International Council for
the Exploration of the Sea

CM 1976/H:43
Pelagic Fish (Northern) Committee
Ref: Demersal Fish (Northern) and
Hydrographic Committees

Preliminary report of the International 0-group fish survey in the Barents Sea and adjacent waters in August - September 1976

INTRODUCTION

The following vessels and scientists participated in the twelth international survey to study the abundance and distribution of 0-group fish in the Barents Sea and the Svalbard region:

USSR:	"Odissey"	V.N. Shleinik
		V.A. Ermolichev
		M.L. Zaferman
		V.Z. Salmov
		A.S. Galkin
	"Fridtjof Nansen"	I. Borkin
Norway:	"Johan Hjort"	O.M. Smedstad
		A. Romslo
	"G. O. Sars"	L. Midttun
		A. Hylen
		J. Hamre
		H.P. Knudsen
		H. Kismul
U.K.:	"Cirolana"	B.W. Jones
		M.R. Vince
		R.N. Tucker
		K. Medler

A Meeting was held in Murmansk between scientists of The Polar Research Institute of Marine Fisheries and Oceanography (PINRO) and the Institute of Marine Research, Bergen to make final arrangement for the coordination of the survey. The period of the survey was from 25 August to 7 September, and a meeting of scientists from the participating research vessels was held in Hammerfest on 8 - 9 September to analyse the data and to prepare the report.

MATERIAL AND METHODS

The distribution and density of the pelagic scattering layers was estimated from echo-sounder paper records, from echo integrator measurements, and by fishing with small meshed midwater trawls. Depth metering devices were used for the accurate control of the depth of trawling. All vessels used the modified capelin trawl with an opening of (18 x 15)m^2 except for "Fridtjof Nansen", which used a smaller trawl with an opening of (6 x 10)m^2.

R.V "Fridtjof Nansen" continued the survey in the eastern Barents Sea, and 12 additional trawl stations were worked. These data could not be worked into the Figures 10 - 18 in time to get the preliminary report mimeographed. However, the additional informations would only effect the abundance estimate of the 1976 year class of Polar cod.

Fig. 1 shows the survey tracks of the ships and the hydrographic stations worked. Positions of trawl stations are indicated on the species distribution charts (Figs. 10 - 17).

RESULTS

Hydrography (Figs 2 - 9).

Hydrographic observations were made along the same standard sections as in previous years. Preliminary analyses of the data are given in Figs. 2 - 9. Mean water temperatures in the

hydrographic sections across the main water currents are given in Tables 1 - 4.

The temperature conditions in the Barents Sea in 1976 seem to be close to the long term average, although the upper 50 meters are somewhat warmer than the normal.

The temperature in the West Spitsbergen Current is found to be above average.

Distribution and abundance of 0-group fish

The distribution of 0-group fish of the main species are shown by the shaded areas in Figs. 10 - 17. Estimates of abundance were calculated by the method of Haug and Nakken (1973) and these are given in Table 5 where they can be compared with estimates prepared from earlier surveys, yearly reported to ICES. Length frequency distributions of the main species are shown in Fig. 18.

Herring (Fig. 10).

A small patch of 0-group herring was recorded extending in a narrow band along the northern coast of Norway. This is possibly the same patch that had been located by a Norwegian research vessel at the end of July in an area north-west of Lofoten.

Cod (Fig. 11).

The distribution of 0-group cod was very similar to that recorded in 1974. No cod were recorded in the Svalbard area, and the main area of distribution in the central Barents Sea was small in extent and of low density. The density index of 43 indicates a year class of low abundance and similar in size to the 1974 year class (Index 51).

Haddock (Fig. 12).

As for cod the haddock distribution was similar to that recorded in 1974. The main distribution area north of Norway was rather more to the west than in 1975. Haddock were also recorded in the vicinity

of Bear Island and west of Spitsbergen. The 1976 year class is an abundant one, but not as large as the very abundant year classes of 1974 and 1975.

Redfish (Fig. 13).

The redfish distribution was very similar to last year, but in the Svalbard area the density was lower than in 1975. The overall index of abundance indicates a very abundant year class comparable with that of 1974.

Capelin (Fig. 14).

The 1976 year class of capelin is similar to last year with respect to both the area of distribution and abundance. As mentioned in last year's report improved sampling techniques for capelin have probably resulted in higher indices of abundance in recent years.

Long Rough Dab (Fig. 15).

As in previous years this species was distributed over a wide area, but at a low density. The abundance index indicates that the 1976 year class is of above average abundance.

Polar Cod (Fig. 16).

In the Svalbard area the distribution was similar to that observed in 1975 and the above average abundance in that area was also similar to last year.

In the eastern Barents Sea, however, few Polar cod were caught. R/V "Fridtjof Nansen" which continued the work after the survey was finished caught 0-group Polar cod on three trawl stations along Novaya Zemlja (between 73°54' and 74°29'N and 53°44' and 54°36'E). The area of distribution is thus a little bigger than shown in Fig. 16 and the additional informations give and increased index for 0-group Polar cod by about 3 units (Table 4). Even with these informations the abundance of the 1976 year class is considered to be low in this area.

Greenland Halibut (Fig. 17).

This species was recorded in the Svalbard area with a similar distribution to previous years.

Mackerel

Small numbers of mackerel were taken off the coast of northern Norway.

Other species

Small numbers of catfish and saithe were caught during the survey. 0-group Leptagonus, Liparis, Lumpenus and Cottus were widely distributed in the colder water. 0-group sandeels were again abundant in the South-eastern Barents Sea.

REFERENCE

HAUG, A. and NAKKEN, O. 1973. Echo abundance indices of 0-group fish in the Barents Sea 1965 - 1972. ICES/FAO/ICNAF Symposium on Acoustic Methods in Fisheries Research Bergen, June 1973. 1 - 13, 4 tab., 27 figs. [Mimeo.]

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	Average 1965 - 1976
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	7.4
50-200 m	3.8	2.6	4.1	3.7	3.1	3.6	3.2	4.0	4.5	3.9	4.6	4.1	3.8
0-200 m	4.6	3.6	4.9	4.4	4.0	4.7	4.2	5.2	5.2	4.9	5.2	5.1	4.7

Table 2. 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	Average 1965 - 1976
0-200 m	5.1	5.5	5.6	5.4	6.0	6.1	5.7	6.3	6.2	6.1	5.7	5.7	5.8

Table 3. 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	Average 1966 - 1976
0-200 m	3.3	4.2	3.6	4.2	No data	4.2	3.9	5.0	4.6	4.9	5.0	4.3

Table 4. Mean water temperature between 0 m and bottom in the section Kap Kanin - North in early September ($t^{o}C$).

Year	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	Average 1965 - 1976
Part of section													
68°45'N 70°05'N	4.8	2.0	6.1	4.7	2.6	4.0	4.0	5.1	5.7	4.5	4.7	4.8	4.4
71°00'N 72°00'N	4.2	2.5	3.7	3.1	2.3	3.3	3.2	4.1	4.5	3.9	No data	4.4	3.9

Table 5. Abundance indices.

Species / Year	Cod	Capelin	Haddock	Redfish	Polar cod	Long rough dab
1965	6	37	7	159	0	66
1966	< 1	119	< 1	236	129	97
1967	34	89	42	44	165	73
1968	25	99	8	21	60	17
1969	93	109	82	295	208	26
1970	606	51	115	247	197	12
1971	157	151	73	172	181	81
1972	140	275	46	177	140	65
1973	684	125	54	385	(26)	67
1974	51	359	147	468	227	83
1975	343	320	170	315	75	113
1976	43	281	112	447	131	96

