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ANNUAL MEETING - JUNE 1973

A preliminary report on the German Young-Herring-Survey carried out by *R/V Walther Herwig* in ICNAF Subarea 5 and Stat. Area 6 in February - March 1973

by

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Introduction

The ICNAF Herring Working Group recommends in 1972 "that member countries make every effort to carry out surveys for young herring in offshore areas of Emerald Bank, Georges-Bank and Subarea 6 in early 1973".

(ICNAF Redbook 1972, Part I, page 60). At a special meeting of US, Canada and German scientists in the early days of January 1973 it was decided that Germany should carry out the survey in the area south of the connection line Cape Cod-Yarmouth/Nova Scotia up to the 200 m depth-line, in the east limited by 66°W, in the west 70°W.

If there would be time left after having carried out this program the survey should be continued on the continental shelf to the south up to Cape Hatteras.

The cruise was made by the new German Research Vessel "Walther Herwig" in the period 15. February - 29. March.

Methods

The above mentioned area was divided in 30 -nm- squares as agreed on an international basis. In each of these a half-hour tow was made using a 180'-herring bottom trawl provided with a small-meshed inside-cod-end. If there were more than 1000 herring in a tow a repetition was undertaken to control the first result. The length of each herring was measured to the nearest half centimeter below.

Furthermore a widespread hydrographical survey with STD- and BT was done. At selected stations an oblique tow with a paired-bongo-ichthyoplankton sampler was made; the samples are worked up in the Institut für Meereskunde at Kiel university.

Results

The preliminary results of the abundance and the length of herring in the catches are shown in figure 1 and Table 1. It can be seen that nearly in the total area investigated between 66° and 73°30'W herring was caught but some areas can be stressed. These are situated at the slopes of Georges-Bank where we found a bottom temperature of 4-6°C with the exception of

the southern side where already warm gulfstream water masses were predominating. Other herring concentrations can be observed in the squares of the western part of the Bank near the Great South Channel; in this region some commercial German catches during the 72 herring season were already made.

Other accumulations were met close to the US-shore near Long Island in a bottom water temperature between 4-5°C and near Cape Sable/Nova Scotia in 2.6-5.8°C. No herring or only very small quantities (<100 per 30 min.) were caught at bottom temperatures higher than 6°C in the total area investigated, which has covered at last the total shelf southwards to Cape Hatteras.

Most of the herring caught during this cruise fell into the size group of 22-25 cm and are supposed to belong - our material is not worked up completely - to the 1970-yearclass. With the exception of one haul (42°09'N/66°48'W, 355 specimens with a mean length of 30.14 cm) we found in all our catches only very few herring greater than 25 cm, so that the whereabouts of the adults which normally come for to spawn e.g. to the northern edge of the Georges-Bank could not be determined during this time of the year by "Walther Herwig". The young herring caught at 43°22'N/66°40'W are supposed to be the 1971-yearclass.

No herring was caught on the shelf south of 40°N to 35°40'N/75°08'W. The most predominant species in the catches in that area were spiny dogfish, mackerel and shad; sometimes greater quantities of squid (max. 390 kg per 30 min.) occurred in the catches.

Summary

In February/March 1973 on board R.V. "Walther Herwig", a Young Herring Survey using a 180'-herring-bottom trawl was carried out in the ICNAF-divisions 4 X, 5 Y, 5 ZW and 6 A. Young herring was found especially on the slopes of Georges-Bank excluding southern part, furthermore in the area of the Great South Channel and near Long Island. Most of them seem to belong to the 1970-yearclass. No herring was found on the shelf south of 40°N to Cape Hatteras.

Table 1: Length frequencies (%) of herring captured by R.V. "Walther Herwig" February/March 1973

Area cm/2	4 X	5 Ze	5 Zw	6 A
20	5			
1	24			
2	71			
3	163			
4	146	+		
25	210	+		
6	85	+		
7	76	+		
8	17	+		
9	17	+		
30	20	+		
1	7	+		
2	10	+		
3	2	-		
4	2	+		
35	10	1		
6	10	1		
7	12	4		
8	22	6		
9	10	11	8	
40	15	18	-	
1	10	27	20	1
2	5	43	20	3
3	5	64	47	9
4	10	83	47	7
45	5	86	92	38
6	2	108	133	57
7	7	110	165	105
8	5	122	147	191
9	5	89	94	171
50	2	84	90	164
1	2	47	71	135
2	2	28	26	61
3	-	11	20	17
4	-	5	16	9
55	-	3	2	3
6	-	6	2	-
7	-	5	-	1
8	-	8	2	-
9	-	6		1
60	2	7		4
1		6		4
2		4		4
3		3		4
4		2		3
65		1		4
6		+		-
7		1		-
8		+		-
9				1
70				1
%o	996	1000	1002	998
n	410	8856	510	703
\bar{x} cm	13.78	23.79	23.94	24.91

