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Marine Environmental Data Service Report for 1984/85

by

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Introduction

This report by MEDS is one of the more extensive that has been produced. The numbers of stations collected but not yet received by MEDS is large but fewer than last year. The numbers of stations received through data exchange is down slightly from last year while the numbers of stations received over the GTS is up. Overall, MEDS has received slightly fewer stations than last year. The numbers of historical stations received this year is much larger than last year. Where last year only 800 stations had been received, this year MEDS has acquired over 7500. A number of cruises were received from WDC-A and submissions were also received from ICES and the Federal Republic of Germany. A large number of Canadian cruises make up this total. These are predominantly cruises using a CTD to collect the data. MEDS has become operational in the processing of CTD data in the past year. As a result, there should be a significant rise in the data collections reported next year.

While many of these data have not reached MEDS primary archives, it was decided that a general summary of MEDS holdings would be useful. To this end a table has been prepared indicating the numbers of stations recorded in each of the NAFO subareas. Presented this way, the data holdings appear extensive. However, when it comes to the investigation of particular phenomenon, it soon becomes clear that the data base suffers from the lack of data.

As indicated last year, MEDS presents this year an attempt to quantify the surface and subsurface oceanographic conditions extant in the past year. This is based upon the utilization of all available data, analysed using the technique of optimum interpolation with the Levitus atlas as the climatology. Qualitative comparisons to the anomaly charts published by the United States show a reasonable degree of comparability between the two. A complete description of the techniques employed to compose these charts is currently in press and will be available as a MEDS Technical Report soon.

1984 Data Not Yet Received by MEDS

Table 1. presents a compilation of the known data collections occurring in the NAFO area but which have not yet reached MEDS. It has been compiled from a number of sources as indicated in the column labeled "reference". The list is ordered chronologically within an alphabetical list of countries. The table shows the information on areas, standard sections and numbers of stations where it is known. There are a total of about 3700 stations represented in the table.

1984 Data Received and Processed

As in past years, most of the data received from the NAFO area in the reporting year are from Canadian ships. This year, there has also been a significant number of stations received from the USSR. A complete list is shown in table 2. Track charts of the fully processed cruises are shown in figures A1 to A31 and cross referenced to table 2. On some of these, both BT and bottle data were collected and where this is so, only one track is shown. NAFO standard sections were run along a very few of these, but contoured sections of temperature and salinity are presented for these in figures B1 to B6.

Table 3 shows the data collections which have reached MEDS through the IGOSS system. A comparison shows that over 1700 stations of table 3 do not duplicate those indicated in table 2. The IGOSS data are a valuable source of both information of data collection activity as well as low resolution data. Again, the data from standard sections have been contoured and appear in figures B7 to B9.

Historical Data Acquisition

This year there were a substantial number of data received from previous years. Of the data collections made last year but which had not reached MEDS at the time of last year's report, only 3 have been received. Table 4. lists the cruises received and the known information about these. The numbers in brackets following the ship name, is the cruise number. The reference list indicates from where the data were received. There are about 7500 stations represented in table 4. This is a substantial increase over last year and serves to indicate the level of data still absent from MEDS files.

As an indication of the data holdings in MEDS files for the NAFO area, tables 5a and 5b have been prepared. They do not include the data recently received. They show the numbers of stations held from each subarea in each month. Overall, there are about 220,000 stations with the majority being from the more southern waters. While the coverage does appear large, when specific problems relating to determining climatic changes are addressed, it is soon found that even these holdings are often inadequate.

Review of Environmental Conditions

Figures C1-C32 show the calculation of the anomalies of temperature and salinity at the surface and 3 depths for each of the seasons of 1984. The winter season is February to April, spring is May to July, summer is August to October and autumn from November to January (1985). These are dictated by the climatology used as the basis from which anomalies have been calculated. The climatology used was that calculated by Levitus (Climatological Atlas of the World Ocean, NOAA Professional Paper 13, US Department of Commerce, 1982). Details describing the calculations of these anomalies are given by Keeley in a MEDS publication presently in press.

Plus and minus anomalies are indicated by contour lines. Contours of 0, 1, 2, 4, 6 and 8 degrees C. are shown for the temperature and 0, 0.2, 0.5, 1.0 and 1.5 PPT for salinity. The regions of negative anomaly are shaded with horizontal lines while those of positive anomalies with short, vertical dashed lines. The uncertainty in the anomaly estimates is indicated by the density of shading. For temperature, the densest shading indicates uncertainties of less than 1 degree and shading disappears for uncertainties greater than 2.5 degrees. For salinity, the regions of heaviest shading correspond to uncertainties of 0.2 PPT and shading vanishes beyond 0.5 PPT.

As a general rule, colder anomalies can be associated with fresher salinity anomalies. This is not always true so that caution must be exercised when using one to infer the other condition.

Throughout the entire year, the sea surface temperature in waters north of 50 degrees was colder than normal. Both at the beginning and the end of the year, there was a cold and fresh anomaly south and east of the Grand Banks. Throughout the entire year, conditions were cold and fresh on the Scotian Shelf. Temperatures and salinities were warmer and saltier than normal in a band stretching from near New York city out along latitude 40 degrees. This was most extensive during the summer season.

At 100 m conditions tended to reflect those at the surface. Again cold conditions persisted throughout the year along the Labrador and Greenland coasts. The cold anomaly off the Grand Banks penetrated through to this depth with no obvious weakening. On the Scotian Shelf, conditions begin the year colder and fresher than usual but by the end of the year the anomalies are warmer than climatology, though only slightly. There is the suggestion of a moderation in conditions as the year progresses.

At 250 m cold anomalies persist in the northern parts of the coast of Labrador and along the West Greenland shore. The cold anomaly near the Grand Banks is still evident at this depth and still persists throughout the year. The warming of the Scotian Shelf begins in summer until by the late part of the year, the waters west of 50 degrees W and south of Newfoundland are dominated by warmer (and there is some indication it is also saltier) conditions.

At 500 m there is not enough data to assess the conditions in the northern parts of the NAFO area. The data that exists lies offshore and is difficult to interpret. However, it does seem to show features consistent with those found at shallower depths.

TABLE 1. Data collected in the NAFO area in 1984 but not received at MEDS. SUM=3735 stations.

PLATFORM	CRUISE PERIOD	NAFO SUBAREA	STANDARD SECTION	NUMBER	REFERENCE
		Canada			
Hudson(1)	23 Jan-3 Feb	4RST		96	ROSCOP
A. Needler	27 Jan-5 Feb	4Vn		?	C84124I01
G. Atlantica	17-20 Feb	3	Flemish Cap	19	NAFO
G. Atlantica	Feb	3		28	NAFO
G. Atlantica	Feb	6		3	NAFO
G. Atlantica	Feb-Mar	4		14	NAFO
G. Atlantica	Feb-Mar	4		50	NAFO
Hudson(12)	27 Apr-15 May	4VsW, 6EF		128	ROSCOP
Dawson(8)	22-28 May	4X		33	ROSCOP
Hudson	25 May-15 Jun	3NO, 4Vs, 6	FG	17	C85015I01
Dawson	5-20 Jun	3LOPs		55	C85021I01
Dawson(23)	8-19 Jun	3NO		45	ROSCOP
Dawson(20)	24-31 Jun	4WX		20	ROSCOP
Shamook	Jun	3		3	NAFO
E.E. Prince	Jun	3		78	NAFO
Dawson(21)	21 Jun-7 Jul	3Ps		115	ROSCOP
?	Jun-Jul	3		28	NAFO
Dawson(33)	10-16 Jul	4X		76	C85016I01
L. Hammond	27-29 Jul	3	Bonavista	30	NAFO
L. Hammond	30-31 Jul	3	White Bay	17	NAFO
Shamook	Jul	3		1	NAFO
W. Templeman	Jul	3		50	NAFO
L. Hammond	Jul	3		6	NAFO
W. Templeman	Jul-Aug	3		6	NAFO
L. Hammond	1-2 Aug	2	Seal Isl.	9	NAFO
L. Hammond	4-6 Aug	3	Flemish Cap	25	NAFO
C. Elizabeth	Aug	2		8	NAFO
Marinus	Aug	3		14	NAFO
Dawson(34)	15 Aug-1 Sep	4W		30	ROSCOP
Dawson(36)	5-19 Sep	4VsW, 6EF		52	ROSCOP
G. Atlantica	Sep	3		1	NAFO
Baffin(39)	26 Sep-3 Oct	0A, 1A		17	ROSCOP
Shamook	Oct	3		18	NAFO

TABLE 1. Continued.

PLATFORM	CRUISE PERIOD	NAFO SUBAREA	STANDARD SECTION	NUMBER	REFERENCE
G. Atlantica	Nov	3		1	NAFO
W. Templeman	Nov	3		1	NAFO
Dawson(48)	29 Nov-7 Dec	4RST		25	ROSCOP
		Denmark			
A. Jensen	Jan - Mar	1		18	NAFO
A. Jensen	5 Jan	1	Fylla	2	NAFO
A. Jensen	23 Feb	1	Fylla	2	NAFO
A. Jensen	29 Feb	1	Frederikshab	4	NAFO
A. Jensen	13 Mar	1	Fylla	4	NAFO
A. Jensen	29 Mar	1	Frederikshab	3	NAFO
A. Jensen	Apr - Jun	1		10	NAFO
A. Jensen	6 Apr	1	Fylla	5	NAFO
A. Jensen	29 Apr	1	Fylla	5	NAFO
A. Jensen	30 Apr	1	Frederikshab	5	NAFO
A. Jensen	1 May	1	C. Desolation	5	NAFO
A. Jensen	3 May	1	C. Farewell	5	NAFO
A. Jensen	15 Jun	1	Fylla	4	NAFO
A. Jensen	Jul - Sep	1		49	NAFO
A. Jensen	6 Jul	1	Egedesminde	5	NAFO
A. Jensen	7 Jul	1	Holsteinborg	5	NAFO
A. Jensen	9 Jul	1	L. Hellefiske.	5	NAFO
A. Jensen	10 Jul	1	Fylla	5	NAFO
A. Jensen	20 Aug	1	Fylla	5	NAFO
A. Jensen	5 Dec	1	Fylla	5	NAFO
		France			
Cryos	Jan - Mar	3PnPs, 4R		162	NAFO
Cryos	Jul - Sep	4VWX		125	NAFO
Cryos	8 Sep		Baccaro	8	NAFO
Cryos	19 Sep		Halifax	10	NAFO
Cryos	26 Sep		Banquereau	7	NAFO
Cryos	Oct - Dec	3Ps		100	NAFO
		Fed. Rep. Germany			
W. Herwig	8 Oct-22 Nov	1F, 2GHJ		175	ROSCOP
		USA			
Vigilant (1)	4 Jan	5Zw		?	SCR
Delaware 2(1)	9 Jan-10 Feb	5YZeZw, 6AB		161	C84086I01
Vigilant (2)	9 Feb	5Zw		?	SCR
Albatross 4(1)	13-24 Feb	5YZeZw, 6A		136	C84089I01
Delaware 2(2)	14-23 Feb	5Zw, 6AB		147	C84107I02
Clearview (1)	25 Feb	5Zw		?	SCR
Albatross 4(2)	29 Feb-16 Mar	5YZeZw, 6AB		175	C84124I02
Bullwinkle (5)	4 Mar	5Zw		?	SCR
Albatross 4(2)	19-29 Mar	5YZeZw, 6A		93	C85044I01
Oceanus (1)	22 Mar	5Zw		?	SCR
Oceanus (2)	28 Mar	5Zw		?	SCR
Albatross 4(2)	2-13 Apr	5YZeZw		55	C85045I01
	16-27 Apr	5YZeZw		82	C85050I01
Oceanus (3)	18 Apr	5Zw		?	SCR
Oceanus (4)	25 Apr	5Zw		?	SCR
Oceanus (5)	1 May	5Zw		?	SCR
C.Henlopen (1)	4 Jun	5Zw		?	SCR
Albatross 4(4,5)	11-22 Jun	5YZeZw, 6AB		?	C85036I01
Bullwinkle (16)	18 Jul	5Zw		?	SCR
Albatross 4(7)	6-16 Aug	5YZeZw, 6AB		70	C84251I01
C.Henlopen (2)	20 Aug	5Zw		?	SCR
Bullwinkle (24)	13 Sep	5Zw		?	SCR
Albatross 4(8)	1-12 Oct	5YZeZw, 6A		42	C85002I01
Vigilant (3)	8 Oct	5Zw		?	SCR
Delaware 2(8)	5-14 Oct	5YZeZw, 6A		250	C85008I01
Delaware 2(8)	15-26 Oct	5YZeZw, 6A		250	"
Albatross 4(8)	15-26 Oct	4X, 5YZeZw		65	C85002I01 C84010I01
Mt.Mitchell(1)	28 Oct	5Zw		?	SCR
Albatross 4(8)	29 Oct-9 Nov	5YZeZw		114	C85014I01
Delaware 2(9)	29 Oct-9 Nov	5Zw,6AB		68	C85035I01
	12-21 Nov	"		29	"

TABLE 1. Continued.

PLATFORM	CRUISE PERIOD	NAFO SUBAREA	STANDARD SECTION	NUMBER	REFERENCE
Vigilant (4)	25 Nov	5Zw		?	SCR
Delaware 2(9)	27 Nov-7 Dec	5Zw,6AB		49	C85035I01
Albatross 4(9)	27 Nov-14 Dec	5YZeZw, 6AB		92	C85036I01

Note: Much of the data collected by Canadian ships used CTDs. MEDS is now able to start archiving these data and will be working to clear up the backlog in the upcoming year.

CODES : NAFO - information has been obtained from NAFO inventory forms.

ROSCOP - information has been obtained from ROSCOP forms.

C..... - information has been extracted from MEDS' CAMDI data base.

SCR - information derived from NAFO documents.

Canada

TABLE 2. Data collected in the NAFO area in 1984 and received by MEDS. SUM=2908 stations.

SHIP NAME	CRUISE PERIOD	SUBAREA	DATA TYPE BOT	DATA TYPE BT	CRUISE NUMBER	FIG
		Canada				
Annapolis	12 Jan-22 Mar			89	181884010	A1
Huron	16 Jan-1 Feb			21	181884002	A2
Saguenay	17 Jan-21 Feb			29	181884003	A3
Margaree	17-23 Feb			18	181884008	A4
Algonquin	17 Jan-1 Mar			36	181884006	A5
Fraser	19 Jan-8 Feb			25	181884001	A6
Skeena	13-22 Feb			7	181884004	A7
Ottawa	17 Feb-21 May	1,2,3,4,5,6		52	181884005	A8
E.E. Prince	28 Feb-13 Mar		138		180384001	A9
A. Needler	2-13 Mar		81	32	180384002	A10
A. Needler	17-27 Mar		102	90	180384003	A11
Skeena	16-18 May	4WX, 6E		9	181884014	
A. Needler	5-13 Jun			65	180384004	A12
Iroquois	16-29 Jun			30	181884007	A13
A. Needler	10-22 Jul		66	24	180384005	A14
A. Needler	25 Jul-2 Aug		78	37	180384006	A15
Ottawa	27 Jul-10 Sep	2, 3, 4, 6		42	181884015	
J.L. Hart	4-7 Sep		32		180384009	A16
Eric 2	7-13 Sep			8	183184001	A17
A. Needler	17 Sep-2 Oct			112	183184004	A18
A. Needler	9-18 Oct		70		180384007	A19
E.E. Prince	10-15 Oct			47	183184002	A20
L. Hammond	6-22 Oct		58		180384011	A21
E.E. Prince	20-26 Oct			14	183184003	A22
Saguenay	22-25 Oct			11	181884012	A23
A. Needler	23 Oct-1 Nov		98		180384008	A24
A. Needler	2-15 Nov		176	45	180384010	A25
Protecteur	5-9 Nov			10	181884011	A26
Fraser	10-16 Dec	4WX		23	181884016	

TABLE 2. Continued.

SHIP NAME	CRUISE PERIOD	SUBAREA	DATA TYPE BOT	DATA TYPE BT	CRUISE NUMBER	FIG
		USSR				
Suloy	15 Oct(83)-29 Jan(84)	0A, 2GHJ, 3LKMN	76	16	90SU83029	
Kokshaisk	31 Oct(83)-13 Jan(84)		67	74	90KK83004	A27
Poisk(19)	29 Mar-13 Jun	3LMNO	41	63	90PK84019	
Suloy(30)	29 Mar-8 Aug		446		90SU84030	A28
Lensk(18)	19 Apr-13 Jun	3LMNO	7	61	90 84018	
Vilnjus(2)	20 Jun-24 Aug		139		90VI84002	A29
Suloy (31)	14 Sep-13 Nov	0B, 2GH, 3MO	44		90SU84031	A30
Kokshaisk	31 Oct(84)-15 Jan(85)		99		90KK84009	A31

TABLE 3. IGOSS data received during 1984.
SUM (stations not in table 2)=1725.

SHIP NAME	COUNTRY	CALL SIGN	CRUISE PERIOD	MSG TYPE BATHY	MSG TYPE TESAC	NAFO SUBAREA
Alf. Needler	Canada	CG2683	17 Sep-2 Oct	92		4VnVsWX, 5ZeY
M de Oliveira	Portugal	CSDQ	9-11 Aug	5		6EFG
		CSDQ	3-9 Oct	12		6DEFG
		CSDQ	23-26 Nov	4		6FGH
W. Herwig	FRG	DBFP	24 Oct- 13 Nov	52		1A-F, 2HJ
?	?	DBLK	15-17 May	13		1F, 2H
		DBLK	1-4 Jun	11		1F, 2H
Monsoon	USSR	EREA	4-28 May	63	29	3MN, 6H
Poryv	USSR	ERES	1 Jan-18 Feb	99	47	3MN, 6H
		ERES	18 Apr-13 May	39	28	3KLNO, 4Vs, 6GH
G Ushakov	USSR	ERET	1-25 Jan	58	25	3M
		ERET	26 Oct-25 Nov	35	34	3MN, 6H
E Krenkel	USSR	EREU	3 Feb- 5 Mar	66	16	3MN, 6H
		EREU	29 Jun-17 Jul	43	8	3MN, 6H
Poisk	USSR	EWEL	16 Apr-15 May	3		1F
Cryos	France	FNBA	24 Jan-3 Feb	46		3Pn, 4R
		FNBA	9 Feb-3 Mar	68		3PnPs, 4R
		FNBA	8-18 Mar	33		3Ps, 4VnVs
		FNBA	1-30 Sep	115		4VsWX, 5Ze
		FNBA	19 Oct-11 Nov	82		3Ps
Delaware 2	USA	KNBD	17-26 Jan	6		5ZeZw
Marshfield	USA	NIZX	30 Sep- 4 Oct	10		6BDEFGH
		NIZX	8-29 Dec	19		3MNO, 4Vs, 6DEF
CGC Dallas	USA	NPCR	18-29 May	13		5Zw, 6A-G
CGC Taney	USA	NRDT	31 May-26 Jul	54		6BDE
Northwind	USA	NRFJ	24 Jul-3 Aug	14		1ABCDEF
Oleander	Neth	PJYG	6-24 Apr	20		6ABD
		PJYG	7-12 Jul	13		6ABD
		PJYG	10-16 Aug	33		6ABD
		PJYG	7-13 Sep	36		6ABD
		PJYG	1-10 Nov	44		6ABD
Passat	USSR	UZGH	27 Jul-17 Aug	31	27	3MN, 6H
		UZGH	24 Oct-15 Dec	13	69	3MN, 6H
L Hammond	Canada	VC9616	8-11 Feb	15		4X
		VC9616	22-29 Mar	52		4X, 5Ze
	Canada	VC9616	18-26 Apr		55	4X
		VC9616	15-22 May		53	4X, 5Ze
		VC9616	12-21 Jun		79	4X, 5Ze
Mt Mitchell	USA	WTEG	23-30 Oct	21		6B
Albatross 4	USA	WMVF	18-27 Sep	24		6AB
		WMVF	5 Oct-1 Nov	22		6AB
?	?	WZC88	3-7 Jun	15		6B
		WZC88	15-21 Aug	8		6B

NOTE: DBFP has a Seal Island-Cape Farewell section.

TABLE 4. Historical data received in 1984.
SUM=7519 stations.