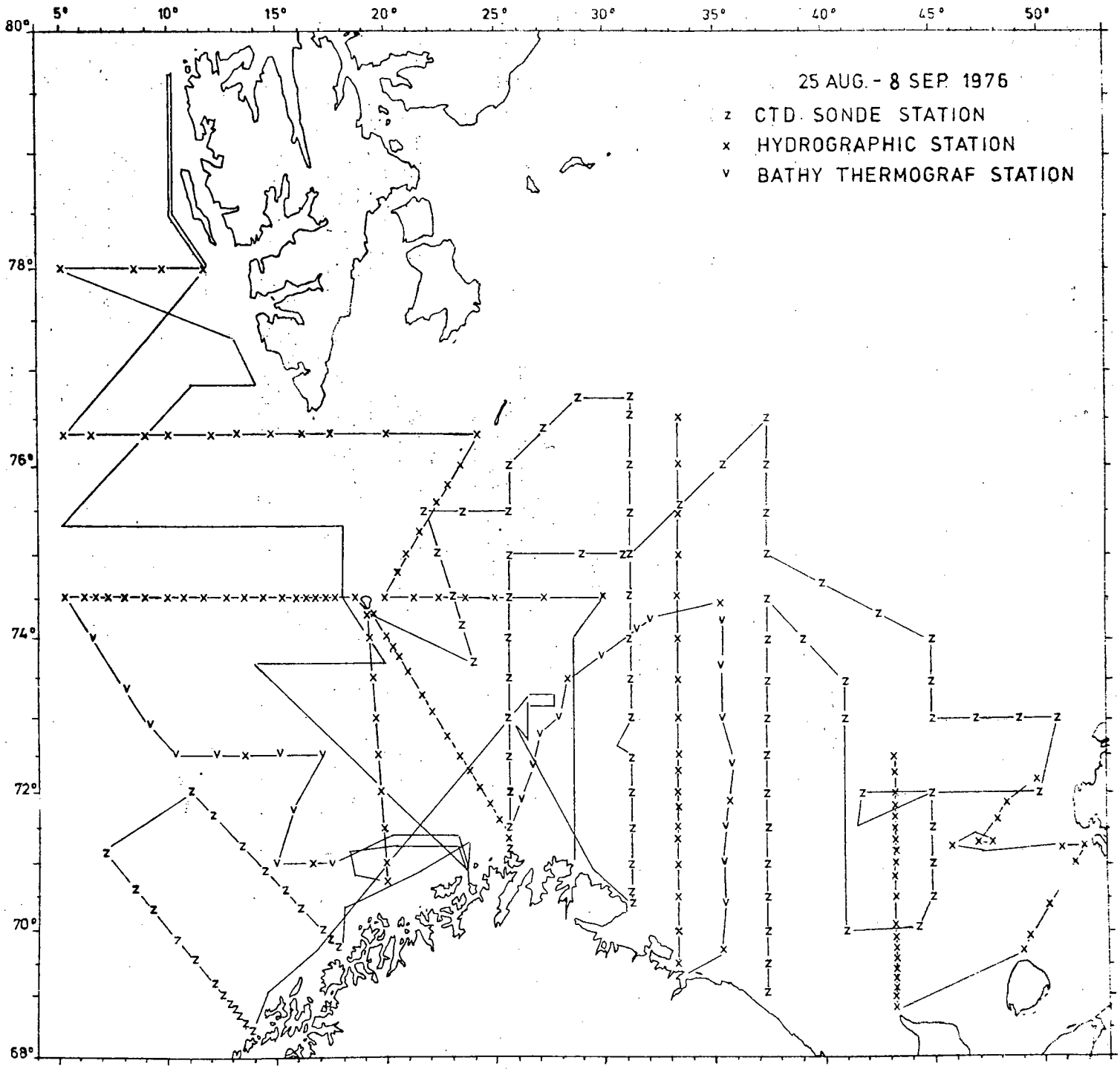

Fig. 1. Survey tracks of the ships and the grid of hydrographic stations.

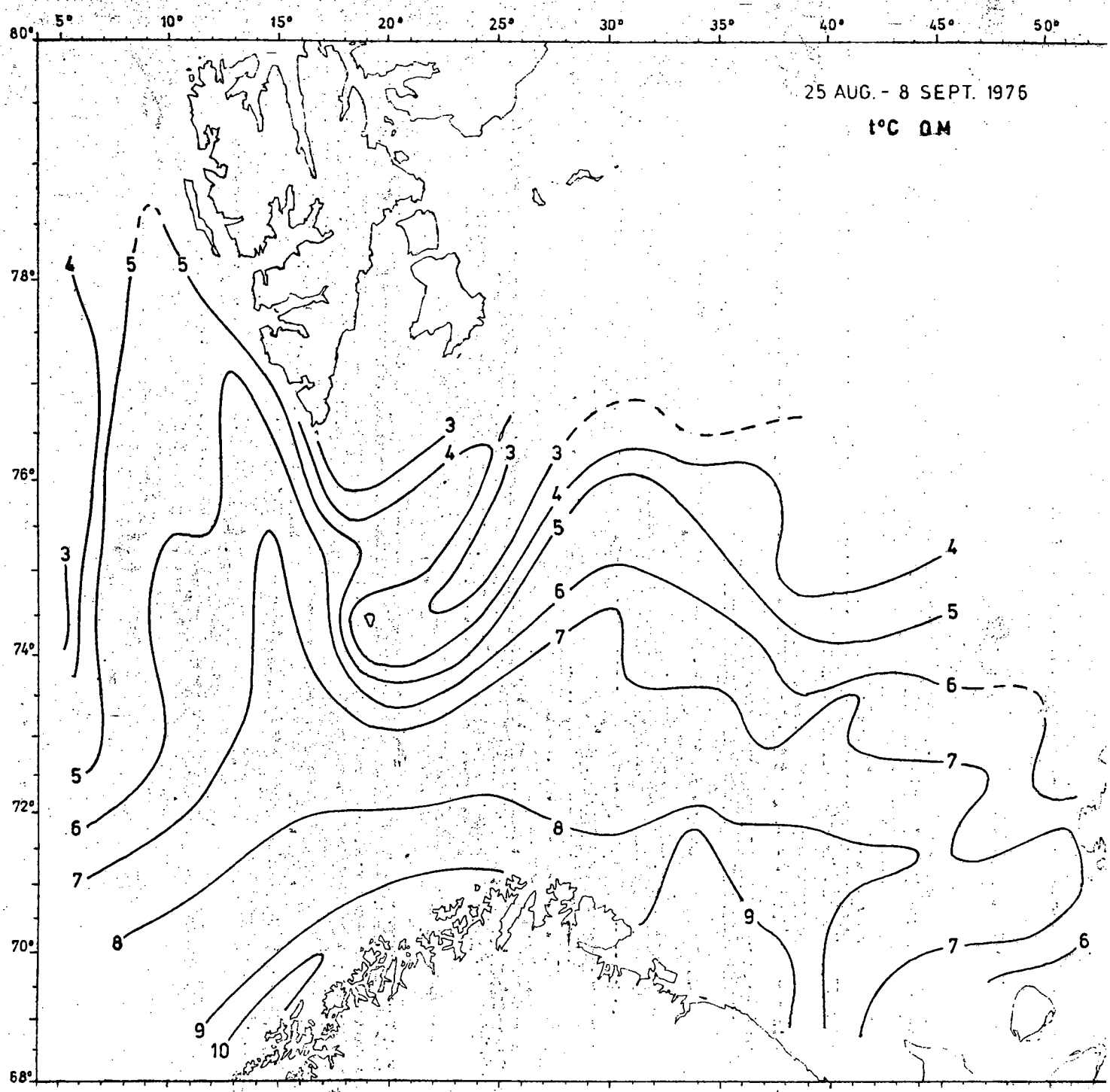

Fig. 2. Isotherms at 0 m.

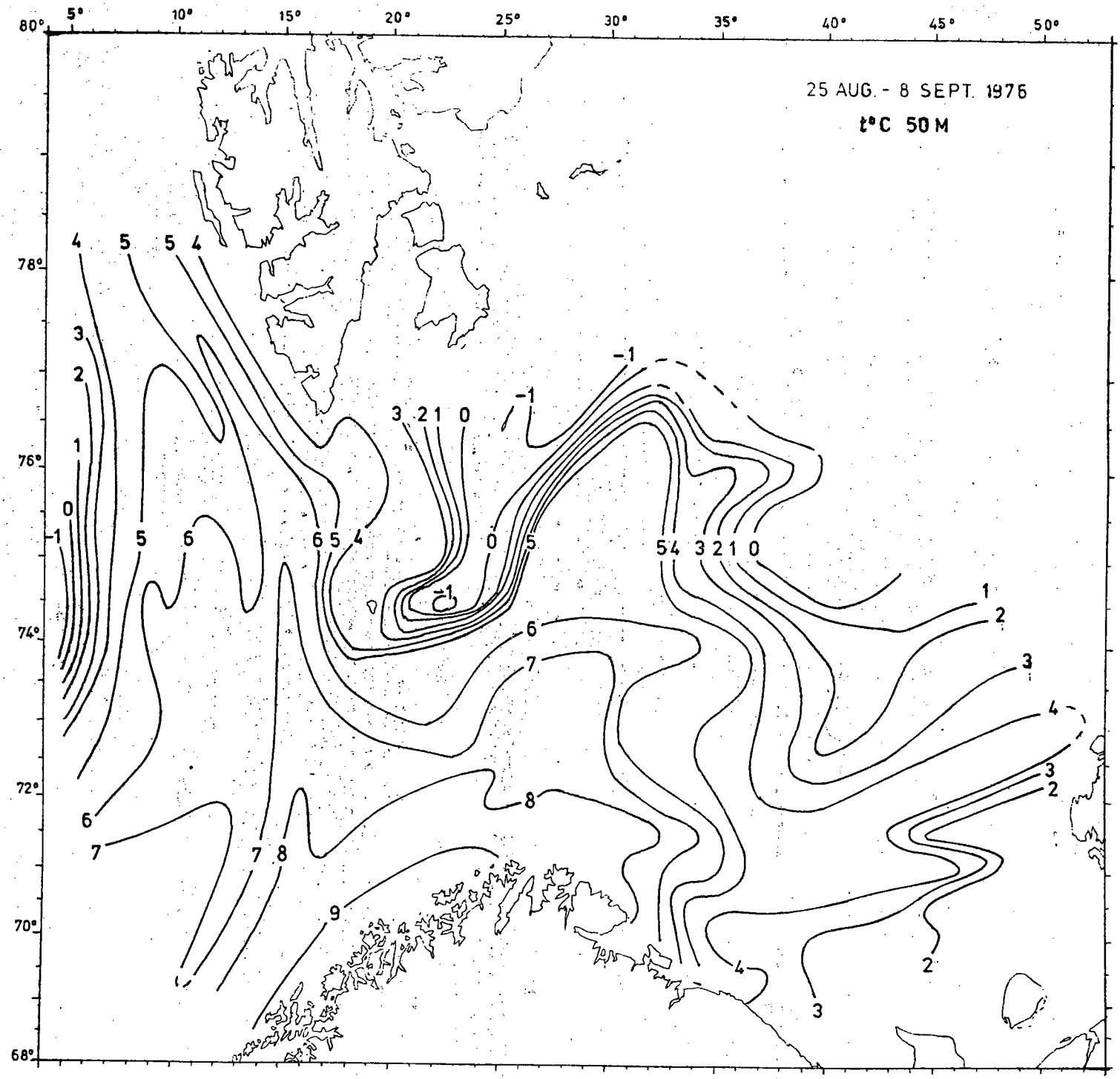

Fig. 3. Isotherms at 50 m.

