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Biomass and Abundance of Demersal Fish Stocks off West Greenland Estimated
from the Greenland Shrimp Fish Survey, 1988-2010.

By

Rasmus Nygaard
Greenland Institute of Natural Resources, Box 570, 3900 Nuuk, Greenland

And

Ole A. Jørgensen
DTU-Aqua, Technical University of Denmark
Charlottenlund Slot, 2920 Charlottenlund, Denmark

Abstract

Since 1988 Greenland Institute of Natural Resources has annually conducted a bottom trawl survey off West Greenland. The main purpose of the survey is to evaluate the biomass and abundance of Northern shrimp (*Pandalus borealis*), but data on fish species have been recorded regularly since 1992. Since 2007 a corresponding survey using the same gear and method has been conducted off East-Greenland. This paper presents biomass and abundance indices and length frequencies from West Greenland of Greenland halibut (*Reinhardtius hippoglossoides*), redfish (*Sebastes marinus* and *Sebastes Mentella*), Atlantic wolffish (*Anarhichas lupus*), Spotted wolffish (*Anarhichas minor*), American plaice (*Hippoglossoides platessoides*) and Thorny skate (*Amblyraja radiata*) from the survey since 1992. Further, a recruitment index for Greenland halibut is presented.

Materials and Methods

The survey covers the offshore areas at West Greenland between 59°15'N and 72°30'N from the 3-mile limit to the 600 m depth contour line and the inshore area Disko Bay and Julianehåb Bay (Table 1). The survey area is divided into NAFO Divisions, which were further subdivided into five depth strata (50-100, 101-150, 151-200, 201-400 and 401-600) on basis of depth contour lines. The area surveyed has, however, changed throughout the years. From 1988 to 1990 the survey area included Div. 1AN to 1D. In 1991 the Div. 1AN was not covered. In 1992 the survey area was extended to include Div. 1AN to 1F and Disko Bay (Div. 1AX), and this area is now surveyed annually. The survey was originally designed as a shrimp survey and sampling of fish data was not complete in the period 1988-1991. Since 1992 the sampling of fish has improved and the survey is now considered as a combined shrimp and fish survey. The survey period is July to September. Since 2007 a corresponding survey using the same gear and method (stratified random) has been conducted off East-Greenland.

The survey is designed as a stratified-random trawl survey. A minimum of two hauls per stratum is always planned. Due to new information on the bottom topography in division 1AN and Disko Bay a re-stratification has been conducted and the historic data has been recalculated according to the new stratum areas. Numbers of stations have been fluctuating between 179 and 271 per year, and the total number of valid hauls in 2010

was 289. The number of valid hauls by year and stratum is listed in Table 2. For further information about allocation of hauls and survey design, see Kingsley et al. 2004.

The survey has been conducted with trawlers of the same size throughout the years. Since 1991 the 722 GRT stern trawler M/Tr 'Pâmiut' has been used. Until 2004, a Skjervoy 3000/20 trawl with steel bobbin gear and double bag was used. The mesh size in the codend was 40 mm from 1988 to 1992. From 1993 the mesh size in the codend has been 20 mm. The changes of mesh size did not influence the catchability of fish except for redfish. Abundance estimates for redfish before 1993 are therefore adjusted in according to Bech 1994. In 2005 the Skjervoy trawl was replaced with a Cosmos trawl (Wieland and Bergström, 2005). Calibration experiments with the two trawls were conducted in 2004 and 2005 (Rosing and Wieland, 2005), but the calibration factors for the different fish species still need to be finally evaluated. To allow comparison of abundance and biomass throughout the time series, the 2005, to 2010 catches were divided by preliminary conversion factors to adjust the Cosmos trawl catches to the former Skjervoy trawl standard. The preliminary conversion factors were derived as described by Rosing and Wieland (2005) and are given in Table 3. To compensate for the smaller average swept area fished by the old Skjervoy trawl, the 2005 to 2010 results were multiplied by 1.1516, (s.e 0.0097). From 1988 through 2003 the trawl doors were of the type *Greenland Perfect*, measuring 9.25 m² and weighing 2 420 kg. They were replaced in 2004 by Injector International 7.5 m² trawl doors with a weight of 2 800 kg to facilitate the change of survey trawl in 2005.

The standard trawling time has been changed through the years. In 1988 to 1997 it was 60 min and thereafter stepwise shortened to a mixture of 30 and 15 min tows. Finally in 2005, standard tow duration was set to 15 minutes at all stations since the reduced tow duration gave no difference in the catches of Northern Shrimp and Greenland halibut (Wieland and Storr-Paulsen 2006). Towing speed has been about 2.5 knots throughout the years. The trawling operations are performed during daytime only. A more detailed description of the survey and its history is given by Bergström (2007).

After each haul the catch was sorted by species or lowest taxonomic level and weighed to 0.1 kg and the number recorded. Fish was measured as total length to 1 cm below. Due to difficulties in identification of species in some years redfish were classified as *Sebastes sp.*

Stratified abundance and biomass estimates were calculated from catch-per-tow data using the stratum areas as weighting factor (Cochran, 1977). The coefficient of catchability was set at 1.0, implying that estimates are merely indices of abundance and biomass. Confidence intervals (CI) were set at the 95% level of significance of the stratified mean. In recent years the principles for the allocation of trawl hauls in the survey has been changed in order to reduce the variance in the estimate of abundance and biomass of shrimp. In order to reduce the effect of this, the estimation of CPUE (recruitment of year one Greenland halibut), has been recalculated including only hauls >300 m in the calculations.

The recruitment index is calculated for the off shore nursery area in Div. 1AS-1B and inshore Disko Bay, respectively. Catches are standardized as catch in number per hour as described in Bech (1995). Separation of ages is based on the Petersen method. Data are plotted by year classes to visualize the relative year class strength and development in relative abundance.

The available age and maturity data on American plaice, Atlantic and Spotted wolffish and Thorny skate were considered to be insufficient for a reliable calculation of spawning biomasses as recommended by STACFIS in 2001.

Results

Greenland halibut (*Reinhardtius hippoglossoides*).

Greenland halibut was found in all divisions, but was most common in division 1A and 1BN and in the Disko Bay. In 2010, the abundance and biomass was estimated to 432 million individuals and 34680 tons, respectively (Table 4 and 5). The abundance and biomass has fluctuated between 260-420 mill individuals and 13000-31000 tons during 1992-2000 (except in 1996). Since 2000 the abundance and especially the biomass has increased with a record high abundance in 2001 and biomass in 2004, indicating twice as high

biomass in 2004 compared to 2003. However, since 2005 the abundance and biomass have decreased again (Fig. 1 and 2). Clear modes can be found in the length distribution at 15 and 23 cm (Fig. 5). Non calibrated distribution of survey catches in number pr. km² and kg pr. km² are given in fig 11. and fig.12..

A recruitment index was provided from the off shore nursery area in Div. 1AS-1B. Catches were standardized as catch in number per hour as described in Bech (1995). This generally increases the mean number per hour but do not change the trend in the index.

The recruitment index declined since the relatively large 1991 year-class, but the recruitment has been above the level in the 1980' (Fig. 3). The recruitment increased again with the 1995-year class, which was the largest on record. The 1996 year-class seemed to be small but the recruitment has increased gradually until the 2000 year-class. Until the 2006 year class the recruitment has been around or a little above average. The recruitment of the 2009 year-class was estimated as 497 age-one caught per hour, some what below the average for the time series (570 no per hr).

In Disko Bay the recruitment has been good in recent years although the recruitment of year classes 2002-2005 has been gradually decreasing (Fig 4.). The recruitment increased again and the 2006 year class was the third largest on record. The 2007 and 2008 year classes were low but the recruitment increased in 2010 where the 2009 year class was estimated to 927 no hr⁻¹, somewhat above the average for the time series (815 hr⁻¹)

Generally there is a steep decline between CPUE at age 1 and age 2 and 3+ which also was observed in the 2010 survey.

Redfish (*Sebastes sp.*).

Redfish was found in all divisions, but was most common in division 1BN and 1C. The abundance and biomass estimated fluctuated without a clear trend between 800-2400 million individuals and 7700-38 000 tons, during the years 1992-1996 (Table 6 and 7). From 1997-2000 the biomass and abundance decreased to 165 million individuals and 12000 tons. This historic low was followed by an increase in biomass as well as abundance until 2003. However, since then both biomass and abundance have decreased (Table 6 and 7). In 2010 the abundance and biomass was estimated to 85.3 million individuals and 9744 tons which is one of the lower values of the time series. Non calibrated distribution of survey catches in number pr. km² and kg pr. km² are given in fig 13. – fig 18.

During the years catches have comprised almost exclusively of individuals smaller than 20 cm. Annual growth increments of 4 cm were indicated by repeatedly pronounced peaks in length compositions at 7-8 cm and 12 cm probably corresponding to age 1 and 2 (Nedreaas, 1990). There is a low consistency in year class strength indicating a high mortality. The resent survey estimates revealed only small peaks at 7-8 cm and 10-14 cm (Fig. 6).

American plaice (*Hippoglossoides platessoides*).

American plaice can be found in all divisions up to 72°00'N. In 2010 the biomass and abundance was estimated to 39.9 million individuals and 3630 tons (Table 8 and 9). The abundance and biomass estimates for American plaice has varied between 10 and 72 million individuals and 700 and 5100 tons. In 2010 a clear mode can be found at 5 and 15 cm indicating new incoming year-classes (Fig. 7). Non calibrated distribution of survey catches in number pr. km² and kg pr. km² are given in fig 19. and fig 20.

Atlantic wolffish (*Anarhichas lupus*)

The Atlantic wolffish distribution has shifted further north since the beginning of the survey. Previously Atlantic wolffish was mainly found south of 68°00'N (Table 10 and 11). The highest estimate in the time series for both abundance and biomass was found in 2005. Indices then decreased, but the 2010 the biomass and abundance was estimated to 5.4 million individuals and 1014 tons respectively, are above average. The length distribution reveals the dominance of small fish < 35cm, although the proportion of larger fish has

increased in the past years (Fig. 8). Non calibrated distribution of survey catches in number pr. km² and kg pr. km² are given in fig 21. and fig 22.

Spotted wolffish (*Anarhichas minor*)

Spotted wolffish is distributed in all survey areas. In 2010 abundance was estimated to 2.068 million individuals and the biomass increased to 4997, the highest estimate throughout the time series (Tables 12 and 13). The abundance and biomass has varied through the time series but has generally been increasing since the survey start. Only in the last five years enough spotted wolffish were caught in the survey to reveal meaningful length distributions. In 2010 the length ranged from 10-121 cm. (Fig. 14). All sizes are represented and only a weak mode at 13 cm can be identified. Non calibrated distribution of survey catches in number pr. km² and kg pr. km² are given in fig 23. and fig 24.

Thorny skate (*Amblyraja radiata*)

The abundance and biomass of Thorny skate have during the years been fluctuating without any significant trend between 4.2-17 million individuals and 900-4500 tons, with a historic high in 2003. In 2010 the abundance and the biomass was estimated to 1219 tons and 4.7 million individuals, an increase compared to the historic low estimate of 2008 (Table 14 and 15). In recent years Thorny skate length distributions have revealed clear modes at 12 cm and 42 cm probably corresponding to recruits and adult individuals at full length (Fig. 10). Non calibrated distribution of survey catches in number pr. km² and kg pr. km² are given in fig 25. and fig 26).

Cod (*Gadus morhua*)

For data on cod see the ICES Report of the North-Western Working Group (Anon., 2010)

Discussion

According to a number of investigations the fishable part of all ground fish stocks off West Greenland has been severely depleted during the last two decade (Ogawa *et al.* 1994; Yokawa *et al.*, 1995; Rätz, 1998; Fock and Stransky, 2011; Nygaard *et al.* 2011). The low biomass and abundance of Redfish, American plaice, wolffishes and Thorny skate presented in this paper supports this general picture. However, the relatively short time series and the high variability on estimates call for some reservation.

The survey was originally designed as a shrimp survey. Between 1988 and 1991 the survey did not cover the same area and the fish data are incomplete. Direct comparison was hence only possible for the 1992-2004 period, bearing in mind that a new trawl was used to obtain the 2005 to 2010 results. The main purpose of the survey is to evaluate the biomass of northern shrimp and the effort is concentrated in areas and depths where the commercial shrimp trawling is taking place, especially on the northern slopes of the bank Store Hellefiskebanke (67°50N 55°00W) and in the inshore area Disko Bay. As Store Hellefiskebanke and Disko Bay are important nursery areas for Greenland halibut and redfish, as well as other important species (Smidt, 1969; Tåning, 1949) it is likely, that the abundance and biomasses estimates of the survey reflects the juvenile stock situation of these species.

The 2002 estimates in division 1AN may have been affected by low coverage in this division, since only 2 hauls was performed in this division in 2002 and therefore not all strata can have been covered. No record exists on whether any compensation for low coverage was made in subarea 1AN in 2002.

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Table 1. Specification of strata. 1AX=Disko Bay.

| Stratum | | | | | depth | area |
|-----------------------------|-----------|-----------|---------|---------|---------|-----------|
| | south | north | east | west | (m) | (km2) |
| 1AN | 70°37.5'N | 72°30' N | 54°15'W | 60°30'W | 50-99 | 325.8 |
| - | | | | | 100-149 | 601.4 |
| - | | | | | 150-199 | 1951.9 |
| - | | | | | 200-399 | 19228.8 |
| - | | | | | 400-599 | 9255.6 |
| 1AS | 68°50' N | 70°37.5'N | 54°15'W | 60°30'W | 50-99 | 1793.7 |
| - | | | | | 100-149 | 3431.6 |
| - | | | | | 150-199 | 7187.5 |
| - | | | | | 200-399 | 16165.0 |
| - | | | | | 400-599 | 6177.5 |
| 1AX | 68°50'N | 70°37.5'N | 51°00'W | 54°15'W | 50-99 | 603.5 |
| - | | | | | 100-149 | 1177.9 |
| - | | | | | 150-199 | 1185.4 |
| - | | | | | 200-399 | 6671.4 |
| - | | | | | 400-599 | 3436.7 |
| 1BN | 67°00' N | 68°50' N | 50°00'W | 59°45'W | 50-99 | 5602.0 |
| - | | | | | 100-149 | 3333.2 |
| - | | | | | 150-199 | 2815.5 |
| - | | | | | 200-399 | 16935.6 |
| - | | | | | 400-599 | 3523.7 |
| 1BS | 66°15' N | 67°00' N | 54°00'W | 57°00'W | 50-99 | 2034.7 |
| - | | | | | 100-149 | 1543.6 |
| - | | | | | 150-199 | 2879.8 |
| - | | | | | 200-399 | 1424 |
| - | | | | | 400-599 | 1257.3 |
| 1C | 64°15' N | 66°15' N | 52°30'W | 57°00'W | 50-99 | 4196.1 |
| - | | | | | 100-149 | 8035.1 |
| - | | | | | 150-199 | 3592.7 |
| - | | | | | 200-399 | 4735.2 |
| - | | | | | 400-599 | 3452.9 |
| 1D | 62°30' N | 64°15' N | 50°30'W | 54°00'W | 50-99 | 3137.3 |
| - | | | | | 100-149 | 1810.5 |
| - | | | | | 150-199 | 1062.2 |
| - | | | | | 200-399 | 3463.1 |
| - | | | | | 400-599 | 1081.9 |
| 1E | 60°45' N | 62°30' N | 48°30'W | 52°00'W | 50-99 | 719.0 |
| - | | | | | 100-149 | 2435.5 |
| - | | | | | 150-199 | 2258.6 |
| - | | | | | 200-399 | 2187.6 |
| - | | | | | 400-599 | 647.6 |
| 1F | 59°15'N | 60°45' N | 44°30'W | 49°15'W | 50-99 | 1244.6 |
| - | | | | | 100-149 | 4747.8 |
| - | | | | | 150-199 | 2605.0 |
| - | | | | | 200-399 | 2719.7 |
| - | | | | | 400-599 | 1312.5 |
| Total West Greenland | | | | | 50-600 | 1517306.7 |

Table 2. Numbers of valid hauls, 1988-2009. 1AX=Disko Bay.