SHIP	DATE	AREA	NUMBER	REF
	Canada			
?	15-31 Oct, 1977	OB, 2GHJ, 3K	125	181077029
?	?	4X	58	181077026
?	26 Jan-11 Apr, 1978	1F, 2GHJ, 3KLM	157	181078002
?	29-30 Sep,1979	4S	29	181079026
?	6-9 Jan, 1980	3L	12	181080002
?	26 Mar-2 Apr, 1980	4X	81	181080006
?	9-16 Apr, 1980	4RSTX	27	181080007
?	17-22 Jul, 1980	2J	49	181080026
?	1-9 Sep, 1980	OB	60	181080028
?	11-18 Sep, 1980	3M, 6H	16	181080029
Misty Sea	29 Sep-12 Oct, 1980	4RSTVn	51	180380027
?	25-27 Oct, 1980	3L	47	181080034
?	23-29 Oct, 1981	4X	24	181081040
?	28-31 Oct, 1980	2J	20	181080037
?	17-18 Nov, 1980	4W	5	181080039
?	11 Apr-9 May, 1981	3M	44	181081007
?	13-22 Nov, 1981	4W	72	181081042
Shamook	2-20 Apr, 1982	3L	16	180582024
G. Atlantica	2-21 Apr, 1982	3L	26	180582018
E.E. Prince	20-27 Apr, 1982	4WVs	19	183182001
Marinus	5-10 May, 1982	3L	16	180582028
Shamook	24-26 May, 1982	3L	7	180582025
G. Atlantica	25 May-13 Jun, 1982	3LNO	207	180582019
Marinus	5-27 Jun, 1982	3L	53	180582029
Shamook	30 Aug-9 Sep, 1982	3L	13	180582026
G. Atlantica	1-7 Sep, 1982	3L	7	180582020
G. Atlantica	9-28 Sep, 1982	2GHJ, 3KL	123	180582021
Marinus	10-11 Sep, 1982	3L	4	180582030
G. Atlantica	30 Sep-26 Oct, 1982	2J, 3KL	27	180582022
G. Atlantica	29 Oct-6 Nov, 1982	2J, 3KL	174	180582023
W. Templeman	30 Oct-1 Nov, 1982	3L	11	180582031
Shamook	4-17 Nov, 1982	3L	12	180582027
A.T. Cameron	5-16 Nov, 1982	3L	55	180582016
E.E. Prince	18 Nov, 1982	4W	5	183182003
A.T. Cameron	23 Nov-6 Dec, 1982	3L	60	180582017
Marinus	19 Jan-17 Feb, 1983	3L	54	180583013
G. Atlantica	2-21 Feb, 1983	3LM	164	180583001
G. Atlantica	19-28 Mar, 1983	3KL	76	180583002
A. Needler	23 Apr-8 May, 1983	3PsPn, 4Vn	188	180583015
G. Atlantica	26 Apr-10 May, 1983	3L	48	180583003
Huron	26 Apr-17 Jun, 1983	3MNO, 4VS, 6FGH	53	181883020
G. Atlantica	12-25 May, 1983	3L	98	180583004
Shamook	18 May-15 Jun, 1983	3L	55	180583012
Marinus	25 May-29 Jun, 1983	3L	64	180583014
G. Atlantica	27 May-8 Jun, 1983	3LOPs	205	180583005
W. Templemen	9-14 Jul, 1983	3L	44	180583016
G. Atlantica	14 Jun-4 Jul, 1983	3LNOPs	64	180583006
W. Templeman	21 Jul-2 Aug, 1983	3L	54	180583017
W. Templeman	6-13 Aug, 1983	3L	33	180583018
W. Templeman	25 Sep-1 Oct, 1983	3L	10	180583019
G. Atlantica	28 Sep, 1983	3L	1	180583007
G. Atlantica	2-25 Oct, 1983	2J, 3KL	34	180583008
W. Templeman	13-18 Oct, 1983	3L	39	180583020
W. Templeman	21 Oct-1 Nov, 1983	3L	58	180583021
G. Atlantica	28 Oct-9 Nov, 1983	2J	97	180583009
W. Templeman	4-15 Nov, 1983	3L	34	180583022
G. Atlantica	11-23 Nov, 1983	2J, 3KL	95	180583010
A. Needler	18-29 Nov, 1983	4WVs	99	180383022
E.E. Prince	20-23 Nov, 1983	4WVs	5	183183001
W. Templeman	21 Nov-2 Dec, 1983	3N	72	180583023
G. Atlantica	27 Nov-9 Dec, 1983	3KL	76	180583011
	Denmark			
A. Jensen	1 Jan-31 Dec, 1982	1A-F	155	26AJ82001

TABLE 4. Continued.

SHIP	DATE	AREA	NUMBER	REF
	Fed. Rep. Germany			
A. Dohrn	27 Feb-22 Apr, 1958		10	06AD58028
A. Dohrn	2 Apr-29 Sep, 1958		15	06AD58031
A. Dohrn	1-27 May, 1961		11	06AD61052
A. Dohrn	23 Feb-12 Mar, 1962		18	06AD62059
A. Dohrn	20 May-3 Jul, 1963		3	06AD63069
A. Dohrn	3 Jul-4 Aug, 1965		53	06AD65088
A. Dohrn	27 Sep-30 Oct, 1966		26	06AD66100
W. Herwig	18 Oct-18 Dec, 1971		99	06HW71039
W. Herwig	1 Mar-6 Apr, 1972		10	06HW72042
A. Dohrn	17 Oct-17 Dec, 1972		47	06AD72165
W. Herwig	15 Oct-15 Dec, 1973		51	06HW73052
W. Herwig	6 Mar-16 Apr, 1974		79	06HW74054
W. Herwig	25 Jun-10 Jul, 1980	1BCDEF	12	06HW80085
	Poland			
Wieczno(2)	20 Feb-20 Mar, 1980		87	WDC-A
	USA			
Delaware 2(5)	6-29 May, 1979		175	WDC-A
Albatross 4(6)	17 Jun-7 Jul, 1979		131	WDC-A
Evergreen	29 Jul-17 Aug, 1979		46	WDC-A
Albatross 4(11)	3-28 Oct, 1979		166	WDC-A
Atlantis 2(107)	17 Oct-2 Nov, 1979		46	WDC-A
Albatross 4(13)	15 Nov-2 Dec, 1979		82	WDC-A
Albatross 4(2)	27 Feb-4 Apr, 1980		156	WDC-A
Evergreen	29 Apr-7 May, 1980		26	WDC-A
Delaware 2(3)	23 May-12 Jun, 1980		121	WDC-A
Evergreen(IIP80)	10-16 Jun, 1980		10	WDC-A
Albatross 4(10)	26 Sep-29 Oct, 1980		175	WDC-A
Albatross 4(12)	19 Nov-21 Dec, 1980		138	WDC-A
Albatross 4(1)	18 Feb-24 Mar, 1981		150	WDC-A
G.B. Kelez(3,4)	19 Mar- 9 Apr, 1981		97	WDC-A
Delaware 2(3)	21 May-17 Jun, 1981		148	WDC-A
Evergreen(IIP81)	25 Jun-3 Jul, 1981		59	WDC-A
Albatross 4(14)	18 Oct-21 Dec, 1981		89	WDC-A
Delaware 2(3)	18 May-11 Jun, 1982		110	WDC-A
Delaware 2	18 Jan-11 Feb, 1983		104	WDC-A
Albatross 4	26 May-21 Jun, 1983		176	WDC-A
Delaware 2	16 Nov-20 Dec, 1983		152	WDC-A
	USSR			
Knipovitch(43)	12 Jun-6 Sep, 1971		152	WDC-A
Belogorsk(3)	6 Oct-1 Nov, 1978		130	WDC-A
Belogorsk(4)	16-29 Nov, 1978		79	WDC-A
Belogorsk(1)	11 Aug-2 Sep, 1979		151	WDC-A
Evrika(1)	17 Apr-12 May, 1980		148	WDC-A
Evrika(6)	16 Jul-9 Aug, 1980		155	WDC-A
Stvor(1)	12 Aug-16 Sep, 1981		107	WDC-A
Protsion(26)	11 Oct-7 Nov, 1982		32	90PH82026
Suloy(26)	14 Oct(82)-20 Feb(83)		139	90SU82026
Suloy(27)	16 Apr-4 Aug, 1983	3KLMNO, 4Vs	179	90SU83027
Gemma	24-31 May, 1983		42	90GE83027

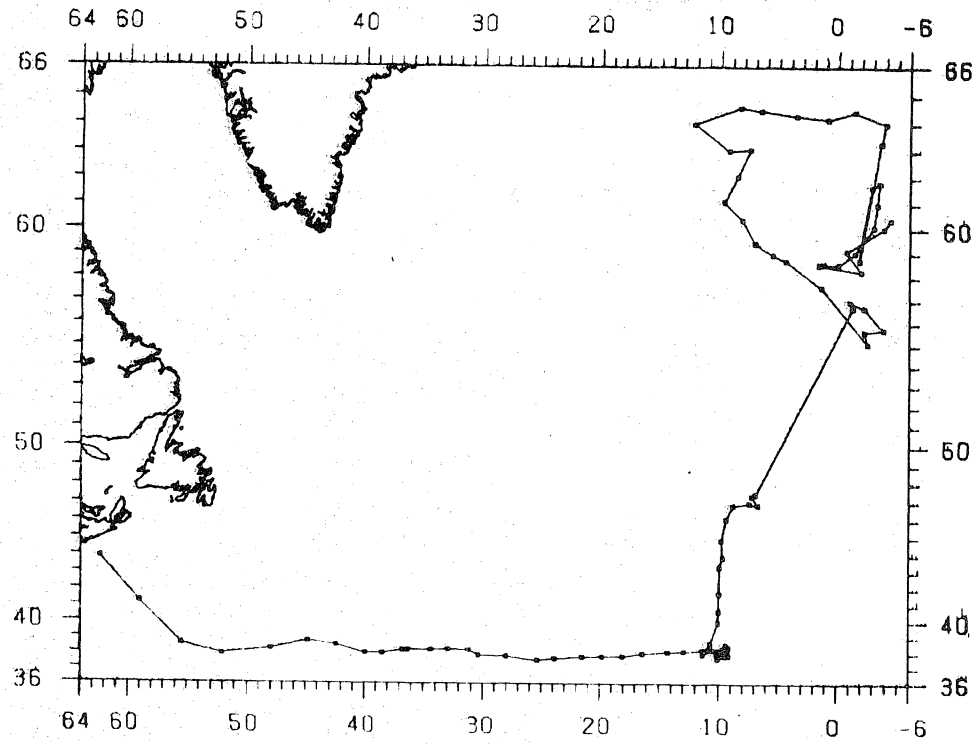
NOTES: The unidentified Canadian cruises from the late 1970s and early 1980s collected CTD data. The ship names are in the headers of the files on the magnetic tape and these have not yet been processed.

TABLE 5a. Counts of hydrocast stations in MEDS files.

AREA	J	F	M	A	M	J	J	A	S	O	N	D	
1A		2					67	177	166	125			537
1B			1	9	4	42	90	45	74	51	19	15	350
1C	6		12	70	12	88	92	64	133	30	26	19	552
1D	14	21	39	165	64	123	165	173	114	60	49	27	1014
1E		13	48	81	64	29	168	95	31	20	22	14	585
1F	8	24	97	124	71	43	337	232	124	63	25	8	1156
2G	2		21	12	5	24	147	80	93	71	71	23	549
2H	124	93	165	256	259	282	365	316	287	221	184	113	2665
2J	46	34	33	50	51	165	631	410	130	233	209	123	2115
3K	47	13	13	141	175	379	370	324	129	70	164	49	1874
3L	193	128	281	1038	1269	1250	1037	580	307	280	218	65	6646
3M	228	171	327	1100	936	638	484	293	119	69	126	23	4514
3N	123	128	228	1774	2044	1445	403	603	151	147	202	34	7282
3O	10	16	149	389	290	381	222	442	87	55	14	14	2069
3Ps	5	103	162	99	93	325	83	319	54	67	36	6	1352
3Pn		8	4		7	17	4	17		1	11		69
4R	43	28	40	38	94	137	109	383	212	86	358	34	1562
4S	31	45	23	62	202	315	165	391	195	133	284	6	1852
4T	100	59	23	111	1305	2412	2139	2353	1635	736	380	26	11279
4Vn	112	67	124	50	140	205	251	237	105	156	117	11	1575
4Vs	64	99	307	157	185	325	562	380	213	298	199	30	2819
4W	194	368	696	411	493	472	1447	1028	803	591	386	84	6973
4X	639	1091	1966	1259	1140	833	1943	1958	1195	1503	2087	404	16018
5Y	71	92	358	215	161	103	202	308	191	223	368	60	2352
5Ze	143	318	357	295	486	397	567	550	561	546	367	302	4889
5Zw	131	383	378	202	198	230	517	909	398	830	298	238	4712
6A	164	183	223	184	125	201	169	491	229	158	142	192	2461
6B	410	353	682	394	464	557	657	770	622	635	385	364	6293
6C	155	268	210	275	279	331	335	396	377	276	234	138	3274
6D	90	51	25	128	173	195	320	340	335	293	80	37	2067
6E	33	17	25	53	83	35	27	62	56	32	71	17	511
6F	2	6	9	29	12	22	14	14	24	10	9	2	153
6G	18	10	25	36	13	17	29	18	13	16	18	9	222
6H	64	86	80	154	183	210	128	80	152	92	51	45	1325

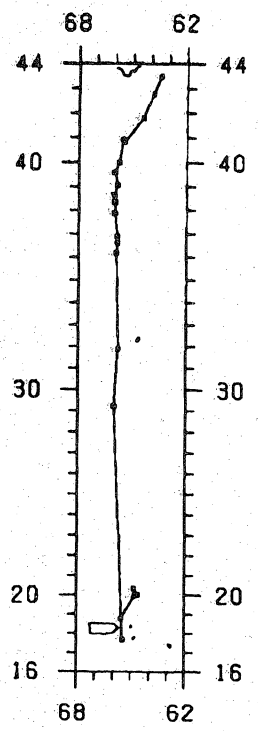
TABLE 5b. Counts of BT stations in MEDS files.

AREA	J	F	M	A	M	J	J	A	S	O	N	D	
1A			6	1		109	262	356	212	52			998
1B			1		8	10	18	24	96	17			174
1C	1		6			20	20	27	46	13			133
1D	10	2	8			20	17	32	45	6			140
1E	6	12	14			22	3	17	22				96
1F		8	29	6		52	14	62	67	19			257
2G	3	14	24	15	3	22	128	216	96	50	52		623
2H	105	7	106	2	71	188	337	377	180	165	106	71	1715
2J	9	17	135	70	135	226	599	841	322	293	445	48	3140
3K	17	11	250	26	172	197	253	555	274	379	269	191	2594
3L	243	195	357	346	1041	719	695	666	626	540	377	73	5878
3M	237	299	55	103	312	61	232	57	40	90	65	4	1555
3N	11	65	75	210	540	798	282	561	183	307	144	26	3202
3O	31	117	161	276	543	596	201	482	129	122	135	30	2823
3Ps	197	362	485	364	384	874	360	504	397	237	241	180	4585
3Pn	71	69	44	35	94	80	22	42	26	32	32	22	569
4R	175	70	9	25	226	562	483	509	432	244	567	70	3372
4S	11	124	10	139	411	474	360	585	316	318	370	19	3137
4T	82	143	31	96	1517	2967	2903	3211	2493	1133	713	134	15423
4Vn	210	73	71	40	204	433	384	260	164	188	356	60	2443
4Vs	284	239	435	373	564	605	694	472	512	413	577	251	5419
4W	636	1276	1229	1096	2008	1423	2118	1988	1802	1569	1663	746	17554
4X	1569	1926	2672	2448	2973	2285	3358	3254	2392	2612	3175	1297	29961
5Y	82	113	231	108	99	42	86	164	166	245	382	46	1764
5Ze	176	262	361	505	662	519	365	356	392	636	571	205	5010
5Zw	88	147	80	144	269	106	97	72	136	136	120	70	1465
6A		1	8	4		7	20	16	2	9	54		121
6B		9	10	22	40	40	26	26	10	15	77	40	315
6C	2	23	44	40	35	12	21	9	12		110	100	408
6D	14	36	40	45	19	48	15	21	7	15	414	152	826
6E	84	49	78	86	187	303	45	63	96	26	153	146	1316
6F	11	9	5	4	7	133	15	5	1		10	1	201
6G	1		45	2	35	22	2	9	6	8	13	5	148
6H	3	1	14	8	184	139		1	15	9			374



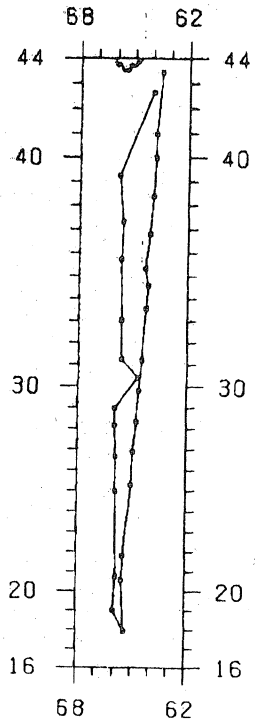
CRUISE 181884010 12/ 1/84 - 22/ 3/84

Figure A1.



CRUISE 181884002 16/ 1/84 - 1/ 2/84

Figure A2.



CRUISE 181884003 17/ 1/84 - 12/ 2/84

Figure A3.

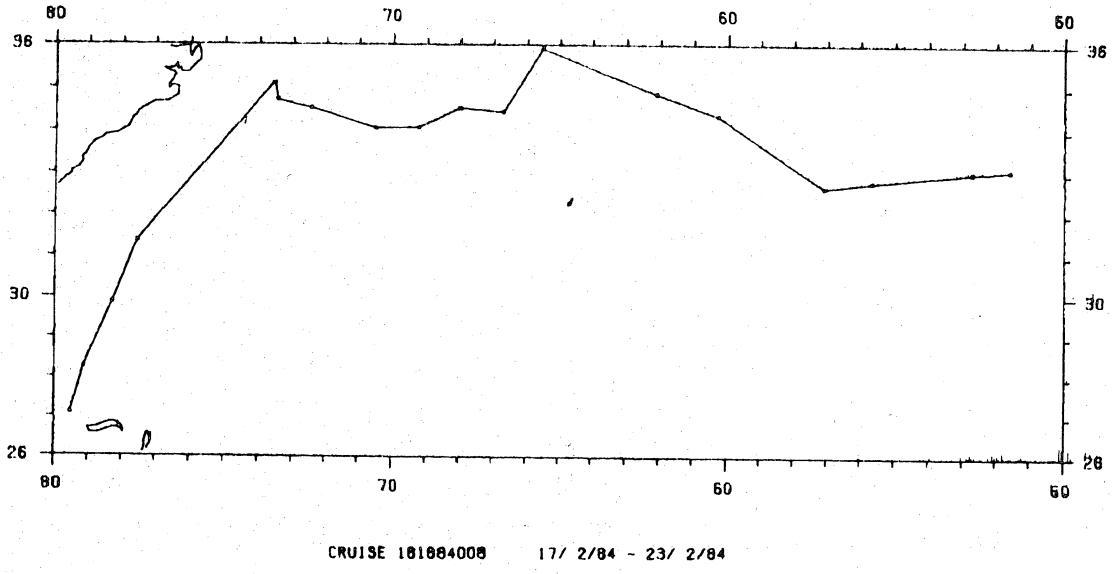


Figure A4.