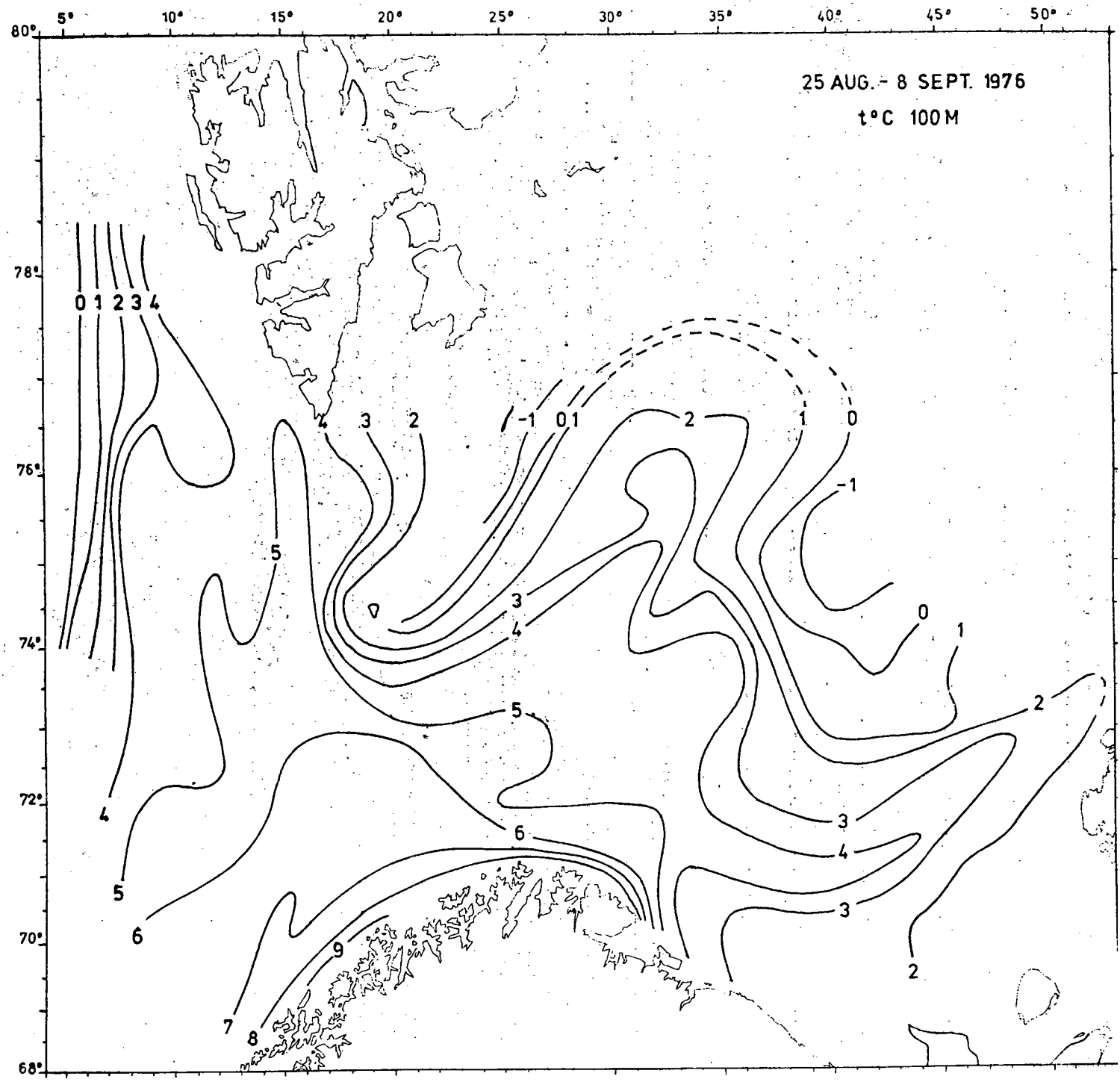

Fig. 4. Isotherms at 100 m.

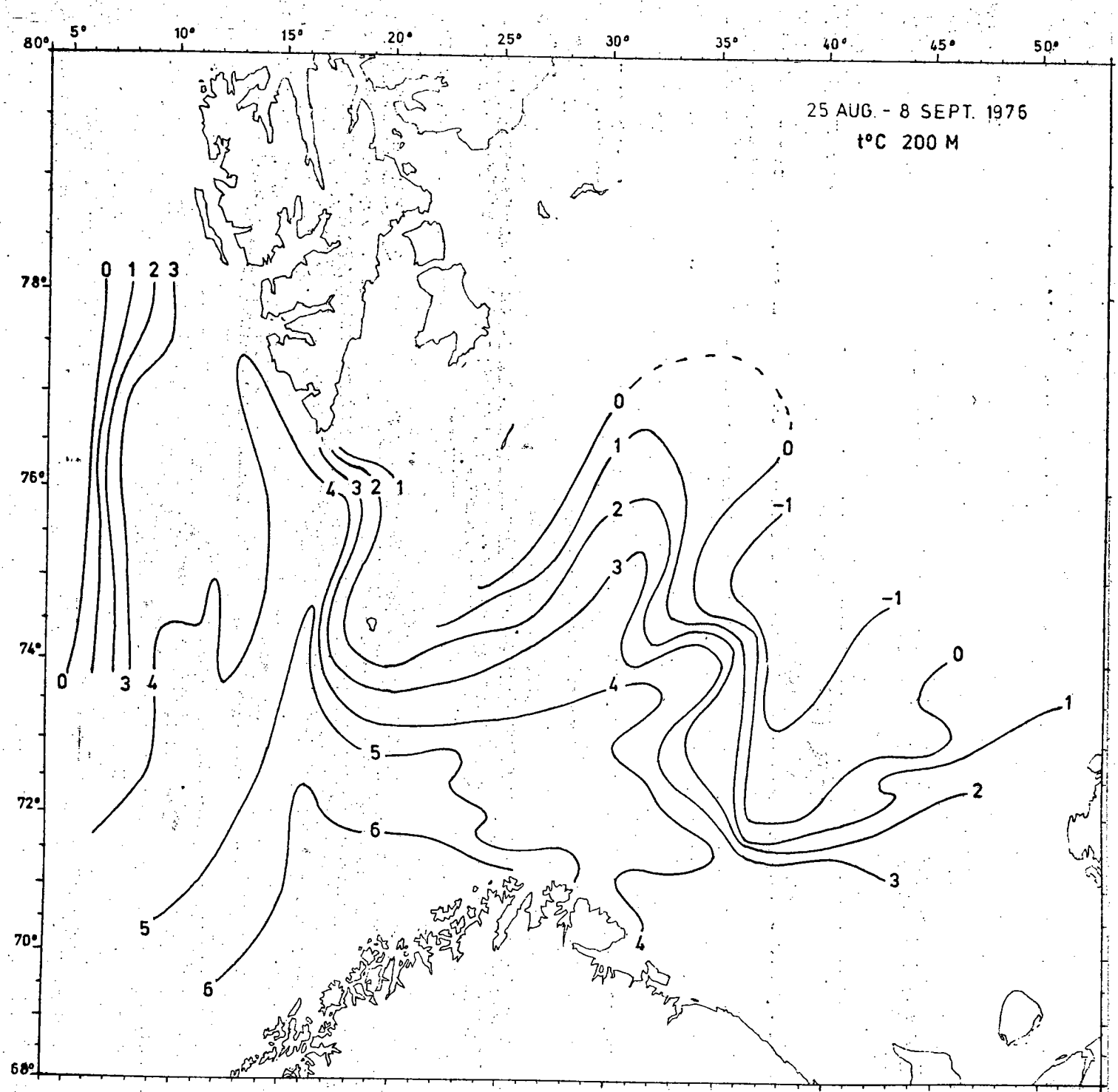

Fig. 5. Isotherms at 200 m.

