Northwest Atlantic Fisheries Organization

Serial No. N1500

NAFO SCS Doc. 88/16

SCIENTIFIC COUNCIL MEETING - JUNE 1988

Denmark (Greenland) Research Report for 1987

Edited by

Klaus Lehmann

Greenland Fisheries and Research Institute, Tagensvej 135
DK-2200, Copenhagen N, Denmark

In September 1987, the Greenland Fisheries and Environment Research Institute (Grønlands Fisheri-og Miljøundersøgelser) was split up into two institutes of which the Greenland Fisheries Research Institute (Grønlands Fiskeriundersøgelser) continues to work on fihsery resources and marine mammals and on related matters such as hydrography.

This report contains information on the fisheries by Greenland vessels and on research carried out by the Greenland Fisheries and Environment Research Institute in the NAFO Area and at East Greenland (ICES Subarea XIV) in 1987. Such work which is of minor interest to NAFO, e.g. work related to environmental protection is not mentioned. Some of it, namely that related to marine studies has been reported to ICES Marine Environmental Quality Committee (Doc. CM 1987/E:1). Various scientists in the institute have contributed to the report. Some information on fisheries by Danish, Faroese and Japanese vessels in joint-venture arrangements is also given.

SUBAREA 0

One of the 36 stations operated in the shrimp survey by the R/V ADOLF JENSEN in July-August was on the shrimp grounds adjacent to the major offshore grounds in Div. 1B.

SUBAREA 1

A. STATUS OF THE FISHERIES

1. General trends

Preliminary statistics for the fisheries in 1987 are given in Table 1. Preliminary figures supplied for the year prior to the NAFO June meeting are usually very close to the final figures. However, due to increased complexity of the fishery in Greenland the preliminary figures here supplied for 1987 may differ somewhat from the final figures to be supplied later in the year.

The total catch in 1987 increased from 87,000 tons in 1986 to 104,000 tons in 1987. The catches of cod increased to the not very high level of 19,000 tons after years with declining catch. The catches of shrimp continued to increase to a new high level of 69,000 tons. The catches of Greenland cod and capelin were halved and the catch of redfish deminished to one quarter of the 1986 level. A decrease of 36 percent was observed in scallops catchs. The catches of salmon and Greenland halibut in 1987 were at the same level as in 1986.

Cod

a) The fisheries

Total landings of cod increased from 6,500 tons in 1986 to about 19,200 tons in 1987.

Several regulations were introduced to protect small cod, especially the 1984 year class. In 1987 directed trawl fishery for cod was not allowed by vessels greater than 80 GRT during the first 10 month. The pound net fishery was restricted to places where, based on experience, at least 30% of the catch by weight would be above 40 cm.

The landings in 1987 were roughly distribute on on gears: Trawlers smaller than 80 GRT made 14% of total landings; larger trawlers made 14% as the cod take by- catches in the redfish fishery; these larger trawlers also made 4 % from a directed cod fishery in November and December. Poundnet, gill net, hand line and long line accounted for 29%, 9%, 8% and 22%, respectively.

b) Forecast

The strong 1984 year-class accounted for 63% of the total landings by numbers. The poor year-classes of 1983 and 1982 accounted for 17 and 3% respectively, and the former very dominating year-class of 1979 for 7% each.

The 1984 year-class now accounts for about 90% of the total stock as determined from the German (FR) trawl-survey in November, 1987. As this year-class is quite strong (maybe the strongest year-class since the early 1960's) a substantial improvement in the fisheries is expected for the years 1988-1992.

The 1985 year-class, which have a year-class strength of approximately 25% of the 1984 year-class will recruit to the fisheries during the years 1988-1990.

Shrimp

a) The fisheries

The total nominal catch of shrimp in Subarea 1 in 1987 by Greenland vessels was about 69,000 tons. Approximately 61,000 tons of this total landing were taken in the offshore area including 10,700 tons from the new fishing grounds north of the Davis Strait.