GH

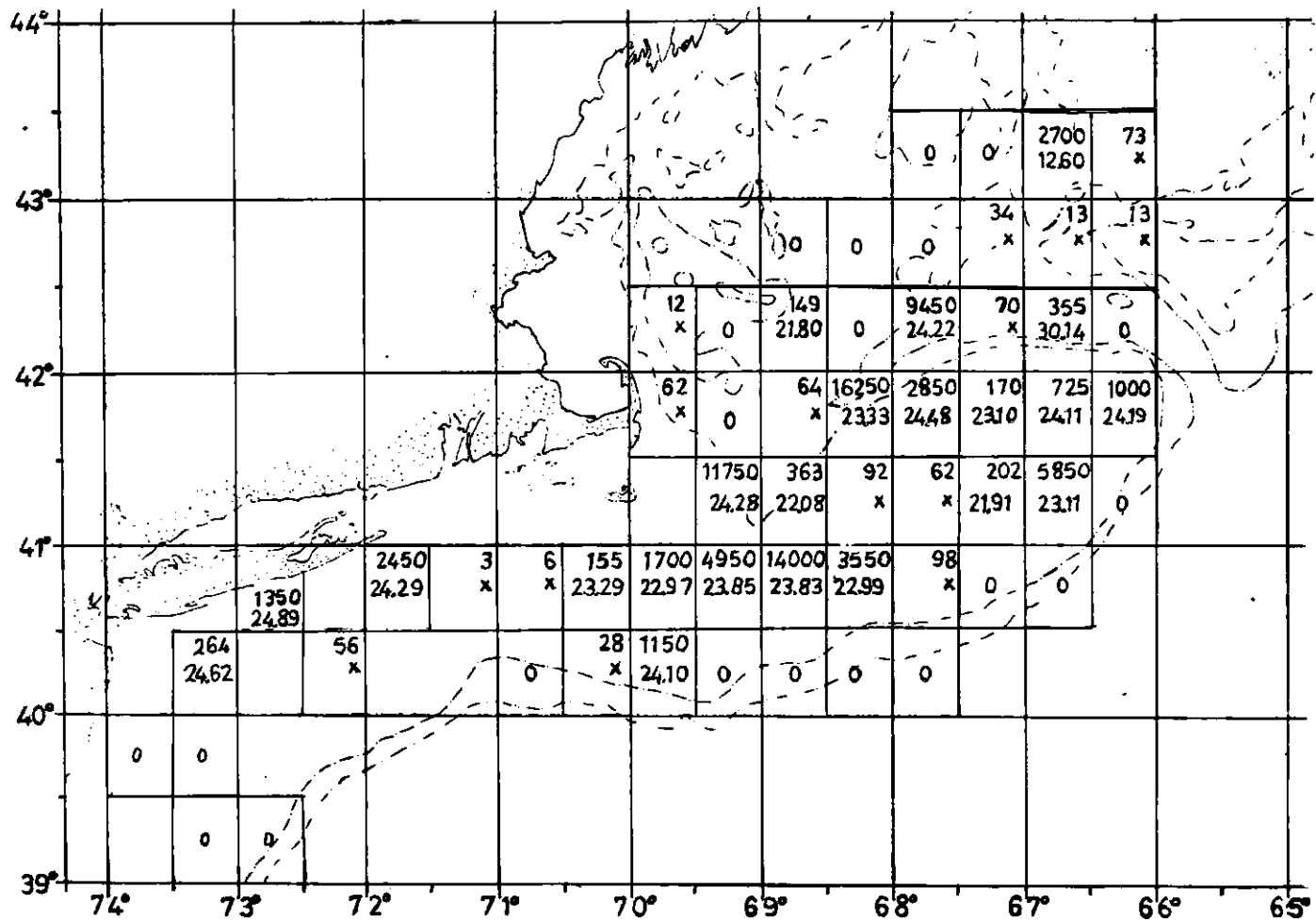


Fig. 1. Distribution of herring during the Young Herring Survey of R/V Walther Herwig in February - March 1973.
 Upper figure: numbers of herring caught per 30 min.
 Lower figure: mean length (cm).
 X: no mean length calculated because less than 100 herring.



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Addendum 1

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in February - March 1973

by

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and

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More detailed information on the results of the young-herring survey that were presented in Res.Doc. 73/84 are now available.

Table 1 lists information from each fishing station haul, including data on catches (in numbers and weight) for species other than herring.

It has not been possible to make a detailed comparison of these data for groundfish species, particularly cod, haddock and pollock, with those of the 1973 ICNAF groundfish surveys. Preliminary inspection of the data does indicate that for some groundfish species, at least, there is general agreement as to areas of distribution and the relative abundance between groundfish surveys and surveys using gear designed to sample pelagic species near the bottom.

Table 1. Station records of R/V Walther Herwig juvenile herring survey - February-March 1973.

ICNAF INTERNATIONAL YOUNG HERRING SURVEY												
						YEAR:	COUNTRY:	SHIP:				
						1973	GERMANY (FRG)	WALTHER HERWIG				
HAUL/STATION	1		4		6		8		9		11	
DATE	26.02.73		26.02.73		26.02.73		27.02.73		27.02.73		27.02.73	
POSITION	43°11'N 66°12'W		43°22'N 66°40'W		43°20'N 66°41'W		43°09'N 67°23'W		43°02'N 67°46'W		42°53'N 67°57'W	
TIME SHOOTING ^{XX}	10.40		14.47		17.10		07.40		10.32		13.50	
TIME HAULING ^{XX}	11.10		15.18		17.40		08.10		11.02		14.20	
DEPTH FROM - TO (m)	94-80		105-107		112-120		175-190		180-150		200-192	
t°C SURFACE A ^X	0.8		2.4		no data		2.5		3.3		3.3	
t°C " B ^X	1.2		3.1		"		2.4		3.2		3.4	
t°C Bottom A ^X	0.9		2.6		no data		7.8		7.4		7.5	
t°C " B ^X	1.3		5.8		"		7.8		7.6		7.8	
WIND	NW 3		rotating 1		rotating 1		NNE 5		NNE 5		NE 4	
CATCH	KG.	NO.	KG.	NO.	KG.	NO.	KG.	NO.	KG.	NO.	KG.	NO.
HERRING	?	73	35.7	2697			0.1	5				
MACKEREL			0.1	1								
GOP			16.0	2	65.0	19	2.7	1	2.4	2	13	3
HADDOCK	?	15	50.0	22	203.0	44			3.3	5	2.9	1
POLLOCK			7.3	1	5.9	2			20.0	10	20	15
SHAD					0.1	1	4.9	22	11.3	11	52	?
SPINY DOGFISH							5.8	4	63	?	110	?
SQUID												
OTHERS			3.2		40.8		6.0		100.0		23.4	
TOTAL	?		112.3		314.8		19.5		452.7		221.3	
REMARKS:												
A ^X : BEFORE SHOOTING												
B ^X : AFTER HAULING												
^{XX} GMT - 4 h												
	repetition haul No. 4!											

Table 1. continued

ICNAF INTERNATIONAL YOUNG HERRING SURVEY		YEAR: 1973		COUNTRY: GERMANY (FRG)		SHIP: WALTHER HERWIG		
		18		20		24		
DATE	TIME	LONGITUDE	TIME	LONGITUDE	TIME	LONGITUDE	TIME	
27.02.73	17.00	28.02.73	17.05	28.02.73	17.35	28.02.73	17.35	
42°50'N 68°11'W	16.30	42°45'N 67°15'W	07.25	42°42'N 66°19'W	13.36	42°08'N 66°25'W	07.05	
DEPTH FROM - TO (m)	17.00	220-225	07.55	170-168	14.06	18.05	07.35	
20 C SURFACE A	3.3	4.0	3.4	3.4	1.0	1.4	4.4	
20 C " B	3.3	4.2	no data	no data	1.0	1.4	no data	
20 C Bottom A	7.1	8.3	6.4	6.4	2.7	5.5	4.9	
20 C " B	6.9	7.5	no data	no data	2.7	6.5	no data	
END	NES	NES	NES	NNE 6	NNE 4	NNE 5	rotating 2	
CATCH	KG.	NO.	KG.	NO.	KG.	NO.	KG.	NO.
HERRING	0.2	2	1.8	34	0.6	13	71.0	355
CKEREL								
OD	3.6	2						
EDDOCK			6.4	3	4.2	7	6.0	8
OLLOCK	16.0	2	3.3	16	18.0	6	127.0	35
OAD	11.0	45	7.2	37	0.3	1	33.0	52
MINY DOGFISH	20.0	9	41.0	30	448.0	?	1.1	1
UID								
HERS	18.0		724.6		21.5		12.7	
TAL	68.8		784.3		493.1		13.1	
MARKS:								
BEFORE SHOOTING								
AFTER HAULING								
EX, GMT - 4 b								

Cruller of the catch:
red fish

Table 1. continued

ICNAF INTERNATIONAL YOUNG HERRING SURVEY			YEAR:		COUNTRY:		SHIP:	
			1973	GERMANY (FRG)	WRITHER HERWIG			
HAUL/STATION	25	27	28	30				
DATE	01.03.73	01.03.73	01.03.73	01.03.73	02.03.73	02.03.73		02.03.73
POSITION	42°07'N 67°13'W	42°03'N 67°36'W	42°02'N 67°41'W	42°15'N 68°09'W	42°37'N 68°54'W	42°05'N 68°55'W		
TIME SHOOTING ^{XX}	09.31	12.45	14.02	17.35	07.07	10.50		
TIME HAULING ^{XX}	10.01	13.15	14.32	18.05	07.37	11.20		
DEPTH FROM - TO (m)	73-65	100-113	100-112	174-185	155-145	135-130		
t°C SURFACE ^A ^X	4.5	4.8	5.2	4.1	4.6	5.2		
t°C " ^B	4.4	4.8	5.3	4.1	4.6	5.3		
t°C Bottom ^A ^X	4.5	5.0	5.2	7.2	6.9	5.2		
t°C " ^B	4.4	5.0	5.3	7.0	6.7	5.2		
WIND	rotating 2		S 3	SSW 5	SSW 4	SW 2		
CATCH	KG.	NO.	KG.	NO.	KG.	NO.	KG.	NO.
HERRING	8.2	70	385.0	3900	1400.0	15000	0.1	2
MACKEREL								144
COD	51.0	24	33.0	6	3.5	2	35.0	14
HADDOCK	130.0	45	26.0	21	42.5	29	11.0	8
POLLOCK	61.0	139	37.0	8	181.0	25	306.0	167
SHAD					3.7	23	11.0	35
SPINY DOGFISH					88.0	39	7.0	2
SQUID								
OTHERS	29.1		35.6		13.5		186.2	
TOTAL	279.3		516.6		1640.5		556.3	
REMARKS:								
^X : BEFORE SHOOTING								
^B : AFTER HAULING								
^{XX} : GMT - 4 h								
			1640.5		Repetition haul No. 27!			

