slatt's own visual(?) descriptions listed analyses of %age gravel, sand, mud and % carbonate (from core top and 60 cm depth) for most of these cores. These data were graphically illustrated in Muller and Milliman (1973) (plus one C14 date)	Samples are generally at Dalhousie University in Geological Curation. A few were spilled in shipment from St. John's. Amoco called Areas A, B, C, and D, H9A, H9B, H9C and H9D respectively in their files. Analyses of core tops used in Slatt (1974a; 1977) Note: Analyses of 16 additional 1969 cores (and their positions are found in Amoco (1969) - COGLA Project 8640-A4-9E (in the project file at AGC). Analyses include core log, grain size, and geotechnical data.
	AB-28	44.84717°	52.99450°	89.6			HPCO	SE Whale Bank	sand		
	AB-33	44.79250°	52.99333°	89.6			HPCO	SE Whale Bank			
	AB-38	44.73917°	52.99217°	91.4			HPCO	SE Whale Bank	sand		
	AH-3	45.12233°	52.90300°	87.8			HPCO	SE Whale Bank	gravelly sand		
	AH-8	45.06817°	52.90200°	86.0			HPCO	SE Whale Bank	gravelly sand		
	AH-13	45.01267°	52.90200°	93.3			HPCO	SE Whale Bank	gravelly sand		
	AH-18	44.95700°	52.90267°	87.8			HPCO	SE Whale Bank	gravelly sand		
	AH-23	44.90400°	52.90083°	87.8			HPCO	SE Whale Bank	gravelly sand		
	AH-38	44.73867°	52.90017°	91.4			HPCO	SE Whale Bank	sand		
	AH-43	44.68367°	52.89967°	95.1			HPCO	SE Whale Bank	sand		
	AH-49	44.61717°	52.89850°	98.8			HPCO	SE Whale Bank	sandy mud		
	AH-58	44.51950°	52.89900°	102.4			HPCO	SE Whale Bank	muddy sand		
	AH-63	44.46433°	52.89850°	109.7			HPCO	SE Whale Bank	sand		
	AH-68	44.40967°	52.89900°	137.2			HPCO	SE Whale Bank	sand		
	AM-3	45.12233°	52.82550°	95.1			HPCO	SE Whale Bank	sand		
	AM-8	45.06817°	52.82483°	98.8			HPCO	SE Whale Bank	sand		
	AM-13	45.01350°	52.82417°	98.8			HPCO	SE Whale Bank	gravelly sand		
	AM-18	44.95833°	52.82417°	86.0			HPCO	SE Whale Bank	gravelly sand		
	AN-23	44.09045°	52.80783°	84.1			HPCO	SE Whale Bank	gravelly sand		
	AM-38	44.73917°	52.82300°	91.4			HPCO	SE Whale Bank	(gravelly) sand		
	AN-43	44.68450°	52.80650°	87.8			HPCO	SE Whale Bank	(gravelly) sand		

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
M/V THERON 1969	AM-48 (Area A)	44.62883°	52.82300°	95.4			HPCO	SE Whale Bank	(gravelly) sand	See * previous on previous page	Samples are generally at Dalhousie University in Geological Curation. A few were spilled in shipment from St. John's.
Amoco - IOE Soil gas	AM-68	44.40967°	52.82117°	111.6			HPCO	SE Whale Bank	sand		
analysis program;	AQ-38	44.73917°	52.76100°	91.4			HPCO	SE Whale Bank	(gravelly) sand		
Contractor: Calvin B. Craig	AR-3	45.12283°	52.74817°	113.4			HPCO	SE Whale Bank	muddy sand		
(first half) Sam Eaton	AS-8	45.06817°	52.73233°	100.6			HPCO	SE Whale bank	gravelly sand		
(second half) of Horvitz	AR-13	45.01300°	52.74783°	86.0			HPCO	SE Whale Bank	gravelly sand		
Research Laboratories,	AR-18	44.95883°	52.74817°	84.1			HPCO	SE Whale Bank	gravelly sand		
Houston, Texas.	AR-23	44.90450°	52.74700°	84.1			HPCO	SE Whale Bank	gravelly sand		
	AR-43	44.68367°	52.74567°	91.4			HPCO	SE Whale Bank	(gravelly) sand		
	AS-48	44.62883°	52.73050°	93.3			HPCO	SE Whale Bank	(gravelly) sand		
	AR-68	44.40967°	52.74567°	104.2			HPCO	SE Whale Bank	(gravelly) sand		
	AT-58	44.51867°	52.71533°	96.9			HPCO	SE Whale Bank	(gravelly) sand		
	AW-3	45.12367°	52.67150°	100.6			HPCO	SE Whale Bank	sand		
	AW-8	45.06767°	52.67033°	87.8			HPCO	SE Whale Bank	muddy sand		
	AW-13	45.01267°	52.66933°	86.0			HPCO	SE Whale Bank	(gravelly) sand		
	AW-18	44.95883°	52.67033°	86.0			HPCO	SE Whale Bank	(gravelly) sand		
	AW-22	44.91500°	52.67967°	82.3			HPCO	SE Whale Bank	sandy gravel		
	AW-38	44.73917°	52.66850°	86.0			HPCO	SE Whale Bank	(gravelly) sand		
	AX-43	44.68250°	52.65383°	87.8			HPCO	SE Whale Bank	gravelly sand		
	AX-57	44.53000°	52.65333°	91.4			HPCO	SE Whale Bank	(gravelly) muddy sand		
	AW-63	44.46533°	52.66850°	95.1			HPCO	SE Whale Bank	gravelly sand		
	AW-68	44.40967°	52.66850°	100.6			HPCO	SE Whale Bank	gravelly sand		
	ABB-3	44.12233°	52.59300°	111.6			HPCO	SE Whale Bank	(gravelly) sand		
	ABB-8	45.06767°	52.59300°	106.1			HPCO	SE Whale Bank	sand		

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
M/V THERON 1969	ABB-13 (Area A)	45.01167°	52.59300°	93.3			HPCO	SE Whale Bank	sandy mud	See * on previous page	Samples are generally at Dalhousie University in Geological Curation. A few were spilled in shipment from St. John's.
Amoco - IOE Soil gas analysis	ACC-44	44.67233°	52.56667°	84.1			HPCO	SE Whale Bank	(gravelly) sand	Position and depth estimated from Map of Area A	
program; Contractor:	ACC-57	44.53000°	52.56667°	89.0			HPCO	SE Whale Bank	(gravelly) sand		
Calvin B. Craig (first half)	AGG-3	45.12333°	52.51517°	98.8			HPCO	SE Whale Bank	sand		
Sam Eaton (second half)	AGG-8	45.06767°	52.51517°	100.6			HPCO	SE Whale Bank	muddy sand		
of Horvitz Research	AGG-13	45.01217°	52.51650°	98.9			HPCO	SE Whale Bank	muddy sand	Took longitude as 52°30.99'W	
Laboratories, Houston,	AHH-44	44.67233°	52.50000°	80.5			HPCO	SE Whale Bank	sand		
Texas.	AHH-48	44.62850°	52.50000°	84.1			HPCO	SE Whale Bank	sand		
	AHH-53	44.57417°	52.50000°	86.0			HPCO	SE Whale Bank	(gravelly) sand		
	AHH-57	44.53033°	52.50000°	89.0			HPCO	SE Whale Bank	(gravelly) sand		
	BC-8 (Area B)	44.69767°	53.62683°	107.9			HPCO	S Whale Bank	sand		
	BC-13	44.64267°	53.62433°	107.9			HPCO	S Whale Bank	sand		
	BD-4	44.74183°	53.61050°	115.2			HPCO	S Whale Bank	sand		
	BH-3	44.75300°	53.54717°	100.6			HPCO	S Whale Bank	sand		
	BH-8	44.69767°	53.46983°	102.4			HPCO	S Whale Bank	sandy mud		
	BH-13	44.64267°	53.47100°	104.2			HPCO	S Whale Bank	sand		
	BH-18	44.58800°	53.54717°	115.2			HPCO	S Whale Bank	sand		
	BM-3	44.75250°	53.47100°	95.1			HPCO	S Whale Bank	sand		
	BM-8	44.69767°	53.46983°	95.4			HPCO	S Whale Bank	sand	Took water depth as 313 ft from Slatt's notes	
	BM-13	44.64267°	53.47100°	107.9			HPCO	S Whale Bank	sand		
	BM-18	44.58800°	53.46983°	111.6			HPCO	S Whale Bank	sand		
	BM-23	44.53300°	53.47083°	133.5			HPCO	S Whale Bank	muddy sand		
	BR-8	44.69767°	53.39367°	98.8			HPCO	S Whale Bank	gravelly sand		

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
M/V THERON 1969 Amoco - IOE	BR-13 (Area B)	44.64267°	53.39367°	107.9			HPCO	S Whale Bank	muddy sand	See * on previous page	Samples thought to be at Dalhousie University in Geological Curation. A few were spilled in shipment from St. John's.
Soil gas analysis	BR-18	44.58850°	53.39367°	109.7			HPCO	S Whale Bank	muddy sand		
program; Contractor: Calvin B. Craig	BR-23	44.53300°	53.39250°	120.7			HPCO	S Whale Bank	muddy sand	took water depth as 396 ft from Slatt's notes	
(first half) Sam Eaton	BW-13	44.64267°	53.31667°	106.1			HPCO	S Whale Bank	muddy sand		
(second half) of Horvitz	BW-18	44.58800°	53.31650°	107.9			HPCO	S Whale Bank	muddy sand		
Research Laboratories,	BW-23	44.53300°	53.32183°	115.2			HPCO	S Whale Bank	sand		
Houston, Texas.	C-3 (Area C)	44.25300°	52.92677°	89.6			HPCO	SW Grand Bank	sand	Area C contains the Tors Cove D-52 wellsite	
	CC-8	44.19917°	52.59267°	82.3			HPCO	SW Grand Bank	(gravelly) sand		
	CC-13	44.14333°	52.58767°	89.6			HPCO	SW Grand Bank	muddy sand		
	CC-18	44.08750°	52.58950°	98.8			HPCO	SW Grand Bank	muddy sand		
	CC-23	44.03383°	52.58767°	129.8			HPCO	SW Grand Bank	muddy sand		
	CC-28	43.97733°	52.58767°	252.4			HPCO	SW Grand Bank	sand		
	CH-3	44.25300°	52.51417°	84.1			HPCO	SW Grand Bank	gravelly sand		
	CH-8	44.19917°	52.51417°	84.1			HPCO	SW Grand Bank	muddy sand		
	CH-13	44.14333°	52.51417°	86.0			HPCO	SW Grand Bank	muddy sand		
	CH-18	44.08750°	52.51417°	91.4			HPCO	SW Grand Bank	muddy sand		
	CH-23	44.03383°	52.51417°	115.2			HPCO	SW Grand Bank	muddy sand		
	CH-28	43.97733°	52.51417°	144.5			HPCO	SW Grand Bank	muddy sand		
	CH-33	43.92367°	52.51417°	223.1			HPCO	SW Grand Bank	sand	not really in area, off south edge	
	CM-3	44.25300°	52.43650°	82.3			HPCO	SW Grand Bank	sand		
	CM-8	44.19917°	52.43650°	84.1			HPCO	SW Grand Bank	sand		
	CM-13	44.14333°	52.43650°	84.1			HPCO	SW Grand Bank	muddy sand		

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
M/V THERON 1969	CM-18 (Area C)	44.08750°	52.43650°	87.8			HPCO	SW Grand Bank	muddy sand	See * on previous page	Samples are gener- ally at Dalhousie
Amoco - IOE Soil gas	CM-23	44.03383°	52.43650°	98.8			HPCO	SW Grand Bank	sand		University in Geo- logical Curation.
analysis program;	CM-28	43.97733°	52.43650°	107.9			HPCO	SW Grand Bank	muddy sand		A few were spilled in shipment from
Contractor: Calvin B. Craig	CM-32	43.93450°	52.43650°	118.9			HPCO	SW Grand Bank	muddy sand		St. John's.
(first half) Sam Eaton	CR-3	44.25300°	52.36167°	93.3			HPCO	SW Grand Bank	gravelly sand		
(second half) of Horvitz	CR-8	44.19917°	52.36167°	89.6			HPCO	SW Grand Bank	sand		
Research Laboratories,	CR-13	44.14583°	52.35867°	93.3			HPCO	SW Grand Bank	muddy sand		
Houston, Texas	CR-18	44.09033°	52.35867°	96.9			HPCO	SW Grand Bank	muddy sand		
	CR-23	44.03650°	52.35867°	100.6			HPCO	SW Grand Bank	muddy sand		
	CR-28	43.97733°	52.35867°	107.9			HPCO	SW Grand Bank	sand		
	CR-33	43.92367°	52.35867°	113.4			HPCO	SW Grand Bank	muddy sand		
	CW-3	44.25300°	52.28550°	86.0			HPCO	SW Grand Bank	gravelly muddy sand		
	CW-8	44.19917°	52.28550°	91.4			HPCO	SW Grand Bank	sandy mud		
	CW-13	44.14333°	52.28550°	93.3			HPCO	SW Grand Bank	muddy sand		
	CW-18	44.08750°	52.28550°	93.3			HPCO	SW Grand Bank	muddy sand		
	DU-5 (Area D)	45.60950°	52.11217°	76.8			HPCO	SW Grand Bank	sand	Area D contains the Grand Falls H-09 wellsite	
	DU-9	45.56550°	52.11217°	76.8			HPCO	SW Grand Bank	sand		
	DU-14	45.51167°	52.11217°	93.3			HPCO	SW Grand Bank	sand		
	DZ-1	45.65383°	52.03050°	87.8			HPCO	SW Grand Bank	sand		
	DZ-5	45.60950°	52.03050°	80.5			HPCO	SW Grand Bank	sand		
	DZ-9	45.56550°	52.03050°	82.3			HPCO	SW Grand Bank	sand		
	DZ-14	45.51167°	52.03050°	84.1			HPCO	SW Grand Bank	sand		
	DEE-1	45.65383°	51.95417°	87.8			HPCO	SW Grand Bank	sand		

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
M/V THERON 1969	DEE-5 (Area D)	45.60950°	51.95417°	82.3			HPCO	SW Grand Bank	sand	See * on previous page	Samples are generally at Dalhousie University in Geological Curation. A few were spilled in shipment from St. John's.
Amoco - IOE Soil gas	DEE-9	45.56550°	51.95417°	78.6			HPCO	SW Grand Bank	gravelly sand		
analysis program;	DEE-14	45.51167°	51.95417°	89.6			HPCO	SW Grand Bank	gravelly sand		
Contractor: Calvin B. Craig	DJJ-1	45.65383°	51.87417°	91.4			HPCO	SW Grand Bank	sand		
(first half) Sam Eaton	DJJ-5	45.60950°	51.87417°	98.8			HPCO	SW Grand Bank	sand		
(second half) of Horvitz	DKK-9	45.56550°	51.86000°	86.0			HPCO	SW Grand Bank	sand		
Research Laboratories,	DJJ-14	45.51167°	51.87417°	86.0			HPCO	SW Grand Bank	sand		
Houston, Texas.	DOO-1	45.65383°	51.79550°	96.9			HPCO	SW Grand Bank	sand		
	DOO-5	45.60950°	51.79550°	91.4			HPCO	SW Grand Bank	sand		
	DOO-9	45.56550°	51.79550°	87.8			HPCO	SW Grand Bank	sand		
	DOO-14	45.51167°	51.79550°	80.5			HPCO	SW Grand Bank	sand		

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
M/V THERON 1969 Amoco - IOE Soil gas analysis program; Contractor: Calvin B. Craig (first half) Sam Eaton (second half) of Horvitz Research Laboratories, Houston, Texas.	AZ-50 (Area A)	44.60556°	52.62222°	?	Program ran from May 10 to Oct. 10, 1969		HPCO	SE Whale Bank	3 in organic silt over sand with shells	Core length 1.2 m	These 16 piston core samples have probably long since been pitched out? Geotechnical analysis found in Geocon (1969) report to Amoco Canada Petroleum Company. COGLA Project 8640-A4-9E
	AJ-54	44.56250°	52.86806°	?			HPCO	SE Whale Bank	3 in organic silt over sand with shells	Core length 1.1 m	
	AJ-30	44.82500°	52.86944°	?			HPCO	SE Whale Bank	3 in organic silt over sand with shells	Core length 0.4 m	
	AH-26	44.86806°	52.90000°	?			HPCO	SE Whale Bank	sand with shells	Core length 1.0 m	
	AO-61	44.48611°	52.79167°	?			HPCO	SE Whale Bank	very thin silt over sand with shells	Core length 0.8 m	
	AH-31	44.81389°	52.90000°	?			HPCO	SE Whale Bank	sand with shells	Core length 0.9 m	
	AP-61	44.48611°	52.77500°	?			HPCO	SE Whale Bank	gray organic silt at top, shells below	Core length 1.3 m	
	AV-30	44.82778°	52.68333°	?			HPCO	SE Whale Bank	gray organic silt with shells at top	Core length 0.6 m	
	AZ-52	44.58472°	52.62222°	?			HPCO	SE Whale Bank	gray silt over sand with shells	Core length 0.7 m	
	AT-30	44.82500°	52.71528°	?			HPCO	SE Whale Bank	silt over sand with shells	Core length 0.7 m	
	CN-23 (Area C)	44.03333°	52.42222°	?			HPCO	SW Grand Bank	thin silt over sand	Core length 0.6 m	
	CL-23	44.03333°	52.45278°	?			HPCO	SW Grand Bank	very thin silt over sand	Core length 0.4 m	
	BJ-7 (Area B)	44.70833°	53.51667°	?			HPCO	S Whale Bank	sand with shells	Core length 1.2 m	
	BO-15	44.62083°	53.44028°	?			HPCO	S Whale Bank	organic fine silty sand with shells	Core length 1.4 m	
	BH-10	44.67639°	53.54722°	?			HPCO	S Whale Bank	very thin veneer of silt over sand with shells	Core length 0.5 m	
	BO-19	44.57778°	53.44028°	?			HPCO	S Whale Bank	very thin veneer of silt over sand with shells	Core length 0.6 m	

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt + Clay = Mud	Remarks	Curation Information
Fisheries Sample Collection 1970 - 71	T191-S243	46.45000°	51.73333°	110			GR	NW of Virgin Rocks and West of Downing Basin					Dalhousie holds residues of pro-processed samples but holds no bulk samples. Grab sampler type not known.
T. Pitt Roger M. Slatt	T191-S245	46.93333°	51.85000°	137			GR	NW of Virgin Rock and West of Downing Basin	0	100	0	69% shell; analysis from folder in G. Fader's cabinet (AGC)	
	T199-S170	46.95000°	51.85000°	156			GR	NW of Virgin Rocks and West of Downing Basin	99.0	1.0	0		
CSS KAPUSKASING 70-018 May 24 - June 18, 1970 Canadian Hydrographic Service Dick D. LeLievre	46 samples taken	Positions given in sounding notes as Decca Hi-Fix ranges June 12, 1970 - 5 stations #1-4, B.1 June 16, 1970 - 41 stations #5-46 The Hi-Fix positions have never been converted to geographic coordinates; they should be. Then sample nos., positions, day/times, depths and CHS visual descriptions could be entered into the SID system. The samples may even still be on hand?		?	?	?	VVGR	Ballard Bank	Visual descriptions and times are all in CHS Sounding Notes File No. 13635 and on Field Sheet 4280 and Boat Board 4280-2. Depths of the samples noted. (See proejct file)			Project File contains the CHS Sounding Notes and Field Sheet 4280 including the CHS visual descriptions etc.	It is not known if the samples have survived.
CSS BAFFIN 71-017 1971 Canadian Hydrographic Service Stu Dunbrack Dusty DeGrasse	?	Field Sheet 4165 must be checked for possible samples in the area. Others may be to east on field sheets 4164 or 4163.		?	?	?	VVGR	E Avalon Channel				May 3 - November 5, 1971 cruise. Final Field report implies that 12 grab samples were in the area on the Grand Banks east of the Avalon Peninsula/Channel. Note: F.S. 4165 located (2 parts) and it shows no grab samples in the project area for 1967, 1971 or 1972.	

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
D/V SEDCO I 1971 AMOCO Canada Petroleum Company Ltd.	Boring 1 Eider A-1 location	45.58250°	51.94389°	79.2	June 11 - 13, 1971		BH	W Grand Bank	See McClelland Engineers, Inc. (1971a) for visual reports, tests, etc.	Drilled to 17.2 m, 10 cores obtained	It is not known if these samples survived
	Boring 2 Murre A-1 location	46.10556°	49.16056°	64.0	Sept. 10 - 11, 1971		BH	Central Grand Bank	See McClelland Engineers, Inc. (1971b) for visual reports, tests, etc.	Drilled to 56.7 m, 21 cores obtained. This borehole is not in the project area.	It is not known if these samples survived
	Boring 3 Puffin A-1 location	44.65250°	53.70778°	108.5	Oct. 29 - 31, 1971		BH	S Whale Bank	See McClelland Engineers, Inc. (1971c) for visual reports, tests, etc.	Drilled to 37.6 m, 20 cores obtained.	It is not known if these samples survived

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt + Clay = Mud	Remarks	Curation Information
CSS DAWSON 71-021 1971 John H. Allen (MUN)	1 (E-1)	47.50000°	52.41667°	168	153	0935	SGR	Avalon Channel	X	X	X	Visual analysis predominantly gravel	Samples thought to be at Dalhousie University in Geological Curation but have not been found.
	2 (E-2)	47.50000°	52.16667°	157	153	?	SGR	Avalon Channel	X			Visual analysis predominantly gravel	
	3 (E-3)	47.50000°	51.91667°	176	153	?	SDG	Avalon Channel	X			Visual analysis predominantly gravel	
	C-1	48°02.2'	52°52.3'	132	163	0955	SGR	Conception Bay	Visual analyses from Cruise Report. Grain size analyses and geochemical analyses (and mineralogical analyses) are graphically illustrated in Slatt (1974b,c)			Visual: mS	
	C-2	47°59.2'	52°51.0'	117	163	?	SGR	Conception Bay				Visual: mS	
	C-3	47°56.0'	52°49.4'	165	163	?	SGR	Conception Bay				Visual: mS	
	C-4	47°51.3'	52°47.5'	185	163	?	SGR	Conception Bay				Visual: mG	
	C-5	47°48.0'	53°04.4'	95	163	?	SGR	Conception Bay				Visual: mG	
	C-6	47°46.9'	52°59.1'	216	163	?	SGR	Conception Bay				Visual: M	
	C-7	47°45.9'	52°53.7'	179	163	?	SGR	Conception Bay				Visual: gM	
	C-8	47°41.25'	52°54.0'	77	163	?	SGR	Conception Bay				Visual: G Hematite present	
	C-9	47°36.8'	52°54.5'	88	163	?	SGR	Conception Bay				Visual: M Hematite present	
	C-10	47°31.4'	53°02.1'	58	163	?	SGR	Conception Bay				Visual: mgS Hematite present	
	C-11	47°30.0'	53°07.5'	212	163	?	SGR	Conception Bay				Visual: M	
	C-12	47°36.3'	53°02.3'	51	163	?	SGR	Conception Bay				Visual: mS Hematite present	
	C-13	47°37.1'	53°07.0'	289	163	?	SGR	Conception Bay				Visual: M	
	C-14	47°39.2'	53°58.9'	47	163	?	SGR	Conception Bay				Visual: mG Hematite present	
	C-15	47°41.1'	53°04.6'	257	163	2230	SGR	Conception Bay				Visual: M	

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt	+ Clay	= Mud	Remarks	Curation Information
CSS DAWSON 72-009 1972 Lewis H. King (AGC)	1	44°28.9'	52°35.0'	88			VVGR	SW Grand Bank	0.04	69.69	16.34	14.02	30.36	Mean = 3.86 Ø St. Dev. = 2.65 Ø Skewness = + 0.47	
	(1)	44°28.9'	52°35.0'	88			CA	SW Grand Bank						18 Frames	G. Fader (AGC)
	2-core-1	44°27.9'	52°30.0'	77			GR (short core?)	SW Grand Bank	29.75	69.43	0.15	0.67	0.83	Mean = -0.140 Ø St. Dev. = 1.70 Ø Skewness = + 0.41	
	2	44°34.2'	52°33.5'	77			VVGR	SW Grand Bank	65.94	27.91	2.10	4.04	6.15	Mean = -2.19 Ø St. Dev. = 3.93 Ø Skewness = + 0.63	
	(2)	44°34.2'	52°33.5'	77			CA	SW Grand Bank						18 Frames	G. Fader (AGC)
	3	47°15.1'	57°44.8'	166			VVGR	Burgeo Bank (out of area)	5.21	22.84	45.29	26.76	71.95	Mean = 5.21 Ø St. Dev. = 3.54 Ø Skenwness = -0.31	
	(3)	47°15.1'	57°44.8'	166			CA	Burgeo Bank (out of area)						14 Frames	G. Fader (AGC)
	3-Dredge	47°15.7'	57°45.7'	179			DREDGE (sub - sample)	Burgeo Bank (out of area)	46.70	47.44	2.96	2.90	5.86	Mean = -1.15 Ø St. Dev. = 3.99 Ø Skewness = + 0.20	
									Grain size analyses (and positions, depths) from file in grain size box, downstairs in AGC. No other reference found.						
RITA MAXWELL 1972 Roger M. Slatt (MUN)	circa 65 samples	?	?	?			SGR	Conception Bay	See textural maps in Slatt (1974b)					no positions found. Only map of sample location in Slatt (1974b) Slatt reports 74 samples but 9 of these appear to be from MUN's 71-021 cruise the previous year	samples were brought to Dalhousie in 1976. Can't be found. See 5 p. forward re Placentia Bay

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
CSS KAPUSKASING 72-014 1972 Canadian Hydrographic Service E. J. Comeau	150 samples attempted 145 samples retained	Kapuskasing sampled on: August 1, 1972 - 72 stations; #1-72; August 28, 1972 - 56 samples, #73-128; August 31, 1972 - 22 samples, #129-150. 145 samples were retained. Positioning was by Decca Hi-Fix for samples #1 to 128 incl. Conventional Decca was used for samples # 129-150. The pattern 1 and 2 Hi-Fix and Decca readings are found in Miscellaneous Notes, File 13784 and 13780. These have never been converted to latitudes and longitudes; they should be. Then the sample nos., positions, depths, day/times and CHS visual descriptions could be entered into the SID system. The samples may even still be on hand?	?	?	?	VVGR	St. Marys Bay Trepassey Bay	Visual descriptions depths and times are all in the CHS 'Miscellaneous Notes' and on the summer's Field Sheets. #4390 and #4391 (See project file)	Project file contains Final CHS Field report and copies of the Miscellaneous Notes with the CHS visual descriptions of the Van Veen samples etc.	It is not known if the samples have survived.

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age					Remarks	Curation Information
									Gravel	Sand	Silt	+ Clay	= Mud		
CSS HUDSON 73-006 1973 L. H. King (phase I - bottom sampling) B. MacLean (phase II - drillholes)	Drillsite 12; also 73-2-354	46.55833°	55.31667°	221	189	2050	DRCO	Placentia Bay						1.05 m core 1.05 m pen.	AGC 11629, latitude given as 46°35.5'N rather than 46°33.5'N in King et al. (1986)
	Drillsite 13	46.50000°	55.33333°	130	189	2223	DRCO	Placentia Bay						boulder core	AGC 11667
	Drillsite 14	45.40167°	54.32333°	?	190	2312	DRCO	Haddock Channel						few pebbles	AGC 11612
	Drillsite 15	45.37167°	54.31500°	?	191	0114	DRCO	Haddock Channel						0.41 m core of boulder	AGC 11613
	73-9-218	44.95500°	55.54667°	374	104	1005	VVGR	St. Pierre Bank	0.00	40.55	39.36	20.09	59.45		AGC 11610
	73-9-219	45.02833°	55.33833°	304	105	1210	VVGR	St. Pierre Bank	2.49	89.42	3.06	5.03	8.09		AGC 11605, 11616, 11647
	73-9-220	45.13833°	55.42500°	146	105		VVGR	St. Pierre Bank	14.65	83.28			2.08		AGC 11623
	73-9-239	45.55500°	55.52500°	71	105	1150	VVGR	St. Pierre Bank	59.74	39.64			0.62		AGC 11607, 11610
	73-9-240	45.78333°	55.44500°	77	107		VVGR	St. Pierre Bank	23.83	75.79			0.38		AGC 11616, 11645
	73-9-255	46.03167°	55.55333°	62	107	0030	VVGR	St. Pierre Bank	90.65	9.11			0.24		AGC 11612
	73-9-256	45.87500°	55.40000°	146	107	0130	VVGR	St. Pierre Bank	0.50	88.93	7.46	3.56	11.02		AGC 11613
	73-9-257	45.80000°	55.33333°	165	107	0200	VVGR	Halibut Channel	19.11	65.88	10.77	4.24	15.01		AGC 11612, 11645
	73-9-258	45.67333°	55.23000°	154	107	0240	VVGR	Halibut Channel	45.68	43.99	7.68	2.64	10.32		AGC 11615
	73-9-259	45.74667°	55.13333°	152	107	0320	VVGR	Halibut Channel	0.13	78.90	16.42	4.54	20.96		AGC 11617
	73-9-260	45.79167°	55.18333°	170	107	0345	VVGR	Halibut Channel	0.29	57.92	33.95	7.84	41.79		AGC 11621

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt	+ Clay	= Mud	Remarks	Curation Information
CSS HUDSON 73-006 1973	73-9-261	45.87667°	55.27000°	160	107	0430	VVGR	Halibut Channel	0.15	84.64	10.14	5.06	25.34		AGC 11612, 11623
L. H. King (phase I - bottom	73-9-262	46.02167°	55.40833°	84	107	0545	VVGR	St. Pierre Bank	13.27	85.37			1.36		AGC 11614
sampling) B. MacLean (phase II -	73-9-263	46.14167°	55.14167°	75	107	0645	VVGR	St. Pierre Bank	72.64	27.13			0.03		AGC 11645
drillholes) (AGC)	73-9-280	46.30500°	55.47500°	130	107	1600	VVGR	St. Pierre Bank	0.05	49.64	45.33	4.99	50.32		AGC 11612, 11645
	73-9-281	46.11667°	55.45833°	91	107	1710	VVGR	St. Pierre Bank							AGC 11608, 11611 11628
	73-9-282	46.09500°	55.42500°	100	107	1745	VVGR	St. Pierre Bank	45.99	51.75	1.22	1.04	2.26		AGC 11620, 11645
	73-9-283	46.08667°	55.40000°	109	107	1800	VVGR	St. Pierre Bank	49.40	47.70			2.90		
	73-9-284	46.07667°	55.38500°	119	107	1820	VVGR	St. Pierre Bank	39.34	56.43	3.11	1.11	4.22		
	73-9-285	46.07167°	55.36500°	128	107	1840	VVGR	St. Pierre Bank	0.23	84.94	11.34	3.49	14.83		AGC 11628
	73-9-286	46.04833°	55.28000°	142	107	1900	VVGR	Halibut Channel	0.05	84.46	12.77	2.72	15.49		AGC 11621
	73-9-287	45.96167°	55.20833°	162	107	1940	VVGR	Halibut Channel	0.05	80.48	15.92	3.54	19.46		AGC 11620, 11623
	73-9-288	45.84667°	55.16667°	160	107		VVGR	Halibut Channel	0.03	79.58	16.56	3.83	20.39		AGC 11621
	73-9-289	45.81667°	55.09500°	152	107		VVGR	Halibut Channel	0.00	70.47	24.31	5.22	29.53		AGC 11620
	73-9-290	45.80000°	55.05500°	140	107		VVGR	Halibut Channel	17.44	76.78	3.13	2.65	5.78		AGC 11604, 11647
	73-9-291	45.83333°	54.94667°	73	107	2141	VVGR	Green Bank	81.08	18.41			0.51		AGC 11604, 11647
	73-9-292	45.89500°	54.98667°	109	107	2200	VVGR	Halibut Channel	51.82	46.81			1.37		AGC 11604, 11618

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt	+ Clay	= Mud	Remarks	Curation Information
CSS HUDSON 73-006 1973	73-9-293	45.92833°	55.03333°	137	107	2230	VVGR	Halibut Channel	0.00	79.50	17.60	3.35	20.95		AGC 11604, 11618
L. H. King (phase I - bottom	73-9-294	45.99667°	55.09167°	179	107	2311	VVGR	Halibut Channel	0.02	70.29	24.83	4.85	29.68		
sampling) B. MacLean (phase II -	73-9-295	46.10000°	55.21667°	139	108	0000	VVGR	Halibut Channel	31.20	62.11	4.95	1.75	6.70		AGC 11610
drillholes) (AGC)	73-9-296	46.24500°	55.35000°	135	108	0100	VVGR	St. Pierre Bank	0.10	64.80	30.79	4.31	35.10		AGC 11614
	73-9-297	46.33500°	55.45000°	163	108	0147	VVGR	Placentia Bay	3.70	41.04	49.06	6.20	55.26		AGC 11615
	73-9-298	46.38667°	55.48333°	179	108	0205	VVGR	Placentia Bay	56.10	24.22	16.68	3.01	19.69		AGC 11615
Phase II begins here	73-2-326	47.56167°	54.96667°	172	186	2332	VVGR	Fortune Bay	3.58	22.83	49.87	23.72	73.59		AGC 11621
	73-2-327	47.41167°	55.36667°	289	187	0204	VVGR	Fortune Bay	0.04	6.00	53.64	40.32	93.96		AGC 11617
	73-2-328	47.34500°	55.38000°	101	187	0250	VVGR	Fortune Bay	65.95	29.63	2.80	1.62	4.42		AGC 11623, 11646
	73-2-329	47.29167°	55.38000°	160	187	0325	VVGR	Fortune Bay	70.00	23.24	4.72	2.04	6.76		AGC 11620
	73-2-336	47.07833°	54.48667°	201	187	?	VVGR	Placentia Bay	visual, sandy, silty till					1 try	Postion digitized from plot on chart 4016
	73-2-337	47.01667°	54.48167°	193	187	?	VVGR	Placentia Bay	visual, sandy silty till					1 try	Position from SID
	73-2-338	46.85667°	54.48000°	175	187	?	VVGR	Placentia Bay	visual only ??					1 try	Position digitized from chart 4016
	73-2-339	46.76000°	54.53333°	128	187	1105	VVGR	Placentia Bay	visual, sandy gravel, shell					2 tries	Position digitized from chart 4016
	73-2-340	46.62167°	54.54667°	106	188	0054	VVGR	Placentia Bay	visual, silt, sand, shells					1 try	Postion from SID
	73-2-341	46.41667°	54.50000°	106	188	?	VVGR	Comus Ridge	visual, 2 pebbles					3 tries	Postion digitized from chart 4016

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt	Clay	CaCO3	Remarks	Curation Information
CSS HUDSON 73-006 1973	73-2-342	46.50833°	54.59000°	91	188	?	VVGR	Comus Ridge	visual 1 small cobble					2 tries	Position digitized from chart 4016
L. H. King (phase I - bottom	73-2-343	46.58667°	54.66833°	168	?	?	VVGR	Placentia Bay							Position from SID
sampling) B. MacLean (phase II -	73-2-344	46.71333°	54.78333°	237	?	?	VVGR	Placentia Bay							Position from SID
drillholes) (AGC)	73-2-345	46.81667°	54.88500°	241	?	?	VVGR	Placentia Bay							Position from SID
	73-2-346	46.88500°	54.95000°	190	?	?	VVGR	Placentia Bay							Position from SID
	73-2-347	46.94167°	54.85500°	201	?	?	VVGR	Placentia Bay							Position from SID
	73-2-348	47.01667°	54.92167°	78	?	?	VVGR	Placentia Bay							Position from SID

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt	Clay	CaCO3	Remarks	Curation Information
CSS DAWSON 73-015 1973 J. H. Allen (MUN)	DAW-1-73 (or G-1)	47.00000°	52.38167°	131.7	153	0352	SGR	Avalon Channel	86.50	13.00	0.5	0.00	4.00	See report by J. H. Allen (1973)	Samples are liste as being at Dalhousie University in Geological Curation but have not been found.
	DAW-2-73 (G-2)	47.00000°	52.50000°	137.2	153	?	SGR	Avalon Channel	97.60	2.4	0.00	0.00	11.50	Grain size analyses, surface texture examination, carbonate %age and lithologic analyses of gravel and sand are graphically illustrated in Slatt (1974a; 1977)	
	DAW-3-73 (G-3)	47.00000°	52.62000°	168.3	153	?	SGR	Avalon Channel	80.90	18.80	0.30	0.00	2.20		
	DAW-4-73 (G-4)	47.16667°	52.62000°	164.6	153	?	SGR	Avalon Channel	43.80	51.10	3.20	1.90	1.80		
	DAW-5-73 (G-5)	47.16667°	52.50000°	164.6	153	?	SGR	Avalon Channel	93.70	5.60	0.70	0.00	1.80		
	DAW-6-73 (G-6)	47.16667°	52.37833°	150.0	153	?	SGR	Avalon Channel	99.30	0.70	0.00	0.00	11.00	Actual values of percentages of gravel, sand, silt, clay and CaCO3 are found in the cruise report by J. H. Allen (1973)	
	DAW-7-73 (G-7)	47.33333°	52.37833°	170.1	153	?	SGR	Avalon Channel	2.50	93.30	2.90	1.30	0.90		
	DAW-8-73 (G-8)	47.33333°	52.50000°	170.1	153	?	SGR	Avalon Channel	83.40	16.20	0.30	0.00	2.20		
	DAW-9-73 (G-9)	47.33333°	52.62000°	159.1	153	1200	SGR	Avalon Channel	98.40	1.40	0.20	0.00	11.20		
	DAW-11-73 (G-11)	47.20167°	52.08167°	151.8	153	?	SGR	Avalon Channel	99.30	0.10	0.50	0.00	-		
	DAW-13-73 (G-13)	47.25000°	51.80000°	166.4	153	?	SGR	Avalon Channel	97.90	1.20	0.90	0.00	7.90		
	DAW-26-73 (G-26)	47.33333°	52.00000°	170.1	159	0445	SGR	Avalon Channel	77.60	16.50	3.90	2.00	3.30		
	DAW-27-73 (G-27)	47.33333°	51.87167°	179.2	159	?	SGR	W Grand Bank	97.80	1.00	1.20	0.00	7.50		
	DAW-28-73 (G-28)	47.33333°	51.74833°	173.1	159	?	SGR	W Grand Bank	94.00	2.80	3.20	0.00	1.80		
	DAW-45-73 (G-41)	47.33333°	51.75000°	168.3	160	?	SGR	W Grand Bank	94.50	0.20	3.20	2.10	-		
	DAW-44-73 (G-42)	47.33333°	51.87333°	173.7	160	?	SGR	W Grand Bank	71.60	22.10	3.90	2.40	2.20		

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt	Clay	CaCO3	Remarks	Curation Information
CSS DAWSON 73-015 1973 J. H. Allen (MUN)	DAW-43-73 (G-43)	47.16667°	52.00000°	144.5	160	1958	SGR	W Grand Bank	94.00	4.90	1.10	0.00	5.10	(See previous page)	Samples are listed as being at Dalhousie University in Geological Curation but have not been found.
	DAW-44B -73 (G-44)	47.00000°	52.00000°	142.6	161	0715	SGR	W Grand Bank	93.80	6.20	0.00	0.00	2.60		
	DAW-45B -73 (G-45)	47.00000°	51.87500°	151.8	161	?	SGR	W Grand Bank	90.30	9.50	0.10	0.00	3.50		
	DAW-46B -73 (G-46)	47.00000°	51.74667°	128.0	161	?	SGR	W Grand Bank	-	-	-	-	-	no values available in cruise report	
	DAW-59-73 (G-59)	46.83333°	51.75000°	131.7	161	?	SGR	Woolfall Bank	77.90	19.60	2.60	0.00	5.30		
	DAW-60B -73 (G-60)	46.83333°	51.87500°	142.6	161	?	SGR	Woolfall Bank	87.20	11.60	1.20	0.00	-		
	DAW-61B -73 (G-61)	46.83333°	52.00000°	131.7	161	1115	SGR	Woolfall Bank	19.90	78.70	1.00	0.40	4.80		
	DAW-62-73 (G-62)	46.66667°	52.00000°	111.6	162	0720	SGR	Woolfall Bank	72.90	26.50	0.70	0.00	4.00		
	DAW-63-73 (G-63)	46.66667°	51.87500°	111.6	162	?	SGR	Woolfall Bank	26.00	65.10	5.20	3.70	12.60		
	DAW-64-73 (G-64)	46.66667°	51.75000°	107.0	162	?	SGR	Woolfall Bank	82.00	18.00	0.00	0.00	9.70		
	DAW-71-73 (G-71)	47.38333°	51.84167°	182.9	162	1320	SGR	Avalon Channel	83.10	9.60	7.30	0.00	3.10		
	DAW-72-73 (G-72)	47.41667°	51.89500°	181.1	162	?	SGR	Avalon Channel	-	-	-	-	-	no values available in cruise report	
	DAW-73-73 (G-73)	47.40833°	52.00000°	179.2	162	?	SGR	Avalon Channel	60.50	21.7	17.80	0.00	2.40		
	DAW-74-73 (G-74)	47.50000°	52.00000°	179.2	162	1600	SGR	Avalon Channel	100.00	0.00	0.00	0.00	0.00		

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt	+ Clay	= Mud	Remarks	Curation Information
RITA MAXWELL 1973 1974 1975 C. F. Stehman J. D. Willey (MUN)	PLA 1	47°44.20'	54°00.20'	?			SGR	N Placentia Bay S Arnolds Cove	57.92	37.49	2.68	1.92	4.60	Radar Positioning used. The raw grain size analysis data are available for all these samples except No. PLA 98. Plotted size analysis data with size fractions skewness, st. dev. etc. are also available for all samples up to PLA 85. Calcium Carbonate weight %age in the 0.06 to 8.0 mm fraction is available for certain samples from Stehman (1981). Grain size analyses were assessed by Stehman (1976). Willey (1976) presents tables of data and a geochemical anaylsis of 28 of these samples marked with an * in column 1.	Charles F. Stehman is now with Law Engineering Testing Company P.O. Box 278 Wilmington, North Carolina 28402. He has provided Alan Ruffman with his 87 grain size ra data sheets as well as plots an his residue samples plus other unpublishe data. These are all to be placed in the AGC sampl repository. When Roger Slatt left Memorial Univeristy in 1976 Charles Stehman brought to Dalhousie's Dept of Geology's curation section all his Conception Bay (marked CON) and all his Placentia Bay (marked PLA) samples in mason jars in sectioned cardboard boxes. These were seen to be placed safely into Curation. However, these could not be found by Alan Ruffman in 1987.
	PLA 2	47°42.50'	53°59.40'	?			SGR	N Placentia Bay S Arnolds Cove	69.73	18.42	6.38	5.48	11.86		
	PLA 8	47°48.20'	54°05.00'	?			SGR	N Placentia Bay off North Hbr.	0.55	85.83	9.98	3.63	13.61		
	PLA 10	47°47.10'	54°08.90'	?			SGR	N Placentia Bay SE Sound Island	84.17	12.07	2.47	1.29	3.76		
	PLA 14	47°43.10'	54°01.20'	?			SGR	N Placentia Bay S Arnolds Cove	8.87	91.13	0.00	0.00 fines lost	0.00		
	PLA 15	47°43.60'	54°03.80'	?			SGR	N Placentia Bay Eastern Channel	69.51	30.49	0.00	0.00 fines lost	0.00		
	PLA 21	47°44.90'	54°10.40'	?			SGR	N Placentia Bay Western Channel	99.80	0.16	0.02	0.02	0.04		
	PLA 22*	47°44.10'	54°08.90'	?			SGR	N Placentia Bay Western Channel	0.00	1.38	43.94	54.67	98.61		
	PLA 23	47°43.70'	54°02.20'	?			SGR	N Placentia Bay nr Come By Chance	95.63	4.37 sands and	0.00	0.00 fines lost	0.00		
	PLA 24	47°43.10'	54°05.50'	?			SGR	N Placentia Bay Central Channel	61.83	38.17	0.00	0.00 fines lost	0.00		
	PLA 25	47°42.50'	54°03.80'	?			SGR	N Placentia Bay Eastern Channel	0.00	4.20	39.91	55.89	95.80		
	PLA 26*	47°41.90'	54°02.20'	?			SGR	N Placentia Bay Eastern Channel	9.43	32.41	31.78	26.38	58.16		
	PLA 27	47°41.30'	54°00.50'	?			SGR	N Placentia Bay Eastern Channel	71.54	4.92	23.41	0.14	23.55		
	PLA 28	47°40.80'	53°58.80'	?			SGR	N Placentia Bay Eastern Channel	65.86	33.46	0.32	0.36	0.68		
	PLA 31	47°44.30'	54°02.40'	?			SGR	N Placentia Bay nr Come By Chance	95.45	4.55	0.00	0.00	0.00		
	PLA 32*	47°48.70'	54°01.20'	10			SGR	N Placentia Bay Come By Chance	5.93	92.65	0.65	0.76	1.40		

