Northwest Atlantic Fisheries Organization

Serial No. N1924

NAFO SCS Doc. 91/13

SCIENTIFIC COUNCIL MEETING - JUNE 1991

Denmark/Greenland Research Report for 1990

by

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This report contains information on catch statistics from the commercial Greenlandic fishery and on research carried out in 1990 by the Greenland Fisheries Research Institute.

NAFO SUBAREA 0

1. Shrimp

During the stratified-random trawl surveys for shrimp in NAFO Subareas 0+1 in July-August 1990 16 out of a total of 250 stations were located on the shrimp grounds in Subarea 0 adjacent to the major offshore grounds in Div. 1B (NAFO SCR Doc. 91/).

WEST GREENLAND (NAFO SUBAREA 1)

A. STATUS OF THE FISHERIES

1. General trends

Provisional statistics for the fisheries in 1989 and 1990 are given in Table 1.

Total nominal catch in Greenland waters decreased from 153,270 tons in 1989 to 129,181 tons in 1990. Landings of cod decreased by 38% to 51,258 tons and the nominal catches of shrimps increased by 13% to 66,964 tons. Decreased landings are seen for greenland cod, wolffishes, atlantic halibut, capelin, salmon, arctic char and lumpsucker, whereas the catches of greenland halibut increased.

2. Cod

a) The fisheries

The total landings of cod in NAFO Subarea 1 decreased from 108.017 tons in 1989 to 60.044 tons in 1990. 65 % of the landings were taken in the off shore areas. The distribution of the off shore fishery was the most southerly seen in the time series with almost no catches taken north of Div. 1E. The annual catch rate from the Greenland fresh fish trawlers declined significantly during the year from 4.3 t/hour in 1989 to

1.7 t/hour 1990. The fisheries have in later years been totally dominated by the strong 1984 year-class and this year-class accounted for ca. 80% of the Greenland off shore catch during the first half of the year. However, during the second half of the year the 1985 year-class became the most important accounting for ca 60% of the catch. The reduction in importance of the 1984 year-class has continued into 1991 where the year-class in first quarter the 1984 year- class contributed 17% of the catch in numbers.

In the inshore catches the 1985 year-class dominated, accounting for 50-90% of the catch in numbers, the remaining part being mostly of the 1984 year-class. However in the northern areas (Div. 1B) a significant proportion of age 4 cod were observed, i.e. the year-class 1986.

b) Assessment

No assessment or forecast is given here but reference is made to the forthcoming report of the Scientific Council's June meeting.

3. Shrimp

a) The fisheries

The total nominal catch of shrimp in Subarea 1 in 1990 by Greenland vessels was about 67,000 tons, of which approx. 51,000 tons were taken in the offshore area (including 2,121 tons from the fishing grounds north of 71°N).

Similar to 1989 ice hampered the access to the main shrimp fishing areas in Division 1B at the beginning of the year. In general the fishery in 1990 took place in the same main areas as the year before, with more fishing effort being expended in the southern parts (Divisions 1C and 1D) compared to earlier years. A total of 57 vessels (above 75 GRT) participated in the offshore shrimp fishery. (NAFO SCR Doc. 91/xxx).

A standardized catch rate index for Division 1B calculated from logbooks of 22 Greenland vessels showed a significant decrease in catch rates from 1987 to 1989, while the index remained relatively stable between 1989 and 1990.

The offshore fishery north of 71°N, in which 38 vessels participated in 1990, took place from June to December.

b) Forecast for 1991

STACFIS adviced a TAC of 50,000 tons for the offshore shrimp stock in Subarea 1 and adjacent parts of Subarea 0 in 1991. Greenland set an effective TAC for the Greenland zone of 37,725 tons, not including the fishery of smaller vessels (< 75 GRT).

Reported offshore catches (by vessels not less than 75 GRT) in the beginning of 1991 including April were about 8,700 tons, which is less than in the same months in 1989 and 1990 (10,300

and 13,000 tons, respectively). In 1991 ice cover has hindered the access to main fishing grounds in Division 1B to a larger extent than in preceeding years.

Results from Greenland trawl surveys in the offshore area of Subarea 0+1 showed an increase in minimum trawlable biomass from 1988 to 1989 based on recruitment of a new dominant size group of small shrimp to the fishery. In 1990 the biomass estimate decreased to the level of 1988. Mean size of shrimp in 1990 was lesser than in 1988, but larger than in 1989. There are no indications of a significant recruitment of small shrimp in 1990 to the fishery. Biomass and mean size of shrimp in the fishery in 1991 will depend higly on recruitment of a new size group, but the amount of larger shrimp (count less than 120 shrimp per kg) will probably be stabilized or even higher than in 1990.

4. Salmon

In 1990 the fishery, which is a small boat fishery carried out in the inshore and coastal areas, was opened on 1. August. The reported landings were 227 tonnes, which is 110 tonnes less than in 1989.

The TAC agreed upon for the period 1988 to 1990 was a total of 2540 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 gear used is driftnet with a target meshsize of 140 mm (stretched).