Table 1. continued

ICNAF INTERNATIONAL YOUNG HERRING SURVEY

		YEAR:	COUNTRY:	SHIP:	
HAUL/STATION		1973	GERMANY (FRG)	WELTHER HERWIG	
DATE	36	48	49	51	
POSITION	02.03.73	03.03.73	03.03.73	03.03.73	
TIME SHOOTING XX	42°05'N 69°13'W	41°38'N 69°33'W	41°43'N 68°50'W	41°42'N 68°22'W	
TIME HAULING XX	13.38	17.42	09.25	15.30	
DEPTH FROM - TO (m)	14.08	18.12	09.55	16.00	
t°C SURFACE A X	190-189	170-210	200-190	38-54	
t°C " B X	4.1	5.2	4.7	4.3	
t°C Bottom A X	5.2	5.0	5.0	4.2	
t°C " B X	6.9	6.6	5.1	4.5	
WIND	6.8	6.9	5.2	4.6	
	rotating 1	rotating 1	ENE 4	E 4	
CATCH	KG.	NO.	KG.	NO.	KG. NO.
HERRING					
MACKEREL					
COD					
HADDOCK					
POLLOCK					
SHAD					
SPINY DOGFISH					
SQUID					
OTHERS					
TOTAL	146.6		2040		2450 30000
REMARKS:					
A: BEFORE SHOOTING					
B: AFTER HAULING					
XX: GMT - 4 h					
			only redfish!		only herring!

Table 1. continued

ICNAF INTERNATIONAL YOUNG HERRING SURVEY

HAUL/STATION	YEAR:		COUNTRY:		SHIP:	
	1973	1974	GERMANY (FRG)	59	WÄLTER HERWIG	65
DATE	03.03.73	55	56	57	04.03.73	05.03.73
POSITION	41°41'N 68°20'W	41°58'N 67°49'W	41°45'N 67°44'W	41°34'N 67°15'W	41°50'N 66°46'W	41°38'N 66°21'W
TIME SHOOTING ^{xx}	16.35	07.10	09.50	13.15	17.20	07.08
TIME HAULING ^{xx}	17.05	07.40	10.20	13.45	17.50	07.38
DEPTH FROM - TO (m)	45-55	77-65	33-38	54-49	58-60	85
t°C SURFACE A ^x	no data	4.7	4.7	3.8	4.2	3.2
t°C " B ^x	no data	4.0	3.8	3.8	4.2	3.2
t°C Bottom A ^x	no data	4.7	4.7	3.8	4.2	4.1
t°C " B ^x	no data	4.2	3.7	3.6	4.2	4.7
WIND	ESE 4	SES	SES 3	SE 4	SS	N 4
CATCH	KG.	NO.	KG.	NO.	KG.	NO.
HERRING	210.0	2500	570.0	5700	13.1	170
MACKEREL					72.0	725
COD	+	+	55.0	6	4.1	3
HADDOCK			5.5	5	211.0	92
POLLOCK			53.0	7	27.0	7
SHAD					6.0	1
SPINY DOGFISH					0.2	1
SQUID						
OTHERS			5.4		0.6	
TOTAL	210.0		688.9		28.4	
REMARKS:	Repetition haul No. 5A1 xx GMT - 4 h					

Table 1. continued

ICHAFF INTERNATIONAL YOUNG HERRING SURVEY

HAUL/STATION	YEAR:		COUNTRY:		SHIP:	
	1973	1974	GERMANY (FRG)	WHYTHE HERWIG	84	85
DATE	77	79	80	83		
POSITION	06.03.73	06.03.73	06.03.73	07.03.73	07.03.73	07.03.73
TIME SHOOTING	41°08'N 68°47'W	41°07'N 69°14'W	41°04'N 69°16'W	40°57'N 69°09'W	40°52'N 69°09'W	40°46'N 68°04'W
TIME HAULING	14.05	17.10	18.16	07.00	08.40	11.40
DEPTH FROM - TO (m)	14.35	17.40	18.46	07.30	09.10	12.10
t°C SURFACE	78-76	48-52	58-53	61	63-72	59-62
t°C " A	4.3	4.4	4.4	4.6	4.4	4.2
t°C " B	no data	4.2	4.2	4.5	no data	no data
t°C Bottom	4.3	4.4	4.4	4.6	4.5	4.1
t°C " A	no data	4.2	4.2	4.6	no data	no data
t°C " B	no data	4.2	4.2	4.6	no data	no data
WIND	E 6	E 6	E 6	E 4	E 4	E 2-3
CATCH	KG.	NO.	KG.	NO.	KG.	NO.
HERRING	27.0	363	1450.0	16000	180.0	2200
MACKEREL					682.0	7700
COD	23.0	10	18.5	4		
HADDOCK	9.5	7	3.4	4	11.5	2
POLLOCK	13.0	2			1.2	2
SHAD	0.2	1			9.5	3
SPINY DOGFISH						
SQUID						
OTHERS	15.5		8.1		1.2	
TOTAL	88.2		1480.0		190.7	
REMARKS:			730.0		697.4	1300.0
A: BEFORE SHOOTING			repetition		repetition	
B: AFTER HAULING			haul No. 79!		haul No. 83!	
xx GMT - 4 h						

Table 1. continued

ICNAP INTERNATIONAL YOUNG HERRING SURVEY

	HAUL/SPATION		YEAR:		COUNTRY:		SHIP:	
	86	88	1973	92	GERMANY (FRG)	93	WRYTHER HERWIG	95
DATE	07.03.73	07.03.73	09.03.73	09.03.73	09.03.73	09.03.73	09.03.73	09.03.73
POSITION	40°44'N 68°45'W	40°42'N 68°21'W	40°43'N 68°15'W	40°53'N 67°51'W	40°50'N 67°18'W	40°57'N 66°07'W		
TIME SHOOTING ^{xx}	12.55	15.35	16.35	07.07	10.07	13.17		
TIME HAULING ^{xx}	13.25	16.05	17.05	07.37	10.37	13.47		
DEPTH FROM - TO (m)	62-63	58-62	64	58	88-91	71-73		
t°C SURFACE A ^x	4.3	4.2	4.8	4.3	4.7	4.7		
t°C " B ^x	no data	4.2	4.6	4.4	4.6	4.1		
t°C Bottom A ^x	4.2	4.1	4.6	4.3	4.0	5.5		
t°C " B ^x	no data	4.0	4.8	4.4	4.3	5.5		
WIND	E 2-3	E 3	E 3	rotating 2	NE 2	NE 2		
CATCH	KG.	NO.	KG.	NO.	KG.	NO.	KG.	NO.
HERRING	1190.0	12000	400.0	5300	142.0	1784	8.3	98
MACKEREL								
COD	+		15.0	6	6.1	2	19.0	8
HADDOCK	+		4.5	1	0.8	5	0.8	9
POLLOCK			10.0	1	4.4	1		
SHAD							0.1	1
SPINY DOGFISH								
SQUID								
OTHERS	+				1.8		0.8	
TOTAL	1190.0		431.5		155.1		29.0	
REMARKS:	repetition							
A ^x : BEFORE SHOOTING	haul No. 85!							
B ^x : AFTER HAULING	repetition							
xx GMT - 4 h	haul No. 88!							

