

Preliminary Report
of the 0-group fish survey in the Barents Sea and adjacent
waters in August-September 1968.

1. Introduction

This survey was the fourth of a series of surveys in the Barents Sea and adjacent waters to study the distribution and abundance of 0-group fish of the main commercial species: herring, capelin, cod, haddock, redfish, saithe, long rough dab and polar cod.

The vessels taking part and the scientists in charge of each vessel were as follows:

U.S.S.R.	R/V "Akademik Knipovich"	Yu.K. Benko
	R/V "Fritjof Hansen"	A.S. Seliverstov
Norway	R/V "Johan Hjort"	C. Dragesund, T. Monstad
	R/V "G.O. Sars"	L. Middtun, P. Hognestad
England	R/V "Ernest Holt"	B.W. Jones

A preliminary planning meeting was held in Bergen on 27-28 June, then all the vessels met in Murmausk on 23-24 August for a final discussion of the programme in the light of the results of a preliminary survey that had been made by "Akademik Knipovich" 6-15 August. The survey proper commenced on 25 August and ended on 5 September.

2. Methods

As in previous years the distribution and density of the pelagic scattering layer were estimated from the echo-sounder paper record, and were identified by direct sampling by mid-water trawl. As in 1967 some of the ships used integration techniques to obtain a more quantitative estimate of the scattering layer. High frequency echo-sounders (100-120 KHz) were also used to obtain better discrimination.

The area covered by the survey was much the same as in previous years. The ships' tracks and the distribution of hydrographic and trawl stations are shown in Fig. 1.

3. Results

3.1. Hydrography

The full hydrographic data are not yet analysed, but the charts have been prepared of the temperature distributions in depths of 4, 50, 100 and 200 meters (Figs. 2, 3, 4 and 5).

3.2. The distribution and abundance of 0-group fish

Fig. 6 shows the variation in total density of the scattering layer, which is composed of a variety of planktonic organisms as well as 0-group fish. Echo density was determined by examination of the paper echo-sounder record and expressed in terms of a scale 0-4. In some areas scattering layers or shoals of fish older than 0-group were recorded. Results from the integrating equipment are not yet analysed.

The general distribution of 0-group fish was closely related to the water temperature. The majority of species were distributed in the warmer water in the central part of the Barents Sea and extending up along the west coast of Spitsbergen. Polar cod was recorded in the colder water in the eastern part of the survey area, but also west of Spitsbergen.

3.2.1. Herring

0-group herring were again very scarce this year being almost entirely absent over the whole area. They were even less abundant than last year. This is the fourth successive year in which very low abundance of herring has been recorded in the joint surveys.

3.2.2. Cod

0-group cod were distributed over an area in the southern central part of the Barents Sea with a small isolated patch west of Spitsbergen (Fig. 7). The length composition is shown in Fig. 13. Once again the abundance of cod recorded was low which suggests that the 1968 year-class will be another weak one. As was the case last year there was again a virtual absence of cod on the Svalbard shelf.

3.2.3. Haddock and saithe

Both these species were found to be of very low abundance. The general distribution of haddock was similar to previous years (Fig. 8), but again the indications are that the 1968 year-class is a poor one.

Saithe also were found only rarely and no shoals which could be identified as saithe were located. The low abundance of saithe

this year can be contrasted with the widespread distribution and high abundance of the previous year when a considerable number of dense shoals were identified.

3.2.4. Redfish

This year redfish were distributed over a more restricted area than in 1967, being limited to an area off the northern coast of Norway (Fig.9) with isolated patches to the west of Bear Island and west of Spitsbergen. This species was also appreciably lower in abundance than in previous years. The average size of redfish was also lower than in previous years (length range 15-45 mm).

3.2.5. Capelin

In contrast to most other fish species 0-group capelin were abundant and widely distributed over the Barents Sea (Fig.10) with a tongue extending almost to Novaya Zemlya coinciding with the eastward extension of the warmer water. Capelin were also found in an area over the west Spitsbergen shelf. The indications are that the 1968 year-class is a good one.

3.2.6. Long rough dab

Long rough dab were distributed in small numbers over the most of the area (Fig.11). This year their distribution extended up to the west coast of Spitsbergen. The general impression is that this species was much less abundant than in previous years.

3.2.7. Polar cod

This species was again found in the colder water at the eastern end of the Barents Sea (Fig.12) with a second area of distribution to the west of Spitsbergen. The general abundance of this species appeared to be similar to last year.

3.2.8. Greenland halibut

0-group greenland halibut were recorded this year sometimes in quite large numbers on the west coast of Spitsbergen. This is the first year that Greenland halibut has been recorded in the joint surveys. The length distribution is shown in Fig.13.

3.2.9. Other species

0-group fish of several other species were recorded during the survey. Jottidae, Agonus and Liparis occurred frequently and other species included Anarrhichas, Triglops, Lyctoplus.

3.2.10. Adult and juvenile pelagic fish

Adult blue whiting were, as last year, recorded over a wide area along the eastern boundary of the Norwegian Sea, from Spitsbergen to the Norwegian coast outside the shelf. The conclusion last year, that the stock size must be quite considerable, was confirmed this year.

Adult polar cod was observed with approximately the same abundance in the same area as last year, namely from east of Bear Island and Hope Island, over the northern part of the Central Bank to Novaya Zemlya.

Fat herring was not observed during the surveys this year. Mature herring were at the time of the surveys concentrated within the area from $72^{\circ}\text{N} - 75^{\circ}\text{N}$ and $6^{\circ}\text{E} - 10^{\circ}\text{E}$.

Adult capelin were found to have a wider distribution than in previous years. The greatest concentrations were found in the area around Bear Island and Hope Island and up to the southwestern part of West-Spitsbergen. The concentrations consisted mainly of I-group fish, but older age-groups (mainly II-group) were also recorded. I-group capelin was also distributed in the central and south-eastern parts of the Barents Sea.

