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Preliminary Report of the International 0-group fish survey in
the Barents Sea and adjacent waters in August-September 1972.

INTRODUCTION

This was the eighth in a series of international surveys to study the abundance of 0-group fish in the Barents Sea and the Svalbard region.

The following vessels and scientists took part in the survey:

USSR : R/V "Akademik Knipovich", V.N.Schlainik
R/V "Fritjof Nansen", V.N.Kusnetsov
R/V "Poisk", A.S.Seliverstov, V.K.Nethaev

Norway: "Johan Hjort", T.Monstad, R.Sætre, O.Smedstad
"G.O.Sars", L.Midttun, P.Hognestad, O.Nakken

R.Sarynina and O.Dragesund participated in the preparation of the report.

Preliminary plans for the survey were made at a meeting in Bergen i May 1972, and final arrangements for coordination were made in Kirkenes and Murmansk immediately before the commencement of the survey. The main part of the survey were carried out between 27 August and 11 September but "Akademik Knipovich" commenced somewhat earlier. The survey was followed by a meeting at sea on 13 September. Material was exchanged and a brief report worked out, based on a rather superficial analysis of the data. The final version of this report was agreed upon at a meeting in Moscow in November 1972.

MATERIAL AND METHODS

The distribution and density of the pelagic scattering layers was estimated from echo sounder paper records but also to some extent from echo integrator measurements. The organisms forming the scattering layers were identified by sampling with small meshed pelagic trawls. Various depth metering devices on the trawl were used for the accurated control of the trawling depth. Since different trawl types were used by the different vessels, a direct quantitative comparison between catches could not be made.

Fig. 1 shows the area surveyed and the ship's tracks together with trawl and hydrographic stations worked.

RESULTS

Hydrography

Hydrographic observations were carried out along the same standard sections as in previous years. A preliminary analysis of the data made it possible to conclude the following (Fig. 2-7): In the summer of 1972 the heat content in the Barents Sea was extraordinarily high. At the end of August the mean temperature in the 0-50 m layer on the Kola section reached 8.7°C, which is the highest value observed during the last 27 years. Due to this high heat content in the upper 50 m, the mean temperature in the 0-200 m layer proved to be higher than ever measured before during the 8 years period of international 0-group surveys in the Barents Sea (Table 1).

TABLE 1

Mean water temperature in the Murman Current, the Kola section at the end of August in the years 1965-1972.

Year	1965	1966	1967	1968	1969	1970	1971	1972
Layer								
0- 50m	6.7	6.7	7.5	6.4	6.7	7.8	7.1	8.7
50-200m	3.8	2.6	4.1	3.7	3.1	3.6	3.2	4.0
0-200m	4.6	3.6	4.9	4.4	4.0	4.7	4.2	5.2

The heat content in the 0-200 m layer in the North Cape Current, north of the North Cape, was also higher than in previous years (Table 2).

TABLE 2

Mean water temperature in the North Cape Current, the North Cape - Bear Island section at the beginning of September in the years 1965-1972.

Year	1965	1966	1967	1968	1969	1970	1971	1972
Layer								
0-200 m	5.1	5.5	5.6	5.4	6.0	6.1	5.7	6.3

In contrast to what was observed in the Murman and North Cape Currents, the temperature in the Norwegian Current, West of Bear Island, was lower than in 1971. This was the case in both the 0-50 m layer and in the 0-200 m layer. Thus the waters of the North Cape and the Murman Currents were considerably warmer compared to previous years than the water masses of the Norwegian and West-Spitsbergen Currents.

The main reason for the large heat content of the water masses in the North Cape and Murman Currents was the high solar heating during the whole summer of 1972, and not an increased advection of warmer water masses into the Barents Sea.

Distribution and abundance of 0-group fish.

The distribution and density of the scattering layers is shown in Fig.8 and 9. The echo records do not include other age group fish but there might be some contribution from invertebrate organisms. The echo abundance is as usual expressed on a subjective scale from 0-4 (Fig.8). However, this year a distribution chart based on echo integrator deflections was also prepared (Fig.9). Integrator deflection is proportional to fish density. Length distribution based on all catches of the most important species is shown in fig.10.

In the following we shall give short comments on the abundance of the different species observed (Fig.11-17). Filled symbols indicate catch.

Herring

No 0-group herring were recorded this year.

Cod

0-group cod were distributed over a rather wide area both in central and eastern parts of the Barents Sea and also along the western and north-western Spitsbergen shelf (Fig.11). The total area of distribution was hardly covered this year, since the cod had an unusual far easterly and northerly distribution within the circulation system. The abundance is considered to be of the same magnitude as in 1971, i.e. somewhat above average.

Haddock

The haddock were found in the western Barents Sea and along the west coast of Spitsbergen (Fig.12). This year the abundance was estimated to be low compared with the years 1969-1971.

Redfish

The distribution area of redfish was found to be similar to that in 1965 and 1971, being located in the western Barents Sea and northwards along the western Svalbard shelf (Fig.13). The 1972 yearclass was considered to be somewhat stronger than the yearclasses of 1965 and 1971 but weaker than the rich 1969 yearclass.

Capelin

The 0-group capelin were distributed over the total Barents Sea south of latitude 77°N and within a smaller area west of Spitsbergen (Fig.14). The exact northern limit of distribution was not fully described by this years field coverage. The

density varied much and the highest concentrations were found west of Novaya Zemlia and near the Bear- and Hope Islands.

The abundance of young capelin (0- and 1-group) can be considered as being high. A part of the recorded capelin originated from the spawning in 1971. This is indicated by the length distribution in Fig.10. The 1971 yearclass must be classified as rich, and is probably comparable to the 1967 and 1969 yearclasses. Judging from the large area of distribution (Fig.14) the 1972 yearclass also seems to be rich.

Long rough dab

The 0-group long rough dab were found within three separate areas as seen from Fig.15. The abundance this year was apparently low.

Polar cod

According to observations from R/V "Akademik Knipovich" the polar cod was found to be abundant in the Novaya Zemlia area, but in the other parts of the area covered, the abundance was low (Fig.16). However, as a conclusion, the 1972 yearclass is considered to be strong, probably of the same order as the 1969. It should also be noted that the distribution in the southern Barents Sea was more south-easterly than in previous years.

Other species

Fig.17 indicate observations of three other species, viz.: Greenland halibut, mackerel and saithe. These species were found only in small quantities. Smaller quantities of sea scorpions, squids and lumpsucker were also observed. The abundance of sea scorpions was probably somewhat higher this year than in 1971.

Adult fish

The observations of adult fish during the 0-group survey have not been reported in this paper, but will be dealt with in national reports.