Table 1. continued

ICMAP INTERNATIONAL YOUNG HERRING SURVEY		YEAR:	COUNTRY:	SHIP:
		1973	GERMANY (FRG)	WÄLTER HERWIG
HAUL/STATION	101	102	104	106
DATE	10.03.73	10.03.73	10.03.73	10.03.73
POSITION	40°28'N 67°52'W	40°26'N 68°20'W	40°27'N 68°52'W	40°27'N 69°17'W
TIME SHOOTING ^{xx}	07.10	09.48	12.50	15.31
TIME HAULING ^{ix}	07.40	10.18	13.20	16.01
DEPTH FROM - TO (m)	128-122	104	73-74	71
t°C SURFACE ^{ix}	6.3	5.2	4.8	4.3
t°C " ^{ix}	6.6	no data	4.6	4.8
t°C Bottom ^{ix}	10.8	8.9	5.5	4.8
t°C " ^{ix}	10.3	no data	5.5	4.8
WIND	NE S	NE S	NE S	NE S
CATCH	KG. NO.	KG. NO.	KG. NO.	KG. NO.
FERRING				
MACKEREL	7.9 16			12.10 1575
COD				4.5 74
Haddock			0.3 1	
POLLACK				
SHAD	1.6 5			5.6 1
SPINY DOGFISH	0.5 2		0.2 1	9.8 74
SQUID	3.1 22			
OTHERS	72.0	0.3	0.0	0.8
TOTAL	85.1	0.3	0.0	0.8
REMARKS:				
A: BEFORE SHOOTING				
B: AFTER HAULING				
xx: OMT - 4 h				
			126.3	445.5
				note: 1-hour-haul!

Table 1. continued

IGMAP INTERNATIONAL YOUNG HERRING SURVEY

HAUL/STATION	YEAR:		COUNTRY:		SHIP:	
	1973	1973	GERMANY (FRG)	120	WÄLTER HEARWIG	125
DATE	11.03.73	11.03.73	11.03.73	11.03.73	12.03.73	12.03.73
POSITION	40°45'N/69°51'W	40°29'N/70°19'W	40°27'N/70°45'W	40°57'N/70°44'W	40°32'N/71°25'W	
TIME SHOOTING ^{xx}	07.17	10.00	15.02	17.47	07.07	
TIME HAULING ^{xx}	07.47	10.30	13.30	15.32	07.37	
DEPTH FROM - TO (m)	38-41	39-43	65-68	75-71	65	
t°C SURFACE A ^x	3.8	3.7	5.5	6.6	4.8	
t°C " B ^x	3.7	3.6	4.6	5.2	3.8	
t°C Bottom A ^x	3.9	3.7	5.3	12.0	4.5	
t°C " B ^x	3.9	3.6	4.3	7.2	4.0	
WIND	NE 2	ENE 2	ENE 2	ENE 2	S 2	
CATCH	KG.	NO.	KG.	NO.	KG.	NO.
HERRING	132.0	1700	14.0	155	0.5	6
MACKEREL			0.9	23		
COD			0.8	1	4.5	7
HADDOCK						
POLLOCK						
SHAD	2.4	4	5.6	26	1.1	28
SPINY DOGFISH	1.5	1	1.8	1	2.3	2
SQUID					1.9	11
OTHERS	9.7		4.3			
TOTAL	146.1		19.1		160.0	
REMARKS:			15.8		160.0	
x: BEFORE SHOOTING						
x: AFTER HAULING						
xx: GWT - 4 b						

Both of the catch
in polypropylene.

Table 1. continued

ICHAFF INTERNATIONAL YOUNG HERRING SURVEY

HAUL/STATION	126		127		128		129		YEAR:	COUNTRY:	SHIP:
	DATE	12.03.73	12.03.73	12.03.73	12.03.73	12.03.73	12.03.73	13.03.73	1973	GERMANY (FRG)	WRITHER-HERWIG
POSITION	40°43'N 7°50'W	40°16'N 72°17'W	40°29'N 72°45'W	40°16'N 73°07'W	39°44'N 73°37'W	39°42'N 73°035'W					
TIME SHOOTING ^{XX}	09.31	12.50	15.25	17.45	18.15	09.43					
TIME HAULING ^{XX}	10.01	13.20	15.55	18.15	18.15	10.13					
DEPTH FROM - TO (m)	5.1	5.7-5.5	4.3-3.9	3.7	3.7	4.9					
t°C SURFACE	4.3	4.7	4.8	5.1	5.1	5.0					
t°C " "	4.7	4.7	5.3	5.0	5.0	6.2					
t°C Bottom	4.3	4.9	5.2	5.1	5.1	5.0					
t°C " "	4.3	5.0	4.9	4.7	4.7	4.6					
WIND	S 2	S 2	W 2	SW 2	SW 2	NW 2					
CATCH	KG.	NO.	KG.	NO.	KG.	NO.	KG.	NO.	KG.	NO.	KG.
ERRA	225.0	2450	5.3	56	136.0	1350	27.0	264	5.6	42	
PACKEREL			0.1	4	0.4	4	0.1	1	0.4	8	19.0
GOD			0.7	1			1.1	1	1.7	2	1.5
HADDOCK											
FOLLOCK					2.4	1					
SHAD	3.6	48			42.0	273	12.0	107	1.1	9	4.0
SPIRY DOGFISH	2.4	2	20.0	9	4.6	1					46.0
SQUID											
OTHERS	5.7		0.4		7.4		6.5		5.1		14.2
TOTAL	236.7		26.5		193.3		46.7		13.9		84.7
REMARKS:											
A ¹ : BEFORE SHOOTING											
B ¹ : AFTER HAULING											
XX GMT - 4 h											

Table 1. continued

ICNAF INTERNATIONAL YOUNG HERRING SURVEY

HAUL/STATION	YEAR:		COUNTRY:		SHIP:	
	1973	1974	GERMANY (FRG)	137	WÄLTHERR HERWIG	138
DATE	13.03.73	13.03.73	14.03.73	14.03.73	14.03.73	14.03.73
POSITION	39°21'N 12°55'W	39°11'N 73°15'W	38°39'N 73°16'W	38°21'N 73°55'W	38°06'N 74°10'W	
TIME SHOOTING XX	12.25	14.35	17.48	07.05	09.15	11.20
TIME HAULING XX	12.55	15.05	18.18	07.35	09.45	11.50
DEPTH FROM - TO (m)	70	59-64	100	49-48	61-66	57-50
°C SURFACE A X	5.4	7.2	8.1	7.2	8.4	8.9
°C " B X	6.9	7.3	8.8	7.3	9.0	8.7
°C Bottom A X	6.7	6.5	13.1	6.9	7.8	6.7
°C " B X	6.5	7.1	13.0	6.7	8.3	7.7
WIND	NW 2	NW 1	SSW 2	rotating 1	rotating 1	SW 1-2
CATCH	KG.	NO.	KG.	NO.	KG.	NO.
REP. AG						
CACEREL	+	28.0	197		21.0	112
OD						
ADDOCK						
POLLOCK						
HAD	+				8.3	29
PINY DOGFISH	900.0	?	240.0	?	480	35
QUID					6.6	120
OTHERS					39.4	?
OTAL	900.0		268.0		166.7	
EMARKS:					256.6	268.6
X BEFORE SHOOTING						
X AFTER HAULING						
XX GMT - 4 h						

