P.S. 18

International Council for
the Exploration of the Sea

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Hydrographic Committees

Anon. 1978:

Preliminary report of the International O-group fish survey in the Barents Sea and adjacent waters in August - September 1978

INTRODUCTION

The aim of this survey has been to study the geographical distribution and the abundance of O-group fish in the area. Temperature observations has been made along the survey tracks in order to give a brief discriptions of the temperature condition in the area, and the data gives some indications of changes from year to year in the main current system.

PARTICIPATION AND ARRANGEMENTS

A preliminary plan for the 1978 survey was discussed by correspondance. Coordination and final arrangements were discussed the 24 August in Murmansk between scientists from the Polar Institute of Marine Fisheries and Oceanography, Murmansk and the Institute of Marine Research, Bergen.

The survey program was covered in the period 20 August - 10 September and the following research vessels participated in the fourteenth international O-group fish survey in the Barents Sea and the Svalbard region:

State	Name of vessel		
Norway	"G.O.Sars"	25 August - 10 September	Institute of Marine Research, Bergen
Norway	"Johan Hjort"	20 August - 10 September	" "
USSR	"Poisk"	25 August - 10 September	The Polar Research Institute of Marine Fisheries and Oceanography, Murmansk
USSR	"Fridtjof Nansen"	25 August - 8 September	" "

Name of scientists and technicians who took part on the different vessels are given in Appendix.

Data collected during the survey was analysed during a meeting in Hammerfest the 11 - 13 September between scientists from the two participating countires. Some preliminary findings are given in this report.

MATERIAL AND METHODS

The geographical distribution and the density of the O-group fish were estimated by fishing with small meshed midwater trawls in the scattering layer, mainly between 0 - 50 m. The trawls used by the different vessels and the trawling procedure were the same as described in the 1977 report of this survey (Annls. Biol. 1977).

Survey tracks and hydrographical stations worked are given in Fig. 1. Trawl stations with and without catch are indicated on the species distribution charts (Figs. 10 - 18).

RESULTS

Hydrography (Figs. 2 - 9)

Hydrographic observations were carried out along the survey tracks and several standard hydrographic sections were worked. Horisontal temperature distributions are shown for 0, 50, 100 and 200 m depth in Figs. 2 - 5. Average temperature in four of the standard hydrographic sections (Figs. 6 - 9) are given in Tables 1 - 4. The general comments are given:

1) Kola section

A Cooling of all layers was observed from 1976 to 1977 and a further decrease in temperature was recorded this year. The anomalies are - 0.7°, - 1.1°, - 1.0° for the layers 0 - 50 m, 50 - 200 m and 0 - 200 m respectively.

2) Cape Kanin - North section

The mean temperature is the lowest observed for the period 1965 - 1978. The anomalies for this section are even larger than for the Kola section, - 1.9° in the south and - 1.7° in the north.

3) North Cape - Bear Island section

The mean temperature in the 0 - 200 m layer are 5.0° compared with 4.8° in 1977. The anomalie are - 0.6°.

4) Bear Island - West section

The mean temperature in the 0 - 200 m layer are close to the average for the period 1966 - 1978, 4.1° compared with 4.2°.

Generally, the low temperature conditions in the south Barents Sea in 1978 indicate low water transport by the Murmansk current.

The temperature conditions west of Bear Island in 1978 indicate a more normal water transport in the Spitsbergen current.

DISTRIBUTION AND ABUNDANCE OF O-GROUP FISH

Distribution of O-group fish of the main species are shown by shaded areas in Figs. 10 - 18. Areas with double shading indicate dense consentrations of O-group fish. The criteria used to discriminate between scattered and dense consentrations in the distribution charts is for cod, haddock, redfish and Greenland halibut 85 O-group fish caught per haul, for capelin and polar cod 1050 and 110 respectively. Abundance indices are calculated as area of distribution, the areas with high densities are weighted by 10. The abundance indices are given for the year classes 1965 - 1978 in Table 5. Length distribuitons of main species are given in Fig. 19.

Herring (Fig. 10)

O-group herring was distributed over a larger area than in previous years.

Catch per haul has also increased, indicating a slight increase in the offshore distribution of O-group herring.

Mackerel (Fig. 11)

Mackeral has occationally been recorded in the O-group survey. This year the mackerel was observed in a wide area from Lofoten to North Cape.

Capelin (Fig. 12)

O-group capelin was distributed in the central part of the Barents Sea. The distribution area was small and the estimated abundance index is the lowest recorded in the period 1966 - 1978. There is, however, a rather low correlation between the O-grqup indices and the acoustic abundance estimate of the year class as two year olds. In spite of this, the survey indicate that the 1978 year class is poor.

Cod (Fig. 13)

As in 1977, the O-group cod was distributed in the central Barents Sea and along the Bear Island - West Spitsbergen shelf. The O-group cod was not distributed as far east as in 1977, and no dence consentration was observed in the central Barents Sea. Dense consentrations were observed along West-Spitsbergen, indicating higher abundance of cod in this area than in the most recent years. The abundance index indicates that the 1978 year class is below average.

Haddock (Fig. 14)

O-group haddock was not observed as far east in the Barents Sea and as far north off West-Spitsbergen as in 1977. The abundance index indicates that the 1978 year class is below the average year class strength, and only half of the 1977 year class which was an abundant one.

Polar cod (Fig. 15)

As in previous years, O-group polar cod occured in two components, one in the Spitsbergen, and one in the Novaya Zemlja area. Neither the 1977 nor the 1978 survey covered the whole area of distribution. Estimated abundance indices are therefore too low. However, compared with the 1977 data the 1978 observations indicate a somewhat lower abundance of the Spitsbergen component and a somewhat higher abundance of the Novaya Zemlja component.

Redfish (Fig. 16)

O-group redfish was not observed as far north off West-Spitsbergen as last year, but the area of dense consentrations was similar to that of 1977. The abundance index indicates that the 1978 year class is strong.

Greenland halibut (Fig. 17)

Greenland halibut was only observed in the West-Spitsbergen area as in previous years. Compared with 1977, the fish was distributed further to the west. The abundance index was the highest estimated in the period 1970 - 1978.

Long rough dab (Fig. 18)

O-group long rough dab was separated in two components. The Bear Island/Spitsbergen component had a similar distribution as in 1977, while the Barents Sea component was distributed over a wider area in the sentral part of the Barents Sea. The abundance index indicates that the 1978 year class is above average abundance.

Table 1. Mean water temperature in the Murmansk current, the Kola section (between 70°30'N and 72°30'N) at the end of August (t°C).

Year Layer	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	Average 1965 - 1978
0-50 m	6.7	6.7	7.5	6.4	6.7	7.8	7.1	8.7	7.7	8.1	7.0	8.1	6.9	6.6	7.3
50-200 m	3.8	2.6	4.0	3.7	3.1	3.6	3.2	4.0	4.5	3.9	4.6	4.0	3.4	2.5	3.6
0-200 m	4.6	3.6	4.9	4.4	4.0	4.7	4.2	5.2	5.5	4.9	5.2	5.0	4.3	3.6	4.6

Table 2. Mean water temperature in the Cape Kanin - North section (between 68°45'N and 72°00'N) from surface to bottom at the beginning of September (t°C).

Year	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	Average 1965 - 1978
68°45'N 70°05'N	4.8	2.0	6.1	4.7	2.6	4.0	4.0	5.1	5.7	4.6	5.6	4.9	4.1	2.4	4.3
71°00'N 72°00'N	4.2	2.5	3.6	3.1	2.3	3.3	3.2	4.1	4.5	-	4.3	4.6	3.3	1.7	3.4

Table 3. Mean water temperature in the North Cape current, the North Cape to Bear Island section (between 71°33'N, 25°02'E and 73°35'N, 20°46'E) at the beginning of September (t°C).

Year Layer	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	Average 1965 - 1978
0-200 m	5.1	5.5	5.6	5.4	6.0	6.1	5.7	6.3	5.9	6.1	5.7	5.7	4.8	5.0	5.6

Table 4. Mean water temperature in the West Spitsbergen current along the West Bear Island section (between 06°34'E and 15°55'E) in early September (t°C).

Year / Layer	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	Average 1966 - 1978
0-200 m	3.3	4.2	3.6	4.2	-	4.2	3.9	5.0	4.6	4.9	5.0	4.0	4.1	4.2

Table 5. Abundance indices.

