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Preliminary Report
of joint Icelandic-Norwegian investigations in the
area between Iceland and East Greenland in August 1970.

Introduction

A joint Icelandic-Norwegian survey was carried out 1 - 11 of August in order to investigate the distribution of pelagic fish (including 0-group fish) in the area between Iceland and East Greenland. The arrangement on the detailed program was reached at a meeting in Reykjavik on 1 August and the survey was conducted with two research vessels.

On 11 - 12 August a meeting was held in Akureyri in order to combine the observations and to prepare a preliminary report. The participating vessels and the scientific and technical staff were:

R/V "Arni Fridriksson",

A. Vilhjalmsson, S.A. Schopka, S. Lydsson, G.Sv. Jonsson, H. Holsvik,
E. Fridgeirsson.

R/V "G.O. Sars",

O. Dragesund, E. Bratberg, J. Blindheim, T. Jakobsen, B. Myrseth, I. Hoff,
A. Storler, S. Agdestein, Ø. Torgersen, P. Eide, F. Kjelstrup-Olsen,
O. Alvheim. S. Lygren, I. Huse.

Program and methods

As will appear from Fig. 1 "G.O. Sars" covered mainly the banks off East Greenland and the Irminger Sea, whereas "Arni Fridriksson" surveyed the area off West and Northwest Iceland. The technique and methods applied was a combination of echo sounding and fishing with pelagic trawl (Dragesund, Midttun and Olsen 1970).

General outline of results

Most of the recordings are due to 0-group fish, but in addition medusae and other planktonic organisms contributed to the echo-abundance. Furthermore adult capelin and probably blue whiting or Norway pout were recorded in an area NW of Iceland (Fig. 2). This report is of a preliminary character because it has not yet been possible to work up, the large material of data collected. Such investigations have never been carried out before in this region and therefore it is impossible to make any firm conclusions about the abundance of 0-group fish.

Hydrography

Horizontal distributions of temperatures at the depths of 6, 50, 100 and 200 m are illustrated in Figs. 3, 4, 5 and 6. Salinity distribution at 6 m depth is illustrated in Fig. 7.

Two hydrographic sections were worked by "G.O.Sars", i.e. between Ocean Weather Station Alfa and Cape Tordenskiold (Fig. 8) and from Cape Dan towards southeast (Fig. 9). From Latrabjarg westwards one section was worked by "Arni Fridriksson" (Fig. 10).

The highest abundance of O-group fish was found inside the cyclonic circulation of the Irminger Current. The most dense concentrations were observed at depths between 20 and 50 m in the area with temperatures exceeding 9,5°C extending westwards from the Icelandic Continental Shelf (Figs. 3 and 4). Along the East Greenland coast navigation was prevented by ice at a distance of approximately 25 nautical miles off the coast.

Capelin

Adult 1-3 years old capelin were found outside the Continental Shelf to the northwest of Iceland (Fig. 11). The capelin were recorded in depths from 250-200 m at day and 75-30 at night. Previously adult capelin have never been located so far west, but mainly in the area 80-120 nautical miles due north of Cape Horn as well as north of Kolbeinsey and to the west of Jan Mayen. Icelandic fishermen believe, however, that Icelandic capelin migrate as far south as Latrabjarg, but this, to our knowledge has never been verified.

It is thought that the capelin populations off Iceland and East Greenland are not panmictic to any mentionable degree and vertebral counts of capelin from West Greenland and Iceland certainly show a difference of 1.0 to 1.3.

Icelandic capelin spawn at temperatures between 4 and 7°C and it is unlikely that such temperatures are ever attainable at East or West Greenland during February-May.

O-group capelin were found to be scattered over a wide area off West Iceland, (Fig. 11) and moreover in a limited region some 100 nautical miles south of Cape Dan. The distribution pattern may, however, be abnormal since practically no capelin spawned to the west of Portland this year.

Considering the length frequencies of O-group capelin there is a marked if not meaningful difference between C I and A XI on one hand, and G XI on the other. This can either indicate an earlier spawning of the East Greenlandic capelin or possibly the earliest larvae from the Icelandic, South coast spawning drift to this area.

Blue whiting and Norway pout.

Some dense concentrations were recorded in an area between 65°30' to 66°00'N and 27°30' to 28°30'W (Fig. 2). To identify the echo recordings, fishing experiments were carried out, but they failed due to difficulties in operating the trawl. It is suggested that the concentrations consisted of blue whiting or Norway pout.

O-group blue whiting was distributed over the northern half of the Irminger Sea (Fig. 12). The highest concentration was at 63°20'N and 26°30'W. Great quantities of O-group Norway pout were caught off Snæfellsnes and Latrabjarg.

Redfish

Redfish were widely distributed over the whole area excepting more coastal waters off West Iceland (Fig. 13). It was not possible to trawl in the central part of this area but echo abundance there was high. The richest trawl catches were made 120 nautical miles west of Snæfellsnes and the density on 63°20'N and 26°30'W was also high. The northwestern and northern limit of distribution seems to be in correlation with the 4-6° isotherms (Figs. 4 and 13) but the distribution pattern may equally well be decided by the bottom topography of the area.

Cod and haddock

Only a few examples of these commercially important species were recorded to the northwest of Iceland (Fig. 14). Possibly, the reason is, that the main O-group population has already reached the North Iceland coast as indicated by previous Icelandic investigations (Einarsson, unpublished).

Catfish, blue ling and Greenland halibut

The catfish had a scattered northerly distribution, and the blue ling were spread over the eastern part of the area as well (Fig. 15). The O-group Greenland halibut (Fig. 16) showed a wide scatter, more or less over the whole area.

Lumpsucker and sand eel

These species (Fig. 17) are only found in the eastern half of the area investigated (30°W). On the stations, where lumpsuckers were observed they were equally scattered. Thus, only 3-8 specimens were caught per station, ranging in length from 50-100 mm. Possibly alle these do not belong to the O-group fish since the size is so great but this remains to be proven. The highest concentrations of sand eel are in shallow waters of Snæfellsnes. The length range is 45-115 mm.

Invertebrates

Small squid with mantle length ranging from 1-5 cm were caught at nearly all the trawl stations and appeared more or less evenly distributed in the area. Aglantha digitale was taken at many trawl stations. Its highest abundance was in the western half of the area. The scyphomedusa Periphylla was found throughout the area. Its greatest concentrations were in an area between 64°00'N to 65°30'N and 30°W to 34°30'W. There one trawl haul gave a catch of 50 litres (188 specimens). The distribution of Aglantha digitale and Periphylla is the same as that observed during the Norwestlant 3 Surveys (Brainbridge and Corlett 1968).

Concluding remarks

Adult capelin were recorded in a limited area off East Greenland near position 64°N and 34-36°W. There a small patch of O-group capelin was, also observed. It is difficult to say if this O-group capelin are derived from the spawning area off South Iceland or whether a minor spawning has taken place in East Greenland waters. Numerous O-group capelin were observed west of Iceland suggesting that the 1970 year-class may be fairly abundant. The adult capelin schools recorded northwest of Iceland will probably move east during late autumn.

Perhaps the most striking features of this survey, is the very low abundance and restricted distribution area of the O-group cod and haddock. This may be caused by a very low survival rate for the 1970 broods of these species or the main part of their populations has reached the north coast of Iceland at this time of the year. The possibility also exists that the O-group cod and haddock have gone to the bottom already. It should be noted that no adult or O₇ group herring were recorded in the area surveyed, indicating that the abundance of herring of the Icelandic spring spawning stock must be low.

This year's redfish brood is distributed over a wide area, thus indicating a strong one. However, this is the first survey of this kind in the Irminger Sea and final conclusions will therefore have to wait for the future.

Length frequencies of the different species are listed in Table 1 and illustrated in Figs. 18 and 19.

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- Brainbridge and Colett 1968. The Zooplankton of the NORWESTLANT Surveys. Spec.Publs int.Comm'n NW.Atlant.Fish NO.7:101-122.
- Dragesund, O., Midttun, L. and Olsen, S. 1970. Methods for estimating distribution and abundance of O-group fish. Coop.Res.Rep.Ser. A int.Coun.Explor.Sea, 18: 25-34.

