PINNGORTITALERIFFIK
GRØNLANDS NATURINSTITUT
GREENLAND INSTITUTE OF NATURAL RESOURCES

Orientering rejer

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Vedr.: Den biologiske rådgivning for 2011 for rejer ved Vest- og Østgrønland.

Hermed fremsendes til orientering den biologiske rådgivning for 2011 for fiskeri efter rejer. Rådgivningen for rejer i Vest- og Østgrønland er formuleret på det seneste møde under NAFO/ICES, som blev afholdt 21.–27. oktober 2010.

Rejer Vestgrønland:
Rejebestanden ved Vestgrønland befandt sig på et meget højt niveau fra 2004 til 2008. I 2009 faldt bestanden til 2003 niveauet. Data fra 2010 viser at bestanden ikke reduceres yderligere og NAFO anbefaler derfor at de samlede fangster i 2011 ikke overstiger 120.000 tons. Rådgivningen for 2010 lå på 110.000 tons.

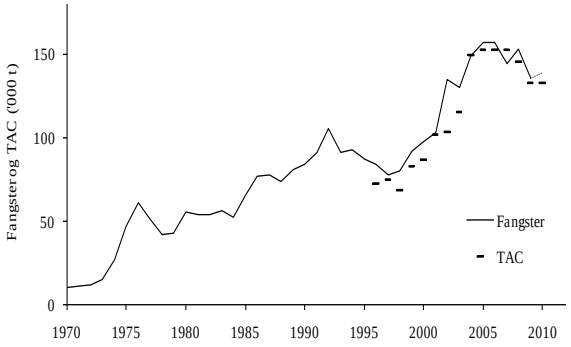
I årene 2004-2008 lå fangsterne (Figur 1) på 150.000 tons/år. I 2009 faldt de til 135.000 tons, som følge af en lavere kvote i Grønland. Fangsterne ultimo 2010 forventes at nå 138.000 tons.

Til vurdering af rejebestanden benyttes en matematisk model der tager højde for **de rejer torsken spiser**. Fangstrater fra logbøgerne viser en nedgang fra 2008 til 2010, hvorimod de biologiske undersøgelser viser en markant stigning fra 2009 til 2010 (figur 4), samtidig er torskebestanden (udenskærs Vestgrønland) reduceret voldsomt fra 2008 til 2010, hvilket vurderes til at være medvirkende årsag til at 2010 rejebestanden holdt samme niveau som i 2009.

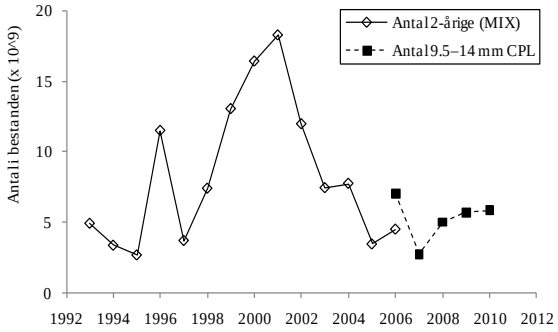
Rådgivningen for 2011 er på 120.000 tons og hermed 10.000 tons højere end sidste år. Forskellen i biologernes vurdering af bestanden i år sammenlignet med sidste år er ikke **stor,** men der er tre væsentlige forhold der har været afgørende for den ændrede rådgivning:

1. Nye analyser viser at tilgangen af små rejer har været stabile fra 2008 til 2010 (Figur 2). I 2009 gav data anledning til bekymring, idet data antydede en markant nedgang i tilgangen af små rejer.
2. Forbedret analyse af logbøger viser, at fiskeriet ikke har koncentreret indsatsen til mindre områder. En koncentreret indsat til mindre områder var en bekymring i 2009 (Figur 3), hvor data var analyseret på større geografiske områder.
3. Torskebestanden (udenskærs Vestgrønland) er reduceret voldsomt siden 2007, hvilket vurderes til at være medvirkende årsag til at 2010 rejebestanden holdes på samme niveau som i 2009.

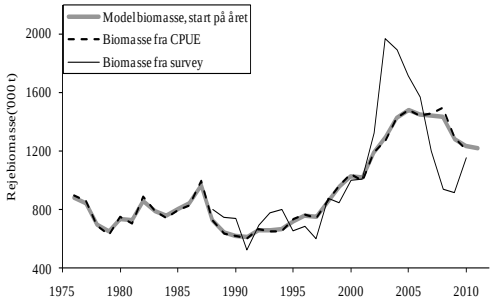
Bilag 1 er det engelske sammendrag af rådgivningen fra NAFO. GN har skrevet og fremlagt i alt 7 dokumenter, der tilsammen danner baggrunden for rådgivningen for Vestgrønland.



