



22. september 2022

J.nr. 20.00-11

Kitaani Tunumilu raajanik aalisarneq pillugu siunnersuutip 2023-moortup eqikkarnera

Eqikkaanermi matumani 2022-mut sanilliullugu siunnersuinermi allannguutit nassuiarneqarput NAFO-millu pisassat amerlassusissaattut siunnersuutigineqartut saqqummiunneqarlutik. Innersuussutit Tapiliussami itisilerneqarput.

2023-mi Kitaani raajat 100.000 tonsit, 2022-mut sanilliullugu 5.000 tonsinik ikinnerusut, aalisarneqarsinnaanissaat innersuussutigineqarpoq. 2023-mi Tunumi raajat 2.000 tonsit, 2022-mut sanilliullugu 1.000 tonsinik ikinnerusut, aalisarneqarnissaat siunnersuutigineqarpoq.

2023-mut raajat pillugit siunnersuut

Kitaa

110.000 tons.

2022-mut siunnersuut: 115.000 tons.

2022-mi pisarineqartussatut
naatsorsuutigineqartut tamakkiisut: 120.000 tons.
miss.

Tunu

2.000 tons.

2022-mut siunnersuut: 3.000 tons.

2022-mi pisarineqartussatut
naatsorsuutigineqartut tamakkiisut: < 5.300 tons.

Siunnersuut pisortatigoortoq Aalisarnermut Naalackersuisoqarfiup tigusimasaata assinga NAFO-p nittartagaani (www.nafo.int) ukiup matuma ingerlanerani pissarsiassaalerumaarpoq. Tamannattaq atuuppoq Pinngortitaleriffiup siunnersuinerminut tunngavilersuutigisaminik allattugaanut. Allattukkat amerlanerusut kissaatigineqarpata soorunami Pinngortitaleriffimmit pissarsiarineqarsinnaapput.

Pinngortitaleriffiup ungasinngitsukkut ingerlatsivimmit aalisarnermillu ingerlatsisunit aallartitaasussat siunnersuummut tunngaviusut sukumiisumik misissuataarneqarnissaannut, tamatumunnga atatillugu apeqqtut akissuteqarfiginissaannut ilisimasanillu avitseqatigiinnissamut, qaaqqujumaarpai.

Inussiarnersumik inuulluaqqusillunga

Helle Siegstad

Immikkoortortami pisortaq

Kitaani raajat

NAFO siunnersuivoq 2023-mi pisat 110.000 tonsit, 2022-mut siunnersuutigineqarsimasunit 5.000 tonsinit ikinnerusut, qaangissanngikkaat.

Siunnersuineq pillugu

Kitaani qanoq-atsigisumik pisaqarsinnaanermik siunnersuuteqarnermut ukiumi matumani raajaqassutsip nalilerneqarneranit inernerusup raajat amerlassusiisa aalaakkaasuunerannik, taamaakkaluatorli raajanik amerlanerusunik nerisaqartussanik saarulleqarnerulernissaanik, takutitsineranik tunngaveqarluni aalajangigaavoq. Tamatumalu saniatigut ilimagineqarpoq peqassutsimit ilanngaataasinnaatitaasunit (TAC-mit), 2021-mi pisassiisutunit nuunneqarsimasunit, raajat 5.000 tonsinik amerlanerusut 2022-mi pisarineqassasut. Tamatuma kinguneraa ukiumi tassani uumasoqatigiiaat ilanngarnerpaaffigisinnaasaata 43 %-imik qaangerneqaratarsinnaanera.

Qarasaasiaq atorlugu naatsorsuutip, peqassutsip ineriartorneranik naatsorsuisartup, siorna raajarniarnermit pisat atorsimavai (Takussutissiaq 1 takuuk), raajaqassutsip oqimaassusinnigortinneqarnera uumassusilinnik misissuineranit, aalisarnermi pisat oqimaassusiinit aamma saarulleqassutsillu oqimaassusinnigortinneranit naatsorsorneqarsimavoq. 2004-mi peqassutsip qaffasinneqarpaasimanera 2014-illu tungaanut allariartorsimanera kisinneqarsimavoq. 2017-ip kingornagut peqassuseq aalaakkaasuusimavoq, naatsorsorneqarsimallunilu 2022-p naajartornerani piujuartitsiniartumik raajaqassutsimit atuisinnaanermut qulakkeerinnittoq qaangerlugu raajaqassuseq inissisimassasoq (Takussutissiaq 2 takuuk).