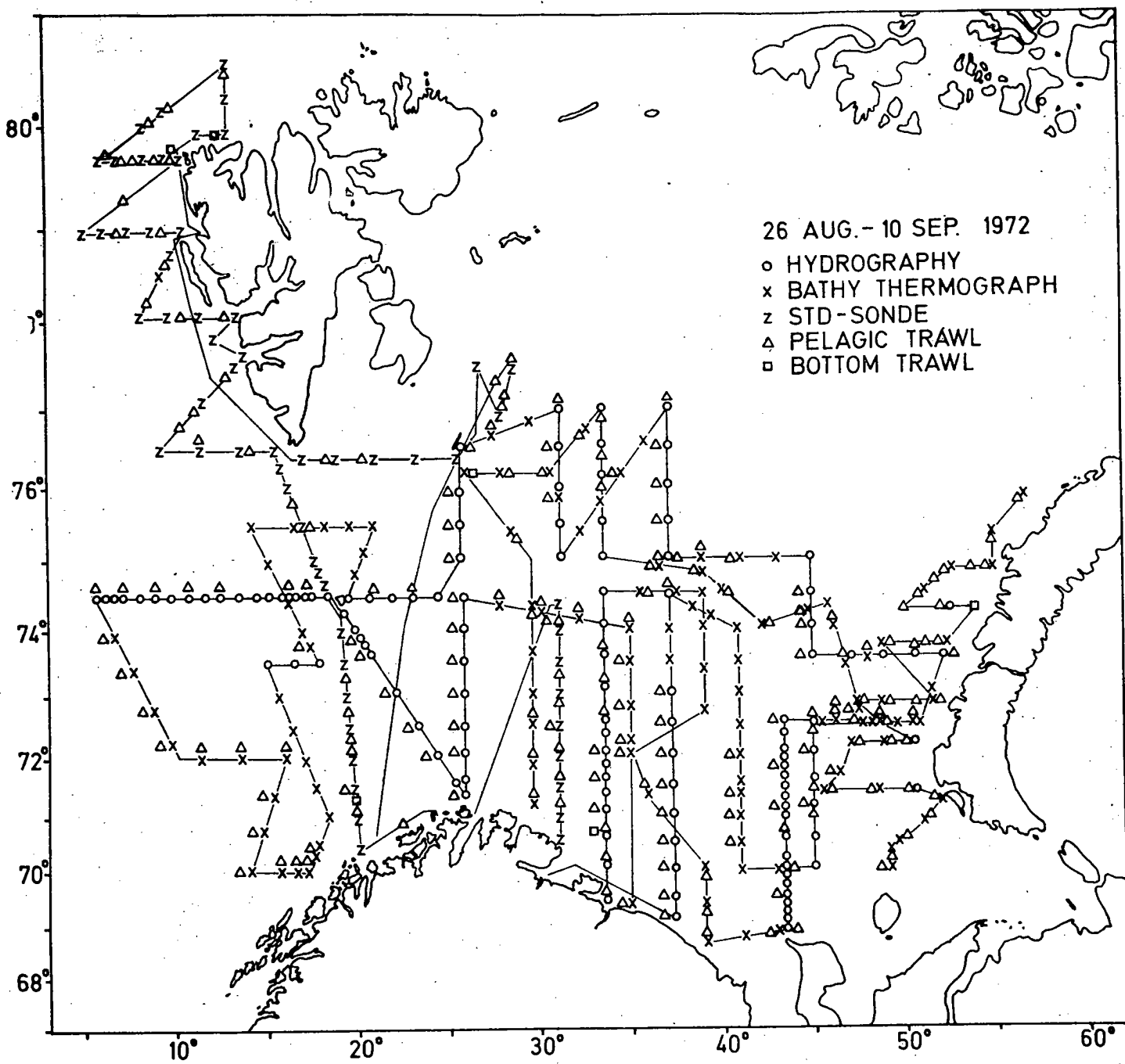


Fig. 1. Survey routes and grid of stations.

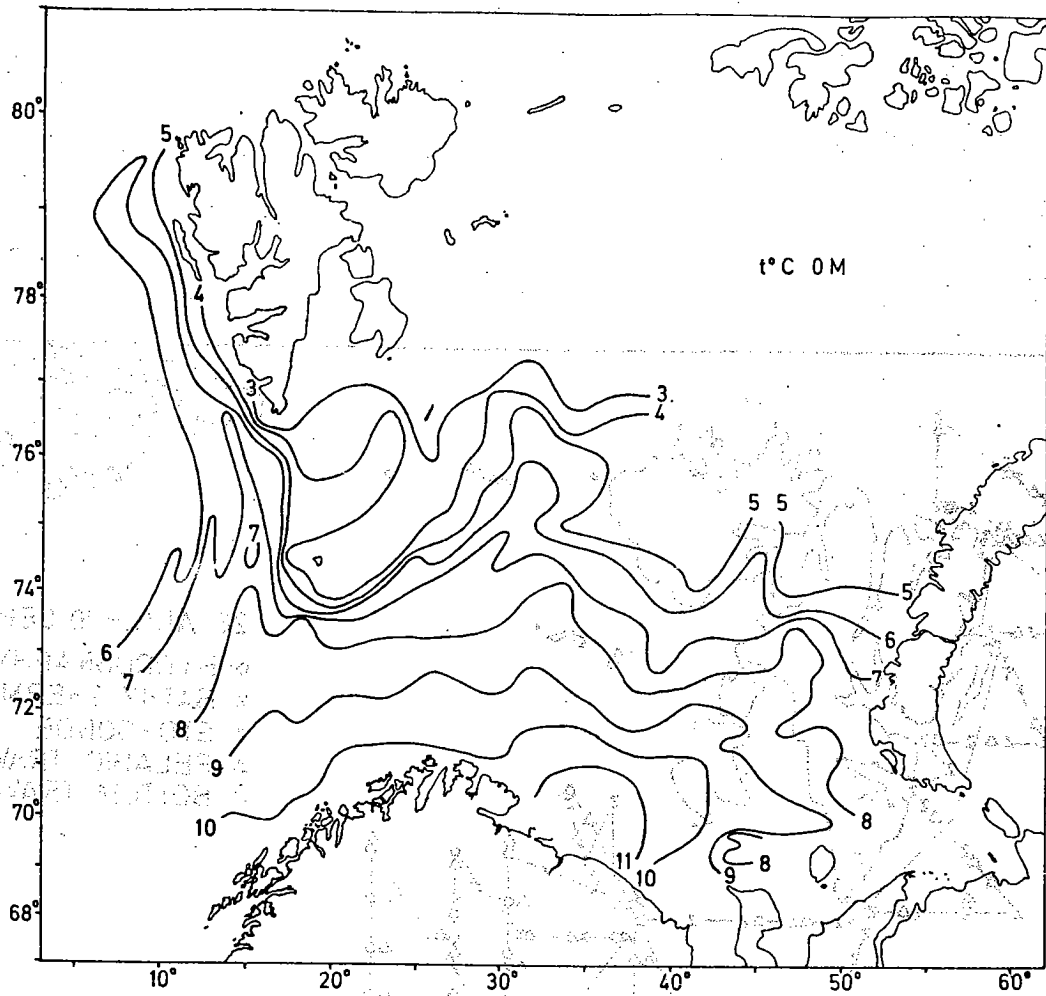
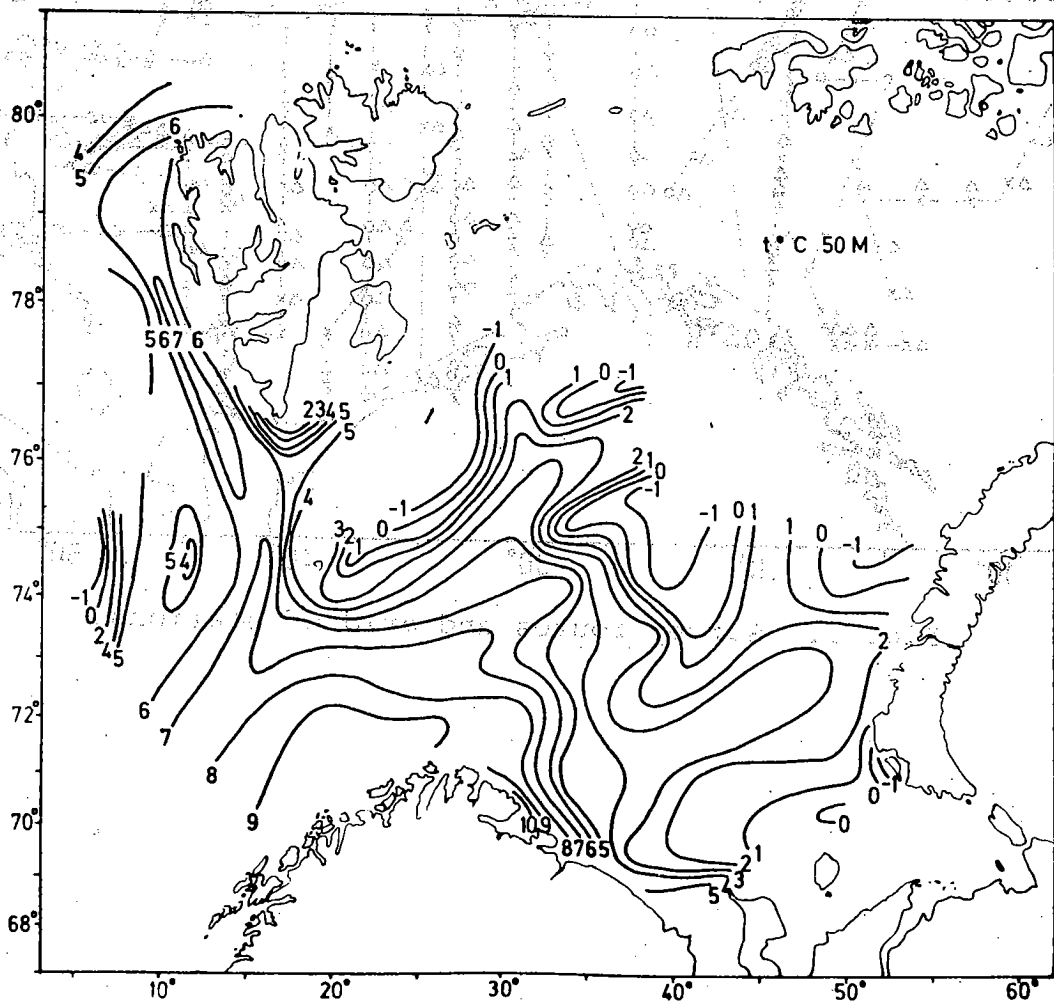


Fig. 2. Isotherms at 0 m.