| Year | 1AN | 1AS | 1AX | 1BN | 1BS | 1C | 1D | 1E | 1F | Westgr.-1AX | Total |
|------|-----|-----|-----|-----|-----|----|----|----|----|-------------|-------|
| 1990 | 29 | 63 | * | 68 | 17 | 35 | 16 | * | * | | 228 |
| 1991 | 18 | 39 | 41 | 44 | 18 | 11 | 16 | * | * | 146 | 187 |
| 1992 | 20 | 33 | 39 | 36 | 8 | 18 | 18 | 11 | 15 | 159 | 198 |
| 1993 | 16 | 22 | 31 | 39 | 10 | 21 | 15 | 12 | 13 | 148 | 179 |
| 1994 | 16 | 33 | 27 | 49 | 9 | 23 | 8 | 9 | 9 | 156 | 183 |
| 1995 | 17 | 33 | 33 | 48 | 13 | 29 | 13 | 14 | 11 | 178 | 211 |
| 1996 | 18 | 20 | 33 | 46 | 11 | 29 | 12 | 9 | 11 | 156 | 189 |
| 1997 | 17 | 33 | 34 | 47 | 9 | 32 | 12 | 12 | 19 | 181 | 215 |
| 1998 | 10 | 34 | 33 | 66 | 14 | 27 | 19 | 14 | 14 | 198 | 231 |
| 1999 | 10 | 40 | 34 | 63 | 18 | 33 | 16 | 14 | 17 | 211 | 245 |
| 2000 | 8 | 25 | 23 | 45 | 17 | 37 | 23 | 14 | 29 | 198 | 221 |
| 2001 | 9 | 28 | 23 | 59 | 16 | 36 | 24 | 15 | 26 | 213 | 236 |
| 2002 | 2 | 26 | 22 | 68 | 12 | 32 | 18 | 20 | 27 | 205 | 227 |
| 2003 | 11 | 21 | 19 | 51 | 12 | 30 | 18 | 15 | 22 | 180 | 199 |
| 2004 | 15 | 25 | 14 | 41 | 14 | 24 | 22 | 20 | 34 | 195 | 209 |
| 2005 | 20 | 30 | 16 | 45 | 10 | 26 | 19 | 23 | 23 | 196 | 212 |
| 2006 | 26 | 40 | 21 | 49 | 9 | 27 | 20 | 21 | 31 | 223 | 244 |
| 2007 | 18 | 38 | 18 | 47 | 9 | 27 | 27 | 31 | 39 | 236 | 254 |
| 2008 | 16 | 38 | 16 | 53 | 7 | 28 | 23 | 25 | 46 | 236 | 252 |
| 2009 | 21 | 31 | 24 | 60 | 13 | 28 | 22 | 24 | 48 | 247 | 271 |
| 2010 | 26 | 44 | 25 | 65 | 11 | 30 | 23 | 24 | 40 | 264 | 289 |

Table 3. To allow comparison of abundance and biomass throughout the time series, the 2005 to 2010 catches were divided by preliminary conversion factors to adjust the Cosmos trawl catches to the former Skjervoy trawl standard. For Greenland halibut and American plaice the conversion were length dependent and for those species x in the equations represents the individual fish length.

| Fishspecies | Greenland halibut | Redfish | American plaice | Atlantic wolffish | Spotted wolffish | Cod | Thorny skate |
|----------------------|----------------------|---------|-------------------|----------------------|---------------------|------|--------------|
| Conversion factor | 0.0404x+0.6527 | 2.4 | -0.0825x + 5.3307 | 2.3 | 2.3 | 1.78 | 5.1 |

Table 4. Greenland halibut (*Reinhardtius hippoglossoides*). Abundance indices ('1000) for West Greenland with 95% confidence limits in percent of the stratified mean. () incomplete coverage of survey area. The 2005 to 2010 estimates are adjusted for changes in trawl gear.

| Year | 1AN | 1AS | 1AX | 1BN | 1BS | 1C | 1D | 1E | 1F | Westgr-1AX | Westgr. | CI |
|------|--------|--------|--------|--------|-------|-------|-------|------|------|------------|----------|----|
| 1990 | 7039 | 2072 | * | 6661 | 193 | 3844 | 353 | * | * | (16530) | 23 | |
| 1991 | 13630 | 6692 | 34030 | 152800 | 3890 | 939 | 3415 | * | * | (181370) | (215400) | 25 |
| 1992 | 50700 | 8183 | 96730 | 231500 | 1499 | 1183 | 800 | 614 | 0 | 294470 | 391200 | 27 |
| 1993 | 29120 | 24250 | 33960 | 152600 | 9799 | 4275 | 4563 | 447 | 497 | 229540 | 263500 | 28 |
| 1994 | 22900 | 35220 | 62960 | 130700 | 9970 | 18070 | 2350 | 142 | 439 | 219840 | 282800 | 22 |
| 1995 | 39460 | 28910 | 89410 | 98870 | 18340 | 12190 | 5720 | 146 | 343 | 203990 | 293400 | 32 |
| 1996 | 92560 | 13710 | 102500 | 265900 | 11760 | 14040 | 10710 | 155 | 363 | 409200 | 511700 | 25 |
| 1997 | 41260 | 17450 | 112100 | 97630 | 2244 | 13040 | 865 | 108 | 258 | 172900 | 285000 | 22 |
| 1998 | 78460 | 30350 | 209600 | 47190 | 23320 | 7168 | 3563 | 1382 | 578 | 192000 | 401600 | 29 |
| 1999 | 100800 | 58160 | 95360 | 91040 | 5805 | 5290 | 7708 | 1299 | 912 | 270940 | 366300 | 35 |
| 2000 | 81660 | 19310 | 172800 | 126700 | 4065 | 4792 | 6715 | 139 | 565 | 244000 | 416800 | 30 |
| 2001 | 145900 | 97870 | 223700 | 111500 | 1679 | 4808 | 2553 | 669 | 1597 | 366500 | 590200 | 28 |
| 2002 | 77960 | 75220 | 148100 | 42490 | 2699 | 6157 | 6482 | 552 | 1268 | 212800 | 360900 | 38 |
| 2003 | 154600 | 37690 | 227000 | 116700 | 2312 | 1964 | 2441 | 69 | 993 | 316800 | 543800 | 36 |
| 2004 | 154800 | 20640 | 199100 | 84760 | 2423 | 2917 | 2849 | 88 | 351 | 268900 | 468000 | 34 |
| 2005 | 120688 | 47688 | 161109 | 125985 | 3372 | 6717 | 1650 | 696 | 405 | 307592 | 468701 | 27 |
| 2006 | 115056 | 77445 | 106028 | 126100 | 3235 | 11051 | 698 | 20 | 227 | 333768 | 439796 | 20 |
| 2007 | 76520 | 90151 | 145764 | 108498 | 1370 | 15162 | 300 | 766 | 238 | 293005 | 438769 | 23 |
| 2008 | 156071 | 96252 | 50390 | 57000 | 821 | 155 | 848 | 204 | 164 | 311515 | 361905 | 28 |
| 2009 | 94654 | 89652 | 71129 | 85944 | 3967 | 322 | 628 | 191 | 35 | 275391 | 346521 | 20 |
| 2010 | 104404 | 128429 | 117453 | 78639 | 2024 | 403 | 913 | 137 | 30 | 314979 | 432432 | 20 |

Table 5. Greenland halibut (*Reinhardtius hippoglossoides*). Biomass indices (tons) for West Greenland with 95% confidence limits in percent of the stratified mean. () incomplete coverage of survey area. The 2005 to 2010 estimates are adjusted for changes in trawl gear.

| Year | 1AN | 1AS | 1AX | 1BN | 1BS | 1C | 1D | 1E | 1F | Westgr-1AX | Westgr. | CI |
|------|-------|------|-------|-------|------|------|-----|-----|-----|------------|---------|----|
| 1990 | 1844 | 697 | * | 3602 | 3 | 305 | 126 | * | * | (6578) | 23 | |
| 1991 | 1213 | 612 | 2510 | 2842 | 280 | 194 | 238 | * | * | 5379 | (7889) | 26 |
| 1992 | 3516 | 785 | 4992 | 4203 | 402 | 206 | 97 | 48 | 0 | 9258 | 14250 | 22 |
| 1993 | 2483 | 1286 | 2507 | 4255 | 747 | 595 | 539 | 333 | 60 | 10297 | 12804 | 27 |
| 1994 | 2007 | 1697 | 3598 | 4748 | 1665 | 1458 | 91 | 10 | 25 | 11601 | 15199 | 26 |
| 1995 | 4367 | 1291 | 5786 | 2567 | 825 | 971 | 502 | 12 | 45 | 10579 | 16365 | 51 |
| 1996 | 3682 | 1294 | 8593 | 5496 | 439 | 1248 | 899 | 9 | 118 | 13185 | 21778 | 22 |
| 1997 | 4972 | 1746 | 6456 | 4929 | 421 | 1754 | 180 | 25 | 84 | 14111 | 20567 | 29 |
| 1998 | 7025 | 4976 | 11874 | 2821 | 1724 | 863 | 275 | 117 | 278 | 18081 | 29955 | 35 |
| 1999 | 10205 | 6025 | 8060 | 5224 | 555 | 778 | 261 | 48 | 318 | 23413 | 31473 | 44 |
| 2000 | 3411 | 1713 | 9537 | 3985 | 454 | 692 | 567 | 38 | 280 | 11138 | 20676 | 30 |
| 2001 | 8433 | 2478 | 10161 | 3802 | 278 | 1208 | 289 | 33 | 443 | 16965 | 27126 | 32 |
| 2002 | 6158 | 2067 | 9070 | 3108 | 779 | 737 | 670 | 39 | 402 | 13985 | 23055 | 40 |
| 2003 | 8297 | 3399 | 16556 | 5693 | 478 | 589 | 297 | 4 | 355 | 19112 | 35668 | 28 |
| 2004 | 15182 | 2079 | 28229 | 11755 | 1147 | 420 | 319 | 2 | 201 | 31103 | 59332 | 36 |
| 2005 | 10188 | 6961 | 17112 | 8788 | 287 | 563 | 137 | 53 | 240 | 27217 | 44329 | 32 |
| 2006 | 9303 | 4800 | 16538 | 7320 | 402 | 2512 | 61 | 0 | 128 | 24526 | 41064 | 26 |
| 2007 | 6082 | 6296 | 12166 | 3842 | 98 | 2349 | 2 | 29 | 122 | 18820 | 30986 | 30 |
| 2008 | 13548 | 2754 | 9140 | 3833 | 114 | 84 | 95 | 22 | 68 | 20519 | 29659 | 30 |
| 2009 | 10563 | 1866 | 9456 | 3986 | 228 | 135 | 70 | 9 | 12 | 16868 | 26324 | 27 |
| 2010 | 12917 | 4667 | 12193 | 4427 | 271 | 26 | 148 | 1 | 30 | 22487 | 34680 | 25 |

Table 6. Redfish (*Sebastes sp.*). Abundance indices ('1000) for West Greenland with 95% confidence limits in percent of the stratified mean. The 2005 to 2010 estimates are adjusted for changes in trawl gear.

| Year | 1AN | 1AS | 1AX | 1BN | 1BS | 1C | 1D | 1E | 1F | Westgr. | CI |
|------|-------|--------|-------|---------|--------|--------|--------|-------|--------|---------|----|
| 1992 | 751 | 145500 | 9118 | 1006000 | 187300 | 69150 | 34430 | 6308 | 4165 | 1462000 | 32 |
| 1993 | 3704 | 210200 | 17270 | 360500 | 21480 | 156800 | 182000 | 96790 | 519600 | 1568000 | 69 |
| 1994 | 12270 | 187100 | 11510 | 1573000 | 224700 | 273000 | 85430 | 9477 | 84390 | 2461000 | 26 |
| 1995 | 843 | 67040 | 11140 | 559000 | 33370 | 182700 | 93020 | 4563 | 4960 | 956600 | 23 |
| 1996 | 998 | 7725 | 8186 | 1688000 | 59270 | 123900 | 62840 | 11370 | 53980 | 2016500 | 29 |
| 1997 | 5257 | 43260 | 6715 | 348000 | 58220 | 156300 | 56610 | 22930 | 21920 | 719300 | 24 |
| 1998 | 492 | 23670 | 19830 | 235800 | 14580 | 115000 | 70680 | 9908 | 31700 | 521600 | 24 |
| 1999 | 2302 | 69440 | 9249 | 287000 | 11180 | 10700 | 60880 | 4172 | 22710 | 573900 | 21 |
| 2000 | 0 | 27120 | 6044 | 26520 | 31570 | 27600 | 10120 | 17880 | 159256 | 165300 | 23 |
| 2001 | 2295 | 76470 | 2586 | 24970 | 15380 | 20380 | 12020 | 1179 | 180314 | 182900 | 60 |
| 2002 | 645 | 23050 | 1118 | 50390 | 83760 | 42470 | 44440 | 1677 | 9661 | 257200 | 27 |
| 2003 | 2142 | 44840 | 1625 | 210300 | 32320 | 78980 | 25340 | 1887 | 25560 | 423000 | 23 |
| 2004 | 2353 | 10820 | 824 | 52040 | 38800 | 46740 | 30190 | 1806 | 68990 | 252600 | 37 |
| 2005 | 404 | 20786 | 647 | 32579 | 37289 | 34709 | 112661 | 4575 | 40513 | 182780 | 30 |
| 2006 | 2887 | 20134 | 752 | 50143 | 22288 | 56812 | 8383 | 1847 | 6655 | 169861 | 26 |
| 2007 | 977 | 24732 | 92 | 45537 | 19122 | 19338 | 2738 | 1507 | 9187 | 123230 | 38 |
| 2008 | 1171 | 20558 | 793 | 55278 | 19642 | 7305 | 1441 | 807 | 5950 | 112945 | 47 |
| 2009 | 891 | 15696 | 453 | 43153 | 11480 | 5516 | 525 | 1275 | 4687 | 83675 | 29 |
| 2010 | 2348 | 11697 | 274 | 30877 | 24527 | 6640 | 3104 | 2174 | 3710 | 85352 | 59 |

Table 7. Redfish (*Sebastes sp.*). Biomass indices (tons) for West Greenland with 95% confidence limits in percent of the stratified mean. () incomplete coverage of survey area. The 2005 to 2010 estimates are adjusted for changes in trawl gear.

| Year | 1AN | 1AS | 1AX | 1BN | 1BS | 1C | 1D | 1E | 1F | Westgr-1AX | Westgr. | CI |
|------|-----|-------|------|-------|------|------|------|------|------|------------|---------|----|
| 1990 | 90 | 2789 | * | 6951 | 28 | 1890 | 725 | * | * | (12473) | 20 | |
| 1991 | 117 | 447 | 373 | 13781 | 1072 | 1175 | 2222 | * | * | 18814 | (19187) | 24 |
| 1992 | 69 | 18117 | 437 | 13423 | 2832 | 1576 | 1124 | 169 | 147 | 37457 | 37894 | 43 |
| 1993 | 195 | 4994 | 710 | 6420 | 300 | 1549 | 3835 | 1923 | 2138 | 21355 | 22065 | 38 |
| 1994 | 590 | 5076 | 538 | 16064 | 1986 | 3886 | 995 | 179 | 1272 | 30048 | 30586 | 24 |
| 1995 | 52 | 1585 | 775 | 5029 | 869 | 2963 | 1952 | 358 | 123 | 12930 | 13705 | 22 |
| 1996 | 18 | 117 | 782 | 12178 | 1694 | 2552 | 1980 | 304 | 1788 | 20631 | 21413 | 28 |
| 1997 | 599 | 1481 | 337 | 4913 | 1597 | 6766 | 1901 | 1099 | 1229 | 19585 | 19922 | 31 |
| 1998 | 39 | 1467 | 1423 | 6193 | 2130 | 3274 | 1953 | 606 | 1198 | 16860 | 18283 | 22 |
| 1999 | 164 | 4021 | 742 | 5596 | 999 | 2742 | 2976 | 207 | 1124 | 17929 | 18671 | 25 |
| 2000 | 0 | 1790 | 793 | 1045 | 2185 | 2337 | 463 | 2411 | 1214 | 11444 | 12237 | 36 |
| 2001 | 192 | 5380 | 536 | 1746 | 1460 | 2637 | 1069 | 60 | 2256 | 14801 | 15337 | 50 |
| 2002 | 55 | 1917 | 397 | 2536 | 2386 | 1676 | 2654 | 272 | 998 | 12494 | 12891 | 28 |
| 2003 | 279 | 2886 | 702 | 6357 | 2319 | 6185 | 1918 | 187 | 2476 | 22606 | 23308 | 32 |
| 2004 | 369 | 462 | 368 | 2210 | 2274 | 2996 | 1679 | 101 | 1026 | 11118 | 11486 | 41 |
| 2005 | 74 | 1091 | 575 | 1429 | 3212 | 2285 | 1270 | 506 | 1700 | 11567 | 12141 | 37 |
| 2006 | 444 | 1268 | 926 | 2038 | 2131 | 3652 | 497 | 525 | 1409 | 11965 | 12891 | 36 |
| 2007 | 99 | 1691 | 95 | 2791 | 844 | 1984 | 218 | 230 | 944 | 8800 | 8895 | 35 |
| 2008 | 242 | 1108 | 123 | 3187 | 2388 | 937 | 137 | 123 | 1409 | 9532 | 9655 | 54 |
| 2009 | 168 | 1222 | 645 | 2135 | 1639 | 881 | 120 | 227 | 685 | 7076 | 7721 | 35 |
| 2010 | 319 | 1699 | 547 | 2257 | 2416 | 1194 | 417 | 430 | 464 | 9197 | 9744 | 51 |

Table 8. American plaice (*Hippoglossoides platessoides*). Abundance indices ('1000) for West Greenland with 95% confidence limits in percent of the stratified mean. () incomplete coverage of survey area. The 2005 to 2010 estimates are adjusted for changes in trawl gear.