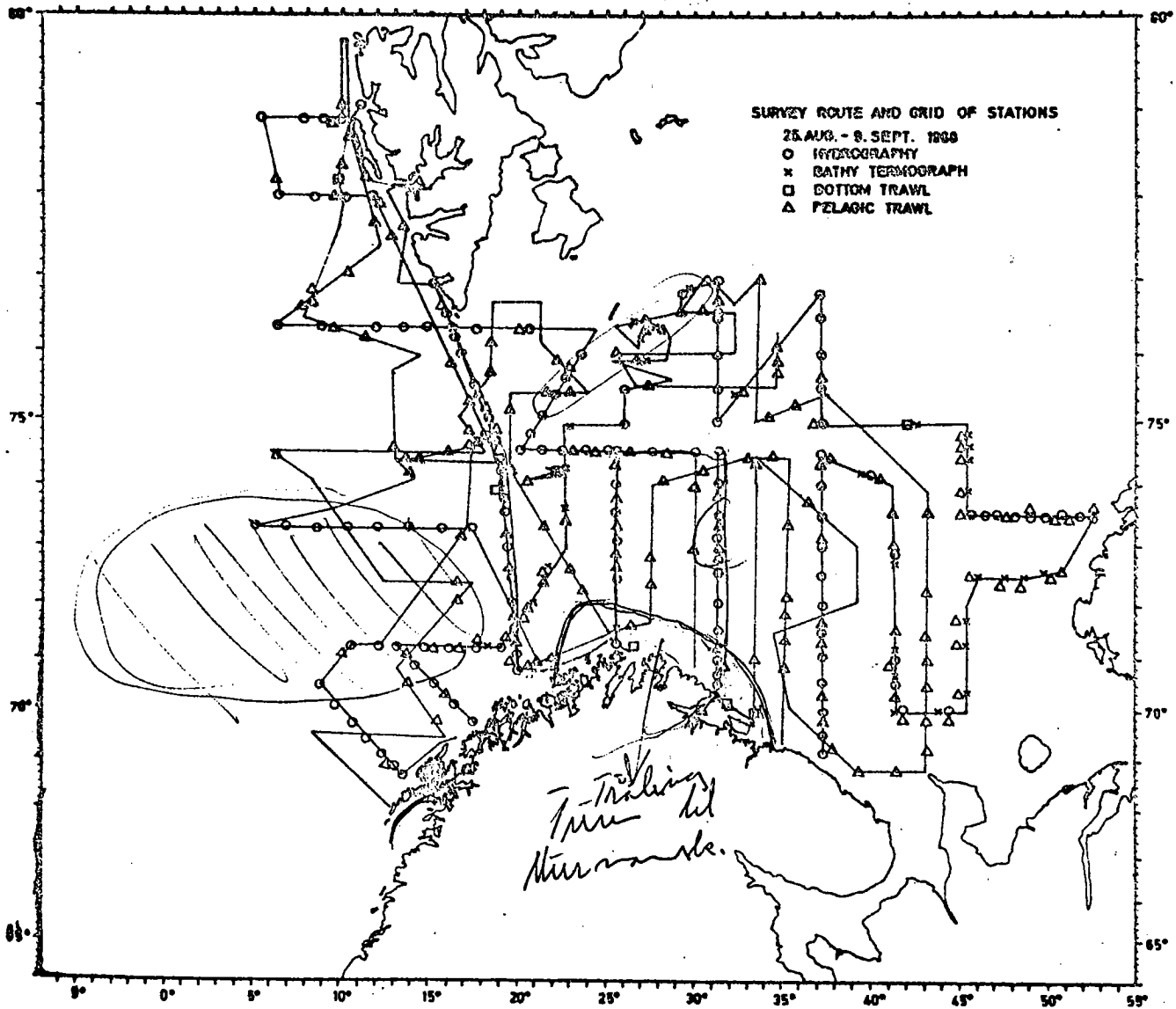


Fig. 1. Survey routes and grid of stations.

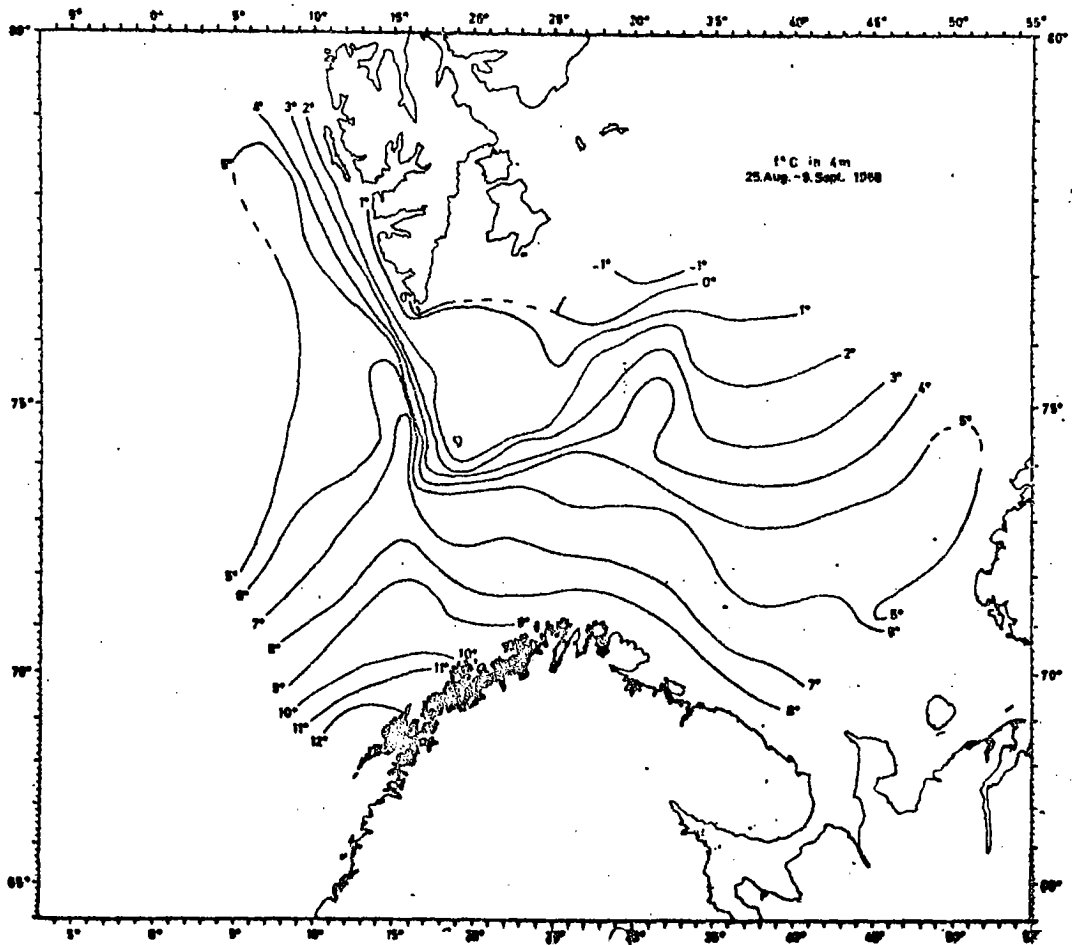


Fig. 2. Isotherma at 4 m.