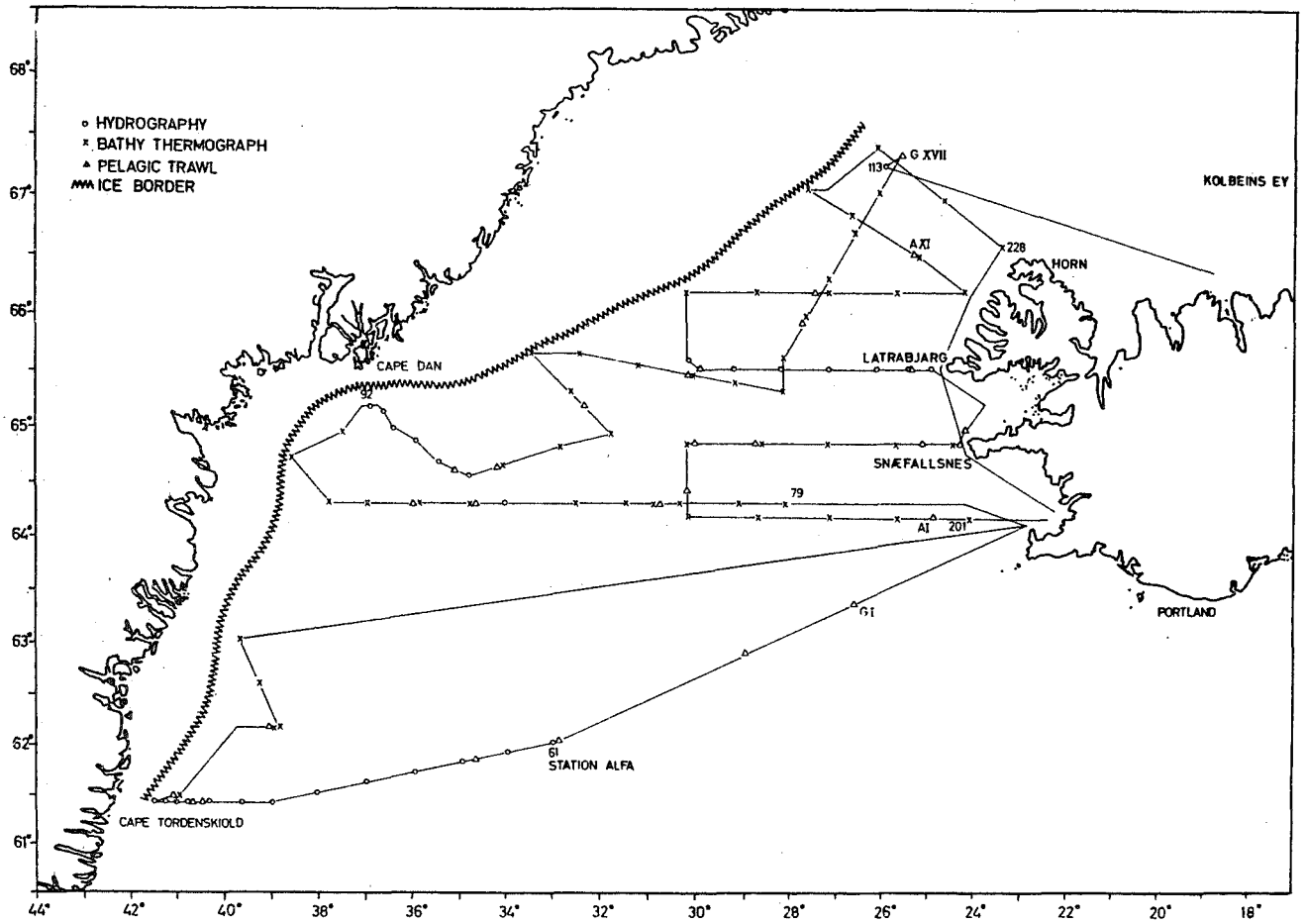


Fig. 1. Survey routes and grid of stations 1-11 August 1970.

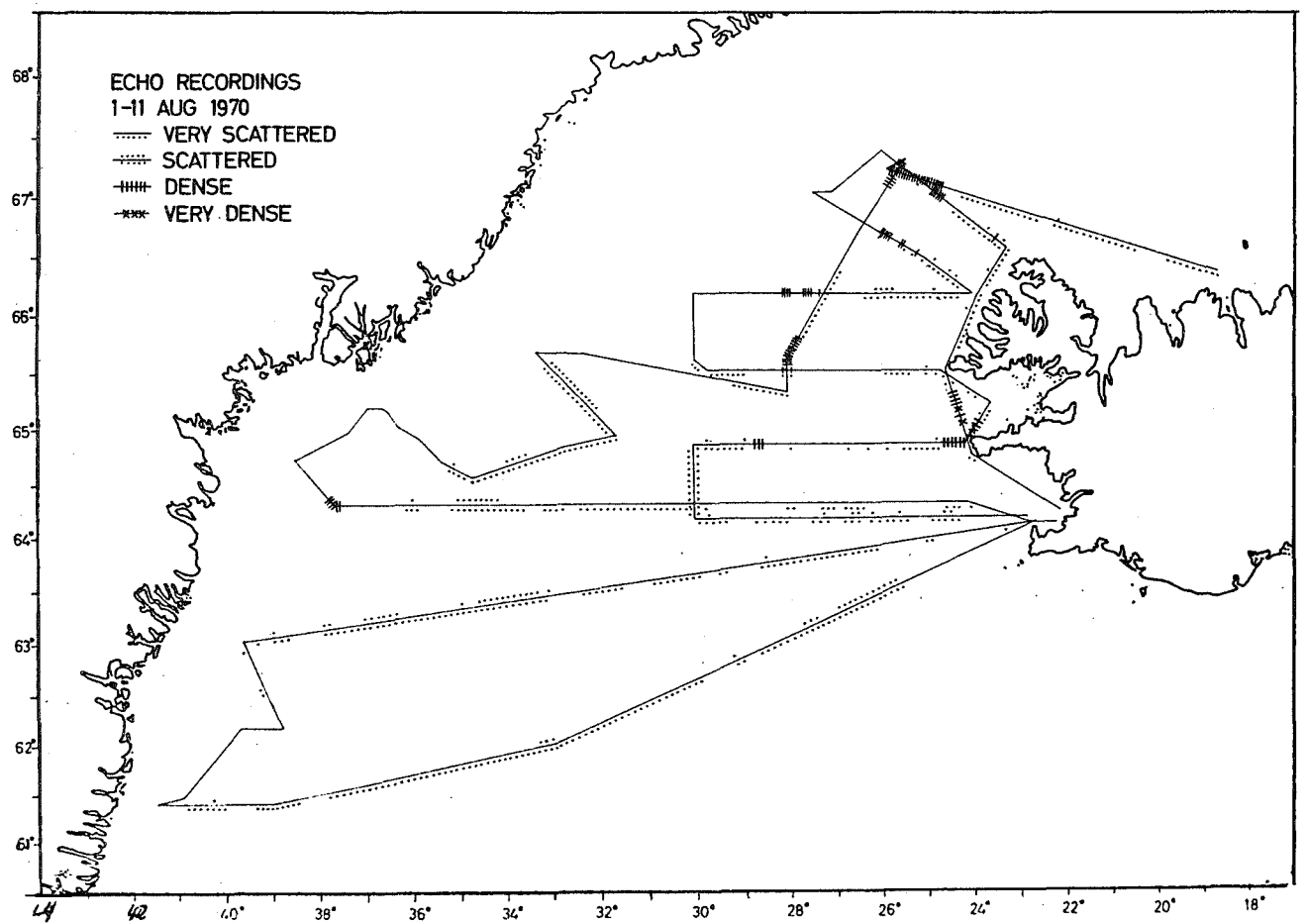


Fig. 2. Total echo abundance along the courses.

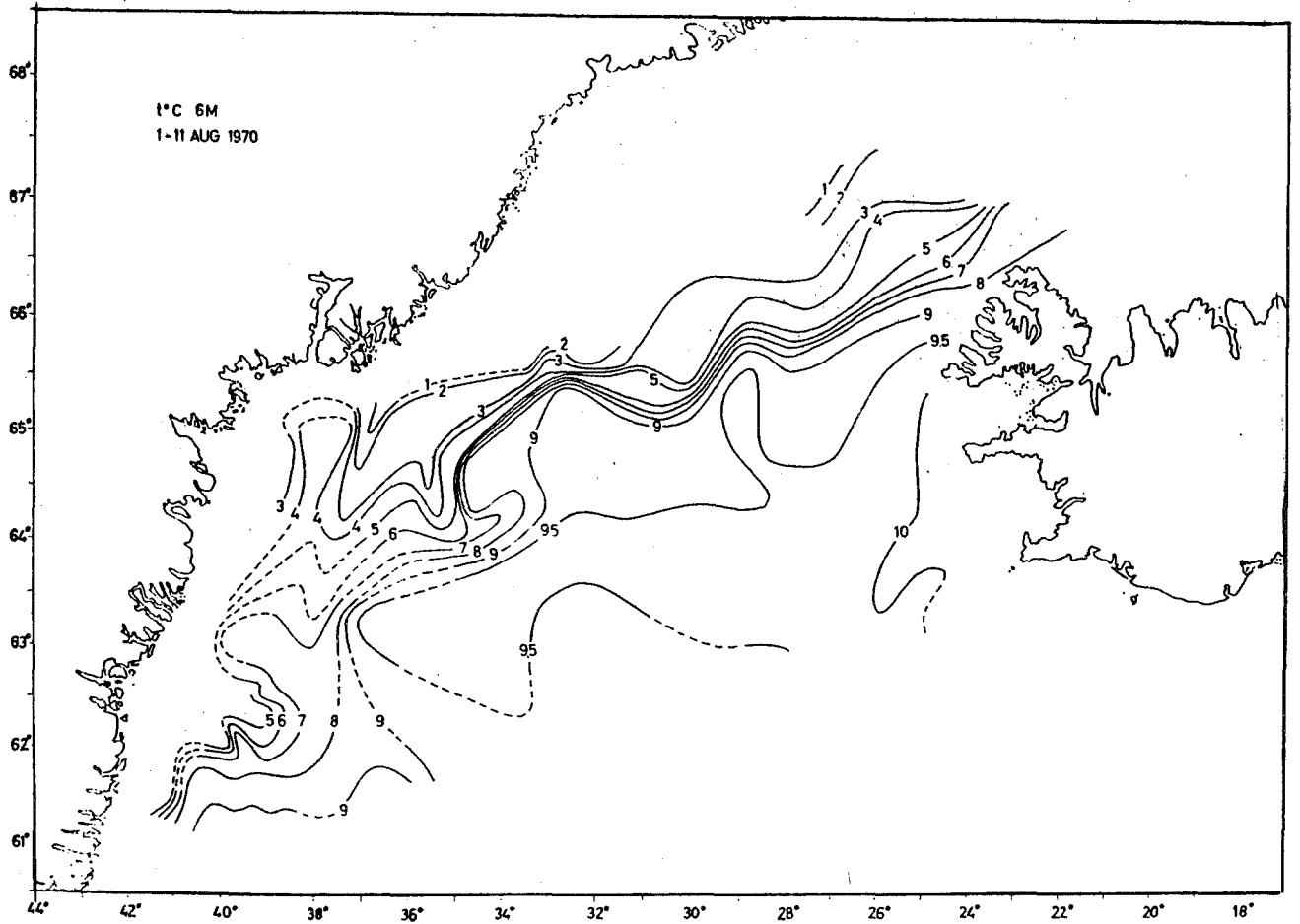


Fig. 3. Isotherms at 6 metres depth.