| Year | 1AN | 1AS | 1AX | 1BN | 1BS | 1C | 1D | 1E | 1F | Westgr-1AX | Westgr. | CI |
|------|------|-------|-------|-------|------|-------|-------|------|------|------------|---------|----|
| 1991 | 52 | 803 | 1759 | 1777 | 561 | 2509 | 2688 | * | * | 11078 | (12837) | 31 |
| 1992 | 1399 | 958 | 2762 | 1441 | 604 | 1666 | 1372 | 525 | 59 | 8028 | 10790 | 22 |
| 1993 | 1273 | 1718 | 1200 | 2969 | 780 | 1989 | 1739 | 624 | 938 | 12030 | 13230 | 24 |
| 1994 | 2219 | 3665 | 3338 | 14940 | 6952 | 9501 | 703 | 258 | 485 | 38682 | 42020 | 32 |
| 1995 | 962 | 551 | 1833 | 6340 | 945 | 2681 | 2988 | 332 | 532 | 15327 | 17160 | 29 |
| 1996 | 1631 | 3390 | 7318 | 4593 | 1676 | 4198 | 3055 | 114 | 670 | 19322 | 26640 | 18 |
| 1997 | 6576 | 1961 | 2662 | 15130 | 1046 | 10370 | 2017 | 335 | 699 | 38128 | 40790 | 47 |
| 1998 | 1648 | 1912 | 2378 | 3551 | 1177 | 1541 | 6402 | 921 | 5640 | 22792 | 25170 | 27 |
| 1999 | 493 | 1659 | 2010 | 6809 | 1165 | 5319 | 1933 | 990 | 557 | 18930 | 20940 | 18 |
| 2000 | 1829 | 4838 | 6737 | 14750 | 1892 | 3519 | 3820 | 529 | 543 | 31713 | 38450 | 23 |
| 2001 | 1295 | 1253 | 2191 | 13640 | 1493 | 3457 | 2261 | 592 | 582 | 24579 | 26770 | 31 |
| 2002 | 0 | 3823 | 4734 | 8807 | 1777 | 5097 | 31840 | 1537 | 1849 | 54726 | 59460 | 49 |
| 2003 | 2167 | 5239 | 5544 | 25650 | 1564 | 13690 | 15030 | 799 | 1970 | 66106 | 71650 | 22 |
| 2004 | 719 | 1423 | 5302 | 11890 | 2801 | 10210 | 8869 | 584 | 1621 | 38108 | 43410 | 27 |
| 2005 | 719 | 4035 | 3563 | 17447 | 5065 | 20533 | 6739 | 1707 | 2145 | 58392 | 61955 | 20 |
| 2006 | 892 | 6680 | 5480 | 13957 | 2939 | 10414 | 4721 | 1148 | 1649 | 42400 | 47879 | 17 |
| 2007 | 319 | 4555 | 3855 | 11973 | 3094 | 9048 | 3675 | 749 | 1089 | 34503 | 38358 | 20 |
| 2008 | 1276 | 3466 | 2326 | 9021 | 662 | 3555 | 4021 | 387 | 494 | 22882 | 25209 | 17 |
| 2009 | 1479 | 5431 | 10833 | 13604 | 1571 | 3815 | 2254 | 327 | 621 | 29102 | 39935 | 28 |
| 2010 | 1041 | 12128 | 6654 | 14983 | 2377 | 10658 | 6461 | 378 | 646 | 48672 | 55326 | 18 |

Table 9. American plaice (*Hippoglossoides platessoides*). Biomass indices (tons) for West Greenland with 95% confidence limits in percent of the stratified mean. () incomplete coverage of survey area. The 2005 to 2010 estimates are adjusted for changes in trawl gear.

| Year | 1AN | 1AS | 1AX | 1BN | 1BS | 1C | 1D | 1E | 1F | Westgr-1AX | Westgr. | CI |
|------|-----|-----|-----|------|-----|------|------|-----|-----|------------|---------|----|
| 1990 | 0 | 2 | * | 15 | 7 | 60 | 142 | * | * | (226) | 38 | |
| 1991 | 3 | 23 | 143 | 72 | 61 | 117 | 311 | * | * | 587 | (730) | 28 |
| 1992 | 57 | 54 | 213 | 78 | 51 | 137 | 128 | 55 | 6 | 566 | 779 | 23 |
| 1993 | 56 | 72 | 87 | 90 | 28 | 107 | 141 | 69 | 43 | 607 | 694 | 26 |
| 1994 | 112 | 293 | 277 | 487 | 308 | 284 | 60 | 22 | 64 | 1629 | 1906 | 22 |
| 1995 | 65 | 54 | 279 | 191 | 51 | 87 | 130 | 19 | 18 | 616 | 895 | 18 |
| 1996 | 119 | 264 | 670 | 231 | 74 | 142 | 119 | 7 | 27 | 984 | 1654 | 18 |
| 1997 | 323 | 150 | 287 | 398 | 87 | 367 | 135 | 31 | 25 | 1516 | 1803 | 21 |
| 1998 | 154 | 178 | 328 | 185 | 48 | 82 | 398 | 97 | 102 | 1245 | 1573 | 20 |
| 1999 | 81 | 136 | 170 | 287 | 43 | 202 | 145 | 65 | 44 | 1003 | 1173 | 17 |
| 2000 | 175 | 278 | 408 | 551 | 74 | 178 | 227 | 89 | 40 | 1613 | 2021 | 18 |
| 2001 | 169 | 79 | 140 | 403 | 65 | 162 | 153 | 38 | 67 | 1136 | 1276 | 17 |
| 2002 | 0 | 184 | 327 | 414 | 151 | 275 | 1061 | 92 | 67 | 2243 | 2570 | 23 |
| 2003 | 196 | 352 | 338 | 1013 | 125 | 680 | 1048 | 59 | 171 | 3642 | 3980 | 20 |
| 2004 | 138 | 143 | 192 | 537 | 128 | 715 | 747 | 38 | 150 | 2597 | 2789 | 27 |
| 2005 | 106 | 453 | 466 | 1079 | 383 | 1401 | 816 | 124 | 236 | 4598 | 5065 | 17 |
| 2006 | 162 | 346 | 679 | 1079 | 232 | 1058 | 515 | 112 | 153 | 3658 | 4337 | 17 |
| 2007 | 51 | 325 | 410 | 813 | 265 | 762 | 295 | 67 | 125 | 2703 | 3112 | 19 |
| 2008 | 215 | 255 | 238 | 679 | 82 | 300 | 362 | 40 | 61 | 1993 | 2231 | 16 |
| 2009 | 197 | 226 | 454 | 693 | 162 | 311 | 261 | 30 | 36 | 1916 | 2370 | 16 |
| 2010 | 101 | 486 | 624 | 831 | 280 | 734 | 474 | 31 | 68 | 3006 | 3630 | 19 |

Table 10. Atlantic wolffish (*Anarhichas lupus*). Abundance indices ('1000) for West Greenland with 95% confidence limits in percent of the stratified mean. The 2005 to 2010 estimates are adjusted for changes in trawl gear.

| Year | 1AN | 1AS | 1AX | 1BN | 1BS | 1C | 1D | 1E | 1F | Westgr-1AX | Westgr. | CI |
|------|-----|------|-----|------|-----|------|------|------|------|------------|---------|----|
| 1992 | 0 | 37 | 0 | 30 | 104 | 263 | 99 | 131 | 138 | 803 | 803 | 33 |
| 1993 | 0 | 28 | 49 | 26 | 27 | 239 | 189 | 344 | 324 | 1177 | 1226 | 41 |
| 1994 | 0 | 63 | 20 | 332 | 179 | 1940 | 366 | 361 | 1628 | 4869 | 4889 | 36 |
| 1995 | 0 | 7 | 0 | 86 | 129 | 351 | 87 | 412 | 231 | 1304 | 1304 | 34 |
| 1996 | 0 | 62 | 5 | 87 | 63 | 424 | 224 | 568 | 610 | 2038 | 2043 | 50 |
| 1997 | 0 | 30 | 0 | 169 | 30 | 807 | 239 | 280 | 119 | 1673 | 1673 | 28 |
| 1998 | 0 | 251 | 6 | 346 | 93 | 717 | 371 | 467 | 726 | 2970 | 2976 | 30 |
| 1999 | 0 | 150 | 110 | 132 | 145 | 407 | 190 | 418 | 415 | 1857 | 1967 | 44 |
| 2000 | 0 | 542 | 87 | 327 | 414 | 369 | 558 | 1729 | 47 | 3886 | 3973 | 69 |
| 2001 | 0 | 137 | 162 | 358 | 55 | 156 | 365 | 228 | 67 | 1365 | 1527 | 40 |
| 2002 | 0 | 375 | 96 | 496 | 12 | 945 | 588 | 1057 | 537 | 4010 | 4106 | 33 |
| 2003 | 0 | 135 | 591 | 2339 | 190 | 1545 | 538 | 2329 | 1108 | 8184 | 8775 | 27 |
| 2004 | 0 | 86 | 262 | 1556 | 941 | 236 | 274 | 703 | 305 | 4101 | 4363 | 39 |
| 2005 | 0 | 274 | 36 | 726 | 289 | 3838 | 1205 | 2684 | 1106 | 10120 | 10156 | 44 |
| 2006 | 112 | 591 | 60 | 641 | 125 | 1428 | 713 | 628 | 1593 | 5833 | 5893 | 22 |
| 2007 | 0 | 317 | 108 | 797 | 211 | 321 | 173 | 184 | 332 | 2335 | 2443 | 19 |
| 2008 | 0 | 385 | 271 | 314 | 182 | 503 | 213 | 213 | 147 | 1957 | 2227 | 20 |
| 2009 | 74 | 415 | 185 | 472 | 127 | 787 | 97 | 514 | 194 | 2681 | 2867 | 35 |
| 2010 | 396 | 1051 | 110 | 1095 | 109 | 1598 | 361 | 434 | 277 | 5321 | 5431 | 24 |

Table 11. Atlantic wolffish (*Anarhichas lupus*). Biomass indices (tons) for West Greenland with 95% confidence limits in percent of the stratified mean. The 2005 to 2010 estimates are adjusted for changes in trawl gear.

| Year | 1AN | 1AS | 1AX | 1BN | 1BS | 1C | 1D | 1E | 1F | Westgr-1AX | Westgr. | CI |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------------|---------|----|
| 1992 | 0 | 7 | 0 | 8 | 21 | 47 | 22 | 28 | 31 | 163 | 163 | 33 |
| 1993 | 0 | 5 | 6 | 1 | 2 | 26 | 35 | 29 | 188 | 286 | 292 | 64 |
| 1994 | 0 | 12 | 9 | 40 | 39 | 198 | 30 | 65 | 249 | 635 | 644 | 38 |
| 1995 | 0 | 0 | 0 | 22 | 9 | 38 | 24 | 90 | 36 | 219 | 219 | 40 |
| 1996 | 0 | 1 | 3 | 17 | 23 | 41 | 35 | 103 | 101 | 321 | 324 | 53 |
| 1997 | 0 | 3 | 0 | 21 | 1 | 115 | 16 | 58 | 15 | 228 | 228 | 30 |
| 1998 | 0 | 3 | 2 | 13 | 9 | 60 | 34 | 104 | 133 | 356 | 358 | 38 |
| 1999 | 0 | 4 | 13 | 21 | 12 | 8 | 6 | 202 | 62 | 316 | 329 | 79 |
| 2000 | 0 | 20 | 3 | 52 | 31 | 55 | 54 | 396 | 15 | 623 | 626 | 90 |
| 2001 | 0 | 1 | 3 | 11 | 1 | 16 | 21 | 42 | 23 | 114 | 117 | 40 |
| 2002 | 0 | 9 | 2 | 77 | 5 | 73 | 78 | 216 | 118 | 577 | 579 | 37 |
| 2003 | 0 | 2 | 41 | 267 | 64 | 361 | 60 | 205 | 148 | 1107 | 1148 | 24 |
| 2004 | 0 | 6 | 19 | 160 | 56 | 96 | 21 | 162 | 100 | 601 | 620 | 27 |
| 2005 | 0 | 37 | 9 | 101 | 55 | 826 | 177 | 436 | 380 | 2015 | 2025 | 41 |
| 2006 | 5 | 40 | 87 | 106 | 35 | 242 | 109 | 119 | 653 | 1309 | 1396 | 26 |
| 2007 | 0 | 40 | 10 | 172 | 108 | 79 | 54 | 70 | 242 | 766 | 776 | 19 |
| 2008 | 0 | 32 | 79 | 62 | 19 | 165 | 39 | 64 | 113 | 496 | 576 | 23 |
| 2009 | 4 | 58 | 51 | 115 | 21 | 148 | 47 | 98 | 329 | 822 | 873 | 21 |
| 2010 | 11 | 109 | 56 | 172 | 35 | 341 | 63 | 62 | 166 | 958 | 1014 | 35 |

Table 12. Spotted wolffish (*Anarhichas minor*). Abundance indices ('1000) for West Greenland with 95% confidence limits in percent of the stratified mean. The 2005 to 2010 estimates are adjusted for changes in trawl gear.

| Year | 1AN | 1AS | 1AX | 1BN | 1BS | 1C | 1D | 1E | 1F | Westgr-1AX | Westgr. | CI |
|------|-----|------|-----|------|-----|-----|-----|-----|----|------------|---------|----|
| 1992 | 14 | 74 | 9 | 72 | 11 | 26 | 39 | 18 | 5 | 334 | 268 | 28 |
| 1993 | 0 | 131 | 29 | 50 | 34 | 50 | 22 | 0 | 57 | 343 | 372 | 36 |
| 1994 | 43 | 304 | 0 | 220 | 84 | 387 | 21 | 12 | 42 | 1113 | 1113 | 33 |
| 1995 | 0 | 155 | 7 | 57 | 41 | 37 | 48 | 26 | 30 | 395 | 402 | 22 |
| 1996 | 131 | 109 | 11 | 120 | 31 | 30 | 30 | 0 | 38 | 489 | 500 | 24 |
| 1997 | 94 | 337 | 29 | 247 | 0 | 33 | 58 | 0 | 8 | 778 | 807 | 23 |
| 1998 | 75 | 218 | 0 | 182 | 23 | 21 | 38 | 25 | 4 | 586 | 586 | 25 |
| 1999 | 856 | 313 | 96 | 396 | 60 | 18 | 5 | 0 | 0 | 1649 | 1745 | 42 |
| 2000 | 0 | 794 | 30 | 507 | 140 | 27 | 6 | 93 | 0 | 1568 | 1598 | 28 |
| 2001 | 302 | 356 | 68 | 269 | 40 | 41 | 0 | 0 | 5 | 1013 | 1081 | 27 |
| 2002 | 258 | 2147 | 54 | 362 | 108 | 73 | 75 | 10 | 42 | 1573 | 1196 | 42 |
| 2003 | 505 | 1515 | 205 | 1372 | 39 | 601 | 35 | 0 | 55 | 4123 | 4328 | 24 |
| 2004 | 151 | 743 | 233 | 605 | 3 | 132 | 92 | 39 | 86 | 1621 | 2084 | 30 |
| 2005 | 601 | 823 | 18 | 370 | 60 | 193 | 147 | 102 | 63 | 2360 | 2378 | 23 |
| 2006 | 282 | 568 | 111 | 553 | 124 | 201 | 90 | 26 | 96 | 1940 | 2051 | 24 |
| 2007 | 281 | 524 | 77 | 529 | 195 | 86 | 90 | 25 | 54 | 1784 | 1862 | 29 |
| 2008 | 234 | 367 | 144 | 205 | 17 | 61 | 62 | 20 | 28 | 993 | 1137 | 20 |
| 2009 | 208 | 499 | 128 | 295 | 39 | 11 | 9 | 12 | 40 | 1241 | 1113 | 19 |
| 2010 | 454 | 749 | 158 | 391 | 49 | 108 | 39 | 26 | 93 | 1910 | 2068 | 17 |

Table 13. Spotted wolffish (*Anarhichas minor*). Biomass indices (tons) for West Greenland with 95% confidence limits in percent of the stratified mean. The 2005 to 2010 estimates adjusted for changes in trawl gear.

