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Danish Research Report, 1969

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Subarea 1

A. Status of the Fisheries

I. TABULAR SUMMARY.

The nominal catches taken by Denmark (Greenland) in 1969 are given in the following table

Table 1. Greenlanders' nominal catches, 1969 (provisional figures).

Species	Nominal catch tons	Increase or decrease from 1968 (%)
Cod	21,315 ⁺	0
Redfish	56 ⁺	-59
Wolffishes	3,356	-13
Greenland halibut	1,221	-22
Atlantic salmon	1,240 ⁺⁺	+114
Capelin	175	-13
Sand eel	225	-4
Lumpsucker roe (not converted to round, fresh fish)	256	+61
Other fish (mainly Arctic char)	181	+218
Deep sea prawn	5,982	+7
Total	34,007	+1

⁺ Excl. 2,934 tons cod (-59 %) and 82 tons redfish (+52%) landed by small Faroese boats in Føringehavn (Div. 1D).

⁺⁺ Excl. Danish drifters (app. 410 tons).

II. COD.

1. The fisheries. After a decrease of about 23% from 1967 to 1968 the nominal catch of the Greenlanders in 1969 was similar to that in 1968. It is remarkable, however, that nearly 10% of the Greenlanders' catch of cod was

taken by their first trawler, which began fishing in late May. Without the intake of this new effort Greenlanders' catches would have continued the downward trend.

Last year's research report predicted a small increase in the Greenlanders' cod fishery, but this prediction did not come true. The main reason for this is the extremely severe ice condition in the first 7-8 months of the year. Polar ice ("storis") occupied the whole inshore region from Cape Farewell to Godthåb until the beginning of August causing great difficulties for the spring and summer pound-net fishery especially, and also creating difficulties for the activity of the trawler.

2. Forecast for 1970-71. Although a small increase in 1969 catches were expected by normal fishing conditions, it should be mentioned that the catch would still have been rather poor compared to most years in the 1960 decade due to the poor recruitment in recent years and to the heavy exploitation in the decade (excl. 1969). Percentage age composition given in histograms will nearly always show one or two predominant year-classes, but these may nevertheless be poor compared to good year-classes no longer existing. At present no real strong year-classes seem to be present in the exploited stock or among the pre-recruits and the total international catch is, therefore, expected rather low in the years 1970-71 at least, especially if continued severe ice conditions cause a further withdrawal of non-Greenlandic fishing vessels from the subarea.

III. ATLANTIC SALMON.

Salmon stock and catches, especially in the offshore areas, were reported to be very good from the beginning of August to late October when fishermen reported that salmon disappeared rather suddenly from the fishing area. Inshore stock and catches varied very much between districts being very poor in the whole of Div. 1F and around Godthåb in 1D but probably normal in other districts. For the first time some Greenland vessels participated in the offshore drift net fisheries. Greenlanders' catch more than doubled from 1968 to 1969 but is still lower than in the years 1964, 66 and 67. All catches consisted of fish in excellent condition. For further information see the report of the ICES/ICNAF Joint Working Party on North Atlantic Salmon, February 1970.

IV. OTHER FISH.

Fisheries for wolffishes, redfish and Greenland halibut decreased, whereas the rather important fishery for lumpsucker, of which the roe is used for caviar increased. There was a trebling in catches of Arctic char due to a probably similar increase in effort.

The decrease in the traditional fishery for Greenland halibut can probably be ascribed partly to the extensive prawn fisheries which take great quantities of very small Greenland halibut.

V. DEEP SEA PRAWN.

An increase in catches was possible as the capacity of the most important plants was increased (e.g. by further installation of peeling machines). Prawns

are now fished inshore in all divisions, the most important grounds still being those in the Disko Bay, Div. 1A, accounting for about 90% of the total catch.

B. Special Research Studies

I. ENVIRONMENTAL STUDIES.

1. Hydrography. See F.Hermann, Part II of this report.

II. BIOLOGICAL STUDIES.

1. Cod.

a. Eggs and larvae. Hauls with a 2 m stramin net were taken on the hydrographic standard sections in the Davis Strait in April-August and on a permanent station at the entrance to Godthåb Fjord (Div. 1D). The hauls were taken as oblique hauls from app. 50 meters depth to surface (wirelength 225-0 m).

