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**REPORT ON THE 0-GROUP FISH SURVEY IN
ICELAND AND EAST GREENLAND WATERS,
AUGUST- SEPTEMBER 1997**

by

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This paper not to be cited without prior reference to the authors

1. Abstract

This paper is a continuation of annual reports on routine investigations on hydrography and the distribution and abundance of 0-group fish in Icelandic and East Greenland waters in August-September.

The temperature was relatively high with a strong warming up of the surface layer.

The 1997 abundance index of cod was very high. The abundance index of haddock was somewhat above the long term average (excluding the extremely rich years of 1976 and 1978) and that of capelin was high. The abundance index of redfish was not estimated as the survey did not cover the main distribution area of the 0-group redfish in the East Greenland- and the Irminger Sea area.

2. Introduction

Annual surveys on the distribution and abundance of 0-group fish in the Iceland-, East Greenland area have been carried out since 1970. The main aim has been to obtain a first index of year class strength of the most important commercial species, i.e. cod, haddock, capelin and redfish. Methods and data handling have been described by Vilhjálmsson and Friðgeirsson (1976).

In 1996 only one vessel covered the survey area as follows:

Árni Friðriksson	13. 8.-5. 9.	The shelf area off W-, N-, E-, NE-, S-Iceland and the Eastern Dohrn Bank
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Survey routes and stations are shown in Figure 1. The East Greenland - Irminger Sea area was not surveyed this year and only the easternmost part of the Dohrn Bank area was surveyed. Acoustic records of 0-group fish were obtained and the density assessed by a 38 kHz Simrad EK 500 split-beam sounder / integrator system. Species composition as well as abundance was, however, primarily assessed by trawling in the scattering layer for a set distance at a time. For 0-group capelin echo abundance was obtained and an index based purely on echo integration was calculated for the 0-group capelin as in previous years.

Hydrographic stations were worked on standard hydrographic sections in Icelandic waters using CTD-sonde.

A total of 255 pelagic trawl stations and 71 hydrographic stations were worked and 33 juvenile lumpsuckers were tagged during the cruise.

Scientific staff on RV Árne Friðriksson was: Sveinn Sveinbjörnsson, Sigurður Þ. Jónsson, Björn Sigurðsson, Albert Stefánsson, Gísli Ólafsson, Páll Svavarsson, Héðinn Valdimarsson, John Mortenssen and Sigurður Gunnarsson.

Svend-Aage Malmberg compiled and commented on the hydrographic data.

3. Hydrography

In August 1997 the main features of the hydrographic conditions (Figs. 2-4) in Icelandic waters were as follows:

South and west of Iceland salinities and temperatures were relatively high (7-10°C) with a strong warming up in the surface layers. The Atlantic inflow into North Icelandic waters was also quite pronounced (5-6°C; $S > 35.0\text{‰}$), covered by a low saline surface layer. A slight relatively cold (4°C) intrusion from the north was observed in the western part of the area. Off the East coast of Iceland temperatures were also relatively high ($> 4^\circ\text{C}$). In deeper waters northeast and east of Iceland the cold East Icelandic Current was, on the other hand, pronounced as earlier this year (0-2°C) but with a strong warming up in the surface layer (7-8°C).

It is concluded that in the summer of 1997 temperatures were relatively high in the survey area with a strong warming up in the surface layers in general.

4. Distribution and abundance of 0-group fish

In the Icelandic area the greatest abundance of 0-group cod (87% of the total index) was recorded off N-Iceland where the highest densities were observed in the inshore areas. In other areas the distribution differed from normal years in that a relatively high proportion of the 0-group was recorded off E-Iceland. Some drift of 0-group cod was detected across the Denmark Strait to the eastern Dohrn Bank area but time constraints did not permit further coverage in that area. The distribution of 0-group haddock was normal and the greatest abundance was recorded off W- and N-Iceland as in 1996. This is contrary to the situation in 1994 and 1995 when the 0-group haddock was mainly recorded at SE- and SW-Iceland. The distribution of 0-group capelin was very extensive as commonly happens in rich years. The distribution of 0-group redfish in the Icelandic region was normal.

In comparative terms the 0-group index of cod was very high, that of haddock was about average whereas the abundance index of capelin was high, ranking among the highest on record for the second consecutive year.

4.1. Cod

The 1997 distribution and relative abundance of 0-group cod is shown in Figure 5 and the total abundance index as well as the contribution by the various subareas in Table 1.

Table 1. Abundance indices of 0-group cod.

Dohrnbank	Iceland					Total
	SE	SW	W	N	E	
4	+	+	97	1005	46	1152

As usual most of the 0-group cod were recorded off North Iceland. The total abundance index ranks among the highest in the series. The size of the distribution area of the 0-group cod is normal for rich years. Some drift of 0-group cod across the Danmark Strait was observed. The condition of the 1997 cod brood as judged by the length distribution was close to the long term average. (Fig. 6).

4.2. Haddock

The distribution and relative abundance of 0-group haddock is shown in Figure 7 and the indices by subareas and the total index is given in Table 2.

Table 2. Abundance indices of 0-group haddock.

Dohrn Bank	Iceland					Total
	SE	SW	W	N	E	
+	+	+	11	15	+	26

Almost all the 0-group haddock was recorded off W- and N-Iceland. The abundance index is close to average and the highest since 1985. The overall mean length of the 0-group haddock (Fig. 8) was considerably above the long term average.

4.3. Capelin

The distribution of 0-group capelin is shown in Figure 9. The highest numbers were recorded off N-Iceland but on the whole the 0-group capelin was widely distributed.

The abundance indices in different areas are given in Table 3.

Table 3. Abundance indices of 0-group capelin

Dohrn Bank	Iceland					Total
	SE	SW	W	N	E	
5	1	3	11	30	11	61

The abundance index ranks among the highest in the series but the overall mean length of the of the 0-group was below the long term average (Fig. 10).

The acoustic abundance index of 0-group capelin (Reynisson and Vilhjálmsón, 1983) was about 98 which is the second highest obtained.

The acoustic abundance indices in the period 1981-1997 are given together with the corresponding CPUE indices in Table 4.

Table 4. Abundance indices of 0-group capelin in 1981-1997.

Year	Acoustic index ($\text{m}^2 * 10^{-5}$)	CPUE index
1981	15.2	29
1982	2.8	13
1983	7.8	22
1984	3.5	28
1985	5.6	33
1986	37.1	37
1987	21.2	14
1988	91.8	52
1989	33.3	40
1990	24.7	21
1991	40.2	54

1992	56.8	35
1993	44.9	51
1994	50.5	94
1995	23.0	24
1996	145.0	82
1997	97.8	61

4.4. Redfish

As mentioned before, no survey was conducted in the main distribution area of 0-group redfish. Consequently it is not possible to give an abundance index for the species. In Figure 11 the distribution and density of the 0-group redfish in the surveyed area is given. The distribution of the 0-group redfish in the Icelandic region was wider than in recent years, the fry being caught off SE-, N-, W- and SW-Iceland. The average length of the 0-group at SW- and W-Iceland in 1997 was smaller than in 1996.