Similar to earlier years - but different from 1986 and 1987 - ice did hamper the access to the main shrimp fishing areas in Division 1B at the beginning of the year. In general the fishing in 1987 took place in the same main areas as in 1985 and 86, with more fishing effort being spent in the southern parts (Divisions 1C and 1D) compared to earlier years (NAFO SCR Doc. 87/8).

The fishery north of 71° N, in which 33 vessels participated in 1986, took place from June to December.

b) Forecast for 1987

The status of the offshore shrimp stock in Subarea 1 was assessed by the Shrimp Working Group of STACFIS in January 1987. Data presented at this meeting indicated continued stability in shrimp abundance since 1982, and it was therefore advised that the overall TAC in 1987 for the offshore fishing grounds in Subarea 1 and adjacent parts of Subarea 0 should not exceed 36,000 tons, which is of the same magnitude as the TAC advised for 1986. Giving this advice, the Working Group however, noted that the apparent stability in the stock might not be present, as catch rates in recent years could be biased upwards due to the introduction of more efficient gears in the fishery. At the annual meeting of NAFO in September 1987, STACFIS review the status of the stock. As no new information was presented, STACFIS advised the same overall TAC for 1988 as for 1987.

4. Salmon

The reported nominal catch of salmon off West Greenland in 1987 was 966 tons, 31 tons higher than the set TAC.

The major part of the catch was taken by drift nets. Effort and catches during the first two weeks of the fishery indicated a lower abundance than in 1986, but higher than in previous years. The catch distribution between NAFO divisions differs from last year, where the catches in NAFO div 1F were the highest. However, in 1987 the distribution between divisions returned to normal, where the main fishing area is NAFO Div. 1C to 1E.

5. Capelin

Capelin is fished inshore and in the spawning season only. In the three most recent years, the fishery has mainly been directed towards roe-bearing females. 421 tons were landed in 1987, including a small catch for local consumption. The landings in 1987 were less than half of the landings the year before. The larger part of the catch was taken in Div. 1A.

6. Redfish

600 tons were landed in 1987 compared to 2,800 tons in 1986. This drastic decline could be due to reduced abundance, as there is indication that effort in 1987 has been at the same level as in 1986. The catch was taken offshore in a directed redfish trawl fishery in division 1D-1F.

7. Greenland halibut

The landings in 1987 of Greenland halibut were 8668 tons which is an increase of 4% compared to 1986. In Div. 1A the landings has increased by 16% compared to the year before and constitutes 88% of the total catch in 1987. The fishery for Greenland halibut is mainly an inshore fishery with gill nets and longlines.

8. Other fish

Landings of halibut increased with 100 tons to 198 tons and wolffishes with 220 tons to 1,889 tons in 1987. These two species are caught as by-catches in cod and redfish trawl fishery with a rather constant CPUE, be assumed that the cod and redfish fishing effort has not declined in 1987 compared to 1986.

B. SPECIAL RESEARCH STUDIES

I. ENVIRONMENTAL STUDIES

1. Hydrography.

In 1987 three hydrographic cruises were performed with the R/V "ADOLF JENSEN". In March measurements were carried out on the standard sections between Fylla Bank and Cape Farewell. In July and November the sections between Fylla Bank and Disko Bay were covered. In addition to these two cruises hydrographic observations were made:

- at the Fylla Bank section regularly throughout the year.
- in connection with biological observations at various stations along the west coast of Greenland.

The parameters observed were temperature, salinity, oxygen and nutrients.

a. Temperature.

Air temperatures over the West Greenland area have been in 1987 oscillating around the normal with anomalies between - 3 C and +1 C, the coldest period being the winter months.

The sea temperatures have in general shown slight negative anomalies at all depths except for the westernmost stations in July. Also the salinities showed negative anomalies. Since the inflow of East Greenland water in 1987 was relatively low, the negative temperature anomalies are believed to be due to atmospheric influence.

II. BIOLOGICAL STUDIES

1. Cod

a) Occurence of pre-recruit cod

A young-cod survey using gill nets with different mesh sizes was carried out in three inshore areas (Div. 1B, 1D and 1F) during July and August, 1987.