By careful analyses part of the eggs (in 1969 17%) called cod eggs when sorting them macroscopic on board vessel has shown not to be so but presumably Brosnius. Figures presented here show what is regarded to be pure cod eggs whereas figures in Danish research reports of most recent years no doubt contain non-cod eggs although not necessarily as many as 17%.

Eggs taken in April and May are shown in Fig. 1. Number of eggs is small compared to 1968 and other years. As in previous years the main spawning areas are found at the western slopes of the West Greenland fishing banks (Divs. 1D-1C). Ice prevented the planned hauls in Div. 1E.

In previous years the best period for taking the larvae has been in July. Various circumstances unfortunately made it impossible to operate in July 1969. Comparison to previous years' amount of larvae is, therefore, difficult. However, the number of larvae taken in June and August (Fig. 2) does not give any support to optimism as to the strength of the 1969 year-class of West Greenland origin, nor does the hydrographic situation do so, except for Div. 1B probably.

b. Occurrence of pre-recruit cod (age-groups I, II and III). Age-group I (the 1968 year-class) has not been observed in any catches by small-meshed gears, nor in any significant numbers by visual observation on shallow water.

Age-group II (the 1967 year-class) has been observed in pound-net catches in Div. 1B (Sample 1 in Fig. 3) and is also likely to constitute part of the reported discarded fish from pound-net catches in Div. 1C. In Div. 1D, however, discards have not amounted to any great quantities compared to Divs. 1B and 1C, so the 1967 year-class does not seem to be of any importance in the southern part of the subarea and of only minor importance in the northern part.

Age-group III (the 1966 year-class) constituted by far the major part of pound-net catches in Div. 1B (Sample 1), and although most individuals (those below app. 40 cm total length) are normally discarded the age-group is also represented in the landings (Sample 2). The age-group is also likely to constitute the major part of discards in Div. 1C. Furthermore this age-group has been observed in Div. 1D, inshore by beach-seine (Sample 6) and offshore by small-meshed otter trawl (Samples 10-13). The 1966 year-class thus seems

to be of some importance, but it is rather difficult to compare its size to former strong year-classes as for example the year-class 1961. In an effort to get comparable figures between years of the pre-recruits some standard trawling stations have been set up. Regular trawling will take place here by a standard trawl, 36 mm cod-end. As we have no comparison to previous years the figures for 1969 do not tell very much about the strength of the pre-recruit year-classes. They are, however, given here for the (in respect to cod) best standard station for future reference.

Table 2. Number of cod per hour's trawling on standard station "Godthåb Dybet", 63°56'N.52°21'W., depth app. 300 m. Otter trawl, 36 mm cod-end. Ref.Nos. 4142, 4164, 4168 and 4213 correspond to Samples 10, 11, 12 and 13 respectively in Fig. 3.

Date	Ref.No.	Total time trawled (min.)	Nos.of hauls	Nos. of cod per hour and age-group						
				II	III	IV	V	VI	VII	VIII+
8-9 Jan.	4142	183	3	0	70	208	68	27	8	13
21 Feb.	4164	45	1	0	103	261	109	41	8	4
4 Mar.	4168	120	2	0	65	157	89	47	9	6
7-8 May	4213	180	3	2	273	130	12	8	0	1

c. Age and size distribution of cod in landings. In Divs 1B, 1C and 1D inshore pound-net landings consisted mainly, in some cases nearly exclusively, of the 1965 year-class (Samples 2, 3, 8 and 9) although in some landings from the Godthåb Fjord (1D) the 1963 year-class was the predominant one (Sample 7). The 1965 year-class is furthermore strongly represented on the standard trawling station in Div 1D offshore mentioned in Section II, 1, b (Samples 10-13) and even in research vessels long-line catches in the same division (Samples 16-20). It is remarkable, however, that landings from the trawler in Divs. 1C-1D hardly contain fish of this year-class (Samples 5 and 14), the most likely explanation for this being that most of these relative small fish did escape the 140 mm meshed cod-end. It is further remarkable that the 1965 year-class is nearly completely absent from samples in Div. 1E, in research samples (Samples 21, 22) as well as in Greenlanders' commercial samples (Samples 28, 29, Fig. 4).