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt	+ Clay	= Mud	Remarks	Curation Information
RITA MAXWELL 1973 1974 1975 C. F. Stehman J. D. Willey (MUN)	PLA 33*	47°48.10'	54°01.50'	20			SGR	N Placentia Bay Come By Chance	60.18	35.47	2.75	1.59	4.34	(See previous page)	(See previous page)
	PLA 34*	47°47.30'	54°02.00'	60			SGR	N Placentia Bay Come By Chance	84.80	12.15	1.85	1.20	3.05		
	PLA 35*	47°46.40'	54°02.90'	110			SGR	N Placentia Bay Come By Chance	71.30	14.01	5.84	8.85	17.74		
	PLA 36*	47°47.50'	54°05.40'	126			SGR	N Placentia Bay off North Hbr.	11.74	13.40	41.28	33.58	92.60		
	PLA 37*	47°49.80'	54°05.10'	30			SGR	N Placentia Bay North Harbour	77.97	22.03	0.00	0.00	0.00		
	PLA 37B	47°49.80'	54°05.10'	30			SGR	N Placentia Bay North Harbour	79.67	17.00	1.93	1.41	3.34		
	PLA 38*	47°51.00'	54°05.40'	16			SGR	N Placentia Bay North Harbour	89.62	2.65	4.89	2.85	7.74		
	PLA 39	47°48.30'	54°07.00'	71			SGR	N Placentia Bay off E Sound Is.	0.00	59.12	7.19	33.69	40.88		
	PLA 40*	47°50.10'	54°08.20'	50			SGR	N Placentia Bay Swift Current R.	63.16	25.99	8.03	2.82	10.85		
	PLA 41	47°51.20'	54°10.10'	20			SGR	N Placentia Bay Swift Current R.	19.55	58.06	16.37	6.02	22.39		
	PLA 42	47°51.20'	54°11.00'	?			SGR	N Placentia Bay Swift Current R.	44.55	45.84	6.49	3.12	9.61		
	PLA 43	47°49.80'	54°11.70'	?			SGR	N Placentia Bay Swift Current R.	35.39	61.77	1.83	1.00	2.83		
	PLA 44	47°47.80'	54°12.20'	35			SGR	N Placentia Bay Swift Current R.	0.00	4.17	49.25	46.58	95.83		
	PLA 45	47°45.10'	54°13.80'	?			SGR	N Placentia Bay nr West Shore	0.00	4.10	47.52	48.38	95.90		
	PLA 46	47°46.40'	54°08.50'	60			SGR	N Placentia Bay SE of Sound Is.	74.99	21.52	1.92	1.58	3.50		
	PLA 47	47°45.50'	54°06.40'	159			SGR	N Placentia Bay SE of Sound Is.	33.83	25.22	21.72	19.23	40.95		

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt	+ Clay	= Mud	Remarks	Curation Information
RITA MAXWELL 1973 1974 1975 C. F. Stehman J. D. Willey (MUN)	PLA 48*	47°44.60'	54°04.20'	330			SGR	N Placentia Bay nr Come By Chance	58.03	7.65	12.75	21.57	34.32	(See previous page)	(See previous page)
	PLA 49*	47°40.10'	54°03.10'	?			SGR	N Placentia Bay Eastern Channel	19.66	20.81	23.87	35.66	59.53		
	PLA 50*	47°39.20'	54°00.10'	300			SGR	N Placentia Bay Eastern Channel	81.41	2.40	6.81	9.38	16.19		
	PLA 51	47°48.30'	53°57.00'	?			SGR	N Placentia Bay Eastern Channel	13.17	80.76	2.83	3.25	6.08		
	PLA 52*	47°36.60'	53°59.30'	365			SGR	N Placentia Bay Eastern Channel	0.00	1.07	42.27	56.66	98.93		
	PLA 53	47°34.80'	54°03.20'	?			SGR	N Placentia Bay Eastern Channel	50.32	28.35	10.61	10.72	21.33		
	PLA 54	47°33.50'	53°59.60'	265			SGR	N Placentia Bay Eastern Channel	0.00	7.83	47.44	44.73	92.17		
	PLA 55	47°32.20'	53°59.90'	?			SGR	N Placentia Bay Eastern Channel	0.00	100.00	0.00	0.00	0.00		
	PLA 56*	47°35.60'	54°07.40'	?			SGR	N Placentia Bay Central Channel	0.00	1.03	32.30	66.67	98.97		
	PLA 57	47°39.30'	54°06.60'	?			SGR	N Placentia Bay Central Channel	71.94	25.57	1.17	1.31	2.48		
	PLA 58	47°43.00'	54°09.40'	95			SGR	N Placentia Bay Western Channel	72.34	17.37	5.35	4.95	10.30		
	PLA 59*	47°29.40'	54°03.60'	?			SGR	N Placentia Bay Eastern Channel	70.25	20.80	4.24	4.71	8.95		
	PLA 60*	47°28.60'	54°01.20'	295			SGR	N Placentia Bay Eastern Channel	0.00	16.74	46.93	36.33	83.26		
	PLA 61*	47°27.40'	53°57.70'	?			SGR	N Placentia Bay Eastern Channel	43.12	33.66	13.05	10.16	23.20		
	PLA 62	47°23.00'	54°00.80'	?			SGR	N Placentia Bay Eastern Channel	44.35	38.26	10.30	7.09	17.39		
	PLA 63	47°23.80'	54°02.20'	?			SGR	N Placentia Bay Eastern Channel	86.00	11.93	2.07	0.00	2.07		

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt	+ Clay	= Mud	Remarks	Curation Information
RITA MAXWELL 1973 1974 1975 C. F. Stehman J. D. Willey (MUN)	PLA 64	47°24.80'	54°05.50'	182			SGR	N Placentia Bay Eastern Channel	52.38	20.06	14.29	13.27	27.56	(See previous page)	(See previous page)
	PLA 65	47°25.60'	54°09.60'	?			SGR	N Placentia Bay N of Red Is.	44.33	36.70	9.97	9.00	18.97		
	PLA 66	47°26.10'	54°11.40'	?			SGR	N Placentia Bay Central Channel	33.77	15.07	22.72	28.44	51.16		
	PLA 67	47°23.80'	54°14.30'	?			SGR	N Placentia Bay Central Channel	0.00	87.56	7.81	4.63	12.44		
	PLA 68*	47°31.80'	54°19.50'	256			SGR	N Placentia Bay Western Channel	0.00	1.51	36.83	61.86	88.69		
	PLA 69*	47°36.70'	54°17.80'	216			SGR	N Placentia Bay Western Channel	0.00	1.49	32.37	66.14	98.51		
	PLA 70*	47°40.70'	54°14.20'	166			SGR	N Placentia Bay Western Channel	0.00	14.86	35.69	49.45	85.14		
	PLA 71	47°40.20'	54°12.10'	73			SGR	N Placentia Bay Western Channel	91.67	6.43	1.07	0.82	1.89		
	PLA 73*	47°25.30'	53°50.10'	30			SGR	N Placentia Bay Long Harbour	98.96	0.33	0.63	0.07	0.70		
	PLA 74*	47°24.80'	53°52.20'	58			SGR	N Placentia Bay Long Harbour	0.00	13.46	56.85	29.69	86.54		
	PLA 75*	47°24.30'	53°54.30'	85			SGR	N Placentia Bay Long Harbour	10.24	54.04	24.96	10.76	35.72		
	PLA 76*	47°23.70'	53°56.20'	84			SGR	N Placentia Bay Long Harbour	0.00	37.59	43.22	19.20	61.42		
	PLA 77*	47°25.10'	53°50.90'	36?			SGR	N Placentia Bay Long Harbour	43.42	39.91	14.05	2.62	16.67		
	PLA 80	47°19.30'	54°04.80'	228			SGR	N Placentia Bay Eastern Channel	0.00	81.24	14.03	4.73	18.76		
	PLA 81	47°20.30'	54°07.50'	110			SGR	N Placentia Bay Eastern Channel	56.12	40.66	1.82	1.40	3.22		
	PLA 82	47°21.20'	54°10.00'	91			SGR	N Placentia Bay Eastern Channel	0.00	100.00	0.00	0.00	0.00		

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt	+ Clay	= Mud	Remarks	Curation Information
RITA MAXWELL 1973 1974	PLA 83*	47°17.10'	54°14.00'	83			SGR	N Placentia Bay Eastern Channel	0.00	25.62	60.98	13.40	74.38	(See previous page)	(See previous page)
1975 C. F. Stehman J. D. Willey (MUN)	PLA 84*	47°26.90'	54°21.20'	380			SGR	N Placentia Bay Western Channel	29.97	1.20	28.07	40.76	68.82		
	PLA 85	47°32.80'	54°23.10'	82			SGR	N Placentia Bay Western Channel	58.77	36.84	1.05	3.34	4.39		
	PLA 86	47°52.50'	54°11.90'	3			SGR	N Placentia Bay Swift Current R.	No plots or calculated values available; must obtain from raw grain size data					Upstream in shallow river	
	PLA 87	47°16.10'	54°02.80'	?			SGR	N Placentia Bay Eastern Channel	as above						
	PLA 88	47°15.00'	54°08.40'	180			SGR	N Placentia Bay Eastern Channel	as above						
	PLA 89	47°19.50'	54°19.60'	290			SGR	N Placentia Bay Central Channel	as above						
	PLA 90	47°20.90'	54°25.50'	145			SGR	N Placentia Bay Western Channel	as above						
	PLA 91	47°25.80'	54°28.60'	?			SGR	N Placentia Bay Presque Harbour	as above						
	PLA 92	47°24.60'	54°85.20'	?			SGR	N Placentia Bay Paradise Sound	as above					latitude originally listed as 46°26.60'N but this position plots well on shore. An exact two minutes shift of the latitude south puts the sample in the channel axis. We list and plot this 2 minute adjustment.	
	PLA 93	47°29.40'	54°30.70'	?			SGR	N Placentia Bay Paradise Sound	as above						
	PLA 94	47°33.60'	54°26.80'	?			SGR	N Placentia Bay Paradise Sound	as above						

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age			Remarks	Curation Information
									Gravel	Sand	Silt + Clay = Mud		
RITA MAXWELL 1973 1974	PLA 95	47°35.50'	54°25.70'	?			SGR	N Placentia Bay Paradise Sound	as above			(See previous page)	(See previous page)
1975 C. F. Stehman J. D. Willey	PLA 96	47°25.90'	54°20.70'	?			SGR	N Placentia Bay Western Channel	as above				
(MUN)	PLA 97	47°25.60'	54°20.20'	130			SGR	N Placentia Bay Western Channel	as above				
	PLA 98	47°28.60'	54°18.30'	170			SGR	N Placentia Bay Western Channel	No gain size data available for this sample.				
	PLA 99	47°28.60'	54°17.70'	?			SGR	N Placentia Bay Western Channel	No plots or calculated values available; must obtain from raw grain size data.				
	PLA 100	47°28.60'	54°17.00'	88			SGR	N Placentia Bay Western Channel	as above				
	PLA 101	47°28.60'	54°16.40'	?			SGR	N Placentia Bay Western Channel	as above				
	PLA 102	47°30.50'	54°15.00'	?			SGR	N Placentia Bay Ragged Islands	as above				
	PLA 103	47°30.80'	54°16.20'	24			SGR	N Placentia Bay Ragged Islands	as above				
	PLA 104	47°35.80'	54°14.50'	70			SGR	N Placentia Bay Western Channel	as above				
	PLA 105	47°41.40'	54°16.70'	40			SGR	N Placentia Bay nr West Shore	as above				

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt + Clay = Mud	Remarks	Curation Information
RITA MAXWELL 1973 1974	P1	47°29.90'	53°58.30'				SGR	N Placentia Bay Eastern Channel	no grain size data available for this sample.			(See previous page)	(See previous page)
1975 C. F. Stehman J. D. Willey	P2	47°30.80'	53°59.60'				SGR	N Placentia Bay Eastern Channel	as above				
(MUN)	P4	47°29.40'	54°00.70'				SGR	N Placentia Bay Eastern Channel	as above				
	P5	47°29.90'	54°02.30'				SGR	N Placentia Bay Eastern Channel	as above				
	P6	47°29.70'	54°00.50'				SGR	N Placentia Bay Eastern Channel	as above				
	P7	47°29.50'	54°00.30'				SGR	N Placentia Bay Eastern Channel	as above				
	P8	47°30.30'	53°58.00'				SGR	N Placentia Bay Eastern Channel	as above				

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
ELF (Oil) 1971	Hermine E-94	45.39147°	54.49853°	82.6			Wild-cat Well	SE Green Bank	Well history and logs available on 3rd floor of AGC from Eastern Petroleum Group and COGLA	Total Depth 3267.5 m Well Ref. No. D38	See G. Karg of COGLA at BIO on 3rd floor of AGC
AMOCO/IOE 1971/72/73 (the "bird" holes)											
1971	Eider M-75	45.58194°	51.94487°	77.7			Wild-cat Well	Western Grand Bank	as above	Total Depth 3530 m Well Ref. No. D28	See G. Karg of COGLA at AGC; A soil (i.e. Quarternary) boring was done at this location plus one more east of the area in 1971 by Amoco See COGLA report 8640-A4-11E
1971-72	Puffin B-90	44.65354°	53.70788°	106.7			Wild-cat Well	Whale Bank - Shelf Edge	as above	Total Depth 4701.5 m Well Ref. No. D35	See G. Karg of COGLA at AGC; A soil (i.e. Quarternary) boring was done at this location plus one more east of the area in 1971 by Amoco See COGLA report 8640-A4-11E
1972	Petrel A-62	44.85175°	52.90430°	85.9			Wild-cat Well	Southeast Whale Bank	as above	Total Depth 1946 m Well Ref. No. D71	See G. Karg of COGLA at AGC
1972	Gannet O-54	45.06516°	52.63603°	99.9			Wild-cat Well	Whale Deep	as above	Total Depth 3048 m Well Ref. No. D78	as above
1972	Shear-water J-20	44.49339°	52.78148°	98.1			Wild-cat Well	Southwestern Grand Bank - Shelf Edge	as above	Total Depth 2321 m Well Ref. No. D77	as above
1972	Kitti-wake P-11	44.68040°	53.52935°	95.7			Wild-cat Well	Whale Bank - Shelf Edge	as above	Total Depth 3550 m Well Ref. No. D79	as above

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
AMOCO/IOE 1971/72/73 (the "bird" holes)											
1972	Heron H-73	44.04074°	52.42794°	105.5			Wild-cat Well	Southwestern Grand Bank - Shelf Edge	as above	Total Depth 3658 m Well Ref. No. D82	See G. Karg of COGLA at AGC
1972-73	Gull F-72	44.19033°	52.44231°	93.6			Wild-cat Well	Southwestern Grand Bank - Shelf Edge	as above	Total Depth 2501 m Well Ref. No. D36	as above
1972-73	Merg-anser I-60	44.82670°	52.38018°	78.6			Wild-cat Well	Southwestern Grand Bank	as above	Total Depth 1903.5 m Well Ref. No. D90	as above

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
AMOCO et al. (AMOCO-IMP-SKELLY) 1973-74 (the "bird" holes)											
1973	Tern A-68	44.45373°	53.15023°	114.6			Wild-cat Well	Whale Bank - Shelf Edge	Well history and logs available on 3rd floor of AGC from Eastern Petroleum Group and COGLA.	Total Depth 4189 m Well Ref. No. D102	See G. Karg of COGLA at AGC
1973	Mallard M-45	44.24616°	52.12289°	84.7			Wild-cat Well	Southwestern Grand Bank	as above	Total Depth 3552 m Well Ref. No. D89	as above
1973	Sandpiper J-77	45.61068°	51.68387°	90.5			Wild-cat Well	Western Grand Bank	as above	Total Depth 803 m	as above
1973	Sandpiper 2-J-77	45.61092°	51.68349°	90.2			Wild-cat Well	Western Grand Bank	as above	Total Depth 286.5 m	as above
1973	Razor-bill F-54	45.22359°	52.13957°	69.1			Wild-cat Well	Western Grand Bank	as above	Total Depth 3135 m Well Ref. No. D100	as above
1973	Heron J-72	44.02604°	52.43573°	109.7			Wild-cat Well	Southwestern Grand Bank - Shelf Edge	as above	Total Depth 1382 m	as above
1973	Pelican J-49	45.47644°	52.61159°	91.4			Wild-cat Well	Whale Deep	as above	Total Depth 1329 m Well Ref. No. D113	as above
1973	Brant P-87	44.28331°	52.70541°	98.8			Wild-cat Well	Southwestern Grand Bank - Shelf Edge	as above	Total Depth 3588 m Well Ref. No. D114	as above
1973-74	Coot K-56	45.76153°	52.14226°	79.9			Wild-cat Well	Western Grand Bank	as above	Total Depth 3536 m Well Ref. No. D119	as above
1974	Carey J-34	45.39234°	52.58408°	100.6			Wild-cat Well	Whale Deep	as above	Total Depth 3689 m Well Ref. No. D124	as above

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt	+ Clay	= Mud	Remarks	Curation Information
ELF et al. 1973-74	Emer-illon C-56	45.25133°	54.38801°	119.8			Wild-cat Well	Outer Haddock Channel	Well history and logs available on 3rd floor of AGC from Eastern Petroleum Group and COGLA					Total Depth 3277 m Well Ref. No. D115	See G. Karg of COGLA at AGC
? STN s 1-18															
CSS HUDSON 75-009 Phase 1 1975 G. Fader (AGC)	009-025 -FAA	47.16283°	51.95783°	146.3	147	2225	DRCO	W of Downing Basin						4.80 m core 5.72 m pen.	
	009-025 -FAA-CA	47.16283°	51.95783°	146.3	147	?	B&WCA	W of Downing Basin						2 negatives	G. Fader (AGC)
	009-025 -FAA-G	47.16283°	51.95783°	146.3	147	?	VVGR	W of Downing Basin	0.00	35.64	52.70	11.66	64.63	mud	AGC 10565. 13038
CSS HUDSON 77-011 G. Fader L. King (AGC)	011-002	47.16333°	52.21333°	148.1	138	1200	CCA	Avalon Channel						No photos	G. Fader (AGC)
	011-002DR	47.16333°	52.21333°	148.1	138	?	DRCO	Avalon Channel						two cores of 0.13 m and 0.63 m	
	011-003	47.16333°	52.68333°	144.5	138	1620	CCA	Avalon Channel						18 colour slides	G. Fader (AGC)
	011-003DR	47.16333°	52.36833°	144.5	138	?	DRCO	Avalon Channel						0.87 m core 5.15 m pen.	
	011-004	47.16333°	52.41333°	155.5	138	1930	DRCO	Avalon Channel							
	011-005	47.39000°	52.57000°	168.2	138	2120	B&WCA	Avalon Channel						6 negatives No sample	G. Fader (AGC)
	011-005DR	47.39000°	52.57000°	168.2	138	?	DRCO	Avalon Channel							
	011-008	47.71333°	52.51333°	179.2	140	?	VVGR	Off Cordelia Deeps							
	011-008CA	47.71333°	52.51333°	179.2	140	?	B&WCA	Off Cordelia Deeps						4 negatives	G. Fader (AGC)
	011-008DR	47.71333°	52.51333°	179.2	140	?	DRCO	Off Cordelia Deeps						0.24 m core 0.89 m pen.	
	011-010DR	47.39167°	51.75833°	164.5	?	?	DRCO	NW of Downing Basin						0.07 m core 1.77 m pen.	
	011-011B	47.24167°	51.75333°	162.7	?	?	DRCO	NW of Downing Basin							

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
CSS HUDSON 77-011 G. Fader L. King (AGC)	011-028	46.89667°	51.97667°	138.9	151	1517	DRCO	E of Bantam Banks		0.06 m core 2.02 m pen.	
	011-028CA	46.89667°	51.97667°	138.9	151	?	B&WCA	E of Bantam Banks		16 negatives	G. Fader (AGC)
	011-029	46.86667°	51.94333°	138.9	151	1810	VVGR	E of Bantam Banks			
	011-029CA	46.86667°	51.94333°	138.9	151	?	B&WCA	E of Bantam Banks		22 negatives (1/2 good)	G. Fader (AGC)
	011-029DR	46.86667°	51.94333°	138.9	151	?	DRCO	E of Bantam Banks			
	011-030	46.87500°	51.94833°	142.6	151	2130	B&WCA	E of Bantam Banks		17 negatives (numbered to 31)	G. Fader (AGC)
	011-030DR	46.87500°	51.94833°	142.6	151	?	DRCO	E of Bantam Banks		0.14 m core 0.78 m pen.	
	011-031DR	46.41500°	52.72333°	175.6	152	1430	DRCO	E Avalon Channel		no recovery?	
	011-032A 011-032B	46.40183°	52.74333°	170.1	152	1600	DRCO DRCO	E Avalon Channel		0.16 m and 0.17 m cores	Two cores, a;b
	011-033	46.39167°	52.79500°	173.7	152	2000	B&WCA	E Avalon Channel		19 negatives	G. Fader (AGC)
CSS HUDSON 78-008 1978 David L. McKeown	(47)	46.77000°	54.99167°	?	124	?	GCO PEN	St. Pierre Channel	Also a Memorial University impact core penetrometer station	These samples are reported in the cruise report by David L. McKeown.	The samples of this cruise are not presently listed in SID. It is not known if the samples survived.
	(50)	46.78000°	54.95500°	?	124	?	PEN	St. Pierre Channel	MUN penetrometer station		
	(54)	46.76667°	54.99167°	?	125	?	PEN	St. Pierre Channel	MUN penetrometer station		
	Drill #2 (58)	46.62550°	55.45050°	?	126	?	DRCO	St. Pierre Channel			
	Drill #3 (59)	46.62333°	55.45167°	?	126	?	DRCO	St. Pierre Channel			

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
CSS HUDSON 78-008 1978	Drill #4 (60)	46.62000°	55.46333°	?	126	?	DRCO	St. Pierre Channel		These samples are reported in the cruise report	The samples of this cruise are not presently listed in
David L. McKeown	Drill #5 (62)	46.58833°	55.51167°	?	126	?	DRCO	St. Pierre Channel		by David L. McKeown.	SID. It is not known if the samples survived.
	Drill #6 (63)	46.64167°	55.53833°	?	126	?	DRCO	St. Pierre Channel			
	Drill #7 (66)	46.66500°	55.36500°	?	127	?	DRCO	St. Pierre Channel			
	Drill #8 (67)	46.72167°	55.66000°	?	127	?	DRCO	St. Pierre Channel			
	Drill #9 (68)	46.70833°	55.78000°	?	127	?	DRCO	St. Pierre Channel			
	Drill #10 (69)	46.70833°	55.78000°	?	127	?	DRCO	St. Pierre Channel			
	Drill #11 (71)	46.72167°	55.66333°	?	127	?	DRCO	St. Pierre Channel			
	Drill #12 (72)	46.72000°	55.66667°	?	127	?	DRCO	St. Pierre Channel			
	"Drill" (73)	46.71667°	55.64667°	?	128	?	DRCO	St. Pierre Channel			
	(82)	46.91333°	54.80167°	?	128	?	PEN	St. Pierre Channel	MUN Penetrometer station		
	(83)	46.91333°	54.80500°	?	128	?	PEN	St. Pierre Channel	MUN Penetrometer station		
	Drill #13 (84)	46.91000°	54.82500°	?	128	?	DRCO	St. Pierre Channel			
	Drill #14 (85)	46.97167°	54.99333°	?	128	?	DRCO	St. Pierre Channel			
	Drill #15 (91)	46.99333°	54.95833°	?	129	?	DRCO	St. Pierre Channel			

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt	+ Clay	= Mud	Remarks	Curation Information
CSS HUDSON 78-008 1978 David L. McKeown	(93)	46.90667°	54.78333°	?	129	?	PEN	St. Pierre Channel	MUN Penetrometer station					These samples are reported in the cruise report by David L. McKeown.	The samples of this cruise are not presently listed in SID. It is not known if the samples survived.
	Drill #16 (94)	46.99500°	54.95667°	?	129	?	DRCO	St. Pierre Channel							
	Drill #17 (101)	46.39667°	52.65833°	?	130	?	DRCO	Avalon Channel							
	Drill #18 (104)	46.40000°	52.71833°	?	130	?	DRCO	Avalon Channel							
	Drill #19 (105)	46.40000°	52.70833°	?	130	?	DRCO	Avalon Channel							
	Drill #20 (106)	46.39833°	52.68167°	?	130	?	DRCO	Avalon Channel							
CSS HUDSON 78-012 1978 G.R. Peters (MUN) G. Fader (AGC)	012-G121A	46.82367°	54.75300°	237.7	140	1249	VVGR	Placentia Bay	0.00	3.07	71.32	25.60	96.92	Hue 5Y 3/2	AGC 12862
	G121A-PCO	46.82367°	54.75300°	237.7	140	?	PCO	Placentia Bay							Memorial University Nfld. Soils Lab. Cold Storage Box 13
	012-G122	46.86520°	54.74167°	232.3	140	1500	VVGR	Placentia Bay	0.00	4.75	72.07	23.19	95.26	Hue 5Y 25/2	AGC 12826
	012-G123A	46.86800°	54.71667°	232.3	140	1551	VVGR	Placentia Bay	0.22	7.75	70.37	21.65	92.02	Hue 5Y 3/1	AGC 12582
	G123A-PCO	46.86800°	54.71667°	232.3	140	?	PCO	Placentia Bay							Memorial Univ. Nfld. Soils Lab. Cold Storage Box 6
	012-G133	46.87000°	54.69333°	228.6	140	1730	VVGR	Placentia Bay	0.00	17.51	67.66	14.83	82.45	Hue 5Y 3/1	AGC B66, 12582
	012-G132A	46.83833°	54.72833°	263.3	140	1825	VVGR	Placentia Bay	0.00	7.68	74.04	18.28	92.32	Hue 5Y 3/2	AGC 12862, 15143

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt	+ Clay	= Mud	Remarks	Curation Information
CSS HUDSON 78-012 1978 G.R. Peters (MUN) G. Fader (AGC)	G132A-PCO	46.83833°	54.72833°	263.3	140	?	PCO	Placentia Bay	0.00	2.67	68.84	28.49	97.33	Interval 20-25 cm	AGC warehouse, cold storage
									0.00	0.82	51.57	47.61	99.18	140-145 cm	
									0.00	1.58	52.88	45.54	98.42	240-245 cm	
									0.00	1.96	49.81	48.23	98.04	340-345 cm	
									0.00	1.31	47.13	51.56	98.69	440-445 cm	
									0.00	1.16	47.01	51.83	98.84	555-560 cm	
									0.00	0.83	47.29	51.88	99.17	575-580 cm	
									0.00	4.17	44.93	50.89	95.82	675-680 cm	
									0.00	0.89	43.79	55.32	99.11	725-730 cm	
									1.34	1.61	43.30	53.75	97.05	855-860 cm	
	012-G131	46.81167°	54.75167°	237.7	140	2052	VVGR	Placentia Bay	0.00	3.92	72.57	23.52	96.09	Hue 5Y 3/1	AGC 18226, 13143
	G131-CA	46.81167°	54.75167°	237.7	140	?	CCA	Placentia Bay							
	012-G141A	46.80750°	54.73667°	230.4	140	2201	VVGR	Placentia Bay	0.00	10.65	70.04	19.31	89.35	Hue 5Y 3/2	AGC 12826, 13143
	G141A-PCO	46.80750°	54.73667°	230.4	140	?	PCO	Placentia Bay							Memorial Univ. Nfld. Cold Storage Box 1
	012-G142	46.82667°	54.71667°	232.2	141	0006	VVGR	Placentia Bay	0.00	12.83	69.76	17.41	87.17	Hue 5Y	AGC 12826, 13143
	012-G143	46.84667°	54.69667°	228.6	141	0040	VVGR	Placentia Bay	0.00	22.85	63.31	18.84	82.15	Hue 5Y 3/2	AGC 12826, 13143
	012-G153	46.85000°	54.67667°	224.9	141	0127	VVGR	Placentia Bay	0.00	36.30	54.69	9.01	63.70	Hue 5Y 3/2	AGC 12826, 13143
	012-G152	46.82833°	54.70833°	228.6	141	0211	VVGR	Placentia Bay	0.00	24.78	61.54	13.69	75.23	Vials Hue 5Y 3/2	AGC 12587, 13143
	012-G151	46.79667°	54.73000°	232.3	141	0250	VVGR	Placentia Bay	0.00	17.02	65.93	17.05	82.98	Hue 5Y 3/2	AGC 12826, 13143
	012-G211	46.84333°	54.72833°	219.5	141	1444	VVGR	Placentia Bay							
	012-G212	46.86833°	54.89833°	219.5	141	1558	VVGR	Placentia Bay	49.70	25.48	18.84	5.98	24.82		AGC 12829
	G212-CA	46.86833°	54.89833°	219.5	141	?	CCA	Placentia Bay							
	012-G213	46.89167°	54.87333°	219.5	141	1657	VVGR	Placentia Bay	47.49	32.23	15.19	5.09	20.28	Hue 5Y 3/2	AGC 12829
	012-G214	46.91000°	54.84667°	226.8	141	1730	VVGR	Placentia Bay	58.37	26.49	11.37	3.77	15.14	Hue 5Y 3/2	AGC 12829
	012-G224	46.90333°	54.84000°	235.9	141	1804	VVGR	Placentia Bay	33.69	29.67	25.24	11.40	36.64	Bags and vials Hue 5Y	AGC 12823
	012-G223	46.88000°	54.86333°	226.8	141	1849	VVGR	Placentia Bay	53.38	26.15	15.68	4.79	20.47	Bags and vials	AGC 12823
	012-G222	46.85500°	54.89000°	223.1	141	1924	VVGR	Placentia Bay	65.96	22.78	8.85	2.41	11.26		AGC 12829

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt	+ Clay	= Mud	Remarks	Curation Information
CSS HUDSON 78-012	012-G221	46.83167°	54.92000°	223.1	141	1951	VVGR	Placentia Bay	93.45	3.50	2.33	0.72	3.05		AGC 12829
1978 G.R. Peters	012-G231	46.83333°	54.92333°	234.1	141	2027	VVGR	Placentia Bay	75.88	11.51	9.91	2.69	12.60	Bags and vials	AGC 12823
(MUN) G. Fader	012-G232	46.85750°	54.86833°	237.7	141	2049	VVGR	Placentia Bay	59.48	18.57	17.39	4.56	21.95	Bags and vials	AGC 12823
(AGC)	012-G233	46.88167°	54.84167°	241.4	141	2128	VVGR	Placentia Bay	65.55	15.68	15.00	3.76	18.76	Bags and vials	AGC 12823
	012-G234	46.90417°	54.81833°	248.7	141	2218	VVGR	Placentia Bay	46.54	23.83	23.95	5.69	29.64	Bags and vials	AGC 12823
	012-G244	46.89500°	54.80500°	219.5	141	2250	VVGR	Placentia Bay	11.34	27.33	51.82	9.50	61.32	Vials	AGC 12582
	012-G243	46.87500°	54.82667°	246.9	141	2335	VVGR	Placentia Bay	18.49	27.27	45.61	8.64	54.25	Vials	AGC 12582
	012-G242	46.84167°	54.85667°	241.4	142	0019	VVGR	Placentia Bay	17.40	30.01	44.03	8.55	52.58	Vials	AGC 12582
	012-G311	46.75000°	54.72833°	186.5	142	1236	VVGR	Placentia Bay	4.22	87.93	6.32	1.53	7.85	Vials, may be error in long.	AGC 12583
	012-G312	46.78167°	54.59500°	173.7	142	1317	VVGR	Placentia Bay	34.83	62.47	1.89	0.81	2.70		AGC 12825
	012-G313	46.81000°	54.56833°	170.1	142	1410	VVGR	Placentia Bay	5.23	87.20	5.92	1.66	7.58		AGC 12825
	012-G323	46.78833°	54.57000°	170.1	142	1505	VVGR	Placentia Bay							May have error in position?
	012-G322	46.77500°	54.64167°	177.4	142	1620	VVGR	Placentia Bay						May be error in longitude	
	012-G321	46.80667°	54.60000°	173.7	142	1719	VVGR	Placentia Bay						No sample	May have error in position?
	012-G331	46.74167°	54.60000°	166.4	142	1819	VVGR	Placentia Bay						No sample	
	012-G332	46.76917°	54.57500°	164.6	142	1859	VVGR	Placentia Bay						No sample	
	012-G333	46.79667°	54.55000°	164.6	142	1958	VVGR	Placentia Bay	19.82	74.54	3.66	1.98	5.64		AGC 12583
	012-G343	46.78500°	54.53667°	153.6	142	2040	VVGR	Placentia Bay						No sample	
	012-G342	46.76417°	54.56417°	157.3	142	2150	VVGR	Placentia Bay	7.76	88.74	0.00	0.00	0.00		AGC 12825
	012-G341	46.74250°	54.53667°	157.3	142	2244	VVGR	Placentia Bay	28.60	67.51	2.63	1.26	3.89		
	012-G351	46.73500°	54.57833°	151.8	142	2330	VVGR	Placentia Bay						No sample	
	012-G352	46.73667°	54.57667°	150.0	143	0021	VVGR	Placentia Bay							
	012-G353	46.78000°	54.53833°	151.8	143	0110	VVGR	Placentia Bay	80.36	18.64	0.78	0.23	1.01	Vials	AGC 12582

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt	+ Clay	= Mud	Remarks	Curation Information
CSS HUDSON 78-012 1978 G.R. Peters (MUN)	012-G313	46.80000°	54.57333°	?	143	1150	PCO	Placentia Bay						Core length 264 cm	Memorial Univ. Nfld. Soils Lab Cold storage 'pipes'
G. Fader (AGC)	012-G321	46.76000°	54.60333°	181.1	143	1336	PCO	Placentia Bay	0.23	32.06	46.05	21.65	67.71	Interval 0-4 cm	AGC 12830
									0.02	2.96	56.93	40.09	87.02	10-15 cm	AGC 12830
									0.07	5.96	53.02	40.95	93.97	60-65 cm	AGC 12830
									0.00	2.17	44.29	53.53	97.82	100-105 cm	AGC 12830
									0.06	2.38	46.00	51.56	97.56	125-130 cm	AGC 12830
									0.00	1.19	47.67	51.15	98.82	210-215 cm	AGC 12830
	012-G332	46.76667°	54.58000°	168.2	143	1420	PCO	Placentia Bay							
	012-G341	46.74667°	54.60000°	164.6	143	1619	PCO	Placentia Bay	26.13	70.10	2.55	1.22	3.77	1/4 split	
	G341-GR	46.74667°	54.60000°	164.6	143	?	VVGR	Placentia Bay	28.93	67.16	3.91	0.00	3.91	Bulk test	
	012-G423	46.65333°	54.70000°	193.9	143	1754	VVGR	Placentia Bay	0.00	87.78	10.17	2.04	12.21	Hue 5Y	AGC 12827, B67
	G423-PCO	46.65333°	54.70000°	193.9	143	?	PCO	Placentia Bay						Core length 135 cm	Memorial Univ. Nfld. Soils Lab Cold Storage 'pipes'
	012-G433	46.64667°	54.69500°	190.2	143	1908	VVGR	Placentia Bay	0.00	92.62	5.83	1.56	7.39		AGC 12827, 13144
	G433-PCO	46.64667°	54.69500°	190.2	143	?	PCO	Placentia Bay						Core Length 264 cm	Memorial Univ. Nfld. Soils Lab Cold Storage 'pipes'
	012-G432	46.65000°	54.72167°	195.7	143	2115	VVGR	Placentia Bay	0.00	86.66	11.25	2.09	13.34		AGC 12827, 13144
	G432-PCO	46.65000°	54.72167°	195.7	143	?	PCO	Placentia Bay						Core Length 234 cm	Memorial Univ. Nfld. Soils Lab Cold Storage 'pipes'
	012-G431	46.59333°	54.74000°	182.9	143	2250	VVGR	Placentia Bay	0.00	85.28	12.29	2.42	14.71		AGC 12827 13144
	012-G411	46.50500°	54.76000°	210.3	143	2325	VVGR	Placentia Bay	0.00	77.28	18.69	4.02	22.71		AGC 12827, 13144
	012-G412	46.62667°	54.74333°	208.5	144	0100	VVGR	Placentia Bay	0.00	81.70	15.06	3.24	18.30		AGC 12827, 13144
	012-G413	46.62667°	54.74333°	201.1	144	0158	VVGR	Placentia Bay	0.00	81.49	15.72	2.79	18.51		AGC 12827, 13144
	012-G422	46.62667°	54.72667°	201.2	144	0146	VVGR	Placentia Bay	0.00	84.92	12.71	2.37	15.08		AGC 12827, 13144

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt	+ Clay	= Mud	Remarks	Curation Information
CSS HUDSON 78-012	012-G511	46.56667°	54.35000°	84.1	144	1139	VVGR	Placentia Bay	94.88	4.41	0.71	0.00	0.71	Bags and vials	AGC 12827
1978 G.R. Peters	012-G512	46.59167°	54.37167°	86.0	144	1230	VVGR	Placentia Bay	97.00	2.58	0.42	0.00	0.42	Bags and vials	AGC 12827
(MUN) G. Fader	G512-CA	46.59167°	54.37167°	86.0	144	?	CCA	Placentia Bay						15 Slides	G. Fader (AGC)
(AGC)	012-G513	46.61833°	54.39333°	100.6	144	1340	VVGR	Placentia Bay	11.88	85.85	2.27	0.00	2.27	Bags and vials	AGC 12827
	012-G523	46.62833°	54.36500°	100.6	144	1415	VVGR	Placentia Bay	18.90	75.77	5.33	0.00	5.23	Bags and vials	AGC 12827
	G523-CA	46.62833°	54.36500°	100.6	144	?	B&WCA	Placentia Bay						14 negatives poor quality	G. Fader (AGC)
	012-G522	46.60600°	54.36500°	98.8	144	1505	VVGR	Placentia Bay	38.72	58.88	2.39	0.00	2.39	Bags and vials	AGC 12827
	G522-CA	46.60600°	54.36500°	98.8	144	?	CCA	Placentia Bay						11 slides	G. Fader (AGC)
	012-G521	46.57667°	54.34000°	78.6	144	1615	VVGR	Placentia Bay	47.63	51.27	1.11	0.00	1.11	Bags and vials	AGC 12827
	012-G531	46.57667°	54.32333°	73.2	144	1645	VVGR	Placentia Bay	79.13	20.40	0.47	0.00	0.47	Bags and vials	AGC 12827
	012-G532	46.60667°	54.35167°	93.3	144	1810	VVGR	Placentia Bay	51.3	46.82	1.89	0.00	1.89		
	G532-CA	46.60667°	54.35167°	93.3	144	?	B&WCA	Placentia Bay						2 negatives poor quality	G. Fader (AGC)
	012-G533	46.63250°	54.37333°	87.8	144	1901	VVGR	Placentia Bay	34.43	62.97	2.61	0.00	2.61	Bags and vials	AGC 12582
	012-G543	46.63500°	54.36000°	84.1	144	1917	VVGR	Placentia Bay	76.69	23.70	1.61	0.00	1.61	Bags and Vials	AGC 12582
	G543-CA	46.63500°	54.36000°	84.1	144	?	CCA	Placentia Bay						11 slides	G. Fader (AGC)
	012-G542	46.60667°	54.33667°	95.1	144	2010	VVGR	Placentia Bay	46.62	48.09	5.29	0.00	5.29		
	012-G541	46.58667°	54.31833°	78.6	144	2043	VVGR	Placentia Bay						No sample	
	012-G551	46.59167°	54.30833°	84.1	144	2120	VVGR	Placentia Bay	80.79	18.44	0.77	0.00	0.77	Bags and Vials	AGC 12582
	G551-CA	46.59167°	54.30833°	84.1	144	?	B&WCA	Placentia Bay						7 negatives poor quality	G. Fader (AGC)
	012-G552	46.61583°	54.32883°	91.4	144	2243	VVGR	Placentia Bay	38.94	79.30	11.76	0.00	11.76		AGC 12583
	012-G553	46.64500°	54.35000°	84.1	144	2243	VVGR	Placentia Bay	70.34	27.63	2.03	0.00	2.03		
	012-G611	46.51500°	55.19167°	151.8	145	1050	VVGR	Placentia Bay	79.12	12.72	5.63	2.53	8.16		AGC 12825
	G611-CA	46.51500°	55.19167°	151.8	145	?	B&WCA	Placentia Bay						12 negatives poor quality	G. Fader (AGC)

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt	+ Clay	= Mud	Remarks	Curation Information
CSS HUDSON 78-012 1978 G.R. Peters (MUN) G. Fader (AGC)	012-G612	46.53667°	55.17000°	151.8	145	1157	VVGR	Placentia Bay							AGC 12825
	G612-CA	46.53667°	55.17000°	151.8	145	?	B&WCA	Placentia Bay							
	012-G613	46.56167°	55.14500°	155.5	145	1248	VVGR	Placentia Bay							AGC 12583
	012-G623	46.55667°	55.14333°	155.5	145	1308	VVGR	Placentia Bay							AGC 12828
	012-G622	46.53333°	55.15833°	159.6	145	1349	VVGR	Placentia Bay						Sand fractions gravel	AGC 12582
	012-G621	46.51333°	55.18000°	151.8	145	1438	VVGR	Placentia Bay						Sand/gravel	AGC 12583
	G621-CA	46.51333°	55.18000°	151.8	145	?	CCA	Placentia Bay						3 slides	G. Fader (AGC)
	012-G631	46.53667°	55.17333°	?	145	1602	VVGR	Placentia Bay							AGC 12828
	012-G632	46.51800°	55.15167°	146.3	145	1645	VVGR	Placentia Bay							AGC 12828
	012-G633	46.54833°	55.13000°	153.6	145	1730	VVGR	Placentia Bay							AGC 12828
	012-G643	46.55333°	55.10833°	157.3	145	1835	VVGR	Placentia Bay							AGC 12828
	012-G642	46.51667°	55.14500°	139.0	145	1927	VVGR	Placentia Bay							AGC 12828
	012-G641	46.48833°	55.17500°	157.3	145	2027	VVGR	Placentia Bay							
	012-G651	46.49000°	55.16667°	153.6	145	2040	VVGR	Placentia Bay							
	012-G652	46.51883°	55.13083°	150.0	145	2100	VVGR	Placentia Bay							
	012-G653	46.54833°	55.11500°	153.6	145	2150	VVGR	Placentia Bay	31.73	51.31	11.98	4.98	16.96		
	012-G241	46.82167°	54.88667°	239.6	146	1346	VVGR	Placentia Bay	37.52	25.08	30.84	6.56	37.40	Bags and vials	AGC 12823
	012-G243	46.87667°	54.82500°	248.7	146	1309	PCO	Placentia Bay							
	012-G244	46.89333°	54.80500°	230.4	146	1342	PCO	Placentia Bay							
	012-G234	46.90167°	54.81667°	252.4	146	1550	PCO	Placentia Bay							
	012-G233	46.88167°	54.84667°	241.4	146	1683	PCO	Placentia Bay							
	012-G232	46.85667°	54.86833°	?	146	?	CCA	Placentia Bay						About 6 good slides	G. Fader (AGC)
	012-G223	46.88000°	54.86333°	226.8	146	1917	PCO	Placentia Bay	0.00	2.14	37.69	60.17	97.86	Interval 10-15 cm	Continued next page
								Placentia Bay	3.44	14.92	32.81	48.84	81.65	75-80 cm	

