GREENLAND HALIBUT – GRÁLÚÐA
Reinhardtius hippoglossoides

GENERAL INFORMATION

Greenland halibut in ICES Subareas 5a, 5b, 6a, 6b, 12 and 14, 14a, 14b (East-Greenland, Iceland, the Faroe Islands) are assessed as one stock. In Icelandic waters, it is found on the continental shelf around Iceland with the highest abundance west, north, and east off the coast in deeper and colder waters. It is mainly found on a muddy substrate at depths ranging from 200-1500 m. The main spawning grounds are located west off the coast at around 1000 m depth and eggs and larvae drift between Iceland and the east coast of Greenland until juveniles seek bottom post metamorphosis. After spawning, Greenland halibut migrates further north and east to their main feeding grounds.

THE FISHERY

Spatial distribution of the fishery 2000-2019, catch and effort in 2019 in the trawl fishery and historical catch in Subareas 5, 6, 12 and 14 is provided in Figures 1-4, respectively. Fishery in the entire area did in the past occur in a seemingly continuous belt on the continental slope from the slope of the Faroe plateau to southeast of Iceland extending north and west of Iceland and further south to southeast Greenland. Fishing depth ranges from 350-500 m southeast, east, and north of Iceland to about 1500 m at East Greenland. In 2019 the distribution of the fishery covered all areas, with noticeable less catch in the western part of Icelandic shelf considering the previous year (Figure 1).

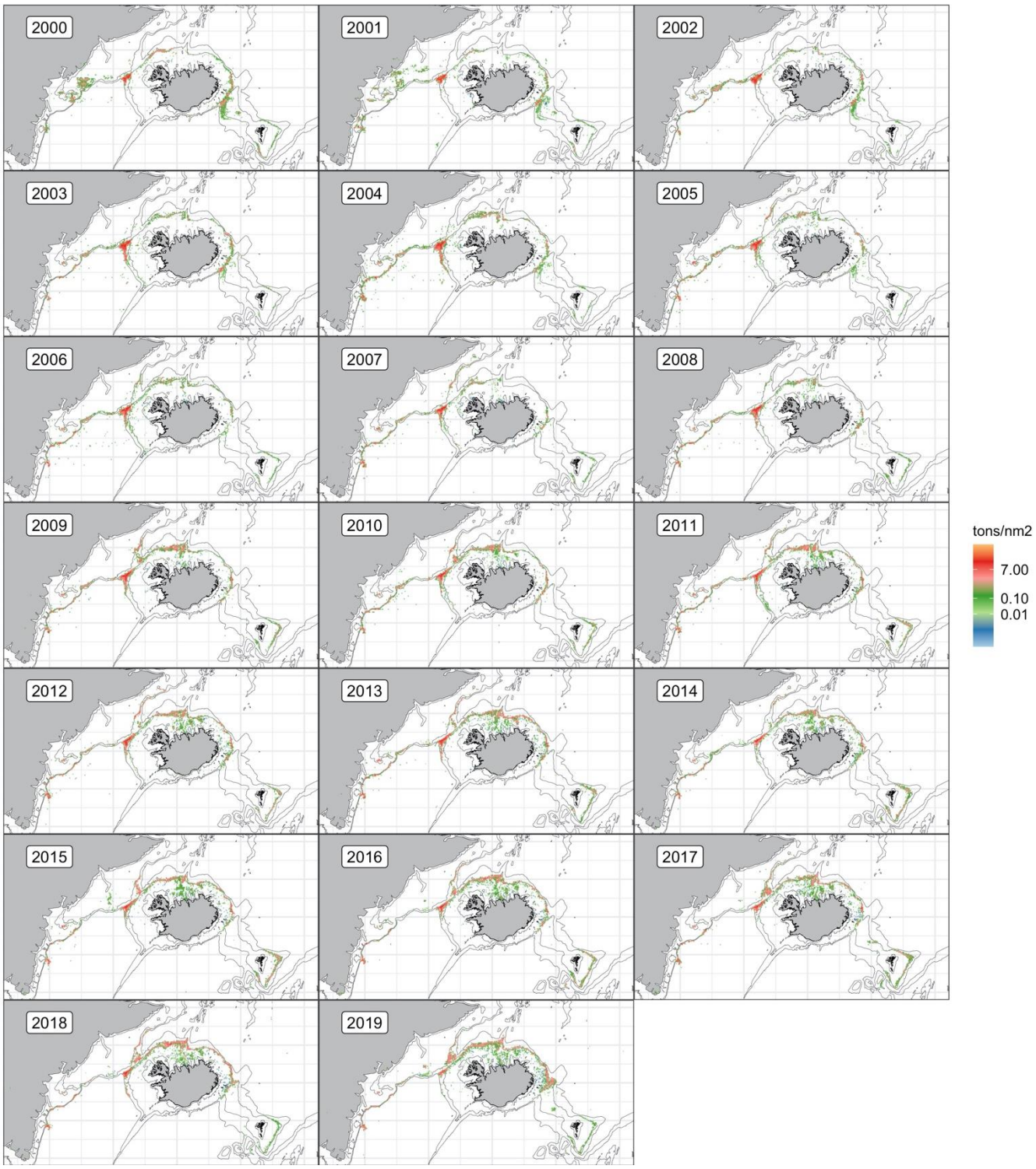

Figure 1. Greenland halibut. Geographical distribution of the fishery in division 5, 6, 12 and 14 since 2000. The 100 m, 400 m and 1000 m depth contours are shown. Reported catch from logbooks.

Mynd 1. Grálúða. Útbreiðsla veiða á svæðum 5, 6, 12 og 14 frá 2000 samkvæmt afladagbókum. Sýndar eru 100 m, 400 m og 1000 m dýptarlínur.

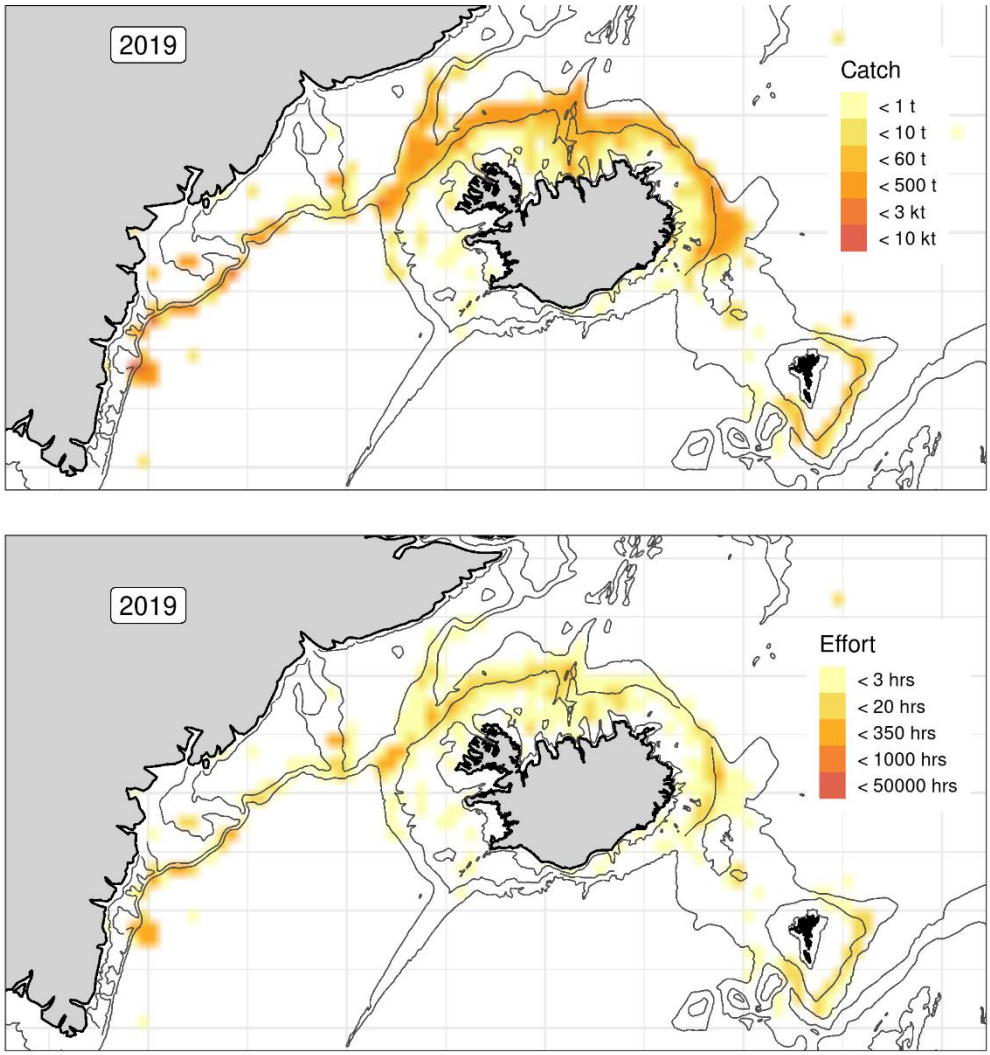

Figure 3. Greenland halibut. Spatial distribution of catch and effort in division 5, 6, 12 and 14 in 2019. The 100, 400 and 1000 m depth contours are shown. Reported catch from logbooks.

Mynd 2. Grálúða. Útbreiðsla veiða á svæðum 5, 6, 12 og 14 árið 2019 samkvæmt afladagbókum. Sýndar eru 100, 400 og 1000 m dýptarlínur.

In 1980–1990, about 75–90% of catches were caught by Iceland (Figure 3). Since 1990, the Icelandic proportion has decreased, and has in recent years been 50–60%. Highest catches were recorded in 1986, about 60 thous. tonnes.

Landings in Icelandic waters (usually allocated to Division 5a) have historically been predominated by the total landings in areas 5+14 (Icelandic waters), but since the mid-1990s fisheries in Subarea 14 and Division 5b have developed. Landings have since 1997 been between 20-31 thous. tonnes (Figure 4).

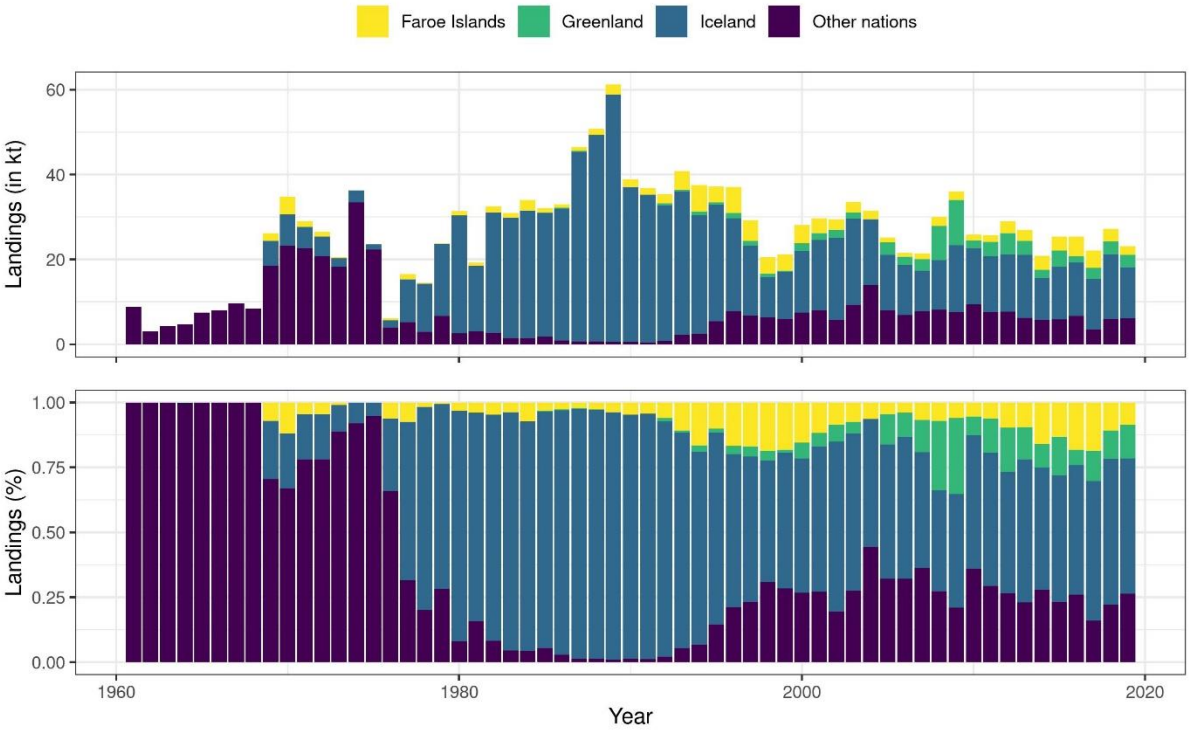

Figure 3. Greenland halibut. Landings from ICES Subareas 5,6,12 and 14 by nations (Greenland, Iceland, and Faroe Islands) in 1961-2019. All gears combined.