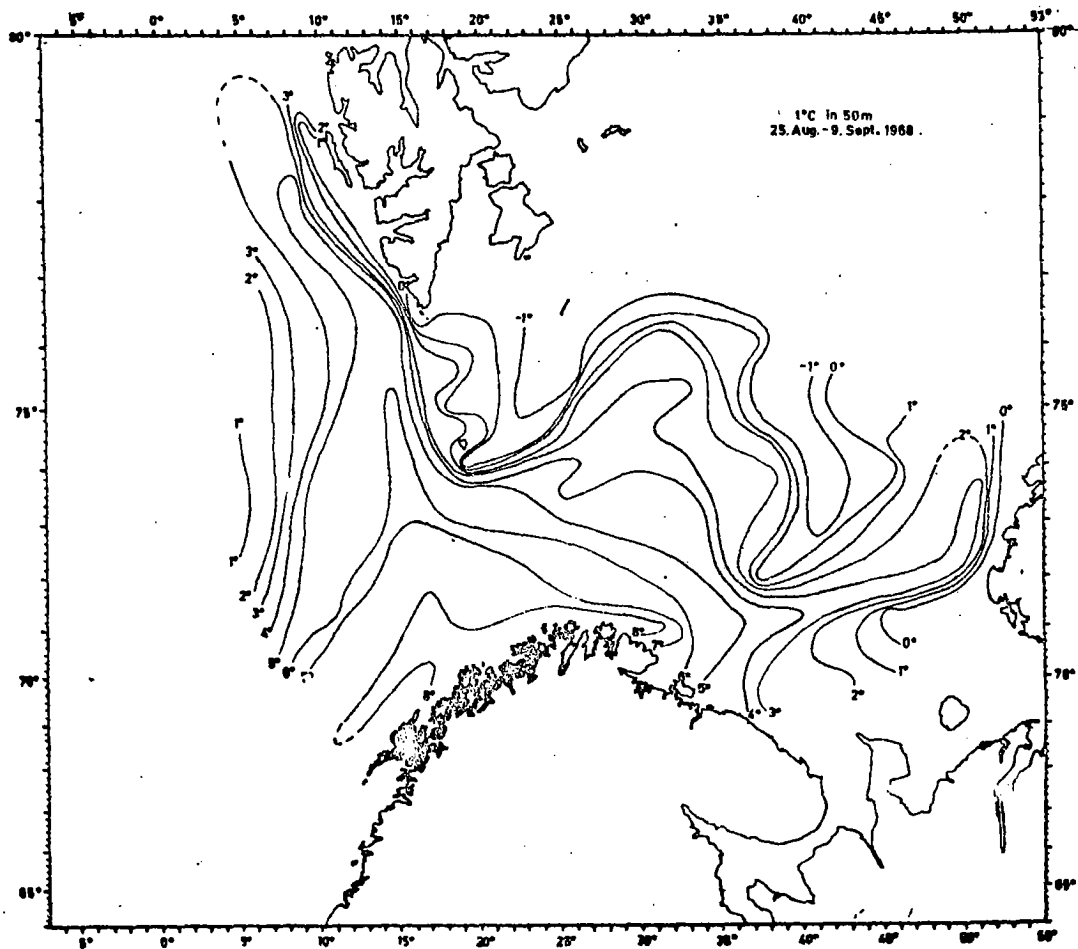


Fig. 3. Isotherms at 50 m.

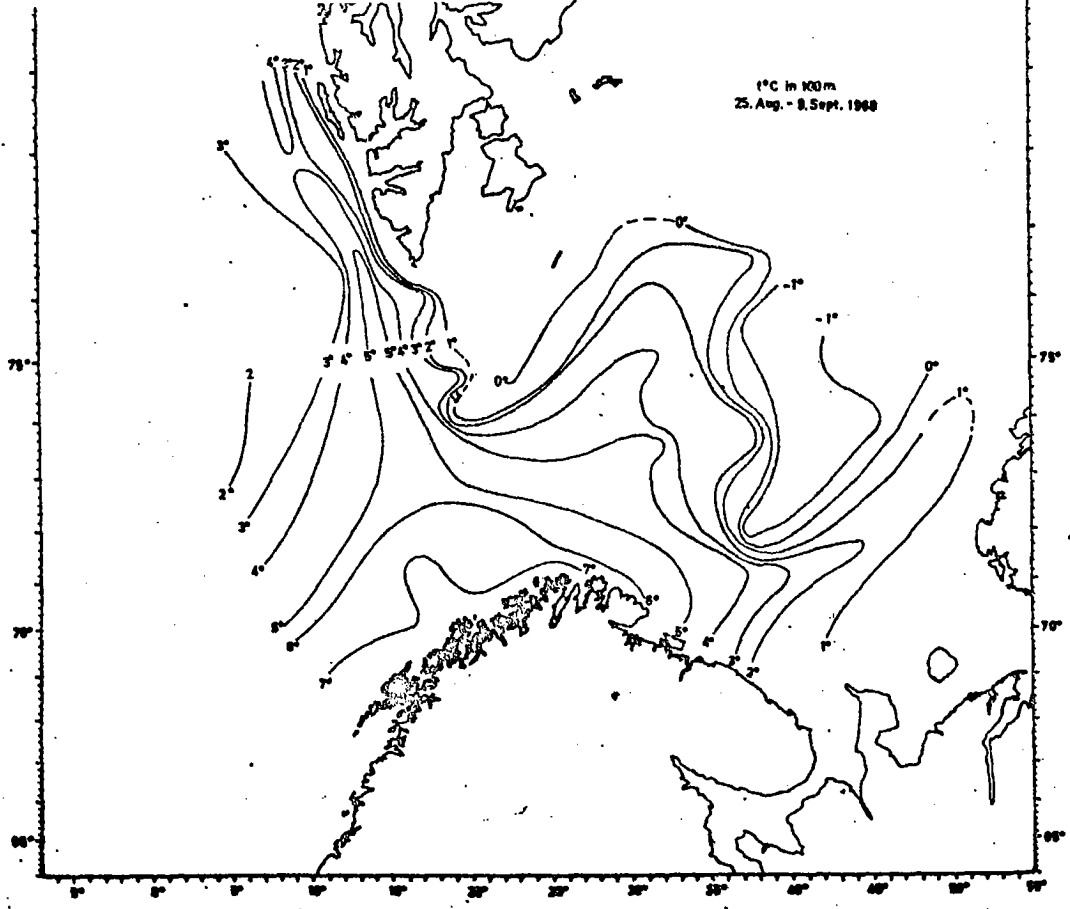


Fig. 4. Isotherms at 100 m.