Species / Year	Capelin	Cod	Haddock	Polar cod West	Polar cod East	Redfish	Greenland Halibut	Long rough dab
1965	37	6	7	0		159		66
1966	119	1	<1	129		236		97
1967	89	34	42	165		44		73
1968	99	25	8	60		21		17
1969	109	93	82	208		295		26
1970	51	606	115	197		247	<1	12
1971	151	157	73	181		172	<1	81
1972	275	140	46	140		177	8.0	65
1973	125	684	54	(26)		385	3.2	67
1974	359	51	147	227		468	13.4	83
1975	320	343	170	75		315	21.1	113
1976	281	43	112	131		447	15.6	96
1977	194	173	116	157	70	472	9.0	72
1978	40	106	61	107	144	460	35.4	76

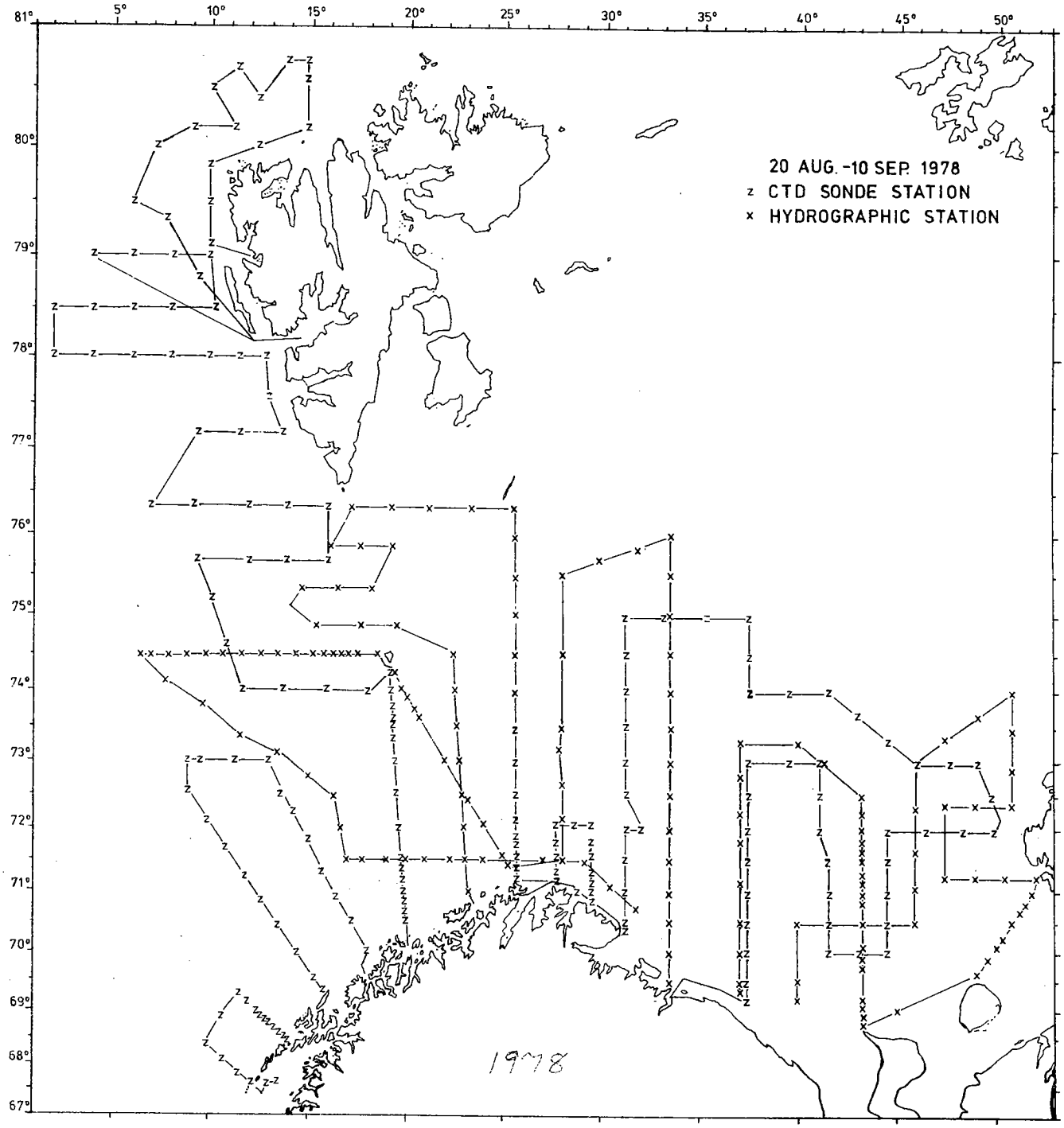

Fig. 1. Survey tracks of the ships and the grid of hydrographic stations.

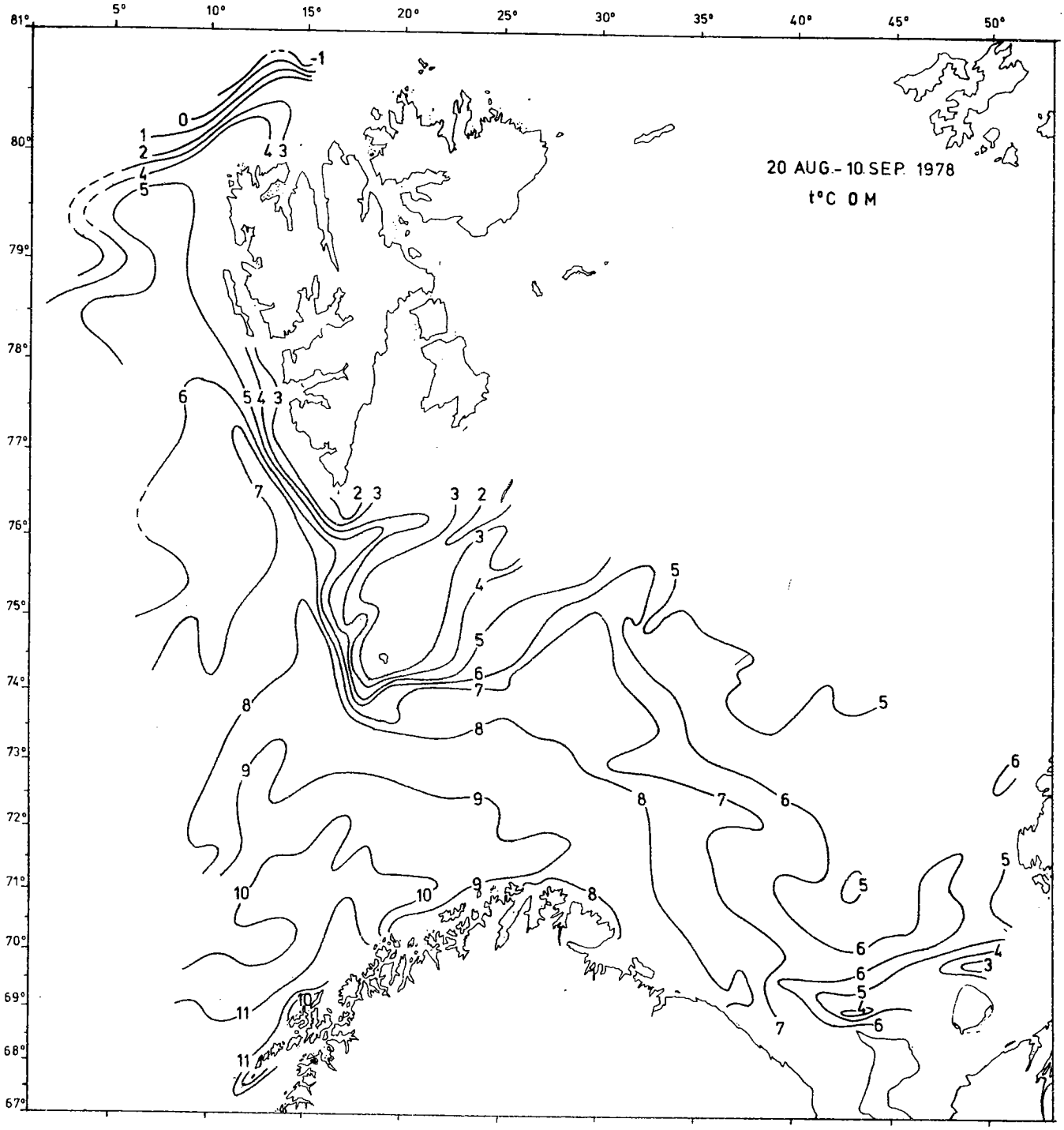

Fig. 2. Isotherms at 0 m.

