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Denmark/Greenland Research Report for 2000

by

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This report presents information on catch statistics from the commercial Greenland fishery and on research carried out in 2000 by the Greenland Institute of Natural Resources.

WEST GREENLAND (NAFO SUBAREA 1)

A. Status of the fisheries

Provisional statistics for the fisheries in 1999 and 2000 are presented in Table 1. The listed catches from 1999 and 2000 are an estimate as no official catch figures has been given from Greenland. Additional information on the status of the fisheries is as follows:

1. Shrimp

The shrimp stock off West Greenland is distributed to NAFO Div.0A and Subarea 1 and the entire shrimp stock is assessed as a single population. The Greenland fishery exploits the stock in Subarea 1 (Div. 1A to 1F) in offshore and inshore areas (primarily Disko Bay). The Canadian fishery has been restricted to Div. 0A since 1981. The *Pandalus borealis* quota in Greenland water was set at 71.000 tons (40.109 tons to the offshore fleet and 30.891 tons to the small-vessel fleet). The Greenland catches showed an overall increase from 1981 to 1992, thereafter decreased from 1992 to 1998. In 1999 catches increased again and catches in 2000 was at 79.120 tons.

The standardized catch-rate index for 1976-99 remained stable during the early 1990s, but has shown a slight increase since 1994. The projected 2000 value for catch-rate was the highest compared to catches during the 1990's.

2. Greenland halibut

The total catches of Greenland halibut by Greenland vessels in NAFO Subarea 1 amounted to 2,656 tons in 2000 including 151 tons taken during a research fishery north of 68°50N. Greenland trawlers took 1,884 tons while 772 ton was taken by a gill-netter. Almost all fishery took place in Div. 1C at depths between 1100 and 1500 m. The catch level in 2000 level is almost the same as in 1999. Additionally, 2,946 tons were taken by foreign vessels offshore (EU, Norway, Faroe Island and Russia). The total catch offshore in NAFO Subarea 1 was thus 5,603 tons. Fig. 1.

The inshore fishery in Div. 1A was concentrated in three areas Disko Bay (7,574 tons), Uummannaq (7,569 tons) and Upernavik (3,764 tons). The fishery was conducted by long lines and gill nets.

Inshore catches in Div. 1B-1F are negligible.

No analytical assessment has been made for either inshore or offshore stock components.

Commercial fisheries data. Three length frequencies samples (n=1030) were collected on board a Greenland trawler (Fig. 2).The mean trawl CPUE, based on logbooks reported to the Greenland authorities (100% coverage in 2000), was estimated at 0.78 ton/hour which is an increase from 0.57 tons/hr in 1999. The increase is mainly caused by the introduction of a new larger trawler, however the other trawler, which has participated in the Greenland fishery for several years, also showed an increase. CPUE by month (only October–December, where almost all the fishery takes place) and over all (all month) is given in Fig. 3.

3. Cod

In the last decade, the inshore cod fishery at West Greenland has contained cod from two different spawning areas: Icelandic cod spawned off South-western Iceland which in some years are carried by the Irminger current to settle off South Greenland, and local, possibly self-sustained, fjord populations. Spawning cod are found in several fjords of the West Greenland especially in NAFO Division 1B, 1C and 1D. In recent years the catches has decreased dramatically from about 2000 tons yearly in 1993-1995 to only 326 tons in 1998. In 1999 the catches has rose to 622 tons but decreased again to 500 tons in 2000.

The inshore fishery takes place from small vessels (<40 GRT). Pound nets, gillnets and handlines are used to take about 95% of the inshore catch. A commercial pound net CPUE series are available since 1992 (total catch from pound nets pr day/total number of poundnet landings pr day). The CPUE decreases from 1994 until 1998 and levels off in 1999. No commercial catch per unit effort data from 2000 was available in 2001.

