

4 Overview on fisheries and their management in Greenland waters.

4.1 Ecosystem considerations

In recent years temperature have increased significant in Greenland water, with historic high temperatures registered in 2003 (50 years time series). Recently increased growth rates and earlier maturation for some fish stocks as indicated from the surveys might be a response of the stock to such favourable environmental conditions (WD 1/2005). As has been observed with the Icelandic cod stock another important interaction is between cod and shrimp and a historic large shrimp biomass is in West Greenland water in present time would make feeding conditions optimal (Hvingel 2004).

4.2 Description of the fisheries

Fisheries targeting living marine resources off Greenland can be divided into inshore and off-shore fleets. The Greenland fleet has been built up through the 60s and is today comprised of 450 ships with an inside motor and a large fleet of small boats. It is estimated that around 1700 small boats are dissipating in some sort of artisanal fishery mainly for private use or in the pound net fishery.

Active fishing fleet reported to Greenland statistic in 1996 – no later number are available.

All fleet (N)	<5	6-10	11-20	21-80	>80
441	31%	34%	2%	9%	6%

There is a large different between the fleet in the northern and southern part of Greenland. In south, where the cod fishery was a major recourse the average age is 22 years, in north only 9 years.

4.2.1 Inshore fleets;

The fleet are constituted by a variety of different platforms from dog sledges used for ice fishing, to small multi purpose boats engaged in whaling or deploying mainly passive gears like gill nets, pound nets, traps, dredges and long lines. West Greenland water is ice free all years up to Sisimiut at 67 °N.

In the northern areas from the Disko Bay at 72°N and north to Upernavik at 74°30N, dog sledge are the platforms in winter and small open vessels the units in summer, both fishing with longlines to target Greenland halibut in the icefjords. The main by-catch from this fishery is redfish, Greenland shark and roughhead grenadier.

The inshore shrimp fisheries are departed along most of the West coast from 61-72°N. The main by-catch with the inshore shrimp trawlers is juvenile redfish, cod and Greenland halibut. An inshore shrimp fishery is conducted mainly in Disko Bay but also occasional in fjords at southwest Greenland. Most of the small inshore shrimp trawlers have dispensation for using sorting grid, which is mandatory in the shrimp fishery.

Cod is targeted all year, but with a peak time in June – July, and pound net and gill net are main gear types. By-catches are mainly the Greenland cod (*Gadus ogac*) and wolffish. There is also some directed fishery for Greenland cod in the fjords.

In the recent years there has been an increasing exploitation rate for lumpfish. Fishing season is rather short, around April and along most of the West coast the roe is landed. By-catch is mainly comprised of eiders.

The scallop fishery is conducted with dredges at the West coast from 64-72 °N, with the main landings at 66°N. By-catch in this fishery is considered insignificant.

Fishery for snow crab is presently the third largest fishery in Greenland waters measured by economic value. The snow crabs are caught in traps in areas 62-70°N. Problems with by-catch are at present unknown.

A small salmon fishery with drifting nets and gillnets are conducted in August to October, regulated by a TAC.

Management of the inshore fleets is regulated by licenses, TAC and closed areas for the snow crab, scallops, salmon and shrimp. Fishery for Greenland cod, Atlantic cod and lumpfish are unregulated.

4.2.2 Offshore fleets

Apart from the Greenland fleet, Greenland living resources are exploited by several nations mainly EU, Iceland and Norway, depending on the status of various resources including exploratory fisheries and other criteria. Recently, Greenland halibut and redfish were target using demersal otter board trawls with a minimum mesh size of 130 mm.

Cod fishing has ceased since 1992 in the West Greenland offshore water but a very reduced fishery is still ongoing at the East coast. The Greenland offshore shrimp fleet consist of 15 freezer trawlers. They exclusively target shrimp stocks off West and East Greenland landing around 135 000 and 13 500 t, respectively. The shrimp fleet is close to or above 80 BT and 75% of the fleet process the shrimps onboard. They deploy shrimp trawls are acquired with a minimum mesh size of 44 mm and a mandatory sorting grid (26 mm) to avoid by-catch of juvenile fish. Even though, juveniles of redfish, Greenland halibut and cod are believed to be caught as by-catch.

