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Results for Greenland halibut, American plaice and Atlantic cod of the Spanish survey in NAFO Div. 3NO for the period 1997-2019

by

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Abstract

Greenland halibut (*Reinhardtius hippoglossoides*), American plaice (*Hippoglossoides platessoides*) and Atlantic cod (*Gadus morhua*) indices from the bottom trawl survey that Spain carries out in Spring since 1995 in Div. 3NO of the NAFO Regulatory Area are presented. Biomass, stratified mean catches and mean number per tow for the three species are presented since 1997, year in which the survey extended the depth strata. Mean catch per tow, length distribution and age distribution (this last except for American plaice) are presented for the last five years (2015-2019).

Greenland halibut biomass and abundance estimates presented a decreasing trend since 1999, cut in 2007-2009 with a high increase. In 2011 the biomass drops under the 2008 value, being stable since then until 2014 with a slight increase in 2015-2019 comprising a big increase in 2017, reaching the maximum of the series. In last years it can be seen a presence of juveniles, mainly in 2004, but the greatest lengths have failed, although in 2009 there is a quite good presence of individuals of ages 6-7 and in 2010 between 5-7. In 2011-2019 the presence of all ages is poor. In 2018 the mode was at 1-2 years, and 2-3 years in 2019, suggesting a fairly strong 2017 cohort. For American plaice we can see a slightly increasing trend from 1999 to 2015, reaching a maximum of mean catch and number in 2006, and a severe decline since 2016, being the 2019 the lowest value of the entire series. The greatest recruitment in the presented series occurred in 2004 and we can follow their mode along the years. No good recruitments were seen since then. In last years the level of all the ages is low. No 2019 age indices are available at this moment. For Atlantic cod, it can be seen a low biomass until 2008, being higher and variable since then, reaching a historical maximum in 2014. From 2015, biomass decreased reaching in 2019 poor values at the level of the 2005 biomass. In 2007-2008 the youngest length classes were much over the rest of the length classes. With the 2006 cohort the series reaches the maximum number of its historical values at five years in 2011. There have been no good recruitments since 2009, although in 2015 and 2016 a discrete presence of individuals of age 1 can be seen.

Material and Methods

Since 1995, Spain carries out a Spring-Summer survey in the NAFO Regulatory Area of Div. 3NO. From 1995 to 2000, the survey was conducted on board the C/V *Playa de Menduñña* with a net trawl type *Pedreira*. In 2001 this vessel was replaced by the R/V *Vizconde de Eza*, using a trawl net type *Campelen*. For more details about the technical specifications of the surveys, see Walsh *et al.* (2001) and González Troncoso *et al.* (2004).



The catch of each haul was sorted and weighted into species and a sample of each species was taken in order to measure the length distribution. For Greenland halibut, American plaice and Atlantic cod each individual of the sample was measured to the total length to the nearest lower cm. As in 1995 and 1996 only depth less than 1000 m was surveyed, these years are not representative for these species, so only data from 1997 are presented. We present the total annual indices of biomass and abundance for the period 1997-2019.

The number of valid tows, the depth strata covered and the dates of the survey series (1997-2019) are presented in Table 1. Table 2 shows the swept area and number of hauls by stratum for the last five years (2015-2019). To know the results of the rest of the years, see González-Troncoso *et al.* (2015).

For each species, we present all the transformed indices until 2000 and no-transformed from 2002 to 2019. In 2001 there are data transformed from the former vessel with original data from the new vessel. To know more about the transformation, see González-Troncoso *et al.* (2004). We present the mean catch, the length distribution in number by sex and year; and the mean numbers with their mean length and mean weight by age for years 2015-2019 except for American plaice in 2019 as the ALK is not yet available. To see the results of the rest of the years, see González-Troncoso *et al.* (2015).

Figure 1 presents the maps with the distribution of the catches of the three species during the 2019 Spanish 3NO survey.

Results

Greenland halibut

The Greenland halibut stock in Subarea 2 and Div. 3KLMNO is considered to be part of a biological stock complex, which includes Subareas 0 and 1. Abundance and biomass indices were available from research vessel surveys by Canada in Div. 2J+3KLMNO (1978-2018), EU in Div. 3M (1988-2018), EU-Spain in Div. 3NO (1997-2018) and EU-Spain in Div. 3L (2003-2018).

In 2003, a fifteen year rebuilding plan was implemented by Fisheries Commission for this stock. Estimated catch over 2004-2010 exceeded the TAC by considerable margins. TAC over-runs have ranged from 22%-64%, despite considerable reductions in effort. In 2010, Fisheries Commission implemented a survey-based harvest control rule to generate annual TACs over at least 2011-2014. In 2013 Fisheries Commission extended this management approach to set the TACs for 2015-2017, but did not apply the HCR in 2017, rather setting the TAC equal to the 2016 TAC. The TAC in 2018 is based on the HCR adopted in 2017. Catch exceeded the TAC in every year from 2004 to 2014 but was similar to the TAC in 2015 through 2018.

Over 1995-2007, indices from the majority of the surveys generally provided a consistent signal in stock biomass. Results since 2007 show greater divergence which complicates interpretation of overall status. Since 2014 there is a clear divergence with the surveys in the NRA (including 3M) generally increasing and Canadian surveys declining. However, in 2018 there was a substantial decline in surveys conducted in the NRA while Canadian surveys increased (NAFO, 2019).

Mean catches and Biomass

Table 3 shows the mean catches and their variance per haul and year for Greenland halibut during the period 2015-2019. Biomass per stratum for the same period is presented in Table 4. Annual total biomass, as their corresponding biomass at ages 5+ and 10+, and mean catch per tow with the total variance per year are presented in Table 5 for years 1997-2019. In Figure 2, we compare the mean catch per tow with the mean number per tow. Figure 3 presents the biomass per swept area per stratum and their total variance per year, as the 5+ and 10+ biomass. In Table 6, we present the length-weight relationship parameters a and b for 2015-2019.

After an increasing of Greenland halibut total biomass between 1997 and 1999, this index decreased until 2002, reaching the lowest value of the whole time-series. From 2002 to 2007, it maintained almost constant values at low levels. It increased substantially in 2009 and 2010, dropping in 2011 to a half of the 2010 value, and it

has maintained stable at higher values than before 2008, with a slight increase in 2015-2018 comprising a big increase in 2017, reaching the maximum of the series. The biomass 5+ has had the same trend as the total biomass with a marked increase from 2008, being 2017 the highest values of the series. Since 2007, 5+ biomass has represented more than 90% of total biomass, being 99% in 2015. In the case of the 10+ biomass, it has increased since 2006 onwards, reaching the maximum value of the time-series in 2017. Since 2012, 10+ biomass has represented more than 20% of total biomass. Despite of this, with respect to the mean number per tow, although in the 2008-2010 period there was a substantial increase in the numbers, this increase is not as the increase in mean catch, reaching the level of the 2001 numbers per tow, but still far of the values of the first years of our series. Without the peak of 2009 and 2010, the numbers had been stable since 2002. A high increase occurred in 2017 and 2019, but the level is still below the first years of the series.

Length Distribution

Table 7 presents the mean number per tow by sex and year for 1997-2019. Table 8 shows this index by length, sex and year, with the number of samples in which there were length measures, the total number of individuals measured in these samples, the sampled catch and the range of lengths met, as the total catch of this species and the total hauls made in the survey, for years 2015-2019. In Figures 4 and 5 we can follow the evolution along the years. We can follow a mode since 1997 until 2001, but since then no high new values appear. The highest recruitments were in 1997, 2001 and 2004. In 2006 and 2007 the small individuals (around 12-14 cm, corresponding to 1 year of age) are the mode of the length distribution range, but all the length ranges were poor. The same occurred in 2011 and in 2017, with a mode in lengths 14-15, that corresponds to age 1. In 2009, 2010, 2017 and 2018 an increase in number for lengths between 38-52 cm (ages 5-7) can be seen. It seems that the high increase in the biomass in 2009-2010 was due to the higher presence of these length classes, while at the beginning of the series the presence of juveniles was stronger. From 2012 the presence of all the length classes has been poor, although a slight increase in the range of the length can be seen for years 2015 and 2016.

Age numbers

We present the mean number by age, sex and year in Table 9 for 2015-2019, and the total by year (for the entire series) in Figure 6. Individuals between 0 and 20 years were caught in the period 1997-2019 and since 2002 more number of younger individuals has been caught. It can be due to the change of gear and/or vessel. We can follow three conspicuous cohorts in our series, the 1994-1996 cohorts (ages 1, 2 and 3 in 1997). Cohorts from following years seem to be weaker than those ones, but more constant. 2001-2003 cohorts appear to be quite strong, as we can see in recent years, particularly 2002 one, and these cohorts seem to be present in year 2008 (ages 5 to 7) and in 2009 (ages 6 to 8). In 2010 the mode of the ages is between 5 and 7 years, which can imply that the cohorts of years 2004 and 2005 could be better than it can be seen in the graph. Over 2014-2017 the mode is at 7 years old, but in 2018 the mode was at 1-2 years, and 2-3 years in 2019, suggesting a fairly strong 2017 cohort. The third mode in 2019 is at age 1. In fact, age 1 represents around 10% of the total numbers in 2015 and 2016 and more than 15% in 2017-2019.

Mean length and mean weight at age

Mean length and weight at age by sex for 2015-2019 are presented in Tables 10 and 11, and for the entire series in Figures 7 and 8. The greatest ages increased their mean length and weight until 2003, and fell in the youngest individuals. In 2012-2016 the mean length and weight were more or less constant, with a decrease since then, probably due to a higher presence of younger individuals.

American plaice

There was no directed fishing of American plaice in 1994 and there has been a moratorium since 1995. Even under moratorium, catches increased substantially from 1995 to 2003 and then decreased. Biomass and SSB are low compared to historic levels. SSB declined to the lowest estimated level in 1994 and 1995. It has increased since then but still remains very low. Recruitment has been low since the late 1980, but Canadian surveys indicate a large number of pre-recruits in Div. 3L in recent years. Current estimates of fishing mortality are low (NAFO, 2019).

Mean catches and Biomass

American plaice mean catches and SD by stratum are presented in Table 12 for 2015-2019. Biomass for stratum for the same period is presented in Table 13.

The annual entire time series (1997-2019) of biomass and stratified mean catches with their SD estimates for American plaice are presented in Table 14 and in Figures 9 and 10. Estimated parameters a and b values of length-weight distribution are presented in Table 15 for 2015-2019.

The American plaice indices show a general increasing trend along the years, agree with the results from the Canadian surveys. Biomass increased from a depressed value in 1997 to 2000. It had a stable trend with a minimum in 2002 and maximum values in 2006 and 2008, showing a severe decline in 2016-2019, being the 2019 the lowest value of the entire series.

Length Distribution

Table 16 shows the mean number per tow by sex and year for 1997-2019, and Table 17 the same index by length for 2015-2019, besides the sample size and catch. Figures 11 and 12 show length distribution by sex and year for the entire period. Between years 2000 and 2004 we can follow a mode that then disappeared; probably the 1998 year-class. In 2004 there is a great presence of juveniles (8 cm) and in 2005 the mode appears around 14 cm, following with a mode of around 20 cm in 2006, 24 in 2007, 26 in 2008 and 28 in 2009. This mode can be seen around 30 cm in 2010, 32 cm in 2011 and 34 cm in 2012, but the mode length in those years is 28, as in 2009. In 2014, there is a mode around 28 cm, it can be follow in 2015 around 30 cm, and in 2016, with very few individuals, around 32 cm. In 2008 and 2010 there is a quite good presence of juveniles (individuals of 10-12 cm in 2008 and 12 cm in 2010) that does not appear in 2011-2013. A discrete occurrence of individuals of 12-20 cm appears in 2015, but not since 2016.

Age numbers

The 2016 ALK for American plaice was not sexed; just the total ALK was used. The 2017-2019 ALKs for American plaice are not available yet. For informative purposes, the 2016 ALK was used over the length distribution of 2017 and 2018 and the resulted numbers are shown here. We consider that to use this ALK for 2019 is no longer appropriate, so for that year no numbers-at-age for American plaice are presented. When the 2017-2019 ALKs are available, the indices will be updated correspondingly.

We present the mean number per tow at age by sex and by year from 2015 to 2018 in Table 18 and the total by year (1997-2018) in Figure 13. The ALK used for all years is the 3N Canadian one. We can follow a cohort without problems since the year 2000, starting in individuals of 2 years old (1998 cohort), reaching 17 year old in 2015 (almost disappeared); a second cohort, weaker, can be followed since 1999, starting in 2 years old (1997 cohort). Another cohort from the year 2002 (one year old in 2003), can be followed until 2016, reaching 14 years old, although it failed at 5 years old and is almost disappeared in 2018. And the 2003 cohort (one year in 2004) is a very strong cohort, reaching in 2008 five years old and the largest number in the whole series, and in 2015 twelve years old. In 2015-2018 the maximum is in 7 years old. Since 2016 the level of all the ages has been being low.

Mean length and mean weight

Mean length and weight at age by sex for 2015-2018 are presented in Tables 19 and 20, and shown in Figures 14 and 15, for 1997-2018. The mean length is more or less stable in all ages, at least since 2002. The same occurs with the mean weight, although with more variations. The major variations appear in the oldest ages studied: 12+ years old individuals.

Biomass and biomass by Division

As part of some biological studies, the biomass and the abundance by age has been separated by Division. Age distribution by age can be seen in Table 21, and in Table 22 and Figure 16 the total biomass and abundance by Division. The majority of the abundance and biomass come from Division 3N.

Atlantic cod

Atlantic cod in Divisions 3NO has been under moratorium to directed fishing since 1994. According to the NAFO Scientific Council, the stock of Atlantic cod in Divisions 3NO declined dramatically during the mid-1980s. The most recent analytical assessment, in 2018, concluded that SSB was well below B_{lim} (60000 t) in 2017. Canadian and EU-Spain survey indices for 2018 have remained similar and declined, respectively, relative to 2017 (NAFO, 2019).

Mean Catches and Biomass

Atlantic cod mean catches and SD by stratum are presented in Table 23 for 2015-2019. Biomass by stratum and year are presented in Table 24 for the same period.

The entire time series (1997-2019) of biomass and stratified mean catches with their SD estimates for Atlantic cod are presented in Table 25 and Figures 17 and 18. Estimated parameters a and b values of length-weight relationship are presented in Table 26 for 2015-2019.

Biomass of cod presents poor values between 1997 and 2005 with some fluctuations and a great deviation due to a few hauls in which the presence of that species was very high (e.g., 2001). Between 2006 and 2014 an increasing trend in the biomass of this species can be seen. Although the 2006 increase is above all for a single catch of almost 2 tons, in general the catches of Atlantic cod in the survey of 2006 were over the mean. In 2008 a quite high increase is shown, and in this case there is no haul with very high catches (the maximum was 585.5 kg). Then the biomass increased to values well above the years before, reaching the maximum of the series in 2014 after a decrease in 2012 and 2013. From 2015, biomass decreased reaching in 2019 poor values at the level of the 2005 biomass.

Length Distribution

Table 27 presents the mean number per tow by year for 1997-2019 and this index by length for the period 2015-2019 can be seen in Table 28, besides the sample size and its catch. Figures 19 and 20 show the length distribution by year (1997-2019). The modal values used to be very low before 2006 except in 2001, and in general all lengths presence was very low, even it is very difficult to follow the modal values. In 2001 we had a good presence of individuals between 36 and 58 cm. From 2006 a series of great modal values along the length distribution can be seen. In 2006 there were two modes in the length distribution, one around 30 cm and another one around 40 cm. There was no good recruitment until 2004, in which the individuals between 12 and 16 cm correspond to the greatest presence in the series, and in 2005 between 24 and 32, with a new mode between 12 and 16 cm, as in last year. In 2007 the youngest lengths dominated the length range, with the highest mode in the lengths 12-16, that are between 2 and 4 times the abundance of the 48 cm length class, the following mode. In 2008-2015 we can follow the evolution of these lengths. In 2015 the mode is in 36 cm, with a discrete presence of individuals of lengths 6-8 cm. It must be note that, although the biomass has decrease from 2014 to 2015, the mean number is almost the same in both years, probably due to the presence of the smallest individuals. Since 2016 mean number per town sharply decreased, and modal values were very low. The mode in 2019 is around 44 cm.

Age numbers

The mean number per tow at age and year (2015-2019) is presented in Table 29 and the total by year (1997-2019) in Figure 21. In accordance with the length distribution, until 2006, the numbers are too low to follow any cohort. But between 2006 and 2008 there are three good cohorts that can be followed (2005-2007 cohorts). With the 2006 cohort the series reaches the maximum number of its historical values at five years in 2011. But it seems that no new good recruitments have occurred since 2009, although in 2015 and 2016 a discrete presence of individuals of age 1 can be seen.

Mean length and mean weight

Mean length and weight at age by sex over time are presented in Tables 30 and 31 (2015-2019), and shown in Figures 22 and 23 (1997-2019). For the central ages, the mean length and the mean weight seem to be more or less stable. That does not occur in the oldest ages, with the two parameters very scattered. The total mean length and mean weight presented no trend until 2006, increasing since then until 2014, decreasing afterwards.

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Table 1. Spanish spring bottom trawl surveys in NAFO Div. 3NO: 1997-2019.

Year	Vessel	Valid tows	Depth strata covered (m)	Dates
1997	<i>C/V Playa de Mendiña</i>	128	42-1263	April 26-May 18
1998	<i>C/V Playa de Mendiña</i>	124	42-1390	May 06-May 26
1999	<i>C/V Playa de Mendiña</i>	114	41-1381	May 07-May 26
2000	<i>C/V Playa de Mendiña</i>	118	42-1401	May 07-May 28
2001 ^(*)	<i>R/V Vizconde de Eza</i>	83	36-1156	May 03-May 24
	<i>C/V Playa de Mendiña</i>	121	40-1500	May 05-May 23
2002	<i>R/V Vizconde de Eza</i>	125	38-1540	April 29-May 19
2003	<i>R/V Vizconde de Eza</i>	118	38-1666	May 11-June 02
2004	<i>R/V Vizconde de Eza</i>	120	43-1539	June 06-June 24
2005	<i>R/V Vizconde de Eza</i>	119	47-1485	June 10-June 29
2005	<i>R/V Vizconde de Eza</i>	119	47-1485	June 10-June 29
2006	<i>R/V Vizconde de Eza</i>	120	45-1480	June 7-June 27
2007	<i>R/V Vizconde de Eza</i>	110	45-1374	May 29-June 19
2008	<i>R/V Vizconde de Eza</i>	122	45-1374	May 27-June 16
2009	<i>R/V Vizconde de Eza</i>	109	45-1374	May 31-June 18
2010	<i>R/V Vizconde de Eza</i>	95	45-1374	May 30-June 18
2011	<i>R/V Vizconde de Eza</i>	122	44-1450	June 5-June 24
2012	<i>R/V Vizconde de Eza</i>	122	44-1450	June 3-June 21
2013	<i>R/V Vizconde de Eza</i>	122	44-1450	June 1-June 21
2014	<i>R/V Vizconde de Eza</i>	122	44-1450	June 2-June 21
2015	<i>R/V Vizconde de Eza</i>	122	44-1450	May 31-June 19
2016	<i>R/V Vizconde de Eza</i>	115	44-1450	May 30-June 18
2017	<i>R/V Vizconde de Eza</i>	113	44-1450	May 23-June 11
2018	<i>R/V Vizconde de Eza</i>	114	44-1450	June 2-June 21
2019	<i>R/V Vizconde de Eza</i>	115	44-1450	June 8-June 24

(*)For the calculation of the series, 83 hauls were taken from the *R/V Vizconde de Eza* and 40 hauls from the *C/V Playa de Mendiña* (123 hauls in total)

Table 2. Swept area and number of hauls by stratum. Spanish Spring Surveys in NAFO Div. 3NO: 2015-2019. Swept area in square miles. n.s. means stratum not surveyed.