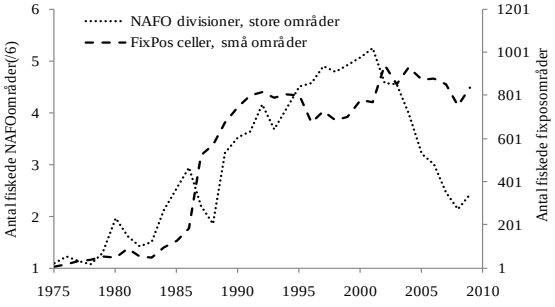
Figur 1. Totale fangster (2009: Grønland 134.890 tons, Canada 420 tons) og kvoter (2009: Grønland 127.300 tons, Canada 18.417 tons).



Figur 2. Mængden af små rejer, der forventes at bidrage til fremtidens fiskeri.



Figur 3. Bestandens udvikling fra 1975–2010.



Figur 4. Analyse af bestandens udbredelsesområde (fra logbøger). De nye undersøgelser viser at fiskeriet ikke koncentrerer indsatsen til få områder som frygtet i 2009.

Rejer Østgrønland:

Rådgivningen for rejebestanden ved Østgrønland for 2011 er uændret på 12.400 tons. Kvoterne har siden 2004 været sat til 12.400 tons. Fangsterne fald voldsomt fra næsten 13.000 tons i 2003 til under 3.000 tons i 2008. I 2009 steg fangsterne igen til 4.500 tons og 2010 forventes at ligge på dette niveau.

Rådgivningen er baseret på data fra fiskeriet (fangstrater fra logbøger) og fra biologiske undersøgelser i årene 2008-2010. Fangstraterne antyder at bestanden er stabil, men der er usikkerhed om hvorvidt fangstraterne afspejler udviklingen i bestanden. Usikkerheden skyldes ikke mindst at det er uklart hvorvidt de faldende fangster skyldes økonomi eller en negativ udvikling i bestanden. De biologiske undersøgelser varierer meget over de tre år og giver derfor ingen klare signaler.

Bilag 2 er det engelske sammendrag af rådgivningen fra NAFO. GN har skrevet og fremlagt 2 dokumenter, der danner baggrunden for rådgivningen for Østgrønland.

Den officielle rådgivning findes på NAFO (www.NAFO.int) hjemmeside. Den engelske rapport over rådgivningen fra NAFO består af mere end 100 sider A4, som Departement og Styrelsen for fiskeri modtager en kopi af.

Med venlig hilsen

Helle Siegstad
Afdelingschef

Bilag 1.Northern shrimp in Subareas 0 and

Background: The shrimp stock off West Greenland is distributed in Subarea 1 and Div. 0A east of 60°30'W. A small-scale inshore fishery began in SA 1 in the 1930s. Since 1969 an offshore fishery has developed.

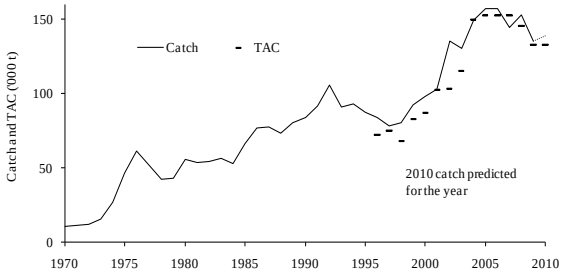
Fishery and Catches: The fishery is prosecuted mostly by Greenland in SA 1 and Canada in Div. 0A. Canada did not fish in 2008 and fished little in 2009, but has resumed fishing in 2010. Recent catches are:

	Catch ('000 t)		TAC ('000 t)	
Year	NIPAG	21A[1]	Advised	Actual[2]
2007	144.2	144.1	130	152.4
2008	152.7	148.6	110	145.7
2009	135.3	134.0	110	133.0
2010	138.5[3]	-	110	133.0

[1] Provisional.

[2] Total of TACs set by Greenland and Canada.

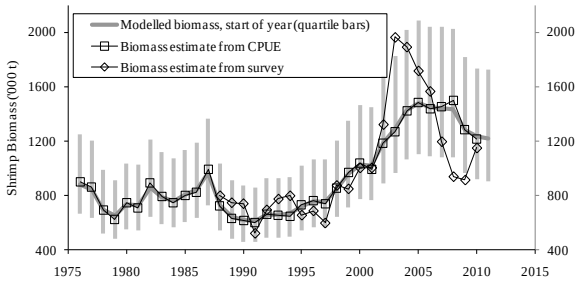
[3] Predicted to year-end by industry observers.