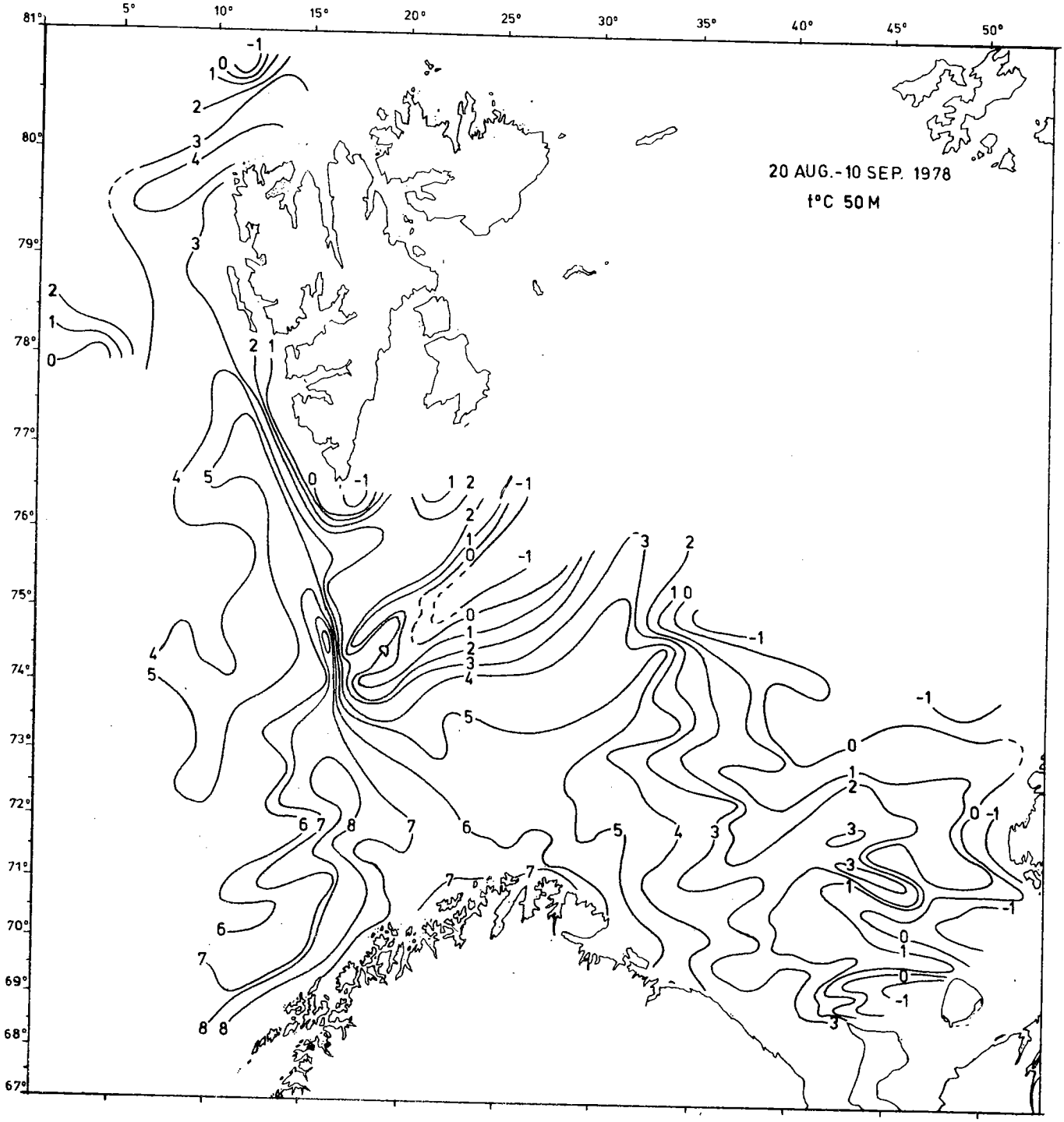

Fig. 3. Isotherms at 50 m.

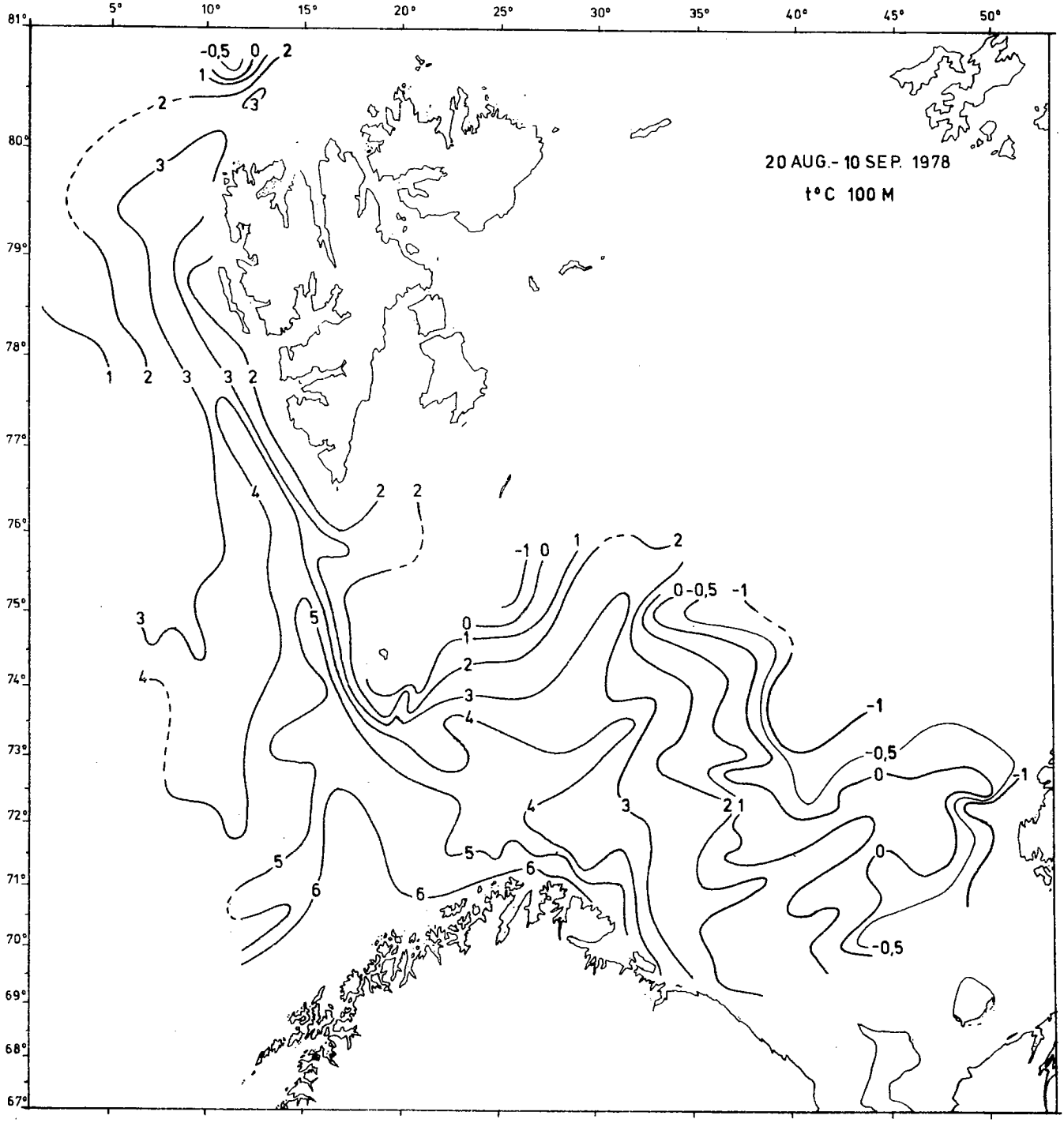

Fig. 4. Isotherms at 100 m.

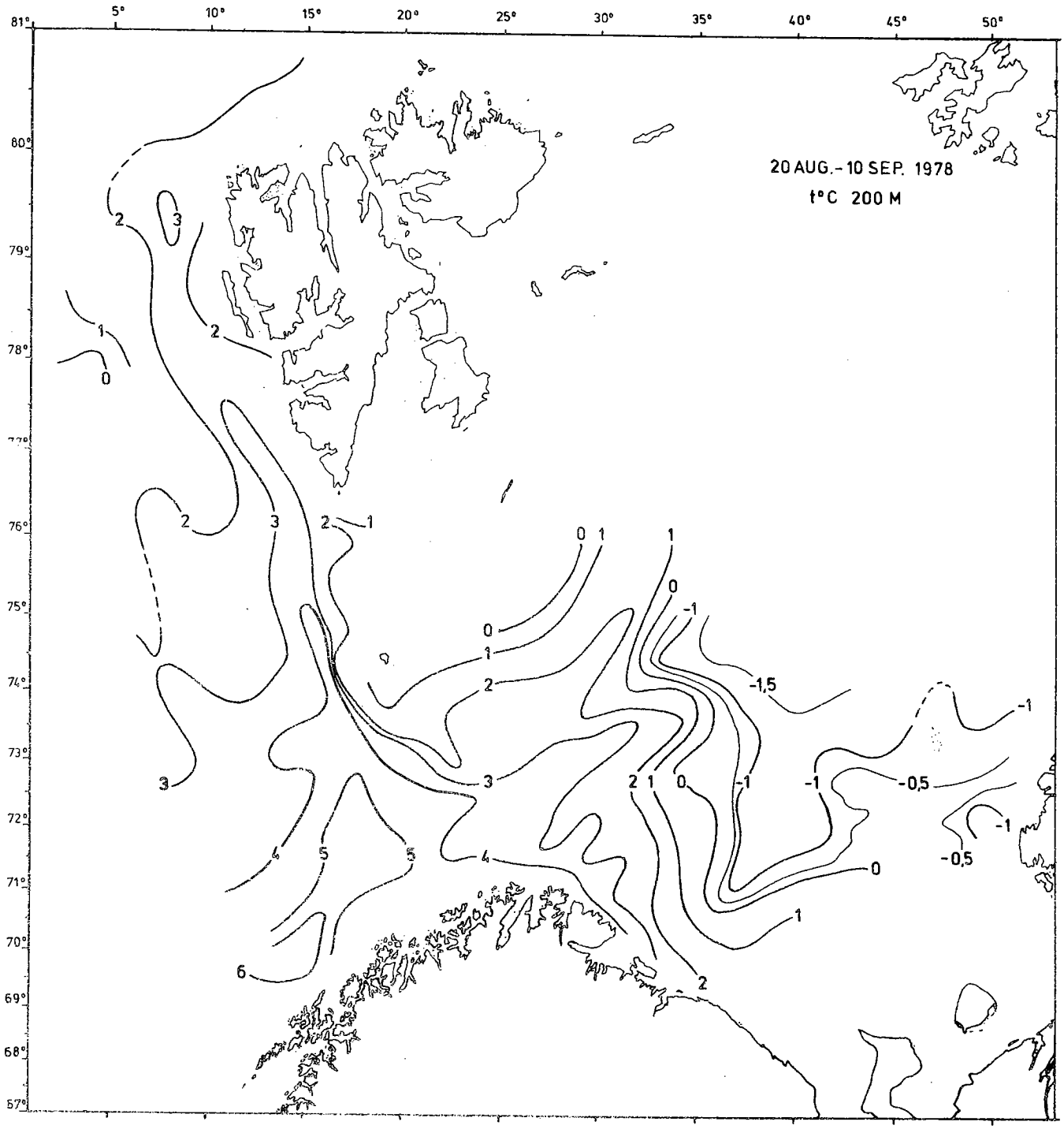

Fig. 5. Isotherms at 200 m.