Catches were dominated by the 1984 year class. This year class was abundant in all areas. The 1985 year-class also had a wide distribution and the size of this year class can be estimated at approximatly 20% of the 1984 year class. The 1986 year-class were found to be almost non-existent.

b) Abundance of cod in inshore areas in November

A long line survey was carried out in inshore and offshore areas of NAFO Div. 1C, 1D and 1E. The purpose of this survey was to estimate the relative abundance of cod inside and outside the area covered by the concurrent trawl survey by Germany(FR).

Cod abundance within the inshore areas was estimated as 22% of the total stock, hence survey estimates based solely on the off-shore components would underestimate the total stock size.

2. Shrimp (Pandalus borealis)

As in previous years offshore shrimp surveys were carried out mainly around Store Hellefiske Banke and west of Disko, while inshore investigations were limited.

Information on the distribution of the shrimp fishery and catch rates was obtained from logbooks of Greenland trawlers. Size composition of the stock was evaluated based on analysis of shrimp samples from research surveys and commercial trawlers (NAFO SCR Doc. 88/X and 88/x).

Catch rates in Division 1B have showed an upward trend since 1984, indicating a stability or even an improvement in the stock. These catch rates may - however - have been biased upwards due to the introduction of more efficient traws in recent years. At present it is not possible to quantify the influence of this new gear on catch rates.

Analysis of commercial and research shrimp samples showed the same size groups of shrimp as in preceeding years to be present in the stock. Difficulties in assessing the influence of vertical and horizontal distribution of the different size groups of shrimp did not allow an estimate of the strength of year classes and hence quantification of recruitment to the fishery.

3. Salmon

Samples of commercial catches were taken at fish plants in NAFO Div 1B to 1F in cooperation with scientists from Canada and USA. Altogether 3,000 scale samples and 13,000 length samples were taken, and in total 25,000 salmon were investigated for coded wire micro tags. A few hundred tissue samples and otoliths were taken, used for classification of continental origin.

5. Greenland halibut

Research samples of Greenland halibut were collected in the winter in Godthaab Fiord (Div. 1D) and in the autumn in Jakobshavn and Uummannaq districts (Div. 1A) with longlines. Samples for age/length keys were taken from commercial landings in the same areas both winter and summer. Tagging experiments were done in Godthaab Fiord, Jakobshavn and Uummannaq districts, where a total of 839, 538 and 244 fish, respectively from longline catches was tagged.

6. Other finfish

Scale samples and length distributions of redfish by species (S. marinus and S. mentella) were taken from research trawlings. Some trawling with small mesh in pelagic trawl was carried out in division 1D and 1E, to investigate drifts of 0-group fish from the East Greenland sea area to West Greenland. Length distributions of wolffish by species (A. lupus and A. minor) in Maniitsoq district (Div. 1C) both summer and autumn from the commercial fishery have been obtained.

7. Scallop (Chlamys islandica)

In order to supply information on distribution, abundance, size/age frequency and growth for the inshore scallop resources at West Greenland R/V "MISILIISOQ" made two scallop surveys in 1987. One scallop survey was made in March covering the area around Nuuk (Div. 1D) and one was made in October covering the area around Maniitsoq (Div. 1C).

8. Marine mammals

As part of an international project with the purpose of conducting simultaneous assessments of whale stocks in the North Atlantic (north of 55° N, from the Barent Sea to the Baffin Bay), areal surveys were carried out in West Greenland waters between Kap Farvel and Svartenhuk (Div. 1A-1F) from mid-July to mid-August.

In 1987 no field work on small cetaceans and seals in Greenland was carried out, but material collected in 1986 and previous years was analysed.

Collection of material for the project: "Heavy Metals in the Greenland Marine Environment" was terminated in 1987 by addition of samples from Ammassalik district, Southeast Greenland. The total samples of the projekt include 1600 seals from 14 districts in Greenland, 168 cetaceans from 5 districts, 42 polar bears from two districts, in addition to samples from birds, fishes, crustaceans etc.