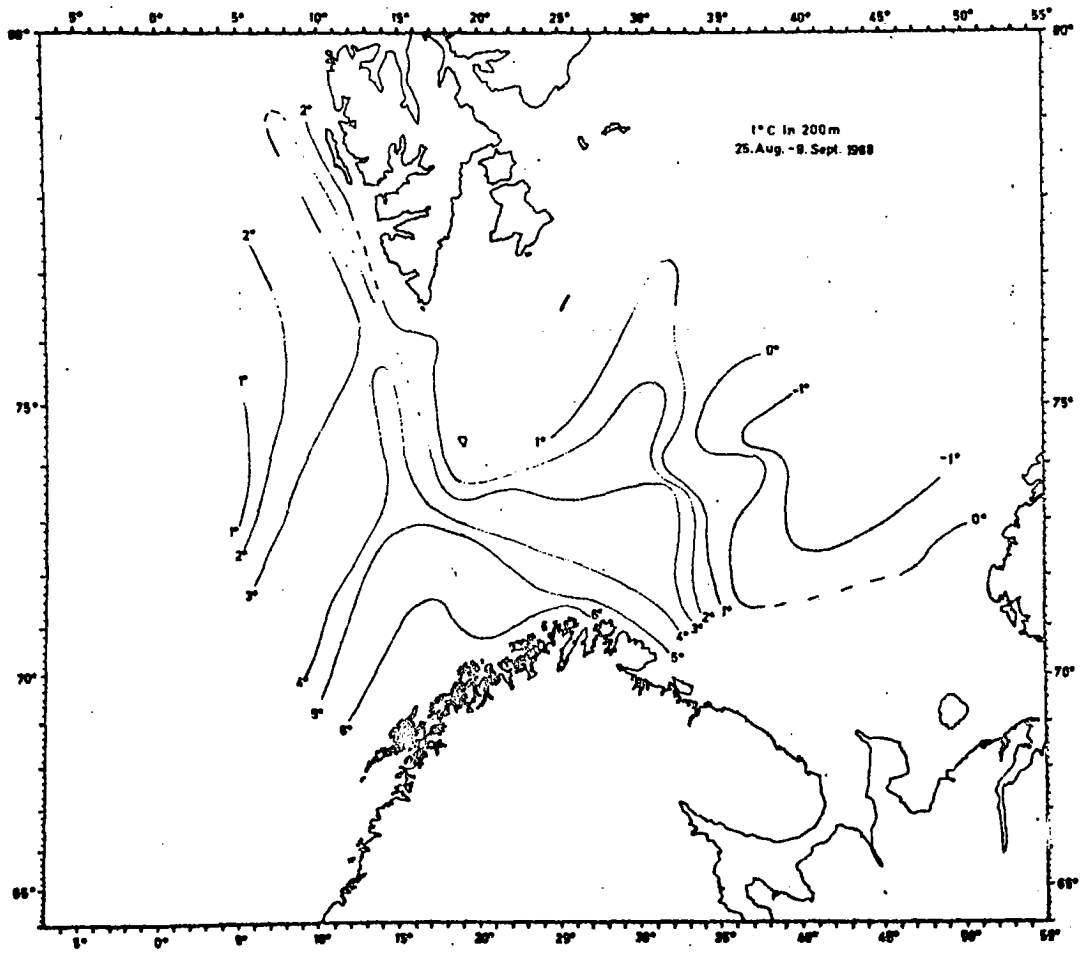


Fig. 5. Isotherms at 200 m.