In most cases, where the 1965 year-class is of minor or no importance it is substituted by the relative good year-class 1963, this especially being the case in Div. 1E (Samples 21, 28, 29) for gears other than long-line, whereas a long-line sample in Div. 1E is dominated by the (originally) very good year-class 1961 (Sample 22). The 1961 year-class has furthermore been of some importance in commercial landings in Div. 1B (Samples 23-25) where also year-class 1960 still is of some importance. These two year-classes, 1960 and 1961, together with year-classes 1962 and 1963 have also contributed considerably to trawler landings from Divs. 1C-1D (Samples 5 and 14), the same being the case for a research hand-line catch in Div. 1D (Sample 15).

d. Tagging experiments. A total number of 2434 cod was tagged. Of these 1205 were small cod (less than 50 cm total length) caught mainly in inshore waters in Div. 1D by pound-nets or beach-seine. Details are given in the following table:

Div.	Inshore		Offshore	
	small cod	big cod	small cod	big cod
1B	3	53	0	0
1C	0	0	53	366
1D	1139	5	4	507
1E	0	0	6	298
Total	1142	58	63	1171

2. Atlantic salmon. Research was carried out in collaboration with scientists from UK and Canada. As special papers on this work were presented to the ICES/ICNAF Joint Working Party on North Atlantic Salmon only a very brief summary is given here.

Research efforts were concentrated on tagging salmon caught offshore on floating long-lines and on measuring the unknown tagging mortality for gill-net caught salmon. Unfortunately only small quantities of salmon were caught in the UK-Danish experiments. Floating long-lines offshore in Div. 1B yielded a total catch of 66 salmon of which 44 were tagged being in apparently excellent condition. At Godthåb 15 salmon caught in inshore gill-nets were tagged.

Further efforts concentrated on sampling catches for age and size distribution, blood and tissue samples.

At least 307 salmon tagged in Europe-North America have been recaptured in Greenland waters in 1969. Of these 180 have been received (bought) as round fresh fish which will be used for parasite investigations.

3. Other fish. Materials for studies of capelin were collected in several districts. Material on Greenland halibut was collected at Jakobshavn (Div.1A), where fishing is taking place from the ice in winter, and at Godthåb (Div.1D). 27 redfish and 1075 Greenland halibut were tagged in the Godthåb Fjord (Div.1D).

4. Deep sea prawn. Research catches have been sampled, especial those taken on offshore grounds in Divs. 1B-1D. The purpose is to obtain information on possible seasonal variations in stock size on the various grounds and of possible year-class fluctuations, and to estimate potential stocks.

5. Research on seals. Preliminary research on seals has started. In first instance an evaluation of the reliability of catch statistics and of age determination of material previously collected is planned, and steps have been taken to sample harp and hood seals in 1970. Canada and Norway have kindly offered their assistance in establishing this work.

C. Practical Fishing Experiments

For several years the Royal Greenland Trade Department has conducted practical fishing experiments in Greenland waters. The main purpose is to investigate possible potentials in the sea and to try new fishing methods. Results of this work is evaluated in close co-operation with the fisheries biologists. The most important experiments in 1969 have been

I. Experimental fishing for sand eel.

Sand eels were trawled on the offshore banks in Div. 1D in June and August. 21 days fishing yielded 192 tons. Hauls varied from 30 to 70 minutes with a mean catch of 2.1 tons per hour. Part of the catch has been frozen for baits in the long-line fishery for cod.

II. Experiments in the prawn fishery.

These experiments have concentrated on locating grounds with big prawns and on methods for ensuring the very best quality, especially during the handling and storage on board. A very high quality of the prawns is necessary for the modern mechanical peeling, and careful handling combined with efficient cooling on board vessels seems to meet demands efficiently.

