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Preliminary Results from the 2025 August Ecosystemic Survey in the Estuary and Northern Gulf of St. Lawrence

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Foreword

This series documents the scientific basis for the evaluation of aquatic resources and ecosystems in Canada. As such, it addresses the issues of the day in the time frames required and the documents it contains are not intended as definitive statements on the subjects addressed but rather as progress reports on ongoing investigations.

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ABSTRACT

Fisheries and Oceans Canada conducts an annual ecosystem survey in the St. Lawrence Estuary and northern Gulf. The survey has several objectives: to estimate the abundance and biomass of groundfish and invertebrates; to assess physical, chemical, and biological (phytoplankton and zooplankton) oceanographic conditions; to evaluate the biodiversity of species found near the seabed; to monitor the pelagic ecosystem over time; and to collect samples for various research projects. In 2025, the survey was conducted between August 5 to September 8 aboard the Canadian Coast Guard Ship (CCGS) *John Cabot*. During this survey, 159 trawl tows were successfully completed. In addition, 68 vertical water column profiles were carried out to characterize oceanographic conditions, and 52 zooplankton samples were also collected.

This report presents the results of successful trawl tow catches of the 2025 survey. A total of 79 fish taxa and 194 invertebrate taxa were identified during this survey. Historical perspectives (catch rates, spatial distribution, length frequency) are presented for 31 taxa. These fishery-independent data will be used for several stock assessments, including Atlantic Cod (*Gadus morhua*), Redfish (*Sebastes mentella* and *S. fasciatus*), Greenland Halibut (*Reinhardtius hippoglossoides*), Atlantic Halibut (*Hippoglossus hippoglossus*), Witch Flounder (*Glyptocephalus cynoglossus*), Capelin (*Mallotus villosus*), and Northern Shrimp (*Pandalus borealis*).

Water temperatures at 300 m have decreased further since the record high of 2022, falling from 7.1 °C in 2022 to 6.5 °C, but remain warm. Temperatures at 150 m and 200 m, however, have increased slightly since 2024. The minimum temperature of the cold intermediate layer has decreased slightly compared to 2024, dropping from the 4th to the 8th warmest since 1985. For the first time since 2019, surface water temperatures were on average close to normal during the July-August and May-August periods.

INTRODUCTION

Fisheries and Oceans Canada (DFO) conducts an annual bottom trawl survey in the Estuary and the northern Gulf of St. Lawrence (hereafter NGSL survey). This ecosystem survey is fishery-independent. Its purpose is to assess the ecosystem with consistent and standardized protocols. This survey examines, among other things, spatial and temporal changes in the distribution and relative abundance of fish, invertebrates and their assemblages. It also aims to gather information on the biological parameters of commercially harvested species.

The main objectives of the survey are:

1. Assess groundfish and Northern Shrimp population abundance, biomass and conditions;
2. Assess environmental conditions;
3. Conduct a biodiversity inventory of benthic and demersal megafauna;
4. Assess phytoplankton and mesozooplankton abundances;
5. Monitor the pelagic ecosystem;
6. Collect samples for various research projects.

In 2025, the survey was conducted between August 5 and September 8 onboard the CCGS *John Cabot* (survey IML-2025-015).

SURVEY DESCRIPTION

The NGSL survey covers the waters of the Laurentian Channel and the area north of it, from the maritime estuary in the west to the Strait of Belle Isle in the north and the Cabot Strait in the east, namely, the Northwest Atlantic Fisheries Organization (NAFO) divisions 4R, 4S, and the northern part of 4T (Figure 1). Since 2008, the coverage of division 4T has been increased in the upstream portion of the maritime estuary to sample the depths between 37 and 183 m (strata 851, 852, 854, and 855). The study area covers 118,587 km².

This survey follows a random stratified sampling design where the study area is composed of 56 strata of similar depth and substrate type, while respecting the NAFO divisions (Figure 2). Before 2013, the initial allocation was 200 trawling stations with a minimum of 3 and a maximum of 8 stations per stratum. From 2013 to 2022, this initial allocation remained the same at 200 stations, but the minimum number of stations per stratum was reduced to two. Starting in 2023, the initial station allocation was reduced to 180 with a minimum of 2 and a maximum of 7 stations per stratum, which is a more realistic target that limits modifications to the sampling plan during the survey. The positions of the sampling stations are determined randomly within each stratum. Starting in 2014, a new rule was added to the survey design to respect a minimum distance of 10 km among stations of the same stratum and, starting in 2023, this constraint has been extended to all stations regardless of stratum.

The fishing gear used on the CCGS *John Cabot* is a four-sided modified Campelen 1800 shrimp trawl equipped with Rockhopper footgear (McCallum and Walsh 2002). The trawl lengthening and codend are equipped with a 12.7 mm knotless nylon lining (Benoît et al. 2024).

The duration of a standard trawl tow is 15 minutes. It corresponds to the elapsed time between the moment the trawl contacts the seabed and the moment it leaves the bottom to begin retrieval, as identified using the Scanmar™ hydroacoustic system. The target towing speed is 3 knots. For each tow, information on the geometry of the trawl while in operation (horizontal spread of the doors and wings, vertical opening of the trawl, depth) is recorded using Scanmar™ hydroacoustic sensors attached to the fishing gear.

At each successful trawl set, the catch was sorted and weighed by taxon, and, for a large number of taxa, individual biological data were collected from a subsample of the catch. For fish, length and weight were recorded for each individual. In addition, for certain species, sex, maturity stage, and the weights of specific organs (e.g., stomach, liver, gonads) were noted. The soft anal fin rays were counted for redfish to differentiate the two species present (Senay et al. 2022). Otoliths were collected from Atlantic Cod, Atlantic Halibut, Greenland Halibut, Witch Flounder, and Redfish to determine fish age. A sample of approximately 2 kg of shrimp was sorted and weighed by species and, for Northern Shrimp, by maturity stage. Shrimps, crabs, squids, and sea pens were measured individually. Crabs were also sexed individually. Other invertebrates were weighed and counted by taxon and were not subject to individual measurements. All taxa were photographed, and the photographs were archived in a photo catalog with keywords (taxonomic identification, station metadata, date, etc.).

The data entry software is the Andes¹ system developed by DFO's Gulf Region (Ricard et al. 2024) and adapted for the NGSL survey. The application, which is based on open-source software and uses a shared code development platform, provides functionalities such as length-stratified biological data collection that were not easily implemented in the previous system². Starting in 2024, individual weight, sex, and maturity measurements have been collected using length-stratified sampling for Atlantic Cod (1/cm/station) rather than on a random basis (measurements taken from the first 30 individuals). Similarly, weight and maturity measurements have been collected using length- and sex-stratified sampling for Greenland Halibut (1/cm/sex/station).

Since 2001, an increased effort in the identification of species has been aided through the use of digital photos. These additional efforts have targeted fish since 2004 (Dutil et al. 2009) and invertebrates since 2005 (Nozères et al. 2014). An identification guide for marine fishes in the Estuary and northern Gulf of St. Lawrence (Nozères et al. 2018), a shrimp atlas (Savard and Nozères 2012), and two identification guides for invertebrates (Nozères and Archambault 2014, Isabel et al. 2024) were used during the survey to identify most observed taxa. Furthermore, the catch photo catalogue enabled revisions to be made to the data collected between 2004 and 2015 (Nozères et al. 2022). The taxon STRAP codes and their names followed Miller and Chabot (2014) and have been updated annually according to the World Register of Marine Species ([WoRMS](#)).

Additional protocols were implemented in 2025 for various scientific projects, including:

1. Stomachs from several fish species to describe their diet;
2. Samples of Atlantic Herring (*Clupea harengus*) and Capelin for laboratory analyses in support of stock assessments;
3. Genetic analyses targeting Redfish, Atlantic Halibut, and rare species;
4. Histology of fish gonads (White Hake (*Urophycis tenuis*), Yellowtail Flounder (*Myxopsetta ferruginea*), and Atlantic Herring);
5. Maturity of the Girard's Hagfish (*Myxine limosa*);
6. Muscle and liver samples from juvenile Greenland Halibut for transcriptomic studies and to identify health indicators;

¹ Andes: Another Data Entry System

² A Visual Basic application relying on a Microsoft Access database.

-
7. Age, stable isotopes, and genetic analyses of Black Dogfish (*Centroscyllium fabricii*) and Spiny Dogfish (*Squalus acanthias*);
 8. Prey of belugas and other marine mammals (several fish species and Northern Shrimp) to monitor changes in isotopic signatures of key NGSL species;
 9. Collection of fish and invertebrates for the ÉPAQ (École des Pêches et de l'Aquaculture) reference collection;
 10. Collection of tunicate species to identify potential invasive species;
 11. Collection of sponges (*Porifera*) to document species diversity;
 12. Collection of sea pens (*Pennatuloides*) and associated taxa;
 13. Water samples for environmental DNA genetic analyses;
 14. Image collection using baited stereoscopic video cameras.

Oceanographic data such as temperature, conductivity (*i.e.* salinity), turbidity, dissolved oxygen, luminosity, and fluorescence were collected during this survey. A total of 56 vertical profiles of the water column were done at the fishing stations. In addition, 12 additional profiles were carried out at stations sampled exclusively for the Atlantic Zone Monitoring Program ([AZMP](#)). The various equipment, conductivity, temperature and depth (*CTD*) sensor (*SeaBird 911Plus*TM), dissolved oxygen sensor (*SBE 43*), photometer (*Biospherical*) and fluorometer (*Eco-FLNTU Wetlabs*) were coupled to the rosette of Niskin bottles. For each profile obtained using the rosette, water samples were also taken at several depths to determine their salinity, pH, dissolved oxygen concentration (Winkler titration), nutritive salt content (nitrite, nitrate, phosphate, silicate), and chlorophyll content. In addition, a *CTD SBE 19Plus*TM device (temperature and salinity), coupled to a dissolved oxygen sensor (*SBE 63*), was also installed on the back of the trawl, thereby allowing oceanographic data to be collected for 122 of the 159 fishing tows on the CCGS *John Cabot*.

To study the distribution and biomass of zooplankton for the entire surveyed area, a part of the sampling program consisted of collecting organisms at 52 stations using a zooplankton net (202 µm) drawn vertically, from the bottom to the surface.

Throughout the survey, hydroacoustic data were continuously recorded for the entire water column using a SIMRADTM EK80 single-beam echosounder operating at six narrowband frequencies (18, 38, 70, 120, 200, and 333 kHz). These data will be used to characterize the pelagic ecosystem.

DATA ANALYSIS

Abundance and biomass data collected on taxa caught in 2025 were integrated into the series of annual summer survey series initiated in 1990. During this period, three vessel-gear tandems were used (1990-2005: CCGS *Alfred Needler* – *URI 81'/114'* trawl; 2004-2022: CCGS *Teleost* – *Campelen 1800* trawl; 2022-2025: CCGS *John Cabot* – modified *Campelen 1800* trawl). The integrity of the time series has been preserved thanks to these comparative fishing studies to quantify the difference in catchability between vessel-gear tandems. The first study took place in 2004-2005 between the *Needler* and the *Teleost* (Bourdages et al. 2007) and the second study in 2021-2022 between the *Teleost* and the *John Cabot* (Benoît et al. 2024). Conversion factors for taxa were therefore applied to catches and length frequencies for taxa where the difference in catchability was significant. The results presented in this document are expressed as the equivalent of the most recent vessel used, the CCGS *John Cabot* with a modified *Campelen 1800* trawl.

During comparative fishing experiments, several stations were successfully fished at the same time by two vessels. To avoid pseudo-replicates at comparative stations (information from two trawl hauls at the same station and at the same time), only the stations from the most recent vessel-gear tandem were retained for the analyses.

Estimated annual catch rates, expressed as mean number and weight (kg) per standardized tow (15-minute tow, corresponding to a swept area of 0.75 nautical mile with an average wing spread of 16.71 m [average opening of the modified Campelen trawl on CCGS *John Cabot*]), along with their confidence intervals, were calculated using estimators for stratified random sampling (see details in Appendix 1). Since, over the years, some strata were not sampled with a minimum of two successful tows (Table 1), values for these strata were estimated using a multiplicative model of the following form:

$$\log(\text{catch} + 0.01) \sim \text{stratum} + \text{year},$$

The value predicted by the model for strata covered by fewer than two tows is calculated using data from the current year and the three preceding years, or from the current year and the three adjacent years for the first three years of the series (1990–1992). Thus, the indicators presented for the series are representative of a standardized total area of 116,115 km², corresponding to the sum of the areas of the 52 strata sampled since 1990. Fishing stations conducted in strata added in 2008 (851, 852, 854, and 855) are not used in the calculation of indices. Reference levels have also been added to the graphs of mean annual catch rates. The solid horizontal line represents the mean annual catch rate calculated for the 1990–2024 period (long-term mean). The two horizontal dashed lines represent the long-term mean plus or minus one-half standard deviation, corresponding to the upper and lower reference limits, respectively.

The distinction between the two Redfish species, *S. fasciatus* and *S. mentella*, is based on analyses of the soft anal fin rays count or depth of capture in cases where ray count data are missing (Senay et al. 2022).

Length-frequency distributions are presented in two formats. The first figure illustrates smoothed distributions using a moving average for the last two years of the series, as well as the long-term mean distribution excluding the terminal year. Frequency values are expressed as the mean number of individuals caught per tow per one-centimeter increment, except for shrimp (0.5 mm), Atlantic Halibut (3 cm), and Monkfish (*Lophius americanus*; 3 cm). The second figure shows length-frequency distributions as mean number per tow for each year of the series from 1990 to 2025. In 2025, the size measurement used for thorny and smooth skates was disk width (DW³). Appendix 2 presents the methodology used to convert DW to total length (TL) in 2025 to ensure continuity of the series.

The geographic distribution of catch rates (or catch per unit effort, CPUE), expressed in kg per standard 15-minute tow for all taxa, was aggregated into six- to eight-year period depending on the species. CPUE interpolation was performed on a grid covering the study area covered (excluding strata added in 2008) using inverse distance weighting (R version 4.3.2, Rgeos library; R Core Team 2023). Pixels of mean densities were then color-coded according to catch rates corresponding to the 5th, 25th, 50th, 75th, and 95th percentiles of the distribution of catches greater than 0.1 kg for fish and 0.001 kg for shrimp. The spatial distribution of catch rates for the 2025 survey is also presented in a “bubble” map that includes stations sampled in the strata added in 2008.

³ Distance between the tips of the wings measured when the skate is lying flat on its ventral side.

Summary results for abundance and biomass indices, length-frequency distributions, and the spatial distribution of catch rates are presented for 31 taxa in Figures 4 to 82. These results are preliminary and may vary significantly following additional validation work and laboratory analyses.

The mean weight per tow for 57 fish taxa and 99 invertebrate taxa is presented in Figures 83 and 84. In these figures, a color code is used to represent the anomaly value.

Finally, Table 2 provides the list of all taxa, both vertebrates and invertebrates, caught in the 159 successful trawl tows during the 2025 survey. Occurrence, defined as the number of tows in which the taxon was recorded, and total catch, in weight and number, are presented for the entire survey. The number of specimens measured per taxon, along with certain descriptive statistics for length, are reported in Table 3.

All analyses and figures were produced using the R language (R Core Team 2023). Previously, data processing was performed with SAS (SAS Institute Inc. 2023), and figures were produced with R (Chamberland et al. 2025). Catch per tow for fish taxa from previous years is available on the [Open Government website](#).

RESULTS

Disclaimer: This survey uses a bottom trawl and is designed to sample benthic and demersal species. However, catches may include pelagic species and species normally associated with coastal, shallow (<35 m) and/or rocky habitats that are more difficult to trawl. These taxa, although present in the catches, have low catchability with a bottom trawl. In addition, some species occupy demersal habitats only for a short and possibly varying period during the summer (e.g., *Melanostigma atlanticum*; Silverberg et al. 1987), which can cause interannual variability in catchability. Furthermore, organisms such as sea pens and certain sponges may remain attached to the trawl and contaminate subsequent station catches by their presence. Results for these taxa should therefore be interpreted with caution, and further analyses will need to account for these uncertainties.

In 2025, of the 180 planned stations, 159 were successfully sampled: 53 in 4R, 68 in 4S, and 38 in 4T. All strata were sampled with a minimum of two stations, except for strata 408, 414, 804, and 829, where only one station per stratum was successfully fished (Figure 3, Table 1).

BIODIVERSITY

A total of 79 fish taxa (bony fishes, sharks, and skates) and 194 invertebrate taxa were identified in 2025 (Table 2).

In 2025, the biomass of the two combined redfish species accounted for 80% of the biomass of all organisms caught in the survey (e.g., invertebrates, pelagic, demersal, and bottom fish), whereas it averaged 15% of the total survey biomass between 1995 and 2012 (Figure 4). Redfish (*Sebastes mentella*) alone represented 69% of the trawl biomass during the survey, indicating that it dominates the NGSL demersal ecosystem.

FISH

The abundance and biomass of **Black Dogfish** (*Centroscyllium fabricii*) were above average in 2025, a general trend that has persisted since 2012 (Figures 5 to 7).

The abundance and biomass of **Monkfish** (*Lophius americanus*) have been increasing steadily since the early 2000s. However, indices seemed to have declined in 2025. The species is distributed in deep channels, mainly in the eastern NGSL (Figures 8 to 10).

The length-frequency distribution of **Capelin** (*Mallotus villosus*) in 2025 showed a mode around 11 cm, compared to 15 cm in 2024. The largest catches came from the west coast of Newfoundland and northern Anticosti. Capelin was also regularly observed in the estuary (Figures 11 and 12).

Since around 2013, the abundance and biomass of **Atlantic Halibut** (*Hippoglossus hippoglossus*) have remained above the historical series average (Figures 13 to 15). Catches have been recorded throughout the entire NGSL.

The abundance and biomass of **Greenland Halibut** (*Reinhardtius hippoglossoides*) have been declining since the mid-2000s. Since 2023, these indicators were well below average. The 2024 cohort (with a mode at 18 cm in 2025) showed slightly higher-than-average abundance. The abundance of individuals over 30 cm decreased compared to 2024 estimates (Figures 16 to 18).

The abundance and biomass of **Atlantic Argentine** (*Argentina silus*) increased from 2020 to 2023 and have remained above average in 2024 and 2025, likely due to the cohort first observed at about 10 cm in 2021. The species is mainly distributed along the eastern side of the Cabot Strait and the west coast of Newfoundland (Figures 19 to 21).

The **Lumpfish** (*Cyclopterus lumpus*) is a species that is rarely abundant in catches but is regularly observed in this survey. Its abundance and biomass have been below the historical series average since 2022 (Figures 22 to 24).

Atlantic Herring (*Clupea harengus*) is frequently observed in this survey and is distributed throughout the NGSL, except in the depths of the Laurentian Channel. The highest catches were observed along the west coast of Newfoundland and in the Strait of Belle Isle (Figure 25).

Catches of **Atlantic Wolffish** (*Anarhichas lupus*) and **Spotted Wolffish** (*Anarhichas minor*) occurred on 28 and 3 occasions, respectively, in 2025. These catches were mainly distributed in the eastern NGSL (Figures 26 and 27).

Since 2007, **Silver Hake** (*Merluccius bilinearis*) has been more frequently caught in the NGSL survey, whereas it was only occasionally observed before (Figures 28 to 30).

The abundance and biomass of **Longfin Hake** (*Phycis chesteri*) have been below the historical series average since 2022 (Figures 31 to 33).

The abundance and biomass of **White Hake** (*Urophycis tenuis*) have been below the historical series average since 2023 (Figures 34 to 36).

Following a sharp decline in 2023 and stabilization in 2024, the abundance and biomass indices of **Atlantic Cod** (*Gadus morhua*) increased in 2025 to reach values near the average of their respective historical series. The 2025 length-frequency distribution showed three modes, at approximately 15 cm (juvenile cod), 25 cm, and 35 cm. These three length ranges had abundances above the historical series average. As in the 2024 survey, the geographic distribution of catches in 2025 was mainly concentrated along the west coast of Newfoundland and in the Strait of Belle Isle (Figures 37 to 39).

Girard's Hagfish (*Myxine limosa*) is a species mainly associated with the depths of the Laurentian Channel. Abundance and biomass indices have fluctuated without trend since the early 1990s. These indices have been below the average of their respective series since 2022. Most individuals caught since 2004 measured between 30 and 45 cm (Figures 40 to 42).

American Plaice (*Hippoglossoides platessoides*) was very frequent in catches. Its abundance and biomass in 2025 were below their historical averages and have been since 2023 (Figures 43 to 45).

Witch Flounder (*Glyptocephalus cynoglossus*) was also very frequent in catches. Abundance and biomass indices were similar to or above average in 2025 (Figures 46 to 48).

Thorny Skate (*Amblyraja radiata*) and **Smooth Skate** (*Malacoraja senta*) are the two most common skate species in the NGSL survey. The abundance and biomass of thorny skate were very close to their respective averages in 2025. For smooth skate, these indices have been declining for more than 10 years and have remained below average since 2018 (Figures 49 to 54). Results of the comparative study between TL and DW are presented in Appendix 2.

The abundance of **Acadian Redfish** (*Sebastes fasciatus*) was near average, while biomass was above average of their respective historical series in 2025 (Figures 55 to 57).

The three strong cohorts (2011, 2012, and 2013) of **Atlantic Redfish** (*S. mentella*) contributed to the increase in abundance and biomass observed between 2013 and 2019. Since then, this species has declined, and in 2025, estimated abundance and biomass represented about one-third and one-half, respectively, of the maximum values observed in 2019 (Figures 58 to 60). Length distributions of *S. mentella* and *S. fasciatus* in 2025 were similar to those in 2024, with modal lengths of 25 cm. The increase in modal length of individuals from the 2011–2013 cohorts of both species has been virtually negligible since 2021 (Figures 56 and 59).

INVERTEBRATES

The abundance and biomass indices of **Norway King Crab** (*Lithodes maja*) were above average in 2025. The highest densities of this species were found in the depths of the Laurentian Channel (Figures 61 to 63).

The abundance and biomass of **Snow Crab** (*Chionoecetes opilio*) were close to the average of their respective time series in 2025. The species is mainly caught along the edges of the study area, which generally corresponds to areas where the cold intermediate layer (CIL) reaches the bottom (Figures 64 to 66).

The three most abundant shrimp species in the deep waters of the NGSL, **Northern Shrimp** (*Pandalus borealis*), **Striped Pink Shrimp** (*Pandalus montagui*) and **Pink Glass Shrimp** (*Pasiphaea multidentata*), experienced a sustained decline for more than ten years, reaching historical lows in abundance and biomass in 2022 or 2023. Since then, abundance and biomass indices have slightly increased, but they remain at low levels compared to historical averages (Figures 67 to 75 and 84).

The abundance and biomass indices of **Northern Shortfin Squid** (*Illex illecebrosus*), a pelagic species that seasonally visits the NGSL, were above their respective mean from 2017 to 2021, and below or near those means from 2022 to 2025 (Figures 76 to 78).

Five species of **sea pens**, a type of soft coral, were present in the NGSL. Large sea pens (*Anthoptilum grandiflorum*, *Balticina finmarchica*, and *Ptilella grandis*) were distributed in the depths of the Laurentian Channel, while the thorny sea pen (*Pennatula aculeata*) is more widespread (Figures 79 to 82). Another small sea pen species (*Kophobelemnion stelliferum*) was identified for the first time in 2020 and observed again in 2022, 2024, and 2025. This species appears to be restricted to the depths of the Laurentian Channel in the Cabot Strait area. A retrospective review of sea pen identifications using the invertebrate photo catalog revealed a specimen of this species collected in 2018. It had previously been classified as debris from the thorny sea pen.

PHYSICAL OCEANOGRAPHIC CONDITIONS

Preliminary analysis of water temperature measurements taken in 2025 (Figures 85 and 86 shows conditions that have cooled slightly at a depth of 300 m, but warmed at 150 and 200 m. Compared to conditions observed in 2024, the waters have cooled by an average of 0.18 °C at 300 m, warmed by 0.15 °C at 200 m, and by 0.3 °C at 150 m. They remain well above the 1991–2020 climatological averages at those three depths. The minimum temperature of the cold intermediate layer (CIL) in August-September 2025 decreased slightly compared to 2024, falling from the 4th to the 8th warmest since 1985. For the first time since 2019, the average surface water temperatures for the periods of July-August and May-August were both close their respective climatological average.

The minimum CIL temperature in the estuary and northern Gulf was preliminarily calculated here using data from the NGSL survey, while some data from southern GSL survey (in September) will also be included when available for ulterior reports. The average temperature of 0.45 °C is 1.4 standard deviations above the 1991–2020 climatological average, the 8th warmest since 1985, although it is the lowest value since the 2021 maximum. Figure 85 shows that in August 2025, the CIL was colder than in August 2024 in the estuary, the northwest, and the central Gulf, but similar to 2024 conditions in the northeast. This water layer was deeper and very thick in the Cabot Strait (although with a minimum temperature >1 °C).

Under the CIL, the estuarine circulation that transports deep waters towards the heads of the channels has caused increasingly warmer waters to spread from the Cabot Strait towards the estuary and the Esquiman and Anticosti channels (Galbraith et al. 2025). However, the average temperature across the entire Gulf peaked in 2022 at 150, 200, and 300 m (7.1 °C) and has since declined (Figure 86). Cooler waters have since progressed upstream at 300 m, and temperatures decreased between August-September 2024 and 2025 in the northwest, northeast, and central Gulf. However, the cooling had not yet reached the estuary by August 2025, and temperature there increased further. In Cabot Strait, the thermocline was 25 m deeper than in August-September 2024 and the temperature at 300 m was higher than in 2024.

Considering all data taken in different months of 2025 up to September, the average across the entire Gulf at 150, 200, and 300 m was 3.9 °C, 5.8 °C, and 6.5 °C, respectively (Figure 86). No deep water temperatures >6.9 °C were measured in the Gulf in August-September 2025, whereas a temperature of 8.2 °C had been reached in August 2022 in the Cabot Strait. Nevertheless, the average temperature at 300 m is still higher than that recorded in 2016 when the 100-year record of 6.2 °C was broken.

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TABLES

Table 1. Number of successful stations per year and stratum for the DFO NGSL survey.

Stratum	NAFO	Surface (km ²)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
401	4T	545	3	4	4	4	3	3	3	3	3	3	3	3	3	3	3	6	3	3	3	3	0	3	3	2	2	3	2	2	2	2	1	2	4
402	4T	909	3	5	5	3	3	1	3	2	3	5	3	3	3	2	0	3	3	3	3	3	3	3	3	2	3	2	2	2	2	2	2	2	5
403	4T	1190	3	3	3	3	3	3	10	10	3	5	3	3	3	6	4	3	3	3	3	3	3	3	3	2	2	3	2	2	1	2	2	1	3
404	4T	792	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	6	3	3	3	3	0	3	3	2	3	2	2	2	2	2	2	4	
405	4T	1478	3	3	3	3	3	3	3	2	4	4	4	3	3	2	9	3	3	3	3	3	3	3	3	3	2	3	2	2	2	2	2	5	
406	4T	2579	5	3	3	3	3	3	5	3	5	3	4	5	3	5	6	4	4	4	4	3	3	3	4	3	3	4	4	3	3	4	5	6	
407	4T	2336	5	3	3	3	3	3	3	2	3	3	3	3	3	5	3	5	3	3	3	3	0	3	3	2	4	4	2	3	4	3	3	7	
408	4T	2734	4	5	5	3	2	3	3	2	5	5	4	3	3	3	2	11	4	4	4	4	3	4	3	4	4	2	4	3	2	2	2	8	
409	4T	909	3	3	3	3	0	3	4	3	3	4	4	4	3	3	3	4	3	3	3	3	3	3	2	3	2	2	2	2	2	2	4	4	
410	4T	1818	2	3	3	3	4	6	10	6	5	4	4	4	5	3	6	3	3	3	3	3	3	3	3	3	3	3	3	2	2	3	4	3	
411	4T	1859	3	3	3	3	4	7	9	7	6	9	5	9	4	3	5	8	3	3	3	3	3	3	3	3	3	2	3	3	2	3	4	6	
412	4T	1283	3	3	3	3	4	5	3	3	3	4	4	4	3	3	2	5	3	3	3	3	3	3	3	3	2	2	2	2	2	2	3	4	
413	4T	731	3	4	3	3	0	3	3	4	3	4	4	4	3	3	1	5	3	3	3	3	3	3	2	2	2	2	2	2	2	1	3	3	
414	4T	388	3	2	3	3	1	3	3	3	3	4	4	4	3	3	6	3	3	2	1	3	3	2	3	2	2	2	2	0	1	0	3	3	
801	4R	1214	3	3	3	4	3	3	3	3	4	5	5	5	2	3	3	4	3	3	3	3	2	3	3	3	3	3	2	3	3	2	2	7	
802	4R	1369	3	3	3	3	3	3	3	3	3	3	3	3	2	8	3	8	2	3	3	3	0	3	3	3	3	2	3	3	3	2	2	4	
803	4S	6976	14	3	2	4	3	3	3	3	4	5	3	4	6	2	1	14	6	8	8	7	3	6	7	3	10	8	5	8	4	4	5	15	
804	4S	2490	5	4	3	3	4	3	3	3	3	3	3	6	3	2	3	10	3	3	3	3	3	3	3	4	4	4	4	3	3	3	6	6	
805	4S	5762	14	7	4	4	6	4	11	8	4	5	5	5	12	8	4	10	8	7	7	6	4	5	7	5	7	7	9	7	5	6	6	11	13
806	4S	2127	4	4	3	3	3	3	3	3	3	3	3	3	3	3	5	4	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	4	
807	4S	2370	3	12	11	10	5	5	4	4	3	4	3	4	3	2	1	0	7	3	3	3	3	2	3	3	4	4	4	4	3	2	3	2	9
808	4S	2428	4	7	6	4	5	4	3	3	2	4	3	3	3	3	0	3	3	3	3	3	2	3	2	4	4	4	4	4	0	2	3	8	
809	4R	1547	3	9	7	6	4	3	3	3	3	3	3	3	3	1	5	3	3	3	3	3	3	2	3	3	3	4	3	3	0	3	2	6	
810	4R	765	3	4	5	4	3	3	3	3	4	4	4	4	6	5	3	8	3	3	4	3	0	3	3	2	3	2	2	2	1	1	2	4	
811	4R	1506	3	4	4	4	5	3	8	6	3	3	3	3	3	3	3	7	3	3	3	2	2	2	3	2	2	2	2	2	0	2	2	4	
812	4R	4648	7	9	8	11	4	3	3	3	3	3	3	3	3	4	5	5	4	5	4	5	3	5	3	8	7	6	6	5	6	5	5	17	
813	4R	3958	6	6	5	9	3	4	6	5	7	4	6	8	2	5	3	9	5	3	5	3	4	4	6	3	6	6	4	3	5	5	6	4	10
814	4S	1029	3	4	4	4	3	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	4	
815	4S	4407	9	15	11	8	5	4	3	3	8	9	9	2	6	3	3	14	5	5	6	5	5	3	6	4	6	7	6	6	5	6	4	7	14
816	4S	5032	9	11	9	9	6	6	17	17	20	21	21	1	6	4	4	11	7	7	7	6	4	4	3	6	6	8	7	7	5	6	4	6	13
817	4S	3646	7	18	11	7	9	10	9	5	11	17	13	14	8	5	2	7	5	5	4	5	3	3	4	4	5	4	6	5	5	6	7	11	
818	4S	2774	4	7	5	4	3	3	3	4	4	4	4	5	7	5	1	6	4	2	4	2	4	3	4	3	4	5	4	4	5	2	8	8	
819	4S	1441	3	7	9	5	4	5	3	2	3	3	4	1	1	3	0	8	2	3	3	2	3	3	3	2	2	2	2	2	1	2	0	6	
820	4R	1358	3	3	3	3	3	3	7	5	6	5	5	3	2	3	3	14	3	3	3	3	0	2	3	3	3	2	3	3	0	2	3	4	
821	4R	1272	3	3	3	3	2	3	3	2	3	3	3	3	3	3	3	7	3	3	3	3	2	4	3	3	3	2	2	3	0	2	1	5	
822	4R	3245	6	4	3	2	3	3	6	4	10	8	10	9	3	3	8	4	4	4	4	3	4	2	4	2	5	3	4	2	3	4	5	4	9
823	4R	556	3	3	3	3	2	3	2	3	1	3	2	3	2	5	2	10	3	3	3	3	2	3	3	3	3	2	2	3	3	2	2	6	
824	4R	837	3	1	3	1	3	3	3	3	3	2	3	2	2	3	6	3	3	3	3	3	3	2	3	2	2	2	1	2	2	2	2	4	
827	4S	3231	0	1	1	1	3	3	0	2	3	1	3	0	2	2	3	6	4	4	3	3	3	2	3	2	2	2	3	3	4	0	2	3	9
828	4S	2435	4	1	2	2	3	3	3	3	3	1	0	1	0	3	3	1	3	3	3	3	3	2	2	2	2	2	2	4	4	3	2	3	7
829	4S	2692	3	2	3	3	3	3	3	0	3	3	2	0	2	1	0	8	4	4	3	2	3	2	2	3	2	4	3	2	3	1	2	3	6
830	4S	1917	3	3	4	3	3	3	2	2	3	3	3	2	1	1	0	6	3	3	3	3	3	2	3	2	4	4	3	3	3	2	3	6	
831	4S	1204	3	0	2	3	3	3	3	2	3	4	3	3	1	3	3	4	3	3	3	3	3	3	2	2	2	2	2	2	1	2	2	3	
832	4S	3962	4	12	11	7	7	9	8	5	3	3	3	3	2	3	4	8	4	5	5	3	4	3	6	4	4	4	3	5	5	4	5	4	10
833	4S	559	3	1	3	3	3	3	3	3	3	3	3	0	3	3	2	6	3	3	3	3	3	3	1	2	2	2	2	2	2	1	2	4	
835	4R	2641	0	6	7	6	3	3	3	3	6	5	6	5	6	3	3	8	5	5	5	4	0	4	5	2	4	3	4	4	0	3	1	3	8
836	4R	3149	0	7	8	6	3	3	3	3	3	3	3	3	2	4	10	5	3	5	4	3	4	4	3	5	2	3	4	3	5	3	3	8	
837	4R	2668	0	5	6	3	2	3	4	4	3	3	3	3	5	5	2	4	4	3	5	3	3	2	5	1	4	4	3	3	3	3	3	5	8
838	4R	3378	0	9	8	7	5	5	0	0	0	2	0	4	4	0	3	10	6	3	6	0	0	3	5	0	6	4	5	3	5	3	5	3	8
839	4S	4390	0	2	5	5	3	2	2	1	2	3	3	0	0	3	2	3	6	5	4	3	3	2	2	3	2	3	2	2	1	1	3	7	
840	4R	765	0	3	3	1	1	0	0	0	0	0	0	2	0	0	0	5	3	0	3	0	0	1	3	0	2	3	2	0	1	0	2	0	3
841	4S	816	0	0	1	3	3	3	3	0	2	1	2	3	2	3	3	3	3	3	2	3	3	3	2	3	2	2	2	2	1	2	1	2	4
Total		116115	191	250	239	214	175	182	217	185	204	224	209	183	171	163	133	354	192	183	189	164	132	156	178	141	177	18							

Table 1. (continued)

Stratum	NAFO	Surface (km ²)	2023	2024	2025
401	4T	545	0	2	2
402	4T	909	2	2	2
403	4T	1190	1	2	2
404	4T	792	0	2	2
405	4T	1478	2	2	2
406	4T	2579	2	4	4
407	4T	2336	1	2	2
408	4T	2734	2	3	1
409	4T	909	2	2	2
410	4T	1818	3	2	3
411	4T	1859	0	3	3
412	4T	1283	0	2	2
413	4T	731	0	2	2
414	4T	388	0	1	1
801	4R	1214	3	3	3
802	4R	1369	2	2	2
803	4S	6976	3	6	5
804	4S	2490	2	2	1
805	4S	5762	5	8	6
806	4S	2127	2	3	2
807	4S	2370	2	3	2
808	4S	2428	2	2	2
809	4R	1547	2	2	2
810	4R	765	1	2	2
811	4R	1506	2	2	2
812	4R	4648	5	6	6
813	4R	3958	4	6	6
814	4S	1029	2	2	2
815	4S	4407	5	6	5
816	4S	5032	6	7	7
817	4S	3646	5	5	5
818	4S	2774	3	4	4
819	4S	1441	2	2	2
820	4R	1358	2	2	2
821	4R	1272	2	1	2
822	4R	3245	2	5	5
823	4R	556	2	2	2
824	4R	837	2	1	2
827	4S	3231	2	3	3
828	4S	2435	2	2	3
829	4S	2692	3	3	1
830	4S	1917	2	3	2
831	4S	1204	1	2	2
832	4S	3962	4	6	6
833	4S	559	1	2	2
835	4R	2641	2	3	4
836	4R	3149	3	4	4
837	4R	2668	2	3	3
838	4R	3378	0	5	4
839	4S	4390	1	2	4
840	4R	765	0	2	2
841	4S	816	1	1	2
Total		116115	107	155	151
851	4T	456	0	2	2
852	4T	427	0	2	2
854	4T	465	0	2	2
855	4T	928	0	2	2

Table 2. Occurrences and raw total catches, in weight and number, by taxon during the 2025 survey (159 successful tows). Values for redfish (STRAP code 792) are calculated from the two beaked redfish species (STRAP codes 794 and 796). Results are presented separately for vertebrates and invertebrates, in alphabetical order of their Latin names.