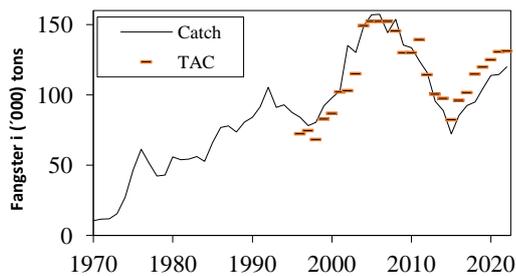
Raajat ukiumik marlunnik utoqqaassusillit amerlassusiat, ukiumi tulliuuttuni pingasuni aalisarneqarsinnaalersussatut naatsorsuutigineqartut, 2019-imi, 2020-mi 2021-milu uteqqiasumik misissuisarnerni kisitsinertalinni agguaqatigiissillugu amerlassusiusumit amerlanerupput (4).

Ilanngarsinnaanerpaaffik (Takussutissiaq 3) 2014-ip kingornagut piffissami sivikitsumi appariartorsimavoq, 2022-lli tungaanut Z_{msy} pallingajallugu qaffakkiartorsimalluni.

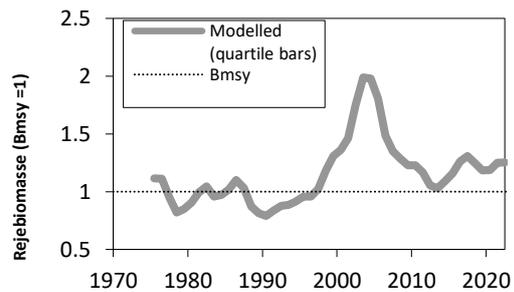
Tabelli 1. Kalaallit Nunaata kitaani Canadamilu 2013-imit 2022-mut tulaassat tamakkiisut (tonsinnigorlugit)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
NIPAG	95 381	88 765	72 256	85 527	92 584	94 878	104 314	113 758	114 569	120 000 ²

¹ naatsorsuutigineqartoq

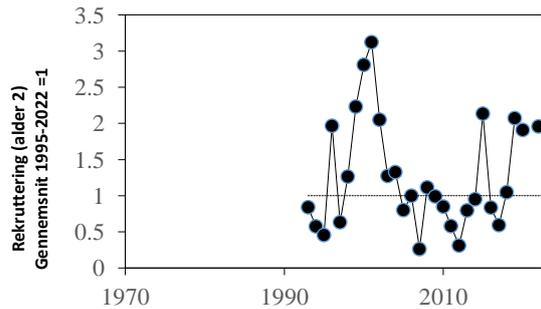
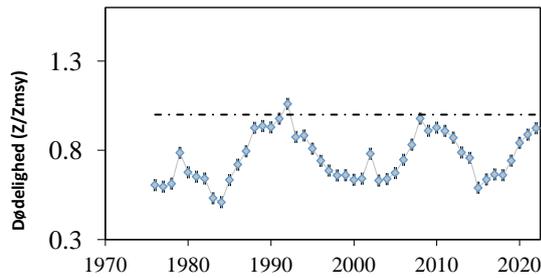


Takussutissiaq 1. Pisat tamakkiisut (1970-2022)



Takussutissiaq 2. Raajaqassuseq (qarasaasiaq atorlugu naatsorsuinermit; 1970-2022)

Tapiliussat



Takussutissiaq 3. Ilanngarsinnaanerpaaffik (aalisarneqarnermit saarullinnillu nerisarineqarnermit; 1970-2022)

Takussutissiaq 4. Piarineqarsinnaanngorneq (Ukiunik marlunnik utoqqaassusillit; 1970-2022)

Ilisimatuussutsikkut siunnersuummi Naalakkersuisut Kitaani raajarniarnermik ingerlatsinermi tunngaviusussatut aalajangersagaat tunngavigalugit nalilernerqarpoq 2023-mi 110.000 tonsinik aalisarnikkut piujuartitsiniarluni peqassutsimit atuineq qulakkeerneqassasoq. Tamanna isumaqarpoq ilanngarsinnaanerpaaffiup, aalisarnikkut piujuaannartitsiniarsinnaajunnaarfiup killingata, (Z_{msy-p}), qaangerneqaratarsinnaaneranut ilimanassutsip 35 %-ip iluaniinneranik, peqassutsillu minnerpaaffigilersinnaasaata, (B_{lim-ip}), ataaniilernissap ilimanassusiata appasinneranik.