Mynd 3. Grálúða. Landaður afli af ICES svæðum 5, 6, 12 og 14 frá 1961-2019 skipt eftir þjóðum. Öll veiðarfæri samanlagt.

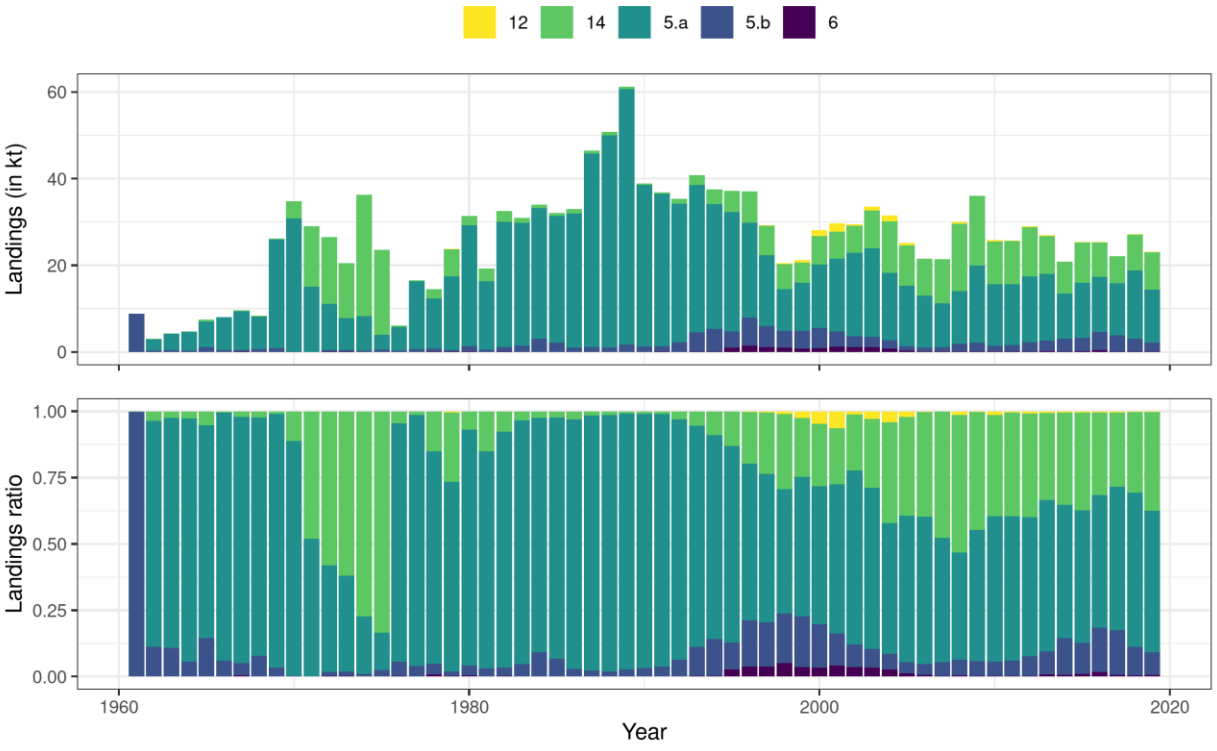

Figure 4. Greenland halibut. Spatial distribution of catch between ICES subareas 5.a, 5.b, 6, 12 and 14 in 1961-2019. All gears combined.

Mynd 4. Grálúða. Útbreiðsla afla á ICES undirsvæðum 5.a, 5.b, 6, 12 og 14 árin 1961-2019. Öll veiðarfæri.

Demersal trawl has been the main fishing gear for Greenland halibut in Icelandic waters, followed by gillnets, while a small proportion of the catch is taken on longlines and in shrimp trawls. Since 2015, landings by gillnets have, however, increased, reaching 62% of total catch in 2019 (Figure 5). The Greenland halibut trawl fishery is considered clean with respect to by-catches. The mandatory use of sorting grids in the shrimp fishery in Icelandic and Greenland waters since 2002 is observed to have reduced by-catches of Greenland halibut considerably.

Greenland halibut is caught in relatively deep waters, with most of the catch (70%) taken between 400-800 meters depth. In 2003, most of Greenland halibut was caught at 800 meters or deeper (73%), but since then, catch has increased steadily in more shallow waters (Figure 6). Changes in depth range where Greenland halibut was caught seem to be reasonably synchronised with changes in fleet and therefore gear structure that target Greenland halibut in most recent years (Figures 5 and 6).

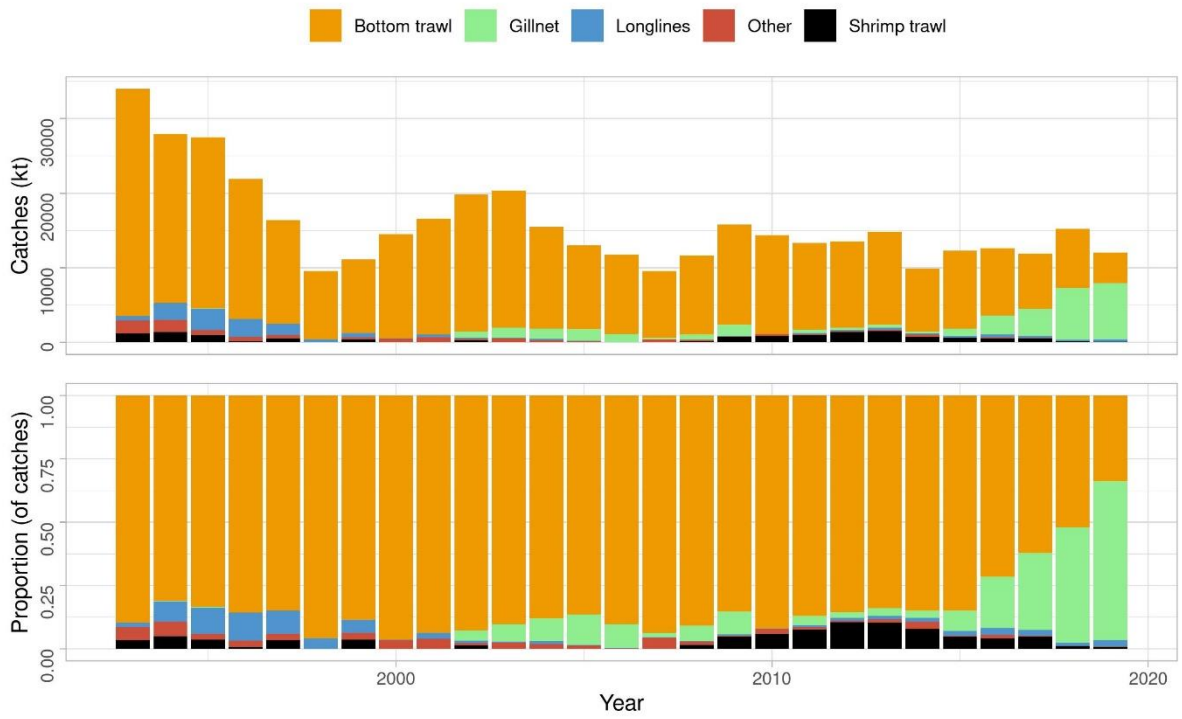

Figure 5. Greenland halibut. Total catch (landings) by fishing gear since 1994 in Icelandic waters, according to statistics from the Directorate of Fisheries.

Mynd 5. Grálúða. Landaður afli eftir veiðarfærum frá 1994 á Íslandsmiðum, samkvæmt aflaskráningarkerfi Fiskistofu.

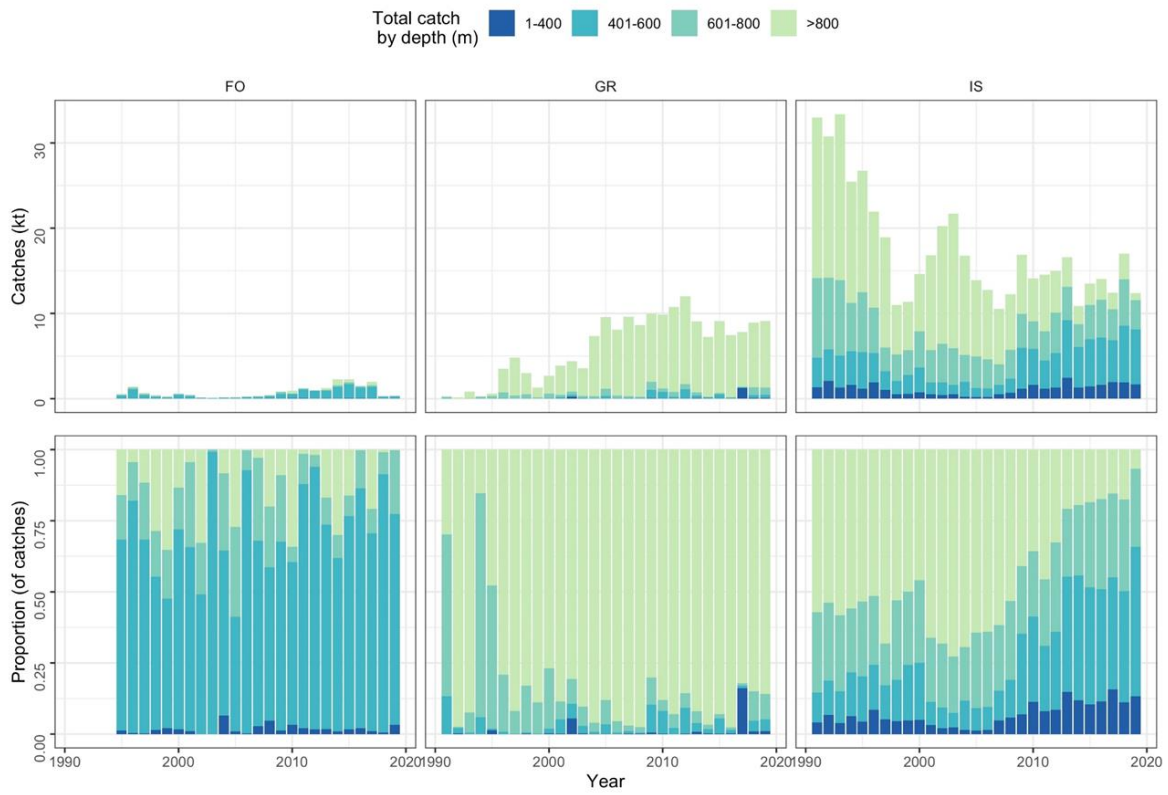

Figure 6. Greenland halibut. Depth distribution of catches in Faroese (FO), Greenlandic (GR) and Icelandic (IS) waters according to combined logbooks.

Mynd 6. Grálúða. Afli samkvæmt sameinuðum afladagbókum skipa af Færeyjar- (FO), Grænlands- (GR) og Íslandsmiðum, skipt eftir dýpi.

Since 2000, the number of Icelandic demersal trawlers reporting catches over 1000 kg of Greenland halibut has decreased, where the number has dropped from 54 vessels in 2000, to 30 in 2019. The catch from trawlers has decreased as well, from approximately 14 thousand tonnes in 2000 to 8000 tonnes in 2018. The Icelandic longline fleet has expanded and in 2018 a total of 24 longliners reported catches over 1000 kg. Since 2000, total annual catches have fluctuated from around 9000 to 20000 tonnes and in 2018 the catch was just over 15000 tonnes (Table 1).

Table 1. Greenland halibut. Number of Icelandic vessels landing catch of 1000 kg or more of Greenland halibut, and all landed catch divided by gear type according to landing statistics from the Directorate of Fisheries

Tafla 1. Grálúða. Fjöldi íslenskra skipa sem landað hafa yfir 1000 kg af grálúðu og allur landaður afli eftir veiðarfærum samkvæmt löndunartölum Fiskistofu.