Data: Catch, effort, and position data were available from all vessels. Series of biomass and recruitment indices and size-composition and sex-composition data were available from research surveys. Series of cod biomass and cod consumption were also available.

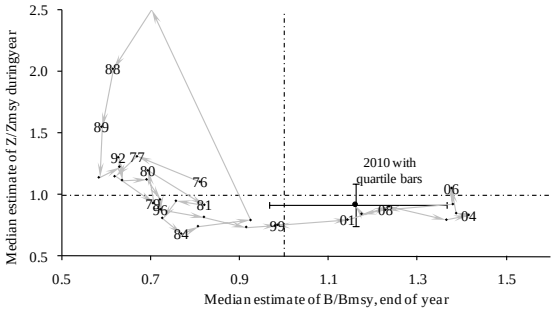
Assessment: An analytical assessment framework was used to describe stock dynamics in terms of biomass (B) and mortality (Z) relative to biological reference points. The model used was a stochastic version of a surplus-production model including an explicit term for predation by Atlantic cod, stated in a state-space framework and fitted by Bayesian methods. *MSY* (Maximum Sustainable Yield) defines maximum production, and B_{msy} is the biomass level giving *MSY*. A precautionary limit reference point for stock biomass (B_{lim}) is 30% of B_{msy} and the limit reference point for mortality (Z_{lim}) is Z_{msy}. The model fitted the data well. Median estimate of *MSY* was 147 000 t/yr.

Indices of how widely the stock and the fishery were distributed were calculated from catch positions in the fishery and the survey.



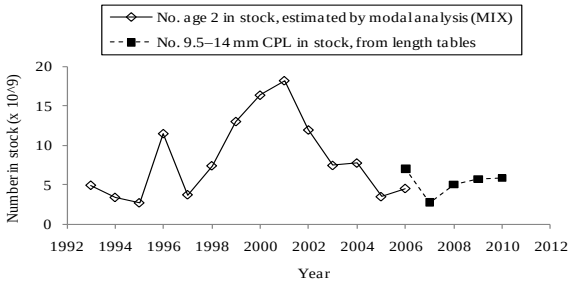
Biomass. A stock-dynamic model showed a biomass peaking in 2005 and declining since. The probability of biomass below B_{msy} at end 2010 with projected catches at 138 500 t was estimated at 28% and of its being below B_{lim} at less than 1%.

Mortality. The mortality caused by fishing and cod predation (Z) has been stable below the upper limit reference (Z_{msy}) since 1995. With catches in 2010 projected at 138 500 t the risk of total mortality in 2010 exceeding Z_{msy} was estimated at about 37.5%.



Recruitment. A recruitment index based on survey numbers of small shrimps fell to low levels in 2005–2006. A second index remained near its 2006 level until 2010.

State of the Stock. Modelled biomass is estimated to have been declining since 2005. However, at the end of 2010 biomass is projected to be still above B_{msy} and total mortality below Z_{msy}. Recent estimates of recruitment indices have been low.



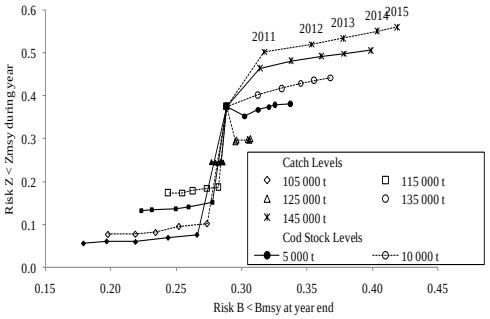
Short-term predictions: Estimated risks for 2011 with a 5 000 t cod stock are:

5 000 t cod Risk (%), in 2011, of:	Catch option ('000 t)				
	105	115	125	135	145
falling below B_{msy}	27	28	28	30	31
falling below B_{lim}	<1	<1	<1	<1	<1
exceeding Z_{msy}	8	15	25	35	46

Medium-term Predictions: Medium-term predictions over five years are based on the assessment model, which does not take into account either below-average recent year classes or changes in the area being fished. Percentage risks of transgressing precautionary limits after five years at cod stock biomass levels of 5 000 and 10 000 t were estimated at:

Catch (Kt/yr)	B_{MSY}		B_{lim}		Z_{msy}	
	5 Kt	10 Kt	5 Kt	10 Kt	5 Kt	10 Kt
105	18	20	<1	<1	6	8
115	22	24	<1	<1	13	17
125	28	30	<1	<1	25	30
135	34	37	<1	<1	38	44
145	40	42	1	1	51	56

and the joint evolution of precautionary-approach risks over five years 2011–2015, with an 'effective' cod stock at 5 000 or 10 000 t, was predicted to be:



Recommendations: The concerns of Scientific Council related to recruitment prospects and to contraction of the area of distribution of the resource are less grave than in 2009. None the less, Scientific Council considers that catches should be set at a level bearing a low risk of exceeding Z_{msy}. Scientific Council therefore advises that catches in 2011 should not exceed 120 000 t.