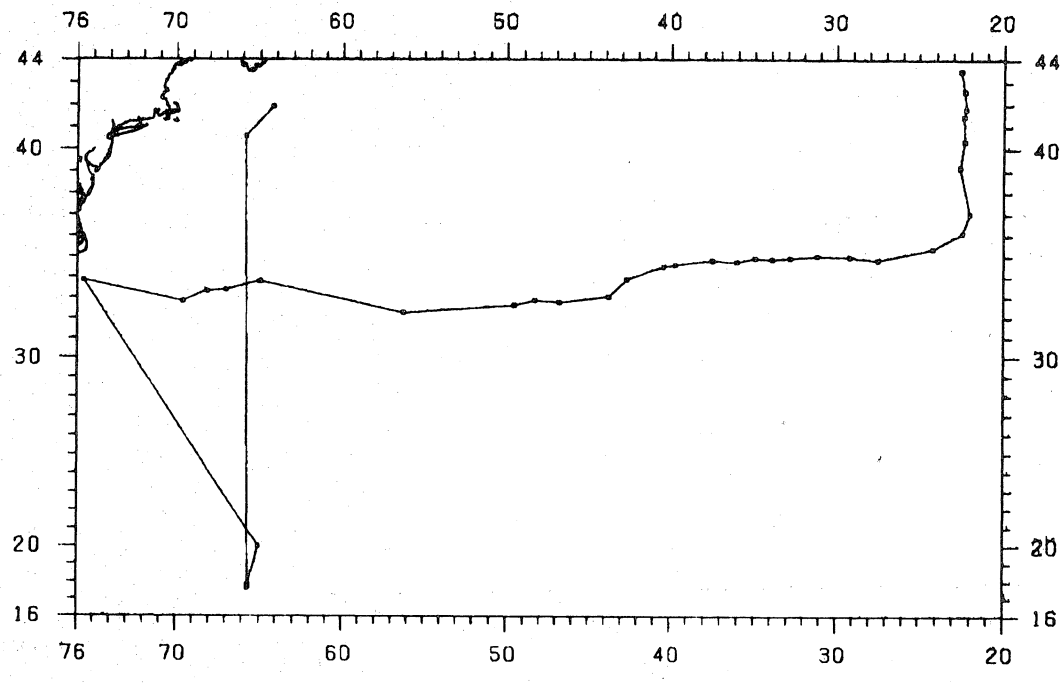
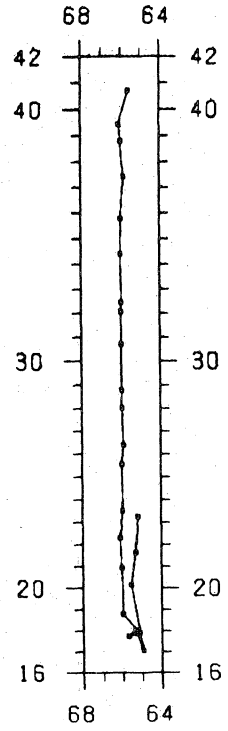
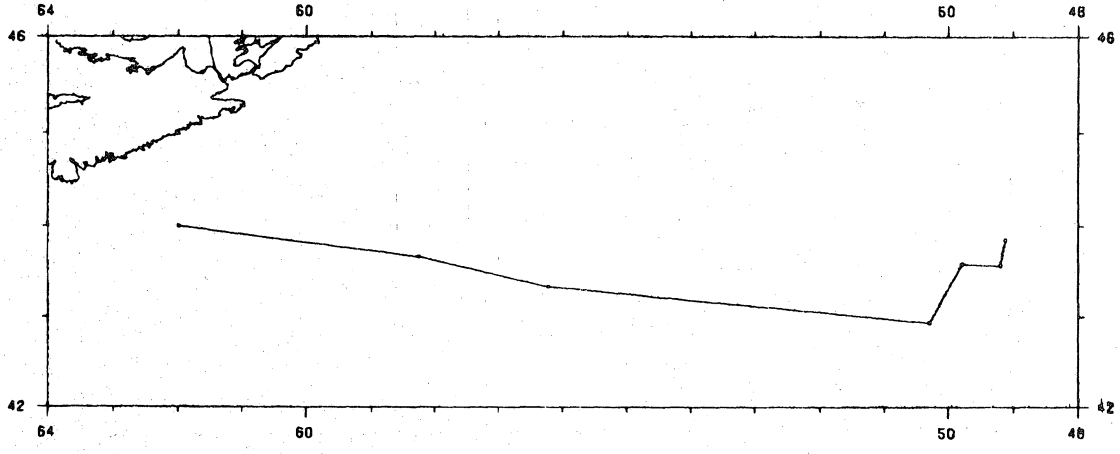


Figure A5.



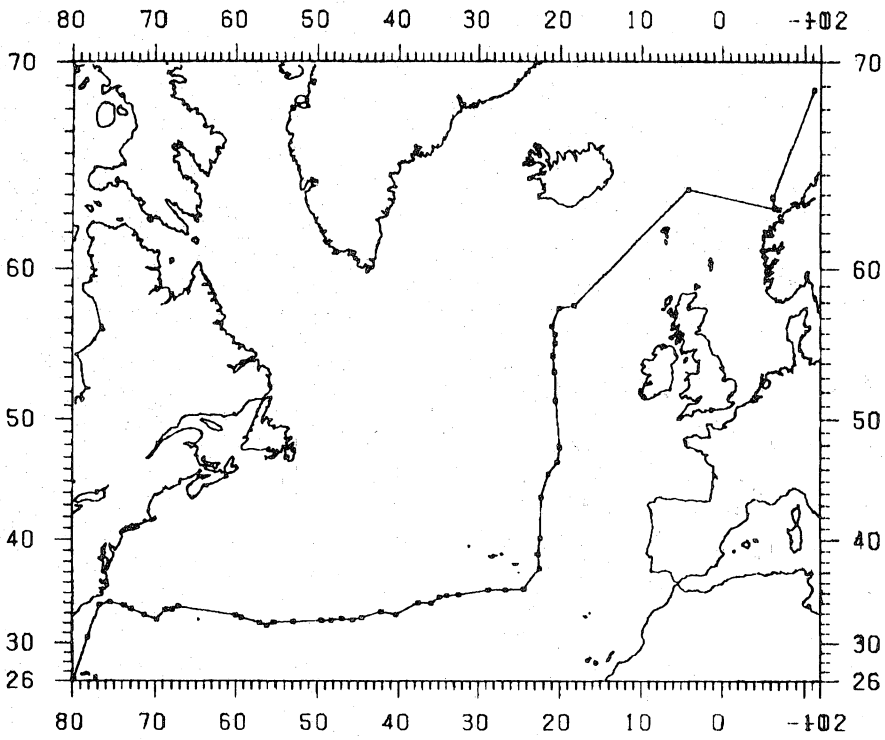
CRUISE 181884001 19/ 1/84 - 8/ 2/84

Figure A6.



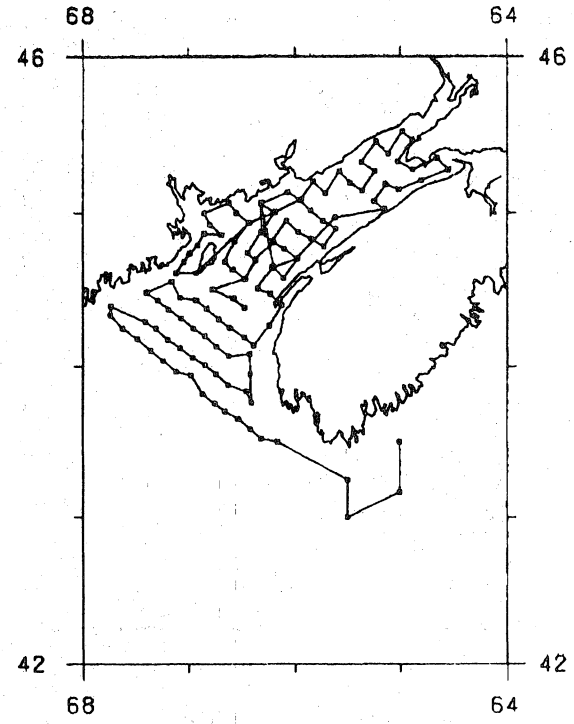
CRUISE 181884004 13/ 2/84 - 22/ 2/84

Figure A7.



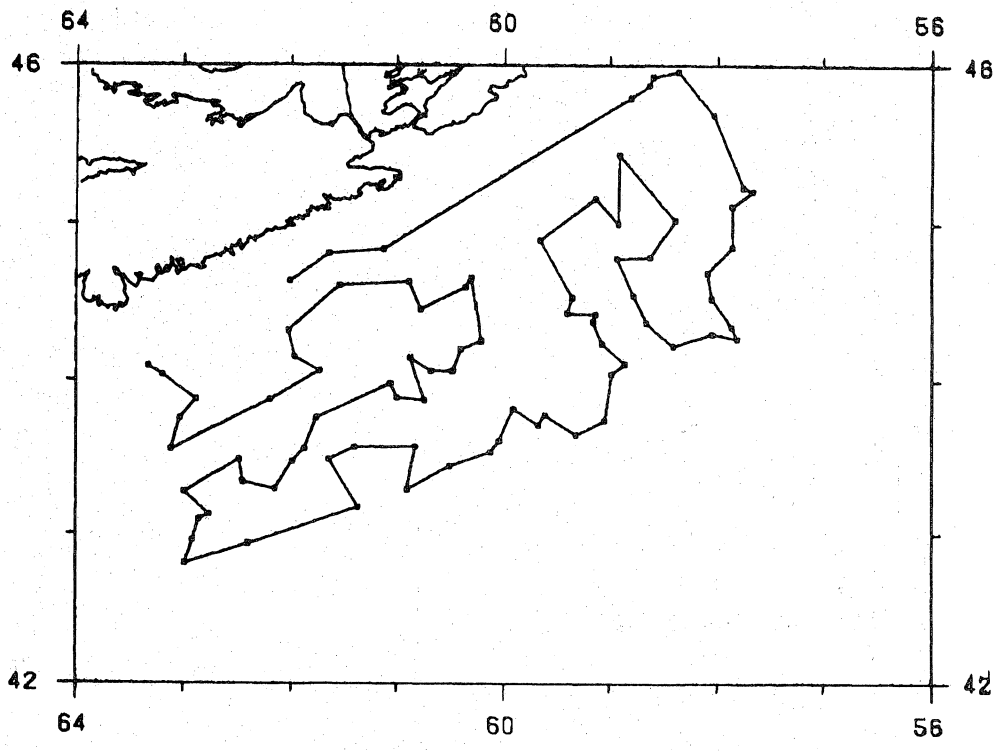
CRUISE 181884005 17/ 2/84 - 21/ 5/84

Figure A8.



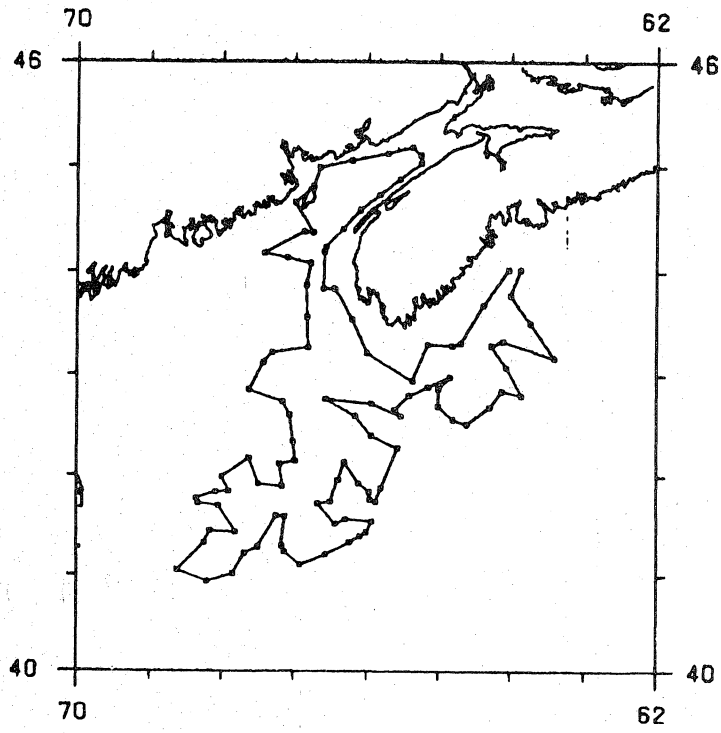
CRUISE 180384001 28/ 2/84 - 13/ 3/84

Figure A9.



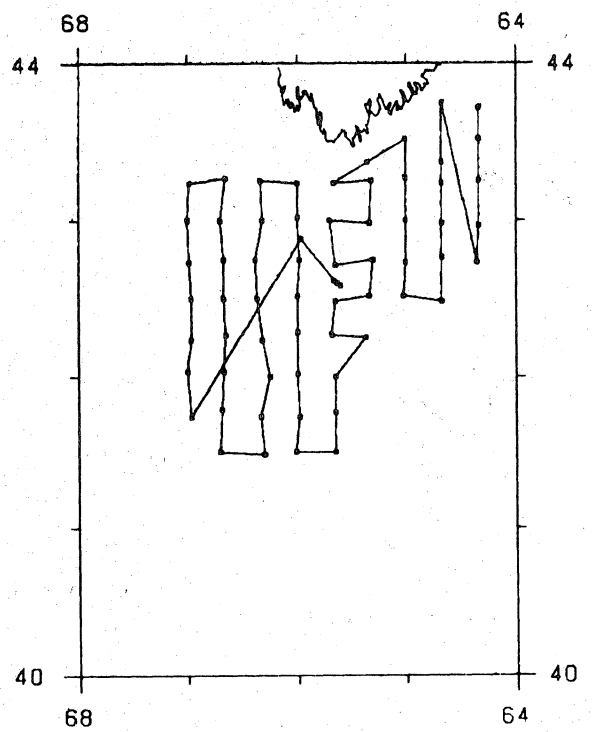
CRUISE 180384002 2/ 3/84 - 13/ 3/84

Figure A10.



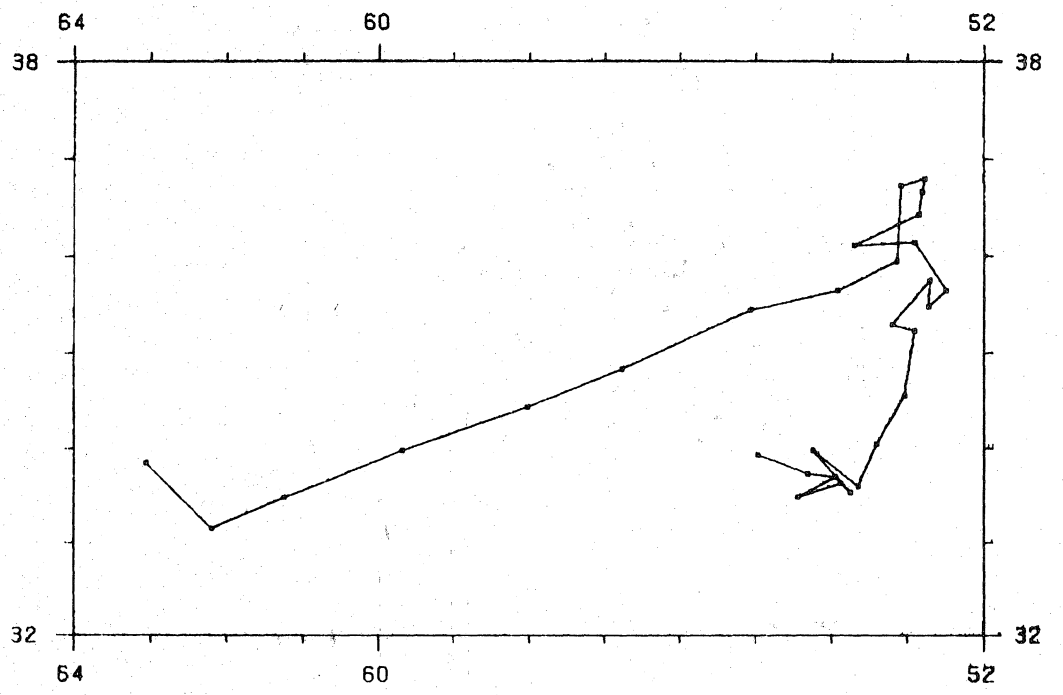
CRUISE 180384003 17/ 3/84 - 27/ 3/84

Figure A11.



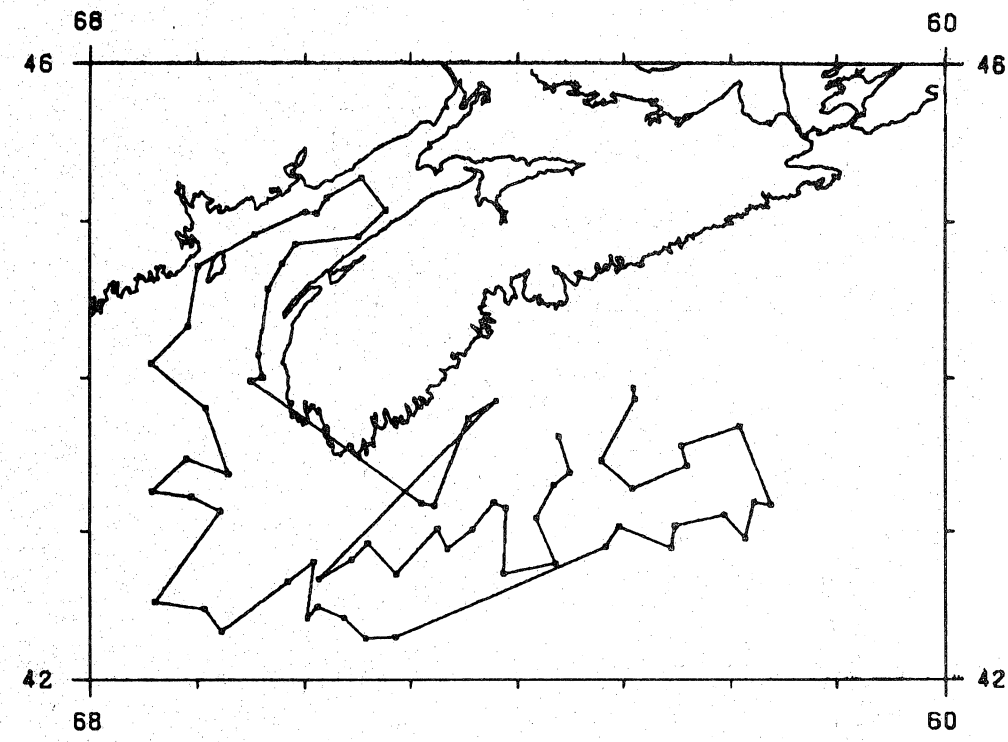
CRUISE 180384004 5/ 6/84 - 13/ 6/84

Figure A12.



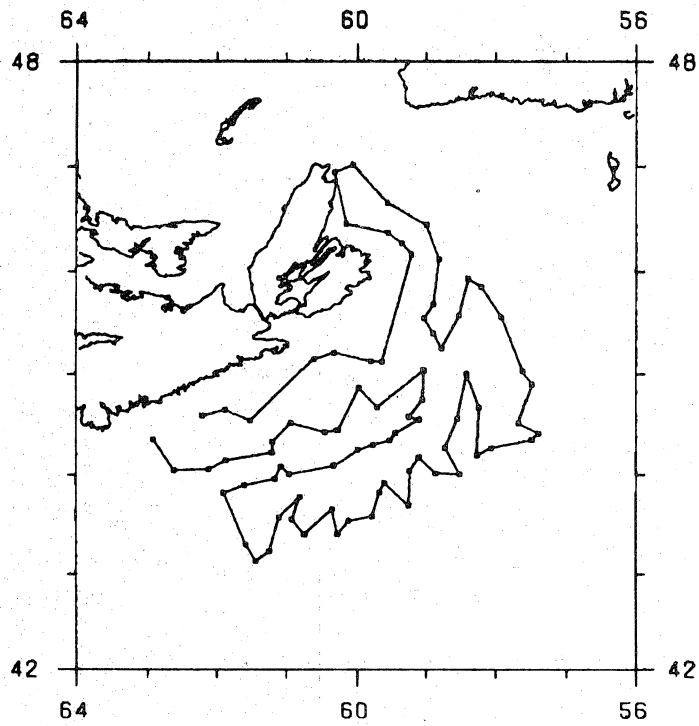
CRUISE 181884007 16/ 6/84 - 29/ 6/84

Figure A13.



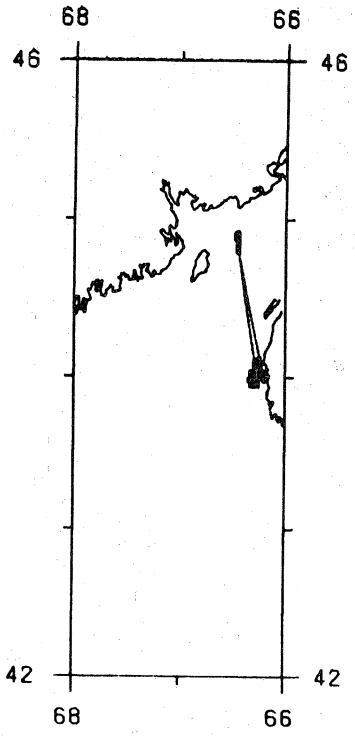
CRUISE 180384005 10/ 7/84 - 22/ 7/84

Figure A14.