4.5. Other species

During the 0-group survey in 1997 20 species other than already mentioned of 0-group fish and juveniles were recorded.

As in previous years the fry and juveniles of the **sand eel** species *Ammodytes marinus* and *A. tobianus* were most numerous in the catches of other 0-group and juvenile fish species. They were recorded at 82 stations from Faxa Bay at SW-Iceland clockwise to the E-Iceland region.

The young stages of **lumpsucker** were widely distributed this year, as in 1996, and were recorded at 51 stations off W, N, NE and E-Iceland. The greatest numbers occurred off N-Iceland.

Whiting was widely recorded (38 stations) mainly off W- and N-Iceland and **norway pout** was caught at 2 stations off W-Iceland.

0- group **wolffish** was fairly abundant and was caught at 27 stations, mainly off N-Iceland. **Spotted wolffish** was caught off NE-Iceland at 3 stations.

Young stages of **herring** were present at 14 stations off SW-, W-, N-and E-Iceland.

Long rough dab was present at 28 stations, being most numerous off N-Iceland.

Witch was recorded at 6 stations off SE- and SW-Iceland and **lemon sole** at 1 station off SE-Iceland.

Greenland halibut was recorded at 3 stations off N-Iceland and in the Dohrn Bank area.

Greater silver smelt were caught at 2 stations off W-Iceland. .

0-group and juvenile **polar cod** was recorded at 10 stations in the Dohrn Bank area and off W-Iceland and N-Iceland.

Five bearded rockling was recorded at 2 stations off W-Iceland.

Short- spined scorpionfish was recorded at 7 stations off SE- and SW-Iceland.

Eelpout was recorded at 2 stations off W-Iceland and **spotted snake blenny** at one station off N-Iceland.

Atlantic seapoacher was caught at 2 stations off W- and N-Iceland and **anglerfish** at 1 station off SW-Iceland.

Several other species of young and adult fish, not belonging to the 0-group and juvenile stages, were caught in the 0-group hauls. They are not commented on in this paper.

5. References

Reynisson, P. and H. Vilhjálmsson, 1983: Acoustic index of 0-group capelin in the Iceland-Greenland area. ICES, C.M. 1983/B:3.

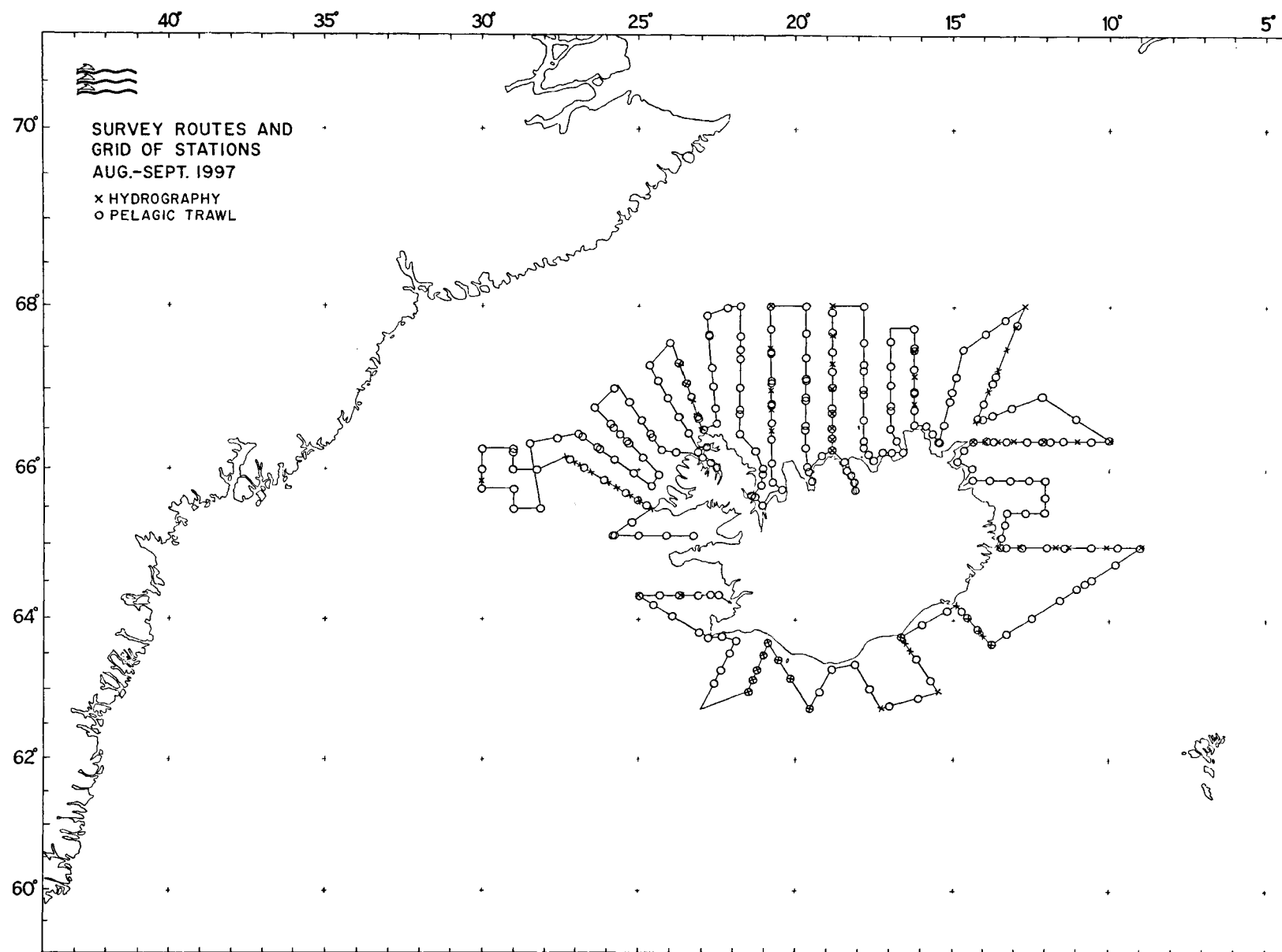


Figure 1. Survey routes and grid of stations, August-September 1997.