The main part of the longliners are operating on the East coast with Greenland halibut as targeted species. By-catches for these longliners are roundnose grenadier, roughhead grenadier, tusk and Atlantic halibut, and Greenland shark (Gordon et al. 2003).

At the East coast an offshore pelagic fleet, are conducting a fishery on capelin (106 000t landed in 2003 by EU, Norway and Iceland). The capelin fishery is considered a rather clean fishery, without any significant by-catches. Also the pelagic red fish fishery is a clean fishery conducted in the Irminger Sea and extending south of Greenland into NAFO area. The demersal and pelagic offshore fishing is managed by TAC, minimum landing sizes, gear specifications and irregularly closed areas.

4.3 Overview of resources

In the last century the main target species of the various fisheries in Greenland waters have changed. A large international fleet landed in the 50s and 60s, large catches of cod reaching historic high in 1962 with about 450 000t. The offshore stock collapsed in the late 60s early 70s due to heavy exploitation and possible due to environmental condition. Since then the stock remained depended on occasional Icelandic larval cod transported. Since 1992 the biomass of offshore cod at West Greenland have been negligible. The TAC for cod is given to the East and West Greenland waters combined. The quota has through a longer period not been fully utilized. In 1969 the offshore shrimp fishery started and has been increasing ever since reaching a historic high of close to 150 000t in 2003.

4.4 Description of the most important commercial fishery resources - except mammals

4.4.1 Shrimp

The shrimp *Pandalus borealis* stock in Greenland water is considered in good condition. The 2003 biomass is estimated as the highest in the time series in West Greenland and stable in East Greenland. The landings in East Greenland estimated to 13 500t. and the CPUE values have been increasing since 1993. In West Greenland landings in 2003 are estimated to 135 000t.

4.4.2 Snow crab

The biomass of snow crab is believed to be decreasing in Greenland water. It has been exploited since the mid 90s in West Greenland inshore water and since 1999 at the offshore area. Total landings have been reported to amount to 12400t in 2002 the main part caught inshore. TAC for 2003 was 27 000t. CPUE have been decreasing from all offshore areas with 65% from 1999-2003.

4.4.3 Scallops

The status of scallops in Greenland is unknown. From the mid 80s to the start 90s landings were between 4-600t yearly. Since then landings have increased to around 2000t a year in 2002 the reported landings were 2240t. The fishery is based on license and is exclusively at the west coast between 20-60m. The growth rate is considered very low reaching the minimum landing size on 65mm on 10 years.

4.4.4 Squids

The status of squids in Greenland water is unknown.

4.4.5 Cod

In 2003, total landings of cod was reported as 5515t where only 300t were reported from the offshore areas. Although the landings are the highest in a 10-years period it is still only a fraction (5.5%) of the landings caught in 1990. Recruitment has been failing ever since the 1984 and 1985 year-class was observed, and no spawning takes at the moment place in the offshore waters. The present observations confirm the depleted status of the stock. The inshore fishery is not regulated and the offshore fishery is managed with license and minimum size. As a response to the favourable environmental conditions (large shrimp stock and high temperatures) cod could re-colonise the offshore areas and therefore a recovery plan is urgently required to rebuild the stock.

4.4.6 Redfish

4.4.7 Greenland halibut

Greenland halibut in the Greenland area consist of at least two stocks and more components; the status of the inshore component is not known but the component have sustained catches of 15.-20 000 t annually. The offshore stock component in NAFO SA 0+1 has remained stable in the last decade, sustaining a fishery of about 10 000 t annually. The East Greenland stock is a part of a complex distributed to Iceland and Faroe Islands. The recent status of this stock of is unknown, but in a longer time perspective the stock is at a low level.