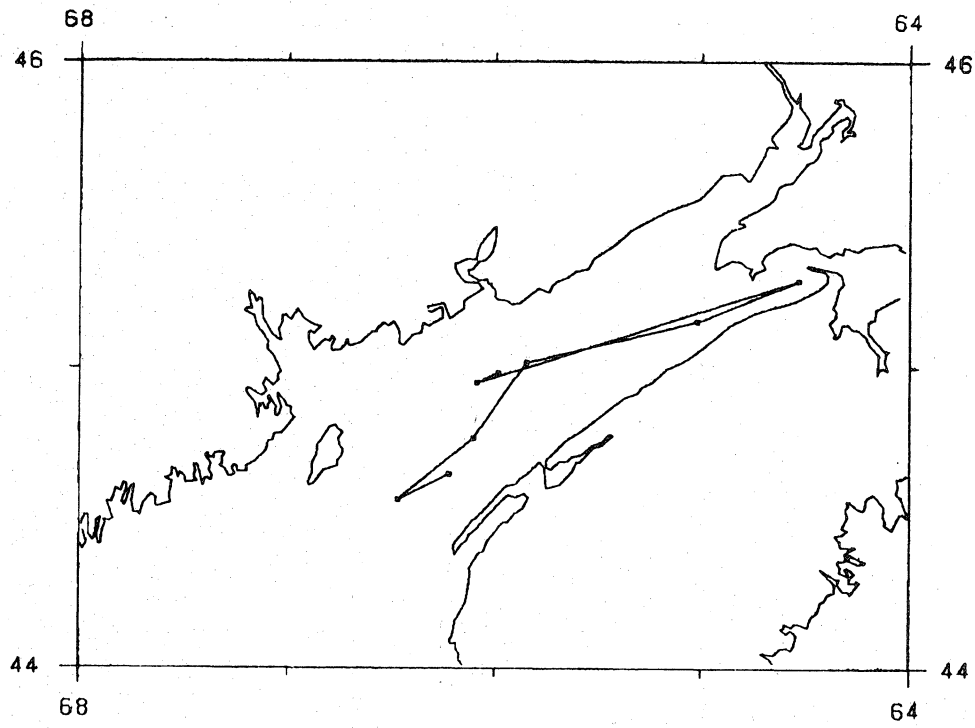
CRUISE 180384006 25/ 7/84 - 2/ 8/84

Figure A15.



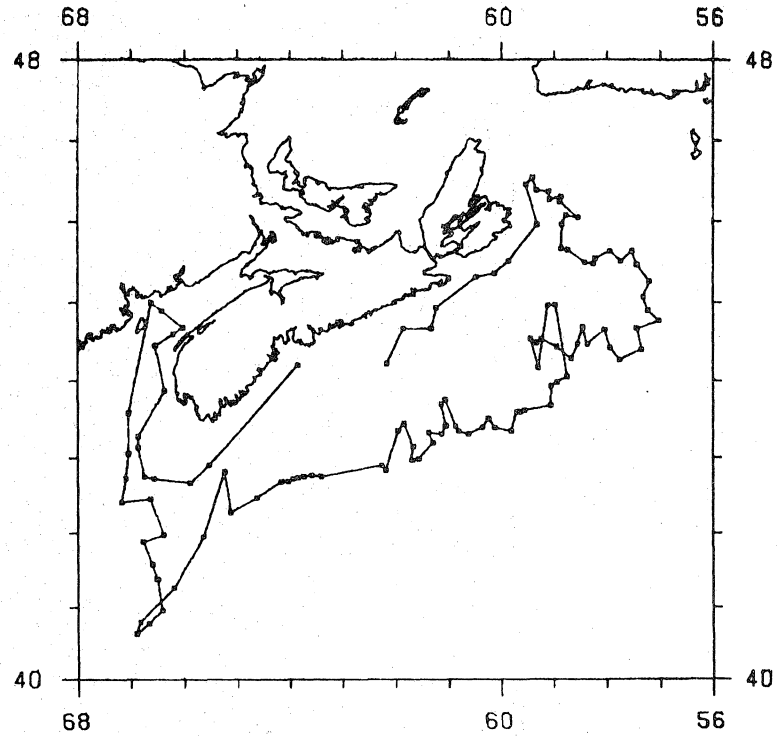
CRUISE 180384009 4/ 9/84 - 7/ 9/84

Figure A16.



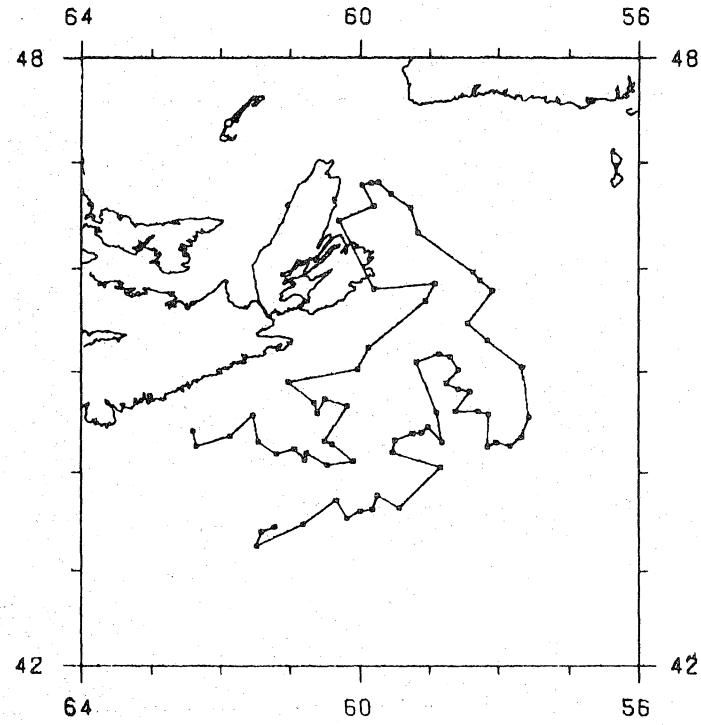
CRUISE 183184001 7/ 9/84 - 13/ 9/84

Figure A17.



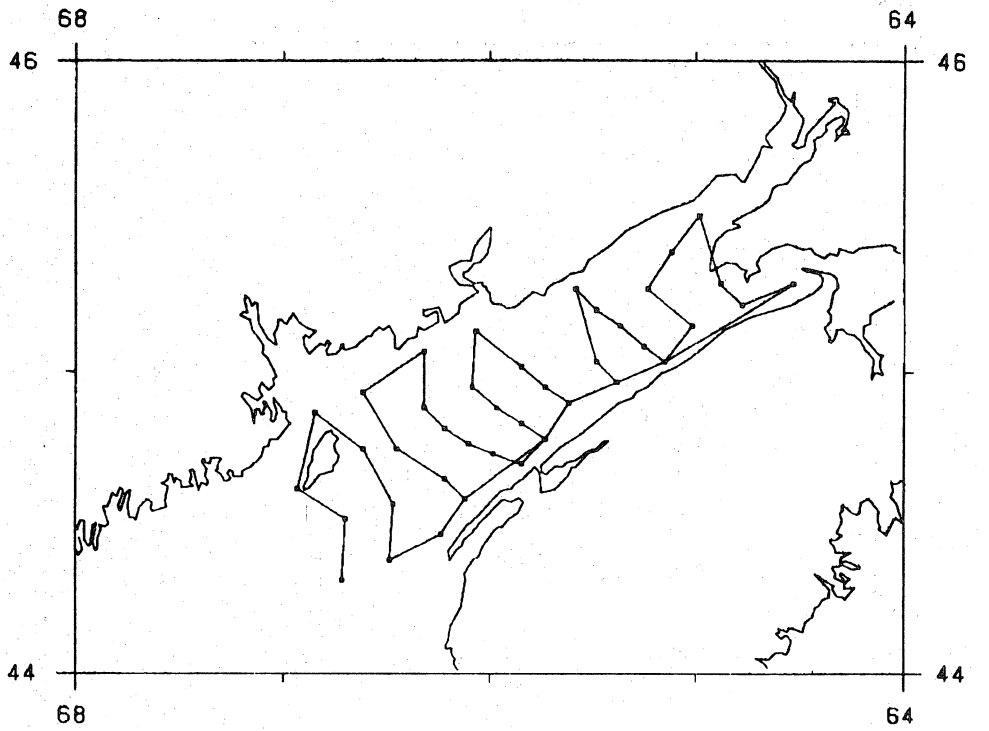
CRUISE 183184004 17/ 9/84 - 2/10/84

Figure A18.



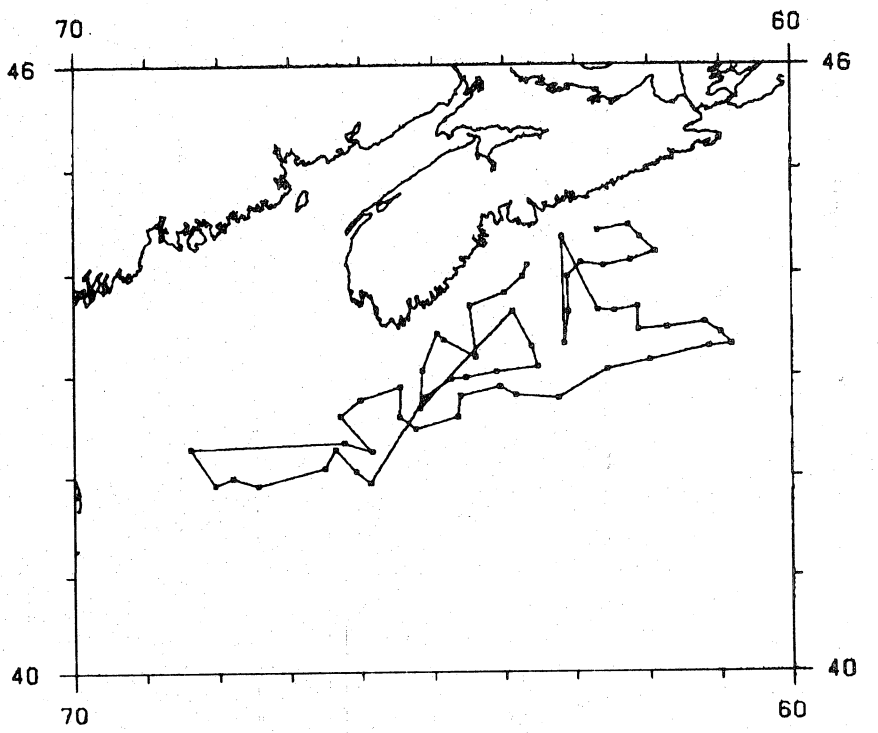
CRUISE 180384007 9/10/84 - 18/10/84

Figure A19.



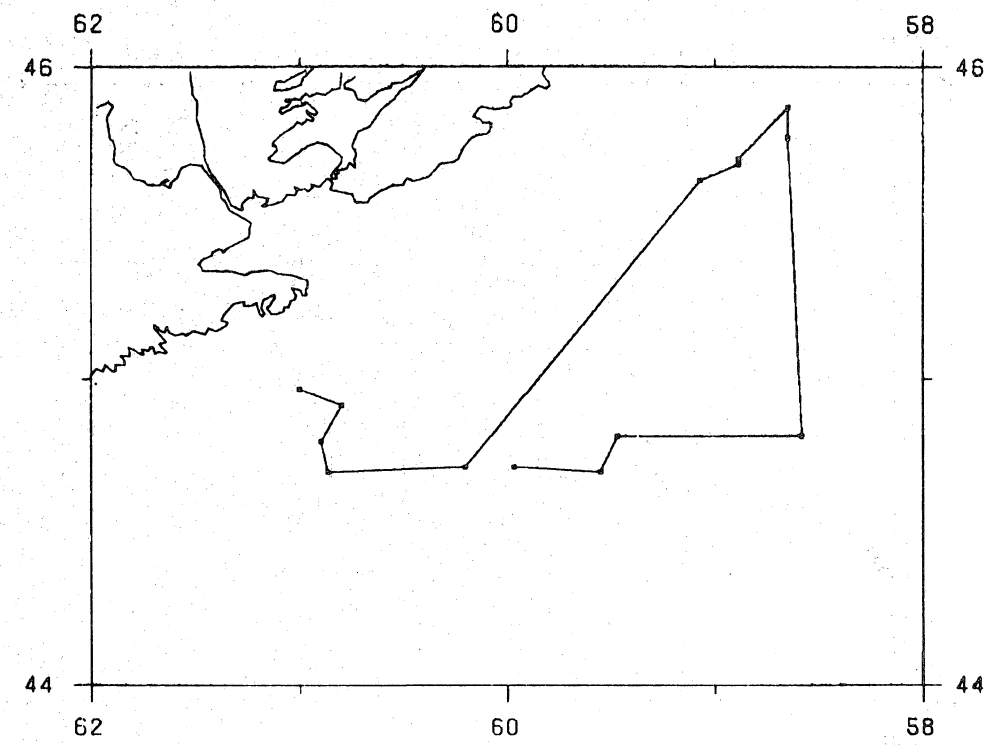
CRUISE 183184002 10/10/84 - 15/10/84

Figure A20.



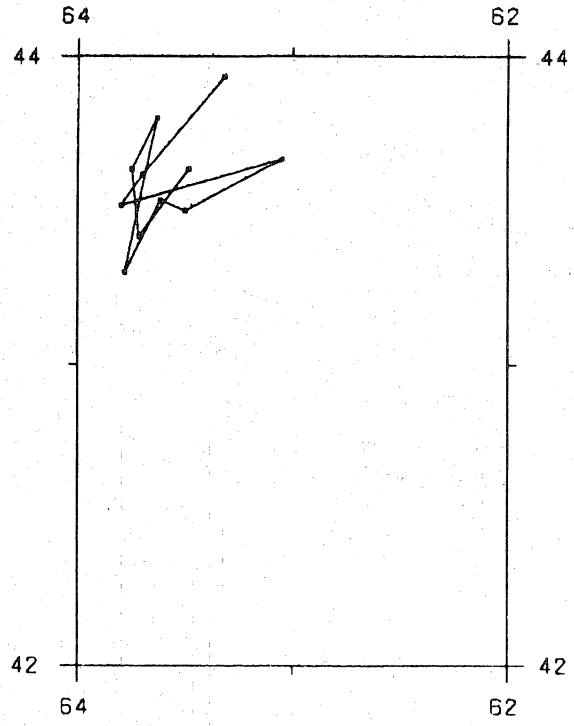
CRUISE 180384011 6/10/84 - 22/10/84

Figure A21.



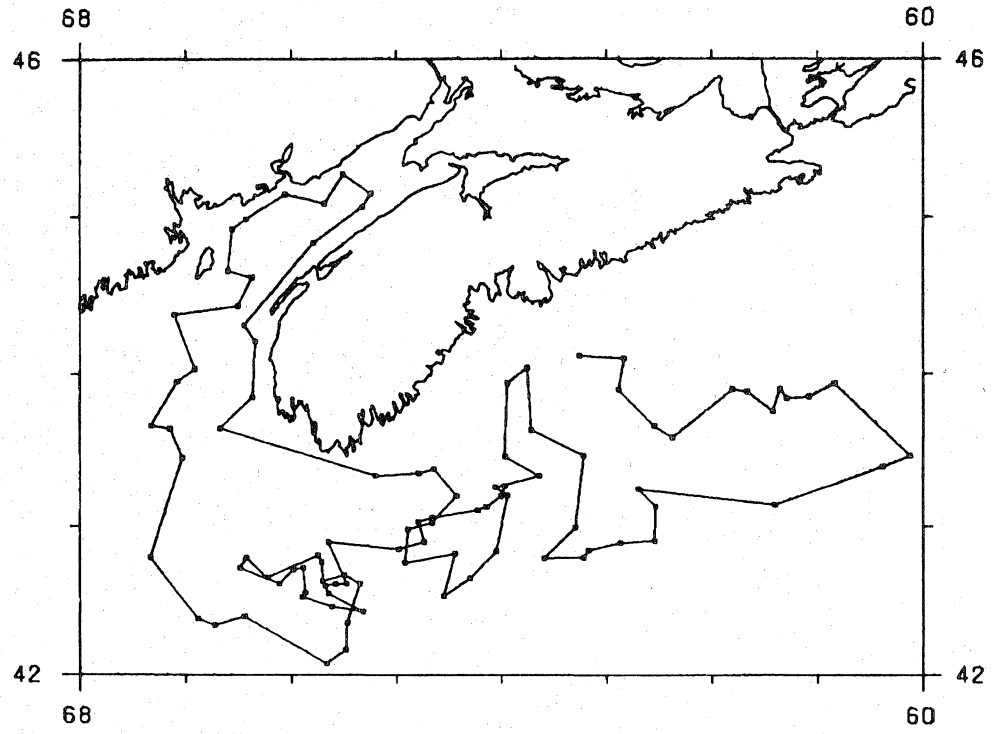
CRUISE 183184003 20/10/84 - 26/10/84

Figure A22.



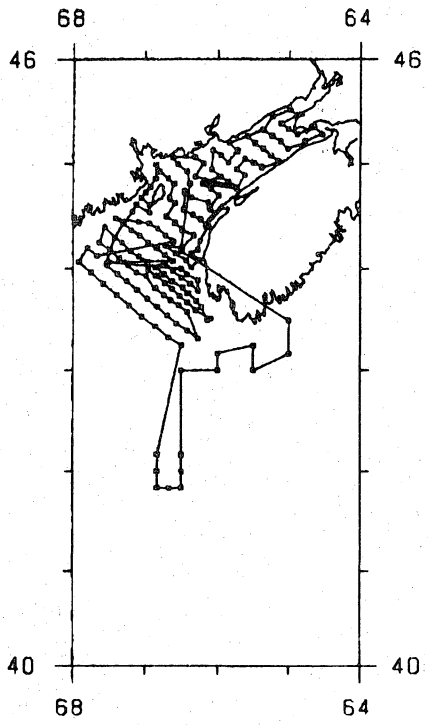
CRUISE 181884012 22/10/84 - 25/10/84

Figure A23.



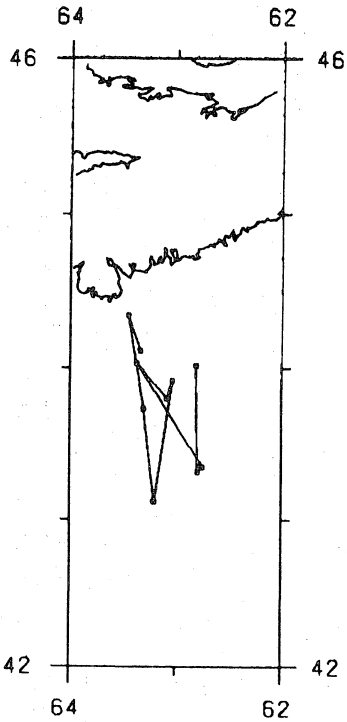
CRUISE 180384008 23/10/84 - 1/11/84

Figure A24.



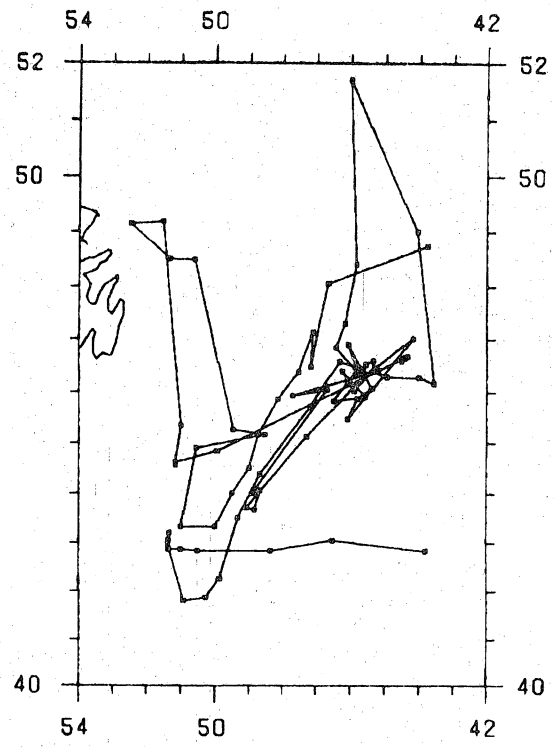
CRUISE 180384010 2/11/84 - 15/11/84

Figure A25.



