

Northwest Atlantic



Fisheries Organization

Serial No. N1623

NAFO SCS Doc. 89/14

SCIENTIFIC COUNCIL MEETING - JUNE 1989

Denmark (Greenland) Research Report for 1988

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This report contains information on catch statistics from the commercial Greenlandic fishery and on research carried out in 1988 by the Greenland Fisheries Research Institute in the NAFO Area and the ICES Subarea XIV. Information on fisheries by Danish, Faroese and Japanese vessels in joint-venture arrangements with Greenland is also given.

SUBAREA 0

Five of the 140 stations operated in the stratified random shrimp survey by the M/T "Elias Kleist" in July 1988 were on the shrimp grounds adjacent to the major offshore grounds in Div. 1B. Further information is presented in NAFO SCR Doc 89/40.

SUBAREA 1

A. STATUS OF THE FISHERIES

1. General trends

Provisional statistics for the fisheries in 1987 and 1988 are given in Table 1.

Total nominal catch in 1988 increased from 105,264 tons in 1987 to 130,318 tons. Catches of cod increased to 53,610 tons. Increased catches were also seen for redfish, wolffishes, grenadiers, Greenland halibut, halibut, Arctic char and lump-sucker. The shrimp catch decreased from 68,190 tons in 1987 to 57,483 tons in 1988. Also catches of Greenland cod, capelin and scallops decreased in 1988.

2. Cod

a) The fisheries

Total landings of cod increased from 19,209 tons in 1987 to 53,610 tons in 1988. The offshore trawl fishery accounted for 67 % of the total catch with the major part taken in Div. 1DEF. In the inshore fisheries poundnet was most important taking 21 % of the year's catch. Longlines, handlines and gillnets accounted for 3 %, 5 % and 3 % respectively. The inshore fisheries took place in all of Division 1B-F and most catches were taken from May to September.

The strong 1984 year-class accounted for 92 % of the catch in numbers and for 86 % in terms of weight.

b) Forecast

The 1984 year-class now accounts for 82 % of the total fishable stock as determined by the German (Fed. Rep.) survey in November 1988. This year-class is the strongest seen in West Greenland since the early 60's and good catches should be expected between 1989 and 1992. The 1985 year-class is approximately 18 % of the 1984 year-class and will recruit to the fisheries during 1989-90. The subsequent year-classes of 1986 and 1987 are, however, weak (approximately of a size of 5 % of the 1984 year-class). A significant drop in annual catches should, therefore, be expected around 1993-94.

3. Shrimp

a) The fisheries

Total nominal catch of shrimp in Subarea 1 in 1988 by Greenland vessels was about 57,483 tons. Approximately 50,000 tons were taken in the offshore area including 6,660 tons from the fishing grounds north of 71°N, where a new fishery began in 1985.

In 1988 ice hampered the access to the main fishing grounds in Div. 1B early in the year. In general, the fishery took place in the same main areas as in 1985 and -86, with more fishing effort being spent in the southern parts (Div. 1C and 1D) compared to earlier years. 46 Greenland vessels above 80 GRT participated in the offshore fishery (NAFO SCR Doc. 89/53).

The fishery north of 71°N, in which 30 vessels participated in 1988, took place from May throughout the year. Differently from earlier years the fishery was concentrated in the southernmost fishing ground of the area, with mean catch rates being the lowest since the start of this fishery (NAFO SCR Doc. 89/38).

b) Forecast for 1989

No specific forecast is given here, but reference is made to the Report of the Scientific Council, June 1988, and the forthcoming report of the Council's June 1989 meeting.

4. Salmon

The reported landing of salmon at West Greenland in 1988 was 893 tonnes, 73 tonnes less than in 1987. The TAC agreed upon for the period 1988 to 1990 was a total of 2520 tonnes, with an annual opening date of 1 August. In addition, the annual catch was not permitted to exceed the annual average (840 tonnes) by more than 10%. The fishery opened on 1 August in NAFO Div. 1F and on 25 August in Div. 1A to 1E, and the landing of 893 tonnes correspond to 820 tonnes with an opening date of 1 August.

The landings were lower in Div. 1A and 1B but higher in Div. 1F as compared to last year. The main part is still caught in Div. 1C to 1E.