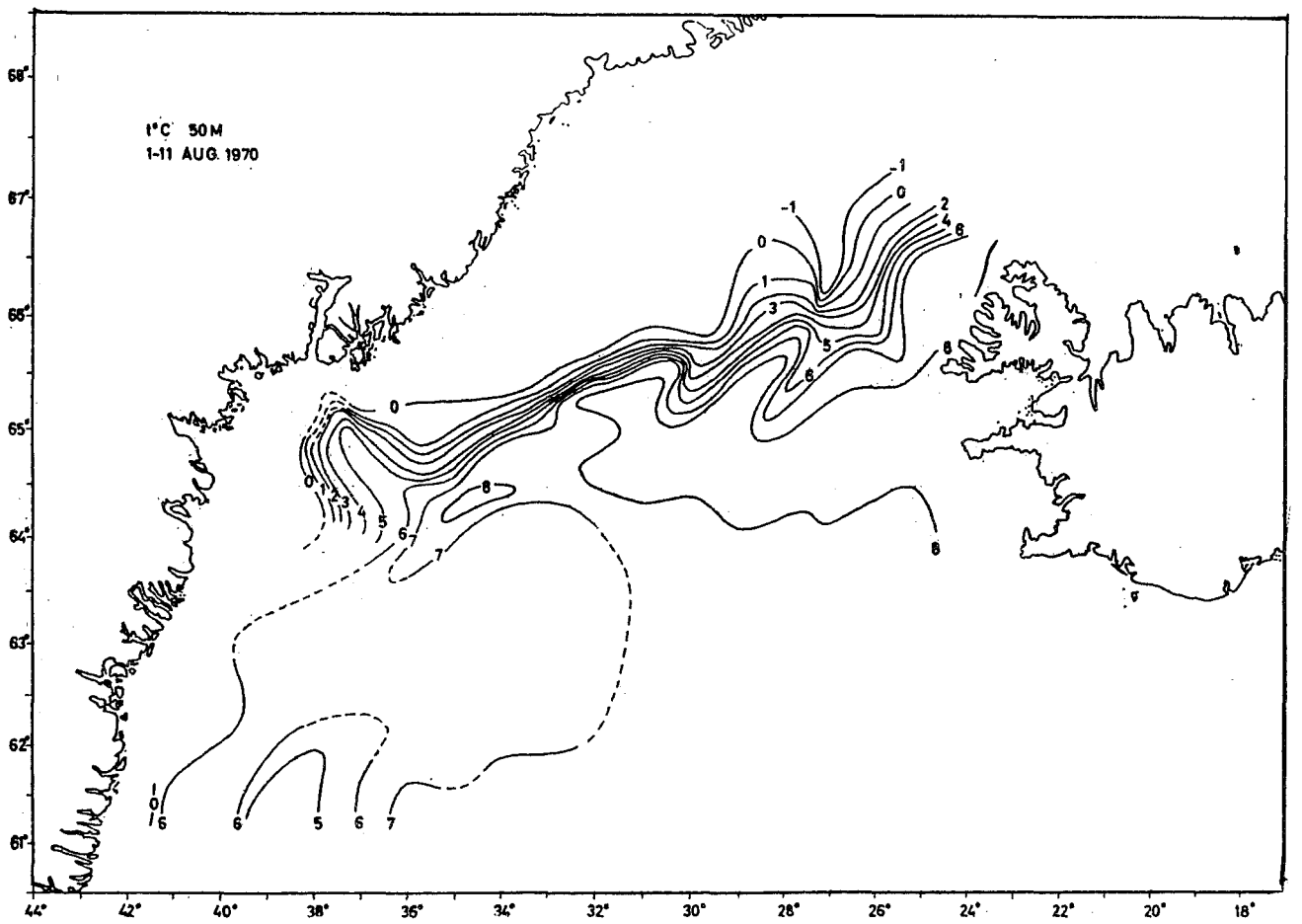


Fig. 4. Isotherms at 50 metres depth.

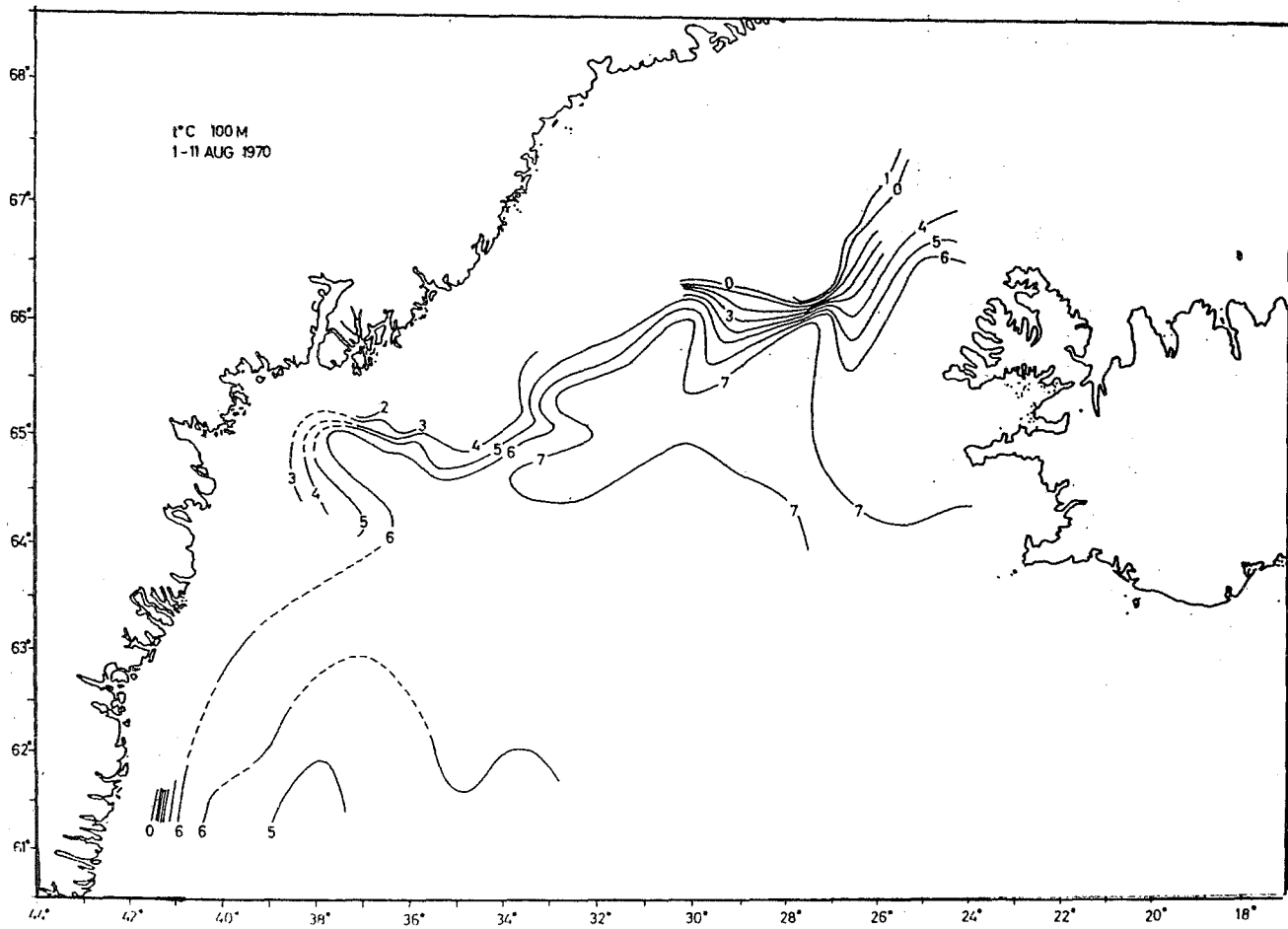


Fig. 5. Isotherms at 100 metres depth.