Vertebrates

STRAP code	Scientific Name	French Name	English Name	Occurrence	Weight (kg)	Number
151	<i>Alosa pseudoharengus</i>	Gasperau	Alewife	1	0.0	2
90	<i>Amblyraja radiata</i>	Raie épineuse	Thorny Skate	118	609.7	1342
696	<i>Ammodytes sp.</i>	Lançons	Sand Lances	20	0.1	65
700	<i>Anarhichas lupus</i>	Loup Atlantique	Atlantic Wolffish	28	94.0	402
701	<i>Anarhichas minor</i>	Loup tacheté	Spotted Wolffish	3	0.2	3
718	<i>Anisarchus medius</i>	Lompénie naine	Stout Eelblenny	1	0.3	38
320	<i>Arctozenus risso</i>	Lussion blanc	White Barracudina	69	8.2	541
193	<i>Argentina silus</i>	Grande argentine	Atlantic Argentine	30	81.9	632
811	<i>Artediellus atlanticus</i>	Hameçon atlantique	Atlantic Hookear Sculpin	27	1.6	295
810	<i>Artediellus sp.</i>	Hameçons	Hookear Sculpins	9	0.2	22
812	<i>Artediellus uncinatus</i>	Hameçon neigeux	Arctic Hookear Sculpin	10	0.8	146
838	<i>Aspidophoroides monopterygius</i>	Poisson-alligator atlantique	Alligatorfish	18	0.2	47
102	<i>Bathyraja spinicauda</i>	Raie à queue épineuse	Spinytail Skate	2	27	2
451	<i>Boreogadus saida</i>	Saïda franc	Arctic Cod	9	0.5	31
865	<i>Careproctus reinhardti</i>	Petite limace de mer	Sea Tadpole	6	0.5	18
27	<i>Centroscyllium fabricii</i>	Aiguillat noir	Black Dogfish	27	2549.6	2507
227	<i>Chauliodus sloani</i>	Chauliode très lumineux	Sloane's Viperfish	1	0.0	1
150	<i>Clupea harengus</i>	Hareng de l'Atlantique	Atlantic Herring	74	244.1	1399
808	<i>Cottidae</i>	Chaboisseaux	Sculpins	1	0.0	1
721	<i>Cryptacanthodes maculatus</i>	Terrassier tacheté	Wrymouth	9	5.5	24
849	<i>Cyclopterus lumpus</i>	Grosse poule de mer	Lumpfish	21	12.7	26
206	<i>Cyclothone sp.</i>	Cyclothone	Anglemouth	1	0.0	1
461	<i>Enchelyopus cimbrius</i>	Motelle à quatre barbillons	Fourbeard Rockling	99	50.3	1311
618	<i>Epigonus pandionis</i>	Cardinal	Big Eye	1	0.0	1
711	<i>Eumesogrammus praecisus</i>	Quatre-lignes atlantique	Fourline Snakeblenny	23	7.5	231
845	<i>Eumicrotremus spinosus variabilis</i>	Petite poule de mer atlantique	Atlantic Spiny Lump sucker Newfoundland Spiny	1	0.0	1
847	<i>Eumicrotremus terraenovae</i>	Petite poule de Terre-Neuve	Lump sucker	23	5.8	364
436	<i>Gadidae</i>	Gadidés	Codfishes	4	0.0	8
438	<i>Gadus morhua</i>	Morue franche	Atlantic Cod	71	2230.8	5722
426	<i>Gasterosteus aculeatus</i>	Épinoche à trois épines	Threespine Stickleback	1	0.0	1
890	<i>Glyptocephalus cynoglossus</i>	Plie grise	Witch Flounder	115	536.2	3532
746	<i>Gymnelus viridis</i>	Unernak caméléon	Fish Doctor	5	0.1	9
823	<i>Gymnocanthus tricuspis</i>	Tricorne arctique	Arctic Staghorn Sculpin	27	5.0	99
797	<i>Helicolenus dactylopterus</i>	Chèvre impériale	Blackbelly Rosefish	8	1.0	12
889	<i>Hippoglossoides platessoides</i>	Plie canadienne	American Plaice	137	631.4	8255
893	<i>Hippoglossus hippoglossus</i>	Flétan de l'Atlantique	Atlantic Halibut	57	883.3	115

STRAP code	Scientific Name	French Name	English Name	Occurrence	Weight (kg)	Number
832	<i>Icelus spatula</i>	Îcèle spatulée	Spatulate Sculpin	6	0.1	11
836	<i>Leptagonus decagonus</i>	Agone atlantique	Atlantic Poacher	9	1.5	102
717	<i>Leptoclinus maculatus</i>	Lompénie tachetée	Daubed Shanny	43	6.6	1143
868	<i>Liparis bathyartcticus</i>	Limace nébuleuse	Nebulous Snailfish	12	4.9	91
966	<i>Lophius americanus</i>	Baudroie d'Amérique	Monkfish, Goosefish	9	62.8	10
716	<i>Lumpenus lampretæformis</i>	Lompénie-serpent	Snakeblenny	26	4.5	197
752	<i>Lycenchelys verrillii</i>	Lycode à tête longue	Wolf Eelpout	4	0.0	4
727	<i>Lycodes esmarkii</i>	Lycode d'Esmark	Esmark's Eelpout	1	0.6	1
728	<i>Lycodes lavalæi</i>	Lycode du Labrador	Newfoundland Eelpout	23	22.3	202
733	<i>Lycodes polaris</i>	Lycode polaire	Canadian Eelpout	1	0.0	1
734	<i>Lycodes terraenovæ</i>	Lycode atlantique	Atlantic Eelpout	1	0.0	1
730	<i>Lycodes vahlii</i>	Lycode à carreaux	Vahl's Eelpout	33	17.7	387
484	<i>Malacocephalus occidentalis</i>	Queue-de-rat d'Amérique	American Straptail Grenadier	1	0.0	1
91	<i>Malacoraja senta</i>	Raie lisse (à queue de velours)	Smooth Skate	81	60.3	302
187	<i>Mallotus villosus</i>	Capelan	Capelin	98	80.4	13621
441	<i>Melanogrammus aeglefinus</i>	Aiglefin	Haddock	3	1.8	5
745	<i>Melanostigma atlanticum</i>	Molasse atlantique	Atlantic Soft Pout	34	0.7	163
449	<i>Merluccius bilinearis</i>	Merlu argenté	Silver Hake	82	67.2	788
272	<i>Myctophidae</i>	Poissons-lanterne	Lanternfishes	3	0.0	3
271	<i>Myctophiformes</i>	Poissons des profondeurs	Deepwater Fishes	2	0.0	4
819	<i>Myoxocephalus scorpius</i>	Chaboisseau à épines courtes	Shorthorn Sculpin	20	17.4	54
13	<i>Myxine limosa</i>	myxine de vase	Girard's hagfish	86	123.2	1879
891	<i>Myzopsetta ferruginea</i>	Limande à queue jaune	Yellowtail Flounder	5	1.6	30
478	<i>Nezumia bairdii</i>	Grenadier du grand Banc	Common Grenadier	81	23	753
275	<i>Notoscopelus kroyeri</i>	Lanterne-voilière nordique	Kroyer's Lanternfish	3	0.1	5
874	<i>Paraliparis calidus</i>	Limace ardente	Lowfin Snailfish	2	0.0	2
854	<i>Paraliparis sp.</i>	Limaces	Snailfishes	1	0.0	1
444	<i>Phycis chesteri</i>	Merluce à longues nageoires	Longfin Hake	23	14.6	98
882	<i>Pleuronectiformes</i>	Poisson-plat	Flatfish	3	0.0	3
443	<i>Pollachius virens</i>	Goberge	Pollock	2	11.0	4
244	<i>Polymetme thaeocoryla</i>	Poisson lumineux	Lighthfishes	1	0.0	1
895	<i>Pseudopleuronectes americanus</i>	Plie rouge	Winter Flounder	1	0.1	1
892	<i>Reinhardtius hippoglossoides</i>	Flétan du Groenland, turbot	Greenland Halibut, Turbot	113	1043.5	7440
572	<i>Scomber scombrus</i>	Maquereau bleu	Atlantic Mackerel	26	4.4	113
398	<i>Scomberesox saurus</i>	Balaou	Atlantic Saury	1	0.1	1
796	<i>Sebastes fasciatus</i>	Sébaste acadien	Acadian Redfish	87	8822.3	43195
794	<i>Sebastes mentella</i>	Sébaste atlantique	Deepwater Redfish	112	44294.9	204795
792	<i>Sebastes spp.</i>	Sébastes	Redfishes	141	53117.2	247990
24	<i>Squalus acanthias</i>	Aiguillat commun	Spiny Dogfish	3	5.2	3
710	<i>Stichæus punctatus</i>	Stichée arctique	Arctic Shanny	2	0.0	4
373	<i>Synaphobranchus kaupii</i>	Anguille égorgée bécuée	Northern Cutthroat Eel	3	0.2	3
814	<i>Triglops murrayi</i>	Faux-trigle armé	Moustache Sculpin	43	23.8	2594
447	<i>Urophycis tenuis</i>	Merluce blanche	White Hake	60	114.8	245

STRAP code	Scientific Name	French Name	English Name	Occurrence	Weight (kg)	Number
Total		Vertébrés	Vertebrates		62 820	305 467

Invertebrates

STRAP code	Scientific Name	French Name	English Name	Occurrence	Weight (kg)	Number
2182	<i>Actinauge cristata</i>	Anémone de mer	Anemone	42	18.3	1579
2165	<i>Actiniaria</i>	Actinies et Anémones	Sea Anemones	19	0.1	43
2162	<i>Actinostola callosa</i>	Anémones de mer	Anemone	49	185.4	4564
6771	<i>Aega psora</i>	Isopode	Isopod	5	0.0	6
2676	<i>Alcyonidium gelatinosum</i>	Bryozoaire marin	Marine bryozoans	1	0.0	1
6930	<i>Amphipoda</i>	Amphipodes	Amphipods	3	0.0	4
8593	<i>Amphiura sp.</i>	Ophiures	Brittle star	8	2.0	2
7389	<i>Anonyx sp.</i>	Gammarides	Gammarids	7	0.0	20
2218	<i>Anthoptilum grandiflorum</i>	Plume de mer	Sea pen	15	1.6	222
5002	<i>Aphrodita hastata</i>	Souris de mer	Sea Mouse	19	2.8	113
6594	<i>Arcoscalpellum michelottianum</i>	Balane	Barnacle	6	0.1	12
8138	<i>Argis dentata</i>	Crevette verte	Arctic Argid	35	21.3	4635
3418	<i>Arrhoges occidentalis</i>	Pied-de-pélican	American Pelicanfoot	17	1.1	141
8742	<i>Ascidia sp.</i>	Ascidie	Sea squirts	74	6.4	1547
8680	<i>Ascidacea</i>	Ascidies, tuniciers sessiles	Ascidians, Sessile Tunicates	17	0.2	12
1169	<i>Asconema</i>	Éponges	Sponges	3	8.9	
4227	<i>Astarte sp.</i>	Astartes	Astartes	1	0.0	4
4226	<i>Astartidae</i>	Astartidé	Astarte	23	2.0	1641
8113	<i>Atlantopandalus propinquus</i>	Crevette	Shrimp	50	3.1	836
2097	<i>Atolla wyvillei</i>	Méduse	Jellyfish	2	0.1	3
6595	<i>Balanidae</i>	Balanes	Barnacles	1	0.0	
2217	<i>Balticina finmarchica</i>	Plume de mer	Sea pen	15	10.3	647
4904	<i>Bathypolypus bairdii</i>	Poulpe	North Atlantic Octopus	38	2.9	63
3995	<i>Bivalvia</i>	Bivalves	Bivalves	4	0.0	12
2158	<i>Bolocera tuediae</i>	Anémone de mer	Anemone	51	10.0	327
8793	<i>Boltenia echinata</i>	Cactus de mer	Cactus Sea Squirt	6	0.0	6
8792	<i>Boltenia ovifera</i>	Patate de mer	Sea Potato	19	19.5	158
3487	<i>Boreotrophon clathratus</i>	Murex	Clathrate Trophon	2	0.0	3
8796	<i>Botrylloides aureus</i>	Botrylle doré	Golden Chain Tunicate	2	0.0	1
5755	<i>Brada inhabilis</i>	Polychète	Flabelligerid worm	2	0.0	3
8378	<i>Brisaster fragilis</i>	Oursin coeur	Heart Urchin	64	705.5	87506
2670	<i>Bryozoa</i>	Bryozoaires	Bryozoans	9	0.0	7
3515	<i>Buccinidae</i>	Buccinidés	Whelks	1	0.0	1
3516	<i>Buccinum sp.</i>	Buccins	Whelk	33	2.5	170
3517	<i>Buccinum undatum</i>	Buccin commun	Waved Whelk	1	0.0	1

STRAP code	Scientific Name	French Name	English Name	Occurrence	Weight (kg)	Number
8173	<i>Calocaris templemani</i>	Crevette fousseuse	Lobster Shrimp	8	0.6	710
8206	<i>Cancer irroratus</i>	Crabe commun	Common Rock Crab	2	0.1	2
8429	<i>Ceramaster granularis</i>	Étoile de mer	Sea Star	24	0.8	86
8213	<i>Chionoecetes opilio</i>	Crabe des neiges	Snow Crab	65	156.4	1656
6593	<i>Chirona hameri</i>	Balane turbané	Turban Barnacle	4	0.7	
4167	<i>Chlamys islandica</i>	Pétoncle d'Islande	Iceland Scallop	12	0.8	61
4351	<i>Ciliatocardium ciliatum</i>	Coque d'Islande	Iceland Cockle	4	0.4	20
8757	<i>Cnemidocarpa finmarkiensis</i>	Ascidie	Tunicate	1	0.0	1
3908	<i>Colga villosa</i>	Nudibranche	Nudibranch	2	0.0	2
3577	<i>Colus pubescens</i>	Buccin	Hairy Whelk	2	0.1	5
3576	<i>Colus stimpsoni</i>	Buccin	Whelk	2	0.1	2
2151	<i>Cribrinopsis similis</i>	Anémone de mer	Sea Anemone	1	0.1	1
8447	<i>Crossaster papposus</i>	Soleil de mer épineux	Spiny Sun Star	19	1.0	48
6000	<i>Crustacea</i>	Crustacé	Crustacean	1	0.0	
3422	<i>Cryptonatica affinis</i>	Lunaties	Arctic moonshell	3	0.0	3
8407	<i>Ctenodiscus crispatus</i>	Étoile de mer	Mud Star	88	143	39676
8312	<i>Cucumaria frondosa</i>	Concombre de mer	Orange Footed Sea Cucumber	5	9.6	36
4526	<i>Cuspidaria glacialis</i>	Bivalve	Glacial Dipperclam	11	0.1	55
2080	<i>Cyanea capillata</i>	Crinière de lion	Lion's Mane	56	40.3	81
4268	<i>Cyclocardia borealis</i>	Vénéricarde boréale	Northern Cyclocardia	1	0.0	1
3895	<i>Dendronotus elegans</i>	Nudibranche orangé	Orange Nudibranch	2	0.0	3
3894	<i>Dendronotus frondosus</i>	Nudibranche	Nudibranch	3	0.0	3
8108	<i>Dichelopandalus leptocerus</i>	Crevette	Bristled Longbeak Shrimp	1	0.0	3
3965	<i>Doridoxa walteri</i>	Nudibranche	Nudibranch	3	0.0	3
2191	<i>Drifa glomerata</i>	Corail mou	Soft coral	24	0.4	10
2183	<i>Duva florida</i>	Corail mou	Sea Cauliflower	8	0.3	4
8373	<i>Echinarachnius parma</i>	Dollar de sable	Common Sand Dollar	2	0.9	103
7383	<i>Epimeria (Epimeria) loricata</i>	Gammaride	Gammarid	5	0.0	7
2156	<i>Epizoanthus erdmanni</i>	Zoanthide	Zoanthid	17	0.0	88
8081	<i>Eualus belcheri</i>	Bouc	Circumpolar Eualid	4	0.1	31
8075	<i>Eualus fabricii</i>	Bouc Arctique	Arctic Eualid	9	0.1	243
8080	<i>Eualus gaimardii gaimardii</i>	Bouc	Circumpolar Eualid	9	0.1	77
8077	<i>Eualus macilentus</i>	Bouc du Groenland	Greenland Shrimp	15	11.7	9576
8074	<i>Eualus sp.</i>	Bouc	Eualid	3	0.0	26
8778	<i>Eudistoma vitreum</i>	Ascidie	Tunicate	11	0.2	34
8033	<i>Eusergestes arcticus</i>	Crevette	Shrimp	6	0.0	6
7195	<i>Eusirus cuspidatus</i>	Gammaride	Gammarid	1	0.0	1
3437	<i>Euspira pallida</i>	Lunatie du Groenland	Pale Moonshell	9	0.0	11
2224	<i>Flabellum (Ulocyathus) alabastrum</i>	Madrépore	Cup coral	7	1.1	69
3175	<i>Gastropoda</i>	Gastéropodes	Gastropods	2	0.0	2
2212	<i>Gersemia fruticosa</i>	Corail frutescent	Hedge carnation coral	5	0.2	7
2184	<i>Gersemia rubiformis</i>	Framboise de mer	Sea Strawberry	15	0.1	20
5902	<i>Golfingia (golfingia) margaritacea</i>	Sipunculide	Sipunculid	7	0.2	31

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4770	<i>Gonatus fabricii</i>	Encornet atlantoboréal	Boreoatlantic Armhook Squid	6	0.2	25
8541	<i>Gorgonocephalus arcticus</i>	Gorgonocéphale	Northern Basket Star	23	215.5	1120
8540	<i>Gorgonocephalus sp.</i>	Gorgonocéphale	Basket Stars	1	2.6	7
8263	<i>Heliometra glacialis</i>	Lis de mer	Feather star	4	0.2	94
3090	<i>Hemithiris psittacea</i>	Brachiopode	Lamp Shell	4	0.0	8
8483	<i>Henricia sp.</i>	Étoiles de mer	Sea Stars	51	0.6	122
4437	<i>Hiatella arctica</i>	Saxicave arctique	Arctic Saxicave	1	0.0	1
8431	<i>Hippasteria phrygiana</i>	Étoile de mer	Sea Star	28	8.8	35
8290	<i>Holothuroidea</i>	Concombres de mer	Sea Cucumbers	2	0.0	3
8154	<i>Homarus americanus</i>	Homard américain	American Lobster	1	1.3	1
2150	<i>Hormathia digitata</i>	Anémone	Anemone	24	0.8	291
2167	<i>Hormathia nodosa</i>	Anémone noduleuse	Rugose Anemone	5	1.1	24
8219	<i>Hyas alutaceus</i>	Crabe lyre (arctique)	Arctic Lyre Crab	37	2.6	242
8217	<i>Hyas araneus</i>	Crabe lyre (araignée)	Atlantic Lyre Crab	19	1.9	57
8216	<i>Hyas sp.</i>	Crabe lyre	Toad Crab	1	0.2	2
1341	<i>Hydrozoa</i>	Hydrozoaires	Hydrozoans	6	0.0	1
1355	<i>Hydrozoans (M. rotunda)</i>	Hydrozoaire	Modeeria rotunda	6	0.1	9
6977	<i>Hyperia galba</i>	Hypéride	Hyperiid	3	0.0	4
4753	<i>Illex illecebrosus</i>	Encornet rouge nordique	Northern Shortfin Squid	32	61.9	518
2213	<i>Kophobelemnion stelliferum</i>	Plume de mer	Sea pen	2	0.0	5
5003	<i>Laetmonice filicornis</i>	Polychète	Seaworm	28	0.2	95
8092	<i>Lebbeus groenlandicus</i>	Bouc	Spiny Lebbeid	9	0.8	184
8095	<i>Lebbeus microceros</i>	Bouc	Shrimp	3	0.0	4
8093	<i>Lebbeus polaris</i>	Bouc	Polar Lebbeid	46	0.9	706
8091	<i>Lebbeus sp.</i>	Boucs	Lebbeids	1	0.0	
8511	<i>Leptasterias (Hexasterias) polaris</i>	Étoile de mer polaire	Polar Sea Star	10	1.2	13
8513	<i>Leptasterias groenlandica</i>	Étoile de mer du Groenland	Greenland Sea Star	6	0.0	6
8521	<i>Leptychaster arcticus</i>	Stelléridé	Sea Star	1	0.0	1
2207	<i>Liponema multicornis</i>	Anémone	Sea anemone	10	0.5	28
8196	<i>Lithodes maja</i>	Crabe épineux du Nord	Norway King Crab	54	49.9	182
4395	<i>Macoma calcarea</i>	Bivalve	Chalky Macoma	10	0.8	370
2185	<i>Malacalcyonacea</i>	Malacalcyonacea	Malacalcyonacea	2	0.0	1
3219	<i>Margarites costalis</i>	Margarite rosé du Nord	Boreal Rosy Margarite	9	0.0	33
3216	<i>Margarites groenlandicus</i>	Troque	Greenland marguerite	2	0.0	3
7268	<i>Megamoera dentata</i>	Gammaride	Gammarid	1	0.0	1
4025	<i>Megayoldia thraciaeformis</i>	Bivalve	Broad Yoldia	32	18.1	3379
8322	<i>Molpadia oolitica</i>	Holothurie	Sea Cucumber	4	0.2	30
8164	<i>Munidopsis curvirostra</i>	Galathée à rostre courbé	Squat Lobster	9	0.0	20
4121	<i>Mytilus sp.</i>	Moules	Mussels	4	0.0	9
3000	<i>Nemertea</i>	Némerte	Ribbon Worm	5	0.0	9
3567	<i>Neptunea despecta</i>	Neptunée commune du nord	Lader Whelk	6	0.2	7
5225	<i>Nereididae</i>	Polychète errant	Clam Worm	1	0.1	51
8448	<i>Novodinia americana</i>	Étoile de mer	Sea star	2	0.9	2

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4019	<i>Nuculana</i> sp.	Bivalves	Nutclams	6	0.0	66
5964	<i>Nymphon hirtipes</i>	Araignée de mer	Sea spider	1	0.0	1
5961	<i>Nymphon</i> sp.	Araignées de mer	Sea Spiders	18	0.0	38
3456	<i>Onchidiopsis corys</i>	Gastéropode	Snail	1	0.0	1
8575	<i>Ophiacantha bidentata</i>	Ophiure épineuse	Brittle Star	17	0.1	66
8583	<i>Ophiopholis aculeata</i>	Ophiure paquerette	Daisy Brittle Star	38	27.4	14863
8585	<i>Ophioscolex glacialis</i>	Ophiure	Brittle star	7	0.0	17
8553	<i>Ophiura sarsii</i>	Ophiure	Brittle Star	70	125.4	54817
8530	<i>Ophiuroidea</i>	Ophiures	Brittle Stars	1	0.0	1
8178	<i>Pagurus</i> sp.	Bernard hermite droitier	Hermit Crab	27	0.2	60
8111	<i>Pandalus borealis</i>	Crevette nordique	Northern Shrimp	121	1420.8	222336
8112	<i>Pandalus montagui</i>	Crevette ésope	Striped Pink Shrimp, Aesop Shrimp	68	186.3	57510
4438	<i>Panomya norvegica</i>	Saxicave	Arctic Roughmya	1	0.2	3
7586	<i>Paramphithoe hystrix</i>	Gammaride	Gammarid	1	0.0	1
8057	<i>Pasiphaea multidentata</i>	Sivade rose, Crevette blanche	Pink Glass Shrimp	64	25.6	7131
8781	<i>Pelonaia corrugata</i>	Ascidie	Tunicate	1	0.0	1
2203	<i>Pennatula aculeata</i>	Plume de mer	Sea Pen	84	22.6	7778
2096	<i>Periphylla periphylla</i>	Méduse à couronne	Crown jellyfish	47	85.2	104
4955	<i>Phyllodoce groenlandica</i>	Polychète	Paddle Worm	1	0.0	2
2255	<i>Pleurobrachia pileus</i>	Groseille de mer ronde	Sea Gooseberry	3	0.0	14
8783	<i>Polycarpa fibrosa</i>	Ascidie	Tunicate	4	0.0	16
4950	<i>Polychaeta</i>	Polychètes	Polychaetes	42	0.6	80
1122	<i>Polymastia andrica</i>	Éponge	Sponge	1	0.0	
1123	<i>Polymastia grimaldii</i>	Éponge	Sponge	1	0.0	
1107	<i>Polymastia hemisphaerica</i>	Éponge	Sponge	15	2.4	306
1109	<i>Polymastia</i> sp.	Éponge	Sponge	2	0.0	4
5007	<i>Polynoidae</i>	Polychète errant	Fifteen-Scaled Worm	21	0.1	47
5264	<i>Polyphysia crassa</i>	Polychète	Sea worm	4	0.0	1
3125	<i>Polyplacophora</i>	Chitons	Chitons	1	0.0	1
8135	<i>Pontophilus norvegicus</i>	Crevette de Norvège	Norwegian Shrimp	78	2.6	1535
8435	<i>Poraniomorpha</i> sp.	Étoile de mer	Sea star	6	0.1	8
1101	<i>Porifera</i>	Éponges	Sponges	102	41.8	5299
2573	<i>Priapulus caudatus</i>	Priapulide	Priapulid	1	0.0	
8433	<i>Pseudarchaster parelii</i>	Étoile de mer	Sea Star	14	0.3	23
8520	<i>Psilaster andromeda</i>	Étoile de mer	Sea Star	15	4.6	474
8294	<i>Psolus phantapus</i>	Holothurie	Sea Cucumber	3	0.0	3
8410	<i>Pteraster militaris</i>	Étoile de mer	Sea Star	7	0.4	39
8412	<i>Pteraster obscurus</i>	Étoile de mer	Sea Star	3	0.2	5
8411	<i>Pteraster pulvillus</i>	Étoile de mer	Sea Star	3	0.0	5
2210	<i>Ptilella grandis</i>	Plume de mer	Sea Pen	18	52.2	1887
2153	<i>Ptychodactis patula</i>	Anémone beige évasée	Anemone	3	0.5	21
1353	<i>Ptychogena lactea</i>	Méduse	Jellyfish	1	0.0	2

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5975	<i>Pycnogonum litorale</i>	Araignée de mer	Sea Spider	1	0.0	1
9970	<i>Rajidae sp. eggs</i>	Capsule de raies	Skates Eggs	1	0.0	2
7211	<i>Rhachotropis aculeata</i>	Gammaride	Gammarid	13	0.0	39
4557	<i>Rossia sp.</i>	Sépioles	Bobtails	10	0.2	11
8129	<i>Sabinea sarsii</i>	Crevette	Sars Shrimp	10	0.1	60
8128	<i>Sabinea septemcarinata</i>	Crevette	Sevenline Shrimp	33	3.1	1151
3491	<i>Scabrotrophon fabricii</i>	Murex	Murex	5	0.0	6
3715	<i>Scaphander punctostriatus</i>	Céphalaspide	Giant Canoe Bubble	20	0.1	36
8119	<i>Sclerocrangon boreas</i>	Crevette de roche (ciselée)	Scultured Shrimp	16	13.6	1682
2040	<i>Scyphozoa</i>	Scyphozoaires (méduse)	Scyphozoans (Jellyfish)	14	0.5	11
2679	<i>Securiflustra securifrons</i>	Bryozoaires marins	Marine bryozoans	3	0.0	4
4352	<i>Serripes groenlandicus</i>	Coque du Groenland	Greenland Smoothcockle	1	0.0	1
8445	<i>Solaster endeca</i>	Soleil de mer pourpre	Purple Sunstar	7	0.0	8
8087	<i>Spirontocaris liljeborgii</i>	Bouc épineux	Friendly Blade Shrimp	25	0.1	97
8084	<i>Spirontocaris sp.</i>	Bouc	Blade Shrimp	5	0.0	11
8085	<i>Spirontocaris spinus</i>	Bouc perroquet	Parrot Shrimp	16	0.4	268
7750	<i>Stegocephalus inflatus</i>	Gammaride	Gammarid	2	0.0	4
1381	<i>Stephalia corona</i>	Stephalia corona	Stephalia corona	8	0.1	18
8515	<i>Stephanasterias albula</i>	Étoile de mer	Sea star	1	0.0	3
2159	<i>Stephanauge nexilis</i>	Anémone de mer	Sea anemone	18	1.1	134
4587	<i>Stoloteuthis leucoptera</i>	Sépiole	Butterfly Squid	25	0.4	69
2173	<i>Stomphia coccinea</i>	Anémone marbrée	Anemone	18	0.4	46
8363	<i>Strongylocentrotus sp.</i>	Oursins	Sea Urchins	46	44.2	1733
1112	<i>Stylocordyla borealis</i>	Éponge	Sponge	1	0.0	1
6791	<i>Syscenus infelix</i>	Isopode	Isopod	30	0.1	99
1108	<i>Tentorium semisuberites</i>	Éponge	Sponge	13	0.1	60
3101	<i>Terebratulina septentrionalis</i>	Térébratule du Nord	Northern Lamp Shell	5	0.0	6
6972	<i>Themisto libellula</i>	Hypéride	Hyperiid	27	0.1	478
1357	<i>Thuiaria thuja</i>	Hydrozoaire	Bottlebrush Hydroid	9	0.0	18
2152	<i>Urticina crassicornis</i>	Anémone de mer	Sea Anemone	22	1.7	49
4451	<i>Xylonora atlantica</i>	Bivalve	Atlantic Woodeater	1	0.0	1
Total		Invertébrés	Invertebrates		3 811	545 469

Table 3. Number of measured and weighed specimens and descriptive length statistics in 2025. P1 : 1st percentile, P99 : 99th percentile

Vertebrates

STRAP Code	Scientific Name	Number sampled		Length (cm)				
		Length	Weight	Min	P1	Median	P99	Max
151	<i>Alosa pseudoharengus</i>	2	1	13.8	13.8	15.1	16.4	16.4
90	<i>Amblyraja radiata</i>	1111	421	7.7	10.3	31.0	61.3	66.8
696	<i>Ammodytes sp.</i>	49	40	5.8	5.9	8.1	11.9	11.9
700	<i>Anarhichas lupus</i>	393	102	6.9	7.6	20.4	59.3	64.5
701	<i>Anarhichas minor</i>	3	3	11.2	11.4	20.4	20.8	20.8
718	<i>Anisarchus medius</i>	38	5	8.9	8.9	14.7	31.3	32.4
320	<i>Arctozenus risso</i>	510	242	15.2	17.5	22.8	27.2	28.0
193	<i>Argentina silus</i>	464	132	7.3	8.9	23.1	37.2	40.1
811	<i>Artediellus atlanticus</i>	176	96	3.6	4.7	6.9	10.1	10.4
810	<i>Artediellus sp.</i>	22	22	7.1	7.1	7.9	10.7	10.8
812	<i>Artediellus uncinatus</i>	86	30	4.8	4.8	6.7	8.2	8.4
838	<i>Aspidophoroides monopterygius</i>	47	36	4.0	4.0	12.7	15.3	15.5
102	<i>Bathyraja spinicauda</i>	2	2	126.0	126.1	132.0	137.9	138.0
451	<i>Boreogadus saida</i>	31	31	4.5	4.6	11.0	22.3	23.0
865	<i>Careproctus reinhardtii</i>	18	15	7.5	7.6	12.2	14.7	14.9
27	<i>Centroscyllium fabricii</i>	409	121	14.7	15.7	36.8	67.2	69.8
227	<i>Chauliodus sloani</i>	1	1	18.4	18.4	18.4	18.4	18.4
150	<i>Clupea harengus</i>	1188	747	12.2	15.0	29.3	34.2	38.5
808	<i>Cottidae</i>	1	1	3.3	3.3	3.3	3.3	3.3
721	<i>Cryptacanthodes maculatus</i>	24	17	8.3	12.3	35.8	87.7	88.9
849	<i>Cyclopterus lumpus</i>	26	26	6.8	6.8	21.1	34.6	35.6
461	<i>Enchelyopus cimbrius</i>	1002	347	2.4	11.6	20.3	26.5	30.5
618	<i>Epigonus pandionis</i>	1	1	15.3	15.3	15.3	15.3	15.3
711	<i>Eumesogrammus praecisus</i>	208	72	9.2	9.7	15.2	20.8	22.0
845	<i>Eumicrotremus spinosus variabilis</i>	1	1	6.1	6.1	6.1	6.1	6.1
847	<i>Eumicrotremus terraenovae</i>	222	81	2.2	2.7	4.7	12.7	13.8
436	<i>Gadidae</i>	7	7	4.4	4.4	5.0	5.6	5.6
438	<i>Gadus morhua</i>	3843	1253	4.1	12.8	29.9	67.0	96.3
426	<i>Gasterosteus aculeatus</i>	1	1	6.6	6.6	6.6	6.6	6.6
890	<i>Glyptocephalus cynoglossus</i>	3018	1688	8.2	9.4	26.9	42.3	47.1
746	<i>Gymnelus viridis</i>	9	9	5.7	6.1	14.5	19.1	19.3
823	<i>Gymnocanthus tricuspis</i>	99	58	7.7	8.8	15.7	23.1	23.2
797	<i>Helicolenus dactylopterus</i>	12	12	14.6	14.7	18.3	20.4	20.5
889	<i>Hippoglossoides platessoides</i>	5810	2685	1.0	7.7	19.1	39.5	48.4
893	<i>Hippoglossus hippoglossus</i>	114	115	14.0	19.8	57.4	161.1	176.0
832	<i>Icelus spatula</i>	11	10	5.3	5.4	8.1	14.6	14.8
836	<i>Leptagonus decagonus</i>	102	36	7.0	7.1	15.2	22.1	25.8
717	<i>Leptoclinus maculatus</i>	501	148	7.0	8.8	11.6	16.9	17.8
868	<i>Liparis bathyartcticus</i>	91	36	2.3	2.7	14.5	21.1	21.5
966	<i>Lophius americanus</i>	10	10	23.6	26.2	67.4	108.4	110.0
716	<i>Lumpenus lampretæformis</i>	191	87	4.8	8.2	26.8	41.9	44.3
752	<i>Lycenchelys verrillii</i>	4	4	11.9	11.9	12.5	12.7	12.7
727	<i>Lycodes esmarkii</i>	1	1	47.2	47.2	47.2	47.2	47.2
728	<i>Lycodes lavalæi</i>	146	73	7.2	8.1	20.2	52.7	58.9
733	<i>Lycodes polaris</i>	1	1	19.8	19.8	19.8	19.8	19.8
734	<i>Lycodes terraenovae</i>	1	1	18.2	18.2	18.2	18.2	18.2
730	<i>Lycodes vahlii</i>	293	118	9.0	10.2	21.0	35.3	36.7
484	<i>Malacocephalus occidentalis</i>	1	0	17.3	17.3	17.3	17.3	17.3
91	<i>Malacoraja senta</i>	302	208	7.9	8.6	27.9	55.9	58.4
187	<i>Mallotus villosus</i>	2438	1196	4.6	7.7	11.4	16.0	19.4
441	<i>Melanogrammus aeglefinus</i>	5	5	18.5	18.6	23.4	44.0	44.2
745	<i>Melanostigma atlanticum</i>	163	101	5.4	6.6	11.4	14.1	14.4
449	<i>Merluccius bilinearis</i>	785	613	10.8	12.0	17.6	36.2	45.5
819	<i>Myoxocephalus scorpius</i>	54	43	6.4	7.0	24.7	40.3	40.7

