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Status of Fisheries and Research carried out in Subarea 1, Statistical Area 0 and off East Greenland in 1974

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I. Pertinent Documents

The following Research Reports by ICNAF member countries contain information on fisheries and/or research carried out in Subarea 1 and Stat. Area 0, and off East Greenland in 1974 (1975 Summ. Doc. No. in brackets): Canada (15), Denmark (31). Federal Republic of Germany (36), German Democratic Republic (29), Norway (27), Spain (13), UK (24) and USSR (30). Also Res. Doc. 75/21 (Spanish by-catches), 75/31 (cod assessment), 75/53 (capelin and sand eel), 75/77-78-79 (hydrography), 75/87 (cod) and 75/87 (cod) and 75/90 (plankton) contain information on research carried out in the Subarea in 1974.

II. Status of the Fisheries

A. Subarea 1 and Stat. Area 0

Table 1 gives the nominal catches by species or group of species for the last six years in Subarea 1. Table 2 shows total catches and catches of cod by countries for the same years. Nominal catches from Stat. Area 0 are given in Table 3.

Table 1. Nominal catches from Subarea 1 (thousands of metric tons) by principal species (excluding mammals) (figures from ICNAF Statistical Bulletin and Summ. Doc. 75/32).

	1969	1970	1971	1972	1973	1974
All species	236	146	150	139	105	111
Cod	215	113	121	111	63	48
Redfish	5	5	3	3	3	3
Grenadirs	+	6	4	3	4	10
Greenland halibut	2	2	4	4	7	13
Salmon	2	2	3	2	2	2
Shrimps	7	9	9	9	13	18
Other species	5	9	6	7	12	16

Table 2. Nominal catches from Subarea 1 (thousands of metric tons) by countries. Only countries with total catches exceeding 1000 tons in at least one of the years are shown separately (figures from ICNAF Statistical Bulletin and Summ. Doc. 75/32).

	All species (excluding mmals)						Cod					
	1969	1970	1971	1972	1973	1974	1969	1970	1971	1972	1973	1974
Denmark (F)	19	8	17	11	6	8	18	8	16	10	4	5
Denmark (G)	38	37	37	41	41	51	24	20	19	23	18	20
France	25	5	4	6	+	-	25	5	4	6	+	-
F.R. Germany	83	45	43	20	9	2	79	41	41	17	6	2
German D.R.	10	5	3	+	3	3	10	2	3	+	-	-
Norway	19	7	8	33	19	10	18	6	6	32	16	4
Portugal	16	9	6	8	8	10	16	9	6	8	8	10
Spain	24	19	23	13	10	6	24	19	22	13	10	6
USSR	+	8	5	4	6	18	+	1	+	1	+	1
UK	1	4	3	1	1	2	1	3	2	1	+	1
Total	236	146	150	139	105	111	215	113	121	111	63	48

Table 3. Nominal catches from Statistical Area 0 (thousand metric tons) (figures from ICNAF Statistical Bulletin and Summ.Doc. 75/32).

	Total							Greenland halibut							Roundnose grenadier						
	68	69	70	71	72	73	74	68	69	70	71	72	73	74	68	69	70	71	72	73	74
Den(G)						1	+						1	+							
GDR					1							1							+		
USSR	7	4	1	6	15	2	4	1	1	+	1	9	1	1	6	3	1	4	6	1	3
Total	7	4	1	6	16	3	4	1	1	+	1	10	2	1	6	3	1	4	6	1	3

Total nominal catches in Subarea 1 increased from 105,000 tons in 1973 to 111,000 tons in 1974. The further decline in catches of cod were more than counterbalanced by increased catches of other species especially Greenland halibut, grenadiers and shrimp. The catch of cod obtained in 1974 only reached about 10% of what was considered to be the MSY level in the 1950's and 1960's.

Denmark (G) and the USSR showed marked increased total catch from Subarea 1 from 1973 to 1974. The Danish increase was primarily due to an increased effort by the new large Greenland trawlers which all were in operation throughout the year and spent nearly all their effort in Subarea 1. Especially the Danish catch of Greenland cod, redfish, wolffishes, Greenland halibut and shrimp showed a marked increase. The increase in the USSR catch was primarily due to good catches of grenadiers and Greenland halibut in the second half of the year in the central part of the Subarea. The marked decrease in total catch reported for Norway was due to a drastic decline in catches of cod which was counterbalanced to a small extent only by increased catches of shrimp.