	NUMBER OF VESSELS			CATCHES (TONNES)				
YEAR	*Trawlers*	*Longliners*	*Gillnetters*	*Demersal trawl*	*Long-line*	*Gillnet*	*Other*	*Sum*
2000	54	0	6	13947	0	20	498	14465
2001	45	0	4	15487	0	387	659	16533
2002	45	1	2	18329	792	157	480	19758
2003	45	1	4	18325	1382	63	526	20296
2004	37	2	5	13547	1394	162	297	15400
2005	36	3	1	11187	1579	1	187	12954
2006	36	4	0	10586	1121	0	34	11741
2007	37	1	1	8923	166	3	423	9515
2008	36	1	4	10554	715	7	333	11609
2009	35	3	3	13451	1433	54	804	15742
2010	35	0	3	13166	0	9	1119	14294
2011	40	1	10	11586	500	48	1145	13279
2012	42	1	18	11495	303	92	1498	13388
2013	38	1	20	12411	450	142	1717	14720
2014	30	1	21	8332	273	79	1039	9723
2015	30	1	27	10392	985	172	610	12159
2016	31	3	26	8967	2569	230	676	12442
2017	26	7	22	7359	3600	171	603	11733
2018	28	5	14	7865	6877	160	164	15066
2019	30	7	26	3986	7516	243	94	11839

The number of vessels accounting for 95% of the catch of Greenland halibut in Icelandic waters changed from about 75 to about 30 vessels in 1994-1998 (Figure 7). This change coincided with reduced catches. Since 1998, the number of vessels accounting for 95% of the catch has been relatively constant despite variable annual catches, with the lowest number of vessels observed in 2018.

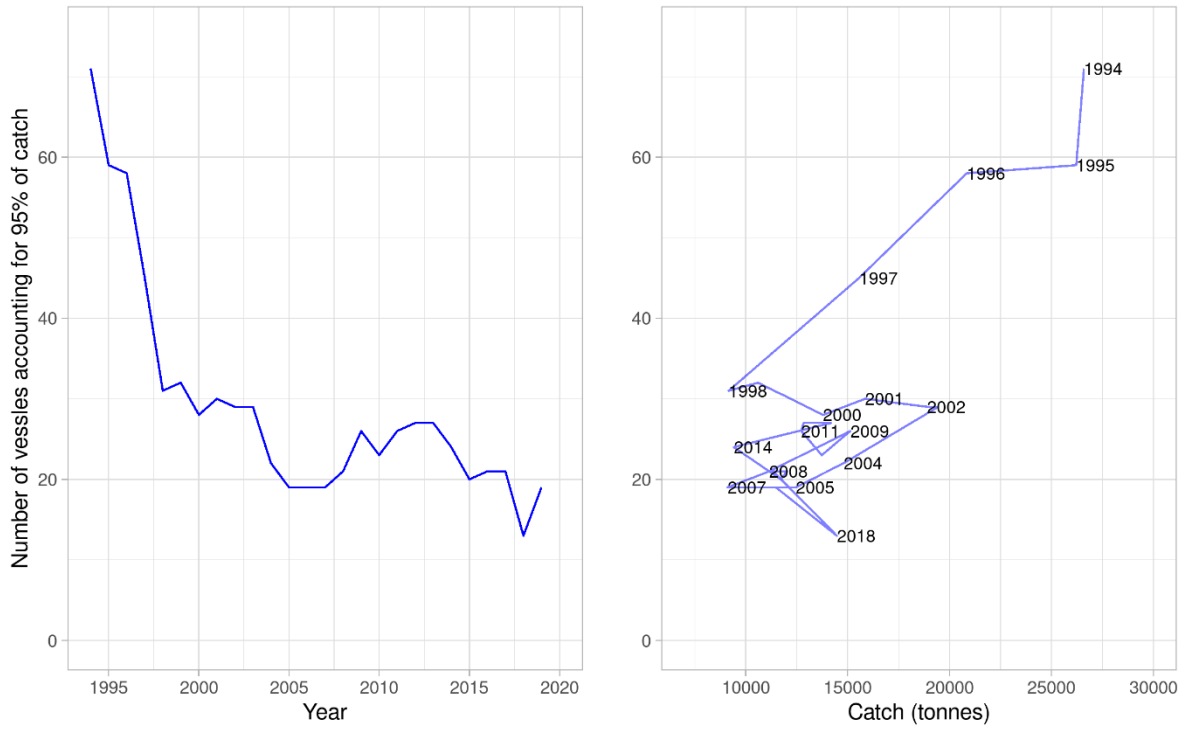

Figure 7. Greenland halibut. Number of vessels (all gear types) accounting for 95% of the total catch annually since 1994. Left: Plotted against year. Right: Plotted against total catch. Data from the Directorate of Fisheries.

Mynd 7. Grálúða. Fjöldi skipa (öll veiðarfæri) sem veiddu 95% heildaraflans hvert ár frá 1994. Vinstri: Sýnt eftir árum. Hægri: Sýnt í samanburði við heildarafla. Gögn frá aflaskráningarkerfi Fiskistofu.

CATCH PER UNIT EFFORT (CPUE) AND EFFORT.

Indices of CPUE for the Icelandic trawl fleet directed at Greenland halibut for the period 1985–2019 is provided in Figure 8. The overall CPUE index for the Icelandic fishery is compiled as the average of the standardised indices from the whole area. Catch rates of Icelandic bottom trawlers decreased for all fishing grounds during 1990–1996 but peaked again in 2001. Since 2003, CPUE has been relatively stable.

The Icelandic CPUE series has for many years been used as one of the biomass indicators in the assessment of the stock. The CPUE of the Greenlandic trawlers and the biomass indices from the Faroese waters have not been used in the assessment, as the stock production model is not able to accommodate the contrasting indices (Icelandic CPUE and Greenlandic/Icelandic autumn surveys) and these CPUE series do not.

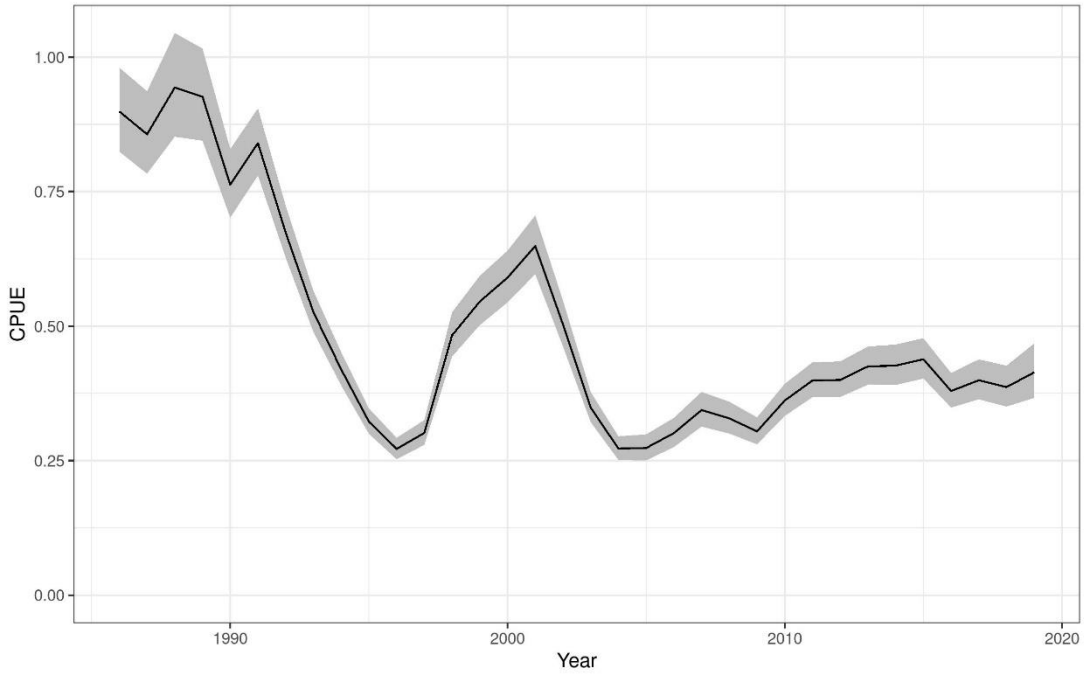

Figure 8. Greenland halibut. Catch per unit effort (CPUE) (log) from the Icelandic trawler fleet in 5a. 95% CI indicated

Mynd 8. Grálúða. Afli á sóknareiningu (kg/togtímar)

SAMPLING OF LANDED GREENLAND HALIBUT

Since 2010, 11-28 thous. individuals of Greenland halibut have been length measured from landed catch. 61-149 samples have been collected yearly by the MFRI and most samples come from demersal trawlers (Table 2, Figure 9). Otoliths are not sampled from landed catch. In 2019, 78 samples were taken, and 2674 individuals measured.

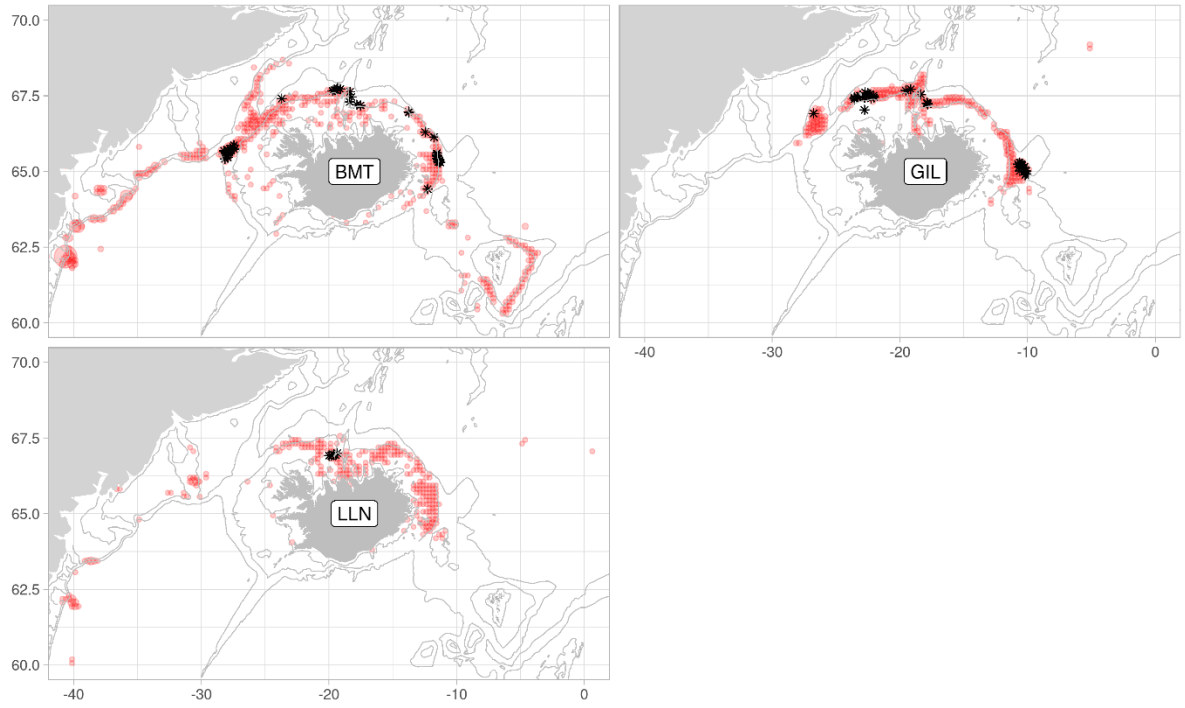

Figure 9. Greenland halibut. Fishing grounds in 2019 as reported in logbooks (red) and positions of samples taken from landings (asterisks). Note that sampling locations are only available from Icelandic sources.

Mynd 9. Grálúða. Veiðisvæði árið 2019 samkvæmt afladagbókum (rautt) og staðsetningar sýna úr lönduðum afla (stjörnur). Einungis er um gögn landaðs afla frá Íslandi að ræða.

Table 2. Greenland halibut. Number of samples and length measured individuals from landed catch.

Tafla 2. Grálúða. Fjöldi sýna og lengdamældra fiska úr lönduðum afla.

Year	*Demersal trawl*		*Other gear*	
	Samples	Individuals	Samples	Individuals
2010	96	3200	20	664
2011	133	4252	9	259
2012	136	4582	13	425
2013	88	2772	2	54
2014	118	4720	2	67
2015	63	2094	4	128
2016	88	3751	20	665
2017	49	1987	12	324
2018	92	3582	31	942
2019	32	1120	46	1554

LENGTH DISTRIBUTION OF LANDED GREENLAND HALIBUT

There has been a shift towards larger fish in the length distribution of landed catch (Figure 10).

