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Young Cod Distribution and Abundance in
West Greenland Inshore Areas, 1989

by

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1. Introduction

A survey using links of gill-nets with different mesh-sizes has been developed and used since 1985 (Hansen and Lehmann 1986, Hovgård 1987, Hovgård and Nygaard 1988, Nygaard et al. 1989). The objective of this programme is dual a) to gain knowledge on the geographical distribution of young cod and b) to assess the relative year-class size of 1- and 2-year old cod.

2. Materials and methods

The young-cod survey was carried out in June-July, 1989 in three inshore areas off West Greenland: Qaqortoq (NAFO Div. 1F), Nuuk (Div. 1D) and Sisimiut (Div. 1B) (Fig. 1).

The links of gillnets contained separate sections with mesh-sizes of 16.5, 18, 24, 28 and 33mm (bar length) arranged in random order. The catching capacity of each mesh-size is bimodal as the cod is attached either behind the gill-cover or at the jaw (mandibulars). Catch efficiency at both catching sites are simply related to fish size, but the gill catching is 4 to 5 times as efficient as the jaw-catching (Hovgård 1988). With the mesh-sizes used fish from 15cm are caught, but large fish are caught with lower efficiency.

A total of 208 net settings were made (Table 1). Nets were set floating or at the bottom at depths ranging from 2 to 35 m. Average fishing time was 7.2 hours, range 3.8 to 12.9 hours, and catch rate (number caught per hour) for each age group is used as an index of abundance.

3. Results

Distribution pattern of young cod

Length frequency distribution of the catch for each mesh-size is shown in figure 2, and age and length composition of the catch by Division in figure 3.

During the survey a total of 2005 cod were caught. In the northern part (Div. 1B) catches were dominated by 2- and 3-year olds, but also cod 4 years and older were caught in substantial amounts. In Division 1D catches were dominated by 2-year olds with smaller amounts of 3-year olds and older fish, whereas in the southern part (Div. 1F) the older cod (4+) dominated, though in small numbers only (Fig. 3).

Only four 1-year old cod were caught (Div. 1B), which indicates a poor recruitment of this year-class, as 1-year olds are caught efficiently by the smaller mesh-sizes when abundant (Hansen and Lehmann 1986).

Catch rates of 2-year olds, by area and depth are shown in table 2. Highest catch rates were generally found in Div.1B, whereas the catchrate was somewhat lower i Div.1D, and very low i Div.1F. For all Divisions catchrates were very low in the floating nets.

Year-class indices

Year-class indices are calculated as the mean of the CPUE given in table 2, excluding surface settings and setting below 20m where effort has been scarce and density is low.

In 1985 and 86 only three mesh-sizes (16.5, 24 and 33mm) were used, whereas in the 1987, 88 and 89 surveys five mesh-sizes (18.5 and 28mm added) were used. For comparison indices using both three and five mesh-sizes have been computed (table 3).

By comparing the abundance indices for 2-year old cod, the 1987 year-class is estimated to number between 75% (three mesh-sizes) and 66% (five mesh-sizes) of the 1985 year-class. The index of the 1 year-olds (1988 year-class) is set as zero.

Discussion

The 1986 year-class show a northern distribution, as found in last years survey. This corresponds with the distribution from Div.1D and farther north found in the offshore trawl survey in the autumn of 1988 (Anon. 1989), and indicates a local West Greenland origin of this stock component.

The 1987 year-class also has a northerly distribution, and again this seems to correspond with the findings from the offshore trawlsurvey in 1988, even if this year-class is poorly caught by the trawl (Anon. 1989). The abundance index is around 70% of the 1985 year-class, and hence the 1987 year-class could account for some 70 mill. fish at age three, using the index as face value and figures for the abundance of the 1985 year-class (Anon., 1989b). This figure is much higher than anticipated by the 1988 survey.

The 1988 year-class does not seem to be abundant compared to the 1984 and -85 year-classes, as one-year olds in effect were absent in this years survey. However, as this was also the situation in the 1987 and -88 surveys, it is to early to judge on the number of fish. In fact the results from these years might indicate, that the number of one-year olds are poorly reflected in the catch of the gillnets.

References.

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Table 1 : Number of gill-net settings by area and depth (hours fished in brackets), 1989.

Area Div.	Qaqortoq 1F	Nuuk 1D	Sisimiut 1B
Depth (m)			
Surface	3 (18)	4 (33)	8 (60)
0 - 5	16 (105)	10 (73)	15 (127)
5 - 10	21 (139)	12 (89)	15 (117)
10 - 15	13 (85)	11 (79)	15 (120)
15 - 20	17 (109)	10 (77)	13 (105)
20 - 30	4 (27)	4 (29)	5 (35)
30 - 40	6 (38)	3 (24)	3 (19)
total	80 (520)	54 (404)	74 (581)

Table 2 : CPUE (Nos. per hour) of two year old cod (1987 year-class) by area and depth.