Except for Denmark (G), Denmark (F) and Portugal there seems to have been a general decrease in fishing effort for cod in the Subarea. Number of days fished by Fed. Rep. Germany decreased to only about 17% of that in 1973. The catch of cod per day fished increased by about 60%. Norway reports that only one trawler fished for cod, most of the catches were taken by longliners and drift net vessels. Denmark reports that the catches of cod taken by the trawlers for which a comparison can be made between 1973 and 1974, seems to have decreased. The small increase in the Danish (G) catch of cod therefore has been possible only by increasing the effort. Portuguese catches of cod increased in Div. 1C-D due mainly to increased fishing effort by gillnetters.

The USSR and Denmark (G) are the only countries reporting catches from Statistical Area 0 in 1974. The USSR catches of Greenland halibut and grenadiers were taken in the southern part of the area in the second half of the year. Denmark (G) reports only a small quantity of Greenland halibut taken during a few hours trawling in November.

B. East Greenland

Nominal catches from waters off East Greenland in the last six years are shown in Table 4.

Table 4. Nominal catches from East Greenland waters (thousand metric tons) (figures from Summ.Doc. 74/40 and 75/36).

	Total						Cod						Redfish					
	69	70	71	72	73	74	69	70	71	72	73	74	69	70	71	72	73	74
FRG	41	31	44	30	14	5	14	14	29	22	9	2	25	16	14	7	4	3
Iceland	9	7	-	-	-	-	4	5	-	-	-	-	4	1	-	-	-	-
Others	1	1	1	1	+		1	1	1	1	+		+	+	+	+	+	
Total	51	39	45	31	14	5	19	20	30	23	9	2	29	17	14	7	4	3

As will be seen from the table, total catch off East Greenland in 1974 is only about one-third of that in 1973. The effort also decreased to about one-third of the 1973 effort. Catch per day decreased for cod and increased markedly for redfish.

As in 1972 and 1973 the catch of Fed.Rep. Germany off East Greenland was higher than its catch in Subarea 1.

III. Research Work

Research work related to Subarea 1 and Stat. Area 0 in 1974 has been reported by Canada, Denmark, Fed.Rep. Germany, German Dem.Rep., Norway, Spain, UK and USSR.

A. Hydrography

(Denmark, USSR)

Work was carried out on the standard hydrographic sections off West Greenland with the best coverage on the section across the Fylla Bank (Div. 1 D).

A rather strong winter cooling was observed in the upper 75 m on Fyllas Bank. In the deeper layers west of Fyllas Bank the temperature was rather high, above 5°C at 400 m in January. The USSR reports, however,

that the water temperature decreased considerably also in deep layers in March, especially on the station closest to the shelf. In May a strong heating started in the upper layer (0-50 m) and in July the mean temperature in this layer reach the average value for the warm period 1950-66 (2.07). Also in the sections further north (Div. 1 C and 1 D) rather high water temperatures were observed in the upper 50 m layer in July, 1-2°C higher than in 1973. On the shallow parts of the banks the temperature in June 1974 thus probably were more favourable than in previous years for the production of a good year-class of cod.

The USSR reports that in October the water temperature was about equal to the 1962-1974 average of 5.62°C in the 0-200 m layer in the section crossing the Atlantic (Irminger) component of the West Greenland Current in Div. 1 F, but below average (at the level of 1972) in the 200-500 m layer. In the section cross the Fylla Bank (Div. 1 D), high temperatures (1.3°C above 1963-1974 average of 3.02°C) were observed in the 0-200 m layer in November and a wedge of warm water nearly reached the cold waters of the Baffin Land Current. However, in the 200-500 m layer the temperature was much lower than average, 0.1 - 0.2° lower than in the cold years 1971 and 1972.

Data on salinity and water circulation collected during five cruises with research vessels in the Davis Strait, Labrador and Newfoundland areas in 1973-1974 are reported by the USSR (Res. Doc. 75/78 and 75/79).

B. Ice Observations

(Denmark)

Both the polar ice and west ice conditions were reported to be close to normal in 1974.