| Year | 1AN | 1AS | 1AX | 1BN | 1BS | 1C | 1D | 1E | 1F | Westgr-1AX | Westgr. | CI |
|------|------|------|-----|-----|-----|-----|------|-----|-----|------------|---------|-----|
| 1992 | 4 | 76 | 65 | 110 | 3 | 34 | 33 | 6 | 19 | 286 | 351 | 28 |
| 1993 | 55 | 0 | 100 | 47 | 16 | 66 | 4 | 0 | 282 | 471 | 571 | 53 |
| 1994 | 223 | 180 | 0 | 81 | 40 | 119 | 28 | 11 | 1 | 683 | 683 | 25 |
| 1995 | 0 | 60 | 15 | 68 | 16 | 22 | 19 | 11 | 164 | 362 | 377 | 49 |
| 1996 | 169 | 77 | 12 | 193 | 15 | 6 | 31 | 0 | 50 | 542 | 554 | 26 |
| 1997 | 193 | 72 | 37 | 81 | 0 | 16 | 124 | 0 | 5 | 493 | 530 | 34 |
| 1998 | 2 | 64 | 0 | 143 | 18 | 6 | 125 | 100 | 7 | 465 | 465 | 32 |
| 1999 | 131 | 121 | 23 | 28 | 36 | 13 | 2 | 0 | 0 | 331 | 354 | 31 |
| 2000 | 0 | 188 | 31 | 133 | 36 | 19 | 1 | 593 | 0 | 969 | 1000 | 114 |
| 2001 | 523 | 30 | 25 | 310 | 80 | 4 | 0 | 0 | 10 | 957 | 982 | 52 |
| 2002 | 135 | 194 | 20 | 169 | 81 | 74 | 233 | 71 | 126 | 1084 | 1104 | 28 |
| 2003 | 299 | 1416 | 195 | 978 | 22 | 741 | 107 | 0 | 226 | 3790 | 3985 | 22 |
| 2004 | 124 | 1270 | 623 | 567 | 2 | 78 | 603 | 352 | 545 | 3541 | 4164 | 35 |
| 2005 | 739 | 830 | 12 | 509 | 54 | 389 | 1073 | 263 | 106 | 3964 | 3975 | 28 |
| 2006 | 432 | 749 | 204 | 529 | 473 | 566 | 429 | 146 | 525 | 3849 | 4053 | 18 |
| 2007 | 304 | 442 | 284 | 624 | 307 | 362 | 221 | 120 | 326 | 2707 | 2991 | 17 |
| 2008 | 830 | 768 | 143 | 369 | 17 | 91 | 441 | 177 | 173 | 2867 | 3010 | 22 |
| 2009 | 131 | 346 | 555 | 576 | 44 | 21 | 40 | 107 | 98 | 1920 | 1365 | 16 |
| 2010 | 1491 | 848 | 912 | 537 | 71 | 115 | 136 | 103 | 781 | 4084 | 4997 | 17 |

Table 14. Thorny skate (*Amblyraja radiata*). Abundance indices ('1000) for West Greenland with 95% confidence limits in percent of the stratified mean. () incomplete coverage of survey area. The 2005 to 2010 estimates are adjusted for changes in trawl gear.

| Year | 1AN | 1AS | 1AX | 1BN | 1BS | 1C | 1D | 1E | 1F | Westgr-1AX | Westgr. | CI |
|------|------|------|------|------|------|------|------|-----|-----|------------|---------|----|
| 1991 | 389 | 765 | 969 | 1495 | 918 | 526 | 156 | * | * | (4249) | (5218) | 24 |
| 1992 | 2949 | 1323 | 1276 | 1412 | 243 | 610 | 1002 | 141 | 21 | 7699 | 8975 | 25 |
| 1993 | 676 | 356 | 800 | 1630 | 493 | 903 | 470 | 586 | 218 | 5202 | 6131 | 21 |
| 1994 | 1853 | 1799 | 1208 | 3941 | 1837 | 2814 | 394 | 170 | 42 | 12852 | 14060 | 21 |
| 1995 | 2735 | 1295 | 841 | 2762 | 1841 | 656 | 2421 | 453 | 84 | 12249 | 13090 | 26 |
| 1996 | 4564 | 2243 | 1525 | 3974 | 390 | 661 | 577 | 10 | 629 | 13045 | 14570 | 23 |
| 1997 | 4581 | 1431 | 649 | 4422 | 208 | 2279 | 692 | 83 | 43 | 13741 | 14390 | 26 |
| 1998 | 2765 | 4053 | 3187 | 3003 | 348 | 611 | 880 | 396 | 270 | 12323 | 15510 | 25 |
| 1999 | 1675 | 3172 | 868 | 2757 | 276 | 1016 | 818 | 210 | 197 | 10122 | 10990 | 23 |
| 2000 | 2081 | 3394 | 2035 | 4032 | 541 | 607 | 488 | 138 | 563 | 11845 | 13880 | 23 |
| 2001 | 3198 | 1184 | 566 | 2344 | 263 | 429 | 457 | 127 | 215 | 8215 | 8781 | 32 |
| 2002 | 511 | 1132 | 878 | 2150 | 383 | 902 | 2648 | 224 | 479 | 8428 | 9306 | 25 |
| 2003 | 3949 | 2384 | 1385 | 7162 | 86 | 720 | 805 | 186 | 691 | 15975 | 17370 | 26 |
| 2004 | 2468 | 1295 | 1254 | 1236 | 215 | 214 | 722 | 188 | 63 | 6625 | 7879 | 24 |
| 2005 | 960 | 845 | 1159 | 723 | 106 | 166 | 152 | 74 | 74 | 3101 | 4260 | 22 |
| 2006 | 906 | 1473 | 1754 | 577 | 35 | 395 | 700 | 76 | 330 | 4086 | 5840 | 20 |
| 2007 | 692 | 4627 | 760 | 541 | 34 | 254 | 229 | 218 | 90 | 6686 | 7446 | 65 |
| 2008 | 1291 | 302 | 604 | 325 | 36 | 114 | 281 | 28 | 48 | 2424 | 3027 | 27 |
| 2009 | 1924 | 459 | 1691 | 322 | 43 | 80 | 104 | 42 | 81 | 3056 | 4747 | 28 |
| 2010 | 1188 | 918 | 1225 | 755 | 137 | 569 | 288 | 24 | 7 | 3886 | 5111 | 21 |

Table 15. Thorny skate (*Amblyraja radiata*). Biomass (tons) for West Greenland with 95% confidence limits in percent of the stratified mean. () incomplete coverage of survey area. The 2005 to 2010 estimates are adjusted for changes in trawl gear.

| Year | 1AN | 1AS | 1AX | 1BN | 1BS | 1C | 1D | 1E | 1F | Westgr-1AX | Westgr. | CI |
|------|------|------|-----|------|-----|-----|-----|----|-----|------------|---------|----|
| 1990 | 0 | 8 | * | 16 | 1 | 62 | 155 | * | * | (243) | (243) | 51 |
| 1991 | 81 | 363 | 167 | 196 | 113 | 64 | 232 | * | * | 1049 | (1216) | 28 |
| 1992 | 370 | 268 | 162 | 226 | 37 | 57 | 113 | 32 | 5 | 1109 | 1271 | 20 |
| 1993 | 60 | 65 | 199 | 171 | 87 | 116 | 128 | 40 | 22 | 688 | 887 | 24 |
| 1994 | 494 | 283 | 182 | 465 | 275 | 311 | 55 | 61 | 3 | 1947 | 2129 | 23 |
| 1995 | 253 | 227 | 301 | 451 | 327 | 121 | 300 | 78 | 24 | 1782 | 2083 | 21 |
| 1996 | 631 | 554 | 623 | 509 | 61 | 105 | 65 | 0 | 207 | 2131 | 2755 | 23 |
| 1997 | 830 | 411 | 322 | 566 | 56 | 156 | 187 | 25 | 7 | 2237 | 2559 | 26 |
| 1998 | 392 | 839 | 535 | 427 | 78 | 38 | 114 | 81 | 76 | 2045 | 2580 | 26 |
| 1999 | 278 | 931 | 253 | 247 | 45 | 94 | 96 | 25 | 49 | 1766 | 2019 | 34 |
| 2000 | 323 | 1178 | 345 | 428 | 122 | 84 | 120 | 3 | 197 | 2454 | 2799 | 23 |
| 2001 | 325 | 215 | 222 | 248 | 52 | 52 | 89 | 10 | 60 | 1050 | 1272 | 28 |
| 2002 | 13 | 246 | 320 | 280 | 101 | 86 | 687 | 63 | 177 | 1653 | 1973 | 29 |
| 2003 | 1005 | 902 | 567 | 1481 | 11 | 107 | 174 | 24 | 206 | 3909 | 4478 | 25 |
| 2004 | 598 | 520 | 791 | 197 | 47 | 33 | 333 | 98 | 78 | 1903 | 2694 | 23 |
| 2005 | 237 | 339 | 357 | 152 | 33 | 31 | 67 | 21 | 30 | 910 | 1267 | 21 |
| 2006 | 210 | 229 | 289 | 89 | 17 | 80 | 198 | 38 | 88 | 948 | 1237 | 17 |
| 2007 | 202 | 233 | 213 | 145 | 14 | 52 | 39 | 26 | 19 | 731 | 944 | 19 |
| 2008 | 376 | 72 | 181 | 65 | 7 | 12 | 54 | 6 | 10 | 601 | 782 | 28 |
| 2009 | 485 | 192 | 370 | 92 | 14 | 19 | 19 | 16 | 12 | 849 | 1219 | 26 |
| 2010 | 248 | 202 | 322 | 148 | 45 | 92 | 93 | 4 | 5 | 835 | 1157 | 18 |

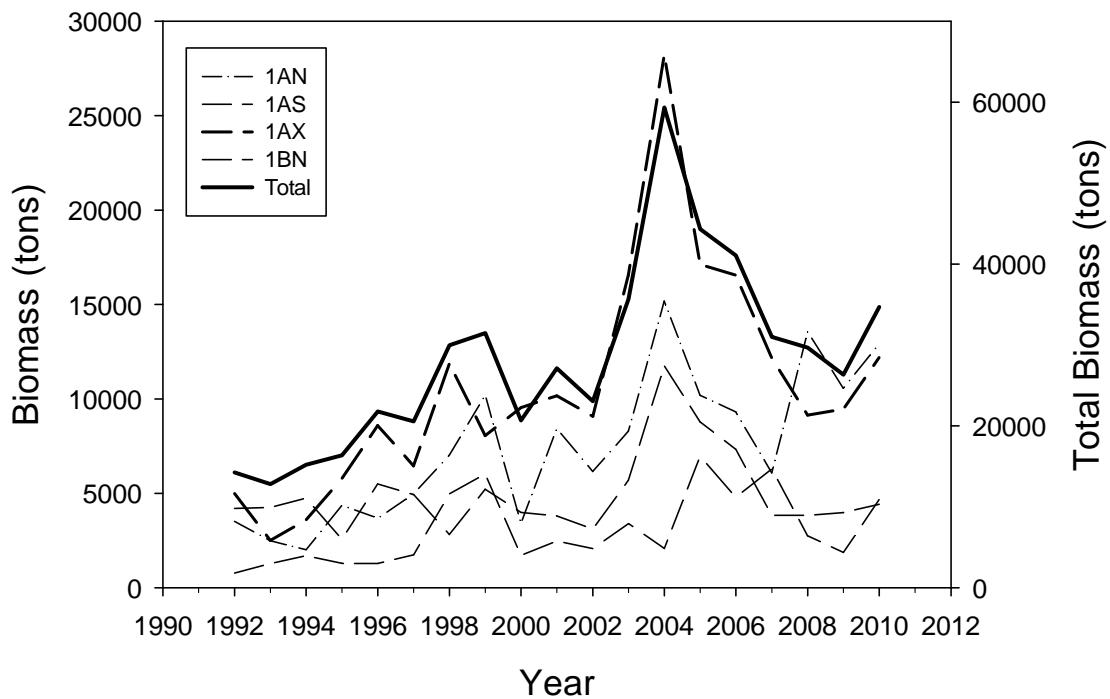


Fig 1. Greenland halibut biomass and biomass by division.

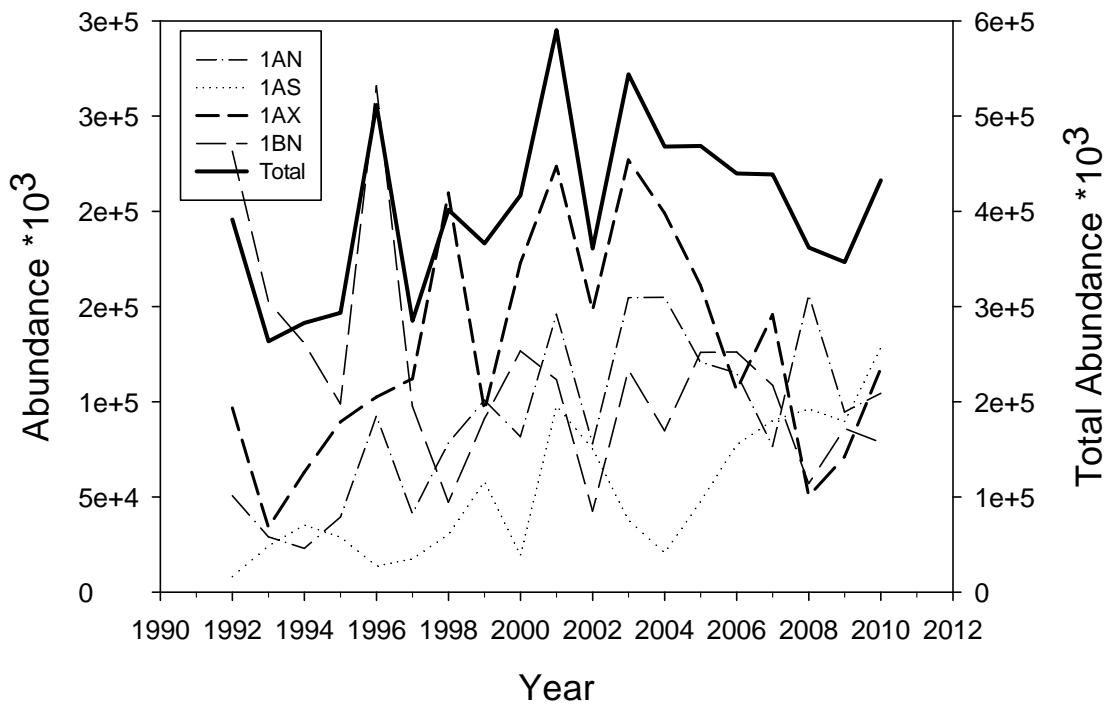


Fig 2. Greenland halibut abundance and abundance by division.

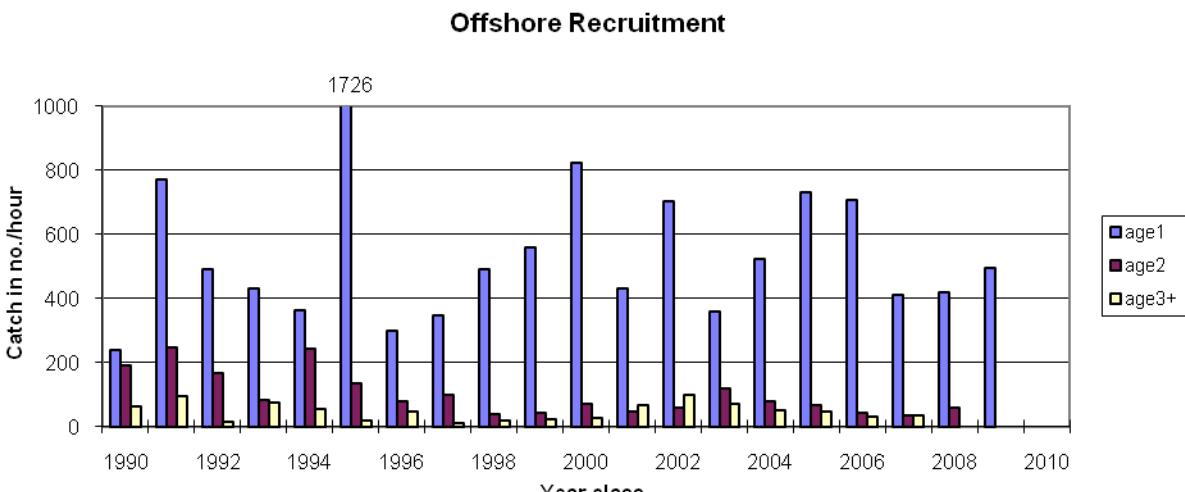


Fig. 3. Catch in number per hour of Greenland halibut at age 1, 2 and 3+ in the offshore nursery area (1AS-1B). The estimates from the 2005 – 2010 surveys are adjusted for changes in trawl gear.

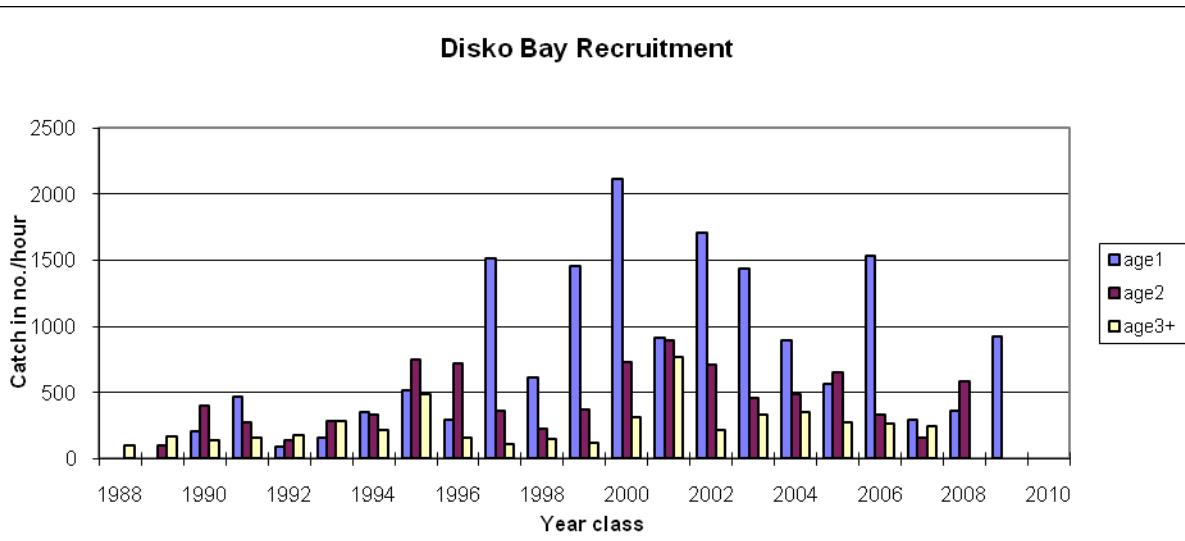


Fig.4. Catch in number per hour of Greenland halibut at age 1, 2 and 3+ in the inshore Disko Bay. The estimates from the 2005 – 2010 surveys are adjusted for changes in trawl gear.