Table 1. continued

ICHAFF INTERNATIONAL YOUNG HERRING SURVEY		YEAR:	COUNTRY:	SHIP:		
		1973	GERMANY (FRG)	WALTER HERWIG		
HAUL/STATION	139	140	142	143	144	145
DATE	14.03.73	14.03.73	15.03.73	15.03.73	15.03.73	15.03.73
POSITION	37°49'N 74°40'W	37°42'N 74°18'W	35°40'N 75°08'W	36°03'N 74°51'W	36°17'N 75°15'W	36°47'N 74°49'W
TIME SHOOTING	15.20	17.48	07.08	16.07	12.50	16.12
TIME HAULING	15.50	18.18	07.38	16.37	13.20	16.42
DEPTH FROM - TO (m)	42-46	100-111	34-31	97-93	28-32	62-59
t°C SURFACE	7.2	10.3	9.7	13.2	7.7	15.2
t°C "	7.7	10.2	9.3	13.4	7.8	16.1
t°C Bottom	7.3	10.7	6.3	8.4	6.3	7.9
t°C "	7.3	11.0	7.0	8.8	7.4	7.8
WIND	SW 1-2	rotating 2	rotating 1	SW 3	SW 3	SW 3
CATCH	KG.	NO.	KG.	NO.	KG.	NO.
HERRING						
MACKEREL					136.0	286
COD					1.4	1
HADDOCK						
POLLOCK						
SHAD			15.0	41	80.0	320
SPINY DOGFISH	1200.0	2	324.0	96	275.0	100
SQUID					340.0	25000
OTHERS	11.7		320.0		702.0	
TOTAL	1211.7		339.0		1092.0	
REMARKS:						
A: BEFORE SHOOTING						
B: AFTER HAULING						
XX: GMT - 4 h						
bulks of the catch:	Centropomus striatus	bulks of the catch:	Stenotomus chrysops			

Table 1. continued

ICNAF INTERNATIONAL YOUNG HERRING SURVEY

		YEAR:	COUNTRY:	SHIP:
HAUL/STATION	146	1973	GERMANY (FRG)	WÄTHER HERWIG
DATE	15.03.73			
POSITION	37°09'N 174°39'W			
TIME SHOOTING XX	18.45			
TIME HAULING XX	19.15			
DEPTH FROM - TO (M)	88-85			
t°C SURFACE A X	13.2			
t°C " B X	12.1			
t°C Bottom A X	10.3			
t°C " B X	11.9			
WIND	SSW 4			
CATCH	KG.	NO.	KG.	NO.
HERRING				
MACKEREL				
COD				
HADDOCK				
POLLOCK				
SHAD				
SPINY DOGFISH				
SQUID	24.0	320		
OTHERS	1086.9			
TOTAL	1110.9			
REMARKS:	South of the catch: <i>Stenotomus chrysops</i> and <i>Pleuronectes evlanus</i> n. <i>Carolinus</i>			
A: BEFORE SHOOTING				
B: AFTER HAULING				
XX GMT - 4.b				

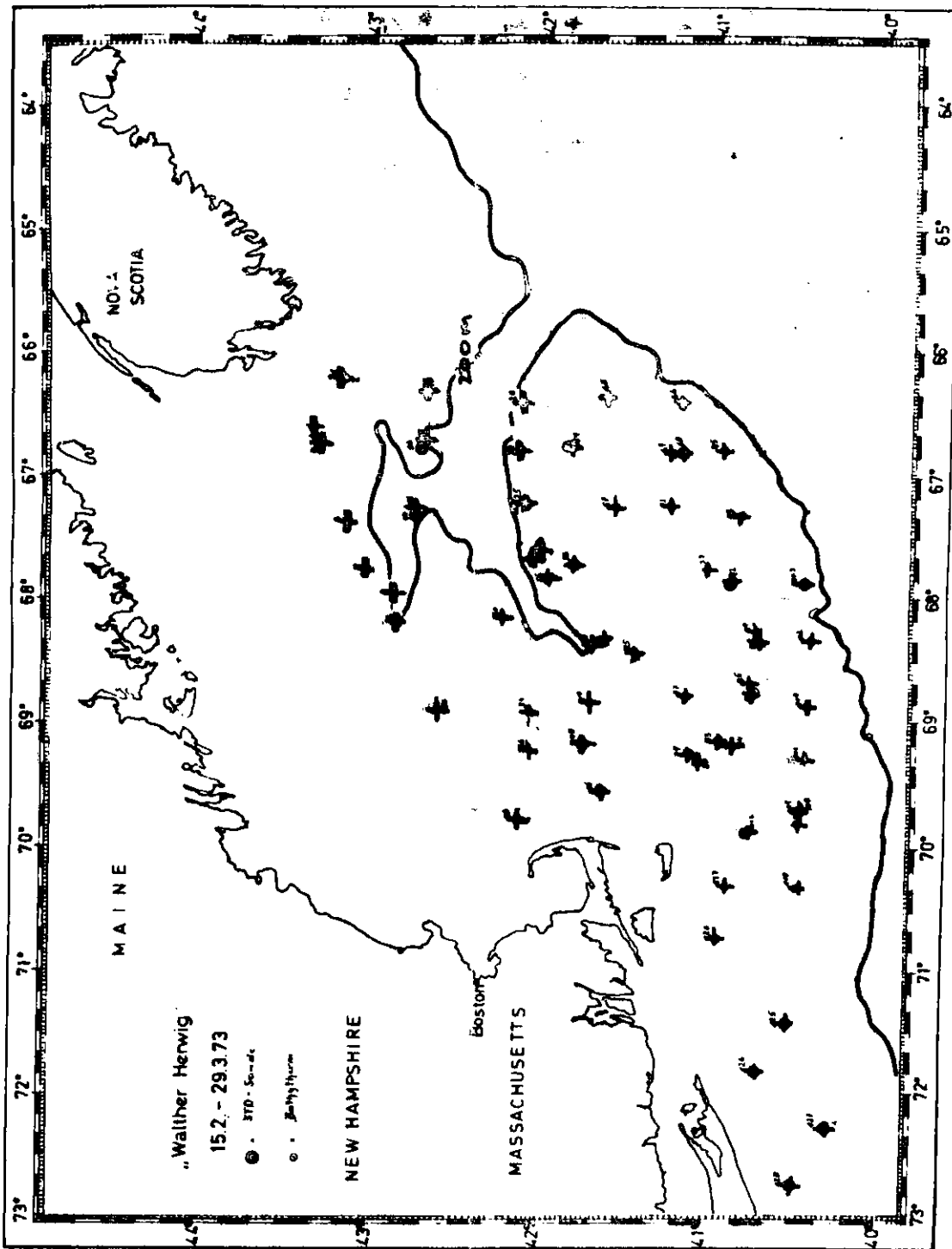


Figure 1. Station positions (heming-rawl, 30min. tow), Walther Herwig, February - March, 1973