STRAP Code	Scientific Name	Number sampled		Length (cm)				
		Length	Weight	Min	P1	Median	P99	Max
13	<i>Myxine limosa</i>	1097	398	12.7	22.5	37.2	48.5	55.1
891	<i>Myzopsetta ferruginea</i>	30	30	13.3	13.4	17.0	26.7	27.6
478	<i>Nezumia bairdii</i>	692	308	7.6	10.0	21.1	31.2	32.1
275	<i>Notoscopelus kroyeri</i>	5	2	13.5	13.5	14.8	16.6	16.6
874	<i>Paraliparis calidus</i>	2	2	9.7	9.7	10.6	11.5	11.5
854	<i>Paraliparis sp.</i>	1	1	0.4	0.4	0.4	0.4	0.4
444	<i>Phycis chesteri</i>	98	64	10.6	15.9	26.7	39.1	39.4
882	<i>Pleuronectiformes</i>	3	3	0.3	0.4	3.4	3.6	3.6
443	<i>Pollachius virens</i>	4	4	38.4	38.6	50.9	83.7	84.5
244	<i>Polymetme thaeocoryla</i>	1	0	12.9	12.9	12.9	12.9	12.9
895	<i>Pseudopleuronectes americanus</i>	1	1	19.0	19.0	19.0	19.0	19.0
892	<i>Reinhardtius hippoglossoides</i>	4179	1506	4.6	15.6	20.0	46.4	75.5
572	<i>Scomber scombrus</i>	113	112	9.3	10.0	14.5	34.3	35.2
398	<i>Scomberesox saurus</i>	1	1	32.9	32.9	32.9	32.9	32.9
796	<i>Sebastes fasciatus</i>	5584	2281	3.0	4.2	23.0	30.6	60.5
794	<i>Sebastes mentella</i>	8912	3103	3.0	4.0	24.8	29.3	60.5
792	<i>Sebastes spp.</i>	10845	3941	3.0	4.1	24.5	29.5	60.5
24	<i>Squalus acanthias</i>	3	3	70.1	70.2	74.3	77.9	78.0
710	<i>Stichaeus punctatus</i>	4	4	8.9	9.0	12.6	13.8	13.8
373	<i>Synaphobranchus kaupii</i>	3	3	31.5	31.7	42.0	48.9	49.0
814	<i>Triglops murrayi</i>	909	191	6.6	7.4	10.7	16.0	20.5
447	<i>Urophycis tenuis</i>	245	210	16.0	20.5	35.3	64.3	74.5

Invertebrates

STRAP code	Scientific Name	Sampled number		Length (cm)				
		Length	Weight	Min	P1	Median	P99	Max
2218	<i>Anthoptilum grandiflorum</i>	137	56	23.8	25.9	46.4	61.1	61.7
8138	<i>Argis dentata</i>	750	0	0.8	0.9	1.7	2.3	2.4
8113	<i>Atlantopandalus propinquus</i>	449	0	0.8	1.3	1.7	2.1	2.2
2217	<i>Balticina finmarchica</i>	95	37	5.1	24.1	68.0	108.6	125.0
8206	<i>Cancer irroratus</i>	2	0	4.0	4.0	6.2	8.3	8.3
8213	<i>Chionoecetes opilio</i>	917	0	0.5	1.1	3.4	12.0	13.6
8108	<i>Dichelopandalus leptocerus</i>	2	0	1.4	1.4	1.5	1.5	1.5
8081	<i>Eualus belcheri</i>	8	0	0.8	0.8	1.3	1.5	1.5
8075	<i>Eualus fabricii</i>	164	0	0.5	0.5	0.8	1.1	1.2
8080	<i>Eualus gaimardii gaimardii</i>	45	0	0.7	0.7	1.0	1.3	1.3
8077	<i>Eualus macilentus</i>	373	0	0.7	0.7	1.1	1.3	1.4
8074	<i>Eualus sp.</i>	7	0	0.7	0.7	0.7	0.9	0.9
8033	<i>Eusergestes arcticus</i>	5	0	1.4	1.4	2.1	2.2	2.2
4770	<i>Gonatus fabricii</i>	5	0	0.7	0.8	3.6	5.0	5.0
8154	<i>Homarus americanus</i>	1	0	12.1	12.1	12.1	12.1	12.1
8219	<i>Hyas alutaceus</i>	232	0	0.6	0.9	1.9	5.6	8.0
8217	<i>Hyas araneus</i>	57	0	0.8	0.8	2.1	7.7	8.3
4753	<i>Illex illecebrosus</i>	202	88	13.8	14.8	17.9	20.0	21.5
2213	<i>Kophobelemnnon stelliferum</i>	3	3	4.6	4.6	5.7	6.6	6.6
8092	<i>Lebbeus groenlandicus</i>	100	0	0.9	0.9	1.4	2.1	2.3
8095	<i>Lebbeus microceros</i>	3	0	1.0	1.0	1.2	1.2	1.2
8093	<i>Lebbeus polaris</i>	339	0	0.5	0.7	1.0	1.4	1.6
8196	<i>Lithodes maja</i>	180	0	1.3	1.7	7.5	10.6	11.1
8111	<i>Pandalus borealis</i>	14741	890	0.7	1.0	2.2	2.8	3.0
8112	<i>Pandalus montagui</i>	2548	0	0.7	0.8	1.5	2.1	2.4
8057	<i>Pasiphaea multidentata</i>	2131	0	1.0	1.6	2.5	3.1	3.8
2203	<i>Pennatula aculeata</i>	628	301	3.6	4.8	13.7	24.3	28.3
8135	<i>Pontophilus norvegicus</i>	895	0	0.6	0.9	1.3	1.5	1.7
2210	<i>Ptilella grandis</i>	131	55	9.8	15.0	34.3	47.6	48.0
8129	<i>Sabinea sarsii</i>	56	0	0.7	0.7	0.9	1.5	1.5
8128	<i>Sabinea septemcarinata</i>	387	0	0.7	0.8	1.2	1.8	2.6
8119	<i>Sclerocrangon boreas</i>	424	0	0.8	0.9	1.6	2.9	3.4

STRAP code	Scientific Name	Sampled number		Length (cm)				
		Length	Weigth	Min	P1	Median	P99	Max
8087	<i>Spirontocaris liljeborgii</i>	63	0	0.6	0.6	1.0	1.4	1.4
8084	<i>Spirontocaris sp.</i>	4	0	0.8	0.8	0.9	1.1	1.1
8085	<i>Spirontocaris spinus</i>	139	0	0.6	0.6	1.1	1.5	1.6

FIGURES

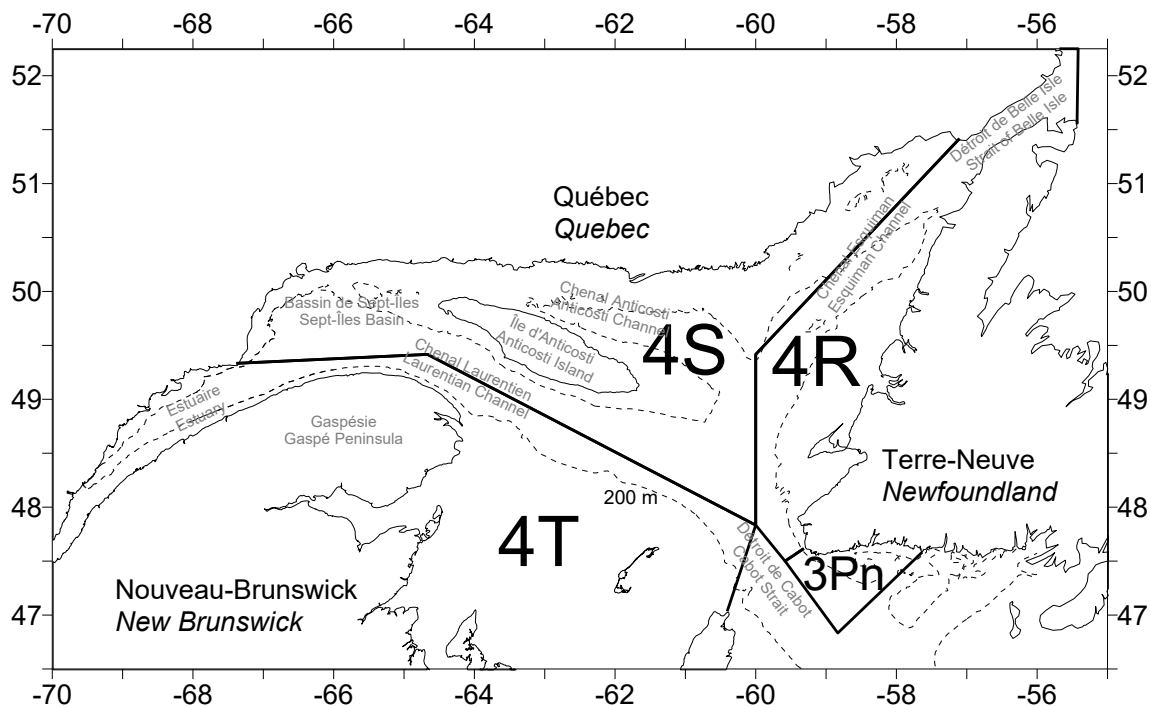


Figure 1. NAFO Divisions of the Estuary and Gulf of St. Lawrence and the names of locations mentioned in the text.

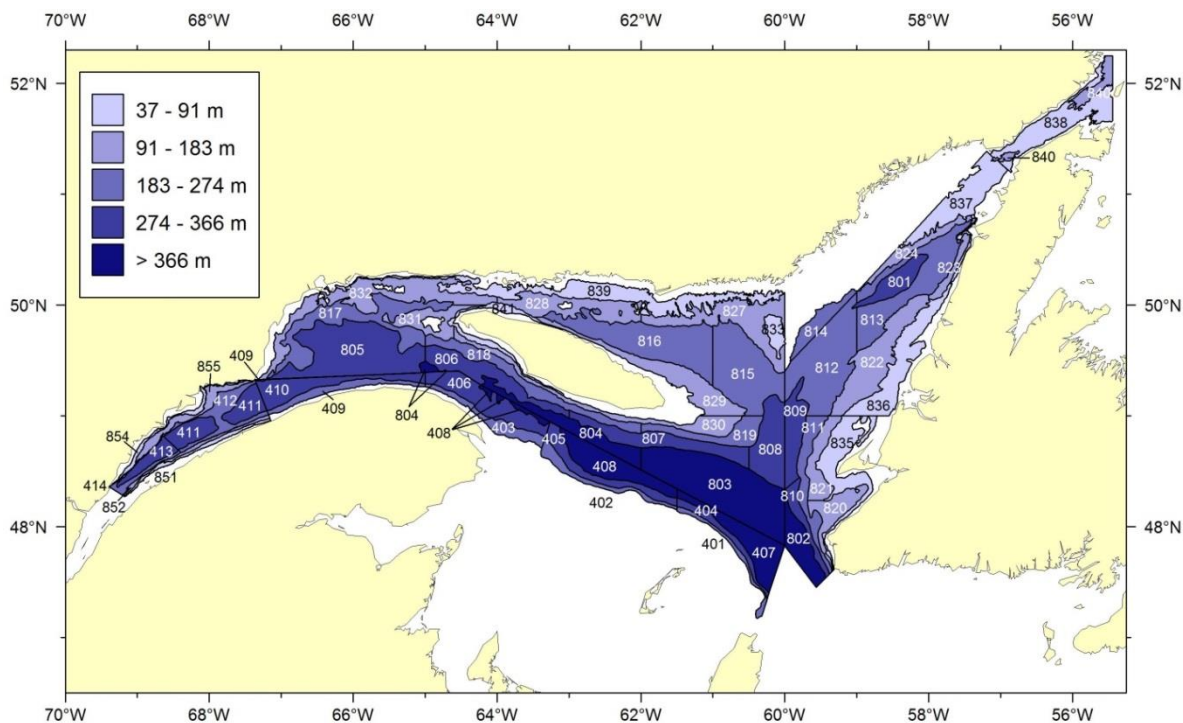


Figure 2. Stratification scheme used for the groundfish and shrimp research survey in the Estuary and northern Gulf of St. Lawrence.

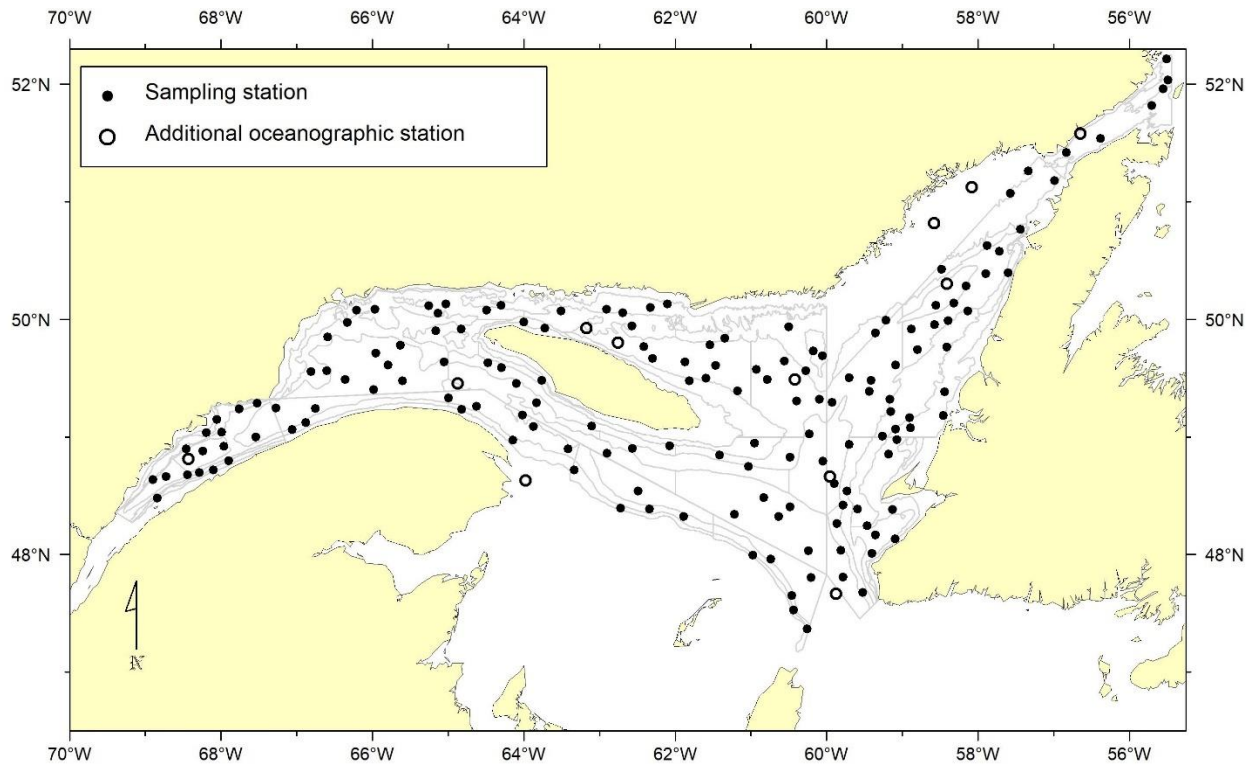


Figure 3. Locations of successful sampling stations (trawl and oceanography) and additional oceanographic stations for the 2025 survey.

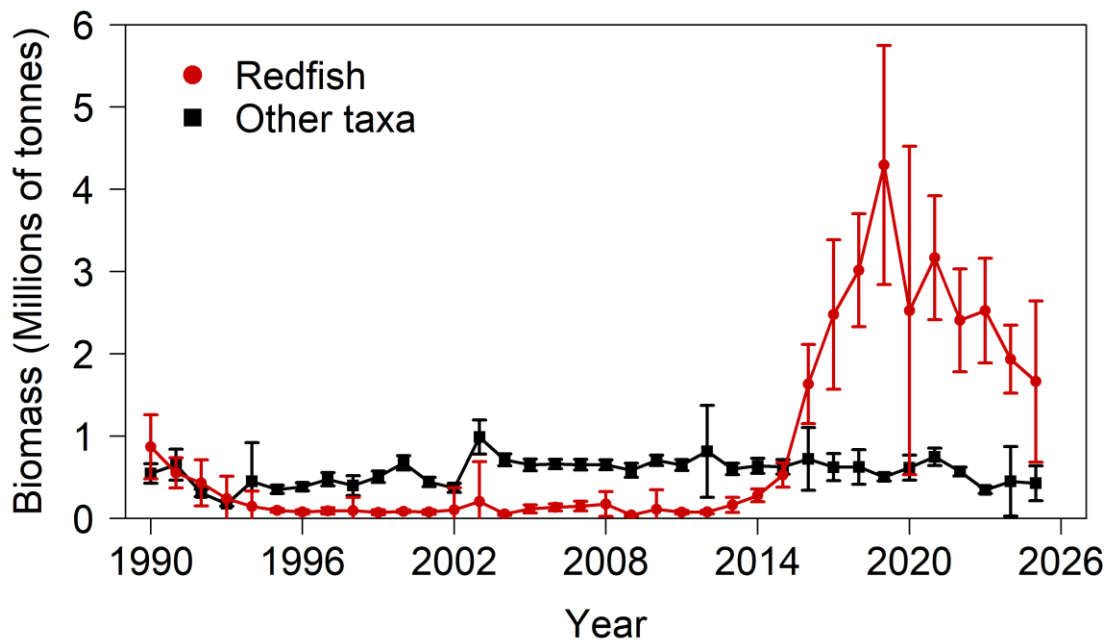


Figure 4. Biomass estimates (millions of tons) of redfish spp. and all other species sampled in the study area. Error bars represent 95% confidence intervals.

Black Dogfish

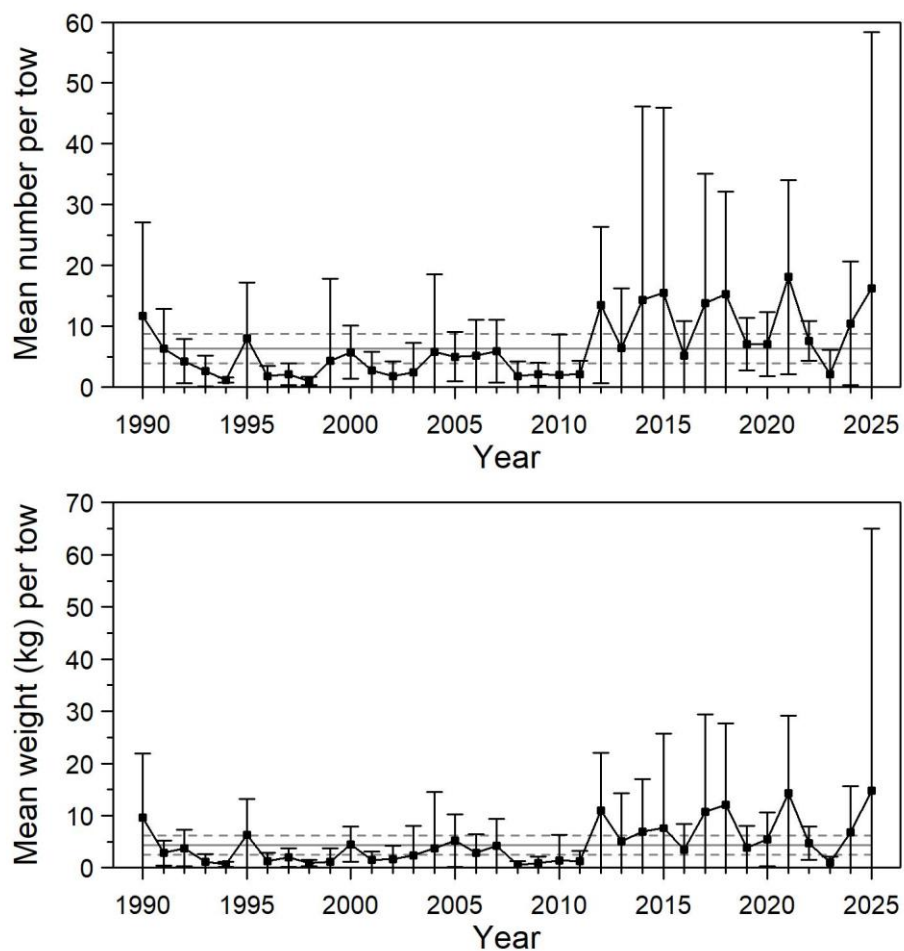


Figure 5. Mean numbers and mean weights per 15-minute tow observed during the survey for black dogfish in 4RST. Error bars indicate the 95% confidence interval and the horizontal lines indicate the mean of the 1990-2024 period (solid line) and upper and lower reference (see text) limits (dashed lines).

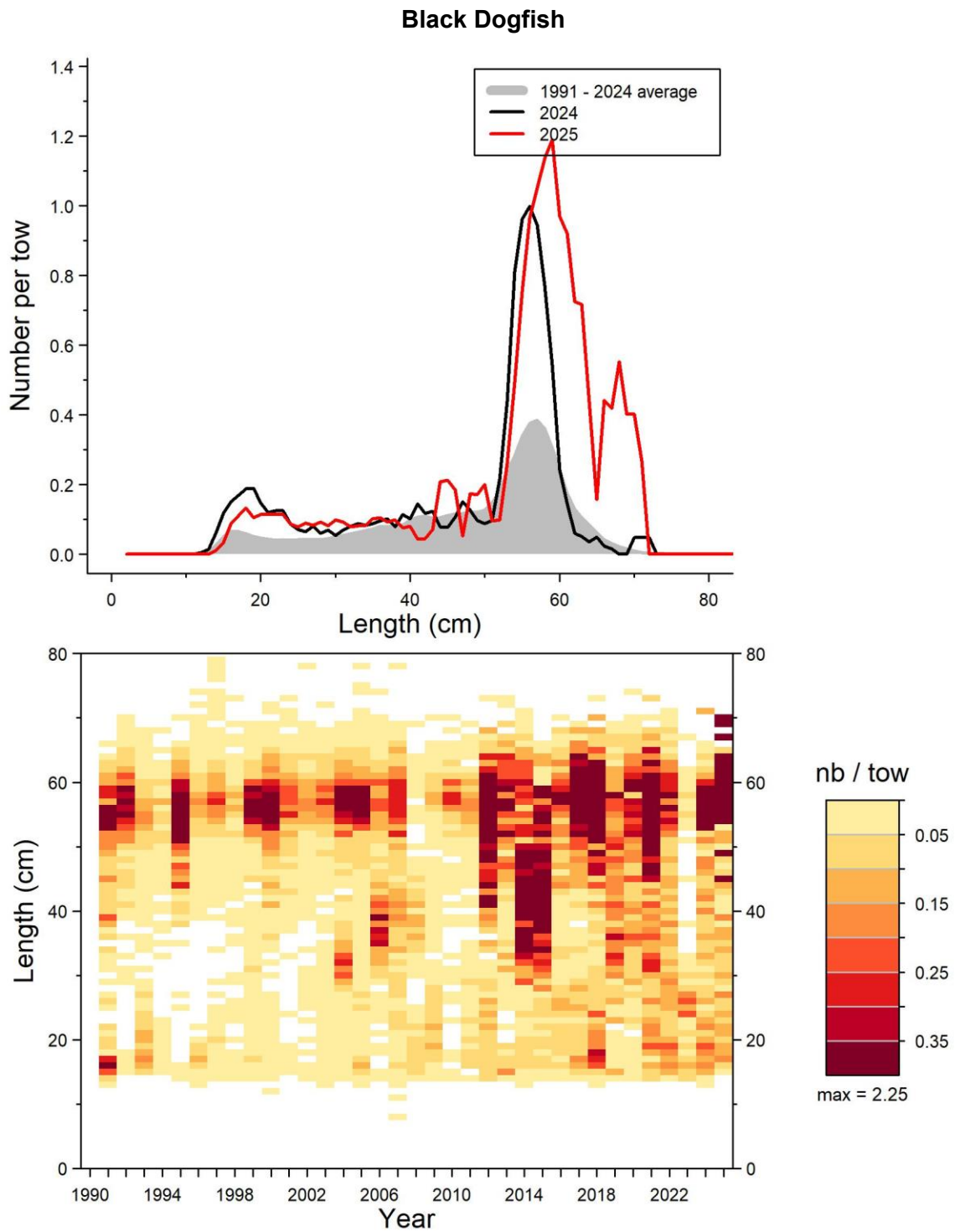


Figure 6. Length frequency distributions (mean number per 15-minute tow) observed during the survey for Black Dogfish in 4RST.

Black Dogfish

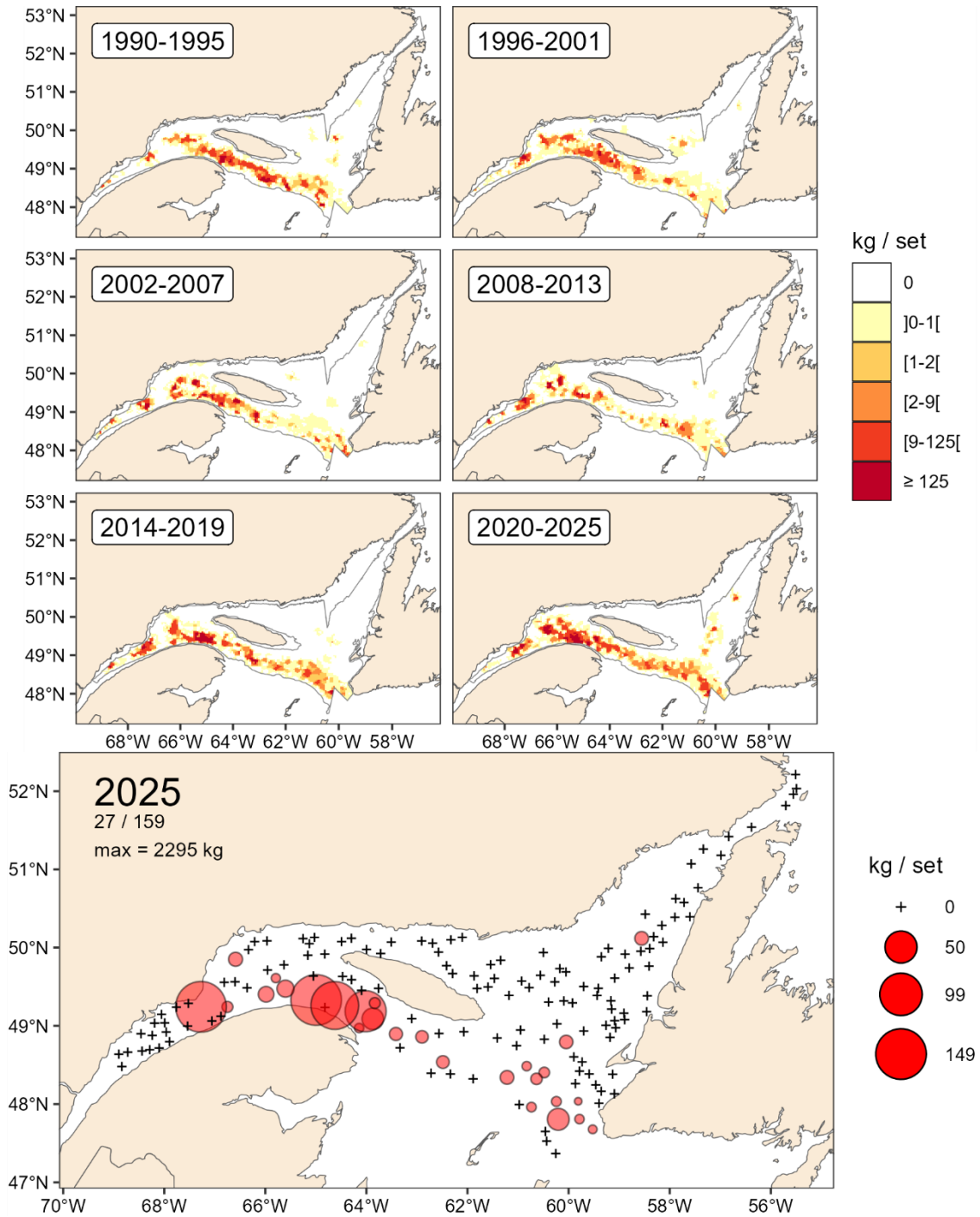


Figure 7. Black Dogfish catch rate (kg/15-minute tow) spatial distributions.

Monkfish

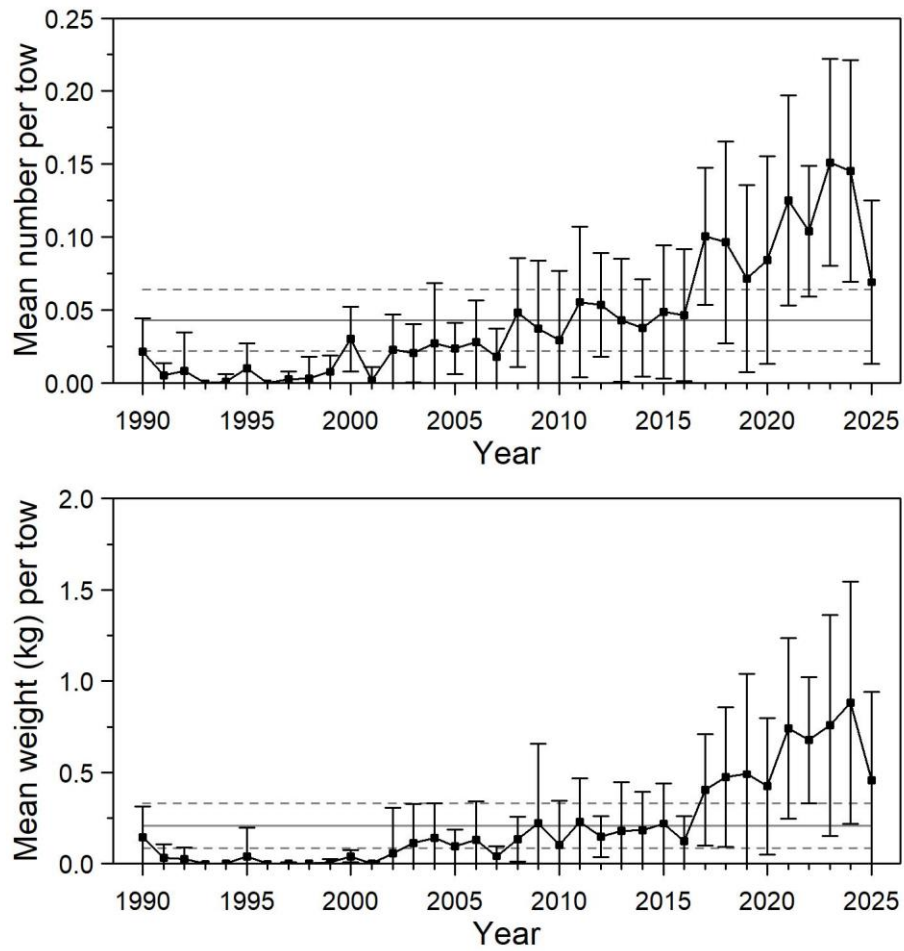


Figure 8. Mean numbers and mean weights per 15-minute tow observed during the survey for Monkfish in 4RST. Error bars indicate the 95% confidence interval and the horizontal lines indicate the mean of the 1990-2024 period (solid line) and upper and lower reference (see text) limits (dashed lines).

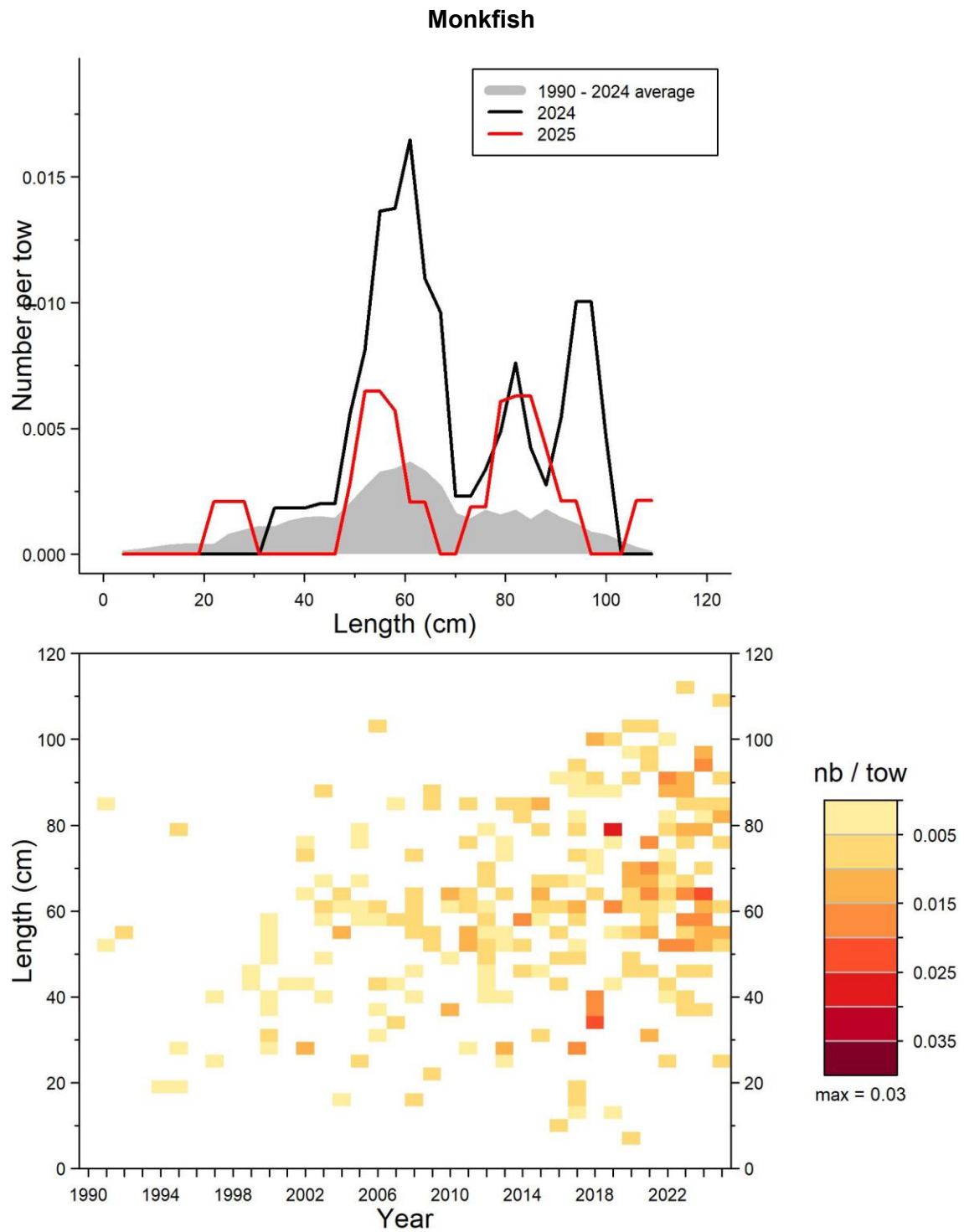


Figure 9. Length frequency distributions (mean number per 15-minute tow) observed during the survey for Monkfish in 4RST.