No assessment or forecast is given here, but reference is made to the Northwestern Working Group report by ICES, April 2001. Greenland offshore trawl survey, conducted in 2000, showed an extremely low biomass of cod off West Greenland. These low values are consistent with the findings in the EU - German survey, conducted in the same area, and are also in line with last years estimate. Probability of stock recovery depends only on future recruitment. In view of the severely depleted spawning stock and rare event of drift from Iceland, substantial stock recovery must be considered as very unlikely.

4. Salmon

The abundance of non-maturing 1SW salmon has declined steadily during the recent 30 years both in the Southern European and the North American continental areas. Some improvement in the number of returning spawners is observed in some of the Canadian rivers. The estimated pre-fishery abundance is still at a historical low level, and the predicted level of abundance for 2000 offers no positive difference between this level and the estimated number of required spawners. Therefore at its annual meeting in 2000 the West Greenland Commission of NASCO agreed that in 1999 the fishery for salmon in Greenland should be restricted to that amount used for internal consumption in Greenland. This amount has in the past been estimated at 20 tons.

The total nominal catches in 2000 amounted to 20.5 tons. In 2000, a private company was given permission to buy catches for freezing and distribution in Greenland. This arrangement reduced the earlier observed private sales and sales at the local markets. The fishing season was extremely short, lasting only for five days. Some private fishery for own consumption has probably taken place after closure of the season, but due to the very scattered nature of this fishery estimating of the magnitude of this fishery is difficult. Nearly all catches were taken in Div. 1D and 1F. In earlier years the fishery of salmon has been more evenly distributed along the coast, however with large variations.

5. Capelin

The capelin fishery in West Greenland is carried out inshore and in the spawning season only (May-July). The main part of the catches amounted a total of 21 tons in 2000 is produced as whole frozen fish for bait and local consumption, while a smaller part is dried and stored as food for sledge dogs in the winter season. The majority of the catches were taken in Div. 1A.

6. **Redfish**

Redfish is reported as Beaked redfish, redfish (unspecified) and Golden redfish. A total of 1.416,8 tons is reported. Redfish is mainly taken as by catch by trawlers in the offshore shrimp trawlers amounted 581,6 tons in 2000 – reported as redfish (unspecified). Smaller vessels take a minor part inshore and landing amounted 34,9 tons in 2000. A EU-German pelagic fishery for oceanic redfish (*Sebastes mentella*) occurred for the first time off West Greenland in 1999. This is probably due to a change in distribution pattern of the pelagic redfish stock in Irminger Sea in a westerly direction as derived from an international hydro-acoustic survey conducted by Iceland, Russia and Germany. In 2000 reported catches from this pelagic fishery of oceanic redfish amounted 800,4 tons – reported as Beaked redfish and Golden redfish.

7. Grenadiers

There are two species of grenadiers of commercial interest in Greenland: roundnose grenadier and rougghead grenadier. All catches are however reported as roundnose grenadier. The catch reported is taken as by-catch in the Greenland halibut fishery. The total catch in 2000 was 17 tons, compared to12 tons the previous year.

8. Snow Crab

The total catch of snow crab by Greenland vessels conducted by traps in Subarea 1 in 2000 was 10,521 tons. The total catch in 2000 increased with 53 % compared to 1999, mainly due to development of the fishery and increasing interest in the resources. The inshore fishery in Div. 1A in Disko Bay (2,770 tons) was concentrated in three areas Vaigat, Qeqertarsuaq and Aasiasat. In Div. 1B two areas (Kangaatsiaq 112 tons) and Sisimiut (1.428 tons), Div. 1C (Maniitsoq 560 tons), Div 1D (Nuuk 344 tons) and 1E (Paamiut 1,606 tons).

Offshore catches, take by the offshore fleet, amounted to 3,700 tons in 2000 and were increased with 41% compared to 1999. The off shore fishery was mainly conducted in Div. 1D and 1E.

9. **Scallops**

The total catches of Icelandic scallops in NAFO Subarea 1 amounted in 2000 to 1.955 tons, which is a small decrease from 1999. A total quota for the scallop is set at 2.329 tons. All catches were taken in inshore areas in Div. 1A, 1 B, 1C 1D in 2000. The fishery in Division 1A is concentrated along the Disko Island, and the area around Sønder Upernavik. Other areas are found at Attu (1B) and Nuuk (1D).

