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International Council for the  
Exploration of the Sea

C.M. 1980/G:45  
Demersal Fish Committee

ON THE NURSERY GROUNDS OF THE GREENLAND  
HALIBUT SPAWNING IN ICELANDIC WATERS.

by

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ABSTRACT

It is reported on Greenland halibut smaller than 20 cm found off the north coast of Iceland, which until now have not been observed in Icelandic waters. Further, the drift and the size of 0-group Greenland halibut in the years 1970 to 1979 are described.

RÉSUMÉ

Le flétan noir, de longueur inférieure à 20 cm, est signalé pour la première fois dans les eaux islandaises, au large de la côte septentrionale. De plus, le déplacement et la distribution de taille du groupe 0, au cours des années 1970 à 1979, sont décrits.

## INTRODUCTION

The spawning grounds of the Greenland halibut at Iceland were found at the continental slope off the west coast of Iceland, in depth of about 1000m in March 1977, when spawning Greenland halibut and bathypelagic eggs of the species were observed in this region (Sigurðsson 1977 and Magnússon 1977).

It is assumed that the Greenland halibut larvae, as well as larvae of other fish species spawning in this area, drift with the ocean currents westward to the East Greenland shelf area and also north-eastward to the Icelandic north coast.

Immature Greenland halibut are common in Icelandic waters. However, there were no records on bottom stages of Greenland halibut smaller than 21 cm long and 2 years old (wrongly aged 3 years by Sigurðsson 1979) in Icelandic waters, and information on young Greenland halibut up to that size and age was completely lacking (Sigurðsson, 1979 p.25), although prawn trawl and otter-trawl with fine mesh cover in or over the cod-end have frequently been used in the last decades from shallow to deep waters in areas where young Greenland halibut were likely to be found. Specimens under 40 cm have only been observed occasionally, and in general, Greenland halibut younger than 7 years and less than 50 cm in size have been rather rare in the catches in Icelandic waters in recent years.

## ONE YEAR OLD GREENLAND HALIBUT OFF THE NORTH COAST OF ICELAND

It was a surprise when small Greenland halibut were reported to be frequently occurring in Axarfjörður at the easterly north coast of Iceland last winter.

A sample from this area, 102 individuals, from February 1980 showed that 101 were one year old and 10-16 cm long (Table 1 and Fig. 2), while one was 20 cm long and two years old.

Table 1

One year old Greenland halibut from Axafjörður (North Iceland) caught with prawn trawl in February 1980.

Length cm	10	11	12	13	14	15	16	total
No.	3	12	22	37	21	5	1	101
%	3.0	11.9	21.8	36.6	20.8	5.0	1.0	100.1

In the beginning of March 1980, two Greenland halibuts 12 and 13 cm long and one year old, were caught in prawn trawl by the research vessel "Dröfn" in Húnaflói (the western-north coast, see also Fig.1).

These findings reported on here indicate that Greenland halibut fry have settled on the bottom off the north coast of Iceland in autumn 1979. It is also assumed because of the above mentioned coverage of the area in question by trawling that Greenland halibut have not settled there previously at least not in recent years.

O-GROUP HALIBUT: DRIFT AND SIZE DURING THE O-GROUP SURVEYS  
1970 - 1979.

During the yearly O-group surveys carried out in the waters around Iceland and between Iceland and Greenland since 1970, mainly in August information on O-group halibut was obtained.

According to the drift pattern formed by the ocean currents, as mentioned before, O-group halibut are observed mainly along the shelf region off East Greenland and to some minor extent also off the north coast of Iceland (See Fig.3). Yet it is not uncommon that they are recorded over the great depths in the Central Irminger Sea.

Off East Greenland, O-group Greenland halibut are sometimes quite numerous all over the shelf area south to 60°N which is the southernmost limit of the survey area. The highest concentrations are observed off Angmagsalik. There, the quantity per

station can exceed 100 specimens (Report on 0-group, 1972, Fig. 19) but it ranges mainly from 1 to 50 specimens per 1 nautical miles tow. However, there are great variations in the yearly abundance. Thus, in certain years, not a single specimen was recorded, as e.g. in 1971, 1975 and 1977. In other years, as e.g. 1972 and 1978 as well as in 1979, 0-group Greenland halibut were relatively abundant.

Compared with the occurrence in the Irminger Sea, the records of 0-group Greenland halibut off the north coast of Iceland are very scarce. There, 0-group Greenland halibut were recorded in five of the ten years of observation, i.e. in 1970 (3 sp.), 1972 (1 sp.), 1974 (2 sp.), 1975 (1 sp.), and 1978 (2 sp.). None were recorded on the 0-group survey in 1979.