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Gravel	Sand	Silt	+ Clay	= Mud	Remarks	Curation Information
									Grain Size Analysis: %age						
CSS HUDSON 78-012 1978 G.R. Peters (MUN) G. Fader (AGC)	012-G223	46.88000°	54.86333°	226.8	146	1917	PCO	Placentia Bay	14.84	15.63	28.01	41.51	69.52	115-120 cm	Continued from previous page
								Placentia Bay	27.30	14.65	25.65	32.40	58.05	215-220 cm	
	012-F1	46.86833°	54.81500°	241.4	146	2020	PCO	Placentia Bay						Core length 315 cm	Memorial Univ. Nfld. Cold Storage Box 6
	012-F1	46.86833°	54.81500°	?	?	?	VVGR	Placentia Bay							
	012-FIGR	46.86833°	54.81500°	241.4	146	?	VVGR	Placentia Bay	0.00	21.96	67.40	10.64	78.04		AGC 12825, 13144
	012-F2	46.77083°	54.89667°	241.4	146?	?	VVGR	Placentia Bay	0.00	23.47	63.47	13.06	76.53	Hue 5Y	AGC 12825, B67 Memorial Univ. Nfld. Cold Storage Box
	012-F2	46.77083°	54.89667°	?	?	?	PCO	Placentia Bay							
	012-G421	46.64500°	54.75333°	204.8	147	1500	PCO	Placentia Bay	This position from SID is in error and needs adjustment. G421-GR below is in error also					Core length 297 cm	Memorial Univ. Nfld. Cold Storage 'pipes'
	G421-GR	46.64500°	54.75333°	204.8	147	?	VVGR	Placentia Bay	0.00	79.55	17.36	3.08	20.44		AGC 12827, 13144
	012-G441	46.64333°	54.72333°	188.4	147	1630	VVGR	Placentia Bay	0.00	91.38	6.65	1.96	8.61		AGC 12581, 12827, B67
	G441-PCO	46.64333°	54.72333°	188.4	147	?	PCO	Placentia Bay	0.00	85.53	11.44	3.03	14.07	Interval 15-20 cm	AGC warehouse, cold storage, long flat core core box; Another box has 6 pieces
									0.00	86.12	11.58	2.30	13.88	45-50 cm	
									0.00	64.00	26.35	9.64	35.99	185-190 cm	
									0.16	46.50	38.92	14.41	53.33	220-225 cm	
									0.05	64.33	26.77	8.85	35.62	260-265 cm	
									0.08	43.86	40.75	15.22	55.97	280-285 cm	
									0.00	52.44	34.46	13.10	47.56	320-325 cm	
									0.06	37.21	47.49	15.24	62.73	375-380 cm	
									0.00	31.10	52.05	16.84	68.89	405-410 cm	
									0.23	56.16	32.94	10.66	43.60	485-490 cm	
	012-G442	46.61333°	54.70667°	190.2	147	1758	VVGR	Placentia Bay	0.00	92.36	5.93	1.71	7.64		AGC 13144
	012-G443	46.64667°	54.68167°	177.4	147	1823	VVGR	Placentia Bay	7.98	85.76	3.89	2.36	6.25		AGC 125-83
	012-G453	46.64167°	54.65833°	179.2	147	1900	VVGR	Placentia Bay	72.01	26.50	1.09	0.41	1.50	Bags and Vials	AGC 125-82
	G453-CA	46.64167°	54.65833°	179.2	147	?	CCA	Placentia Bay						12 slides	G. Fader (AGC)
	012-G452	46.61333°	54.71833°	179.2	147	2003	VVGR	Placentia Bay	0.56	94.95	3.40	1.09	4.49		AGC 128-27, 13144
	G452-CA	46.61333°	54.71833°	179.2	147	?	B&WCA	Placentia Bay						2 negatives poor quality	G. Fader (AGC)

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt	+ Clay	= Mud	Remarks	Curation Information
CSS HUDSON 78-012	012-G451	46.65833°	54.71833°	179.2	147	2100	VVGR	Placentia Bay	0.03	94.92	3.84	1.22	4.06		AGC 125-82, 13144
1978	G451-CA	46.65833°	54.71833°	179.2	147	?	CCA	Placentia Bay						1 slide	G. Fader (AGC)
G.R. Peters (MUN)	G451-PCO	46.65833°	54.71833°	179.2	147	?	PCO	Placentia Bay							
G. Fader (AGC)	012-G121	46.82833°	54.75500°	235.9	148	1020	PCO	Placentia Bay							Memorial Univ. Nfld. Soils Lab Cold Storage Box 13
	012-G123	46.86667°	54.72667°	?	148	1248	PCO	Placentia Bay							Memorial Univ. Nfld. Soils Lab Cold Storage Box 5
	012-G132	46.88833°	54.72667°	?	148	1407	PCO	Placentia Bay							ACG warehouse, cold storage, 13 pieces
	012-G113	46.88167°	54.71833°	234.1	148	1520	VVGR	Placentia Bay	0.00	6.96	73.04	20.01	93.05	Hue 5Y	AGC 128-26, 13143
	012-G112	46.86333°	54.74833°	237.7	148	1600	VVGR	Placentia Bay	0.00	3.52	70.92	25.55	96.47		AGC 128-26
	012-G111	46.82500°	54.77833°	237.7	148	1638	VVGR	Placentia Bay	0.00	3.56	73.46	22.98	96.44		AGC 125-82
	012-G141	46.80667°	54.73833°	234.1	149	1220	PCO	Placentia Bay							Memorial Univ. Nfld. Soils Lab Cold Storage Box 1
	012-G143	46.84667°	54.69667°	228.6	149	1116	PCO	Placentia Bay						Core length 297 cm	Memorial Univ. Nfld. Soils Lab Cold Storage Box 5
	012-F3	46.79667°	54.59667°	190.2	149	1205	PCO	Placentia Bay							Memorial Univ. Nfld. Soils Lab Cold Storage Box 12(2)
	012-F4	46.70333°	54.65333°	184.7	149	1252	PCO	Placentia Bay							Memorial Univ. Nfld. Soils Lab Cold Storage 'pipes'
	012-G432	46.61500°	54.72167°	195.7	149	1323	PCO	Placentia Bay							

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt + Clay = Mud	Remarks	Curation Information
CSS HUDSON 78-012 1978 G.R. Peters (MUN)	012-G423	46.65500°	54.70167°	195.7	149	1418	PCO	Placentia Bay					Memorial Univ. Nfld. Soils Lab Cold Storage 'pipes'
G. Fader (AGC)	012-G433	46.66167°	54.69833°	193.9	149	1563	PCO	Placentia Bay				No sample	
	012-G442	46.61667°	54.70667°	190.2	149	1734	PCO	Placentia Bay					AGC 12583
	012-G441	46.59333°	54.72333°	190.2	149	1843	PCO	Placentia Bay					
CSS HUDSON 78-023 1978 R.T. Haworth (Formerly AGC)	36A	47°18.9'	52°37.8'				DRCO	Avalon Channel				Extension 96 cm Core 21 cm Sandstone pebbles	samples at AGC archives
	36B	47°18.9'	52°37.8'				DRCO	Avalon Channel				Extension 217 cm Core 18 cm Sandstone pebbles	
	36C	47°18.9'	52°37.8'				DRCO	Avalon Channel				Extension 220 cm Core 58 cm Sandstone and basalt pebbles	
	36D	47°18.8'	52°38.1'				DRCO	Avalon Channel				Extension 284 cm Core 68 cm Sandstone pebbles	
	36E	47°19.0'	52°37.9'				DRCO	Avalon Channel				Extension 279 cm Core 43 cm Sandstone pebbles	
	36F	47°18.9'	52°37.9'				DRCO	Avalon Channel				Extension 303 cm Core 21 cm no rock type given	

Source:
Cruise Report

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
CSS HUDSON 79-011 1979 L. King G. Fader (AGC)	DR STAT #1	46.70300°	55.00000°	210	145	1150	DRCO	Placentia Bay		0.50 m core 1.13 m pen.	Samples where recovered are archived at AGC
	DR STAT #2	46,70333°	54.99167°	212	146	1200	DRCO	Placentia Bay		1.0 m core 1.0 m pen.	
	DR STAT #3A	46.69583°	55.02167°	212	146	1940?	DRCO	Placentia Bay		1 bag of till? Fragments of sandstone 0.57 m core	Called 3A in SID and just 3 in ship's log, large drill used.
	DR STAT #3B	46.70250°	55.02417°	211	146	2117	DRCO	Placentia Bay		1.75 m core 3.00 m pen.?	small drill used
	DR STAT #4A	46.97167°	54.99333° (est.)	47	147	1340	DRCO	Placentia Bay Offer Bank		0.90 m core	6 attempts on Offer Bank
	DR STAT #4B	46.97167°	54.99333° (est.)	34	147	1425	DRCO	Placentia Bay Offer Bank		0.84 m core	
	DR STAT #4C	46.97167° (est.)	54.99333° (est.)	?	147	?	DRCO	Placentia Bay Offer Bank		0.97 m core	
	DR STAT #4D	46.97333°	54.99333°	42	147	1636	DRCO	Placentia Bay Offer Bank		0.29 m core	
	DR STAT #4E	46.97333° (est.)	54.98833° (est.)	?	147	?	DRCO	Placentia Bay Offer Bank		0.05 m core	
	DR STAT #4F	46.97333°	54.98833°	51	147	1855	DRCO	Placentia Bay Offer Bank		2.97 m core 3.00 m pen.	purple, coarse conglomerate
	DR STAT #5	46.87333°	54.89500°	223	148	?	DRCO	Placentia Bay		4 bags - VCO? 1.0 m core	AGC 13148
	DR STAT #5-CA	46.87333°	54.89500°	223	148	?	CCA	Placentia Bay		3 slides	G. Fader (AGC)
	DR STAT #6	46.86667°	55.03000°	194	148	?	DRCO	Placentia Bay		PCO?	AGC 13148
	DR STAT #1	46.70300°	55.00000°	210	149	1230	DRCO	Placentia Bay		Repeat Station	
	Vibracore #1 (Stat.17)	46.70167°	54.91683°	212	149	1734	VCO	Placentia Bay			AGC Warehouse, cold storage, AR-0-140 cm, 140-290 cm, 290-403 cm AGC 13149

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt	+ Clay	= Mud	Remarks	Curation Information
Mobil/ MacLaren Plansearch	8	47.00000°	52.47727°	137	100		VVGR	Avalon Channel	69.52	28.22	0.80	1.46	2.26	% Organic Carbon Median Gr. Size	All samples have been discarded
Main Sampling Transect	9	47.00000°	52.00000°	150	100		VVGR	E of Avalon Channel	74.85	12.74	10.06	2.34	12.40	% Organic Carbon Median Gr. Size	
1980 (80 MMP)	24-1	46.00000°	55.59091°	77	98		VVGR	St. Pierre Bank	40.22	59.78	0.00	0.00	0.00	% Organic Carbon Median Gr. Size	
	24-2	46.00000°	55.59091°	75	130		VVGR	St. Pierre Bank	0.38	99.62	0.00	0.00	0.00	% Organic Carbon Median Gr. Size Sediment sampled from residue of benthic invertebrates after washing to remove the fines	
	24-3a	46.00000°	55.59091°	65	202		VVGR	St. Pierre Bank	60.75	39.25	0.00	0.00	0.00	% Organic Carbon Median Gr. Size	
	24-3b	46.00000°	55.59091°	65	202		VVGR	St. Pierre Bank	0.00	100.0	0.00	0.00	0.00	% Organic Cardon Median Gr. Size	
	24-4	46.00000°	55.59091°	77	254		VVGR	St. Pierre Bank	45.54	64.46	0.00	0.00	0.00	% Organic Carbon Median Gr. Size	
	24-5	46.00000°	55.59091°	77	314		VVGR	St. Pierre Bank	0.64	99.36	0.00	0.00	0.00	% Organic Carbon Median Gr. Size	
	25	46.00000°	55.00000°	145	98		VVGR	Halibut Channel	0.00	70.96	23.91	5.13	29.04	% Organic Carbon Median Gr. Size	
	26	46.00000°	54.56818°	106	98		VVGR	Green Bank	0.03	97.22	0.83	1.92	2.75	% Organic Carbon Median Gr. Size	
	27	46.00000°	54.00000°	145	98		VVGR	Haddock Channel	0.00	96.68	1.80	1.52	3.32	% Organic Carbon Median Gr. Size	
	28	46.00000°	53.47727°	76	98		VVGR	Avalon Channel	57.38	42.62	0.00	0.00	0.00	% Organic Carbon Median Gr. Size	
	29	46.00000°	53.00000°	110	97		VVGR	S of Avalon Channel	36.46	63.54	0.00	0.00	0.00	% Organic Carbon Median Gr. Size	
	30	46.00000°	52.45455°	91	97		VVGR	S of Avalon Channel	67.67	32.33	0.00	0.00	0.00	% Organic Carbon Median Gr. Size	

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt	+ Clay	= Mud	Remarks	Curation Information
Mobil/ MacLaren Plansearch	31	46.00000°	52.00000°	86	97		VVGR	SE of Avalon Channel	93.13	6.87	0.00	0.00	0.00	% Organic Carbon Median Gr. Size	All samples have been discarded
Main Sampling Transect 1980	42	44.00000°	52.52272°	124	92		VVGR	South Grand Bank	0.00	90.86	3.69	5.45	9.14	% Organic Carbon Median Gr. Size	
(80 MMP)	43	44.00000°	51.88636°	92	184		VVGR	South Grand Banks	0.00	100	0.00	0.00	0.00	% Organic Carbon Median Gr. Size	
CSS BAFFIN 80-014	014-1	47.43633°	55.45300°	267	157	1929	VVGR	Fortune Bay					X	Visual analysis	Unable to locate samples, no record of them in AGC Repository. Water depths recorded by CHS in sounding notes. Visual descriptions found in CHS Miscellaneous Notes, File 14516, see project file. They are also shown on CHS field sheet for this project.
1980 Hydrography	014-2	47.42300°	55.48533°	142	157	1533	VVGR	Fortune Bay	X				X	Visual analysis	
V.J. Gaudet (CHS)	014-3	47.40933°	55.50933°	145	157	1613	VVGR	Fortune Bay	X					Visual analysis	
	014-5	47.56800°	55.05000°	262	158	0927	VVGR	Fortune Bay					X	Visual analysis	
	014-7	47.52067°	55.23333°	249	158	1041	VVGR	Fortune Bay					X	Visual analysis	
	014-9	47.51967°	55.28833°	337	158	1137	VVGR	Fortune Bay					X	Visual analysis	
	014-12	47.48500°	55.27067°	292	158	1319	VVGR	Fortune Bay					X	Visual analysis	
	014-18	47.53850°	55.02250°	230	158	1600	VVGR	Fortune Bay					X	Visual analysis	
	014-19	47.43900°	54.99117°	181	158	1628	VVGR	Fortune Bay	X				X	Visual analysis	
	014-22	47.57650°	54.91983°	174	158	1700	VVGR	Fortune Bay	X				X	Visual analysis	
	014-23	47.57550°	54.96500°	169	158	1800	VVGR	Fortune Bay	X				X	Visual analysis	
	014-24	47.57317°	54.98667°	305	158	1820	VVGR	Fortune Bay	X				X	Visual analysis shells	
	014-25	47.56867°	55.01950°	200	158	1847	VVGR	Fortune Bay	X				X	Visual analysis	
	014-26	47.55683°	55.05500°	260	158	1909	VVGR	Fortune Bay					X	Visual analysis	
	014-30	47.50400°	55.11850°	355	159	1058	VVGR	Fortune Bay					X	Visual analysis	
	014-34	47.53800°	54.95783°	280	159	1418	VVGR	Fortune Bay					X	Visual analysis	
	014-37	47.60500°	54.92400°	350	159	1541	VVGR	Fortune Bay					X	Visual analysis	
	014-40	47.56967°	55.05683°	225	160	1033	VVGR	Fortune Bay					X	Visual analysis	
	014-45	47.62433°	54.93983°	180	160	1240	VVGR	Fortune Bay	X				X	Visual analysis	

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt + Clay = Mud	Remarks	Curation Information
CSS BAFFIN 80-014 1980 Hydrography V. J. Gaudet (CHS)	014-50	47.57017°	55.02333°	275	160	1511	VVGR	Fortune Bay			X	Visual analysis	Unable to locate samples, no record of them in AGC Repository. Water depths recorded by CHS in sounding notes. Visual descriptions found in CHS Miscellaneous Notes File 14516, see project file. They are also shown on CHS field sheet for this project.
	014-54	47.42650°	55.40833°	385	161	0937	VVGR	Fortune Bay			X	Visual analysis	
	014-62	47.30200°	55.50517°	226	161	1740	VVGR	Fortune Bay			X	Visual analysis	
	014-64	47.33500°	55.50517°	208	161	1825	VVGR	Fortune Bay	X		X	Visual analysis	
	014-73	47.39117°	55.49133°	375	162	1535	VVGR	Fortune Bay				no description	
	014-76	47.38718°	55.44033°	255	163	1124	VVGR	Fortune Bay	X		X	Visual analysis	
	014-81	47.31950°	55.59283°	210	163	1403	VVGR	Fortune Bay			X	Visual analysis	
	014-83	47.28783°	55.50750°	192	163	1512	VVGR	Fortune Bay	X		X	Visual analysis	
	014-85	47.28900°	55.47583°	225	163	1618	VVGR	Fortune Bay			X	Visual analysis	
	014-87	47.28733°	55.42400°	190	164	1228	VVGR	Fortune Bay			X	Visual analysis	
	014-91	47.22567°	55.55167°	203	164	1407	VVGR	Fortune Bay			X	Visual analysis	
	014-93	47.20483°	55.55000°	163	165	1456	VVGR	Fortune Bay	X		X	Visual analysis	
	014-97	47.25900°	55.43833°	159	165	1630	VVGR	Fortune Bay	X		X	Visual analysis	
	014-99	47.35517°	55.45317°	229	166	1320	VVGR	Fortune Bay			X	Visual analysis	
CSS BAFFIN 80-014 1980 D. Piper P. Mudie (AGC coring program)	014-900G	47.42167°	55.49317°	144	162	1358	GCO	Fortune Bay	0.22 m long core			Description by J. Easton for D. Piper	At Dalhousie Univ. Geological Curation List of precise positions is available in Dalhousie curation notes but are a bit confusing. Cores noted in CHS Miscellaneous Notes File 14516 Depths taken from CHS notes.
	014-901G	47.44833°	55.50450°	76	162	1332	GCO	Fortune Bay	0.77 m long core			as above	
	014-902G	47.43917°	55.47500°	80	162	1151	GCO	Fortune Bay	1.19 m long core			as above	
	014-903G	47.45217°	55.45900°	72	162	1248	GCO	Fortune Bay	1.15 m long core			as above	
	014-904G	47.32433°	55.42650°	190	164	0955	GCO	Fortune Bay	1.85 m long core?			Unsplit	
	014-905G	47.45417°	55.46833°	55	162	1307	GCO	Fortune Bay	1.02 m long core			Description by J. Easton for D. Piper	
	014-906G	47.30183°	55.37633°	138	164	1052	GCO	Fortune Bay	1.21 m long core			as above	
	014-907G	47.30300°	55.38617°	152	164	1113	GCO	Fortune Bay	1.23 m long core			as above	

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
CSS BAFFIN 80-014 1980 D. Piper	014-908G	47.30500°	55.38850°	164	164	1113	GCO	Fortune Bay	1.18 m long core	Description by J. Easton for D. Piper	At Dalhousie Univ. Geological Curation
P. Mudie (AGC coring program)	fix 2	18999 Patt. 1	18227 Patt.2	182	164	1025	GCO	Fortune Bay	no recovery	Only have Hi Fix ranges for positions	
CSS DAWSON 80-030 1980 M. J. Keen C. Keen	GC1 (Stn. 1)	47.63433°	53.09583°	267	268	1057	GCO	Conception Bay		Split. Described by J. Easton 1.17 m core	All working sections at Dalhousie Univ. in Geological Curation.
P. Mudie (AGC)	PC2 (Stn. 2)	47.63367°	53.09667°	264	268	1542	PCO	Conception Bay		Split. Described, pollen; P. Mudie processed phys/chem & pollen vials; 6.1 m core AGC 12753	Visual descriptions in cruise report, all fixes by radar. Positions and depths in Appendix F of the cruise
	TW2 (Stn. 2)	47.63367°	53.09667°	264	268	1542	TWCO	Conception Bay		Split. Described, pollen; P. Mudie processed phys/chem & pollen vials; 0.67 m core; AGC 12753	report were accepted except in case of PC10 at station 18 where the depth of 658 m does not agree with the 306fm =
	PC3 (Stn. 3)	47.64000°	53.10867°	280	268	1825	PCO	Conception Bay		Described, pollen; P. Mudie 5.49 m core	560 m of Appendix C
	TW3 (Stn. 3)	47.64000°	53.10867°	280	268	1825	TWCO	Conception Bay		0.35 m core	
	PC4 (Stn. 5)	47.63483°	53.06583°	196	268	2114	PCO	Conception Bay		X-rays, pollen, P. Mudie, processed phys/chem sample vials 6.10 m core	AGC 12753
	TW4 (Stn. 5)	47.63483°	53.06583°	196	268	2114	TWCO	Conception Bay		0.91 m core	
	(Stn. 9)	47.88333°	52.85333°	179	269	1201	PCO	Conception Bay		no recovery	

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age				Remarks	Curation Information
									Gravel	Sand	Silt + Clay	= Mud		
CSS DAWSON 80-030 1980 M. J. Keen C. Keen P. Mudie (AGC)	GC5 (Stn. 10)	47.88333°	52.83833°	183	269	1309	GCO	Conception Bay					Described L. Ogden; pollen; P. Mudie 1.37 m core	All working sections at Dalhousie Univ. in Geological Curation
	GC6 (Stn. 12)	47.70833°	53.03567°	225	269	1445	GCO	Conception Bay					Described J. Easton; pollen P. Mudie 1.03 m core	Position in cruise report 1° low
	GC7 (Stn. 15)	47.64133°	52.88750°	159	269	1842	GCO	Conception Bay					Described J. Easton 1.7 m core	
	GC8 (Stn. 16)	47.66417°	52.89367°	120	269	1913	GCO	Conception Bay					Processed phys/chem pollen vials 0.18 m core	AGC 12753
	GC9 (Stn. 16)	47.66417°	52.89367°	123	269	1921	GCO	Conception Bay					Split 0.36 m core	
	PC10 (Stn. 18)	47.99083°	53.40833°	560	270	1310	PCO	Trinity Bay					Described J. Easton 4.57 m core	Depth of 658 m in App. F incorrect. SID entry incorrect as well
	TW10 (Stn. 18)	47.99083°	53.40833°	560	270	1310	TWCO	Trinity Bay					Described L. Ogden 1.85 m core	
	GC11 (Stn. 24)	48.02300°	53.74000°	263	271	1144	GCO	Trinity Bay SW Arm					Described 1.85 m core	North of area
	GC12 (Stn. 25)	48.04000°	53.68867°	276	271	1225	GCO	Trinity Bay SW Arm					Described J. Easton 0.84 m core	North of area
	PC13 (Stn. 25)	48.04000°	53.68867°	276	271	1240	PCO	Trinity Bay SW Arm (N of area)					Described 5.49 m core	At Dalhousie Univ. in Geological Curation
	TW13 (Stn. 25)	48.04000°	53.68867°	276	271	1240	TWCO	Trinity Bay SW Arm					Described 0.79 m core	(as above) North of area
	Gr. 1 (Stn. 6)	47.88333°	52.85333°	183 approx.	269	1031	VVGR	Conception Bay Bay Entrance					Forams/Pollen Visual description in cruise report	AGC 12770

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt + Clay	= Mud	Remarks	Curation Information
CSS DAWSON 80-030 1980	Gr. 2 (Stn. 7)	47.87917°	52.85500°	180 approx.	269	1059	VVGR	Conception Bay Entrance						
M. J. Keen C. Keen P. Mudie (AGC)	Gr. 3 (Stn. 8)	47.88000°	52.80000°	168	269	1128	VVGR	Conception Bay Entrance					Processed phys/ chem & pollen vials	AGC 12753
	Gr. 4 (Stn. 10)	47.88333°	52.83833°	183	269	1244	VVGR	Conception Bay Entrance					Forams/Pollen	
	Gr. 5 (Stn. 21)	47.94000°	52.44167°	534	270	1750	VVGR	Trinity Bay Central Basin					Forams/Pollen	AGC 12770
	Gr. 6 (Stn. 23)	47.08733°	52.33333°	556	270	2041	VVGR	Trinity Bay Central Basin					Forams/Pollen	No visual description in cruise report
													More analysed samples from 80-030 are curated in AGC 12763, 12770. No record of these samples' origin	
CSS BAFFIN 81-019 1981	1	46.87850°	52.72331°	183	195	0843	VVGR	Ballard Bank		X			Positions and CHS visual descriptions found	All in AGC Repository BIN 136
Canadian Hydrographic	2	46.85675°	52.73353°	194	195	0913	VVGR	Ballard Bank	X	X		X	in CHS Miscellaneous Notes, File	Box 14, AGC
Service Gary W.	3	46.83375°	52.73258°	197	195	1350	VVGR	Ballard Bank		X	shell	X	No. 14602 Fixes 1 to 24	Box 13
Henderson (CHS)	4	46.80914°	52.73575°	189	195	1423	VVGR	Ballard Bank	X	X			are from two miniranger ranges.	Box ?
	5	46.78703°	52.78522°	197	195	1440	VVGR	Ballard Bank	X	X		X	Times are ship's time	Box 13
	6	46.76442°	52.73614°	208	195	1500	VVGR	Ballard Bank	X	X	shells			Box 15
	7	46.74100°	52.73517°	210	195	1520	VVGR	Ballard Bank	X	X				Box 15
	8	46.71858°	52.73600°	207	195	1544	VVGR	Ballard Bank	X	X	shells			Box 15
	9	46.69711°	52.73861°	195	195	1606	VVGR	Ballard Bank	X?				sample not kept	
	10	46.67467°	52.73589°	?	195	1632	VVGR	Ballard Bank	X?				no depth	Box 14
	11	46.65264°	52.73736°	196	195	1657	VVGR	Ballard Bank					bed rock?	
	12	46.63156°	52.73272°	194	195	1722	VVGR	Ballard Bank	X	X				Box 15

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt + Clay	= Mud	Remarks	Curation Information
CSS BAFFIN 81-019	13	46.63061°	52.78128°	179	195	1750	VVGR	Ballard Bank	X	X	shells		Positions and CHS visual des-	Box 14, AGC
1981 Canadian	14	46.65197°	52.77961°	174	195	1821	VVGR	Ballard Bank	X	X	shells		criptions found in CHS Miscell-	Box 14
Hydrographic Service	15	46.67461°	52.78000°	169	195	1852	VVGR	Ballard Bank	X	X	shells		aneous Notes, File No. 14602	Box 15
Gary W. Henderson	16	46.76989°	52.77947°	172	195	1911	VVGR	Ballard Bank	X	X	shells		Fixes 1 to 24 are from two	Box 15
(CHS)	17	46.71089°	52.77939°	166	195	1937	VVGR	Ballard Bank	X	X	shells		miniranger ranges	Box 14
	18	46.75067°	52.78656°	179	195	2017	VVGR	Ballard Bank	X	X	shells		Times are ship's time	Box 14
	19	46.76497°	52.78708°	180	195	2037	VVGR	Ballard Bank	X	X	shells			Box 15
	20	46.78778°	52.78268°	175	195	2100	VVGR	Ballard Bank	X					Box 14
	21	46.80992°	52.78294°	175	195	2121	VVGR	Ballard Bank	X	X		X		Box 14
	22	46.83322°	52.78261°	168	195	2141	VVGR	Ballard Bank	X					Box 13
	23	46.85497°	52.78372°	164	195	2159	VVGR	Ballard Bank	X		X	X		Box 13
	24	46.87997°	52.78856°	162	195	2220	VVGR	Ballard Bank	X	X	shells		End of day	Box 14
	25	46.59425°	53.13672°	41	196	0120	VVGR	Ballard Bank	X	X			Fixes 25-39 incl. are radar	Box 15
	26	46.56650°	53.13989°	40	196	0150	VVGR	Ballard Bank	X		shells, coral		fixes with one miniranger	Box 14
	27	46.54094°	53.13789°	46	196	0214	VVGR	Ballard Bank	X		coral		range	Box 14
	28	46.51394°	53.13619°	52	196	0238	VVGR	Ballard Bank	X		coral			Box 13
	29	46.51967°	53.09372°	57	196	0258	VVGR	Ballard Bank	X	X	coral, shells			Box 13
	30	46.54197°	53.09164°	64	196	0315	VVGR	Ballard Bank	X		shells			Box 15
	31	46.56833°	53.09069°	50	196	0340	VVGR	Ballard Bank	X	X	shells, coral			Box 13
	32	46.59022°	53.07358°	50	196	0355	VVGR	Ballard Bank					sample not kept	
	33	46.61117°	53.06100°	64	196	0416	VVGR	Ballard Bank	X	X	shells, coral			Box 14
	34	46.63144°	53.03433°	64	196	0436	VVGR	Ballard Bank	X	X	shells, coral			Box 13
	35	46.65433°	53.01200°	60	196	0454	VVGR	Ballard Bank	X		shells, coral			Box 15
	36	46.67386°	52.98919°	62	196	0512	VVGR	Ballard Bank	X	X	shells, coral			Box ?

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt + Clay = Mud	Remarks	Curation Information
CSS BAFFIN 81-019	37	46.69239°	52.97136°	64	196	0530	VVGR	Ballard Bank	X	X	coral		Box 15, AGC
1981	38	46.71436°	52.94978°	68	196	0549	VVGR	Ballard Bank	X				Box 13
Canadian Hydrographic Service	39	46.73428°	52.92925°	71	196	0607	VVGR	Ballard Bank	X	X			Box 14
Gary W. Henderson	40	46.75647°	52.90942°	74	196	0626	VVGR	Ballard Bank	X	X	shells, coral		Box 15
(CHS)	41	46.77944°	52.90919°	66	196	0642	VVGR	Ballard Bank	X		coral		Box 13
	42	46.80097°	52.90414°	65	196	0658	VVGR	Ballard Bank	X		shells, coral		Box 13
	43	46.82594°	52.90294°	55	196	0714	VVGR	Ballard Bank		X		sample not kept	40 samples apparently retained from whole program

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt + Clay = Mud	Remarks	Curation Information
M/V FOGO ISLE Sept. 12-24 1981 Mobil Oil, Contractor	(Sta. 1) start	46.63000°	54.10000°	80	262	2330	CCA	S Avalon Channel				only 2 of five colour shots obtained frame 11-11A	copies with the data section AGC; original negatives with Mobil Oil in St. John's.
Geonautics and D'Appolonia	(Sta. 1) end	46.63000°	54.10000°	80	262	2333	CCA	S Avalon Channel				gravelly bottom frame 12-12A	
Consulting Engineers Dave Ross	(Sta. 2) start	46.58000°	54.11000°	54.9	263	0035	CCA	S Avalon Channel				Five colour shots frame 15-15A	
and Monty Dyke (NORDCO)	(Sta. 2) end	46.58000°	54.11000°	54.9	263	0041	CCA	S Avalon Channel				gravelly-cobbley bottom frame 19-19A	
	(Sta. 16) start	46.34891°	52.77451°	165	266	2300	CCA	S Avalon Channel				five colour shots frame 20-20A	
	(Sta. 16) end	46.34927°	52.77502°	165	266	2306	CCA	S Avalon Channel				gravelly-cobbley bottom, some fines frame 24-24A	
	(Sta. 17) start	46.24596°	52.67452°	150	267	0005	CCA	S Avalon Channel				five colour shots frame 25-25A	
	(Sta. 17) end	46.24780°	52.67552°	150	267	0009	CCA	S Avalon Channel				generally fine bottom some gravel, shells frame 29-29A	
	M-G01 (Sta. 1)	46.62000°	54.11000°	75	262	2234	SGR	S Avalon Channel				jaws closed some recovery	Visual descrip- tions only in table 9 of re- port. If samples kept they are with Mobil Oil in St. John's. Copy of report with G. Fader, AGC
	M-G01A (Sta. 1)	46.62000°	54.10000°	75	262	2242	SGR	S Avalon Channel				jaws closed some recovery	
	M-G02 (Sta. 2)	46.58000°	54.11000°	55	263	0053	SGR	S Avalon Channel				jaws closed good sample	
	M-G03A (Sta. 9)	46.22470°	54.08610°	69	265	2233	SGR	S Avalon Channel				jaws closed no recovery	
	M-G03B (Sta. 9)	46.22209°	54.08419°	69	265	2245	SGR	S Avalon Channel				jaws closed little recovery	
	M-G03C (Sta. 9)	46.22011°	54.08252°	69	265	2257	SGR	S Avalon Channel				jaws closed no recovery	

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
M/V FOGO ISLE Sept. 12-24 1981 Mobil Oil, Contractor Geonautics and D'Appolonia Consulting Engineers Dave Ross and Monty Dyke (NORDCO)	M-G04A (Sta. 8)	46.14085°	54.09910°	71	265	2343	SGR	S Avalon Channel		jaws closed little recovery	Visual descriptions only in table 9 of report. If samples kept they are with Mobil Oil in St. John's. Copy of report with G. Fader, AGC
	M-G04B (Sta. 8)	46.13947°	54.09799°	71	265	2352	SGR	S Avalon Channel		jaws closed little recovery	
	M-G05A (Sta. 7)	46.30017°	53.90794°	77	266	0123	SGR	S Avalon Channel		jaws closed no recovery	
	M-G05B (Sta. 7)	46.30150°	53.90747°	77	266	0130	SGR	S Avalon Channel		jaws closed no recovery	
	M-G05C (Sta. 7)	46.30311°	53.90625°	77	266	0137	SGR	S Avalon Channel		jaws closed little recovery	
	M-G06A (Sta. 5)	46.27962°	53.68623°	65	266	0249	SGR	S Avalon channel		jaws open; did not hit bottom	
	M-G06B (Sta. 5)	46.27953°	53.68285°	65	266	0257	SGR	S Avalon Channel		jaws closed no recovery	
	M-G06C (Sta. 5)	46.27900°	53.67839°	65	266	0307	SGR	S Avalon Channel		jaws closed some recovery	
	M-G07 (Sta. 16)	46.34867°	52.77358°	165	266	2247	SGR	S Avalon Channel		jaws closed some recovery	
	M-G08A (Sta. 17)	46.25542°	52.68527°	150	267	0020	SGR	S Avalon Channel		jaws closed little recovery	
	M-G08B (Sta. 17)	46.25812°	52.68709°	150	267	0027	SGR	S Avalon Channel		jaws closed no recovery	
	M-G08C (Sta. 17)	46.25879°	52.68883°	150	267	0035	SGR	S Avalon Channel		jaws closed good sample	
	M-G09A (Sta. 15)	46.30140°	52.98630°	145	267	0156	SGR	S Avalon Channel		no recovery	
	M-G09B (Sta. 15)	46.30170°	52.98920°	145	267	0203	SGR	S Avalon Channel		no recovery	
	M-G09C (Sta. 15)	46.30220°	52.99220°	145	267	0210	SGR	S Avalon Channel		no recovery	
	M-G10A (Sta. 13)	46.21920°	53.29300°	143	267	0355	SGR	S Avalon Channel		no recovery	

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age				Remarks	Curation Information
									Gravel	Sand	Silt + Clay	= Mud		
M/V FOGO ISLE Sept. 12-24 1981	M-G10B (Sta. 13)	46.21510°	53.30310°	143	267	0339	SGR	S Avalon Channel					no recovery	Visual descriptions only in table 9 of report. If samples kept they are with Mobil Oil in St. John's. Copy of report with G. Fader, AGC
Mobil Oil, Contractor Geonautics	M-G10C (Sta. 13)	46.20980°	53.31380°	143	267	0349	SGR	S Avalon Channel					recovered sample	
and D'Appolonia Consulting	M-G11A (Sta. 10)	46.10520°	53.49660°	143	267	0514	SGR	S Avalon Channel					no recovery	
Engineers Dave Ross and Monty	M-G11B (Sta. 10)	46.10410°	53.50440°	143	267	0527	SGR	S Avalon Channel					single cobble recovered	
Dyke (NORDCO)	M-G11C (Sta. 10)	46.10230°	53.51230°	143	267	0540	SGR	S Avalon Channel					no recovery	
	M-G12A (Sta. 11)	46.39420°	53.49550°	88	267	0745	SGR	S Avalon Channel					good sample	

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
M/V RAVENSTURM Sept. 30 - Oct. 15, 1981 Mobil Oil Canada, contractor Geonautics and D'Appolonia Consulting Engineers, Monty Dyke (NORDCO)	Core 1 (Sta. 1)	46.70074°	53.90502°	75	274	1715-1810	VCO	S Avalon Channel	3.9 m of core obtained, top of Core is green, fine, silty sand	Aimers, McLean Vibracorer used 6 m travel, 114 mm diameter	samples if kept are with Mobil Oil in St. John's; Core logs in Appendix E of report with other data in Table 6. Size analyses on Figure 26 of report. Copy of report with G. Fader, AGC
	(Sta. 17)	46.54281°	53.69519°	150	275	0530-0900	VCO	S Avalon Channel		motor short, no attempt made to core. Left for Argentia	
	Core 2 (Sta. 2)	46.43110°	53.68969°	55	279	0910-0945	VCO	S Avalon Channel	0.70 m of core obtained, top is green, fine, silty sand with shell fragments		
	(Sta. 17) (1st attempt)	46.54281°	53.69519°	150	279	1302-1350	VCO	S Avalon Channel		no core present	
	(Sta. 17) (2nd attempt)	46.54281°	53.69519°	150	279	1430-1505	VCO	S Avalon Channel		no core	
	(Sta. 16) (1st attempt)	46.44013°	54.01470°	165	279	1710-1736	VCO	S Avalon Channel		Gate pin did not trip, no core	
	(Sta. 16) (2nd attempt)	46.44013°	53.01470°	165	279	1745-1806	VCO	S Avalon Channel		no core	
	(Sta. 16) (3rd attempt)	46.44013°	53.01470°	165	279	1930-1955	VCO	S Avalon Channel		no core	
	(Sta. 8) (1st attempt)	46.21984°	53.28816°	71	280	0758-0838	VCO	S Avalon Channel		no core recover-ed, may have slipped back through core catcher	
	Core 5 (Sta. 8) (2nd attempt)	46.21984°	53.28816°	71	280	1405-1457	VCO	S Avalon Channel	1.0 m of core obtained. Top is green, fine to coarse, silty sand with some gravel and shell fragments		

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
M/V RAVENSTURM Sept. 30 - Oct. 15/81 Mobil Oil Canada; Contractor Geonautics and D'Appolonia Consulting Engineers, Monty Dyke (NORDCO)	(Sta. 5) (1st attempt)	46.10359°	53.49747°	65	280	1820-1910	VCO	S Avalon Channel		no core recovered, about 0.5 m of clay slipped out and reversed corer catcher	samples if kept are with Mobil Oil in St. John's; Core logs in Appendix E of report with other data in Table 6. Size analyses on Figure 26 of report. Copy of report with G. Fader, AGC
	Core 6 (Sta. 5) (2nd attempt)	46.10359°	53.49747°	65	280	2003-2030	VCO	S Avalon Channel	0.5 m of core obtained. Top is green, fine to coarse, silty sand with some shell fragments		
	Core 7 (Sta. 7)	46.38880°	53.28978°	77	281	1855-1925	VCO	S Avalon Channel	1.2 m of core obtained. Top is dark green, fine, silty sand with some shell fragments		
	(Sta. 10)	46.10230°	53.51230°	143	281	2230	VCO	S Avalon Channel		Attempt aborted because of weather	
	Core 8 (Sta. 15)	46.32267°	53.98646°	145	282	0955-1035	VCO	S Avalon Channel	1.2 m of very fluid core recovered. Top is brown fine, silty sand with shell fragments		
	(Sta. 4)	46.10435°	53.55833°	circa 180	282	1454-1528	VCO	S Avalon Channel		At 1540 lost corer when line parted. Left with umbilical. Dragged on Oct. 12 (Day 285) and failed to recover. Then left it for lost.	
	(Sta. 16) (1st attempt)	46.43950°	54.01585°	165	286	1022-1045	DCO	S Avalon Channel	sample of a "couple of handfulls" of "small stones". Core catcher sheared. Scores on drill barrel show apparent penetration to about 0.06 m	C-CORE seabed corer used 3 m core barrel 64 mm diameter	
	"C-CORE" (Sta. 16) (2nd attempt)	46.43950°	54.01585°	165	286	1345-1420	DCO	S Avalon Channel	0.50 m of core recover- with indications of 1 m of core barrel penetration. Top is medium to fine gravel	C-CORE seabed corer used	

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
M/V RAVENSTRUM Sept. 30 - Oct. 15/81 Mobil Oil Canada; contractor, Geonautics and D'Appolonia Consulting Engineers, Monty Dyke (NORDCO)	(Sta. 6)	46.38861°	53.49243°	circa 170	286	1839-1930	DCO	S Avalon Channel	"About 1 litre of small stones with one lump of clay."	C-CORE called off further tests and vessel departed for St. Mary's Bay buoy check re nav. then to St. John's	samples if kept are with Mobil Oil in St. John's Core logs in Appendix E of report with other data in Table 6. Size analyses on Figure 26 of report. Copy of report with G. Fader, AGC
	Anchor Sample (Sta. 16)	46.43950°	54.01585°	165	279 or 286	?	G	S Avalon Channel	sandy, silty, clay with trace of gravel	not clear when obtained	
CSS HUDSON 81-045 1981 C. F. M. Lewis C. Schafer (AGC)	045-074	47.56683°	52.69917°	?	308	1205	PCO	St. John's Harbour		Core catcher unsplit	AGC 12760 AGC warehouse, cold storage AR 59204 cm (several more sections?)
	045-074	47.56683°	52.69917°	?	308	1205	TWCO	St. John's Harbour		Core catcher	AGC 12760
	045-075	47.56683°	52.69667°	?	308	1309	PCO	St. John's Harbour		Forams P. Core Catcher Core Catcher	AGC warehouse, cold storage AR-0-128 cm, 128-228 cm, 228-431 cm, W-0-128 cm, 128-228 cm, 288-431 cm AGC 13340 AGC 12760 AGC warehouse, cold storage, section 1-unsplit
	045-076	47.56333°	52.69917°	?	308	1205	PCO	St. John's Harbour		P. Core Catcher	AGC 13340
	045-077	47.56583°	52.69917°	18	308	1445	PCO	St. John's Harbour		Core Catcher 2 P Core catchers	AGC 12760 AGC 13340

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt	+ Clay	= Mud	Remarks	Curation Information
M/V PANDORA II PISCES IV 81-054 1981 Gordon Fader Mike Lewis (AGC)	1068	46.70000°	54.65833°	192-164	242	1253-1557	PCCA	Placentia Bay Megaflutes west to east on line #4						PISCES Dive 1068, Dive #1 of cruise, no samples taken, Black and white film used, Fader and Bob Miller were observers	
	1071	position uncertain not recorded		174-175	296	0926-1058	PCCA	NE Cape St Francis, Cordelia Deeps?						PISCES Dive 1071, Dive #4 of cruise, no samples, 400 ASA colour slide film used, Fader and Miller were observers	
	1072	47.85333°	52.58333°	175-175	246	1319-1443	PCCA VIDEO	Cordelia Deeps east of Cape St. Francis						PISCES Dive 1072 Dive #5 of cruise, 2 video cameras, Lewis and Steve d'Apollonia were observers	
	1072-10	47.85333°	52.58333°	174	246	1355 from log	PGR	Cordelia Deeps east of Cape St. Francis						Some fines lost through grab's mesh openings, stored at AGC Repository	
	1073	position uncertain not recorded		172-174	247	1000-1110	PCCA	East of Baccalieu Is.						PISCES Dive 1073, Dive #6 of cruise, no samples taken, 400 ASA colour slide film used, Fader and Miller were observers	
	1074	position uncertain not recorded		172-170	247	1320-1502	PCCA	East of Baccaleieu Is.						PISCES Dive 1074, Dive #7 of cruise, no samples taken, 400 ASA colour slide film used, Lewis and Bob Murphy were observers	
CSS DAWSON 82-013 1982 Hugh Miller (MUN) (NICOS gravity cruise)	10 samples	?	?	?	?	?	G	Conception Bay Avalon Channel off the Avalon Pen.	?	?	?	?	?	The brief cruise report indicates that ten grab samples were taken but no list of stations or any further details are given. No formal cruise report is on file; none of the NICOS cruises out of Memorial University of Newfoundland have filed cruise reports with details re the samples gathered	