The major part of the catch is taken by driftnet, with a target meshsize of 140 mm (stretched). 723 tonnes or 81% of the total landings were taken by boats smaller than 30 feet, operating inshore or within a short distance from the coast.

5. Capelin

The capelin fishery in West Greenland is carried out inshore

and during the spawning season only. The fishery is directed mainly towards roe-bearing females. In 1988 311 tons were landed, mainly from Div. 1A. The catch decreased from 421 tons in 1987, which is a continued decline from the year before.

6. Redfish

The catch of redfish is taken in an offshore trawl fishery directed for redfish in division 1D-1F. In 1988 1,314 tons were landed, compared to 607 tons in 1987.

7. Greenland halibut

The landings increased from 9574 tons in 1987 to 11533 tons in 1988, an increase of 20%. Landings in Div. 1A constitute 75 % of the landings in Subarea 1. The increase in landings in 1988 is due partly to an increased fishing effort in Upernavik in the northern part of Div. 1A and partly to an offshore Japanese fishery in Div. 1C and 1D. The fishery in Div. 1A is an inshore fishery carried out equally as a longline and gillnet fishery.

8. Other species

Landings of halibut increased by 65% to 326 tons, wolffishes by 28% to 2,413 tons and lumpsucker increased from 13 tons to 293 tons in 1988. The scallop catch decreased with 280 tons to 720 tons due to a decreased effort.

B. SPECIAL RESEARCH STUDIES

I. ENVIRONMENTAL STUDIES

1. Hydrography.

In 1988 two hydrographic cruises were performed with the R/V "Adolf Jensen". In July and November stations on 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.

Environmental conditions in 1988.

In 1988, the air temperatures over the West Greenland area were below normal from April to October and in December with negative anomalies experienced in May-June of more than 2.0°C below normal.

The surface layer temperatures were below normal throughout the year with about 0.5°C. Surface layer salinities were slightly above normal during the first half of the year, while they were markedly below during the second half.

At medium depths west of the banks, there were clear signs of a great inflow of East Greenland polar water during spring and early summer.

From September to November, the water column below 200 m showed temperature and salinity values indicating the strongest inflow of warm, high salinity Irminger water experienced in recent years.

II. BIOLOGICAL STUDIES

1. Cod

a) Occurrence 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, 1988 (NAFO SCR Doc. 89/21).

Catches were dominated by the 1984 and 1985 year classes which were abundant in all areas. The size of the 1985 year-class was estimated to approximately 20% of the 1984 year class. The size of the 1986 year-class were found to be about 5 % of the 1984 year-class. Catches of cod of the 1987 year-class were small and this year-class must also be expected to be weak.

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 during October-November 1988 (NAFO SCR Doc. 89/33). The purpose of this survey was to estimate the relative abundance of cod inside the area covered by the concurrent trawl survey by the Fed. Rep. of Germany.

Cod abundance within the inshore areas was estimated as 21% of the total stock, with the highest inshore components found in Div. 1C.

2. Shrimp (*Pandalus borealis*)

Since 1976, ICNAF/NAFO has continuously repeated a recommendation that stratified random trawls surveys be carried out in Subarea 0+1 to improve the assessment of the shrimp stocks, but during the years few surveys have been carried out, and none of them covering the total distributional area of the stocks. In 1988, it became possible for the Greenland Fisheries Research Institute to conduct a survey in July, using a trawler owned by the Greenland Home Rule Trawler

Company. The survey area covered most of the stock area, from 63°52'5N to 72°30'N, including adjacent stock distribution areas in Subarea 0. During the survey a total of 140 scientific hauls were taken. Results are presented in NAFO SCR Doc. 89/40.

Since 1986 it has been compulsory for all fishing vessels above 50 GRT to use a new logbook form and deliver a copy to the Greenland Fisheries Research Institute. Information on the distribution of the shrimp fishery and catch rates was obtained from logbooks of Greenland trawlers.

Size composition of the shrimp stock was evaluated based on analysis of shrimp samples from commercial trawlers (NAFO SCR Doc. 88/56). Analysis of commercial shrimp samples show the same size groups of shrimp as in preceeding years to be present in the stock. More frequent occurrence of small shrimp in the samples compared to the 1986-samples from the same areas and period might indicate a higher recruitment to the fishery in 1989.