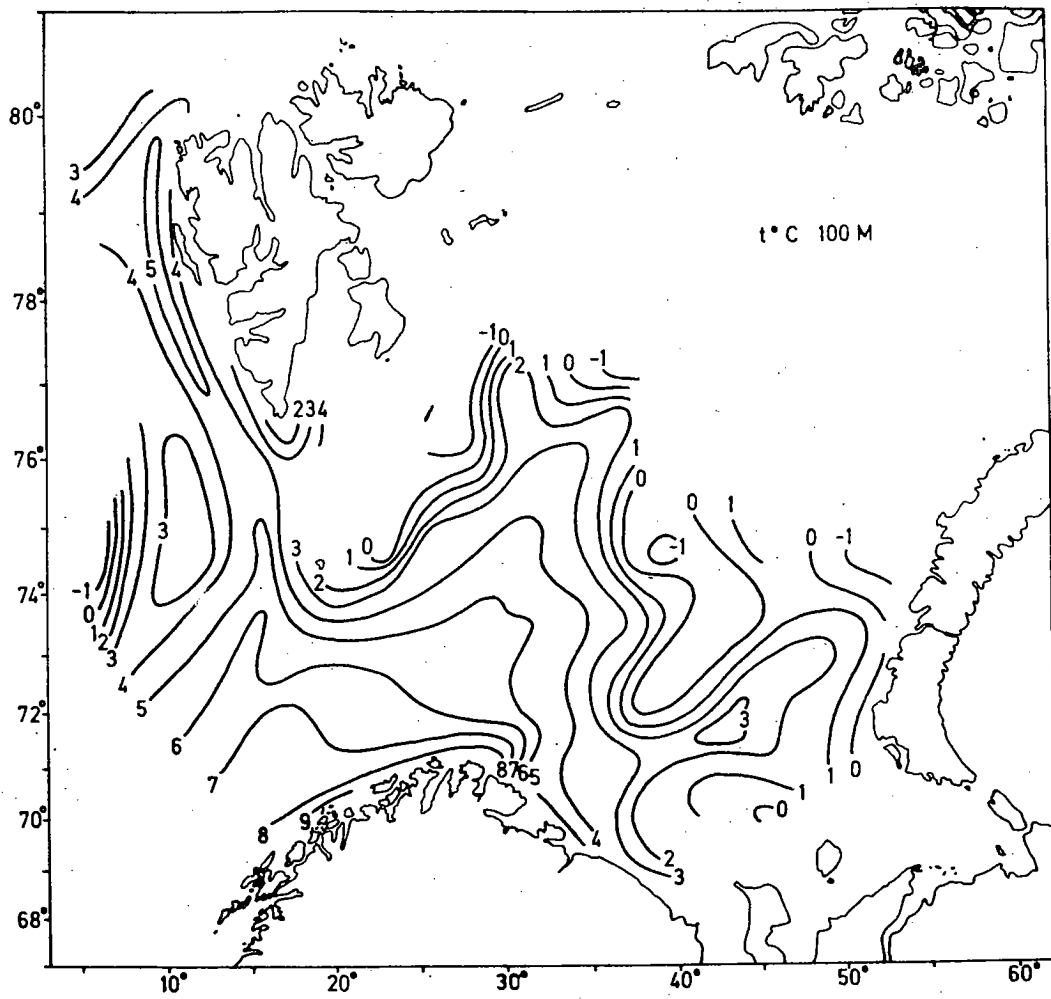


Fig. 4. Isotherms at 100 m.

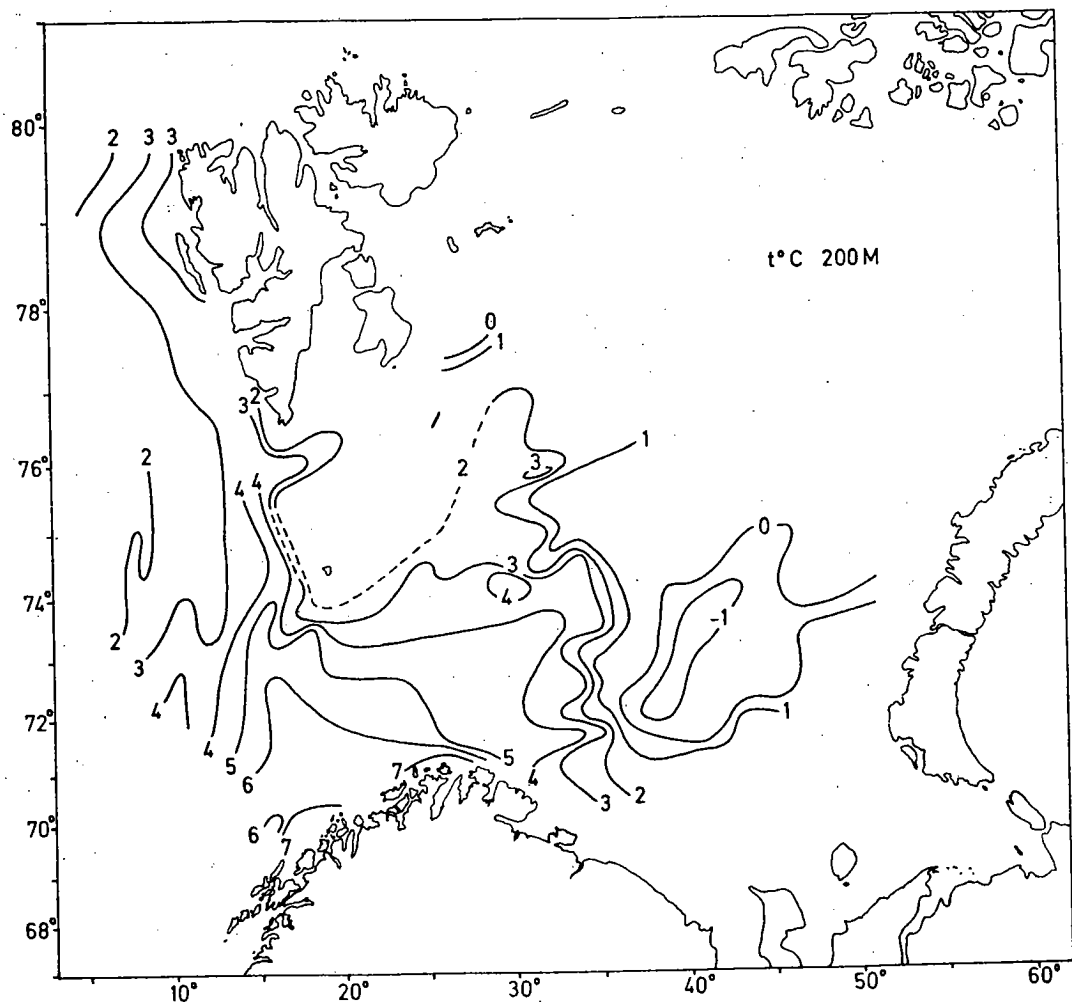


Fig. 5. Isotherms at 200 m.