C. Other environmental studies

(Denmark)

The lead and zinc mine in Umanak Fjord (Div. 1 A, inshore) started production in the autumn 1973. The environmental background investigations carried out by Denmark before production started, were followed up by surveys in February and September 1974. Water and sediment samples were taken, and some fish, mussels and seaweed were sampled for analysis of heavy metals content.

The investigations in 1974 showed that the very stringent restrictions to prevent more than local pollution are being adhered to. The situation will be kept under current control both in winter and summer.

D. Plankton

(Denmark, UK)

The results of the Continuous Plankton Recorder Survey, operated on commercial vessels by the Oceanographic Laboratory, Edinburgh, were seriously affected by the abandonment of the Ocean Weather Stations BRAVO and DELTA and changes in shipping schedules in the ICNAF area in 1974. 915 miles were covered in Subarea 1. This is 500 less than in 1973, and there was no sampling in the period from January to May. Phytoplankton production appeared to be close to the long-term mean and the numbers of redfish larvae were above average in July.

Danish samples from the Fylla Bank section showed the plankton volume to be somewhat above the average for the cold years 1969-74, but still considerably below the average for the warmer years in the 1960's.

E. Cod

(Denmark, Fed.Rep. Germany, Spain and USSR)

1. Eggs and larvae

As in the years 1969-73 very few cod larvae were found during the Danish plankton surveys. Although water temperatures suggest a relatively good survival of eggs and larvae in 1974, the numbers of larvae found in the plankton do not support the hope of an improved future recruitment of cod.

2. Young fish (age - groups I, II and III)

Young cod occured only in small numbers in catches at the Danish standard stations for trawling and were not seen in noteworthy quantities in shallow waters in summer, nor were small cod reported

in great quantities in the Greenland pound net fishery. However, Spanish trawl catches in August-December contained 10-30 % of 3 year old cod (year-class 1971) in Div. 1 C and 1-16 % in Div. 1 D. The Fed. Rep. Germany reported that 1 year-old cod (1973 year class) strongly dominated in research vessel catches in Div. 1F in December.

3. Composition of commercial catches

The 1968 year-class was by far the most important one in Danish and in the Fed.Rep. Germany's commercial trawl catches. This year-class now seems to occur mainly in Div. 1D-1E, where it contributed nearly 90% by numbers in some samples from the Danish catches. Further north (Dvi. 1B-1C) there was a greater contribution of younger year-classes, and in one of the samples the 1969 year-class was the most frequent one.

Spanish trawl catches contained more fish of the year-classes 1969-1971, especially in Div. 1 C where these three year-classes accounted for 46-79 % of the catch by numbers. However, the 1968-year-class also dominated in the Spanish catches in Div. 1 D in October-December.

Fed.Rep. Germany reports that off East Greenland the contribution of the formerly predominant year-classes 1961, 1962, 1963 and 1964 decreased considerably in 1974. They are, however, still dominating in the northern part of the area (Dohrn Bank). Off southeast Greenland the 1968 year-class, which seems to be of moderate size, is dominating.

4. Tagging

Denmark tagged 770 cod in 1974.

5. Other studies on cod

Studies on sexual maturity and sex ratio were carried out by Spain.

6. By-catch in the fishery for cod

Observations on by-catches were made on board a Spanish pair-trawler in Div. 1 C and 1 D in September. Wolffishes and American plaice were the most important species, followed by halibut, Greenland cod and sand eel. This is in good agreement with observations made in 1973. With the exception of large Greenland cod, all by-catches were discarded. Samples for length distributions were taken of cod, American plaice, wolffish, halibut, redfish, sand eel and of

discarded individuals of cod and Greenland cod.

F. Roundnose Grenadiers

(Denmark, German Dem. Rep., USSR)

A groundfish survey was conducted by Denmark in the Davis Strait (Subarea 1 and Stat. Area 0) in July. Grenadiers were not found on the stations north of the Greenland-Canada ridge. South of the ridge good catches were made at depth between 650 and 900 m with a rapid decline at depths larger than 900 m. Otoliths, lengths and weights were sampled. The lengths ranged from 15 to 95 cm. Small specimens were more abundant in Div. 1 C than in Stat. Area 0, but no conclusions as to possible stock separation could be drawn.

The USSR conducted a series of trawl hauls in Stat. Area 0 and in the central part of Subarea 1 in July-August. Males dominated in both areas. Length groups in the range 57-68 cm dominated in Stat. Area 0, and the mean length was about 61 cm. In Subarea 1 the length range was wider and the mean was about 57 cm.