Stratum	2015		2016		2017		2018		2019	
	Swept area	Tow number	Swept area	Tow number	Swept area	Tow number	Swept area	Tow number	Swept area	Tow number
353	0.0401	3	0.0356	3	0.0360	3	0.0338	3	0.0386	3
354	0.0390	3	0.0345	3	0.0356	3	0.0341	3	0.0383	3
355	0.0263	2	0.0233	2	0.0225	2	0.0233	2	0.0263	2
356	0.0255	2	0.0225	2	0.0233	2	0.0225	2	0.0248	2
357	0.0233	2	0.0233	2	0.0233	2	0.0236	2	0.0251	2
358	0.0349	3	0.0338	3	0.0364	3	0.0345	3	0.0383	3
359	0.0855	7	0.0593	5	0.0596	5	0.0589	5	0.0634	5
360	0.2363	20	0.1995	17	0.2044	17	0.1939	17	0.2213	17
374	0.0229	2	0.0233	2	0.0236	2	0.0225	2	0.0255	2
375	0.0341	3	0.0360	3	0.0364	3	0.0356	3	0.0383	3
376	0.1159	10	0.0945	8	0.0975	8	0.0908	8	0.1043	8
377	0.0233	2	0.0233	2	0.0251	2	0.0233	2	0.0263	2
378	0.0225	2	0.0225	2	0.0236	2	0.0229	2	0.0259	2
379	0.0225	2	0.0229	2	0.0244	2	0.0225	2	0.0263	2
380	0.0229	2	0.0236	2	0.0236	2	0.0225	2	0.0263	2
381	0.0236	2	0.0229	2	0.0229	2	0.0225	2	0.0255	2
382	0.0458	4	0.0465	4	0.0360	3	0.0450	4	0.0645	5
721	0.0240	2	0.0225	2	0.0229	2	0.0229	2	0.0263	2
722	0.0259	2	0.0229	2	0.0233	2	0.0236	2	0.0255	2
723	0.0233	2	0.0225	2	0.0229	2	0.0240	2	0.0248	2
724	0.0236	2	0.0233	2	0.0240	2	0.0233	2	0.0244	2
725	0.0229	2	0.0229	2	0.0244	2	0.0233	2	0.0255	2
726	0.0229	2	0.0225	2	0.0233	2	0.0225	2	0.0259	2
727	0.0225	2	0.0225	2	0.0229	2	0.0225	2	0.0248	2
728	0.0225	2	0.0229	2	0.0229	2	0.0225	2	0.0248	2
752	0.0225	2	0.0236	2	0.0236	2	0.0233	2	0.0266	2
753	0.0233	2	0.0229	2	0.0233	2	0.0236	2	0.0248	2
754	0.0225	2	0.0225	2	0.0218	2	0.0225	2	0.0240	2
755	0.0450	4	0.0458	4	0.0338	3	0.0338	3	0.0356	3
756	0.0229	2	0.0225	2	0.0229	2	0.0229	2	0.0251	2
757	0.0229	2	0.0225	2	0.0225	2	0.0225	2	0.0263	2
758	0.0221	2	0.0221	2	0.0229	2	0.0225	2	0.0259	2
759	0.0229	2	0.0229	2	0.0225	2	0.0225	2	0.0251	2
760	0.0225	2	0.0229	2	0.0236	2	0.0356	3	0.0255	2
761	0.0240	2	0.0225	2	0.0236	2	0.0124	1	0.0236	2
762	0.0229	2	0.0225	2	0.0229	2	0.0225	2	0.0255	2
763	0.0341	3	0.0338	3	0.0353	3	0.0345	3	0.0383	3
764	0.0251	2	0.0225	2	0.0229	2	0.0225	2	0.0248	2
765	0.0236	2	0.0229	2	0.0225	2	0.0233	2	0.0251	2
766	0.0236	2	0.0229	2	0.0225	2	0.0229	2	0.0248	2
767	0.0229	2	0.0229	2	0.0229	2	0.0236	2	0.0244	2

Table 3. Greenland halibut mean catch (kg) and SD by stratum. Spanish Spring Surveys in NAFO Div. 3NO: 2015-2019. n.s. means stratum not surveyed.

Stratum	2015		2016		2017		2018		2019	
	GHL Mean catch	GHL SD	GHL Mean catch	GHL SD	GHL Mean catch	GHL SD	GHL Mean catch	GHL SD	GHL Mean catch	GHL SD
353	0.11	0.18	0.03	0.03	0.03	0.01	3.46	2.19	1.29	0.79
354	0.61	0.87	0.19	0.16	1.10	0.54	0.29	0.24	0.64	0.30
355	5.04	7.00	0.15	0.08	0.60	0.09	1.38	1.14	8.65	11.95
356	1.10	1.43	0.32	0.33	0.08	0.02	0.30	0.16	1.78	0.62
357	0.47	0.54	0.18	0.13	0.67	0.90	0.08	0.11	0.23	0.05
358	0.02	0.03	0.00	0.00	0.00	0.00	0.53	0.40	0.49	0.82
359	0.00	0.00	0.02	0.02	0.21	0.33	0.46	0.60	0.25	0.36
360	0.00	0.01	0.00	0.01	0.03	0.04	0.06	0.15	0.06	0.17
374	0.00	0.00	0.00	0.00	0.23	0.25	0.00	0.00	0.01	0.02
375	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
376	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.01
377	0.15	0.21	0.14	0.20	0.05	0.02	0.71	0.44	0.00	0.00
378	0.03	0.05	0.03	0.02	1.73	1.76	0.79	0.05	0.13	0.14
379	0.02	0.02	0.00	0.00	0.01	0.01	0.13	0.15	0.01	0.02
380	2.38	0.88	1.20	1.69	16.02	2.71	10.69	7.25	57.19	47.26
381	0.91	1.13	0.48	0.68	1.59	1.01	0.07	0.08	28.28	18.56
382	0.12	0.14	0.06	0.08	0.15	0.06	0.03	0.03	0.30	0.61
721	2.34	0.04	0.83	1.18	3.93	5.56	6.54	4.61	1.17	0.26
722	24.22	13.02	6.56	6.28	9.50	11.58	15.95	8.63	14.18	11.39
723	5.58	0.09	0.03	0.02	2.87	4.00	3.17	3.23	5.05	5.83
724	20.72	15.86	9.91	4.51	3.45	0.85	1.44	2.03	12.86	13.57
725	2.51	1.24	0.31	0.43	4.77	0.74	5.18	4.07	13.17	8.52
726	22.88	15.06	10.45	6.32	22.78	5.63	8.24	0.92	33.37	15.24
727	9.78	1.80	6.98	3.62	57.93	45.29	32.23	7.67	85.46	14.16
728	20.21	20.51	26.86	30.76	135.45	125.16	20.70	24.41	39.63	10.01
752	50.45	10.96	62.16	32.16	92.18	11.84	23.80	20.65	28.68	1.80
753	21.65	5.73	46.35	5.30	41.55	6.09	14.70	15.77	16.10	11.74
754	22.35	2.33	57.60	16.55	59.06	38.12	35.99	12.35	37.10	35.64
755	25.70	21.22	28.07	14.22	35.47	18.06	16.18	11.22	27.90	27.26
756	44.67	2.59	20.06	4.73	102.82	10.66	27.20	5.65	35.60	15.98
757	51.77	19.99	59.35	10.96	149.78	60.42	38.70	17.63	32.42	10.65
758	35.70	4.25	33.81	13.71	159.00	174.37	74.63	54.48	14.19	12.25
759	44.64	14.75	41.68	44.72	75.48	19.13	17.45	2.55	23.19	10.87
760	37.97	28.68	27.91	18.80	46.29	32.61	33.03	4.42	30.49	30.98
761	50.94	23.95	37.46	1.64	23.26	7.22	32.80	-	28.13	5.10
762	58.78	6.02	37.16	19.57	80.02	35.79	33.30	19.02	12.81	1.90
763	28.55	19.86	31.24	19.73	55.06	56.85	24.19	9.60	14.90	5.88
764	28.98	0.53	14.29	3.56	37.14	1.86	31.38	15.60	13.12	0.53
765	23.60	6.05	15.46	2.08	15.48	7.04	49.22	32.19	16.08	2.81
766	16.88	0.82	8.91	1.08	29.16	17.40	10.72	1.27	39.57	11.51
767	10.82	12.01	9.00	5.01	23.30	16.68	8.39	9.36	9.15	9.60

Table 4. Greenland halibut survey biomass (t) by stratum in NAFO Div. 3NO: 2015-2019. n.s. means stratum not surveyed.

Strata	2015	2016	2017	2018	2019	Strata	2015	2016	2017	2018	2019
353	2	1	1	83	27	725	23	3	41	47	108
354	12	4	23	6	12	726	144	67	141	53	186
355	28	1	4	9	49	727	83	60	486	275	663
356	4	1	0	1	7	728	140	183	924	144	250
357	7	2	9	1	3	752	587	689	1022	268	282
358	0	0	0	10	9	753	257	559	493	172	180
359	0	1	7	16	8	754	358	922	977	576	557
360	1	1	6	13	12	755	880	945	1214	554	905
374	0	0	4	0	0	756	394	180	908	240	286
375	0	0	0	0	0	757	462	538	1358	351	252
376	0	0	1	0	0	758	319	303	1376	657	109
377	1	1	0	6	0	759	496	463	852	197	234
378	0	0	20	10	1	760	520	376	603	428	368
379	0	0	0	1	0	761	726	569	337	453	407
380	20	10	130	91	418	762	1089	700	1483	627	213
381	11	6	20	1	319	763	655	725	1223	549	305
382	4	2	4	1	8	764	231	127	325	279	106
721	13	5	22	37	6	765	248	168	171	525	159
722	157	48	69	113	93	766	206	112	373	135	460
723	74	0	39	41	63	767	149	124	322	112	119
724	217	106	36	15	131						

Table 5. Greenland halibut survey biomass (t) with SD and stratified mean catch per tow (kg) and SD by in NAFO Div. 3NO: 1997-2019.

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Biomass	6859	11305	11246	9331	7721	2380	4701	3437	3071	2720	3286	7272
SD	546	860	973	707	790	410	575	373	325	379	363	708
Biomass 5+	4303	6284	6367	8785	6700	2011	3386	2318	2585	2151	3057	6908
Biomass 10+	406	504	660	1111	741	279	495	318	380	182	343	798
MCPT	7.73	11.73	12.00	9.48	8.17	2.64	5.10	3.68	3.39	3.03	3.98	7.66
SD	0.62	0.89	1.00	0.75	0.84	0.45	0.61	0.40	0.36	0.42	0.44	0.74

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Biomass	12927	12462	6483	6830	4959	5482	8519	8002	15026	7099	7316
SD	1506	1197	593	631	606	465	664	700	1728	658	811
Biomass 5+	11971	12057	6091	6297	4697	5322	8397	7784	14521	6653	5905
Biomass 10+	1134	1158	1163	1587	1319	1529	1759	1945	2436	1182	1556
MCPT	14.78	14.80	7.09	7.37	5.46	6.24	9.49	8.80	16.63	7.88	8.82
SD	1.73	1.40	0.63	0.69	0.47	0.53	0.73	0.78	1.92	0.72	0.95

Table 6. Greenland halibut length weight relationships in Spanish Spring Surveys in NAFO Div. 3NO: 2015-2019. E(x) means Error of the parameter x.

	Males						Females						Total					
	a	b	E(a)	E(b)	R2	N	a	b	E(a)	E(b)	R2	N	a	b	E(a)	E(b)	R2	N
2015	0.00354	3.20453	0.0962	0.0281	0.996	441	0.0034	3.2296	0.0638	0.0172	0.998	789	0.0028	3.2852	0.0692	0.019	0.998	1239
2016	0.00353	3.20496	0.0725	0.0207	0.998	383	0.0031	3.2581	0.066	0.0177	0.998	697	0.0029	3.2736	0.063	0.0169	0.998	1086
2017	0.00440	3.14204	0.0813	0.0233	0.999	501	0.0031	3.2499	0.0605	0.0164	0.999	667	0.0032	3.2393	0.0529	0.0144	0.999	1184
2018	0.00423	3.15622	0.0710	0.0200	0.998	611	0.0034	3.2294	0.0520	0.0140	0.999	821	0.0036	3.2137	0.0635	0.0174	0.999	1447
2019	0.00431	3.14895	0.0369	0.0107	0.999	831	0.0026	3.2940	0.0927	0.0255	0.996	1071	0.0034	3.2275	0.0446	0.0124	0.999	1917

Table 7. Greenland halibut mean number per tow by year in Spanish Spring Surveys in NAFO Div. 3NO: 1997-2019. Indet. means indeterminate.

	1997				1998				1999				2000				2001				2002			
	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
MNPT	11.087	16.467	1.445	28.999	14.270	19.987	0.239	34.496	14.821	21.726	0.251	36.799	6.364	11.103	0.286	17.753	9.894	14.977	1.036	25.907	3.262	4.718	0.111	8.092
	2003				2004				2005				2006				2007				2008			
	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
MNPT	5.077	8.101	0.111	13.288	6.738	8.459	0.087	15.284	3.381	5.359	0.012	8.752	3.683	4.765	0.007	8.455	2.895	4.803	0.048	7.746	3.698	7.075	0.051	10.825
	2009				2010				2011				2012				2013				2014			
	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
MNPT	8.980	14.667	0.128	23.775	6.657	13.979	0.010	20.646	3.849	6.847	0.107	10.802	3.453	6.618	0.010	10.081	2.234	4.463	0.049	6.746	2.614	4.853	0.004	7.472
	2015				2016				2017				2018				2019							
	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
MNPT	2.785	6.951	0.046	9.782	2.632	6.586	0.040	9.259	6.436	14.333	0.852	21.621	4.891	7.869	0.231	12.991	10.136	11.572	0.230	21.939				

Table 8. Greenland halibut mean number per tow by length class and year. Spanish Spring Survey in NAFO 3NO: 2015-2019. Indet. means indeterminate.

Length (cm)	2015				2016				2017				2018				2019			
	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
6	0.000	0.000	0.016	0.016	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8	0.021	0.000	0.010	0.031	0.000	0.000	0.000	0.000	0.000	0.000	0.033	0.033	0.008	0.000	0.007	0.015	0.020	0.007	0.006	0.034
10	0.242	0.104	0.013	0.359	0.281	0.227	0.026	0.534	0.240	0.217	0.277	0.734	0.196	0.174	0.089	0.459	0.675	0.335	0.101	1.111
12	0.203	0.225	0.007	0.435	0.225	0.265	0.015	0.504	0.756	0.592	0.514	1.862	0.445	0.646	0.128	1.219	0.873	0.744	0.116	1.733
14	0.054	0.046	0.000	0.100	0.016	0.012	0.000	0.028	0.287	0.226	0.020	0.534	0.305	0.399	0.008	0.712	0.212	0.147	0.007	0.366
16	0.014	0.028	0.000	0.043	0.016	0.004	0.000	0.021	0.146	0.103	0.000	0.249	0.186	0.184	0.000	0.370	0.325	0.211	0.000	0.536
18	0.071	0.068	0.000	0.139	0.014	0.077	0.000	0.091	0.118	0.193	0.007	0.318	0.203	0.260	0.000	0.463	0.465	0.509	0.000	0.973
20	0.117	0.101	0.000	0.219	0.104	0.113	0.000	0.217	0.298	0.323	0.000	0.621	0.313	0.359	0.000	0.672	0.642	0.726	0.000	1.368
22	0.090	0.099	0.000	0.189	0.075	0.106	0.000	0.181	0.252	0.339	0.000	0.592	0.152	0.381	0.000	0.533	0.614	0.583	0.000	1.198
24	0.029	0.039	0.000	0.068	0.034	0.059	0.000	0.092	0.164	0.190	0.000	0.354	0.126	0.184	0.000	0.310	0.646	0.443	0.000	1.089
26	0.022	0.009	0.000	0.031	0.014	0.048	0.000	0.063	0.098	0.122	0.000	0.221	0.113	0.134	0.000	0.247	0.725	0.545	0.000	1.270
28	0.036	0.047	0.000	0.083	0.053	0.093	0.000	0.146	0.181	0.204	0.000	0.385	0.140	0.177	0.000	0.317	0.732	0.621	0.000	1.353
30	0.034	0.098	0.000	0.132	0.068	0.101	0.000	0.169	0.305	0.272	0.000	0.578	0.193	0.149	0.000	0.342	0.669	0.707	0.000	1.376
32	0.042	0.076	0.000	0.118	0.078	0.162	0.000	0.240	0.179	0.371	0.000	0.550	0.204	0.172	0.000	0.376	0.608	0.518	0.000	1.126
34	0.048	0.034	0.000	0.082	0.086	0.071	0.000	0.157	0.242	0.288	0.000	0.530	0.146	0.125	0.000	0.271	0.531	0.712	0.000	1.243
36	0.058	0.038	0.000	0.097	0.054	0.100	0.000	0.154	0.190	0.316	0.000	0.506	0.223	0.274	0.000	0.497	0.444	0.558	0.000	1.002
38	0.096	0.050	0.000	0.146	0.204	0.129	0.000	0.334	0.208	0.352	0.000	0.560	0.245	0.272	0.000	0.517	0.397	0.486	0.000	0.883
40	0.133	0.182	0.000	0.315	0.117	0.202	0.000	0.319	0.262	0.500	0.000	0.762	0.194	0.221	0.000	0.415	0.305	0.407	0.000	0.712
42	0.176	0.227	0.000	0.403	0.078	0.210	0.000	0.288	0.376	0.654	0.000	1.029	0.215	0.241	0.000	0.455	0.185	0.394	0.000	0.579
44	0.132	0.446	0.000	0.577	0.194	0.334	0.000	0.528	0.324	0.934	0.000	1.258	0.254	0.362	0.000	0.616	0.192	0.268	0.000	0.460
46	0.130	0.613	0.000	0.743	0.170	0.398	0.000	0.568	0.329	1.107	0.000	1.437	0.198	0.398	0.000	0.597	0.210	0.323	0.000	0.533
48	0.274	0.825	0.000	1.099	0.118	0.528	0.000	0.646	0.340	0.952	0.000	1.291	0.201	0.390	0.000	0.590	0.160	0.224	0.000	0.384
50	0.292	0.756	0.000	1.048	0.211	0.535	0.000	0.747	0.327	1.021	0.000	1.348	0.191	0.337	0.000	0.528	0.114	0.373	0.000	0.486
52	0.187	0.766	0.000	0.954	0.125	0.750	0.000	0.876	0.322	1.068	0.000	1.389	0.142	0.314	0.000	0.455	0.070	0.232	0.000	0.302
54	0.146	0.578	0.000	0.724	0.185	0.680	0.000	0.865	0.233	1.003	0.000	1.236	0.133	0.334	0.000	0.467	0.145	0.220	0.000	0.365
56	0.123	0.538	0.000	0.661	0.046	0.465	0.000	0.511	0.118	1.053	0.000	1.171	0.115	0.377	0.000	0.492	0.097	0.353	0.000	0.450
58	0.014	0.310	0.000	0.323	0.056	0.237	0.000	0.293	0.077	0.742	0.000	0.819	0.008	0.350	0.000	0.358	0.054	0.248	0.000	0.302
60	0.000	0.194	0.000	0.194	0.000	0.204	0.000	0.204	0.021	0.325	0.000	0.347	0.031	0.261	0.000	0.292	0.019	0.209	0.000	0.228
62	0.000	0.138	0.000	0.138	0.000	0.137	0.000	0.137	0.011	0.246	0.000	0.257	0.005	0.152	0.000	0.157	0.008	0.133	0.000	0.141
64	0.000	0.086	0.000	0.086	0.008	0.055	0.000	0.064	0.032	0.190	0.000	0.221	0.008	0.073	0.000	0.081	0.000	0.147	0.000	0.147
66	0.000	0.042	0.000	0.042	0.000	0.094	0.000	0.094	0.000	0.108	0.000	0.108	0.000	0.059	0.000	0.059	0.000	0.061	0.000	0.061
68	0.000	0.029	0.000	0.029	0.000	0.034	0.000	0.034	0.000	0.123	0.000	0.123	0.000	0.026	0.000	0.026	0.000	0.054	0.000	0.054
70	0.000	0.047	0.000	0.047	0.000	0.021	0.000	0.021	0.000	0.081	0.000	0.081	0.000	0.023	0.000	0.023	0.000	0.026	0.000	0.026
72	0.000	0.041	0.000	0.041	0.000	0.029	0.000	0.029	0.000	0.024	0.000	0.024	0.000	0.005	0.000	0.005	0.000	0.015	0.000	0.015
74	0.000	0.007	0.000	0.007	0.000	0.016	0.000	0.016	0.000	0.015	0.000	0.015	0.000	0.013	0.000	0.013	0.000	0.000	0.000	0.000
76	0.000	0.015	0.000	0.015	0.000	0.030	0.000	0.030	0.000	0.026	0.000	0.026	0.000	0.009	0.000	0.009	0.000	0.023	0.000	0.023
78	0.000	0.014	0.000	0.014	0.000	0.019	0.000	0.019	0.000	0.022	0.000	0.022	0.000	0.013	0.000	0.013	0.000	0.005	0.000	0.005
80	0.000	0.007	0.000	0.007	0.000	0.006	0.000	0.006	0.000	0.024	0.000	0.024	0.000	0.005	0.000	0.005	0.000	0.000	0.000	0.000
82	0.000	0.006	0.000	0.006	0.000	0.014	0.000	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
84	0.000	0.011	0.000	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
86	0.000	0.008	0.000	0.008	0.000	0.006	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.006
88	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.005	0.000	0.000	0.000	0.000
90	0.000	0.000	0.000	0.000	0.000	0.008	0.000	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
92	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
94	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.012	0.000	0.012	0.000	0.000	0.000	0.000
96	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
98	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
102	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
104	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	2.785	6.951	0.046	9.782	2.632	6.586	0.040	9.259	6.436	14.333	0.852	21.621	4.891	7.869	0.231	12.991	10.136	11.572	0.230	21.939
N° samples:				73				80				96				90				90
N° Ind.:	444	1119	8	1571	447	1074	6	1527	1039	2316	102	3457	830	1307	27	2164	1654	1926	49	3629
Sampled catch:				1421				1273				2499				1211				1311
Range:				7-87				10-95				7-81				9-95				8-86
Total catch:				1426				1278				2669				1215				1415
Total hauls:				122				115				113				114				115

Table 9. Greenland halibut mean number per tow by age, sex and year. Spanish Spring Survey in NAFO 3NO: 2015-2019. Indet. means indeterminate.