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age			Remarks	Curation Information
									Gravel	Sand	Silt + Clay = Mud		
D/V PHOLAS 1983 Mobil Southern Pipeline route Oct. 6-11/83 in map area; full cruise Sept. 14- Oct. 11/83	PL-8	46.17056°	51.71222°		279	1826	BH	Western Grand Bank				Visual core logs: see C-CORE report (M. Lewis has copy in AGC)	Cores if kept are retained by Mobil Oil. Times given are at the start of the borehole. Water depths not noted in C-CORE report.
	PL-8A	46.17029°	51.71221°		279	1955	BH	Western Grand Bank					
	PL-8B	46.17032°	51.71222°		283	0711	BH	Western Grand Bank					
	PL-9	46.17077°	52.22791°		280	0155	BH	Western Grand Bank					
	PL-9A	46.17082°	52.22791°		280	0600	BH	Western Grand Bank					
	PL-10	46.16911°	52.63790°		280	1257	BH	Avalon Channel					
	PL-11	46.22562°	53.08118°		281	0303	BH	Avalon Channel					
	PL-12	46.36577°	53.28154°		281	1545	BH	Avalon Channel					
	PL-12A	46.36577°	53.28154°		281	1800	BH	Avalon Channel					
	PL-12B	46.36577°	53.28154°		281	2255	BH	Avalon Channel					
	PL-13	46.17073°	51.95238°		282	1000	BH	Western Grand Bank					
CSS DAWSON 83-014 1983 D. Forbes (Project #810086) (AGC) (MUN gravity cruise)	4516A	46°53.03'	53°49.91'				GR	St. Mary's Bay				D. Forbes #8306101 (ie year, mon., sample no.)	Positions from AGC's SID system and from D. Forbes' sample listings (in project file). Station numbers are bottom gravity station numbers. Visual texture description on next two pages from Forbes (1984)
	4516B	46°53.03'	53°49.91'				GR	St. Mary's Bay				D. Forbes #8306102	
	4517A	46°53.25'	53°45.14'				GR	St. Mary's Bay				D. Forbes #8306103	
	4517B	46°53.25'	53°45.14'				GR	St. Mary's Bay				D. Forbes #8306104	

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt	+ Clay	= Mud	Remarks	Curation Information
CSS DAWSON 83-014 1983	4517C	46°53.25'	53°45.14'				GR	St. Mary's Bay						D. Forbes #8306105	
D. Forbes (Project #810086)	4518A	46°53.25'	53°40.63'				GR	St. Mary's Bay						D. Forbes #8306106	
(AGC) (MUN gravity	4519A	46°50.00'	53°45.00'				GR	St. Mary's Bay						D. Forbes #8306107	
cruise)	4519B	46°50.00'	53°45.00'				GR	St. Mary's Bay						D. Forbes #8306108	
	4520A	46°50.00'	53°50.00'				GR	St. Mary's Bay						D. Forbes #8306109	
	4520B	46°50.00'	53°50.00'				GR	St. Mary's Bay						D. Forbes #8306110	
	4522A	46°43.44'	53°53.56'				GR	St. Mary's Bay						D. Forbes #8306111	
	4522B	46°43.44'	53°53.56'				GR	St. Mary's Bay						D. Forbes #8306112	
	4522C	46°43.44'	53°53.56'				GR	St. Mary's Bay						D. Forbes #8306113	
	M2A	46°41.50'	53°22.25'	31			VCO	Trepassey Bay (Mutton Bay)	X					D. Forbes #8306148 Also #8306V-005 (vibrocore 5)	
	M2B	46°41.50'	53°22.25'	31			VCO	Trepassey Bay (Mutton Bay)	X					D. Forbes #8306149 Also #8306V-005 (vibrocore 5)	
	M3-1A	46°40.40'	53°22.61'				GR	Trepassey Bay (Mutton Bay)	X					D. Forbes #8306150	
	M3-1B	46°40.40'	53°22.61'				GR	Trepassey Bay (Mutton Bay)	X					D. Forbes #8306151	
	M3-2	46°40.40'	53°22.61'				GR	Trepassey Bay (Mutton Bay)	X					D. Forbes #8306152	
	M3-2A	46°40.40'	53°22.61'				GR	Trepassey Bay (Mutton Bay)	X					D. Forbes #8306153	
	M3-2B	46°40.40'	53°22.61'				GR	Trepassey Bay (Mutton Bay)	X					D. Forbes #8306154	

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
CSS DAWSON 83-014 1983 D. Forbes (Project #810086) (AGC) (MUN gravity cruise)	M4	46°39.76'	53°22.91'				GR	Trepassey Bay (Mutton Bay)	X	D. Forbes #8306155	
	M5	46°39.25'	53°22.93'				GR	Trepassey Bay (Mutton Bay)	X	D. Forbes #8306156	
	M6A	46°38.75'	53°23.20'				GR	Trepassey Bay (Mutton Bay)	X	D. Forbes #8306157	
	M6B	46°38.75'	53°23.20'				GR	Trepassey Bay (Mutton Bay)	X	D. Forbes #8306158	
	M7A(C)	46°38.25'	53°23.38'				GR	Trepassey Bay (Mutton Bay)	X	D. Forbes #8306159	
	M7A(S)	46°38.25'	53°23.38'				GR	Trepassey Bay (Mutton Bay)	X	D. Forbes #8306160	
	M7B	46°38.25'	53°23.38'				GR	Trepassey Bay (Mutton Bay)	X	D. Forbes #8306161	
	M8	46°37.55'	53°23.60'				GR	Trepassey Bay (Mutton Bay)	X	D. Forbes #8306162	
	M9A	46°37.06'	53°23.85'				GR	Trepassey Bay (Mutton Bay)	X	D. Forbes #8306163	
	M9B	46°37.06'	53°23.85'				GR	Trepassey Bay (Mutton Bay)	X	D. Forbes #8306164	
	M10	46°36.10'	53°24.50'				GR	Trepassey Bay (Mutton Bay)	X	D. Forbes #8306165	
	C1	46°57.19'	53°35.33'				PCO	St. Mary's Harbour		D. Forbes #8306C-001 High Gas Core 1 Length 414 cm	3 sections A,B,C -section C ex-truded by gas pressure in bag -catcher in bag
	C1	46°57.19'	53°35.33'				TWCO	St. Mary's Harbour		D. Forbes #8306C-002, Length 93 cm	
	V1	46°56.00'	53°36.70'				VCO	St. Mary's Harbour sill	Visual: sand (38 cm)/gravel (predom. metased. local)	D. Forbes #8306V-001; vibrocore 1 Length 40 cm	
	V2	46°46.08'	53°37.74'				VCO	Holyrood Bay St. Mary's Bay	Visual: sand (with gravel) gravel/muddy sandy gravel	D. Forbes #8306V-002 Length 40 cm	

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt	+ Clay	= Mud	Remarks	Curation Information
CSS DAWSON 83-014 1983	V3	46°45.72'	53°38.36'				VCO	Holyrood Bay St. Mary's Bay	Visual: gravel/sand					D. Forbes #8306V-003; Length 75 cm	
D. Forbes (Project #810086)	V4	46°44.92'	53°40.20'				VCO	Holyrood Bay St. Mary's Bay	Visual: gravel/diamicton (till?)					D. Forbes #8306V-004; Length 5 cm	
(AGC) (MUN gravity	V5/M2	46°41.50'	53°22.25'	31			VCO	Trepassey Bay (Mutton Bay)	X					D. Forbes #8306V-005; Length 5 cm	
cruise)	V6/M1	46.70000°	53.36660°	17			VCO	Trepassey Bay (Mutton Bay)						No recovery on core so grab taken	
	V6/M1	46.70000°	53.36660°	17			SGR	Trepassey Bay (Mutton Bay)			X			D. Forbes #8306V-006	

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt + Clay = Mud	Remarks	Curation Information
CSS HUDSON 83-017 1983	1	45.02500°	54.98833°		?	?	SGR	Haddock/Avalon Channel				Don't know if analysed	In AGC repository
Keith Manchester & David Piper (AGC)	2	46.08633°	53.54133°		172	1255	SGR	Avalon Channel				Don't know if analysed	Bridge Log has slightly different position.
CSS DAWSON 84-003 1984 Dave Piper (AGC)	84-003 -007	44.70870°	55.53366°	1124	062	?	PCO	St. Pierre Bk. Slope				core 6.16 m	AGC storage; Core also used as a geotechnical core
	84-003 -007	44.70870°	55.53366°	1124	062	?	TWCO	St. Pierre Bk. Slope				core 0.28 m	AGC storage
CSS HUDSON 84-024 1984	1	46.94080°	53.59833°	65	171	1655	PCO	St. Mary's Harbour				Length 7.58 m	Position, length visual description from cruise report and archives
C.F.M. Lewis (AGC)	1	46.94080°	53.59833°	65	171	1655	TWCO	St. Mary's Harbour				Length 1.32 m	
	2	46.93600°	53.60266°	73.2	171	?	PCO	St. Mary's Harbour				Length 6.79 m	
	2	46.93600°	53.60266°	73.2	171	?	TWCO	St. Mary's Harbour				Length 1.04 m	Analyses sheet in Gordon's cabinet
	3	46.65700°	53.77150°	53	171	?	PCO	St. Mary's Bay				Length 1.10 m	
	4	46.65880°	53.77000°	52.8	171	?	PCO	St. Mary's Bay				Length 1.19 m fell out and put in sample bag, no TWCO	
	5	46.46250°	53.85733°	75	172	1412	PCO	Mouth of St. Mary's Bay				Length 0.20 m core cutter damaged	
	6	46.46030°	53.85766°	76	172	?	PCO	Mouth of St. Mary's Bay				Length 0.01 m one shale rock fragment	

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age			Remarks	Curation Information
									Gravel	Sand	Silt + Clay = Mud		
CSS HUDSON 84-024 1984	7 start	46.47430°	53.83966°	?	172	?	Dal Video	Mouth of St. Mary's Bay				may be 53.25667° W at start	In AGC repository
C.F.M. Lewis (AGC)	7 end	46.51330°	53.79333°	?	172	?	Dal Video	Mouth of St. Mary's Bay					
	8	46.28430°	53.43800°	130	172	?	VVGR	North flank of Avalon Channel	85.08	14.14	0.78	1 phi gravel analysis visual: sand, pebbles	
	9	46.30250°	53.43316°	125	172	?	IKUGR	North flank of Avalon Channel	65.72	33.11	1.17	1 phi gravel analysis Visual: sand, pebbles, cobbles	
	10	46.32920°	53.43500°	117	172	?	VVGR	North flank of Avalon Channel				Visual: sand	
	11	46.34330°	53.42816°	113	172	?	VVGR	North flank of Avalon Channel				Visual: sand	
	12	46.35170°	53.42716°	108	172	?	VVGR	North flank of Avalon Channel				Visual: sand	
	13	46.37130°	53.41983°	95	172	?	IKUGR	North flank of Avalon Channel				Visual: sand, shells	
	14	46.38700°	53.41900°	88	172	?	VVGR	North flank of Avalon Channel	63.28	35.39	1.33	1 phi gravel analysis visual: sand, pebbles, shells	
	15	46.40370°	53.42316°	79	172	?	VVGR	North flank of Avalon Channel	78.84	20.40	0.76	1 phi gravel analysis Visual: pebbles, sand, shells	
	16	46.41550°	53.41716°	68	172	?	IKUGR	North flank of Avalon Channel	72.53	24.95	2.52	1 phi gravel analysis Visual: pebbles, sand, shells	
	17	46.42550°	53.41616°	71	172	?	VVGR	North flank of Avalon Channel	94.50	5.26	0.24	1 phi gravel analysis Visual: pebbles, cobbles, sand. Jaws held open by rock	
	18	46.57670°	52.76650°	185	173	?	PCO	Avalon Channel				no recovery, apparent penetration	
	19	46.58030°	52.74916°	177.4	173	?	PCO	Avalon Channel				Length 1.20 m broken core liner	

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt + Clay = Mud	Remarks	Curation Information
CSS HUDSON 84-024 1984 C.F.M. Lewis (AGC)	19	46.58030°	52.74916°	177.4	173	?	TWCO	Avalon Channel				1.50 m recovery	
	20	46.44700°	52.37333°	120	173	?	VVGR	SE flank of Avalon Channel	75.00	22.52	2.48	1 phi gravel analysis Visual: pebbles, cobbles, sand	
	21	46.43750°	52.34916°	100	173	?	VVGR	SE flank of Avalon Channel	95.37	4.54	0.09	1 phi gravel analysis Visual: pebbles, cobbles, sand. Jaws held open by rock	
	22	46.42470°	52.32983°	82	173	2157	VVGR	SE flank of Avalon Channel	86.91	12.67	0.42	1 phi gravel analysis visual: pebbles, cobbles, sand. Jaws held open by rock	
	23	46.41100°	52.28116°	75	173	?	VVGR	SE flank of Avalon Channel				Visual: sand	
	24	46.46820°	52.25733°	66	173	?	VVGR	SE flank of Avalon Channel				Visual: sand	
	25	46.39970°	52.24616°	64	173	?	VVGR	SE flank of Avalon Channel	33.40	65.83	0.77	1 phi gravel anaylsis Visual: sand	
	26	46.38980°	52.22033°	72	173	?	SGR	SE flank of Avalon Channel				Visual: sand, cobbles shells	
	27	47.04733°	52.88250°	35	174	?	PCO	Calvert Bay E Avalon Pen.				No core recovery, penetrated 2 ft then bent barrel. No trigger weight core recovered; one vial of a few rounded pebbles retained	
	28	47.04880°	52.88483°	36	174	?	SGR	Calvert Bay E. Avalon Pen.				Visual: sand, pebbles, cobbles	
	29	47.11140°	52.88166°	36	174	?	PCO	Calvert Bay E Avalon Pen.				No core recovery, penetration not known, no trigger weight core 0.05 m from core catcher of stiff clay, sand and pebbles, all put in one vial	

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
CSS DAWSON 84-050	01	47°28.7'	55°23.58'				CO	Fortune Bay			Samples were collected in December 1984. These samples are being worked on by Kalidas Pulchan as part of an MSc thesis at the Department of Geological Sciences of MUN. He is also working on 6 other cores from the Bay d'Espoir west of the project area from DAWSON 85-022A cruise.
1984 Dick Haedrich	02	47°36.0'	55°12.24'				CO	Fortune Bay			
NICOS Memorial	03	47°21.6'	55°32.57'				CO	Fortune Bay			
University of New-	04	47°22.2'	55°31.78'				CO	Fortune Bay			
foundland	05	47°13.4'	55°44.80'				CO	Fortune Bay (west of area)			

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt	+ Clay	= Mud	Remarks	Curation Information
CSS HUDSON 85-005 1985 G. Fader (AGC)	20	47°27.61'	52°40.85'	35	109	1710	VVGR	Motion Bay (Test site for (Nordco Drill)						3 attempts, first open Hard bottom - kelp and sea urchins, no gravel or cobbles	Grain size analyses sheets in Gordon Fader's cabinet at AGC
	20	47°27.61'	52°40.85'	35	109	1720-1812	CA	Motion Bay (Test site for Nordco Drill)						Black & white plus colour 2 cameras on the same frame	G. Fader (AGC)
	21	47°27.09'	52°46.98'	182	110	2345	VVGR	Avalon channel South of Avalon Peninsula (furrowed till surface)	65.18	33.28			1.54	1 phi gravel analysis; 2nd attempt - sandy till(?) with little mud - gravel brittle stars, sea urchins	
	21	46°26.68'	52°46.34'	182	111	0035-0120	CA	Avalon Channel South of Avalon Peninsula (furrowed till surface)						Black & white plus colour, 2 cameras on the same frame. The position is the 0120/111 position at the end of the camera station	G. Fader (AGC)
	22	46°34.03'	53°12.15'	47	111	1525	VVGR	Mouth of Trepassey Bay (Test site for Nordco Drill)	99.98	0.02	-	-	-	1 phi gravel analysis; 4 attempts - Gravel with some sand - gravel subrounded, various lithologies, some shells. 1st closed, gravel; 2nd a rock; 3rd open; 4th closed but empty	
	23 start	46°34.51'	53°12.30'	43	111	1805	CA	Mouth of Trepassey Bay (Test site for Nordco Drill)						Black & white plus colour in 2 cameras on the same frame	G. Fader (AGC)
	23 end	46°34.77'	53°11.95'	43	111	1840	CA								

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt + Clay = Mud	Remarks	Curation Information
CSS BAFFIN 85-009 Phase 2 1985 Canadian Hydrographic Service Stu S. Dunbrack (CHS)	108 (Phase 2)	46.09983°	55.43250°	82	?	?	VVGR	St. Pierre Bank				All samples in project area collected during phase 2, July 8-26, 1985 Note SID has incorrect latitude for No. 111 being 46.93050°N which plots onshore.	219 cruise samples found in AGC Repository
	109	46.01416°	55.43350°	75	?	?	VVGR	St. Pierre Bank					
	111	45.93050°	55.45033°	91	?	?	VVGR	St. Pierre Bank					
	135	45.84900°	55.43333°	95	?	?	VVGR	St. Pierre Bank					
	136	45.76583°	55.42583°	79	?	?	VVGR	St. Pierre Bank					
	149	45.67283°	55.41700°	78	?	?	VVGR	St. Pierre Bank					
	150	45.84283°	55.01683°	98	?	?	VVGR	St. Pierre Bank					
	151	45.76033°	55.02750°	72	?	?	VVGR	St. Pierre Bank					
	152	45.68600°	55.03066°	85	?	?	VVGR	St. Pierre Bank					
	153	45.61183°	55.03333°	86	?	?	VVGR	St. Pierre Bank					
	154	45.53650°	55.03216°	93	?	?	VVGR	St. Pierre Bank					
	173	45.26467°	55.03567°	71	?	?	VVGR	St. Pierre Bank					
	201	45.51550°	55.43700°	101	?	?	VVGR	St. Pierre Bank					
	202	45.59617°	55.42800°	79	?	?	VVGR	St. Pierre Bank					

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
CSS DAWSON 85-022A 1985 Dick Haedrich NICOS (MUN)	?	?	?	?	?	?	VVGR	Fortune Bay	?	?	Note: no cruise reports appear to ever been submitted to BIO/AGC from most of the NICOS cruises and thus one often unable to know what samples have been collected from where.
		There is a single sheet in the cruise report file that reports 5 camera stations, 5 gravity cores and 42 Van Veen grab samples. We have no idea where these were located.									
CSS DAWSON 85-022B 1985 James Wright (MUN) (This was also a NICOS cruise)	TB01	47°52.2'	53°31.0'	550	235	1730?	GCO	Trinity Bay	Both cores Holocene based on Carbon 13 and N 15 stable isotope analysis. Water depths approximate.	0.70 m core	Samples were collected in August 1985. These samples are being worked on by Catherine Troke as part of a BSc Honours thesis at the Dept. of Geological Sciences of Memorial Univ. of Newfoundland. She is also working on samples from White Bay and Notre Dame Bay from the same cruise.
	TB02	48°01.35'	53°22.1'	520	236	1800 app.	GCO	Trinity Bay (N of area)		0.70 m core	
M/V PANDORA II PISCES IV Submersible 85-057 1985 Gordon B.J. Fader (AGC)	PISCES Dive 1634-4-01 (Dive 4)	46.56667°	52.81667°	102	187	?	PGR	Avalon Channel	Large quartz angular rock rock, visual description	grab samples taken during Dive #4 in the "superfurrow" iceberg scour located at 46.57033°N, 52.80000°W Fader and Steve d'Apollonia were observers on the dive	samples at AGC Repository
	PISCES Dive 1634-4-02 (Dive 4)	46.56667°	52.81667°	102	187	?	PGR	Avalon Channel	cobbles and sand, visual description		

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt + Clay = Mud	Remarks	Curation Information
CSS HUDSON 86-013 1986	001	44.30383°	53.74933°	1614	149	?	PCO	Whale Bank Slope					AGC
Ian Reid (AGC)	001	44.30383°	53.74933°	1614	149	?	TWCO	Whale Bank Slope					AGC
	002	44.30633°	53.74333°	1578	149	?	PCO	Whale Bank Slope					AGC
	002	44.30633°	53.74333°	1578	149	?	TWCO	Whale Bank Slope					AGC
	003	44.30600°	53.73817°	1574	149	?	PCO	Whale Bank Slope					AGC
	003	44.30600°	53.73817°	1574	149	?	TWCO	Whale Bank Slope					AGC
	004	44.40500°	53.69167°	1200	149	?	PCO	Whale Bank Slope					AGC
	004	44.40500°	53.69167°	1200	149	?	TWCO	Whale Bank Slope					AGC
	005	44.42167°	53.66500°	900	149	?	PCO	Whale Bank Slope					AGC
	005	44.42167°	53.66500°	900	149	?	TWCO	Whale Bank Slope					AGC
	006	44.42833°	53.63500°	600	149	?	PCO	Whale Bank Slope					AGC
	006	44.42833°	53.63500°	600	149	?	TWCO	Whale Bank Slope					AGC

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt + Clay = Mud	Remarks	Curation Information
CSS HUDSON 86-017 1986 G. Fader (AGC)	86017001 -C Start	45°11.30'	52°35.71'	113	172	1301	CCA	Whale Deep				UMEL Camera used on this cruise with Tri-X, B and W and Ectachrome 22 frames	Photos and slides are with G. Fader of AGC
	86017001 -C End	45°11.48'	52°35.63'	113	172	?	CCA	Whale Deep					
	86017001 -P	45°11.03'	52°36.31'	113	172	1207	PCO	Whale Deep				10 m Benthos corer used on on cruise. 9.12 m pene-tration 3.66 m recovered	Cores are with AGC repository
	86017001 -P	45°11.03'	52°36.31'	113	172	1207	TWCO	Whale Deep				0.45 m recovered trigger weight corer barrel bent	
	87017001 -G	45°11.11'	52°36.08'	113	172	1228	VVGR	Whale Deep				Sample split on board	grab samples are with AGC reposi-tory. One split sent to Eric Le Gresley at Queens for all grabs on this cruise
	86017002 -C Start	45°06.38'	52°34.63'	108	172	1558	CCA	Whale Deep				23 frames	G. Fader, AGC
	86017002 End	45°06.36'	52°34.60'	108	172	?	CCA	Whale Deep				time not recorded at the end of station	
	86017002 -G	45°06.65'	52°34.56'	108	172	1509?	VVGR	Whale Deep				Good grab sample	split sample for Le Gresley, Queens
	86017002 -P	45°06.65'	52°34.56'	108	172	1509?	PCO	Whale Deep				Small sample in core catcher; no trigger core	
	86017003 -G	45°06.36'	52°34.63'	108	172	1614	IKUGR	Whale Deep				70 cm apparent penetration	
	86017004 -G	45°01.36'	52°33.08'	93	172	1750	VVGR	Whale Deep					

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt + Clay = Mud	Remarks	Curation Information
CSS HUDSON 86-017 1986 G. Fader (AGC)	86017004 -C Start	45°01.35'	52°32.97'	93	172	1755	CCA	Whale Deep				24 frames	G. Fader (AGC)
	86017004 -C End	45°01.41'	52°33.00'	93	172	?	CCA	Whale Deep				time not recorded at end of station	
	86017004 -VC	45°01.44'	52°32.95'	93	172	1819	VCO	Whale Deep				2.5 m core recovered	
	86017005 -VV	46°20.86'	53°25.60'	110	174	1638	VVGR	South of Trepassey Bay					
	86017005 -VC	46°20.80'	53°25.69'	110	174	1652	VCO	South of Trepassey Bay				1.25 m core recovered	
	86017005 -C	46°21.08'	53°25.57'	110	174	1722	CCA	South of Trepassey Bay				Position at end of station not recorded 26 frames	G. Fader (AGC)
	86017006 -VC	46°20.95'	53°25.65'	104.2	174	1748	VCO	South of Trepassey Bay				1.56 m core including cc and core cutter	
	86017007 -IKU	46°21.54'	53°25.61'	104.2	174	1826	IKUGR	South of Trepassey Bay					Subsample to Queens
	86017008 -VC	45°47.68'	55°07.82'	167	177	1149	VCO	Halibut Channel				2.02 m including cc of 10 cm	
	86017008 -VV	45°47.90'	55°07.98'	167	177	1208	VVGR	Halibut Channel					
	86017008 -C Start	45°47.93'	55°07.96'	167	177	1218	CCA	Halibut Channel				11 colour frames	G. Fader (AGC)
	86017008 -C End	?	?	167	177	1233	CCA	Halibut Channel				Times are on deck-times. End position not kept. Film did not advance fully	
	86017009 -VV	45°48.81'	55°06.34'	155	177	1313	VVGR	Halibut Channel					

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel	Sand	Silt + Clay = Mud	Remarks	Curation Information
CSS HUDSON 86-017 1986 G. Fader (AGC)	86017009 -C Start	45°48.83'	55°06.33'	158	177	1318	CCA	Halibut Channel				20 frames	G. Fader (AGC)
	86017009 -C End	?	?	158	177	1334	CCA	Halibut Channel				lost pinger; did not record position at end of run	
	86017010 -VV	45°48.70'	55°05.14'	146	177	1357	VVGR	W flank Green Bk.					
	86017010 -C Start	45°48.84'	55°05.09'	146	177	1409	CCA	W flank Green Bk.				25 frames Position and time at end of station not recorded	G. Fader (AGC)
	86017011 -VV	45°48.79'	55°04.15'	139	177	1445	VVGR	W flank Green Bk.					
	86017011 -C Start	45°48.89'	55°04.09'	146	177	1456	CCA	W flank Green Bk.				14 frames	G. Fader (AGC)
	86017011 -C End	?	?	146	177	1520	CCA	W flank Green Bk.				Did not record position at end of run	
	86017012 -VV first attempt	45°48.72'	55°02.77'	134	177	1533	VVGR	W flank Green Bk.				Single rock put in bucket labled 86017012A	
	86017012 -VV second attempt	45°48.72'	55°02.77'	134	177	1541	VVGR	W flank Green Bk				Put in two buckets labled 86017012B and C	
	86017012 -C Start	45°48.77'	55°02.76'	130	177	1552	CCA	W flank Green Bk.				25 frames	G. Fader (AGC)
	86017012 -C on deck	?	?	130	177	1608	CCA	W flank Green Bk.				Position and time at end of run not recorded	
	86017013 -VV	45°48.65'	55°01.60'	86	177	1624	VVGR	W flank Green Bk.					

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
CSS HUDSON 86-017 1986 G. Fader (AGC)	86017013 -C Start	45°48.74'	55°01.57'	86	177	1634	CCA	W flank Green Bk.		27 frames	G. Fader (AGC)
	86015013 -C on deck	?	?	86	177	1649	CCA	W flank Green Bk.		Position and time at end of run not recorded	
	86017014 -IKU	45°48.65'	55°01.60'	88	177	1724	IKUGR	Green Bank		Sample bagged for Queens	
	86017014 -C Start	45°48.77'	54°54.26'	86	177	1732	CCA	Green Bank		27 frames	G. Fader (AGC)
	86017014 -C End	?	?	86	177	1748	CCA	Green Bank		Position at end of run not noted	
	86017015 -IKU	45°48.70'	54°46.51'	69	177	1824	IKUGR	Green Bank	very rich benthic fauna	One subsample for Queens	
	86017015 -C	45°48.73'	54°46.48'	69	177	1831	CCA	Green Bank		22 frames no time or position recorded at end of camera run	G. Fader (AGC)
	86017016 -VC	45°58.45'	55°04.14'	164	177	2048	VCO	Halibut Channel		Core 1.02 m long	5 Subsamples to Queens
	86017016 -C Start	45°58.47'	55°04.15'	164	177	2110	CCA	Halibut Channel		28 frames	G. Fader (AGC)
	86017016 -C End	?	?	164	177	2132	CCA	Halibut Channel		Position at end of run not recorded	
	86017016 -VV	45°58.48'	55°04.15'	164	177	2135	VVGR	Halibut Channel			

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
CSS HUDSON 86-017 1986 G. Fader (AGC)	86017017 -P	45°58.50'	55°04.10'	160	178	1525	PCO	St. Pierre Bank		Trigger core tripped prematurely, Piston core 7.95 m long	
	86017017 -VV	45°58.50'	55°04.10'	160	178	1553	VVGR	St. Pierre Bank		Positions for all of Station 17's work were estimated from the Bridge Log	
	86017017 -C Start	45°58.50'	55°04.10'	160	178	1556	CCA	St. Pierre Bank		28 frames. Positions estimated from Bridge Log	G. Fader (AGC)
	86017017 -C End	45°58.50'	55°04.10'	160	178	1613	CCA	St. Pierre Bank		End of station	
	86017018 -IKU	45°58.50'	54°49.50'	71	178	1726	IKUGR	W flank Green Bk.		All positions for Station 18 taken from Bridge Log	1 bag to Queens
	86017018 -C Start	45°58.50'	54°49.50'	71	178	1733	CCA	W flank Green Bk.		23 frames, Positions estim-ated from Bridge Log.	G. Fader (AGC)
	86017018 -C End	45°58.50'	57°49.40'	71	178	1748	CCA	W flank Green Bk.		End of station	
	86017019 -IKU	45°08.50'	54°33.50'	100	178	2002	IKUGR	Green Bank		All positions for station 19 taken from Bridge Log	
	86017019 -C Start	46°08.50'	54°33.50'	100	178	2017	CCA	Green Bank		28 frames, Positions estim-ated from Bridge Log	G. Fader (AGC)
	86017019 -C End	46°08.50'	54°33.50'	100	178	2049	CCA	Green Bank		End of station	

SHIP Cruise Number Date (Scientist)	Sample Number (Station)	Latitude	Longitude	Water Depth (m)	Day	Time (GMT)	Sample Type	Sample Area	Grain Size Analysis: %age Gravel Sand Silt + Clay = Mud	Remarks	Curation Information
CSS HUDSON 86-018 1986 Russell Parrott (AGC)	86-018 -047	45.58717°	52.75183°	92	193	1332	PCO	Whale Deep		core 2.55 m began to lower 193/1324 which may be position time	Bagged sample from top of core. Water sample from top of core. Samples at AGC Repository.
CSS DAWSON 86-026 1986 Dick Haedrich NICOS (MUN)	86-026 -009	48°09.33'	53°09.50'				PCO	Conception Bay		No samples from this cruise actually in area	Nathaniel Ostrom is presently working on these cores as part of an MSc thesis at the Department of Geological Sciences, Memorial Unversity of Newfoundland. He is also working on cores from White Bay, Exploits Bay, Halls Bay, Green Bay, Bonavista Bay and Notre Dame Bay; all are from the same cruise. Ewan Cumming has also begun an MSc thesis on some of the Memorial data offshore.
	86-026 -010	48°00.43'	53°23.79'				PCO	North Trinity Bay			
M/V BALDER CHALLENGER 87-400 Aug. - Sept. 1987 Kate Moran (AGC)	Borehole 1	45.34948°	55.28661°	?	?	?	BH	Halibut Channel		Contract vessel and borehole rig provided by Jacques McClelland Geo-Sciences Inc.; 4.5 in IF Grade E oilfield drill-pipe used.	samples at AGC Repository
	Borehole 2	45.32266°	55.29679°	?	?	?	BH	Halibut Channel			
Northcor et al. 1987	Narwhal F-99	44.30611°	53.74308°	1573	?	?	Wild-cat Well	Slope of the Southwestern Grand Banks	Well history and logs available 2 years after rig release or when acreage dropped.	Total Depth 4585 m	See G. Karg of COGLA at BIO on 3rd floor of AGC.

APPENDIX 17

Full printout from the AGC "SID" inventory file for samples located in the project area 43°58'N to 47°55'N and 51°45'W to 55°30'W including samples from BIO/AGC cruises arranged in chronological order, offshore hydrocarbon wells and a series of onshore beach and occasional pond samples courtesy of Steve Hart, AGC.

CRUISE	STATION	LATITUDE	LONGITUDE	SCIENTIST-SHIP	GEOGRAPHIC AREA	DEPTH	JULIAN	SAMPLE	TYPE	LENG
***										
* 73006	012	46.55833	-55.31666	KING,L.		221.30		DRILL	ELECTRIC	
* 73006	013	46.49999	-55.33333	KING,L.		129.80		DRILL	ELECTRIC	
* 73006	014	45.40166	-54.32333	KING,L.		0.00		DRILL	ELECTRIC	
* 73006	015	45.37166	-54.31499	KING,L.		0.00		DRILL	ELECTRIC	
* 73006	219	45.02833	-55.33833	KING,L.		304.00	105	GRAB	VAN VEEN	
* 73006	220	45.13833	-55.42499	KING,L.		146.00	105	GRAB	VAN VEEN	
* 73006	240	45.78333	-55.44499	KING,L.		77.00	107	CAMERA	SHIPBORNE	
* 73006	240	45.78333	-55.44499	KING,L.		77.00	107	GRAB	VAN VEEN	
* 73006	240	45.78333	-55.44499	KING,L.		77.00	107	CAMERA	SHIPBORNE	
* 73006	256	45.87499	-55.39999	FADER,G.		135.00	107	GRAB	VAN VEEN	
* 73006	257	45.79999	-55.33333	FADER,G.		164.60	107	GRAB	VAN VEEN	
* 73006	258	45.67333	-55.22999	FADER,G.		153.60	107	GRAB	VAN VEEN	
* 73006	259	45.74666	-55.13333	FADER,G.		151.80	107	GRAB	VAN VEEN	
* 73006	260	45.79166	-55.18333	FADER,G.		170.00	107	GRAB	VAN VEEN	
* 73006	261	45.87666	-55.26999	MACLEAN,B.		160.00	107	GRAB	VAN VEEN	
* 73006	262	46.02166	-55.40833	MACLEAN,B.		84.00	107	GRAB	VAN VEEN	
* 73006	280	46.22999	-55.47499	KING,L.		130.00	107	GRAB	VAN VEEN	
* 73006	280	46.22999	-55.47499	KING,L.		130.00	107	CAMERA	SHIPBORNE	
* 73006	280	46.22999	-55.47499	KING,L.		130.00	107	CAMERA	SHIPBORNE	
* 73006	281	46.11666	-55.45833	KING,L.		91.00	107	GRAB	VAN VEEN	
* 73006	282	46.09499	-55.42499	KING,L.		100.00	107	GRAB	VAN VEEN	
* 73006	283	46.08666	-55.39999	KING,L.		109.00	107	GRAB	VAN VEEN	
* 73006	284	46.07666	-55.38499	KING,L.		119.00	107	GRAB	VAN VEEN	
* 73006	285	46.08833	-55.36499	KING,L.		128.00	107	GRAB	VAN VEEN	
* 73006	286	46.04833	-55.27999	KING,L.		142.00	107	GRAB	VAN VEEN	
* 73006	287	45.96166	-55.20833	KING,L.		162.00	107	GRAB	VAN VEEN	
* 73006	288	45.84666	-55.16666	JOICE,G.		160.00	107	GRAB	VAN VEEN	
* 73006	289	45.81666	-55.09499	JOICE,G.		151.80	107	GRAB	VAN VEEN	
* 73006	290	45.79999	-55.05499	JOICE,G.		140.00	107	GRAB	VAN VEEN	
* 73006	291	45.83333	-54.94666	JOICE,G.		73.00	107	GRAB	VAN VEEN	
* 73006	292	45.89499	-54.98666	JOICE,G.		109.00	107	GRAB	VAN VEEN	
* 73006	293	45.92833	-55.03333	JOICE,G.		137.00	107	GRAB	VAN VEEN	
* 73006	294	45.99666	-55.09166	JOICE,G.		179.00	107	GRAB	VAN VEEN	
* 73006	295	46.09999	-55.21666	FADER,G.		139.00	108	GRAB	VAN VEEN	
* 73006	296	46.24499	-55.34999	FADER,G.		135.30	107	GRAB	VAN VEEN	
* 73006	297	46.33499	-55.44999	FADER,G.		162.80	107	GRAB	VAN VEEN	
* 73006	298	46.38666	-55.48333	FADER,G.		179.20	108	GRAB	VAN VEEN	
* 73006	312	47.42499	-54.03333	JOICE,G.		131.70	185	GRAB	VAN VEEN	
* 73006	326	47.56166	-54.96666	KING,L.		171.90	186	GRAB	VAN VEEN	
* 73006	327	47.41166	-55.36666	KING,L.		289.00	184	GRAB	VAN VEEN	
* 73006	328	47.34499	-55.37999	KING,L.		100.60	186	GRAB	VAN VEEN	
* 73006	329	47.29166	-55.37999	JOICE,G.		160.00	187	GRAB	VAN VEEN	
* 73006	336	47.01667	-54.48167			201.00		GRAB	VAN VEEN	
* 73006	337	47.01667	-54.48167			193.00		GRAB	VAN VEEN	
* 73006	340	46.62167	-54.54667			106.00		GRAB	VAN VEEN	
* 73006	343	46.58667	-54.66833			168.00		GRAB	VAN VEEN	
* 73006	344	46.71333	-54.78333			237.00		GRAB	VAN VEEN	
* 73006	345	46.81667	-54.88500			241.00		GRAB	VAN VEEN	
* 73006	346	46.88500	-54.95000			190.00		GRAB	VAN VEEN	
* 73006	347	46.94167	-54.85500			201.00		GRAB	VAN VEEN	
* 73006	348	47.01667	-54.92167			78.00		GRAB	VAN VEEN	
* 73006	354	46.55833	-55.31666	KING,L.		221.00		DRILL	ELECTRIC	

EOI ENCOUNTERED.

CRUISE	STATION	LATITUDE	LONGITUDE	SCIENTIST-SHIP	GEOGRAPHIC AREA	DEPTH	JULIAN	SAMPLE	TYPE	LENGTH
***										
* 75009	025	47.16283	-51.95783	FADER,G.		146.00	147	CAMERA	SHIPBORNE	
* 75009	025	47.16283	-51.95783	FADER,G.		146.00	147	DRILL	ELECTRIC	480.0
* 75009	025	47.16283	-51.95783	FADER,G.		146.00	147	DRILL	ELECTRIC	480.0
* 75009	025	47.62833	-51.95783	FADER,G./HUDSON	GRAND BANKS AND FLEMISH CAP	146.00	147	GRAB	VAN VEEN	

EOI ENCOUNTERED.

CRUISE	STATION	LATITUDE	LONGITUDE	SCIENTIST-SHIP	GEOGRAPHIC AREA	DEPTH	JULIAN	SAMPLE	TYPE	LENG
***										
* 77011	002	47.16333	-52.21333	FADER,G.		148.00	138	DRILL	ELECTRIC	77.
* 77011	003	47.16333	-52.36833	FADER,G.		144.50	138	CAMERA	SHIPBORNE	
* 77011	003	47.16333	-52.36833	FADER,G.		144.50	138	CAMERA	SHIPBORNE	
* 77011	003	47.16333	-52.36833	FADER,G.		144.50	138	DRILL	ELECTRIC	
* 77011	004	47.16333	-52.41333	FADER,G.		155.40	138	DRILL	ELECTRIC	64.
* 77011	005	47.38999	-52.56999	FADER,G.		168.20	138	DRILL	ELECTRIC	
* 77011	005	47.38999	-52.56999	FADER,G.		168.20	138	CAMERA	SHIPBORNE	
* 77011	005	47.38999	-52.56999	FADER,G.		168.20	138	CAMERA	SHIPBORNE	
* 77011	008	47.71333	-52.51333	FADER,G.		179.20	141	DRILL	ELECTRIC	24.
* 77011	008	47.71333	-52.51333	FADER,G.		179.20	141	CAMERA	SHIPBORNE	
* 77011	008	47.71333	-52.51333	FADER,G.		179.20	141	GRAB	VAN VEEN	
* 77011	008	47.71330	-52.51330	KING,L./HUDSON	GRAND BANKS OF NEWFOUNDLAND	182.28	141	GRAB	VAN VEEN	
* 77011	008	47.71333	-52.51333	FADER,G.		179.20	141	CAMERA	SHIPBORNE	
* 77011	010	47.39166	-51.75833	KING,L./HUDSON	GRAND BANKS OF NEWFOUNDLAND	167.40	141	GRAB	VAN VEEN	
* 77011	010	47.39166	-51.75833	FADER,G.		164.50	141	CAMERA	SHIPBORNE	
* 77011	010	47.39166	-51.75833	FADER,G.		164.50	141	GRAB	VAN VEEN	
* 77011	010	47.39166	-51.75833	FADER,G.		164.50	141	CAMERA	SHIPBORNE	
* 77011	010	47.39166	-51.75833	FADER,G.		164.50	141	DRILL	ELECTRIC	12.
* 77011	011	47.24166	-51.75333	FADER,G.		162.70	141	GRAB	VAN VEEN	
* 77011	011	47.24166	-51.75333	FADER,G.		162.70	141	CAMERA	SHIPBORNE	
* 77011	011	47.24166	-51.75333	FADER,G.		162.70	141	DRILL	ELECTRIC	5.
* 77011	011	47.09616	-51.75330	KING,L./HUDSON	GRAND BANKS OF NEWFOUNDLAND	165.54	141	GRAB	VAN VEEN	
* 77011	011	47.24166	-51.75333	FADER,G.		162.70	141	CAMERA	SHIPBORNE	
* 77011	028	46.89666	-51.97666	FADER,G.		138.90	151	CAMERA	SHIPBORNE	
* 77011	028	46.89666	-51.97666	FADER,G.		138.90	151	DRILL	ELECTRIC	28.
* 77011	028	46.89666	-51.97666	FADER,G.		138.90	151	CAMERA	SHIPBORNE	
* 77011	029	46.86666	-51.94333	FADER,G.		138.90	151	CAMERA	SHIPBORNE	
* 77011	029	46.87499	-51.94833	FADER,G.		142.60	151	DRILL	ELECTRIC	18.
* 77011	029	46.86666	-51.94333	FADER,G.		138.90	151	GRAB	VAN VEEN	
* 77011	029	46.86666	-51.94333	FADER,G.		138.90	151	DRILL	ELECTRIC	30.
* 77011	029	46.86666	-51.94333	FADER,G.		138.90	151	CAMERA	SHIPBORNE	
* 77011	030	46.87499	-51.94833	FADER,G.		142.60	151	CAMERA	SHIPBORNE	
* 77011	031	46.41499	-52.72333	FADER,G.		175.50	152	DRILL	ELECTRIC	65.
* 77011	033	46.39166	-52.79499	FADER,G.		173.70	152	DRILL	ELECTRIC	53.

EOI ENCOUNTERED.