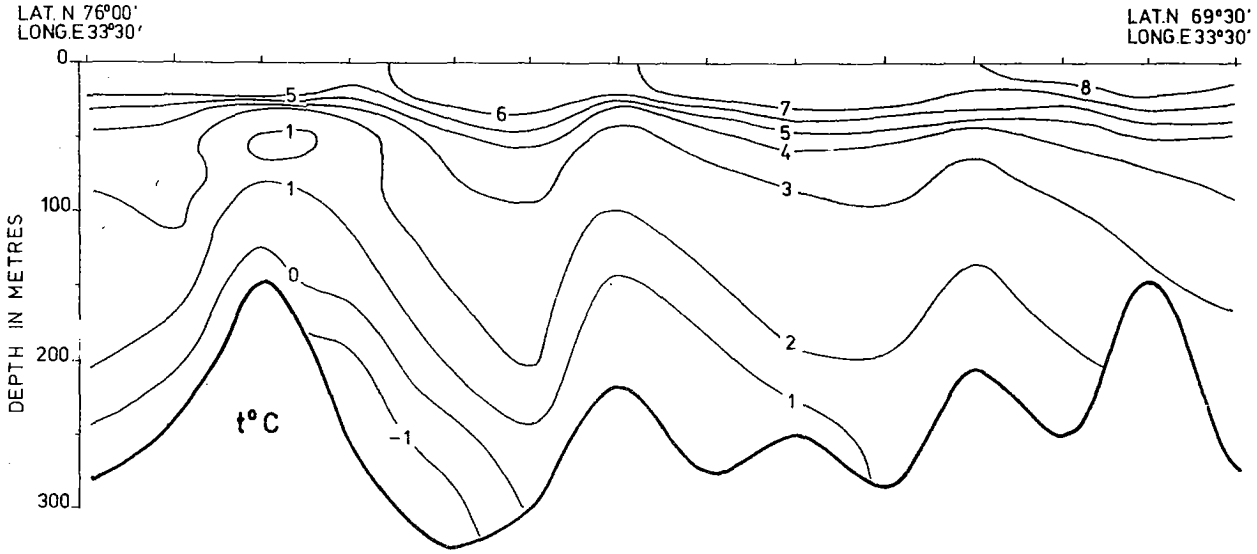

Fig. 6. Temperature section along the Kola meridian.

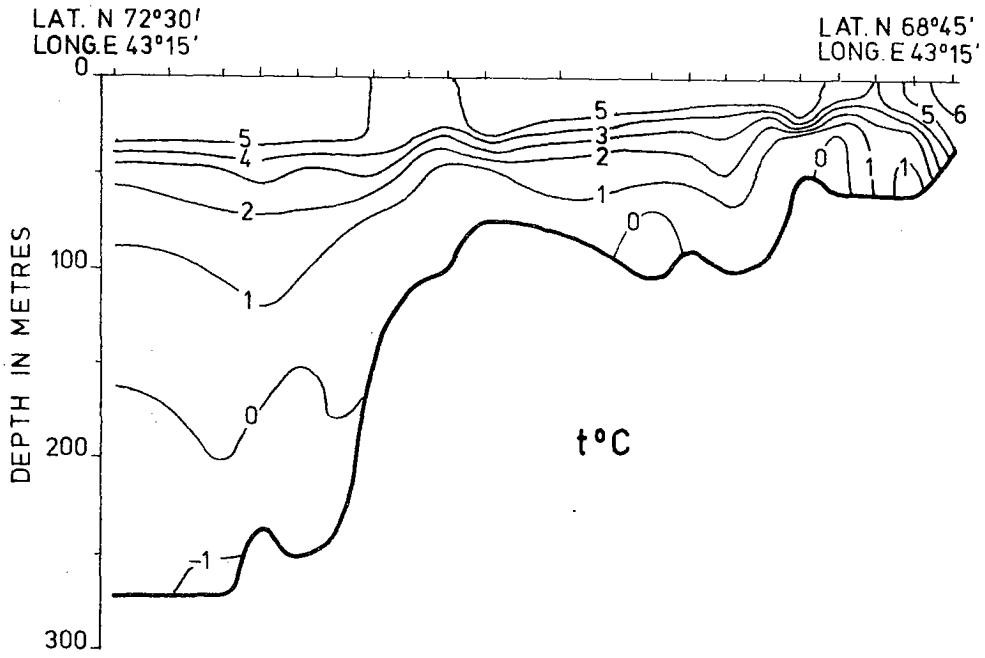

Fig. 7. Temperature section Cape Kanin - North.

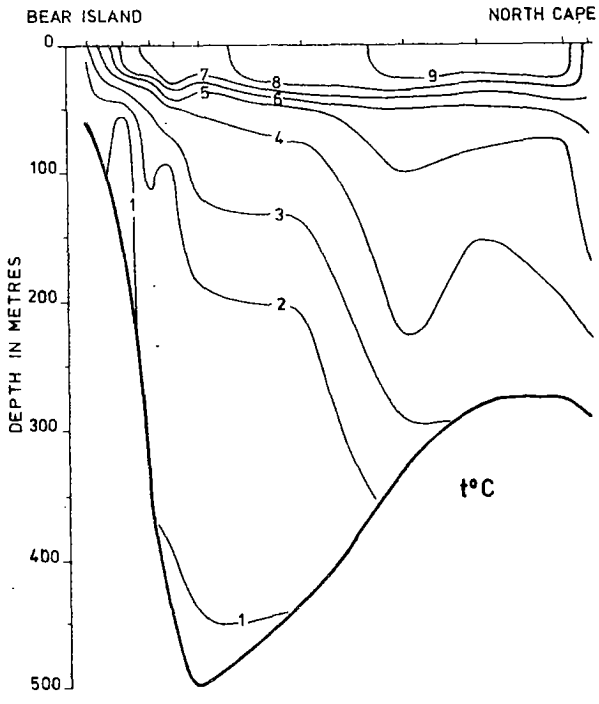

Fig. 8. Temperature section Bear Island - North Cape.

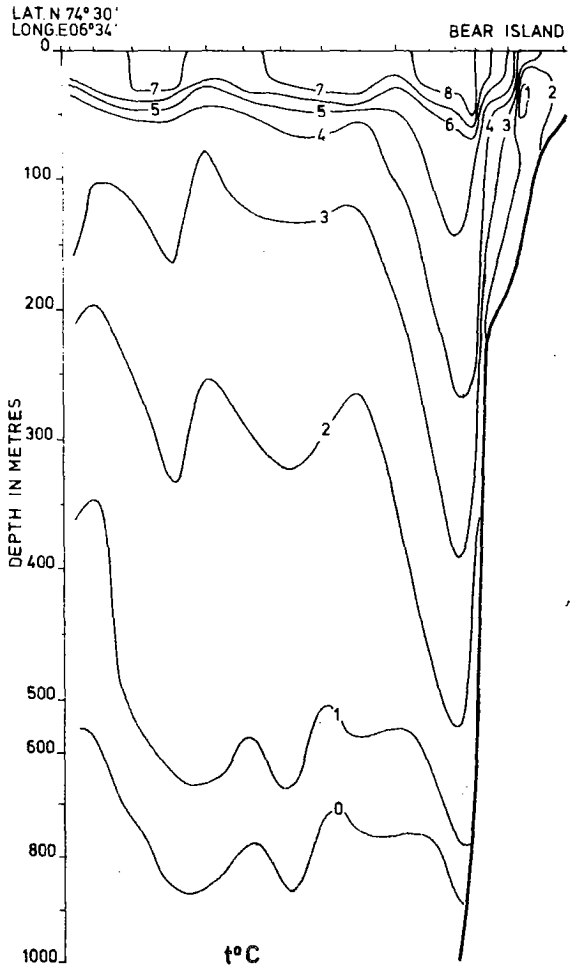

Fig. 9. Temperature section Bear Island - West.