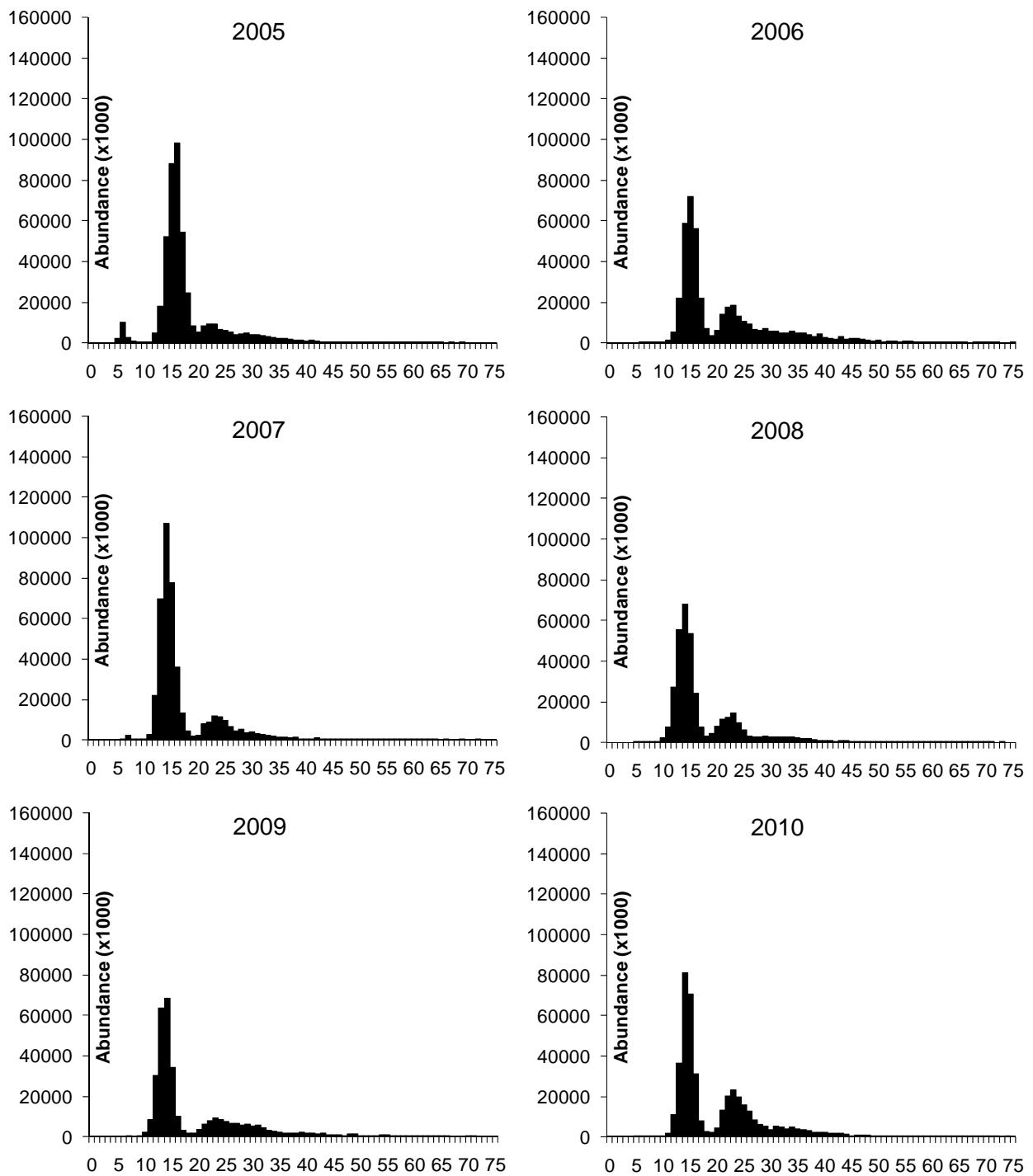


Fig. 5. Greenland halibut (*Reinhardtius hippoglossoides*). Length frequencies for West Greenland.

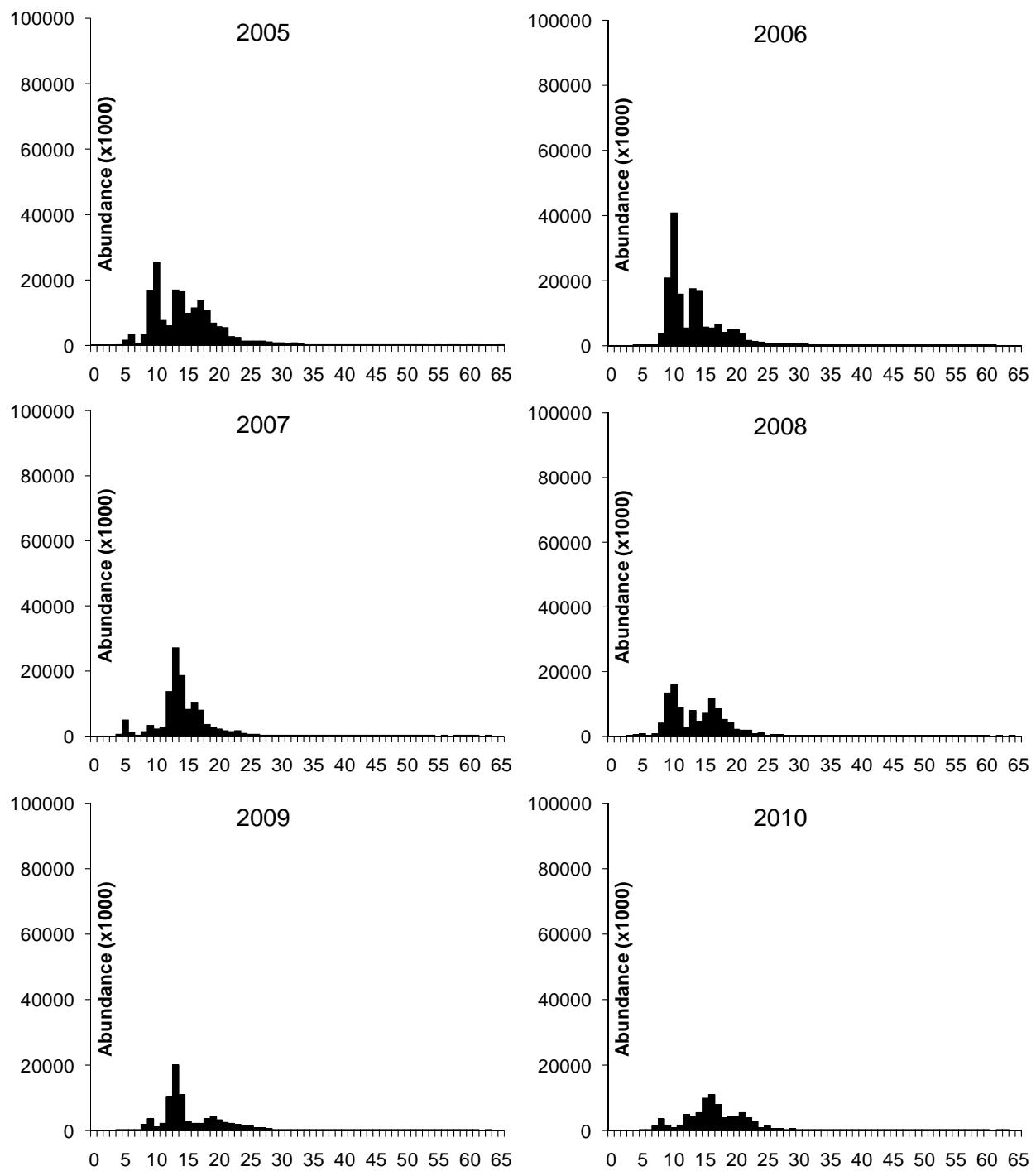


Fig. 6. Redfish (*Sebastodes sp.*). Length frequencies for West Greenland.

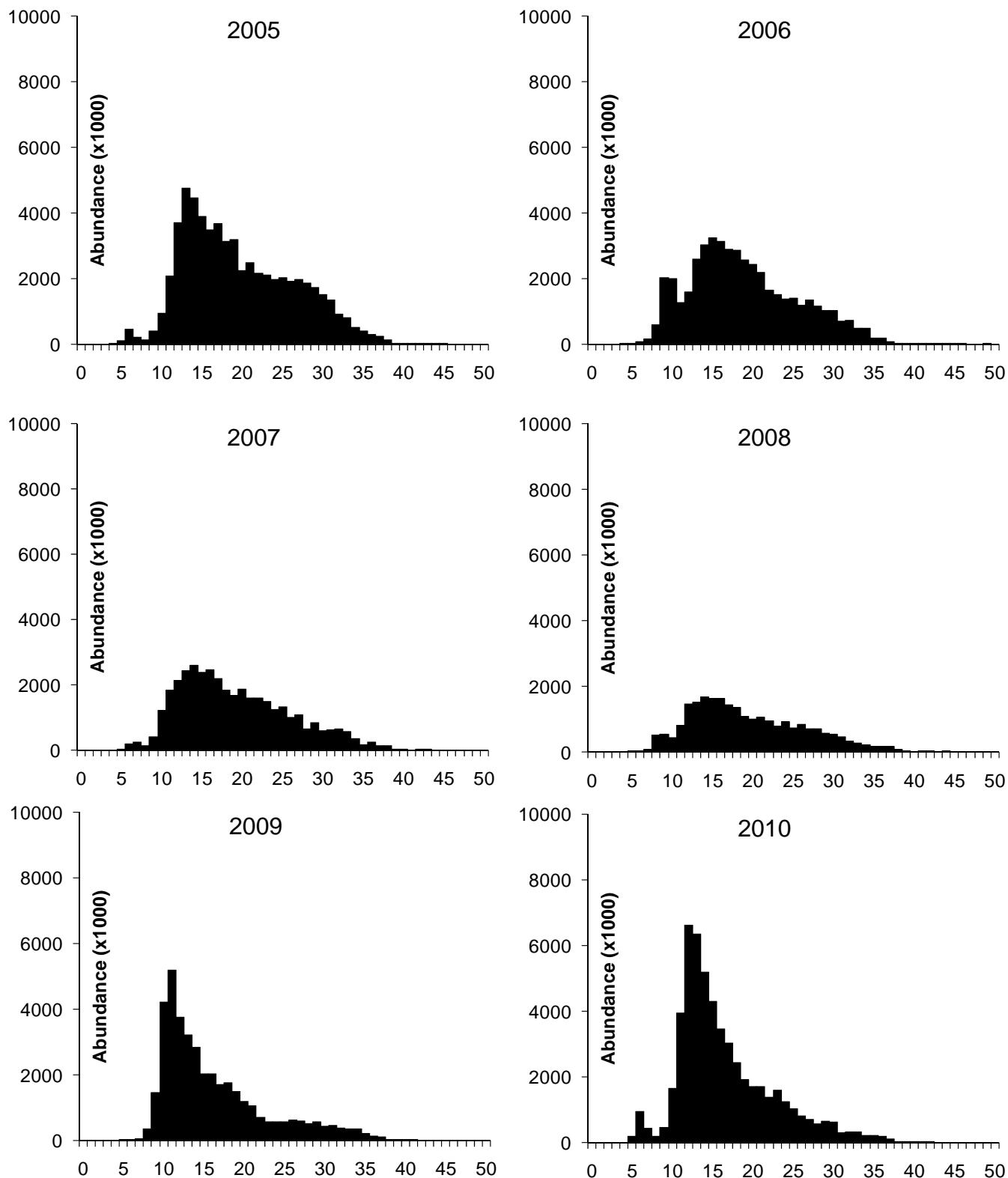


Fig. 7. American plaice (*Hippoglossoides platessoides*). Length frequencies.

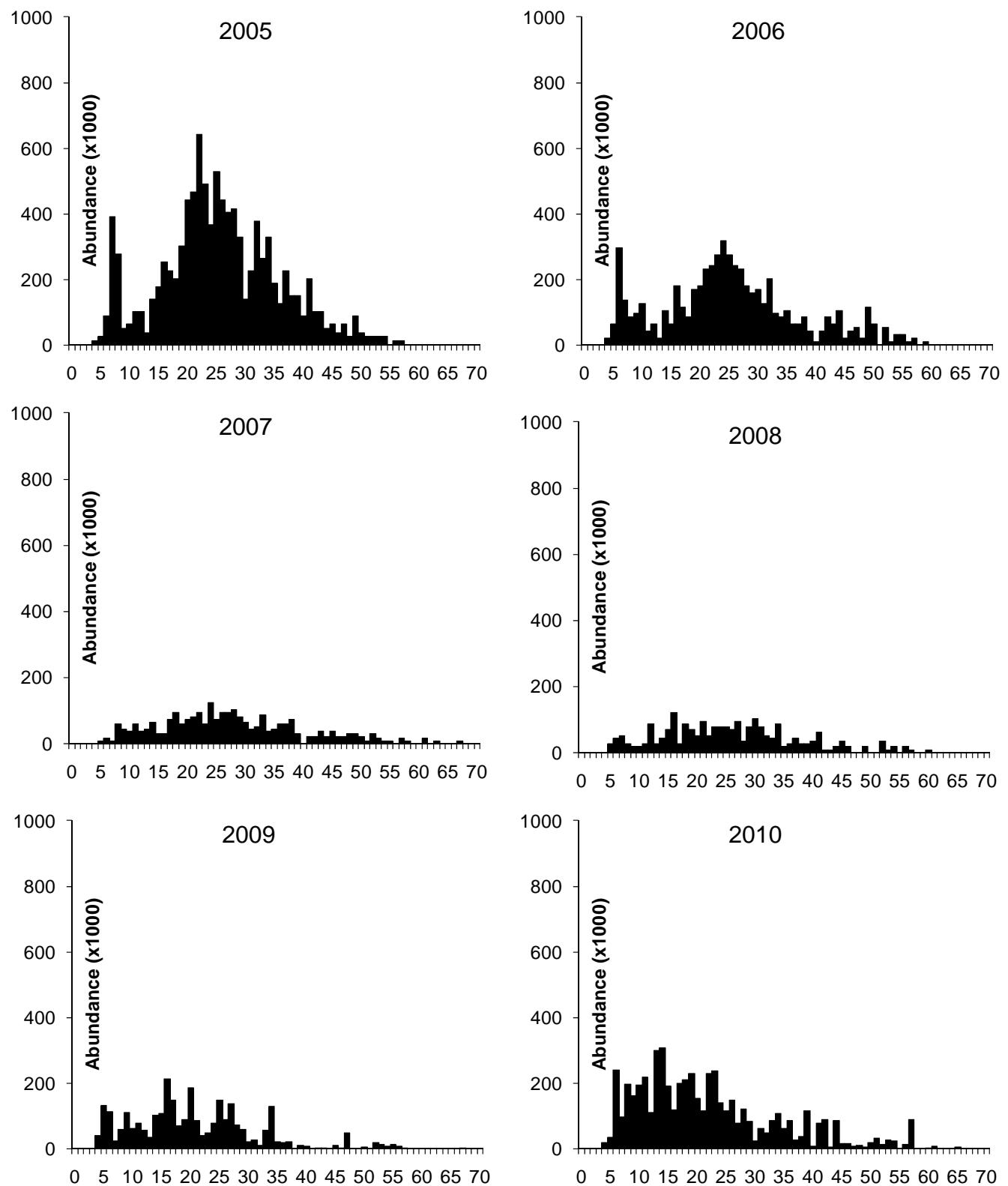


Fig. 8. Atlantic wolffish (*Anarhichas lupus*). Length frequencies for West Greenland 1992-2000.