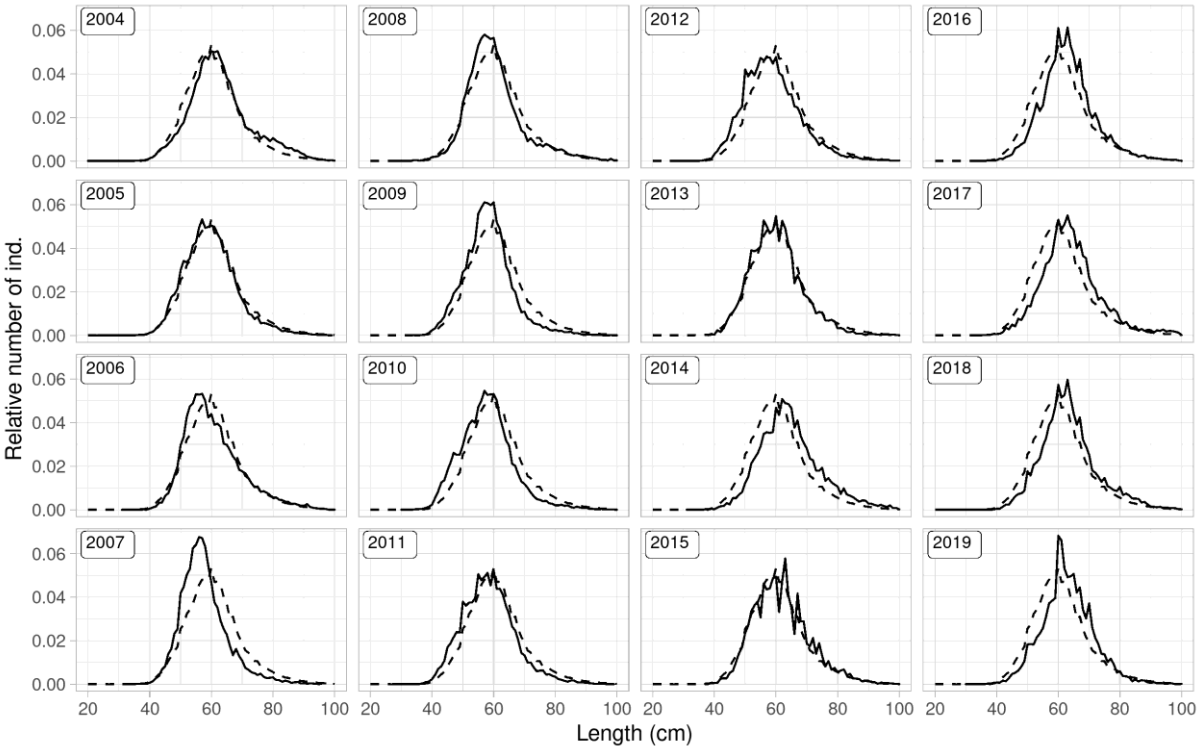

Figure 10. Greenland halibut. Length distribution from landed catch. The dotted line represents the mean length distribution for all years.

Mynd 10. Grálúða. Lengdardreifing aflasýna frá árinu 2004 með meðal lengdardreifingu fyrir öll árin (punktalína).

Males measured from landed catch have the tendency to be smaller than females, with mean length ranging from 55.4 – 61.0 cm since 2002. The mean length of females ranged from 59.3 – 66.7 cm and in 2019, the mean length of females were 64.4 compared to 60.2 cm in males (Figure 11).

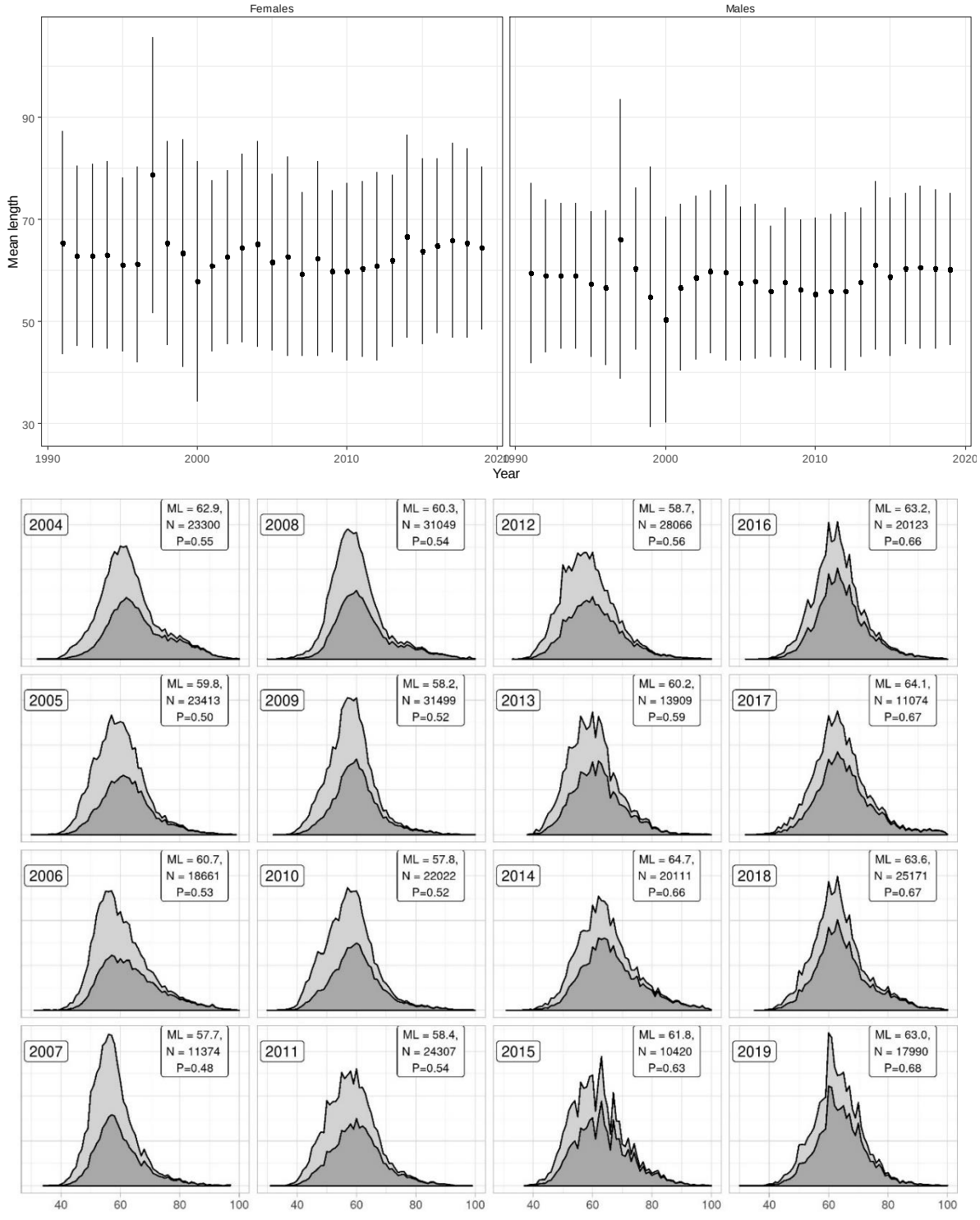

Figure 11. Greenland halibut. Mean length by sex (upper) and length distribution (lower) of males (light-grey) and females (dark-grey) from landed catch from 2004-2019. ML is mean length, N is number of individuals and P is the proportion of females in the catch.

Mynd 11. Grálúða. Meðallengd eftir kyni (efri mynd) og lengdardreifing (neðri mynd) hænga (ljósgrár) og hrygna (dökkgrár) úr aflasýnum frá árinu 2004-2019. ML er meðallengd, N er fjöldi í sýni og P er hlutfall hrygna í afla.

SURVEY DATA

The Icelandic autumn groundfish survey (hereafter autumn survey) was commenced in 1996. The autumn survey was not conducted in 2011. Spatial distribution and abundance are shown in Figures 12-13 and Figure 14 shows trends in various biomass indices, and a recruitment index based on abundance of Greenland halibut ≤40 cm. Survey length distributions are shown in Figure 15.

In the 2019 survey, Greenland halibut were mainly caught on the continental slope south east, north, and northwest of the country (Figure 12).

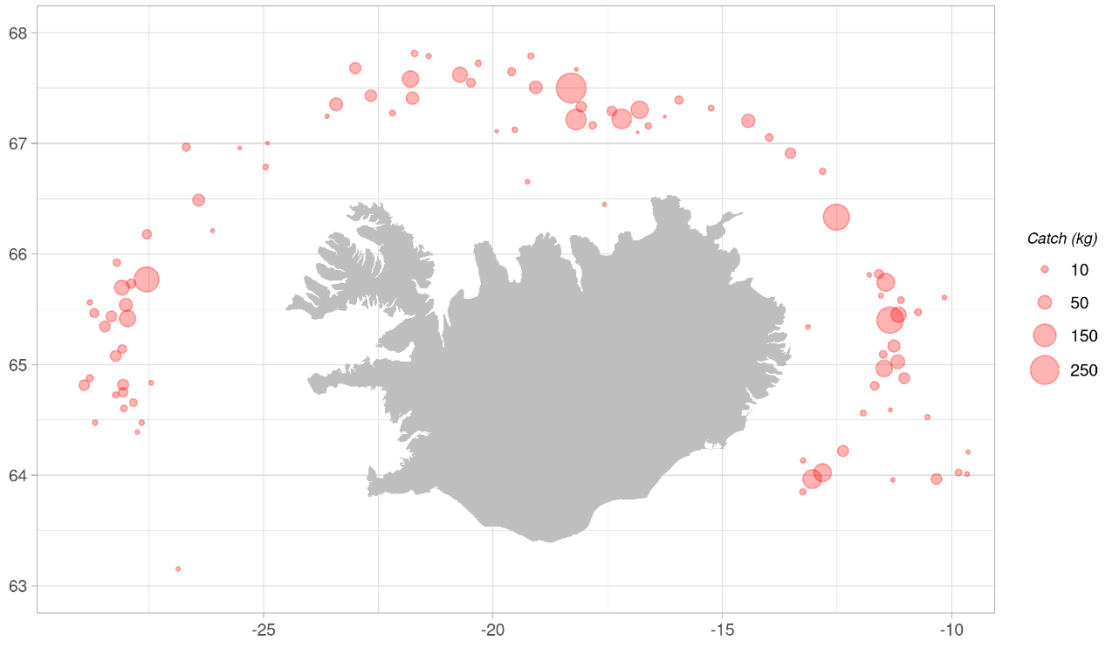

Figure 12. Greenland halibut. Spatial distribution of Greenland halibut in the autumn survey 2019.

Mynd 12. Grálúða. Útbreiðsla í stofnmælingu botnfiska að hausti árið 2019.

Since the survey was commenced in 1996, the distributional pattern has remained quite stable, with the greatest biomass index in the northeast and northwest. Since 1996, biomass index in the west has been steadily decreasing, while increasing in the southeast (Figure 13)

Biomass indices for the total stock of Greenland halibut and Greenland halibut larger than 40 cm (harvestable part of the stock), that are based on the combined Icelandic and Greenlandic autumn surveys, showed an increase from 1996-2001. After peaking in 2001, indices dropped but increased steadily from 2004 till 2017 when the stock started to decrease (Figure 14). The same holds for the index of Greenland halibut larger than 60 cm. The index of juvenile abundance (<40 cm) has fluctuated between years, peaking in 2002 but remained low in the past six years (Figure 14). Since 2016 the East Greenland area has not been surveyed, and for the indices the values from 2016 are used for the years after that.