Monkfish

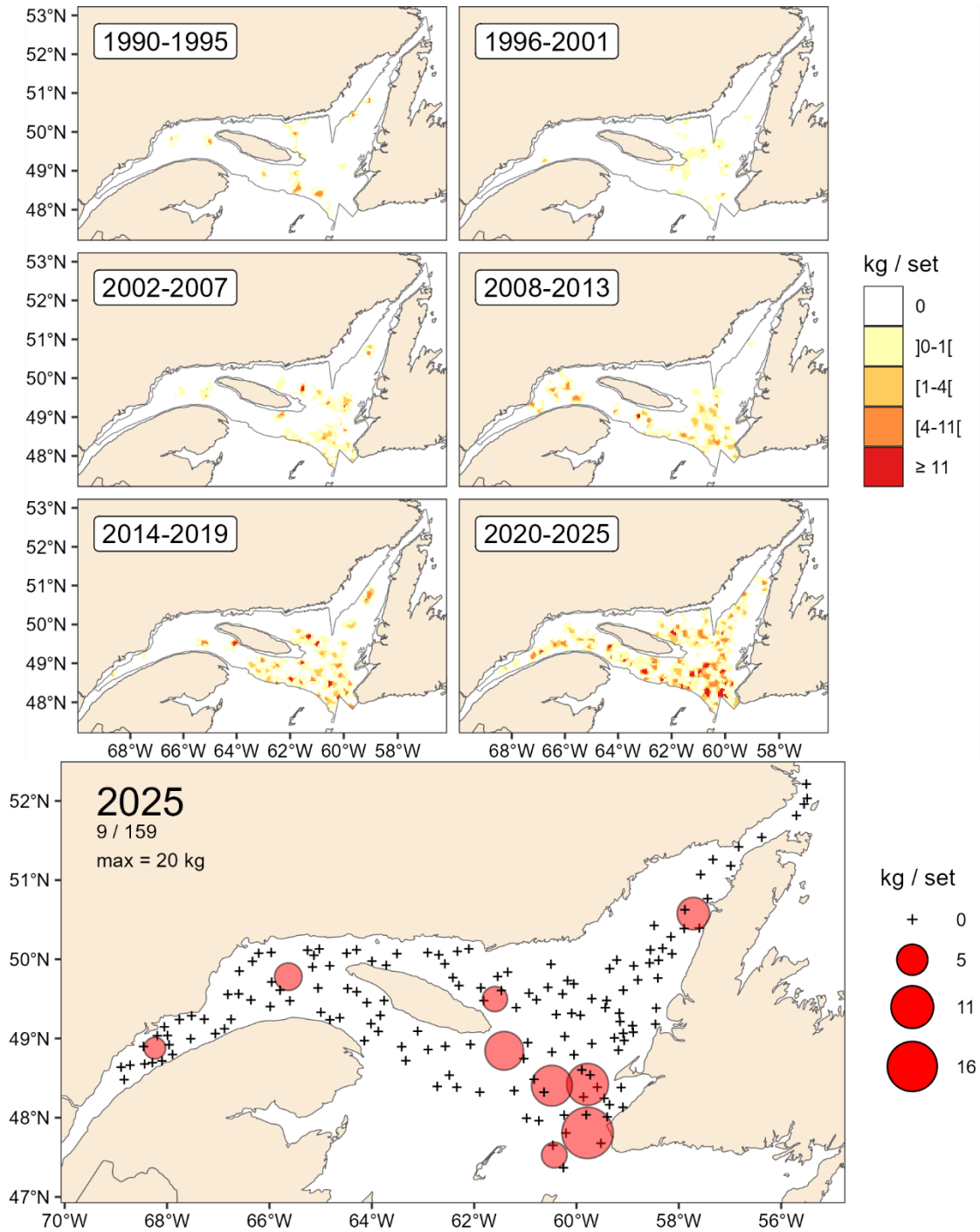


Figure 10. Monkfish catch rate (kg/15-minute tow) distributions.

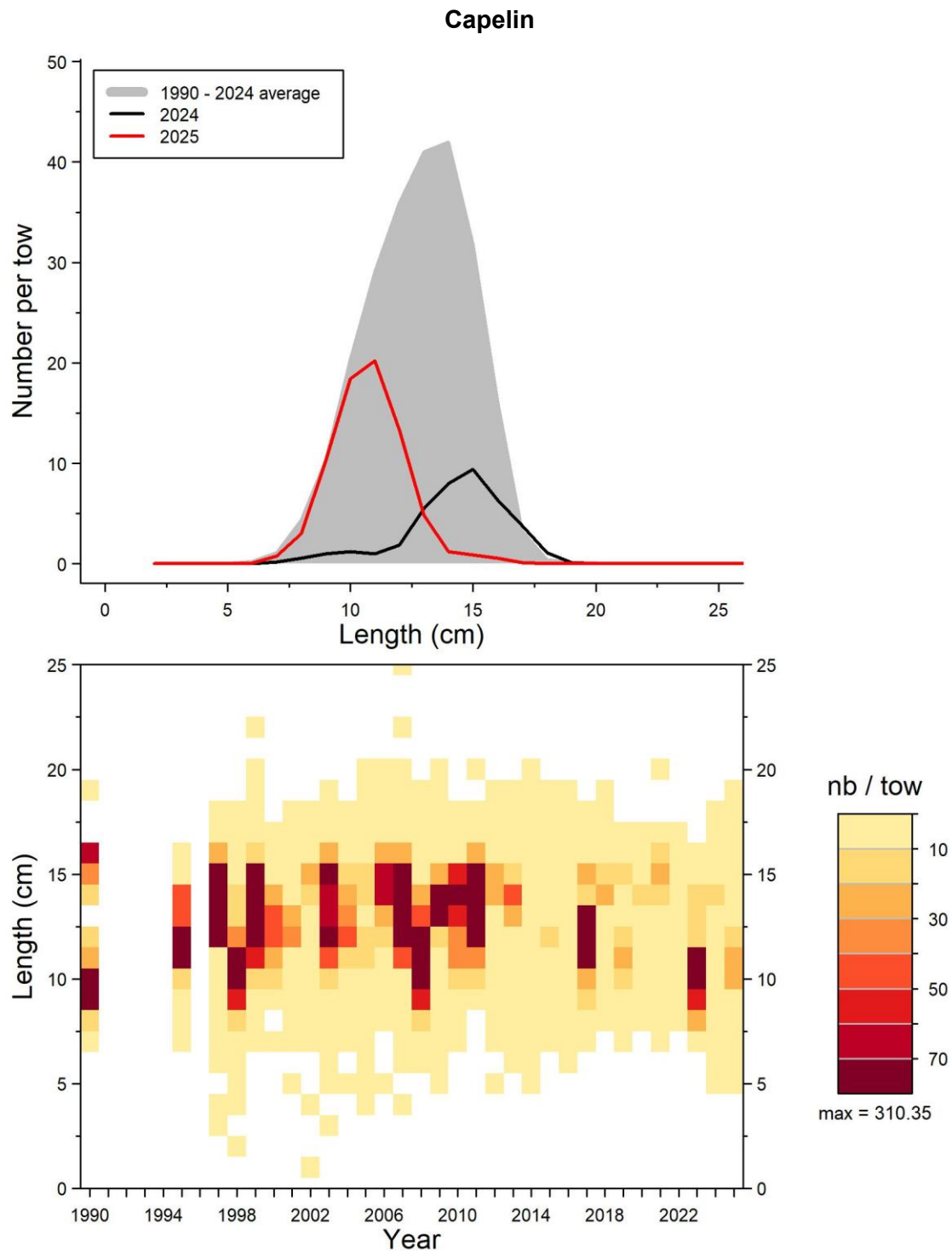


Figure 11. Length frequency distributions (mean number per 15-minute tow) observed during the survey for Capelin in 4RST.

Capelin

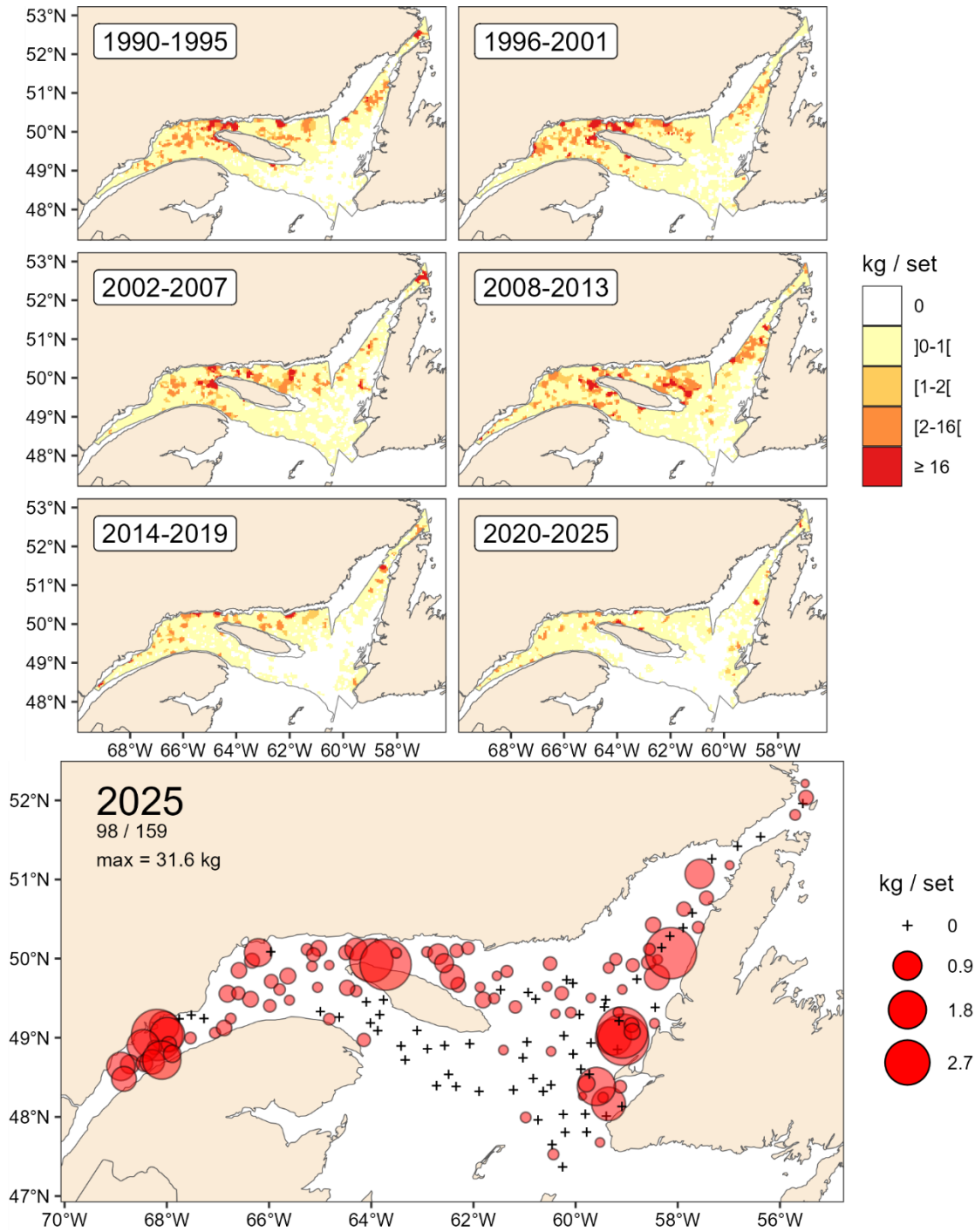


Figure 12. Capelin catch rate (kg/15-minute tow) spatial distributions.

Atlantic Halibut

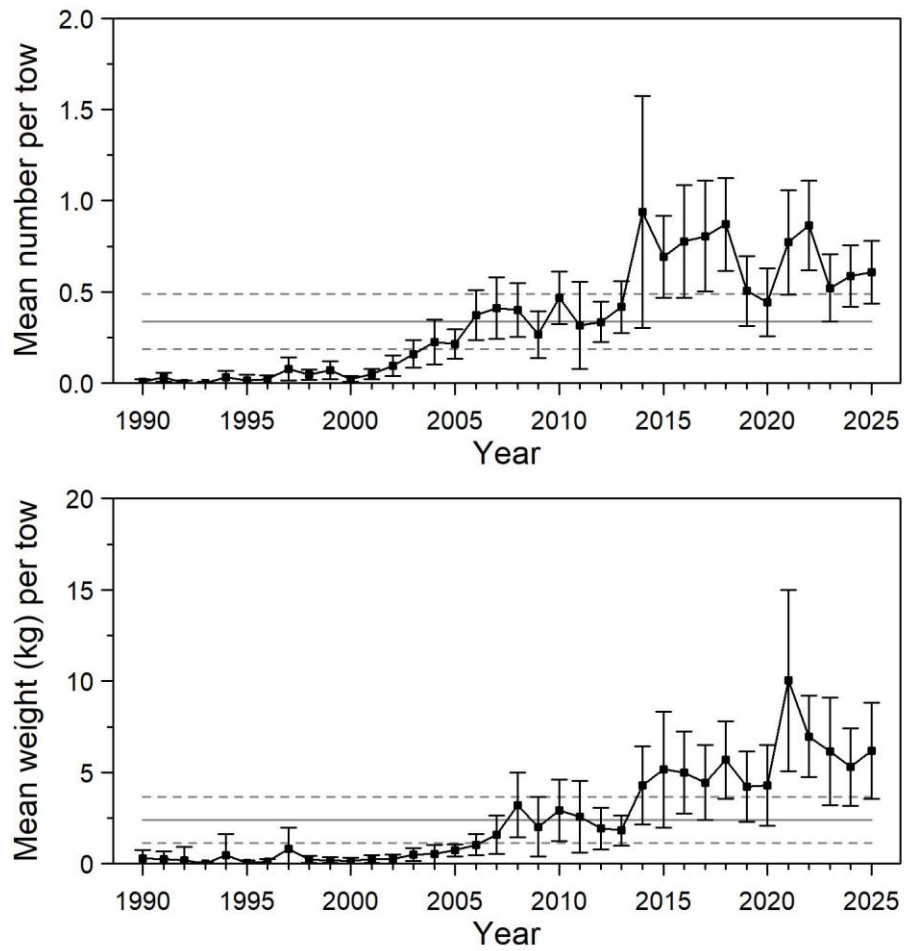


Figure 13. Mean numbers and mean weights per 15-minute tow observed during the survey for Atlantic Halibut in 4RST. Error bars indicate the 95% confidence interval and the horizontal lines indicate the mean of the 1990-2024 period (solid line) and upper and lower reference (see text) limits (dashed lines).

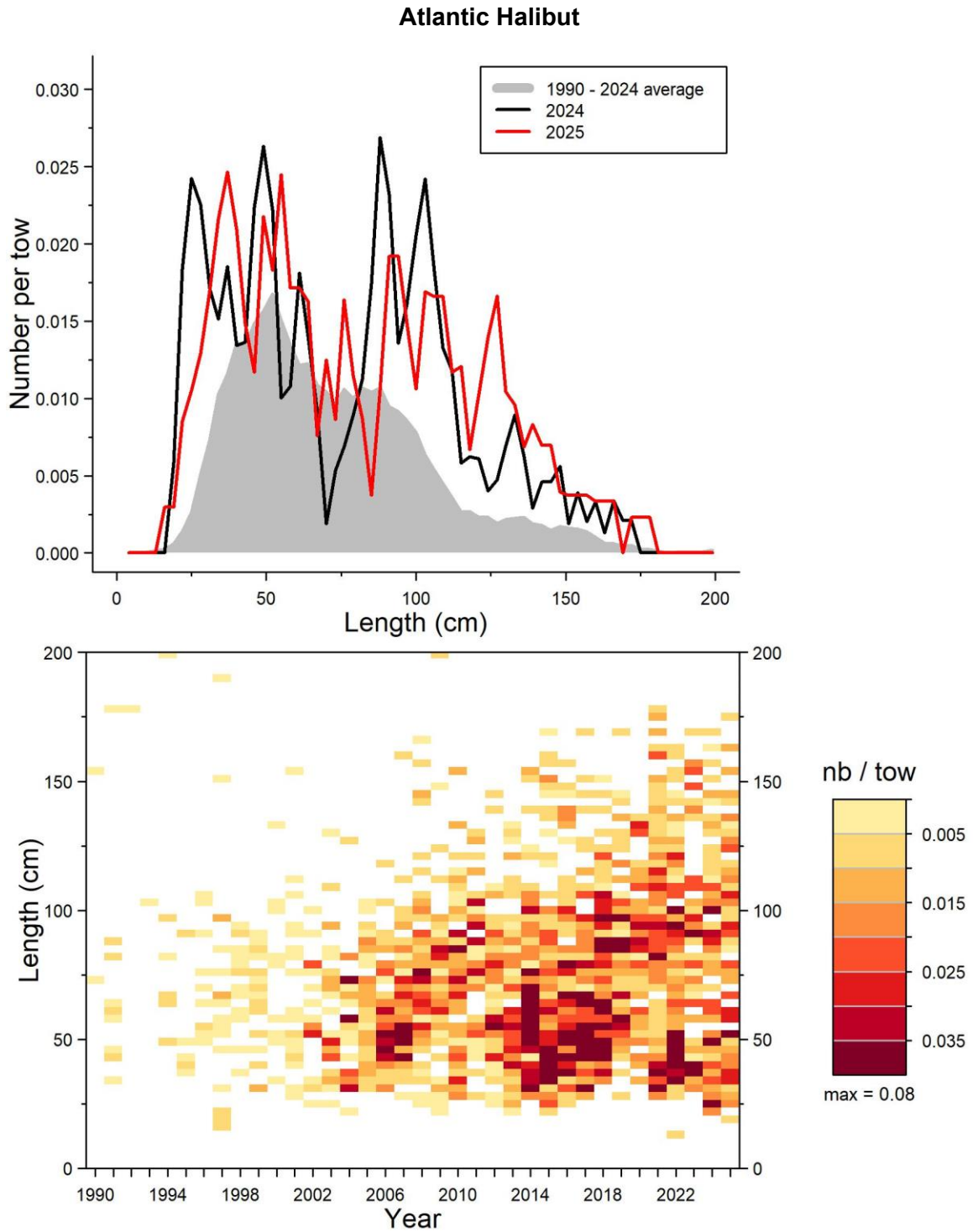


Figure 14. Length frequency distributions (mean number per 15-minute tow) observed during the survey for Atlantic Halibut in 4RST.

Atlantic Halibut

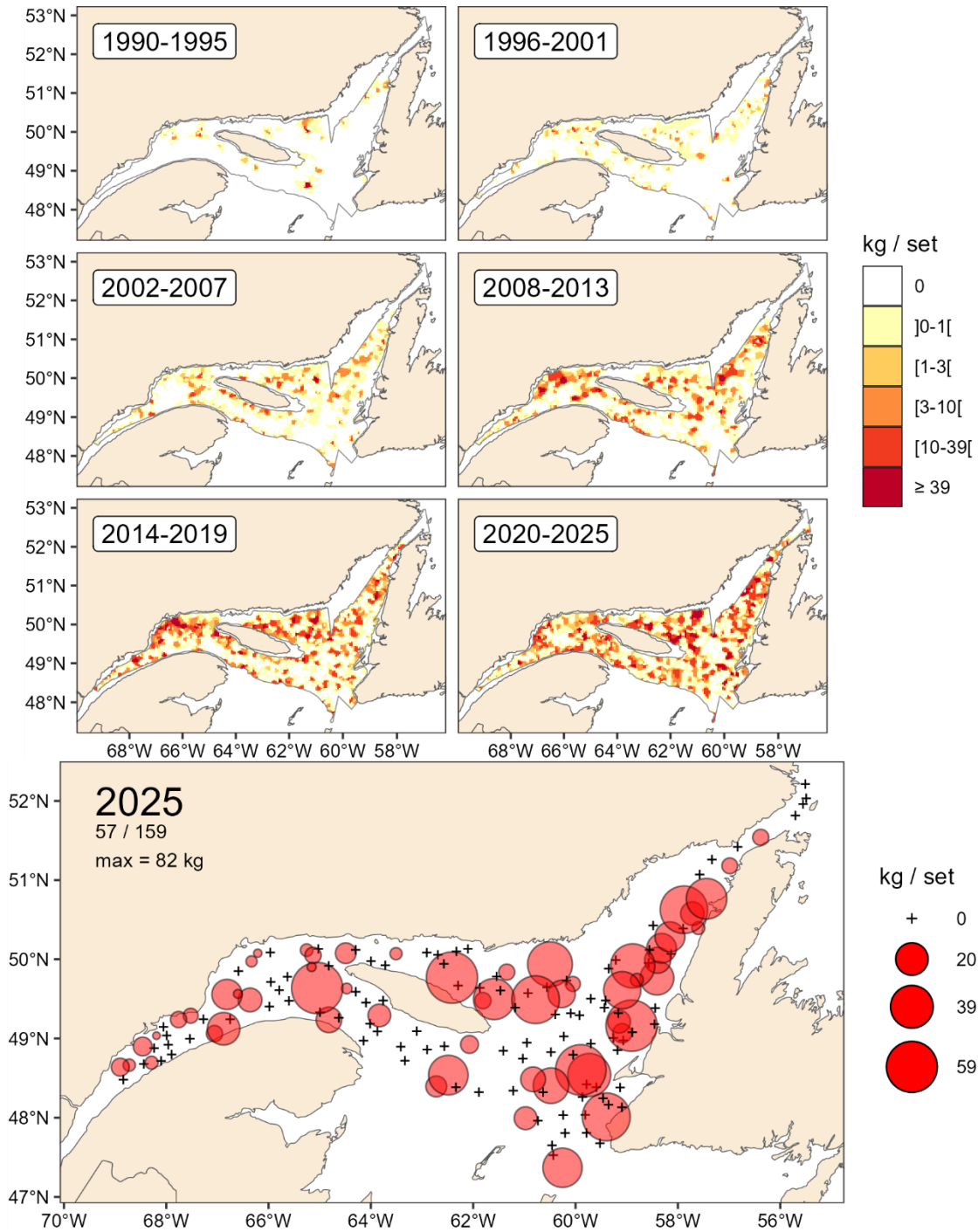


Figure 15. Atlantic Halibut catch rate (kg/15-minute tow) spatial distributions.

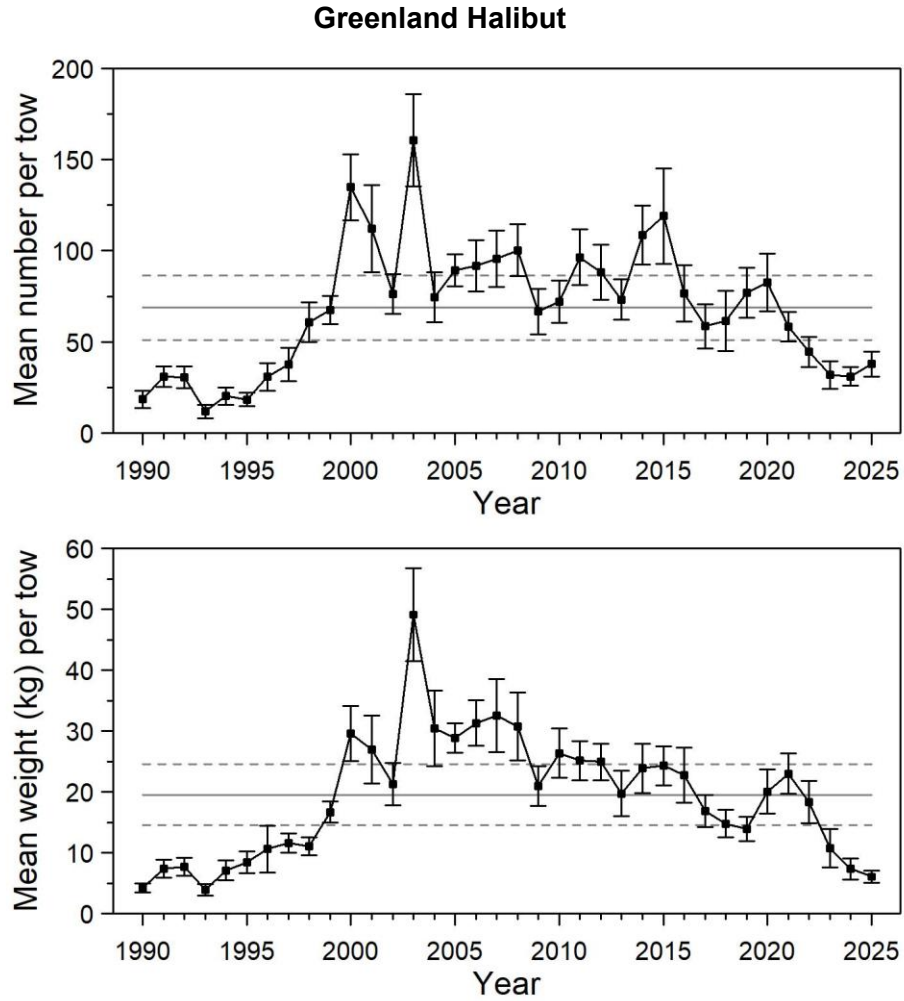


Figure 16. Mean numbers and mean weights per 15-minute tow observed during the survey for Greenland halibut in 4RST. Error bars indicate the 95% confidence interval and the horizontal lines indicate the mean of the 1990-2024 period (solid line) and upper and lower reference (see text) limits (dashed lines).

Greenland Halibut

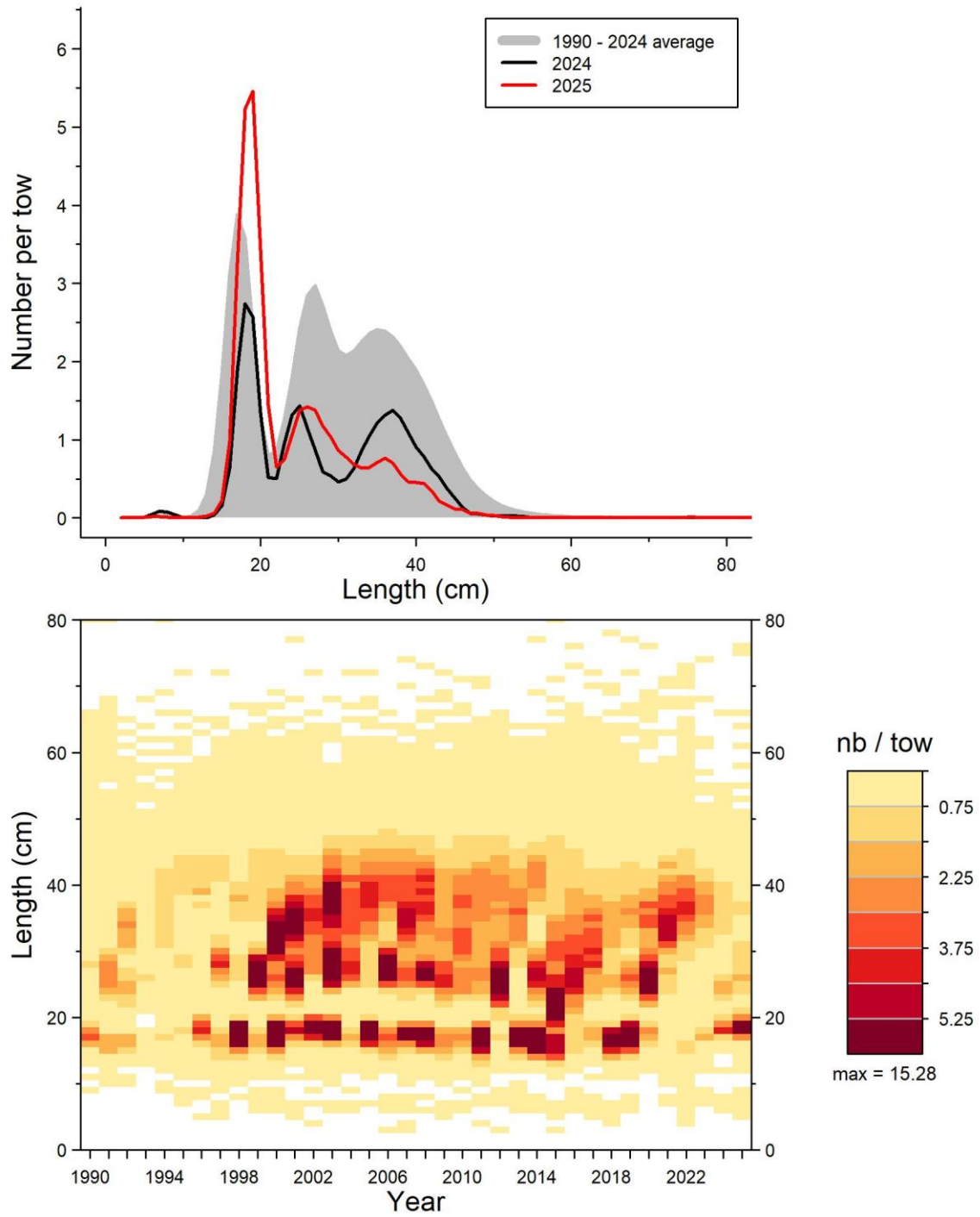


Figure 17. Length frequency distributions (mean number per 15-minute tow) observed during the survey for Greenland halibut in 4RST.

Greenland Halibut

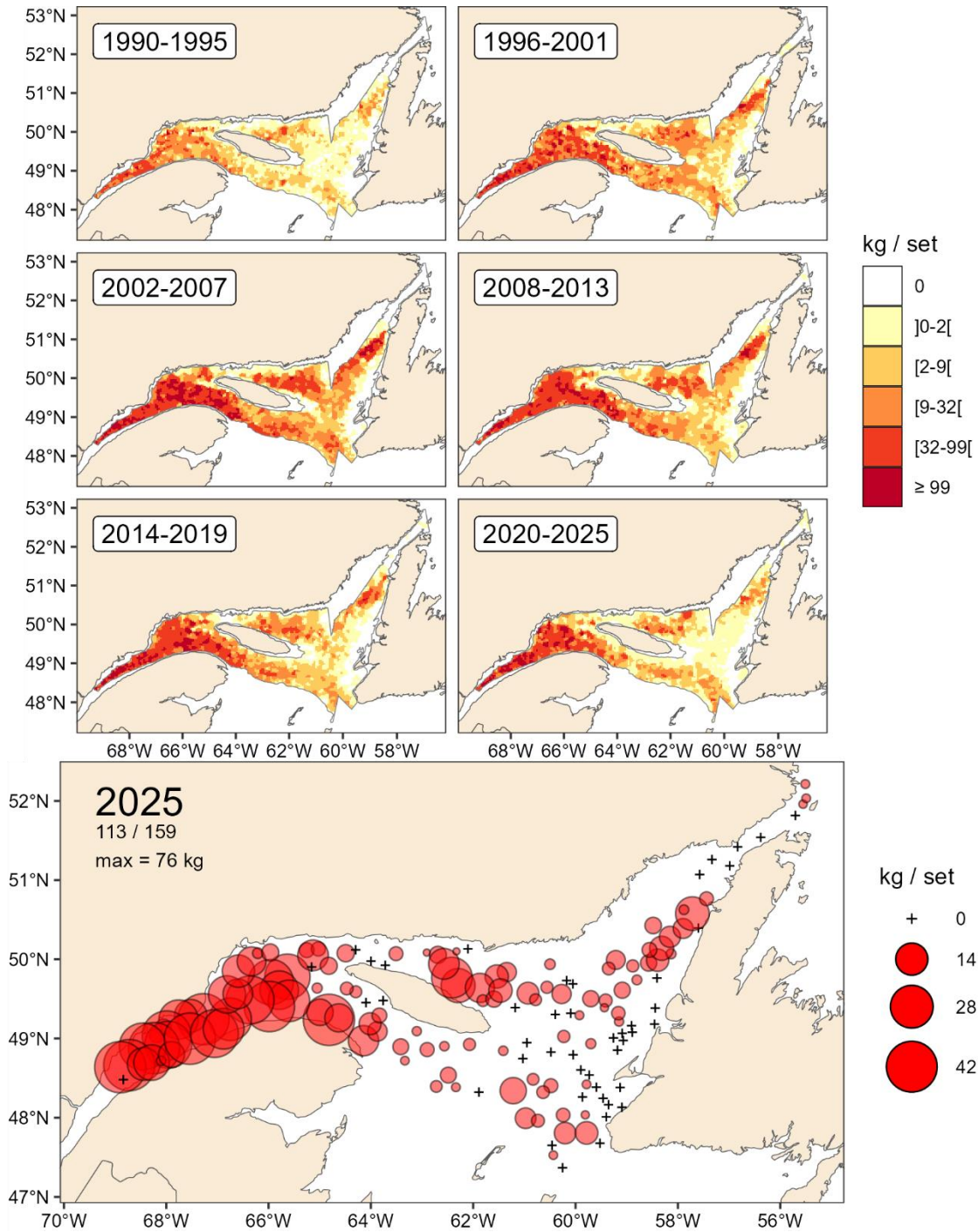


Figure 18. Greenland halibut catch rate (kg/15-minute tow) spatial distributions.

Atlantic Argentine

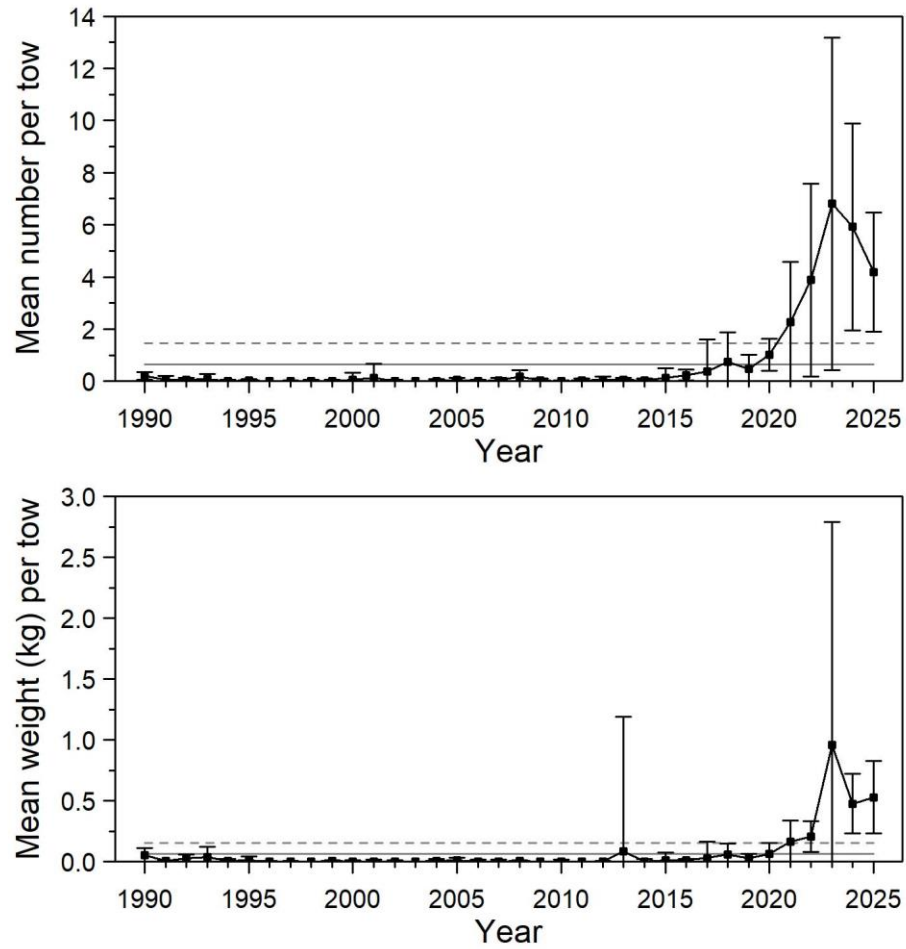


Figure 19. Mean numbers and mean weights per 15-minute tow observed during the survey for Atlantic Argentine in 4RST. Error bars indicate the 95% confidence interval and the horizontal lines indicate the mean of the 1990-2024 period (solid line) and upper and lower reference (see text) limits (dashed lines).