Tunumi raajat

NAFO-p siunnersuutigaa 2023-mi piarineqartussat 2.000 tonsit, 2022-mi siunnersuinermit sanilliullugu 1.000 tonsinik ikinnerusut, qaangissanngikkaat. Peqassutsip siaruarsimaffia pillugu qulakkeerinntoqarsimanngilaq, uumassuilinnilli misissuinerit aalisarnermillu paasissutissat pissariarineqarsinnaasut takussutissiipput raajat sumiiffimmi killilimmi ataatsimoornerannik. Ukioq manna NAFO-p ilisimatuussutsikkut siunnersuisuisa qarasaasiaq atorlugu naatsorsuutip SPiCT-p Tunumi raajaqassutsip nalilernerqarnissaannut atortussatut atorineqarsinnaanera akueraat.

Siunnersuineq pillugu

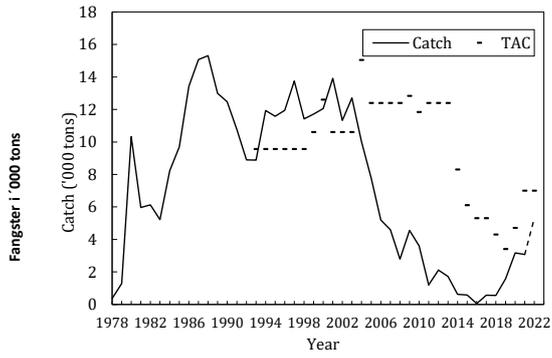
2017-ip kingornagut pisat amerliartorsimapput (Takussutissiaq 5 takuuk). 2022-mi raajaqassuseq raajaqassutsip pitsaernerpaaffigisinnaasaanit 15%-imik appasinnerusumi inissisimavoq (Takussutissiaq 6 takuuk), aalisarneqarnikkullu ilanngarneqarsinnaanerpaaffik aalisarnikkut ilanngarneqarsinnaanerpaaffiup qulaani inissisimalluni (Takussutissiaq 7 takuuk). Aalisartoqarpallaarsimanngimmat qularnarpoq aalisarnermi pisat oqimaassusiisa sumiiffimmi tassani uumasooqassuseq sunniivigisassagaat. Tamatuma saniatigut 2020-mi 2022-milu peqassutsimik oqimaassusinngortitsilluni misissuinerit 2014-imillu aalisartut Tunumi Dohrn Bankemi sumiiffimmi annikitsuinnarmi pisimapput. Piarineqarsinnaanngortunut kisitsisitigut ersersitsisoqanngilaq sumiiffimmi misissuiffiusumi raajaqqat (suli inerissimanngitsut) ikittuinnaat piarineqarsimammata.

Tabelli 2. Tunumi 2013-imit 2022-mut raajat tulaassat tamakkiisut (tonsinnngorlugit)

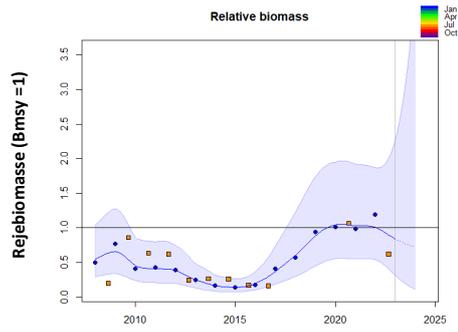
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
NIPAG	1 717	622	576	49	561	547	1 580	3 172	3 067	5 295 ¹

¹ naatsorsuutigineqartoq

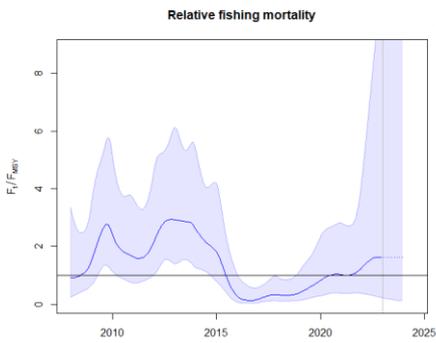
Tapiliussat



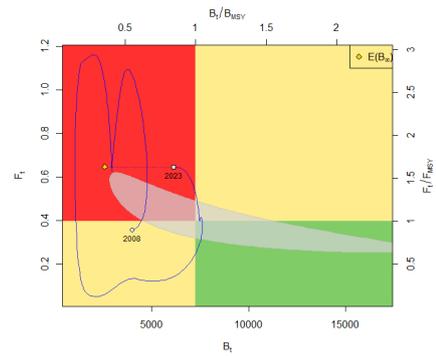
Takussutissiaq 5. Pisat tamakkiisut (1978-2022)