Age	2015				2016				2017				2018				2019				
	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	
0																					
1	0.53	0.36	0.05	0.93	0.54	0.50	0.04	1.08	1.45	1.08	0.85	3.37	1.00	1.12	0.23	2.35	1.81	1.29	0.23	3.34	
2	0.28	0.33		0.62	0.19	0.35		0.54	0.66	1.00	0.01	1.66	0.78	1.22	0.00	2.00	2.27	1.93	0.00	4.20	
3	0.10	0.11		0.20	0.15	0.19		0.34	0.40	0.48		0.88	0.43	0.54		0.97	1.78	2.32		4.10	
4	0.04	0.18		0.21	0.19	0.26		0.45	0.55	0.55		1.10	0.36	0.44		0.80	1.89	0.89		2.77	
5	0.26	0.21		0.47	0.22	0.29		0.51	0.63	1.75		2.38	0.84	0.80		1.64	0.95	1.67		2.62	
6	0.55	1.26		1.81	0.54	1.32		1.86	1.21	3.17		4.38	0.67	1.21		1.88	0.75	1.24		1.98	
7	0.86	2.52		3.38	0.48	2.07		2.55	1.10	3.52		4.62	0.64	0.97		1.61	0.46	0.79		1.25	
8	0.14	0.80		0.94	0.28	0.62		0.90	0.28	1.39		1.68	0.09	0.85		0.94	0.17	0.47		0.64	
9	0.03	0.40		0.44	0.03	0.19		0.22	0.14	0.37		0.51	0.06	0.23		0.29	0.03	0.21		0.24	
10		0.35		0.35		0.01	0.27		0.28	0.03	0.35		0.38	0.02	0.20		0.22	0.03	0.49		0.52
11		0.19		0.19		0.01	0.11		0.12		0.23		0.23		0.14		0.14		0.14		0.14
12		0.10		0.10			0.17		0.17		0.22		0.22		0.04		0.04		0.08		0.08
13		0.03		0.03			0.08		0.08		0.11		0.11		0.04		0.04		0.02		0.02
14		0.04		0.04			0.05		0.05		0.05		0.05						0.01		0.01
15		0.02		0.02			0.03		0.03		0.01		0.01		0.02		0.02		0.01		0.01
16		0.03		0.03			0.03		0.03		0.02		0.02		0.01		0.01		0.00		0.00
17		0.02		0.02			0.01		0.01		0.01		0.01						0.01		0.01
18							0.00		0.00					0.02		0.02		0.01		0.01	
19																					
20							0.01		0.01												
Total	2.79	6.95	0.05	9.78	2.63	6.59	0.04	9.26	6.44	14.33	0.85	21.62	4.89	7.86	0.23	12.99	10.14	11.57	0.23	21.94	

Table 10. Greenland halibut mean length (cm) per tow by age, sex and year. Spanish Spring Survey in NAFO 3NO: 2015-2019. Indet. means indeterminate.

Age	2015				2016				2017				2018				2019				
	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	
0																					
1	12.19	12.69	9.44	12.25	12.16	12.19	11.35	12.14	13.75	13.19	12.27	13.20	13.37	13.32	12.15	13.23	12.64	12.91	12.00	12.70	
2	21.15	20.87		21.00	21.74	21.74		21.74	21.32	21.38	19.50	21.35	20.35	20.41	14.50	20.38	21.30	21.16	14.50	21.23	
3	26.32	28.59		27.52	28.30	29.44		28.95	26.57	28.10		27.41	26.79	25.76		26.22	27.65	28.14		27.93	
4	31.07	32.71		32.43	33.85	32.95		33.32	31.60	32.53		32.07	32.21	32.48		32.36	32.39	33.39		32.71	
5	37.83	40.01		38.81	38.83	38.08		38.41	37.70	39.66		39.14	38.69	39.63		39.15	38.33	37.68		37.92	
6	44.08	45.61		45.14	44.27	45.58		45.19	44.30	46.01		45.54	45.39	45.60		45.52	43.29	44.87		44.27	
7	51.25	51.21		51.22	49.95	52.50		52.02	50.10	53.15		52.42	51.12	52.81		52.14	51.25	51.13		51.18	
8	55.92	55.02		55.15	55.47	55.49		55.49	55.94	56.78		56.64	54.66	55.86		55.75	55.96	56.77		56.55	
9	57.50	57.28		57.30	58.14	58.86		58.76	58.52	59.76		59.43	58.57	60.67		60.25	58.79	58.43		58.48	
10		60.46		60.46	58.50	59.16		59.15	61.20	62.40		62.30	63.12	62.42		62.49	60.15	61.35		61.28	
11		63.70		63.70	65.50	63.35		63.50		65.34		65.34		64.63		64.63		65.67		65.67	
12		66.82		66.82		64.56		64.56		66.39		66.39		66.81		66.81		68.40		68.40	
13		72.71		72.71		69.42		69.42		71.72		71.72		70.70		70.70		74.19		74.19	
14		72.45		72.45		70.39		70.39		74.67		74.67		72.50		72.50		70.50		70.50	
15		75.21		75.21		75.89		75.89		71.50		71.50		77.80		77.80		77.50		77.50	
16		77.99		77.99		78.54		78.54		79.38		79.38		72.79		72.79		79.50		79.50	
17		86.05		86.05		81.02		81.02		77.50		77.50		88.50		88.50		77.50		77.50	
18						95.50		95.50						91.60		91.60		86.50		86.50	
19																					
20							88.73		88.73												
Total	37.34	47.91	9.44	44.72	36.45	46.30	11.35	43.35	34.16	44.51	12.32	40.16	32.20	38.13	12.16	35.43	28.33	34.48	12.01	31.40	

Table 11. Greenland halibut mean weight (g) per tow by age, sex and year. Spanish Spring Survey in NAFO 3NO: 2015-2019. Indet. means indeterminate.

Age	2015				2016				2017				2018				2019				
	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	
0																					
1	11	13	5	12	11	11	8	11	18	14	11	15	16	15	11	15	13	13	10	13	
2	64	66		65	69	73		72	68	67	48	67	60	62	19	61	70	65	19	67	
3	128	177		154	163	193		180	135	160		149	141	127		133	155	163		159	
4	213	267		258	284	278		280	229	257		243	246	261		254	252	278		260	
5	410	511		456	440	443		442	402	499		473	442	503		472	426	414		419	
6	661	782		745	679	797		762	670	788		756	729	779		761	624	737		695	
7	1063	1137		1118	988	1256		1206	975	1257		1190	1064	1255		1179	1058	1126		1101	
8	1397	1432		1426	1375	1497		1459	1368	1546		1516	1301	1493		1476	1381	1581		1527	
9	1524	1622		1615	1597	1811		1782	1590	1825		1763	1609	1935		1870	1615	1735		1720	
10		1932		1932	1625	1848		1842	1809	2100		2075	2038	2124		2115	1727	2051		2033	
11		2288		2288	2335	2305		2307		2446		2446		2379		2379		2553		2553	
12		2673		2673		2462		2462		2577		2577		2650		2650		2915		2915	
13		3510		3510		3148		3148		3321		3321		3184		3184		3812		3812	
14		3462		3462		3260		3260		3806		3806		3438				3215		3215	
15		3919		3919		4150		4150		3259		3259		4329		4329		4392		4392	
16		4414		4414		4673		4673		4588		4588		3503		3503		4777		4777	
17		6030		6030		5128		5128		4235		4235		6547				4392		4392	
18						8752		8752						7438		7438		6307		6307	
19																					
20						6900		6900													
Total	602	1124	5	970	569	1108	8	950	473	947	11	769	409	746	11	606	260	535	11	402	

Table 12. American plaice mean catch (kg) and SD by stratum. Spanish Spring Surveys in NAFO Div. 3NO: 2015-2019. n.s. means stratum not surveyed.

Stratum	2015		2016		2017		2018		2019	
	A. Plaice Mean catch	A. Plaice SD	A. Plaice Mean catch	A. Plaice SD	A. Plaice Mean catch	A. Plaice SD	A. Plaice Mean catch	A. Plaice SD	A. Plaice Mean catch	A. Plaice SD
353	73.66	18.18	23.23	24.97	14.96	5.64	49.04	28.87	0.96	0.63
354	78.85	81.90	42.63	32.66	84.16	68.30	6.17	5.88	6.62	7.80
355	3.96	3.35	8.66	3.17	24.68	1.87	1.65	0.57	2.87	3.61
356	1.09	1.54	0.10	0.14	3.14	0.88	1.19	1.32	0.00	0.00
357	0.18	0.25	0.01	0.02	0.69	0.98	0.00	0.00	0.00	0.00
358	50.48	74.16	145.62	53.39	93.22	130.18	5.69	2.22	126.72	198.16
359	222.91	98.41	50.75	47.15	96.70	90.20	100.26	67.33	58.02	28.16
360	262.51	231.68	63.87	81.60	57.13	88.03	110.80	109.78	9.46	12.47
374	301.29	239.68	32.03	15.03	1.06	1.21	86.12	54.42	11.88	1.10
375	56.90	61.60	14.22	10.12	5.92	4.50	28.14	30.59	3.34	1.81
376	51.41	31.11	29.99	20.60	17.76	16.93	33.15	49.97	5.97	7.04
377	207.38	7.64	67.83	48.01	8.91	8.26	108.30	21.64	167.11	208.58
378	67.52	64.74	79.65	77.57	84.05	79.17	47.92	20.67	10.07	9.98
379	0.00	0.00	1.85	0.49	42.03	59.43	0.69	0.97	0.00	0.00
380	0.78	0.69	269.90	204.64	50.50	26.73	254.89	252.10	16.19	1.82
381	506.96	18.72	87.31	77.48	4.39	0.72	62.86	80.13	115.86	51.11
382	368.11	166.21	11.63	7.91	3.38	1.22	27.52	24.32	62.45	79.75
721	0.01	0.02	0.00	0.00	0.16	0.22	0.00	0.00	0.00	0.00
722	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
723	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
724	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
725	0.21	0.30	0.87	1.22	0.54	0.76	0.04	0.06	0.00	0.00
726	0.00	0.00	0.00	0.00	0.65	0.92	0.00	0.00	0.00	0.00
727	0.00	0.00	61.38	60.13	16.75	1.63	2.93	4.14	6.54	9.24
728	0.00	0.00	14.77	18.71	0.00	0.00	1.36	1.26	0.00	0.00
752	0.00	0.00	0.00	0.00	1.72	1.05	0.00	0.00	0.00	0.00
753	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
754	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
755	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
756	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
757	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
758	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
759	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
760	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
761	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00
762	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
763	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
764	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
765	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
766	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
767	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 13. American plaice survey biomass (t) by stratum in NAFO Div. 3NO: 2015-2019. n.s. means stratum not surveyed.

Strata	2015	2016	2017	2018	2019	Strata	2015	2016	2017	2018	2019
353	1481	526	335	1173	20	725	2	8	5	0	0
354	1492	912	1743	133	128	726	0	0	4	0	0
355	22	55	162	10	16	727	0	524	141	25	51
356	4	0	13	5	0	728	0	101	0	9	0
357	3	0	10	0	0	752	0	0	19	0	0
358	977	2912	1730	111	2236	753	0	0	0	0	0
359	7683	1803	3414	3585	1927	754	0	0	0	0	0
360	61846	15147	13224	27037	2022	755	0	0	0	0	0
374	5637	590	19	1638	199	756	0	0	0	0	0
375	1356	321	132	642	71	757	0	0	0	0	0
376	5919	3387	1944	3898	612	758	0	0	0	0	0
377	1784	583	71	932	1273	759	0	0	0	0	0
378	834	984	989	582	108	760	0	0	0	0	0
379	0	17	366	6	0	761	0	0	0	0	0
380	7	2193	410	2175	118	762	0	0	0	0	0
381	6180	1099	55	805	1309	763	0	0	0	0	0
382	11039	343	97	839	1660	764	0	0	0	0	0
721	0	0	1	0	0	765	0	0	0	0	0
722	0	0	0	0	0	766	0	0	0	0	0
723	0	0	0	0	0	767	0	0	0	0	0
724	0	0	0	0	0						

Table 14. American plaice survey biomass (t) with SD and stratified mean catch per tow (kg) and SD by in NAFO Div. 3NO: 1997-2019.

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Biomass	21827	64635	110010	152997	101137	69511	116842	129432	123227	170910	112086	172735
SD	4495	5946	5825	16740	10841	7097	9777	12335	11396	24806	13032	17696
MCPT	25.80	72.25	128.72	175.49	115.95	77.77	127.17	143.93	138.77	202.84	141.82	193.67
SD	5.09	6.51	6.85	19.24	12.31	7.46	10.79	13.03	12.92	29.01	15.31	20.39

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Biomass	93025	112247	151160	137964	155264	85691	106267	31506	24885	43607	11751
SD	10258	18089	29753	27395	29284	14019	13432	5257	5713	6971	2655
MCPT	106.59	134.33	172.05	155.11	176.26	108.50	121.19	35.55	28.88	48.14	14.62
SD	11.31	22.27	34.95	30.53	31.60	17.41	14.89	5.84	6.38	7.92	3.31

Table 15. American plaice length weight relationships in Spanish Spring Surveys in NAFO Div. 3NO: 2015-2019. E(x) means Error of the parameter x.

	Males						Females						Indet.					
	a	b	E(a)	E(b)	R2	N	a	b	E(a)	E(b)	R2	N	a	b	E(a)	E(b)	R2	N
2015	0.00585	3.09893	0.0495	0.0157	0.999	742	0.0036	3.2490	0.0439	0.0126	0.999	1105	0.0043	3.2033	0.062	0.018	0.998	1861
2016	0.00492	3.13599	0.0965	0.0304	0.997	551	0.0037	3.2299	0.0572	0.0162	0.999	810	0.0033	3.2565	0.0616	0.0178	0.998	1365
2017	0.00432	3.17842	0.1382	0.0427	0.997	361	0.0033	3.2539	0.073	0.0207	0.999	546	0.0034	3.2508	0.0644	0.0186	0.999	912
2018	0.00412	3.20039	0.1095	0.0336	0.999	419	0.0034	3.2589	0.0680	0.0194	0.9991	640	0.0037	3.2419	0.0618	0.0177	0.999	1059
2019	0.00480	3.14580	0.1219	0.0373	0.996	400	0.0041	3.2017	0.0900	0.0259	0.9969	681	0.0047	3.1627	0.0860	0.0251	0.997	1084

Table 16. American plaice mean number per tow by year in Spanish Spring Surveys in NAFO Div. 3NO: 1997-2019. Indet. means indeterminate.

	1997				1998				1999				2000				2001				2002			
	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
MNPT	40.511	38.798	0.023	79.332	56.883	108.124	0.000	165.008	122.141	183.012	10.273	315.426	222.117	359.467	0.348	581.933	252.254	261.936	5.053	519.242	149.083	175.044	0.319	324.447
	2003				2004				2005				2006				2007				2008			
	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
MNPT	245.522	236.752	0.407	482.682	206.765	241.817	64.714	513.296	279.087	280.604	2.603	562.294	443.600	423.144	0.191	866.936	249.539	242.885	3.602	496.025	351.426	361.373	12.541	725.340
	2009				2010				2011				2012				2013				2014			
	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
MNPT	134.548	186.163	4.328	325.039	281.719	234.732	0.195	516.645	385.477	286.713	0.010	672.200	350.620	246.778	0.684	598.083	376.247	261.170	3.239	640.655	172.242	155.876	0.596	328.714
	2015				2016				2017				2018				2019							
	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
MNPT	241.001	182.255	0.633	423.888	64.051	56.961	0.156	121.168	52.599	38.981	0.051	91.631	75.548	70.562	0.017	146.127	10.650	26.921	0.060	37.631				



Table 17. American plaice mean number per tow by length class and year. Spanish Spring Survey in NAFO 3NO: 2015-2019. Indet. means indeterminate.

Length (cm.)	2015				2016				2017				2018				2019			
	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4	0.000	0.000	0.026	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6	0.000	0.005	0.178	0.183	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8	0.303	0.182	0.322	0.807	0.000	0.016	0.008	0.024	0.000	0.000	0.051	0.051	0.000	0.000	0.017	0.017	0.016	0.008	0.031	0.055
10	1.632	1.327	0.107	3.066	0.201	0.154	0.061	0.416	0.048	0.101	0.000	0.149	0.008	0.044	0.000	0.052	0.000	0.013	0.016	0.029
12	7.178	5.396	0.000	12.574	0.441	0.504	0.071	1.017	0.080	0.161	0.000	0.241	0.000	0.023	0.000	0.023	0.013	0.021	0.000	0.034
14	5.752	4.795	0.000	10.547	1.185	1.080	0.016	2.280	0.323	0.295	0.000	0.618	0.133	0.261	0.000	0.395	0.033	0.079	0.000	0.112
16	9.844	9.659	0.000	19.503	1.983	2.957	0.000	4.940	0.654	0.610	0.000	1.264	0.313	0.397	0.000	0.710	0.183	0.176	0.000	0.358
18	11.529	12.282	0.000	23.810	2.286	2.716	0.000	5.003	0.966	1.258	0.000	2.225	0.844	0.609	0.000	1.452	0.151	0.127	0.000	0.278
20	5.084	5.797	0.000	10.881	3.162	3.999	0.000	7.161	1.784	2.096	0.000	3.880	1.489	1.738	0.000	3.228	0.162	0.314	0.000	0.476
22	2.107	1.564	0.000	3.670	2.755	3.430	0.000	6.185	2.707	2.337	0.000	5.044	3.254	3.059	0.000	6.312	0.343	0.907	0.000	1.250
24	2.802	1.954	0.000	4.756	1.995	1.518	0.000	3.513	3.466	3.185	0.000	6.652	4.757	4.129	0.000	8.886	0.220	1.433	0.000	1.653
26	14.845	4.340	0.000	19.185	2.844	1.439	0.000	4.283	2.923	2.488	0.000	5.411	5.963	5.896	0.000	11.859	0.877	1.859	0.000	2.736
28	46.555	6.934	0.000	53.489	6.996	1.551	0.000	8.547	4.276	2.444	0.000	6.721	6.085	7.285	0.000	13.371	0.987	1.801	0.000	2.788
30	56.759	14.921	0.000	71.680	14.755	2.456	0.000	17.211	10.391	1.571	0.000	11.962	15.847	7.507	0.000	23.354	1.295	2.632	0.000	3.927
32	44.302	22.259	0.000	66.561	13.875	4.106	0.000	17.982	12.488	1.610	0.000	14.098	17.568	5.390	0.000	22.958	2.199	2.772	0.000	4.971
34	22.175	20.642	0.000	42.817	7.580	4.986	0.000	12.565	8.860	2.430	0.000	11.290	12.723	4.565	0.000	17.288	2.058	2.670	0.000	4.728
36	8.837	19.273	0.000	28.109	2.945	7.238	0.000	10.183	2.745	3.283	0.000	6.028	5.000	5.178	0.000	10.178	1.494	1.727	0.000	3.221
38	1.064	18.609	0.000	19.673	0.813	6.827	0.000	7.640	0.710	3.639	0.000	4.350	1.224	6.881	0.000	8.105	0.517	1.811	0.000	2.328
40	0.188	12.337	0.000	12.525	0.228	5.013	0.000	5.241	0.095	3.955	0.000	4.050	0.270	7.360	0.000	7.630	0.040	2.584	0.000	2.624
42	0.021	10.183	0.000	10.204	0.000	3.262	0.000	3.262	0.054	2.679	0.000	2.732	0.030	4.633	0.000	4.663	0.039	2.570	0.000	2.609
44	0.011	3.169	0.000	3.179	0.007	1.376	0.000	1.383	0.028	1.501	0.000	1.529	0.021	2.849	0.000	2.870	0.008	1.924	0.000	1.933
46	0.016	2.416	0.000	2.432	0.000	0.639	0.000	0.639	0.000	1.354	0.000	1.354	0.000	1.137	0.000	1.137	0.000	0.706	0.000	0.706
48	0.000	1.547	0.000	1.547	0.000	0.483	0.000	0.483	0.000	0.710	0.000	0.710	0.000	0.573	0.000	0.573	0.016	0.383	0.000	0.398
50	0.000	0.793	0.000	0.793	0.000	0.303	0.000	0.303	0.000	0.459	0.000	0.459	0.000	0.463	0.000	0.463	0.000	0.125	0.000	0.125
52	0.000	0.455	0.000	0.455	0.000	0.269	0.000	0.269	0.000	0.251	0.000	0.251	0.000	0.158	0.000	0.158	0.000	0.095	0.013	0.108
54	0.000	0.417	0.000	0.417	0.000	0.102	0.000	0.102	0.000	0.152	0.000	0.152	0.000	0.081	0.000	0.081	0.000	0.076	0.000	0.076
56	0.000	0.260	0.000	0.260	0.000	0.167	0.000	0.167	0.000	0.094	0.000	0.094	0.000	0.054	0.000	0.054	0.000	0.000	0.000	0.000
58	0.000	0.216	0.000	0.216	0.000	0.195	0.000	0.195	0.000	0.100	0.000	0.100	0.000	0.103	0.000	0.103	0.000	0.061	0.000	0.061
60	0.000	0.104	0.000	0.104	0.000	0.065	0.000	0.065	0.000	0.028	0.000	0.028	0.021	0.101	0.000	0.122	0.000	0.000	0.000	0.000
62	0.000	0.118	0.000	0.118	0.000	0.042	0.000	0.042	0.000	0.163	0.000	0.163	0.000	0.043	0.000	0.043	0.000	0.032	0.000	0.032
64	0.000	0.245	0.000	0.245	0.000	0.041	0.000	0.041	0.000	0.020	0.000	0.020	0.000	0.043	0.000	0.043	0.000	0.016	0.000	0.016
66	0.000	0.013	0.000	0.013	0.000	0.016	0.000	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
68	0.000	0.032	0.000	0.032	0.000	0.009	0.000	0.009	0.000	0.008	0.000	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
70	0.000	0.013	0.000	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
72	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
74	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
76	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	241.001	182.255	0.633	423.888	64.051	56.961	0.156	121.168	52.599	38.981	0.051	91.631	75.548	70.562	0.017	146.127	10.650	26.921	0.060	37.631
N° samples:				68				67				68				65				59
N° Ind.:	6727	6444	17	13188	2986	3583	16	6585	2265	2781	5	5051	2883	3841	2	6726	836	2515	4	3355
Sampled catch:				4013				1970				1518				2120				1211
Range:				4-70				8-68				8-69				8-64				8-64
Total catch:				11756				3552				2680				4163				1885
Total hauls:				122				115				113				114				115

Table 18.- American plaice mean number per tow by age, sex and year. Spanish Spring Survey in NAFO 3NO: 2015-2019. Indet. means indeterminate. In 2016, the ALK is not sexed. 2017-2019 ALKs are not available yet. 2016 ALK was used to get the 2017-2018 numbers at age. No 2019 numbers at age are available.