Atlantic Argentine

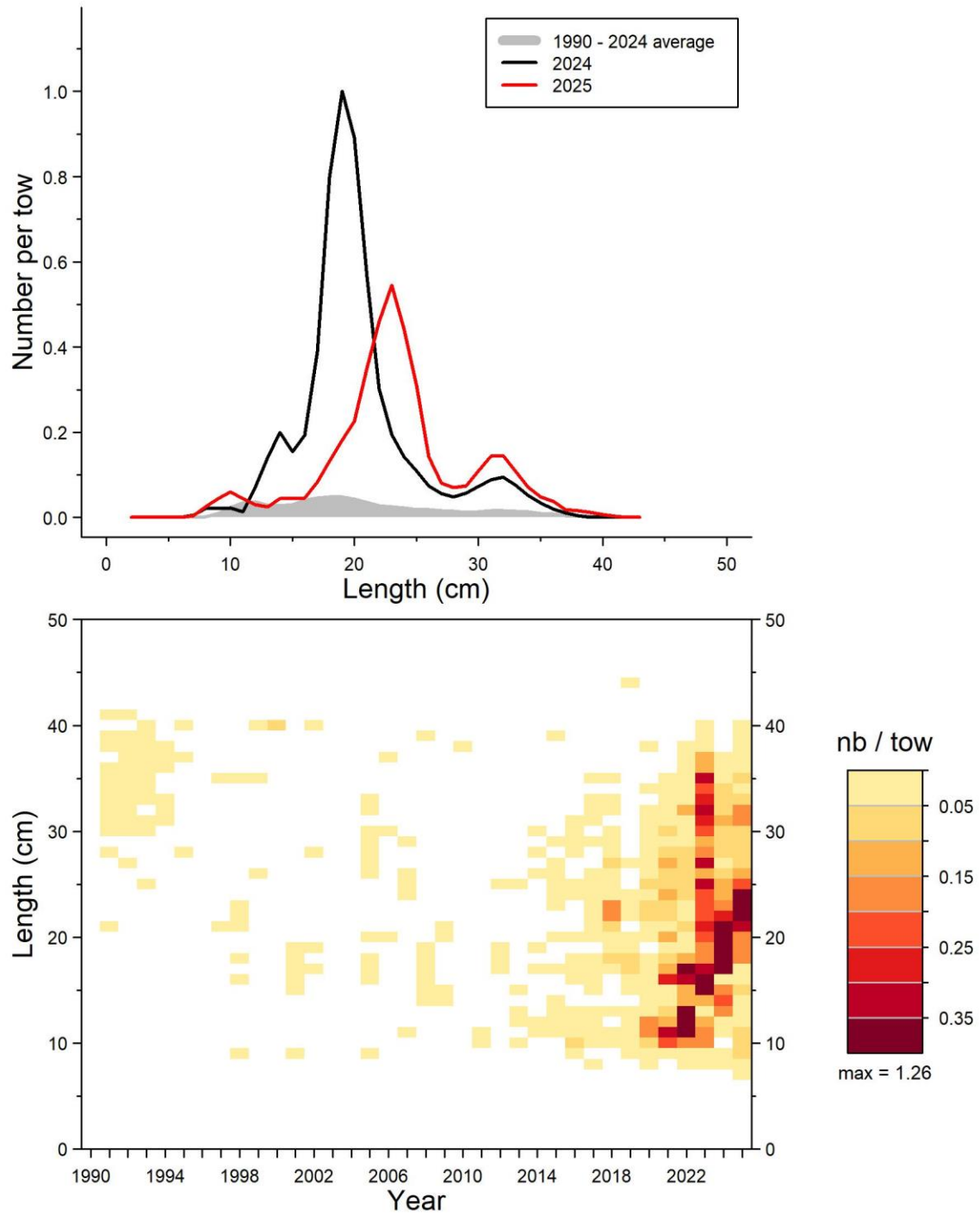


Figure 20. Length frequency distributions (mean number per 15-minute tow) observed during the survey for Atlantic Argentine in 4RST.

Atlantic Argentine

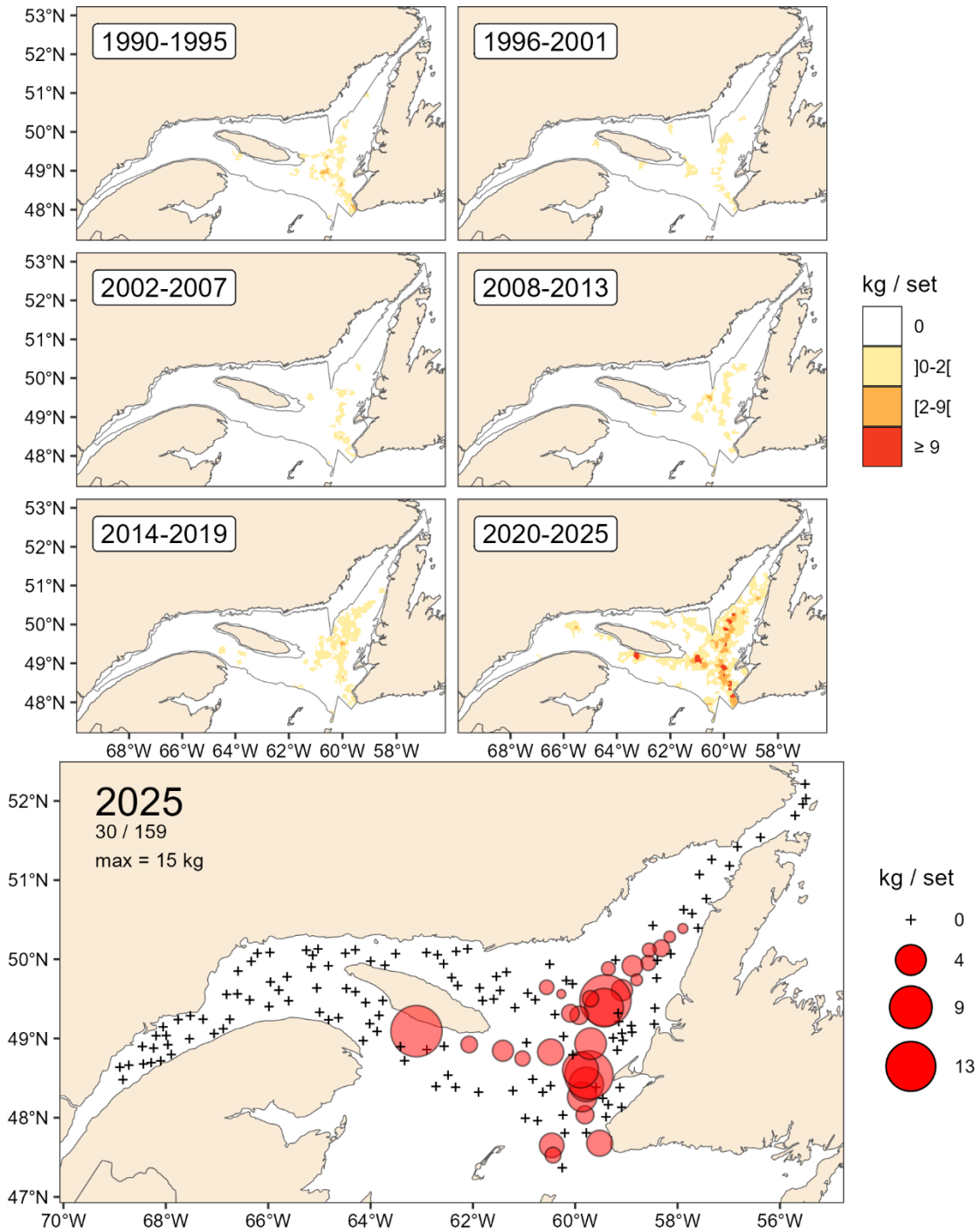


Figure 21. Atlantic Argentine catch rate (kg/15-minute tow) spatial distributions.

Lumpfish

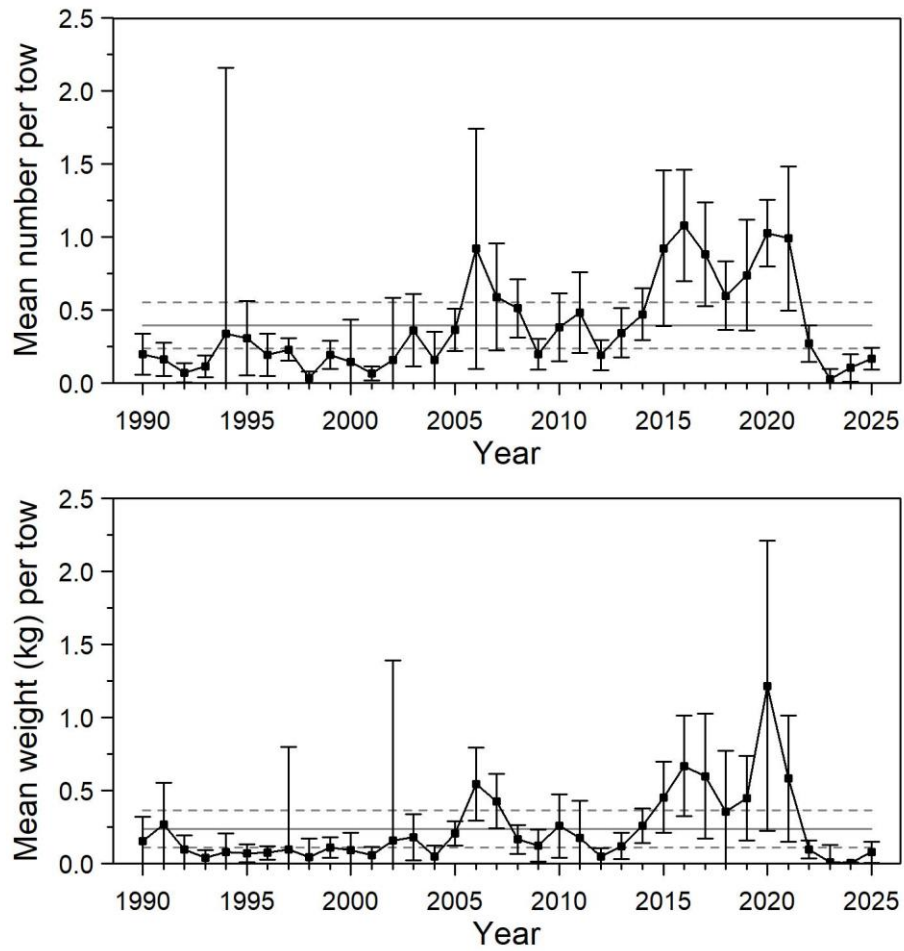


Figure 22. Mean numbers and mean weights per 15-minute tow observed during the survey for Lumpfish in 4RST. Error bars indicate the 95% confidence interval and the horizontal lines indicate the mean of the 1990-2024 period (solid line) and upper and lower reference (see text) limits (dashed lines).

Lumpfish

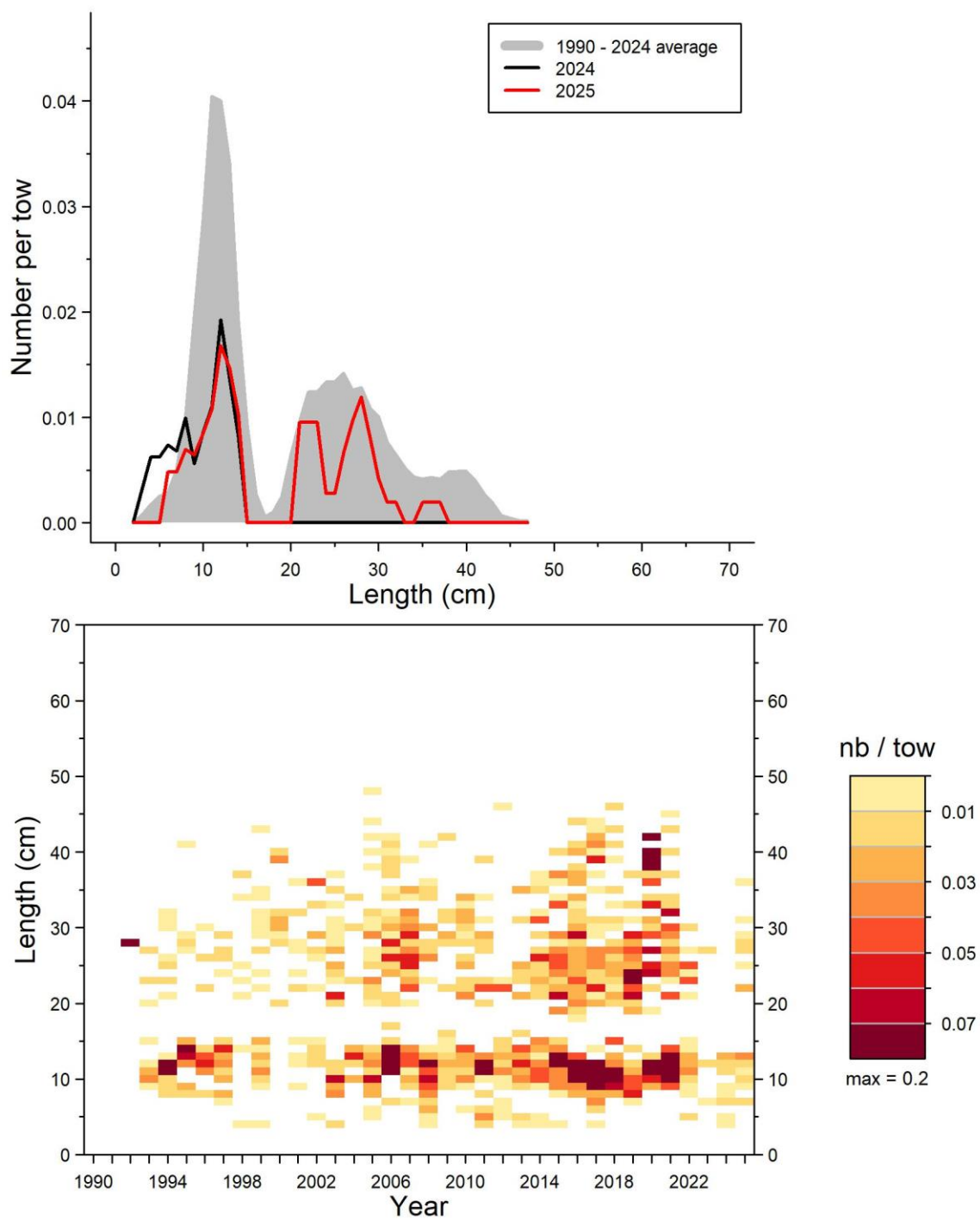


Figure 23. Length frequency distributions (mean number per 15-minute tow) observed during the survey for Lumpfish in 4RST.

Lumpfish

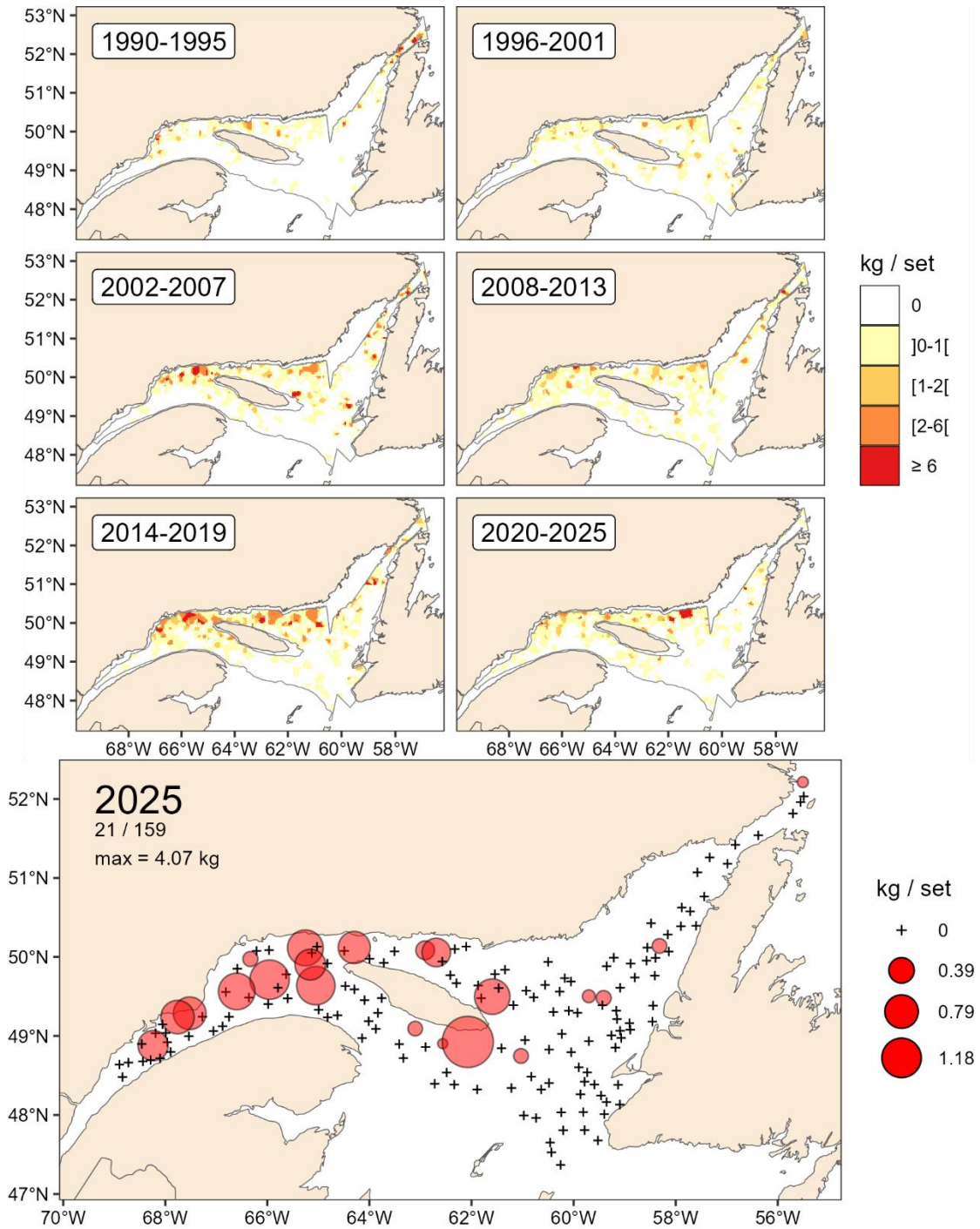


Figure 24. Lumpfish catch rate (kg/15-minute tow) spatial distributions.

Atlantic Herring

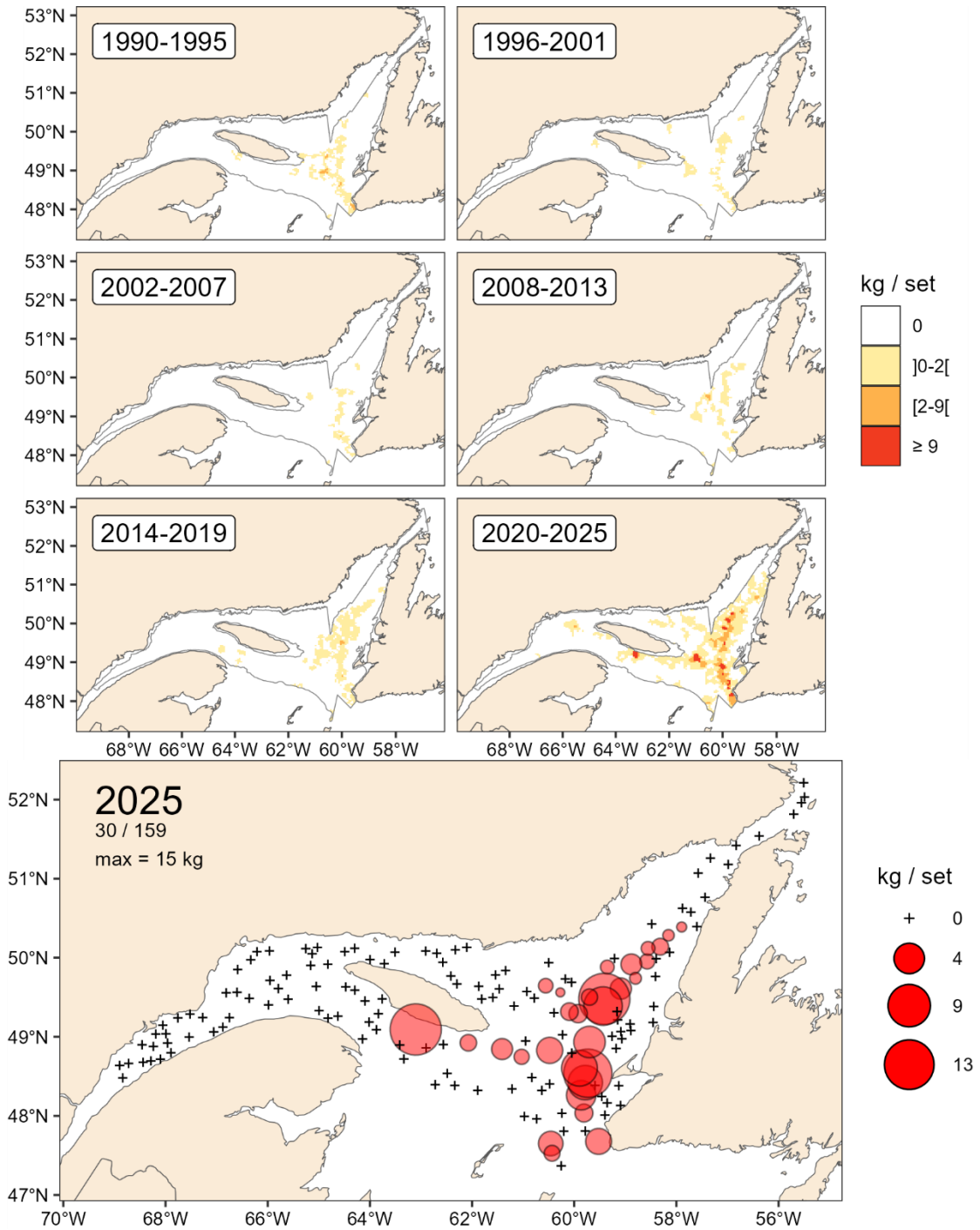


Figure 25. Atlantic Herring catch rate (kg/15-minute tow) spatial distributions.

Atlantic Wolffish

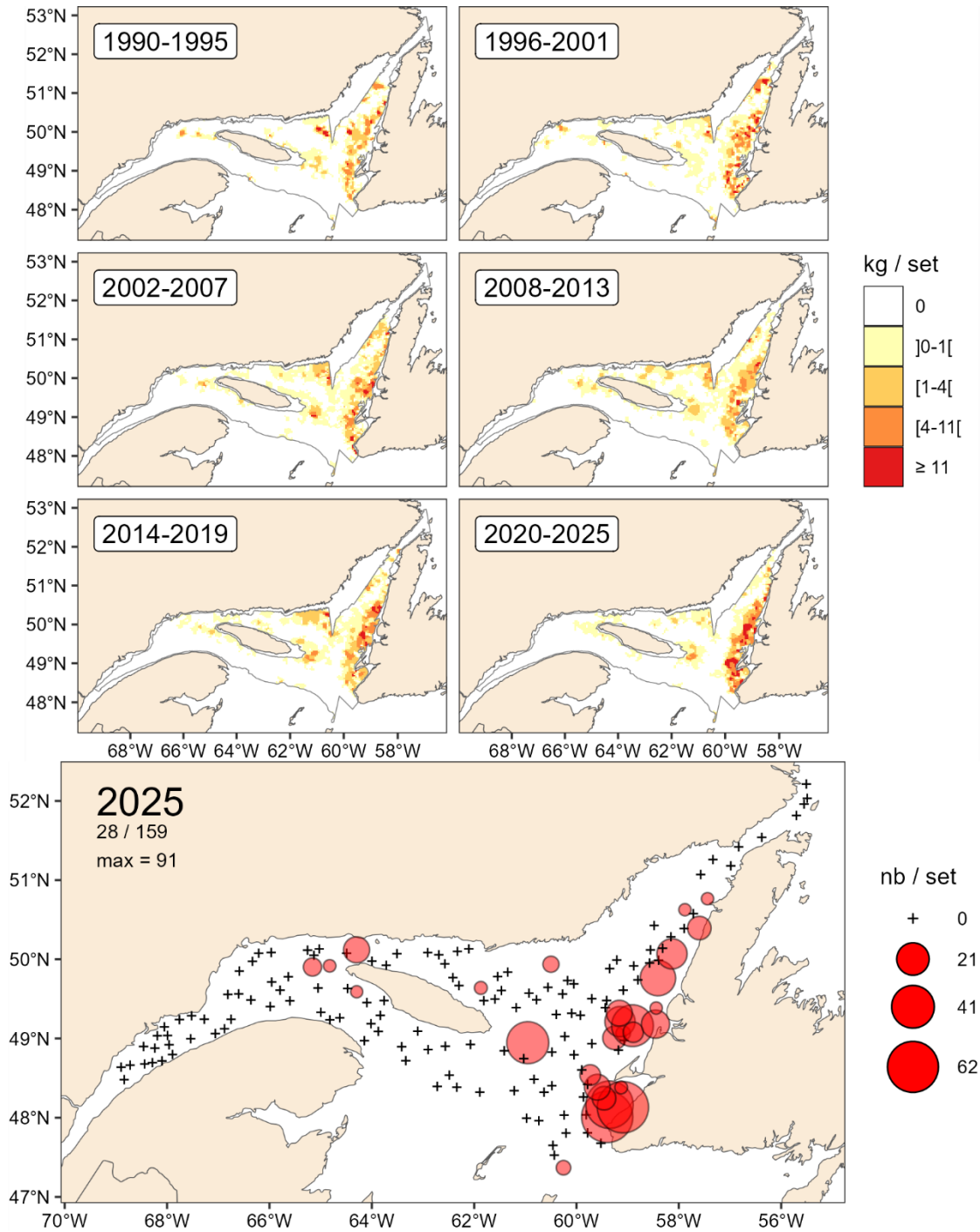


Figure 26. Atlantic Wolffish catch rate (kg/15-minute tow) spatial distributions. The interpolation maps show catch rates in kg per tow, whereas the bubble map shows numbers per tow.

Spotted Wolffish

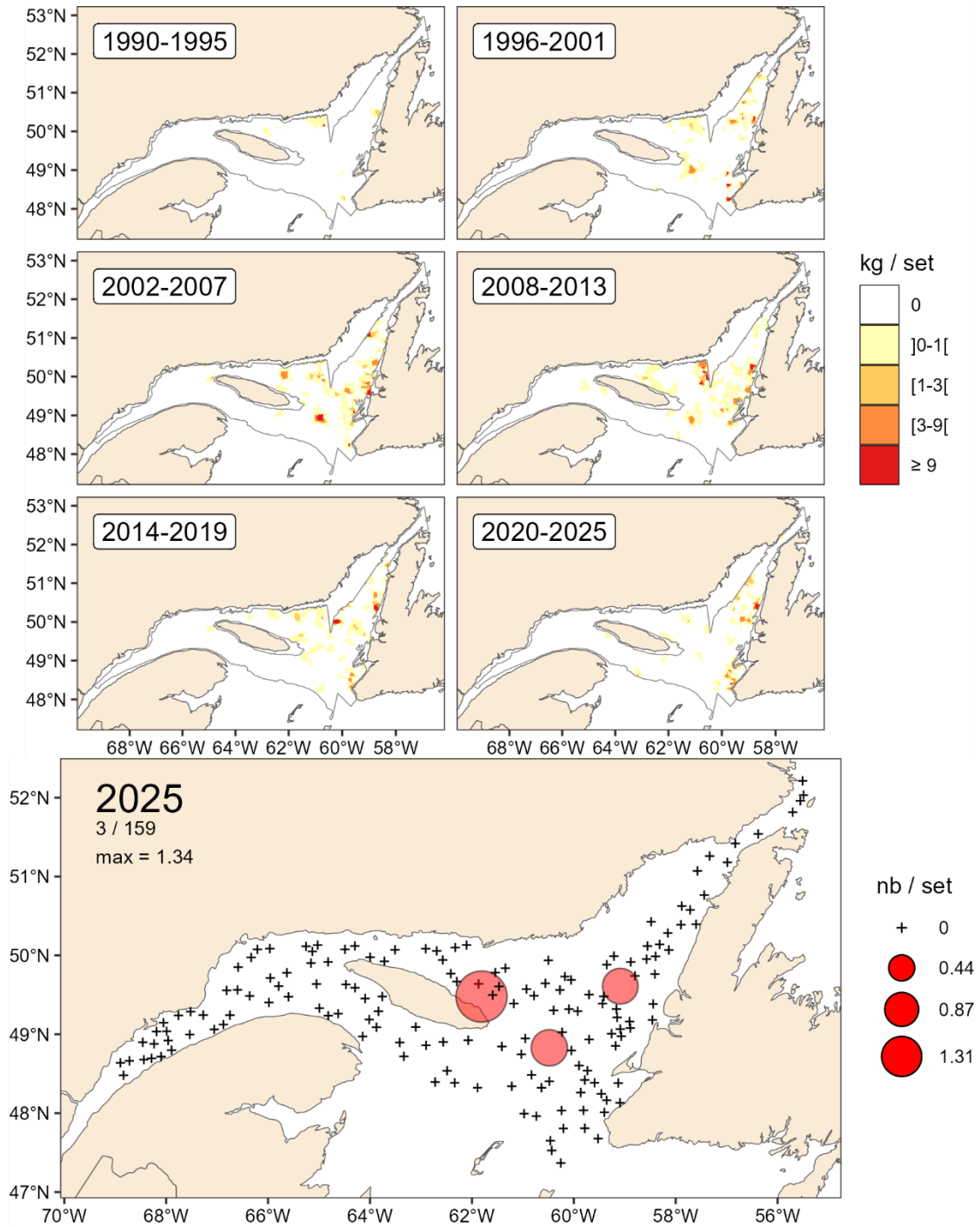


Figure 27. Spotted Wolffish catch rate (kg/15-minute tow) spatial distributions. The interpolation maps show catch rates in kg per tow, whereas the bubble map shows numbers per tow.

Silver Hake

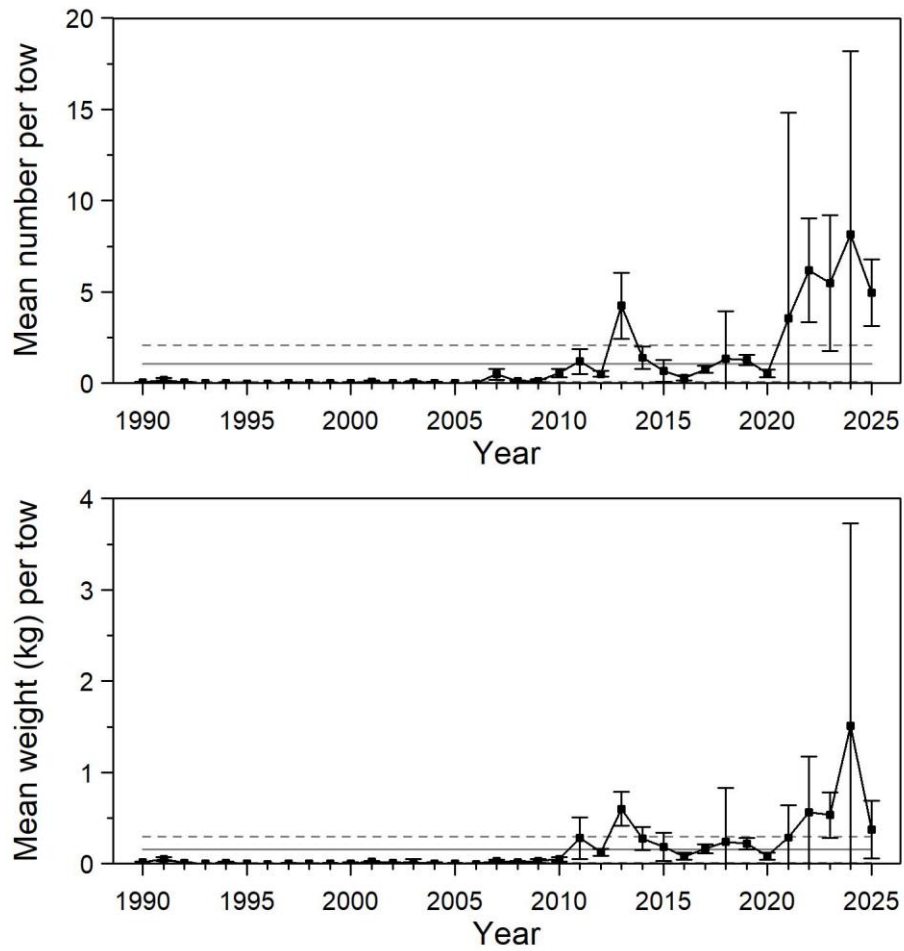


Figure 28. Mean numbers and mean weights per 15-minute tow observed during the survey for Silver Hake in 4RST. Error bars indicate the 95% confidence interval and the horizontal lines indicate the mean of the 1990-2024 period (solid line) and upper and lower reference (see text) limits (dashed lines).

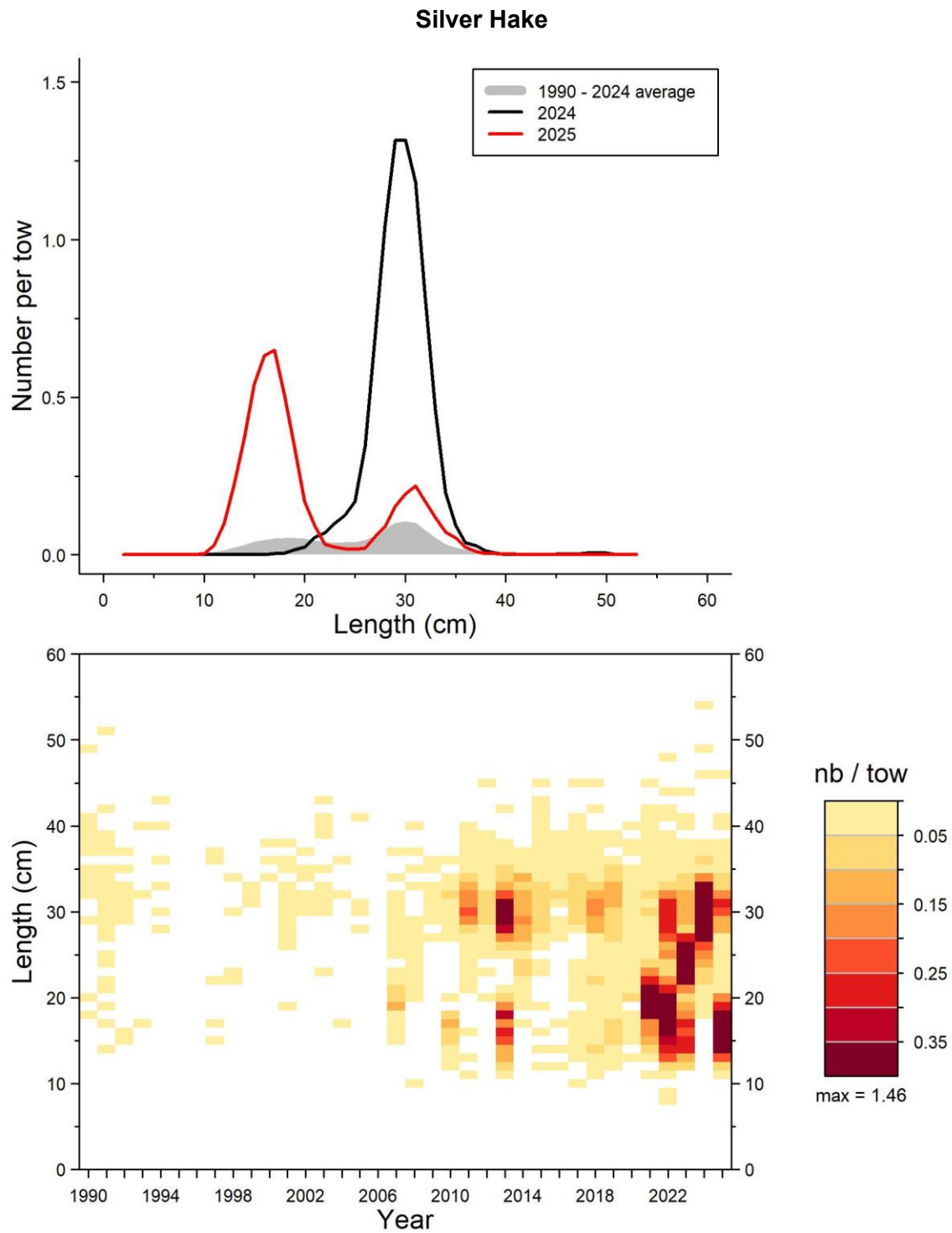


Figure 29. Length frequency distributions (mean number per 15-minute tow) observed during the survey for Silver Hake in 4RST.