Takussutissiaq 6. Raajaqassuseq qarasaasiaq atorlugu naatsorsuinermit (1987-2022).



Takussutissiaq 7. Ilanngarsinnaanerpaaffik qarasaasiaq atorlugu naatsorsuinermit (1987-2022)



Takussutissiaq 8. Peqassuseq qarasaasiaq atorlugu naatsorsuinermit (1987-2022)

Northern shrimp in Subarea 1 and Div. 0A

Advice September 2022 for 2023

Recommendation

In line with Greenland’s stated management objective of maintaining a mortality risk of no more than 35% (subject to a risk of biomass being below B_{lim} of less than 1%), Scientific Council advises that catches in 2023 should not exceed 110 000 t.

With regard to the Canadian harvest strategy, Scientific Council notes that catches of 110 000 t in 2023 would result in less than 35% risk of exceeding Z_{msy} in 2023 and 2024, and a 35% risk of exceeding Z_{msy} in 2025, assuming catches at the same level as in 2023.

Management Objectives

A management plan and management objectives have been defined by the Government of Greenland in 2018. The objective is to maintain a mortality risk of no more than 35% (subject to a risk of biomass being below B_{lim} of less than 1%). Canada has a harvest strategy with the objective to maintain the stock in the Healthy Zone (>80% of B_{msy}); when the biomass is above 80% of B_{msy} , the risk of being above Z_{msy} should be no more than 35%, based on the 3-year projections. Advice was also drafted to be consistent with the NAFO precautionary approach (FC Doc. 04-12).

<i>Objective</i>	<i>Status</i>	<i>Comment/consideration</i>
Maintain risk of being above Z_{msy} at no more than 35%		The TAC set for 2022 equates to a risk of being above Z_{msy} by the end of 2022 of 43%
Maintain the stock in the Healthy Zone (>80% of B_{msy})		The stock is above B_{msy} in 2022
Maintain risk of biomass being below B_{lim} of less than 1%		The risk of biomass in 2022 being below B_{lim} is less than 1%

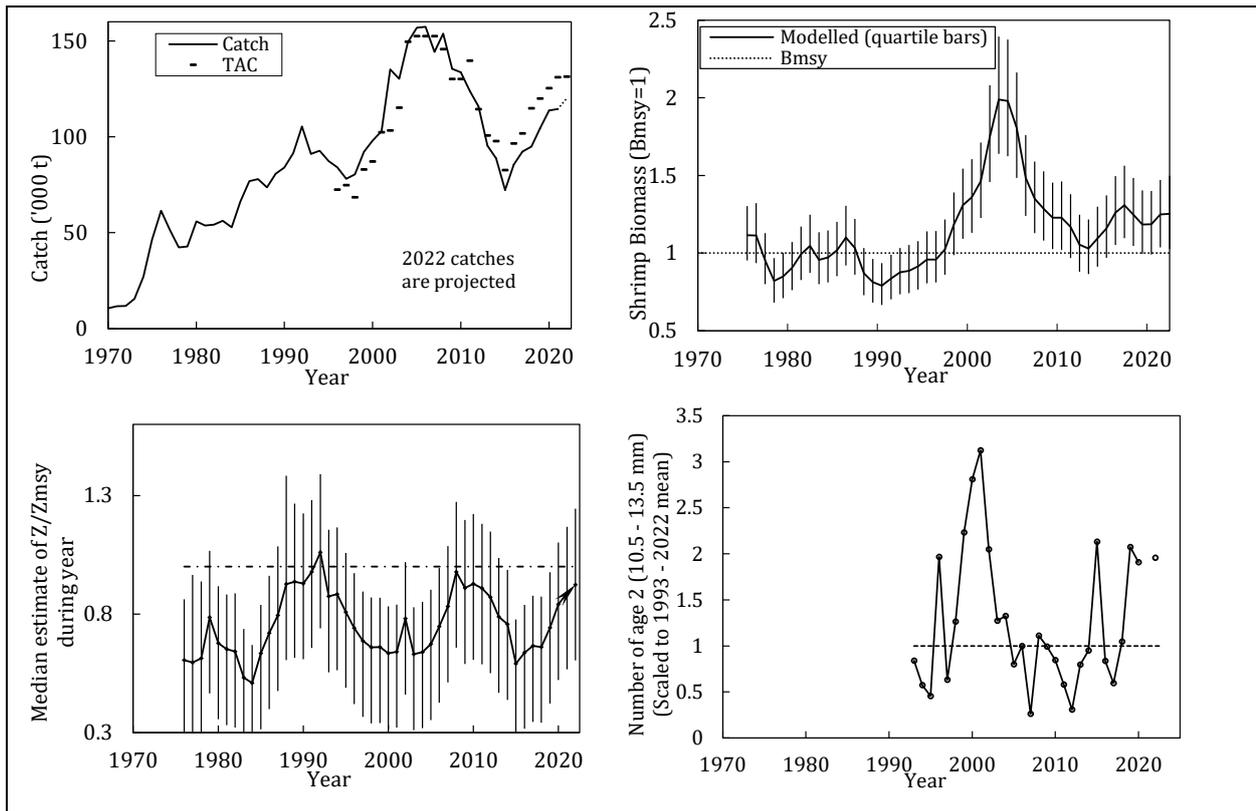
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 Intermediate