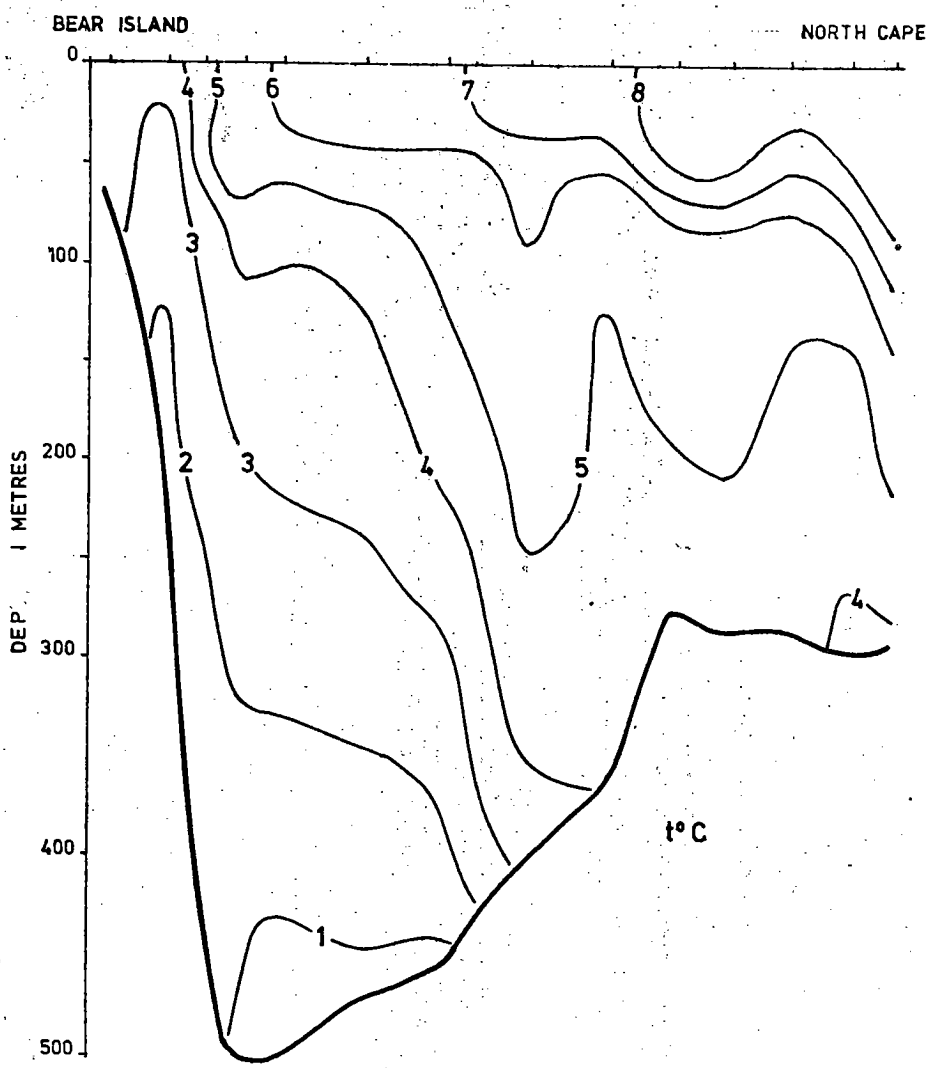

Fig. 6. Temperature section Bear Island - North Cape.

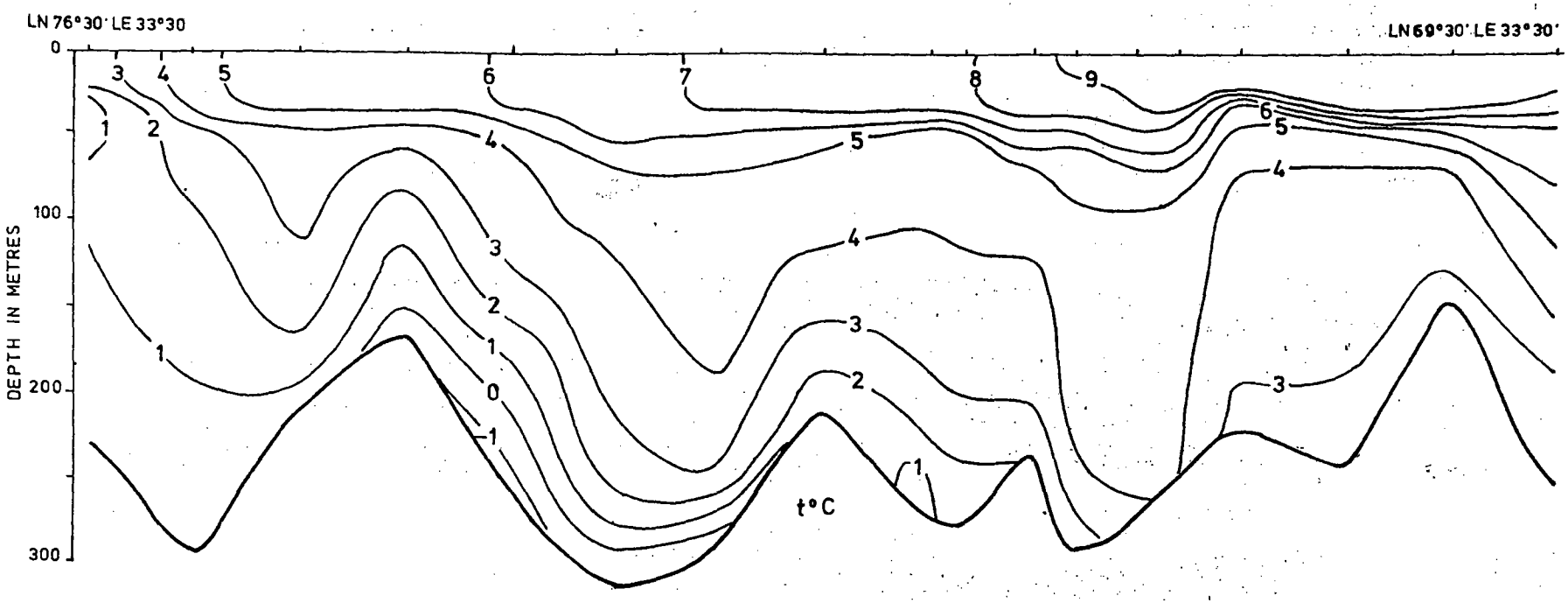

Fig. 7. Temperature section along the Kola meridian.

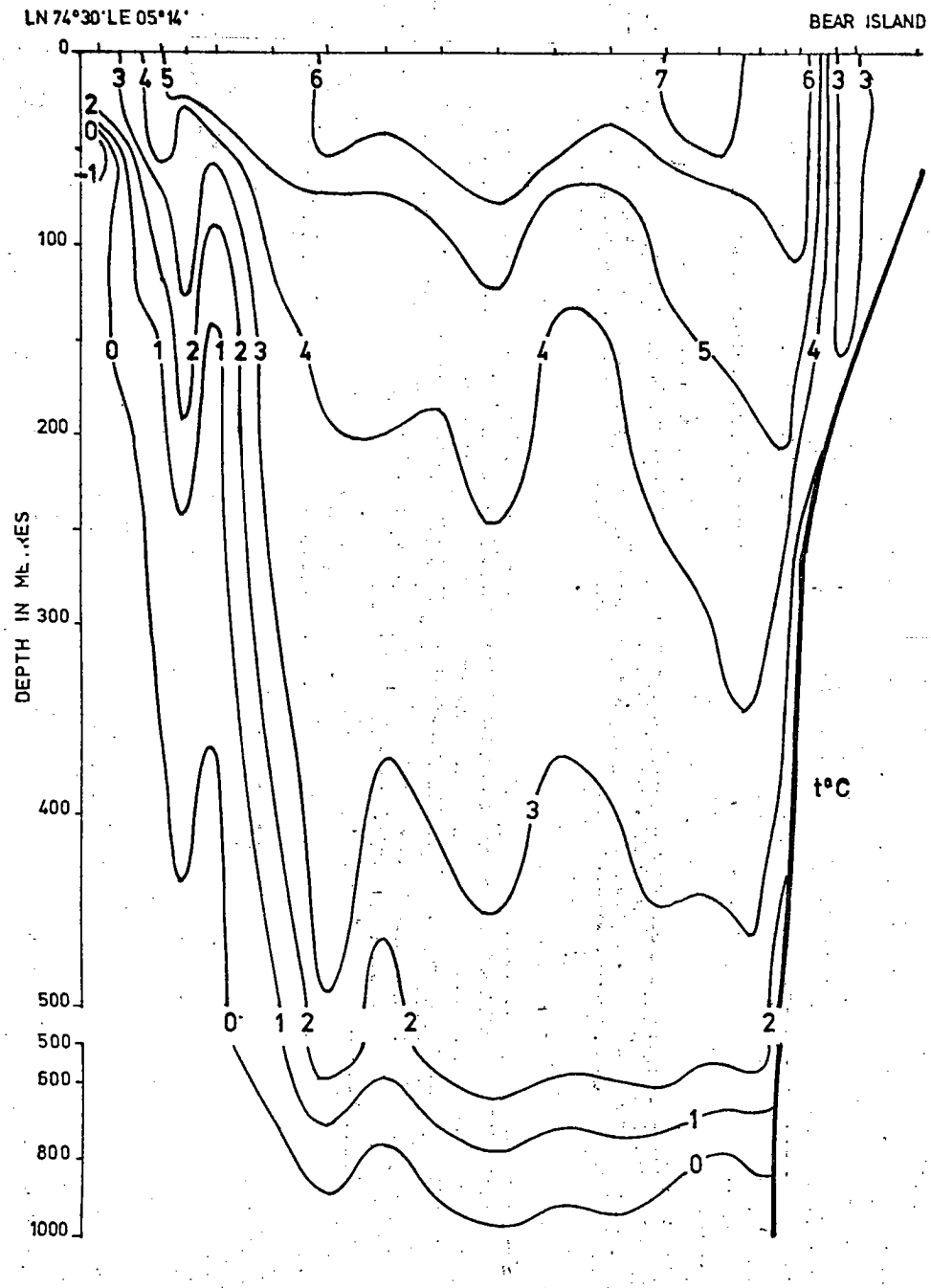

Fig. 8. Temperature section Bear Island - West.