Silver Hake

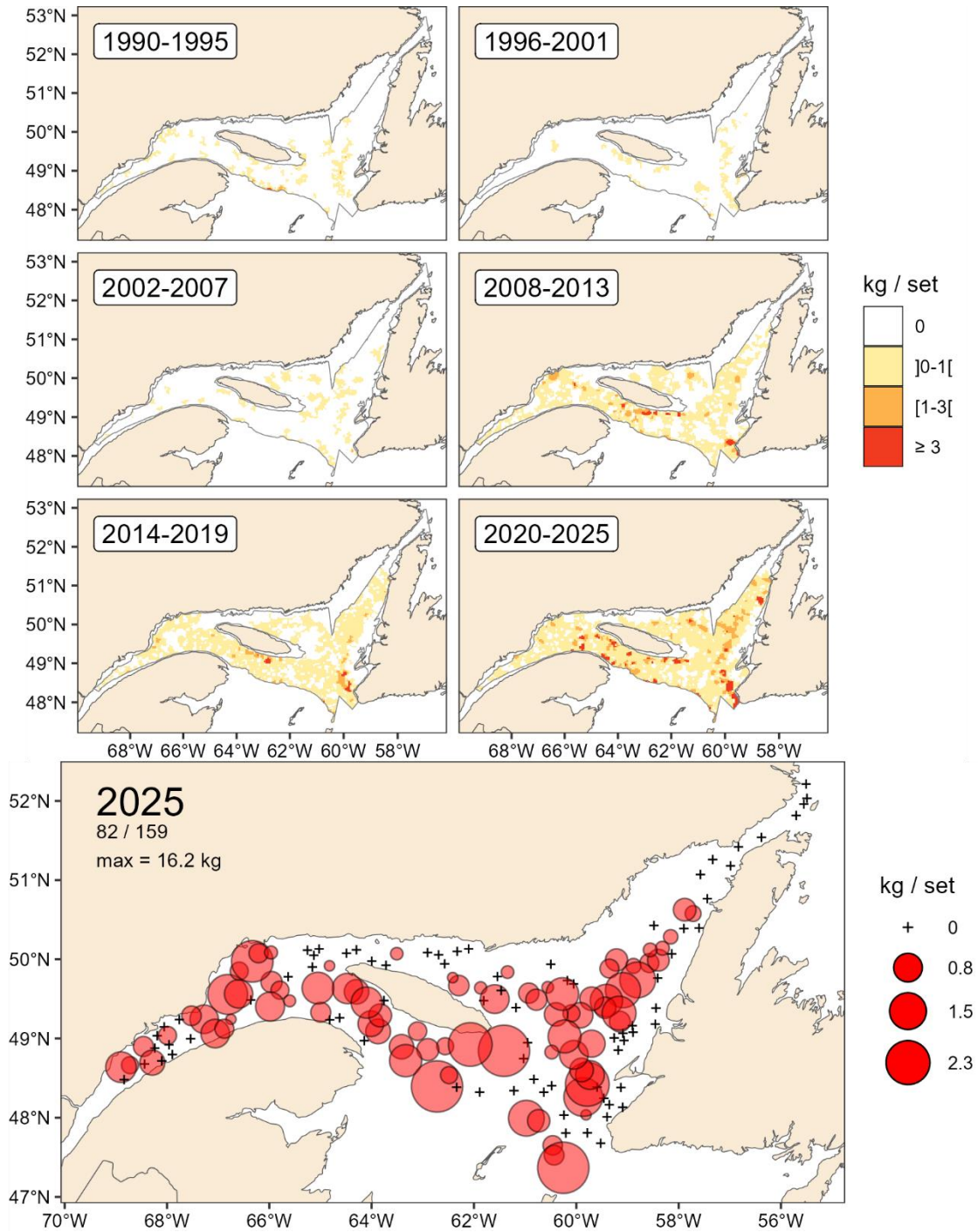


Figure 30. Silver Hake catch rate (kg/15-minute tow) spatial distributions.

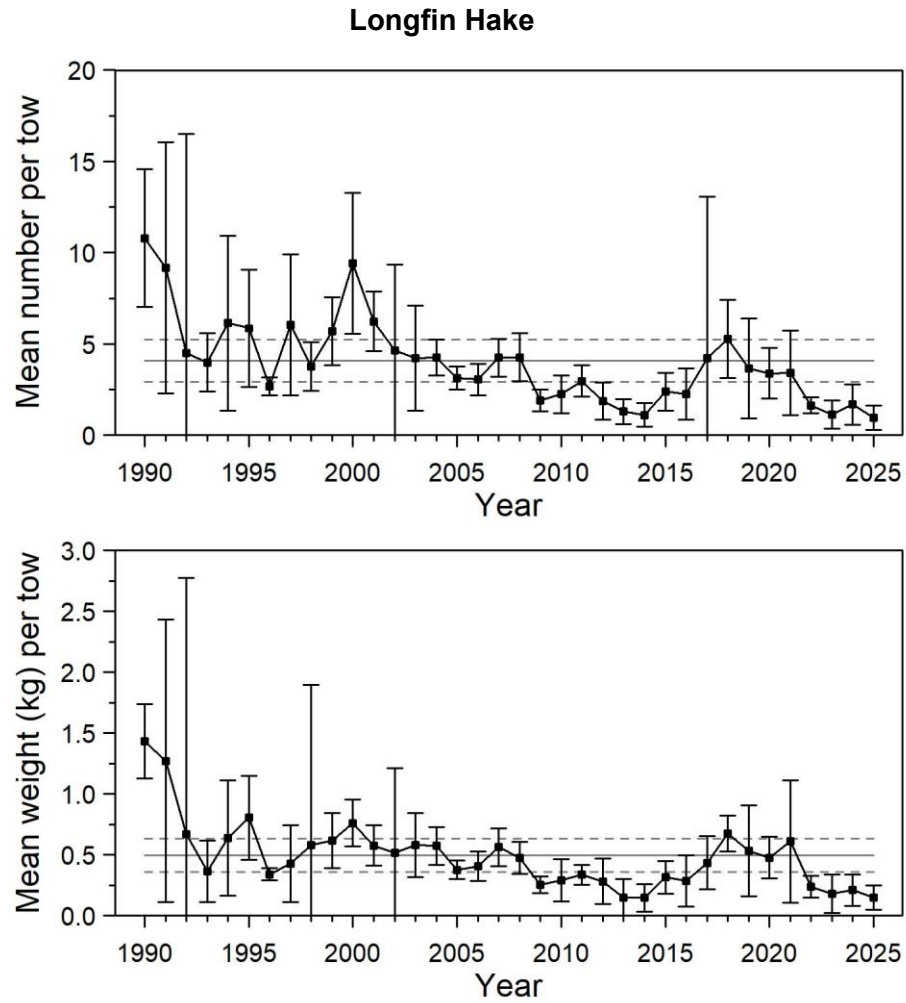


Figure 31. Mean numbers and mean weights per 15-minute tow observed during the survey for Longfin Hake in 4RST. Error bars indicate the 95% confidence interval and the horizontal lines indicate the mean of the 1990-2024 period (solid line) and upper and lower reference (see text) limits (dashed lines).

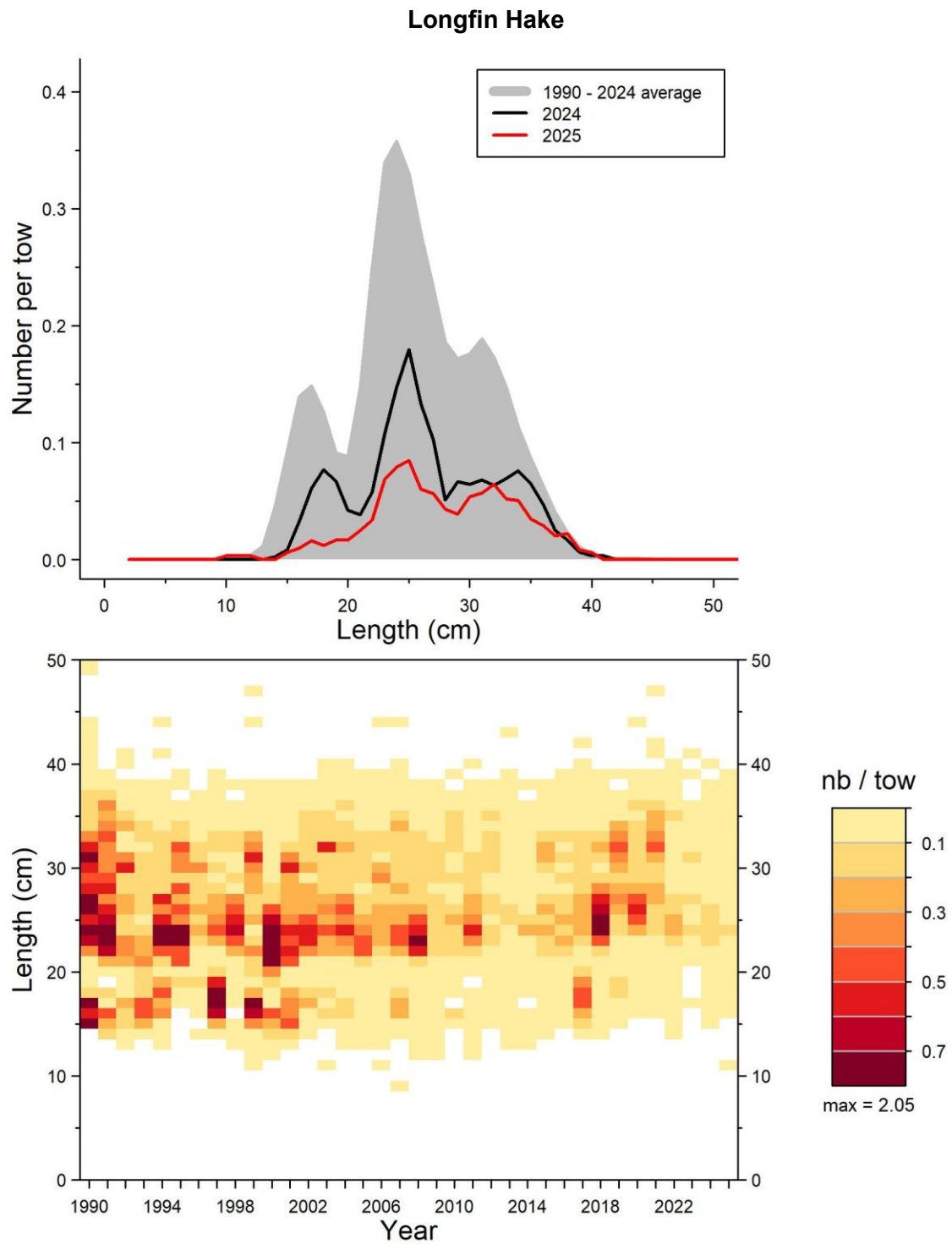


Figure 32. Length frequency distributions (mean number per 15-minute tow) observed during the survey for Longfin Hake in 4RST.

Longfin Hake

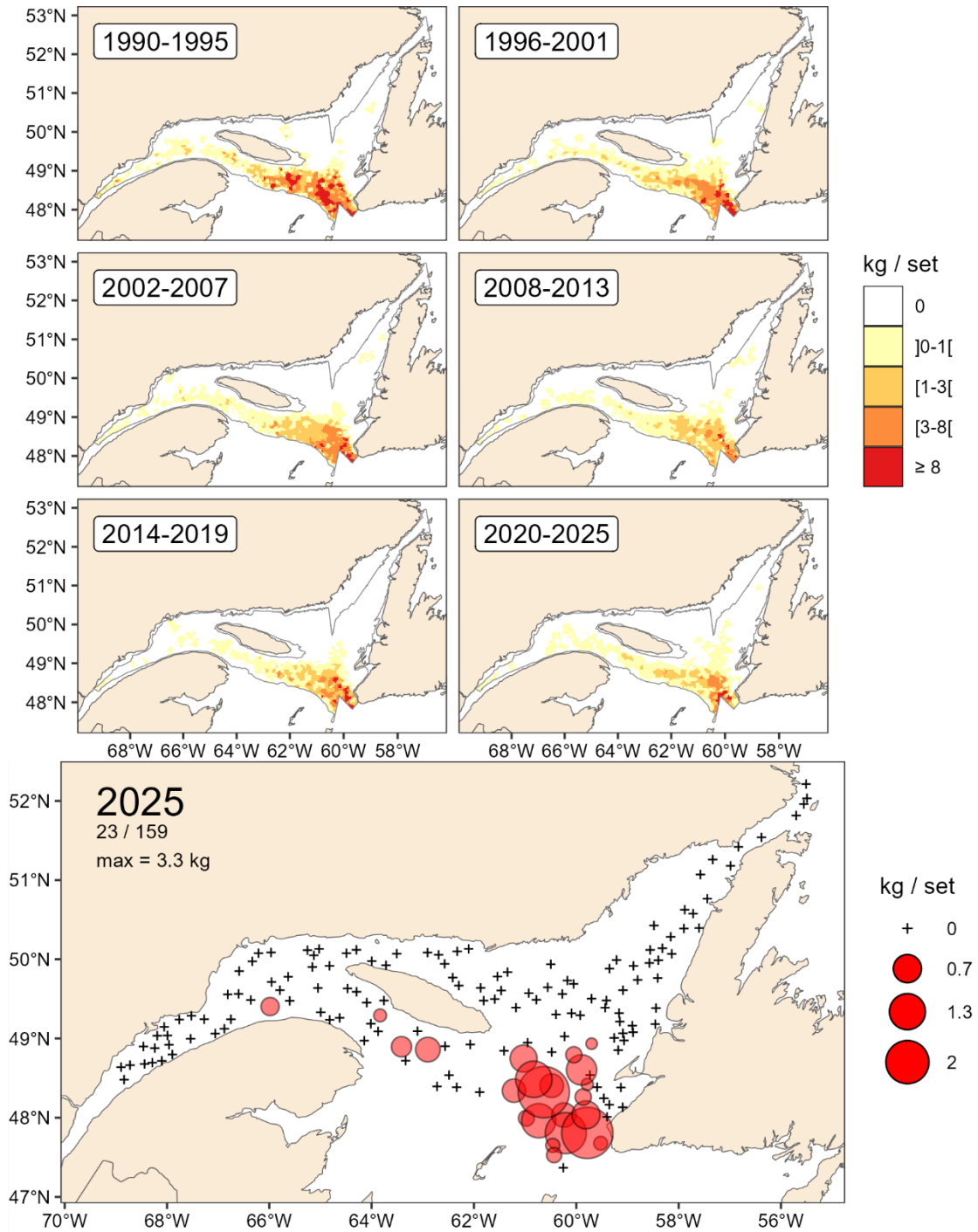


Figure 33. Longfin Hake catch rate (kg/15-minute tow) spatial distributions.

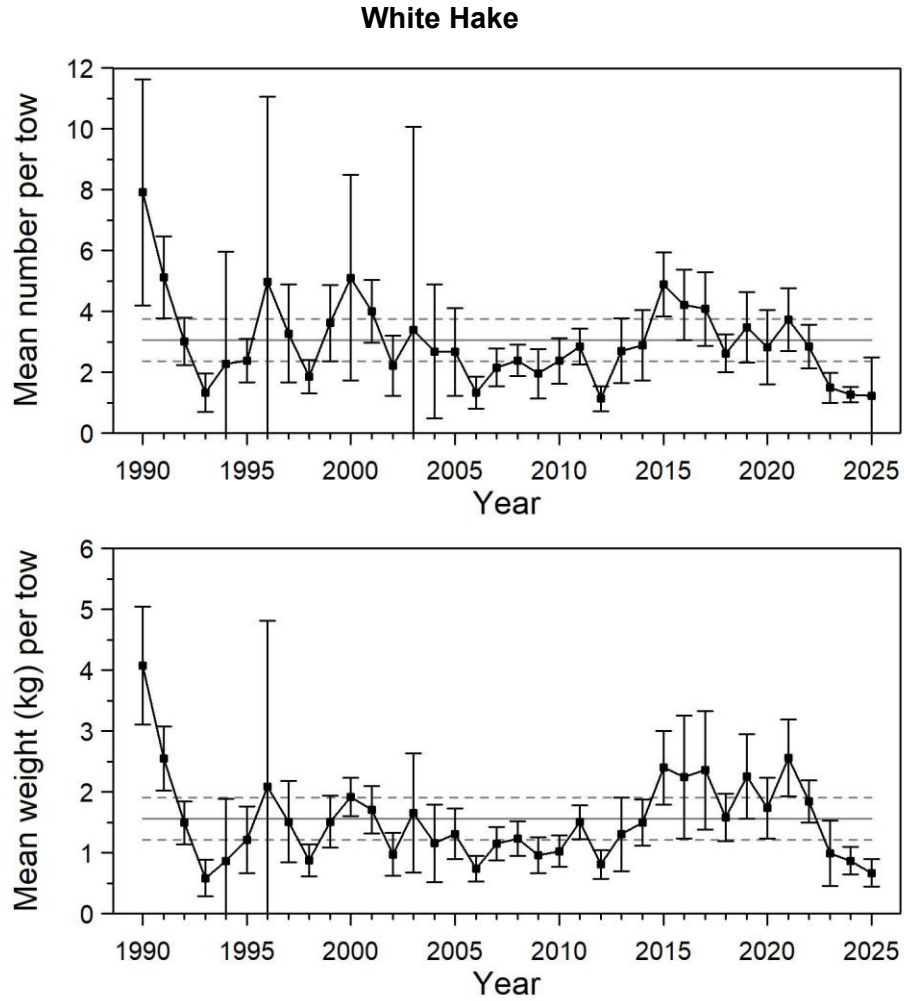


Figure 34. Mean numbers and mean weights per 15-minute tow observed during the survey for White Hake in 4RST. Error bars indicate the 95% confidence interval and the horizontal lines indicate the mean of the 1990-2024 period (solid line) and upper and lower reference (see text) limits (dashed lines).

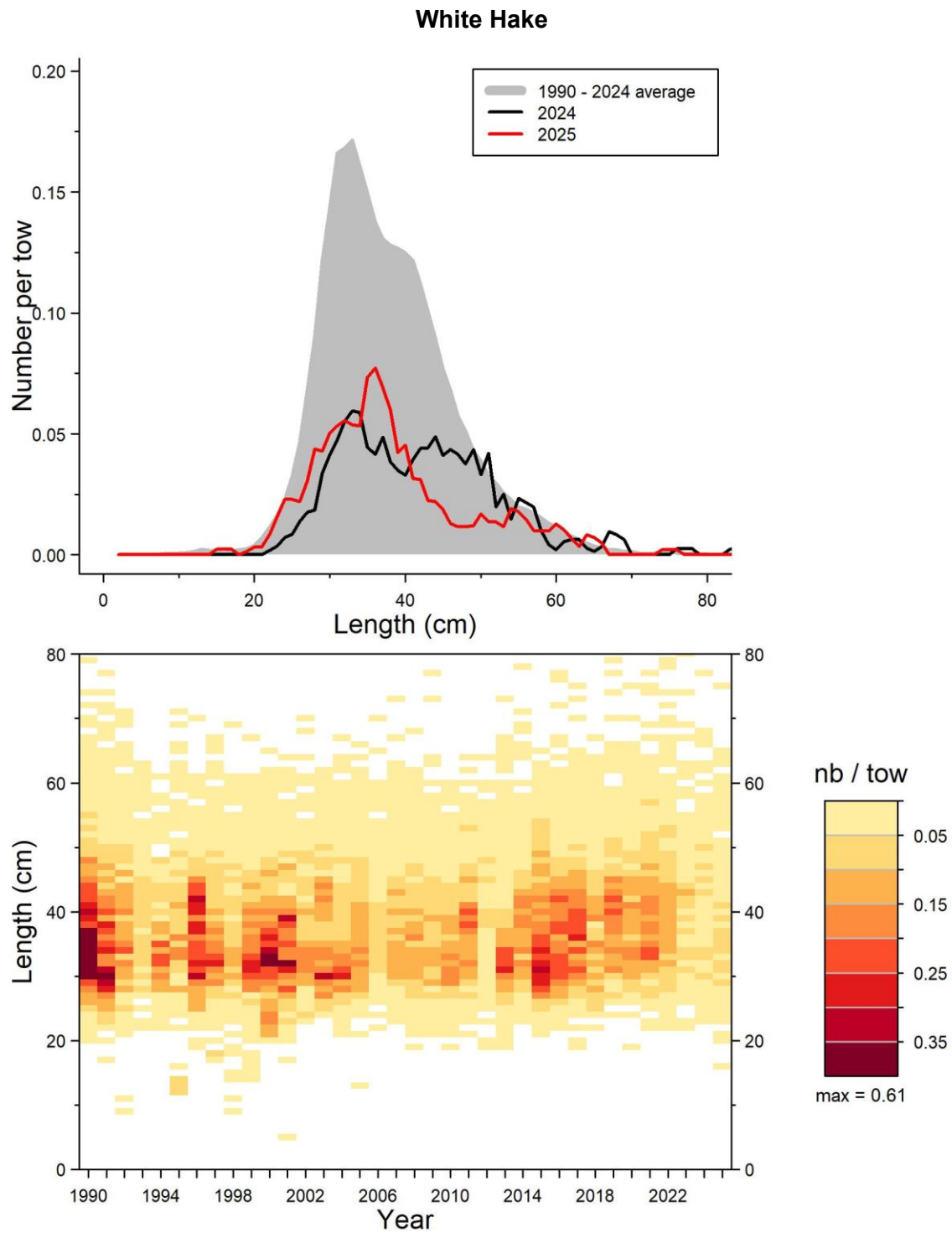


Figure 35. Length frequency distributions (mean number per 15-minute tow) observed during the survey for White Hake in 4RST.

White Hake

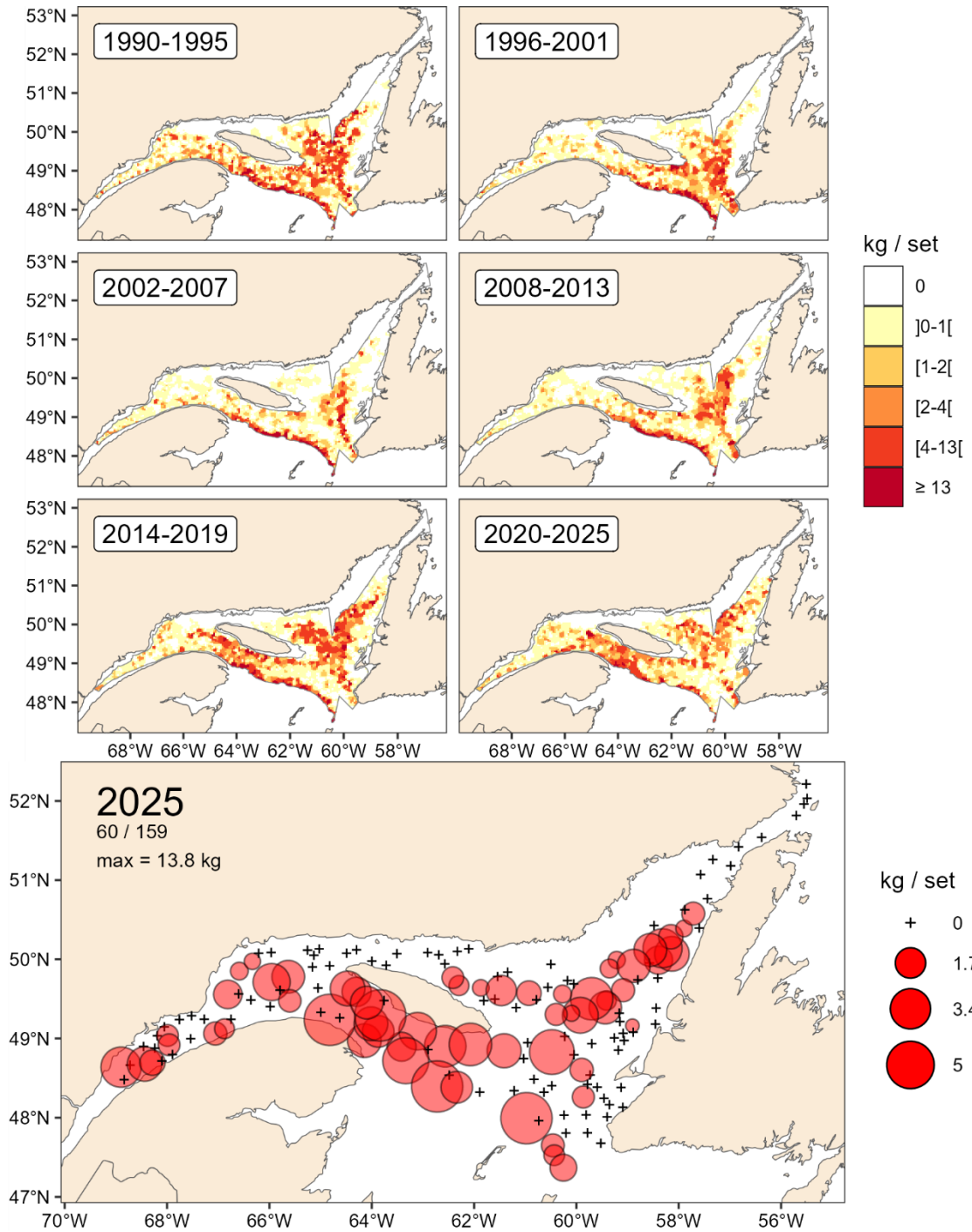


Figure 36. White Hake catch rate (kg/15-minute tow) spatial distributions.

Atlantic Cod

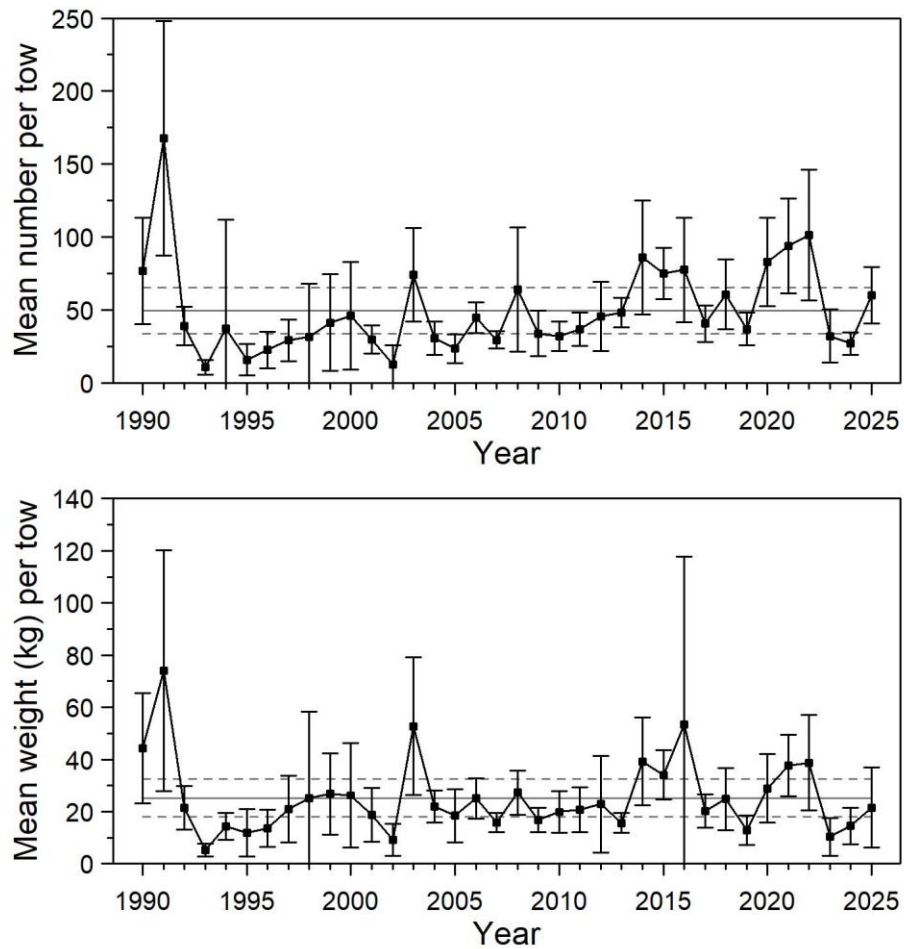


Figure 37. Mean numbers and mean weights per 15-minute tow observed during the survey for Atlantic Cod in 4RS. Error bars indicate the 95% confidence interval and the horizontal lines indicate the mean of the 1990-2024 period (solid line) and upper and lower reference (see text) limits (dashed lines).

Atlantic Cod

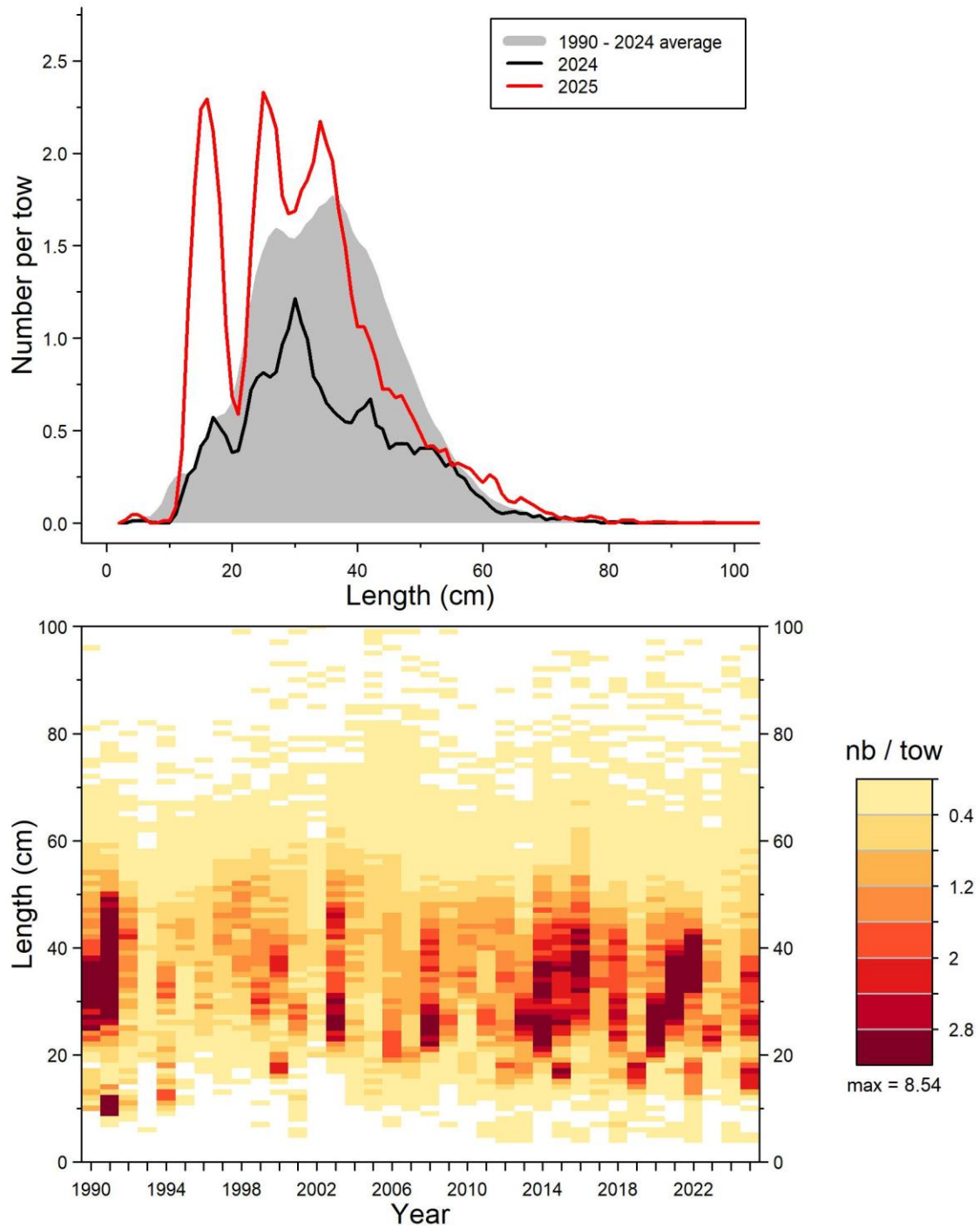


Figure 38. Length frequency distributions (mean number per 15-minute tow) observed during the survey for Atlantic Cod in 4RS.

Atlantic Cod

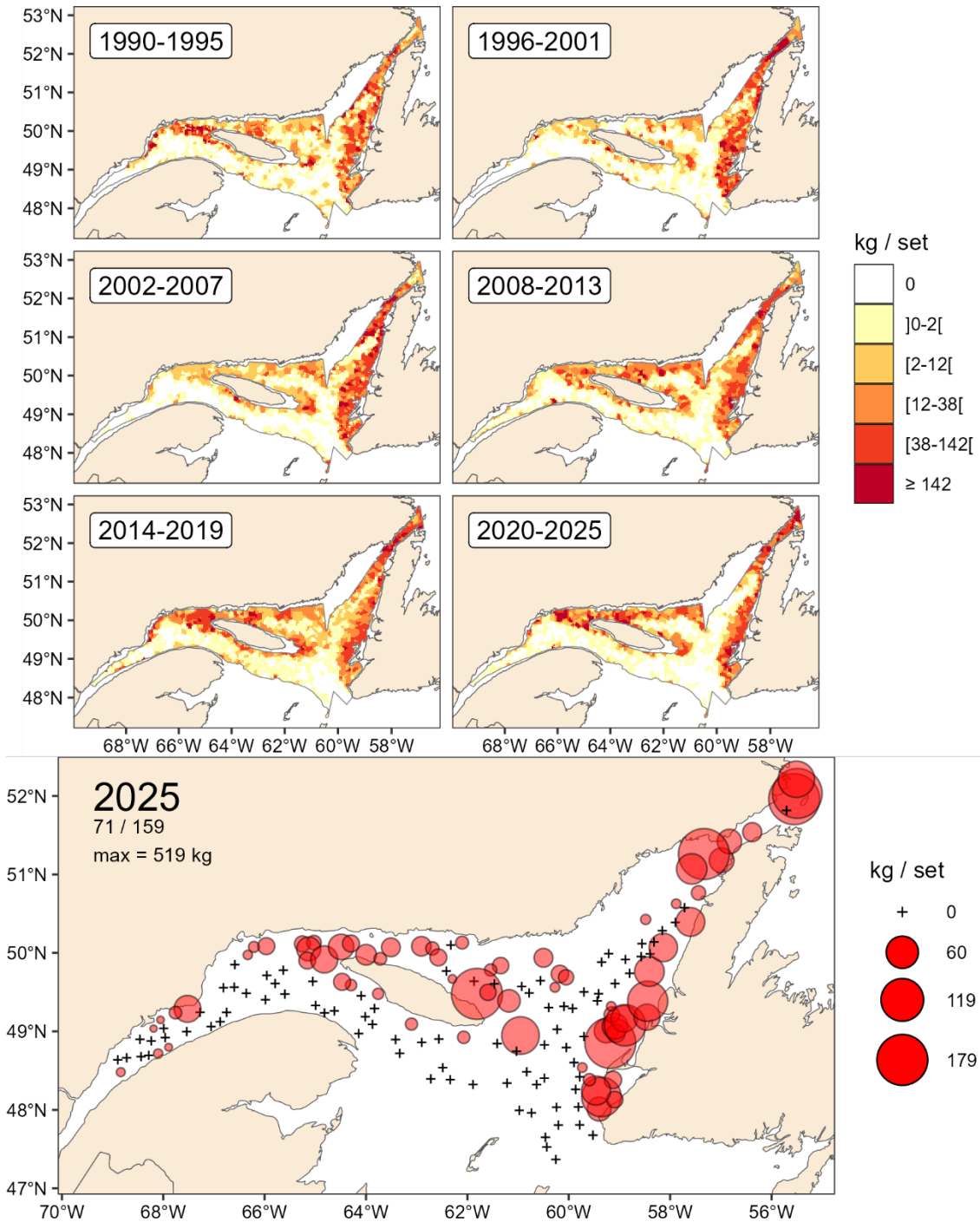


Figure 39. Atlantic Cod catch rate (kg/15-minute tow) spatial distributions.