CRUISE	STATION	LATITUDE	LONGITUDE	SCIENTIST-SHIP	GEOGRAPHIC AREA	DEPTH	JULIAN	SAMPLE	TYPE	LENG
***										
* 78012	001	46.86833	-54.81500	FADER,G.		241.00	146	CORE	PISTON	609.
* 78012	001	46.86833	-54.81500	FADER,G.		241.00	146	GRAB	VAN VEEN	
* 78012	002	46.77083	-54.89666	FADER,G.		241.00	146	GRAB	VAN VEEN	
* 78012	002	46.77083	-54.89666	FADER,G.		241.00	146	CORE	TRIGGER W EIGHT	121.
* 78012	002	46.77083	-54.89666	FADER,G.		241.00	146	CORE	PISTON	914.
* 78012	003	46.79666	-54.59666	FADER,G.		190.00	149	CORE	PISTON	548.
* 78012	004	46.70333	-54.65333	FADER,G.		185.00	149	IN SIT U		
* 78012	004	46.70333	-54.65333	FADER,G.		185.00	149	CORE	PISTON	335.
* 78012	111	46.82499	-54.77833	FADER,G.		238.00	148	GRAB	VAN VEEN	
* 78012	112	46.86333	-54.74833	FADER,G.		238.00	148	GRAB	VAN VEEN	
* 78012	113	46.88166	-54.71833	FADER,G.		234.00	148	GRAB	VAN VEEN	
* 78012	121	46.82366	-54.75300	FADER,G.		237.00	140	GRAB	VAN VEEN	
* 78012	121	46.82366	-54.75299	FADER,G.		237.00	140	CORE	PISTON	914.
* 78012	121	46.82366	-54.75299	FADER,G.		237.00	140	GRAB	VAN VEEN	
* 78012	121	46.82366	-54.75300	FADER,G.		237.00	140	GRAB	PISTON	
* 78012	122	46.86249	-54.74166	FADER,G.		234.00	140	GRAB	VAN VEEN	
* 78012	122	46.86249	-54.74166	FADER,G.		428.00	140	GRAB	VAN VEEN	
* 78012	123	46.86799	-54.71666	FADER,G.		232.00	140	GRAB	VAN VEEN	
* 78012	123	46.86666	-54.71666	FADER,G.		127.00	140	CORE	PISTON	
* 78012	123	46.86666	-54.71666	FADER,G.		127.00	140	GRAB	VAN VEEN	
* 78012	123	46.86799	-54.71666	FADER,G.		232.00	140	IN SIT U	PENETROME TER	
* 78012	123-140	46.86799	-54.71666	FADER,G.		232.00	140	CORE	PISTON	
* 78012	123-148	46.86666	-54.72666	FADER,G.		0.00	148	CORE	PISTON	853.
* 78012	131	46.82833	-54.75499	FADER,G.		236.00	148	IN SIT U	PENETROME TER	
* 78012	131	46.81166	-54.75166	FADER,G.		238.00	140	CAMERA	SHIPBORNE	
* 78012	131	46.82833	-54.75499	FADER,G.		236.00	148	CORE	PISTON	4.
* 78012	131	46.81166	-54.75166	FADER,G.		237.00	140	CAMERA	SHIPBORNE	
* 78012	131	46.81166	-54.75166	FADER,G.		237.00	140	GRAB	VAN VEEN	
* 78012	131	46.81166	-54.75166	FADER,G.		238.00	140	CAMERA	SHIPBORNE	
* 78012	131	46.81166	-54.75166	FADER,G.		238.00	140	GRAB	VAN VEEN	
* 78012	131	46.81166	-54.75166	FADER,G.		237.00	140	CAMERA	SHIPBORNE	
* 78012	132	46.83833	-54.72833	FADER,G.		263.00	144	IN SIT U	PENETROME TER	
* 78012	132	46.83833	-54.72833	FADER,G.		263.00	140	GRAB	VAN VEEN	
* 78012	132	46.83833	-54.72833	FADER,G.		263.00	140	GRAB	VAN VEEN	
* 78012	132	46.83833	-54.72666	FADER,G.		179.00	147	IN SIT U	PENETROME TER	
* 78012	132	46.83833	-54.72833	FADER,G.		263.00	140	CORE	PISTON	246.
* 78012	132A	46.83833	-54.72833	VILKS,G./KING,L. /HUDSON	PLACENTIA BAY,N EWFOUNDLAND	144.00	140	CORE	PISTON	884.
* 78012	132-144	46.83833	-54.72833	FADER,G.		263.00	144	CORE	PISTON	884.
* 78012	132-147	46.83833	-54.72666	FADER,G.		179.00	147	CORE	PISTON	
* 78012	133	46.86999	-54.69333	FADER,G.		229.00	140	GRAB	VAN VEEN	
* 78012	133	46.86999	-54.69333	FADER,G.		229.00	140	GRAB	VAN VEEN	
* 78012	141	46.80749	-54.73666	FADER,G.		230.00	140	GRAB	VAN VEEN	
* 78012	141	46.80749	-54.73666	FADER,G.		230.00	140	CORE	PISTON	701.
* 78012	141	46.80749	-54.73666	FADER,G.		230.00	140	GRAB	VAN VEEN	
* 78012	141	46.80749	-54.73666	FADER,G.		230.00	140	CORE	TRIGGER W EIGHT	152.
* 78012	141	46.80666	-54.77166	FADER,G.		234.00	148	IN SIT U	PENETROME TER	
* 78012	141-140	46.80749	-54.73666	FADER,G.		230.00	140	CORE	PISTON	6.
* 78012	141-148	46.80666	-54.77166	FADER,G.		234.00	148	CORE	PISTON	7.
* 78012	142	46.81666	-54.71666	FADER,G.		232.00	141	GRAB	VAN VEEN	
* 78012	142	46.82666	-54.71666	FADER,G.		232.00	141	GRAB	VAN VEEN	
* 78012	143	46.84666	-54.69666	FADER,G.		219.00	141	GRAB	VAN VEEN	

* 78012	143	46.84666	-54.69666	FADER,G.	219.00	141	GRAB	VAN VEEN	
* 78012	143	46.84666	-54.69666	FADER,G.	229.00	149	CORE	PISTON	853.
* 78012	151	46.79666	-54.72999	FADER,G.	232.00	140	GRAB	VAN VEEN	
* 78012	151	46.79666	-54.72999	FADER,G.	232.00	140	GRAB	VAN VEEN	
* 78012	152	46.81833	-54.70833	FADER,G.	229.00	141	GRAB	VAN VEEN	
* 78012	152	46.81933	-54.70833	FADER,G.	229.00	141	GRAB	VAN VEEN	
* 78012	153	46.84999	-54.67666	FADER,G.	225.00	141	GRAB	VAN VEEN	
* 78012	153	46.84999	-54.67666	FADER,G.	225.00	141	GRAB	VAN VEEN	
* 78012	211	46.84333	-54.92833	FADER,G.	219.00	141	GRAB	VAN VEEN	
* 78012	211	46.84333	-54.92833	FADER,G.	219.00	141	GRAB	VAN VEEN	
* 78012	212	46.86833	-54.89833	FADER,G.	219.00	141	GRAB	VAN VEEN	
* 78012	212	46.86833	-54.89833	FADER,G.	219.00	141	CAMERA	SHIPBORNE	
* 78012	212	46.86833	-54.89833	FADER,G.	219.00	141	CAMERA	SHIPBORNE	
* 78012	212	46.86833	-54.89833	FADER,G.	219.00	141	CAMERA	SHIPBORNE	
* 78012	212	46.86833	-54.89833	FADER,G.	219.00	141	CAMERA	SHIPBORNE	
* 78012	212	46.86833	-54.89833	FADER,G.	219.00	141	GRAB	VAN VEEN	
* 78012	213	46.89166	-54.87333	FADER,G.	219.00	141	GRAB	VAN VEEN	
* 78012	213	46.89166	-54.87333	FADER,G.	219.00	141	GRAB	VAN VEEN	
* 78012	214	46.91000	-54.84666	FADER,G.	227.00	141	GRAB	VAN VEEN	
* 78012	214	46.90999	-54.84666	FADER,G.	227.00	141	GRAB	VAN VEEN	
* 78012	221	46.83166	-54.91999	FADER,G.	223.00	141	GRAB	VAN VEEN	
* 78012	221	46.83166	-54.91999	FADER,G.	223.00	141	GRAB	VAN VEEN	
* 78012	222	46.85499	-54.89000	FADER,G.	223.00	141	GRAB	VAN VEEN	
* 78012	222	46.85499	-54.88999	FADER,G.	223.00	141	GRAB	VAN VEEN	
* 78012	223	46.87999	-54.86333	FADER,G.	227.00	141	GRAB	VAN VEEN	
* 78012	223	46.87999	-54.86333	FADER,G.	227.00	146	CORE	PISTON	
* 78012	223	46.87999	-54.86333	FADER,G.	227.00	146	CORE	TRIGGER W EIGHT	91.
* 78012	223	46.87999	-54.86333	FADER,G.	227.00	146	IN SIT U		
* 78012	224	46.90333	-54.83999	FADER,G.	236.00	141	GRAB	VAN VEEN	
* 78012	231	46.83333	-54.92333	FADER,G.	234.00	141	GRAB	VAN VEEN	
* 78012	232	46.85666	-54.86833	FADER,G.	0.00	146	CAMERA	SHIPBORNE	
* 78012	232	46.85666	-54.86833	FADER,G.		146	CAMERA	SHIPBORNE	
* 78012	232	46.85749	-54.86833	FADER,G.	238.00	141	GRAB	VAN VEEN	
* 78012	232	46.85666	-54.86833	FADER,G.		146	CAMERA	SHIPBORNE	
* 78012	232	46.85666	-54.86833	FADER,G.	0.00	146	CAMERA	SHIPBORNE	
* 78012	233	46.88166	-54.84666	FADER,G.	241.00	146	CORE	TRIGGER W EIGHT	121.
* 78012	233	46.88166	-54.84000	FADER,G.	241.00	141	GRAB	VAN VEEN	
* 78012	233	46.88166	-54.84666	FADER,G.	241.00	146	CORE	PISTON	243.
* 78012	234	46.57083	-54.81833	FADER,G.	249.00	141	GRAB	VAN VEEN	
* 78012	234	46.90166	-54.81666	FADER,G.	252.00	146	CORE	TRIGGER W EIGHT	121.
* 78012	234	46.90166	-54.81666	FADER,G.	252.00	146	CORE	PISTON	426.
* 78012	241	46.82166	-54.88666	FADER,G.	240.00	146	GRAB	VAN VEEN	
* 78012	241	46.82166	-54.88666	FADER,G.	240.00	146	GRAB	VAN VEEN	
* 78012	242	46.84166	-54.85666	FADER,G.	241.00	142	GRAB	VAN VEEN	
* 78012	243	46.87666	-54.82499	FADER,G.	249.00	146	IN SIT U	PENETROME TER	
* 78012	243	46.87666	-54.82666	FADER,G.	247.00	141	GRAB	VAN VEEN	
* 78012	243	46.87666	-54.82499	FADER,G.	249.00	146	CORE	PISTON	274.
* 78012	244	46.89333	-54.80499	FADER,G.	230.00	146	CORE	PISTON	548.
* 78012	244	46.89499	-54.80499	FADER,G.	219.00	141	GRAB	VAN VEEN	
* 78012	244	46.89499	-54.80499	FADER,G.	219.00	141	GRAB	VAN VEEN	
* 78012	311	46.74999	-54.71833	FADER,G.	187.00	142	GRAB	VAN VEEN	
* 78012	311	46.84166	-54.85666	FADER,G.	187.00	142	GRAB	VAN VEEN	
* 78012	312	46.78166	-54.59499	FADER,G.	174.00	142	GRAB	VAN VEEN	
* 78012	312	46.78166	-54.59499	FADER,G.	174.00	142	GRAB	VAN VEEN	
* 78012	313	46.80999	-54.56833	FADER,G.	0.00	142	GRAB	VAN VEEN	
* 78012	313	46.81499	-54.57333	FADER,G.	0.00	143	CORE	PISTON	152.
* 78012	313	46.81500	-54.57333	FADER,G.		143	CORE	PISTON	548.
* 78012	313	46.80999	-54.57833	FADER,G.		142	GRAB	VAN VEEN	
* 78012	321	46.75999	-54.60333	FADER,G.	181.00	143	IN SIT U	PENETROME TER	
* 78012	321	46.80666	-54.58999	FADER,G.	174.00	142	GRAB	VAN VEEN	

* 78012	321	46.75999	-54.60333	FADER,G.	181.00	143	CORE	PISTON	243.
* 78012	321	46.80666	-54.59999	FADER,G.	174.00	142	GRAB	VAN VEEN	
* 78012	322	46.77499	-54.64166	FADER,G.	177.00	142	GRAB	VAN VEEN	
* 78012	322	46.77499	-54.64166	FADER,G.	177.00	142	GRAB	VAN VEEN	
* 78012	323	46.78833	-54.56999	FADER,G.	170.00	142	GRAB	VAN VEEN	
* 78012	323	46.78833	-54.57000	FADER,G.	170.00	142	GRAB	VAN VEEN	
* 78012	331	46.74166	-54.59999	FADER,G.	166.00	142	GRAB	VAN VEEN	
* 78012	331	46.74166	-54.59999	FADER,G.	166.00	142	GRAB	VAN VEEN	
* 78012	332	46.76666	-54.57999	FADER,G.	168.00	143	CORE	PISTON	3.
* 78012	332	46.76899	-54.57499	FADER,G.	165.00	142	GRAB	VAN VEEN	
* 78012	332	46.76666	-54.57999	FADER,G.	168.00	143	IN SITU	PENETROMETER	
* 78012	332	46.76916	-54.57499	FADER,G.	165.00	142	GRAB	VAN VEEN	
* 78012	332	46.76666	-54.57999	FADER,G.	168.00	143	CORE	VAN VEEN	396.
* 78012	333	46.79666	-54.54999	FADER,G.	165.00	142	GRAB	VAN VEEN	
* 78012	333	46.79666	-54.54999	FADER,G.	165.00	142	GRAB	VAN VEEN	
* 78012	341	46.74666	-54.59999	FADER,G.	165.00	143	IN SITU	PENETROMETER	
* 78012	341	46.74249	-54.53666	FADER,G.	157.00	142	GRAB	VAN VEEN	
* 78012	342	46.76416	-54.56416	FADER,G.	157.00	142	GRAB	VAN VEEN	
* 78012	342	46.76416	-54.56416	FADER,G.	157.00	142	GRAB	VAN VEEN	
* 78012	343	46.79499	-54.53666	FADER,G.	154.00	142	GRAB	VAN VEEN	
* 78012	343	46.79499	-54.53666	FADER,G.	154.00	142	GRAB	SHIPEK	
* 78012	351	46.73499	-54.57833	FADER,G.	152.00	142	GRAB	VAN VEEN	
* 78012	351	46.73499	-54.57833	FADER,G.	152.00	142	GRAB	VAN VEEN	
* 78012	352	46.73666	-54.57666	FADER,G.	150.00	143	GRAB	VAN VEEN	
* 78012	352	46.73666	-54.57666	FADER,G.	150.00	142	GRAB	VAN VEEN	
* 78012	353	46.77999	-54.53833	FADER,G.	274.00	142	GRAB	VAN VEEN	
* 78012	353	46.77999	-54.53833	FADER,G.	274.00	143	GRAB	VAN VEEN	
* 78012	411	46.60499	-54.75999	FADER,G.	210.00	143	GRAB	VAN VEEN	
* 78012	411	46.60499	-54.72666	FADER,G.	210.00	143	GRAB	VAN VEEN	
* 78012	412	46.62666	-54.74333	FADER,G.	208.00	144	GRAB	VAN VEEN	
* 78012	412	46.62666	-54.74333	FADER,G.	208.00	144	GRAB	VAN VEEN	
* 78012	413	46.62666	-54.74333	FADER,G.	201.00	144	GRAB	VAN VEEN	
* 78012	413	46.62666	-54.74333	FADER,G.	210.00	155	GRAB	VAN VEEN	
* 78012	421	46.64499	-54.75333	FADER,G.	205.00	147	GRAB	VAN VEEN	
* 78012	421	46.64499	-54.75333	FADER,G.	205.00	147	GRAB	VAN VEEN	
* 78012	421	46.64499	-54.75333	FADER,G.	205.00	147	CORE	PISTON	8.
* 78012	421	46.64499	-54.75333	FADER,G.	205.00	147	IN SITU	PENETROMETER	
* 78012	421	46.64499	-54.75333	FADER,G.	205.00	147	CORE	PISTON	822.
* 78012	422	46.62666	-54.72666	FADER,G.	201.00	145	GRAB	VAN VEEN	
* 78012	422	46.62666	-54.72666	FADER,G.	201.00	145	GRAB	VAN VEEN	
* 78012	423	46.65333	-54.69999	FADER,G.	194.00	143	GRAB	VAN VEEN	
* 78012	423	46.65333	-54.69999	FADER,G.	194.00	143	IN SITU	PENETROMETER	
* 78012	423	46.65499	-54.70166	FADER,G.	196.00	149	IN SITU	PENETROMETER	
* 78012	423	46.65333	-54.69999	FADER,G.	194.00	143	GRAB	VAN VEEN	
* 78012	423	46.65333	-54.69999	FADER,G.	195.00	143	CORE	PISTON	609.
* 78012	423-143	46.65333	-54.69999	FADER,G.	194.00	143	CORE	PISTON	2.
* 78012	423-149	46.65499	-54.70166	FADER,G.	196.00	149	CORE	PISTON	5.
* 78012	431	46.59333	-54.73999	FADER,G.	201.00	143	GRAB	VAN VEEN	
* 78012	431	46.59333	-54.73999	FADER,G.	201.00	143	GRAB	VAN VEEN	
* 78012	432	46.64999	-54.72166	FADER,G.	196.00	143	CORE	PISTON	548.
* 78012	432	46.64999	-54.72166	FADER,G.	196.00	143	IN SITU	PENETROMETER	
* 78012	432	46.64999	-54.72166	FADER,G.	196.00	143	GRAB	VAN VEEN	
* 78012	432	46.64999	-54.72166	FADER,G.	196.00	143	GRAB	VAN VEEN	
* 78012	432	46.61499	-54.72166	FADER,G.	196.00	149	IN SITU	PENETROMETER	
* 78012	432-149	46.61499	-54.72166	FADER,G.	196.00	149	CORE	PISTON	122.
* 78012	433	46.64666	-54.71166	FADER,G.	190.00	143	CORE	PISTON	687.
* 78012	433	46.64666	-54.69499	FADER,G.	190.00	143	IN SITU	PENETROMETER	
* 78012	433	46.64666	-54.69499	FADER,G.	190.00	143	GRAB	VAN VEEN	

*	78012	433	46.64666	-54.71166	FADER,G.	190.00	143	GRAB	VAN VEEN	
*	78012	433-143	46.64666	-54.69499	FADER,G.	190.00	143	CORE	PISTON	4.8
*	78012	433-149	46.66166	-54.69833	FADER,G.	194.00	149	CORE	PISTON	
*	78012	441	46.64333	-54.72333	FADER,G.	188.00	147	GRAB	VAN VEEN	
*	78012	441	46.64333	-54.72333	FADER,G.	188.00	147	GRAB	VAN VEEN	
*	78012	441	46.64333	-54.72333	FADER,G.	188.00	147	CORE	PISTON	518.1
*	78012	441	46.64333	-54.72333	FADER,G.	188.00	147	IN SIT U	PENETROME TER	
*	78012	441-147	46.64333	-54.72333	FADER,G.	188.00	147	CORE	PISTON	548.
*	78012	442	46.61333	-54.70666	FADER,G.	190.00	147	GRAB	VAN VEEN	
*	78012	442	46.61666	-54.70666	FADER,G.	190.00	149	CORE	PISTON	
*	78012	442	46.61666	-54.70666	FADER,G.	190.00	149	IN SIT U	PENETROME TER	
*	78012	442	46.61333	-54.70666	FADER,G.	190.00	147	GRAB	VAN VEEN	
*	78012	443	46.64666	-54.68166	FADER,G.	177.00	147	GRAB	VAN VEEN	
*	78012	443	46.64666	-54.68166	FADER,G.	177.00	147	GRAB	VAN VEEN	
*	78012	451	46.65833	-54.71833	FADER,G.	179.00	147	CAMERA	SHIPBORNE	
*	78012	451	46.65833	-54.71833	FADER,G.	179.00	147	GRAB	VAN VEEN	
*	78012	451	46.65833	-54.71833	FADER,G.	179.00	147	CORE	PISTON	426.
*	78012	451	46.65833	-54.71833	FADER,G.	179.00	147	CAMERA	SHIPBORNE	
*	78012	452	46.61333	-54.68999	FADER,G.	179.00	147	GRAB	VAN VEEN	
*	78012	452	46.61333	-54.68999	FADER,G.	179.00	147	CAMERA	SHIPBORNE	
*	78012	452	46.61333	-54.68999	FADER,G.	179.00	147	CAMERA	SHIPBORNE	
*	78012	453	46.64166	-54.62499	FADER,G.	179.00	147	CAMERA	SHIPBORNE	
*	78012	453	46.64166	-54.62499	FADER,G.	179.00	147	CAMERA	SHIPBORNE	
*	78012	453	46.64266	-54.65833	FADER,G.	179.00	147	GRAB	VAN VEEN	
*	78012	453	46.64166	-54.62499	FADER,G.	179.00	147	GRAB	VAN VEEN	
*	78012	511	46.56666	-54.34999	FADER,G.	84.00	144	GRAB	VAN VEEN	
*	78012	511	46.56666	-54.34999	FADER,G.	84.00	144	GRAB	VAN VEEN	
*	78012	512	46.59166	-54.37166	FADER,G.	86.00	144	GRAB	VAN VEEN	
*	78012	512	46.59166	-54.37166	FADER,G.	86.00	144	GRAB	VAN VEEN	
*	78012	513	46.61833	-54.39333	FADER,G.	101.00	144	GRAB	VAN VFEN	
*	78012	513	46.61833	-54.39333	FADER,G.	101.00	144	GRAB	VAN VEEN	
*	78012	521	46.57666	-54.33999	FADER,G.	970.00	144	GRAB	VAN VEEN	
*	78012	521	46.56666	-54.33999	FADER,G.	97.00	144	GRAB	VAN VEEN	
*	78012	522	46.60499	-54.36499	FADER,G.	99.00	144	GRAB	VAN VEEN	
*	78012	522	46.60499	-54.46499	FADER,G.	99.00	144	GRAB	VAN VEEN	
*	78012	523	46.62833	-54.39333	FADER,G.	101.00	144	GRAB	VAN VEEN	
*	78012	523	46.62833	-54.39333	FADER,G.	101.00	144	GRAB	VAN VEEN	
*	78012	531	46.57666	-54.32333	FADER,G.	73.00	144	GRAB	VAN VEEN	
*	78012	531	46.57666	-54.32333	FADER,G.	73.00	144	GRAB	VAN VEEN	
*	78012	532	46.60666	-54.35166	FADER,G.	93.00	144	GRAB	VAN VEEN	
*	78012	533	46.63249	-54.37333	FADER,G.	88.00	144	GRAB	VAN VEEN	
*	78012	533	46.63250	-54.37333	FADER,G.	88.00	144	GRAB	VAN VEEN	
*	78012	541	46.58666	-54.90016	FADER,G.	79.00	144	GRAB	VAN VEEN	
*	78012	541	46.58666	-54.31833	FADER,G.	79.00	144	GRAB	VAN VEEN	
*	78012	542	46.60666	-54.33666	FADER,G.	95.00	144	GRAB	VAN VEEN	
*	78012	543	46.63499	-54.45999	FADER,G.	84.00	144	GRAB	VAN VEEN	
*	78012	543	46.63499	-54.35999	FADER,G.	84.00	144	GRAB	VAN VEEN	
*	78012	551	46.59166	-54.30833	FADER,G.	84.00	144	GRAB	VAN VEEN	
*	78012	551	46.59166	-54.30833	FADER,G.	84.00	144	GRAB	VAN VEEN	
*	78012	552	46.61583	-54.32833	FADER,G.	91.00	144	GRAB	VAN VEEN	
*	78012	552	46.61583	-54.32833	FADER,G.	91.00	144	GRAB	VAN VEEN	
*	78012	553	46.64499	-54.34999	FADER,G.	84.00	144	GRAB	VAN VEEN	
*	78012	611	46.51499	-55.19166	FADER,G.	152.00	145	GRAB	VAN VEEN	
*	78012	611	46.51499	-55.19166	FADER,G.	152.00	145	CAMERA	SHIPBORNE	
*	78012	611	46.51499	-55.19166	FADER,G.	152.00	145	GRAB	VAN VEEN	
*	78012	611	46.51499	-55.19166	FADER,G.	152.00	145	CAMERA	SHIPBORNE	
*	78012	612	46.53666	-55.16999	FADER,G.	152.00	145	GRAB	VAN VEEN	
*	78012	612	46.53666	-55.16999	FADER,G.	152.00	145	CAMERA	SHIPBORNE	
*	78012	612	46.53666	-55.16999	FADER,G.	152.00	145	GRAB	VAN VEEN	
*	78012	612	46.53666	-55.16999	FADER,G.	152.00	145	CAMERA	SHIPBORNE	
*	78012	612	46.53666	-55.16999	FADER,G.	152.00	145	CAMERA	SHIPBORNE	
*	78012	612	46.53666	-55.16999	FADER,G.	152.00	145	CAMERA	SHIPBORNE	
*	78012	613	46.56166	-55.14499	FADER,G.	155.00	145	GRAB	VAN VEEN	
*	78012	613	46.56166	-55.14499	FADER,G.	155.00	145	GRAB	VAN VEEN	

* 78012	621	45.13333	-55.17999	FADER,G.	152.00	145	GRAB	VAN VEEN
* 78012	621	46.51333	-55.17999	FADER,G.	152.00	145	CAMERA	SHIPBORNE
* 78012	621	46.51333	-55.17999	FADER,G.	152.00	145	IN SIT U	
* 78012	621	46.51333	-55.17999	FADER,G.	152.00	145	CAMERA	SHIPBORNE
* 78012	621	46.51333	-55.17999	FADER,G.	152.00	145	GRAB	VAN VEEN
* 78012	621	46.51333	-55.17999	FADER,G.	152.00	145	CAMERA	SHIPBORNE
* 78012	621	46.51333	-55.17999	FADER,G.	152.00	145	CAMERA	SHIPBORNE
* 78012	622	46.53333	-55.15833	FADER,G.	154.00	145	GRAB	VAN VEEN
* 78012	622	46.53333	-55.15833	FADER,G.	154.00	145	GRAB	VAN VEEN
* 78012	623	46.55666	-55.14333	FADER,G.	155.00	145	GRAB	VAN VEEN
* 78012	623	46.55666	-55.13333	FADER,G.	155.00	145	GRAB	VAN VEEN
* 78012	631	46.50333	-55.17333	FADER,G.	154.00	145	GRAB	VAN VEEN
* 78012	631	46.50333	-55.17333	FADER,G.	154.00	145	GRAB	VAN VEEN
* 78012	632	46.51666	-55.15166	FADER,G.	146.00	145	GRAB	VAN VEEN
* 78012	632	46.51799	-55.15166	FADER,G.	146.00	145	GRAB	VAN VEEN
* 78012	633	46.76716	-55.12999	FADER,G.	154.00	145	GRAB	VAN VEEN
* 78012	633	46.53666	-55.12999	FADER,G.	154.00	145	GRAB	VAN VEEN
* 78012	641	46.48833	-55.17499	FADER,G.	157.00	145	GRAB	VAN VEEN
* 78012	641	46.48833	-55.17499	FADER,G.	157.00	145	GRAB	VAN VEEN
* 78012	642	46.51666	-55.14499	FADER,G.	139.00	145	GRAB	VAN VEEN
* 78012	642	46.51666	-55.14499	FADER,G.	139.00	145	GRAB	VAN VEEN
* 78012	643	46.55333	-55.10833	FADER,G.	157.00	145	GRAB	VAN VEEN
* 78012	643	46.53666	-55.10833	FADER,G.	157.00	145	GRAB	VAN VEEN
* 78012	651	46.48999	-55.15666	FADER,G.	154.00	145	GRAB	VAN VEEN
* 78012	651	46.48999	-55.15666	FADER,G.	154.00	145	GRAB	VAN VEEN
* 78012	652	46.51833	-55.13083	FADER,G.	150.00	145	GRAB	VAN VEEN
* 78012	652	46.51833	-55.03083	FADER,G.	150.00	145	GRAB	VAN VEEN
* 78012	653	46.54833	-55.09999	FADER,G.	157.00	145	GRAB	VAN VEEN
* 78012	653	46.54833	-55.10833	FADER,G.	157.00	145	GRAB	VAN VEEN

EOI ENCOUNTERED.

CRUISE	STATION	LATITUDE	LONGITUDE	SCIENTIST-SHIP	GEOGRAPHIC AREA	DEPTH	JULIAN	SAMPLE	TYPE	LENGT
***										
* 78023	36A	47.31466	-52.63033	HAWORTH,R.		82.00	221	DRILL	ELECTRIC	21.0
* 78023	36A	47.31466	-52.63033	HAWORTH,R.		82.00	221	DRILL	ELECTRIC	21.0
* 78023	36B	47.31466	-52.63033	HAWORTH,R.		0.00	221	DRILL	ELECTRIC	18.0
* 78023	36B	47.31466	-52.63033	HAWORTH,R.		0.00	221	DRILL	ELECTRIC	18.0
* 78023	36C	47.31466	-52.63033	HAWORTH,R.		82.00	221	DRILL	ELECTRIC	58.0
* 78023	36C	47.31466	-52.63033	HAWORTH,R.		82.00	221	DRILL	ELECTRIC	58.0
* 78023	36D	47.31399	-52.63433	HAWORTH,R.		82.00	221	DRILL	ELECTRIC	68.0
* 78023	36D	47.31399	-52.63433	HAWORTH,R.		82.00	221	DRILL	ELECTRIC	68.0
* 78023	36E	47.31583	-52.63133	HAWORTH,R.		82.00	221	DRILL	ELECTRIC	43.0
* 78023	36E	47.31583	-52.63133	HAWORTH,R.		82.00	221	DRILL	ELECTRIC	43.0
* 78023	36F	47.31549	-52.63083	HAWORTH,R.		82.00	221	DRILL	ELECTRIC	21.0
* 78023	36F	47.31549	-52.63083	HAWORTH,R.		82.00	221	DRILL	ELECTRIC	21.0

EOI ENCOUNTERED.

CRUISE	STATION	LATITUDE	LONGITUDE	SCIENTIST-SHIP	GEOGRAPHIC AREA	DEPTH	JULIAN	SAMPLE	TYPE	LENGTH
***										
* 79011	001	46.70166	-54.91683	VILKS,G.		212.00	149	CORE	VIBRACORE	385.0
* 79011	001A	46.70299	-55.00000	VILKS,G.		210.00	145	DRILL	ELECTRIC	65.0
* 79011	001B	46.70299	-55.00000	VILKS,G.		212.00	149	DRILL	ELECTRIC	75.0
* 79011	001B	46.70299	-55.00000	VILKS,G.		212.00	149	DRILL	ELECTRIC	75.0
* 79011	002	46.70333	-54.99166	VILKS,G.		212.00	146	DRILL	ELECTRIC	100.0
* 79011	003A	46.69583	-55.02166	VILKS,G.		212.00	146	DRILL	ELECTRIC	
* 79011	003B	46.70250	-55.02416	VILKS,G.		211.00	146	DRILL	ELECTRIC	300.0
* 79011	003B	46.70250	-55.02416	VILKS,G.		211.00	146	DRILL	ELECTRIC	300.0
* 79011	004	46.97166	-54.91999	VILKS,G.				DRILL	ELECTRIC	602.0
* 79011	005	46.87333	-54.89499	VILKS,G.		223.00	148	DRILL	ELECTRIC	100.0
* 79011	006	46.69999	-55.02999	VILKS,G.		194.00	148	DRILL	ELECTRIC	92.0
* 79011	012	46.87333	-54.89499	VILKS,G.		223.00	148	CAMERA	SHIPBORNE	

EOI ENCOUNTERED.

CRUISE	STATION	LATITUDE	LONGITUDE	SCIENTIST-SHIP	GEOGRAPHIC AREA	DEPTH	JULIAN	SAMPLE	TYPE	LENGT
***										
* 80030	001	47.63433	-53.09583	KEEN,M.		267.00	268	CORE	GRAVITY	117.(
* 80030	002	47.63500	-53.09667	KEEN,C.		314.55	268			
* 80030	002	47.63500	-53.09667	KEEN,C.		351.13	268			
* 80030	002	47.63500	-53.09167	KEEN,C.		277.98	268			
* 80030	002	47.63500	-53.09667	KEEN,C.		277.98	268			
* 80030	002	47.63500	-53.09667	KEEN,C.		270.66	268			
* 80030	002	47.63366	-53.09666	KEEN,M.		264.00	268	CORE	PISTON	610.(
* 80030	002	47.63366	-53.09666	KEEN,M.		264.00	268	CORE	TRIGGER W EIGHT	67.(
* 80030	002	47.63500	-53.09667	KEEN,C.		265.18	268			
* 80030	003	47.64000	-53.10866	KEEN,M.		280.00	268	CORE	PISTON	549.(
* 80030	003	47.63633	-53.10867	KEEN,C.		277.98	268			
* 80030	003	47.64000	-53.10866	KEEN,M.		280.00	268	CORE	TRIGGER W EIGHT	35.(
* 80030	004	47.63500	-53.08833	KEEN,C.		265.18	268			
* 80030	005	47.63483	-53.06583	KEEN,M.		196.00	268	CORE	TRIGGER W EIGHT	91.(
* 80030	005	47.63483	-53.06583	KEEN,M.		196.00	268	CORE	PISTON	610.(
* 80030	006	47.88333	-52.85333	KEEN,M.		183.00		GRAB	VAN VEEN	
* 80030	006	47.88333	-52.85333	KEEN,C.		182.88	269	GRAB		
* 80030	007	47.87899	-52.85499	KEEN,M.		180.00		GRAB	VAN VEEN	
* 80030	007	47.87917	-52.85500	KEEN,C.		182.88	269	GRAB		
* 80030	008	47.87999	-52.79999	KEEN,M.		168.00		GRAB	VAN VEEN	
* 80030	008	47.88000	-52.80000	KEEN,C.		168.25	269	GRAB		
* 80030	009	47.88333	-52.85333	KEEN,C.		179.22	269	CORE	PISTON	
* 80030	010	47.88333	-52.83833	KEEN,M.		183.00	269	CORE	GRAVITY	137.(
* 80030	010	47.88333	-52.83833	KEEN,C.		182.88	269	GRAB		
* 80030	010	47.88333	-52.50499	KEEN,M.		168.00		GRAB	VAN VEEN	
* 80030	011	47.87833	-52.84333	KEEN,C.		186.54	269			
* 80030	012	47.70833	-52.03567	KEEN,C.		237.74	269		RADAR	
* 80030	012	47.70833	-53.03566	KEEN,M.		225.00	269	CORE	GRAVITY	103.(
* 80030	012	47.70833	-52.03567	KEEN,C.		237.74	269		RADAR	
* 80030	013	47.71333	-53.05600	KEEN,C.		241.40	269		RADAR	
* 80030	013	47.71333	-53.05600	KEEN,C.		245.06	269			
* 80030	014	47.70167	-53.02167	KEEN,C.		241.40	269		RADAR	
* 80030	014	47.70167	-53.02167	KEEN,C.		241.40	269		RADAR	
* 80030	015	47.64133	-52.88749	KEEN,M.		159.00	269	CORE	GRAVITY	170.(
* 80030	016	47.66416	-52.89366	KEEN,M.		123.00	269	CORE	GRAVITY	36.(
* 80030	016	47.66416	-52.89366	KEEN,M.		120.00	269	CORE	GRAVITY	18.(
* 80030	017	47.63667	-52.10000	KEEN,C.		267.00	269		RADAR	

EOI ENCOUNTERED.

CRUISE	STATION	LATITUDE	LONGITUDE	SCIENTIST-SHIP	GEOGRAPHIC AREA	DEPTH	JULIAN	SAMPLE	TYPE	LENGTH
***										
* 81045	074	47.56833	-52.69916	LEWIS,M.			308	CORE	TRIGGER W EIGHT	16.5
* 81045	074	47.56830	-52.69917	LEWIS,M./HUDSON	ST. JOHN'S HARB OUR		308			
* 81045	074	47.56833	-52.69917	LEWIS,M.			308	CORE	PISTON	362.0
* 81045	074	47.56833	-52.69916	LEWIS,M.			308	CORE	PISTON	362.0
* 81045	074	47.56830	-52.69917	LEWIS,M./HUDSON	ST. JOHN'S HARB OUR		308			
* 81045	075	47.56683	-52.69667	LEWIS,M./HUDSON	ST. JOHN'S HARB OUR		308			
* 81045	076	47.56333	-52.69917	LEWIS,M.			308	CORE	PISTON	20.0
* 81045	076	47.56330	-52.69917	LEWIS,M./HUDSON	ST. JOHN'S HARB OUR		308			
* 81045	076	47.56333	-52.69916	LEWIS,M.			308	CORE	PISTON	2.0
* 81045	077	47.56583	-52.69917	LEWIS,M.		18.00	308	CORE	GRAVITY	15.0
* 81045	077	47.56583	-52.69916	LEWIS,M.		18.00	308	CORE	GRAVITY	15.0
* 81045	077	47.56583	-52.69917	LEWIS,M./HUDSON	ST. JOHN'S HARB OUR		308			

EOI ENCOUNTERED.

CRUISE ***	STATION	LATITUDE	LONGITUDE	SCIENTIST-SHI P	GEOGRAPHIC AREA	DEPTH	JULIAN	SAMPLE	TYPE	LENGT
* 81054	1072-01 0	47.85330	-52.58300	FADER,G.	GRAND BANKS OF NEWFOUNDLAND	174.00	246	GRAB	PISCES4	
* 85057	004	46.56667	-52.81667	FADER,G./PANDORA	TAIL OF GRAND B ANKS,NFLD	102.00	184	GRAB	PISCES IV	
* 85057	004	46.56667	-52.81667	FADER,G./PANDORA	TAIL OF GRAND B ANKS,NFLD	102.00	184	GRAB	PISCES IV	
* 85059	002	44.63267	-55.17250	PIPER,D./PANDORA II	ST. PIERRE SLOP E	1605.00	204	CAMERA		
* 86018	047	45.58717	-52.75183	PARROTT,R./HUDSO N	WHALE DEEP	92.00	193	CORE	PISTON	255.0

EOI ENCOUNTERED.

CRUISE	STATION	LATITUDE	LONGITUDE	SCIENTIST-SHIP	GEOGRAPHIC AREA	DEPTH	JULIAN	SAMPLE	TYPE	LENGT
***										
* 83017	001	45.02500	-54.98833	LEWIS,M./HUDSON	GRAND BANKS	722.00	171	GRAB	SHIPEK	
* 83017	002	46.08667	-53.54167	LEWIS,M./HUDSON	GRAND BANKS	174.00	172	GRAB	SHIPEK	

EOI ENCOUNTERED.

CRUISE	STATION	LATITUDE	LONGITUDE	SCIENTIST-SHIP	GEOGRAPHIC AREA	DEPTH	JULIAN	SAMPLE	TYPE	LENGT
***										
* 84024	001	46.94080	-53.59833	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	65.00	171	CORE	TRIGGER W EIGHT	132.0
* 84024	001	46.94080	-53.59833	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	65.00	171	CORE	PISTON	758.0
* 84024	002	46.93600	-53.60266	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	73.00	171	CORE	TRIGGER W EIGHT	104.0
* 84024	002	46.93600	-53.60266	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	73.00	171	CORE	PISTON	679.0
* 84024	003	46.65700	-53.77150	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	53.00	171	CORE	PISTON	110.0
* 84024	004	46.65880	-53.77000	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	53.00	171	CORE	PISTON	119.0
* 84024	005	46.46250	-53.85733	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	75.00	172	CORE	PISTON	20.0
* 84024	006	46.46030	-53.85766	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	76.00	172	CORE	PISTON	
* 84024	008	46.28430	-53.43800	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	130.00	172	GRAB	VAN VEEN	
* 84024	009	46.30250	-53.43316	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	125.00	172	GRAB	IKU	
* 84024	010	46.32920	-53.43500	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	117.00	172	GRAB	VAN VEEN	
* 84024	011	46.34330	-53.42816	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	113.00	172	GRAB	VAN VEEN	
* 84024	012	46.35170	-53.42716	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	108.00	172	GRAB	VAN VEEN	
* 84024	013	46.37130	-53.41983	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	95.00	172	GRAB	IKU	
* 84024	014	46.38700	-53.41900	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	88.00	172	GRAB	VAN VEEN	
* 84024	015	46.40370	-53.42316	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	79.00	172	GRAB	VAN VEEN	
* 84024	016	46.41550	-53.41716	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	68.00	172	GRAB	IKU	
* 84024	017	46.42550	-53.41616	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	71.00	172	GRAB	VAN VEEN	
* 84024	018	46.57670	-52.76650	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	185.00	173	CORE	PISTON	
* 84024	019	46.58030	-52.74916	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	173.00	173	CORE	TRIGGER W EIGHT	150.0
* 84024	019	46.58030	-52.74916	LEWIS,M./HUDSON	AVALON CHANNEL,	173.00	173	CORE	PISTON	120.0

					ST. MARYS HARBO UR					
* 84024	020	46.44700	-52.37333	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	120.00	173	GRAB	VAN VEEN	
* 84024	021	46.43750	-52.34916	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	100.00	173	GRAB	VAN VEEN	
* 84024	022	46.42470	-52.32983	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	82.00	173	GRAB	VAN VEEN	
* 84024	023	46.41100	-52.28116	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	75.00	173	GRAB	VAN VEEN	
* 84024	024	46.40820	-52.25733	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	66.00	173	GRAB	VAN VEEN	
* 84024	025	46.39970	-52.24616	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	64.00	173	GRAB	VAN VEEN	
* 84024	026	46.38980	-52.22033	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	72.00	173	GRAB	SHIPEK	
* 84024	028	47.04880	-52.88483	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	36.00	174	GRAB	SHIPEK	
* 84024	029	47.11140	-52.88166	LEWIS,M./HUDSON	AVALON CHANNEL, ST. MARYS HARBO UR	36.00	174	CORE	PISTON	5.

EOI ENCOUNTERED.

CRUISE	STATION	LATITUDE	LONGITUDE	SCIENTIST-SHIP	GEOGRAPHIC AREA	DEPTH	JULIAN	SAMPLE	TYPE	LENGT
***										
* 85COOT E POND	001	46.91667	-53.50000	LEWIS,M./	COOTES POND, ST MARY'S HRB, NF LD	0.00	286	BEACH	TROWEL	
* 85COOT E POND	001	46.94833	-53.52983	LEWIS,M./	COOTES POND, ST MARY'S HRB, NF LD	0.90	191	CORE	PISTON	0.
* 85COOT E POND	001	47.58033	-52.66750	LEWIS,M./	QUIDI VIDI HRB. , NFLD	4.90	189	CORE	PISTON	100.
* 85COOT E POND	002	46.91667	-53.50000	LEWIS,M./	COOTES POND, ST MARY'S HRB, NF LD	0.00	286	BEACH	TROWEL	
* 85COOT E POND	002	47.56167	-52.67583	LEWIS,M./	QUIDI VIDI HRB. , NFLD	4.30	286	CORE	PISTON	400.
* 85COOT E POND	003	46.91667	-53.50000	LEWIS,M./	COOTES POND, ST MARY'S HRB, NF LD	0.00	286	BEACH	TROWEL	
* 85COOT E POND	004	46.91667	-53.50000	LEWIS,M./	COOTES POND, ST MARY'S HRB, NF LD	0.00	286	BEACH	TROWEL	
* 85COOT E POND	005	46.91667	-53.50000	LEWIS,M./	COOTES POND, ST MARY'S HRB, NF LD	0.00	286	BEACH	TROWEL	
* 85COOT E POND	006	46.91667	-53.50000	LEWIS,M./	COOTES POND, ST MARY'S HRB, NF LD	0.00	286	BEACH	TROWEL	
* 85COOT E POND	007	46.91667	-53.50000	LEWIS,M./	COOTES POND, ST MARY'S HRB, NF LD	0.00	286	BEACH	TROWEL	
* 85COOT E POND	008	46.91667	-53.50000	LEWIS,M./	COOTES POND, ST MARY'S HRB, NF LD	0.00	286	BEACH	TROWEL	

EOI ENCOUNTERED.

CRUISE	STATION	LATITUDE	LONGITUDE	SCIENTIST-SHI P	GEOGRAPHIC AREA	DEPTH	JULIAN	SAMPLE	TYPE	LENGT
***										
* 85005	020	47.46016	-52.68083	FADER,G./HUDSON	MOTION BAY, NFL D	35.00	109	GRAB	VAN VEEN	
* 85005	020	47.46016	-52.68083	FADER,G./HUDSON	MOTION BAY, NFL D	35.00	109	CAMERA	SUBMERSIB LE	
* 85005	021	46.45150	-52.78300	FADER,G./HUDSON	SOUTH OF AVALON PENINSULA,GRAN D BANKS,NFLD	182.00	110	CAMERA	SUBMERSIB LE	
* 85005	021	46.45150	-52.78300	FADER,G./HUDSON	SOUTH OF AVALON PENINSULA,GRAN D BANKS,NFLD	182.00	110	GRAB	VAN VEEN	
* 85005	022	46.56716	-53.20250	FADER,G./HUDSON	SOUTHEAST OF TR ESPASSEY BAY,NF LD	47.00	111	GRAB	VAN VEEN	
* 85005	023	46.57516	-53.20500	FADER,G./HUDSON	SOUTHEAST OF TR ESPASSEY BAY,NF LD	40.30	111	CAMERA	SUBMERSIB LE	

EOI ENCOUNTERED.