In cooperation with Canadian biologists a study in age-by-length splitting of research shrimp samples from Subarea 0+1 was performed (NAFO SCR Doc. 88/67).

3. Salmon

Samples were taken from commercial catches at fish plants in NAFO Div. 1A to 1F in cooperation with scientists from Canada and the USA. Altogether 2500 scale samples were collected and used for age determination as well as for separating the salmon into continental origin. Besides 11000 length samples were taken, and a total 22327 salmon were examined for coded wire microtags. In total, 110 of such tags were found, 58 stemming from USA, 23 from Canada, Ireland 17, England and Wales 8, Iceland 3 and Scotland 1. A few hundred tissue samples were taken and used to test the classification of continental origin derived from the analysis of the scales.

4. Greenland halibut

Samples of Greenland halibut were obtained from research catches in January in the Cape Farewell area (Div. 1F) and in September in the Davis Strait (Div. 1C). The samples were used for stock discrimination studies in the Northwest Atlantic (NAFO SCR Doc. 89/25 and 89/26). In connection with the research fishery in 1F, 120 Greenland halibut from longline catches were tagged.

Samples for age/length keys were taken from the commercial fishery in August in Umanak/Upernavik (Div. 1A) (NAFO SCR Doc. 89/27).

See also Section 8.

5. Other finfish

Length distributions of redfish by species (Sebastes marinus and S. mentella) were obtained from research trawlings. Some hauls with small meshed pelagic trawl were made in Div. 1D and

1E to investigate drift of 0-group fish from the East Greenland sea area to West Greenland.

6. Scallop (*Chlamys islandica*)

In order to supply information on distribution, abundance, length- and age frequencies and growth for the inshore scallop resources at West Greenland the R/V "Misiliisoq" made two scallop surveys in 1988. The first survey was carried out in May-June covering the area around Sisimiut (Div. 1B) and Qeqertarsuatsiaat (Div. 1D). The second survey was carried out in September covering the area around Aasiat (Div. 1B).

7. Marine mammals

Collection of material for studies of harp seal feeding was continued in 1988. In February collection of stomachs through hunters in Kangaamiut, Maniitsoq (Sukkertoppen) district (Div. 1c), was organized. In July, an expedition to offshore areas (Store Hellefiskebanke, Div. 1B) was conducted, and in September samples were collected during field work in Kanger-suatsiaq (Prøven), Upernavik district (Div. 1A). Similar material was collected by a graduate student of the University of Copenhagen from Attu (Div. 1B) and Qeqertarsuaq (Godhavn)- (Div. 1A), Central West Greenland, in December 1987- February 1988, and in Qeqertarsuaq during June-August 1988. The material of harp seal stomachs collected in Greenland 1985-1988 now totals more than 800 specimens, and is being analyzed for presentation in 1989.

In July-August aerial surveys were carried out in West Greenland between Svartenhuk and Kap Farvel (NAFO Div. 1A - 1F), and in East Greenland between Kap Farvel and the Denmark Strait (ICES Area XIVb), with the purpose of assessing the stocks of minke whale and fin whale.

In addition, a cruise was conducted, also in July-August, in West Greenland collecting photographic material and biopsies for individual identification of blue, fin, and humpback whales with the purpose of determining stock discrimination and size.

8. Joint-venture program

As part of the joint-venture program between the Greenland Home Role Trawling Company (GTC) and the Japan Marine Fishery Resource Research Center (JAMARC) two trawl surveys were carried out at West- and East Greenland, respectively.

The West Greenland survey was carried out as a stratified-random bottom trawl survey in order to make general biomass estimations in the area between 70°N and 73°N and to make investigations primarily on Greenland halibut and roundnose grenadier between 62°30'N and 70°N (NAFO SCR Doc. 89/30 and 89/31).

The East Greenland survey is reported under the section on biological studies in East Greenland.

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 61,030 tons landed in 1988, an decrease of 22% compared to the landing of 78,516 tons in 1987. The main bulk of the landings (80%) is due to the capelin fishery which is a joint-venture arrangement with Faroese trawlers. Compared with 1987 there is a decrease in the catch of capelin from 66,342 tons in 1987 to 48,791 tons in 1988, a decrease in the catch of cod from 1,550 tons to 340 tons in 1988. The catches of shrimp increase from 6,627 tons to 7,577 tons. Redfish catches in 1988 were 3,751 tons and at the same relatively low level as in 1987. Greenland halibut catches decrease 46% to 217 tons. Halibut catches decreased 37% to 70 tons. Catches of wolffishes were 190 tons in 1988 an at the same level as in 1987.