Management unit

The stock, considered distinct from all others, is distributed throughout Subarea 1, extends into Div. 0A east of 60°30’W, and is assessed as a single stock. In 2021, more than 99% of the landings were from Greenland.

Stock status

Biomass in 2022 is above B_{msy} and the probability of being below B_{lim} is very low (<1%). The probability of mortality in 2022 being above Z_{msy} is 43%. Recruitment (number of age-2 shrimp) in 2022 was above average.



Reference points

B_{lim} has been established as 30% B_{msy} , and Z_{msy} has been set as the mortality reference point. B_{msy} and Z_{msy} are estimated directly from the assessment model.

Projections

Predicted probabilities of transgressing precautionary reference points in 2023 – 2025 under eight catch options and subject to predation by a cod stock with an effective biomass of 19 Kt.

19 Kt cod Risk of:	Catch option ('000 tons)							
	95	100	105	110	115	120	125	130
falling below Bmsy end 2023 (%)	24	24	23	25	25	25	26	26
falling below Bmsy end 2024 (%)	25	25	26	27	28	29	30	29
falling below Bmsy end 2025 (%)	25	27	27	29	30	32	33	33
falling below Blim end 2023 (%)	0	0	0	0	0	0	0	0
falling below Blim end 2024 (%)	0	0	0	0	0	0	0	0
falling below Blim end 2025 (%)	0	0	0	0	0	0	0	0
exceeding Zmsy in 2023 (%)	22	25	29	32	36	39	43	46
exceeding Zmsy in 2024 (%)	22	26	30	33	38	40	44	47
exceeding Zmsy in 2025 (%)	23	27	30	34	38	42	45	49
falling below Bmsy 80% end 2023 (%)	8	8	8	8	9	9	9	9
falling below Bmsy 80% end 2024 (%)	9	9	10	11	11	11	13	12
falling below Bmsy 80% end 2025 (%)	10	11	12	13	14	13	16	16

Assessment

Advice is based on risk analysis from a quantitative model. The analytical assessment was run in 2022 with updated input data series.

The next assessment is scheduled for 2023.

Human impact

Mortality related to the fishery has been documented. Other human sources (e.g. pollution, shipping, oil-industry) are un-documented.

Biological and Environmental Interactions

Cod is an important predator on shrimp. This assessment incorporates this interaction. Other predation is likely but not explicitly considered. Shrimps might be important predators on, for example, fish eggs and larvae.

Fishery

Shrimps are caught in a directed trawl fishery. Bycatch of fish in the shrimp fishery is around 1% by weight. The fishery is regulated by TAC.