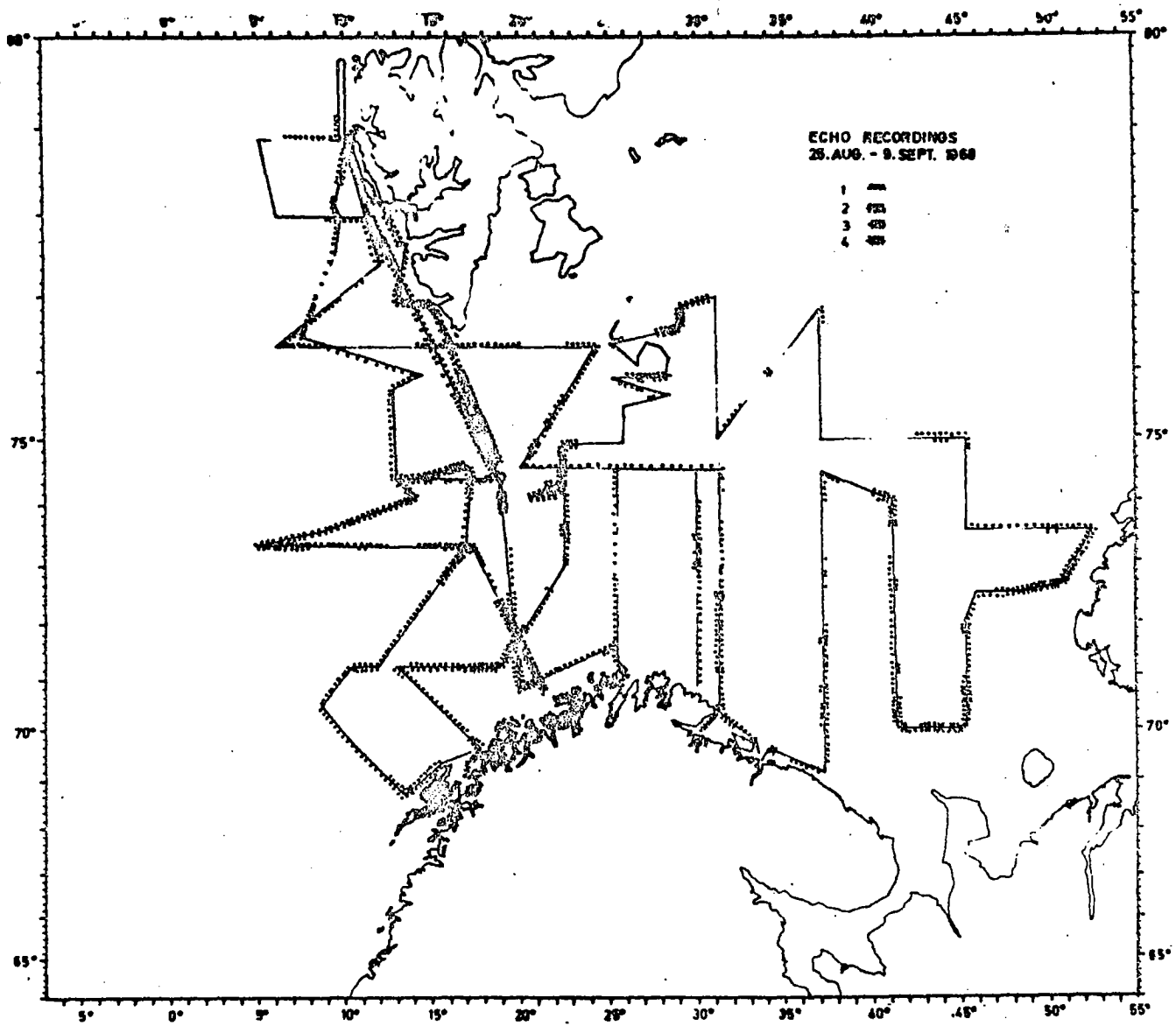


Fig. 6. Courses and echo recordings.

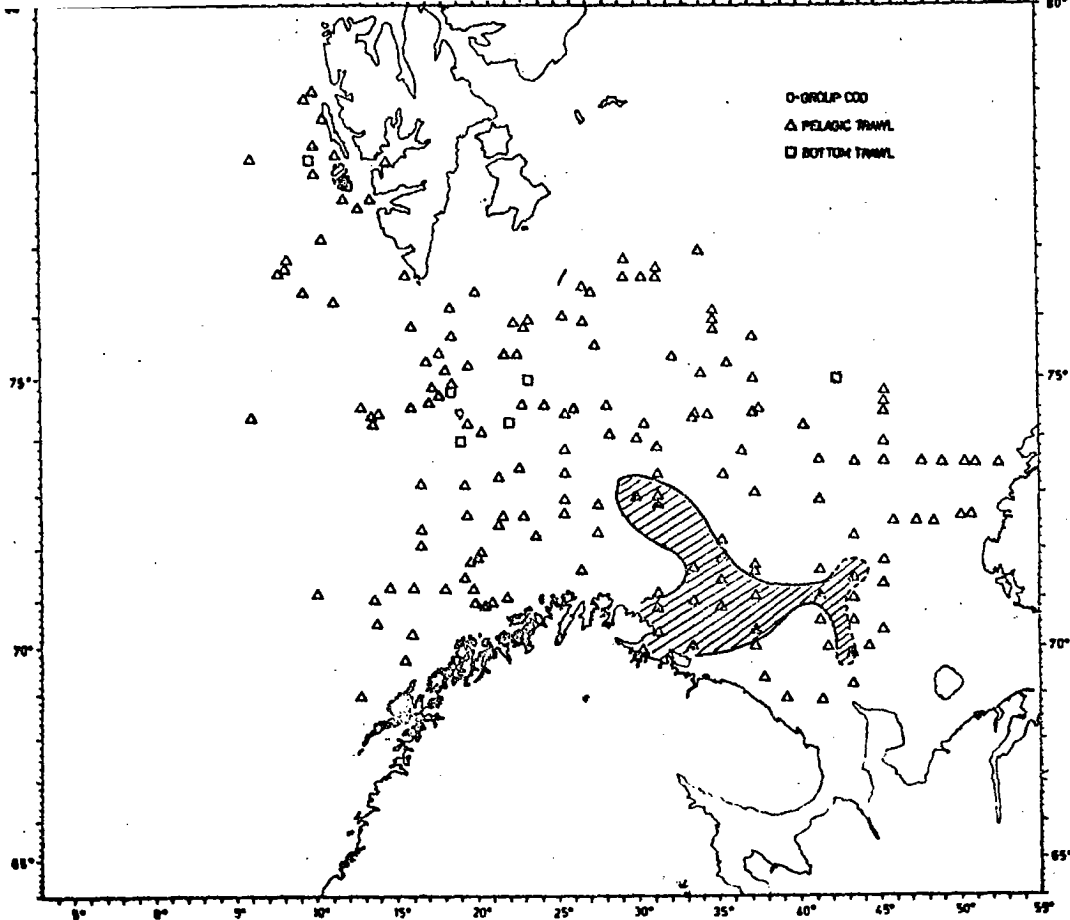


Fig. 7. Distribution of O-group cod.