German Dem. Rep. measured 2647 specimens in Subarea 1 (Div. 1 B and 1 C) in September. Otoliths were taken for age determination. The mean length in catches ranged from 48.1 to 61.5 cm in Stat. Area 0, and it is reported that there was no difference between Subarea 1 and Stat. Area 0 as the catches were taken near the border between the areas.

G. Greenland halibut

(Denmark, German Dem. Rep., USSR)

During the Danish groundfish survey in the Davis Strait, Greenland halibut occured in the catches, but in rather small quantities compared to roundnose grenadiers. Lengths of Greenland halibuts ranged from 35 to 95 cm with the greatest abundance of fish of about 50 cm.

The German Dem. Rep. measured 800 specimens for length and 150 scales were taken for age reading in Div. 1 C in September. The predominant length groups were 50-75 cm.

The USSR tagged 100 specimens in Subarea 1.

H. American Plaice

(Denmark, Spain, USSR)

Denmark reports that length measurements were taken from research vessel catches. Spanish by-catches of Americal plaice were sampled for length composition.

As in 1973 the USSR observed pre-spawning and spawning concentrations of American plaice in Div. 1 C in January-April. A scouting vessel made more than one hundred trawl hauls on these concentrations. The largest catches were taken by bottom trawl at depths between 140 and 180 m. Spawning was over and the concentrations spread again in April. The mean lengths were 24-27 cm for males and 36-38 cm for females. 66-71 % of the catch (in numbers) were females.

USSR scientists point out that the abundance of American plaice, which is a cold water fish, has increased strongly concurrently with a considerable decrease in cod abundance and that apparently a process is gradually developing in reverse of the one observed 50 years ago, when the warming of the water masses started off West Greenland.

I. Other groundfish

(Denmark, Spain)

Denmark reports that length samples of exploited species other than those mentioned above have been taken from research vessel catches, especially samples of redfish.

Spain sampled by-catches of Greenland cod, Atlantic halibut and redfish for length compositions.

J. Capelin

(Denmark, Norway)

Denmark reports that samples were obtained from a number of locations by pelagic trawling and that further experience has been gained on the distribution and density of shoals.

Norway conducted an acoustic survey on capelin in June-July, covering the banks and a few selected fjords at West Greenland. The registrations were identified with pelagic trawl and the catches were sampled for age and length compositions and maturity stages. The capelin had recently spawned when the survey started in June and, apart from some small concentrations on Fyllas Bank, capelin were found only in inshore waters and in the fjords. Later a migration to the banks took place, and in July capelin were found on all the southern banks. It was tentatively concluded that the stock size is only 5-10 % of the capelin stock in the Barent Sea.

K. Sand eel

(Norway, Spain)

Norway reports that shoals of sand eel were recorded on all banks surveyed at West Greenland during the acoustic survey for capelin. Catches of sand eel were sampled for age and length compositions. The catches mostly consisted of old fish, 6 years and older.

Spain reports length composition of by-catches of sand eel.

L. Salmon

(Denmark, Canada, UK)

Off West Greenland 520 salmon were caught during a Danish research vessel cruise. Blood and scales were sampled for further studies of stock separation by Canadian scientists who participated in the cruise. UK reports that work was continued at the laboratories in 1974 on the analysis of biological material, including blood samples for racial analysis, collected during the tagging experiment at West Greenland in 1972.

At East Greenland Denmark conducted some experimental fishing with drift net in the Irminger Sea to study the distribution and density of salmon in the area. The results together with results from previous years show that salmon is widely distributed in the Irminger Sea, but probably not with concentrations comparable to those found at West Greenland.

M. Crustaceans

(Denmark)

Denmark reports that a sampling and survey program on shrimps (Pandalus borealis) has been initiated, aiming to supply data for a stock by stock assessment of the species. The basic data will be commercial catch and effort figures by small areas and sampling data from research vessel catches.

Fishing experiments for snow crab (Chionoecetes opilio) were continued in Div. 1 D inshore in 1974 and were also extended to Div. 1 C inshore and Div. 1 A.

N. Gear and selectivity studies

(Denmark)

Fishing experiments with bottom gill nets for Greenland halibut were carried out in Div. 1 D.