CRUISE	STATION	LATITUDE	LONGITUDE	SCIENTIST-SHIP	GEOGRAPHIC AREA	DEPTH	JULIAN	SAMPLE	TYPE	LENG
***										
* 85009P	108	46.09983	-55.43250	FADER,G./BAFFIN HASE2	ST. PIERRE BANK ,NFLD	82.00	158	GRAB	VAN VEEN	
* 85009P	109	46.01416	-55.43350	FADER,G./BAFFIN HASE2	ST. PIERRE BANK ,NFLD	75.00	158	GRAB	VAN VEEN	
* 85009P	111	46.93050	-55.45033	FADER,G./BAFFIN HASE2	ST. PIERRE BANK ,NFLD	91.00	158	GRAB	VAN VEEN	
* 85009P	135	45.84900	-55.43333	FADER,G./BAFFIN HASE2	ST. PIERRE BANK ,NFLD	95.00	159	GRAB	VAN VEEN	
* 85009P	136	45.76583	-55.42583	FADER,G./BAFFIN HASE2	ST. PIERRE BANK ,NFLD	79.00	159	GRAB	VAN VEEN	
* 85009P	149	45.67283	-55.41700	FADER,G./BAFFIN HASE2	ST. PIERRE BANK ,NFLD	78.00	159	GRAB	VAN VEEN	
* 85009P	150	45.84283	-55.01683	FADER,G./BAFFIN HASE2	ST. PIERRE BANK ,NFLD	98.00	160	GRAB	VAN VEEN	
* 85009P	151	45.76033	-55.02750	FADER,G./BAFFIN HASE2	ST. PIERRE BANK ,NFLD	72.00	160	GRAB	VAN VEEN	
* 85009P	152	45.68600	-55.03066	FADER,G./BAFFIN HASE2	ST. PIERRE BANK ,NFLD	85.00	160	GRAB	VAN VEEN	
* 85009P	153	45.61183	-55.03333	FADER,G./BAFFIN HASE2	ST. PIERRE BANK ,NFLD	86.00	160	GRAB	VAN VEEN	
* 85009P	154	45.53650	-55.03216	FADER,G./BAFFIN HASE2	ST. PIERRE BANK ,NFLD	93.00	160	GRAB	VAN VEEN	
* 85009P	173	45.26467	-55.03567	FADER,G./BAFFIN HASE2	ST. PIERRE BANK ,NFLD	71.00	175	GRAB	VAN VEEN	
* 85009P	201	45.51550	-55.43700	FADER,G./BAFFIN HASE2	ST. PIERRE BANK ,NFLD	101.00	175	GRAB	VAN VEEN	
* 85009P	202	45.59617	-55.42800	FADER,G./BAFFIN HASE2	ST. PIERRE BANK ,NFLD	79.00	175	GRAB	VAN VEEN	

EOI ENCOUNTERED.

CRUISE	STATION	LATITUDE	LONGITUDE	SCIENTIST-SHI P	GEOGRAPHIC AREA	DEPTH	JULIAN	SAMPLE	TYPE	LENG
***										
* 86013	001	44.30383	-53.74933	PIPER,D.,REID,I. /HUDSON	LAURENTIAN FAN(NORHTCORE WELL SITE)	1614.00	149	CORE	PISTON	1124.
* 86013	001	44.30383	-53.74933	PIPER,D.,REID,I. /HUDSON	LAURENTIAN FAN(NORTHCORE WELL SITE)	1614.00	149	CORE	TRIGGER W EIGHT	143.
* 86013	002	44.30633	-53.74333	PIPER,D.,REID,I. /HUDSON	LAURENTIAN FAN(NORTHCORE WELL SITE)	1578.00	149	CORE	PISTON	1162.
* 86013	002	44.30633	-53.74333	PIPER,D.,REID,I. /HUDSON	LAURENTIAN FAN(NORTHCORE WELL SITE)	1578.00	149	CORE	TRIGGER W EIGHT	155.
* 86013	003	44.30600	-53.73817	PIPER,D.,REID,I. /HUDSON	LAURENTIAN FAN(NORTHCORE WELL SITE)	1574.00	149	CORE	PISTON	1132.
* 86013	003	44.30600	-53.73817	PIPER,D.,REID,I. /HUDSON	LAURENTIAN FAN(NORTHCORE WELL SITE)	1574.00	149	CORE	TRIGGER W EIGHT	152.
* 86013	004	44.40500	-53.69167	PIPER,D.,REID,I. /HUDSON	SLOPE SOUTH OF WHALE BANK	1200.00	149	CORE	TRIGGER W EIGHT	237.
* 86013	004	44.40500	-53.69167	PIPER,D.,REID,I. /HUDSON	SLOPE SOUTH OF WHALE BANK	1200.00	149	CORE	PISTON	986.
* 86013	005	44.42167	-53.66500	PIPER,D.,REID,I. /HUDSON	SLOPE SOUTH OF WHALE BANK	900.00	149	CORE	TRIGGER W EIGHT	127.
* 86013	005	44.42167	-53.66500	PIPER,D.,REID,I. /HUDSON	SLOPE SOUTH OF WHALE BANK	900.00	149	CORE	PISTON	1134.
* 86013	006	44.42833	-53.63500	PIPER,D.,REID,I. /HUDSON	SLOPE SOUTH OF WHALE BANK	600.00	149	CORE	TRIGGER W EIGHT	142.
* 86013	006	44.42833	-53.63500	PIPER,D.,REID,I. /HUDSON	SLOPE SOUTH OF WHALE BANK	600.00	149	CORE	PISTON	998.

EOI ENCOUNTERED.

CRUISE	STATION	LATITUDE	LONGITUDE	SCIENTIST-SHI	P	GEOGRAPHIC AREA	DEPTH	JULIAN	SAMPLE	TYPE	LENG
***											
* 86017	001G	45.18517	-52.60133	FADER,G./HUDSON		WHALE DEEP GRAN D BANKS	113.00	172	GRAB	VAN VEEN	
* 86017	001P	45.18383	-52.60517	FADER,G./HUDSON		WHALE DEEP GRAN D BANKS	113.00	172	CORE	PISTON	366.
* 86017	001TWC	45.18383	-52.60517	FADER,G./HUDSON		WHALE DEEP GRAN D BANKS	113.00	172	CORE	TRIGGER W EIGHT	45.
* 86017	002G	45.10917	-54.57600	FADER,G./HUDSON		WHALE DEEP GRAN D BANKS	108.00	172	GRAB	VAN VEEN	
* 86017	002P	45.11083	-52.57600	FADER,G./HUDSON		WHALE DEEP GRAN D BANKS	108.00	172	CORE	PISTON	0.
* 86017	002TWC	45.11083	-52.57600	FADER,G./HUDSON		WHALE DEEP GRAN D BANKS	108.00	172	CORE	TRIGGER W EIGHT	0.
* 86017	003G	45.10600	-52.57717	FADER,G./HUDSON		WHALE DEEP GRAN D BANKS	108.00	172	GRAB	IKU	
* 86017	004G	45.02267	-52.55133	FADER,G./HUDSON		WHALE DEEP GRAN D BANKS	93.00	172	GRAB	VAN VEEN	
* 86017	004VC	45.02400	-52.54917	FADER,G./HUDSON		WHALE DEEP GRAN D BANKS	93.00	172	CORE	VIBRACORE	250.
* 86017	005G	46.34767	-53.42667	FADER,G./HUDSON		TREPASSEY BAY, NFLD.	110.00	174	GRAB	VAN VEEN	
* 86017	005VC	46.34667	-53.42817	FADER,G./HUDSON		TREPASSEY BAY, NFLD.	110.00	174	CORE	VIBRACORE	125.
* 86017	006VC	46.34917	-53.42750	FADER,G./HUDSON		TREPASSEY BAY, NFLD.	104.00	174	CORE	VIBRACORE	156.
* 86017	007G	46.35900	-53.42683	FADER,G./HUDSON		TREPASSEY BAY, NFLD.	57.00	174	GRAB	IKU	
* 86017	008VC	45.79467	-55.13033	FADER,G./HUDSON		HALIBUT CH. GR. BNK,NFLD	167.00	177	CORE	VIBRACORE	202.
* 86017	008VV	45.79833	-55.13300	FADER,G./HUDSON		HALIBUT CH. GR. BNK,NFLD	167.00	177	GRAB	VAN VEEN	
* 86017	009VV	45.81350	-55.10567	FADER,G./HUDSON		HALIBUT CH. GR. BNK,NFLD	155.00	177	GRAB	VAN VEEN	
* 86017	010VV	45.81167	-55.08567	FADER,G./HUDSON		HALIBUT CH. GR. BNK,NFLD	146.00	177	GRAB	VAN VEEN	
* 86017	011VV	45.81317	-55.06917	FADER,G./HUDSON		HALIBUT CH. GR. BNK,NFLD	146.00	177	GRAB	VAN VEEN	
* 86017	012VV	45.81200	-55.04617	FADER,G./HUDSON		HALIBUT CH. GR. BNK,NFLD	134.00	177	GRAB	VAN VEEN	
* 86017	013VV	45.81083	-55.02667	FADER,G./HUDSON		HALIBUT CH. GR. BNK,NFLD	86.00	177	GRAB	VAN VEEN	
* 86017	014IKU	45.81083	-55.02667	FADER,G./HUDSON		HALIBUT CH. GR. BNK,NFLD	88.00	177	GRAB	IKU	
* 86017	015IKU	45.81167	-54.77517	FADER,G./HUDSON		GREEN BANK, NFL D	69.00	177	GRAB	IKU	
* 86017	016VC	45.97417	-55.06900	FADER,G./HUDSON		HALIBUT CH. NFL D	164.00	177	CORE	VIBRACORE	102.
* 86017	016VV	45.97467	-55.06917	FADER,G./HUDSON		GREEN BANK, NFL D	164.00	177	GRAB	VAN VEEN	
* 86017	017P	45.97500	-55.06833	FADER,G./HUDSON		ST. PIERRE BANK , NFLD	160.00	178	CORE	PISTON	795.
* 86017	017VV	45.97500	-55.06833	FADER,G./HUDSON		ST. PIERRE BANK , NFLD	160.00	178	GRAB	VAN VEEN	
* 86017	018IKU	45.97500	-54.82500	FADER,G./HUDSON		WEST SIDE GREEN BANK	71.00	178	GRAB	IKU	
* 86017	019IKU	46.14167	-54.55833	FADER,G./HUDSON		GREEN BANK, NFL D.	100.00	178	GRAB	IKU	

EOI ENCOUNTERED.

CRUISE	STATION	LATITUDE	LONGITUDE	SCIENTIST-SHI	P	GEOGRAPHIC AREA	DEPTH	JULIAN	SAMPLE	TYPE	LENG
***											
* 86304		47.23333	-53.96667	D.FORBES		NEWFOUNDLAND		292	SAND		
* 86304		47.23333	-53.96667	D.FORBES		NEWFOUNDLAND		292	GRAVEL		
* 86304		47.23333	-53.96667	J.SHAW		NEWFOUNDLAND		291	PEAT		1.
* 86304		46.78333	-53.63333	D.FORBES		NEWFOUNDLAND		293	SAND,G RAVEL CORE		
* 86304		46.78333	-53.63333	D.FORBES		NEWFOUNDLAND		293	SAND		
* 86304		47.23333	-53.96667	J.SHAW		NEWFOUNDLAND		291	PEAT		0.
* 86304		47.23333	-53.96667	J.SHAW		NEWFOUNDLAND		292	PEAT		10.
* 86304		47.23333	-53.96667	J.SHAW		NEWFOUNDLAND		292	PEAT		0.
* 86304		47.23333	-53.96667	J.SHAW		NEWFOUNDLAND		291	PEAT		2.
* 86304		47.23333	-53.96667	J.SHAW		NEWFOUNDLAND		292	PEAT		0.
* 86304		47.23333	-53.96667	J.SHAW		NEWFOUNDLAND		291	PEAT		0.
* 86304	3	47.15000	-55.48333	J.SHAW		NEWFOUNDLAND		297	PEAT	HILLER PE AT SAMPLE R	0.
* 86304	3	47.15000	-55.48333	D.FORBES		NEWFOUNDLAND		297	WOOD		
* 86304	3	47.15000	-55.48333	D.FORBES		NEWFOUNDLAND		297	WOOD		
* 86304	3	47.15000	-55.48333	D.FORBES		NEWFOUNDLAND		297	WOOD		
* 86304	3	47.15000	-55.48333	J.SHAW		NEWFOUNDLAND		297	PEAT	HILLER PE AT SAMPLE R	7.
* 86304	4	47.21667	-55.40000	J.SHAW		NEWFOUNDLAND	0.30	296	PEAT	HILLER PE AT SAMPLE R	0.
* 86304	4	47.21667	-55.40000	J.SHAW		NEWFOUNDLAND	0.30	296	PEAT	HILLER PE AT SAMPLE R	0.
* 86304	4	47.21667	-55.40000	J.SHAW		NEWFOUNDLAND	0.30	296	PEAT	HILLER PE S1AT SAMP LER	9.
* 86304	5	47.21667	-55.40000	J.SHAW		NEWFOUNDLAND		296	PEAT		0.
* 86304	6	47.21667	-55.40000	J.SHAW		NEWFOUNDLAND		296	PEAT	HILLER PE AT SAMPLE R	0.
* 86304	8	47.21667	-55.00400	J.SHAW		NEWFOUNDLAND		297	PEAT		0.

EOI ENCOUNTERED.

Offshore hydrocarbon wells located in the project area
Note: not all the wells which have been drilled are listed in SID and the dates for D-52 to K-56 are incorrect in SID. All listed wells were drilled from 1971 to 1974 with the exception of first 2 which were in 1966; the dates are correct in Appendix 16 in this report.

CRUISE	STATION	LATITUDE	LONGITUDE	SCIENTIST-SHIP	GEOGRAPHIC AREA	DEPTH	JULIAN	SAMPLE	TYPE	LENGTH
***										
* 68NR	D-52	44.18722	-52.39500	NOT RECORDED				DRILL	OFFSHORE	1473.0
* 68NR	H-09	45.47195	-52.00001	NOT RECORDED				DRILL	OFFSHORE	1600.0
* 73NR	E-94	45.39147	-54.49853	NOT RECORDED				DRILL	OFFSHORE	3267.0
* 73NR	M-75	45.58193	-51.94487	NOT RECORDED				DRILL	OFFSHORE	3530.0
* 74NR	A-62	44.85175	-52.90430	NOT RECORDED				DRILL	OFFSHORE	1946.0
* 74NR	B-90	44.65383	-53.70788	NOT RECORDED				DRILL	OFFSHORE	4701.0
* 74NR	H-73	44.04073	-52.42793	NOT RECORDED				DRILL	OFFSHORE	3658.0
* 74NR	J-20	44.49340	-52.78148	NOT RECORDED				DRILL	OFFSHORE	2321.0
* 74NR	O-54	45.06515	-52.63603	NOT RECORDED				DRILL	OFFSHORE	3048.0
* 74NR	P-11	44.68040	-53.52935	NOT RECORDED				DRILL	OFFSHORE	3550.0
* 75NR	A-68	44.45373	-53.15023	NOT RECORDED				DRILL	OFFSHORE	4189.0
* 75NR	F-54	45.22360	-52.13957	NOT RECORDED				DRILL	OFFSHORE	3135.0
* 75NR	F-72	44.19033	-52.44230	NOT RECORDED				DRILL	OFFSHORE	2501.0
* 75NR	I-60	44.82670	-52.38018	NOT RECORDED				DRILL	OFFSHORE	1903.0
* 75NR	J-49	45.47643	-52.61158	NOT RECORDED				DRILL	OFFSHORE	1329.0
* 75NR	J-72	44.02603	-52.43573	NOT RECORDED				DRILL	OFFSHORE	1382.0
* 75NR	M-45	44.24615	-52.12288	NOT RECORDED				DRILL	OFFSHORE	3522.0
* 75NR	P-87	44.28332	-52.70542	NOT RECORDED				DRILL	OFFSHORE	3588.0
* 76NR	C-56	45.25133	-54.38802	NOT RECORDED				DRILL	OFFSHORE	3277.0
* 76NR	J-34	45.39233	-52.58408	NOT RECORDED				DRILL	OFFSHORE	3689.0
* 76NR	K-56	45.76153	-52.14227	NOT RECORDED				DRILL	OFFSHORE	3536.0

EOI ENCOUNTERED.

Onshore beach and occasional pond samples located in the project area.

GEOGRAPHIC AREA	STATION NUMBER	SAMPLE TYPE	INSTRUMENT TYPE	LATITUDE	LONGITUDE
LONG BEACH,NEWFOUNDLAND		GRAB		47.57700	-53.26500
LONG BEACH,NEWFOUNDLAND		GRAB		47.57750	-53.26383
MUTTON BAY,NEWFOUNDLAND		GRAB		45.70000	-53.36660
LONG COVE,NEWFOUNDLAND		GRAB		45.53960	-53.13700
LONG COVE,NEWFOUNDLAND		GRAB		45.53960	-53.13700
TOPSAIL COVE,NEWFOUNDLAND		GRAB		47.54330	-52.92260
EAST SAINT MARY'S BAY,NEWFOUNDLAND		CORE		47.13330	-53.55000
COME-BY-CHANCE,NEWFOUNDLAND		WATER	ESTUARY	47.83415	-54.00000
SOUTH TRINITY BAY,NEWFOUNDLAND		BEACH	TROWEL	47.63330	-53.78330
SOUTH TRINITY BAY,NEWFOUNDLAND		BEACH	TROWEL	47.63330	-53.78330
SOUTHWEST CONCEPTION BAY,NEWFOUNDLAND		BEACH	TROWEL	47.57660	-53.26500
SOUTH TRINITY BAY,NEWFOUNDLAND		BEACH	TROWEL	47.63330	-53.78330
SOUTH TRINITY BAY,NEWFOUNDLAND		BEACH	TROWEL	47.63330	-53.78330
SOUTHWEST TRINITY BAY,NEWFOUNDLAND		BEACH	TROWEL	47.67350	-53.81500

LAND				
SOUTHWEST TRINITY BAY,NEWFOUNDLAND	BEACH	TROWEL	47.67350	-53.81500
LONG BEACH,NEWFOUNDLAND	BEACH	TROWEL	47.57660	-53.25500
MIDDLE COVE,NEWFOUNDLAND	BEACH	TROWEL	47.65160	-52.69660
WITLESS BAY,NEWFOUNDLAND	BEACH	TROWEL	47.27830	-52.83330
SAINT MARY'S BAY,NEWFOUNDLAND	BEACH	TROWEL	46.90000	-53.61660
EAST SAINT MARY'S BAY,NEWFOUNDLAND	BEACH	TROWEL	46.95000	-53.51660
SAINT MARY'S BAY,NEWFOUNDLAND	BEACH	TROWEL	47.06600	-53.56660
SAINT MARY'S BAY,NEWFOUNDLAND	BEACH	TROWEL	47.01660	-53.65000
SAINT MARY'S BAY,AVALON PENINSULA,NEWFOUNDLAND	BEACH	TROWEL	46.01310	-53.64166
NORTH AVALON BAY	BEACH	TROWEL	47.65160	-52.69660
NORTH AVALON BAY	BEACH	TROWEL	47.65160	-52.69660
NORTH AVALON BAY	BEACH	TROWEL	47.65160	-52.69660
NORTH AVALON BAY	BEACH	TROWEL	47.65160	-52.69660
EAST AVALON BAY,NEWFOUNDLAND	BEACH	TROWEL	47.27830	-52.83330
EAST AVALON BAY,NEWFOUNDLAND	BEACH	TROWEL	46.90000	-53.61660
SOUTH AVALON PENINSULA,NEWFOUNDLAND	BEACH	TROWEL	46.75830	-53.60830
SAINT MARY'S BAY,NEWFOUNDLAND	BEACH	TROWEL	46.90000	-53.61660
NEWFOUNDLAND	BEACH	TROWEL	46.95000	-53.51660
SOUTHWEST CONCEPTION BAY,NEWFOUNDLAND	BEACH	TROWEL	47.57660	-53.26500
SOUTHWEST CONCEPTION BAY,NEWFOUNDLAND	BEACH	TROWEL	47.57660	-53.26500
DROOK,NEWFOUNDLAND	BEACH	TROWEL	46.67160	-53.24330
HOLYROOD POND,NEWFOUNDLAND	BEACH	TROWEL	46.76000	-53.63660
DROOK,NEWFOUNDLAND	BEACH	TROWEL	46.67160	-53.24330
EAST SAINT MARY'S BAY,NEWFOUNDLAND	BEACH	TROWEL	46.95000	-53.51660
MONTIER BAY,NEWFOUNDLAND	BEACH	TROWEL	47.20000	-55.10000
MUTTON BAY,NEWFOUNDLAND	BEACH	TROWEL	46.70000	-53.36660
FRENCHMAN'S COVE,NEWFOUNDLAND	BEACH	TROWEL	47.22000	-53.38500
DROOK,NEWFOUNDLAND	BEACH	TROWEL	46.68330	-53.25000
NEWFOUNDLAND	BEACH	TROWEL	47.06660	-53.56660

Sample collection was accomplished with a piston-type coring tool with a core barrel six feet long and three inches in diameter. A heavy plastic liner was placed inside the barrel. The tool was lowered by the winch to the sea-floor where it was released by means of a trigger device and allowed to penetrate the sediment. The unit was then winched back to the deck and the liner was removed from the barrel.

A water sample was collected immediately from above the sediment core and this was sealed in a glass jar. A second jar of water was collected and some sediment from the top of the core was added to this jar before sealing. The complete core recovery was then extruded from the liner. Four sediment samples were collected immediately from the recovery as per Research Department instructions (Ref. 1). These samples were sealed in plastic bags which were in turn put into cloth "sand-sample" bags and prepared for shipment. Each core was sampled at top, bottom and two intermediate depths and the residual of the core was discarded.

Operations

The number of cores taken per month was:

May (6 days)	25	-	average 4/day
June	286	-	average 9/day
July	582	-	average 19/day
August	1097	-	average 35/day
September	705	-	average 23/day
October (10 days)	465	-	average 46/day
Total	3160		

The increase in productivity over the $4\frac{1}{2}$ month operating period is attributed primarily to experience gained over the season by the sampling crews. In May, June and July, considerable time was lost to adverse weather. Some time was lost due to the fact that Horvitz used only one sampling crew. Production would have been increased if two crews had been used, working in shifts. However, two crews could not have produced double the number of stations as most of the lost time was due to the rough seas that are common to this area; the sampling crew had to work on the deck and over the side of the ship and this was not possible for much of the time.

Appendix 19

Printout of full Canadian Hydrographic Service data base for the project area 43°58'N to 47°55'N and 51°45'W to 55°30'W. The printout is exhaustive and one probably needs to consult with Kirk MacDonald of Technical Records, CHS at BIO to fully decipher it.

Printout was courtesy of Graham King of CHS.

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS R MARSHALL
SCALE* 1000000
STATUS* E
CORRESPONDENCE DATE* 04/01/1976
LOCATION NAMES* GEBCO SHEET 39 ATLANTIC
CATALOGUE NUMBER* 3681

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* C
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 3681
ENTRY DATE* 03/31/1977

CHART REFERENCE* GEBCO

SOUNDING NOTES* 70771
SOUNDING ROLLS* S141
FS INSPECTION NOTES* CORRECTED 1977

UPPER LEFT LATITUDE* 440000
UPPER LEFT LONGITUDE* 600000
LOWER RIGHT LATITUDE* 420000
LOWER RIGHT LONGITUDE* 520000

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 1200
STATUS* E
CORRESPONDENCE DATE* 10/01/1984
LOCATION NAMES* BERTHS 16,17,19 AND QUEEN'S WHARF,ST.JOHN'S,NFLD
CATALOGUE NUMBER* 3267H

REGION* OTT

STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 3267H
ENTRY DATE* 03/22/1985

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 3267H
ENTRY DATE* 03/15/1985

CHART REFERENCE* 4588

OBSERVATION NOTES* 14755
COMPUTATION NOTES* 14756
MISCELLANEOUS NOTES* 14758
SOUNDING NOTES* 14757

UPPER LEFT LATITUDE* 473412
UPPER LEFT LONGITUDE* 524214
LOWER RIGHT LATITUDE* 473348
LOWER RIGHT LONGITUDE* 524132

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 1200
STATUS* E
CORRESPONDENCE DATE* 10/01/1984
LOCATION NAMES* SYNCROLIFT AND GRAVING DOCK,ST.JOHN'S,NFLD
CATALOGUE NUMBER* 3267I

REGION* OTT
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 3267I
ENTRY DATE* 03/22/1985

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 3267I
ENTRY DATE* 03/15/1985

CHART REFERENCE* 4588

OBSERVATION NOTES* 14755
COMPUTATION NOTES* 14756
MISCELLANEOUS NOTES* 14758
SOUNDING NOTES* 14757

UPPER LEFT LATITUDE* 473330
UPPER LEFT LONGITUDE* 524248
LOWER RIGHT LATITUDE* 473318
LOWER RIGHT LONGITUDE* 524227

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 1500000
STATUS* E
CORRESPONDENCE DATE* 01/01/1979
LOCATION NAMES* SCOTIAN SHELF AND GRAND BANKS
DOCUMENT REMARKS* HENDERSON/79, SWIM/82
CATALOGUE NUMBER* 9030

REGION* OTT
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 9030
ENTRY DATE* 05/24/1985

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 9030
ENTRY DATE* 04/12/1985

CHART REFERENCE* 4001

CHART REFERENCE* 4003

MISCELLANEOUS NOTES* 14668
SOUNDING NOTES* 14666
SOUNDING ROLLS* 869
BOAT BOARDS* 874
MAG TAPE SOURCE DATA* 82-D27295-D27351
MAG TAPE FIELD SHEET DATA* DS2905

MISCELLANEOUS NOTES* 14448
SOUNDING NOTES* 14447
SOUNDING ROLLS* 711-2-3
MAG TAPE SOURCE DATA* 82-D27295-D27351
MAG TAPE FIELD SHEET DATA* DS2909

MAG TAPE SOURCE DATA* 82-D27295-D27351
MAG TAPE FIELD SHEET DATA* 1983-DS2905,2909

SOUNDING ROLLS* 1983-910,911
MAG TAPE SOURCE DATA* 82-D27295-D27351
MAG TAPE FIELD SHEET DATA* 79-D97260-D97305

SOUNDING NOTES* 1983-14715S 910,911
MAG TAPE SOURCE DATA* 82-D27295-D27351
MAG TAPE FIELD SHEET DATA* 79-D97260-D97305

MISCELLANEOUS NOTES* 1983-14716S 910,911
MAG TAPE SOURCE DATA* 82-D27295-D27351
MAG TAPE FIELD SHEET DATA* 79-D97260-D97305

UPPER LEFT LATITUDE* 470000
UPPER LEFT LONGITUDE* 690000
LOWER RIGHT LATITUDE* 380000
LOWER RIGHT LONGITUDE* 490000

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 18000
STATUS* E
CORRESPONDENCE DATE* 01/01/1983
LOCATION NAMES* LONG POINT TO HANTS HEAD, TRINITY BAY
DOCUMENT REMARKS* SHOAL EXAMINATIONS
CATALOGUE NUMBER* 9067

REGION* OTT
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 9067
ENTRY DATE* 05/31/1985

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 9067
ENTRY DATE* 04/19/1985

CHART REFERENCE* 4563

OBSERVATION NOTES* 14718
COMPUTATION NOTES* 14719
MISCELLANEOUS NOTES* 14721
SOUNDING NOTES* 14720

UPPER LEFT LATITUDE* 480000
UPPER LEFT LONGITUDE* 533100
LOWER RIGHT LATITUDE* 474900
LOWER RIGHT LONGITUDE* 531800

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 6080
STATUS* E
CORRESPONDENCE DATE* 01/01/1942
LOCATION NAMES* HARBOUR GRACE
CATALOGUE NUMBER* 1463

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* A
REGION CATALOGUE NUMBER* 1463
ENTRY DATE* 01/01/1942

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 8014

CHART REFERENCE* 4565

CHART REFERENCE* 4590

CENTER LATITUDE* 474200
CENTER LONGITUDE* 531300

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 2400
STATUS* E
CORRESPONDENCE DATE* 01/01/1941
LOCATION NAMES* ENTRANCE TO MORTIER BAY
CATALOGUE NUMBER* 1247

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* A
REGION CATALOGUE NUMBER* 1247
ENTRY DATE* 01/01/1941

CHART REFERENCE* 4587

CHART REFERENCE* 4624

CHART REFERENCE* 4016

CENTER LATITUDE* 471100
CENTER LONGITUDE* 550600

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 3600
STATUS* E
CORRESPONDENCE DATE* 01/01/1941
LOCATION NAMES* ST JOHN'S HARBOUR NFLD
CATALOGUE NUMBER* 1272

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* ATL
REGION CATALOGUE NUMBER* 1272
ENTRY DATE* 01/01/1941

CHART REFERENCE* 4588

CHART REFERENCE* 4574

CHART REFERENCE* 4565

CHART REFERENCE* 4567

COMPUTATION NOTES* 10123,18036
MISCELLANEOUS NOTES* 10108,10109,20014,20015

UPPER LEFT LATITUDE* 473445
UPPER LEFT LONGITUDE* 524300
LOWER RIGHT LATITUDE* 473300
LOWER RIGHT LONGITUDE* 524015

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 2490
STATUS* E
CORRESPONDENCE DATE* 01/01/1943
LOCATION NAMES* BAY BULLS
CATALOGUE NUMBER* 1525

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* ATL
REGION CATALOGUE NUMBER* 1525
ENTRY DATE* 01/01/1944

CHART REFERENCE* 4586

CHART REFERENCE* 4567

CHART REFERENCE* 4017

CHART REFERENCE* 8014

COMPUTATION NOTES* 18035OTT

UPPER LEFT LATITUDE* 471900
UPPER LEFT LONGITUDE* 524900

LOWER RIGHT LATITUDE* 471815
LOWER RIGHT LONGITUDE* 524747

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 12158
STATUS* E
CORRESPONDENCE DATE* 01/01/1943
LOCATION NAMES* BAY BULLS $ WITLESS BAY
CATALOGUE NUMBER* 1526

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* ATL
REGION CATALOGUE NUMBER* 1526
ENTRY DATE* 01/01/1943

CHART REFERENCE* 4586

CHART REFERENCE* 4567

CHART REFERENCE* 2915

CHART REFERENCE* 4017

UPPER LEFT LATITUDE* 472000
UPPER LEFT LONGITUDE* 525100
LOWER RIGHT LATITUDE* 471500
LOWER RIGHT LONGITUDE* 524400

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 12159
STATUS* E
CORRESPONDENCE DATE* 01/01/1942
LOCATION NAMES* HARBOUR GRACE & CARBONEAR
CATALOGUE NUMBER* 1461

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 1461
ENTRY DATE* 01/01/1942

CHART REFERENCE* 4590

CHART REFERENCE* 4565

CHART REFERENCE* 4572

CHART REFERENCE* 4017

CHART REFERENCE* 4001

UPPER LEFT LATITUDE* 474500
UPPER LEFT LONGITUDE* 531700
LOWER RIGHT LATITUDE* 473930
LOWER RIGHT LONGITUDE* 530500

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS

STATUS* E
CORRESPONDENCE DATE* 10/01/1984
LOCATION NAMES* PLACENTIA BAY
CATALOGUE NUMBER* 9093

REGION* OTT
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 9093
ENTRY DATE* 08/23/1985

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 9093
ENTRY DATE* 06/28/1985

CHART REFERENCE* 4614

CHART REFERENCE* 4613

CHART REFERENCE* 2915

UPPER LEFT LATITUDE* 472050
UPPER LEFT LONGITUDE* 535825
LOWER RIGHT LATITUDE* 471657
LOWER RIGHT LONGITUDE* 535040

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 24000
STATUS* E
CORRESPONDENCE DATE* 01/01/1949
LOCATION NAMES* CAPE RACE NFLD
CATALOGUE NUMBER* 1980

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 1980
ENTRY DATE* 01/01/1949

CHART REFERENCE* 2915

CHART REFERENCE* 4001

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 4576

CHART REFERENCE* 8011

OBSERVATION NOTES* 27045-270460TT
COMPUTATION NOTES* 270440TT

UPPER LEFT LATITUDE* 464036
UPPER LEFT LONGITUDE* 531024
LOWER RIGHT LATITUDE* 463500
LOWER RIGHT LONGITUDE* 530248

DOCUMENT FORMAT* FS

DOCUMENT SOURCE* CHS
SCALE* 1200
STATUS* E
CORRESPONDENCE DATE* 10/21/1943
LOCATION NAMES* MAGGOTY COVE
CATALOGUE NUMBER* 1773

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 1773
ENTRY DATE* 10/21/1943

CHART REFERENCE* 4001

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 8011

CHART REFERENCE* 8014

CHART REFERENCE* 4567

CHART REFERENCE* 4586

CENTER LATITUDE* 471824
CENTER LONGITUDE* 524836

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 3600
STATUS* E
CORRESPONDENCE DATE* 01/01/1942
LOCATION NAMES* HOLYROOD NORTH ARM
CATALOGUE NUMBER* 1771

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 1771
ENTRY DATE* 01/01/1942

CHART REFERENCE* 4593

CHART REFERENCE* 4565

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 8014

UPPER LEFT LATITUDE* 472500
UPPER LEFT LONGITUDE* 530935
LOWER RIGHT LATITUDE* 472330
LOWER RIGHT LONGITUDE* 530810

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 12000

STATUS* E
CORRESPONDENCE DATE* 01/01/1949
LOCATION NAMES* LITTLE SOUTHERN HARBOUR
CATALOGUE NUMBER* 1987

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 1987
ENTRY DATE* 01/01/1949

CHART REFERENCE* 4618

CHART REFERENCE* 4017

CHART REFERENCE* 4016

OBSERVATION NOTES* 10183
COMPUTATION NOTES* 101820TT
PHOTOGRAPHS* A11959-206

OBSERVATION NOTES* 101840TT

UPPER LEFT LATITUDE* 474400
UPPER LEFT LONGITUDE* 540000
LOWER RIGHT LATITUDE* 474000
LOWER RIGHT LONGITUDE* 535500

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 1000
STATUS* E
CORRESPONDENCE DATE* 01/01/1983
LOCATION NAMES* HEART'S CONTENT GOVERNMENT WHARVES
DOCUMENT REMARKS* SEE C.O.R.N.S. 850723
CATALOGUE NUMBER* 9104

REGION* OTT
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 9104
ENTRY DATE* 08/23/1985

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* SOUNDINGS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 9104
ENTRY DATE* 07/12/1985

CHART REFERENCE* 4563

CHART REFERENCE* 4577

OBSERVATION NOTES* 14718
COMPUTATION NOTES* 14719
MISCELLANEOUS NOTES* 14721
SOUNDING NOTES* 14720

UPPER LEFT LATITUDE* 475250
UPPER LEFT LONGITUDE* 532230
LOWER RIGHT LATITUDE* 475210
LOWER RIGHT LONGITUDE* 532200

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 1200
STATUS* E
CORRESPONDENCE DATE* 01/01/1950
LOCATION NAMES* ENTRANCE ST JOHN'S HARBOUR
CATALOGUE NUMBER* 2133A

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2133A
ENTRY DATE* 01/01/1950

CHART REFERENCE* 4588

CHART REFERENCE* 4574

CHART REFERENCE* 4565

CHART REFERENCE* 4567

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 8014

UPPER LEFT LATITUDE* 473418
UPPER LEFT LONGITUDE* 524136
LOWER RIGHT LATITUDE* 473348
LOWER RIGHT LONGITUDE* 524106

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 300
STATUS* E
CORRESPONDENCE DATE* 01/01/1950
LOCATION NAMES* CHAIN ROCK AND RUBY ROCK
CATALOGUE NUMBER* 2133B

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2133B
ENTRY DATE* 01/01/1950

CHART REFERENCE* 4588

CHART REFERENCE* 4565

CHART REFERENCE* 4567

CHART REFERENCE* 4574

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 8014

CENTER LATITUDE* 473400

CENTER LONGITUDE* 524120

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 2400
STATUS* E
CORRESPONDENCE DATE* 01/01/1950
LOCATION NAMES* PORTUGAL COVE
CATALOGUE NUMBER* 2189

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2189
ENTRY DATE* 01/01/1950

CHART REFERENCE* 4566

CHART REFERENCE* 4565

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 8014

COMPUTATION NOTES* 171190TT

UPPER LEFT LATITUDE* 473800
UPPER LEFT LONGITUDE* 525220
LOWER RIGHT LATITUDE* 473715
LOWER RIGHT LONGITUDE* 525130

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 12000
STATUS* E
CORRESPONDENCE DATE* 01/01/1950
LOCATION NAMES* BELL ISLAND TO TOPSAIL
CATALOGUE NUMBER* 2192

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2192
ENTRY DATE* 01/01/1950

CHART REFERENCE* 4001

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 4565

CHART REFERENCE* 4566

CHART REFERENCE* 4581

CHART REFERENCE* 8014

COMPUTATION NOTES* 180380TT

UPPER LEFT LATITUDE* 474000
UPPER LEFT LONGITUDE* 530000
LOWER RIGHT LATITUDE* 473200
LOWER RIGHT LONGITUDE* 525000

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 12000
STATUS* E
CORRESPONDENCE DATE* 01/01/1950
LOCATION NAMES* BELL ISLE TO SEAL COVE
CATALOGUE NUMBER* 2193

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2193
ENTRY DATE* 01/01/1950

CHART REFERENCE* 4581

CHART REFERENCE* 4573

CHART REFERENCE* 4566

CHART REFERENCE* 4572

CHART REFERENCE* 4565

CHART REFERENCE* 4016

CHART REFERENCE* 4017

COMPUTATION NOTES* 180380TT
PHOTOGRAPHS* NFL1-105

PHOTOGRAPHS* NFL1-108

PHOTOGRAPHS* NFL1-109

PHOTOGRAPHS* NFL1-164

PHOTOGRAPHS* NFL1-201

PHOTOGRAPHS* NFL1-202

UPPER LEFT LATITUDE* 473800
UPPER LEFT LONGITUDE* 530400
LOWER RIGHT LATITUDE* 472800
LOWER RIGHT LONGITUDE* 525600

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 12000
STATUS* E
CORRESPONDENCE DATE* 01/01/1950
LOCATION NAMES* BELL ISLE TO ORE HEAD
CATALOGUE NUMBER* 2191

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL

STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2191
ENTRY DATE* 01/01/1950

CHART REFERENCE* 4566

CHART REFERENCE* 4565

CHART REFERENCE* 4016

CHART REFERENCE* 4017

COMPUTATION NOTES* 180380TT
PHOTOGRAPHS* NFL1-82

PHOTOGRAPHS* NFL1-83

PHOTOGRAPHS* NFL1-198

PHOTOGRAPHS* NFL1-199

PHOTOGRAPHS* NFL1-200

PHOTOGRAPHS* NFL1-201

UPPER LEFT LATITUDE* 474200
UPPER LEFT LONGITUDE* 525754
LOWER RIGHT LATITUDE* 473703
LOWER RIGHT LONGITUDE* 525124

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 7500
STATUS* E
CORRESPONDENCE DATE* 10/01/1984
LOCATION NAMES* ARGENTIA HARBOUR & APPROACHES, NEWFOUNDLAND
DOCUMENT REMARKS* SEE C.O.R.N.S. 850724
CATALOGUE NUMBER* 9092

REGION* OTT
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 9092
ENTRY DATE* 08/23/1985

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 9092
ENTRY DATE* 07/19/1985

CHART REFERENCE* 4613

CHART REFERENCE* 4614

OBSERVATION NOTES* 14755
COMPUTATION NOTES* 14756
MISCELLANEOUS NOTES* 14758
SOUNDING NOTES* 14757

UPPER LEFT LATITUDE* 472125
UPPER LEFT LONGITUDE* 540207
LOWER RIGHT LATITUDE* 471650
LOWER RIGHT LONGITUDE* 535640

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 75000
STATUS* E
CORRESPONDENCE DATE* 01/01/1953
LOCATION NAMES* BACCALIEU ISLAND TO BAY BULLS
CATALOGUE NUMBER* 2431 432

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2431
ENTRY DATE* 01/01/1953

CHART REFERENCE* 4001

CHART REFERENCE* 8011

CHART REFERENCE* 8014

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 4563

CHART REFERENCE* 4565

CHART REFERENCE* 4566

COMPUTATION NOTES* 18040,180430TT

UPPER LEFT LATITUDE* 481000
UPPER LEFT LONGITUDE* 530000
LOWER RIGHT LATITUDE* 471300
LOWER RIGHT LONGITUDE* 521000

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 48640
STATUS* E
CORRESPONDENCE DATE* 01/01/1952
LOCATION NAMES* LONG ISLAND TO LAWN HEAD
CATALOGUE NUMBER* 2382

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2382
ENTRY DATE* 01/01/1952

CHART REFERENCE* 4642

CHART REFERENCE* 4587

CHART REFERENCE* 4616

CHART REFERENCE* 4615

CHART REFERENCE* 4622

CHART REFERENCE* 4624

CHART REFERENCE* 4016

CHART REFERENCE* 4017

COMPUTATION NOTES* 17196AOTT

UPPER LEFT LATITUDE* 472000
UPPER LEFT LONGITUDE* 553200
LOWER RIGHT LATITUDE* 465000
LOWER RIGHT LONGITUDE* 544000

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 12000
STATUS* E
CORRESPONDENCE DATE* 01/01/1952
LOCATION NAMES* ST JOHN'S TO CAPE SPEAR
CATALOGUE NUMBER* 2381

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2381
ENTRY DATE* 01/01/1952

CHART REFERENCE* 4574

CHART REFERENCE* 4565

CHART REFERENCE* 4567

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 8014

COMPUTATION NOTES* 180400TT

UPPER LEFT LATITUDE* 473400
UPPER LEFT LONGITUDE* 524400
LOWER RIGHT LATITUDE* 473000
LOWER RIGHT LONGITUDE* 523600

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 40000
STATUS* E
CORRESPONDENCE DATE* 01/01/1952
LOCATION NAMES* ST JOHN'S TO MOBILE BAY
CATALOGUE NUMBER* 2377

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2377
ENTRY DATE* 01/01/1952

CHART REFERENCE* 4001

CHART REFERENCE* 4017

CHART REFERENCE* 4016

CHART REFERENCE* 8014

CHART REFERENCE* 4565

CHART REFERENCE* 4567

CHART REFERENCE* 4574

CHART REFERENCE* 4586

PHOTOGRAPHS* NFL1 7-16,27-32

UPPER LEFT LATITUDE* 474000
UPPER LEFT LONGITUDE* 525500
LOWER RIGHT LATITUDE* 471300
LOWER RIGHT LONGITUDE* 522500

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 40000
STATUS* E
CORRESPONDENCE DATE* 01/01/1952
LOCATION NAMES* FLAMBRO HEAD TO CAPE ST FRANCIS
CATALOGUE NUMBER* 2373

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2373
ENTRY DATE* 01/01/1952

CHART REFERENCE* 4574

CHART REFERENCE* 4565

CHART REFERENCE* 4017

CHART REFERENCE* 4520

PHOTOGRAPHS* A13257-201,203,206,207

PHOTOGRAPHS* A13362-62

PHOTOGRAPHS* A13258-8,11,14

UPPER LEFT LATITUDE* 480000
UPPER LEFT LONGITUDE* 531000
LOWER RIGHT LATITUDE* 473500
LOWER RIGHT LONGITUDE* 522000

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 12000
STATUS* E
CORRESPONDENCE DATE* 01/01/1952
LOCATION NAMES* ST LAWRENCE HARBOUR
CATALOGUE NUMBER* 2360