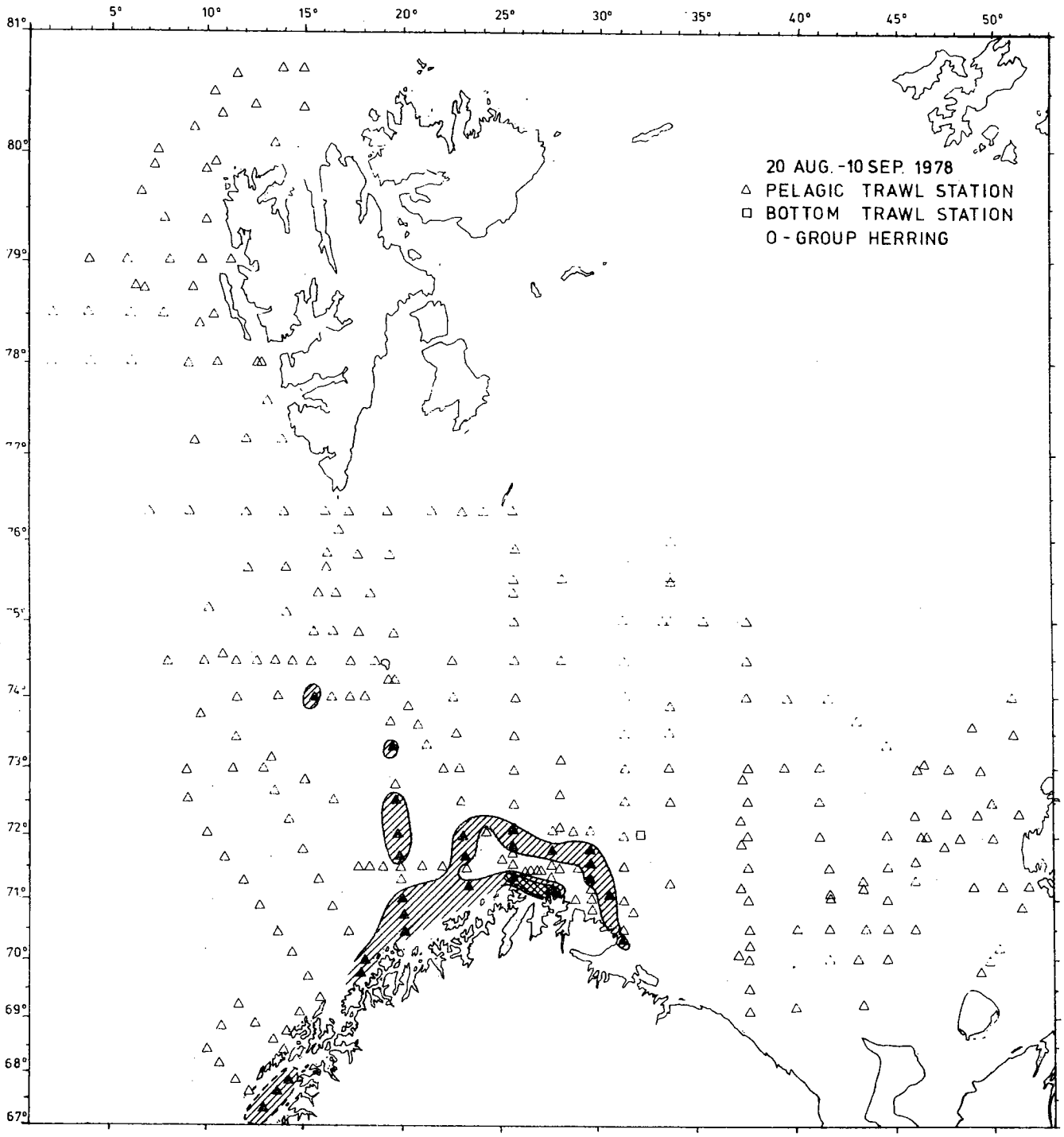

Fig. 10. Distribution of O-group herring.

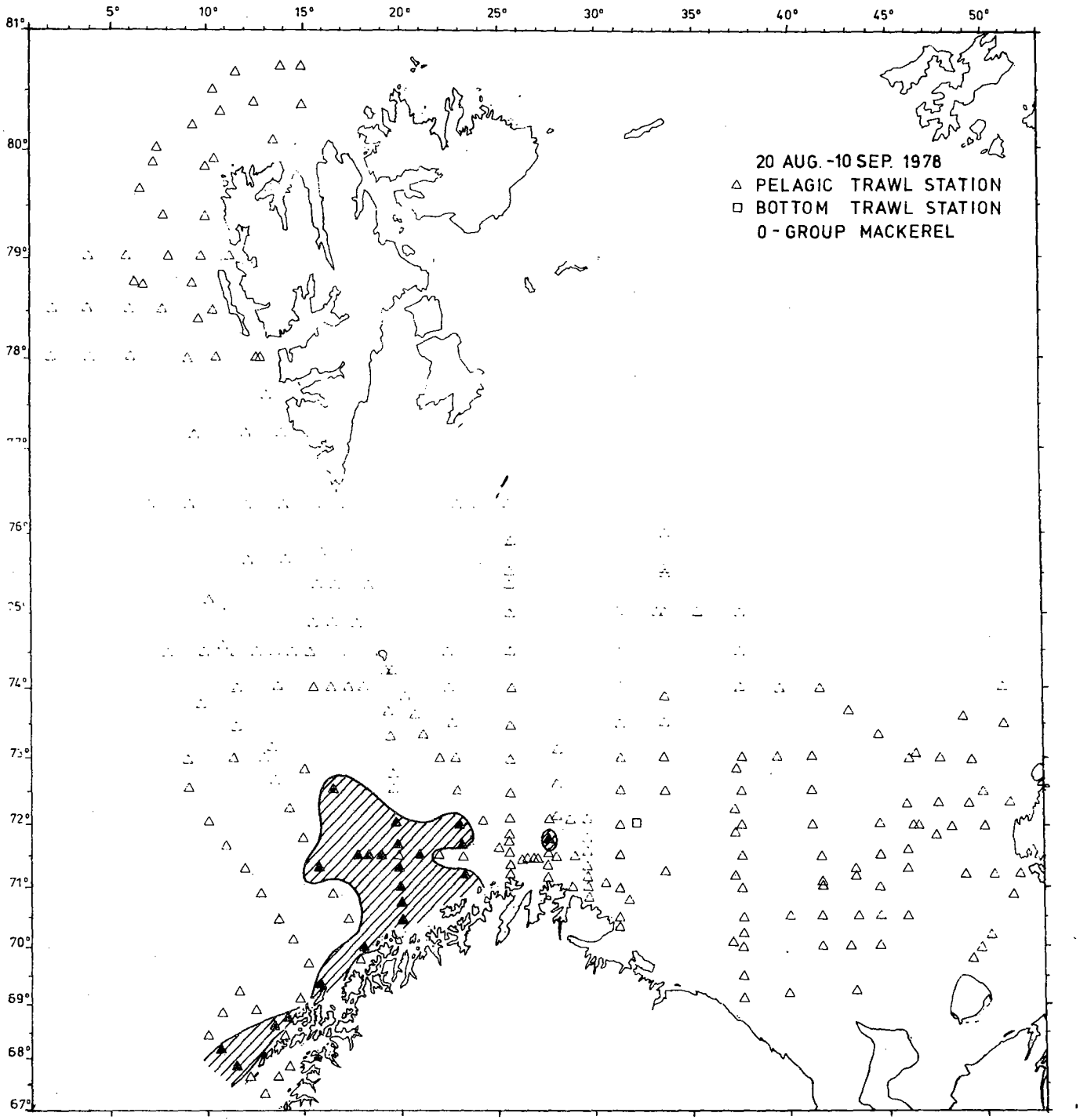

Fig. 11. Distribution of O-group mackerel.

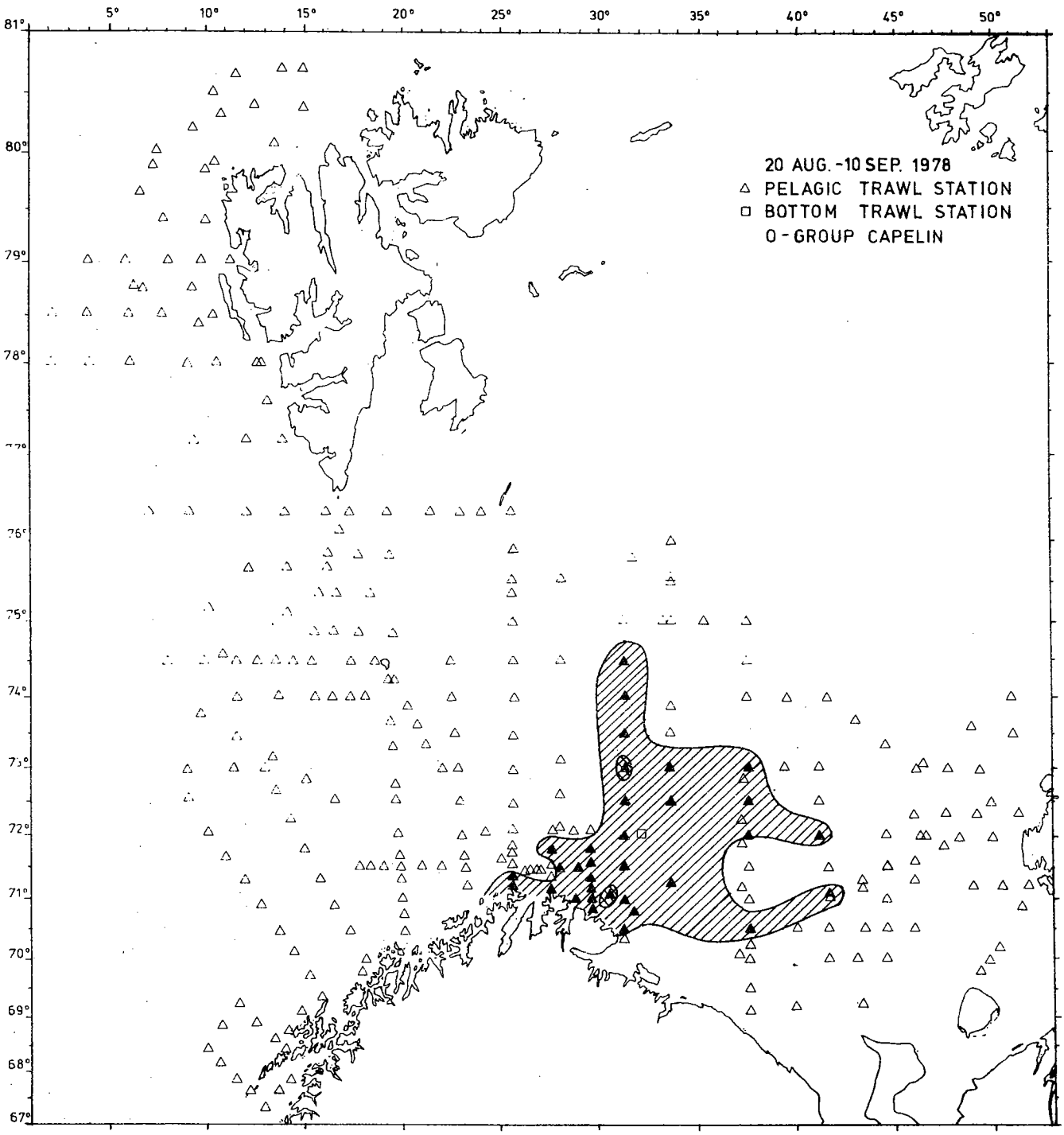

Fig. 12. Distribution of O-group capelin.