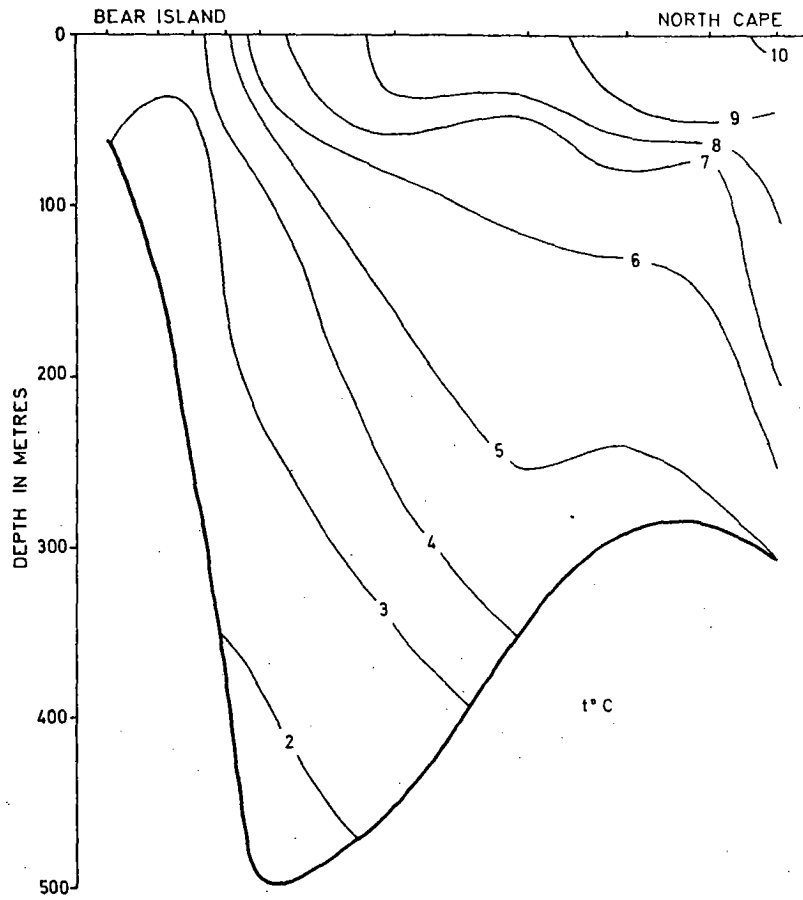


Fig. 6. Temperature section Bear Island - North Cape.

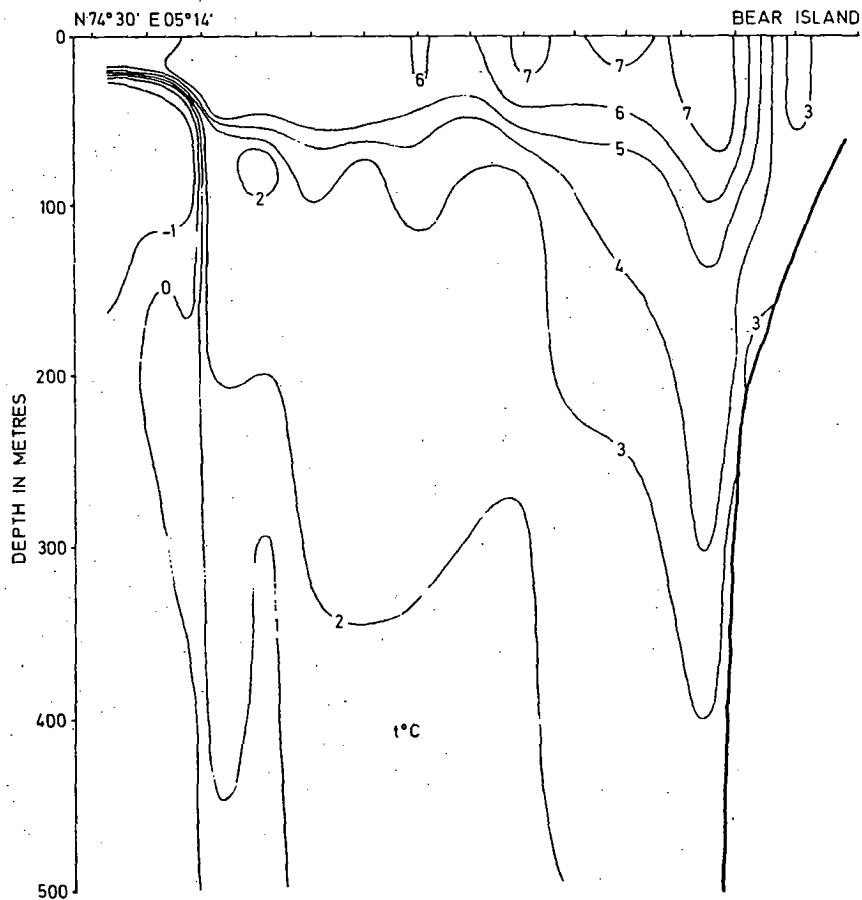


Fig. 7. Temperature section Bear Island. - West.

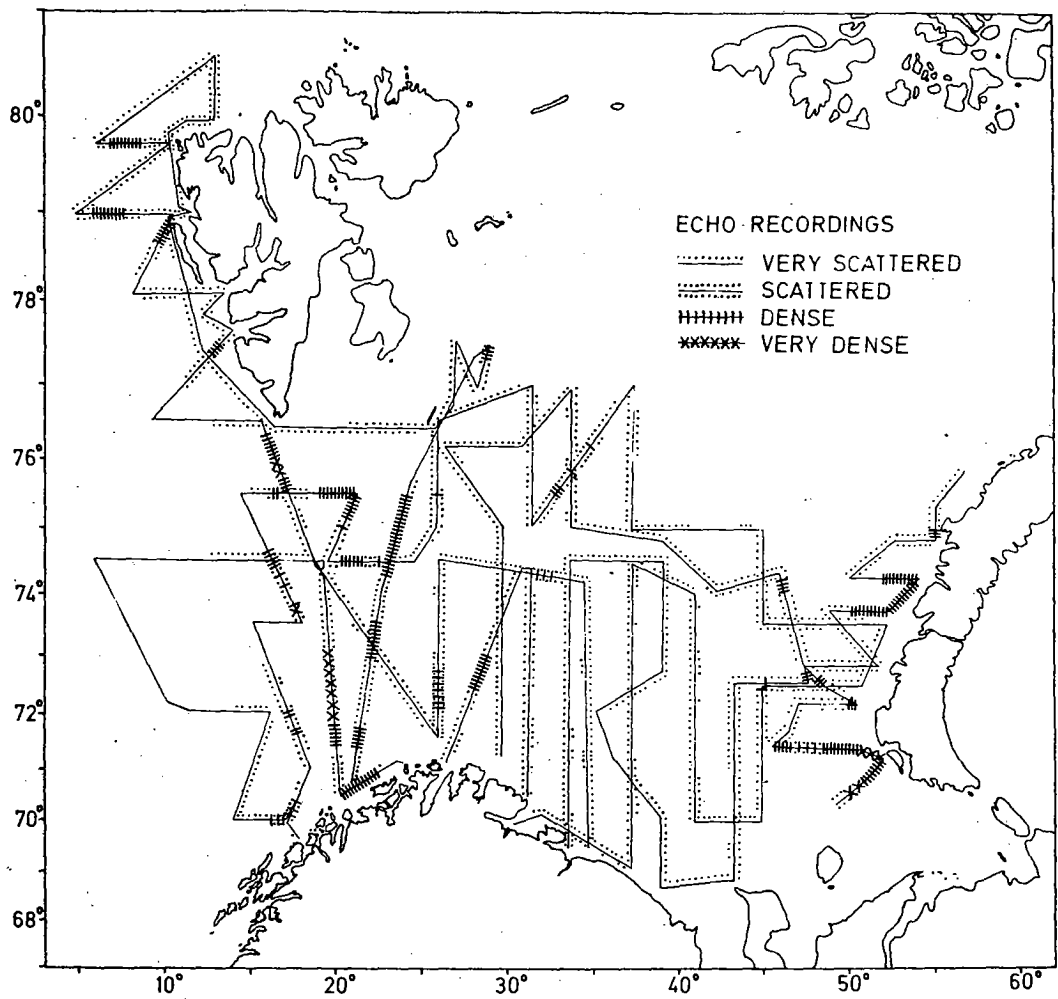


Fig. 8. Total echo recordings of 0-group fish.