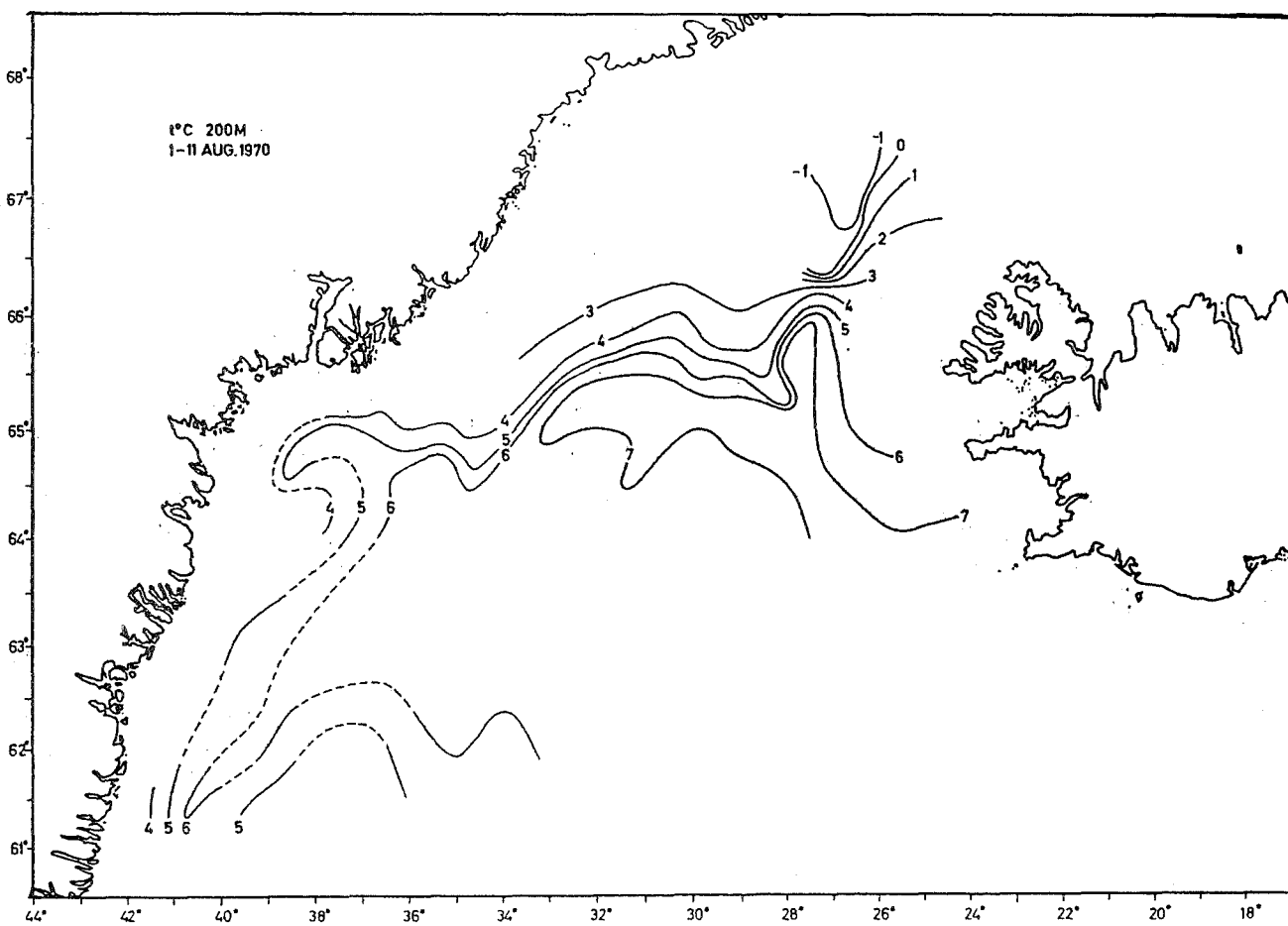


Fig. 6. Isotherms at 200 metres depth.

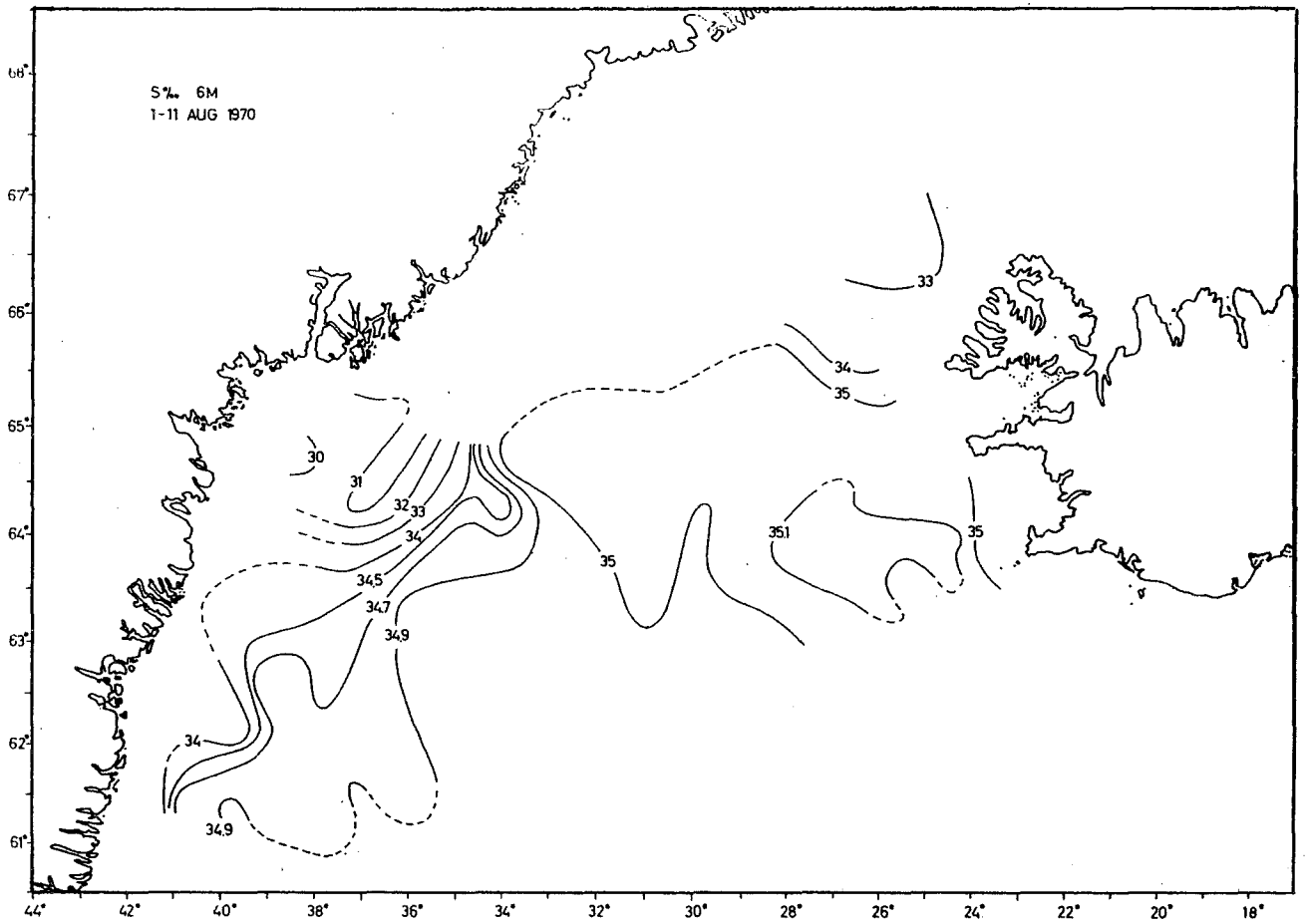


Fig. 7. Isohalines at 6 metres depth.

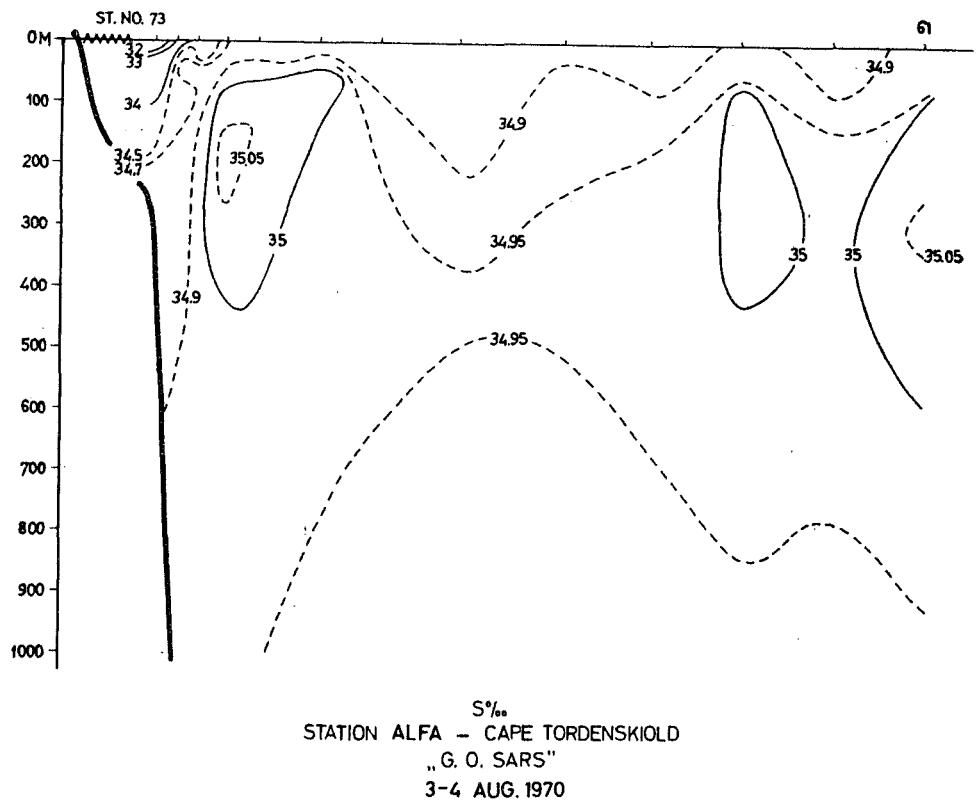
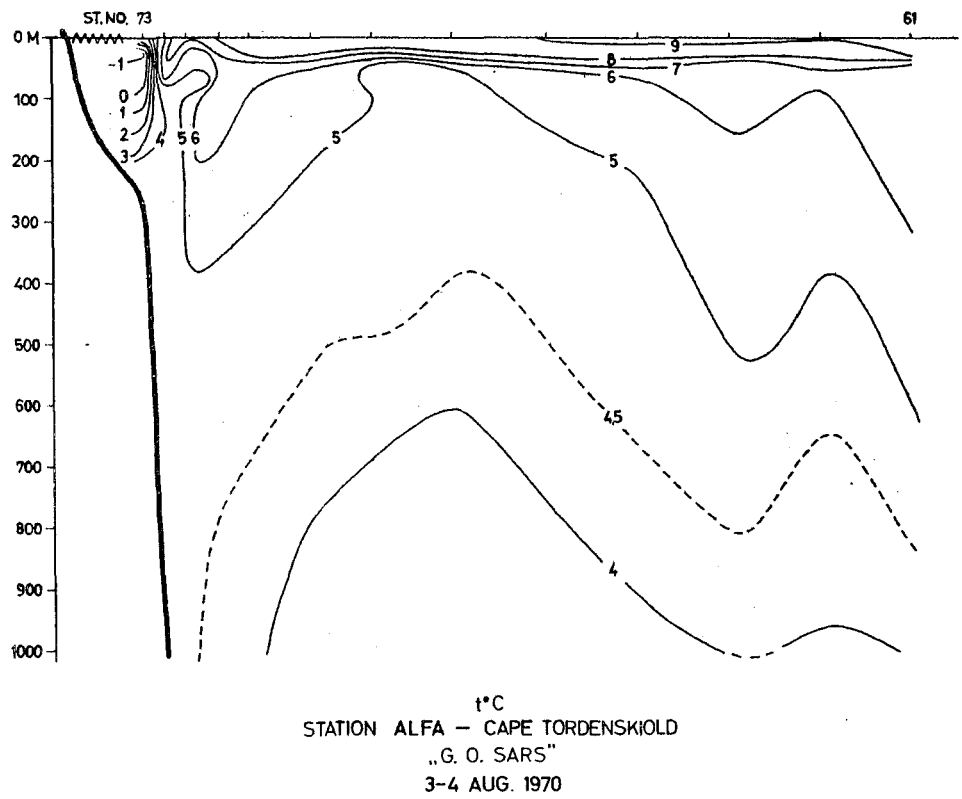


Fig. 8. Temperature and salinity in a section Ocean Weather Station Alfa - Cape Tordenskiold.