The geographical distribution of the fishery in 1990 differs only very little from previous years, and the main part is still taken in Div. 1C to 1E.

5. Capelin

The capelin fishery in West Greenland is carried out inshore and in the spawning season only. In 1990 the fishery was directed towards larger fish for bait and human consumption. A smaller part of the catches was produced as dryed fish, primarily as food for sledge dogs. In total 170 tons were landed, and mainly from Div 1A.

6. Redfish

Redfish is mainly taken as by-catch in off shore trawl fisheries directed at cod in Div. 1C-1F. The nominal catch of redfish increased from 195 tons in 1989 to 287 tons in 1990.

7. Greenland halibut

The total nominal catch in Sub. 1 increased from 8727 tons in 1989 to 9055 tons in 1990. Landings in Div. 1A constitute 80 % of the landings in Sub. 1. The fishery in Div. 1A is an inshore fishery with longlines and gillnets.

B. SPECIAL RESEARCH STUDIES

I. BIOLOGIGAL STUDIES

1. Cod

a) Abundance of pre-recruit cod

A survey for pre-recruit cod using links of gill nets with different mesh sizes were carried out in inshore areas of Div. 1B, 1D and 1F during July, 1990 (NAFO SCR. Doc. 91/..). The survey has been carried out annually since 1985 with the main purpose of deriving an index of abundance of 2 year-old cod. The index was found to be about 36% of the value of the 1985 year-class indicating a year-class strength of the 1988 year-class of some 35 mill. cod age 3. However, comparing the gill-net index with the index of the same year-classes as found by the German trawl survey indicates substantial differences in relative abundance between year-classes inshore and offshore. The distribution pattern is also different in the two surveys as the inshore survey generally show highest catches in the northern areas whereas the highest abundance in the trawl survey is normally found in the southern parts.It is therefore possible that the inshore index reflects the size of the recruitment from local fiord stocks rather than the overall recruitment.

b) Taggings

A tagging experiment was carried out in September in NAFO div 1D to 1F. It was very difficult to locate any concentrations of cod and only 460 cod were tagged.

2. Shrimp (*Pandalus borealis*)

A series of annual stratified-random trawl surveys in the offshore shrimp fishing area was initiated in 1988 and continued in 1989 and 1990. In July-August 1990 two trawlers performed a total of 250 trawl hauls in the major parts of what is considered to be the total distributional area of the offshore shrimp stocks. Results from the surveys will be presented at the STACFIS meeting in June 1991 (NAFO SCR Doc. 91/xxx).

Except for a few trial fisheries in non-exploited inshore areas investigations were limited.

Information on the distribution of the offshore shrimp fishery and catch rates was obtained from logbooks of Greenland trawlers. A standardised catch rate index was calculated to show the development of mean CPUE from 1987 to 1990 (NAFO SCR Doc. 91/xxx). To avoid the possible influence of non-reported shrimp discards, a similar index was calculated only taking large shrimp (which are supposed to be discarded at lower rates than smaller shrimp) into account.

Observers were placed onboard commercial shrimp trawlers to estimate the size of shrimp discards and the variation of this by season. Results from this work will be presented at the Scientific Council Meeting in June 1991 (NAFO SCR. Doc. 91/xxx).

Trawling experiments with different mesh sizes in the cod-end was conducted to investigate the significance of the mesh size for retainment of small - non-commercial size - shrimp.

3. Salmon

Samples taken in Div. 1C, 1D and 1E in cooperation with scientists from Canada and USA indicate the following composition of the landings in number.

Sea age	North American		European		Total	
	N	%	N	%	N	%
1	59672	96	20917	96	805899	96
2	2120	3	652	3	2772	3
PS	561	1	152	1	713	1
Total	62353	100	21721	100	84074	100
Continent	74%		26%			

The age composition is similiar to previous years, but the contribution of North American salmon was bigger than in previous years.

4. Greenland halibut

Samples for age/length keys were obtained from the commercial fishery in February and August in Uummannnaq/Upernavik (Div. 1A). A research longline fishery was conducted in August in northern Upernavik (74° - 75°N lat.). Catches were composed of relatively small fish in the length range 40-80 cm and mean cpue was 29 g/hook.

5. Joint-venture program

As a part of the joint-venture program between the Greenlandic Home Rule (GHR) and the Japan Marine Fishery Resource Research Center (JAMARC) two trawl surveys were carried out at West Greenland.

The surveys were carried out as stratified random bottom trawl surveys in order to make investigations primarely on Greenland halibut and roundnose grenadier between 62°30N and 70°N at depths between 400 and 1500 m (NAFO SCR Doc. 91/..).

6. Marin mammals.

a) Harp seal (*Phoca groenlandica*).

The analyses of the feeding habits of harp seals during their stay in West Greenland waters were continued in 1990, and a report on the results from examining a total of 871 stomachs was concluded.