Age	2015				2016				2017				2018				2019			
	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
1	0.04	0.19	0.20	0.43																
2	4.35	1.67	0.43	6.45		0.01	0.00	0.01			0.03	0.03			0.01	0.01				
3	30.99	29.61		60.61	2.17	2.40	0.13	4.70	0.93	1.12	0.03	2.07	0.77	0.76	0.01	1.54				
4	9.59	10.05		19.64	9.35	10.74	0.02	20.11	6.17	5.97		12.14	7.02	6.96		13.98				
5	12.10	1.76		13.86	3.81	3.32		7.13	3.34	3.03		6.37	4.53	4.46		9.00				
6	65.55	11.54		77.09	8.42	2.59		11.01	6.89	3.15		10.04	10.57	7.92		18.49				
7	103.99	53.47		157.46	22.33	8.06		30.38	18.46	5.35		23.81	27.41	14.77		42.18				
8	12.96	26.04		39.00	12.34	10.14		22.48	11.49	5.18		16.67	17.08	10.87		27.95				
9	1.35	26.39		27.75	4.35	6.54		10.89	4.16	3.95		8.11	6.21	7.51		13.71				
10	0.06	10.93		10.99	0.98	6.36		7.34	0.88	4.52		5.39	1.45	8.10		9.55				
11		6.05		6.05	0.24	3.04		3.28	0.23	2.54		2.77	0.40	4.32		4.72				
12	0.00	2.09		2.10	0.06	1.88		1.94	0.05	1.98		2.02	0.08	2.70		2.78				
13	0.00	0.70		0.71	0.01	0.64		0.65	0.01	0.80		0.81	0.01	0.95		0.96				
14	0.00	0.38		0.38	0.00	0.73		0.73	0.00	0.94		0.94		0.83		0.83				
15	0.00	0.23		0.23		0.09		0.09		0.11		0.11		0.10		0.10				
16		0.10		0.10		0.05		0.05		0.09		0.09		0.04		0.04				
17		0.37		0.37		0.24		0.24		0.17		0.17		0.15		0.15				
18		0.07		0.07		0.01		0.01		0.05		0.05		0.01		0.01				
19		0.16		0.16				0.00												
20		0.07		0.07		0.07		0.07		0.04		0.04	0.02	0.10		0.12				
21		0.24		0.24				0.00												
22		0.06		0.06		0.02		0.02												
23								0.00												
24		0.08		0.08		0.01		0.01		0.01		0.01		0.01		0.01				
Total	241.00	182.25	0.63	423.89	64.05	56.96	0.16	121.17	52.60	38.98	0.05	91.63	75.55	70.56	0.02	146.13				

Table 19. American plaice mean length (cm) per tow by age, sex and year. Spanish Spring Survey in NAFO 3NO: 2015-2019. Indet. means indeterminate. In 2016, the ALK is not sexed. 2017-2019 ALKs are not available yet. 2016 ALK was used to get the 2017-2018 mean length at age. No 2019 mean length at age are available.

Age	2015				2016				2017				2018				2019			
	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
1	9.00	8.95	6.74	7.90																
2	12.54	11.82	9.50	12.15		9.00	9.00	9.00			9.00	9.00			9.00	9.00				
3	17.06	16.95		17.01	17.08	17.32	12.01	17.06	19.27	18.42	9.00	18.69	21.10	20.16	9.00	20.57				
4	20.98	20.65		20.81	20.69	20.08	13.95	20.36	22.33	22.02		22.18	23.54	23.37		23.46				
5	27.57	23.35		27.04	24.10	22.54		23.37	24.60	24.11		24.37	25.22	25.31		25.27				
6	30.21	29.50		30.11	29.86	28.92		29.64	29.58	27.79		29.02	29.47	28.57		29.08				
7	32.02	33.15		32.41	31.75	33.48		32.21	31.92	31.93		31.92	31.89	31.67		31.82				
8	35.07	37.48		36.68	33.57	36.20		34.75	33.91	35.94		34.54	34.01	35.18		34.47				
9	38.51	38.91		38.89	34.21	38.45		36.76	34.34	39.30		36.75	34.47	38.73		36.80				
10	42.80	42.46		42.46	36.34	40.59		40.02	36.38	41.30		40.50	36.56	41.17		40.47				
11		44.80		44.80	37.97	41.75		41.47	38.25	42.64		42.28	37.96	42.43		42.05				
12	45.00	48.56		48.56	40.13	43.99		43.87	40.49	45.24		45.13	40.20	43.84		43.73				
13	45.00	52.66		52.62	41.14	47.00		46.91	42.01	48.08		48.04	41.33	46.46		46.39				
14	45.00	52.90		52.85	45.00	50.66		50.66	45.00	49.37		49.37	45.00	48.69		48.69				
15	45.00	53.00		52.93		51.87		51.87		51.64		51.64		51.45		51.45				
16		57.71		57.71		55.66		55.66		59.02		59.02		56.90		56.90				
17		59.68		59.68		59.93		59.93		60.78		60.78		60.56		60.56				
18		58.28		58.28		63.00		63.00		63.00		63.00		63.00		63.00				
19		56.99		56.99																
20		63.70		63.70		61.98		61.98		62.78		62.78	61.00	61.00		61.00				
21		60.75		60.75																
22		62.21		62.21		67.00		67.00												
23																				
24		65.00		65.00		65.00		65.00		65.00		65.00		65.00		65.00				
Total	28.79	32.17	8.61	30.21	29.56	32.66	12.20	30.99	30.54	33.89	9.00	31.95	31.10	34.04	9.00	32.52				



Table 20. American plaice mean weight (g) per tow by age, sex and year. Spanish Spring Survey in NAFO 3NO: 2015-2019. Indet. means indeterminate. In 2016, the ALK is not sexed. 2017-2019 ALKs are not available yet. 2016 ALK was used to get the 2017-2018 mean weight at age. No 2019 mean weight at age are available.

Age	2015				2016				2017				2018				2019			
	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
1	5.30	4.52	2.02	3.40																
2	15.82	11.94	6.03	14.16	4.45	4.28	4.39		4.28	4.28			4.54	4.54						
3	41.83	39.13		40.51	41.84	42.44	11.37	41.31	59.74	51.65	4.28	54.69	76.39	69.91	4.54	72.79				
4	78.72	72.00		75.28	72.77	64.64	18.16	68.37	89.98	84.38		87.23	106.71	106.15		106.43				
5	172.69	103.63		163.94	113.28	91.26		103.02	118.82	110.18		114.71	130.52	134.00		132.24				
6	229.49	221.61		228.31	212.63	201.56		210.03	210.83	172.07		198.67	213.99	196.25		206.39				
7	274.66	323.91		291.38	256.12	321.38		273.43	265.50	279.18		268.57	272.78	279.50		275.14				
8	364.35	477.90		440.17	305.27	404.99		350.27	320.06	395.04		343.34	333.33	389.46		355.16				
9	480.94	539.40		536.55	323.10	495.36		426.61	332.58	528.38		427.83	347.19	530.83		447.72				
10	673.23	712.17		711.96	392.42	584.46		558.88	403.33	613.96		579.65	421.54	637.73		604.96				
11		850.46		850.46	444.75	640.98		626.38	468.57	681.21		663.68	470.39	702.74		683.03				
12	777.02	1098.66		1098.34	527.28	772.61		765.01	559.67	839.23		832.89	563.27	791.31		784.39				
13	777.02	1431.52		1427.64	568.69	963.60		957.38	627.54	1025.18		1022.44	614.10	966.97		962.27				
14	777.02	1454.81		1451.05	752.87	1206.54		1206.32	775.91	1099.93		1099.45	804.34	1103.19		1102.81				
15	777.02	1456.59		1450.37	1274.47		1274.47		1254.28		1254.28		1302.73		1302.73					
16		1923.01		1923.01	1636.31		1636.31		1983.08		1983.08		1855.95		1855.95					
17		2220.24		2220.24	2038.37		2038.37		2139.38		2139.38		2227.88		2227.88					
18		2021.26		2021.26	2385.42		2385.42		2392.82		2392.82		2517.49		2517.49					
19		1858.05		1858.05																
20		2706.30		2706.30	2277.85		2277.85		2390.58		2390.58		2129.45	2266.25		2242.67				
21		2276.55		2276.55																
22		2465.25		2465.25	2910.14		2910.14													
23																				
24		2826.95		2826.95	2638.78		2638.78		2648.95		2648.95		2787.40		2787.40					
Total	220.90	374.97	4.73	286.82	225.00	371.34	12.16	293.52	245.56	410.14	4.28	315.44	263.19	400.96	4.54	329.68				

Table 21. American plaice total abundance (thousands) by Division, age and year. Spanish Spring Survey in NAFO 3NO: 2002-2019. In 2016, the ALK is not sexed. 2017-2019 ALKs are not available yet. 2016 ALK was used to get the 2017-2018 numbers at age. No 2019 numbers at age are available.

Age	2002			2003			2004			2005			2006			2007			2008			2009			2010					
	3N	3O	3NO	3N	3O	3NO	3N	3O	3NO	3N	3O	3NO	3N	3O	3NO	3N	3O	3NO	3N	3O	3NO	3N	3O	3NO	3N	3O	3NO			
1	37	5	42	261	219	480	12351	6733	19085	664	229	893	80	0	80	2282	864	3146	2505	468	2973	1276	411	1687	106	76	182			
2	7542	1651	9194	3108	338	3446	29729	19203	48933	55489	11783	67272	9473	1684	11157	1249	355	1604	49223	8725	57949	2640	991	3631	30066	6790	36855			
3	16163	5021	21184	27643	4611	32254	9688	2315	12003	92903	20557	113461	114367	13092	127458	7844	354	8199	8374	1299	9673	20334	5721	26055	21326	3841	25167			
4	82095	58738	140831	40566	10422	50977	27876	3635	31511	13483	1432	14915	156754	16194	172949	114982	2758	122241	30263	2505	32768	5096	818	5914	56193	7109	63302			
5	20163	12702	32865	134936	71704	206640	64948	8961	73909	34013	2253	36266	81003	7530	98533	77121	4218	81340	228363	20650	248033	41551	2619	44170	36740	3425	40165			
6	7357	2980	10336	36219	16206	62425	146376	25327	171703	77943	5681	83624	67534	4820	72364	24016	1272	25288	101209	8946	110154	73867	4543	78510	90265	3093	83358			
7	6906	2033	8939	15569	6628	22197	35887	6654	42541	87477	7120	94597	67774	4796	72570	43627	1294	44922	31241	1964	33204	28099	1813	29913	114289	3370	117659			
8	12598	2954	15552	12040	3316	15355	13853	2405	16258	32124	2641	34765	56889	3766	60655	32670	950	33620	61090	3254	64344	16872	930	17802	26158	810	26968			
9	9192	2465	11658	14316	3823	18139	9797	912	10709	17841	1399	19240	43130	2704	45834	39852	1003	40856	34061	1597	35658	14916	662	15578	12696	354	13050			
10	5972	1583	7555	5885	1613	7498	10304	981	11284	9274	756	10029	20215	1282	21497	9908	279	10187	24278	1020	25298	18052	670	18722	9690	157	9847			
11	7999	2195	10134	5435	1576	7010	5001	498	5499	4015	302	4317	9367	631	9998	3562	109	3671	7930	301	8231	16615	536	17150	8231	99	8330			
12	4781	1286	6067	6935	2079	9014	6108	626	6734	3380	267	3646	4581	336	2816	2340	99	2438	4658	167	5025	6257	240	6498	9919	81	10001			
13	1136	351	1487	2519	725	3301	3329	335	3663	2577	203	2779	2485	306	2624	1647	80	7728	1426	1586	42	1467	41	1633	3463	41	3504			
14	640	216	856	1197	297	1495	2903	370	3273	1826	144	1971	1614	133	1747	1609	73	1682	2037	85	2122	1209	53	1262	1148	29	1177			
15	57	17	74	581	148	729	574	98	672	1270	234	1503	1070	107	1177	1383	74	1457	1993	69	2062	1933	73	2006	1139	21	1160			
16	194	37	231	269	147	417	220	27	247	695	133	828	605	70	676	571	41	611	2085	72	2158	1695	75	1771	2123	115	2239			
17	39	1	40	73	27	100	0	0	0	72	4	76	221	27	248	310	9	319	612	33	645	1240	111	1352	1245	37	1283			
18	0	0	0	6	27	33	70	0	70	458	91	549	159	15	174	483	25	508	9	5	13	667	56	724	419	15	433			
19	11	0	11	0	0	0	22	0	22	55	18	73	28	5	32	4	0	4	208	8	216	275	21	296	388	44	432			
20	0	0	0	0	0	0	0	0	0	0	0	0	23	0	23	165	13	178	12	0	12	87	81	168	6	0	6			
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	238	23	261	0	0	0	0	0	0	0		
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	182878	94237	277115	307604	123905	431509	379035	79081	458117	436559	55246	490805	637371	57398	694769	365626	18372	383998	592035	51232	643267	254367	20474	274841	425707	29511	455218			
Age	2011			2012			2013			2014			2015			2016			2017			2018								
	3N	3O	3NO	3N	3O	3NO	3N	3O	3NO	3N	3O	3NO	3N	3O	3NO	3N	3O	3NO	3N	3O	3NO	3N	3O	3NO	3N	3O	3NO			
1	71	0	71	165	56	221	1427	290	1717	1146	113	1259	301	1	302	0	0	0	0	0	0	0	0	0	0	0	0	0		
2	4935	778	5712	423	243	666	1146	243	1389	1921	137	2057	5417	125	5542	7	4	11	22	0	22	0	0	8	8	8	8	8		
3	71792	7640	79432	3271	457	3729	942	88	1030	8829	1325	10154	50980	2614	53593	4017	171	4188	1614	208	1822	1305	157	1462	1305	157	1462	1305	157	1462
4	61641	4178	65819	51835	3320	55155	9728	890	10619	6392	479	6871	15833	1383	17217	16718	1200	17918	8985	1678	10662	12252	1025	13278	12252	1025	13278	12252	1025	13278
5	108255	4756	113010	63521	2254	65775	110832	7933	118764	9021	424																			

Table 22. American plaice total biomass (tons) and abundance (thousands) by Division and year.

		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Biomass	3N	19459	49503	96478	139759	84270	49787	85031	114533	112952	160980	107880	162423	87890	108349	146205	135241	148896	83415	103267	30013	22630	42286	11587
	3O	2368	15132	13532	13238	16867	19724	31811	14900	10275	9930	4207	10312	5135	3898	4954	2723	6368	2276	3000	1494	2255	1322	164
	3NO	21827	64635	110010	152997	101137	69511	116842	129432	123227	170910	112086	172735	93025	112247	151160	137964	155264	85691	106267	31506	24885	43607	11751
Abundance	3N					182878	307604	379035	435559	637371	365626	592035	254367	425707	592428	527797	557749	258008	360664	102612	72559	133240	29730	
	3O					94237	123905	79081	55246	57398	18372	51232	20474	29511	26698	14162	28060	9302	11429	5350	7916	5660	423	
	3NO					277115	431509	458117	490805	694769	383998	643267	274841	455218	619126	541959	585809	267309	372093	107962	80476	138800	30153	



Table 23. Atlantic cod mean catch (kg) and SD by stratum. Spanish Spring Surveys in NAFO Div. 3NO: 2015-2019. n.s. means stratum not surveyed.

Stratum	2015		2016		2017		2018		2019	
	Cod Mean catch	Cod SD	Cod Mean catch	Cod SD	Cod Mean catch	Cod SD	Cod Mean catch	Cod SD	Cod Mean catch	Cod SD
353	70.81	104.76	12.22	9.54	23.86	31.61	7.81	10.64	0.00	0.00
354	180.78	213.46	125.13	96.34	28.55	15.60	1.12	1.95	0.00	0.00
355	21.53	30.44	29.56	39.65	13.90	13.60	0.00	0.00	0.35	0.49
356	5.47	4.32	4.84	3.17	30.60	10.26	1.45	2.05	0.00	0.00
357	5.31	6.04	1.01	1.43	26.98	12.21	31.88	18.55	10.29	3.24
358	1268.78	2109.79	430.29	527.16	1197.25	1491.99	5.88	4.90	19.19	22.03
359	196.07	362.84	14.56	24.02	17.52	17.14	3.11	2.67	3.30	4.49
360	50.46	119.32	111.17	302.23	39.55	136.60	12.80	20.72	2.37	4.57
374	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
375	4.85	3.13	0.15	0.26	0.10	0.10	3.71	6.29	3.81	3.30
376	18.63	39.72	0.15	0.16	0.25	0.51	2.81	3.59	4.38	6.57
377	549.79	14.52	26.82	37.93	0.66	0.94	299.10	146.37	141.12	96.08
378	1286.60	1620.13	178.50	147.64	137.19	106.98	116.98	99.88	6.00	0.16
379	1.56	2.21	28.86	29.20	48.47	64.53	4.25	6.01	0.92	1.30
380	23.10	28.99	201.32	263.77	38.66	24.53	49.43	2.23	8.45	11.80
381	400.87	196.56	341.10	482.39	2.64	3.73	119.06	163.82	107.66	14.51
382	183.58	118.93	0.02	0.02	0.00	0.00	7.01	8.15	16.60	37.12
721	5.09	4.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
722	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
723	0.00	0.00	0.00	0.00	0.00	0.00	2.75	0.08	3.37	4.77
724	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
725	0.00	0.00	3.74	5.29	10.89	15.39	0.00	0.00	0.00	0.00
726	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
727	0.00	0.00	8.83	8.02	1.74	1.51	0.00	0.00	1.57	2.22
728	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
752	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
753	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
754	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
755	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
756	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
757	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
758	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
759	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
760	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
761	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00
762	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
763	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
764	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
765	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
766	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
767	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 24. Atlantic cod survey biomass (t) by stratum in NAFO Div. 3NO: 2015-2019. n.s. means stratum not surveyed.

Strata	2015	2016	2017	2018	2019	Strata	2015	2016	2017	2018	2019
353	1424	277	535	187	0	725	0	34	94	0	0
354	3421	2677	591	24	0	726	0	0	0	0	0
355	121	188	91	0	2	727	0	75	15	0	12
356	20	20	124	6	0	728	0	0	0	0	0
357	75	14	381	443	134	752	0	0	0	0	0
358	24557	8606	22217	115	339	753	0	0	0	0	0
359	6758	517	618	111	110	754	0	0	0	0	0
360	11888	26364	9157	3124	507	755	0	0	0	0	0
374	0	0	0	0	0	756	0	0	0	0	0
375	115	3	2	85	81	757	0	0	0	0	0
376	2145	17	28	331	448	758	0	0	0	0	0
377	4729	231	5	2573	1075	759	0	0	0	0	0
378	15897	2205	1614	1422	64	760	0	0	0	0	0
379	15	267	422	40	7	761	0	0	0	0	0
380	194	1636	314	422	62	762	0	0	0	0	0
381	4887	4295	33	1524	1216	763	0	0	0	0	0
382	5505	1	0	214	441	764	0	0	0	0	0
721	28	0	0	0	0	765	0	0	0	0	0
722	0	0	0	0	0	766	0	0	0	0	0
723	0	0	0	35	42	767	0	0	0	0	0
724	0	0	0	0	0						

Table 25. Atlantic cod survey biomass (t) with SD and stratified mean catch per tow (kg) and SD by in NAFO Div. 3NO: 1997-2019.