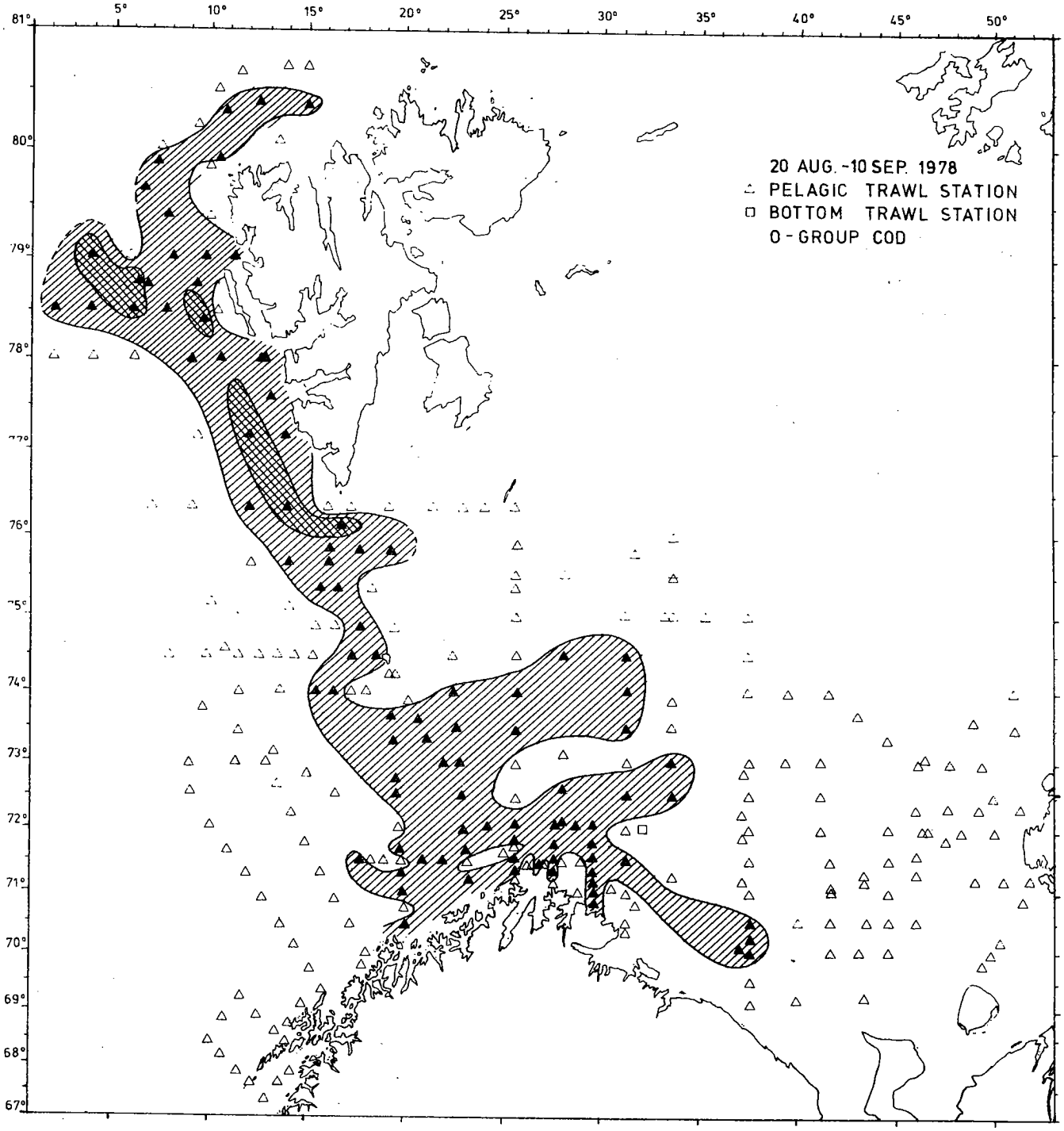

Fig. 13. Distribution of O-group cod.

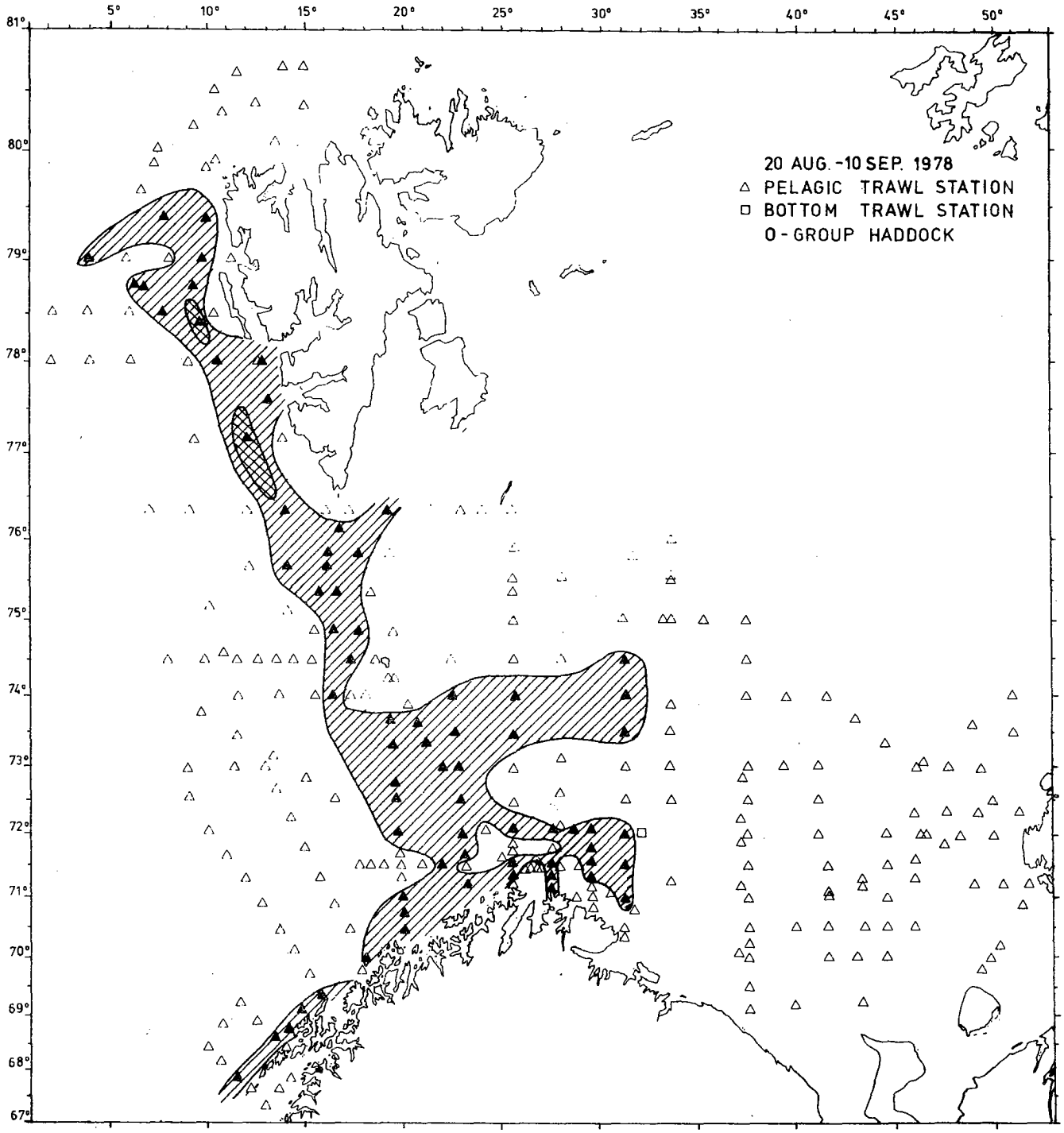

Fig. 14. Distribution of O-group haddock.