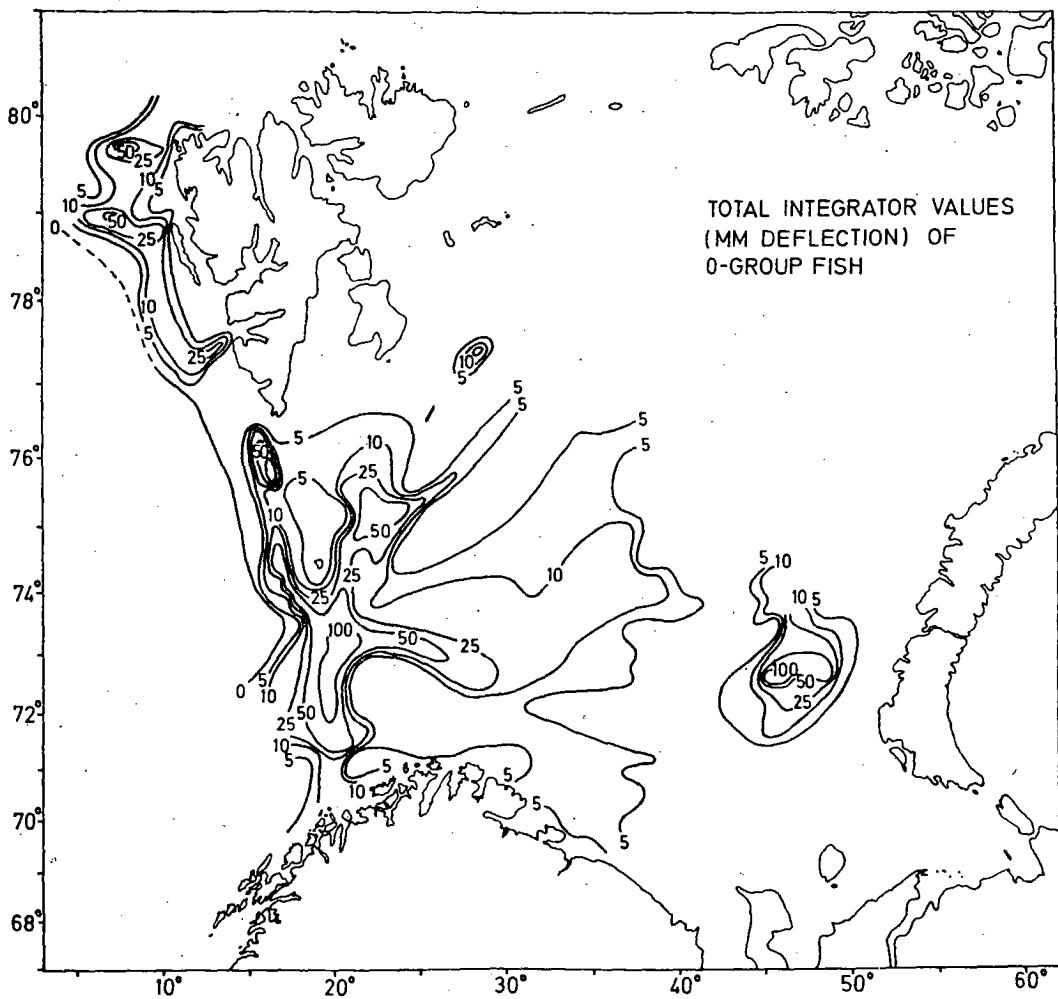


Fig. 9. Total integrator values (mm deflection) of 0-group fish.

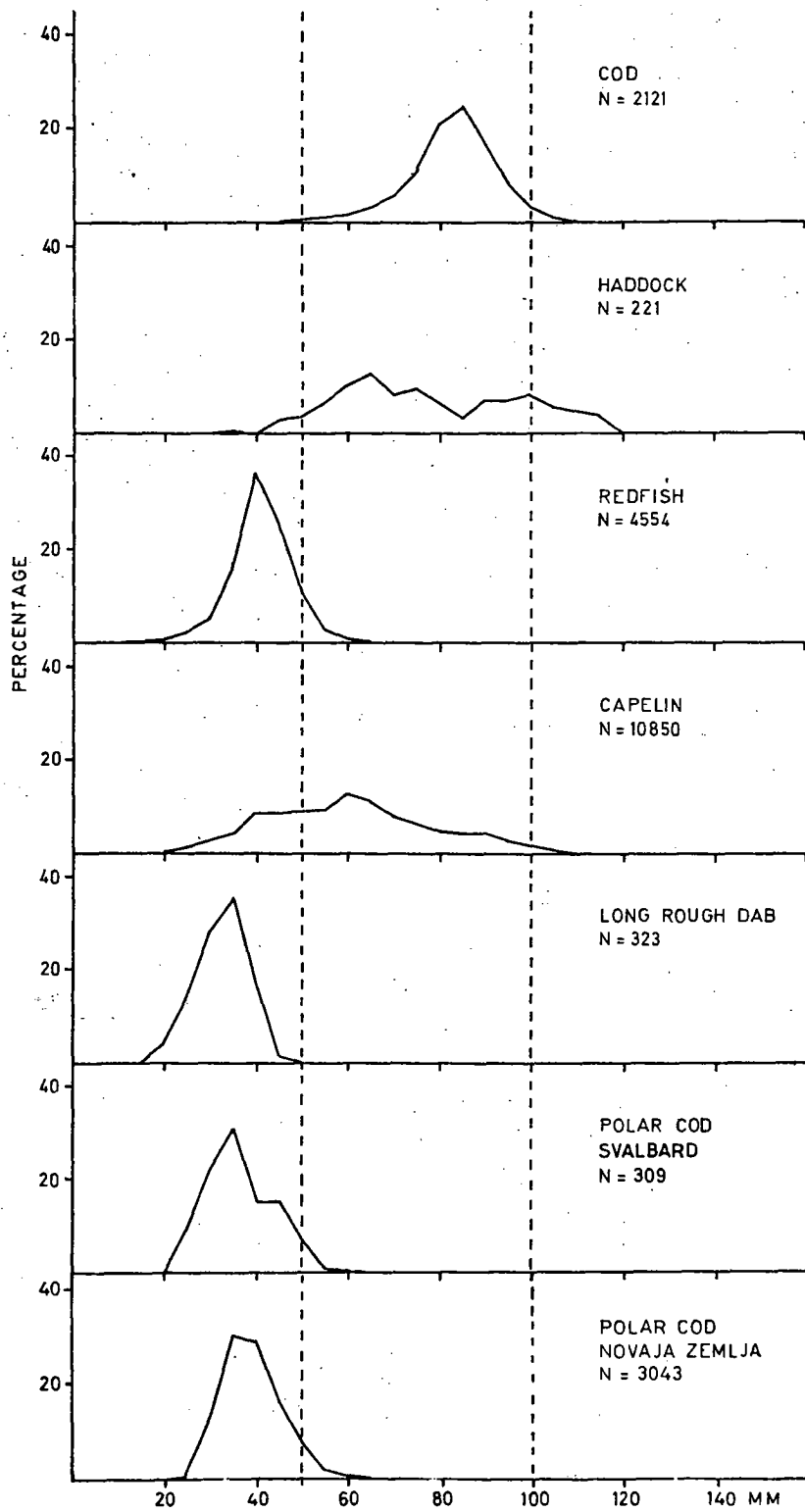


Fig. 10. Length distribution of 0-group fish.