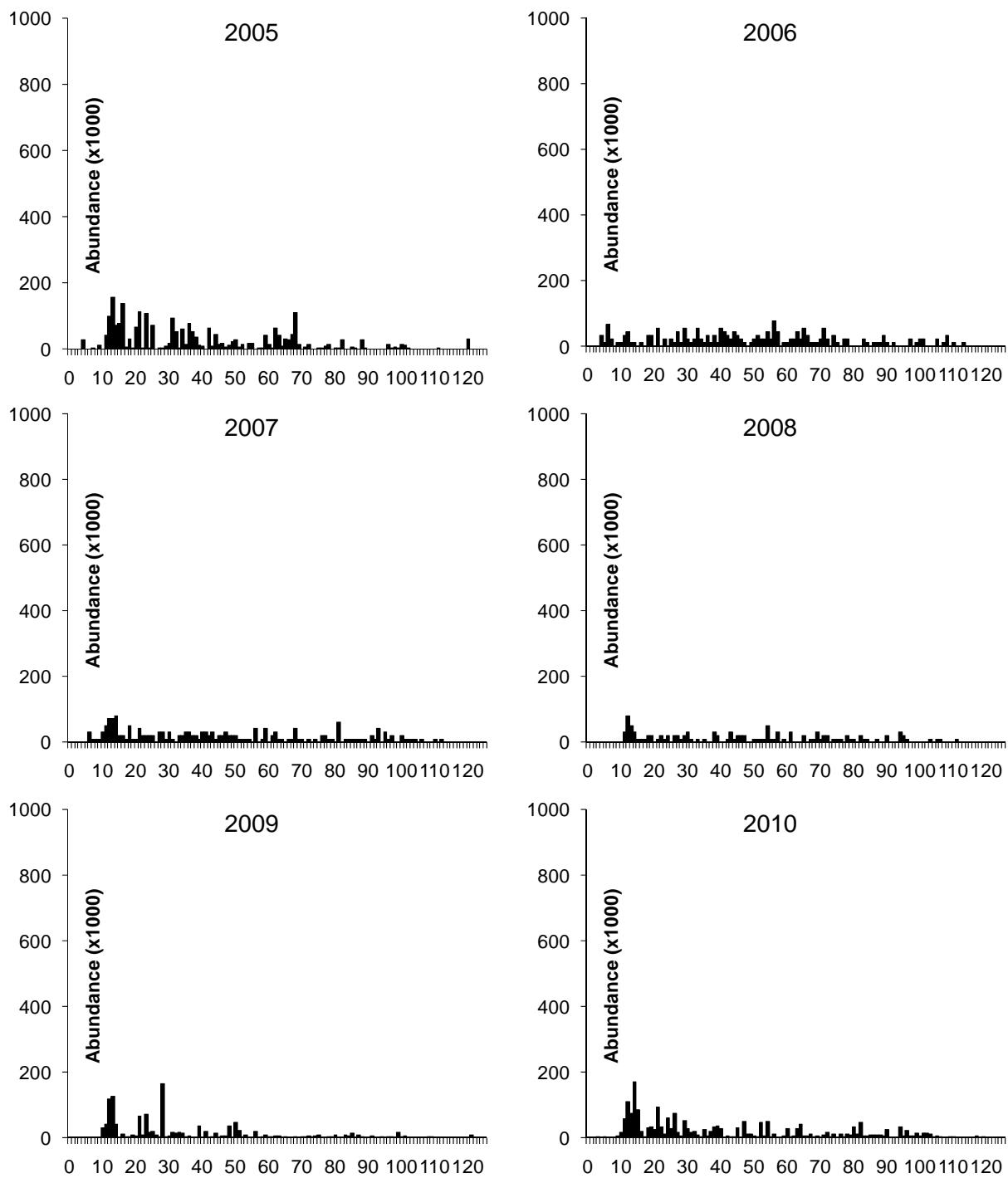


Fig. 9. Spotted wolffish (*Anarhichas lupus*). Length frequencies for West Greenland 2005-2011.

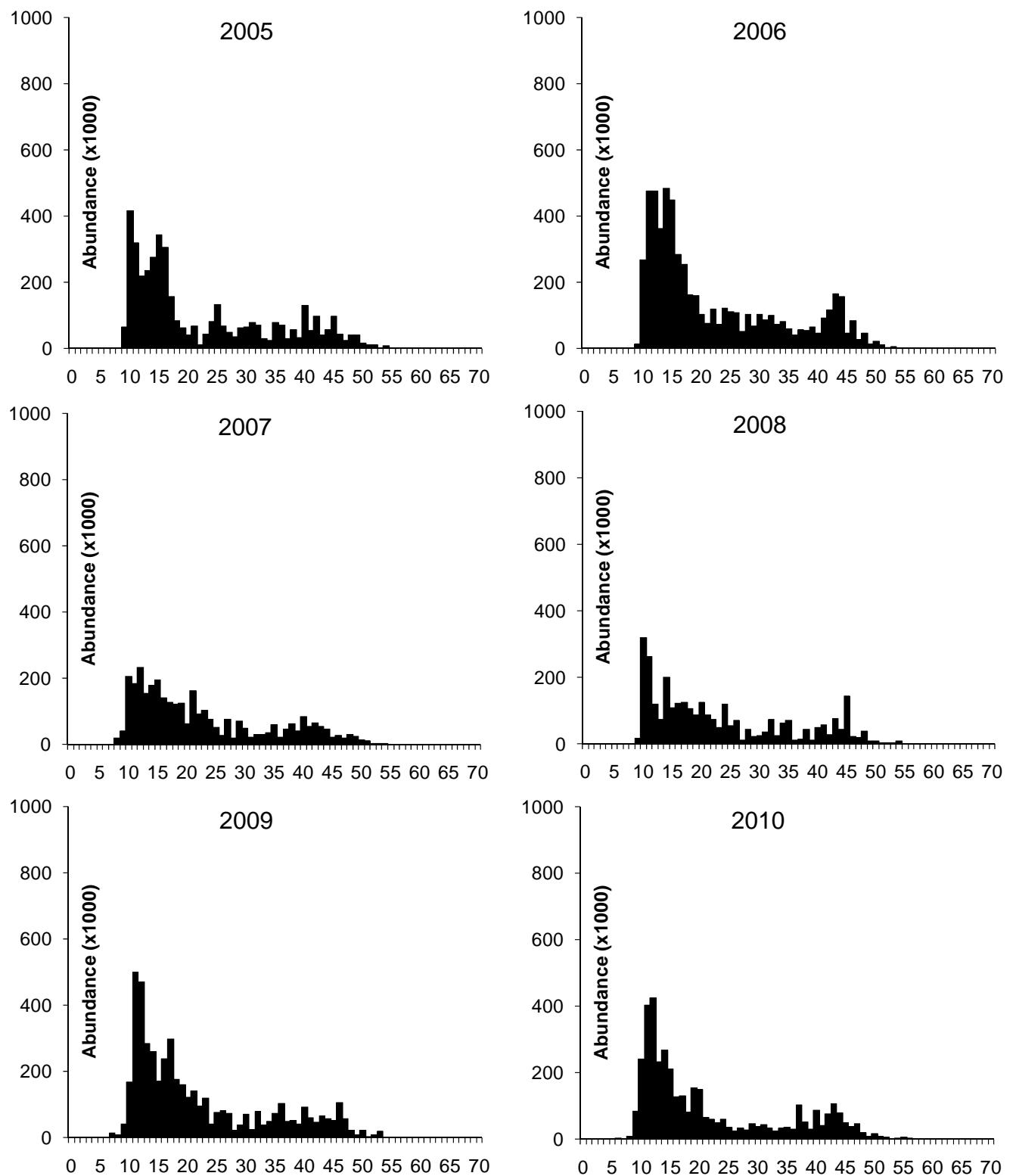


Fig. 10. Thorny skate (*Amblyraja radiata*). Length frequencies for West Greenland 2005-2011.

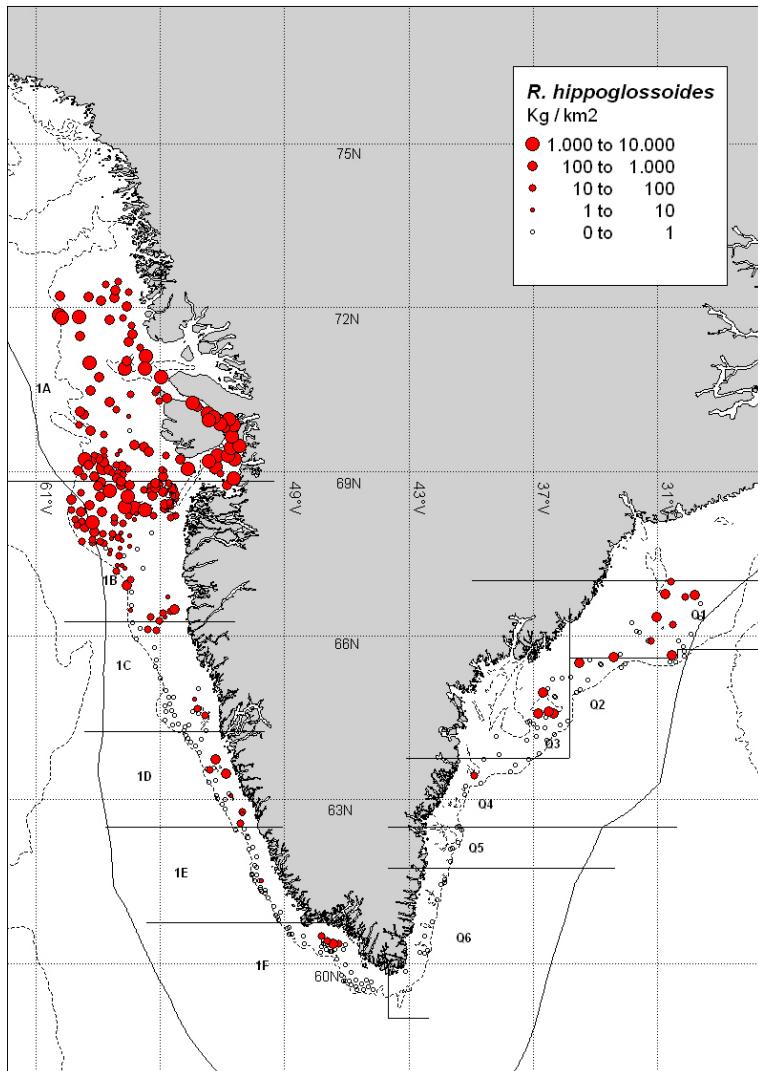


Fig. 11. 2010 Greenland halibut survey biomass in kg / km².

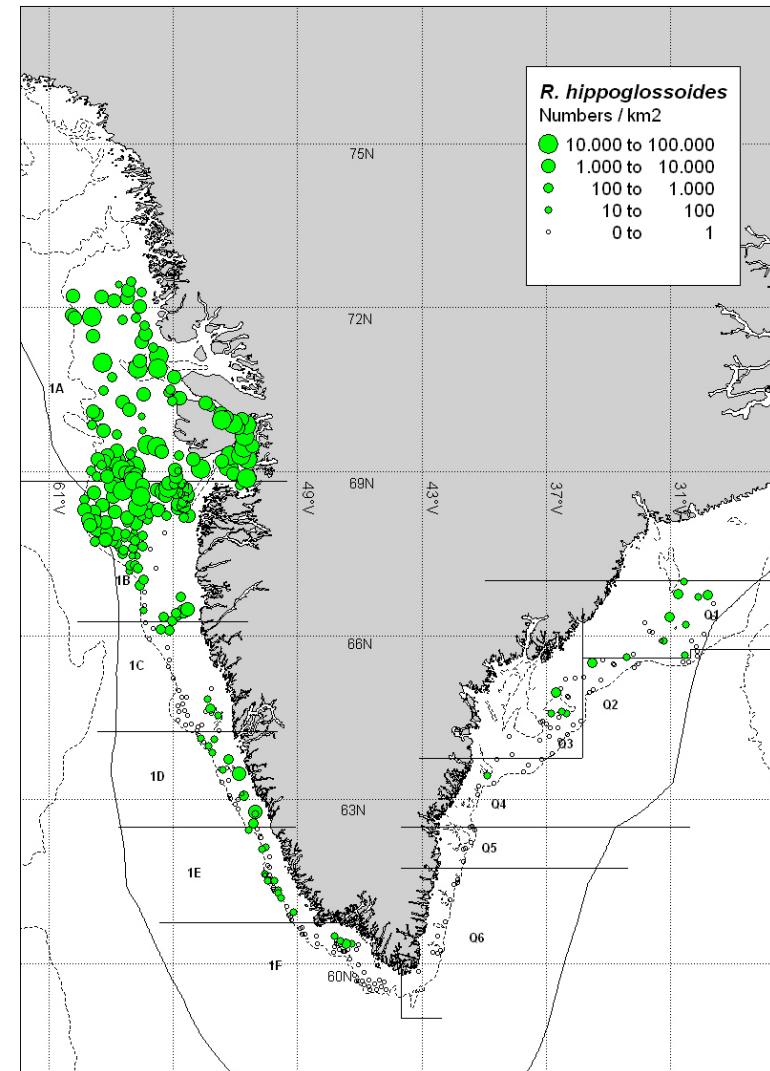


Fig. 12. 2010 Greenland halibut survey abundance in numbers / km².

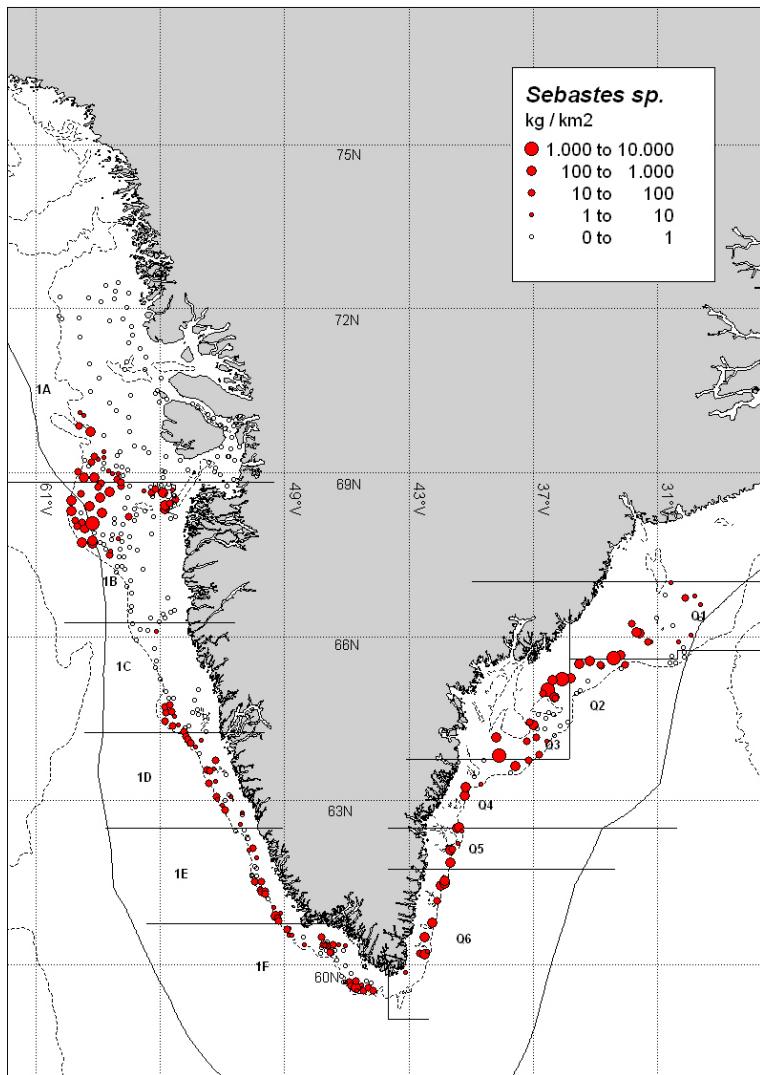


Fig. 13. 2010 Juvenile redfish < 20 cm survey biomass in kg / km².

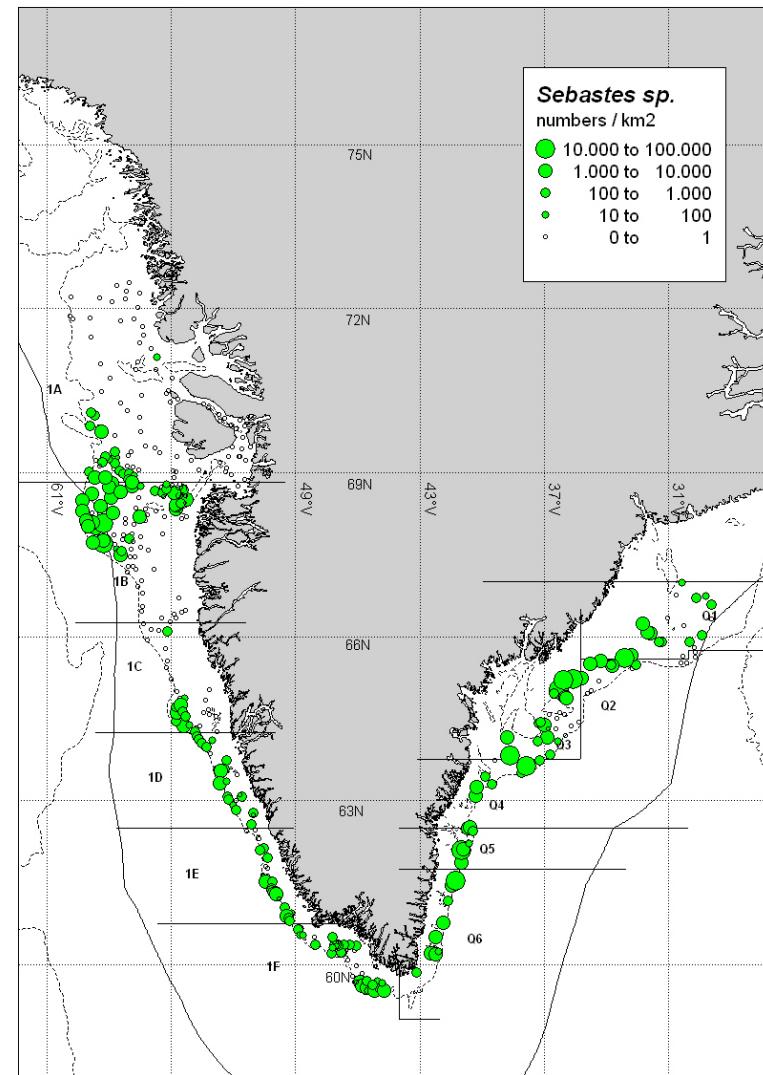


Fig. 14. 2010 Juvenile redfish < 20 cm survey abundance in numbers / km².