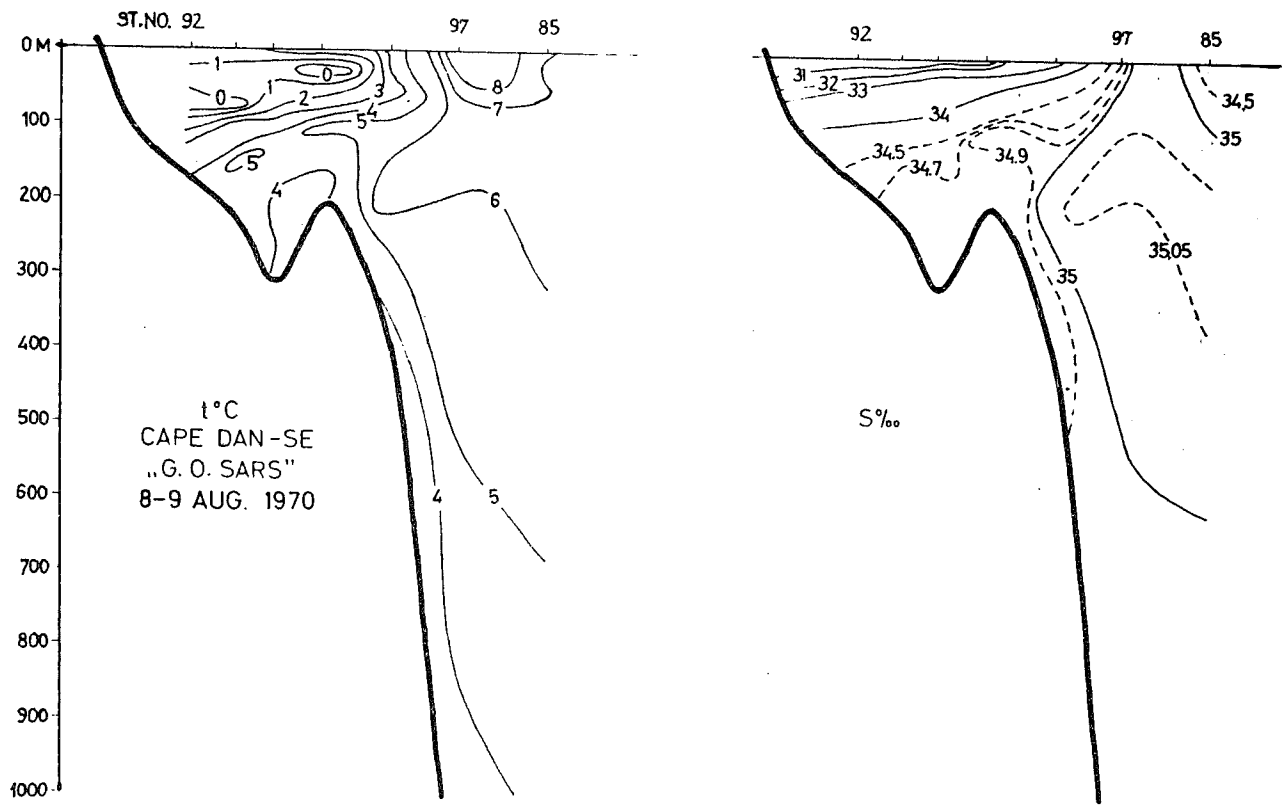


Fig. 9. Temperature and salinity in a section Cape Dan - Southeast

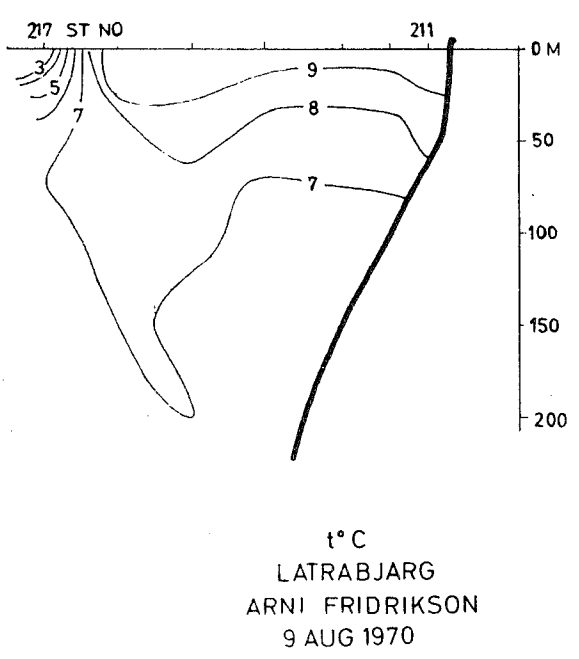


Fig. 10. Temperature in a section Latrabjarg - West.

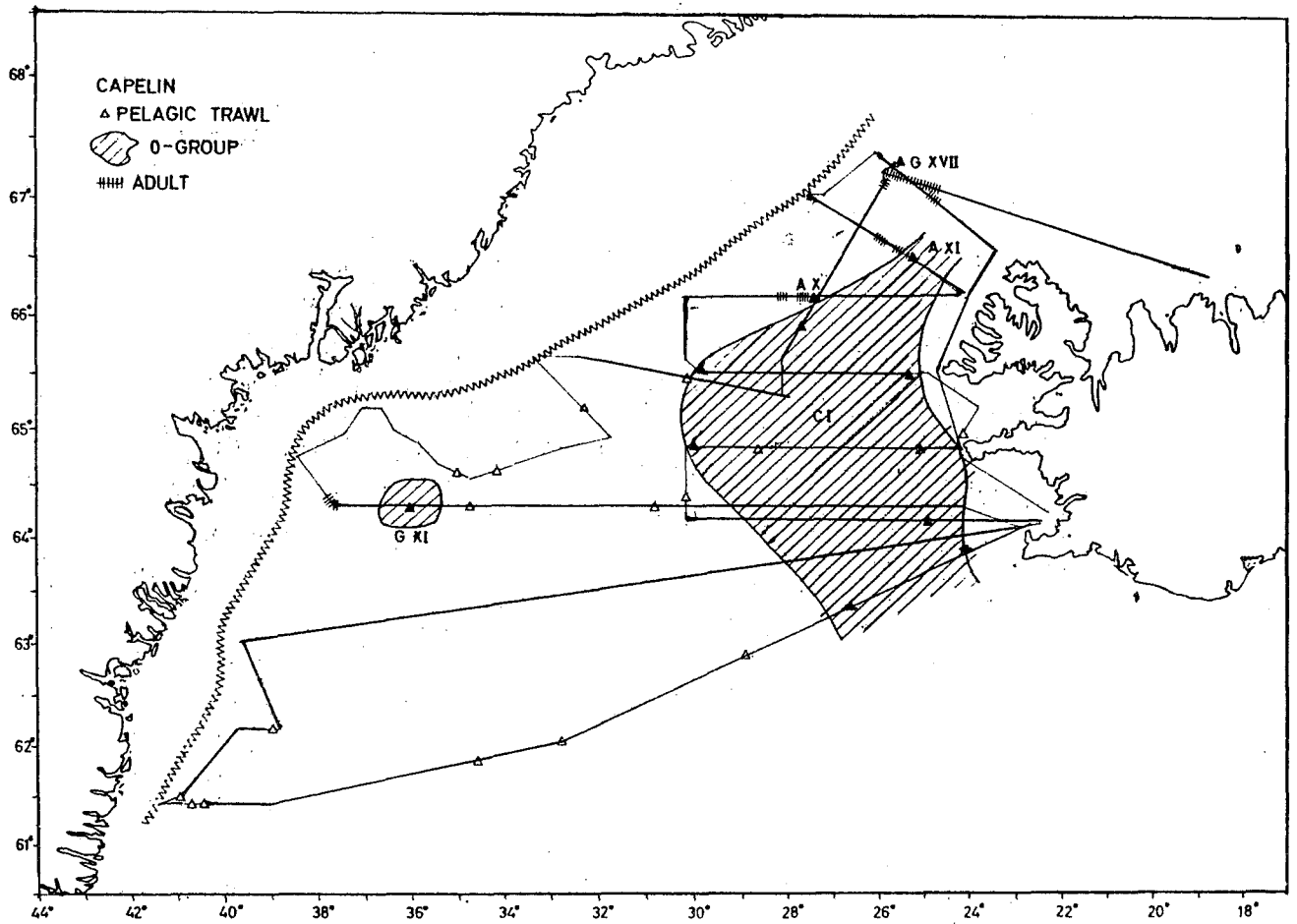


Fig. 11. Distribution of capelin. Filled symbols are stations with catch.