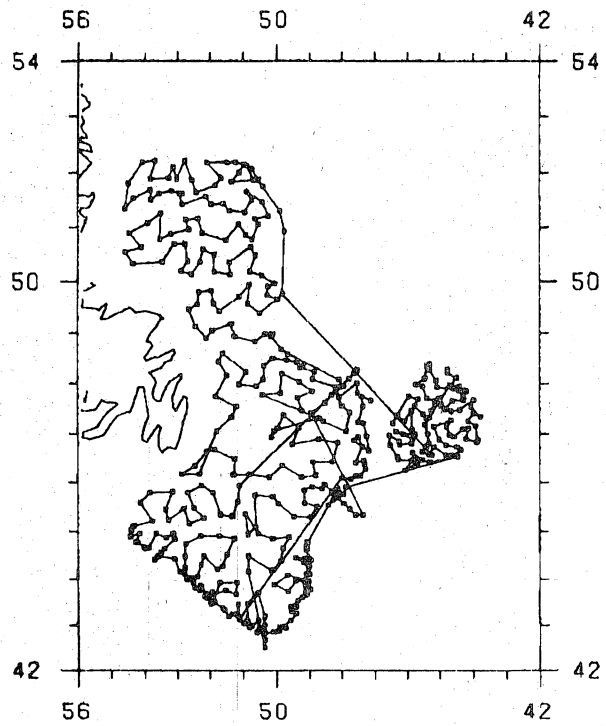
CRUISE 181884011 5/11/84 - 9/11/84

Figure A26.



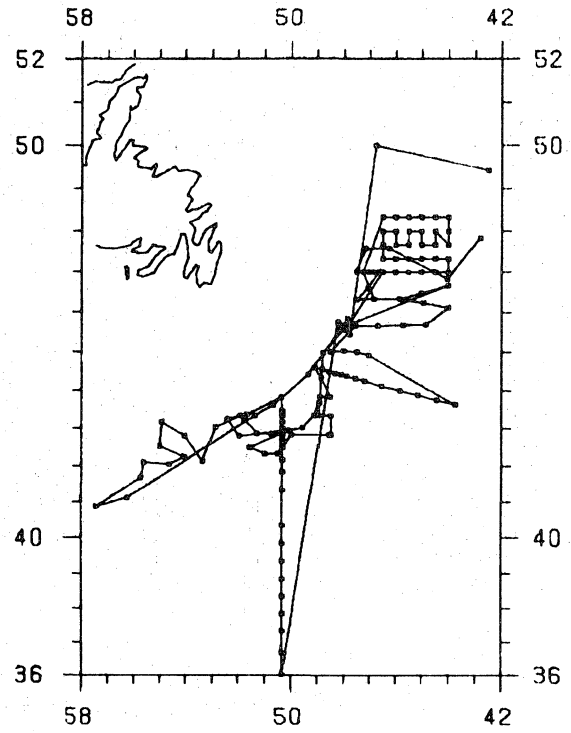
CRUISE 90KK83004 31/10/83 - 13/ 1/84

Figure A27.



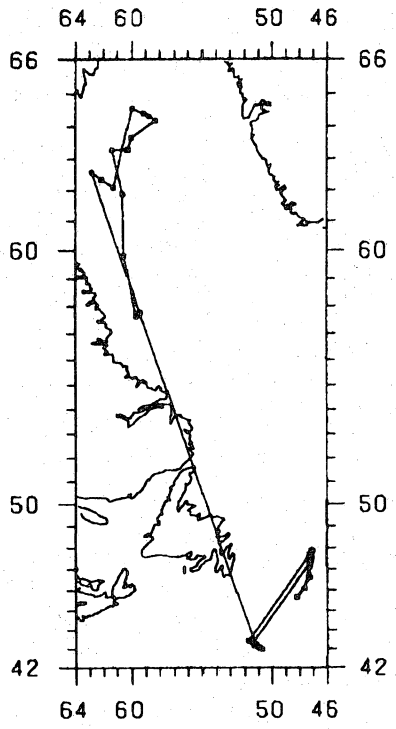
CRUISE 90SV84 30 29/ 3/84 - 20/ 7/84

Figure A28.



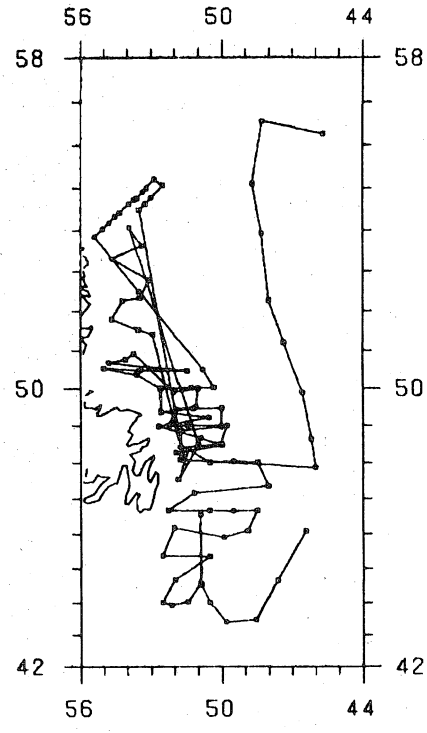
CRUISE 90VI84 2 20/ 6/84 - 24/ 8/84

Figure A29.



RUISE 90SV84 31 14/ 9/84 - 13/11/84

Figure A30.



CRUISE 90KS84 9 31/10/84 - 15/ 1/85

Figure A31.

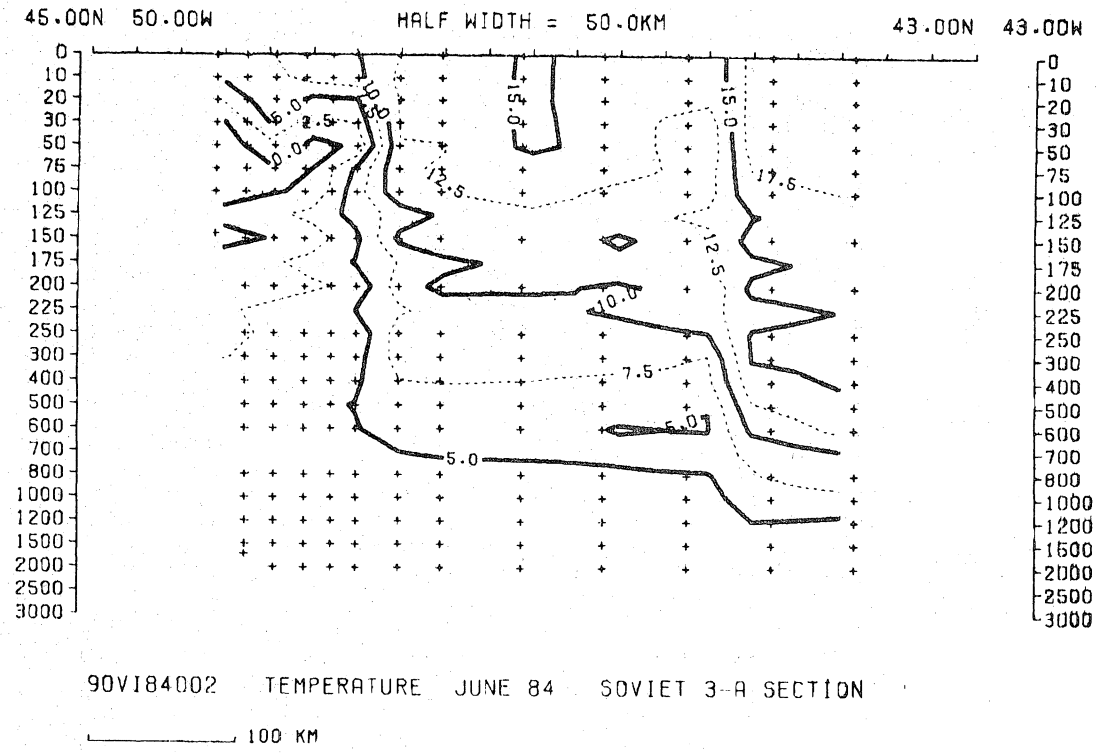


Figure B1.

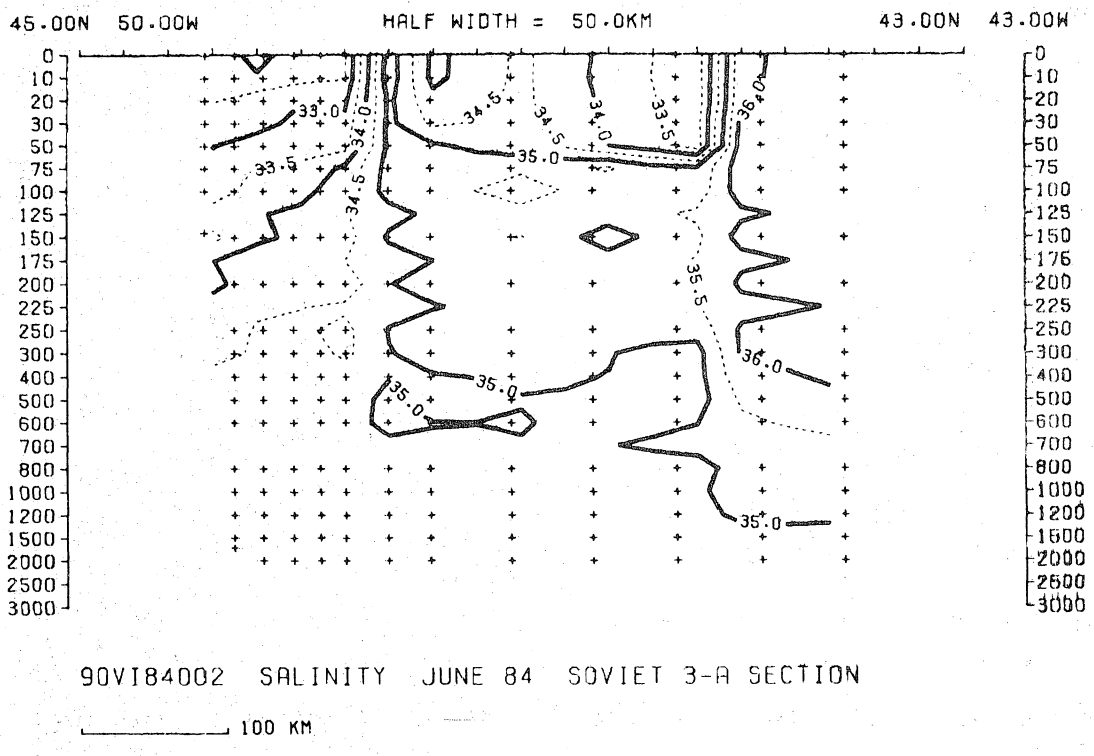


Figure B2.

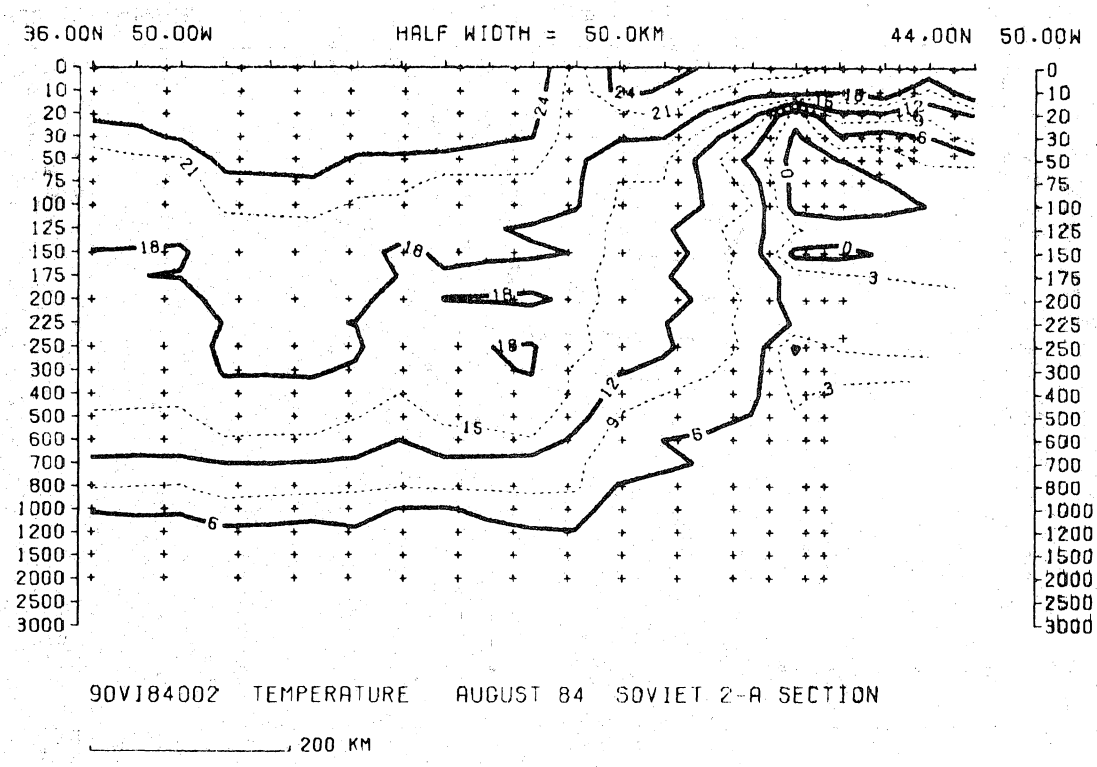


Figure B3.

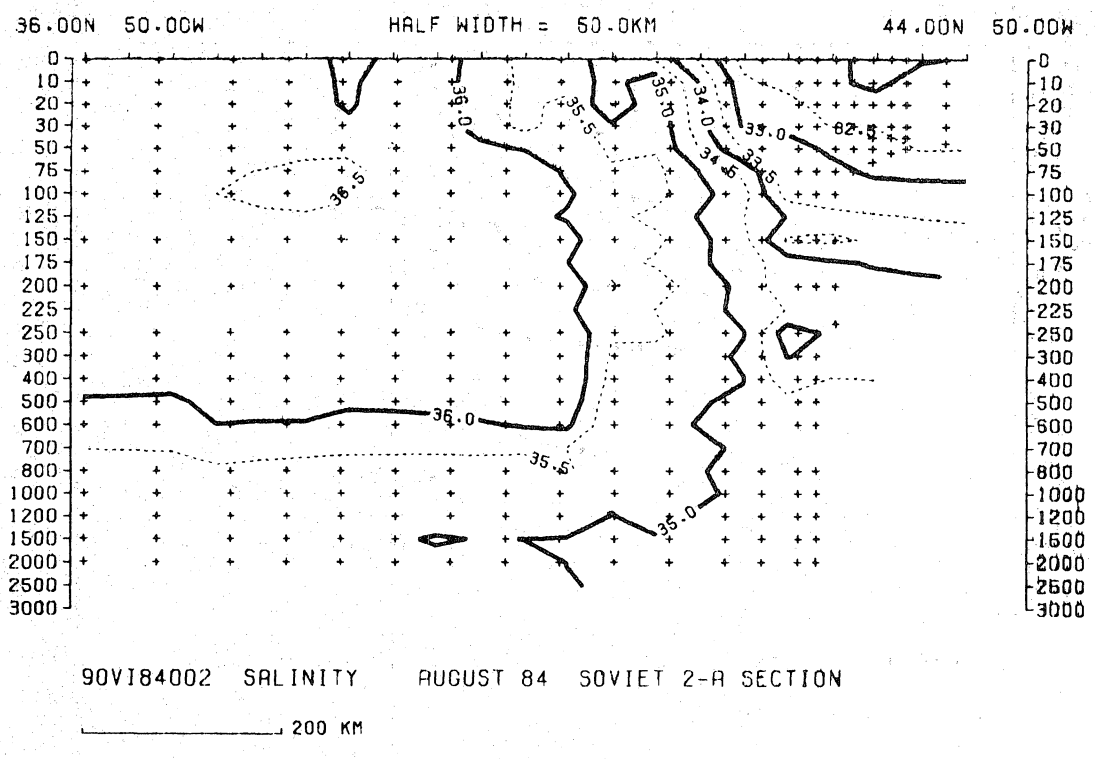


Figure B4.

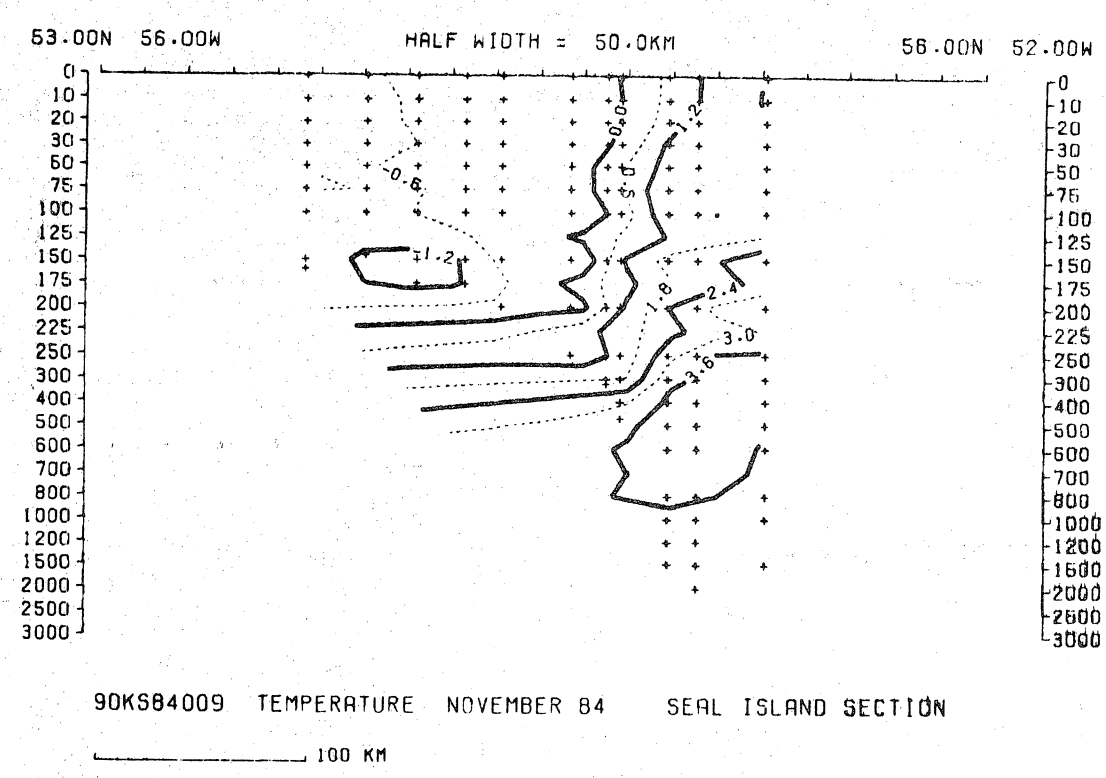


Figure B5.