Special Comments: The Scientific Council advice is for catch weight, correctly reported, without overpacking or allowances.

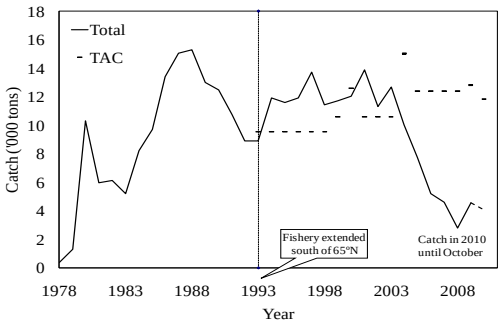
Sources of Information: SCR Doc. 02/158, 03/74, 04/75, 76, 10/51, 53, 54, 56, 57; SCS Doc. 04/12.

Bilag 2: Northern shrimp in Denmark Strait and off East Greenland

Background: The fishery began in 1978 in areas north of 65°N in Denmark Strait, where it occurs on both sides of the midline between Greenland and Iceland. Areas south of 65°N in Greenlandic waters have been exploited since 1993. Until 2005 catches in the area south of 65°N accounted for 50 - 60% of the total catch but since 2006 catches in the southern area accounted for 25% or less of the total catch.

Fishery and Catches: Four nations participated in the fishery in 2010. Catches in the Iceland EEZ decreased from 2002-2005 and since 2006 no catches has been taken. Recent catches and recommended TACs are as follows:

	Catch ('000 t)	TAC ('000 t)		
Year	NIPAG	Recommended	Greenland EEZ	Iceland EEZ[1]
2006	5.2	12.4	12.4	
2007	4.6	12.4	12.4	
2008	2.8	12.4	12.4	
2009	4.6	12.4	12.8	
2010	4.1[2]	12.4	11.8	

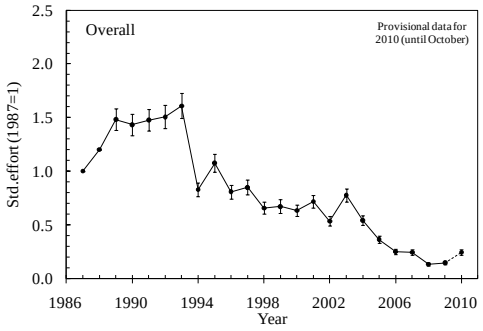


[1] Fishery unregulated in Icelandic EEZ;
[2] Catch till October 2010.

Data: Catch and effort data were available from trawlers of several nations. Annual surveys have been conducted since 2008.

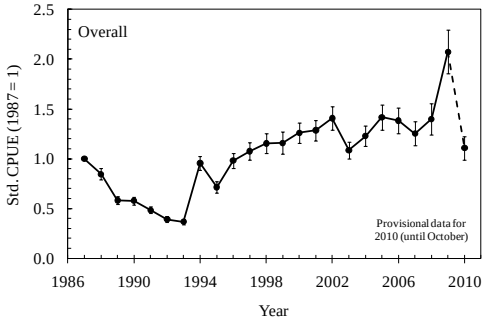
Assessment: No analytical assessment is available. Evaluation of the status of the stock is based on interpretation of commercial fishery data and survey data.

Recruitment: No recruitment estimates were available.



Exploitation rate: Since the mid 1990s, the exploitation index (standardized effort) has decreased, reaching the lowest levels seen in the time series from 2008 to 2010.
Biomass: The biomass index from 2008-2010 varied greatly with no clear trend.

CPUE: Combined standardized catch-rate index for the total area decreased steadily from 1987 to 1993, showed an increase to a relatively high level at the beginning of the 2000s, and has fluctuated around this level until 2008. In 2009 the standardized catch rate rose to the highest level ever seen, but probably does not reflect a corresponding increase in biomass. In 2010 the standardized catch rate is back to the level seen from the beginning of the 2000s.



State of the Stock: The stock biomass is believed to be at a relatively high level, and to have been there since the beginning of the 2000s.

Recommendation: Scientific Council finds no basis to change its previous advice and recommended that catches should remain below 12 400 t in 2011.

Special Comments: The predominant fleet, accounting for 40% of total catch, has decreased their effort in recent years, which gives some uncertainty on whether recent index values are a true reflection of the stock biomass. This decrease may be related to the economics of the fishery.

Sources of Information: SCR Doc. 03/74, 10/59, 10/69.