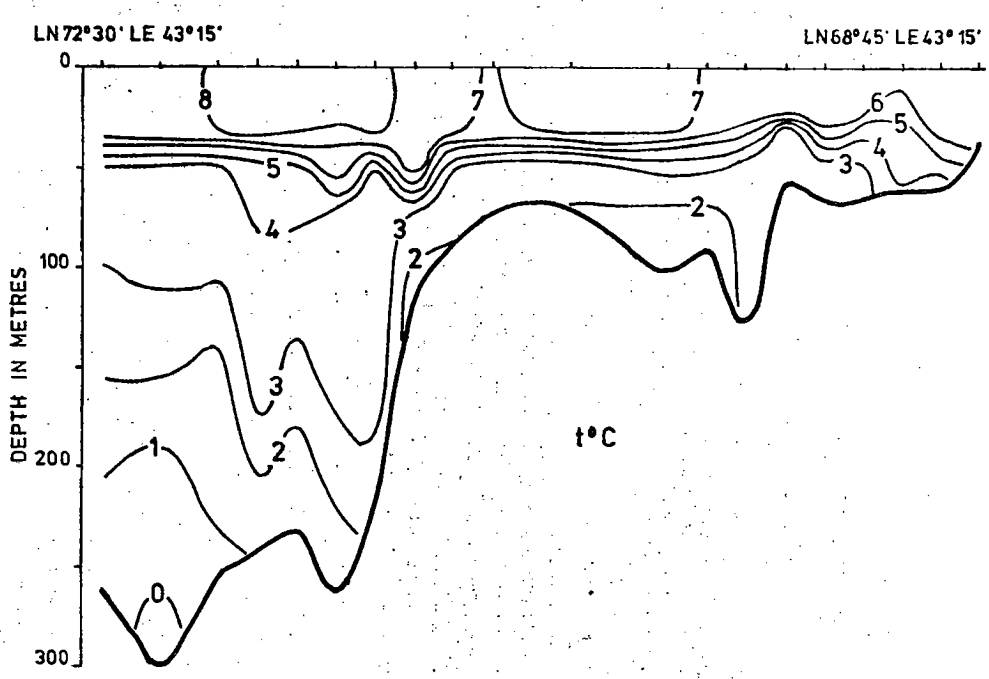

Fig. 9. Temperature section along the Kap Kanin meridian.

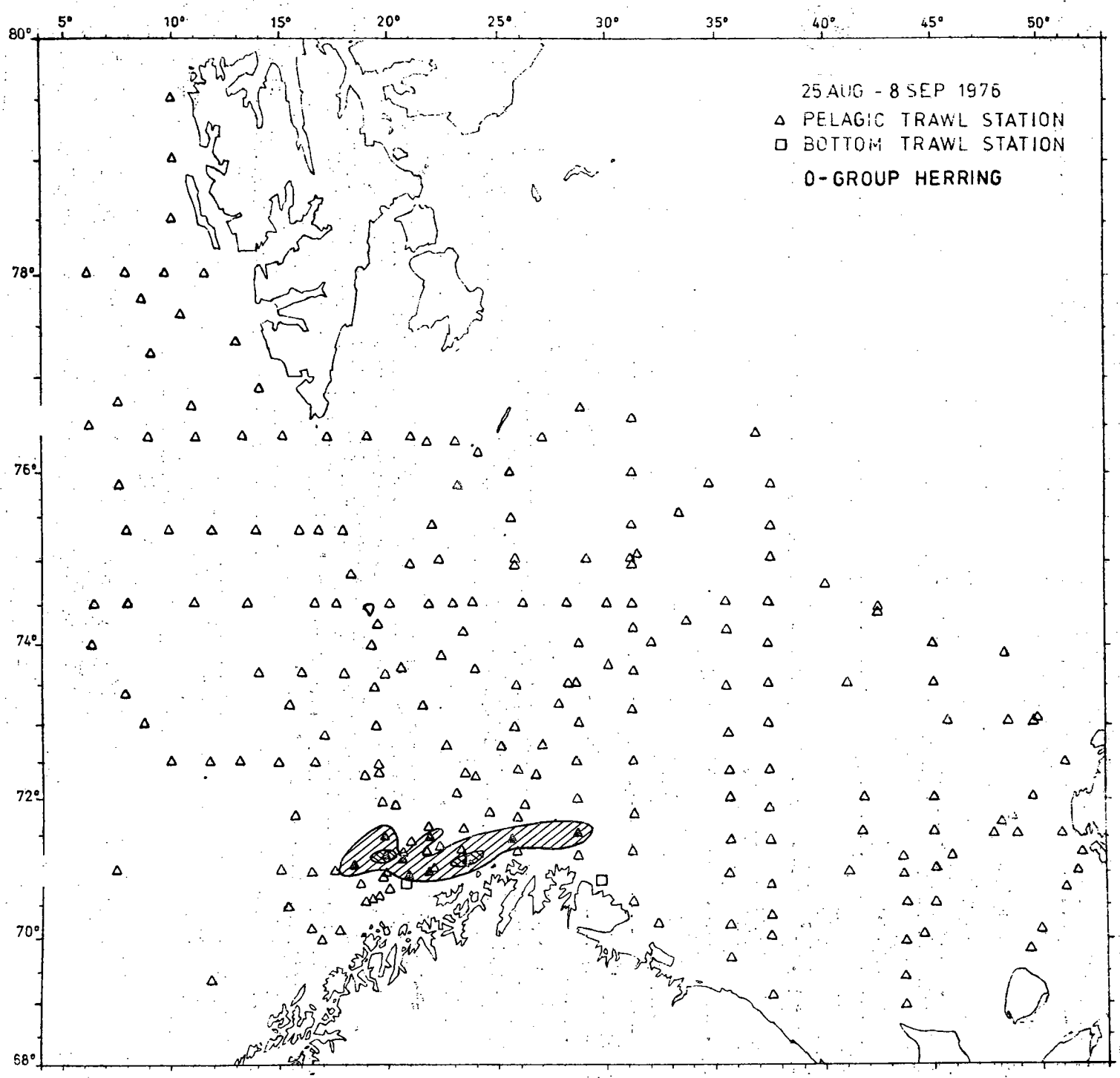

Fig. 10. Distribution of 0-group herring.

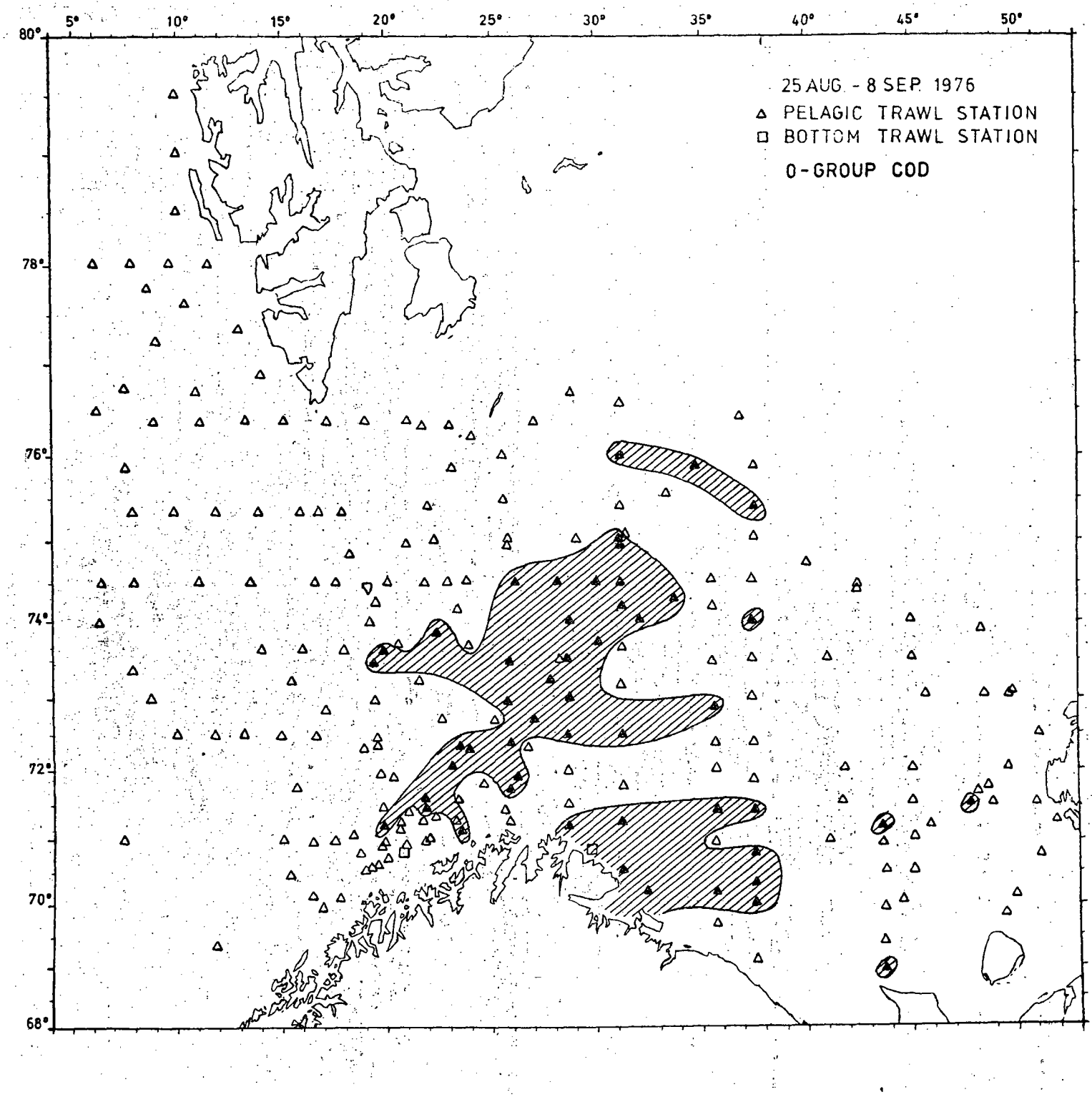

Fig. 11. Distribution of 0-group cod.