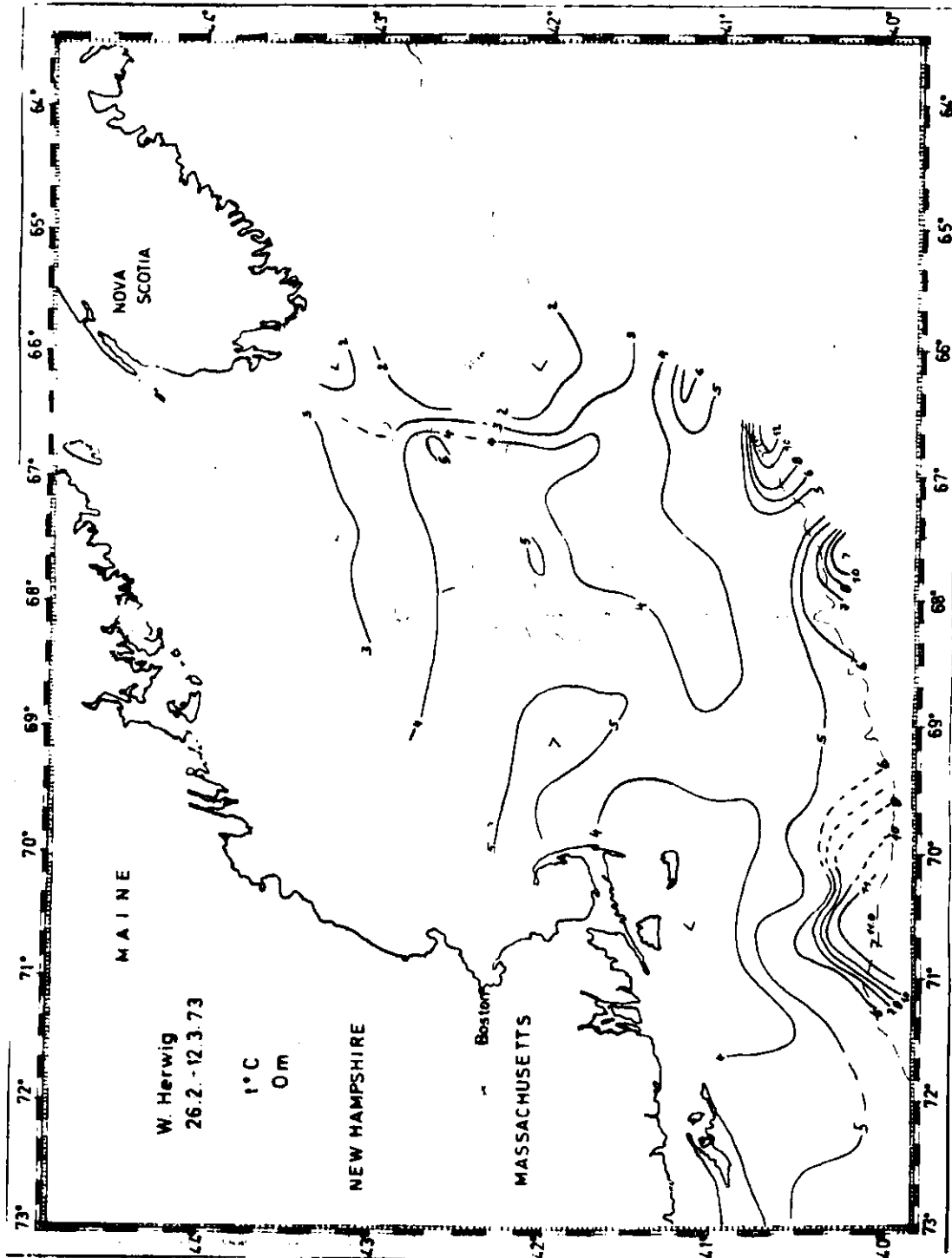


Figure 2 . Surface temperature (t°C)

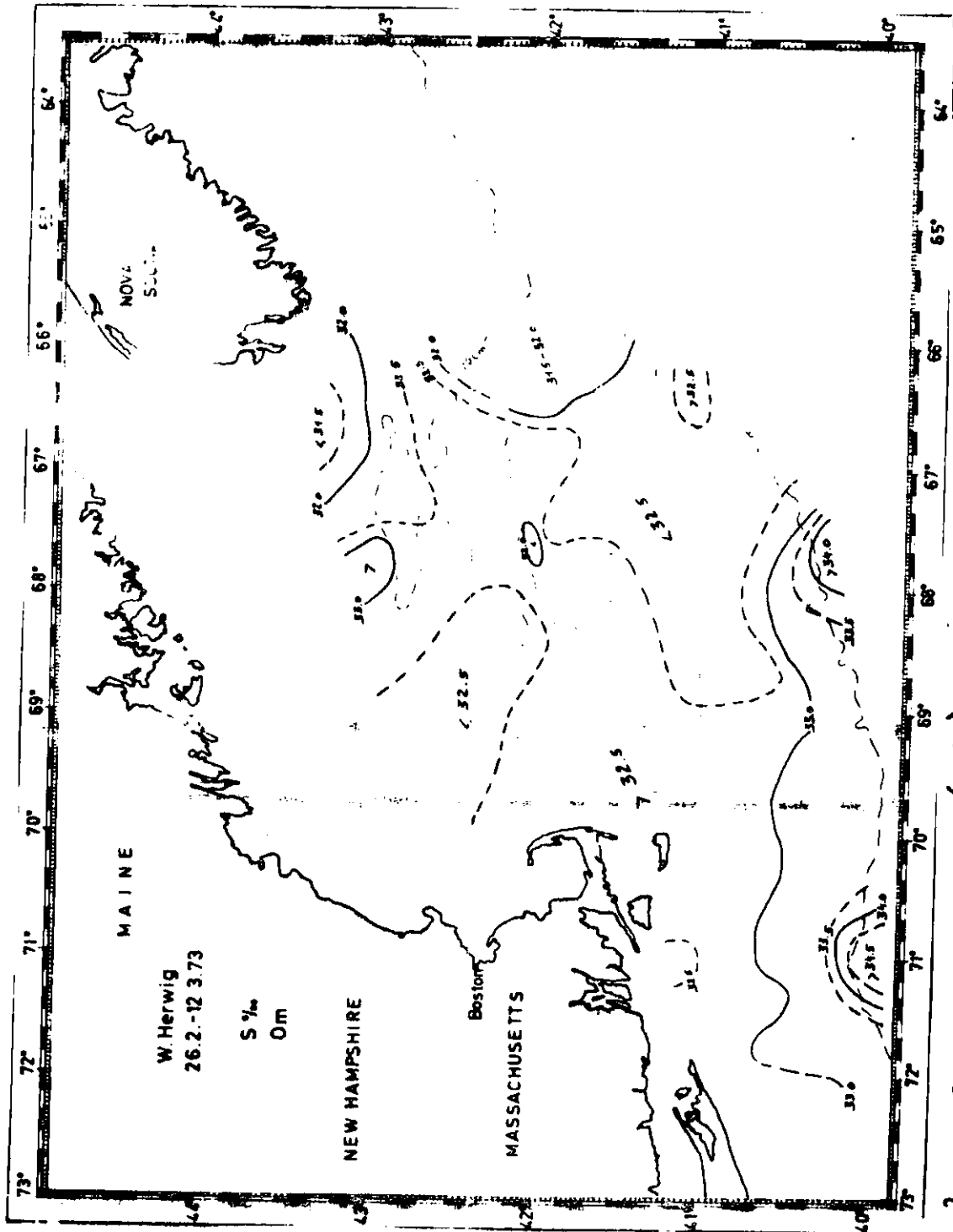


Figure 3 Surface salinity (‰).