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Biomass	2131	19444	3054	7576	32548	10502	5455	3712	4509	19921	10592	23817
SD	1322	18206	655	2566	15903	7971	3016	848	1984	8109	5853	5221
MCPT	2.50	19.47	3.50	8.46	36.96	11.07	5.93	4.09	5.06	23.35	13.47	26.55
SD	1.54	17.82	0.75	2.58	17.97	7.82	3.29	0.95	2.16	9.39	7.44	5.71

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Biomass	72757	76856	137378	87436	37945	143299	81780	47429	36241	10655	4541
SD	40466	37369	54393	30292	5114	54386	28297	19188	17444	2307	802
MCPT	80.73	90.96	155.16	97.02	43.33	180.81	92.64	53.13	42.28	11.80	5.67
SD	46.81	43.41	64.42	32.90	5.90	67.34	32.30	21.51	20.79	2.54	1.01

Table 26. Atlantic cod length weight relationships in Spanish Spring Surveys in NAFO Div. 3NO: 2015-2019. E(x) means Error of the parameter x.

	a	b	E(a)	E(b)	R2	N
2015	0.00514	3.11990	0.0452	0.0116	0.999	2733
2016	0.00419	3.16019	0.0446	0.0112	0.999	1375
2017	0.00379	3.18329	0.0829	0.0209	0.998	942
2018	0.00476	3.14187	0.0453	0.0117	0.999	1110
2019	0.00531	3.11892	0.0205	0.0787	0.997	822

Table 27. Atlantic cod mean number per tow by year in Spanish Spring Surveys in NAFO Div. 3NO: 1997-2019. Indet. means indeterminate.

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
MNPT	1.997	12.378	8.847	9.220	41.290	12.930	4.684	9.035	9.005	40.718	32.605	49.717
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
MNPT	131.444	118.451	139.982	79.685	26.421	82.688	83.149	22.871	36.521	11.026	5.191	

Table 28. Atlantic cod mean number per tow by length class and year. Spanish Spring Survey in NAFO 3NO: 2015-2019.

Length (cm.)	2015	2016	2017	2018	2019
	Total	Total	Total	Total	Total
6	0.039	0.000	0.000	0.000	0.000
8	0.013	0.000	0.000	0.000	0.000
10	0.026	0.000	0.018	0.015	0.032
12	0.091	0.024	0.052	0.056	0.031
14	0.229	0.149	0.150	0.108	0.023
16	0.358	0.445	0.139	0.186	0.073
18	0.179	0.314	0.171	0.095	0.083
20	0.142	0.405	0.167	0.057	0.091
22	0.711	0.806	0.285	0.051	0.136
24	2.836	1.189	1.109	0.164	0.121
26	4.258	1.082	1.886	0.403	0.167
28	3.838	0.721	1.954	0.499	0.149
30	2.722	0.627	1.649	0.479	0.101
32	3.328	0.629	1.440	0.659	0.099
34	5.313	0.629	1.573	0.735	0.167
36	7.129	0.455	2.585	0.917	0.286
38	4.582	0.307	2.454	0.860	0.363
40	4.773	0.439	2.461	0.808	0.342
42	4.396	0.392	2.018	0.780	0.364
44	4.105	0.333	1.688	0.578	0.468
46	3.406	0.319	1.471	0.509	0.271
48	2.181	0.328	1.451	0.411	0.328
50	3.019	0.287	2.111	0.271	0.273
52	2.460	0.375	0.917	0.265	0.266
54	2.697	0.549	0.775	0.193	0.158
56	2.535	0.654	0.801	0.185	0.157
58	2.458	0.644	0.506	0.136	0.064
60	2.265	0.782	0.302	0.185	0.061
62	1.677	0.579	0.719	0.077	0.052
64	1.953	0.675	0.433	0.111	0.056
66	1.390	0.568	0.894	0.089	0.027
68	1.096	0.679	0.604	0.092	0.035
70	1.084	0.533	0.324	0.081	0.027
72	1.099	0.527	0.458	0.089	0.025
74	0.804	0.535	0.263	0.121	0.016
76	0.566	0.398	0.315	0.105	0.021
78	0.502	0.566	0.284	0.075	0.033
80	0.549	0.564	0.166	0.068	0.030
82	0.498	0.774	0.347	0.118	0.029
84	0.408	0.725	0.313	0.107	0.047
86	0.331	0.581	0.255	0.122	0.008
88	0.237	0.560	0.228	0.029	0.016
90	0.114	0.359	0.146	0.000	0.016
92	0.199	0.254	0.112	0.031	0.024
94	0.197	0.390	0.164	0.020	0.000
96	0.125	0.212	0.150	0.031	0.016
98	0.044	0.031	0.025	0.000	0.008
100	0.088	0.155	0.064	0.031	0.016
102	0.026	0.055	0.025	0.000	0.000
104	0.027	0.084	0.042	0.015	0.000
106	0.000	0.040	0.025	0.000	0.000
108	0.031	0.037	0.009	0.000	0.000
110	0.013	0.099	0.000	0.009	0.000
112	0.000	0.007	0.009	0.000	0.000
114	0.000	0.000	0.000	0.000	0.000
116	0.000	0.000	0.000	0.000	0.016
118	0.000	0.000	0.000	0.000	0.000
120	0.000	0.000	0.017	0.000	0.000
122	0.000	0.000	0.000	0.000	0.000
124	0.000	0.000	0.000	0.000	0.000
126	0.000	0.000	0.000	0.000	0.000
128	0.000	0.000	0.000	0.000	0.000
130	0.000	0.000	0.000	0.000	0.000
132	0.000	0.000	0.000	0.000	0.000
Total	83.149	22.871	36.521	11.026	5.191
N° samples:	61	49	47	47	33
N° Ind.:	4728	2255	1709	1747	822
Sampled catch:	7607	3959	0	1553	787
Range:	6-110	13-113	10-121	10-110	11-117
Total catch:	12477	5317	5135	1589	803
Total hauls:	122	115	114	114	115

Table 29. Atlantic cod mean number per tow by age and year. Spanish Spring Survey in NAFO 3NO: 2015-2019.

Age	2015	2016	2017	2018	2019
1	0.96	0.71	0.28		0.19
2	13.89	4.56	5.14	0.46	0.76
3	23.68	2.26	8.41	1.16	0.69
4	14.29	1.53	7.99	3.83	1.71
5	5.04	1.40	5.58	1.50	0.66
6	10.62	0.74	1.93	1.71	0.56
7	4.45	4.48	1.03	0.57	0.20
8	1.26	2.61	1.78	0.46	0.05
9	8.29	0.26	1.81	0.14	0.06
10	0.21	3.82	0.16	0.31	0.07
11	0.36	0.24	2.05	0.38	0.07
12	0.09	0.07	0.07	0.06	0.03
13	0.01	0.12	0.19	0.38	0.09
14		0.06	0.08	0.05	0.04
15			0.01	0.02	
16					
17					
18					
19					
Total	83.15	22.87	36.52	11.03	5.19

Table 30. Atlantic cod mean length (cm) per tow by age and year. Spanish Spring Survey in NAFO 3NO: 2015-2019.

Age	2015	2016	2017	2018	2019
1	15.98	16.60	15.24	16.38	15.45
2	27.61	25.66	26.88	27.28	25.58
3	36.90	33.53	34.71	36.43	35.82
4	44.63	43.35	42.04	42.81	43.76
5	52.27	51.25	49.08	46.08	49.78
6	59.86	60.02	56.20	54.90	54.45
7	61.79	71.50	61.92	60.56	58.73
8	64.69	73.17	69.15	64.10	67.43
9	69.76	76.90	71.81	75.10	70.06
10	88.22	80.81	77.75	78.15	76.14
11	90.55	103.52	80.05	85.39	86.87
12	92.05	99.77	102.97	81.84	82.58
13	103.50	99.10	93.68	84.48	88.90
14		107.52	91.90	105.50	99.40
15			108.50		
16					
17					
18					
19					
Total	45.76	55.89	46.00	43.97	44.54

Table 31. Atlantic cod mean weight (g) per tow by age and year. Spanish Spring Survey in NAFO 3NO: 2015-2019.

Age	2015	2016	2017	2018	2019
1	33	31	24	33	28
2	165	126	142	159	135
3	408	287	320	399	374
4	740	649	576	662	700
5	1220	1095	938	830	1061
6	1914	1847	1462	1434	1385
7	2191	3239	2012	1967	1809
8	2544	3580	2943	2300	2698
9	3142	4132	3284	3880	3044
10	6493	4793	4410	4466	3924
11	6788	9859	4584	5818	6102
12	7061	8751	10051	5100	5060
13	9937	8635	7474	5511	6456
14		11085	6778	10832	9591
15			11439		
16					
17					
18					
19					
Total	1114	2323	1158	1070	1077

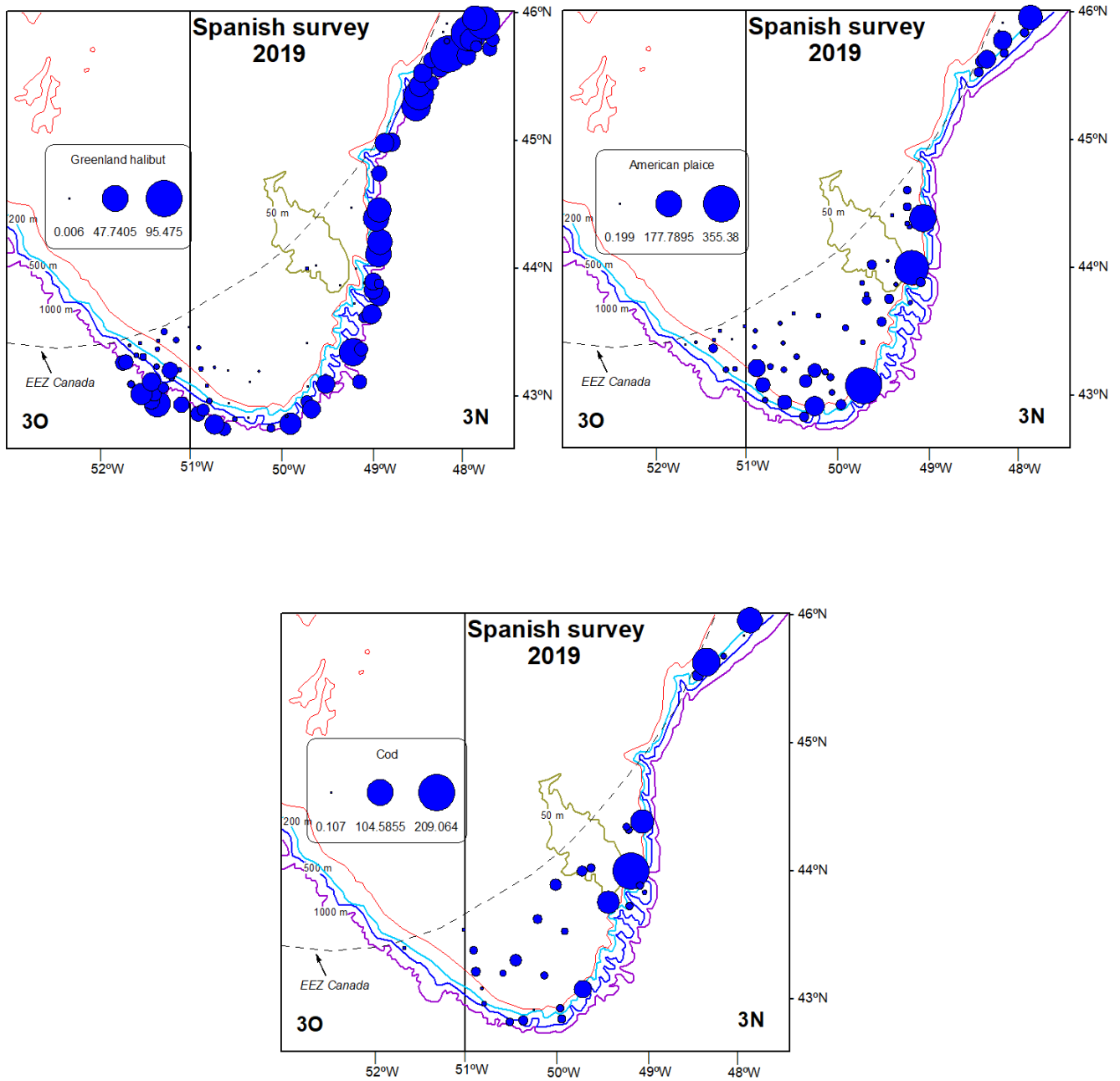


Figure 1. Position of the hauls and the catch of Greenland halibut, American plaice and Atlantic cod during the 2019 Spanish 3NO survey. Note that the scale is different in the three graphs.

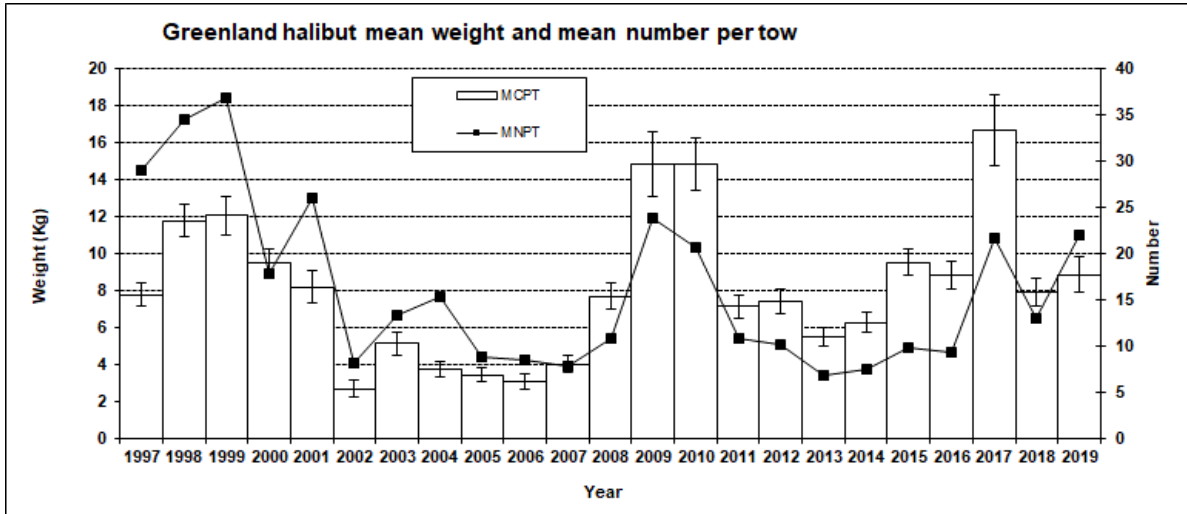


Figure 2. Greenland halibut stratified mean catches in Kg and \pm SD by year and mean number by year. Spanish Spring surveys in NAFO Div. 3NO: 1997-2019.

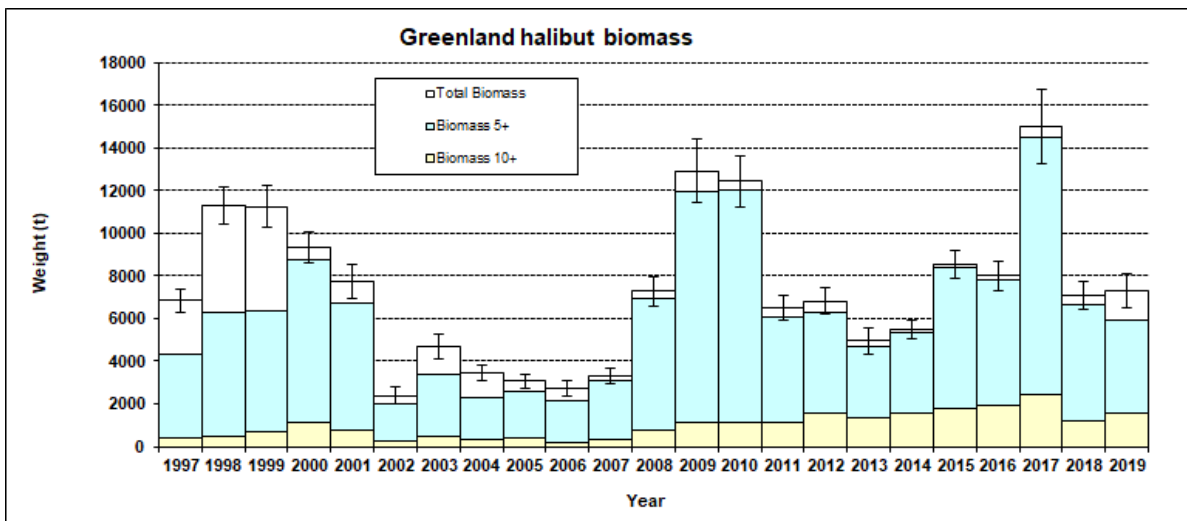


Figure 3. Greenland halibut biomass calculated by the swept area method in tons and \pm SD by year. Spanish Spring surveys in NAFO Div. 3NO: 1997-2019.

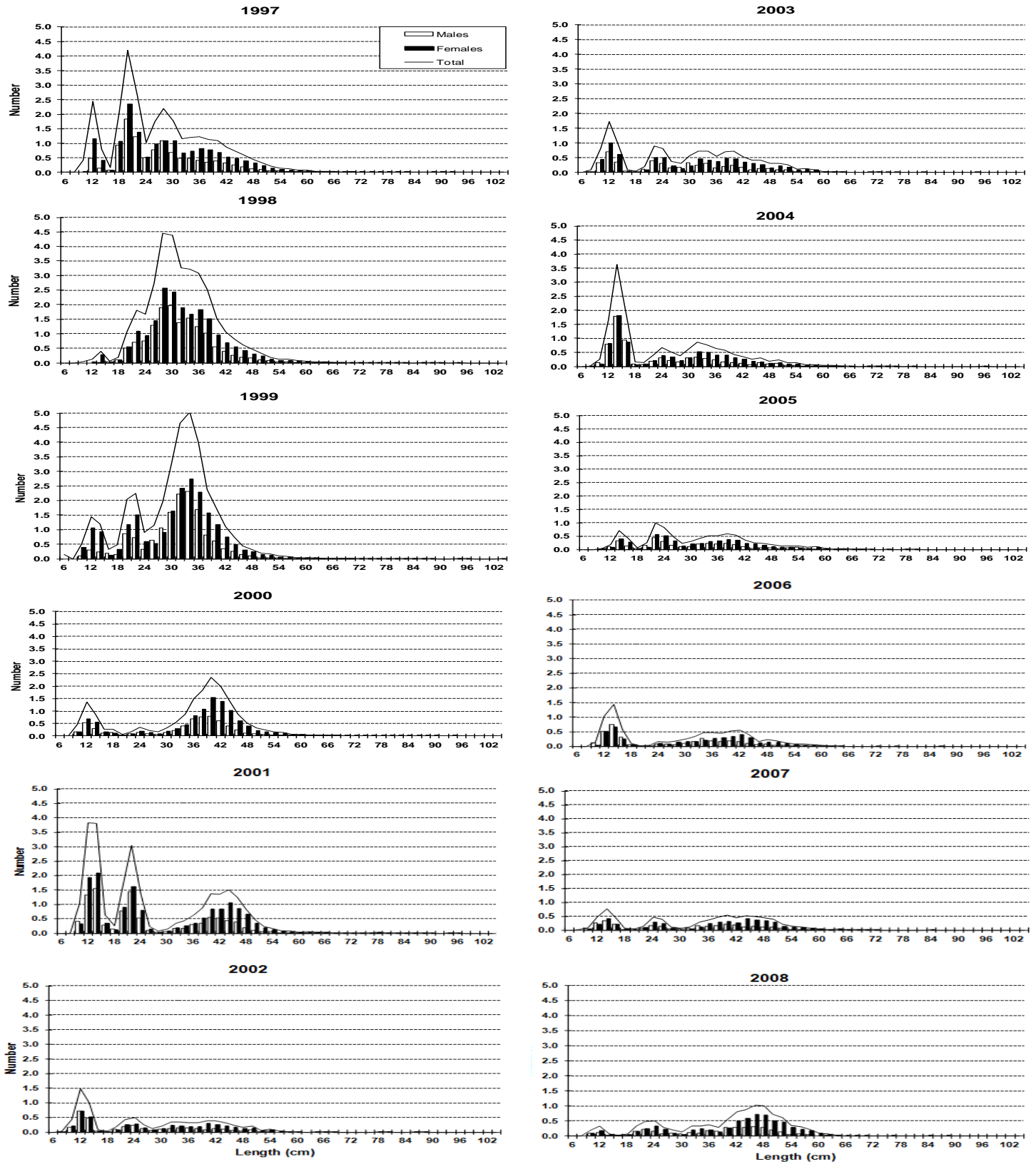


Figure 4. Greenland halibut length distribution (cm) on NAFO 3NO: 1997-2019. Mean numbers per tow. Data from 2015 to 2019 are in Table 8; data for 1997-2014 can be seen in SCR Doc 15/07.