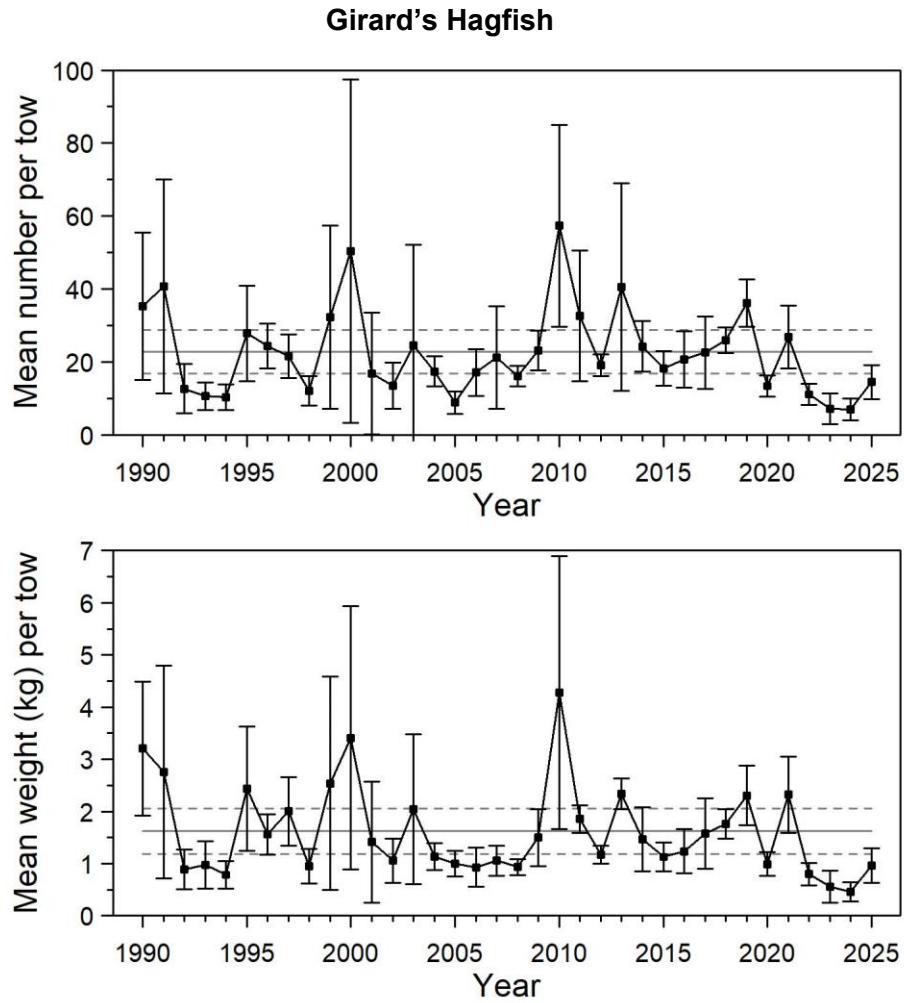


Figure 40. Mean numbers and mean weights per 15-minute tow observed during the survey for Girard's Hagfish in 4RST. Error bars indicate the 95% confidence interval and the horizontal lines indicate the mean of the 1990-2024 period (solid line) and upper and lower reference (see text) limits (dashed lines).

Girard's Hagfish

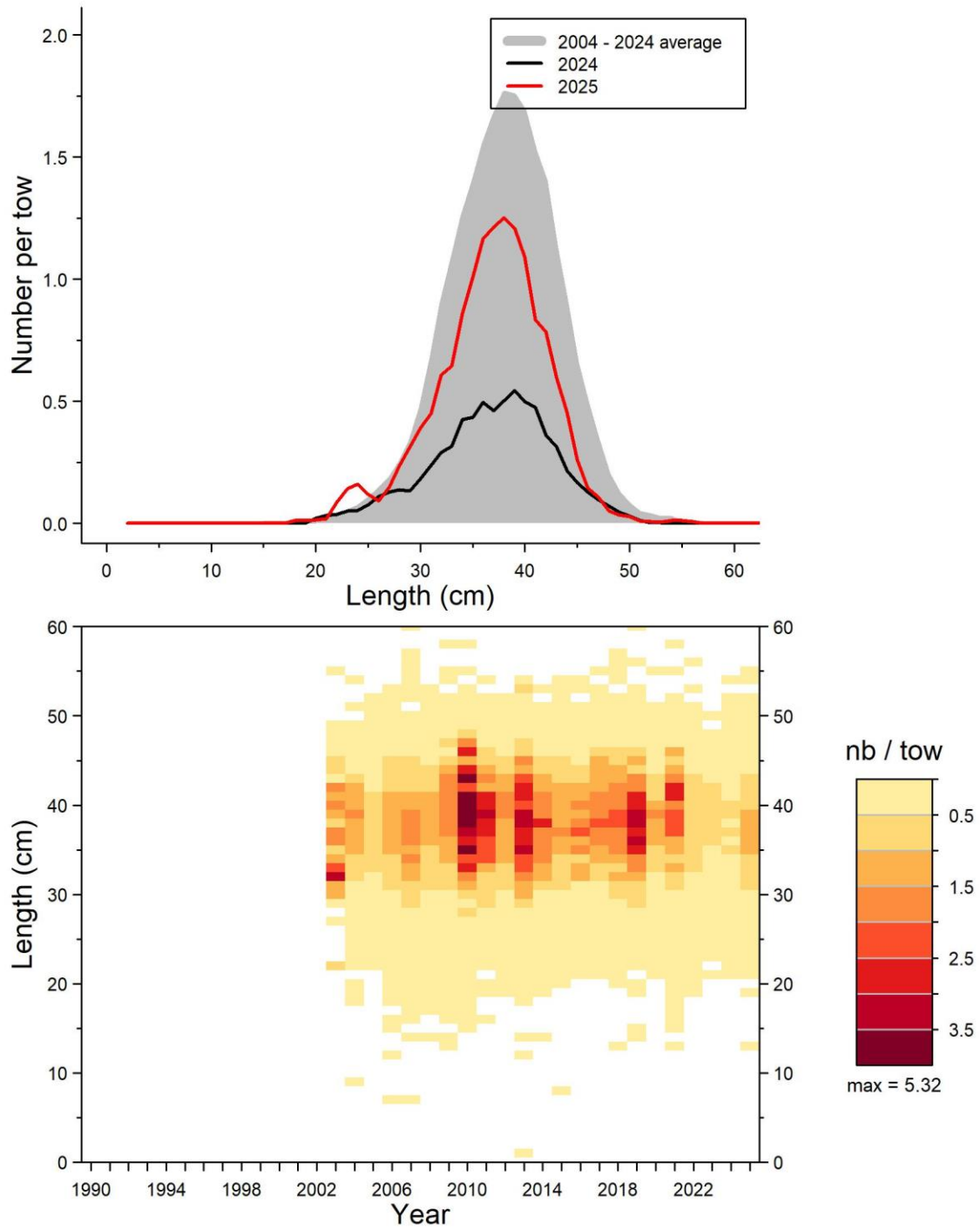


Figure 41. Length frequency distributions (mean number per 15-minute tow) observed during the survey for Girard's Hagfish in 4RST.

Girard's Hagfish

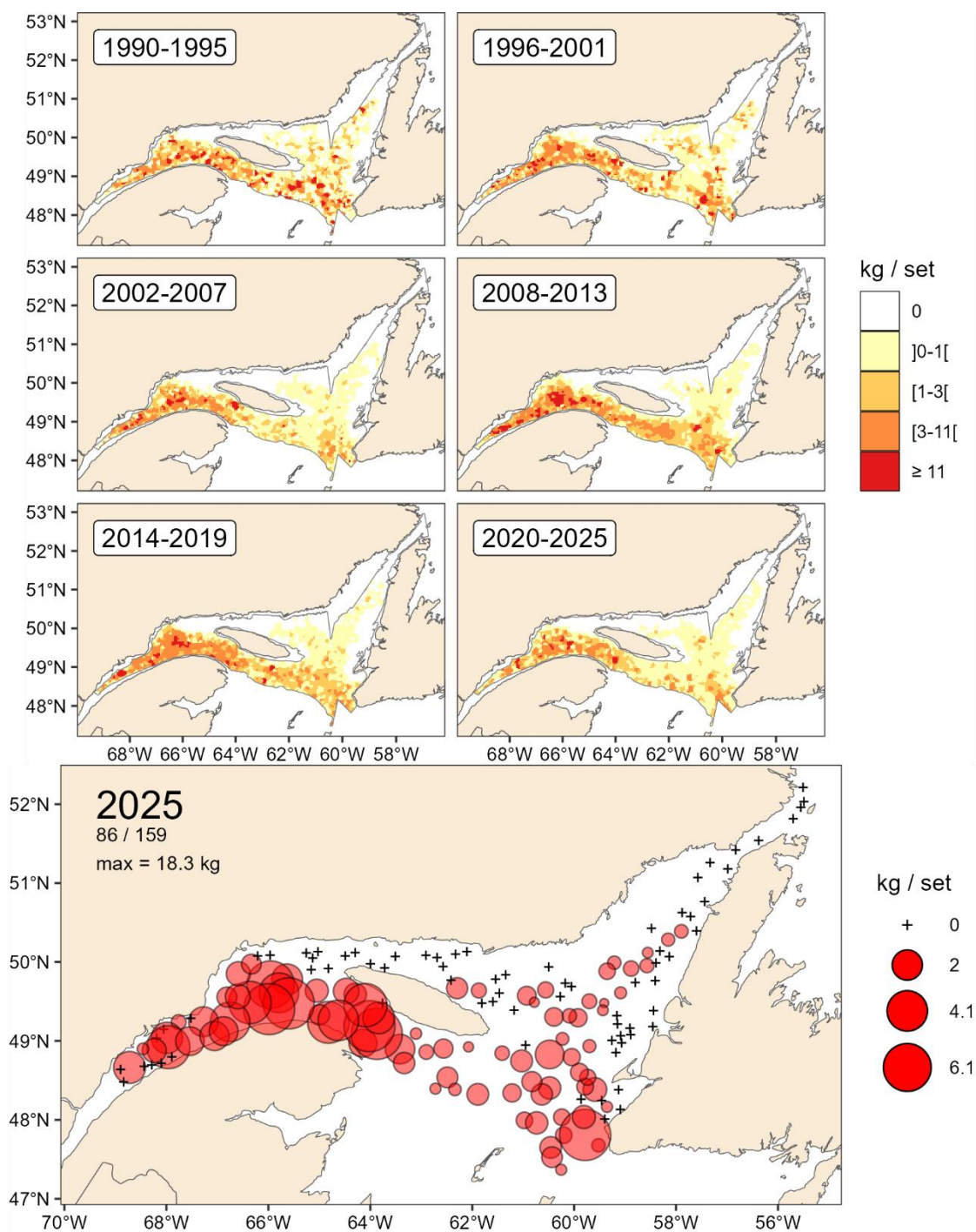


Figure 42. Girard's Hagfish catch rate (kg/15-minute tow) spatial distributions.

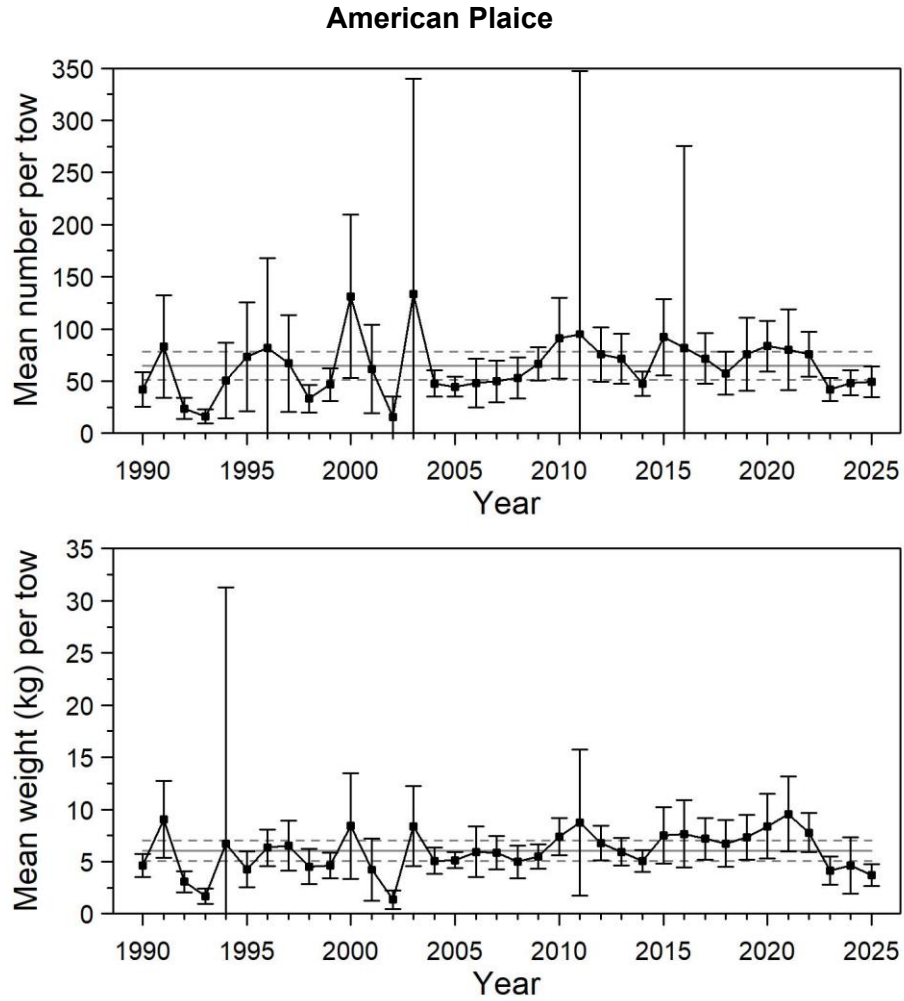


Figure 43. Mean numbers and mean weights per 15-minute tow observed during the survey for American Plaice in 4RST. Error bars indicate the 95% confidence interval and the horizontal lines indicate the mean of the 1990-2024 period (solid line) and upper and lower reference (see text) limits (dashed lines).

American Plaice

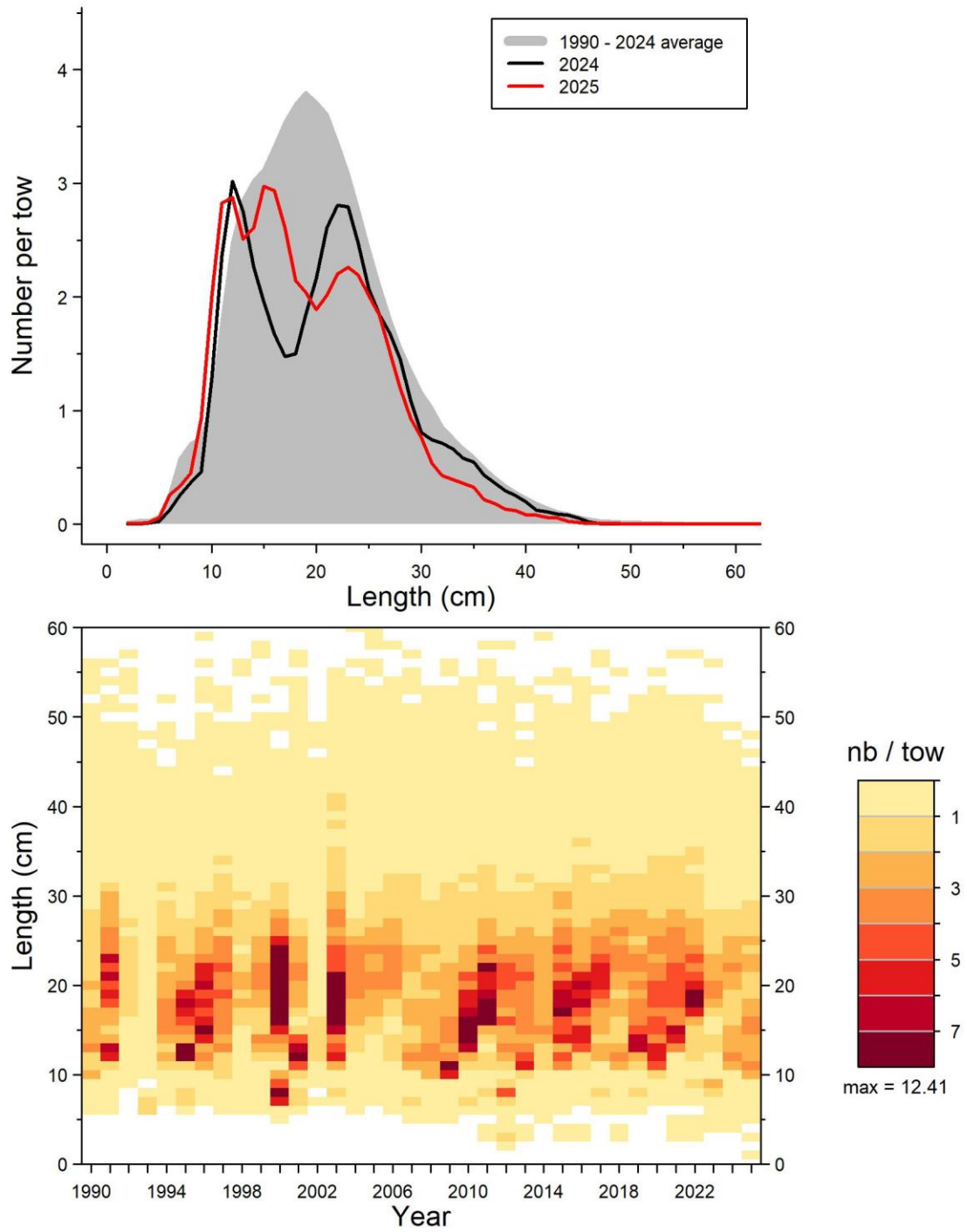


Figure 44. Length frequency distributions (mean number per 15-minute tow) observed during the survey for American Plaice in 4RST.

American Plaice

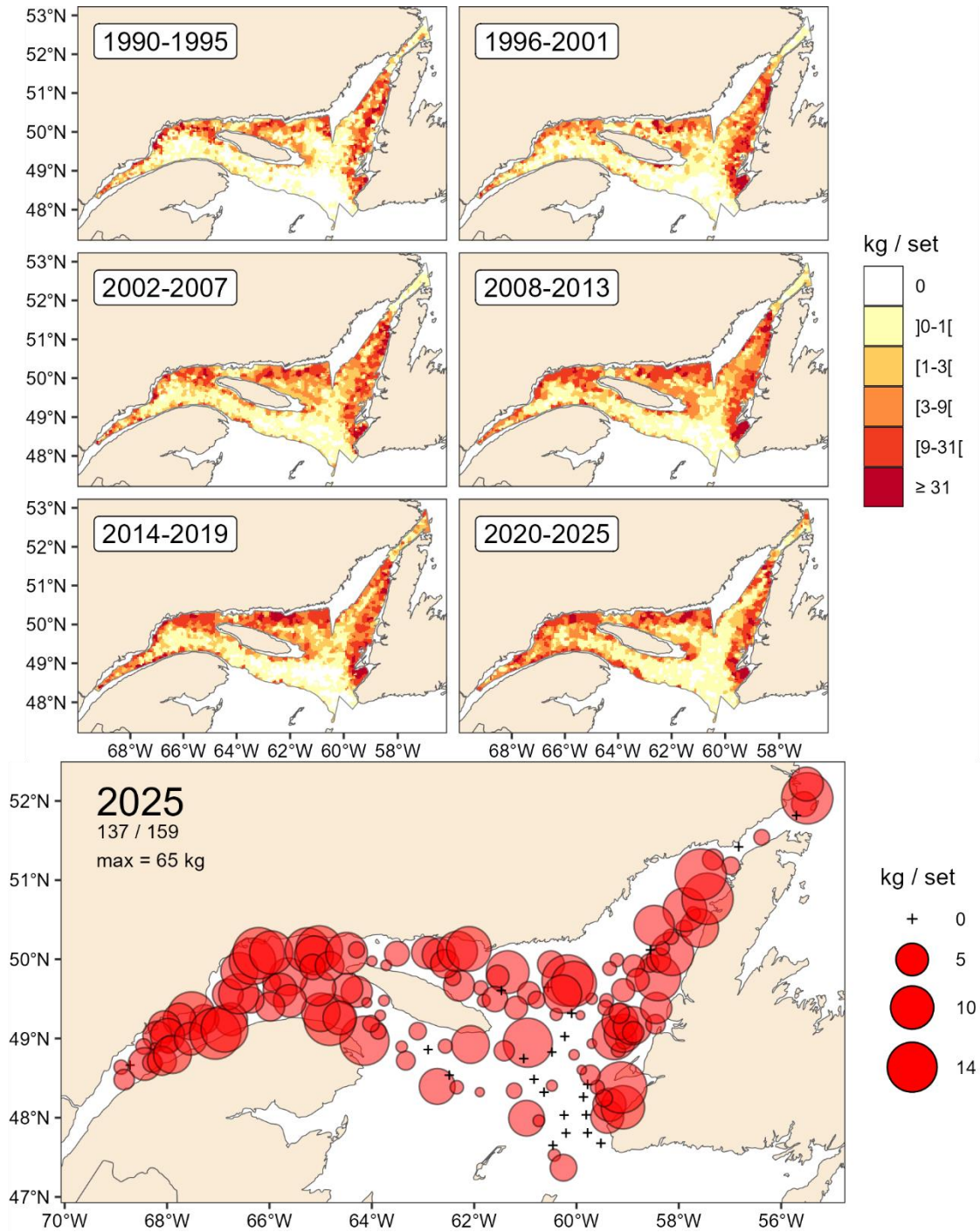


Figure 45. American Plaice catch rate (kg/15-minute tow) spatial distributions.

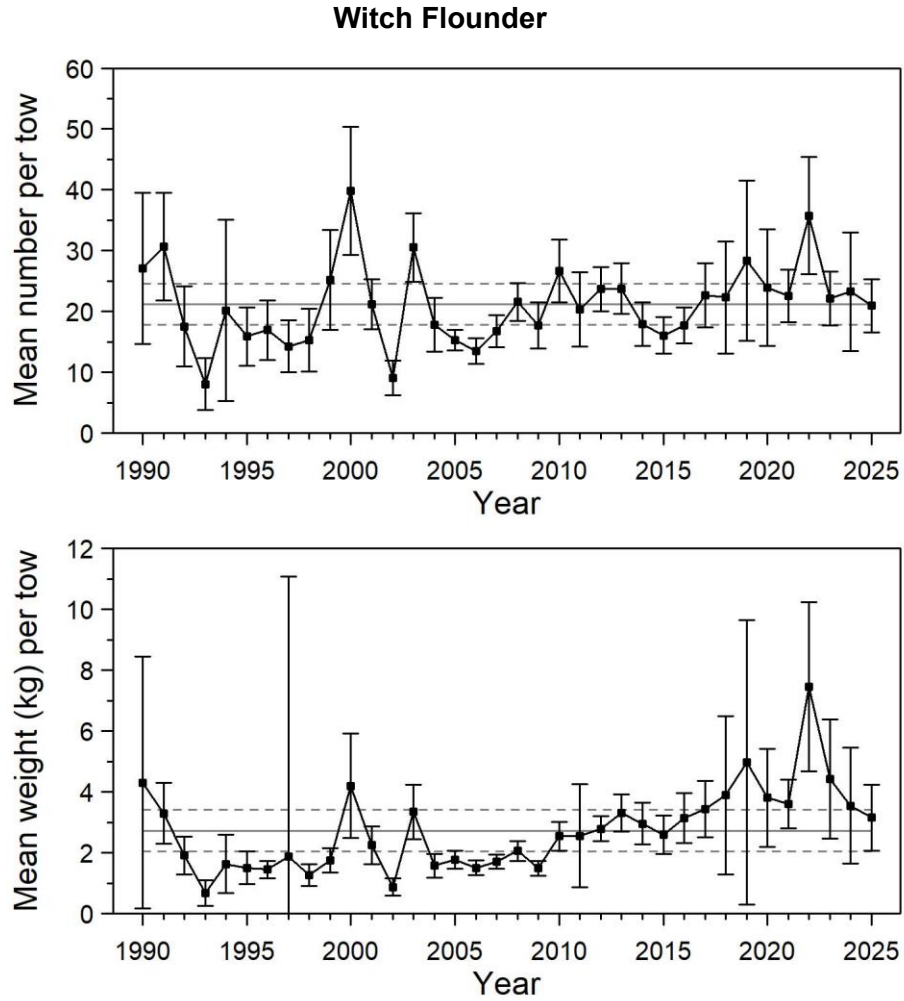


Figure 46. Mean numbers and mean weights per 15-minute tow observed during the survey for Witch Flounder in 4RST. Error bars indicate the 95% confidence interval and the horizontal lines indicate the mean of the 1990-2024 period (solid line) and upper and lower reference (see text) limits (dashed lines).

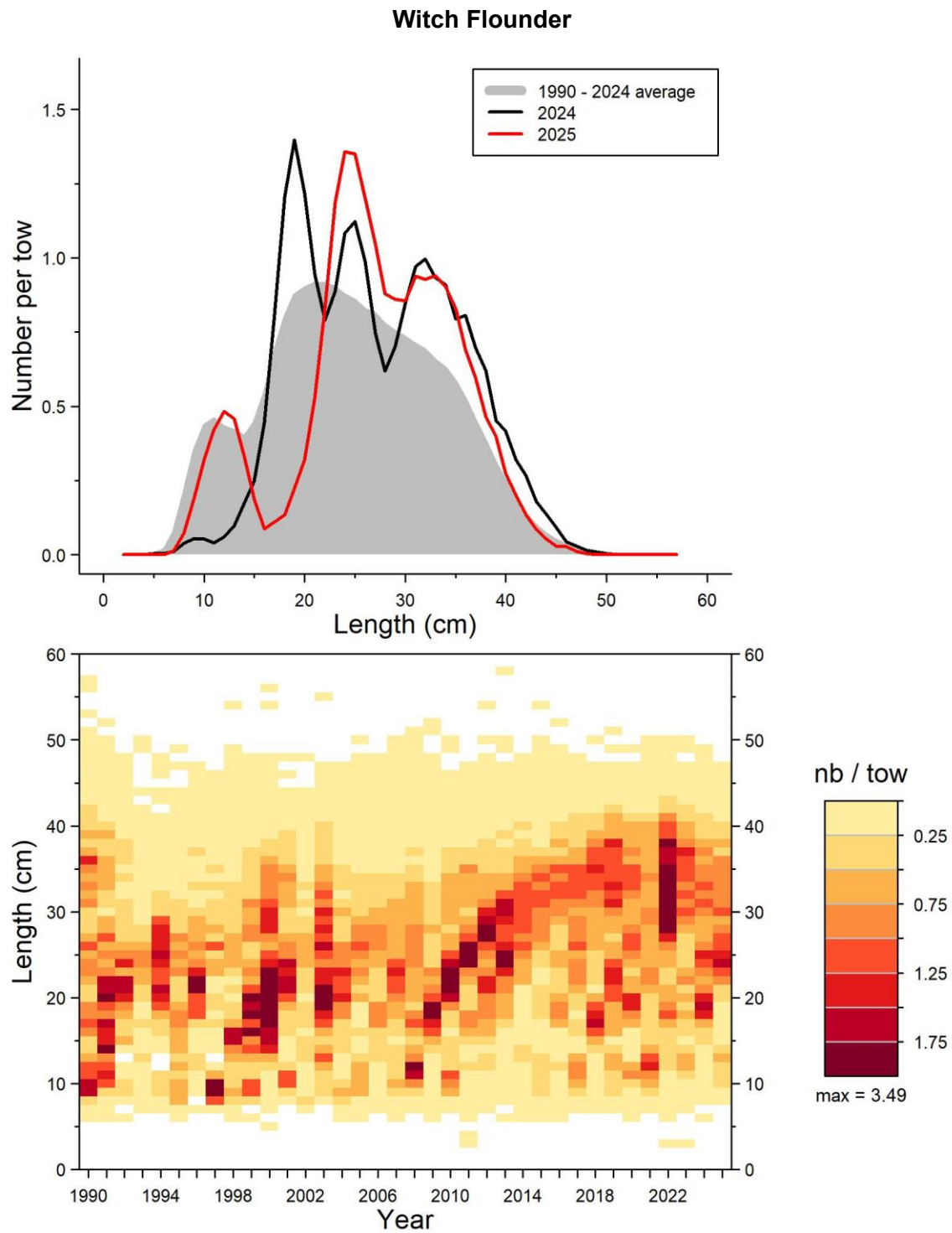


Figure 47. Length frequency distributions (mean number per 15-minute tow) observed during the survey for Witch Flounder in 4RST.

Witch Flounder

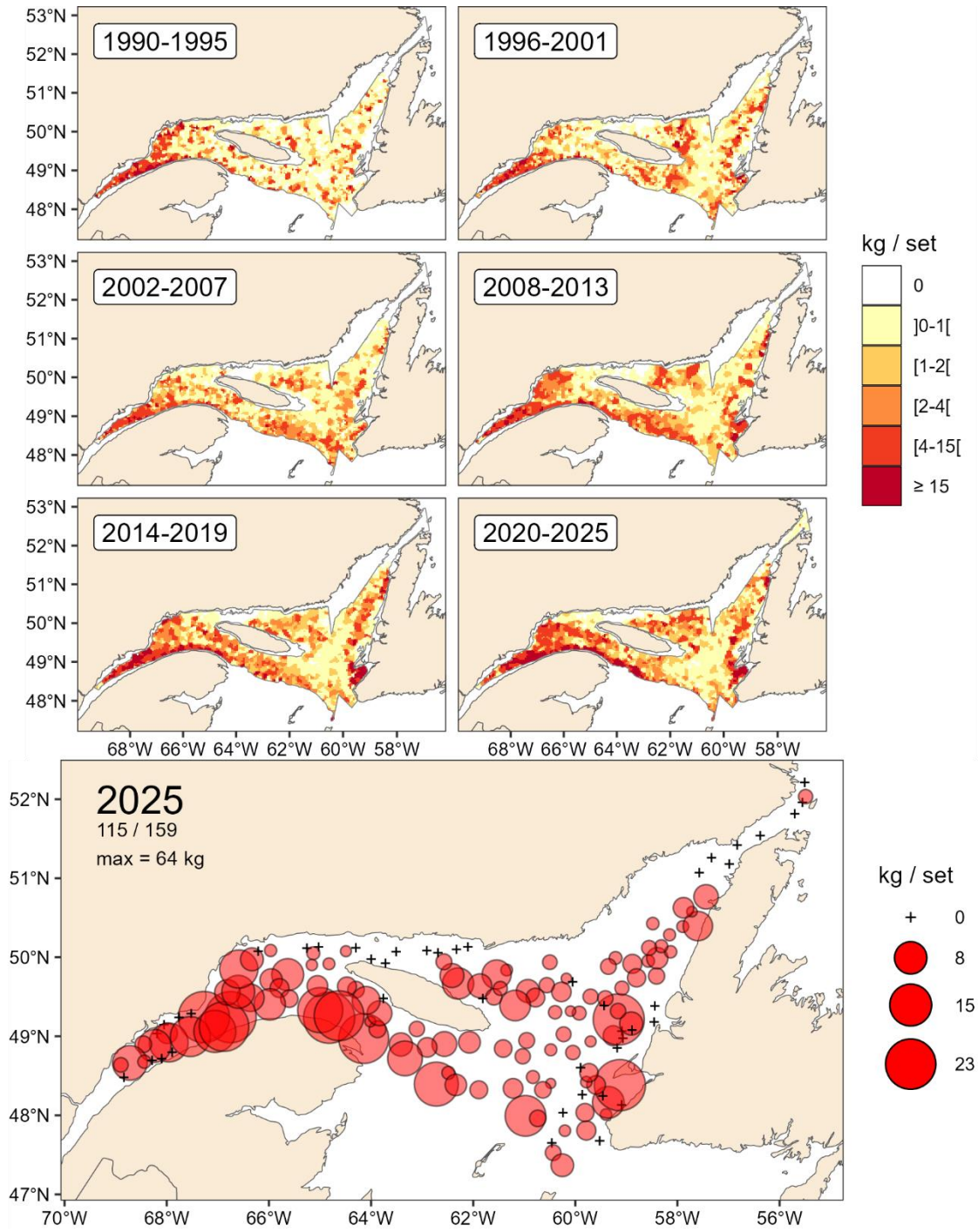


Figure 48. Witch Flounder catch rate (kg/15-minute tow) spatial distributions.

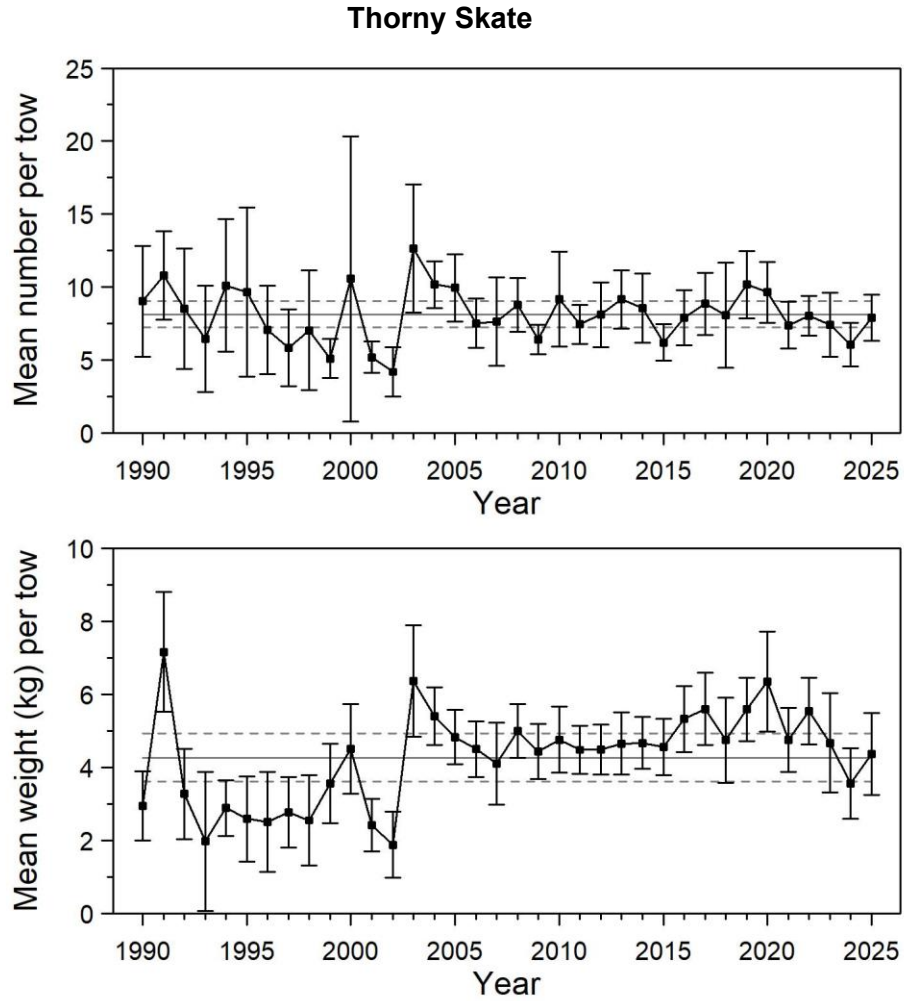


Figure 49. Mean numbers and mean weights per 15-minute tow observed during the survey for Thorny Skate in 4RST. Error bars indicate the 95% confidence interval and the horizontal lines indicate the mean of the 1990-2024 period (solid line) and upper and lower reference (see text) limits (dashed lines).