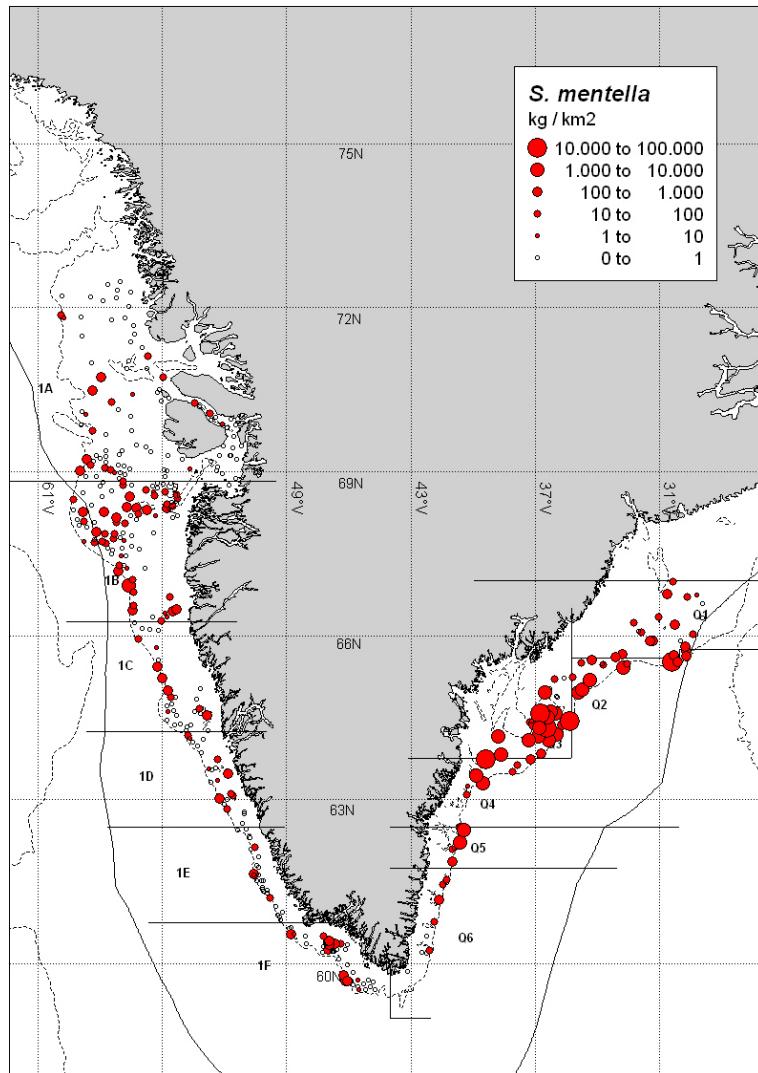


Fig. 15. 2010 Deep-sea redfish survey biomass in kg / km².

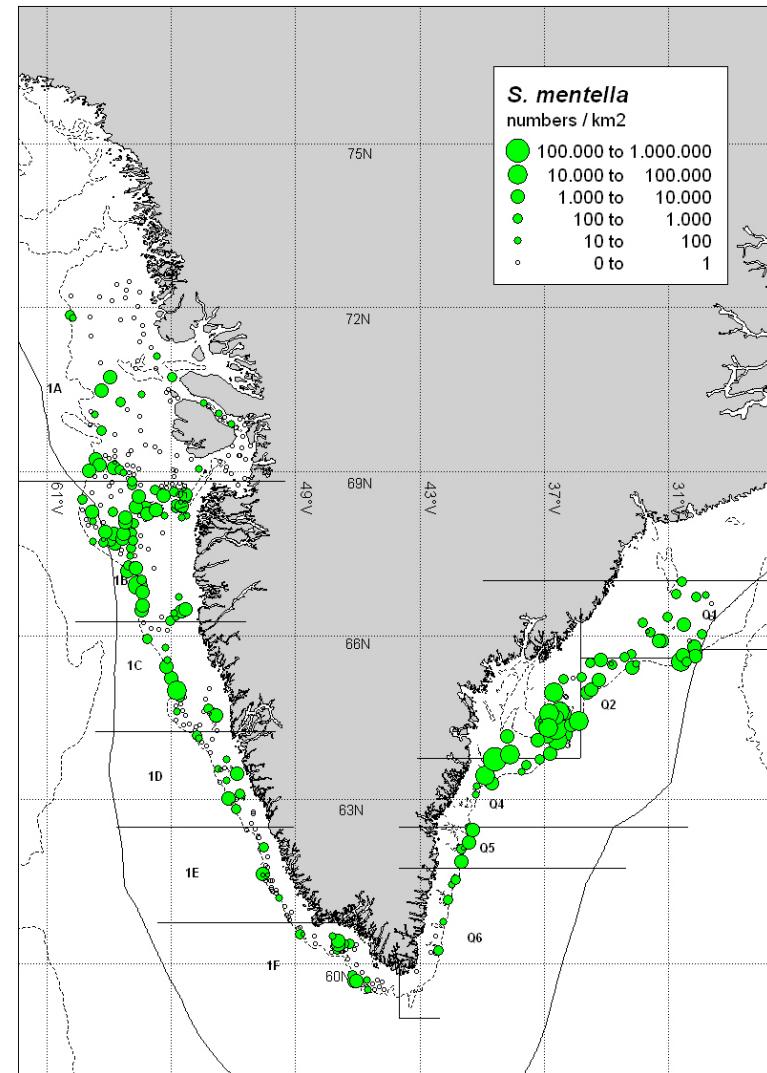


Fig. 16. 2010 Deep sea redfish survey abundance in numbers / km².

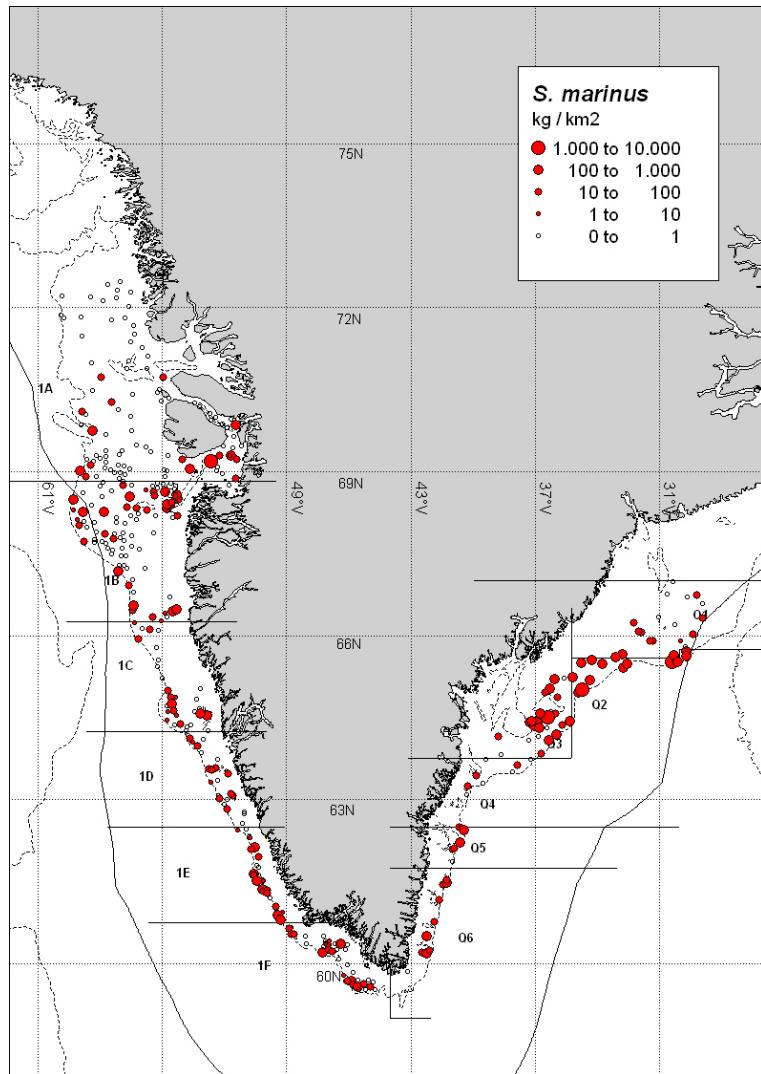


Fig. 17. 2010 Golden redfish survey biomass in kg / km².

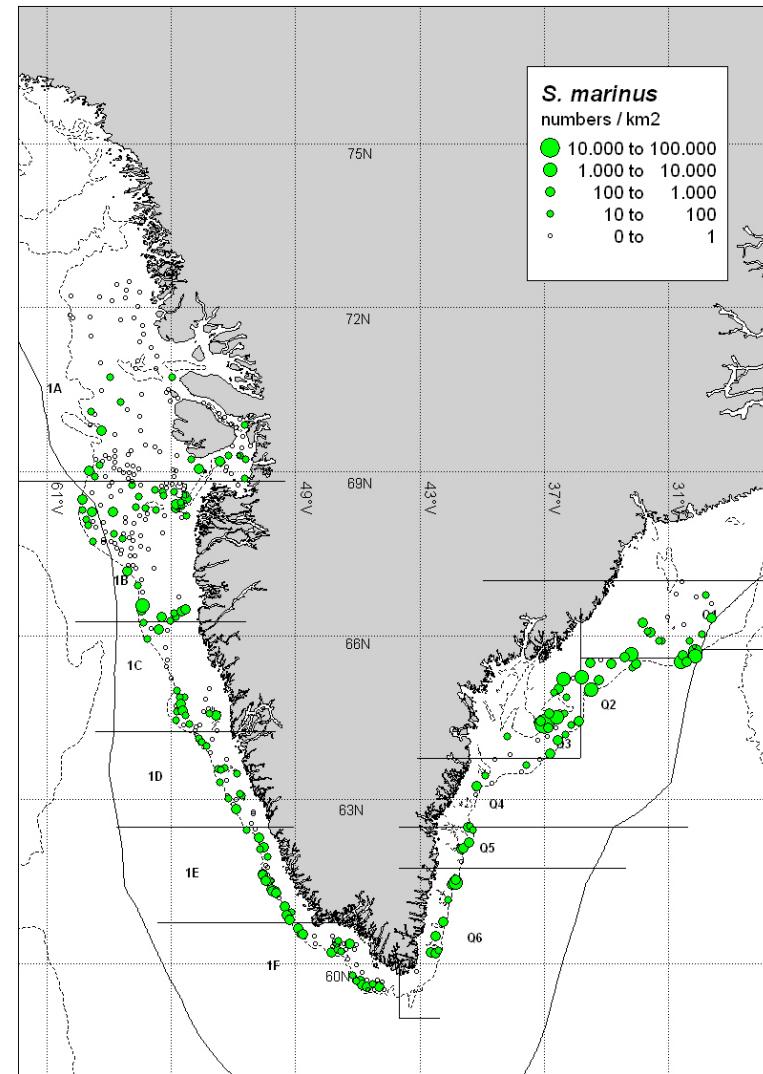


Fig. 18. 2010 Golden redfish survey abundance in numbers / km².

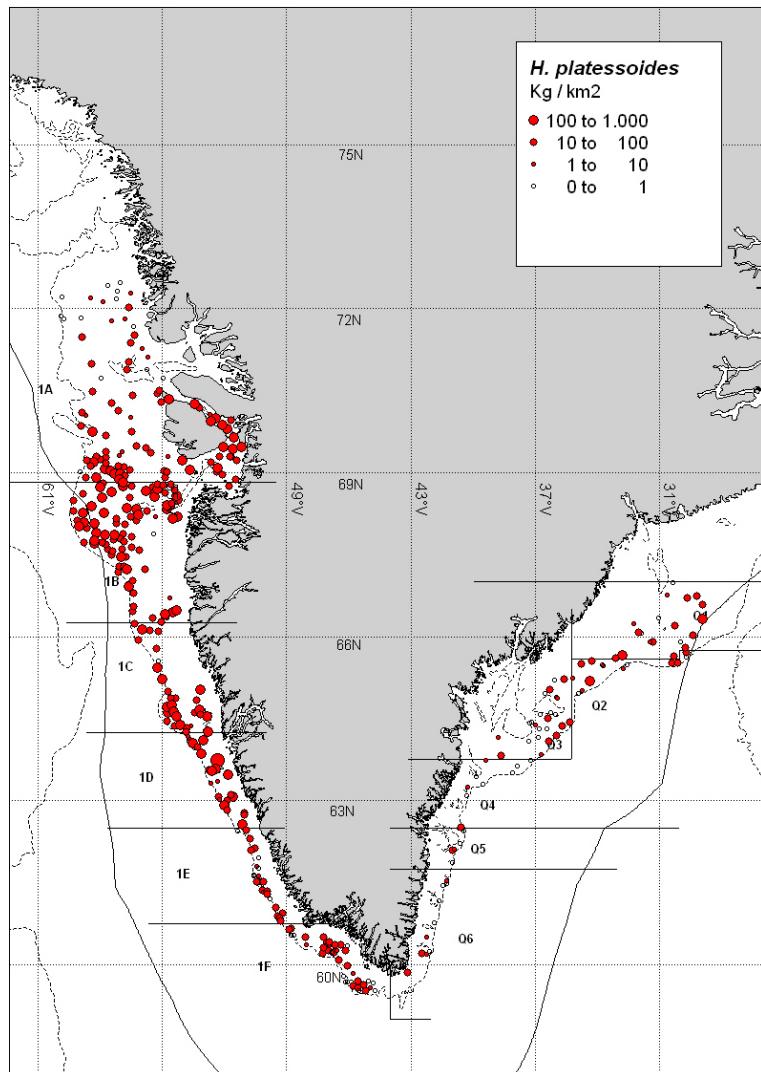


Fig. 19. 2010 American plaice survey biomass in kg / km².

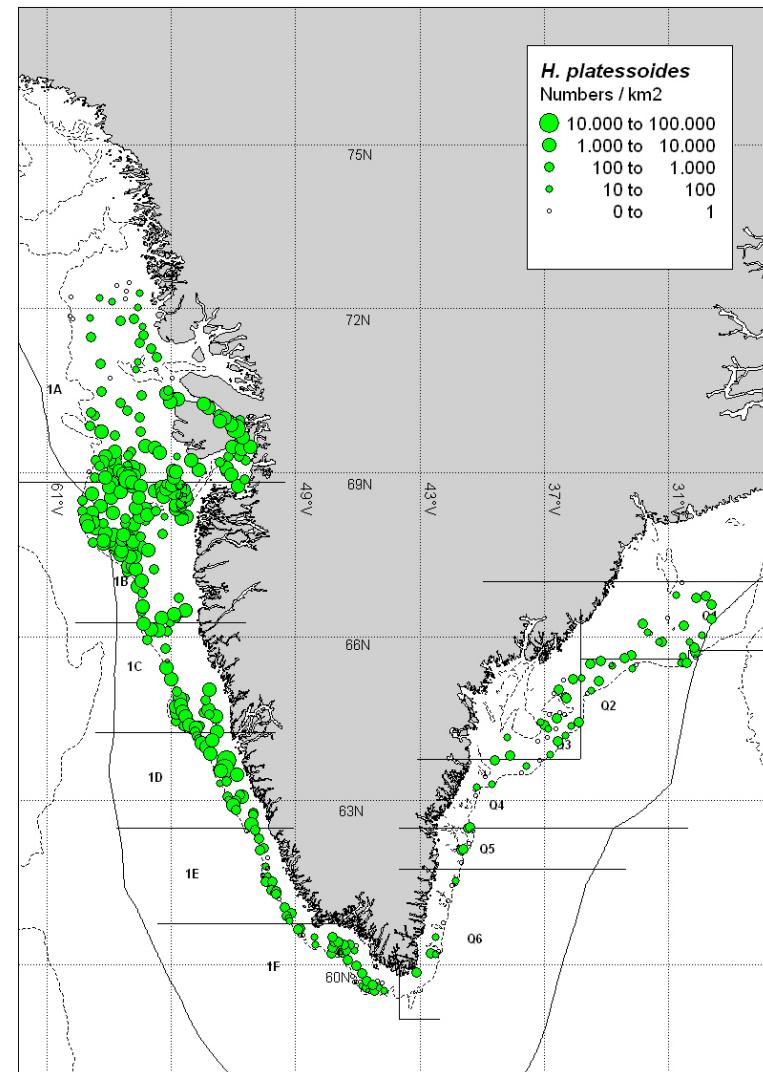


Fig. 20. 2010 American plaice survey abundance in numbers / km².