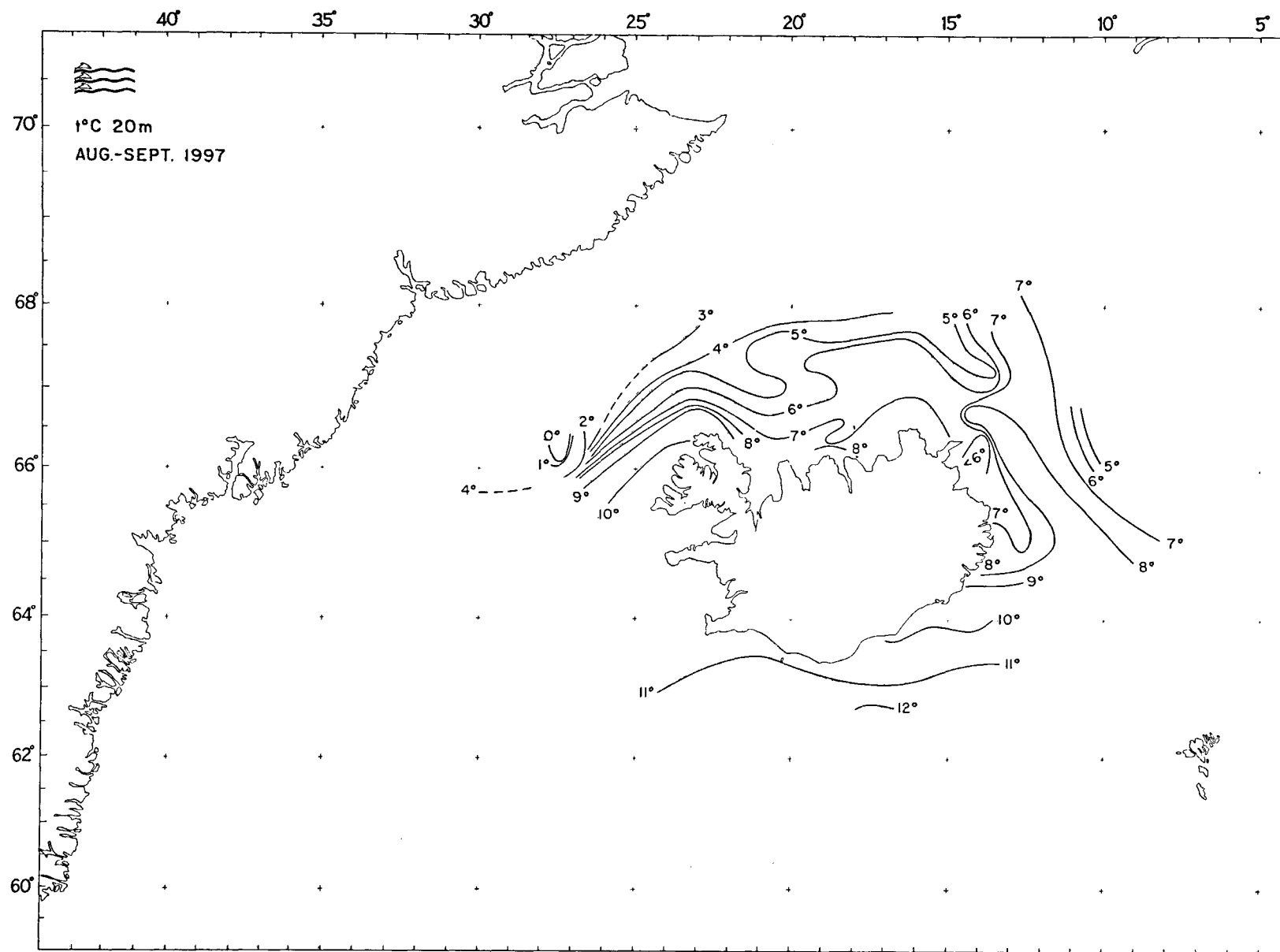


Figure 2. Temperature at 20 m depth, August-September 1997.

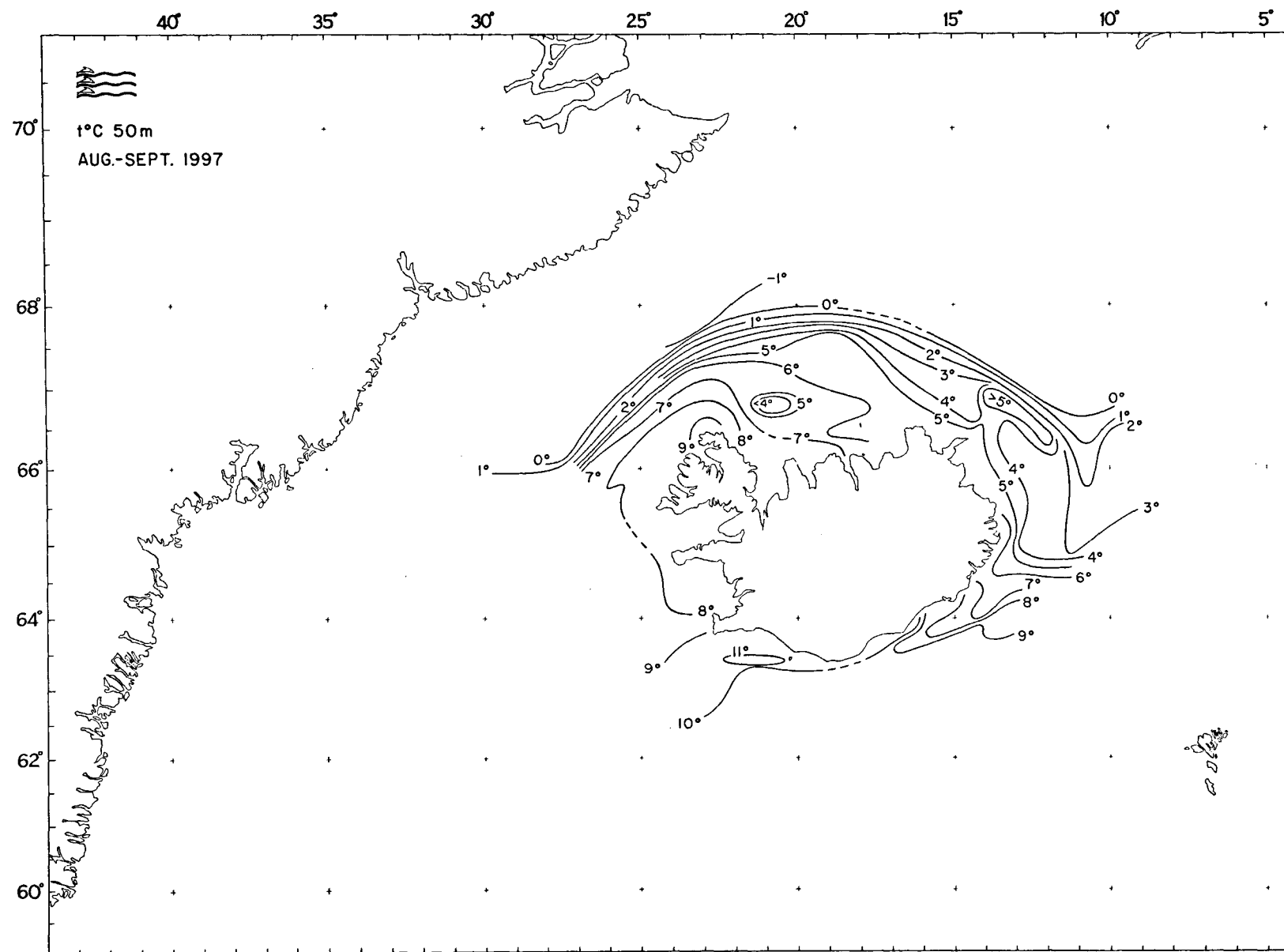


Figure 3. Temperature at 50 m depth, August-September 1997.