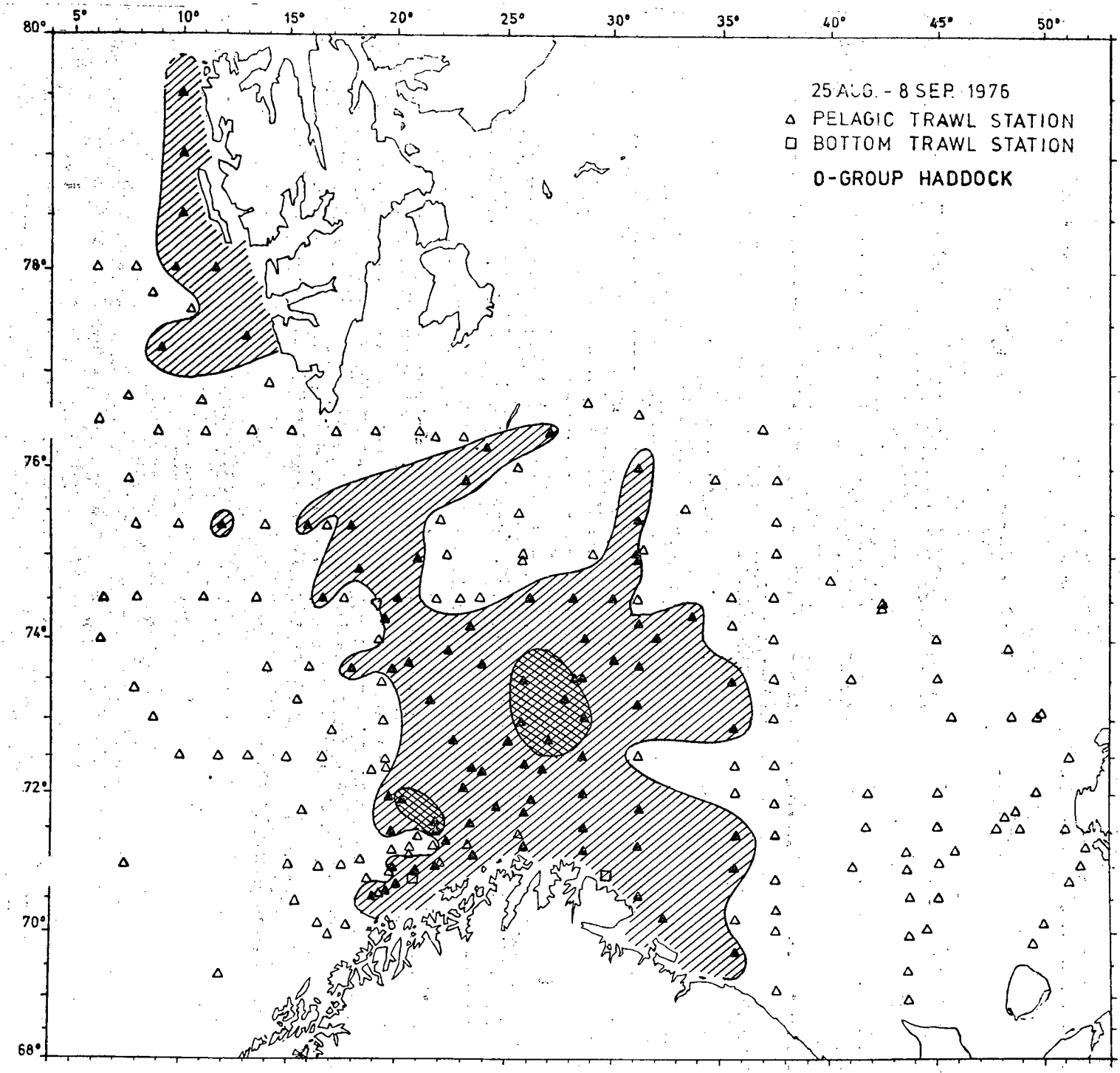

Fig. 12. Distribution of 0-group haddock.

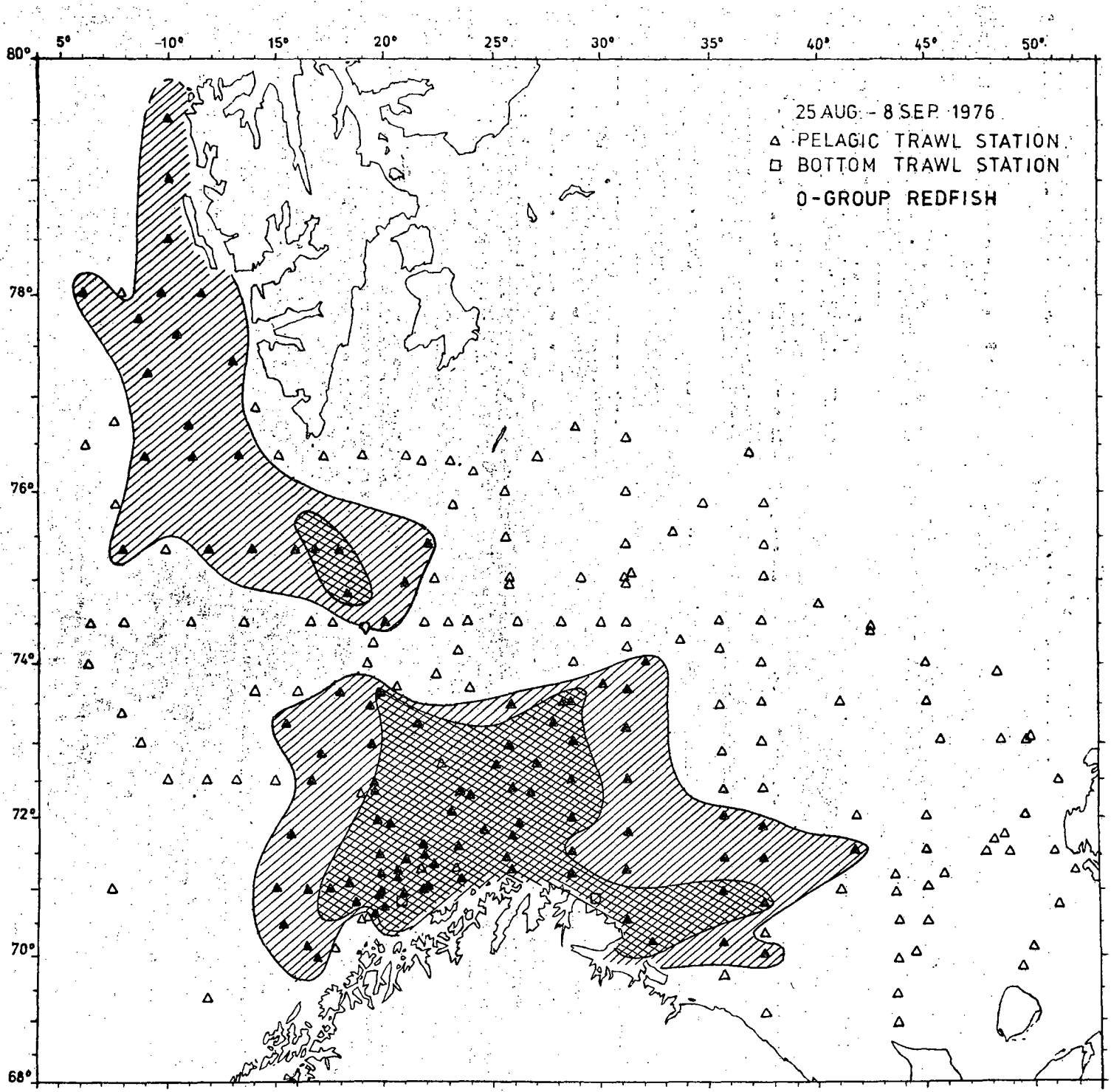

Fig. 13. Distribution of 0-group redfish.