B. Special Research Studies

1. **Environmental Studies**

a. Hydrographic Studies

A survey of oceanographic stations along the West Greenland standard sections was carried out in 2000. Although the North Atlantic Oscillation (NAO) Index has been fairly positive, the climate over Greenland has in recent years been rather mild, which can be attributed to at eastward shift of the Icelandic Low. The oceanographic conditions in the surface showed temperatures around 1°C above normal on top of Fylla Bank, while the salinity was slightly below normal. The inflow of Polar water was above normal while the inflow of Irminger water was very limited in 2000.

b. Recruitment Studies in Davis Strait

A three year project entitled "Hydrographic and biological processes of importance for variability in recruitment of northern shrimp, copepods and fish in West Greenland water" was initiated in spring 1999. The main objectives of the present project are: 1) to investigate the distributions of Pandalus shrimp larvae (*Pandalus montagui* and *P. borealis*) and fish larvae (mainly Greenland halibut) in relation to hydrography and food abundance, 2) to identify the effect of hydrography frontal regimes on larval and juvenile shrimp and fish condition and survival potential and 3) to investigate stomach contents and tracer lipids to establish trophic relationships.

2. Biological Studies

a. Shrimp

The series of annual stratified-random trawl surveys initiated in 1988 was continued in 2000. In July-September about 230 research trawl hauls were made in the major parts of the distribution area of the West Greenland shrimp stock, including areas in Subarea 0 and the inshore areas in Disko Bay and Vaigat.

During the period of stratified random surveys in the offshore areas of shrimp distribution the biomass estimates have indicated a good stability until 1998 around a level of 250 thousand tons, apart from somewhat lower values in 1991, 1995 and 1997. From 1998 a significant increase is observed with record high biomass in 2000 of 350 thousand tons. Total number of shrimp in 2000 is at the highest level found in the survey series, accounting for both male and female shrimp. Recruitment to the female group appears therefore to be secured for the coming years.

b. Greenland halibut

A Greenland offshore trawl survey for Greenland halibut was initiated in 1997. The survey is a continuing of the joint Japanese / Greenland survey carried out in the period 1987-95. The survey covered NAFO Div. 1C and 1D between the 3 nm line and the 200 nm line or the midline against Canada at depths between 400 and 1500 m. The survey is carried out as a stratified random bottom trawl survey. A total of 30 hauls were made in September-October 2000.

A longline survey for Greenland halibut in the inshore areas of Disko Bay, Uummannaq, and Upernavik was initiated in 1993. In 2000 60 settings were carried out in Upernavik and Disko Bay areas.

c. Young Cod survey

The series of annual gill-net surveys initiated in 1985 was continued in 2000. Results from this work are presented in the ICES Report of the North-Western Working Group in 2001.

d. Snow crab

An annual monitoring program (trapping survey) was initiated in 1997 in Disko Bay (Div. 1A) and Sisimiut (Div. 1B). In 2000 the surveys were conducted in May/June with the research vessel “Adolf Jensen”. The survey used baited traps with large and small mesh. All snow crabs were enumerated by sex, the carapace length, carapace width, chela height, weight and carapace condition was determined. Females were sampled in relation to studies on reproductive strategies and fecundity.

The objective of the monitoring program is to assess the abundance and distribution of snow crab in inshore areas of Greenland. Results from this survey are presented in the Technical Report Series of the Greenland Institute of Natural Resources.

e. Growth and recruitment study of snow crab and northern shrimp in a local fjord in Nuuk area

The project main goal is to follow a local stock of snow crab and northern shrimp in a fjord in Nuuk area for determining the yearly growth, reproductive potential and others biological parameters.

f. Marine mammals

Studies of white whale and narwhal continued in 2000. Details are being reported to JCCM and NAMMCO. Studies of minke whale, fin whale and humpback whale continued in 2000. Details are being reported to IWC. Studies of harp and hooded seals are being reported to the Joint ICES/NAFO Working Group on Harp and Hooded Seals.