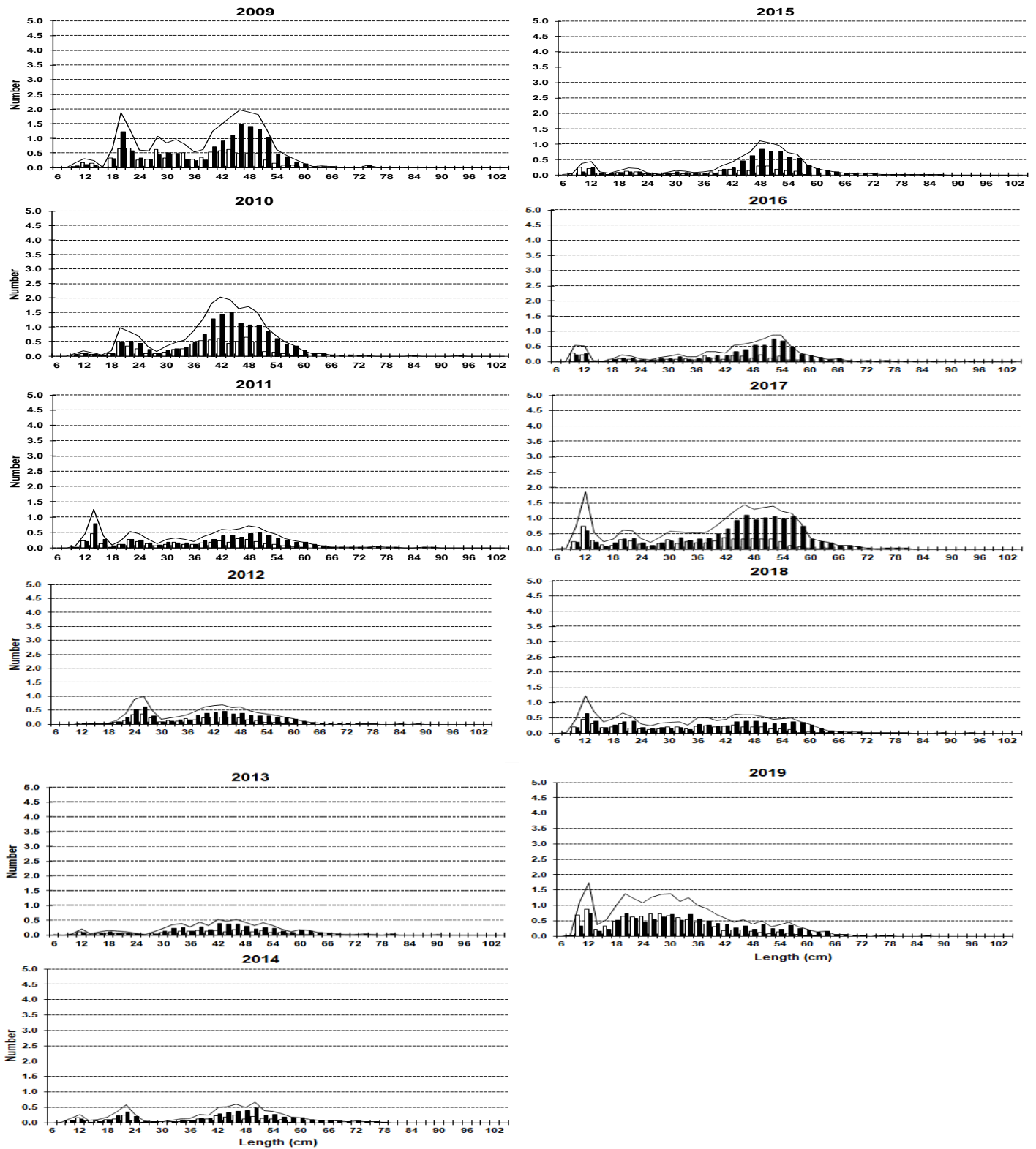


Figure 4 (cont.). Greenland halibut length distribution (cm) on NAFO 3NO: 1997-2019. Mean catches per tow number. Data from 2015 to 2019 are in Table 8; data for 1997-2014 can be seen in SCR Doc 15/07.

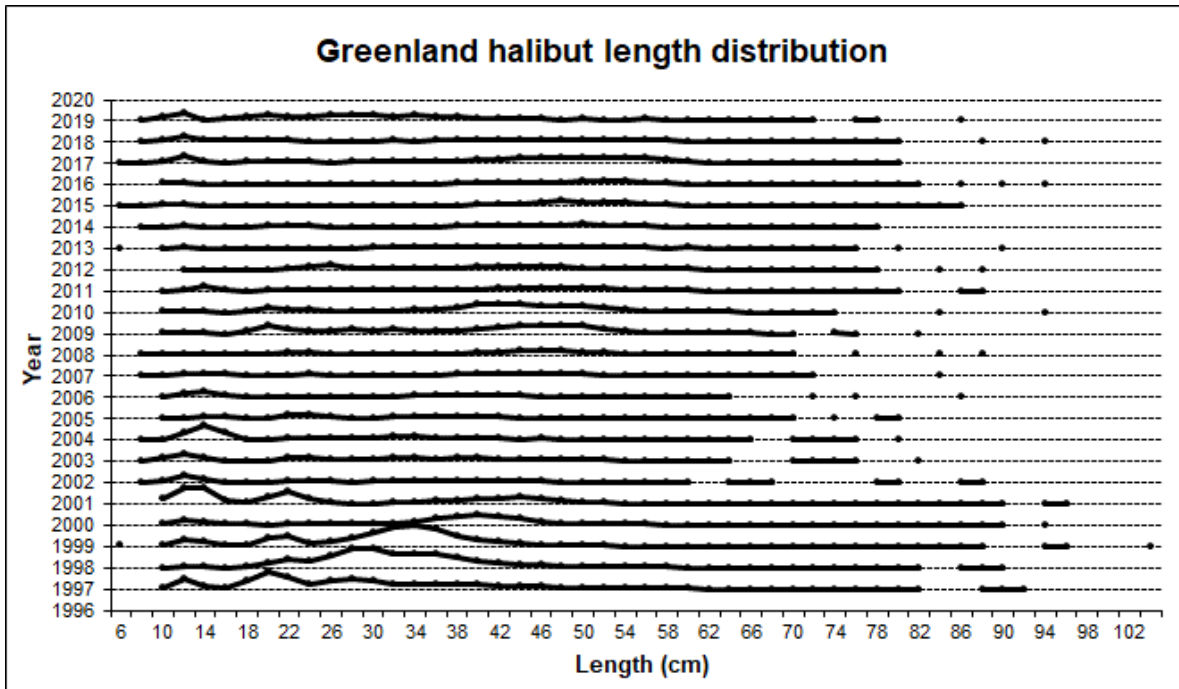


Figure 5. Greenland halibut mean number per tow by length (cm) on NAFO 3NO: 1997-2019. Data from 2015 to 2019 are in Table 8; data for 1997-2014 can be seen in SCR Doc 15/07.

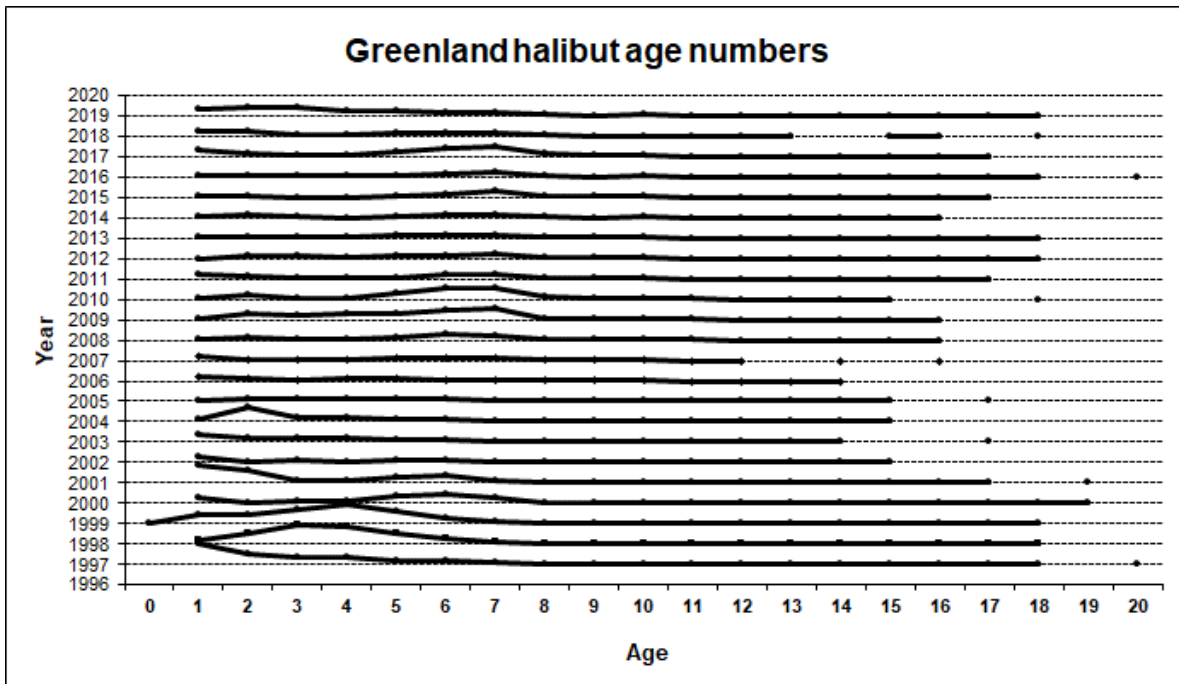


Figure 6. Greenland halibut mean numbers per tow by age on NAFO 3NO: 1997-2019. Data from 2015 to 2019 are in Table 9; data for 1997-2014 can be seen in SCR Doc 15/07.

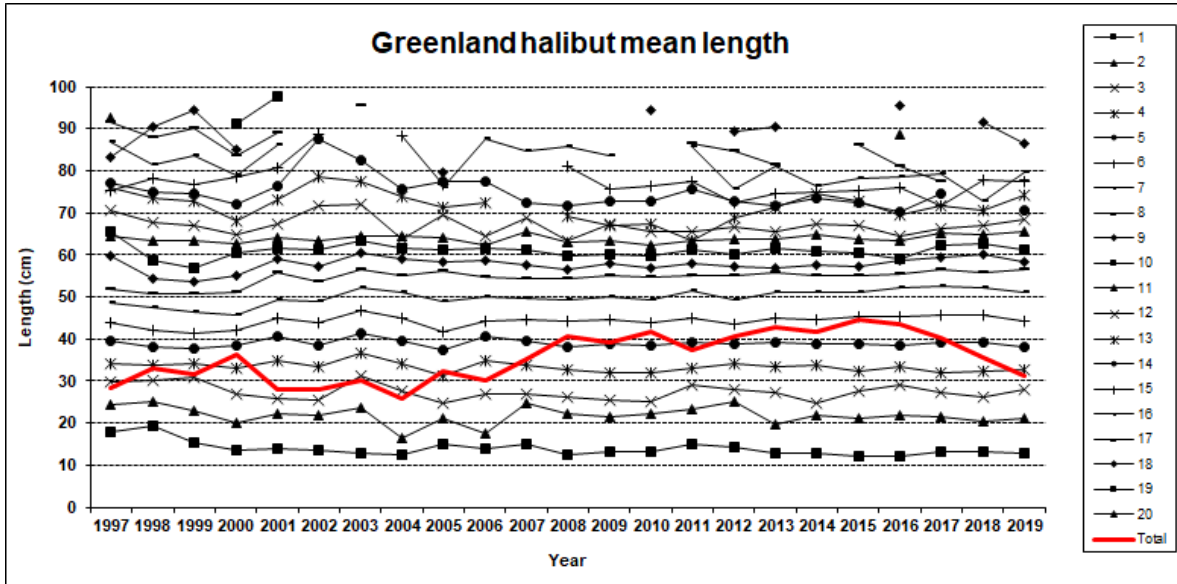


Figure 7. Greenland halibut mean length (cm) at age on NAFO 3NO: 1997-2019. Data from 2015 to 2019 are in Table 10; data for 1997-2014 can be seen in SCR Doc 15/07.

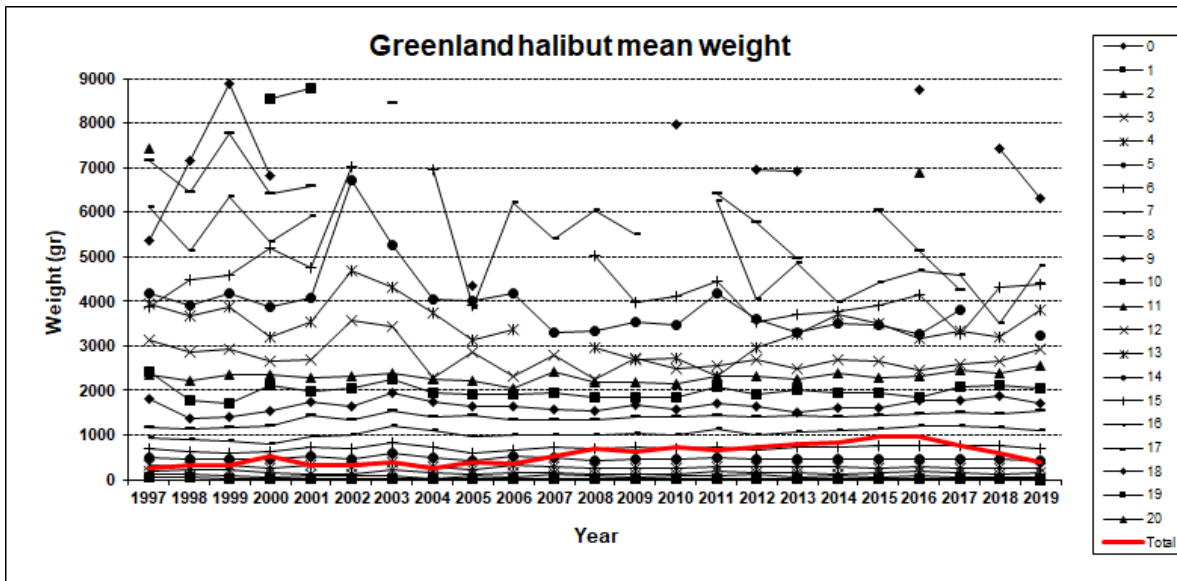


Figure 8. Greenland halibut mean weight (gr) at age on NAFO 3NO: 1997-2019. Data from 2015 to 2019 are in Table 11; data for 1997-2014 can be seen in SCR Doc 15/07.

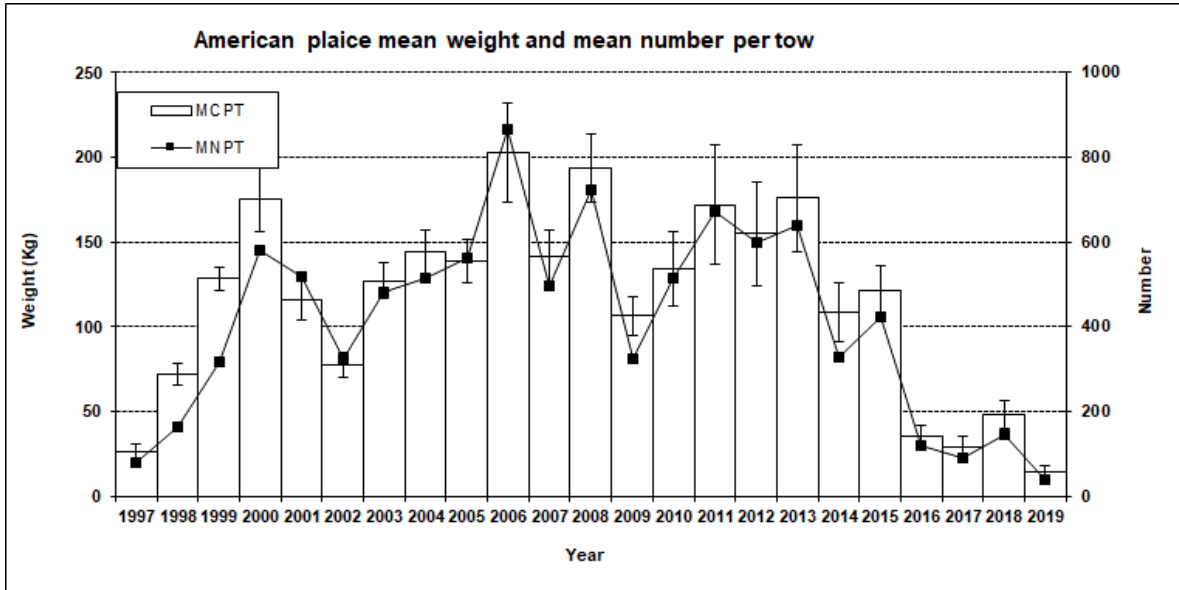


Figure 9. American plaice stratified mean catches in Kg and \pm SD by year and mean number by year. Spanish Spring surveys in NAFO Div. 3NO: 1997-2019.

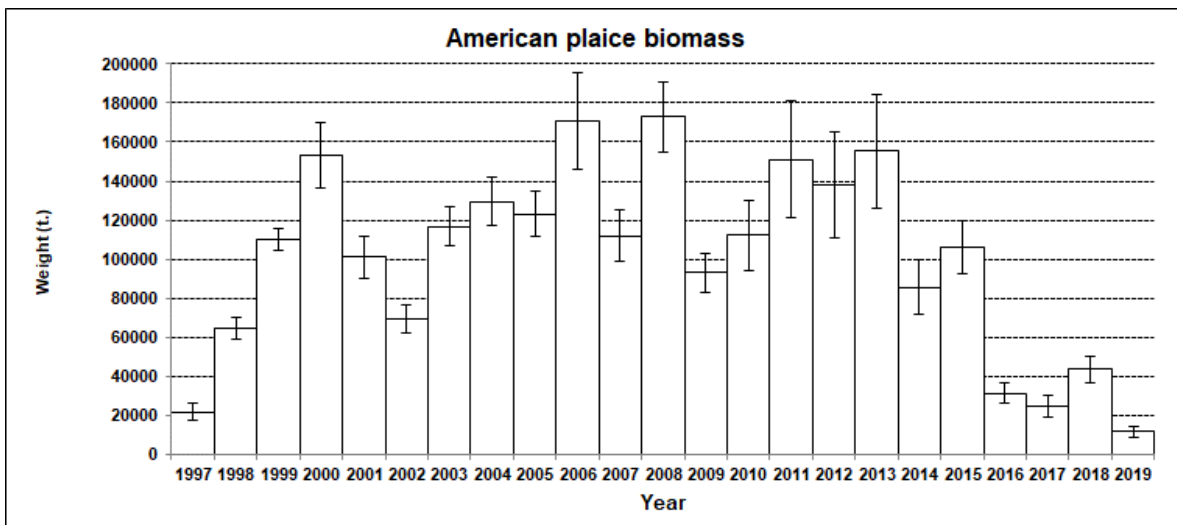


Figure 10. American plaice biomass calculated by the swept method in tons and \pm SD by year. Spanish Spring surveys in NAFO Div. 3NO: 1997-2019.

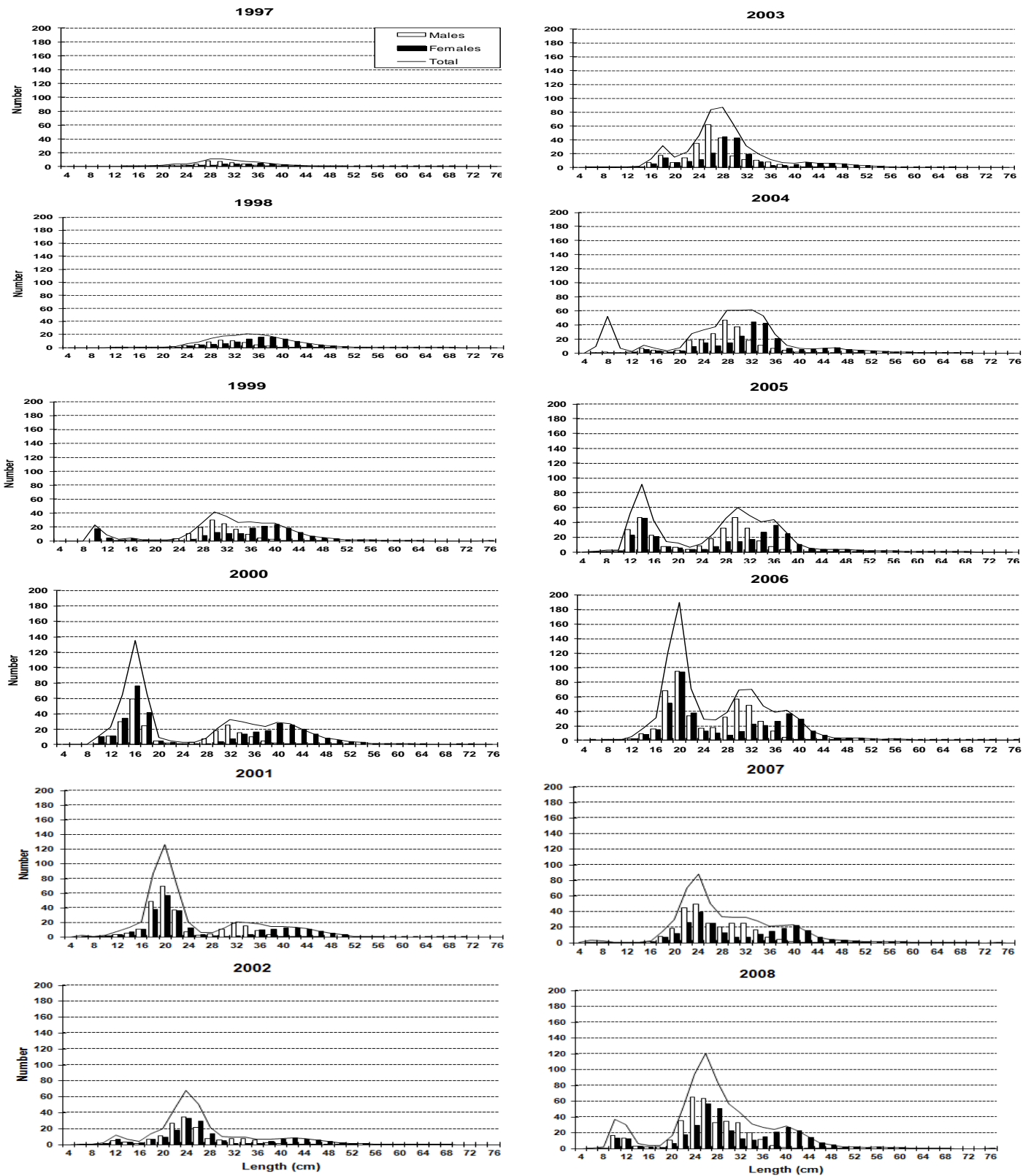


Figure 11. American plaice length distribution (cm) on NAFO 3NO: 1997-2019. Mean numbers per tow. Data from 2015 to 2019 are in Table 17; data for 1997-2014 can be seen in SCR Doc 15/07.