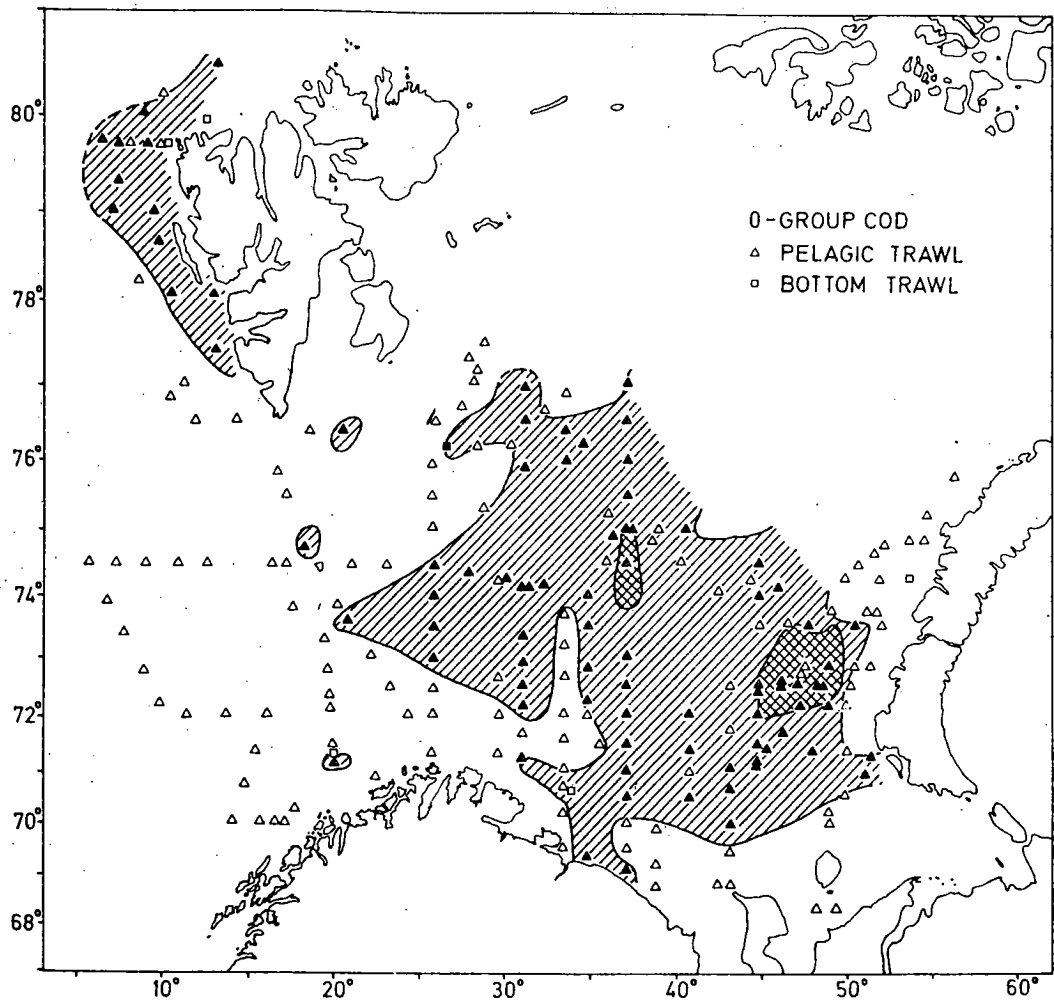


Fig. 11. Distribution of 0-group cod.

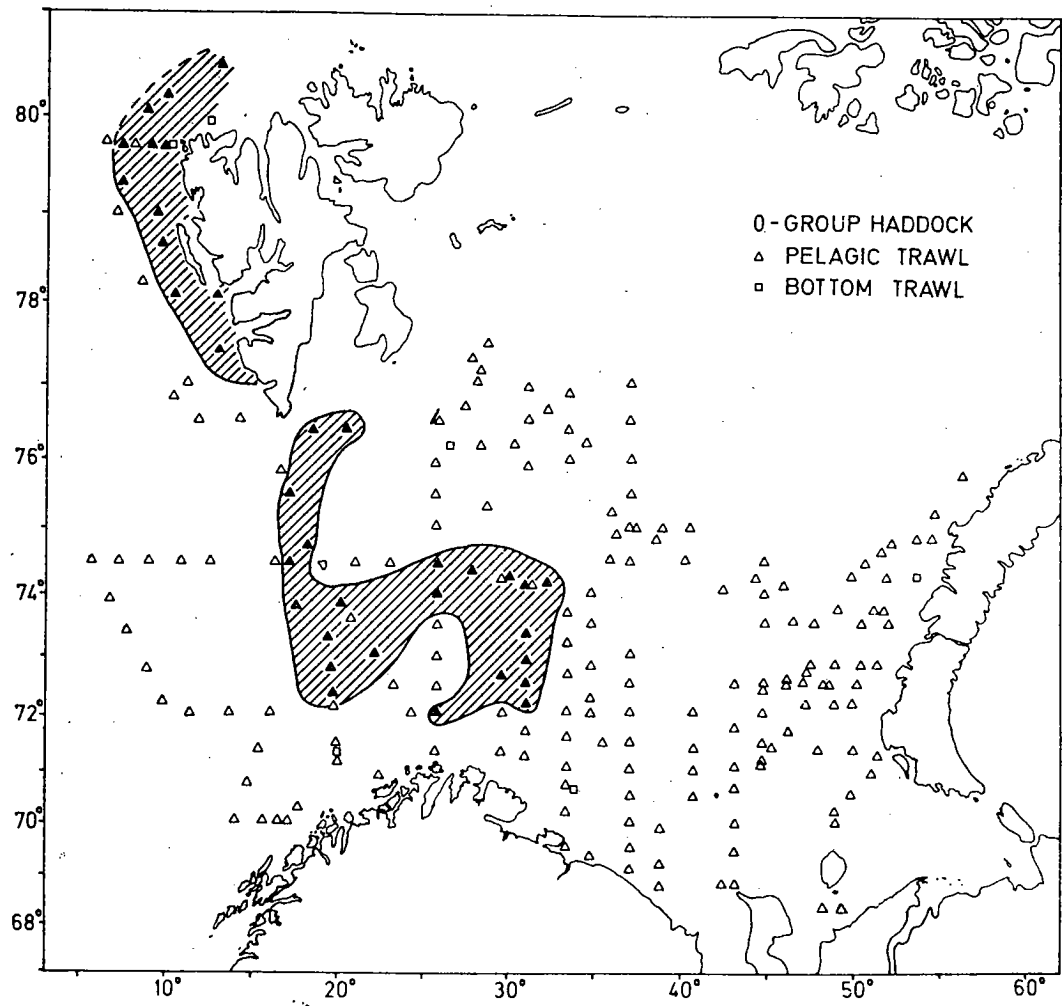


Fig. 12. Distribution of 0-group haddock.