Area Div.	Qaqortoq 1F	Nuuk 1D	Sisimiut 1B
Depth (m)			
Surface	0.00	0.08	0.02
0 - 5	0.06	0.55	1.00
5 - 10	0.07	1.58	0.52
10 - 15	0.03	0.34	1.43
15 - 20	0.05	0.74	0.98
20 - 30	0.00	0.14	0.52
30 - 40	0.00	0.33	0.33

Table 3: Indices of year-class strength.

Meshsizes 16.5, 24 and 33mm.

Survey	Age 1	Age 2
1985	0.74	+
1986	0.09	1.61
1987	+	0.36
1988	+	0.09
1989	+	0.27

Meshsizes 16.5, 18, 24, 28 and 33mm.

Survey	Age 1	Age 2
1987	+	0.93
1988	+	0.25
1989	+	0.61

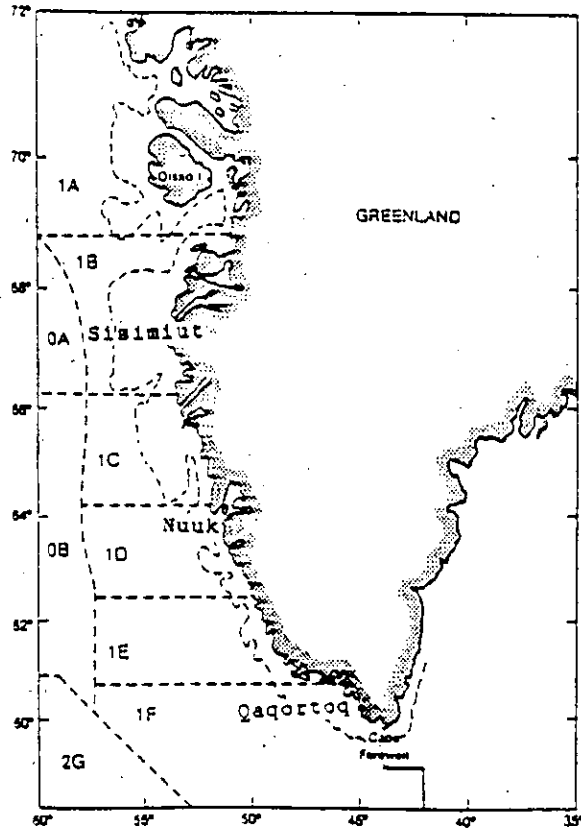


Fig. 1 Map of West Greenland.