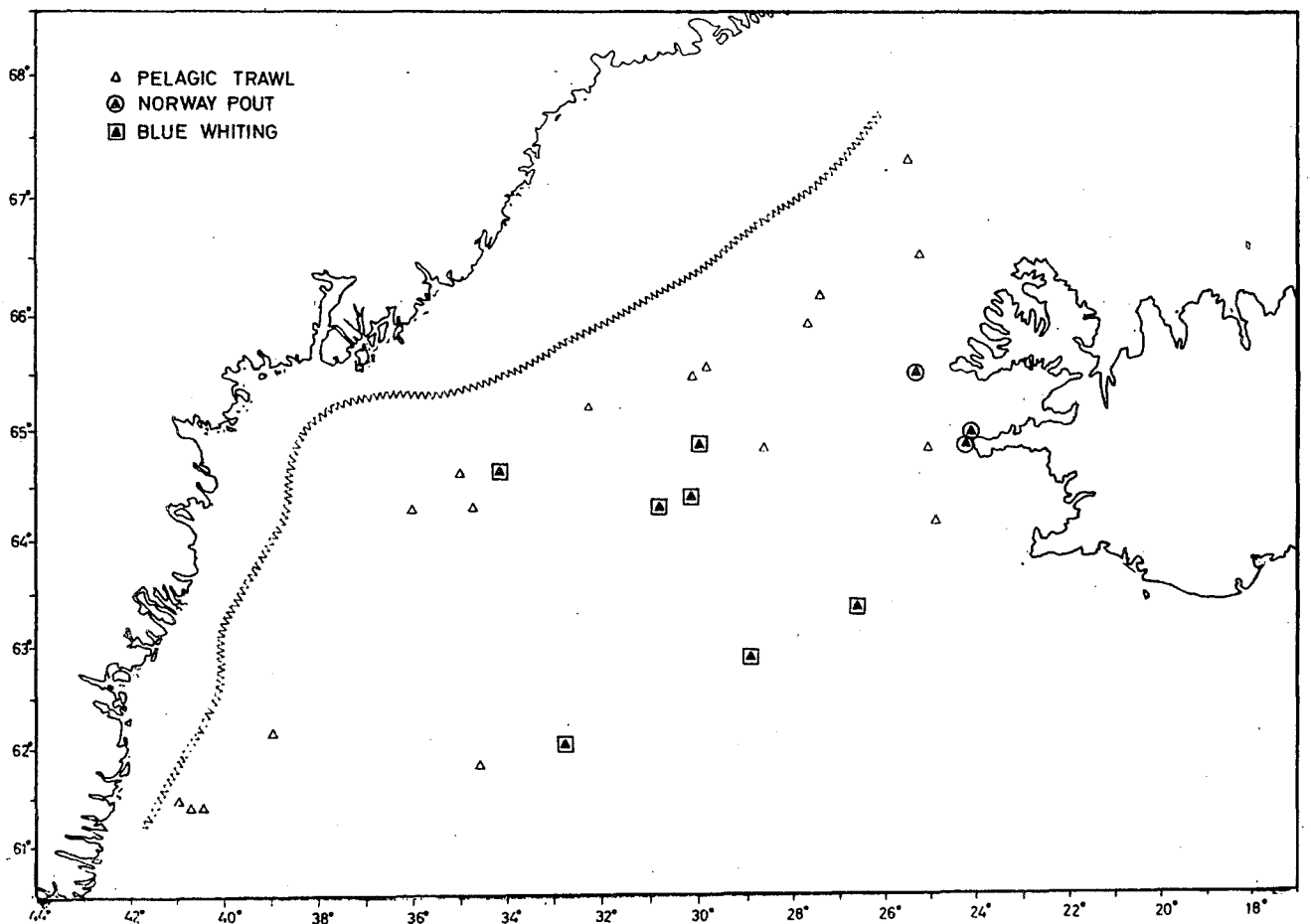


Fig. 12. Distribution of 0-group blue whiting and Norway pout. Filled symbols are stations with catch.

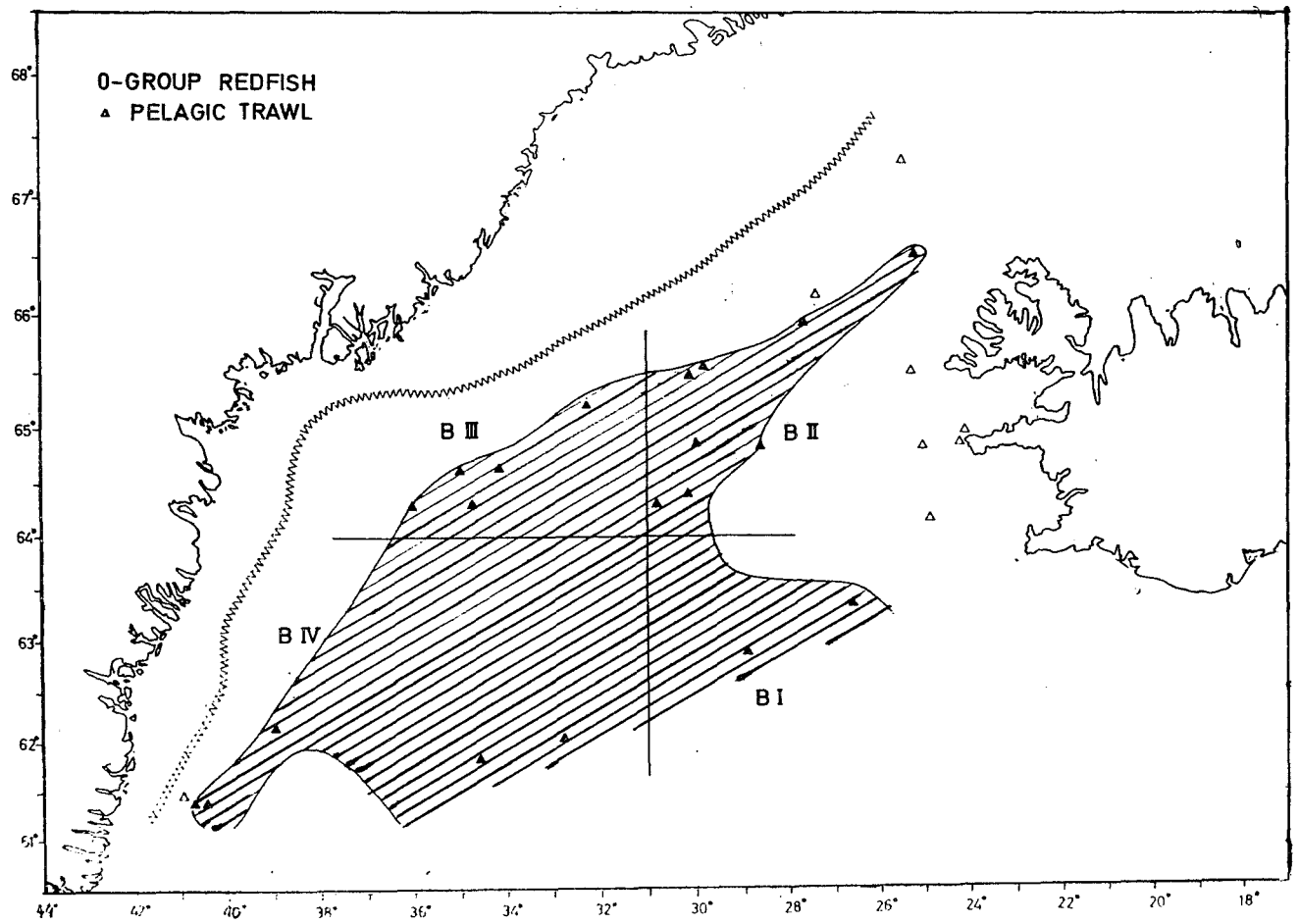


Fig. 13. Distribution of O-group redfish. Filled symbols are stations with catch.