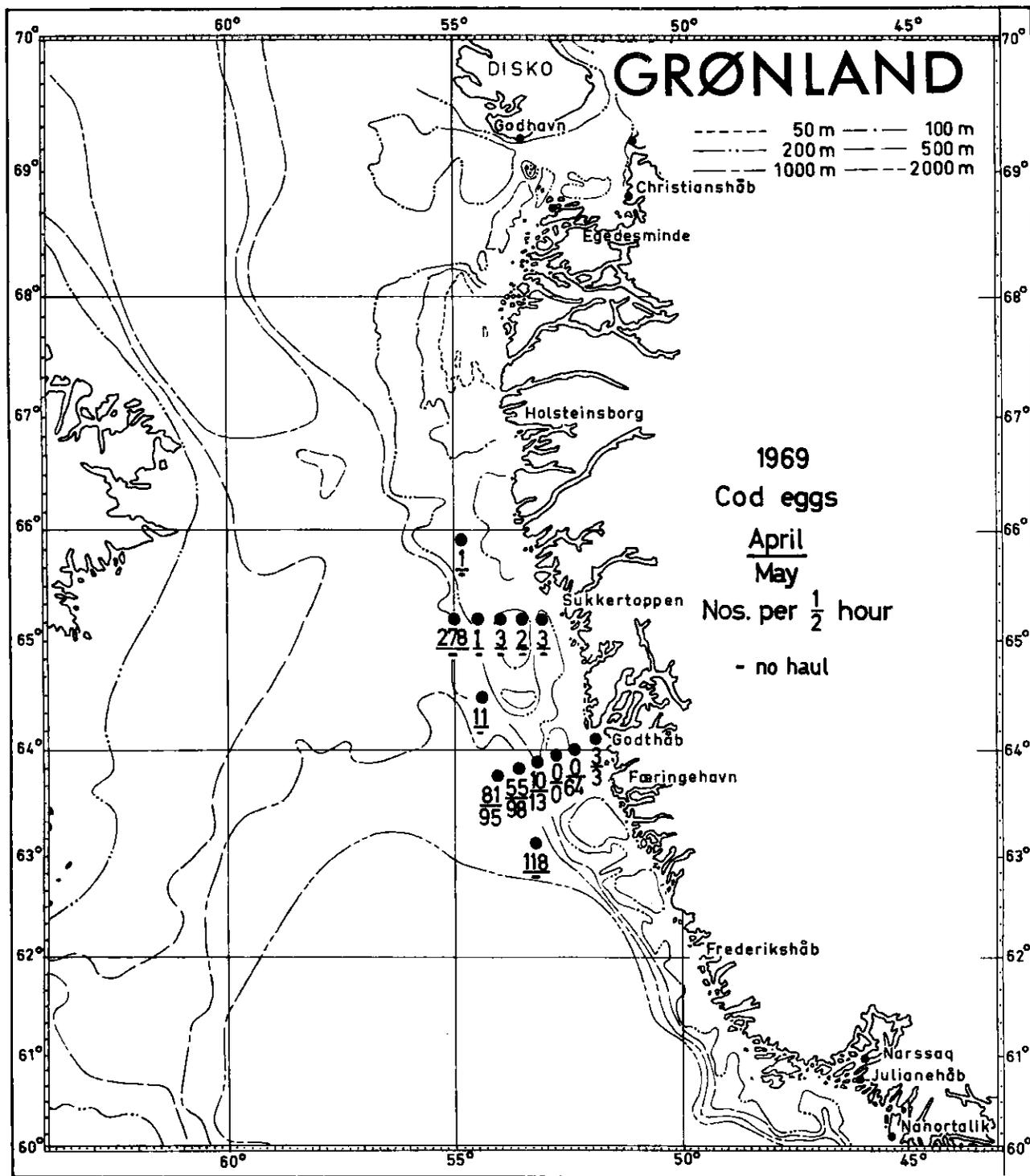


Fig. 1. Cod eggs (numbers per 1/2 hour) taken by 2 m stramin net in the upper water layers (maximum depth about 50 m).