4.4.8 Lump sucker

The status of the lumpfish is unknown. The landing of lumpfish has increased the last couple of years reaching close to 10 000t in 2003, which is more than a doubling compared to last year. Local depletion will likely occur due to a heavy exploitation.

4.4.9 Capelin;

Advice on demersal stocks under mixed fisheries consideration

4.5 Advice on demersal fisheries

ICES recommends a zero catch for cod in Greenland for all offshore areas. A recovery plan is recommended to ensure a sustainable increase in SSB and recruitment. Such plan must include appropriate measures to avoid any cod by-catch in other fisheries deploying mobile gears capable of catching cod. Observers must monitor functionality of measures.

Gordon, J.D.M., Bergstad, O.A., Figueiredo, I. And G. Menezes. 2003. Deep-water Fisheries of the Northeast Atlantic: I Description and current Trends. *J. Northw. Atl. Fish. Sci.* Vol: 31; 37-150.

East Greenland

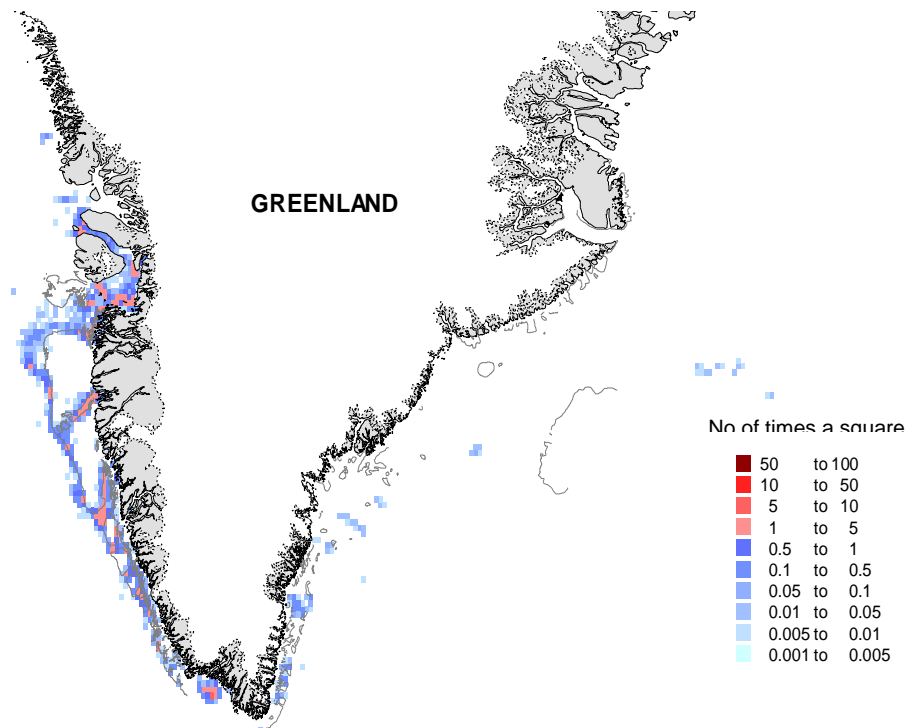
OFFSHORE:	VESSELS	TONNES	DICARD
Capelin	70	117838	0
G.halibut	26	8026	10
A.Halibut	10	248	0
Shrimp	28	7349	11
S. mentella Pel.	35	10680	11
Redfish sp.	2	106	0
S.Marinus	19	366	0
Roundn. grenadier	19	104	6
Wolfish	3	10	0
Mixed quota	3	485	1

West Greenland

OFFSHORE:	VESSELS	TONNES	DICARD
G.halibut	17	9502	18
A.halibut	1	20	0
Shrimp	20	58623	9
Redfish sp.	14	2349	0
Roundn. grenadier	7	46	30
Cod	10	728	0
Inshore:			
Snow crab	12	2802	41
Scallops	4	2215	0

***vessels number included vessels from EU, Norway and Iceland**

Impact of shrimp fishery in 2002



Disturbance by fishing gear during the history of logbooks (~ 20 years)