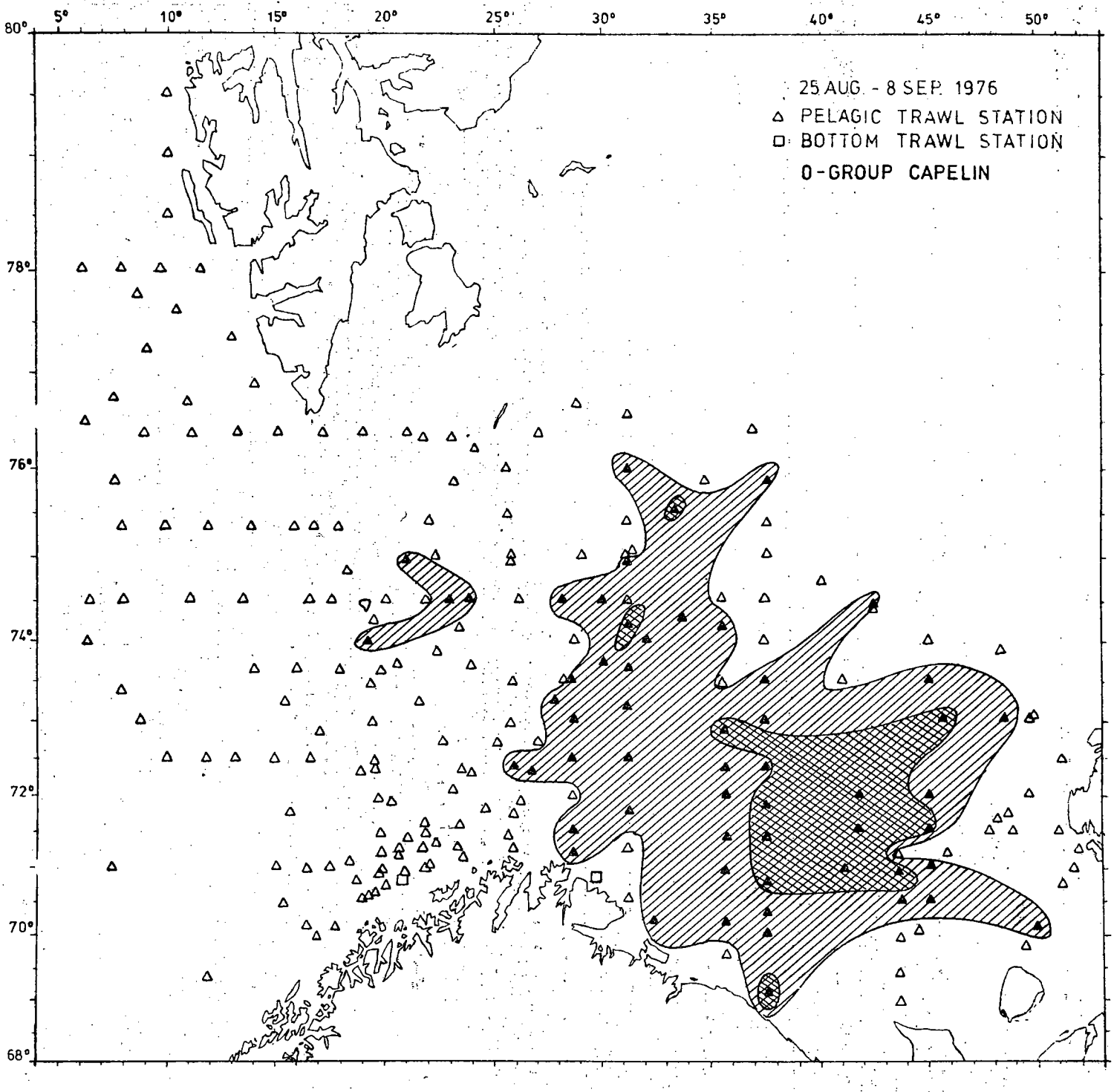

Fig. 14. Distribution of 0-group capelin.

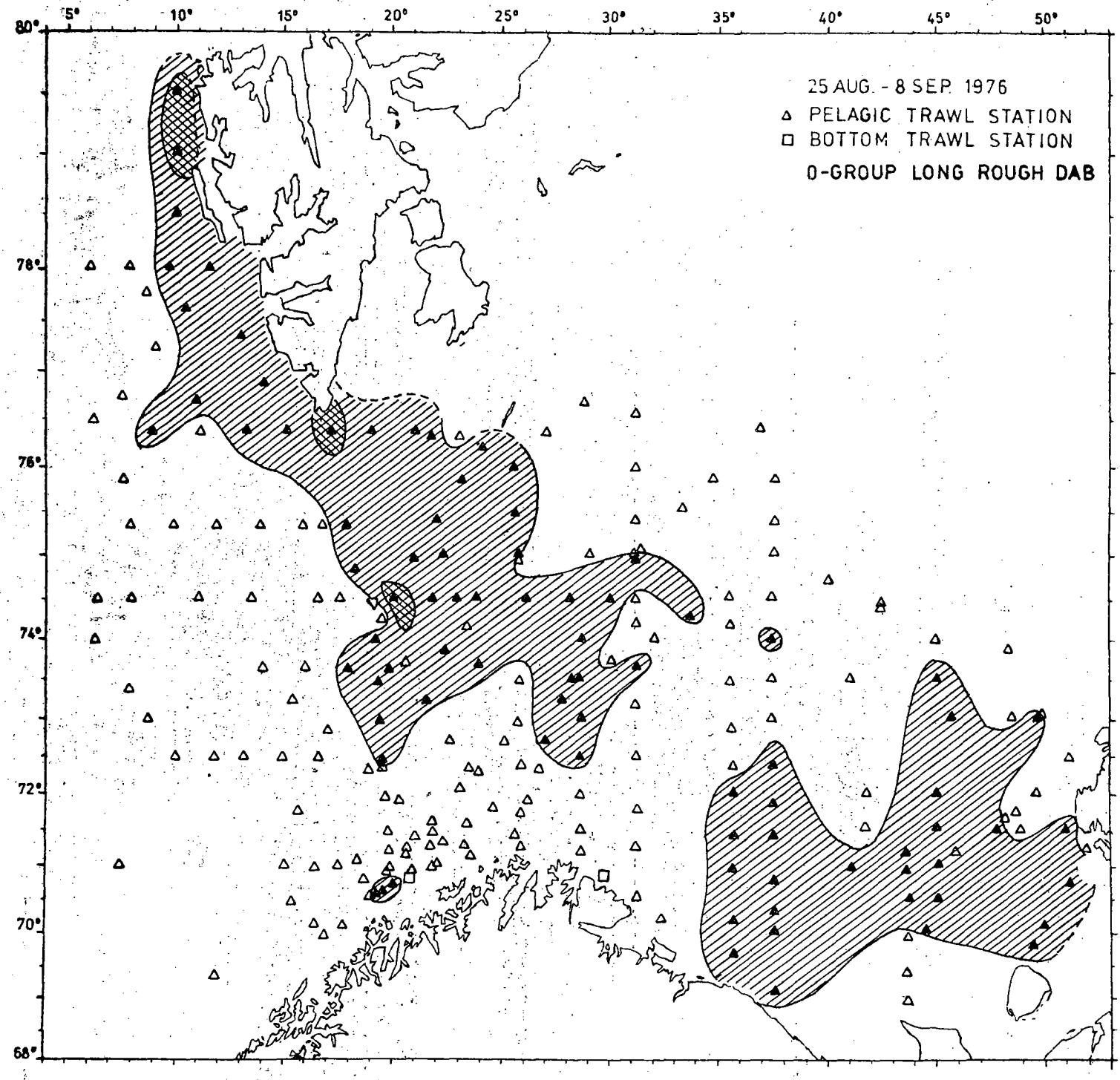

Fig. 15. Distribution of 0-group long rough dab.