B. Special research studies

I. Environmental studies

1. Hydrography

A joint Danish-Icelandic cruise to the Icelandic Sea-Greenland Sea was carried out in September 1988 as part of the international "Greenland Sea Projekt". A special and basic objective of the cruise was the establishment of 8 current meter moorings, 5 on the line between Greenland and Jan Mayen and 3 just north of the Denmark Strait. carried out in the area between

II. Biological studies

1. Redfish

A joint GTC-JAMARC (see Section B,II,8 for Subarea 1) survey for pelagic redfish were carried out in the Greenlandic part of the Irminger Sea, and a general biomass stratified-random bottom trawl survey were carried out in the area between 64°30'N and 65°30'N. Results of these surveys will be presented at the ICES Statutory Meeting in 1989.

2. Capelin.

The capelin fishery in the East Greenland offshore area took place in July through October, totalling 48,791 tons, which was about 10-15 tons less than average for the later years. All catches were taken by Faroese vessels fishing under Greenland licence.

An acoustic survey was carried out 1 September in collaboration with the Marine Research Institute in Iceland in the west Greenland area from 69°N to 63°N to observe the western part of the capelin distribution area.

Table 1. Nominal catches (tons) by Greenland vessels¹⁾ in West Greenland (Subarea 1) in 1987 and 1988 (provisional figures), and the relative changes from 1987 to 1988.

Species	Nom. catch:	1987	1988	Percentage change from 1987 to 1988
Cod		19,209	53,610	+179
Greenland cod		3,048	1,383	-55
Redfish		607	1,314	+116
Wolffishes		1,889	2,413	+28
Grenadiers		63	431	+584
Greenland halibut		9,574	11,533	+20
Halibut		198	326	+65
Capelin		421	311	-26
Atlantic salmon		966	893	-8
Arctic char		80	129	+61
Lumpsucker		13	293	+2,154
A. plaice		2	+	
Blue ling		+	3	+
Cusk		3	+	
Shark		+	26	+
Atlantic herring		+	+	
Industrial fish and fish not specified		1	+	
Shrimp		68,190	57,483	-16
Scallops		1,000	720	-28
Sum total		105,264	130,559	+24

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

1987: Joint-venture catches in tons: Cod-9; Redfish-398; Wolffishes-5; Halibut-1; Greenland halibut-1568. Catches of Danish vessels: Shrimp-502 tons. Catches of Faroese vessels: Shrimp-474 tons.

1988: Joint-venture catches in tons: Cod-2; Redfish-93; Wolffishes-17; Greenland Halibut-1568. Catches of Danish vessels: Shrimp-312 tons. Catches of Faroese vessels: Shrimp-423 tons.

Table 2. Nominal catches (tons) by Greenland vessels¹⁾ in East Greenland (ICES Subarea XIV) in 1987 and 1988 (provisional figures), and the relative changes from 1987 to 1988.

Species	Nom. catch	1987	1988	Percentage change 1987 to 1988
Cod		1,550	340	-78
Redfish		3,300	3,751	+14
Wolffishes		183	190	+4
Greenland halibut		403	217	-46
Halibut		111	70	-37
Capelin		66,342	48,791	-26
Blue ling		+	90	+
Blue whiting		-	-	
Atlantic salmon		+	4	+
Arctic char		+	+	
Dogfishes		+	+	
Shrimp		6,627	7,577	14
Total		78,516	61,030	-22

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

1987: Joint-venture catches in tons: Capelin-66,330; Cod-74; Redfish-2,630; Greenland halibut-249; Halibut-52; Wolffishes-177. Catches of Danish vessels: Shrimp-557 tons. Catches of Faroese vessels: Shrimp-598 tons.

1988: Joint-venture catches in tons: Capelin-48,791; Cod-42; Redfish-3,709; Greenland halibut-209; Halibut-66; Wolffishes-187. Catches of Danish vessels: Shrimp-444 tons. Catches of Faroese vessels: Shrimp- 678 tons.