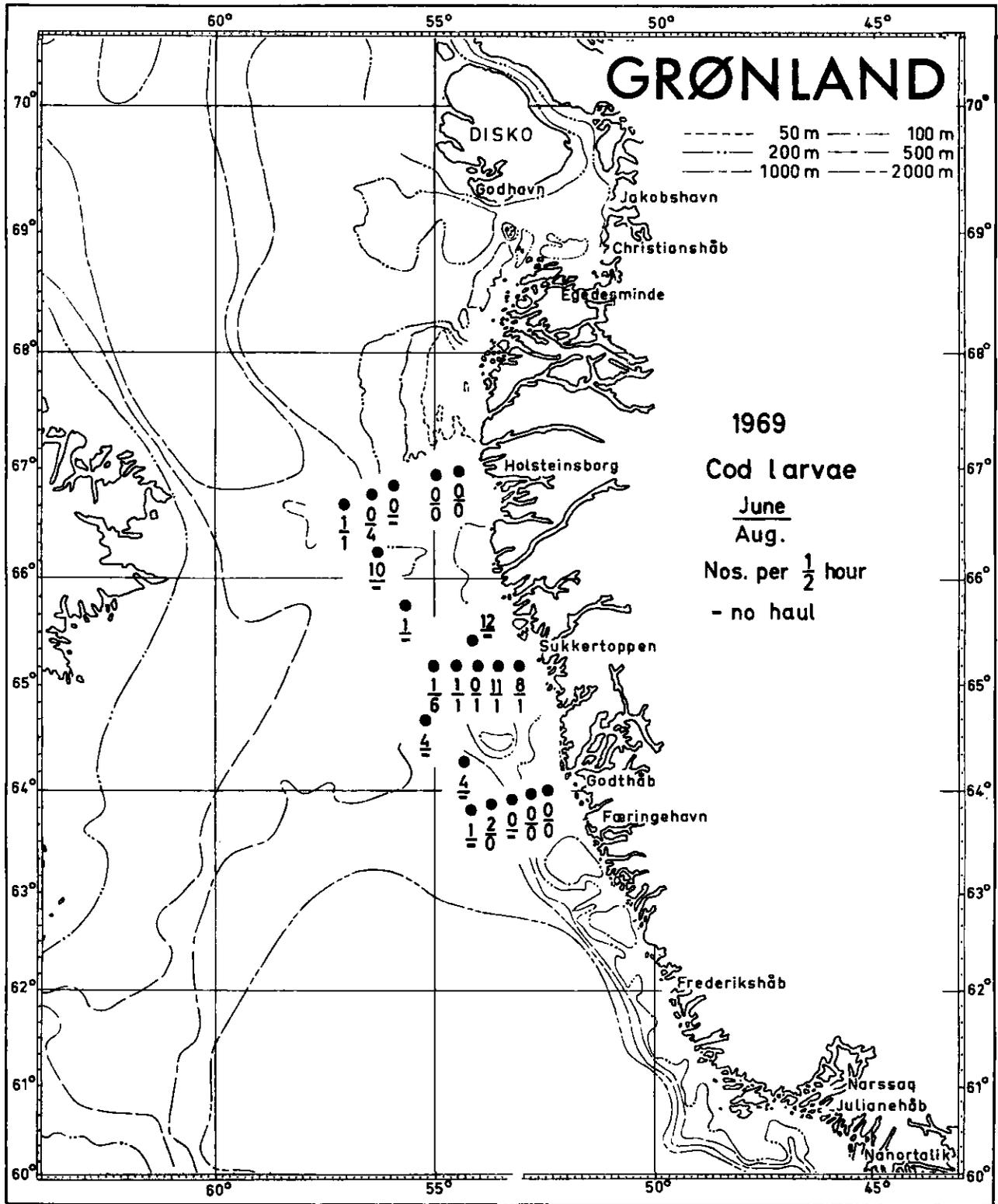


Fig. 2. Cod larvae (number per 1/2 hour) taken by 2 m stramin net in the upper water layers (maximum depth about 50 m).