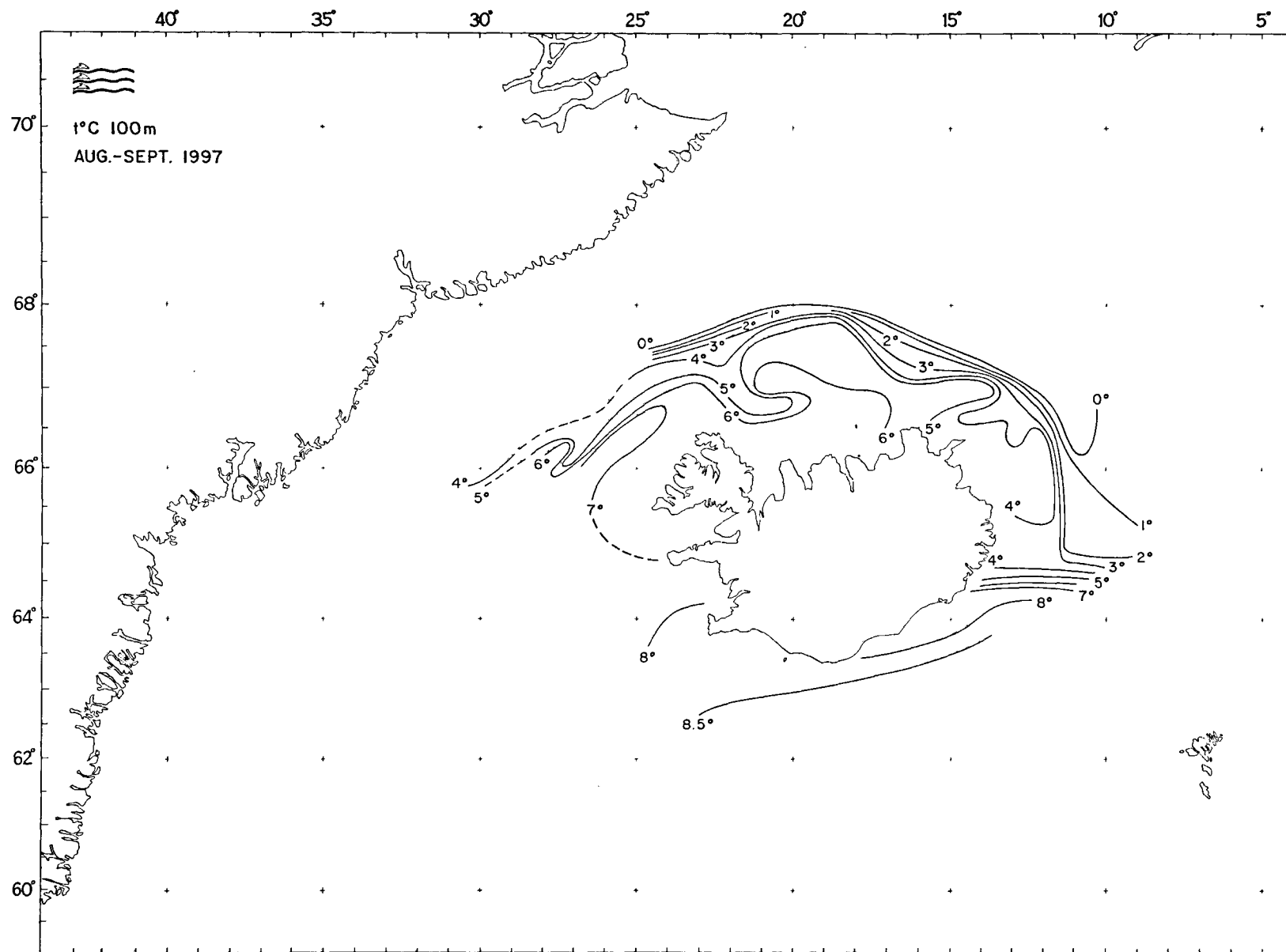


Figure 4. Temperature at 100 m depth, August-September 1997.