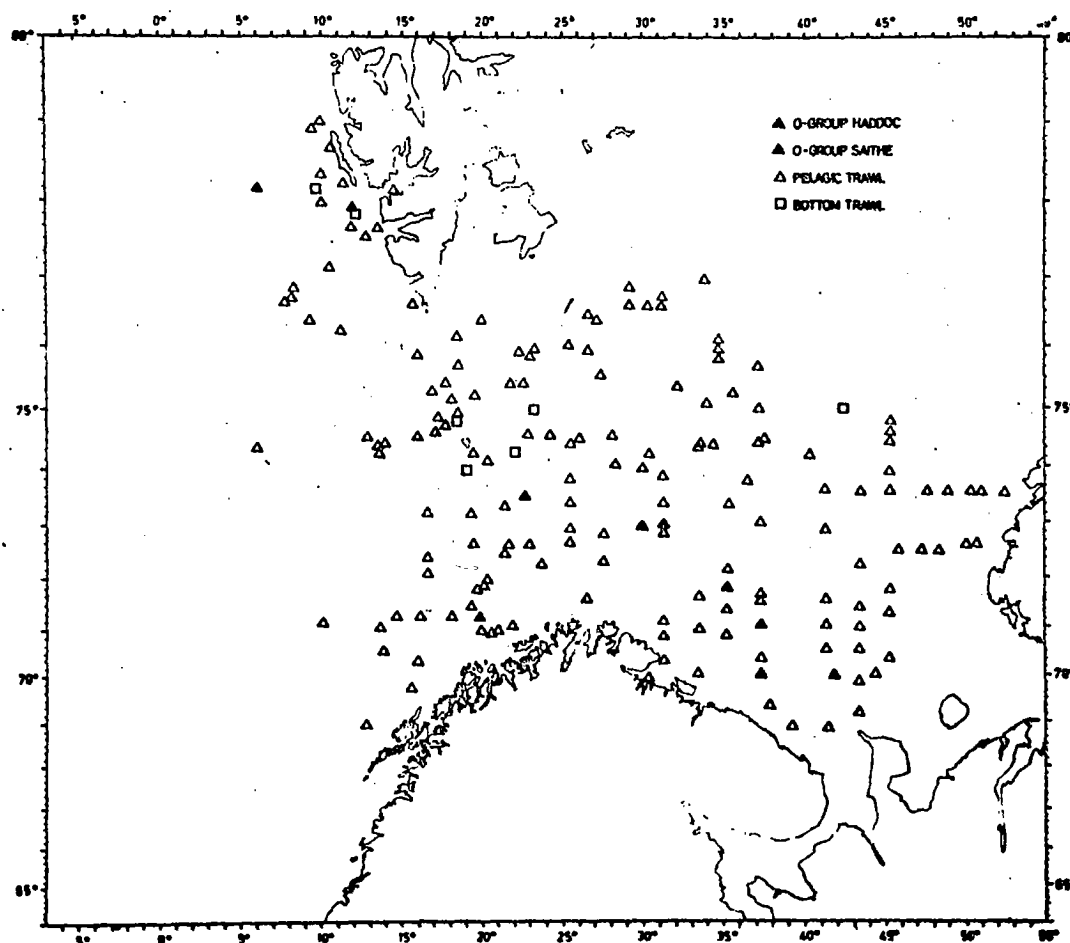


Fig. 8. Distribution of O-group haddock and saithe.

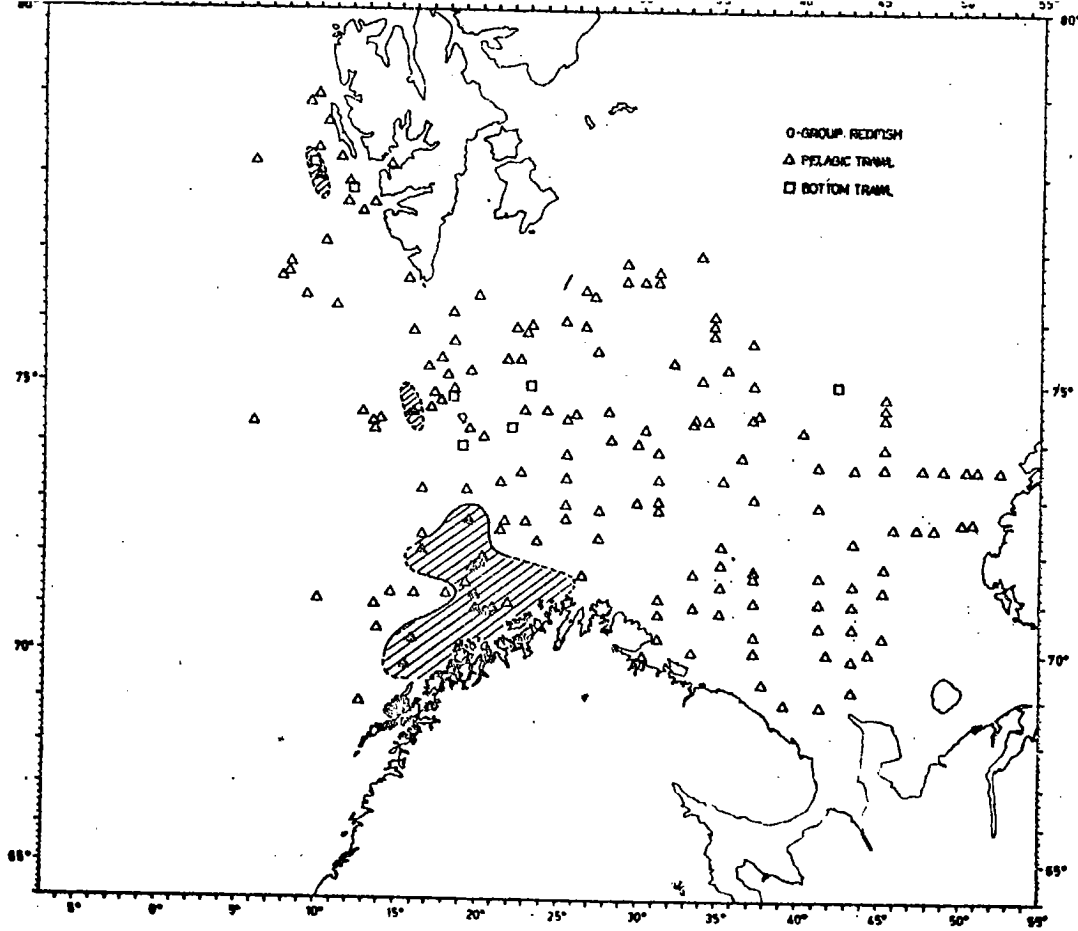


Fig. 9. Distribution of 0-group redfish.