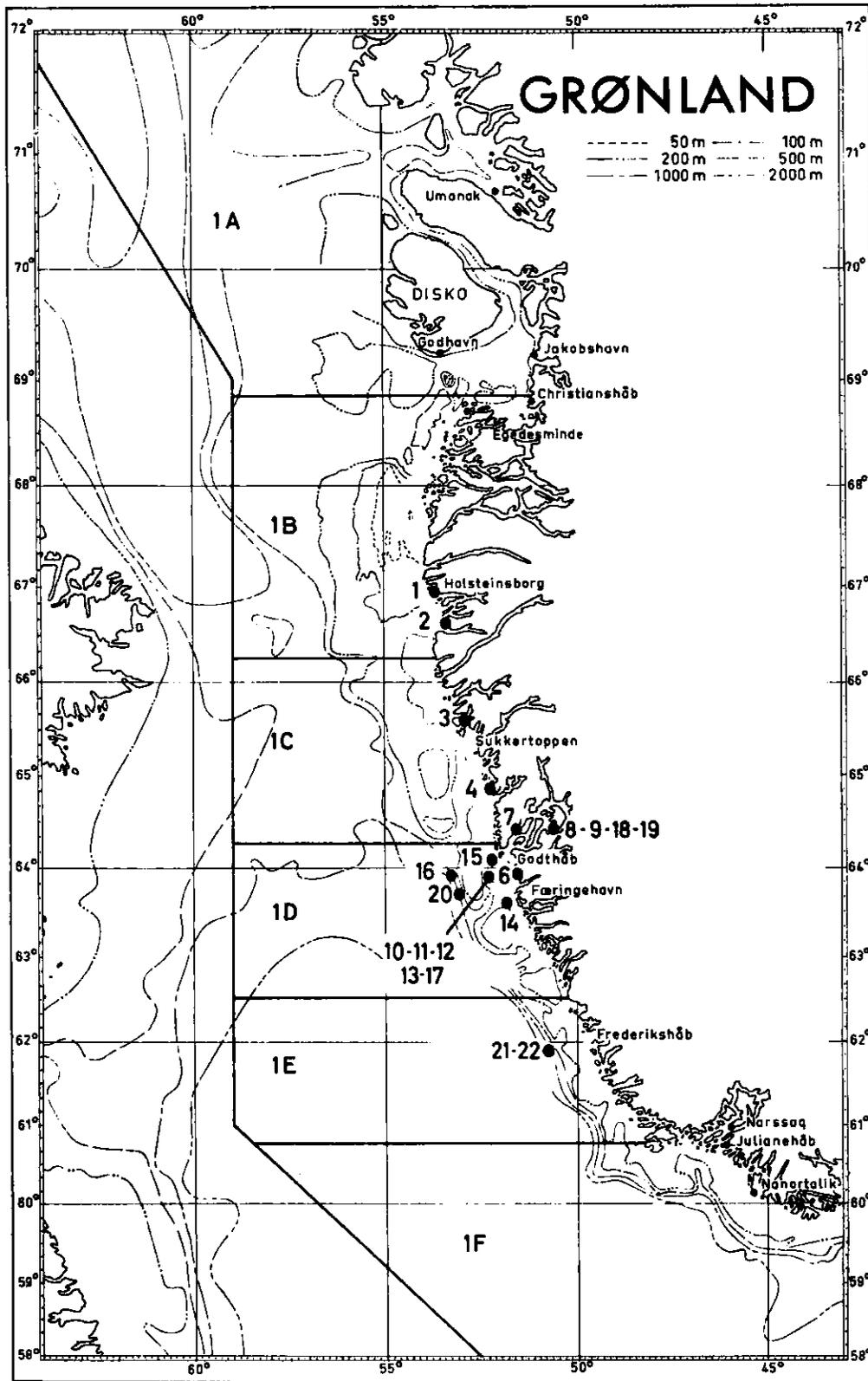


Fig. 3. Map showing localities of samples in Fig. 4.