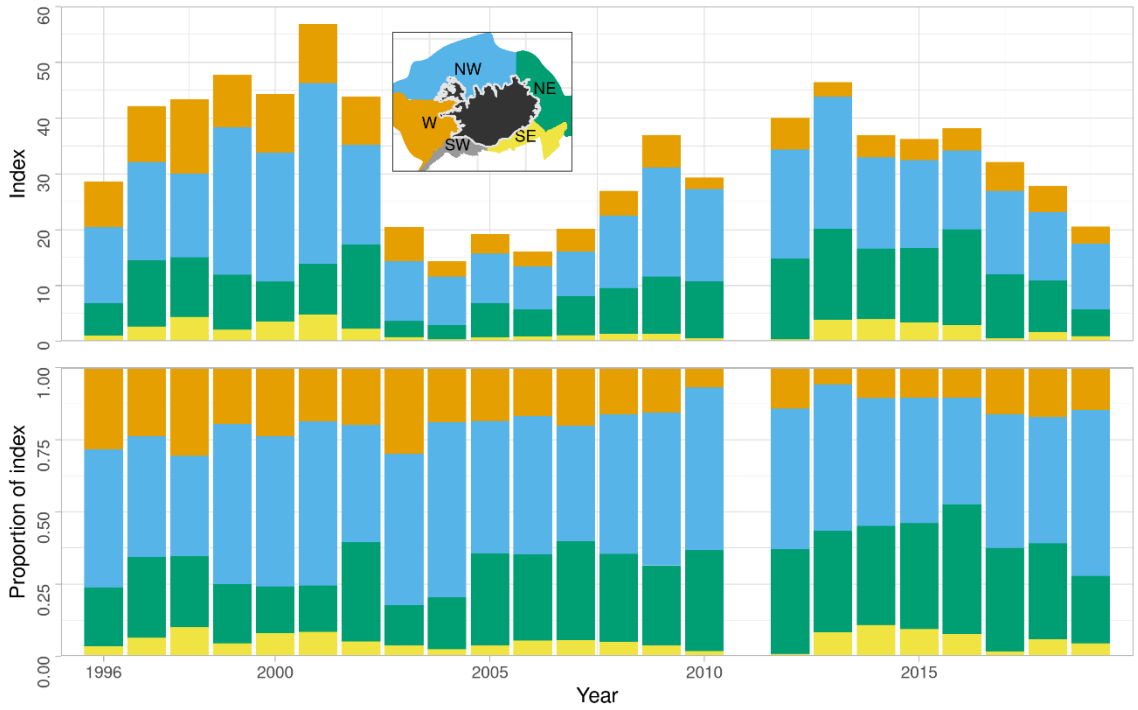

Figure 13. Greenland halibut. Spatial distribution of biomass index from the autumn survey.

Mynd 13. Grálúða. Dreifing lífmassavísitölu í stofnmælingu botnfiska að hausti árin.

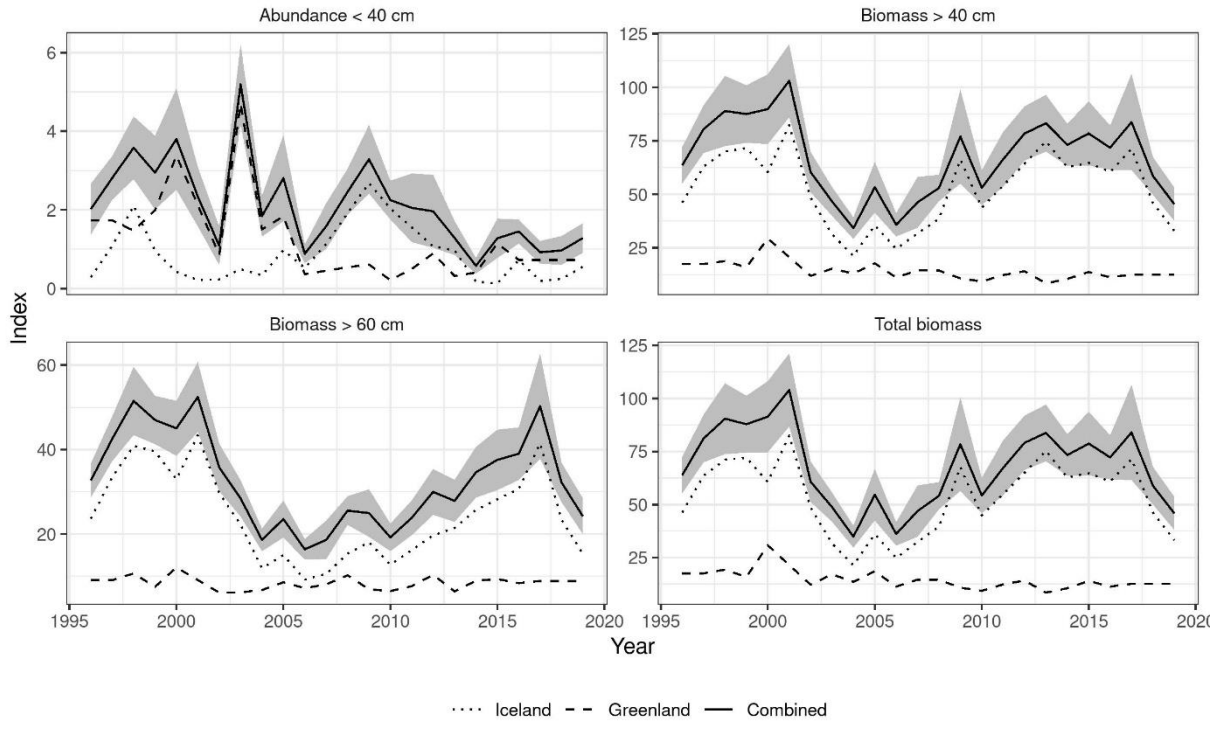

Figure 14. Greenland halibut. Indices from Iceland (smaller dots) Greenland (larger dots) and combined (straight line) with 95% CI indicated. Harvestable biomass indices (>40 cm) (upper left), juvenile abundance indices (<40 cm) (upper right), biomass indices of larger ind. (>60cm) (lower left) and total biomass indices (lover right).

Mynd 14. Grálúða. Vísitölur frá Íslandi (litlir punktar), Grænlandi (stórir punktar) og samanlagt (lína) með 95% öryggismörkum. Nýliðunarvísitala (>40 cm) (efri til vinstri), vísitala veiðistofns (40 cm og stærri, efri til hægri), vísitala stærri einstaklinga (<60 cm) (neðri til vinstri) og stofnvísitala grálúðu (neðri til hægri).

Length distributions from the survey show a similar trend as in landed catch. Females tend to be larger than males and in greater abundance. The average length for females fluctuates from 51-61 cm throughout the years when males fluctuate from 50-59 cm. The length distribution has been gradually increasing since 2010, and in 2019, the mean length of males and females was 54.3 and 59.0 cm, respectively.

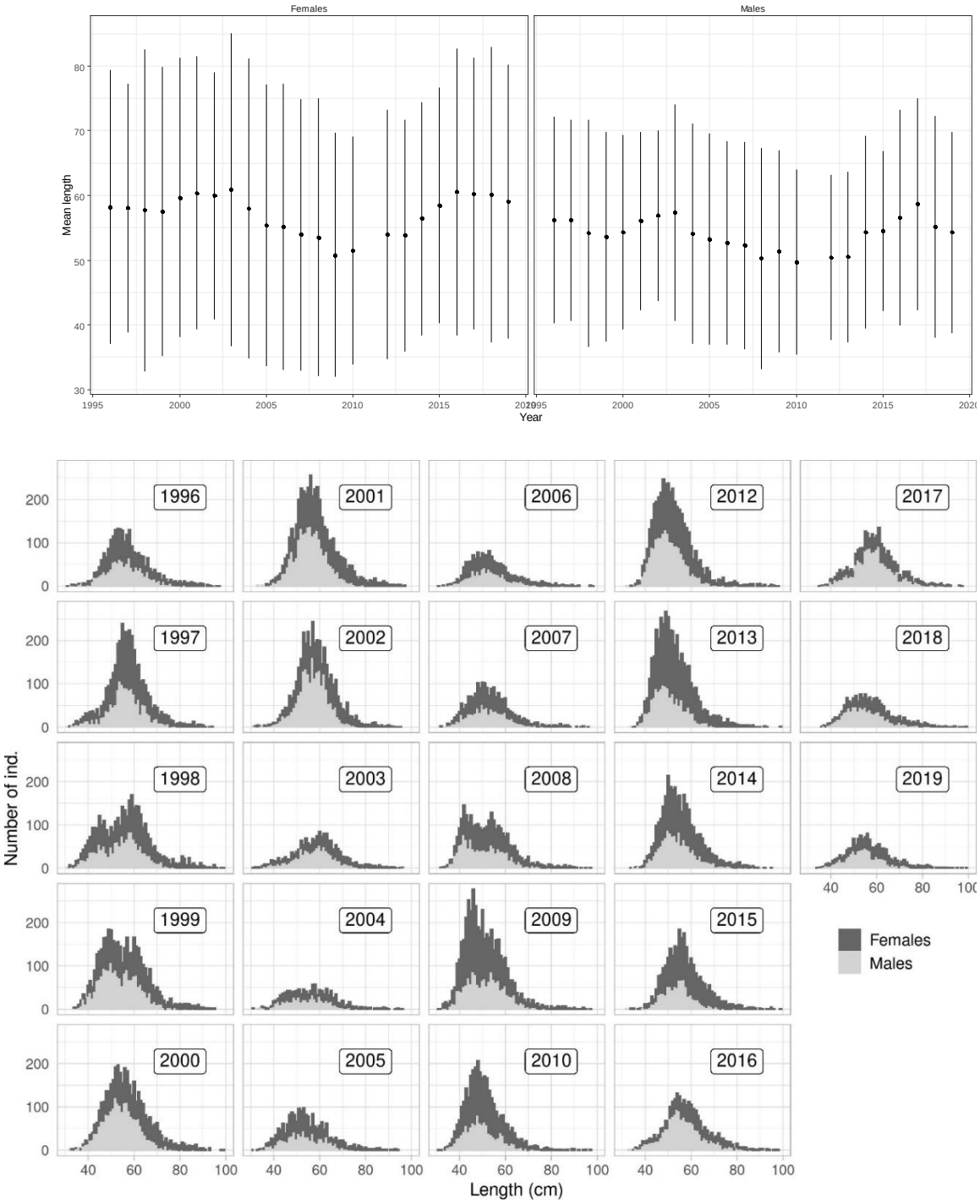

Figure 15. Greenland halibut. Mean length and 95% CI (upper) and length distribution (lower) of females and males from the autumn survey since 1996..

Mynd 15. Grálúða. Meðallengd og 95% öryggisbil (efri mynd) og lengdardreifing (neðri mynd) eftir kyni úr stofnmælingu botnfiska að hausti frá 1996.

Age distribution of the sexes of Greenland halibut from the autumn survey 2015-2019 show that the greatest proportion males are between 9 and 10 years old and range between 4-16 years. The greatest proportion of females are 11-13 years old and range from 3 to 22 years.

It is worth noting that aging recently resumed after a long period where otoliths were sampled but not age read. Recent advances in age reading techniques suggested that older age reading methods used previously were biased and thus older age-readings are not considered representative of the age structure in the population. Further, otoliths sampled prior to 2015 were not stored in a manner compatible with the newer age-reading method. It is therefore uncertain whether data on the age structure will ever be available.

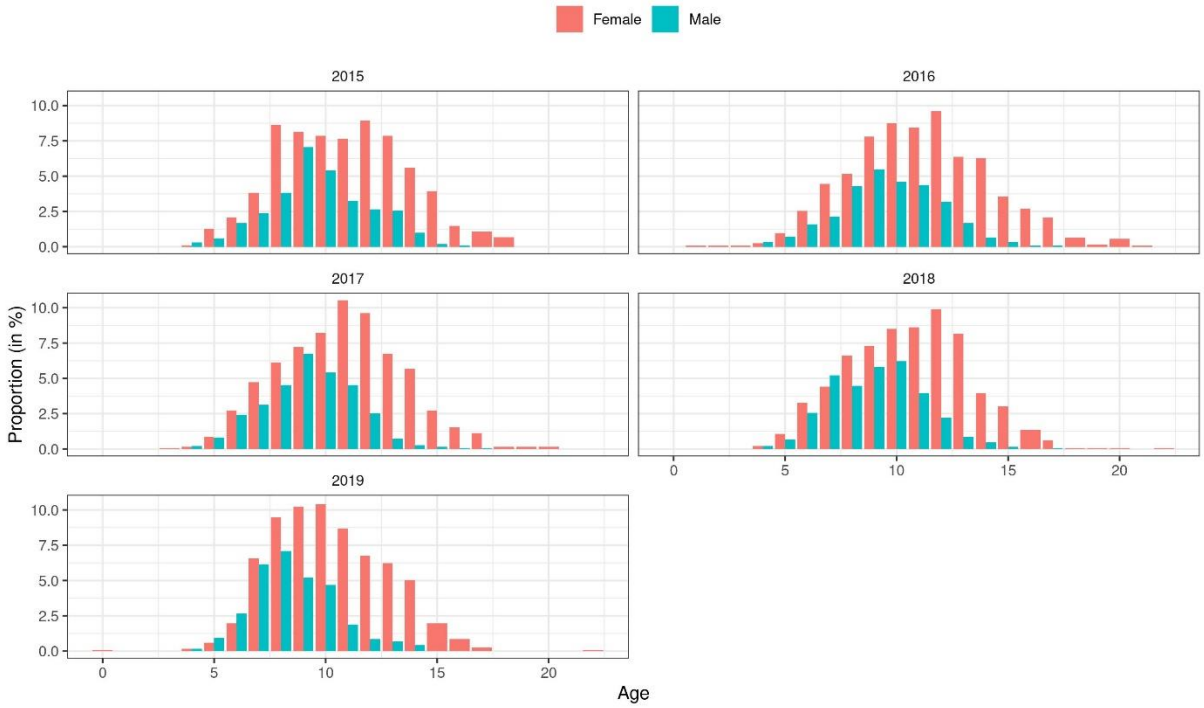

Figure 16. Greenland halibut. Proportion by age from the autumn survey 2015-2019.