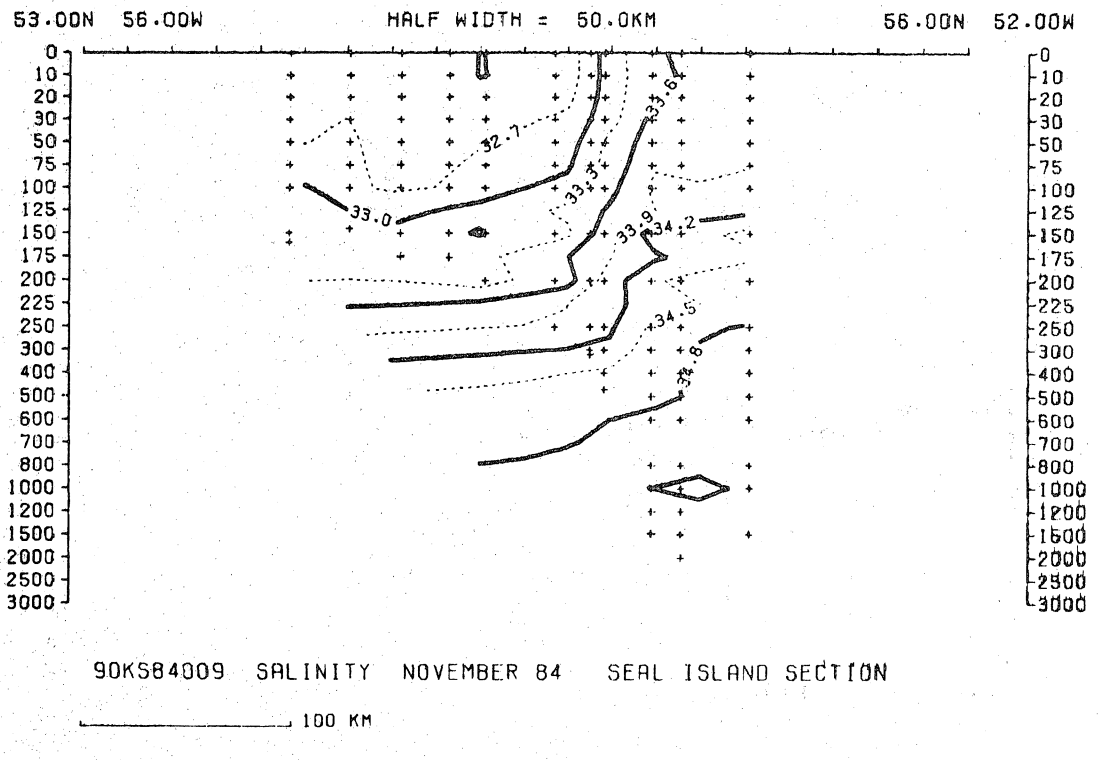


Figure B6.

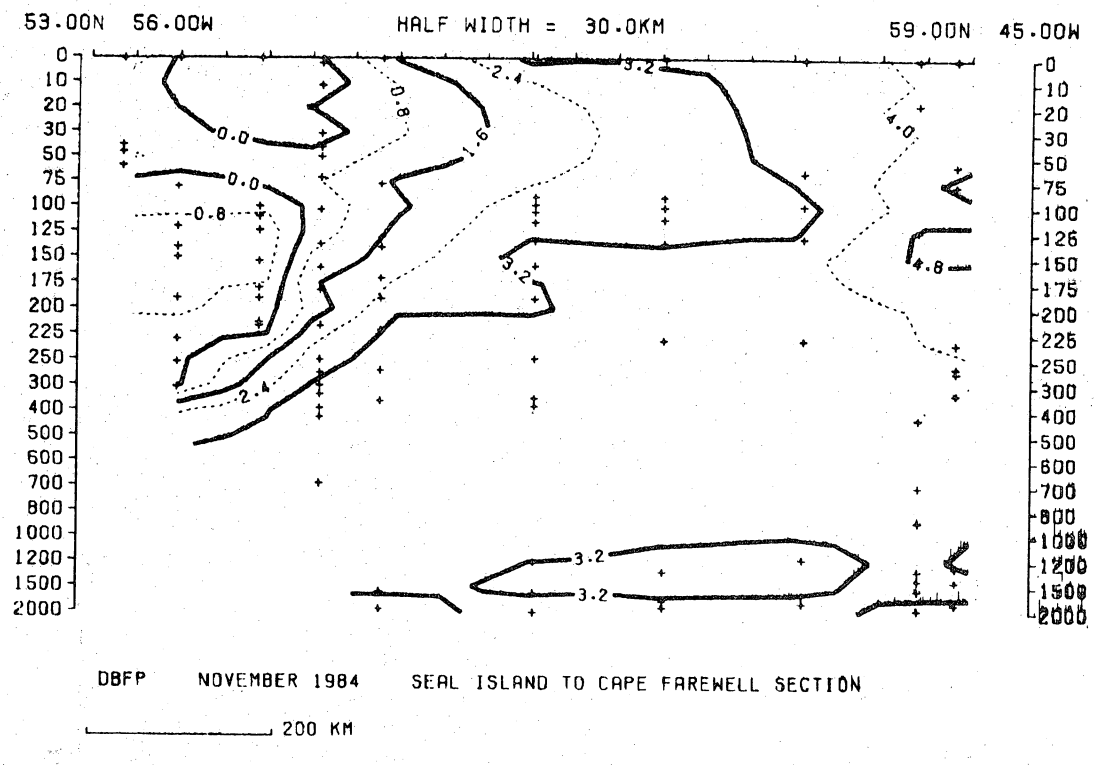


Figure B7.

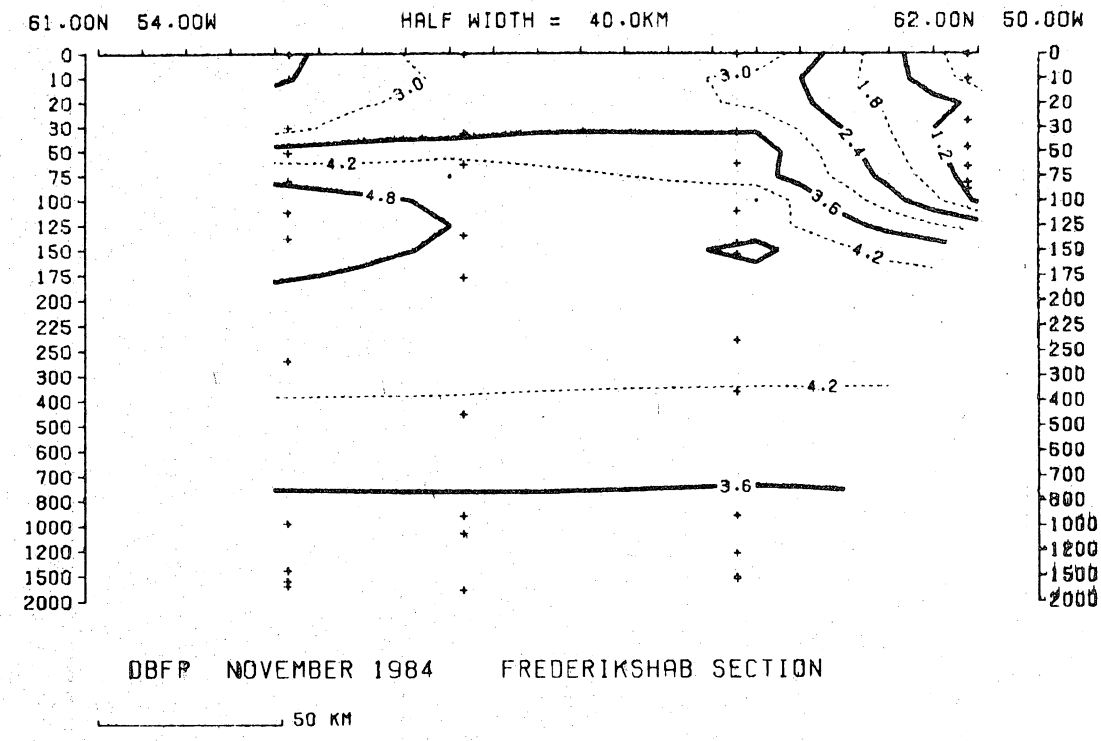


Figure B8.

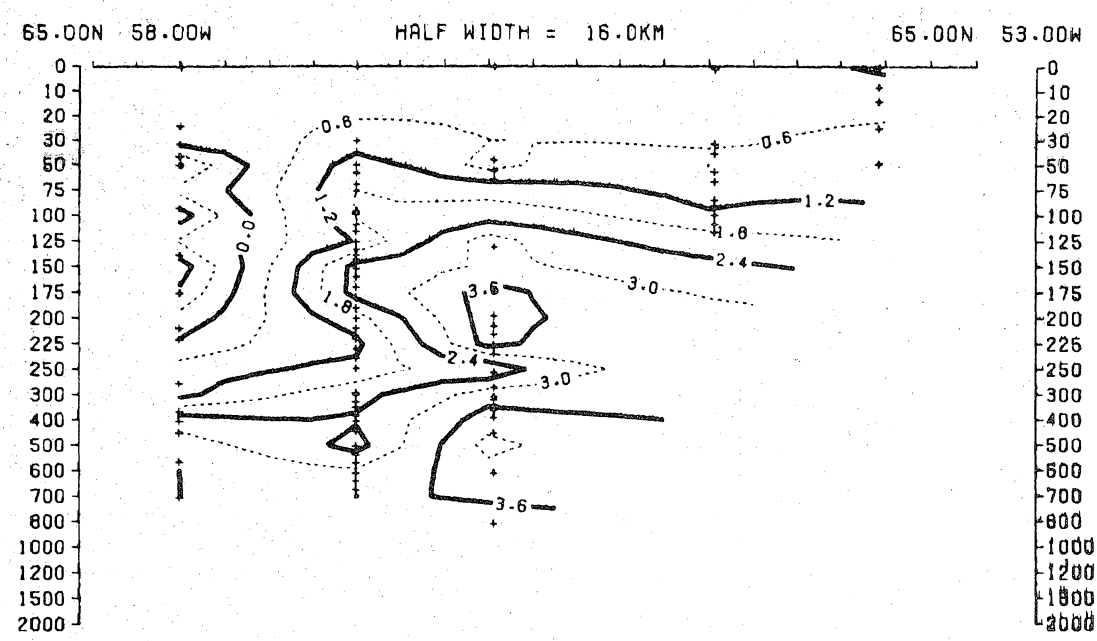
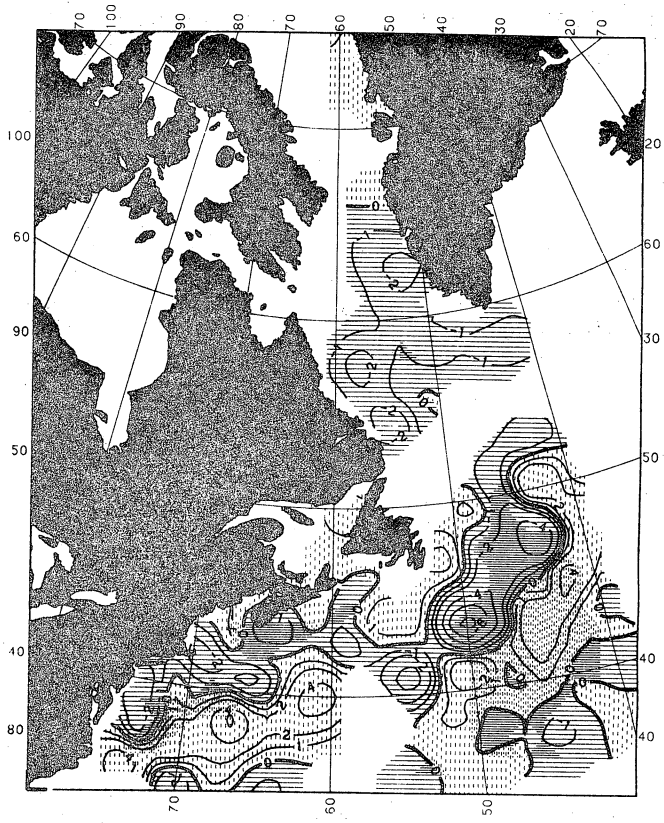

65.00N 58.00W
HALF WIDTH = 16.0KM
65.00N 53.00W
0
10
20
30
50
75
100
125
150
175
200
225
250
300
400
500
600
700
800
1000
1200
1500
2000
0.0
0.6
1.2
1.8
2.4
3.0
3.6
DBFP OCTOBER 1984 LILLE HELLEFISKEBANKE SECTION
50 KM

Figure B9.

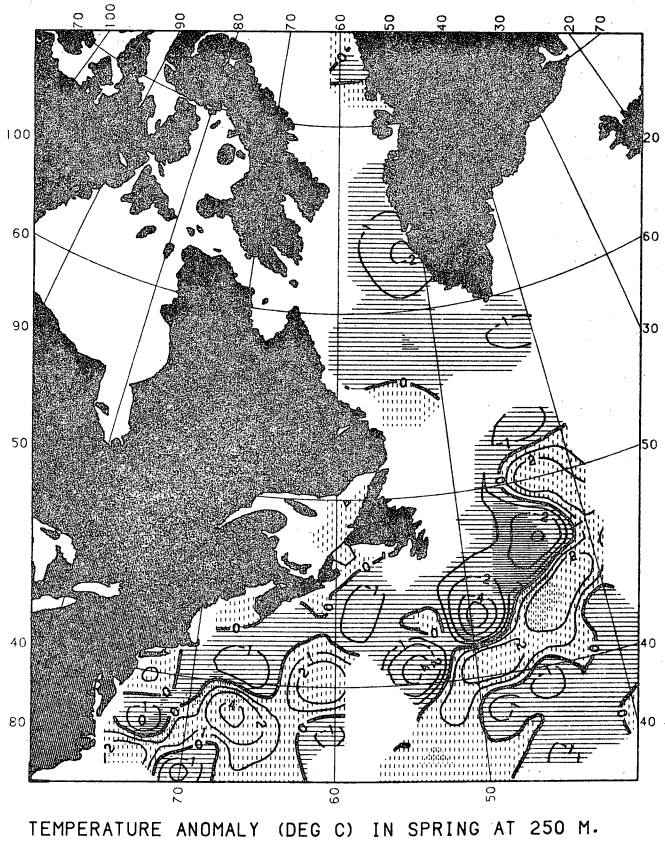
TEMPERATURE ANOMALY (DEG C) IN SPRING AT 0 M.

Figure C1.



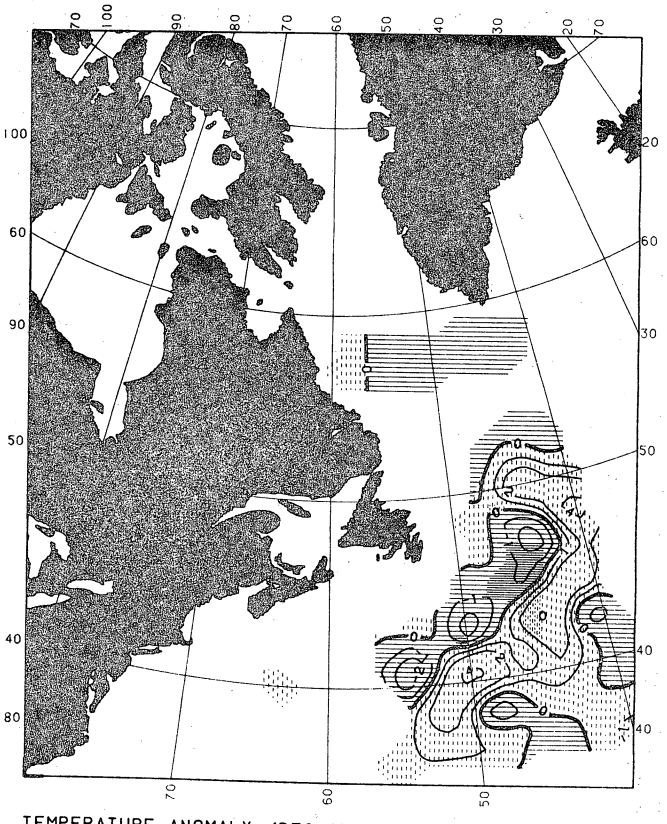
TEMPERATURE ANOMALY (DEG C) IN SPRING AT 100 M.

Figure C2.



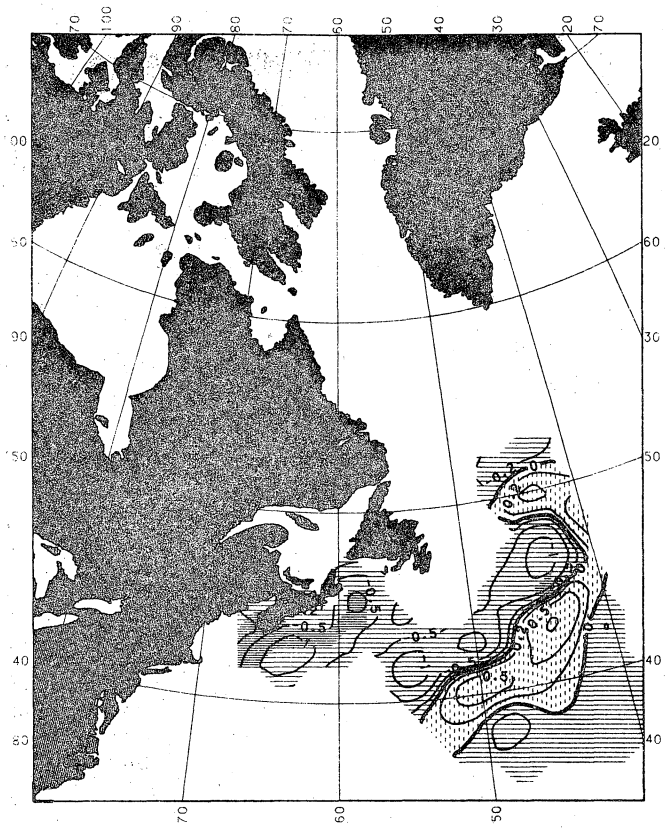
TEMPERATURE ANOMALY (DEG C) IN SPRING AT 250 M.

Figure C3.



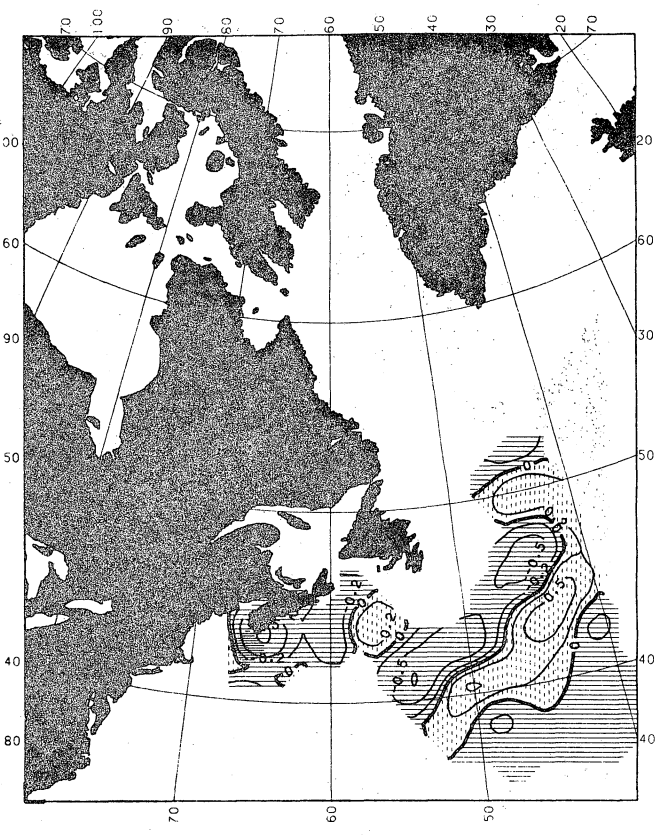
TEMPERATURE ANOMALY (DEG C) IN SPRING AT 500 M.

Figure C4.



SALINITY ANOMALY IN SPRING AT 0 M.

Figure C5.

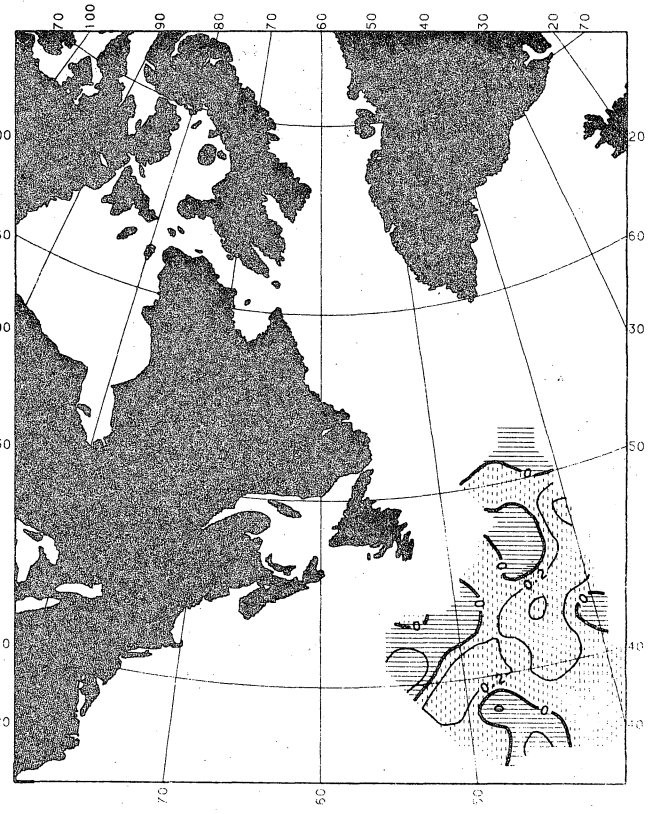


SALINITY ANOMALY IN SPRING AT 100 M.