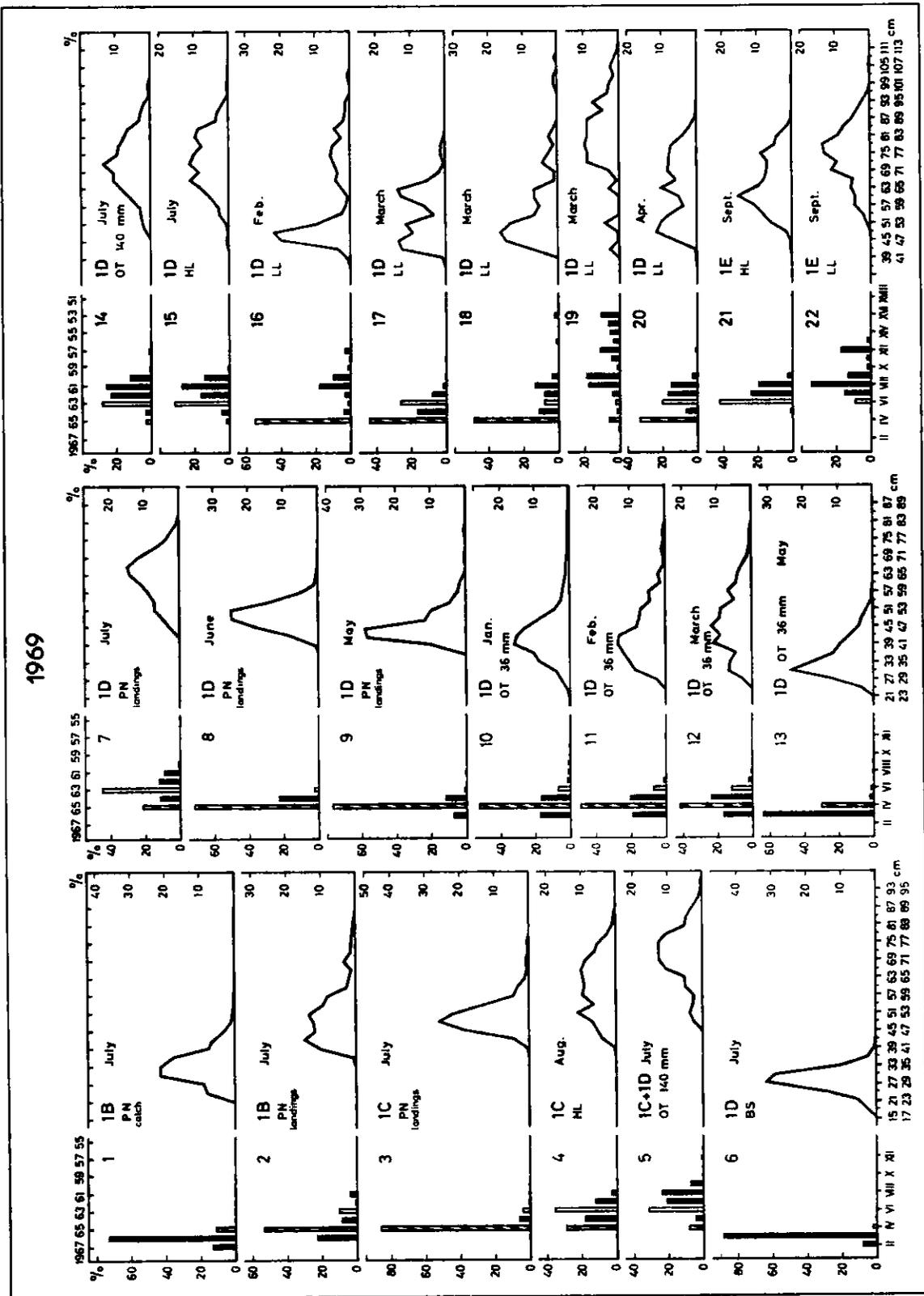


Fig. 4. Age and length compositions of cod sampled by the fisheries investigations from research vessel (Samples 4, 6, 10-13, 15-22) or from commercial vessels (Samples 1-3, 5, 7-9, 14). BS = beach seine, HL = handline, LL = longline, OT = otter trawl (mesh size in codend added), PN = poundnet.