According to JENSEN (1935) for West Greenland and HOGNE-STAD (1965) for the Spitsbergen area the fry of Greenland halibut 60-70 mm in size are preparing for life at the bottom. SMIDT (1969) noticed that 0-group Greenland halibut in the Irminger Sea taken in July 1963 were much bigger than those taken from Davis Strait same year and month, and he suggests an earlier spawning in the East Greenland-Iceland area than in the West Greenland area. For orientation on the size of 0-group Greenland halibut off East Greenland, Table 2 is given.

Table 2.

Length of 0-group Greenland halibut off East Greenland  
1970 - 1979.

Year	No. meas.	Length range mm	Av. length	Time of cruises
1970	9	52 - 69	60.33	1.8 - 11.8
1972	133	40 - 80	60.91	2.8 - 25.8
1973	212	23 - 72	56.06	9.8 - 29.8
1974	14	50 - 66	57.71	22.7 - 18.8
1976	29	27 - 72	51.83	5.8 - 29.8
1978	94	46 - 80	63.06	9.8 - 2.9
1979	109	41 - 81	67.60	20.8 - 10.9

According to the table and to observations on the general appearance (metamorphosis usually completed, pigmentation on the blind side fading or already lacking) the size at which Greenland halibut at East Greenland seek bottom is about 70 mm and bigger. Most probably the fry at that stage will seek bottom in the East Greenland fjords as already assumed by TANING (1936).

Off the north coast of Iceland, the size range for all years was 38 to 74 mm, av. 52.4 mm.

#### DISCUSSION.

Fig. 3 indicates a stronger drift of Greenland halibut fry from the Icelandic spawning area to the East Greenland shelf area than to the areas at the Icelandic coasts. The strength of the Irminger current and other hydrographical conditions at the time of spawning will doubtless have a strong influence on the direction of the larval drift and the magnitude of the recruitment. In some years the direction might only be towards East Greenland.

The complete lack of 0-group Greenland halibut in some years indicates that the time at which Greenland halibut is spawning is rather restricted but varies somewhat in the timing.

It is assumed that young Greenland halibut of similar size as observed in Axafjörður early this year, live also for some time in shallow waters off East Greenland probably mainly off Angmagsalik.

Since the mid fifties, a number of Icelandic research cruises have been carried out in East Greenland waters. These cruises have mainly been directed to the outer banks of the East Greenland continental shelf and to the slope areas, using bottom trawl usually with the codend lined with fine-meshed net. Young stages of Greenland halibut have, however, not been recorded on these cruises. It is, therefore, unlikely that young Greenland halibut on their way back to Iceland will migrate along the continental slope area. It is more likely that they will eventually move in the East Greenland current closer to the shore along East Greenland north-eastwards.

According to the information received by the 0-group surveys, the nursery grounds for the Greenland halibut spawning west of Iceland, are mainly located off East Greenland. But the above described findings of young Greenland halibut in Axafjörður (North Iceland) indicate alternatives which are most probably very much dependant on the strength of the ocean currents at the time of the larval drift.

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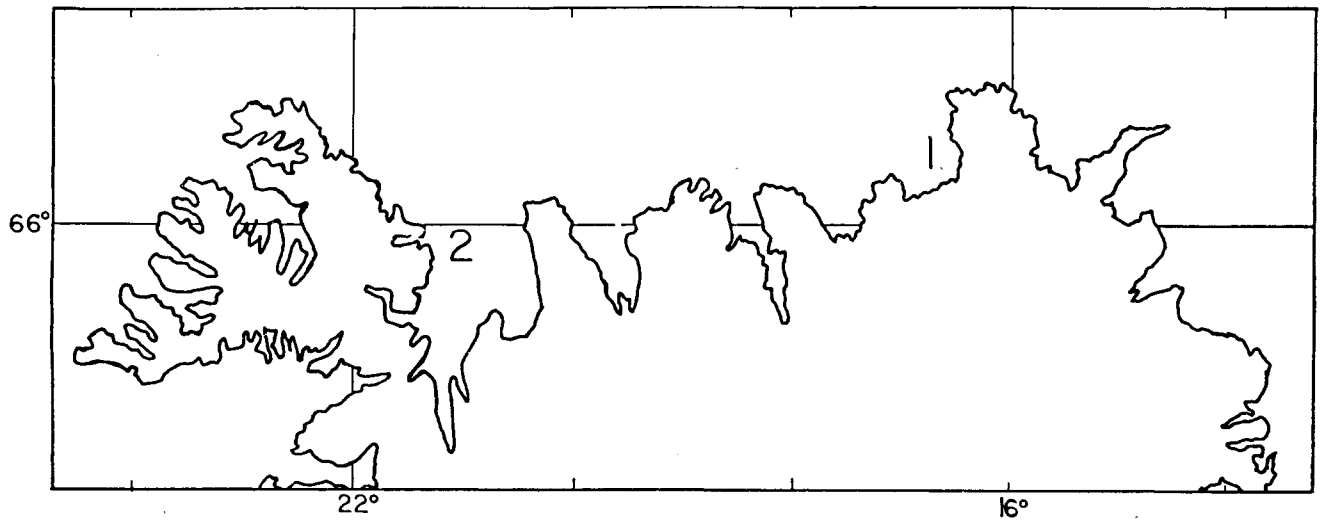