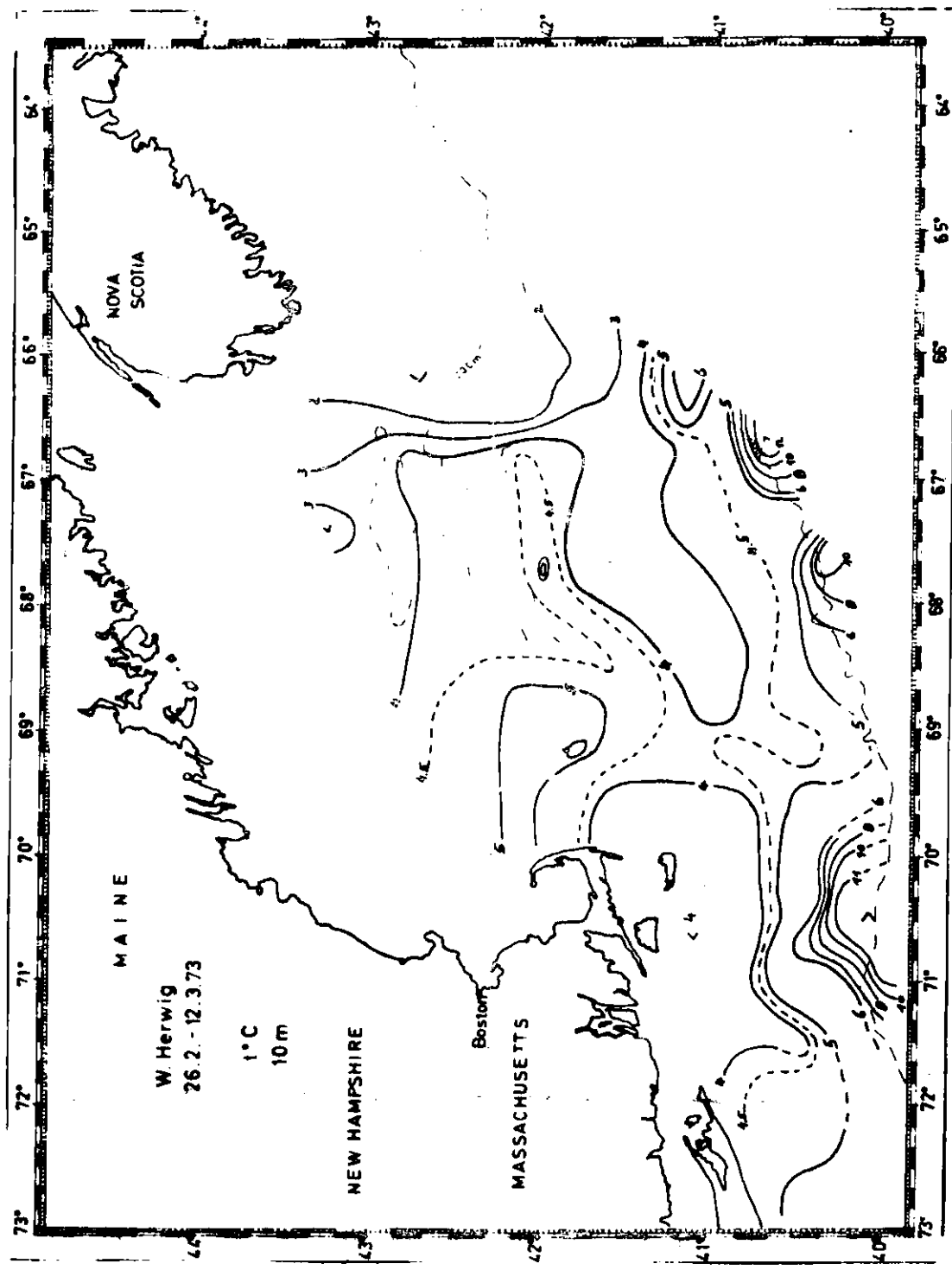


Figure 4 Temperature at 10m (t°C)

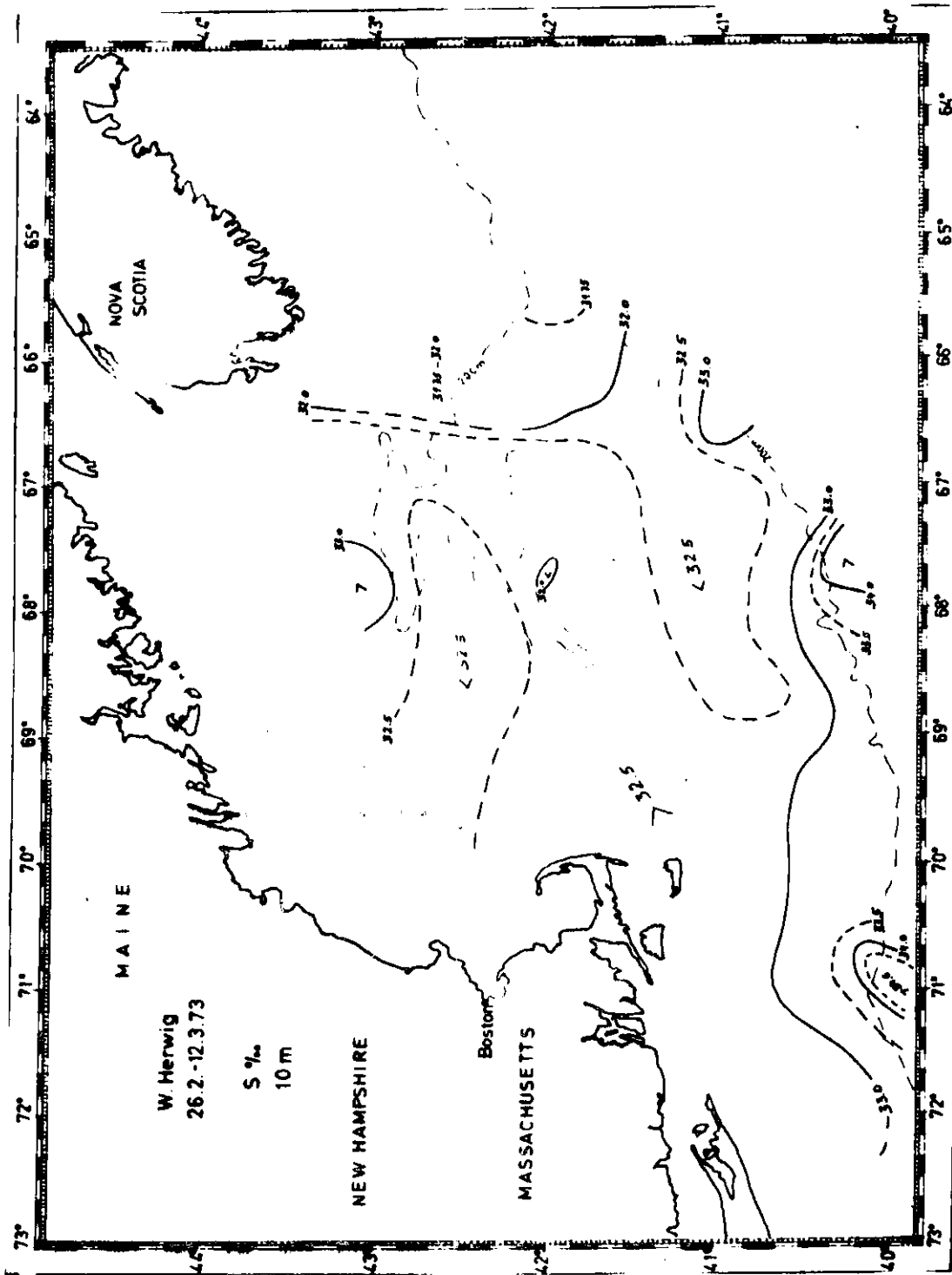


Figure 5 Salinity at 10m (‰)