GREENLAND FISHERY IN OTHER NAFO SUBAREAS

A. Status of the fisheries

In 2000 one Greenland vessel was engaged in shrimp fishery at Flemish Cap (NAFO Div. 3M) and Grand Bank (NAFO Div. 3L). Total nominal catches amounted to 1771 tons and 34 tons respectively.

Table 1. Nominal catches (tons) by Greenland vessels at West Greenland (NAFO Subarea 1) in 1999 and 2000. *The nominal catches from 1999 and 2000 are an estimate, as no STATLANT A or B has been given from Greenland.

	NAFO SA				
	Div. 1A, B, C, D, E, F			Div 3M	Div 3L
Species	Nominal catch 1999*	Nominal catch 2000*	% change 1999-00	Nominal catch 2000*	Nominal catch 2000*
American Plaice	3	*nd*			
Arctic char	24	*nd*			
Atlantic halibut	<1	9			
Atlantic salmon	19	21	11		
Capelin	34	21	-38		
Cod	621	500	-19		
Crabs	4.373	10.521	141		
Greenland cod	1.899	*nd*			
Greenland halibut	26.899	23.219	-14		
Grenadiers	12	17	39		
Lumpsucker	3.057	3.000	-2		
Redfish	78	1.416	1715		
Scallops	2.624	1.995	-24		
Shark	*nd*	*nd*			
Shrimp	70.167	79.120	13	1.771	34
Wolffishes	26	37	42		
Fish not specified	*nd*				
Sum total	109.836	119.875	9	1.771	

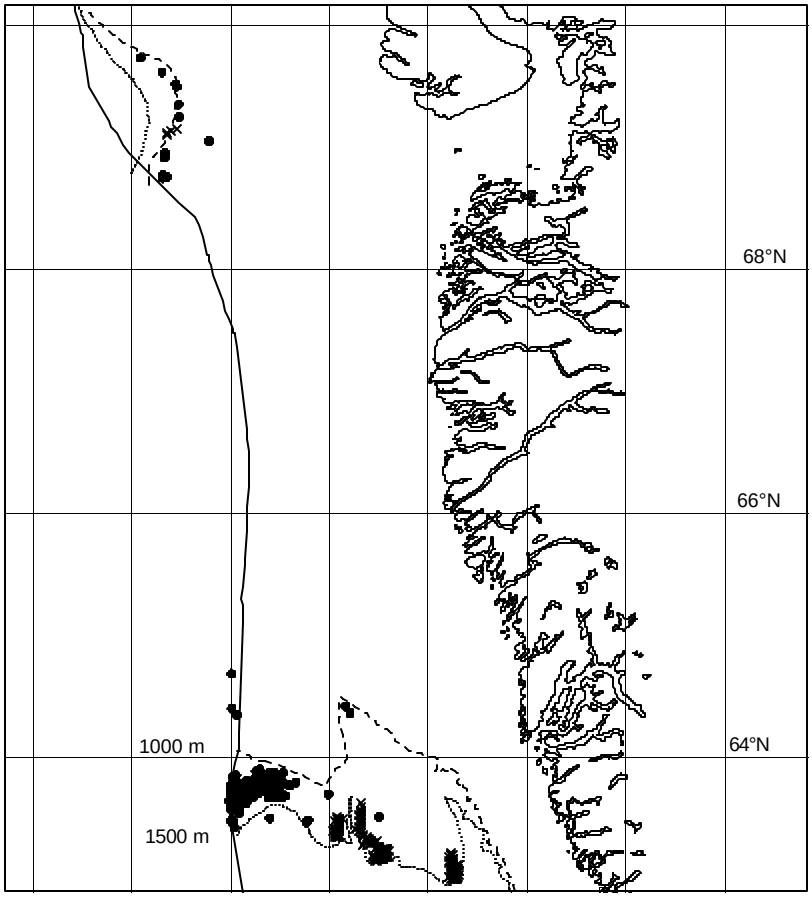

Fig 1. Distribution of the Greenland fisheries for Greenland halibut. • Trawl, × Gillnet.