Additional material of harp seal stomachs was collected in May-June 1990 in Southwest Greenland (div 1F) appr. 130 samples, and in August in Upernavik district Northwest Greenland (div 1A) appr. 30 samples. A premilary examination of the stomach contents does not seem to change the above mentioned analyses significantly.

b) Small cetaceans

The collection of samples from the Inuit catches of white whales (*Delphinapterus leucas*) and narwhals (*Monodon monoceros*) was continued in 1990. A total of appr. 160 and 15 samples was collected in West- and East Greenland, respectively.
In April 1990, an aerial survey of white whales wintering in Central West Greenland indicated a significant decline in abundance compared to surveys conducted in the samme area in 1981 and 1982. A contributory factor could be an unusual large ice entrapment ('sassat') in the Disko Bay in February 1990: an estimated 500 white whales were taken, and an unknown number struck- and lost.
A joint program on satellite tracking of narwhals was initiated by Greenland Environmental Research Institute (GE) and Greenland Fisheries Research Institutet (GF).
A joint program on elastic flipper tag for toothed whales was conducted by GE, GF and Duisburg Zoo, Germany.

c) Large cetaceans

Aerial surveys were again carried out in West Greenland in July-August 1990 with the purpose of assessing the stocks of minke and fin whales (*Balaenoptera acutorostrata* and *B. physalus*).

Collection of material for identification of individual whales - by photographs as well as by skin biopsy - was continued in West Greenland waters as well as in the Caribian Sea.

In June, two humpback whales on Fylla Banke (Div. 1D) were instrumented with VHF-transmitters with the purpose of collecting data on dive frequencies.

In July-August aerial surveys were carried out in West Greenland between Svartenhuk and Kap Farvel (Div. 1 A - 1 F) 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 determinating stock discrimination and size.

EAST GREENLAND (ICES SUBAREA XIV)

A. STATUS OF THE FISHERIES

Provisional figures for the Greenland fisheries in ICES Subarea XIV are presented in Table 2. In absence of capelin fishery the total nominal catches in 1990 decrease by 52% to 10,757 compare to 1989.

B. SPECIAL RESEARCH STUDIES

I. BIOLOGICAL STUDIES

1. Shrimp (*Pandalus borealis*)

A stratified-random trawl survey was carried out in Denmark Strait in August-September 1990. The survey covered areas considered to constitute the total stock area, and hence included Iceland fishing zone. Further information is given in NAFO SCR Doc. 91/xxx.

Similar to West Greenland observers were placed onboard commercial shrimp trawlers to estimate the size of shrimp discards and the variation of this by season. Results from this work will be presented at the Scientific Council Meeting in June 1991 (NAFO SCR. Doc. 91/xxx).

2. Greenland Halibut

In order to investigate the possibilities of an increase of the commercial fishery in the Ammassalik district samples of Greenland Halibut from the commercial fisheries as well as from the research vessels catches from the inshore waters were taken. In total 1200 and 800 fish were sampled from the commercial and research vessels catches, respectively. An tagging experiment was carried out too, and 180 Greenland halibut were tagged in order to investigate the spawning migration.

3. Capelin

Due to irregular distribution of the stock only very small quantities of capelin were found in the East Greenland offshore area in both 1989 and 1990. Most of the quota allocated to Greenland was taken inside the Iceland economic zone in accordance with the agreement between Greenland, Iceland and Norway. Information on stock concentrations obtained from the commercial fishing fleet and from Icelandic acoustic surveys indicated a drastic reduction of this stock, and the fishery was therefore closed before the end of the year in order to reserve a spawning stock of a sufficient magnitude.

Table 1. Nominal catches (tons) by Greenland vessels in West Greenland (Subarea 1) in 1989 and 1990 (provisional figures), and the relative changes from 1989 to 1990.

Species Nom. catch:	1989	1990	Percentage change from 1989 to 1990
Cod	83,240	51,258	-38
Greenland cod	364	297	-18
Redfish	195	287	+47
Wolffishes	970	588	-39
Grenadiers	8	46	+475
Greenland halibut	7,428	8,063	+9
Atlantic halibut	202	157	-22
Capelin	228	170	-25
Atlantic salmon	337	227	-33
Arctic char	62	105	+69
Lumpsucker	162	19	-88
Shrimp	59,074	66,964	+13
Scallops	1,000	1,000	-
Sum total	153,270	129,181	-16

Table 2. Nominal catches (tons) by Greenland vessels in East Greenland (ICES Subarea XIV) in 1989 and 1990 (provisional figures), and the relative changes from 1989 to 1990.

Species Nom. catch	1989	1990	Percentage change 1989 to 1990
Cod	3,876	4,442	+15
Haddock	1	5	+900
Redfish	3	24	+700
Wolffishes	12	3	-75
Greenland halibut	13	40	+208
Halibut	7	25	+257
Capelin	12,480	3	-100
Roundnose grenadier	+	1	+100
Atlantic salmon	+	2	+400
Arctic char	+	+	-
Shrimp	5,979	6,211	+4
Sum total	22,368	10,757	-52