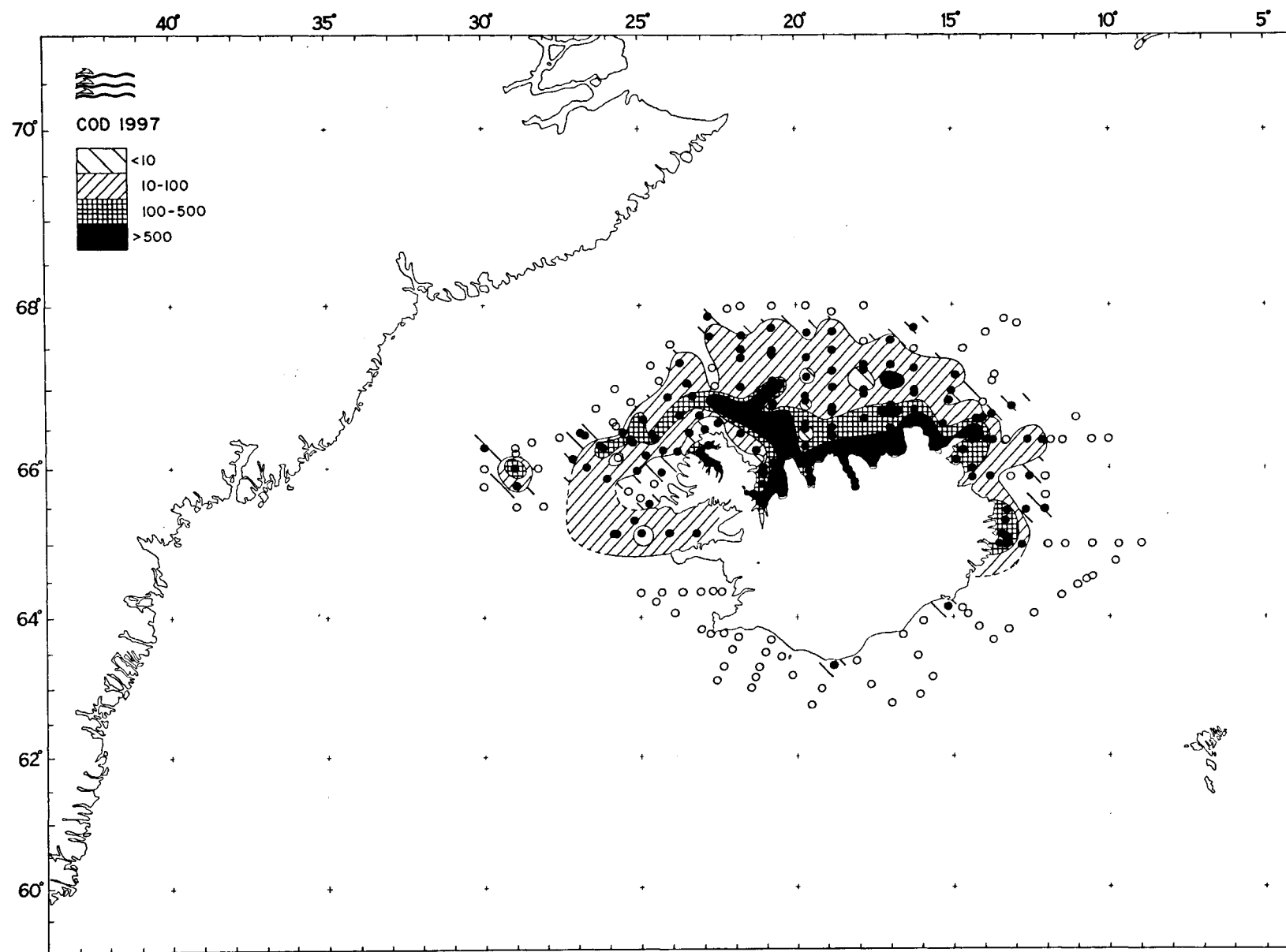
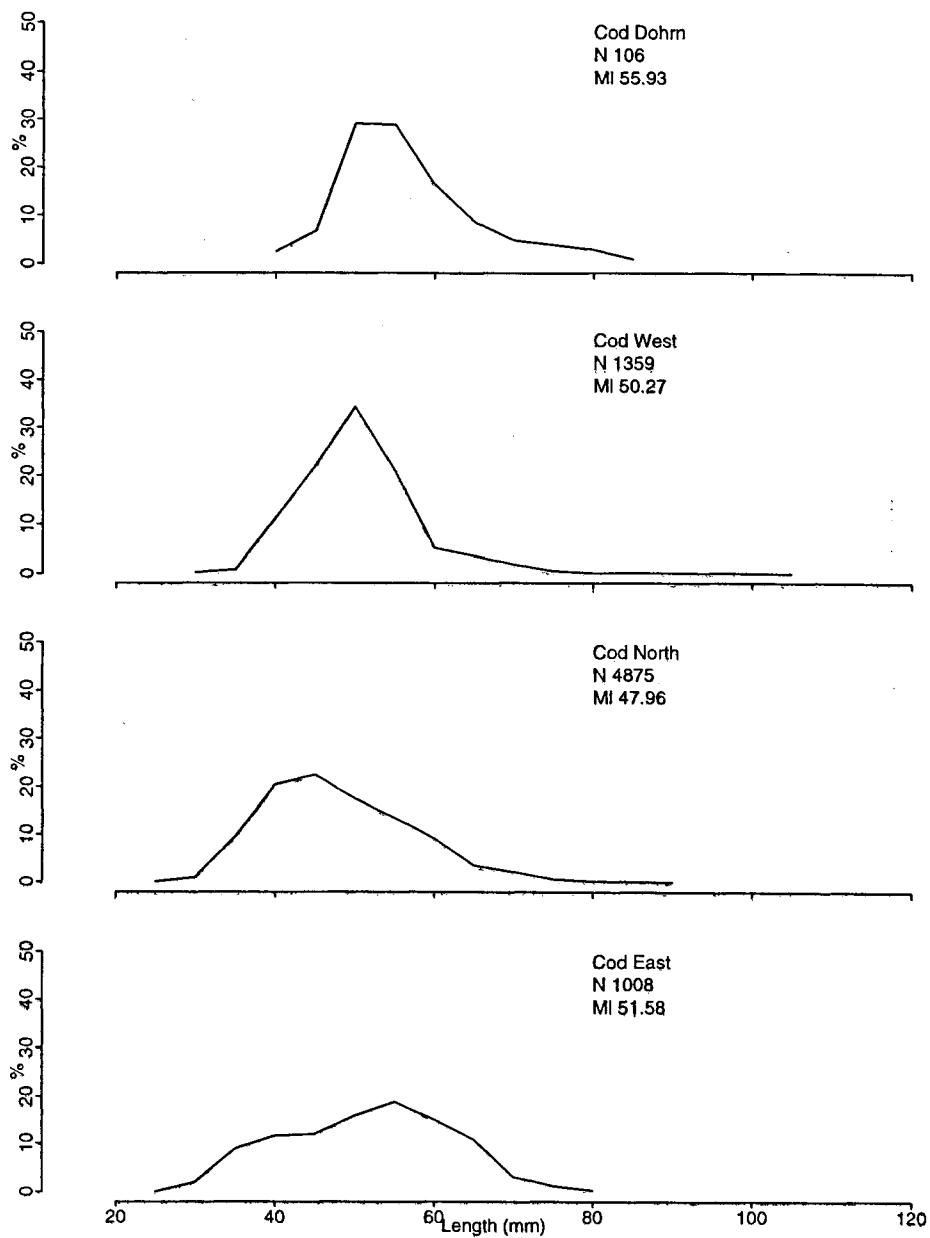


Figure 5. Distribution and density of 0-group cod (n/1 n.m.), August-September 1997.

AUG-SEPT 1997

Cod Southwest
NO DATA



Cod Southeast
N 2
MI 35

Figure 6. Length distribution of cod, August-September 1997.