Mynd 16. Grálúða. Hlutfall eftir aldri úr stofnmælingu botnfiska að hausti 2015-2019.

According to the length distribution by age of Greenland halibut, it reaches 60 cm at the roughly the age of 12 on the average. The growth of Greenland halibut appears to be similar between the sexes, while female exhibit larger variability in size. It is noteworthy that males tend to be on average smaller in the catches than females, even though both sexes seem to have similar mean length at age. This may suggest differences in behaviour of the sexes, such as catchability with respect to gear and/or natural mortality.

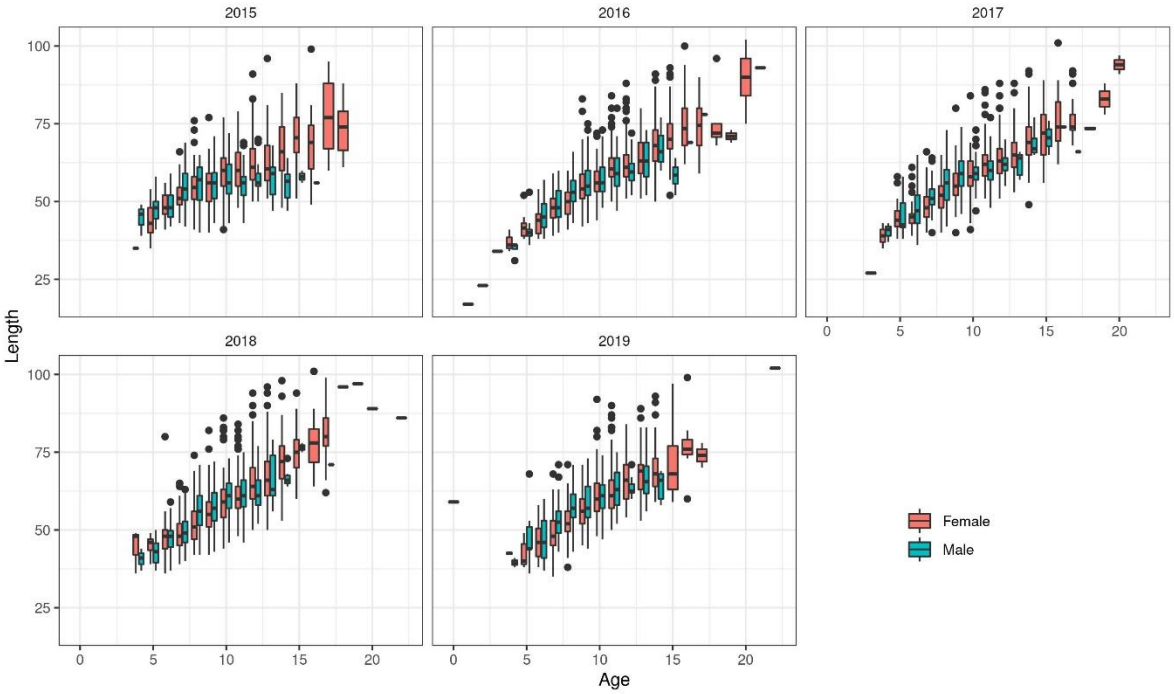

Figure 17. Greenland halibut. Distribution of length at age by sex from the autumn survey.

Mynd 17. Grálúða. Lengdardreifing sem fall af aldri skipt eftir kyni úr stofnmælingu botnfiska að hausti.

STOCK ASSESSMENT

The assessment uses a stochastic version of the logistic production model and Bayesian inference according to the Stock Annex in which a more detailed formulation of the model and its performance is found.

INPUT DATA

The model synthesizes information from input priors and two independent series of Greenland halibut biomass indices and one series of catches by the fishery (see the Stock Annex). The two series of biomass indices are a revised annually for use in assessment: a standardised series of annual commercial-vessel catch rates in 5a in 1985–2019, $CPUE_t$, and a combined trawl-survey biomass index (5a and 14b) for 1996–2019, $Isur_t$,. In 2017, 2018 and 2019 the survey index is based on the Icelandic survey and the 2016 values from the Greenland survey due to lack Greenland survey data (see Figure 14).

Total reported catch in ICES Subareas 5, 6, 12 and 14 1961–2019 was used as yield data (Figure 3). Since the fishery has no major discarding problems or misreporting, the reported catches were entered into the model as error-free. The assumed catches for 2019 was 25 000 t based on agreed TACs for 5a and 14b and a continued catch level for 5b.

MODEL PERFORMANCE

The model parameters were estimated (posterior) based on the prior assumptions (Figure 17.5.1). The data could not be expected to carry much information on the parameter P_{1960} – the initial stock size 25 years prior to when the series of stock biomass series start – and the posterior resembled the prior (Figure 17.5.1). The prior for K was updated but similar to previous estimates. However, the posterior still had a wide distribution with an inter-quartile range of 713–1069 kt (Table 17.5.3).

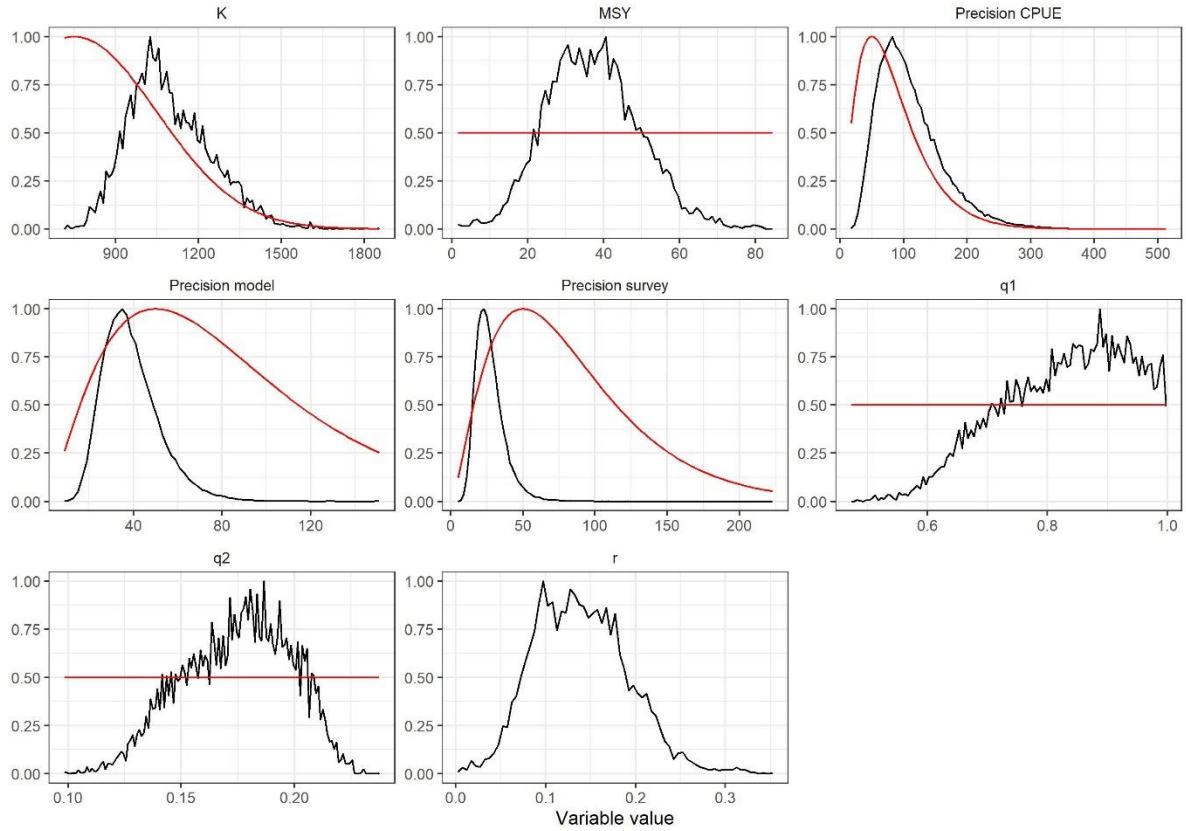

Figure 18. Greenland halibut. Probability density distributions of model parameters: estimated posterior (black line) and prior (red line) distributions.

Mynd 18. Grálúða. Líkindadreifingar fyrir stika líkansins: eftirá- (svört lína) og fyrirframdreifingar (rauð lína).

The posterior for MSY was positively skewed with upper and lower quartiles at 26 kt and 40 kt. MSY appears to be informed by the data and is relatively insensitive to changes in prior distributions.

The model was able to produce a reasonable simulation of the observed data (Figure 19). The 2019 observations have, however, high residuals for both indices (-12% and 9%) both outside the quantiles of the model estimate.

The retrospective runs suggest high consistency for both biomass and fishing mortality within +- 20% (range -0.02 to 0.06, Figure 20).

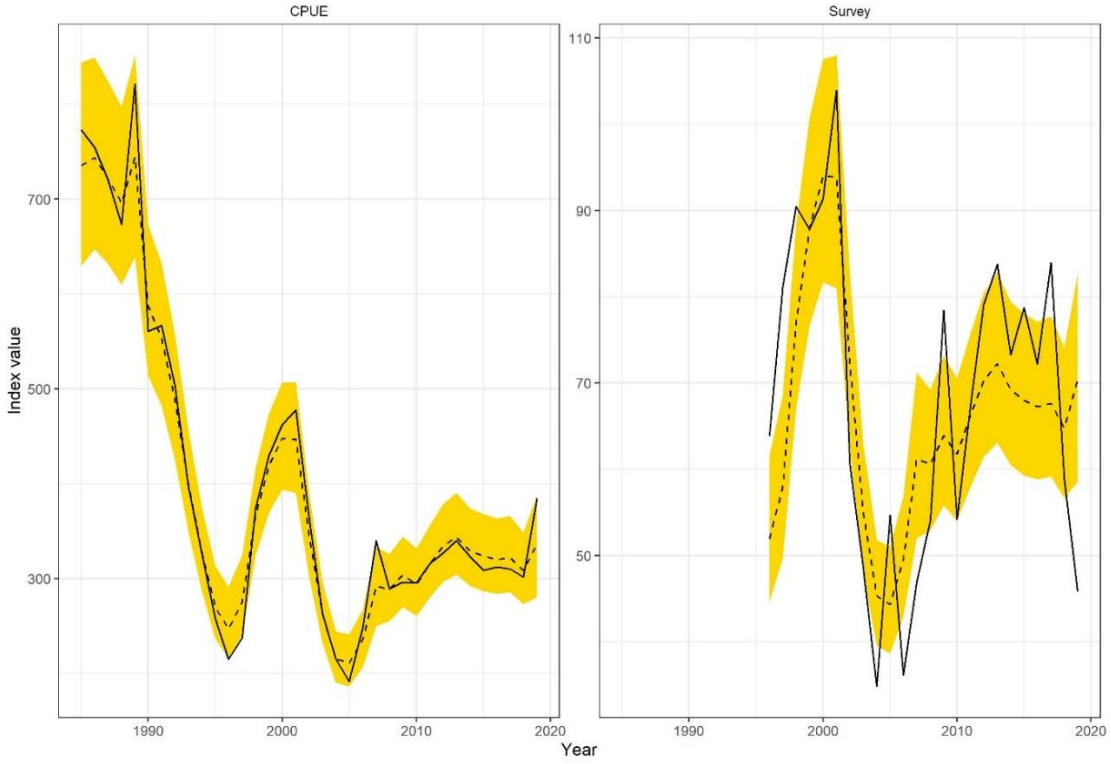

Figure 19. Greenland halibut. Observed (black solid lines) and predicted (dashed lines) series of the two biomass indices input to the model. Shaded regions are the 95%-tile range of the model estimates.

Mynd 19. Grálúða. Mældar (heilar svartar línur) og spáðar (brotalínur) tímaraðir lífmassavísitalna sem notaðar eru í stofnmatinu. Skyggð svæði tákna 95% vikmörk stofnmatsins.