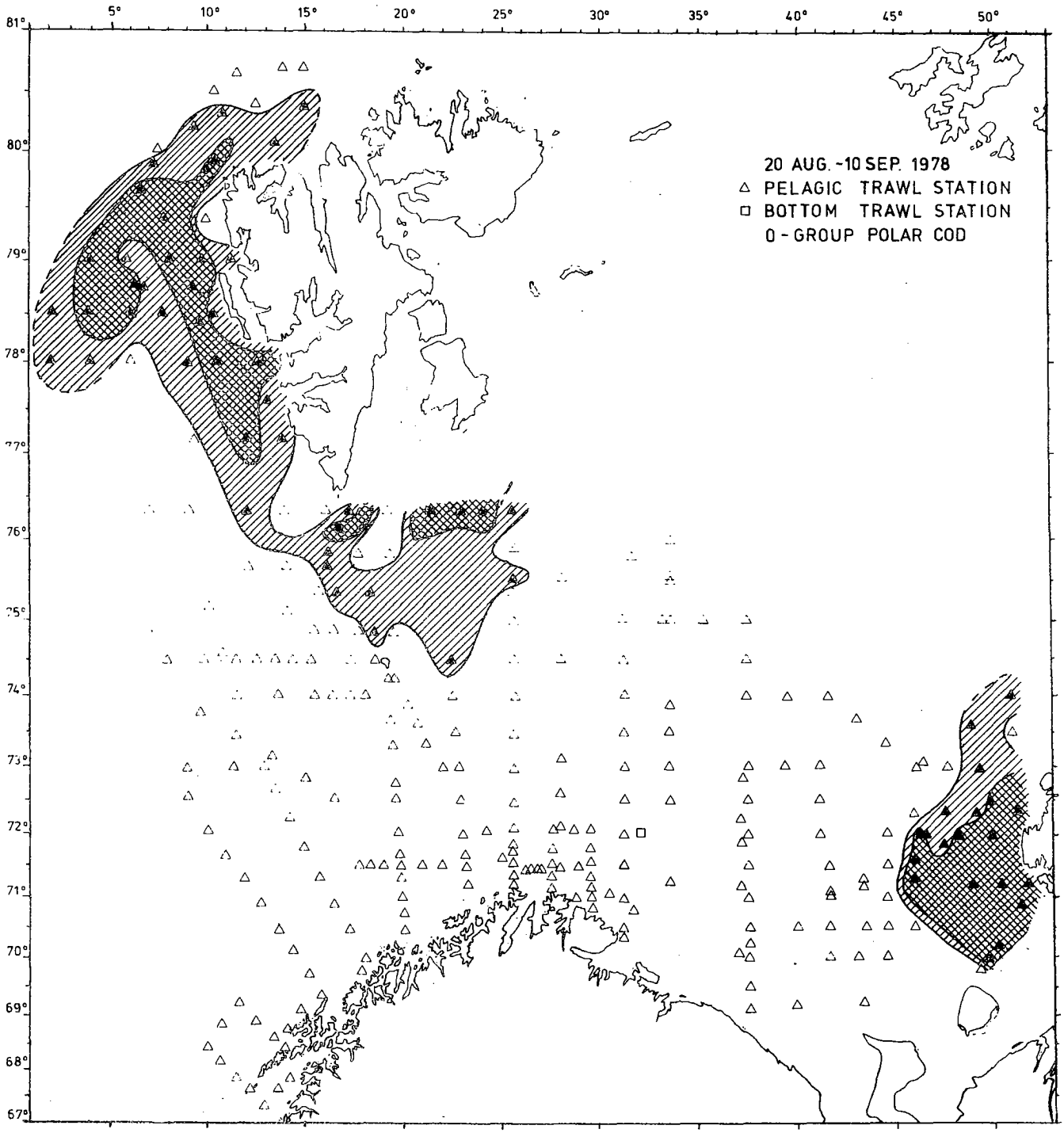

Fig. 15. Distribution of O-group polar cod.

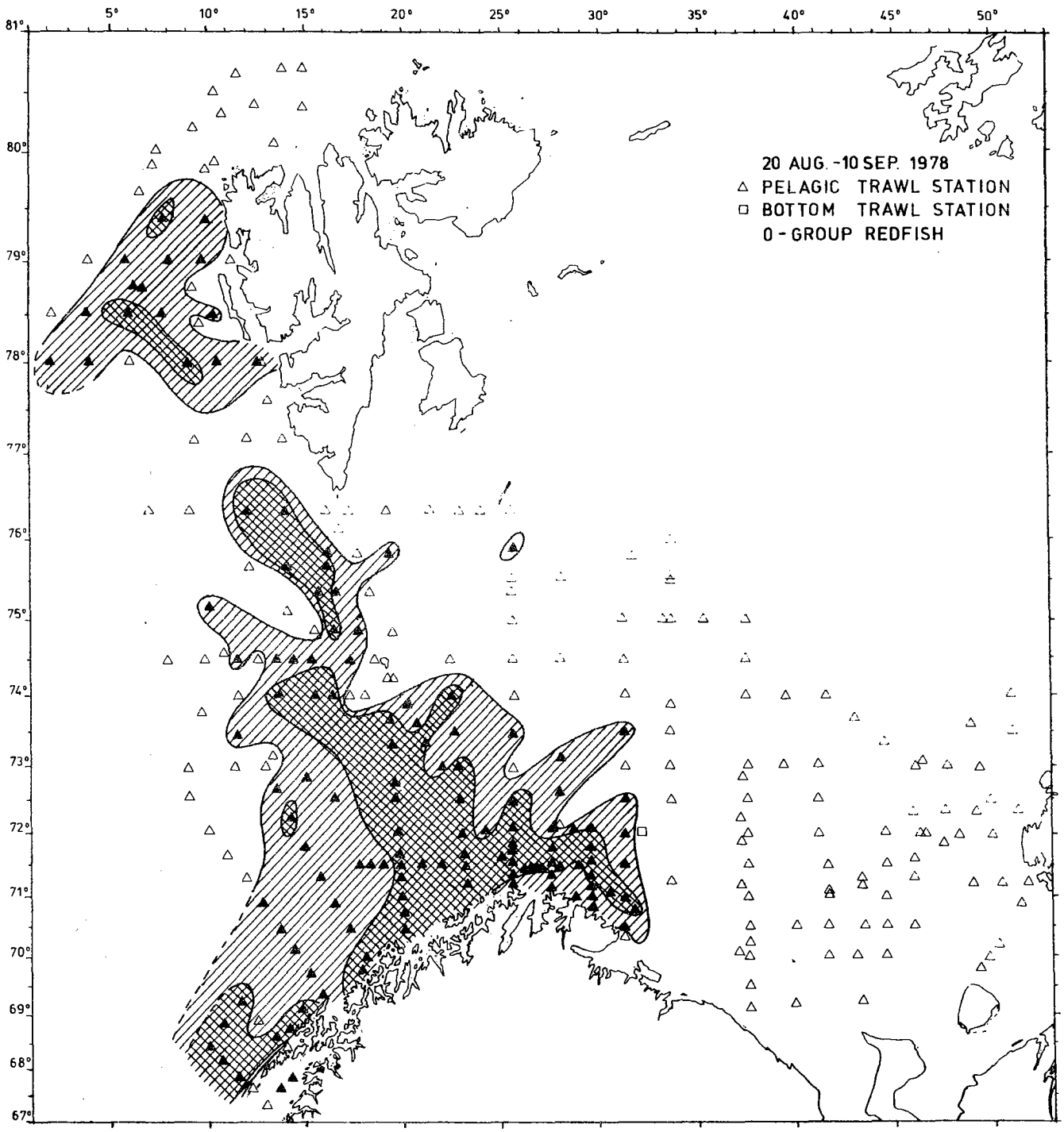

Fig. 16. Distribution of O-group redfish.

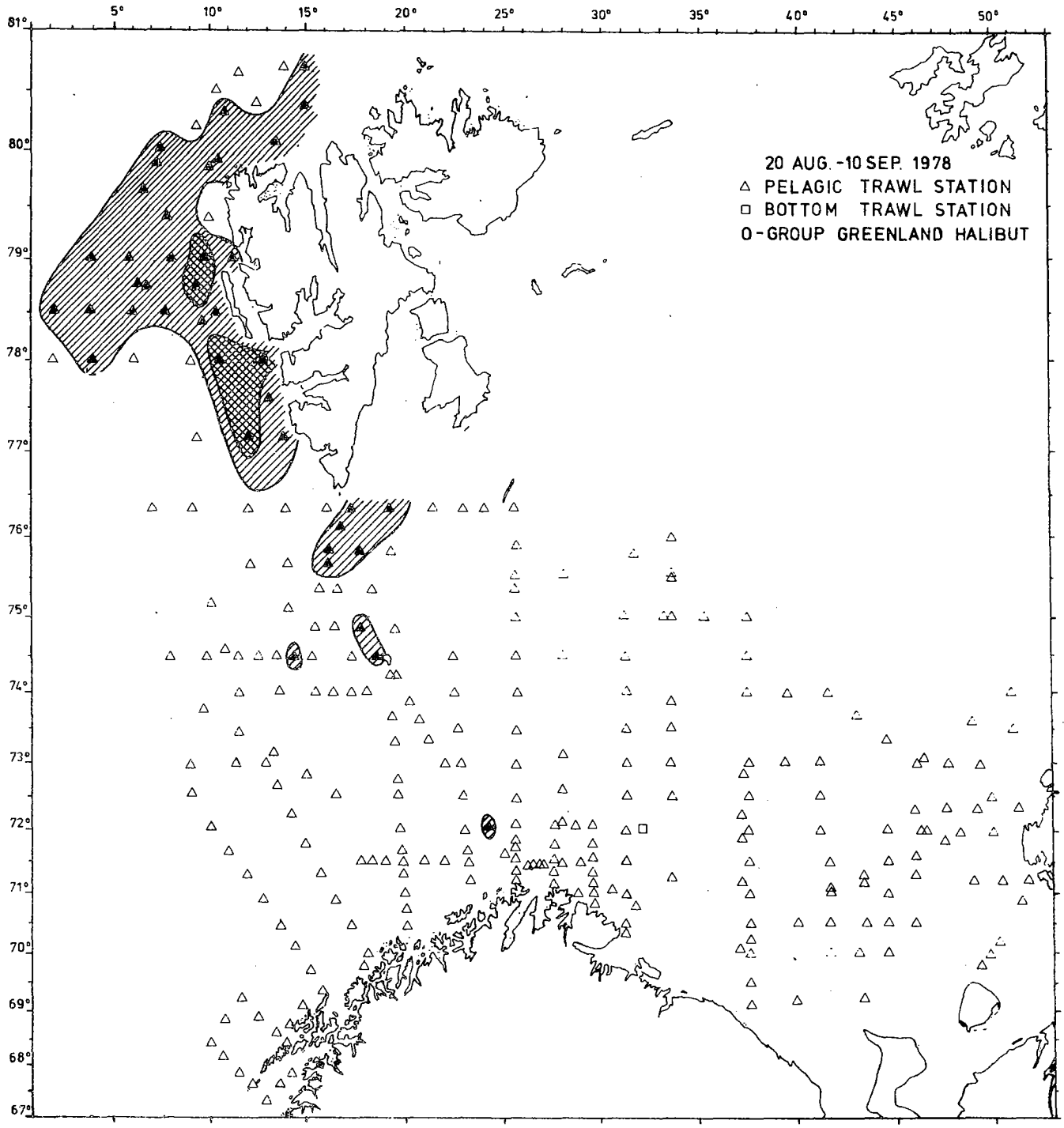

Fig. 17. Distribution of O-group Greenland halibut.