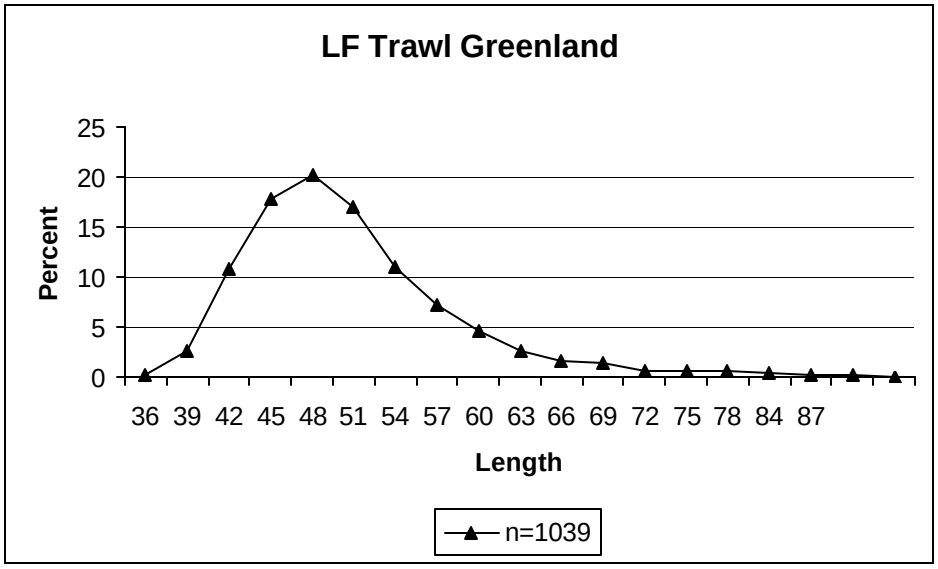

Fig. 2. Greenland halibut length frequencies samples (n=1030) from a Greenland trawler.

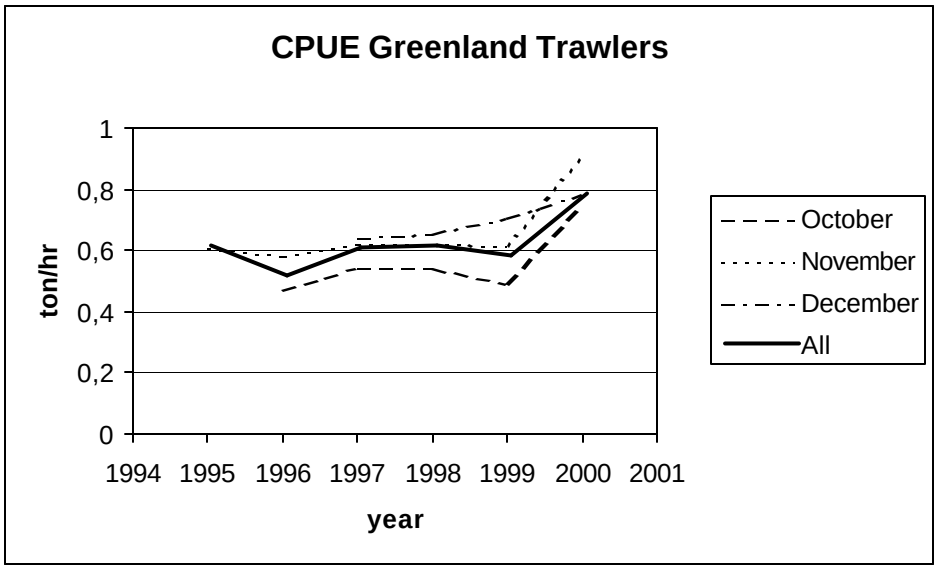

Fig. 3. Greenland halibut CPUE by month from 1994 – 2000.