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Denmark/Greenland Research Report for 1991

by

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This report presents information on catch statistics from the commercial Greenland fishery and on research carried out in 1991 by the Greenland Fisheries Research Institute.

NAFO SUBAREA 0

WEST GREENLAND (NAFO SUBAREA 1)

A. STATUS OF THE FISHERIES

1. General trends

Provisional statistics for the fisheries in 1990 and 1991 are given in Table 1.

Total nominal catch in Greenland waters decreased from 125,633 tons in 1990 to 104,179 tons in 1991. Landings of cod decreased by 61% to 20,235 tons. Decreased landings were seen for wolffishes and atlantic halibuts, whereas the catches of Greenland cod, Greenland halibut, Atlantic salmon and lumpsucker increased. The catches of shrimp, redfish and capelin in 1991 were at the same level as in 1990.

2. Cod

a) The fisheries

The total landings of cod in NAFO Subarea 1 amounted to 21,000 tons in 1991 which is a significant decline compared to 108,000 and 60,000 tons landed in 1989 and 1990. 91% of the catches were taken in the inshore areas mainly by pound net fishery. The catch rates in the offshore trawl fisheries, corrected for seasonal and areal effects by a multiplicative analysis, were the lowest on record and this fishery ceased by the end of March.

The large fishery in former years has been sustained by the strong 1984 year-class which according to young fish distribution and tag returns are believed to be mainly of Icelandic origin. Due to the fisheries and migration this yearclass is now of little importance and it did only account for 4% of the numbers landed in 1991. The 1985 year-class, also partly of Icelandic origin, accounted for 39% overall, although it was somewhat more important in the southernmost areas. The fisheries in Div. 1ABCD were dominated by the year-classes of 1986 and 1987, both of which are believed to be of local coastal origin.

b) Assessment

No assessment or forecast is given here but reference is made to the Northwestern Working Group report by ICES, May 1992.

3. Shrimp

a) The fisheries

The total nominal catch of shrimp in Subarea 1 in 1991 by Greenland vessels was about 69,000, of which approximately 51,600 tons were taken in the offshore area (including 1,077 tons from the fishing grounds north of 71°N).

Similar to 1990 ice hampered the access to the main fishing areas in Division 1B at the beginning of the year. In general the fishery took place in the same main areas as earlier years, with more fishing effort

being expended in the southern parts (Divisions 1C-1E) compared to earlier years, especially in the months August through December. A total of 48 vessels (above 75 GRT) participated in the offshore shrimp fishery (NAFO SCR Doc. 92/65).

Information on the distribution of the offshore shrimp fishery and catch rates was obtained from logbooks of Greenland trawlers. A standardized catch rate index was calculated to show the development of mean CPUE from 1987-91 (NAFO SCR Doc. 92/65). 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.

This index showed a significant decrease in catch rates from 1987 to 1989, while it remained relatively stable between 1989 and 1991.

The offshore fishery north of 71°N, in which 16 vessels participated in 1991, took place from July to November. Catches in this area were only half of the 1990-level.

b) Forecast for 1992

STACFIS advised a TAC of 50,000 tons for the offshore shrimp stock in Subarea 1 and adjacent parts of Subarea 0 for 1992. Greenland set an effective TAC of 35,700 tons for the Greenland zone, not including the fishery by smaller vessels (< 75 GRT).

Reported offshore catches (by vessels not >75 GRT) in the beginning of 1992 including April were about 10,100 tons, which is a little less than catches in the same months in 1989 and 1990, but larger than those of 1991. In 1991 ice cover has hindered the access to the main fishing grounds in Division 1B to a larger extent than before due to an extremely cold winter.

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 year-class of small shrimp to the fishery. In 1990 the biomass estimate decreased to the level of 1988, and the estimate for 1991 decreased further to about 70% of the 1990-level.

There are no indications of a significant recruitment of small shrimp to the fishery in 1991.

4. Salmon

In 1991 the fishery, which is a small boat fishery carried out in the inshore and coastal areas, was opened in early August and ended in November. The nominal landings were 437 tons, 210 tons more than in 1990.

The TAC for 1991 was set unilaterally at 840 tons, and as usually divided into a "free" part of 373 tons and a part of 467 for the "small boats". Because of the small landings this arrangement had no practical implications.

The geographical distribution differs only little from previous years, and the main part is still taken in divisions 1C to 1F.