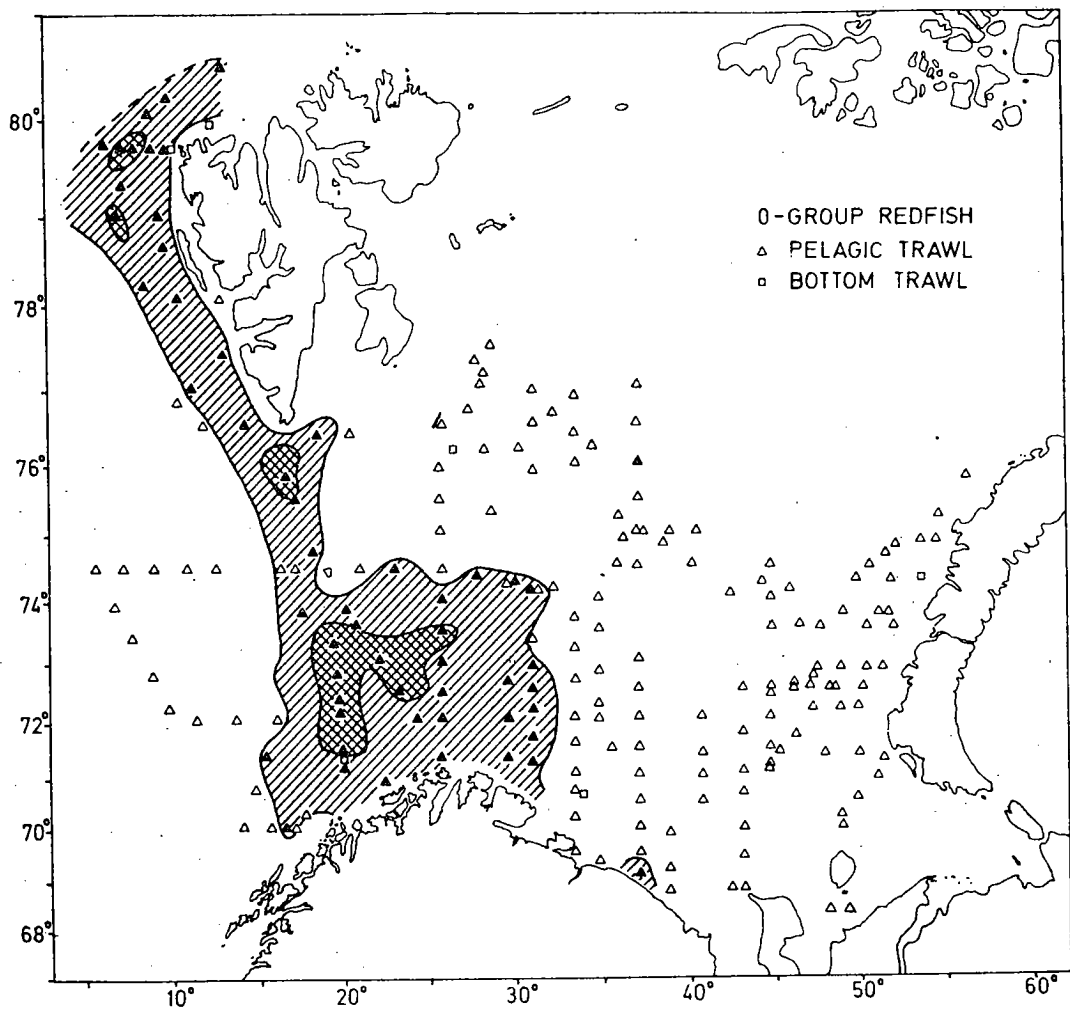


Fig. 13. Distribution of 0-group redfish.

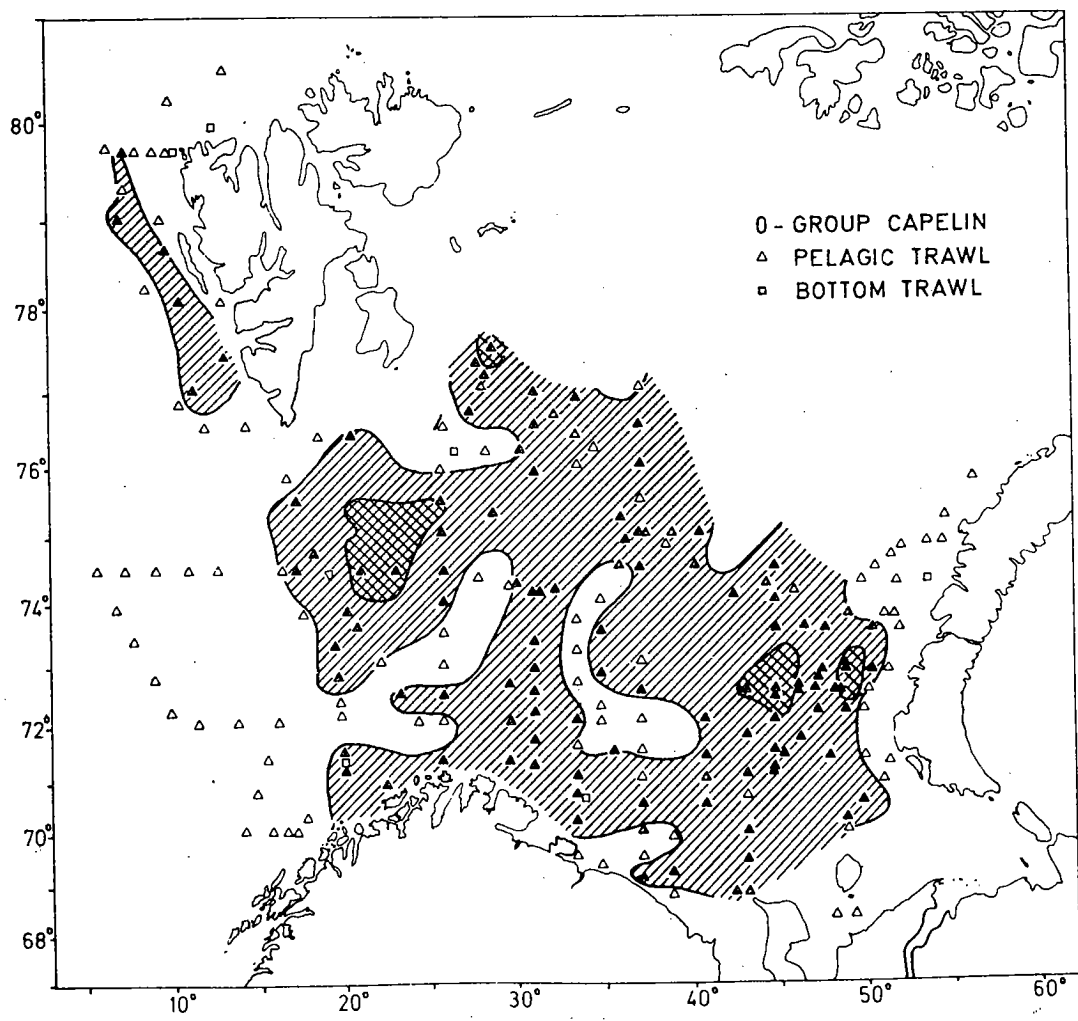


Fig. 14. Distribution of 0-group capelin.

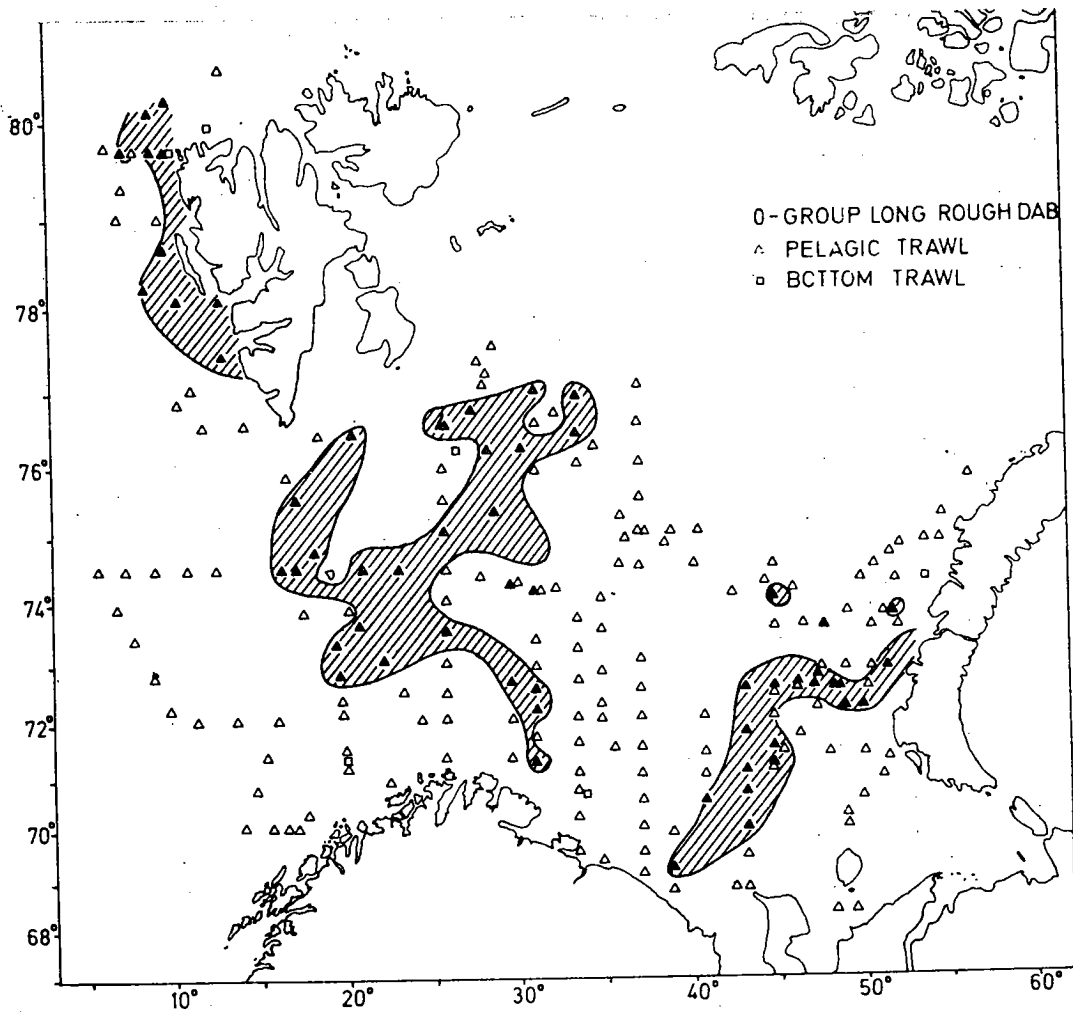


Fig. 15. Distribution of 0-group long rough dab.