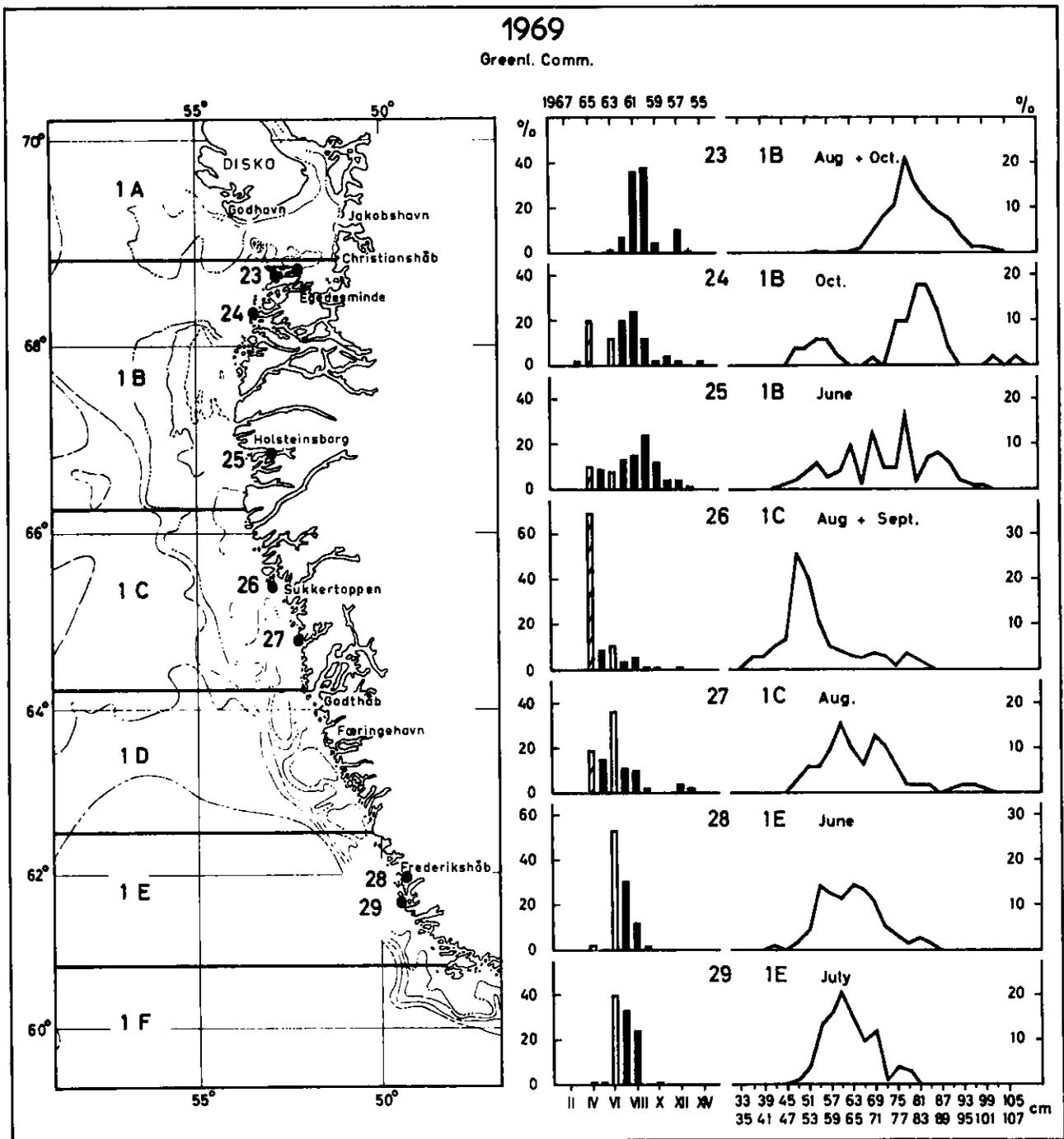


Fig. 5. Age and length compositions of cod sampled by Greenland fishermen from their commercial landings. Gear unknown, but not trawl.