5. Capelin

The capelin fishery in West Greenland is carried out inshore and in the spawning season only (June-July). As in the year before, the fishery was directed towards larger specimens for bait and human consumption. A smaller part of the catches was produced as dried fish, primarily for food for sled dogs. In total 167 tons were landed, mainly from Div. 1A, being of the same level as the preceding year.

6. Redfish

Redfish is mainly taken as by-catch in offshore trawl fisheries directed at cod in Div. 1C-1F. The nominal catch of redfish in 1991 was 290 tons and at the same level as in 1990.

7. Greenland halibut

The landings increased from 8,352 tons in 1990 to 10,888 tons in 1991, an increase of 30% which mainly occurred in Ilulissat in Division 1A. Landings in Div. 1A constitute 92% of the landings in Subarea 1. The fishery in Div. 1A is an inshore fishery carried out as a longline and a gillnet fishery, the former dominating the fishery by 83% of the landings.

B. SPECIAL RESEARCH STUDIES

I. BIOLOGICAL STUDIES

1. Cod

a) Abundance of pre-recruit cod

Since 1985 surveys for estimating mainly age 2 cod abundance have been carried out in inshore areas in Div. 1BDF using strings of gill-nets with different mesh sizes. Age 2 cod were unusual scarce in all three areas in 1991 leading to an abundance index of less than a tenth of the previous lowest value (1986 year-class). The survey however found a high abundance of age 1 cod in the fjords of Div. 1D.

Based on the total time series the surveys indicate an existence of local coastal stock components in Div. 1B and 1D, as year-class strength varies independently between these areas and also differs from concurrent offshore year-class size indices as obtained by trawl surveys. In contrast, the year-class indices of Div. 1F closely mirrors the pattern found offshore hence indicating a common origin. These findings is in agreement with knowledge on local spawning which is well documented in Div. 1BD whereas spawning as well as cod egg occurrence is only sporadically reported from Southwest Greenland.

2. Shrimp (Pandalus borealis)

A series of annual stratified-random trawl surveys in the offshore shrimp fishing area was initiated in 1988 and has been continued in the following years. In July-September 1991 a trawler performed a total of 115 trawl hauls in the major parts of what is considered to be the total distributional area of the offshore shrimp stocks and 47 hauls in inshore areas in the Disko Bay and the Vaigat (NAFO SCR Doc. 92/67, 92/55).

An observer programme initiated in 1990 to estimate the size of and the seasonal variation in shrimp discards was continued in 1991 (NAFO SCR Doc. 92/56).

In cooperation with other Nordic countries experiments have been made with sorting devices in shrimp trawls to avoid the catch of the small shrimp and by-catch of fish species.

3. Salmon

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

Sea age	North American	European	Total
1	98,126	56,972	155,098
2	4,285	3,859	8,144
PS	602	104	706
Total	102,966 63%	60,935 37%	163,901

The age composition is similar to previous years, but the contribution of North American salmon is less than last year.

4. Greenland halibut

Length samples were obtained from the commercial fishery in Ilulissat in August and from Kullorsuaq in February (Div. 1A). A research longline fishery was conducted in August in the Davis Strait by the Faroese vessel Varsol in Div. 1CD. Catches were composed of fish in the length range 40-120 cm, with the bulk at about 80 cm, and mean CPUE was approx. 250 g/hook.

5. Joint-venture program

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

The first survey was divided in two parts:

- 1) a stratified-random bottom trawl survey in order to make investigations primarily on Greenland halibut and roundnose grenadier in NAFO Div. 1A-1D at depths between 400 and 1500 m.

2) a stratified random bottom trawl survey in shallow water (0-400 m) in Div. 1A and 1B in order to estimate biomasses of small redfish and small Greenland halibut. Stomach samples were collected as a part of a project on the relations between the fish stocks and the shrimp stock.

The second survey was a repetition of part 2) in the first survey, except that the depth range was expanded from 0 to 400 m to 0 to 1000 m. (NAFO SCR Doc. 92/48).

6. Marine mammals

a) Pinnipeds.

Harp and hooded seals (*Phoca groenlandicus*, *Cystophora cristata*)
Collection of stomachs for studies of the feeding habits of harp seals in Greenland waters was continued in August-September 1991 in Saqqaq (the Disko Bugt region, Central West Greenland), and in Ammassalik district (South East Greenland); in the latter area similar material from hooded seals, and some ringed seals, was also collected.

Walrus (*Odobenus rosmarus*)

In June 1991, data on body weight, somatical dimensions, body composition, blubber topography, body temperature etc. were collected from 21 Atlantic walruses (*O. r. rosmarus*) in northwestern Greenland. A handy tool for weighing large seals in the field was constructed and used with success to obtain weights of 18 walruses with total body weights ranging from 192 to 1198 kg.