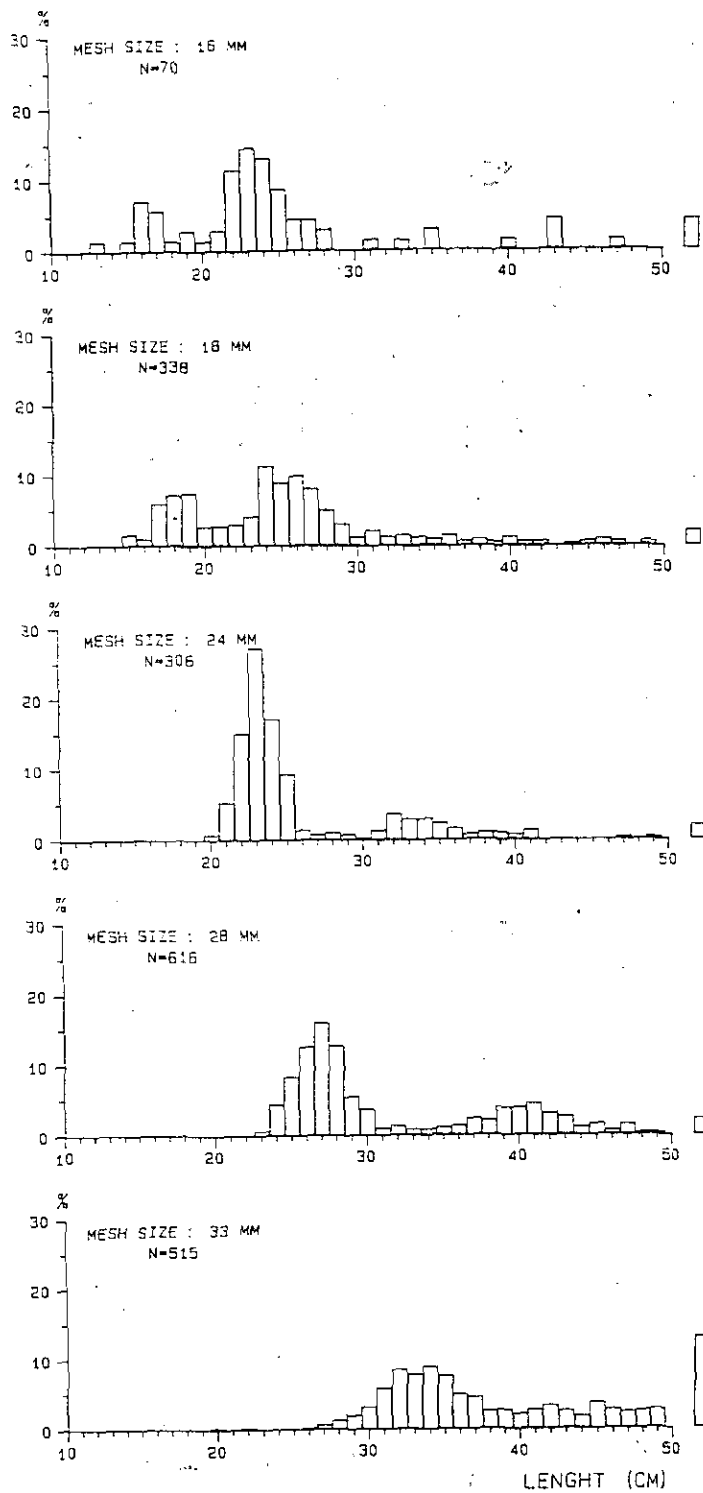


Fig. 2 Length-frequency distribution for the different mesh-sizes.

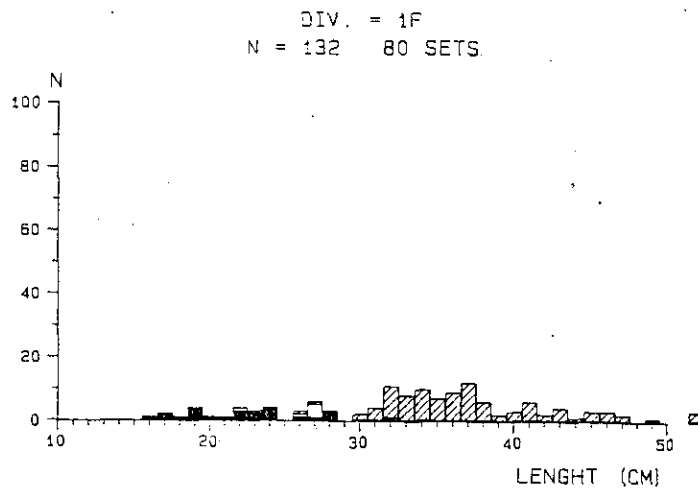
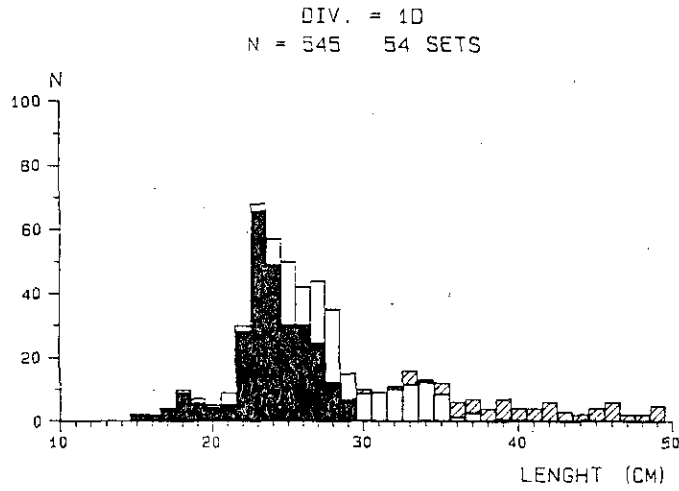
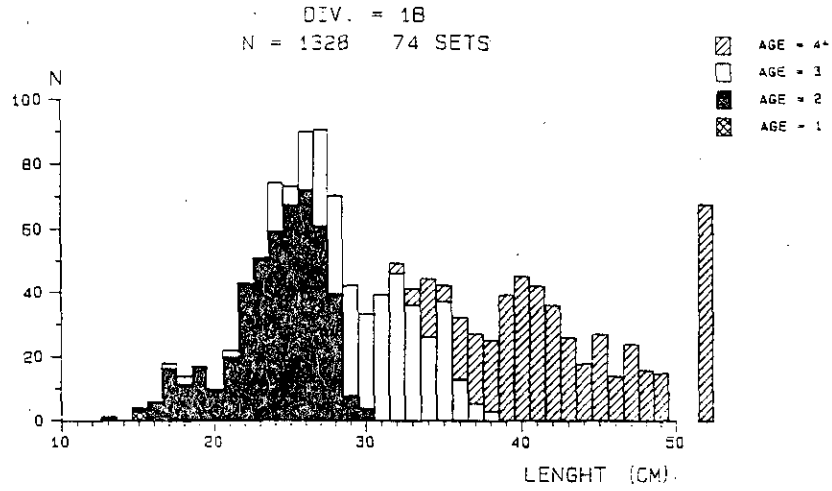


Fig. 3 Length-frequency distribution by Division.