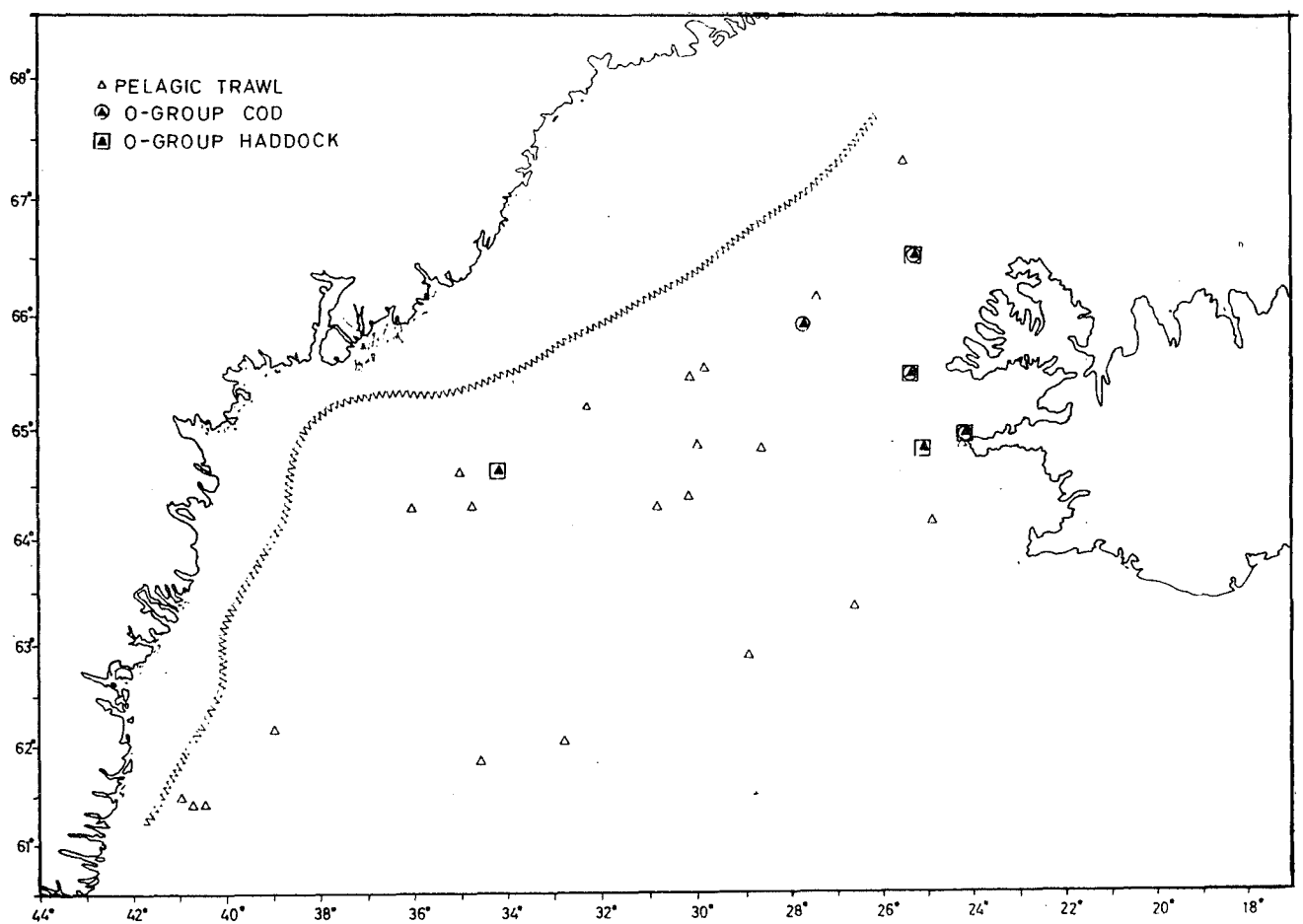


Fig. 14. Distribution of O-group cod and haddock. Filled symbols are stations with catch.

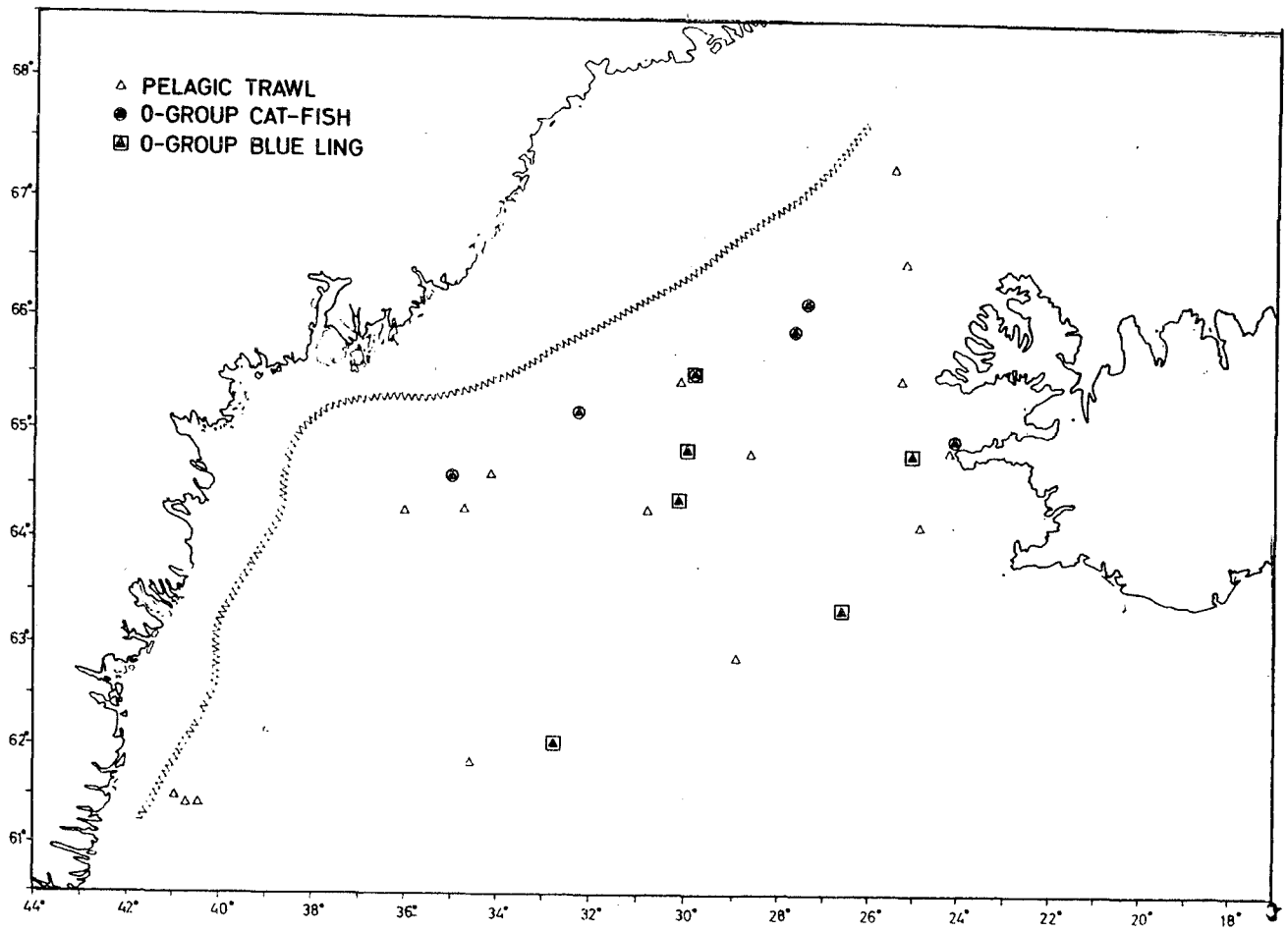


Fig. 15. Distribution of O-group catfish and blue ling. Filled symbols are stations with catch.

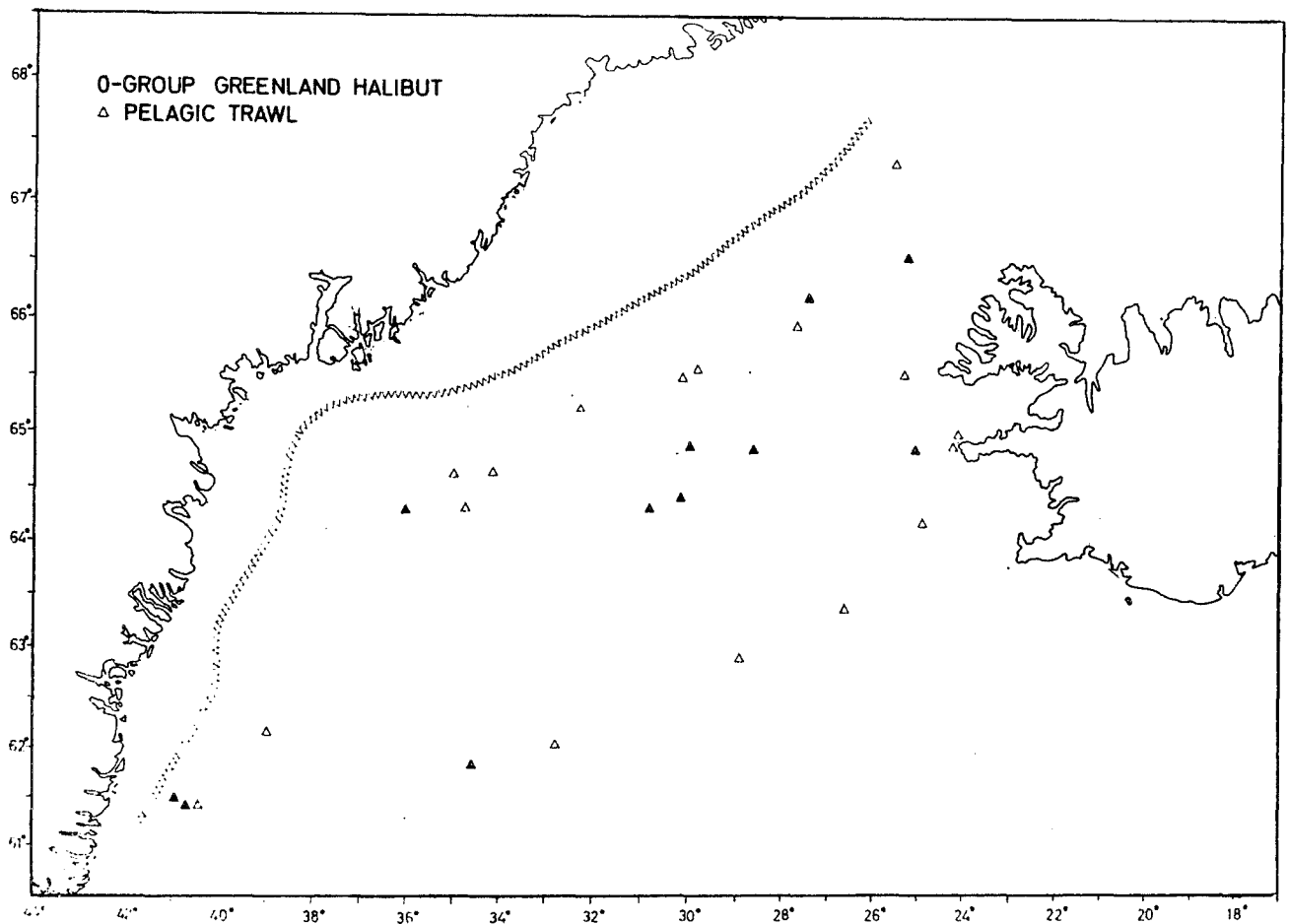


Fig. 16. Distribution of O-group Greenland halibut. Filled symbols are stations with catch.