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2360
ENTRY DATE* 01/01/1952

CHART REFERENCE* 4642

CHART REFERENCE* 4625

CHART REFERENCE* 4624

CHART REFERENCE* 4016

COMPUTATION NOTES* 17196AOTT

UPPER LEFT LATITUDE* 465700
UPPER LEFT LONGITUDE* 552400
LOWER RIGHT LATITUDE* 465200
LOWER RIGHT LONGITUDE* 551800

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 12000
STATUS* E
CORRESPONDENCE DATE* 01/01/1952
LOCATION NAMES* BURIN HARBOUR
CATALOGUE NUMBER* 2358

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2358
ENTRY DATE* 01/01/1952

CHART REFERENCE* 4587

CHART REFERENCE* 4616

CHART REFERENCE* 4624

CHART REFERENCE* 4016

COMPUTATION NOTES* 17196AOTT

UPPER LEFT LATITUDE* 470800
UPPER LEFT LONGITUDE* 551500
LOWER RIGHT LATITUDE* 465600
LOWER RIGHT LONGITUDE* 550300

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 12160
STATUS* E
CORRESPONDENCE DATE* 01/01/1952
LOCATION NAMES* PAYS COVE TO TERRENCEVILLE
CATALOGUE NUMBER* 2342

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2342
ENTRY DATE* 01/01/1952

CHART REFERENCE* 4612

CHART REFERENCE* 4607

CHART REFERENCE* 4016

CHART REFERENCE* 4015

UPPER LEFT LATITUDE* 474100
UPPER LEFT LONGITUDE* 545100
LOWER RIGHT LATITUDE* 473600
LOWER RIGHT LONGITUDE* 544300

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 12000
STATUS* E
CORRESPONDENCE DATE* 01/01/1941
LOCATION NAMES* MORTIER BAY NFLD
CATALOGUE NUMBER* 1243

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 1243
ENTRY DATE* 01/01/1941

CHART REFERENCE* 4587

CHART REFERENCE* 4616

CHART REFERENCE* 4624

CHART REFERENCE* 4016

UPPER LEFT LATITUDE* 471300
UPPER LEFT LONGITUDE* 551000
LOWER RIGHT LATITUDE* 470600
LOWER RIGHT LONGITUDE* 550100

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 24000
STATUS* E
CORRESPONDENCE DATE* 01/01/1951
LOCATION NAMES* SOUTH CONCEPTION BAY NFLD
CATALOGUE NUMBER* 2273

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2273
ENTRY DATE* 01/01/1951

CHART REFERENCE* 4001

CHART REFERENCE* 62683
EDITION* 10/13/1955

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 8014

CHART REFERENCE* 4565

CHART REFERENCE* 4566

CHART REFERENCE* 4572

CHART REFERENCE* 4573

PHOTOGRAPHS* NFL4-193,194-202

UPPER LEFT LATITUDE* 474000
UPPER LEFT LONGITUDE* 531800
LOWER RIGHT LATITUDE* 472600
LOWER RIGHT LONGITUDE* 525800

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 95040
STATUS* E
CORRESPONDENCE DATE* 01/01/1963
LOCATION NAMES* PLACENTIA BAY WEST CHANNEL
DOCUMENT REMARKS* 1 OF 2
CATALOGUE NUMBER* 2266

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2266
ENTRY DATE* 01/01/1963

CHART REFERENCE* 4001

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 4622

CHART REFERENCE* 4619

MISCELLANEOUS NOTES* 112405
SOUNDING NOTES* 112405

UPPER LEFT LATITUDE* 472600
UPPER LEFT LONGITUDE* 544000
LOWER RIGHT LATITUDE* 471200
LOWER RIGHT LONGITUDE* 540800

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 95040
STATUS* E
CORRESPONDENCE DATE* 01/01/1973
LOCATION NAMES* PLACENTIA BAY WEST CHANNEL
DOCUMENT REMARKS* 2 OF 2
CATALOGUE NUMBER* 2266

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2266
ENTRY DATE* 01/01/1973

CHART REFERENCE* 4001

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 4619

CHART REFERENCE* 4622

OBSERVATION NOTES* 139590TT
MISCELLANEOUS NOTES* 139596A074302

UPPER LEFT LATITUDE* 472600
UPPER LEFT LONGITUDE* 544000
LOWER RIGHT LATITUDE* 471200
LOWER RIGHT LONGITUDE* 540800

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 24000
STATUS* E
CORRESPONDENCE DATE* 01/01/1951
LOCATION NAMES* NORTH CONCEPTION BAY
CATALOGUE NUMBER* 2272

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2272
ENTRY DATE* 01/01/1951

CHART REFERENCE* 4001

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 4565

CHART REFERENCE* 4566

CHART REFERENCE* 4572

CHART REFERENCE* 4590

CHART REFERENCE* 8014

PHOTOGRAPHS* NFLD1-83 TO 85, 175 TO 178

PHOTOGRAPHS* NFLD4-183 TO 185,190,191

UPPER LEFT LATITUDE* 475200
UPPER LEFT LONGITUDE* 531200
LOWER RIGHT LATITUDE* 473600
LOWER RIGHT LONGITUDE* 524800

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS

SCALE* 48640
STATUS* E
CORRESPONDENCE DATE* 01/01/1951
LOCATION NAMES* BECKFORD HEAD TO PATRICK COVE
CATALOGUE NUMBER* 2265

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2265
ENTRY DATE* 01/01/1951

CHART REFERENCE* 4001

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 2915

CHART REFERENCE* 4622

CHART REFERENCE* 4842

UPPER LEFT LATITUDE* 470400
UPPER LEFT LONGITUDE* 544300
LOWER RIGHT LATITUDE* 464000
LOWER RIGHT LONGITUDE* 535200

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 72307
STATUS* E
CORRESPONDENCE DATE* 01/01/1951
LOCATION NAMES* APPROACHES TO PLACENTIA HARBOUR
CATALOGUE NUMBER* 2264L7

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2264L7
ENTRY DATE* 01/01/1951

CHART REFERENCE* 4587

CHART REFERENCE* 4613

CHART REFERENCE* 4614

CHART REFERENCE* 4615

CHART REFERENCE* 4616

CHART REFERENCE* 4617

CHART REFERENCE* 4619

CHART REFERENCE* 4642

UPPER LEFT LATITUDE* 472500
UPPER LEFT LONGITUDE* 553400
LOWER RIGHT LATITUDE* 464000

LOWER RIGHT LONGITUDE* 540000

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 12160
STATUS* E
CORRESPONDENCE DATE* 01/01/1951
LOCATION NAMES* PETIT-FORT HARBOUR TO BROAD COVE
CATALOGUE NUMBER* 2263

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2263
ENTRY DATE* 01/01/1951

CHART REFERENCE* 4001

CHART REFERENCE* 4016

CHART REFERENCE* 4622

COMPUTATION NOTES* 17196AOTT

UPPER LEFT LATITUDE* 472600
UPPER LEFT LONGITUDE* 545800
LOWER RIGHT LATITUDE* 471700
LOWER RIGHT LONGITUDE* 543600

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 12182
STATUS* E
CORRESPONDENCE DATE* 01/01/1942
LOCATION NAMES* HOLYROOD BAY
CATALOGUE NUMBER* 1462

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 1462
ENTRY DATE* 01/01/1942

CHART REFERENCE* 4573

CHART REFERENCE* 4572

CHART REFERENCE* 4565

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 8014

UPPER LEFT LATITUDE* 472900
UPPER LEFT LONGITUDE* 531100
LOWER RIGHT LATITUDE* 472300
LOWER RIGHT LONGITUDE* 530400

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS

SCALE* 10000
STATUS* E
CORRESPONDENCE DATE* 01/01/1955
LOCATION NAMES* TRINITY BAY
CATALOGUE NUMBER* 2537

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2537
ENTRY DATE* 01/01/1955

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 4545

CHART REFERENCE* 4563

CHART REFERENCE* 4577

UPPER LEFT LATITUDE* 480000
UPPER LEFT LONGITUDE* 533200
LOWER RIGHT LATITUDE* 474900
LOWER RIGHT LONGITUDE* 531600

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 1200
STATUS* E
CORRESPONDENCE DATE* 01/01/1954
LOCATION NAMES* WHARF IN BROYLE HARBOUR, CALVERT BAY
CATALOGUE NUMBER* 2547

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2547
ENTRY DATE* 01/01/1954

CHART REFERENCE* 2915

CHART REFERENCE* 4001

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 4575

CHART REFERENCE* 4567

CHART REFERENCE* 8011

CHART REFERENCE* 8014

CENTER LATITUDE* 465758
CENTER LONGITUDE* 525618

CENTER LATITUDE* 465812
CENTER LONGITUDE* 525654

CENTER LATITUDE* 470020
CENTER LONGITUDE* 525644

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 24000
STATUS* E
CORRESPONDENCE DATE* 01/01/1954
LOCATION NAMES* GREAT ISLAND TO RENEWSE HARBOUR
CATALOGUE NUMBER* 2539

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2539
ENTRY DATE* 01/01/1954

CHART REFERENCE* 8011

CHART REFERENCE* 8014

CHART REFERENCE* 4575

CHART REFERENCE* 4567

CHART REFERENCE* 4016

CHART REFERENCE* 4017

OBSERVATION NOTES* 172080TT
COMPUTATION NOTES* 190220TT
SOUNDING NOTES* 17200,17201,17209S
PHOTOGRAPHS* 13255,1-8,13262,123-134,234-240

PHOTOGRAPHS* 13263,1-7,64-81

PHOTOGRAPHS* 13265,115-133,204-210

PHOTOGRAPHS* 13270,24-34,137-144

PHOTOGRAPHS* 13361,53-57

UPPER LEFT LATITUDE* 471400
UPPER LEFT LONGITUDE* 530000
LOWER RIGHT LATITUDE* 465400
LOWER RIGHT LONGITUDE* 524400

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 3600
STATUS* E
CORRESPONDENCE DATE* 01/01/1955
LOCATION NAMES* LITTLE BURIN HARBOUR & APPROACHES
CATALOGUE NUMBER* 2558

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2558
ENTRY DATE* 01/01/1955

CHART REFERENCE* 4616

CHART REFERENCE* 4624

CHART REFERENCE* 4016

UPPER LEFT LATITUDE* 470300
UPPER LEFT LONGITUDE* 551100
LOWER RIGHT LATITUDE* 470200
LOWER RIGHT LONGITUDE* 550900

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 2400
STATUS* E
CORRESPONDENCE DATE* 01/01/1955
LOCATION NAMES* FERMEUSE HARBOUR NFLD
CATALOGUE NUMBER* 2584

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2584
ENTRY DATE* 01/01/1955

CHART REFERENCE* 8014

CHART REFERENCE* 2915

CHART REFERENCE* 4657

CHART REFERENCE* 4575

CHART REFERENCE* 4001

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 8011

UPPER LEFT LATITUDE* 465854
UPPER LEFT LONGITUDE* 527545
LOWER RIGHT LATITUDE* 465742
LOWER RIGHT LONGITUDE* 525636

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 18000
STATUS* E
CORRESPONDENCE DATE* 01/01/1955
LOCATION NAMES* LONG POINT TO HANTS HEAD
CATALOGUE NUMBER* 2597

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2597
ENTRY DATE* 01/01/1955

CHART REFERENCE* 4014

UPPER LEFT LATITUDE* 480000
UPPER LEFT LONGITUDE* 533200
LOWER RIGHT LATITUDE* 475000
LOWER RIGHT LONGITUDE* 531800

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 24000
STATUS* E
CORRESPONDENCE DATE* 01/01/1955
LOCATION NAMES* RED ISLAND TO PINCHGUT POINT
DOCUMENT REMARKS* ADDITIONAL HYDROGRAPHY 1975
CATALOGUE NUMBER* 2592C

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2592C
ENTRY DATE* 01/01/1955

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 4618

SOUNDING NOTES* 140985

UPPER LEFT LATITUDE* 474600
UPPER LEFT LONGITUDE* 540700
LOWER RIGHT LATITUDE* 473600
LOWER RIGHT LONGITUDE* 535500

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 24000
STATUS* E
CORRESPONDENCE DATE* 09/01/1972
LOCATION NAMES* HAYSTACK TO SWIFT CURRENT
DOCUMENT REMARKS* ONE OF TWO
CATALOGUE NUMBER* 2592B

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2592B
ENTRY DATE* 09/01/1972

CHART REFERENCE* 4001

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 4618

CHART REFERENCE* 4620

MISCELLANEOUS NOTES* 138275A049521

UPPER LEFT LATITUDE* 475000
UPPER LEFT LONGITUDE* 540700

LOWER RIGHT LATITUDE* 474400
LOWER RIGHT LONGITUDE* 535500

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 24000
STATUS* E
CORRESPONDENCE DATE* 09/01/1972
LOCATION NAMES* HAYSTACK TO SWIFT CURRENT
DOCUMENT REMARKS* TWO OF TWO
CATALOGUE NUMBER* 2592B

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2592B
ENTRY DATE* 09/01/1972

CHART REFERENCE* 4001

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 4618

CHART REFERENCE* 4620

UPPER LEFT LATITUDE* 475000
UPPER LEFT LONGITUDE* 540700
LOWER RIGHT LATITUDE* 474400
LOWER RIGHT LONGITUDE* 535500

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 24000
STATUS* E
CORRESPONDENCE DATE* 01/01/1956
LOCATION NAMES* HAYSTACK TO SWIFT CURRENT
CATALOGUE NUMBER* 2592

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2592
ENTRY DATE* 01/01/1956

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 4618

CHART REFERENCE* 4620

OBSERVATION NOTES* 172330TT
MISCELLANEOUS NOTES* 17231,172329
SOUNDING NOTES* 172308
PHOTOGRAPHS* A11962 135-142,187-192,204-208

PHOTOGRAPHS* A11959 142-150,151-157,196-215

PHOTOGRAPHS* A11961 18-26,A12102 11-20

PHOTOGRAPHS* NFL 3-91,3-92,3-162,3-170

UPPER LEFT LATITUDE* 475600
UPPER LEFT LONGITUDE* 542100
LOWER RIGHT LATITUDE* 473600
LOWER RIGHT LONGITUDE* 535500

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 1200
STATUS* E
CORRESPONDENCE DATE* 01/01/1954
LOCATION NAMES* HARBOUR BUFFET WHARVES
CATALOGUE NUMBER* 2591

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2591
ENTRY DATE* 01/01/1954

CHART REFERENCE* 4001

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 4617

UPPER LEFT LATITUDE* 473150
UPPER LEFT LONGITUDE* 540530
LOWER RIGHT LATITUDE* 473120
LOWER RIGHT LONGITUDE* 540446

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 24000
STATUS* E
CORRESPONDENCE DATE* 01/01/1954
LOCATION NAMES* RED ISLAND TO HAYSTACK NFLD
CATALOGUE NUMBER* 2590

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2590
ENTRY DATE* 01/01/1954

CHART REFERENCE* 4617

CHART REFERENCE* 4618

CHART REFERENCE* 4622

CHART REFERENCE* 4001

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 4613

UPPER LEFT LATITUDE* 473900
UPPER LEFT LONGITUDE* 541500
LOWER RIGHT LATITUDE* 472300
LOWER RIGHT LONGITUDE* 534700

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 8000
STATUS* E
CORRESPONDENCE DATE* 01/01/1955
LOCATION NAMES* HEARTS CONTENT HARBOUR
CATALOGUE NUMBER* 2621

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2621
ENTRY DATE* 01/01/1955

CHART REFERENCE* 4001

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 4563

CHART REFERENCE* 4577

CENTER LATITUDE* 475256
CENTER LONGITUDE* 532309

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 8000
STATUS* E
CORRESPONDENCE DATE* 01/01/1955
LOCATION NAMES* NEW PELICAN HARBOUR
CATALOGUE NUMBER* 2622

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2622
ENTRY DATE* 01/01/1955

CHART REFERENCE* 4577

CHART REFERENCE* 4563

CHART REFERENCE* 4017

CHART REFERENCE* 4016

UPPER LEFT LATITUDE* 475540
UPPER LEFT LONGITUDE* 532242
LOWER RIGHT LATITUDE* 475428
LOWER RIGHT LONGITUDE* 532112

DOCUMENT FORMAT* FS

DOCUMENT SOURCE* CHS
SCALE* 150000
STATUS* E
CORRESPONDENCE DATE* 01/01/1967
LOCATION NAMES* GRAND BANK NEWFOUNDLAND
DOCUMENT REMARKS* ONE OF TWO
CATALOGUE NUMBER* 4165

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 4165
ENTRY DATE* 01/01/1967

CHART REFERENCE* 4001

CHART REFERENCE* 4017

CHART REFERENCE* 8011

CHART REFERENCE* 8014

OBSERVATION NOTES* 13371 OTT
COMPUTATION NOTES* 13369 OTT
MISCELLANEOUS NOTES* 13371S A024897
SOUNDING ROLLS* FS4165 A024897
BOAT BOARDS* FS4165 A100202

UPPER LEFT LATITUDE* 482000
UPPER LEFT LONGITUDE* 522000
LOWER RIGHT LATITUDE* 463000
LOWER RIGHT LONGITUDE* 500000

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 150000
STATUS* E
CORRESPONDENCE DATE* 01/01/1971
LOCATION NAMES* GRAND BANK NEWFOUNDLAND
CATALOGUE NUMBER* 4165

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 4165
ENTRY DATE* 01/01/1971

CHART REFERENCE* 4001

CHART REFERENCE* 4017

CHART REFERENCE* 8011

CHART REFERENCE* 8014

OBSERVATION NOTES* 13712 OTT
COMPUTATION NOTES* 13713 OTT
SOUNDING NOTES* 13714S A049504
SOUNDING ROLLS* FS4165 A049504
BOAT BOARDS* FS4165 A0100319

UPPER LEFT LATITUDE* 482000

UPPER LEFT LONGITUDE* 522000
LOWER RIGHT LATITUDE* 463000
LOWER RIGHT LONGITUDE* 500000

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 5000
STATUS* E
CORRESPONDENCE DATE* 01/01/1968
LOCATION NAMES* GRASSY POINT TO FOX HEAD
CATALOGUE NUMBER* 4193

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 4193
ENTRY DATE* 01/01/1968

CHART REFERENCE* 4620

CHART REFERENCE* 4016

CHART REFERENCE* 4017

OBSERVATION NOTES* 13432 OTT
COMPUTATION NOTES* 13433 OTT
MISCELLANEOUS NOTES* 134345 A024911
SOUNDING NOTES* 134355 A024911
SOUNDING ROLLS* FS4193 A024911
PHOTOGRAPHS* A18883 59,60,142,143 A18845 17,18

UPPER LEFT LATITUDE* 474815
UPPER LEFT LONGITUDE* 540315
LOWER RIGHT LATITUDE* 474430
LOWER RIGHT LONGITUDE* 540000

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 5000
STATUS* E
CORRESPONDENCE DATE* 01/01/1968
LOCATION NAMES* COME BY CHANCE HARBOUR
CATALOGUE NUMBER* 4194

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 4194
ENTRY DATE* 01/01/1968

CHART REFERENCE* 4620

CHART REFERENCE* 4618

CHART REFERENCE* 4016

CHART REFERENCE* 4017

OBSERVATION NOTES* 13432 OTT
COMPUTATION NOTES* 13433 OTT
MISCELLANEOUS NOTES* 134348 A024911
SOUNDING NOTES* 134359 A024911

SOUNDING ROLLS* FS4194 A024911

UPPER LEFT LATITUDE* 475000
UPPER LEFT LONGITUDE* 540300
LOWER RIGHT LATITUDE* 474630
LOWER RIGHT LONGITUDE* 540000

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 1000
STATUS* E
CORRESPONDENCE DATE* 10/01/1968
LOCATION NAMES* RATTLING BROOK TO SALMON RIVER
CATALOGUE NUMBER* 4195A

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 4195A
ENTRY DATE* 10/01/1968

CHART REFERENCE* 4001

CHART REFERENCE* 4016

CHART REFERENCE* 4622

CHART REFERENCE* 4617

OBSERVATION NOTES* 13437 OTT
COMPUTATION NOTES* 13438 OTT
MISCELLANEOUS NOTES* 13439S A024912
SOUNDING NOTES* 13440S A024912
SOUNDING ROLLS* FS4195 A024912

UPPER LEFT LATITUDE* 472545
UPPER LEFT LONGITUDE* 535000
LOWER RIGHT LATITUDE* 472515
LOWER RIGHT LONGITUDE* 534900

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 1000
STATUS* E
CORRESPONDENCE DATE* 01/01/1972
LOCATION NAMES* RATTLING BROOK COVE TO SALMON HOLE
DOCUMENT REMARKS* ONE OF TWO
CATALOGUE NUMBER* 4195B

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 4195B
ENTRY DATE* 01/01/1972

CHART REFERENCE* 4617

CHART REFERENCE* 4016

CHART REFERENCE* 4017

SOUNDING NOTES* 128459 A049519

CENTER LATITUDE* 472520
CENTER LONGITUDE* 534930

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 1000
STATUS* E
CORRESPONDENCE DATE* 01/01/1982
LOCATION NAMES* RATTLING BROOK COVE TO SALMON HOLE
DOCUMENT REMARKS* TWO OF TWO
CATALOGUE NUMBER* 4195B

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 4195B
ENTRY DATE* 01/01/1982

CHART REFERENCE* 4617

CHART REFERENCE* 4016

CHART REFERENCE* 4017

OBSERVATION NOTES* 14651 OTT
COMPUTATION NOTES* 14652 OTT
MISCELLANEOUS NOTES* 14654S 916
SOUNDING NOTES* 14653S 916
SOUNDING ROLLS* FS4195B 916

CENTER LATITUDE* 472520
CENTER LONGITUDE* 534930

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 1000
STATUS* E
CORRESPONDENCE DATE* 01/01/1968
LOCATION NAMES* MARYSTOWN WHARF MORTIER BAY
CATALOGUE NUMBER* 4196

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 4196
ENTRY DATE* 01/01/1968

CHART REFERENCE* 4587

CHART REFERENCE* 4624

CHART REFERENCE* 4016

OBSERVATION NOTES* 13441 OTT
COMPUTATION NOTES* 13442 OTT
MISCELLANEOUS NOTES* 13443S A024912
SOUNDING NOTES* 13444S A024912
SOUNDING ROLLS* FS4196 A024912

UPPER LEFT LATITUDE* 471011
UPPER LEFT LONGITUDE* [illegible]

LOWER RIGHT LATITUDE* 470950
LOWER RIGHT LONGITUDE* 550820

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 150000
STATUS* E
CORRESPONDENCE DATE* 07/01/1972
LOCATION NAMES* GRAND BANKS OF NEWFOUNDLAND
CATALOGUE NUMBER* 4165B

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 4165B
ENTRY DATE* 07/01/1972

CHART REFERENCE* 4001

CHART REFERENCE* 4017

CHART REFERENCE* 8011

CHART REFERENCE* 8014

OBSERVATION NOTES* 13752 OTT
COMPUTATION NOTES* 13753 OTT
SOUNDING NOTES* 13754S

UPPER LEFT LATITUDE* 482000
UPPER LEFT LONGITUDE* 522000
LOWER RIGHT LATITUDE* 474000
LOWER RIGHT LONGITUDE* 500000

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 7500
STATUS* E
CORRESPONDENCE DATE* 07/01/1966
LOCATION NAMES* TREPASSY HARBOUR
CATALOGUE NUMBER* 4101

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 4101
ENTRY DATE* 01/01/1966

CHART REFERENCE* 4579

CHART REFERENCE* 4001

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 2915

OBSERVATION NOTES* 13253 OTT
COMPUTATION NOTES* 13252 OTT
MISCELLANEOUS NOTES* 13255S A012742
SOUNDING NOTES* 13254S A012742

SOUNDING ROLLS* FS4101 A012742
BOAT BOARDS* FS4101 A100119

UPPER LEFT LATITUDE* 464600
UPPER LEFT LONGITUDE* 532500
LOWER RIGHT LATITUDE* 464400
LOWER RIGHT LONGITUDE* 532100

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 7500
STATUS* E
CORRESPONDENCE DATE* 01/01/1966
LOCATION NAMES* TREPASSY HARBOUR SOUTH
CATALOGUE NUMBER* 4102

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 4102
ENTRY DATE* 01/01/1966

CHART REFERENCE* 4579

CHART REFERENCE* 4016

OBSERVATION NOTES* 13253 OTT
COMPUTATION NOTES* 13252 OTT
MISCELLANEOUS NOTES* 13255S A012742
SOUNDING NOTES* 13254S A012742
SOUNDING ROLLS* FS4102 A012742
BOAT BOARDS* FS4102 A100135
PHOTOGRAPHS* A13256-17,19,47,48,90

UPPER LEFT LATITUDE* 464300
UPPER LEFT LONGITUDE* 532600
LOWER RIGHT LATITUDE* 464000
LOWER RIGHT LONGITUDE* 532300

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 1200
STATUS* E
CORRESPONDENCE DATE* 07/01/1966
LOCATION NAMES* HARBOUR GRACE NFLD
CATALOGUE NUMBER* 4106

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 4106
ENTRY DATE* 07/01/1966

CHART REFERENCE* 4572

CHART REFERENCE* 4590

CHART REFERENCE* 4001

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 4565

OBSERVATION NOTES* 13247 OTT
COMPUTATION NOTES* 13246 OTT
MISCELLANEOUS NOTES* 13248S A012742
SOUNDING ROLLS* FS4106 A012742 454
BOAT BOARDS* FS4106 A100119

CENTER LATITUDE* 474000
CENTER LONGITUDE* 531500

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 1200
STATUS* E
CORRESPONDENCE DATE* 01/01/1966
LOCATION NAMES* CARBONEAR GOVERNMENT WHARF
CATALOGUE NUMBER* 4107

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 4107
ENTRY DATE* 01/01/1966

CHART REFERENCE* 4590

CHART REFERENCE* 4565

OBSERVATION NOTES* 13250 OTT
COMPUTATION NOTES* 13249 OTT
MISCELLANEOUS NOTES* 13251S A012742
SOUNDING ROLLS* FS4107 A012742

CENTER LATITUDE* 474415
CENTER LONGITUDE* 531329

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 1200
STATUS* E
CORRESPONDENCE DATE* 01/01/1983
LOCATION NAMES* CARBONEAR GOVERNMENT WHARF
CATALOGUE NUMBER* 4107B

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 4107B
ENTRY DATE* 01/01/1983

CHART REFERENCE* 4590

CHART REFERENCE* 4001

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 4565

OBSERVATION NOTES* 14706 OTT
COMPUTATION NOTES* 14707 OTT
MISCELLANEOUS NOTES* 14709S
SOUNDING NOTES* 14708S

CENTER LATITUDE* 474415
CENTER LONGITUDE* 531329

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 1200
STATUS* E
CORRESPONDENCE DATE* 01/01/1966
LOCATION NAMES* TREPASSEY HARBOUR GOVERNMENT WHARF
CATALOGUE NUMBER* 4110

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 4110
ENTRY DATE* 01/01/1966

CHART REFERENCE* 4579

CHART REFERENCE* 4016

OBSERVATION NOTES* 13253 OTT
COMPUTATION NOTES* 13252 OTT
MISCELLANEOUS NOTES* 13255S A012742
SOUNDING ROLLS* FS4110 A012742
BOAT BOARDS* FS4110 A100135

CENTER LATITUDE* 464407
CENTER LONGITUDE* 532218

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 1000
STATUS* E
CORRESPONDENCE DATE* 01/01/1968
LOCATION NAMES* LONGPOND NFLD
CATALOGUE NUMBER* 4223

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 4223
ENTRY DATE* 01/01/1968

CHART REFERENCE* 4615

CHART REFERENCE* 4624

CHART REFERENCE* 4622

CHART REFERENCE* 4016

OBSERVATION NOTES* 13437 OTT
COMPUTATION NOTES* 13438 OTT
MISCELLANEOUS NOTES* 13439S A024912
SOUNDING NOTES* 13440S A024912
SOUNDING ROLLS* FS4223 A024912

BOAT BOARDS* FS4228 A100219

UPPER LEFT LATITUDE* 472520
UPPER LEFT LONGITUDE* 535000
LOWER RIGHT LATITUDE* 472500
LOWER RIGHT LONGITUDE* 534900

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 600
STATUS* E
CORRESPONDENCE DATE* 01/01/1968
LOCATION NAMES* NORTH HARBOUR NFLD
CATALOGUE NUMBER* 4228

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 4228
ENTRY DATE* 01/01/1968

CHART REFERENCE* 4618

CHART REFERENCE* 4016

CHART REFERENCE* 4017

OBSERVATION NOTES* 13432 OTT
COMPUTATION NOTES* 13433 OTT
MISCELLANEOUS NOTES* 13434S A024911
SOUNDING NOTES* 13435S A024911
SOUNDING ROLLS* FS4228 A024911

CENTER LATITUDE* 475047
CENTER LONGITUDE* 540552

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 1200
STATUS* E
CORRESPONDENCE DATE* 01/01/1969
LOCATION NAMES* MORTIER BAY NFLD
CATALOGUE NUMBER* 4271

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 4271
ENTRY DATE* 01/01/1969

CHART REFERENCE* 4587

CHART REFERENCE* 4624

CHART REFERENCE* 4016

OBSERVATION NOTES* 13441 OTT
COMPUTATION NOTES* 13442 OTT
MISCELLANEOUS NOTES* 13443S A024919
SOUNDING NOTES* 13444S A024919
SOUNDING ROLLS* FS4271 A024919
BOAT BOARDS* FS4271 A100224

UPPER LEFT LATITUDE* 471136
UPPER LEFT LONGITUDE* 550746
LOWER RIGHT LATITUDE* 471128
LOWER RIGHT LONGITUDE* 550734

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 50000
STATUS* E
CORRESPONDENCE DATE* 01/01/1970
LOCATION NAMES* BALLARD BANK, NFLD
CATALOGUE NUMBER* 4280

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 4280
ENTRY DATE* 01/01/1970

CHART REFERENCE* 2915

CHART REFERENCE* 4016

CHART REFERENCE* 4017

OBSERVATION NOTES* 13572 OTT
COMPUTATION NOTES* 13573 OTT
MISCELLANEOUS NOTES* 13574S A024935
SOUNDING NOTES* 13635S A024935
SOUNDING ROLLS* FS4280 A024935
BOAT BOARDS* FS4280 A100233

UPPER LEFT LATITUDE* 470000
UPPER LEFT LONGITUDE* 531500
LOWER RIGHT LATITUDE* 463000
LOWER RIGHT LONGITUDE* 524500

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 50000
STATUS* E
CORRESPONDENCE DATE* 01/01/1981
LOCATION NAMES* BALLARD BANK NFLD
CATALOGUE NUMBER* 4280B

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 4280B
ENTRY DATE* 01/01/1981

CHART REFERENCE* 4001

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 4576

MISCELLANEOUS NOTES* 14602S 834
SOUNDING NOTES* 14601S 834

SOUNDING ROLLS* FS4280B 834
BOAT BOARDS* FS4280B 835
PHOTOGRAPHS* A19761-2,35 A20010-108,109,111

UPPER LEFT LATITUDE* 470000
UPPER LEFT LONGITUDE* 531500
LOWER RIGHT LATITUDE* 462830
LOWER RIGHT LONGITUDE* 524230

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 50000
STATUS* I
CORRESPONDENCE DATE* 01/01/1983
LOCATION NAMES* TRINITY BAY,INNER PORTION
DOCUMENT REMARKS* SEE CORNS 851002
CATALOGUE NUMBER* 9035

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 9035
ENTRY DATE* 10/25/1985

CHART REFERENCE* 4544

CHART REFERENCE* 4547

CHART REFERENCE* 4017

CHART REFERENCE* 4016

OBSERVATION NOTES* 14701
COMPUTATION NOTES* 14702
MISCELLANEOUS NOTES* 14704
SOUNDING NOTES* 14703
MAG TAPE FIELD SHEET DATA* DS3101

UPPER LEFT LATITUDE* 480000
UPPER LEFT LONGITUDE* 540000
LOWER RIGHT LATITUDE* 473000
LOWER RIGHT LONGITUDE* 532200

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 24320
STATUS* E
CORRESPONDENCE DATE* 01/01/1952
LOCATION NAMES* LONG IS TO JOHN THE BHD
CATALOGUE NUMBER* 2364

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2364
ENTRY DATE* 01/01/1952

CHART REFERENCE* 4615

CHART REFERENCE* 4624

CHART REFERENCE* 4622

CHART REFERENCE* 4016

COMPUTATION NOTES* 17196AOTT

UPPER LEFT LATITUDE* 471800
UPPER LEFT LONGITUDE* 550800
LOWER RIGHT LATITUDE* 470600
LOWER RIGHT LONGITUDE* 544200

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 24320
STATUS* E
CORRESPONDENCE DATE* 01/01/1952
LOCATION NAMES* LONG IS TO JOHN THE BHD
CATALOGUE NUMBER* 2364

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2364
ENTRY DATE* 01/01/1952

CHART REFERENCE* 4615

CHART REFERENCE* 4624

CHART REFERENCE* 4622

CHART REFERENCE* 4016

COMPUTATION NOTES* 17196AOTT

UPPER LEFT LATITUDE* 471800
UPPER LEFT LONGITUDE* 550800
LOWER RIGHT LATITUDE* 470600
LOWER RIGHT LONGITUDE* 544200

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 600
STATUS* E
CORRESPONDENCE DATE* 01/01/1942
LOCATION NAMES* BAY BULLS (WHARVES)
CATALOGUE NUMBER* 1772

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 1772
ENTRY DATE* 01/01/1942

CHART REFERENCE* 4586

CHART REFERENCE* 4567

CHART REFERENCE* 4017

CHART REFERENCE* 8014

UPPER LEFT LATITUDE* 471824

UPPER LEFT LONGITUDE* 525142
LOWER RIGHT LATITUDE* 471834
LOWER RIGHT LONGITUDE* 525116

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 2400
STATUS* E
CORRESPONDENCE DATE* 01/01/1956
LOCATION NAMES* ST JOHNS HR
CATALOGUE NUMBER* 2717

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2717
ENTRY DATE* 01/01/1956

CHART REFERENCE* 4588

CHART REFERENCE* 4574

CHART REFERENCE* 4565

CHART REFERENCE* 4567

CHART REFERENCE* 4016

CHART REFERENCE* 8014

UPPER LEFT LATITUDE* 473414
UPPER LEFT LONGITUDE* 524246
LOWER RIGHT LATITUDE* 473316
LOWER RIGHT LONGITUDE* 524121

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 2400
STATUS* E
CORRESPONDENCE DATE* 01/01/1950
LOCATION NAMES* WHARVES AT BELL I.
CATALOGUE NUMBER* 2190

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2190
ENTRY DATE* 01/01/1950

CHART REFERENCE* 4001

CHART REFERENCE* 8014

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 4565

CHART REFERENCE* 4566

COMPUTATION NOTES* 17119 OTT

CENTER LATITUDE* 473800
CENTER LONGITUDE* 525800

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 2400
STATUS* E
CORRESPONDENCE DATE* 01/01/1952
LOCATION NAMES* PLANS OF WF S W SHORE
CATALOGUE NUMBER* 2352

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2352
ENTRY DATE* 01/01/1952

CHART REFERENCE* 4572

CHART REFERENCE* 4573

CHART REFERENCE* 4565

CHART REFERENCE* 4017

UPPER LEFT LATITUDE* 473500
UPPER LEFT LONGITUDE* 531700
LOWER RIGHT LATITUDE* 472500
LOWER RIGHT LONGITUDE* 531000

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 1200
STATUS* E
CORRESPONDENCE DATE* 01/01/1966
LOCATION NAMES* TREPASSY HBR. FISHERY PROD. LTD.'S WRF
CATALOGUE NUMBER* 4111

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 4111
ENTRY DATE* 01/01/1966

CHART REFERENCE* 4579

CHART REFERENCE* 2915

CHART REFERENCE* 4016

OBSERVATION NOTES* 13253 OTT
COMPUTATION NOTES* 13252 OTT
MISCELLANEOUS NOTES* 13255 A012742
SOUNDING ROLLS* A012742
BOAT BOARDS* A100135

CENTER LATITUDE* 464300
CENTER LONGITUDE* 532400

DOCUMENT FORMAT* FS

SCALE* 2400
STATUS* E
CORRESPONDENCE DATE* 01/01/1966
LOCATION NAMES* DANIEL PT TO TREPASSY HARBOUR NFLD
CATALOGUE NUMBER* 4112

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 4112
ENTRY DATE* 01/01/1966

CHART REFERENCE* 4579

CHART REFERENCE* 2915

CHART REFERENCE* 4016

OBSERVATION NOTES* 13253OTT
COMPUTATION NOTES* 13252OTT
MISCELLANEOUS NOTES* 13255A012742
SOUNDING ROLLS* A012742
BOAT BOARDS* A100135
PHOTOGRAPHS* A13256-121

UPPER LEFT LATITUDE* 464500
UPPER LEFT LONGITUDE* 532400
LOWER RIGHT LATITUDE* 464300
LOWER RIGHT LONGITUDE* 532300

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 12000
STATUS* E
CORRESPONDENCE DATE* 01/01/1957
LOCATION NAMES* TACKS BEACH
CATALOGUE NUMBER* 2763

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2763
ENTRY DATE* 01/01/1957

CHART REFERENCE* 4001

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 4617

CHART REFERENCE* 4618

CHART REFERENCE* 4619

OBSERVATION NOTES* 20045 OTT
COMPUTATION NOTES* 20046 OTT
MISCELLANEOUS NOTES* 20044S
SOUNDING NOTES* 2042,20435
PHOTOGRAPHS* A11961-21 TO 25

PHOTOGRAPHS* A12102-15 TO 18 A12102-53 TO 58 A12102-68 TO 73

UPPER LEFT LATITUDE* 474000
UPPER LEFT LONGITUDE* 542000
LOWER RIGHT LATITUDE* 472900
LOWER RIGHT LONGITUDE* 540800

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 75000
STATUS* E
CORRESPONDENCE DATE* 01/01/1957
LOCATION NAMES* BURIN PEN TO C RACE
CATALOGUE NUMBER* 2791 102E

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2791 102E
ENTRY DATE* 01/01/1957

CHART REFERENCE* 4016

CHART REFERENCE* 8009

UPPER LEFT LATITUDE* 465000
UPPER LEFT LONGITUDE* 552000
LOWER RIGHT LATITUDE* 461000
LOWER RIGHT LONGITUDE* 543000

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 75000
STATUS* E
CORRESPONDENCE DATE* 01/01/1957
LOCATION NAMES* BURIN PEN TO C RACE
CATALOGUE NUMBER* 2791 103E

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2791 103E
ENTRY DATE* 01/01/1957

CHART REFERENCE* 4576

CHART REFERENCE* 2915

CHART REFERENCE* 4017

CHART REFERENCE* 4016

UPPER LEFT LATITUDE* 465000
UPPER LEFT LONGITUDE* 543000
LOWER RIGHT LATITUDE* 461000
LOWER RIGHT LONGITUDE* 534000

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 75000
STATUS* E
CORRESPONDENCE DATE* 01/01/1957

LOCATION NAMES* BURIN PT TO C RACE
CATALOGUE NUMBER* 2791 104E

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2791 104E
ENTRY DATE* 01/01/1957

CHART REFERENCE* 4576

CHART REFERENCE* 4842

CHART REFERENCE* 4016

CHART REFERENCE* 4016

CHART REFERENCE* 8009

CHART REFERENCE* 8011

UPPER LEFT LATITUDE* 465000
UPPER LEFT LONGITUDE* 533000
LOWER RIGHT LATITUDE* 461000
LOWER RIGHT LONGITUDE* 525000

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 75000
STATUS* E
CORRESPONDENCE DATE* 01/01/1957
LOCATION NAMES* BURIN PT TO C RACE
CATALOGUE NUMBER* 2791 105E

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2791 105E
ENTRY DATE* 01/01/1957

CHART REFERENCE* 4001

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 8011

UPPER LEFT LATITUDE* 465000
UPPER LEFT LONGITUDE* 524000
LOWER RIGHT LATITUDE* 460000
LOWER RIGHT LONGITUDE* 520000

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 75000
STATUS* E
CORRESPONDENCE DATE* 01/01/1957
LOCATION NAMES* BURIN PT TO C RACE
CATALOGUE NUMBER* 2791 108E

DOCUMENT CATEGORY* DEPTHS

ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2791 108E
ENTRY DATE* 01/01/1957

CHART REFERENCE* 4576

CHART REFERENCE* 2915

CHART REFERENCE* 4017

CHART REFERENCE* 4016

UPPER LEFT LATITUDE* 461000
UPPER LEFT LONGITUDE* 552000
LOWER RIGHT LATITUDE* 452000
LOWER RIGHT LONGITUDE* 543000

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 75000
STATUS* E
CORRESPONDENCE DATE* 01/01/1959
LOCATION NAMES* BURIN PT TO C RACE
CATALOGUE NUMBER* 2791 109E

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2791 109E
ENTRY DATE* 01/01/1959

CHART REFERENCE* 4016

CHART REFERENCE* 8009

UPPER LEFT LATITUDE* 461000
UPPER LEFT LONGITUDE* 543000
LOWER RIGHT LATITUDE* 453000
LOWER RIGHT LONGITUDE* 534000

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 75000
STATUS* E
CORRESPONDENCE DATE* 01/01/1957
LOCATION NAMES* BURIN PT TO C RACE
CATALOGUE NUMBER* 2791 110E

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2791 110E
ENTRY DATE* 01/01/1957

CHART REFERENCE* 4576

CHART REFERENCE* 2915

CHART REFERENCE* 4017

CHART REFERENCE* 4016

UPPER LEFT LATITUDE* 461000
UPPER LEFT LONGITUDE* 534000
LOWER RIGHT LATITUDE* 452000
LOWER RIGHT LONGITUDE* 525000

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 75000
STATUS* E
CORRESPONDENCE DATE* 01/01/1957
LOCATION NAMES* BURIN PT TO C RACE
CATALOGUE NUMBER* 2791 111E

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2791 111E
ENTRY DATE* 01/01/1957

CHART REFERENCE* 4001

CHART REFERENCE* 4016

CHART REFERENCE* 4017

CHART REFERENCE* 8011

UPPER LEFT LATITUDE* 460000
UPPER LEFT LONGITUDE* 525000
LOWER RIGHT LATITUDE* 452000
LOWER RIGHT LONGITUDE* 520000

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 75000
STATUS* E
CORRESPONDENCE DATE* 01/01/1957
LOCATION NAMES* BURIN PT TO C RACE
CATALOGUE NUMBER* 2791 115E

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2791 115E
ENTRY DATE* 01/01/1957

CHART REFERENCE* 8009

UPPER LEFT LATITUDE* 452000
UPPER LEFT LONGITUDE* 543000
LOWER RIGHT LATITUDE* 444000
LOWER RIGHT LONGITUDE* 535000

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 75000
STATUS* E
CORRESPONDENCE DATE* 01/01/1957
LOCATION NAMES* BURIN PT TO C RACE

CATALOGUE NUMBER* 2791 116E

DOCUMENT CATEGORY* ATL
ACTIVITY DESCRIPTION* GABS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2791 116E
ENTRY DATE* 01/01/1957

CHART REFERENCE* 4576

CHART REFERENCE* 2915

CHART REFERENCE* 4017

CHART REFERENCE* 4016

UPPER LEFT LATITUDE* 452500
UPPER LEFT LONGITUDE* 534500
LOWER RIGHT LATITUDE* 443500
LOWER RIGHT LONGITUDE* 525500

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 75000
STATUS* E
CORRESPONDENCE DATE* 01/01/1957
LOCATION NAMES* BURIN PT TO C RACE
CATALOGUE NUMBER* 2791 117E

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION CATALOGUE NUMBER* 2791 117E
ENTRY DATE* 01/01/1957

CHART REFERENCE* 4016

CHART REFERENCE* 8010

CHART REFERENCE* 8011

UPPER LEFT LATITUDE* 452000
UPPER LEFT LONGITUDE* 525000
LOWER RIGHT LATITUDE* 444000
LOWER RIGHT LONGITUDE* 521000

DOCUMENT FORMAT* FS
DOCUMENT SOURCE* CHS
SCALE* 75000
STATUS* E
CORRESPONDENCE DATE* 01/01/1957
LOCATION NAMES* BURIN PT TO C RACE
CATALOGUE NUMBER* 2791 121E,122E

DOCUMENT CATEGORY* DEPTHS
ACTIVITY DESCRIPTION* FS

REGION* ATL
STORAGE LOCATION CODE* GABS
REGION .