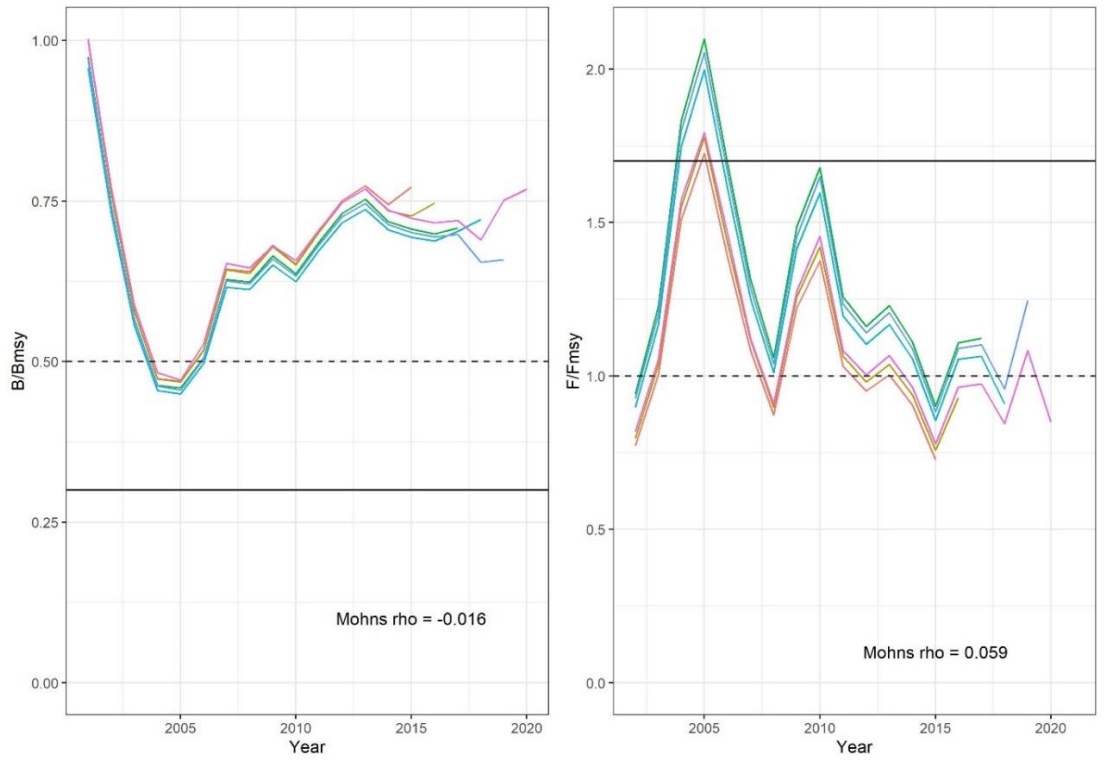

Figure 20. Greenland halibut. Analytical retrospective analyses of medians of relative biomass (B/B_{msy}) and fishing mortality (F/F_{msy}).

Mynd 20. Grálúða. Reiknuð endurlitsgreining á miðgildum hlutfallslegs lífmassa (B/B_{msy}) og fiskveiðidánartölu (F/F_{msy}).

ASSESSMENT RESULTS

The time series of estimated median biomass-ratios starts in 1960 as a virgin stock at K (2 x B_{msy}, Figure 21). The fishery on the stock starts in 1961. Under continuously increasing fishing mortality the stock declined sharply in the mid–1990s to levels below the optimum, B_{MSY}. Some rebuilding towards B_{MSY} was then seen in the late 1990s. Since then the stock started to increase from its lowest level in 2004–5 of approx. 48% of B_{MSY} and has in recent years been around 70% of B_{MSY} with a slight increase in 2019. The median fishing mortality ratio (F/F_{MSY}) has exceeded F_{MSY} since the 1990s but has in recent years decreased and are now close to F_{MSY} (Figures 21 og 22). Relative fishing mortality can only be estimated with large uncertainty and the posteriors therefore also include values below F_{MSY}. However, the probability that F exceed F_{MSY} is high for most of the years.

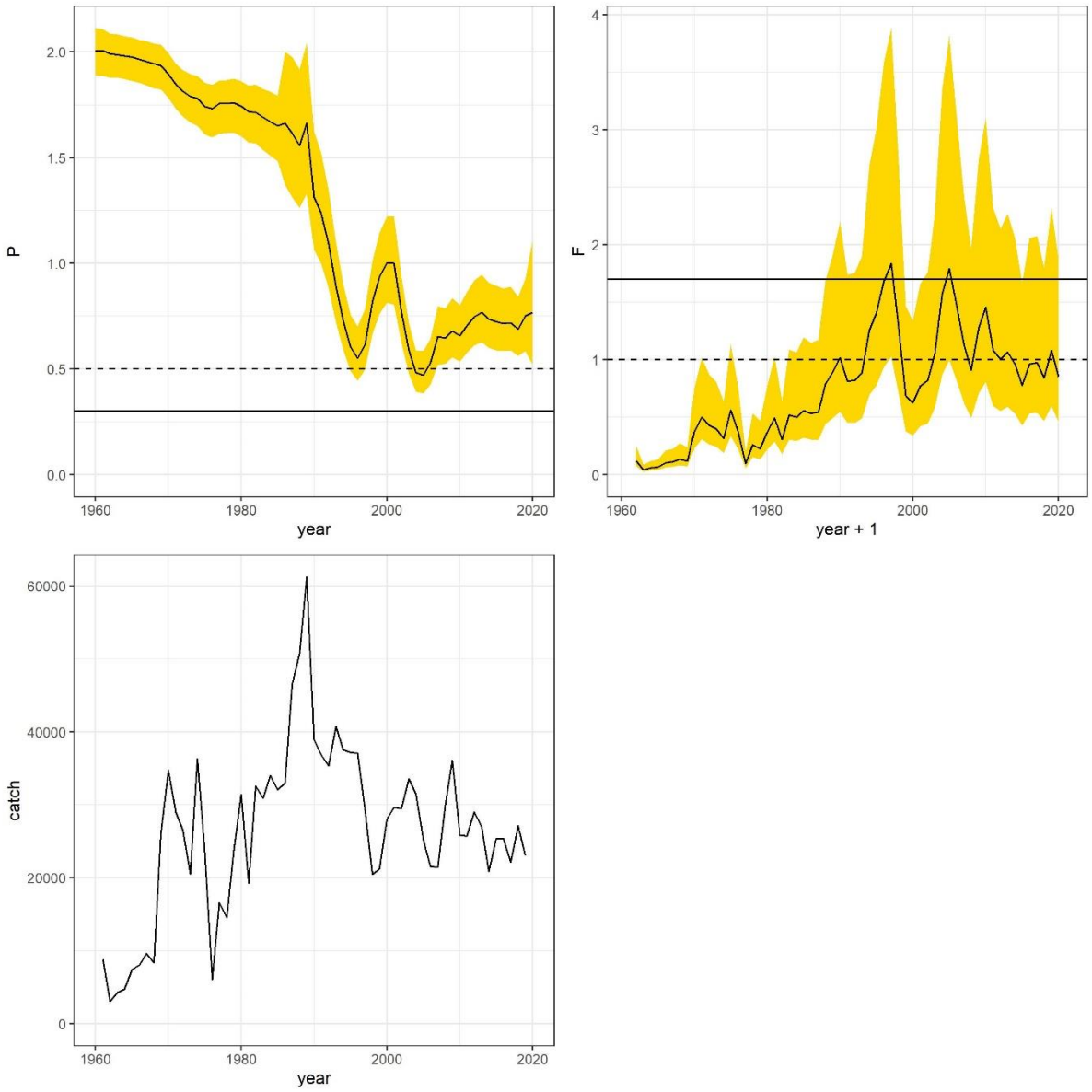

Figure 21. Greenland halibut. Stock summary, upper panel right: fishing mortality (F/F_{msy}) and 95% conf limits, left: total biomass (B/B_{msy}) and 95% conf limits and lower panel is landings since start of the fishery. MSY $B_{trigger}$ and F_{msy} (dashed line), B_{lim} and F_{lim} (solid lines) are indicated.

Mynd 21. Grálúða. Samantekt stofnmats, efri mynd til hægri: hlutfallsleg fiskveiðidánartala (F/Fmsy) og 95% öryggismörk, vinstri: hlutfallslegur lífmassi (B/B_{msy}) og 95% öryggisbil, og neðst er aflinn frá upphafi mælinga. Aðgerðamörk (MSY Btrigger) og kjörsókn(Fmsy) (brotalínur) og varúðarmörk (B_{lim} og F_{lim}, heilar línur) eru sýnd.

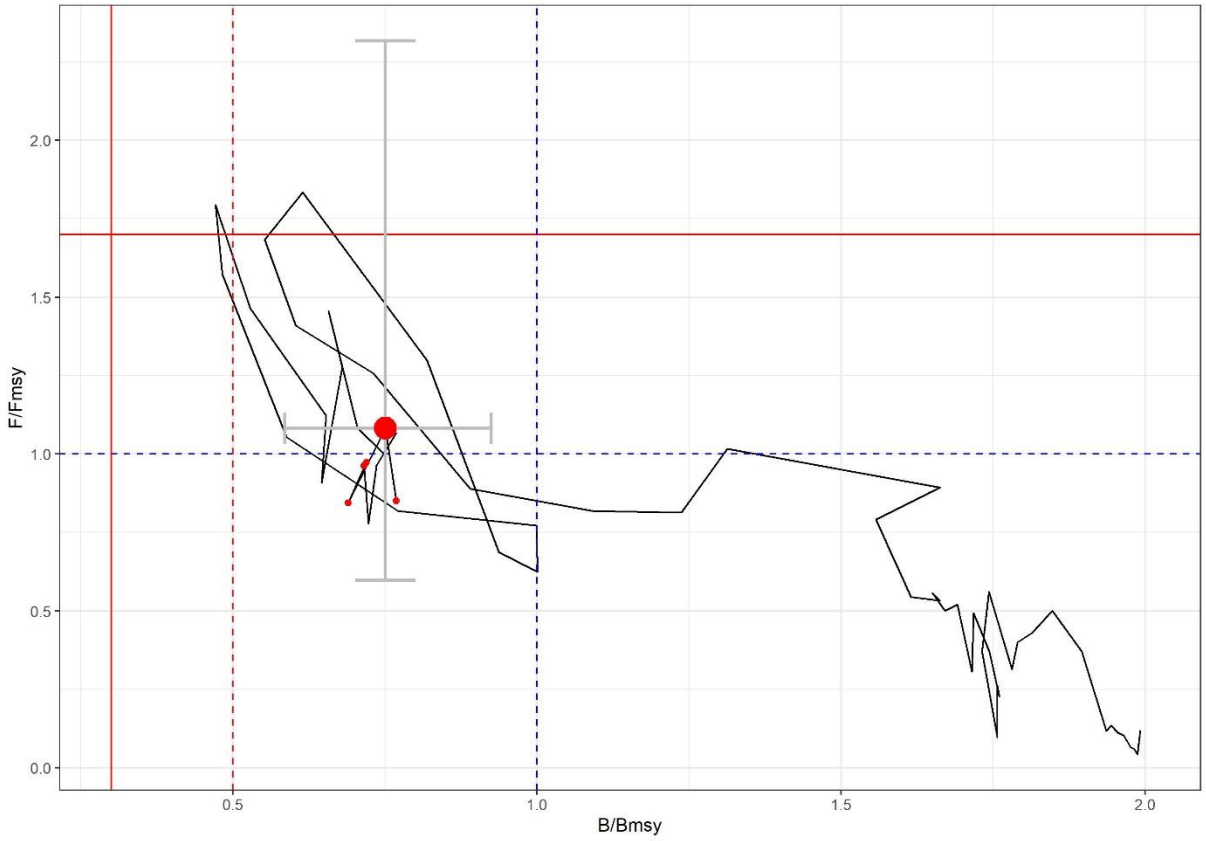

Figure 22. Greenland halibut. Stock trajectory 1960-2019. Estimated annual median biomass-ratio (B/BMSY) and fishing mortality-ratio (F/FMSY). B_{lim}, MSY $B_{trigger}$ and F_{lim} are indicated. Last five years are indicated with red stocks, 2019 assessment the largest. The gray cross indicates the uncertainty in the assessment year

Mynd 22. Grálúða. Stofnþróun 1960 til 2019. Hlutfallslegur lífmassi (B/B_{msy}) sem fall af hlutfallslegri fiskveiðidánartölu (F/Fmsy). Viðmiðunar aðgerðamörk (MSY Btrigger, rauð brotalína) og kjörsókn(Fmsy, blá brotalína), lífmassi sem leiðir til hámarksafraksturs (B_{msy}) og varúðarmörk (B_{lim} og F_{lim}, rauðar heilar línur) eru sýnd. Seinustu 5 ár stofnmatsins eru sýnd með rauðum punktum, sá stærsti er 2019. Grár kross gefur til kynna óvissu á úttektarári.