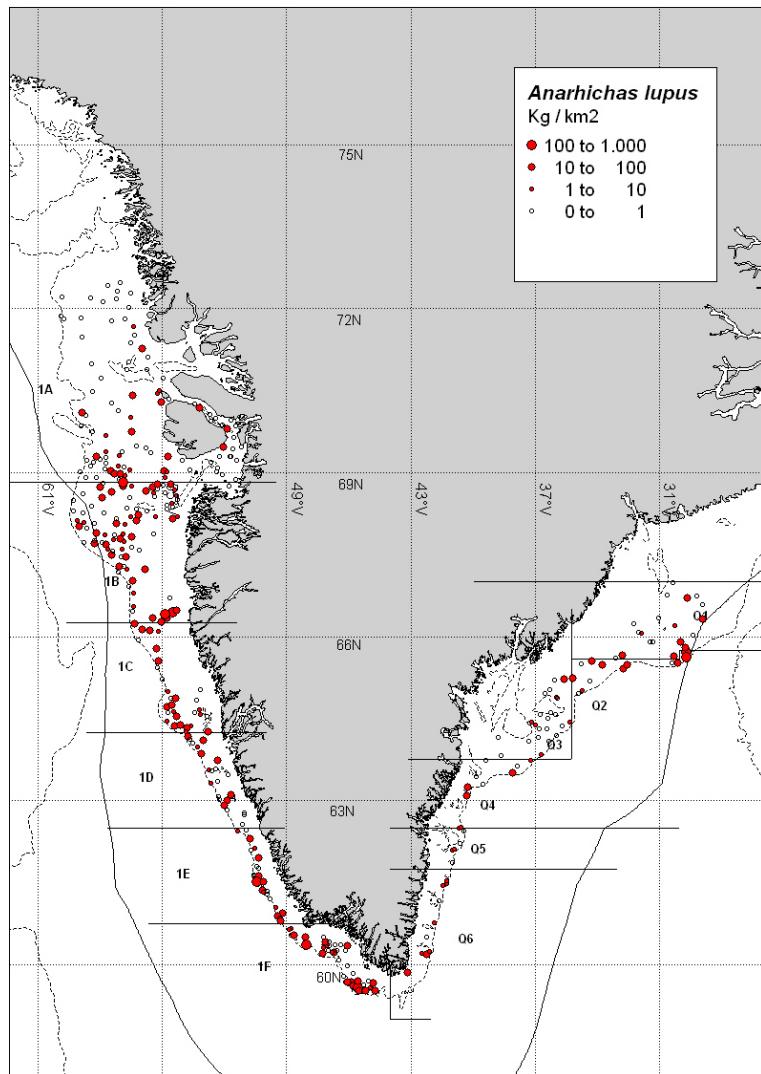


Fig. 21. 2010 Atlantic wolffish survey biomass in kg / km².

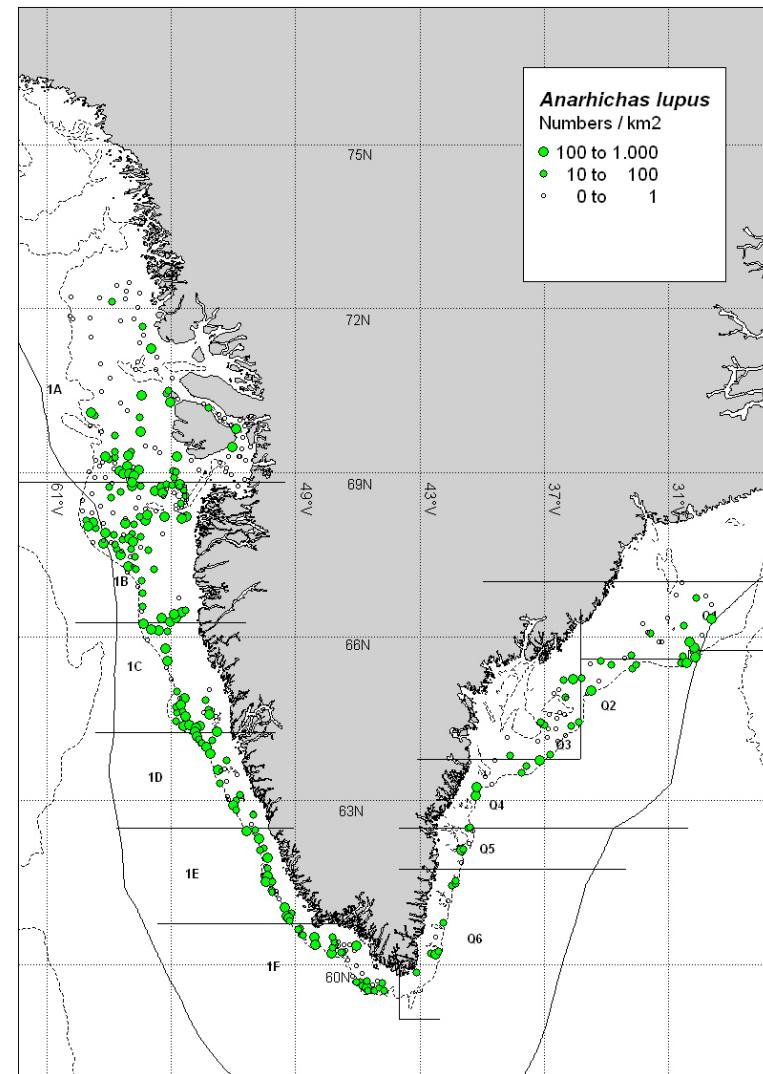


Fig. 22. 2010 Atlantic wolffish survey abundance in numbers / km².

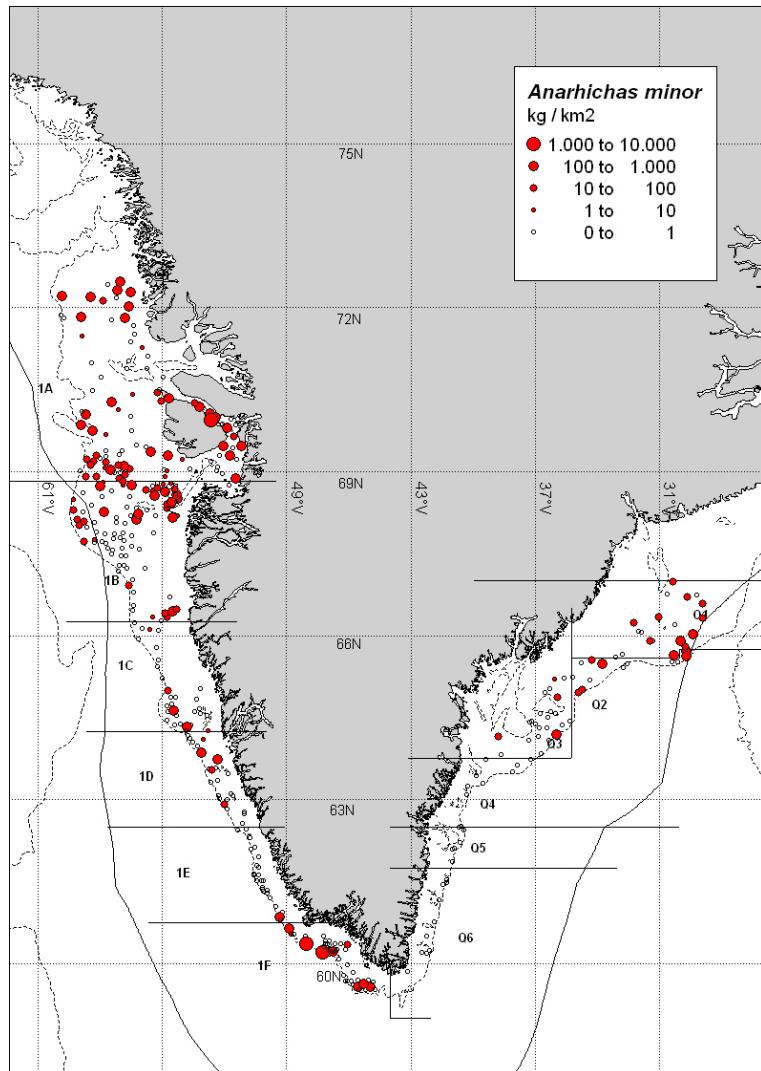


Fig. 23. 2010 Spotted wolffish survey biomass in kg / km².

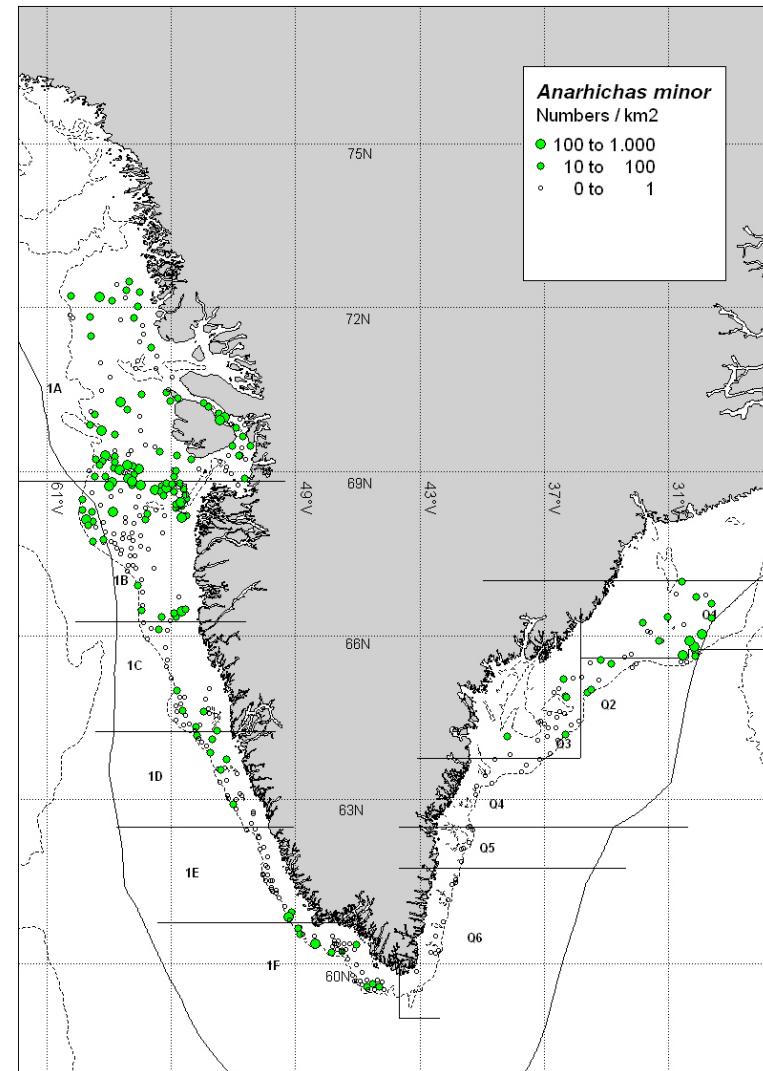


Fig. 24. 2010 Spotted wolffish survey abundance in numbers / km².

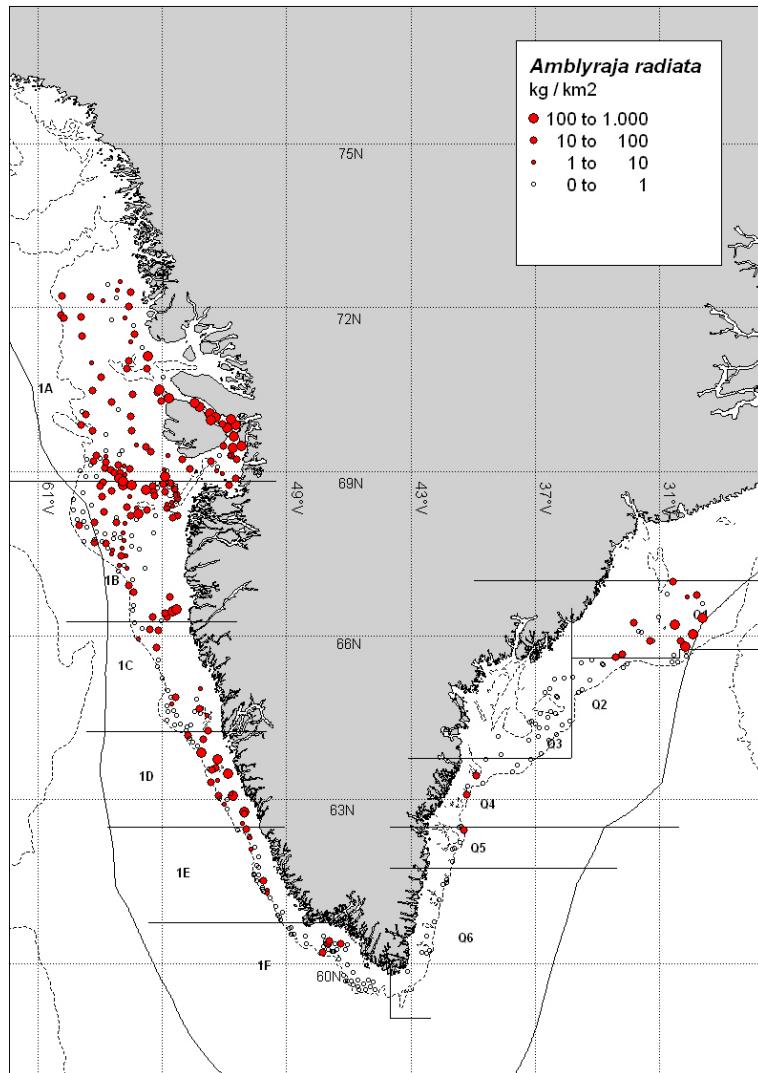


Fig. 25. 2010 Thorny skate survey biomass in kg / km².

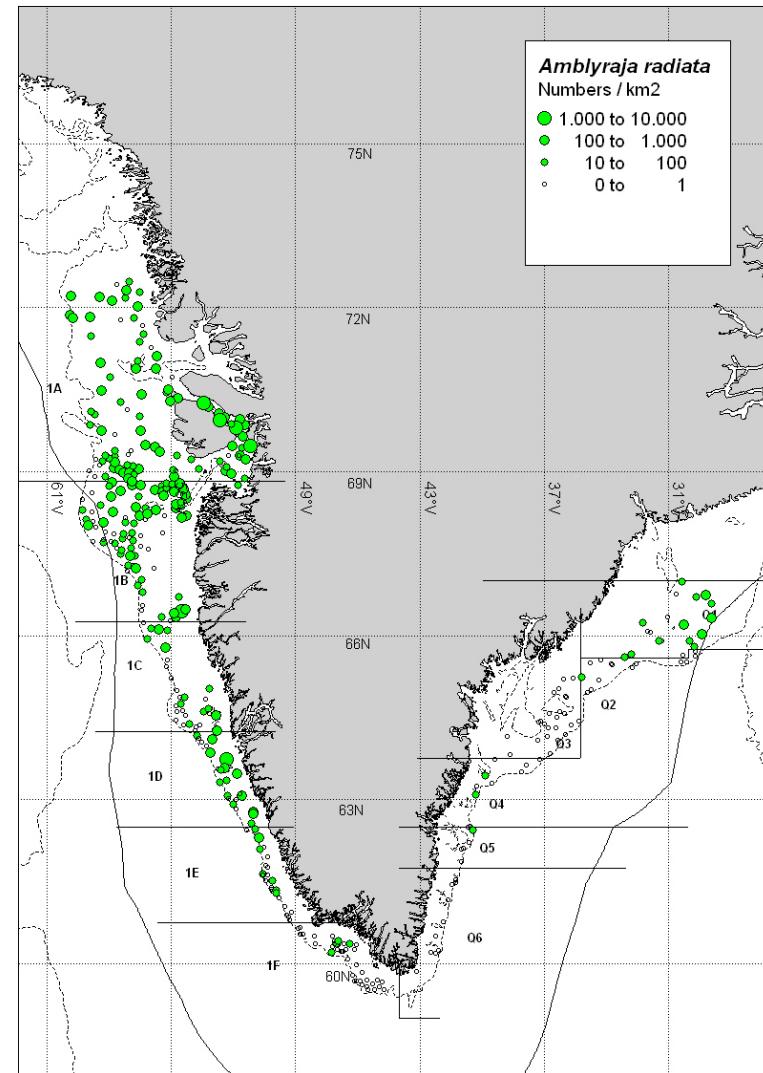


Fig. 26. 2010 Thorny skate survey abundance in numbers / km².