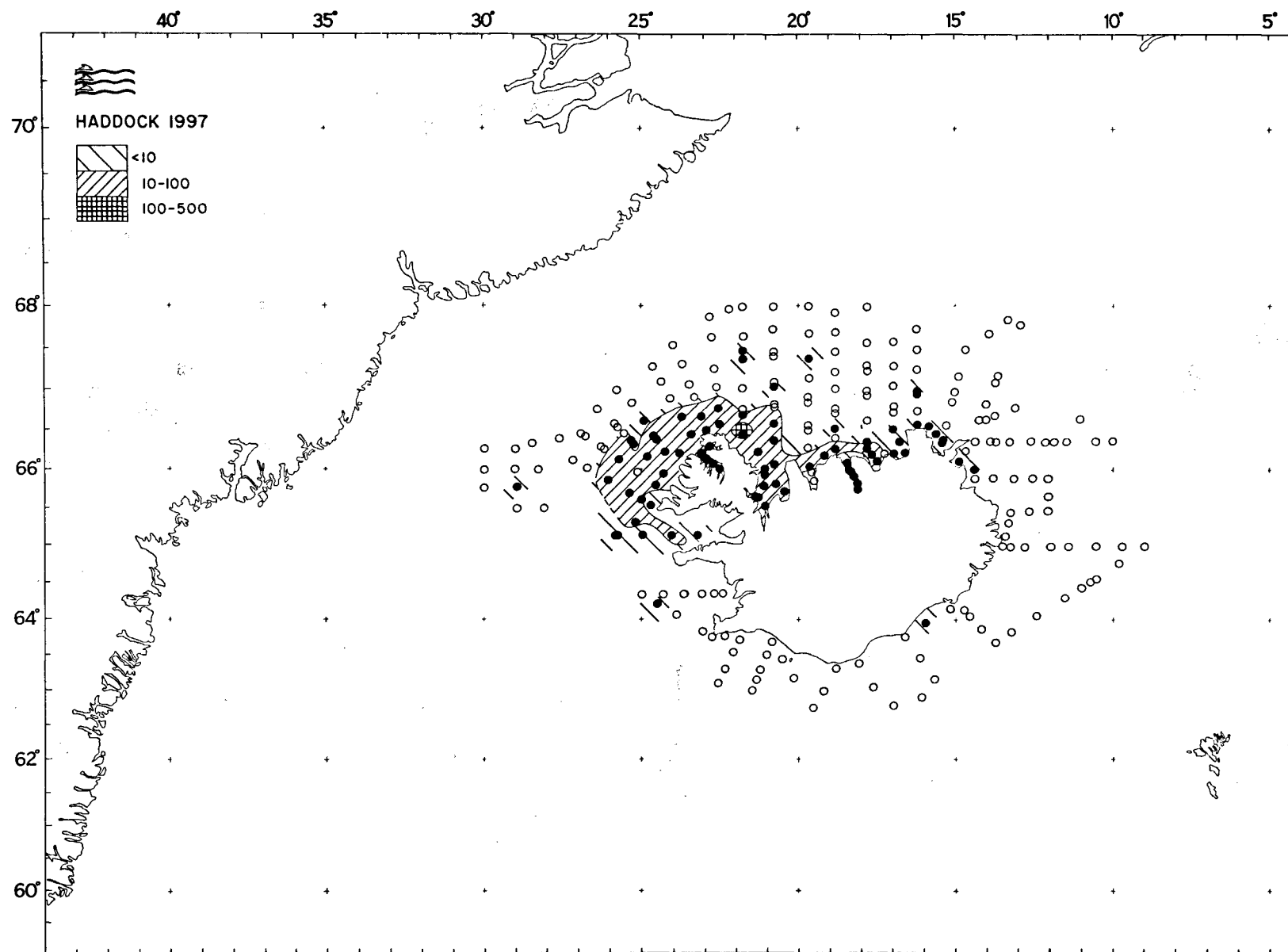


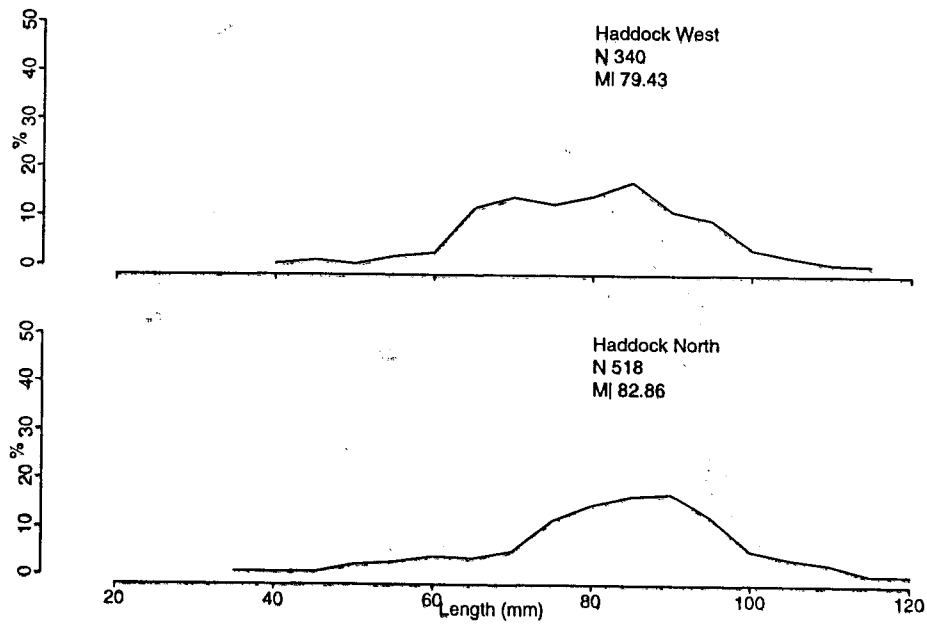
Figure 7. Distribution and density of 0-group haddock (n/1 n.m.), August-September 1997.

AUG-SEPT 1997

Haddock Southwest
N 2
MI 107.5

Haddock Dohrn
N 2
MI 87.5

Haddock West
N 340
MI 79.43



Haddock East
N 4
MI 96.25

Haddock Southeast
N 1
MI 35

Figure 8. Length distribution of haddock, August-September 1997.