Recent catches and TACs (t) have been as follows:

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Enacted TAC ¹	100 596	97 649	82 561	96 426	101 706	114 876	119 875	125 229	130 937	131 292
STATLANT 21	91 802	88 834	71 779	84 303	91 725	91 869	102 706	110 250	107 571	
NIPAG	95 381	88 765	72 256	85 527	92 584	94 878	104 314	113 758	114 569	120 000 ²

¹ Sum of TACs autonomously set by Canada and Greenland.

² Projected to year end.

Effects of the fishery on the ecosystem

Measures to reduce effects of the fishery on the ecosystem include area closures, moving rules and gear modifications to reduce damage to benthic communities and reduce bycatch.

Special comment

From 1993 to 2010 the Greenlandic survey in the Canadian area (SFA1) was conducted annually. In that period, average biomass in that area was 2% of the total biomass estimated in Subarea 1 and Div. 0A. Since 2011, due to ice cover, there has only been sporadic information from the Greenlandic survey in the Canadian area (SFA1). The area was surveyed only in 2013 and 2017. In 2013, the biomass in that area (SFA1) was less than 1% of the total estimated biomass in Subarea 1 and Div. 0A, whereas it was about 2% in 2017.

SC recommends that the projection table should be given in projected catch increments of no less than 5 Kt due to uncertainty in calculating risk levels.

Source of Information

SCS Doc 13/04, FC Docs 04-18, SCR Docs. 20/053, 20/057, 22/045, 22/046, 22/047, 22/048.

Northern shrimp in Denmark Strait and off East Greenland

Advice September 2022 for 2023

Recommendation

Catches of 2 500 t in 2023 will result in a low risk (6%) of biomass falling below B_{lim} . However, fishing at this level will result in a risk of more than 50% of fishing mortality exceeding F_{msy} and likely impede growth of the stock towards B_{msy} . SC recommends that catches should not exceed 2 000 t in 2023.

Management objectives

No explicit management plan or management objectives have been defined by the Government of Greenland. Advice was drafted to be consistent with the NAFO precautionary approach (FC Doc 04-12).

Objective	Status	Comment/consideration
Apply Precautionary Approach	●	B_{lim} is defined as 30% of B_{msy}

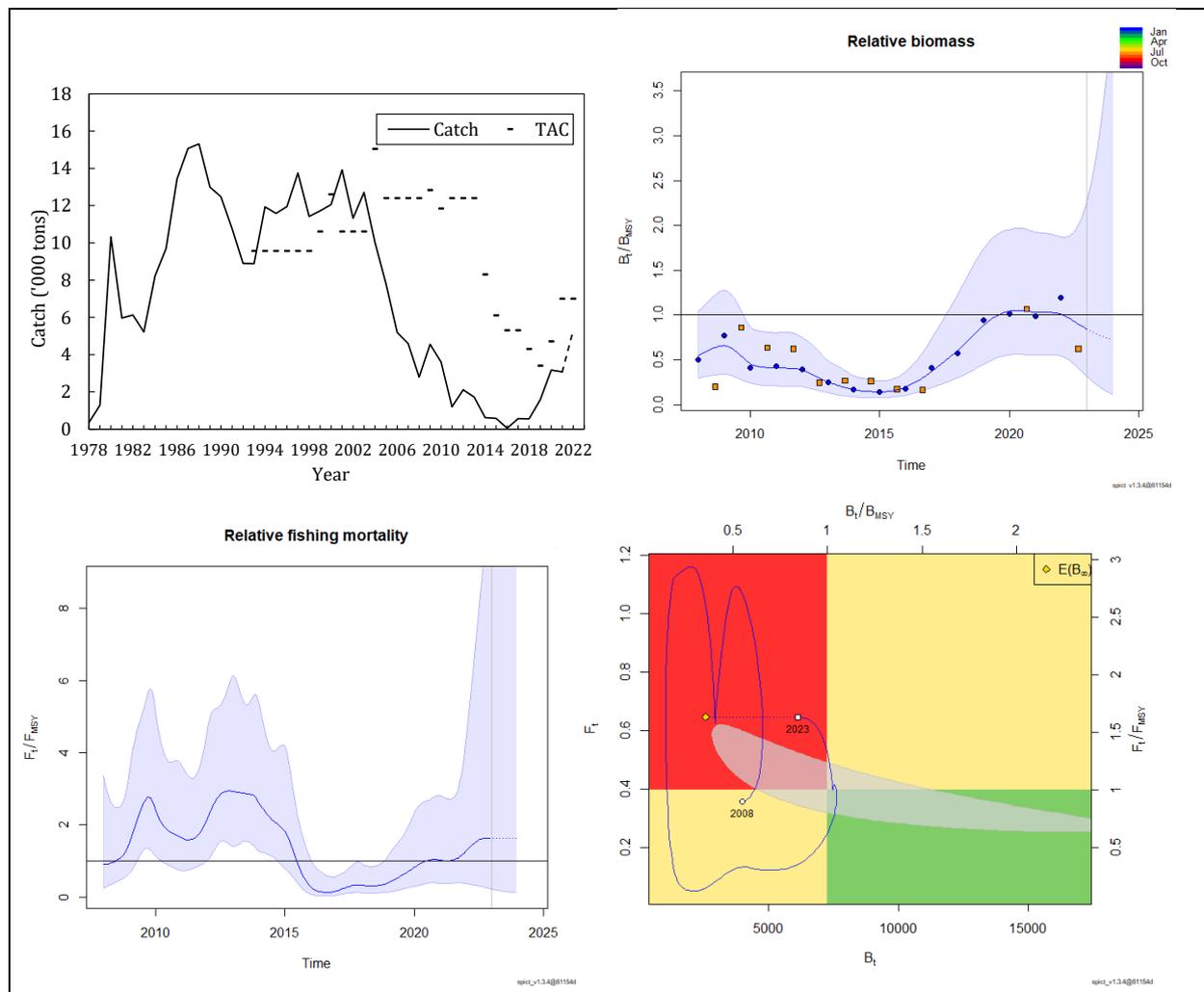
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Management unit