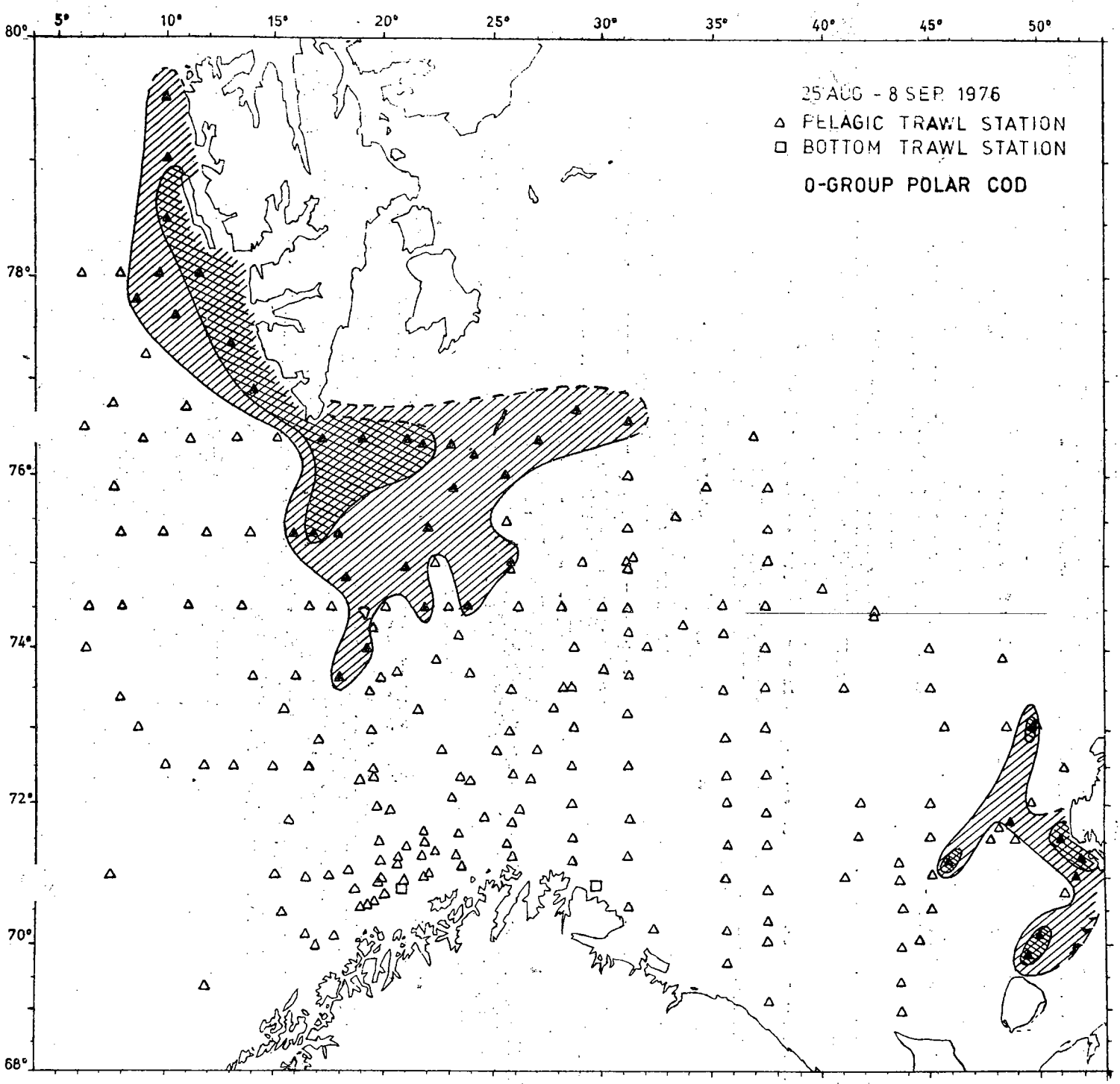

Fig. 16. Distribution of 0-group polar cod.

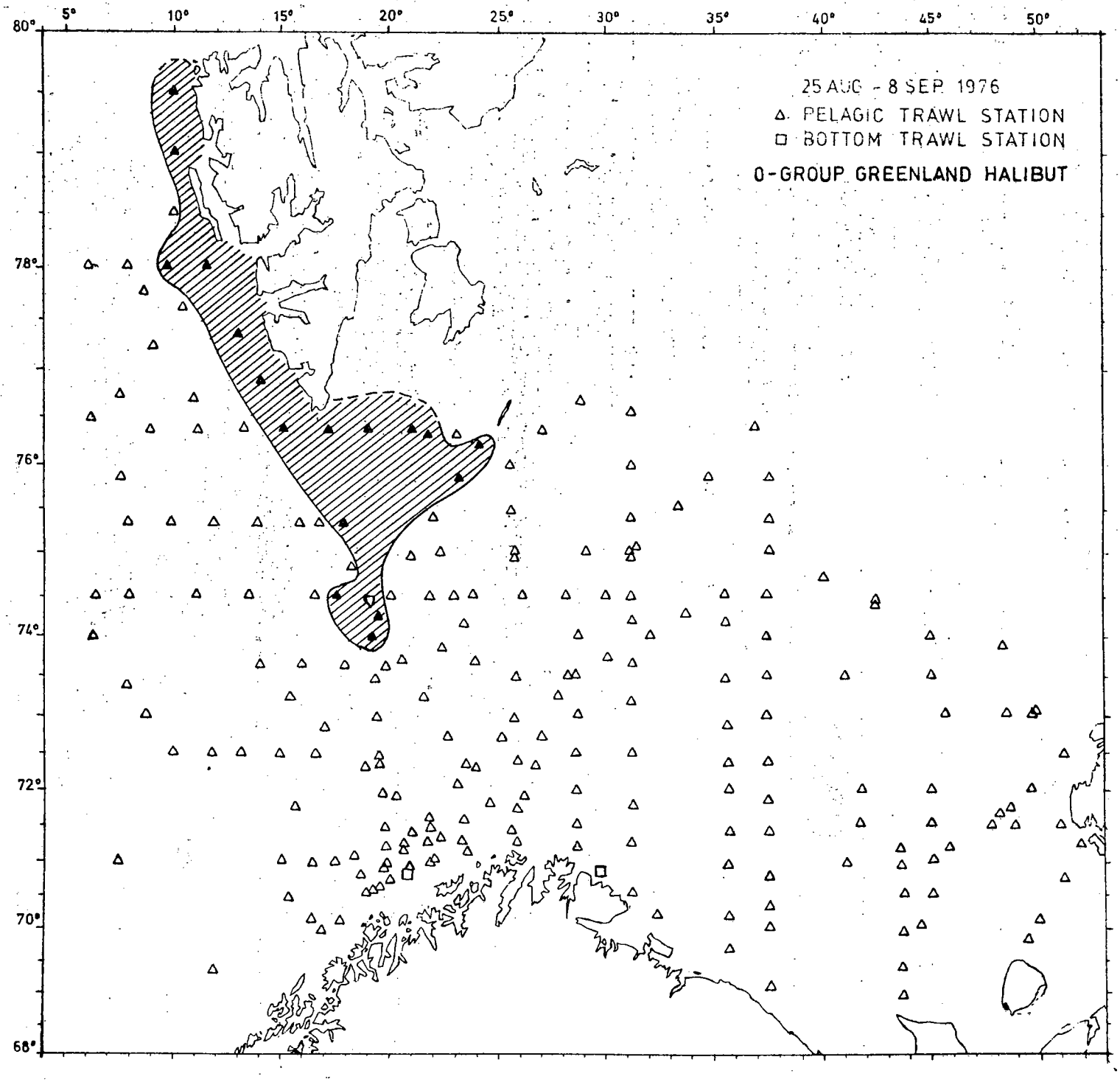

Fig. 17. Distribution of 0-group Greenland halibut.

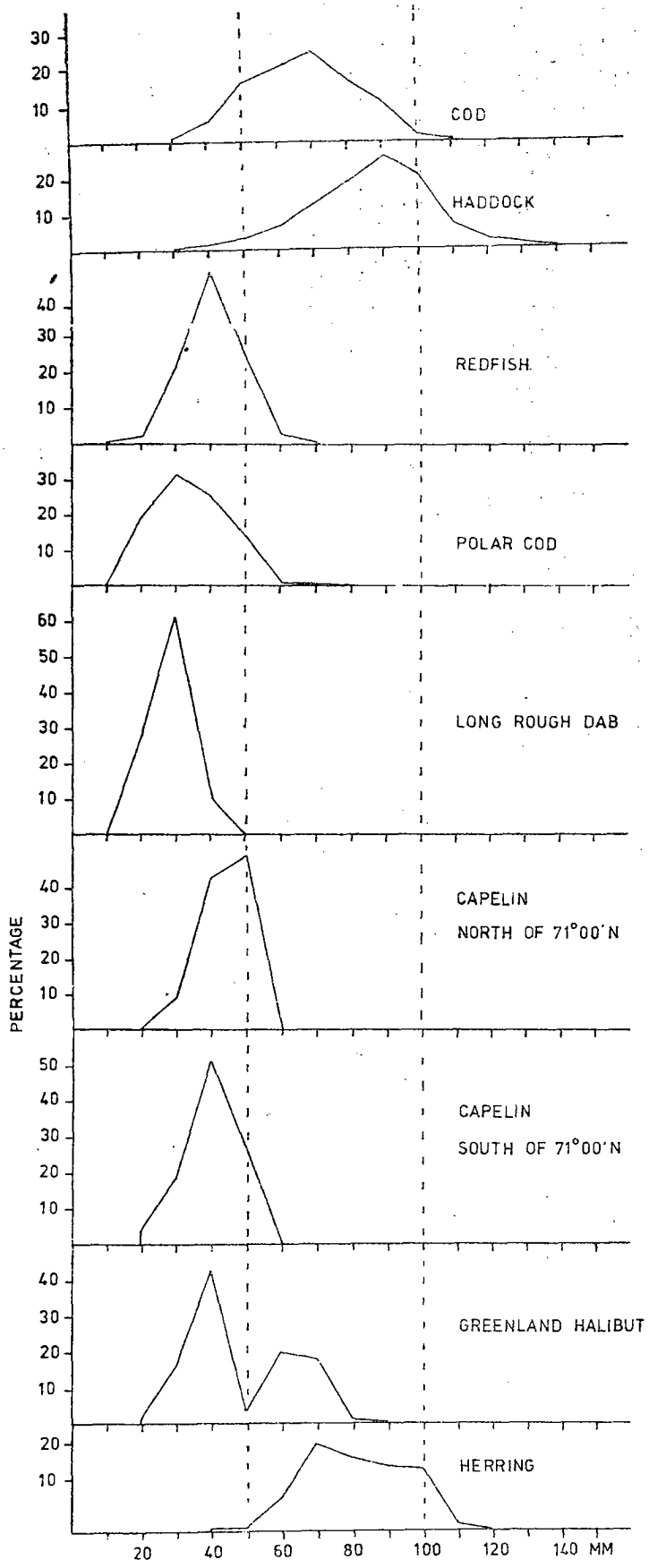

Fig. 18. Length distribution of 0-group fish.