Figure 1: Locations of the findings of small Greenland halibut at the North coast of Iceland. 1 Axarfjörður 2 Húnaflói.

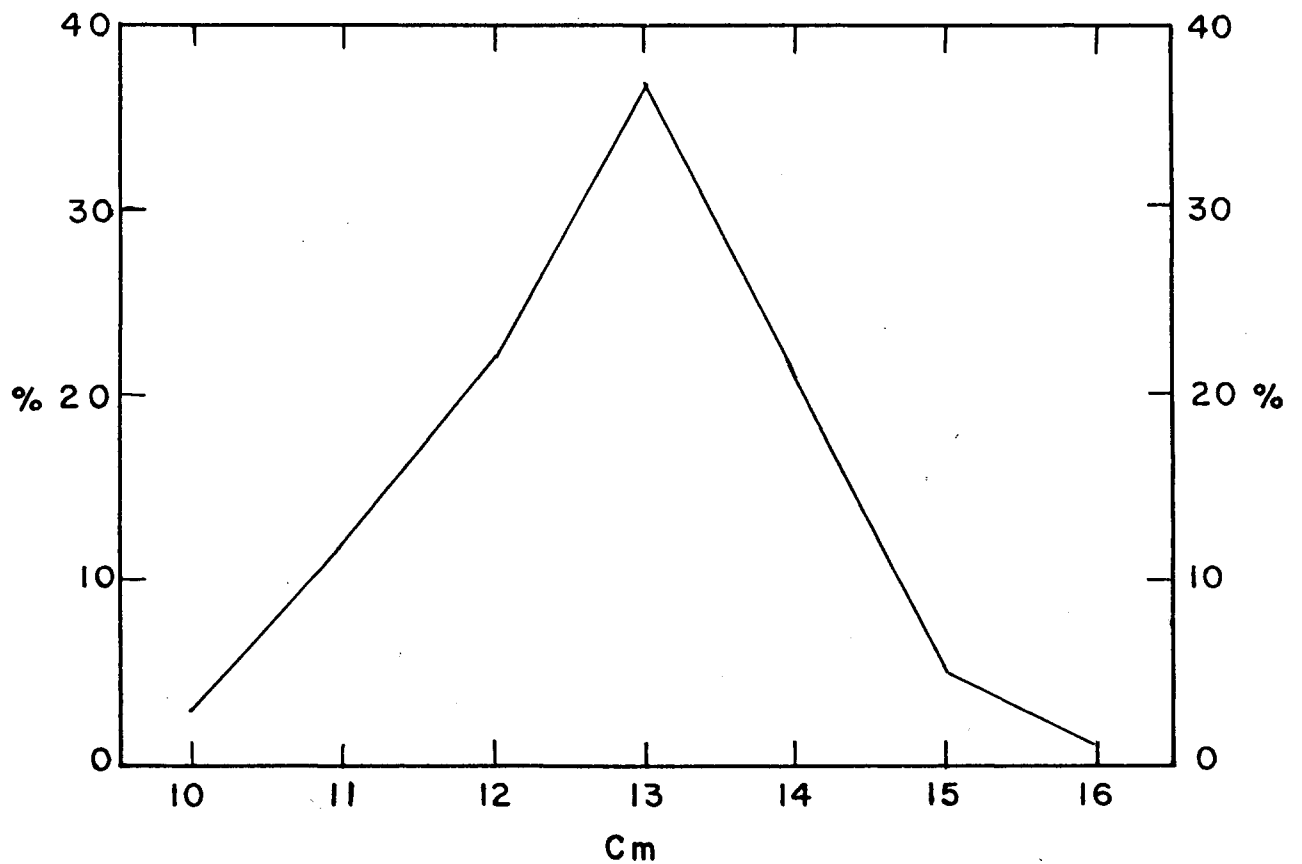


Figure 2: Length distribution of one year old Greenland halibut from Axarfjörður (North Iceland).