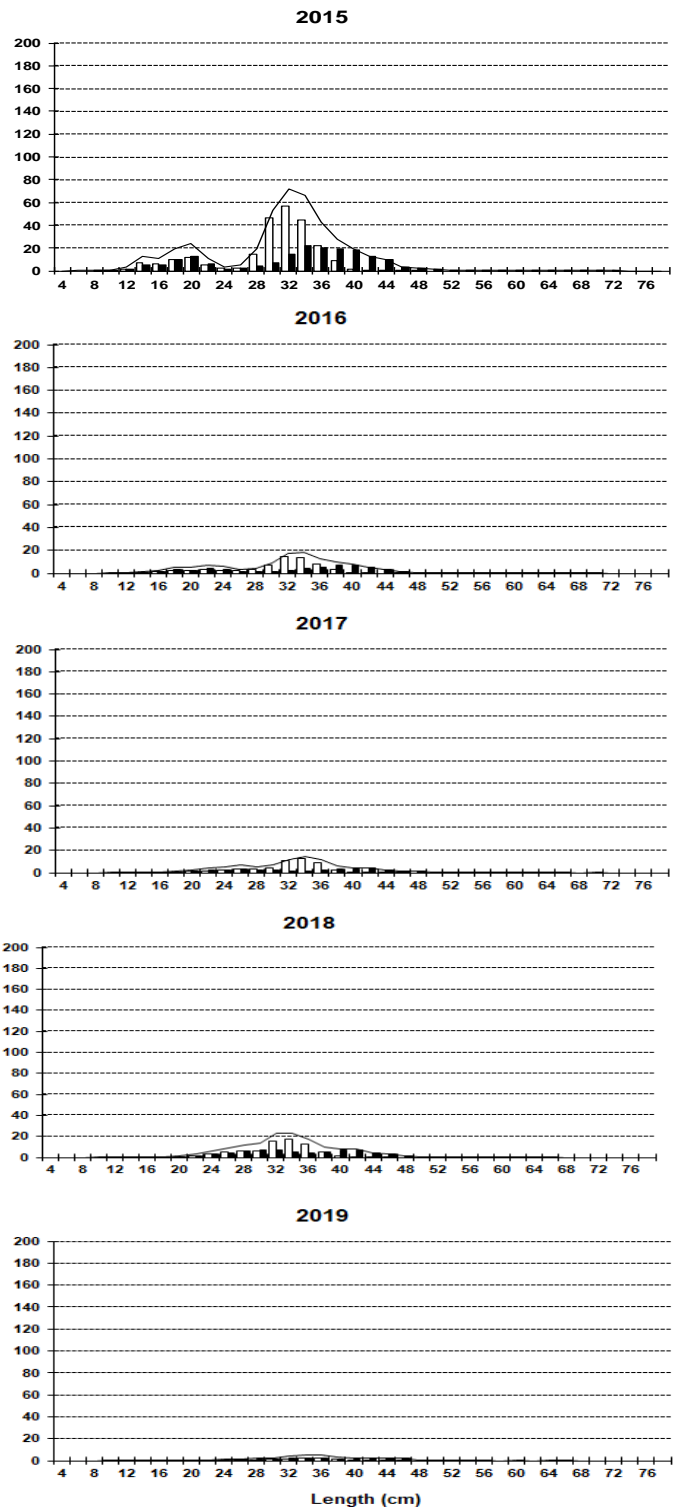
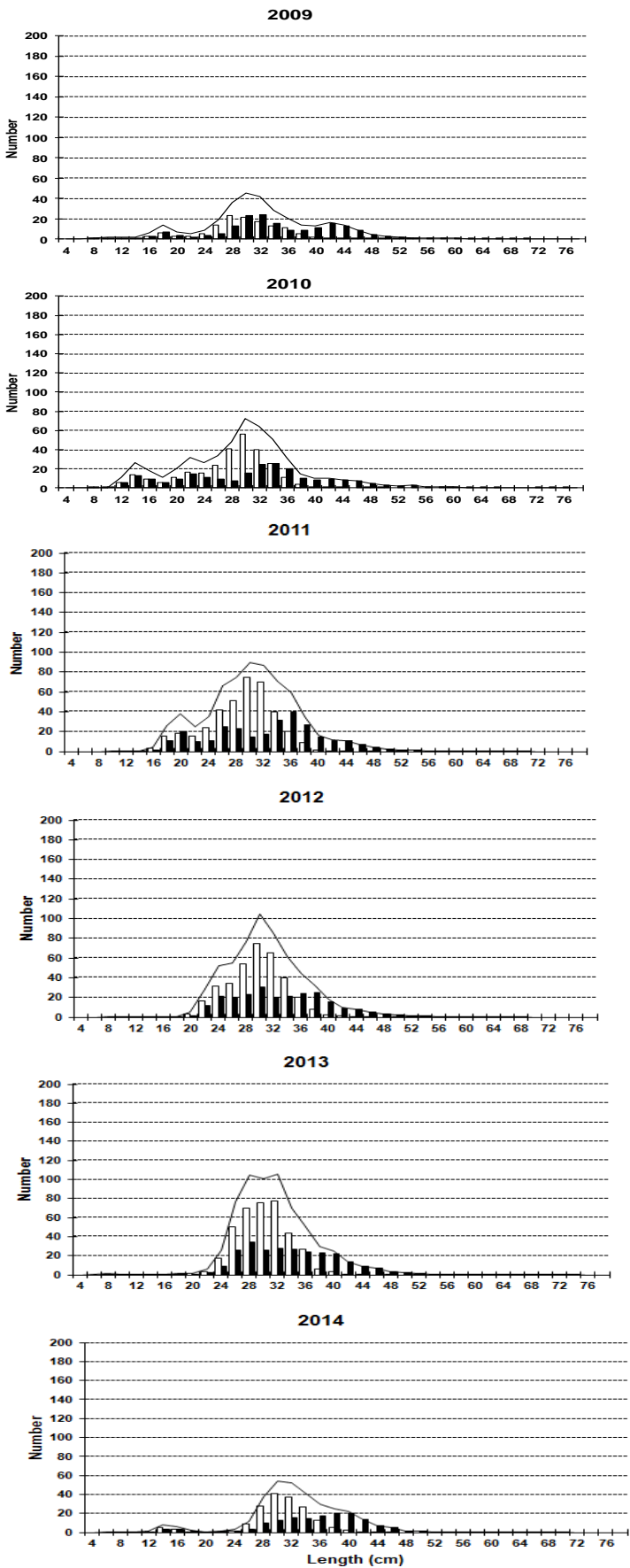


Figure 11 (cont.) American plaice length distribution (cm) on NAFO 3NO: 1997-2019. Mean numbers per tow. Data from 2015 to 2019 are in Table 17; data for 1997-2014 can be seen in SCR Doc 15/07.



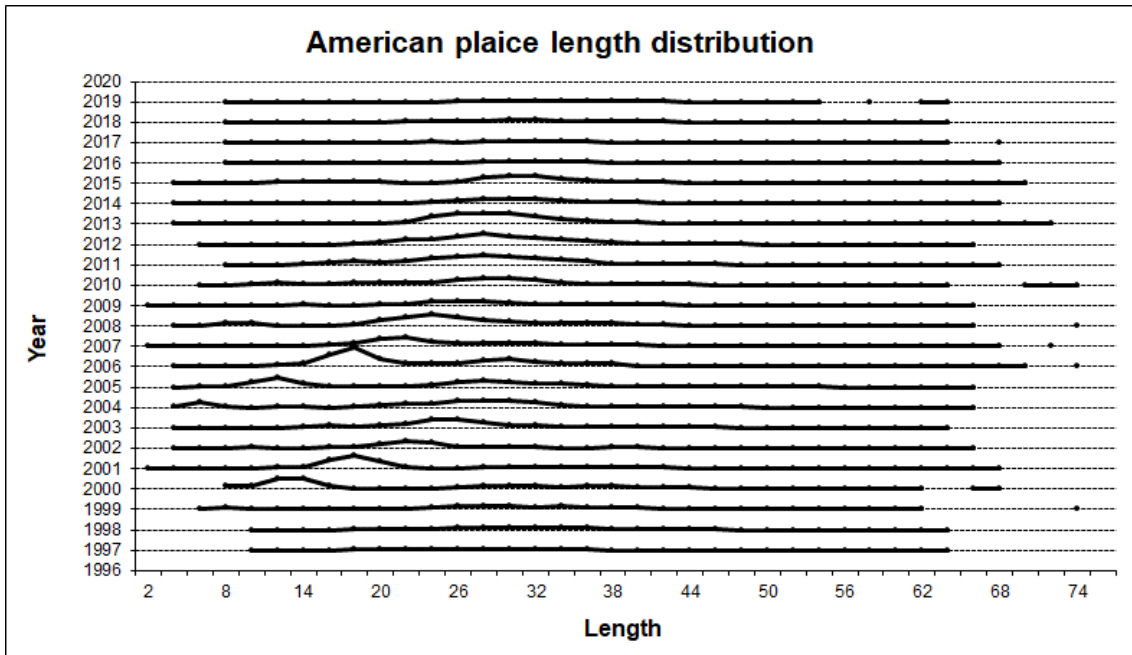


Figure 12. American plaice mean catches per tow by length (cm) on NAFO 3NO: 1997-2019. Data from 2015 to 2019 are in Table 17; data for 1997-2014 can be seen in SCR Doc 15/07.

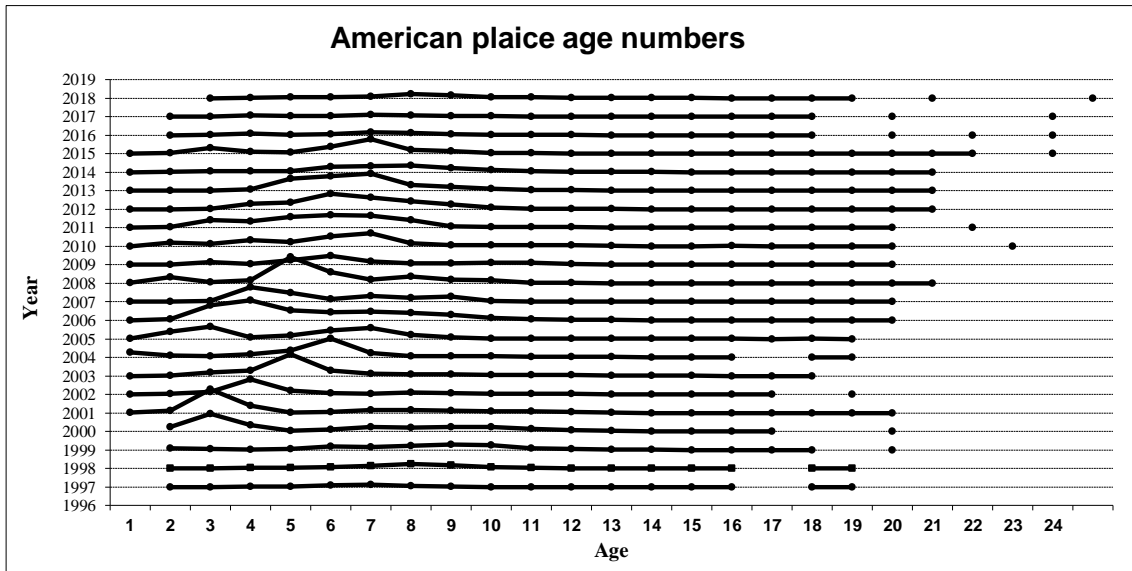


Figure 13. American plaice mean numbers per tow by age on NAFO 3NO: 1997-2019. Data from 2015 to 2018 are in Table 18; data for 1997-2014 can be seen in SCR Doc 15/07. In 2016, the ALK is not sexed. 2017-2019 ALKs are not available yet. 2016 ALK was used to get the 2017-2018 numbers at age. No 2019 numbers at age are available.

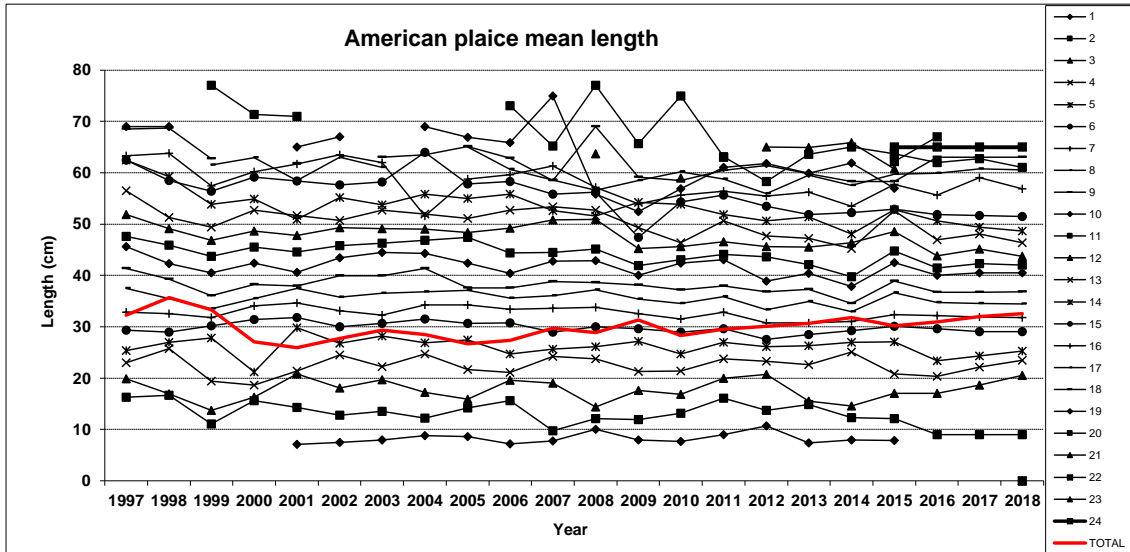


Figure 14. American plaice mean length (cm) at age on NAFO 3NO: 1997-2019. Data from 2015 to 2018 are in Table 19; data for 1997-2014 can be seen in SCR Doc 15/07. In 2016, the ALK is not sexed. 2017-2019 ALKs are not available yet. 2016 ALK was used to get the 2017-2018 mean length at age. No 2019 mean length at age are available.

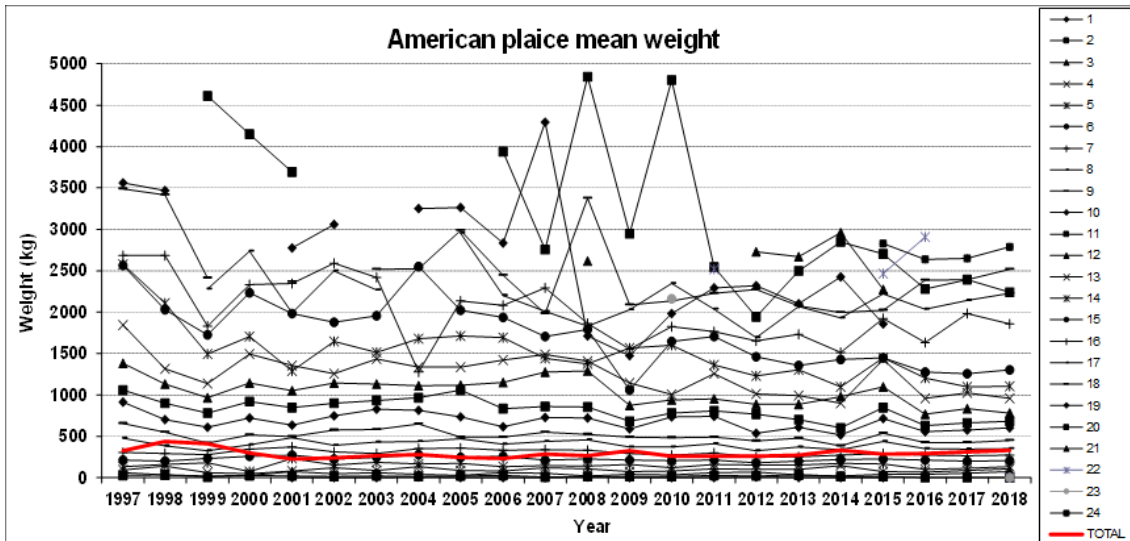


Figure 15. American plaice mean weight (gr) at age on NAFO 3NO: 1997-2019. Data from 2015 to 2018 are in Table 20; data for 1997-2014 can be seen in SCR Doc 15/07. In 2016, the ALK is not sexed. 2017-2019 ALKs are not available yet. 2016 ALK was used to get the 2017-2018 mean weight at age. No 2019 mean weight at age are available.

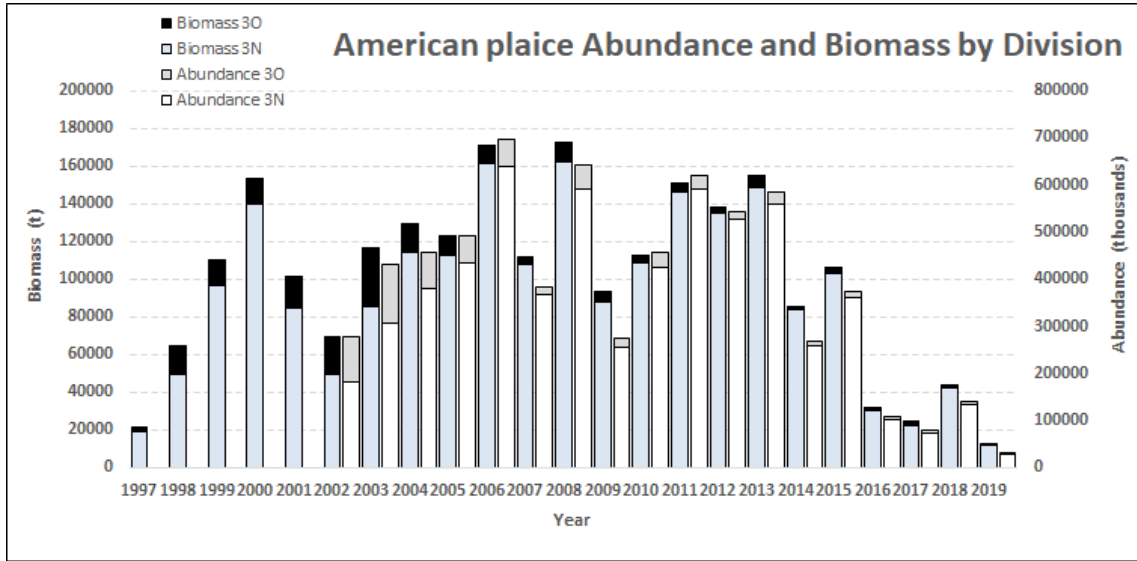


Figure 16. American plaice total biomass (tons) and abundance (thousands) by Division and year.

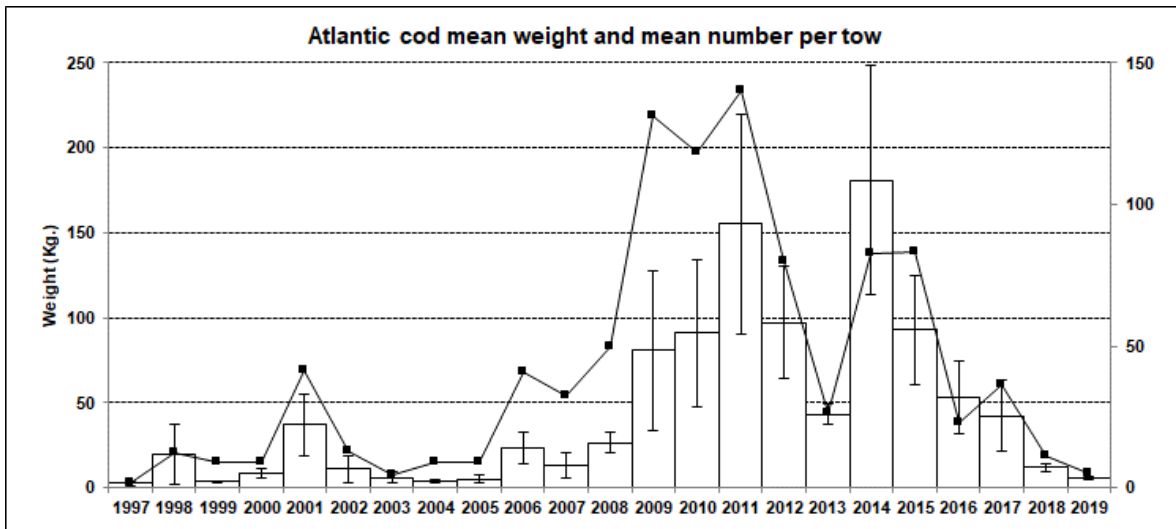


Figure 17. Atlantic cod stratified mean catches in Kg and \pm SD by year and mean number by year. Spanish Spring surveys in NAFO Div. 3NO: 1997-2019.