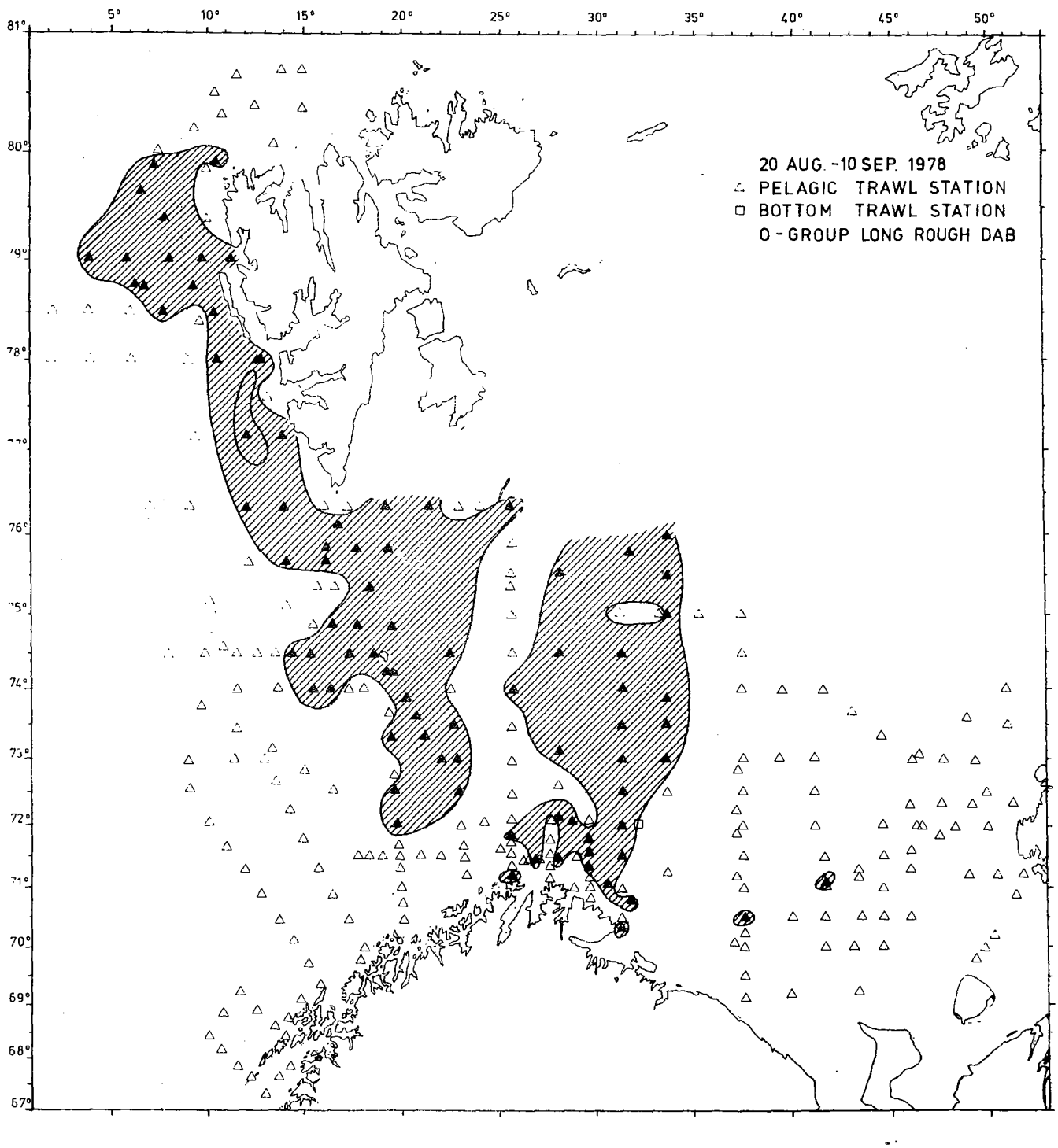

Fig. 18. Distribution of 0-group long rough dab.

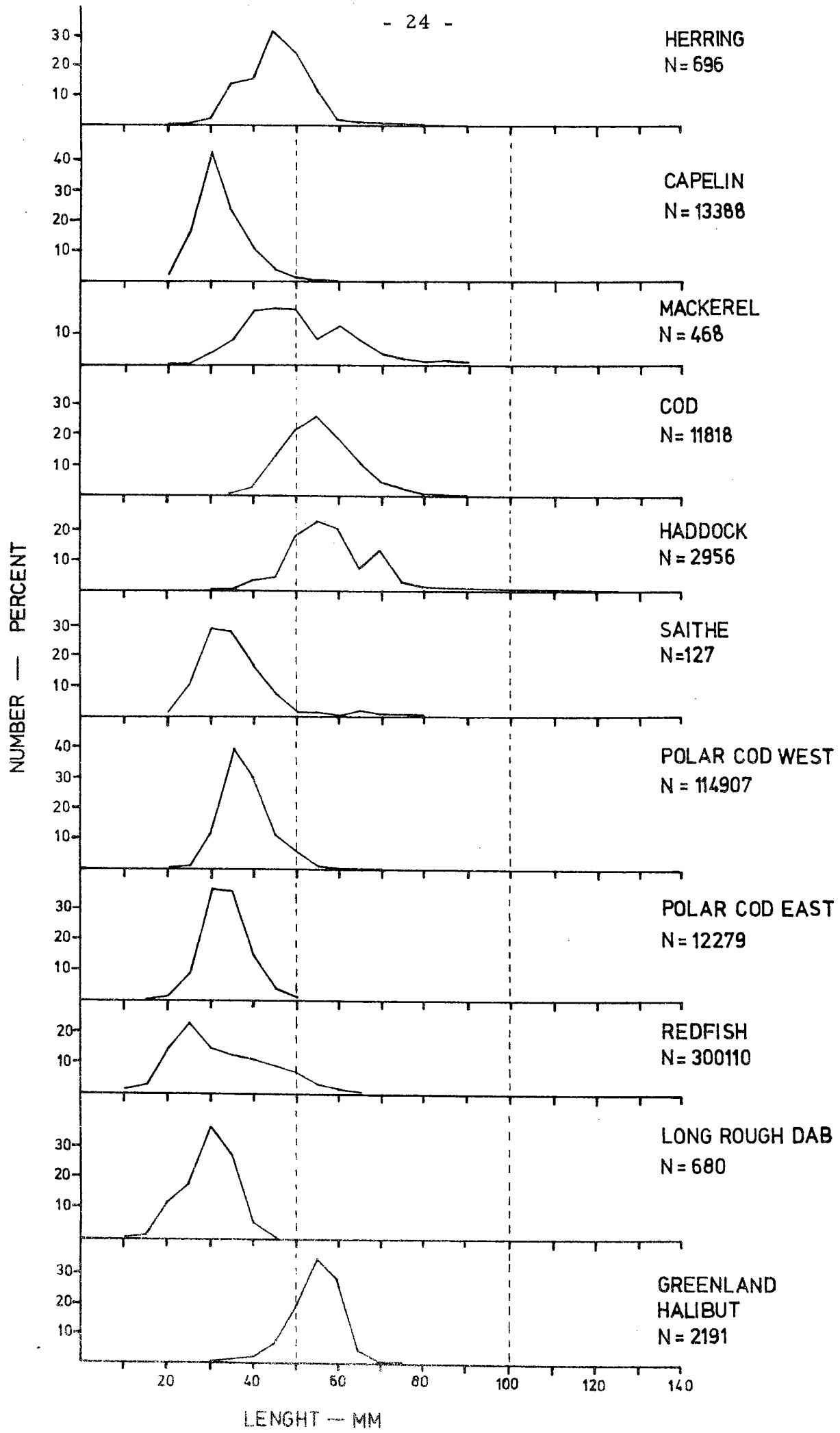

Fig. 19. Length distribution of O-group fish.

APPENDIX

Survey period	Research vessel	Research Institute	Participants
25 August - 10 September	"G.O. Sars"	Institute of Marine Research, Bergen.	O. Annaniassen, T. Antonsen, J. Hamre, K. Hansen, V. Helgason, A. Hylen, H. Kismul, E. Lifjell, O. Martinsen, A. I. Prøven, A. Romslo, E. Sælen, A. Thomassen.
20 August - 10 September	"Johan Hjort"	Institute of Marine Research, Bergen.	J. Blindheim, L. Kolbeinshavn, S. Lygren, T. Monstad, J.E. Nygaard, Ø. Tangen, Ø. Torgersen, A. Asenjo.
25 August - 10 September	"Poisk"	Polar Research Institute of Marine Fisheries and Oceanography, Murmansk.	A.S. Galkin, Z.M. Berdichevski, I.I. Balabanov, V.ja. Korelski, V.I. Zubov, A.P. Tereschenko, A.V. Averchenko, T.M. Sergeeva, A.V. Il'ina.
25 August - 8 September	"Fridtjof Nansen"	Polar Research Institute of Marine Fisheries and Oceanography, Murmansk.	S.V. Rochitelev, V.F. Terzlev.