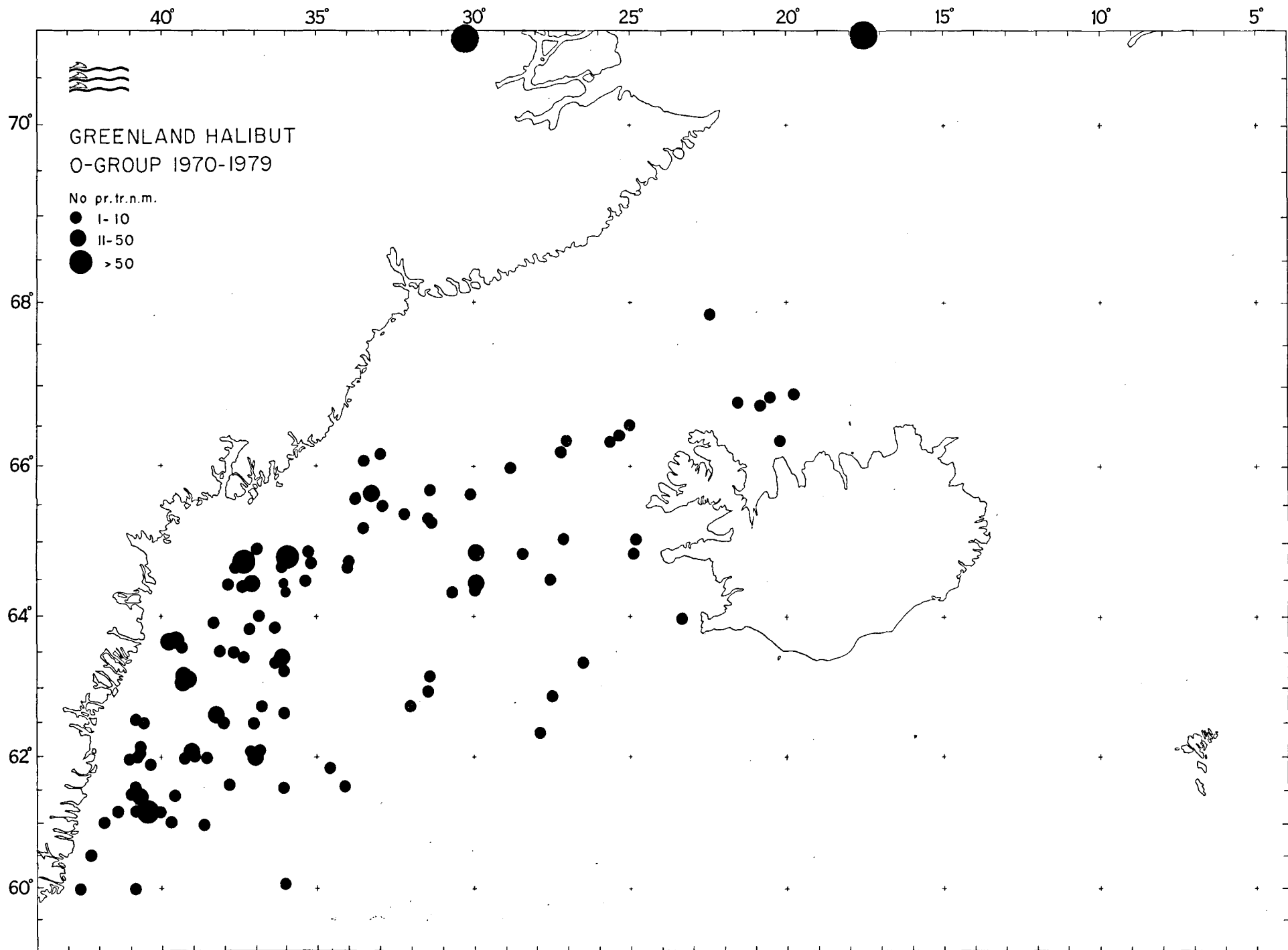


Figure 3: Distribution and abundance of 0-group Greenland halibut from 0-group surveys 1970 - 1979.