EAST GREENLAND (ICES SUBAREA XIV)

A. STATUS OF THE FISHERIES

Provisional figures for the Greenland fisheries in this area (ICES Subarea XIV) show a total of 78,516 tons landed in 1987, an increase of 11% compared to the landing of 70,678 tons in 1986. The main bulk of the landings (84%) is due to the capelin fishery which is a joint-venture arrangement with Faroese trawlers. Compared with 1986 the increase is in catches of capelin increased from 54,000 tons in 1986 to 66,000 tons in 1987, those of shrimp from 5,781 tons to 6,644 tons, and there was a doubling of the cod catches from 606 tons to 1,550 tons. In absolute terms, cod catches are still at a low level. Redfish catches decreased substantially from 9,542 tons in 1986 to 3,300 tons in 1987. Other species were caught in negligible quantities.

Capelin.

The capelin fishery in the East Greenland offshore area was carried out from August through October, totalling 66,330 tons, which is about the same as in the two foregoing years. All catches were taken by Faroese vessels fishing under Greenland licences.

Table 1. Nominal catches (tons) by Greenland vessels[1] in Subarea 1 in 1986 and 1987 (provisional figures), and the relative changes from 1986 to 1987.

Species Nom. catch:	1986	1987 (provisional)	Percentage change from 1985
Cod	6,549	19,202	+193
Greenland cod	5,952	3,048	-49
Redfish	2,780	607	-78
Wolffishes	1,338	1,889	+41
Grenadiers	81	63	-22
Greenland halibut	8,333	8,668	+4
Halibut	99	198	+100
Capelin	1,156	421	-64
Atlanic herring	4	0	-
Atlantic salmon	960	966	+1
Arctic char	126	80	-36
Lumpsucker	189	13	-93
A. plaice	5	2	-
Cusk		3	+
Dogfishes	13	0	-
Skates	1	0	-
Industrial fish and fish not specified	40	1	-
Shrimp	58,179	68,849	18
Scallops	765	487	-36
Sum total	86,900	104,497	20

1) including non-Greenland vessels in joint-venture arrangements, but excluding catches by Danish and Faroese vessels.

1986: Joint-venture catches in 1986 in tons
Cod: 11 - Redfish 2,016 - Wolffishes: 8 -
Greenland halibut: 1 - Atlantic halibut 6 -

Catches of Dansh vessels: Shrimp: 572 tons.

Catches of Faroese vessels: Shrimp: 481 tons.

1987: Joint-venture catches in tons:
Cod: 9 - Redfish: 398 - Wolffishes: 5 - Halibut 1.

Catches of Danish vessels: Shrimp: 502 tons.

Catches of Faroese vessels: Shrimp: 474 tons.

Table 2. Nominal catches (tons) by Greenland vessels1) in ICES Subarea XIV in 1986 and 1987 (provisional figures), and the relative changes from 1986 to 1987.

Species	Nom. catch 1986	1987 (provisional)	Percentage change from 1986
Cod	606	1,550	156
Redfish	9,542	3,300	-65
Wolffishes	71	183	158
Greenland halibut	177	403	128
Halibut	168	111	-34
Capelin	54,320	66,342	22
Blue whiting	10	-	-
Atlantic salmon	+	+	
Arctic char	+	+	
Dogfishes	3	+	-
Shrimp	5,781	6,627	15
Total	70,678	78,516	11

1) including non-Greenland vessels in joint-venture arrangements, but excluding catches of Danish and Faroese vessels (except catches of capelin by Faroese vessels)

1986: Joint-venture catches in tons:
Capelin: 54,370 - Cod: 97 - Redfish: 9,084 - Greenland halibut: 170 - Atlantic halibut: 162 - Wolffishes: 71 - Blue whiting: 10

Catches of Danish vessels in tons:
Capelin: 5,300 - Shrimp: 500

Catches of Faroese vessels in tons:
Capelin: 10,000 - Shrimp: 727

1987: Joint-venture catches in tons:
Capelin: 66,330 - Cod: 74 - Redfish: 2,630 - Greenland halibut: 249 - Atlantic halibut: 52 - wolffishes: 177 -

Catches of Danish vessels in tons:
Shrimp: 557

Catches of Faroese vessels in tons:
Shrimp: 598