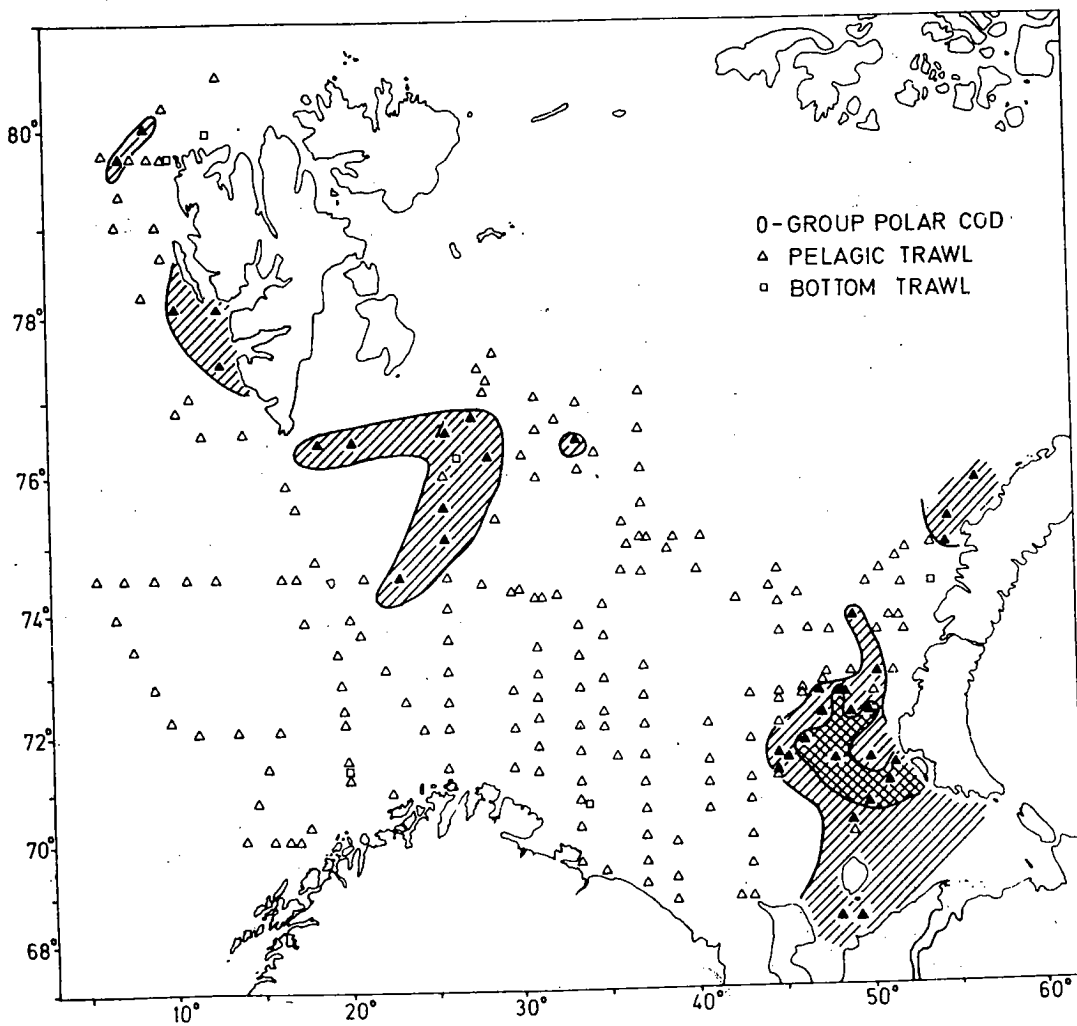


Fig. 16. Distribution of 0-group polar cod.

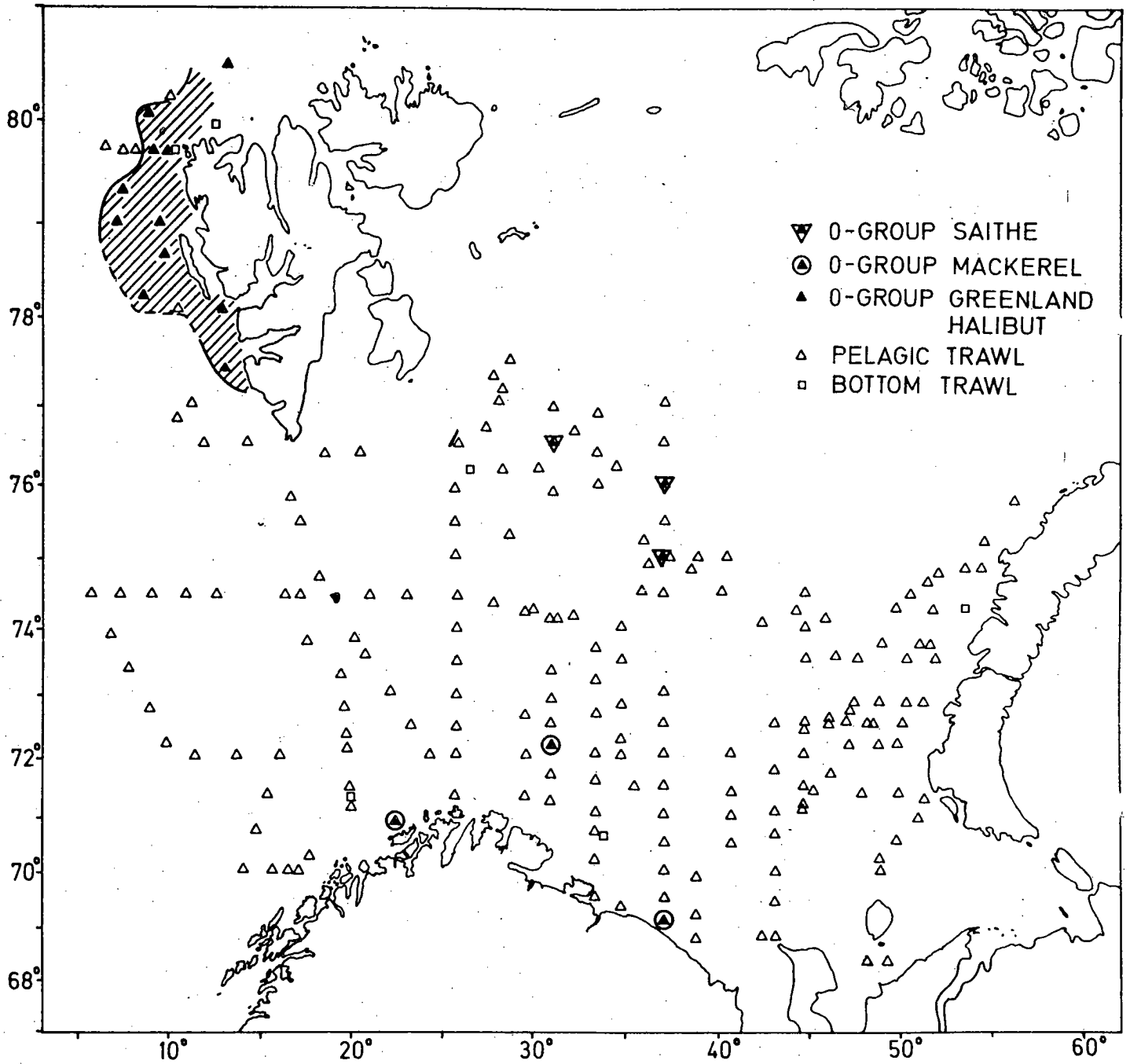


Fig. 17. Distribution of 0-group saithe, mackerel and Greenland halibut.