Geomarine
HALIFAX & ST. JOHN'S
CANADA

SOUTH AVALON PENINSULA,NEWFOUNDLAND	BEACH	TROWEL	46.68330	-53.25000
SOUTH AVALON PENINSULA,TRESPASSEY BAY,NFLD	BEACH	TROWEL	46.70000	-53.36667
SOUTH AVALON PENINSULA,TREPASSEY BAY,NFLD	BEACH	TROWEL	46.70000	-53.36667
SOUTH AVALON PENINSULA,TREPASSEY BAY,NFLD	BEACH	TROWEL	46.70000	-53.36667
PETER'S RIVER,HOLYROOD POND,NFLD	BEACH	TROWEL	46.75667	-53.61167
SAINT MARY'S BAY,NEWFOUNDLAND	BEACH	TROWEL	46.90000	-53.51660
CHANCE COVE,NEWFOUNDLAND	BEACH	TROWEL	47.67330	-53.81500
MIDDLE COVE,NEWFOUNDLAND	BEACH	TROWEL	47.65160	-52.69660
MIDDLE COVE,NEWFOUNDLAND	BEACH	TROWEL	47.65160	-52.69660
WITLESS BAY,NEWFOUNDLAND	BEACH	TROWEL	47.27330	-52.83330
HOLYROOD POND,NEWFOUNDLAND	BEACH	TROWEL	46.75660	-53.61160
HOLYROOD POND,NEWFOUNDLAND	BEACH	TROWEL	46.78330	-53.63330
HOLYROOD POND,NEWFOUNDLAND	BEACH	TROWEL	46.78330	-53.63000
SOUTH AVALON PENINSULA	BEACH	TROWEL	46.70000	-53.36660
EAST SAINT MARY'S BAY,NEWFOUNDLAND	BEACH	TROWEL	46.95000	-53.51660
HOLYROOD POND,NEWFOUNDLAND	BEACH	TROWEL	46.79000	-53.63660
HOLYROOD POND,NEWFOUNDLAND	BEACH	TROWEL	46.79000	-53.63660
DROOK,NEWFOUNDLAND	BEACH	TROWEL	46.67150	-53.24330
HOLYROOD POND,NEWFOUNDLAND	BEACH	TROWEL	46.79000	-53.63660
MIDDLE COVE,NEWFOUNDLAND	BEACH	TROWEL	47.65150	-52.69660
BURIN PENINSULA,NEWFOUNDLAND	BEACH	TROWEL	46.88330	-55.41660
EAST SAINT MARY'S BAY,NEWFOUNDLAND	BEACH	TROWEL	46.95000	-53.51660
WITLESS BAY,NEWFOUNDLAND	BEACH	TROWEL	47.27830	-52.83330
NEWFOUNDLAND	BEACH	TROWEL	47.27830	-52.83330
MIDDLE COVE,NEWFOUNDLAND	BEACH	TROWEL	47.65150	-52.69660
MIDDLE COVE,NEWFOUNDLAND	BEACH	TROWEL	47.65160	-52.69660
MIDDLE COVE,NEWFOUNDLAND	BEACH	TROWEL	47.65160	-52.69660
MIDDLE COVE,NEWFOUNDLAND	BEACH	TROWEL	47.65160	-52.69660
HOLYROOD POND,NEWFOUNDLAND	BEACH	TROWEL	46.79166	-53.63330
HOLYROOD POND,N	BEACH	TROWEL	46.78330	-53.63300

EWFOUNDLAND					
HOLYROOD POND,NEWFOUNDLAND		BEACH	TROWEL	46.78330	-53.63300
HOLYROOD POND,NEWFOUNDLAND		BEACH	TROWEL	46.77500	-53.62500
HOLYROOD POND,NEWFOUNDLAND		BEACH	TROWEL	46.76600	-53.61660
BROOK,NEWFOUNDLAND		BEACH	TROWEL	46.79160	-53.25000
PETER'S RIVER,HOLYROOD POND,NFLD		BEACH	TROWEL	46.75660	-53.61160
HOLYROOD POND,NEWFOUNDLAND		BEACH	TROWEL	46.79330	-53.63833
HOLYROOD POND,NEWFOUNDLAND		BEACH	TROWEL	46.79166	-53.64150
BLACKHEAD BAY,NEWFOUNDLAND		BEACH	TROWEL	47.80516	-54.88600
BURIN PENINSULA,NEWFOUNDLAND		BEACH	TROWEL	46.83330	-55.41660
EAST SAINT MARY'S BAY,NEWFOUNDLAND		BEACH	TROWEL	46.96660	-53.58330
PLACENTIA,NEWFOUNDLAND		BEACH	TROWEL	47.24580	-53.96660
BLACKHEAD BAY,NEWFOUNDLAND		BEACH	TROWEL	47.80516	-54.88600
PLACENTIA BAY,NEWFOUNDLAND		BEACH	TROWEL	47.24580	-53.96660
HOLYROOD POND,NEWFOUNDLAND		BEACH	TROWEL	46.79330	-53.63333
SOUTHWEST CONCEPTION BAY,NEWFOUNDLAND		BEACH	TROWEL	47.57660	-53.26500
BLACKHEAD BAY,NEWFOUNDLAND		BEACH	TROWEL	47.80516	-54.88500
PLACENTIA,NEWFOUNDLAND		BEACH	TROWEL	47.24013	-53.97160
POINT VERDE,NEWFOUNDLAND		BEACH	TROWEL	47.23630	-54.00660
PLACENTIA,NEWFOUNDLAND		BEACH	TROWEL	47.24330	-53.95916
EAST SAINT MARY'S BAY,NEWFOUNDLAND		BEACH	TROWEL	46.96660	-53.58330
LANCE COVE,NEWFOUNDLAND		BEACH	TROWEL	46.80850	-54.08060
LANCE COVE,NEWFOUNDLAND		BEACH	TROWEL	46.80833	-54.07500
LANCE COVE,NEWFOUNDLAND		BEACH	TROWEL	46.80916	-54.07500
LANCE COVE,NEWFOUNDLAND		BEACH	TROWEL	46.80960	-54.08530
LANCE COVE,NEWFOUNDLAND		BEACH	TROWEL	46.80960	-54.08066
HOLYROOD POND,NEWFOUNDLAND		BEACH	TROWEL	46.79330	-53.63833
SAINT MARY'S BAY,NEWFOUNDLAND		BEACH	TROWEL	46.90000	-53.61660
SAINT MARY'S BAY,NEWFOUNDLAND		BEACH	TROWEL	46.90000	-53.61660
TREPASSEY BAY,NEWFOUNDLAND	M10	GRAB		46.60160	-53.40830
NEWFOUNDLAND	M2A	GRAB		46.59160	-53.37083
TREPASSEY BAY,N	M2B	GRAB		46.59160	-53.37083

EWFOUNDLAND					
TREPASSEY BAY,NEWFOUNDLAND	M3.1A	GRAB		46.67330	-53.37680
TREPASSEY BAY,NEWFOUNDLAND	M3.1B	GRAB		46.67330	-53.37680
TREPASSEY BAY,NEWFOUNDLAND	M3.2	GRAB		46.67330	-53.37680
TREPASSEY BAY,NEWFOUNDLAND	M3.2A	GRAB		46.67330	-53.37680
TREPASSEY BAY,NEWFOUNDLAND	M3.2B	GRAB		46.67330	-53.37680
TREPASSEY BAY,NEWFOUNDLAND	M4	GRAB		46.66260	-53.38183
TREPASSEY BAY,NEWFOUNDLAND	M5	GRAB		46.65416	-53.38215
TREPASSEY BAY,NEWFOUNDLAND	M6A	GRAB		46.64560	-53.38650
TREPASSEY BAY,NEWFOUNDLAND	M6B	GRAB		46.64583	-53.38650
TREPASSEY BAY,NEWFOUNDLAND	M7AC	GRAB		46.63750	-53.38960
TREPASSEY BAY,NEWFOUNDLAND	M7AS	GRAB		46.63750	-53.38950
NEWFOUNDLAND	M7B	BEACH	TROWEL	46.63750	-53.38960
NEWFOUNDLAND	M8	BEACH	TROWEL	46.62580	-53.39330
NEWFOUNDLAND	M9B	BEACH	TROWEL	46.61670	-53.39750
SAINT MARY'S BAY,NEWFOUNDLAND	4516A	GRAB		46.88380	-53.83183
SAINT MARY'S BAY,NEWFOUNDLAND	4516B	GRAB		46.88380	-53.83183
SAINT MARY'S BAY,NEWFOUNDLAND	4517A	GRAB		46.88750	-53.75230
SAINT MARY'S BAY,NEWFOUNDLAND	4517B	GRAB		46.88750	-53.75230
SAINT MARY'S BAY,NEWFOUNDLAND	4517C	GRAB		46.88750	-53.75230
SAINT MARY'S BAY,NEWFOUNDLAND	4518A	GRAB		46.88750	-53.67716
SAINT MARY'S BAY,NEWFOUNDLAND	4519A	GRAB		46.83330	-53.75000
SAINT MARY'S BAY,NEWFOUNDLAND	4519B	GRAB		46.83330	-53.75000
SAINT MARY'S BAY,NEWFOUNDLAND	4520A	GRAB		46.83330	-53.75000
SAINT MARY'S BAY,NEWFOUNDLAND	4520B	GRAB		46.83330	-53.75000
SAINT MARY'S BAY,NEWFOUNDLAND	4522A	GRAB		46.72400	-54.89260
SAINT MARY'S BAY,NEWFOUNDLAND	4522B	GRAB		46.72400	-54.89260
SAINT MARY'S BAY,NEWFOUNDLAND	4522C	GRAB		46.72400	-54.89260

PROJECT	SAMPLE	LATITUDE	LONGITUDE	SCIENTIST-SHI	P	GEOGRAPHIC AREA	DEPTH	JULIAN	SAMPLE	TYPE	LENGT
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* 810036	8107001	47.27830	-52.82830	FORBES,D.		WITLESS BAY,NEW FOUNDLAND	19.81		BEACH	TROWEL	
* 810036	8108001	46.96330	-53.69830	FORBES,D.		WILD COVE,NEWFO UNDLAND	19.81		BEACH	TROWEL	
* 810036	8108002	46.88330	-53.40330	FORBES,D.		SHOAL COVE,NEWF OUNDLAND	19.81		BEACH	TROWEL	
* 810036	8108004	46.88000	-53.66830	FORBES,D.		LORD'S COVE,NEW FOUNDLAND	19.81		BEACH	TROWEL	
* 810036	8108005	47.63330	-53.76330	FORBES,D.		BELLEVILLE BEAC H,NEWFOUNDLAND	19.81		BEACH	TROWEL	
* 810036	8108006	47.63330	-53.76330	FORBES,D.		BELLEVILLE BEAC H,NEWFOUNDLAND	19.81		BEACH	TROWEL	
* 810036	8108007	47.22000	-55.38500	FORBES,D.		FRENCHMAN'S COV E,NEWFOUNDLAND	19.81		BEACH	TROWEL	
* 810036	8109003	46.90000	-53.61667	FORBES,D.		SAINT MARY'S BA Y,NEWFOUNDLAND	19.81		BEACH	TROWEL	

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PROJECT	SAMPLE	LATITUDE	LONGITUDE	SCIENTIST-SHI	P	GEOGRAPHIC AREA	DEPTH	JULIAN	SAMPLE	TYPE	LENGT
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* 810036	8108010	46.67160	-53.24330	FORBES,D.		DROOK,NEWFOUNDL AND			BEACH	TROWEL	
* 810036	8108011	46.67160	-53.24330	FORBES,D.		DROOK,NEWFOUNDL AND			BEACH	TROWEL	
* 810036	8108012	46.67160	-53.24330	FORBES,D.		DROOK,NEWFOUNDL AND			BEACH	TROWEL	
* 810036	8108013	46.79000	-53.63660	FORBES,D.		HOLYROOD POND,N EWFOUNDLAND			BEACH	TROWEL	
* 810036	8108014	46.76000	-53.63660	FORBES,D.		HOLYROOD POND,N EWFOUNDLAND			BEACH	TROWEL	
* 810036	8108015	46.79000	-53.63660	FORBES,D.		HOLYROOD POND,N EWFOUNDLAND			BEACH	TROWEL	
* 810036	8108016	46.79000	-53.63660	FORBES,D.		HOLYROOD POND,N EWFOUNDLAND			BEACH	TROWEL	
* 810036	8202007	47.67330	-53.81500	FORBES,D.		CHANCE COVE,NEW FOUNDLAND		47	BEACH	TROWEL	
* 810036	8202008	47.57660	-53.26500	FORBES,D.		LONG BEACH,NEWF OUNDLAND		47	BEACH	TROWEL	
* 810036	8202009	47.65160	-52.69660	FORBES,D.		MIDDLE COVE,NEW FOUNDLAND		49	BEACH	TROWEL	
* 810036	8202010	47.65160	-52.69660	FORBES,D.		MIDDLE COVE,NEW FOUNDLAND		49	BEACH	TROWEL	
* 810036	8202011	47.65160	-52.69660	FORBES,D.		MIDDLE COVE,NEW FOUNDLAND		49	BEACH	TROWEL	
* 810036	8202012	47.65160	-52.69660	FORBES,D.		MIDDLE COVE,NEW FOUNDLAND		49	BEACH	TROWEL	
* 810036	8202013	47.65160	-52.69660	FORBES,D.		MIDDLE COVE,NEW FOUNDLAND		49	BEACH	TROWEL	
* 810036	8202013	47.65160	-52.69660	FORBES,D.		MIDDLE COVE,NEW FOUNDLAND		49	BEACH	TROWEL	
* 810036	8202014	47.65160	-52.69660	FORBES,D.		MIDDLE COVE,NEW FOUNDLAND		49	BEACH	TROWEL	
* 810036	8202014	47.65160	-52.69660	FORBES,D.		MIDDLE COVE,NEW FOUNDLAND		49	BEACH	TROWEL	
* 810036	8202015	47.27830	-52.83330	FORBES,D.		NEWFOUNDLAND		51	BEACH	TROWEL	
* 810036	8202016	47.27830	-52.83330	FORBES,D.		WITLESS BAY,NEW FOUNDLAND		51	BEACH	TROWEL	
* 810036	8202016	47.27830	-52.83330	FORBES,D.		WITLESS BAY,NEW FOUNDLAND		51	BEACH	TROWEL	
* 810036	8202017	47.27830	-52.83330	FORBES,D.		WITLESS BAY,NEW FOUNDLAND		51	BEACH	TROWEL	
* 810036	8202018	46.76667	-53.61167	FORBES,D.		PETER'S RIVER,H OLYROOD POND,NF LD			BEACH	TROWEL	
* 810036	8202019	46.76660	-53.61160	FORBES,D.		PETER'S RIVER,H OLYROOD POND,NF LD			BEACH	TROWEL	
* 810036	8202020	46.76660	-53.61160	FORBES,D.		HOLYROOD POND,N EWFOUNDLAND		52	BEACH	TROWEL	
* 810036	8202021	46.78330	-53.63330	FORBES,D.		HOLYROOD POND,N EWFOUNDLAND		53	BEACH	TROWEL	
* 810036	8202022	46.70000	-53.36660	FORBES,D.		MUTTON BAY,NEWF OUNDLAND		44	GRAB		
* 810036	8202022	46.70000	-53.36660	FORBES,D.		MUTTON BAY,NEWF OUNDLAND		54	BEACH	TROWEL	
* 810036	8202023	46.78330	-53.63000	FORBES,D.		HOLYROOD POND,N EWFOUNDLAND		54	BEACH	TROWEL	
* 810036	8202024	47.22000	-53.38500	FORBES,D.		FRENCHMAN'S COV E,NEWFOUNDLAND		55	BEACH	TROWEL	

* 810036	8208001	46.68330	-53.25000	FORBES,D.	SOUTH AVALON PE NINSULA,NEWFOUN DLAND	233	BEACH	TROWEL
* 810036	8208002	46.79160	-53.25000	FORBES,D.	DROOK,NEWFOUNDL AND		BEACH	TROWEL
* 810036	8208003	46.68330	-53.25000	FORBES,D.	DROOK,NEWFOUNDL AND	233	BEACH	TROWEL
* 810036	8208004	46.79166	-53.64160	FORBES,D.	HOLYROOD POND,N EWFOUNDLAND		BEACH	TROWEL
* 810036	8208005	46.79166	-53.63830	FORBES,D.	HOLYROOD POND,N EWFOUNDLAND		BEACH	TROWEL
* 810036	8208006	46.78330	-53.63300	FORBES,D.	HOLYROOD POND,N EWFOUNDLAND		BEACH	TROWEL
* 810036	8208007	46.78330	-53.63300	FORBES,D.	HOLYROOD POND,N EWFOUNDLAND		BEACH	TROWEL
* 810036	8208008	46.77500	-53.62500	FORBES,D.	HOLYROOD POND,N EWFOUNDLAND		BEACH	TROWEL
* 810036	8208009	46.76600	-53.61660	FORBES,D.	HOLYROOD POND,N EWFOUNDLAND		BEACH	TROWEL
* 810036	8208010	46.75830	-53.60830	FORBES,D.	SOUTH AVALON PE NINSULA,NEWFOUN DLAND		BEACH	TROWEL
* 810036	8208017	46.70000	-53.36660	FORBES,D.	SOUTH AVALON PE NINSULA	234	BEACH	TROWEL
* 810036	8208021	47.57660	-53.26500	FORBES,D.	SOUTHWEST CONCE PTION BAY,NEWFO UNDLAND	233	BEACH	TROWEL
* 810036	8208022	47.57660	-53.26500	FORBES,D.	SOUTHWEST CONCE PTION BAY,NEWFO UNDLAND	233	BEACH	TROWEL
* 810036	8208023	47.57660	-53.26500	FORBES,D.	SOUTHWEST CONCE PTION BAY,NEWFO UNDLAND	233	BEACH	TROWEL
* 810036	8208024	47.57660	-53.26500	FORBES,D.	SOUTHWEST CONCE PTION BAY,NEWFO UNDLAND	233	BEACH	TROWEL
* 810036	8208025	47.63330	-53.78330	FORBES,D.	SOUTH TRINITY B AY,NEWFOUNDLAND	233	BEACH	TROWEL
* 810036	8208026	47.63330	-53.78330	FORBES,D.	SOUTH TRINITY B AY,NEWFOUNDLAND	233	BEACH	TROWEL
* 810036	8208027	47.63330	-53.78330	FORBES,D.	SOUTH TRINITY B AY,NEWFOUNDLAND	233	BEACH	TROWEL
* 810036	8208028	47.63330	-53.78330	FORBES,D.	SOUTH TRINITY B AY,NEWFOUNDLAND	233	BEACH	TROWEL
* 810036	8208029	47.67350	-53.81500	FORBES,D.	SOUTHWEST TRINI TY BAY,NEWFOUND LAND	233	BEACH	TROWEL
* 810036	8208030	47.67350	-53.81500	FORBES,D.	SOUTHWEST TRINI TY BAY,NEWFOUND LAND	233	BEACH	TROWEL
* 810036	8208031	47.65160	-52.69660	FORBES,D.	NORTH AVALON BA Y		BEACH	TROWEL
* 810036	8208032	47.65160	-52.69660	FORBES,D.	NORTH AVALON BA Y		BEACH	TROWEL
* 810036	8208033	47.65160	-52.69660	FORBES,D.	NORTH AVALON BA Y		BEACH	TROWEL
* 810036	8208034	47.65160	-52.69660	FORBES,D.	NORTH AVALON BA Y		BEACH	TROWEL
* 810036	8208035	47.27830	-52.83330	FORBES,D.	EAST AVALON BAY ,NEWFOUNDLAND		BEACH	TROWEL
* 810036	8208036	46.90000	-53.61660	FORBES,D.	EAST AVALON BAY ,NEWFOUNDLAND		BEACH	TROWEL
* 810036	8208037	46.95000	-53.51660	FORBES,D.	EAST SAINT MARY 'S BAY,NEWFOUND LAND	241	BEACH	TROWEL
* 810036	8208038	46.95000	-53.51660	FORBES,D.	EAST SAINT MARY	241	BEACH	TROWEL

					'S BAY,NEWFOUND LAND			
* 810036	8209002	46.90000	-53.61660	FORBES,D.	SAINT MARY'S BA Y,NEWFOUNDLAND		BEACH	TROWEL
* 810036	8209002	46.90000	-53.61660	FORBES,D.	SAINT MARY'S BA Y,NEWFOUNDLAND		BEACH	TROWEL
* 810036	8209003	46.90000	-53.61660	FORBES,D.	SAINT MARY'S BA Y,NEWFOUNDLAND		BEACH	TROWEL
* 810036	8209004	46.01310	-53.64166	FORBES,D.	SAINT MARY'S BA Y,AVALON PENINS ULA,NEWFOUNDLAN D		BEACH	TROWEL
* 810036	8209005	46.90000	-53.61660	FORBES,D.	SAINT MARY'S BA Y,NEWFOUNDLAND	241	BEACH	TROWEL
* 810036	8209005	46.90000	-53.61660	FORBES,D.	SAINT MARY'S BA Y,NEWFOUNDLAND	241	BEACH	TROWEL
* 810036	8209006	46.95000	-53.51660	FORBES,D.	EAST SAINT MARY 'S BAY,NEWFOUND LAND		BEACH	TROWEL
* 810036	8209006	46.95000	-53.51660	FORBES,D.	EAST SAINT MARY 'S BAY,NEWFOUND LAND		BEACH	TROWEL
* 810036	8209007	46.95000	-53.51660	FORBES,D.	NEWFOUNDLAND	241	BEACH	TROWEL
* 810036	8209009	47.06660	-53.56660	FORBES,D.	NEWFOUNDLAND	241	BEACH	TROWEL
* 810036	8209010	47.06600	-53.56660	FORBES,D.	SAINT MARY'S BA Y,NEWFOUNDLAND		BEACH	TROWEL
* 810036	8209011	47.01660	-53.65000	FORBES,D.	SAINT MARY'S BA Y.NEWFOUNDLAND		BEACH	TROWEL
* 810036	8209012	46.70000	-53.36667	FORBES,D.	SOUTH AVALON PE NINSULA,TRESPAS SEY BAY,NFLD		BEACH	TROWEL
* 810036	8209014	46.70000	-53.36667	FORBES,D.	SOUTH AVALON PE NINSULA,TREPASS EY BAY,NFLD		BEACH	TROWEL
* 810036	8209015	46.70000	-53.36667	FORBES,D.	SOUTH AVALON PE NINSULA,TREPASS EY BAY,NFLD		BEACH	TROWEL
* 810036	8209017	47.13330	-53.55000	FORBES,D.	EAST SAINT MARY 'S BAY,NEWFOUND LAND	242	CORE	
* 810036	8209019	46.96660	-53.58330	FORBES,D.	EAST SAINT MARY 'S BAY,NEWFOUND LAND		BEACH	TROWEL
* 810036	8209020	46.96660	-53.58330	FORBES,D.	EAST SAINT MARY 'S BAY,NEWFOUND LAND		BEACH	TROWEL
* 810036	8209107	46.88330	-55.41660	FORBES,D.	BURIN PENINSULA ,NEWFOUNDLAND	245	BEACH	TROWEL
* 810036	8209109	46.88330	-55.41660	FORBES,D.	BURIN PENINSULA ,NEWFOUNDLAND	245	BEACH	TROWEL
* 810036	8209110	47.20000	-55.10000	FORBES,D.	MONTIER BAY,NEW FOUNDLAND	246	BEACH	TROWEL
* 810036	8306001	47.24580	-53.96660	FORBES,D.	PLACENTIA,NEWFO UNDLAND	163	BEACH	TROWEL
* 810036	8306002	47.24330	-53.96916	FORBES,D.	PLACENTIA,NEWFO UNDLAND	163	BEACH	TROWEL
* 810036	8306003	47.24018	-53.97160	FORBES,D.	PLACENTIA,NEWFO UNDLAND	163	BEACH	TROWEL
* 810036	8306004	47.24580	-53.96660	FORBES,D.	PLACENTIA BAY,N EWFOUNDLAND	164	BEACH	TROWEL
* 810036	8306006	47.23680	-54.00660	FORBES,D.	POINT VERDE,NEW FOUNDLAND	164	BEACH	TROWEL
* 810036	8306007	46.80916	-54.07500	FORBES,D.	LANCE COVE,NEWF OUNDLAND	165	BEACH	TROWEL
* 810036	8306008	46.80960	-54.08066	FORBES,D.	LANCE COVE,NEWF OUNDLAND	165	BEACH	TROWEL

*	810036	8306009	46.80960	-54.08330	FORBES,D.	LANCE COVE,NEWF OUNDLAND	165	BEACH	TROWEL
*	810036	8306010	46.80860	-54.08060	FORBES,D.	LANCE COVE,NEWF OUNDLAND	165	BEACH	TROWEL
*	810036	8306011	46.80833	-54.07500	FORBES,D.	LANCE COVE,NEWF OUNDLAND	165	BEACH	TROWEL
*	810036	8306012	46.63960	-53.13700	FORBES,D.	LONG COVE,NEWFO UNDLAND		GRAB	
*	810036	8306013	46.63960	-53.13700	FORBES,D.	LONG COVE,NEWFO UNDLAND		GRAB	
*	810036	8306014	46.79330	-53.63833	FORBES,D.	HOLYROOD POND,N EWFOUNDLAND	170	BEACH	TROWEL
*	810036	8306015	46.79330	-53.63833	FORBES,D.	HOLYROOD POND,N EWFOUNDLAND	170	BEACH	TROWEL
*	810036	8306017	46.79330	-53.63833	FORBES,D.	HOLYROOD POND,N EWFOUNDLAND	170	BEACH	TROWEL
*	810036	8306018	47.54330	-52.92260	FORBES,D.	TOPSAIL COVE,NE WFOUNDLAND	172	GRAB	
*	810036	8306019	47.57700	-53.26500	FORBES,D.	LONG BEACH,NEWF OUNDLAND	174	GRAB	
*	810036	8306020	47.57750	-53.26383	FORBES,D.	LONG BEACH,NEWF OUNDLAND	174	GRAB	
*	810036	8306021	47.83416	-54.00000	FORBES,D.	COME-BY-CHANCE, NEWFOUNDLAND	175	WATER	ESTUARY
*	810036	8306022	47.80516	-54.88600	FORBES,D.	BLACKHEAD BAY,N EWFOUNDLAND	176	BEACH	TROWEL
*	810036	8306022	47.80516	-54.88600	FORBES,D.	BLACKHEAD BAY,N EWFOUNDLAND	176	BEACH	TROWEL
*	810036	8306022	47.80516	-54.88600	FORBES,D.	BLACKHEAD BAY,N EWFOUNDLAND	176	BEACH	TROWEL
*	810036	8306101	46.88380	-53.83183	FORBES,D.	SAINT MARY'S BA Y,NEWFOUNDLAND	164	GRAB	
*	810036	8306102	46.88380	-53.83183	FORBES,D.	SAINT MARY'S BA Y,NEWFOUNDLAND	164	GRAB	
*	810036	8306103	46.88750	-53.75230	FORBES,D.	SAINT MARY'S BA Y,NEWFOUNDLAND	164	GRAB	
*	810036	8306104	46.88750	-53.75230	FORBES,D.	SAINT MARY'S BA Y,NEWFOUNDLAND	164	GRAB	
*	810036	8306105	46.88750	-53.75230	FORBES,D.	SAINT MARY'S BA Y,NEWFOUNDLAND	164	GRAB	
*	810036	8306106	46.88750	-53.67716	FORBES,D.	SAINT MARY'S BA Y,NEWFOUNDLAND	164	GRAB	
*	810036	8306107	46.83330	-53.75000	FORBES,D.	SAINT MARY'S BA Y,NEWFOUNDLAND	164	GRAB	
*	810036	8306108	46.83330	-53.75000	FORBES,D.	SAINT MARY'S BA Y,NEWFOUNDLAND	164	GRAB	
*	810036	8306109	46.83330	-53.75000	FORBES,D.	SAINT MARY'S BA Y,NEWFOUNDLAND	164	GRAB	
*	810036	8306110	46.83330	-53.75000	FORBES,D.	SAINT MARY'S BA Y,NEWFOUNDLAND	164	GRAB	
*	810036	8306111	46.72400	-54.89260	FORBES,D.	SAINT MARY'S BA Y,NEWFOUNDLAND	164	GRAB	
*	810036	8306112	46.72400	-54.89260	FORBES,D.	SAINT MARY'S BA Y,NEWFOUNDLAND	164	GRAB	
*	810036	8306113	46.72400	-54.89260	FORBES,D.	SAINT MARY'S BA Y,NEWFOUNDLAND	164	GRAB	
*	810036	8306148	46.69160	-53.37083	FORBES,D.	NEWFOUNDLAND	168	GRAB	
*	810036	8306149	46.69160	-53.37083	FORBES,D.	TREPASSEY BAY,N EWFOUNDLAND	168	GRAB	
*	810036	8306150	46.67330	-53.37680	FORBES,D.	TREPASSEY BAY,N EWFOUNDLAND	168	GRAB	
*	810036	8306151	46.67330	-53.37680	FORBES,D.	TREPASSEY BAY,N EWFOUNDLAND	168	GRAB	
*	810036	8306152	46.67330	-53.37680	FORBES,D.	TREPASSEY BAY,N EWFOUNDLAND	168	GRAB	
*	810036	8306153	46.67330	-53.37680	FORBES,D.	TREPASSEY BAY,N	168	GRAB	

					EWFOUNDLAND			
* 810036	8306154	46.67330	-53.37680	FORBES,D.	TREPASSEY BAY,N EWFOUNDLAND	168	GRAB	
* 810036	8306155	46.66260	-53.38183	FORBES,D.	TREPASSEY BAY,N EWFOUNDLAND	168	GRAB	
* 810036	8306156	46.65416	-53.38216	FORBES,D.	TREPASSEY BAY,N EWFOUNDLAND	168	GRAB	
* 810036	8306157	46.64580	-53.38660	FORBES,D.	TREPASSEY BAY,N EWFOUNDLAND	168	GRAB	
* 810036	8306158	46.64583	-53.38660	FORBES,D.	TREPASSEY BAY,N EWFOUNDLAND	168	GRAB	
* 810036	8306159	46.63750	-53.38960	FORBES,D.	TREPASSEY BAY,N EWFOUNDLAND	168	GRAB	
* 810036	8306160	46.63750	-53.38960	FORBES,D.	TREPASSEY BAY,N EWFOUNDLAND	168	GRAB	
* 810036	8306161	46.63750	-53.38960	FORBES,D.	NEWFOUNDLAND		BEACH	TROWEL
* 810036	8306162	46.62580	-53.39330	FORBES,D.	NEWFOUNDLAND		BEACH	TROWEL
* 810036	8306164	46.61670	-53.39750	FORBES,D.	NEWFOUNDLAND		BEACH	TROWEL
* 810036	8306165	46.60160	-53.40830	FORBES,D.	TREPASSEY BAY,N EWFOUNDLAND	168	GRAB	

EOI ENCOUNTERED.

Appendix 18

Jim H. Swift's (1969) brief write-up on the Pan American Petroleum Corporation's 1969 M/V THERON 'Soil Gas Program'. This was kindly provided by Swift (personal communication, 1987); his index map is seen in Figure 26 in the text of the main report.

SOIL GAS PROGRAM

General Discussion

Bottom sediment samples were collected at 3160 locations on the Grand Banks. In addition, water samples from the sediment-water interface were taken at 2223 locations and a mixture of water and sediment from the sediment-water interface was collected at about the same number of locations. Sampling stations were on a 4000 foot orthogonal grid as recommended by E.C. Dahlberg (ref. 1).

The location of the sample areas is shown on figure 1; these are labeled H9A (for Horvitz - 1969 - Area A), H9B, H9C and H9D. Parts of the program originally planned for areas A, C and D were not completed. Imperial Oil participated in 20% of the total program; Imperial's locations are entirely within the A area.

The field work and the analytical work was done by Horvitz Research Laboratories, 8116 Westglen Drive, Houston, Texas. The field supervisor was Mr. Calvin B. Craig during the first half of the season and Mr. Sam Eaton during the second half of the season.

Mobilization was at Halifax, May 10 to May 16. From May 17 to May 25, the sampling equipment was tested on location and the navigation system was calibrated. The first sample was collected May 26, and sampling operations continued through October 10, 1969. During the operating period, St. John's, Newfoundland was used as base of operations.

Survey Ship

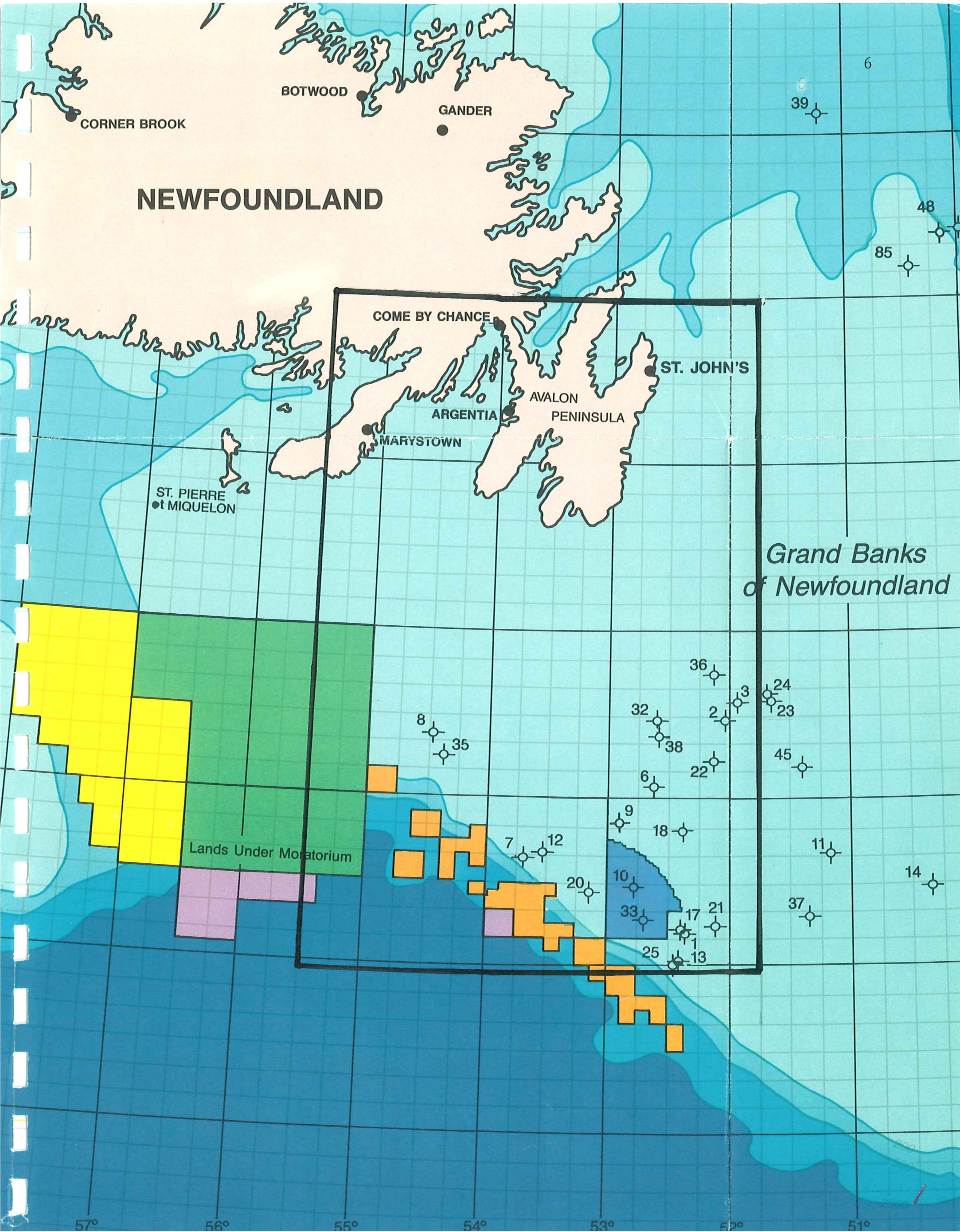
The ship M.V. Theron, owned by Christensen Canadian Enterprises Limited, of Halifax, Nova Scotia, was chartered by Horvitz Research Laboratories to conduct the Grand Banks survey. A navigation antenna was installed on a superstructure constructed over the aft deck.

Navigation

Survey locations were determined by a Decca Lambda system owned by Amoco Canada Petroleum Company and Imperial Oil Enterprises. Computing Devices of Canada Limited provided the services and logistic support in connection with the establishment, calibration, operation and demobilization of the equipment. Track plots for the pre-determined sample locations were prepared at the Amoco Canada office in Calgary.

Sampling Procedure

An A-frame about 15 feet high was constructed from four inch drill pipe and installed on the port side of the ship. The sampling unit was attached to a 3/8 inch steel cable and was lowered and raised over a sheave at the top of the A-frame by a Gardner-Denver HK Series single drum air hoist.



NEWFOUNDLAND
CORNER BROOK
BOTWOOD
GANDER
COME BY CHANCE
ST. JOHN'S
AVALON
PENINSULA
ARGENTIA
MARYSTOWN
ST. PIERRE et MIQUELON
Grand Banks of Newfoundland
Lands Under Moratorium
6
39
48
85
36
3
24
23
32
2
38
8
35
45
22
6
9
18
7
12
11
14
20
10
33
17
21
37
1
25
13
57°
56°
55°
54°
53°
52°
51°

No.	Operator	Well
1	Pan Am Imperial	Tors Cove D-52
2	Pan Am Imperial	Grand Falls H-09
3	Amoco Imperial	Eider M-75
4	Amoco Imperial	Murre G-67
5	Tenneco et al	Leif E-38
6	Amoco Imperial	Gannet O-54
7	Amoco Imperial	Puffin B-90
8	Elf	Hermine E-94
9	Amoco Imperial	Petrel A-62
10	Amoco Imperial	Shearwater J-20
11	Amoco Imperial	Bittern M-62
12	Amoco Imperial	Kittiwake P-11
13	Amoco Imperial	Heron H-73
14	Amoco Imperial	Jaeger A-49
15	Amoco Imperial	Cormorant N-83
16	Mobil Gulf	Adolphus K-41
17	Amoco Imperial	Gull F-72
18	Amoco Imperial	Merganser I-60
19	Mobil Gulf	Adolphus 2K-41
20	Amoco Imperial Skelly	Tern A-68
21	Amoco Imperial Skelly	Mallard M-45
22	Amoco Imperial Skelly	Razorbill F-54
23	Amoco Imperial Skelly	Sandpiper J-77
24	Amoco Imperial Skelly	Sandpiper 2J-77
25	Amoco Imperial Skelly	Heron J-72
26	Amoco Imperial Skelly	Osprey H-84
27	Amoco Imperial Skelly	Egret K-36
28	Eastcan et al	Leif M-48
29	Eastcan et al	Bjarni H-81
30	Amoco Imperial Skelly	Spoonbill C-30
31	Mobil Gulf	Flying Foam I-13
32	Amoco Imperial Skelly	Pelican J-49
33	Amoco Imperial Skelly	Brant P-87
34	Mobil Gulf	Bonnition H-32
35	Elf et al	Emerillon C-56
36	Amoco Imperial Skelly	Coot K-56
37	Amoco Imperial Skelly	Twillick G-49
38	Amoco Imperial Skelly	Carey J-34
39	BP Columbia	Bonavista C-99
40	Eastcan et al	Gudrid H-55
41	Amoco Imperial Skelly	Egret N-46
42	Mobil Gulf	Dominion O-23
43	Amoco Imperial Skelly	Skua E-41
44	Mobil Gulf	Adolphus D-50
45	Amoco Imperial Skelly	Phalarope P-62
46	Eastcan et al	Freydis B-87
47	Eastcan et al	Snorri J-90
48	Mobil Gulf Imperial	Cumberland B-55
49	Eastcan et al	Karlsefni A-13
50	BP Columbia et al	Indian Harbour M-52
51	Eastcan et al	Cartier D-70
52	Eastcan et al	Cabot G-91
53	Eastcan et al	Herjolf M-92
54	Eastcan et al	Verrazano L-77
55	Eastcan et al	Skolp E-07
56	Chevron et al	Hopedale E-33
57	Eastcan et al	Roberval K-92
58	Texaco Shell et al	Blue H-28
59	Esso Voyager	Gabriel C-60
60	Chevron et al	Hibernia P-15
61	BP et al	Hare Bay E-21
62	Eastcan et al	Tyrk P-100
63	Eastcan et al	Bjarni O-82
64	Petro-Canada et al	Gilbert F-53
65	Mobil et al	Hibernia O-35
66	Mobil et al	Ben Nevis I-45
67	Mobil et al	Hibernia B-08
68	Petro-Canada et al	Roberval C-02
69	Chevron et al	South Labrador N-79
70	Petro-Canada et al	Ogmund E-72
71	Petro-Canada et al	North Leif I-05
72	Mobil et al	South Tempest G-88
73	Petro-Canada et al	North Bjarni F-06
74	Mobil et al	Hibernia G-55
75	Mobil et al	Hebron I-13
76	Mobil et al	Hibernia K-18
77	Mobil et al	Sheridan J-87
78	Petro-Canada et al	Rut H-11
79	Mobil et al	Nautilus C-92
80	Petro-Canada et al	Corte Real P-85
81	Mobil et al	West Flying Foam L-23
82	Mobil et al	Hibernia J-34
83	Mobil et al	Bonanza M-71
84	Petro-Canada et al	Pothurst P-19
85	Mobil et al	Linnet E-63
86	Mobil et al	North Dana I-43
87	Mobil et al	Hibernia I-46
88	Mobil et al	Rankin M-36
89	Petro-Canada et al	Pining E-16
90	Canterra et al	South Hopedale L-39
91	Petro-Canada et al	Terra Nova K-08
92	Mobil et al	Hibernia B-27
93	Mobil et al	Hibernia K-14
94	Husky/Bow Valley et al	Trave E-87
95	Mobil et al	Hibernia C-96
96	Husky/Bow Valley et al	Voyager J-18
97	Mobil et al	South Mara C-13
98	Canterra PCI et al	Port Au Port J-97
99	Husky/Bow Valley et al	Archer K-19
100	Husky/Bow Valley et al	Whiterose N-22
101	Petro-Canada et al	West Ben Nevis B-75
102	Petro-Canada et al	Terra Nova K-18
103	Mobil et al	Mara M-54
104	Canterra PCI et al	Beothuk M-05
105	Husky/Bow Valley et al	Conquest K-09
106	Husky/Bow Valley et al	North Ben Nevis P-93
107	Husky/Bow Valley et al	Panther P-52
108	Petro-Canada et al	North Trinity H-71
109	Esso PAREX et al	Baccalieu I-78
110	Mobil et al	Mercury K-76
111	BP Beau et al	Baie Verte J-57
112	Husky/Bow Valley et al	Whiterose J-49
113	Petro-Canada et al	Terra Nova K-07
114	Canterra PCI et al	Terra Nova K-17
115	Petro-Canada et al	Gambo N-70
116	Petro-Canada et al	Terra Nova I-97
117	Husky/Bow Valley et al	Whiterose L-61
118	Husky/Bow Valley et al	North Ben Nevis M-61
119	Gulf et al	Mara E-30
120	Husky/Bow Valley et al	Fortune G-57
121	Canterra PCI	St. George J-55
122	Petro-Canada	Lancaster G-70
123	Esso PAREX et al	Kyle L-11
124	Husky/Bow Valley et al	Golconda C-64
125	Husky/Bow Valley et al	Bonne Bay C-73

Land Holders

- Amoco Canada Petroleum Co. Ltd.
- Esso Resources Canada Limited
- Gulf Canada Resources Inc.
- Mobil Oil Canada Ltd.
- Canterra Energy Ltd.
- Petro-Canada Inc.
- Labrador Group
- Shell Canada Resources Ltd.
- Texaco Canada Resources Ltd.

○ Drilling
Suspended Well
Dry and Abandoned
Abandoned with Oil Shows
● Oil Well (Abandoned Suspended)
Abandoned Oil and Gas Well
Gas Well (Abandoned Suspended)