Satellite tracking of walruses in Northeast Greenland gave a last location at 80°46'N 09°49'W on 27 March 1991 from an adult male which was instrumented together with five other males in Dove Bay (appr. 77°N, North East Greenland) in August 1990. This indicates together with locations obtained from three other instrumented adult males, which all transmitted for a minimum of 110 days, that walruses winter in the dense pack ice off North East Greenland between approximately 80° and 81°N.

b) Small cetaceans .

Collection of samples from the inuit catch of white whales (*Delphinapterus leucas*) was continued in 1991. Also, an aerial survey of white whales wintering in Central West Greenland was conducted, as in 1990.

The pilot project on implementing satellite tags on narwhal (*Monodon monoceros*) was pursued in 1991.

c) Large cetaceans.

Collection of material for identification of individual whales (*Balaenoptera acutorostrata*, *B. physalus*, *Megaptera novaeangliae*), by photographs as well as by skin biopsies, was continued in West Greenland waters in 1991.

7. Multispecies research

In 1990 GFRI started investigations of food-chain structures and predation processes for the dominating fish species in the marine ecosystem in the Davis Strait off West Greenland. In 1990-92 fish stomachs from several fish species were sampled during resource surveys and analysed in the laboratory. The aim of the study is to evaluate the interactions between the fish stocks and the shrimp stock. The study will continue in 1992. Important questions are: "Who eats who and how much?" and "what is the effect on the fish community structure of the intensive commercial shrimp fishery in the Davis Strait?"

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. The total nominal catch in 1991 increased by 4% to 11,136 compared to 1990. Landings of shrimp decreased by 32% to 4,202 tons, whereas the catches of others species increased.

B. SPECIAL RESEARCH STUDIES

I. BIOLOGICAL STUDIES

1. Shrimp (*Pandalus borealis*)

An observer programme to estimate discard of shrimp in the commercial shrimp fishery initiated in 1990 was continued in 1991.

2. By-catch of small redfish in the Denmark Strait shrimp fishery

Investigations made by GFRI onboard the Greenland shrimp trawler M/Tr TASIILAQ fishing in Sub-area XIV between 65°30'N and 67°00'N in spring 1991 showed that the by-catch of redfish generally was small. The average by-catch of redfish in 149 random selected hauls east of the "Redfish Box" was 89 redfish per hour or 5.2 kg small redfish per hour. The average by-catch of redfish in 30 random selected hauls during a trial fishery for shrimp in the north-eastern corner of the "Redfish Box" was 75 redfish per hour or 3.9 kg per hour. The bulk of the by-caught redfish was in length range 10-20 cm with a mode at 13 cm. Redfish caught during the trial fishery in the "Redfish Box" was generally smaller than redfish taken outside this area.

Table 1. Nominal catches (tons) by Greenland vessels in West Greenland (Subarea 1) in 1990 and 1991 (provisional figures), and the relative changes from 1990 to 1991.

Species	Nom. catch:	1990	1991	Percentage change from 1990 to 1991
Cod		51,258	20,235	-61
Greenland cod		297	1,164	+292
Redfish		287	290	+1
Wolffishes		588	350	-40
Grenadiers		46	81	+76
Greenland halibut		8,352	10,241	+23
Atlantic halibut		157	48	-69
Capelin		170	167	-2
Atlantic salmon		227	437	+210
Arctic char		105	117	+11
A. plaice		-	3	+
Lumpsucker		19	158	+732
Shrimp		63,127	68,906	+9
Ray		-	+	+
Fish not specified		-	3	+
Scallops		1,000	1,979	-
Sum total		125,633	104,179	-17

Table 2. Nominal catches (tons) by Greenland vessels in East Greenland (ICES Subarea XIV) in 1990 and 1991 (provisional figures), and the relative changes from 1990 to 1991.

Species	Nom. catch:	1990	1991	Percentage change from 1990 to 1991
Cod		4,442	6,679	+50
Greenland cod		-	1	+
Haddock		5	-	-
Redfish		24	42	+75
Wolffishes		3	30	+900
Greenland halibut		40	65	+63
Halibut		25	97	+288
Capelin		3	6	+100
Roundnose grenadier		1	4	+300
Atlantic salmon		0	4	+4
Arctic char		+	+	+
Blue ling		-	5	+
Shrimp		6,211	4,202	-32
Shark		-	1	+
Sum total		10,754	11,136	+4