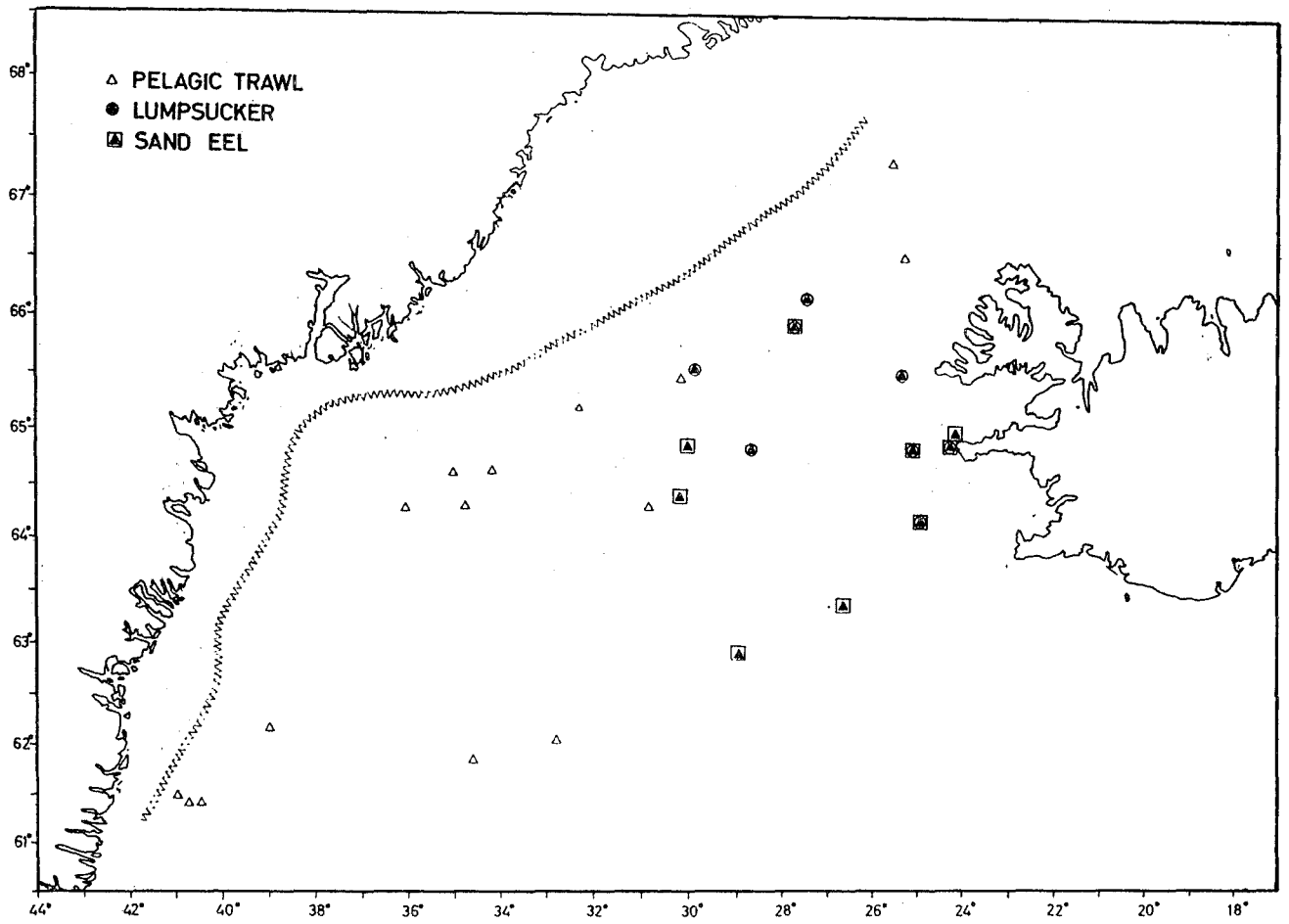


Fig. 17. Distribution of O-group lumpsucker and sand eel. Filled symbols are stations with catch.

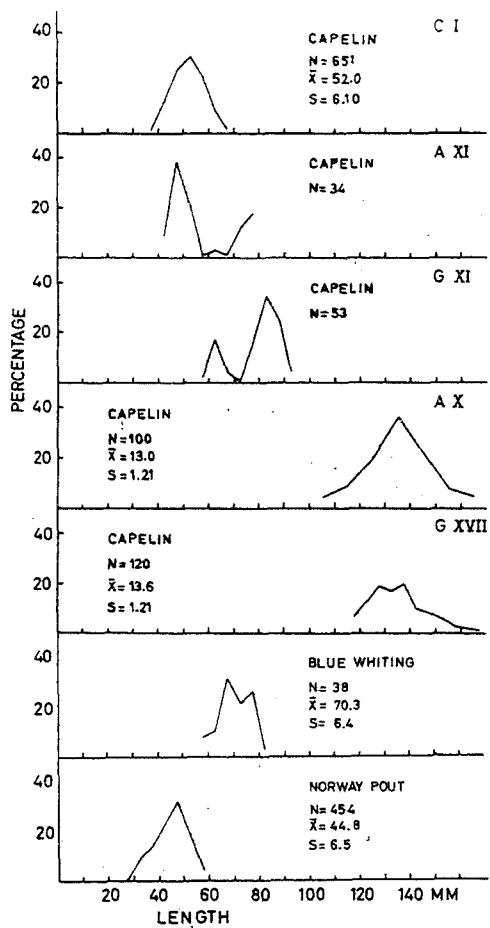


Fig. 18. Length distribution of capelin, blue whiting and Norway pout.

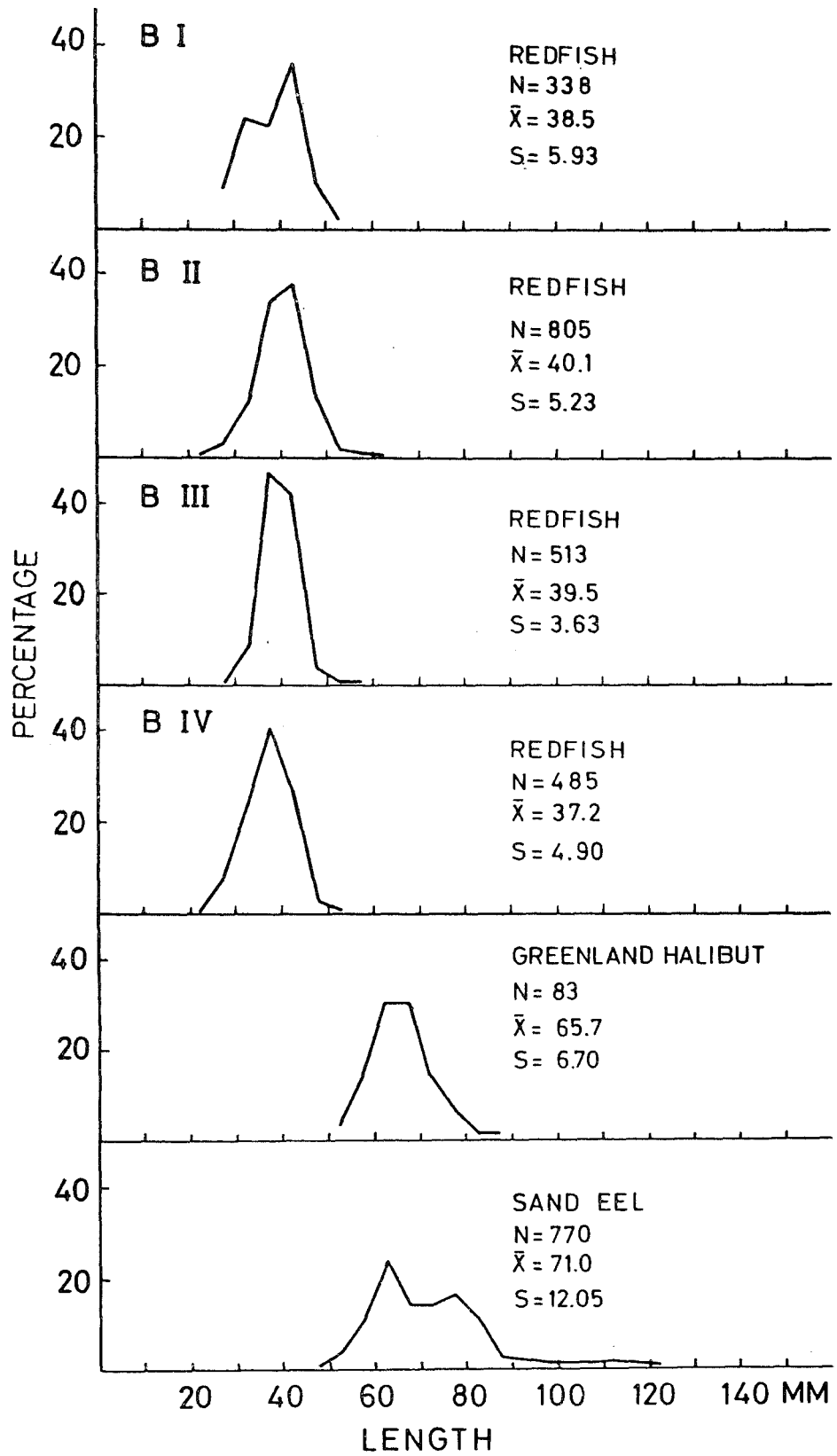


Fig. 19. Length distribution of red fish, Greenland halibut and sand eel.