Figure C6.

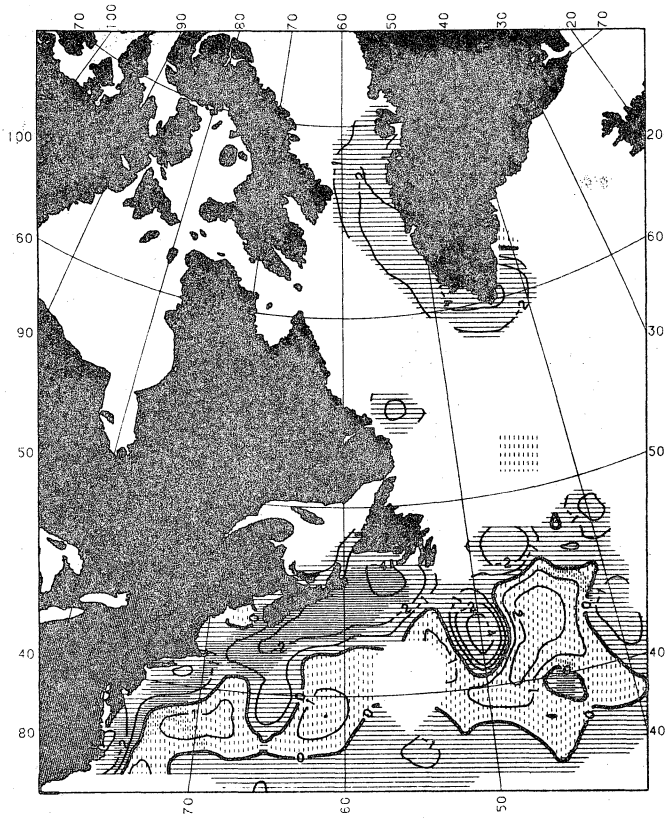
SALINITY ANOMALY IN SPRING AT 250 M.

Figure C7.



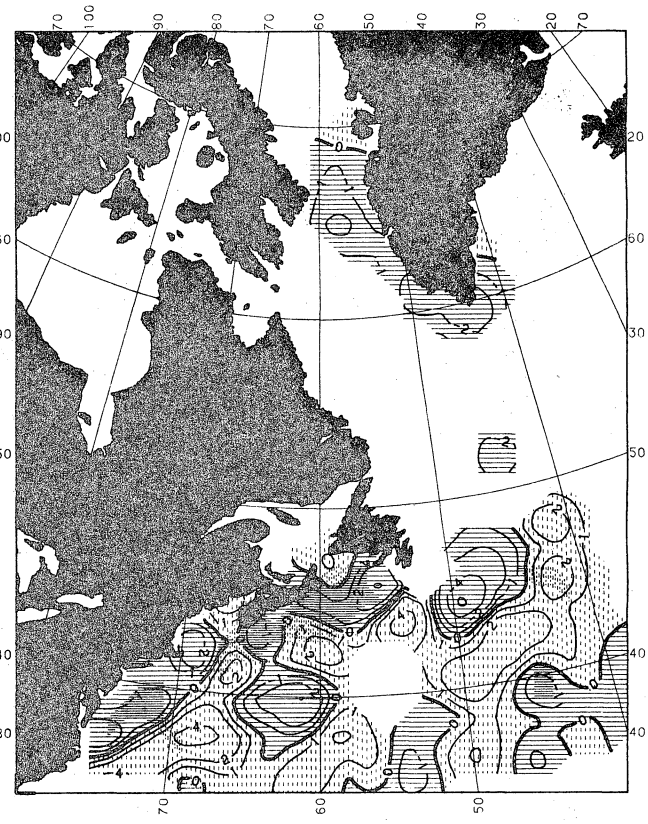
SALINITY ANOMALY IN SPRING AT 500 M.

Figure C8.



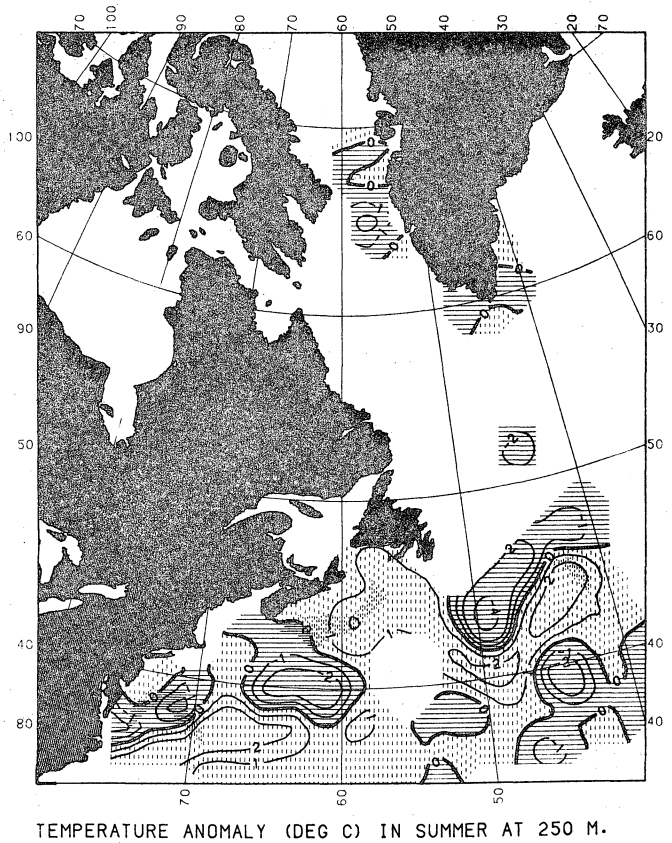
TEMPERATURE ANOMALY (DEG C) IN SUMMER AT 0 M.

Figure C9.



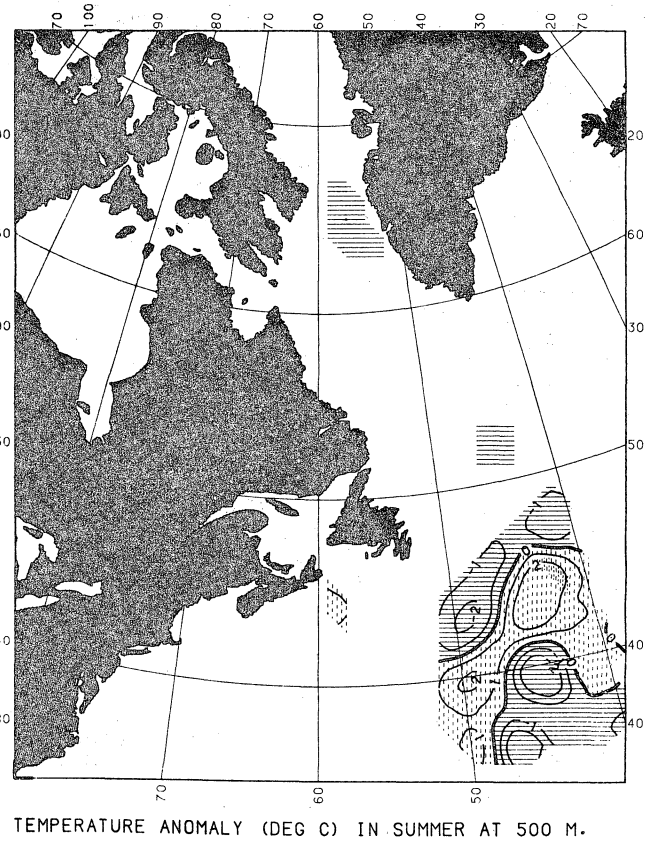
TEMPERATURE ANOMALY (DEG C) IN SUMMER AT 100 M.

Figure C10.



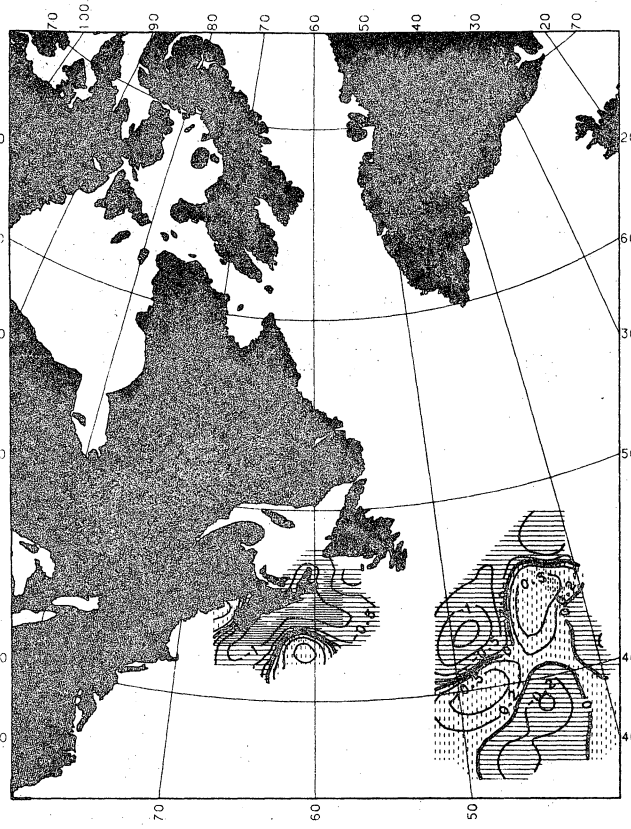
TEMPERATURE ANOMALY (DEG C) IN SUMMER AT 250 M.

Figure C11.



TEMPERATURE ANOMALY (DEG C) IN SUMMER AT 500 M.

Figure C12.

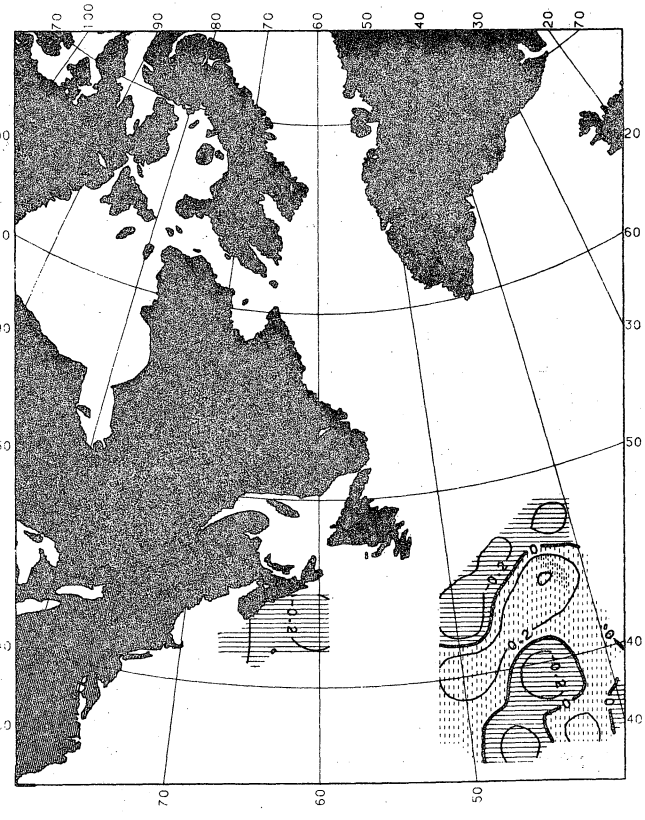


SALINITY ANOMALY IN SUMMER AT 0 M.

Figure C13.

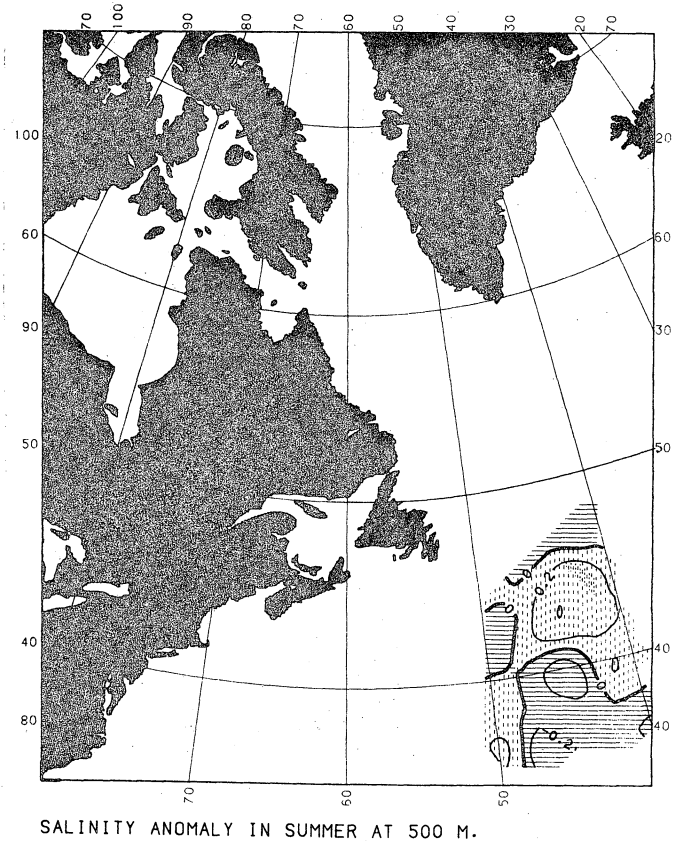
SALINITY ANOMALY IN SUMMER AT 100 M.

Figure C14.



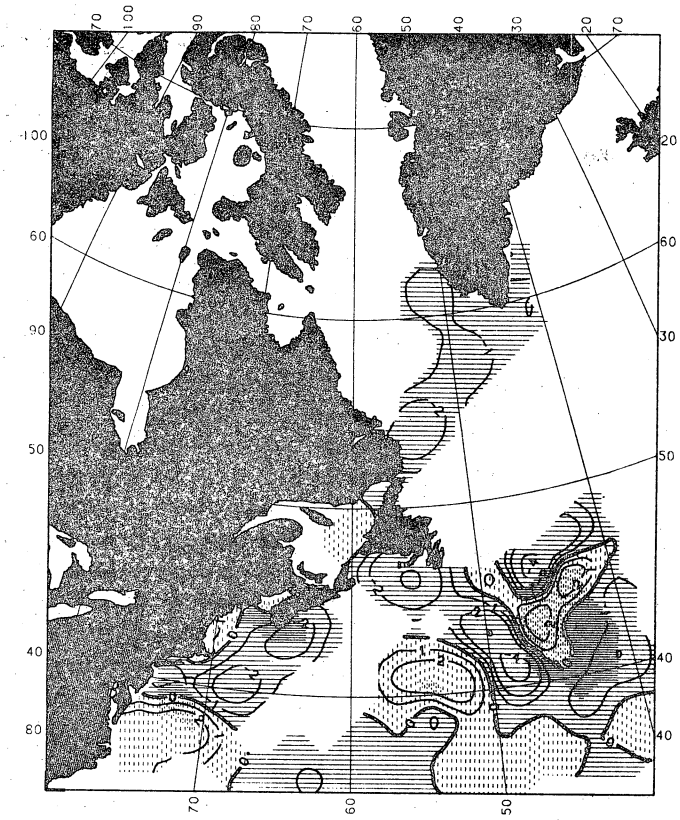
SALINITY ANOMALY IN SUMMER AT 250 M.

Figure C15.



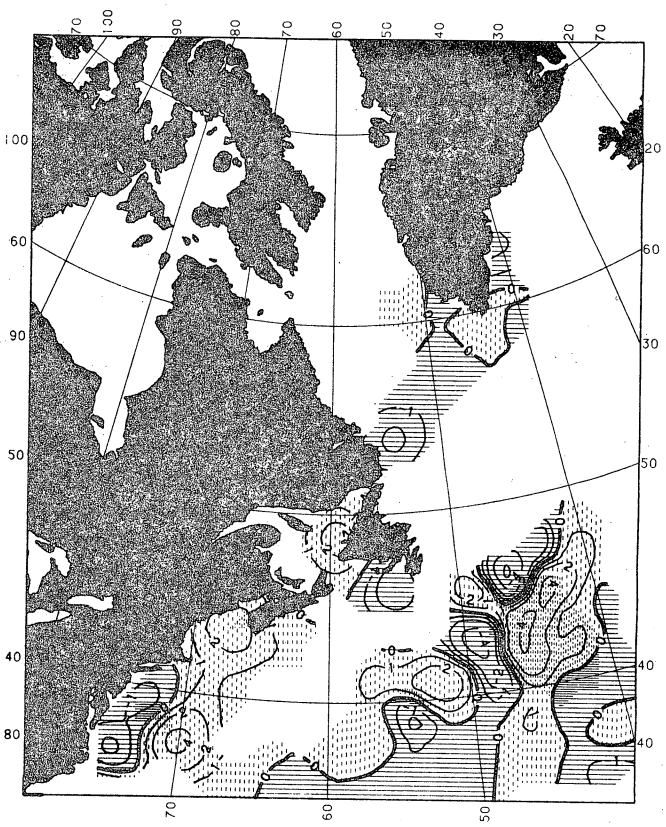
SALINITY ANOMALY IN SUMMER AT 500 M.

Figure C16.



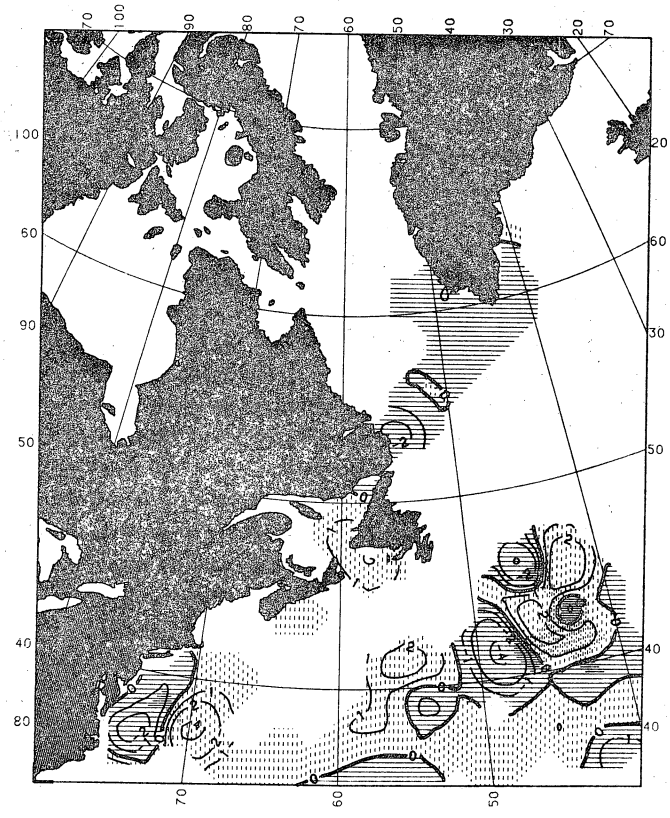
TEMPERATURE ANOMALY (DEG C) IN AUTUMN AT 0 M.

Figure C17.