The shrimp stock is distributed off East Greenland in ICES Div. 14b and 5a and is assessed as a single stock.

Stock status

Biomass is currently below B_{msy} ($B/B_{msy} = 0.85$). The probability of being below B_{lim} is currently 0.015. Fishing mortality is currently above F_{msy} ($F/F_{msy} = 1.63$). No estimates of recruitment are available.



Reference points

B_{lim} is 2 180 t which corresponds to 30% of B_{msy} . The SPiCT model uses relative reference points B/B_{msy} and F/F_{msy} . The current relative B/B_{msy} is 0.85 and the relative F/F_{msy} is 1.63. The probability of being below B_{lim} is currently 0.015.

Projections

Relative reference points are estimated for six catch options for 2023.

Catch (t)	B/B _{msy}	F/F _{msy}	Prob B > B _{msy}	Prob B < B _{lim}
1 500	1.03	0.56	0.52	0.01
2 000	0.96	0.77	0.47	0.03
2 500	0.89	1.01	0.43	0.06
3 000	0.81	1.26	0.40	0.10
3 500	0.74	1.54	0.37	0.16
4000	0.66	1.86	0.34	0.22

Assessment

A comprehensive sensitivity analyses of the surplus production model in continuous time (SPiCT) was performed as recommended by NIPAG 2021 (SCR Doc 21/044). During the 2022 SC shrimp meeting an updated SPiCT model was presented and accepted as a valid assessment tool for this stock (SCR Doc. 22/051) based on a review of the model diagnostics.

The next assessment is scheduled for 2023.

Human impact

Mainly fishery related mortality has been documented. Other sources (e.g. pollution, shipping, oil-industry) are considered un-documented.

Biological and Environmental Interactions

Cod is an important predator on shrimp. The cod stock has fluctuated in East Greenland waters since 2014. The impact on the shrimp biomass is unknown.

Fishery

Shrimp is caught in a directed trawl fishery. The fishery is regulated by TAC and bycatch reduction measures include move-on rules and sorting grids.

Recent catches and TAC (t) were as follows:

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Enacted TAC	12 400	8 300	6 100	5 300	5 300	4 300	3 384	4 750	7 000	6 850
SC Recommended TAC	12 400	2 000	2 000	2 000	2 000	2 000	2 000	3 000	3 000	3 000
NIPAG catch	1 717	622	576	49	561	547	1 580	3 172	3 067	5 295 ¹

¹ To June 30

Effects of the fishery on the ecosystem

Measures to reduce effects of the fishery on the ecosystem include move-on rules to protect sponges and corals.

Source of Information

SCR Docs. 22/049, 22/050, 22/051, 21/044, FC Doc. 04-18