SHORT-TERM FORECAST AND MANAGEMENT OPTIONS

Assuming catches of 25 000 t in 2020, a fishery a F_{MSY} ($F / F_{MSY} = 1$) in 2021 will lead to catches of 23 530 t. Fishing at this level in 2021 will result in a 2% increase in biomass in 2022 and constitute an increase in advice of 10%.

Biomass scenarios at various catch options are provided in Figure 23. Catches below 30 kt is estimated to lead to an increase in biomass, while catches of 30 kt will remain biomass at current level over the next decade. Only catches of less or equal to 20 kt will lead the biomass to reach B_{MSY} within the next decade (Figure 23).

The risk trajectory associated with ten-year projections of stock development assuming a maintained annual catch in the entire period ranging from 0 to 30 kt were investigated. The calculated risk is a result of the projected development of the stock and the increase in uncertainty as projections are carried forward. It must be noted that a catch scenario of a maintained constant catch over a decade without considering arrival of new biological information and advice is unrealistic.

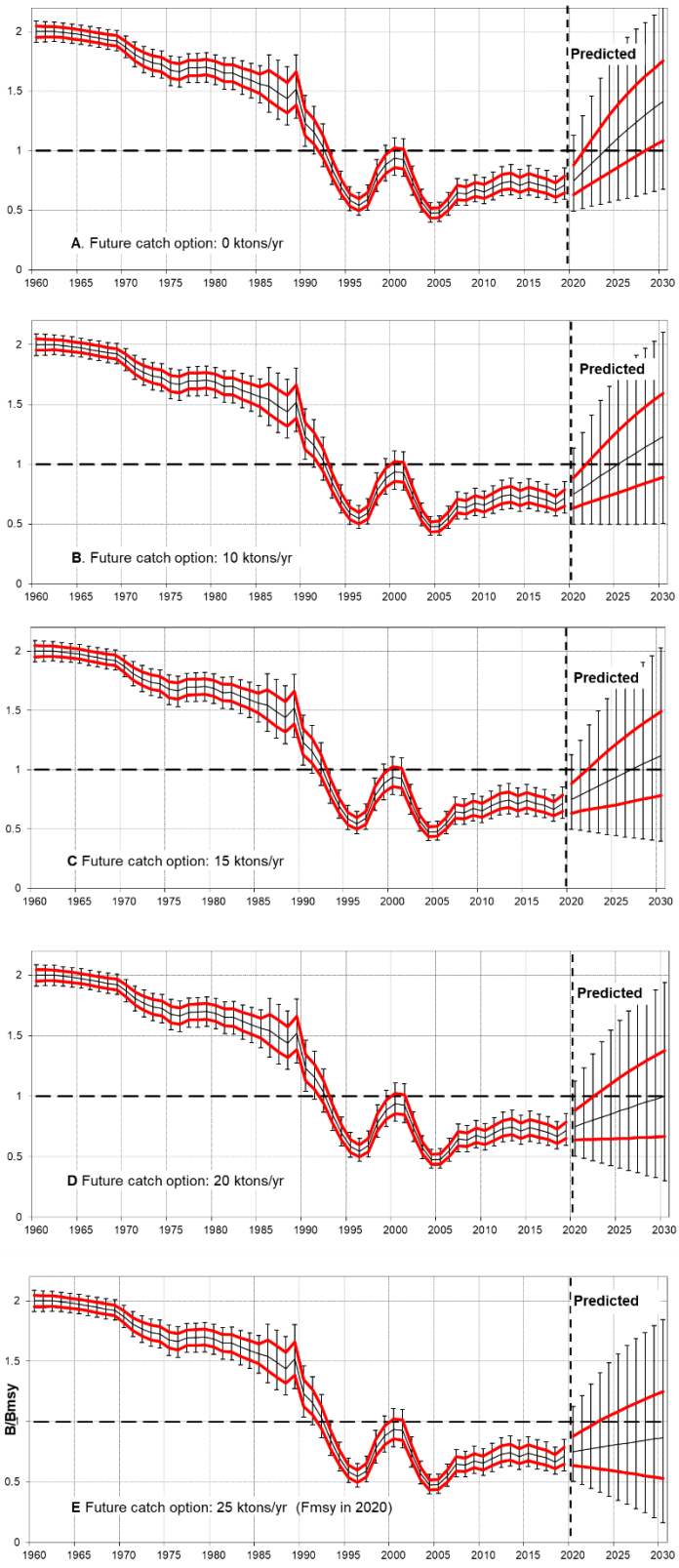

Figure 23. Greenland halibut. Estimated time series of relative biomass (B_i/B_{msy}) under different catch option scenarios: 0, 10, 15, 20 and 25 kt catch from upper to lower panel. Bold red lines are inter-quartile ranges and the solid black line is the median; the error bars extend to cover the central 90 per cent of the distribution.

Mynd 23. Grálúða. Metin tímaröð hlutfallslegs lífmassa (B/B_{msy}) m.v. mismunandi forsendur fyrir afla: 0, 10, 15, 20 og 25 þúsund tonn frá efstu mynd niður að neðstu. Rauðar línur sýna fjórðungabil og svarta línan miðgildi spárinnar. 90% vikmörk eru sýnd sem skekkjumörk.

MANAGEMENT

Table 6 shows the recommended TAC to the East-Greenland/Iceland/Faroes, national TAC, and catches (thous. tonnes) since 1984. In 2014, the Greenland and Iceland entered a five-year bilateral agreement to limit the fishing pressure of the Greenland halibut stock in East-Greenland, Iceland and Faroes to F_{msy}. According to this agreement 56.4% of the TAC is allocated to Iceland and 37.6% to Greenland. The Faroe Islands were not party to the agreement. Currently no agreement exists between the parties but Greenland and Iceland will maintain the TAC split for this fishing year.

Table 6. Greenland halibut. Recommended TAC to East Greenland/Iceland/Faroes, national TAC, and catches (thous. tonnes).

Tafla 6. Grálúða. Tillögur Hafrannsóknastofnunar um hámarksafla fyrir Austur-Grænland/Ísland/Færeyjar, ákvörðun stjórnvalda um heildarafla og afli (tonn).

FISHING YEAR	REC. TAC	NATIONAL TAC ICELAND	LANDINGS ICELAND	LANDINGS OTHER AREAS	TOTAL LANDINGS
1991/92	25.0	25.0	30.3	3.5	33.8
1992/93	30.0	30.0	34.5	6.7	41.3
1993/94	25.0	30.0	29.5	8.4	37.6
1994/95	30.0	30.0	26.4	8.9	35.3
1995/96	20.0	20.0	22.3	13.8	36.1
1996/97	15.0	15.0	17.7	13.3	31.0
1997/98	10.0	10.0	11.0	9.8	20.8
1998/99	10.0	10.0	11.2	9.3	20.5
1999/00	10.0	10.0	11.5	12.0	23.5
2000/01	20.0	20.0	20.0	11.3	31.3
2001/02	20.0	20.0	19.2	9.9	29.1
2002/03	23.0	23.0	20.3	10.2	30.5
2003/04	20.0	23.0	26.9	11.3	32.1
2004/05	15.0	15.0	13.0	11.0	24.0
2005/06	15.0	15.0	12.7	9.5	22.2
2006/07	15.0	15.0	9.6	11.3	20.9
2007/08	15.0	15.0	9.7	11.1	20.8
2008/09	5.0	15.0	15.6	11.6	27.2
2009/10	5.0	12.0	14.1	11.6	25.7
2010/11	5.0	13.0	12.2	13.0	26.4
2011/12	12.0	13.0	13.2	15.6	29.4
2012/13	20.0	14.7	14.1	12.0	26.9
2013/14	20.0	12.5	11.5	11.2	21.0
2014/15	25.0	14.1	11.9	13.3	25.7
2015/16	22.0	12.4	13.4	12.7	25.4
2016/17	24.0	13.5	12.2	11.3	23.5
2017/18	24.0	13.5	14.9	11.3	27.1
2018/19	24.15	13.3	12.7	10.8	23.1
2019/20	21.36	12.0			
2020/21	23.53				

In recent fishing years, landings have been similar to the advised TAC (Table 6). Figure 24 shows the net transfers in the Icelandic ITQ-system since 1991. In this period, transfers to Greenland halibut from other species (positive values) and transfers from Greenland halibut to other species (negative values) have fluctuated (Figure 18). Since 2002/03, transfers have been negative, apart from 2009/10 and the past two fishing years, when a small amount was transferred to Greenland halibut quota.

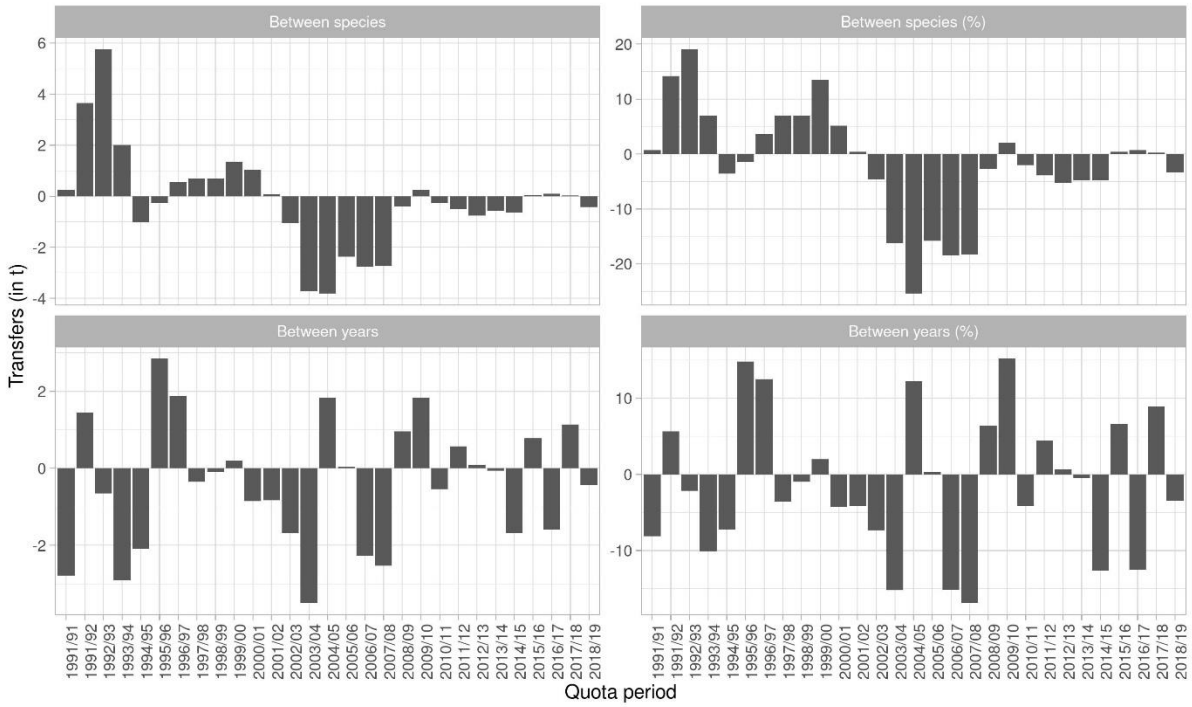

Figure 24. Greenland halibut. Net transfers of quota to and from Greenland halibut in the Icelandic ITQ system by fishing year. Between species (upper): Positive values indicate a transfer of other species to Greenland halibut, but negative values indicate a transfer of Greenland halibut quota to other species. Between years (lower): Net transfer of quota for a given fishing year.

Mynd 24. Grálúða. Nettó tilfærsla á kvóta eftir fiskveiðiárum. Tilfærsla milli tegunda (efri myndir): Jákvæð gildi tákna tilfærslu á kvóta annarra tegunda yfir á grálúðu en neikvæð gildi tilfærslu grálúðukvóta á aðrar tegundir. Tilfærsla milli ára (neðri myndir): Nettó tilfærsla kvóta á viðkomandi fiskveiðiári.