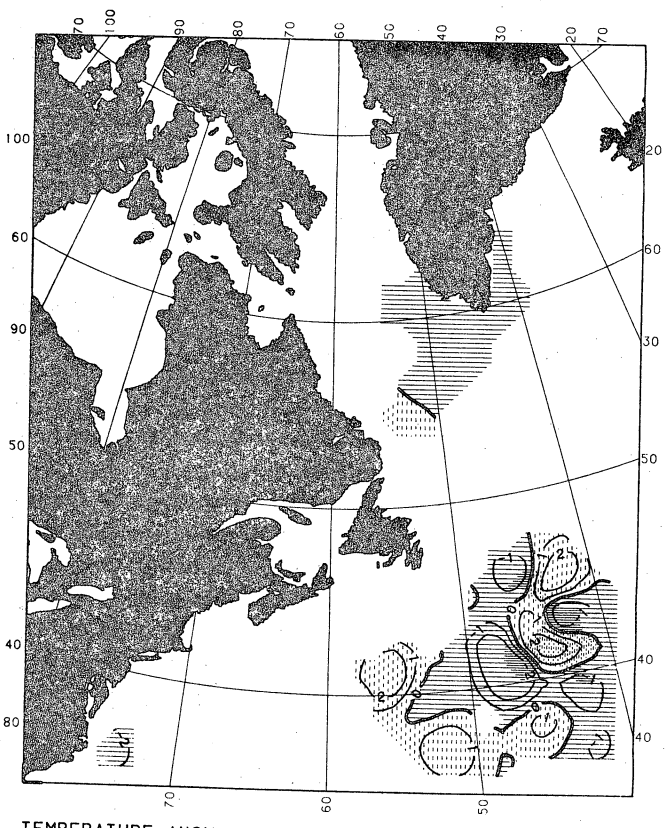
TEMPERATURE ANOMALY (DEG C) IN AUTUMN AT 100 M.

Figure C18.



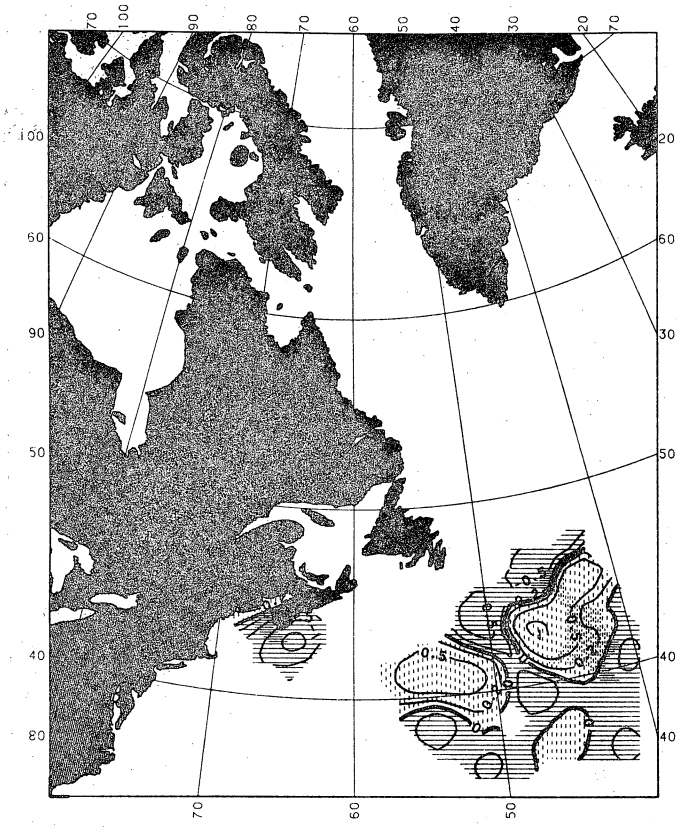
TEMPERATURE ANOMALY (DEG C) IN AUTUMN AT 250 M.

Figure C19.



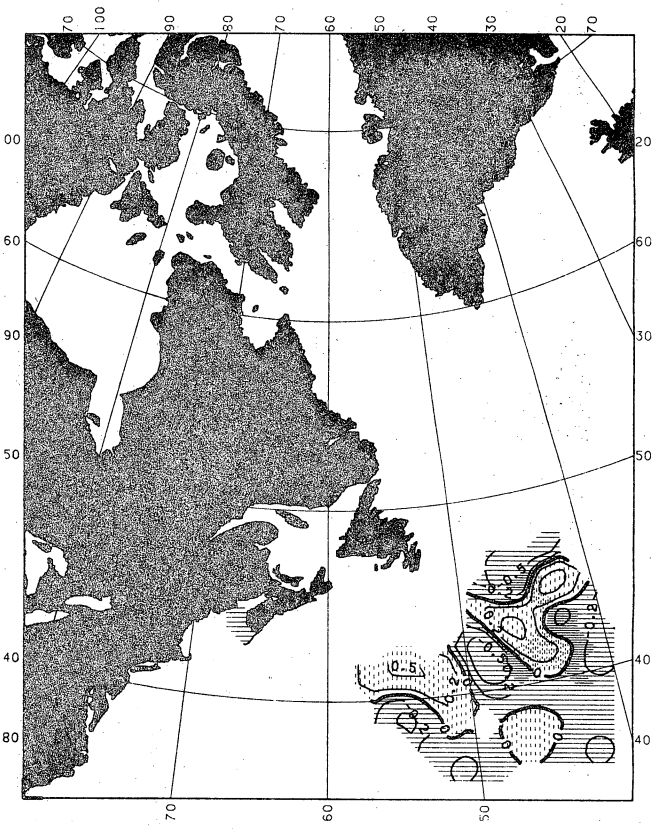
TEMPERATURE ANOMALY (DEG C) IN AUTUMN AT 500 M.

Figure C20.



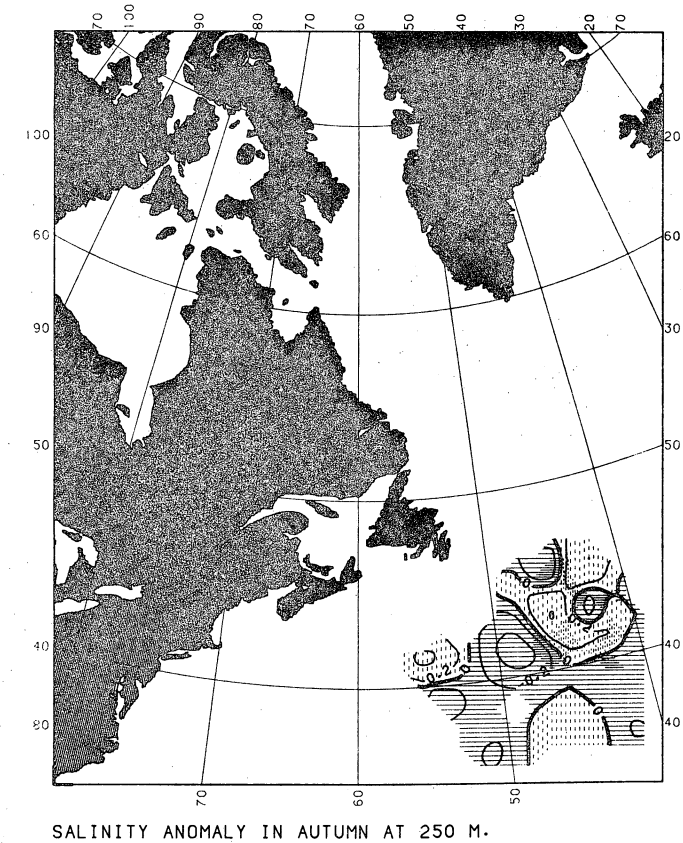
SALINITY ANOMALY IN AUTUMN AT 0 M.

Figure C21.



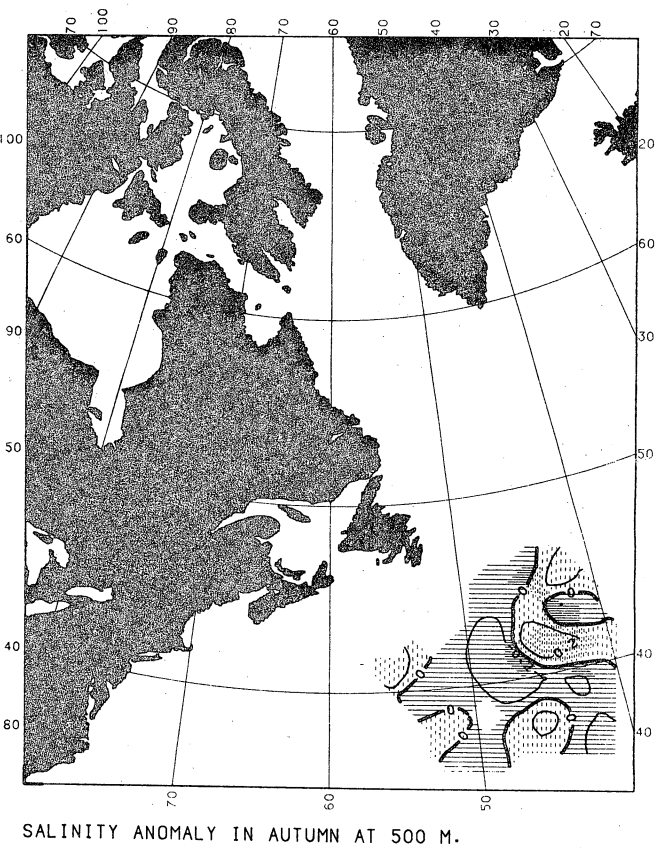
SALINITY ANOMALY IN AUTUMN AT 100 M.

Figure C22.



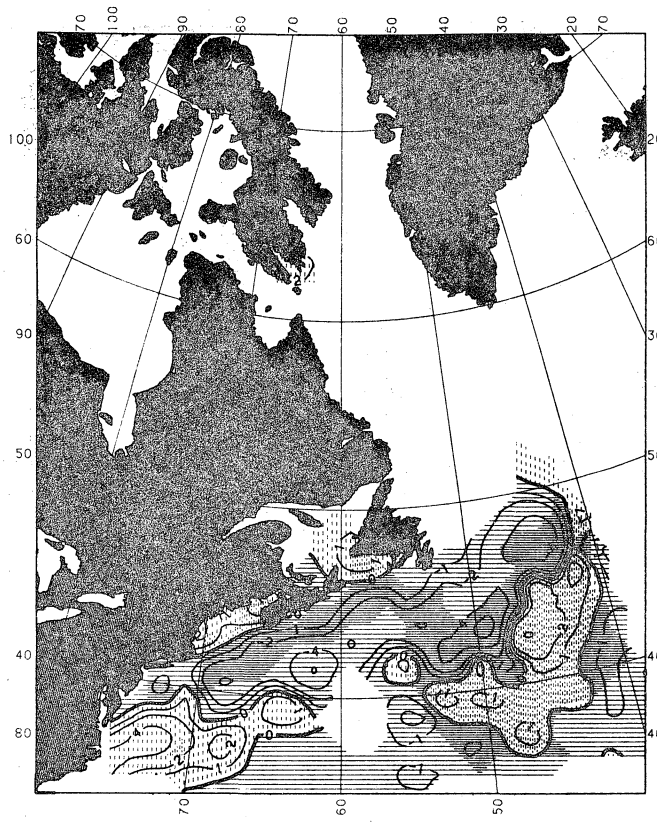
SALINITY ANOMALY IN AUTUMN AT 250 M.

Figure C23.



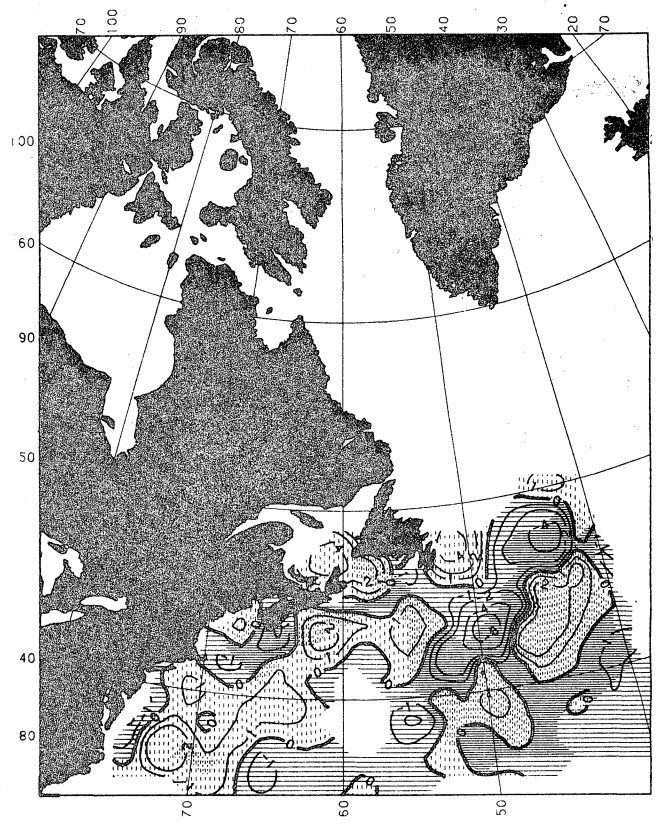
SALINITY ANOMALY IN AUTUMN AT 500 M.

Figure C24.



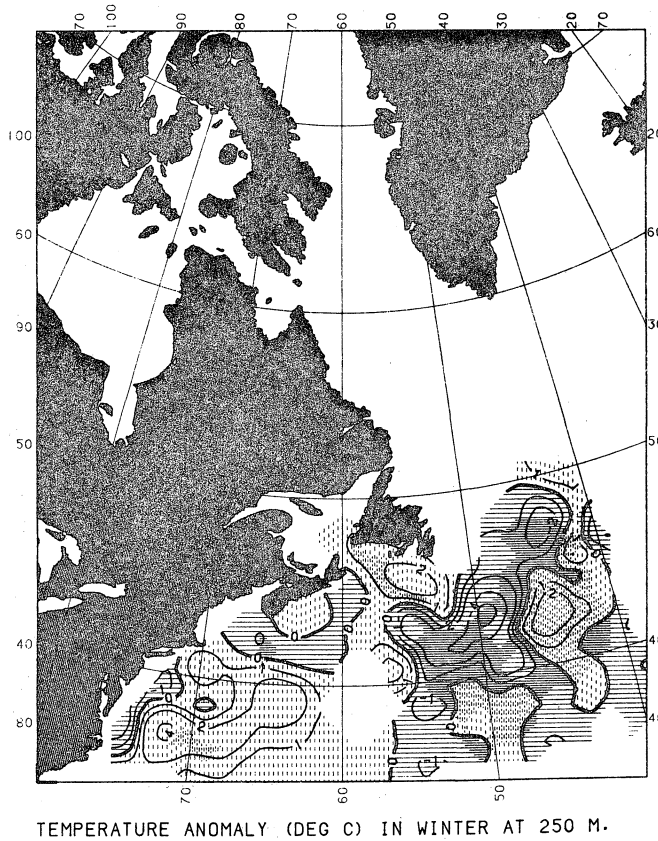
TEMPERATURE ANOMALY (DEG C) IN WINTER AT 0 M.

Figure C25.



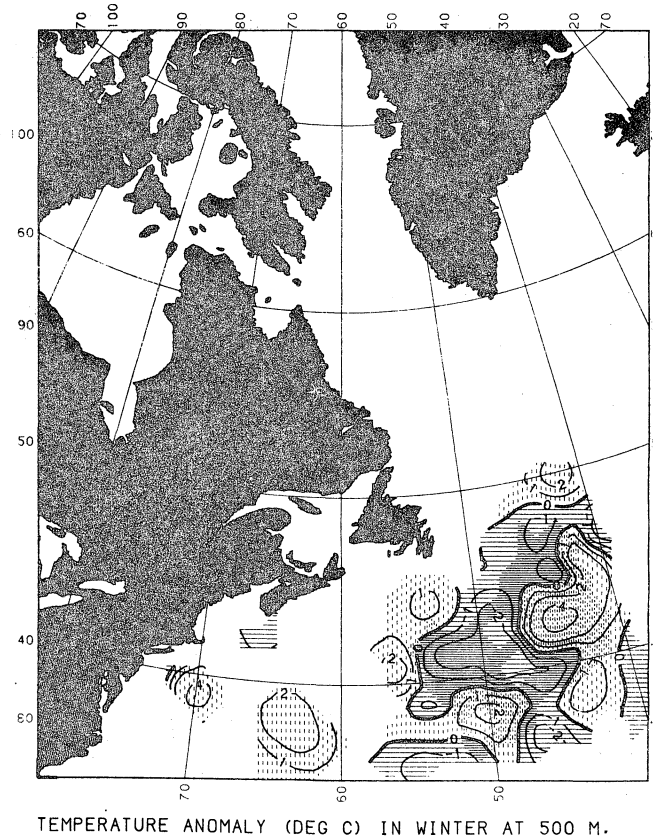
TEMPERATURE ANOMALY (DEG C) IN WINTER AT 100 M.

Figure C26.



TEMPERATURE ANOMALY (DEG C) IN WINTER AT 250 M.

Figure C27.

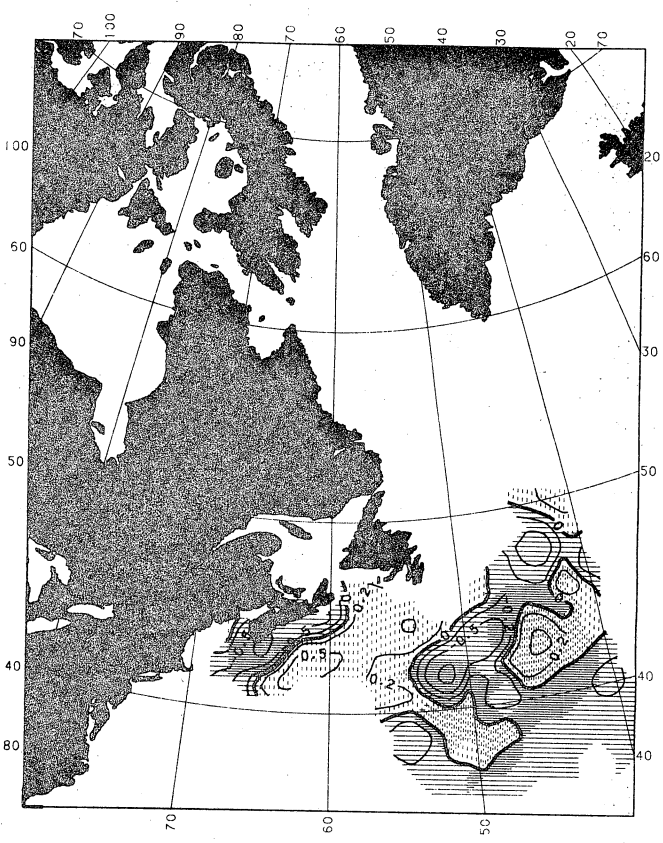


TEMPERATURE ANOMALY (DEG C) IN WINTER AT 500 M.

Figure C28.

SALINITY ANOMALY IN WINTER AT 0 M.

Figure C29.

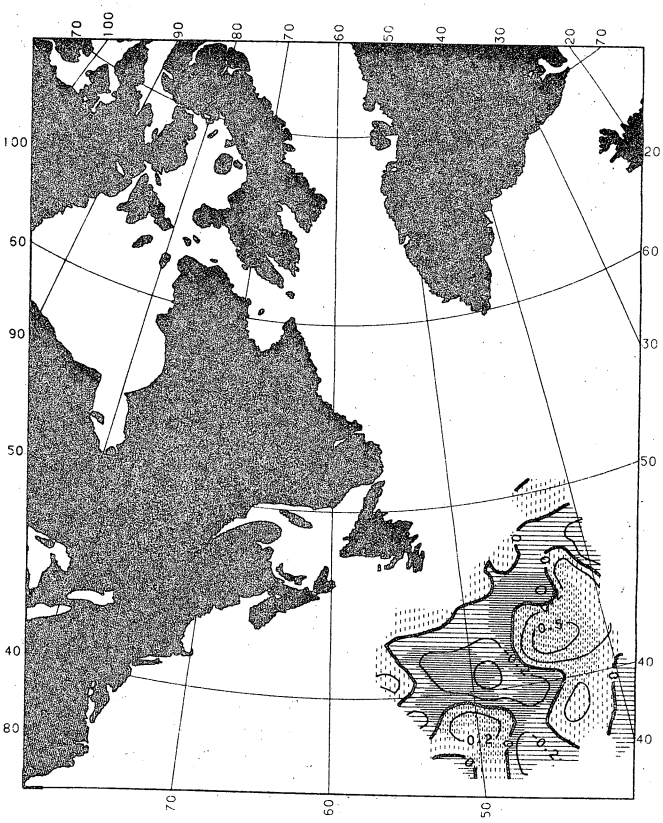


SALINITY ANOMALY IN WINTER AT 100 M.

Figure C30.

SALINITY ANOMALY IN WINTER AT 250 M.

Figure C31.



SALINITY ANOMALY IN WINTER AT 500 M.

Figure C32.