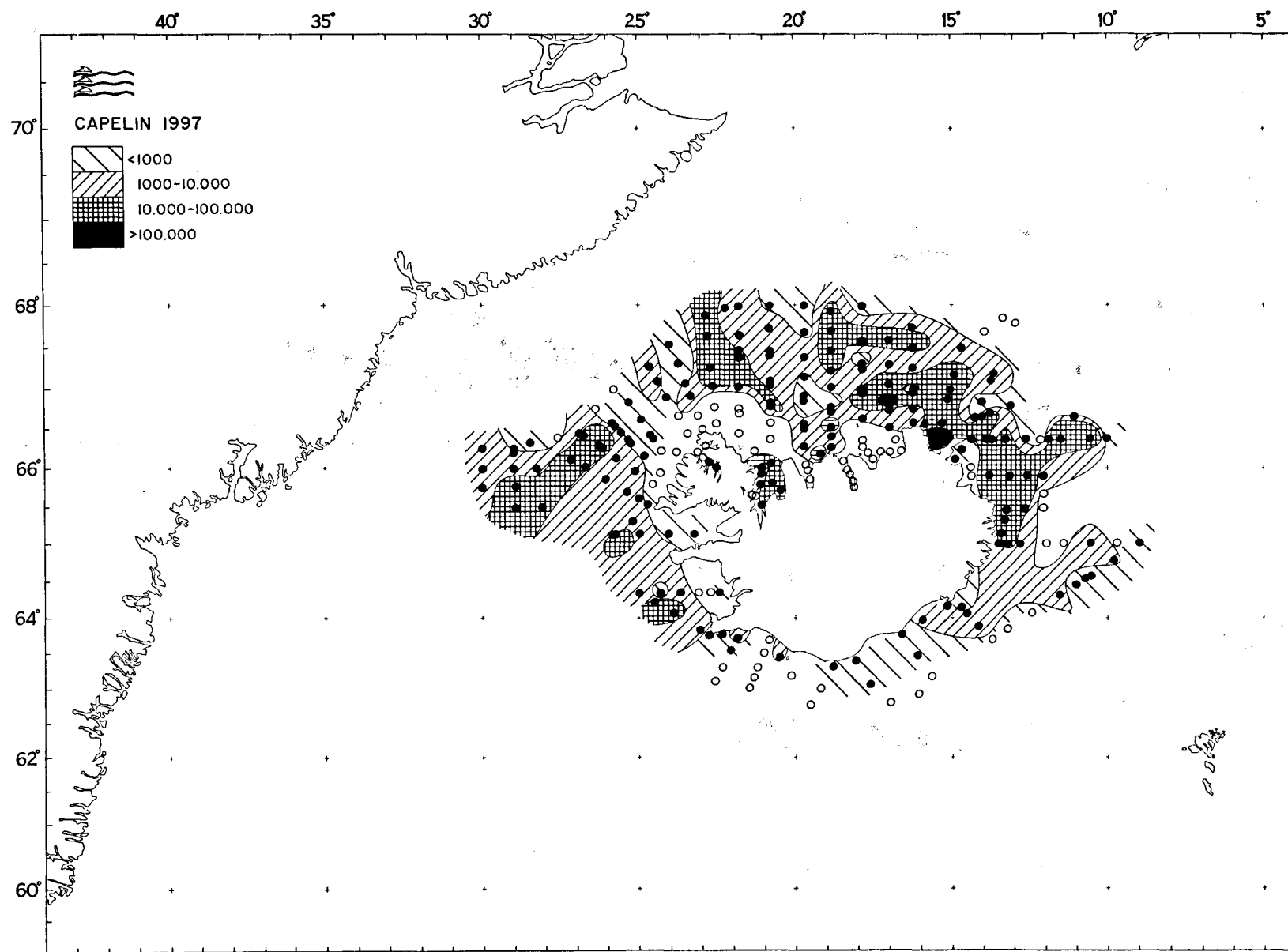


Figure 9. Distribution and density of 0-group capelin (n/1 n.m.), August-September 1997.

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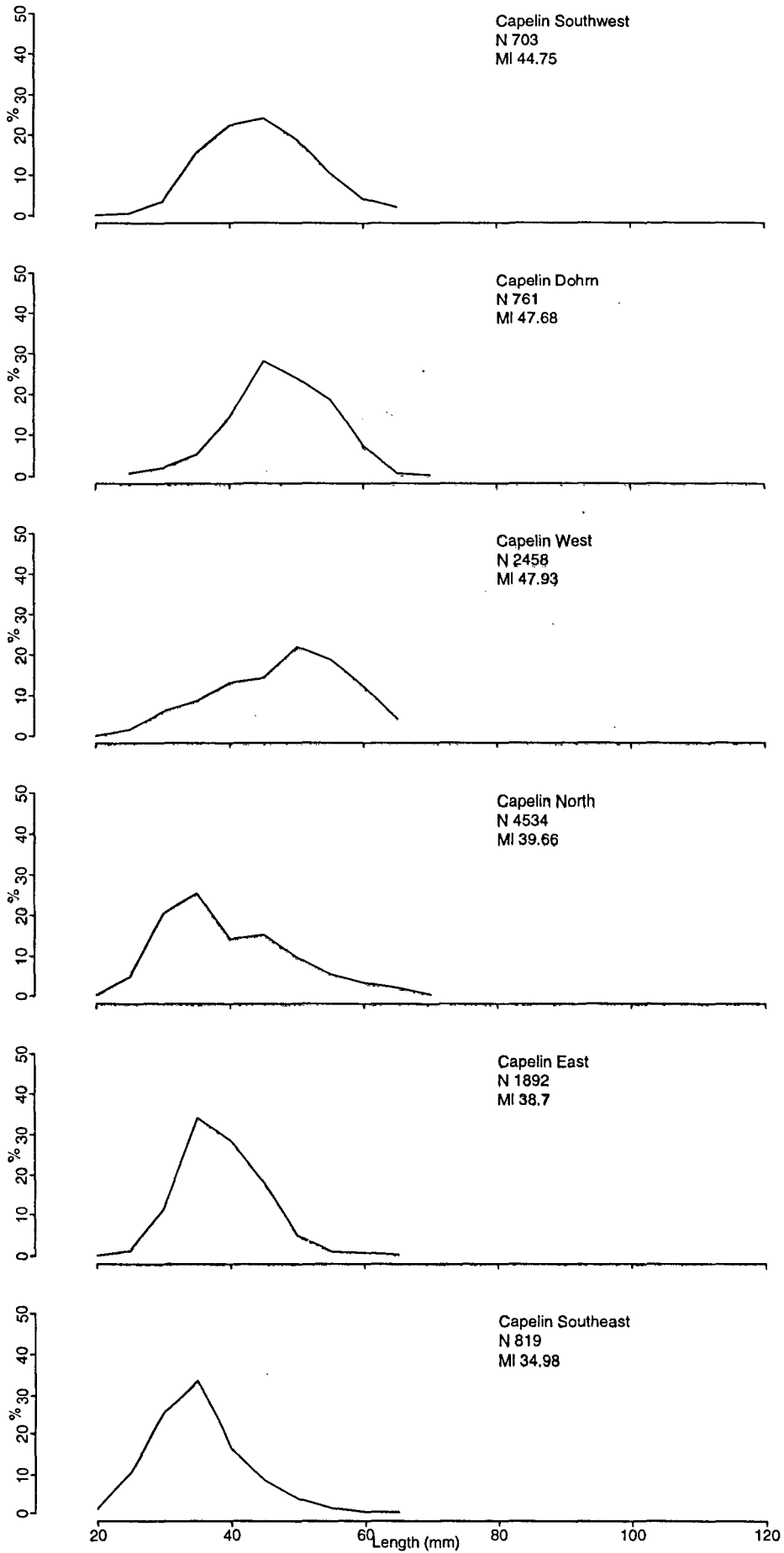


Figure 10. Length distribution of capelin, August-September 1997.