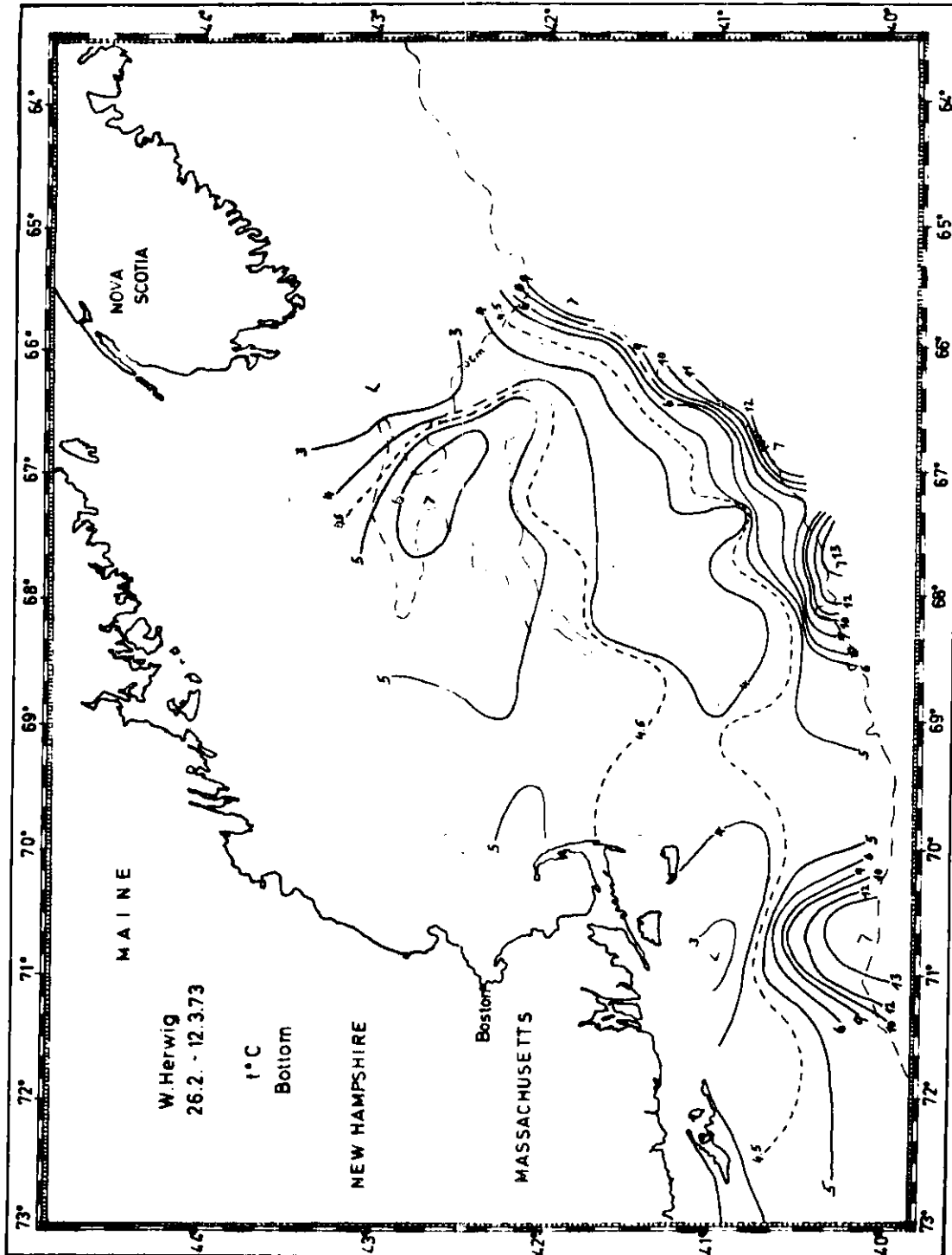


Figure 6 Bottom temperature (°C)

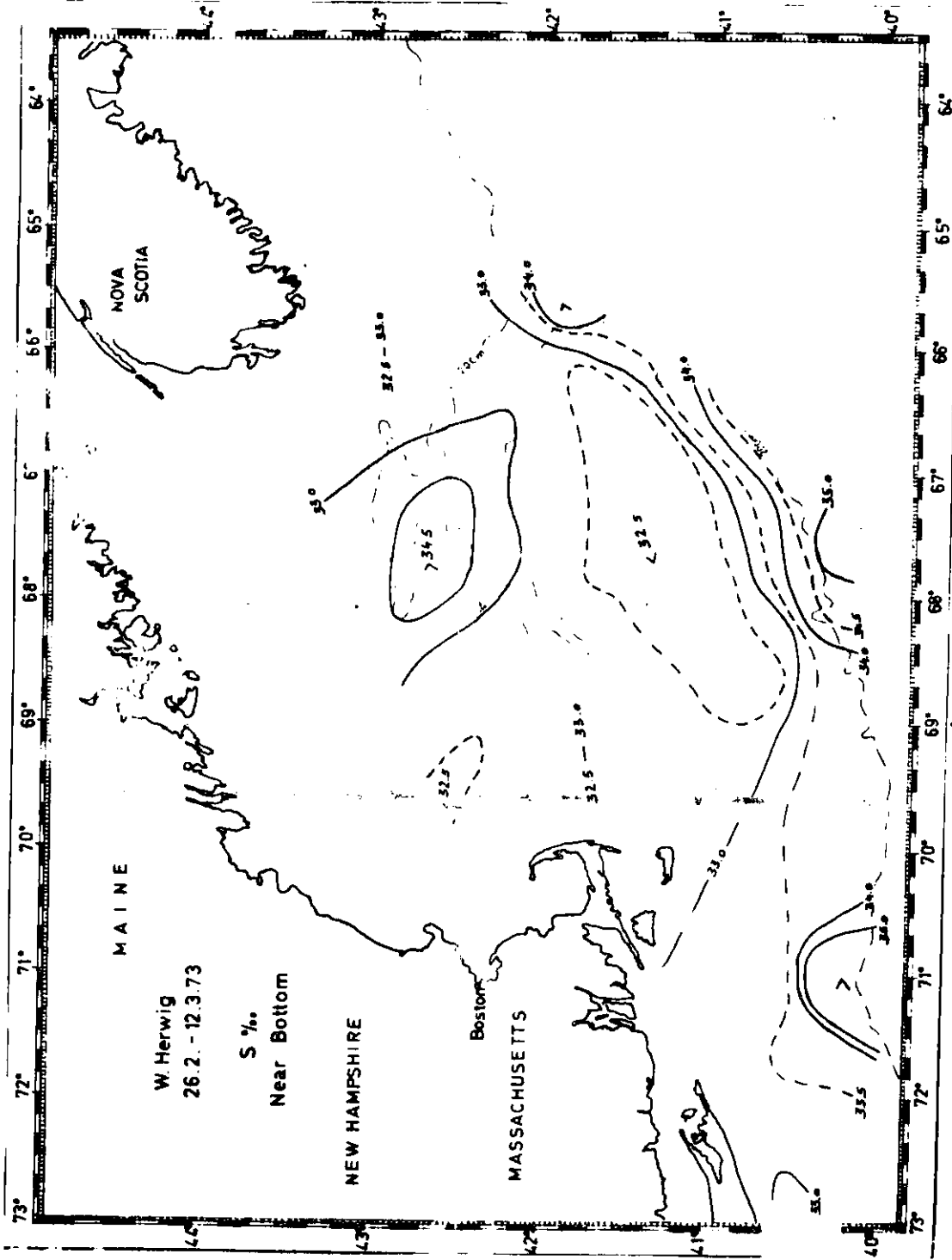


Figure 7. Bottom salinity (‰).