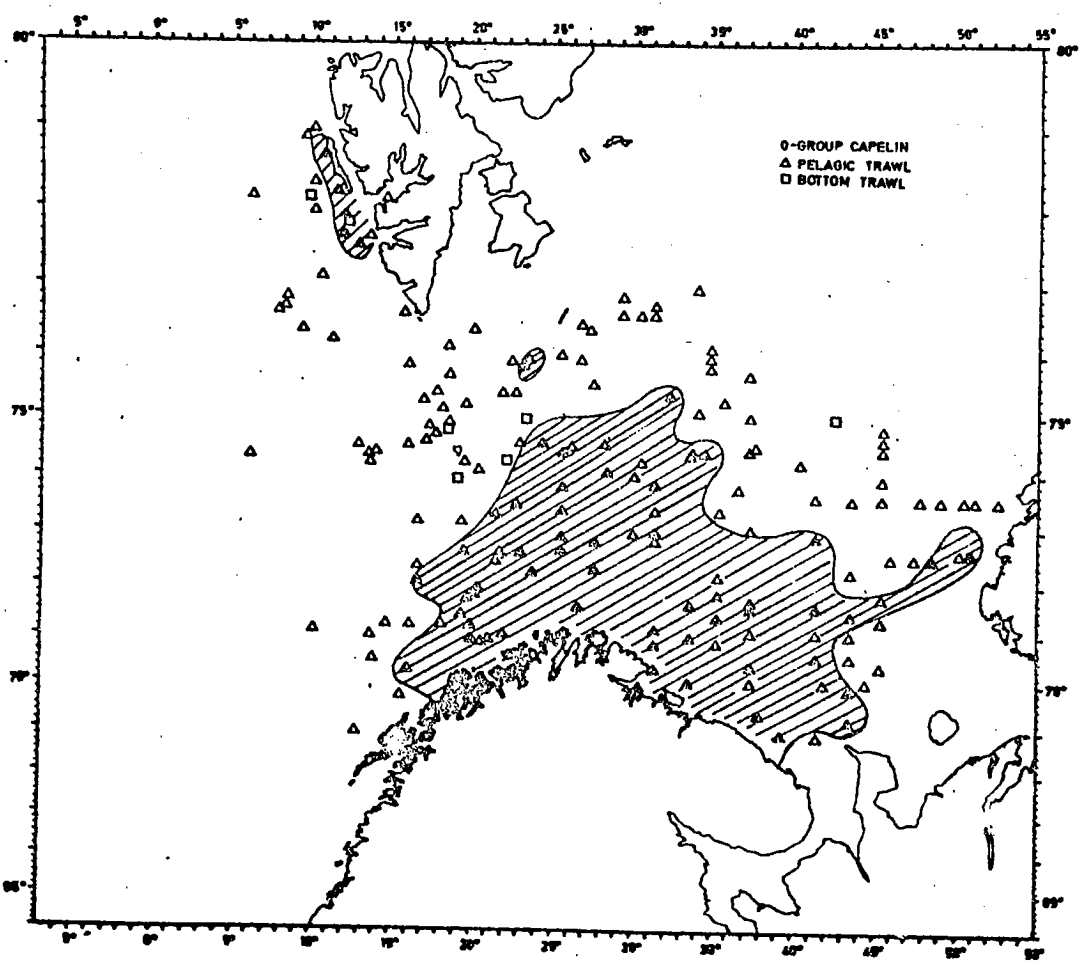


Fig. 10. Distribution of 0-group capelin.

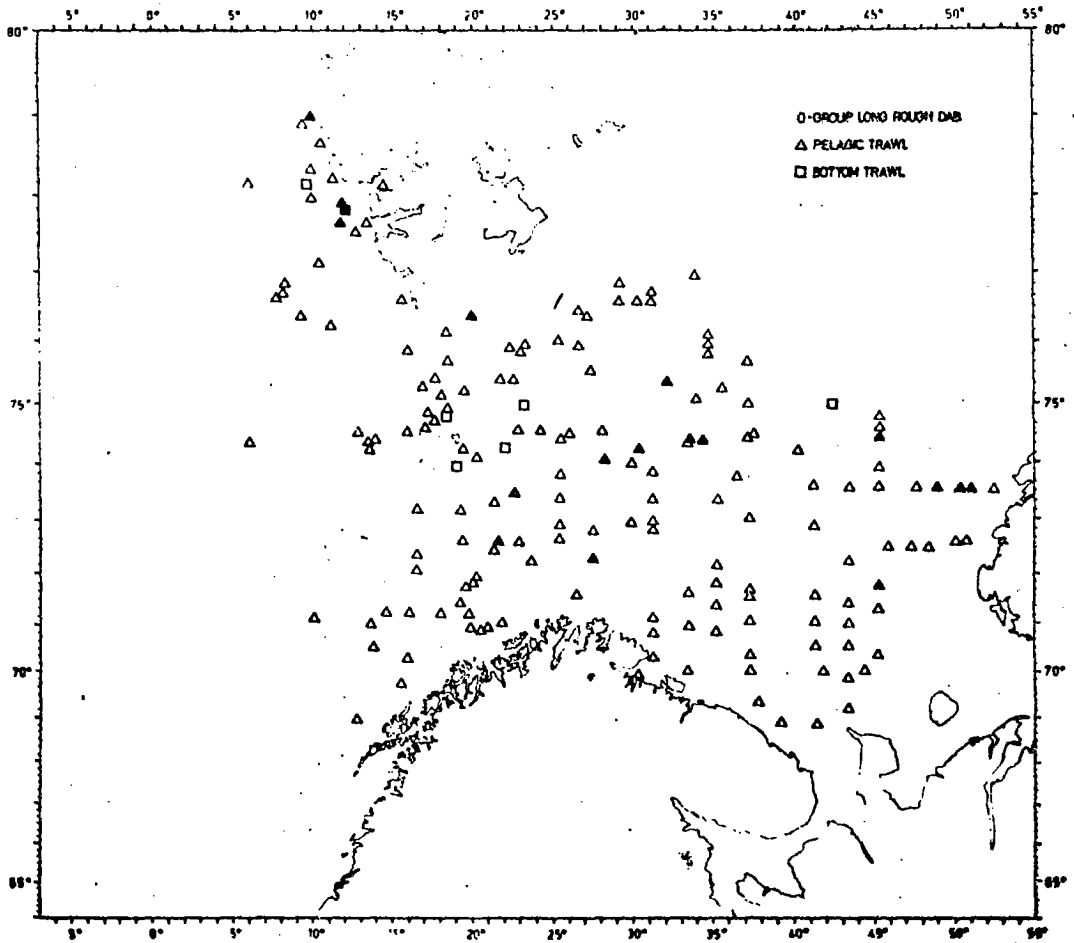


Fig. 11. Distribution of 0-group long rough dab.