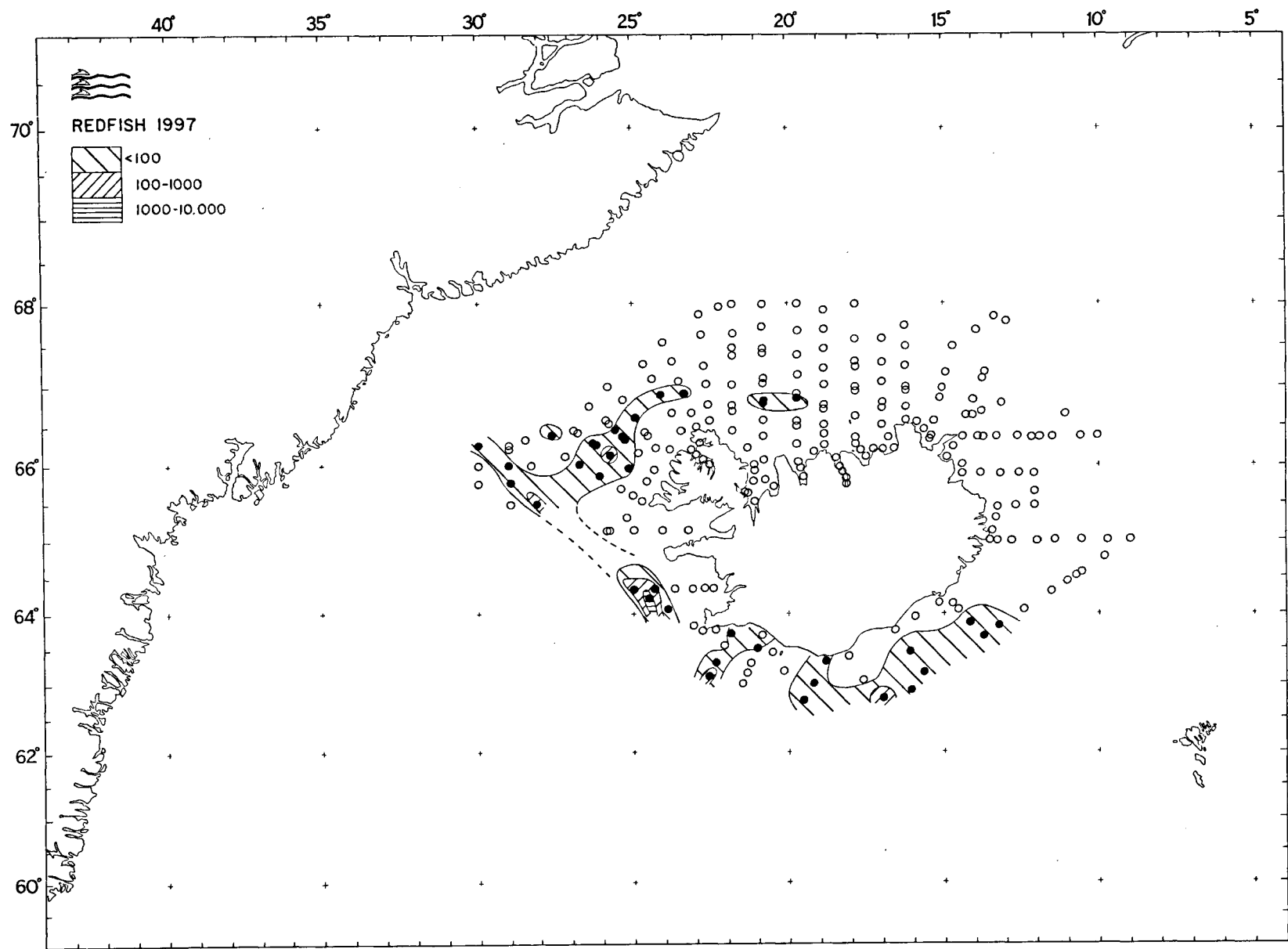


Figure 11. Distribution and density of 0-group redfish (n/1 n.m.), August-September 1997.

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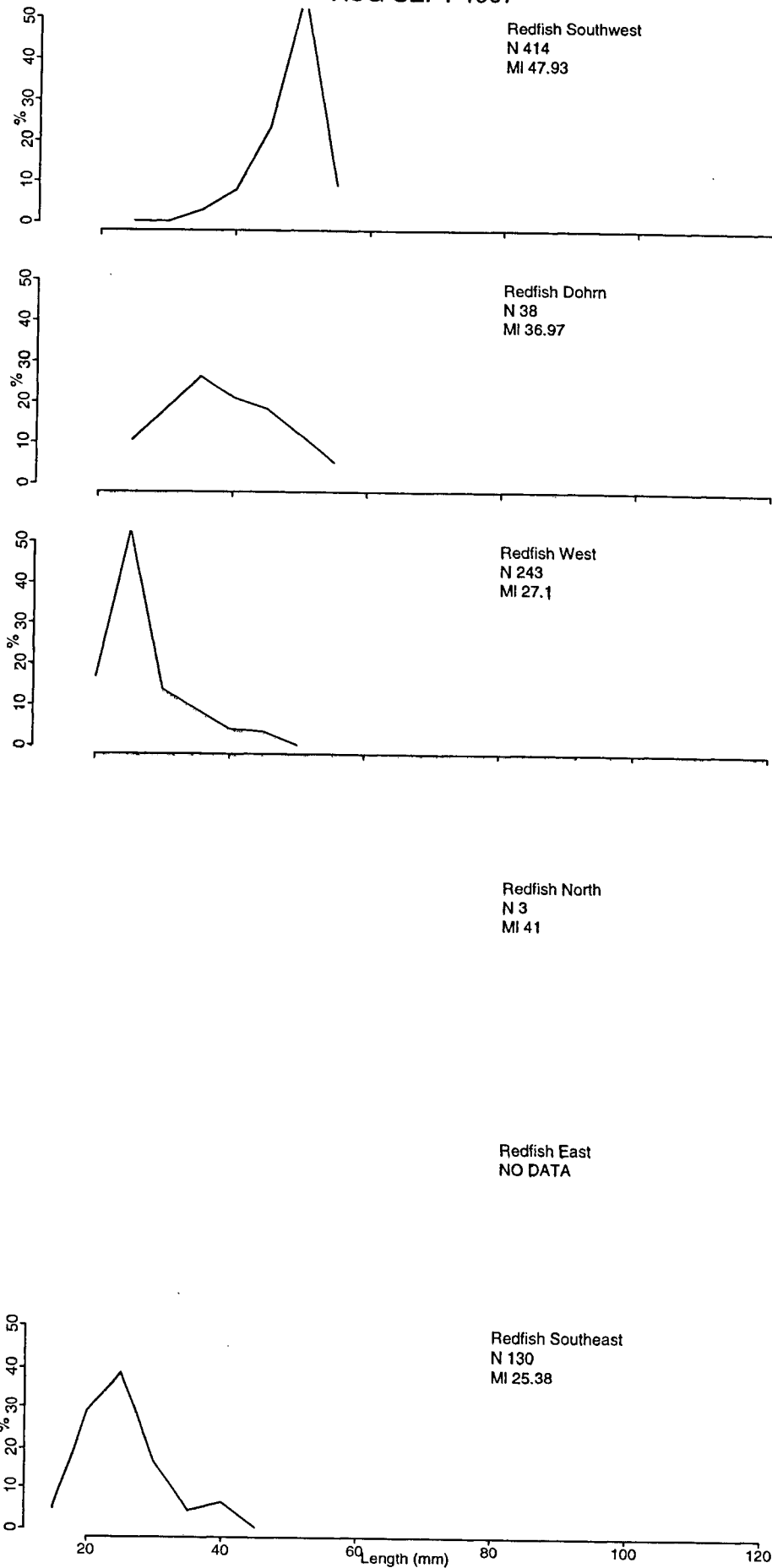


Figure 12. Length distribution of redfish, August-September 1997.