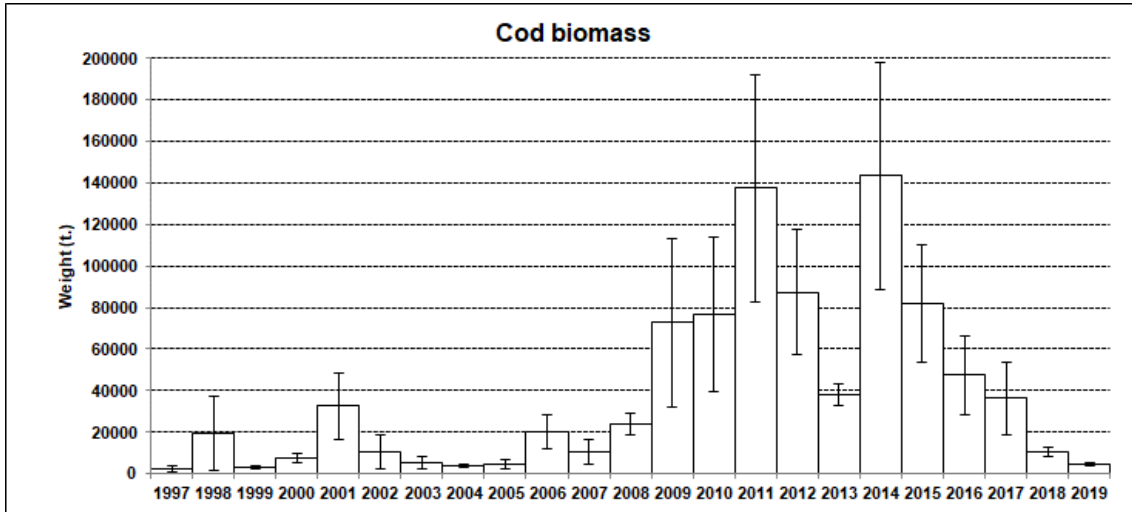


Figure 18. Atlantic cod biomass calculated by the swept method in tons and \pm SD by year. Spanish Spring surveys in NAFO Div. 3NO: 1997-2019.

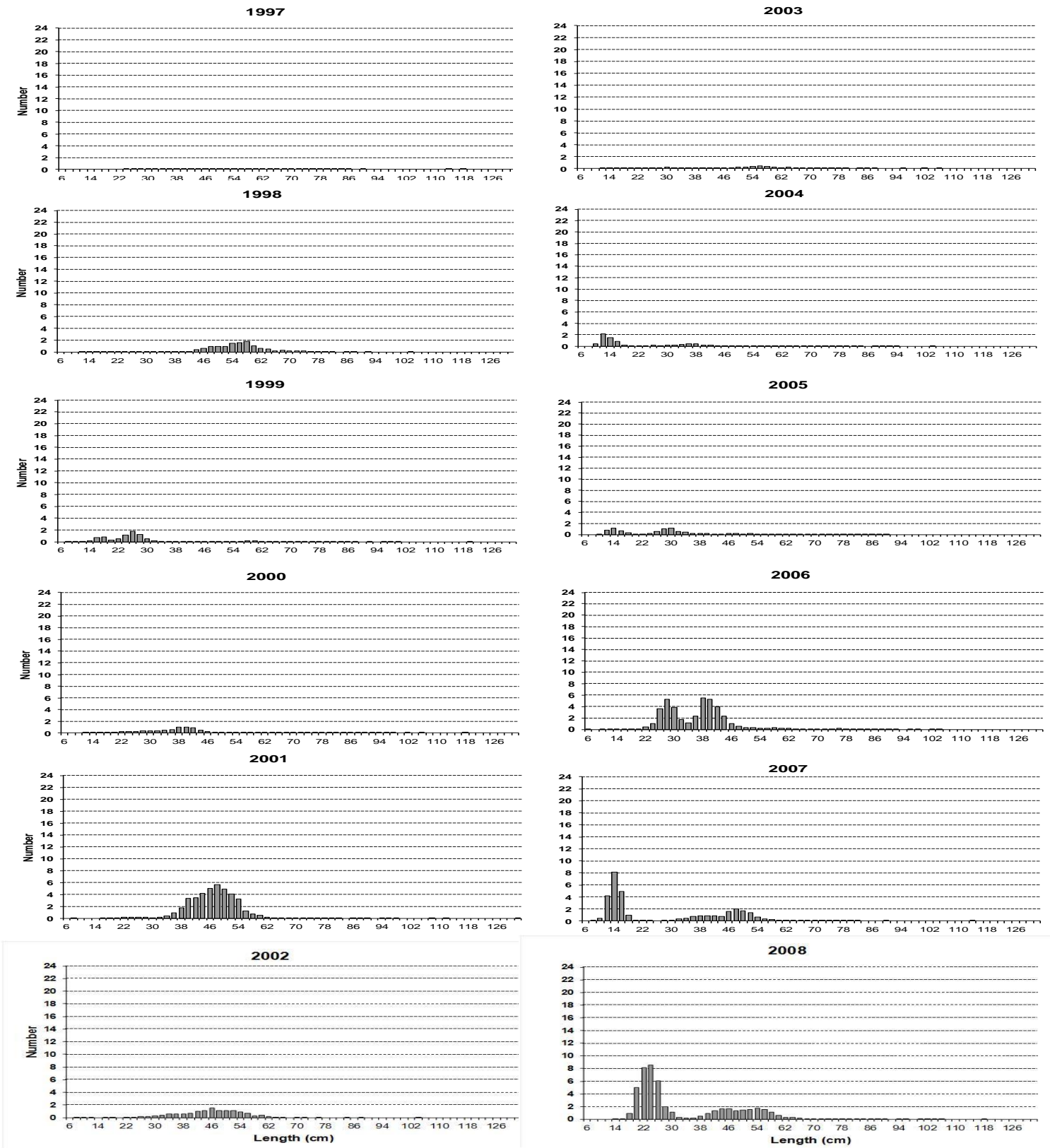


Figure 19. Atlantic cod length distribution (cm) on NAFO 3NO: 1997-2019. Mean catches per tow number. Data from 2015 to 2019 are in Table 28; data for 1997-2014 can be seen in SCR Doc 15/07.

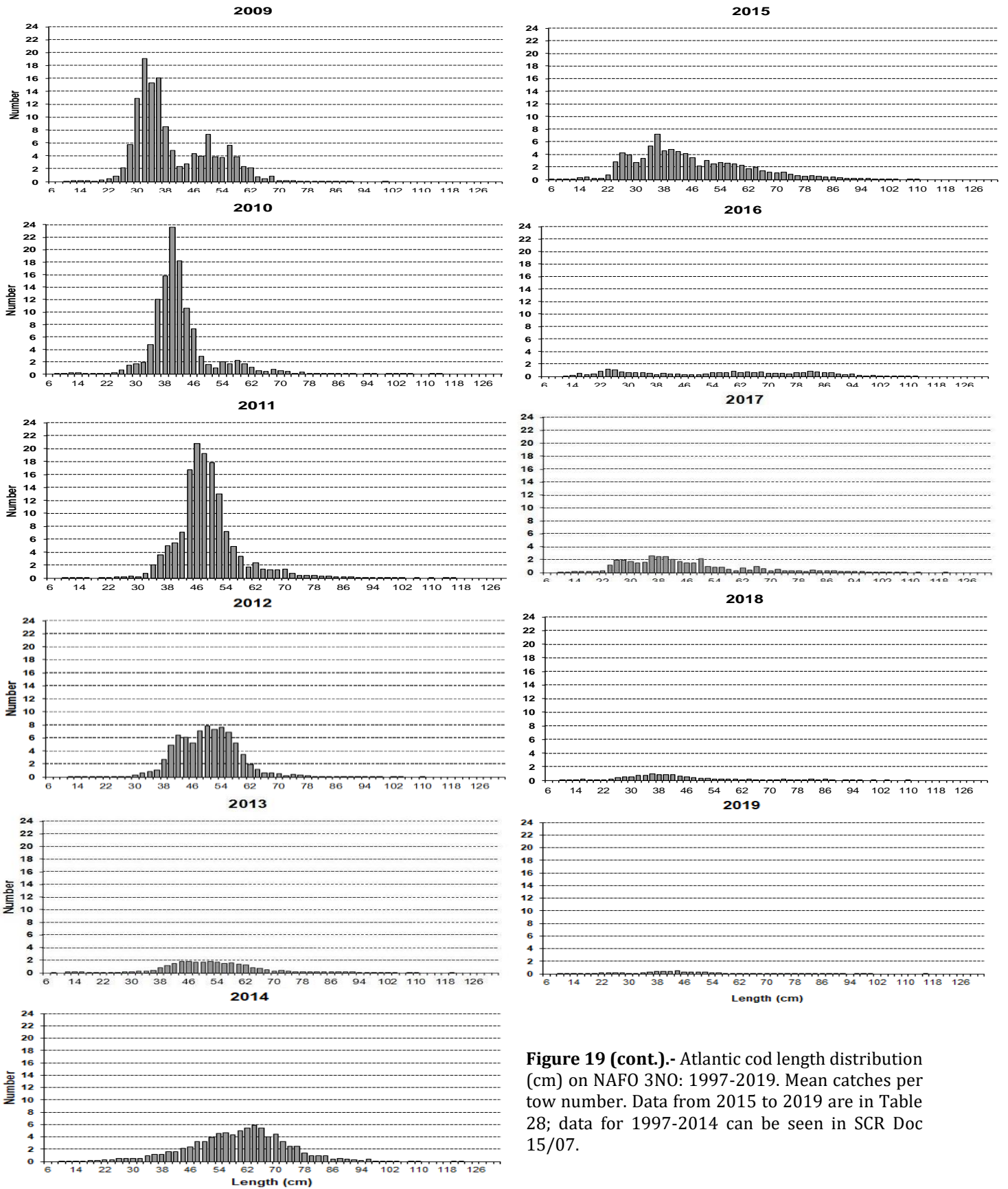


Figure 19 (cont.)- Atlantic cod length distribution (cm) on NAFO 3NO: 1997-2019. Mean catches per tow number. Data from 2015 to 2019 are in Table 28; data for 1997-2014 can be seen in SCR Doc 15/07.

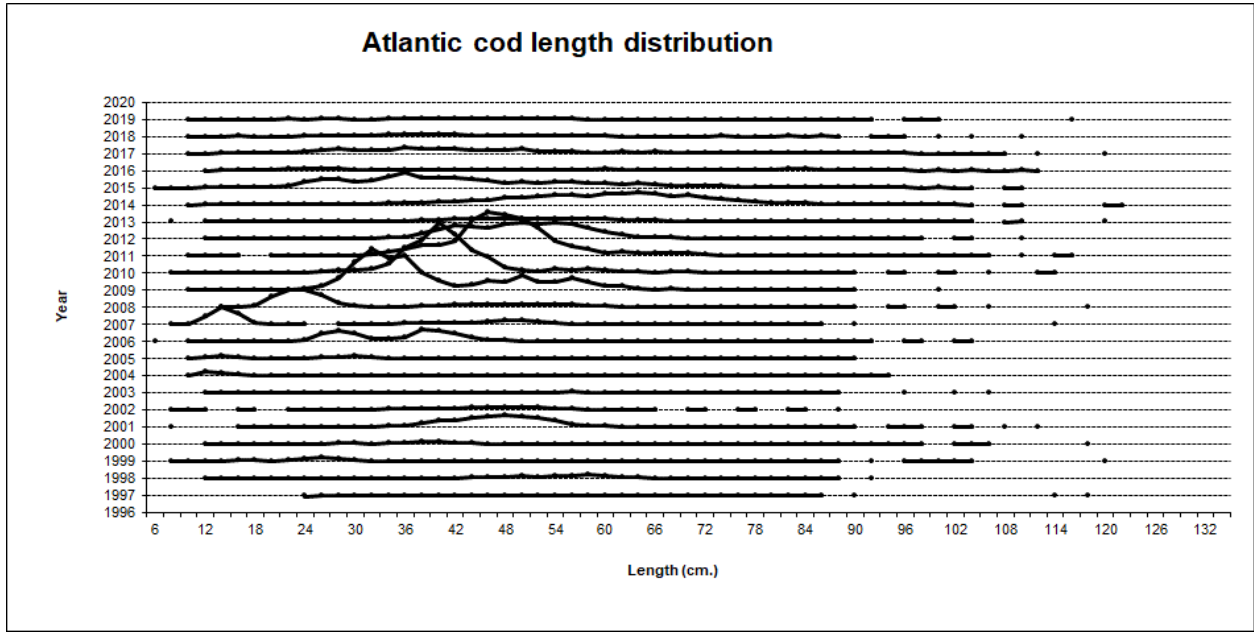


Figure 20. Atlantic cod mean catches per tow by length (cm) on NAFO 3NO: 1997-2019. Data from 2015 to 2019 are in Table 28; data for 1997-2014 can be seen in SCR Doc 15/07.

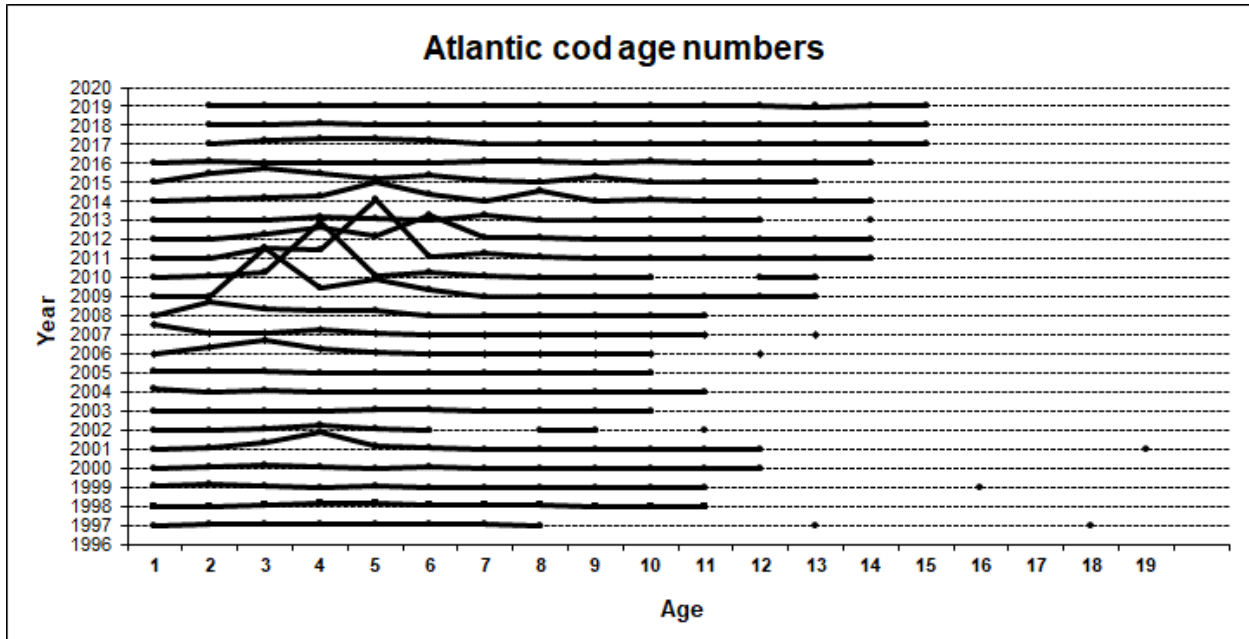


Figure 21. Atlantic cod mean number per tow by age on NAFO 3NO: 1997-2019. Data from 2015 to 2019 are in Table 29; data for 1997-2014 can be seen in SCR Doc 15/07.

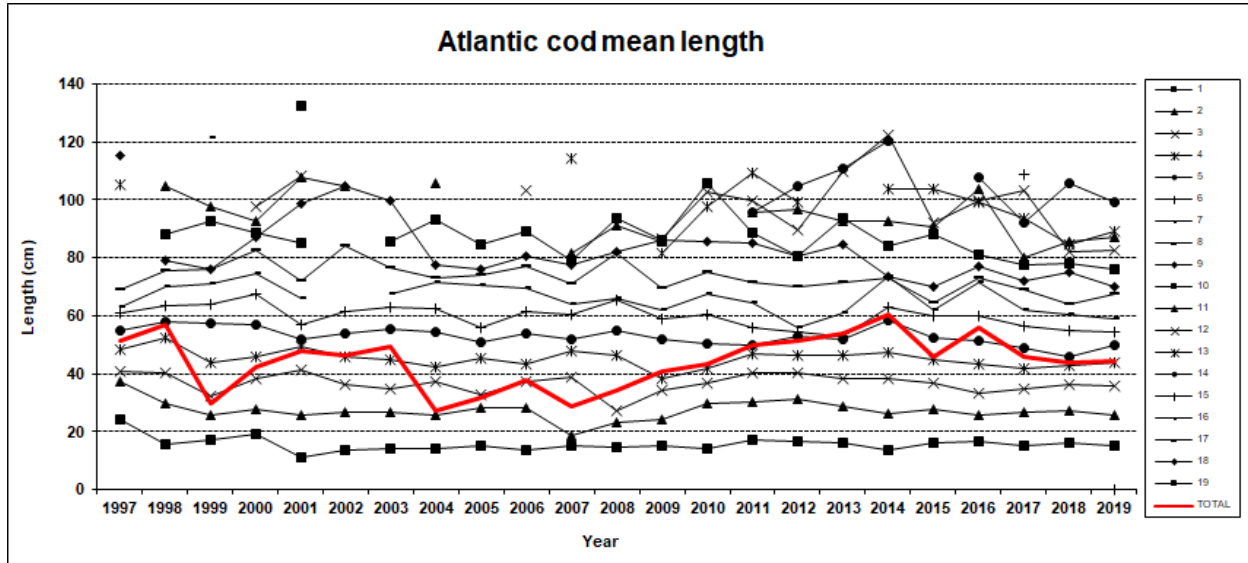


Figure 22. Atlantic cod mean length (cm) at age on NAFO 3NO: 1997-2019. Ages from 1 to 19. Data from 2015 to 2019 are in Table 30; data for 1997-2014 can be seen in SCR Doc 15/07.

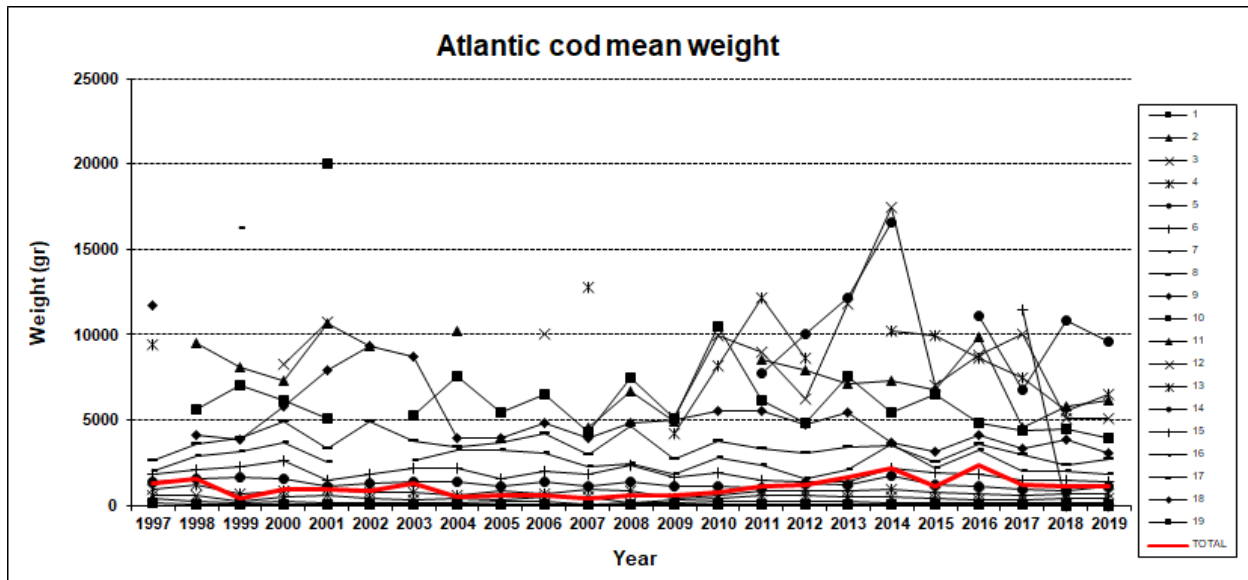


Figure 23. Atlantic cod mean weight (gr) at age on NAFO 3NO: 1997-2019. Ages from 1 to 19. Data from 2015 to 2019 are in Table 31; data for 1997-2014 can be seen in SCR Doc 15/07.