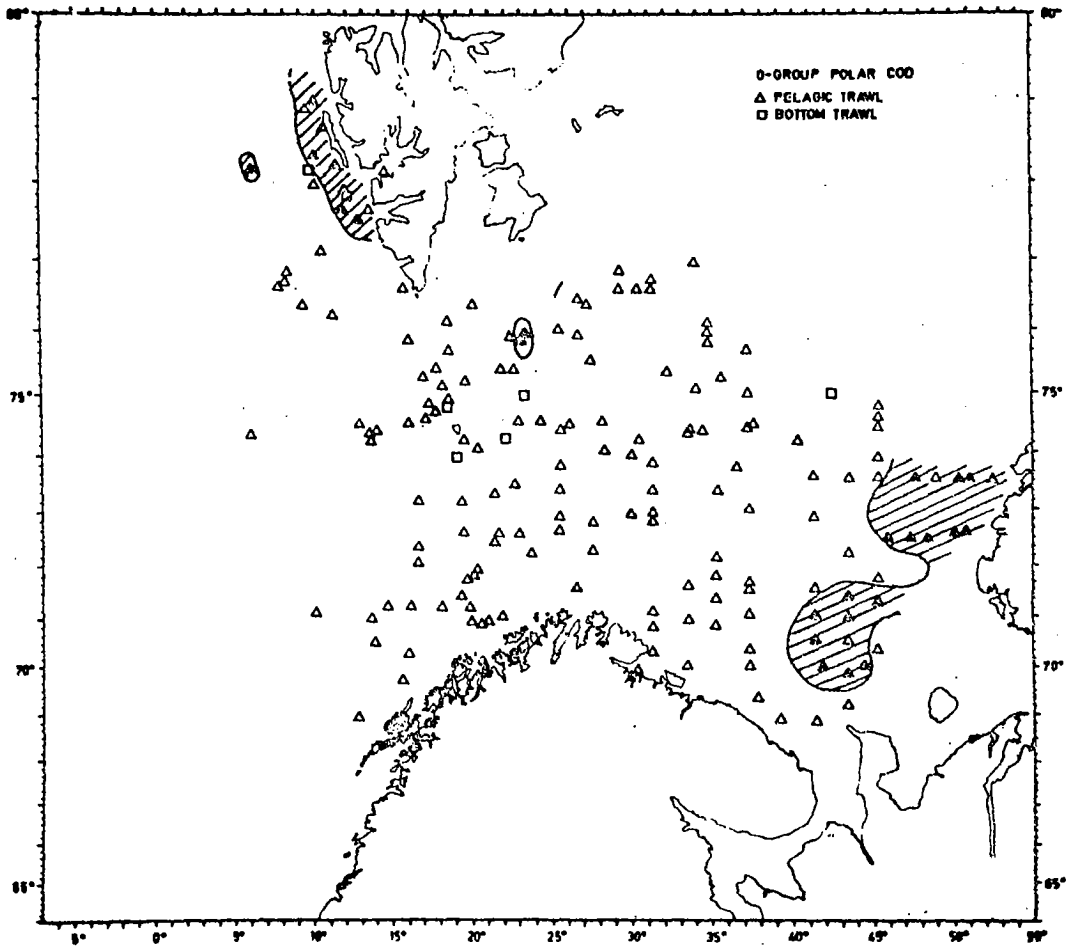


Fig. 12. Distribution of 0-group polar cod.

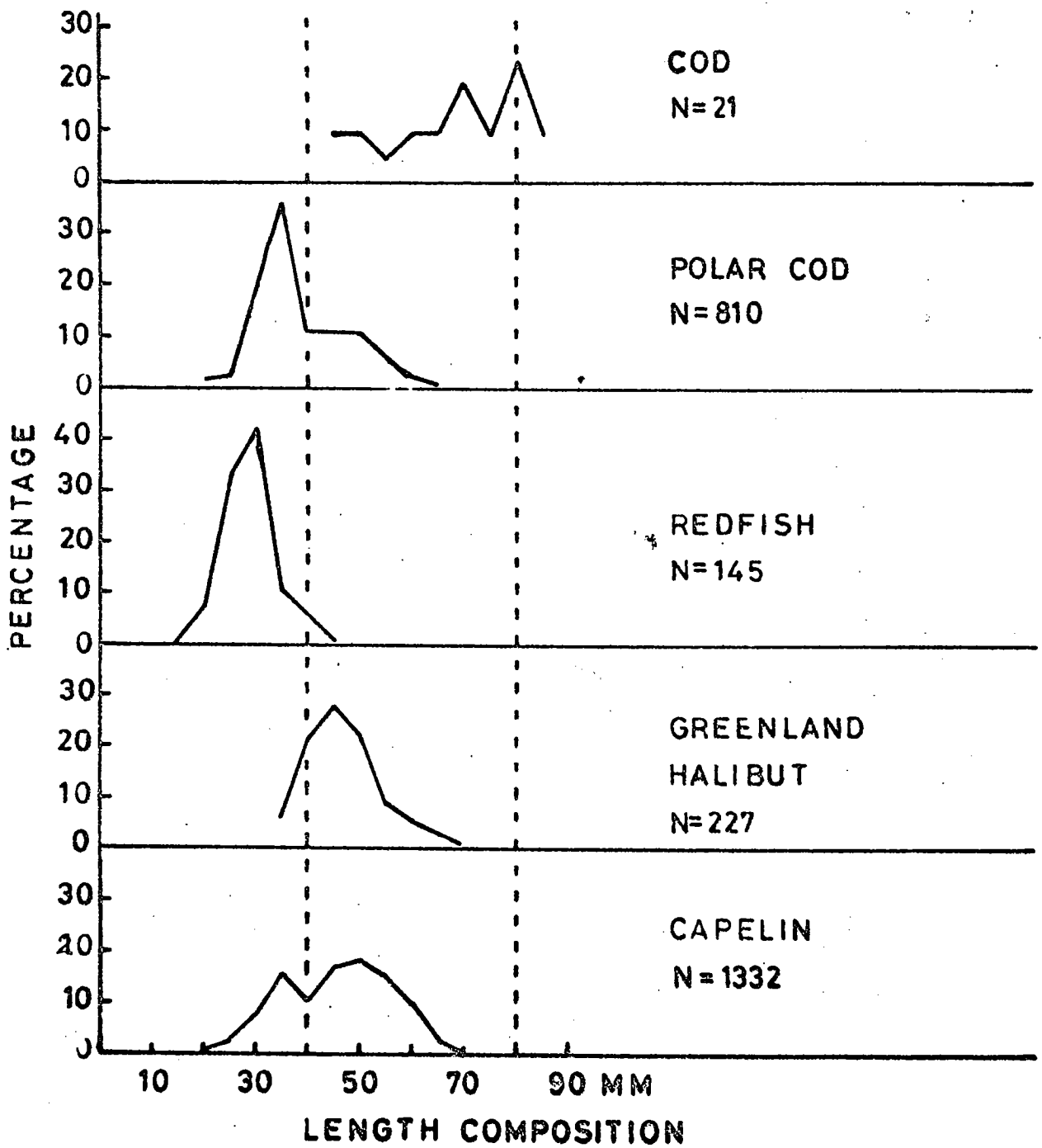


Fig. 13. Length composition.