Thorny Skate

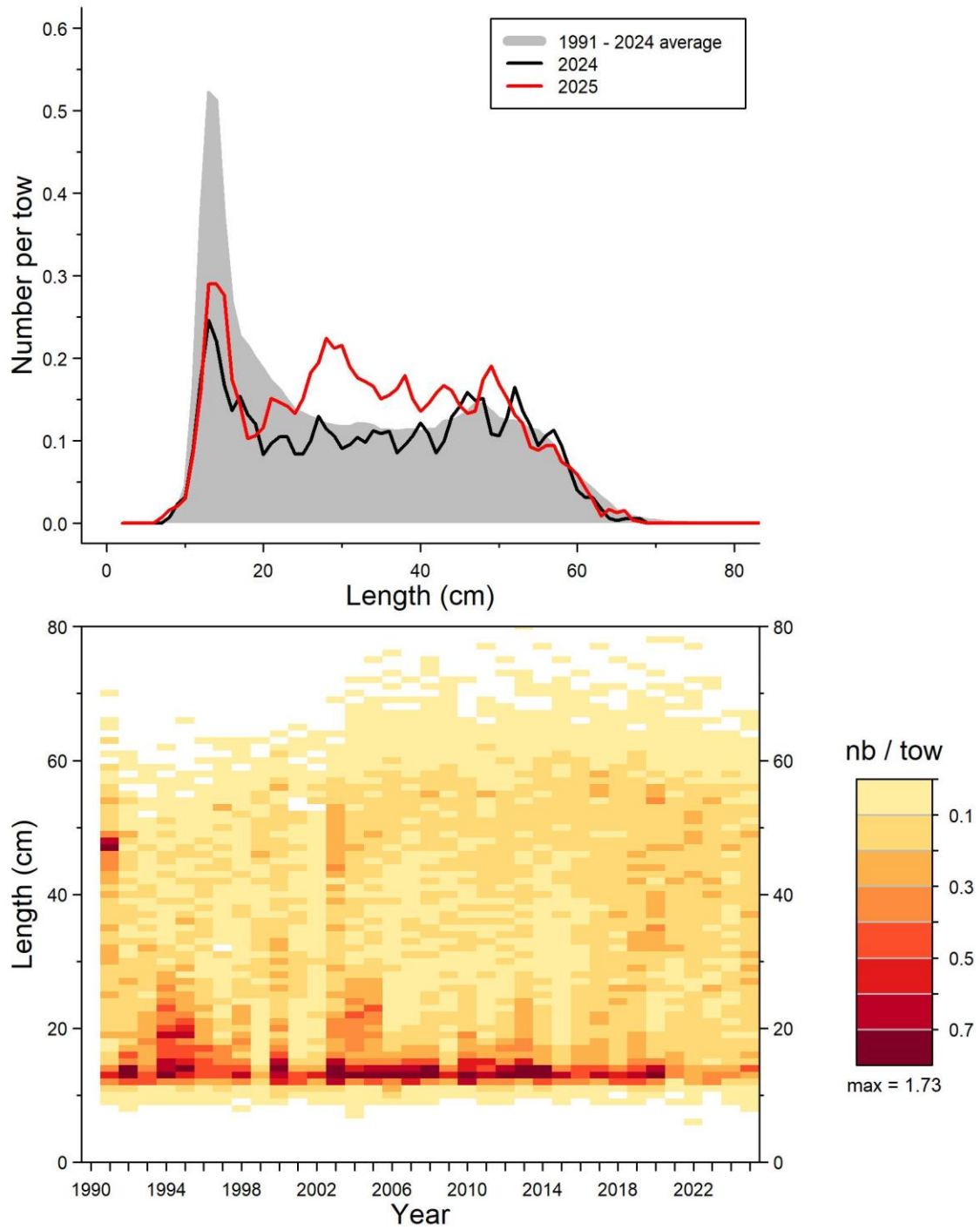


Figure 50. Length frequency distributions (mean number per 15-minute tow) observed during the survey for Thorny Skate in 4RST.

Thorny Skate

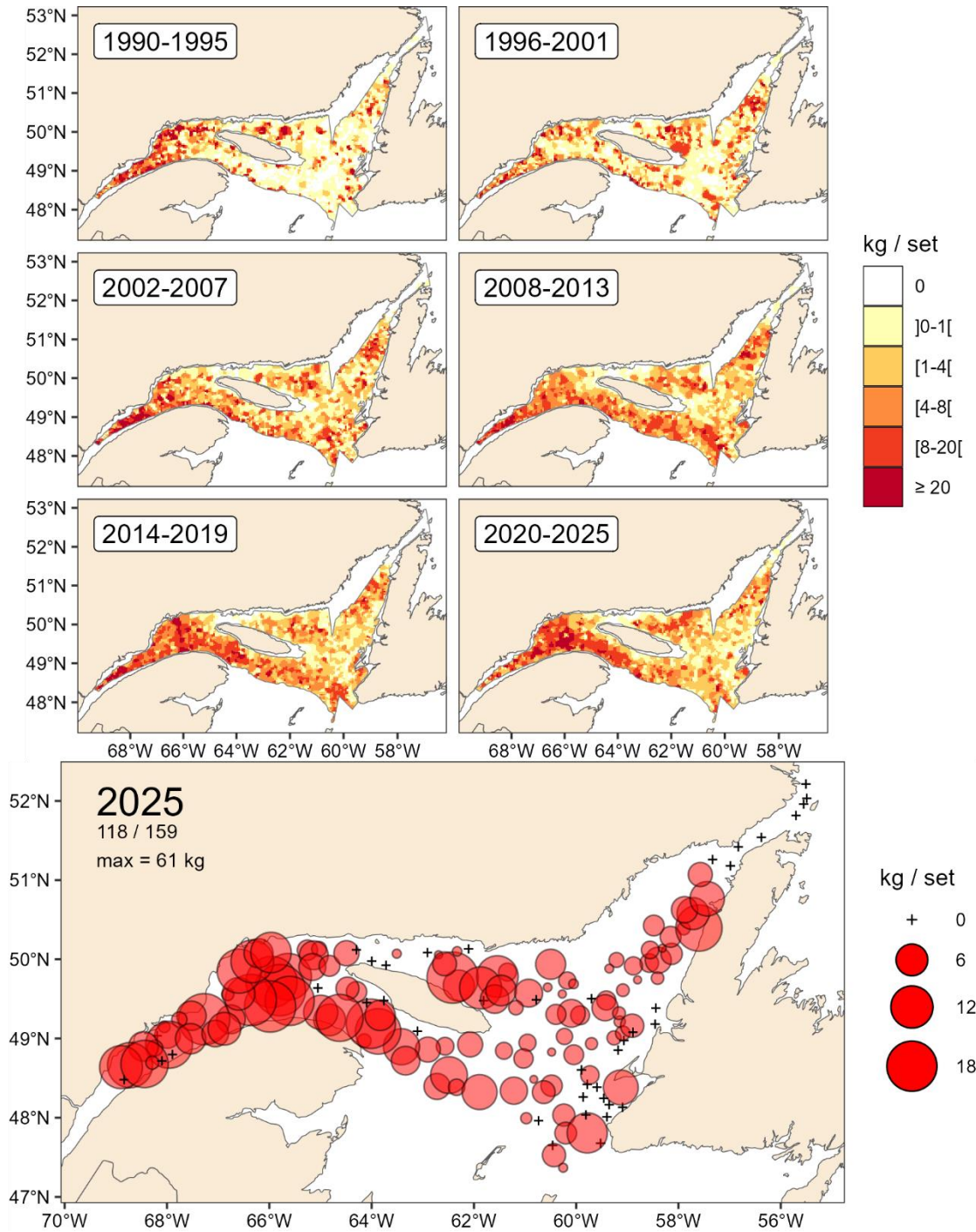


Figure 51. Thorny Skate catch rate (kg/15-minute tow) spatial distributions.

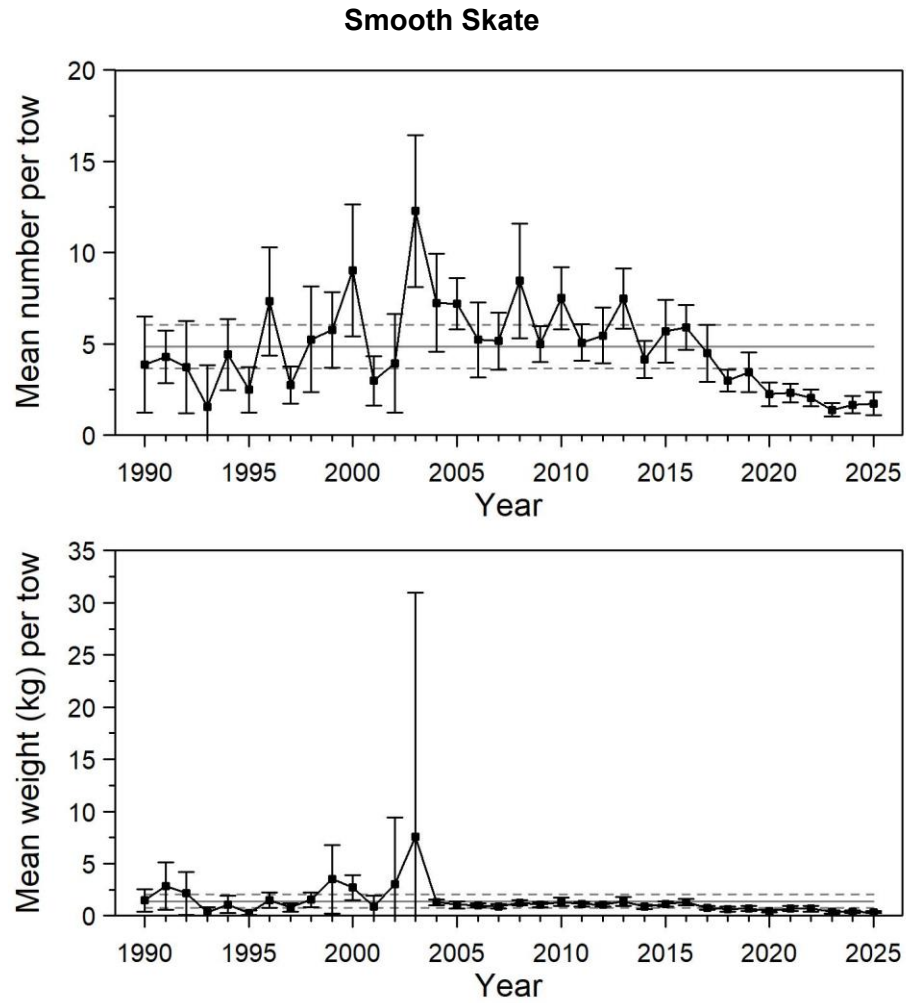


Figure 52. Mean numbers and mean weights per 15-minute tow observed during the survey for Smooth Skate in 4RST. Error bars indicate the 95% confidence interval and the horizontal lines indicate the mean of the 1990-2024 period (solid line) and upper and lower reference (see text) limits (dashed lines).

Smooth Skate

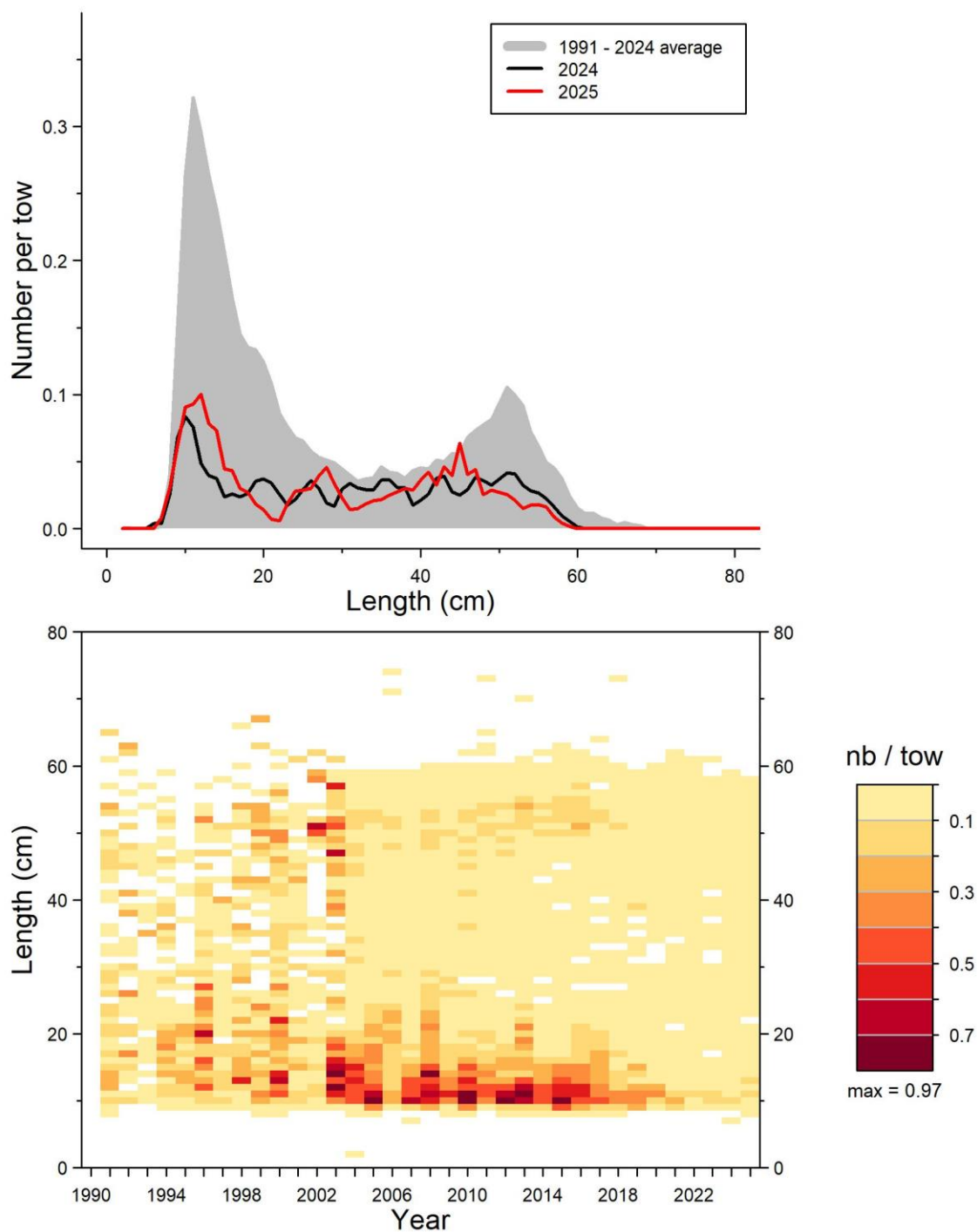


Figure 53. Length frequency distributions (mean number per 15-minute tow) observed during the survey for Smooth Skate in 4RST.

Smooth Skate

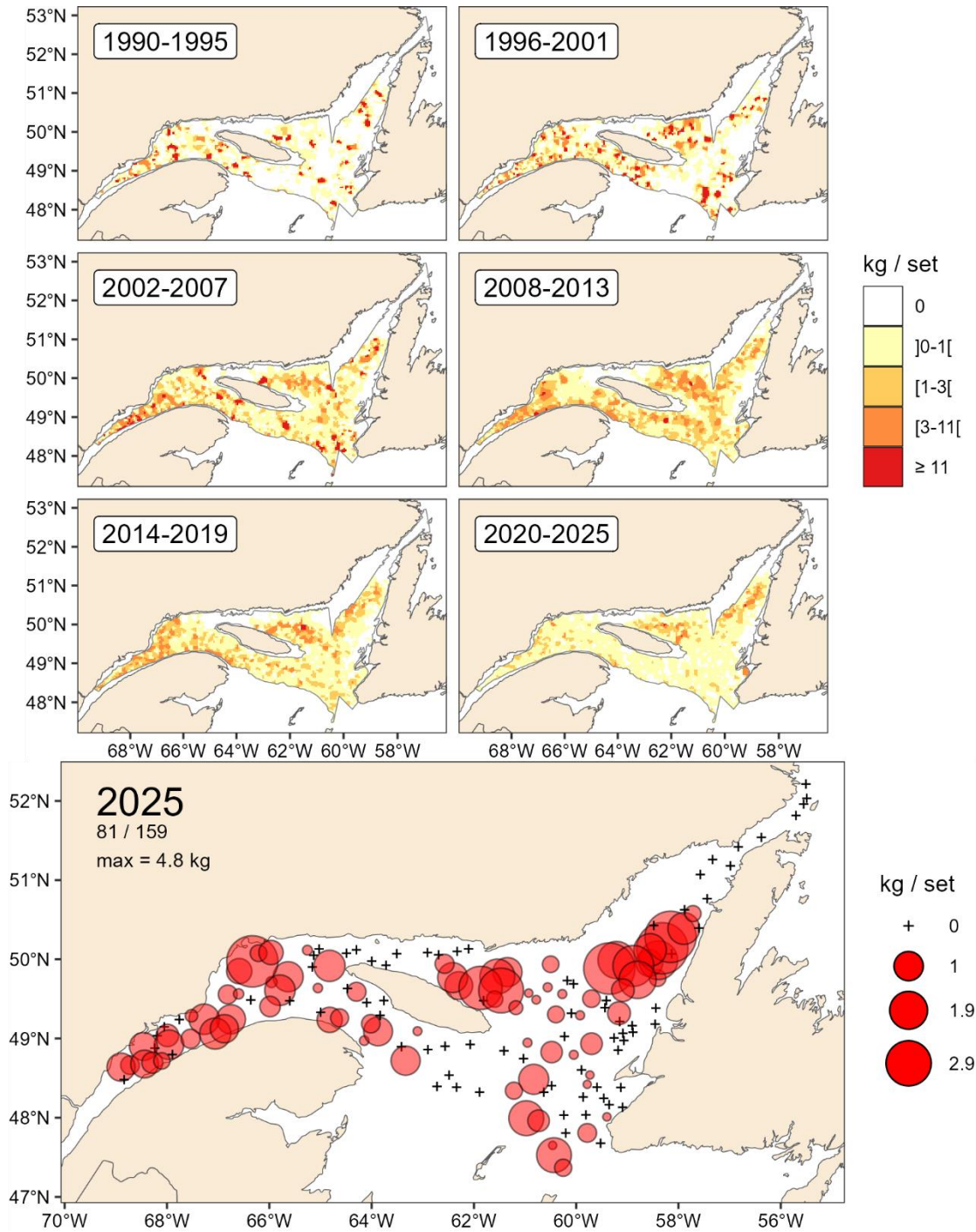


Figure 54. Smooth Skate catch rate (kg/15-minute tow) spatial distributions.

Acadian Redfish (*Sebastes fasciatus*)

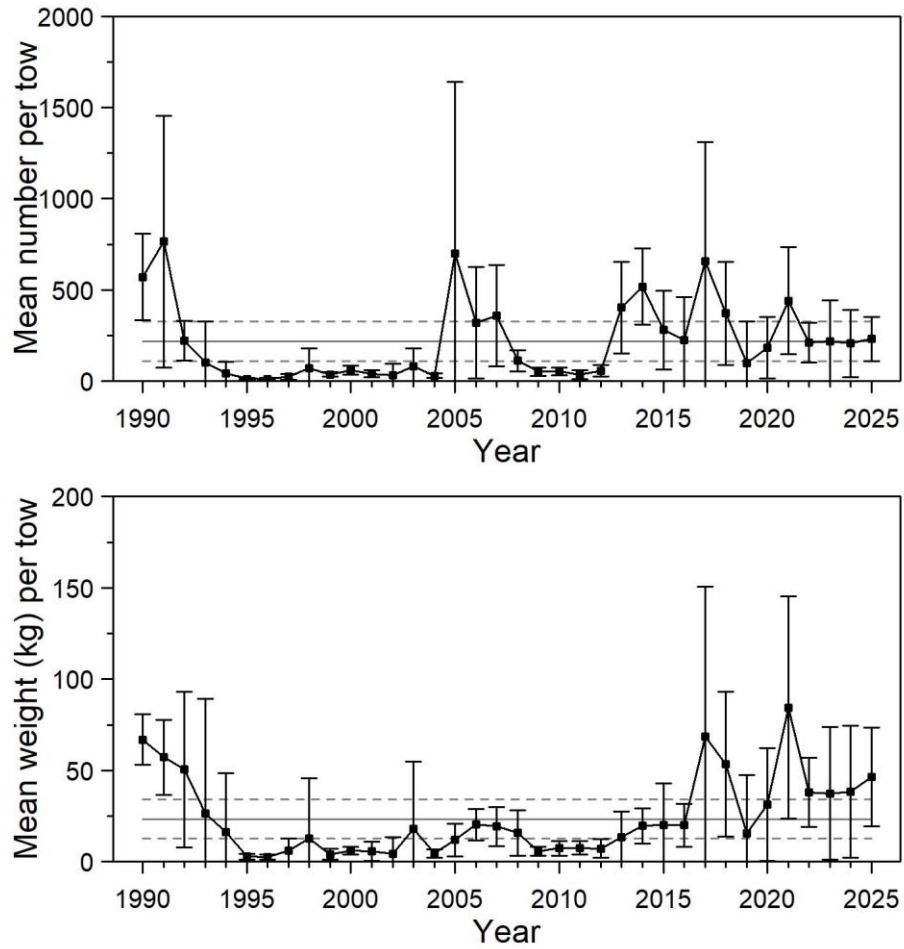


Figure 55. Mean numbers and mean weights per 15-minute tow observed during the survey for Acadian Redfish in 4RST. Error bars indicate the 95% confidence interval and the horizontal lines indicate the mean of the 1990-2024 period (solid line) and upper and lower reference (see text) limits (dashed lines).

Acadian Redfish (*Sebastes fasciatus*)

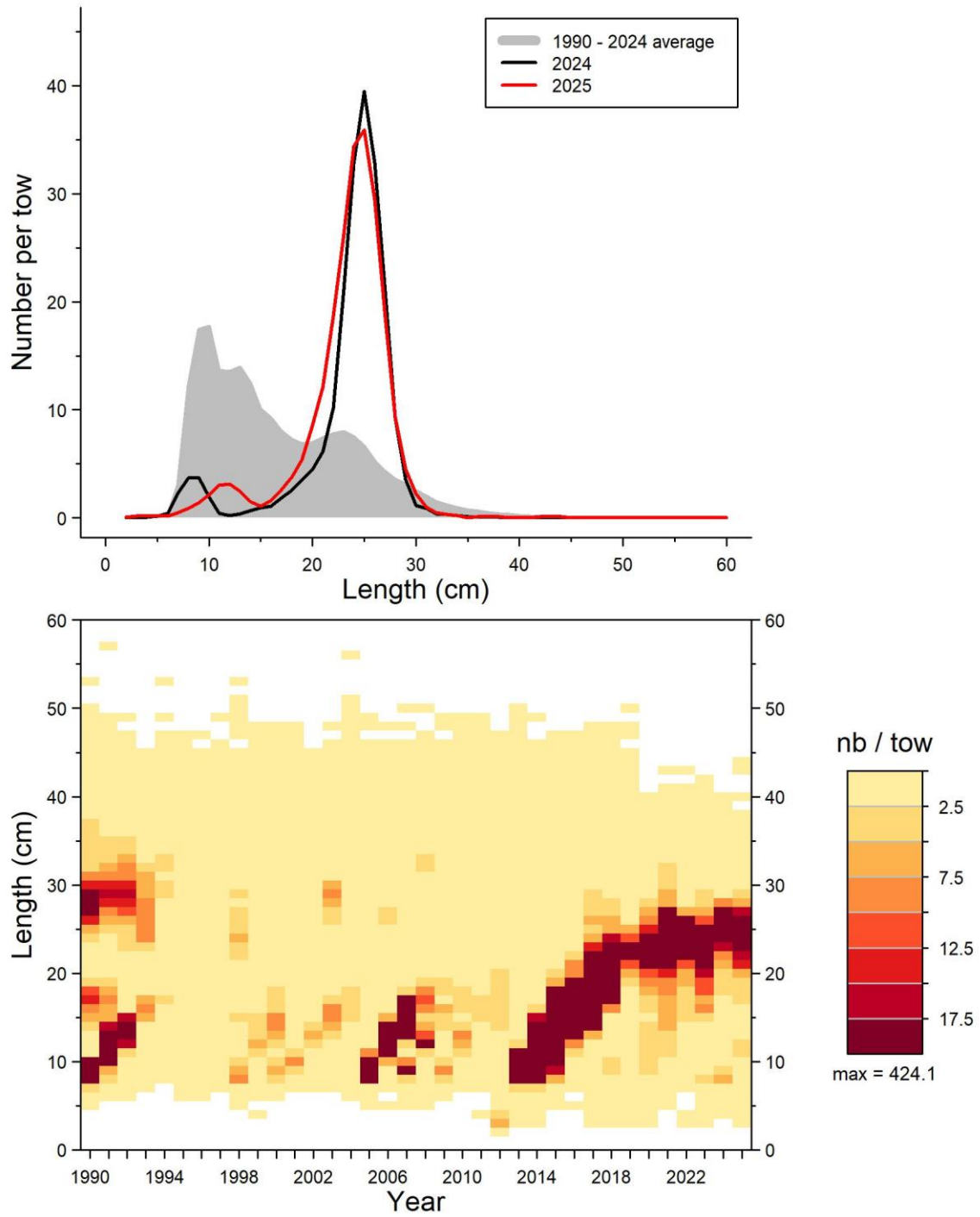


Figure 56. Length frequency distributions (mean number per 15-minute tow) observed during the survey for Acadian Redfish in 4RST.

Acadian Redfish (*Sebastes fasciatus*)

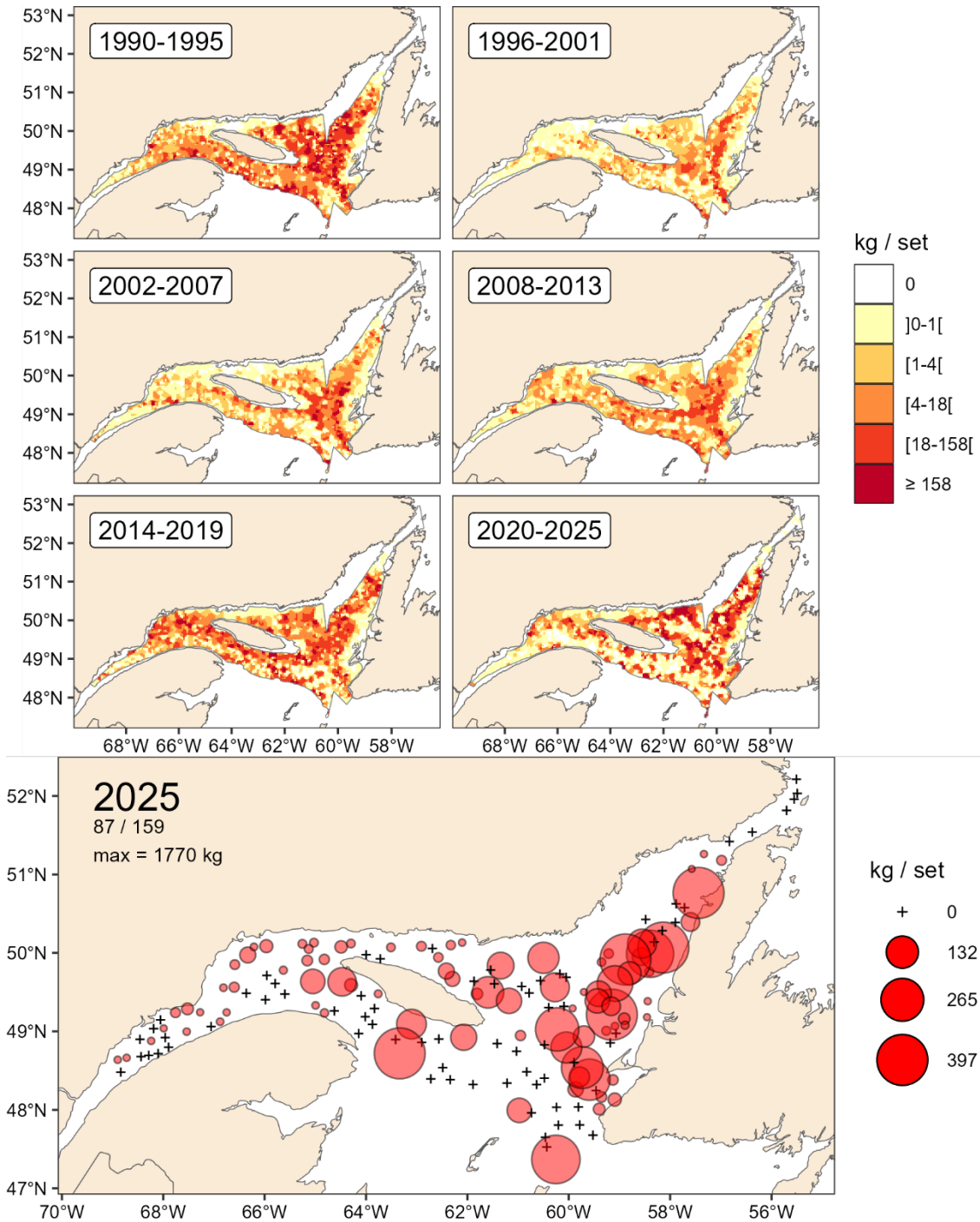


Figure 57. Acadian Redfish catch rate (kg/15-minute tow) spatial distributions.

Deepwater Redfish (*Sebastes mentella*)

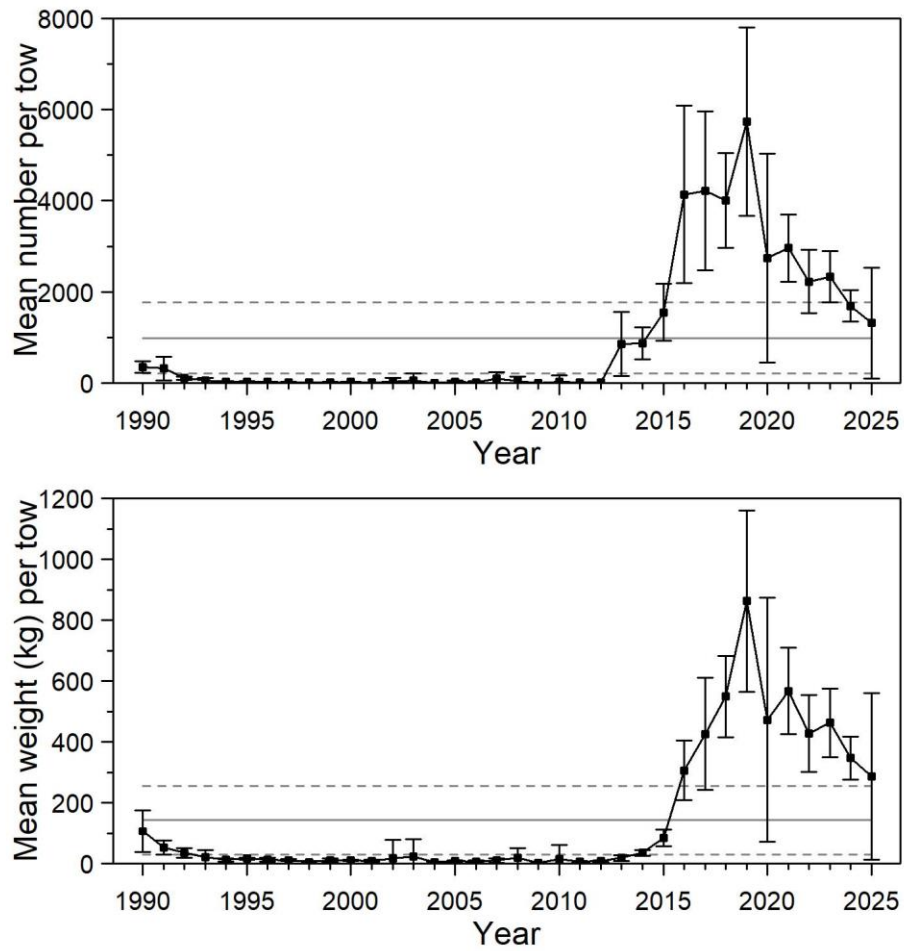


Figure 58. Mean numbers and mean weights per 15-minute tow observed during the survey for Deepwater Redfish in 4RST. Error bars indicate the 95% confidence interval and the horizontal lines indicate the mean of the 1990-2024 period (solid line) and upper and lower reference (see text) limits (dashed lines).

Deepwater Redfish (*Sebastes mentella*)

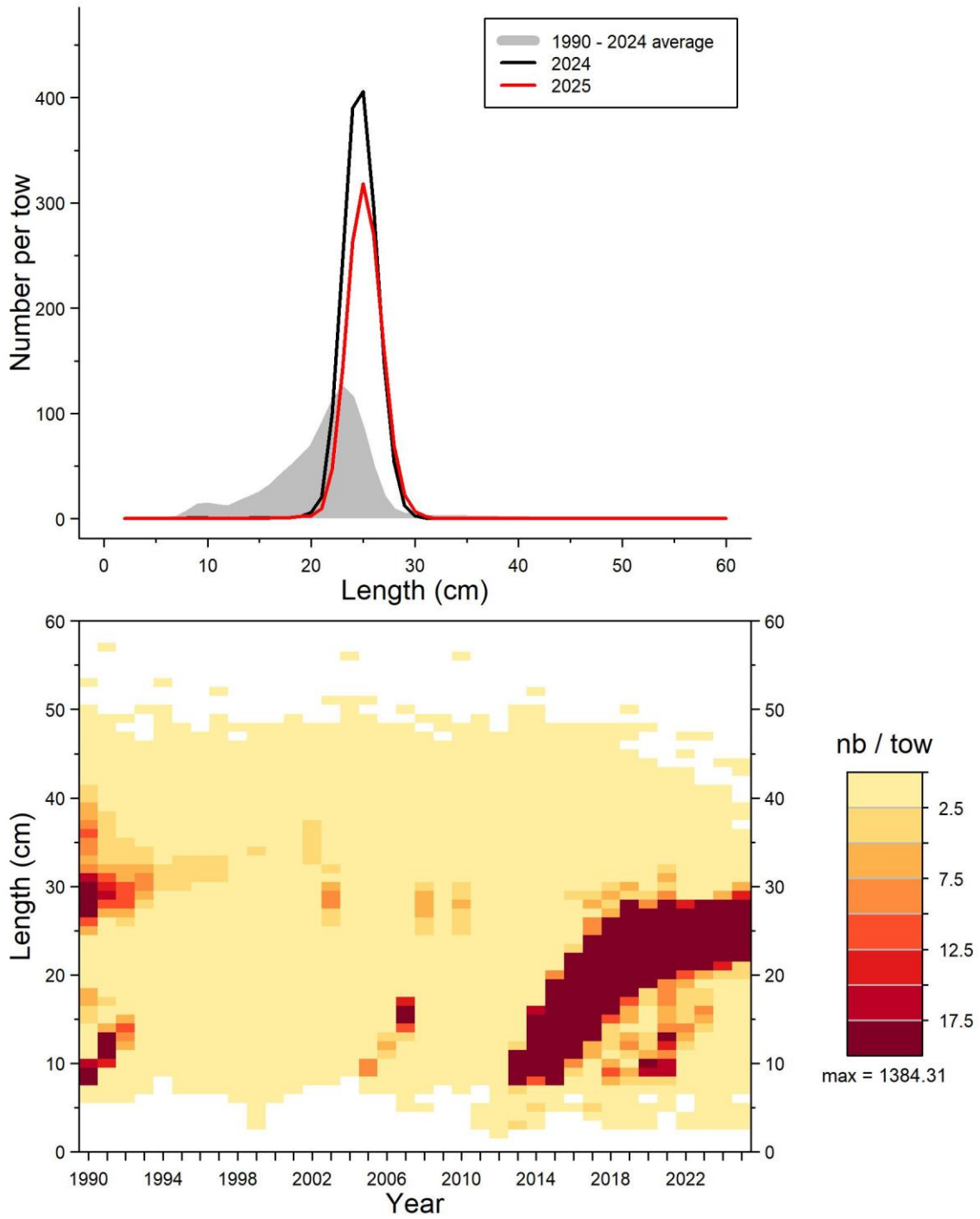


Figure 59. Length frequency distributions (mean number per 15-minute tow) observed during the survey for Deepwater Redfish in 4RST.

Deepwater Redfish (*Sebastes mentella*)

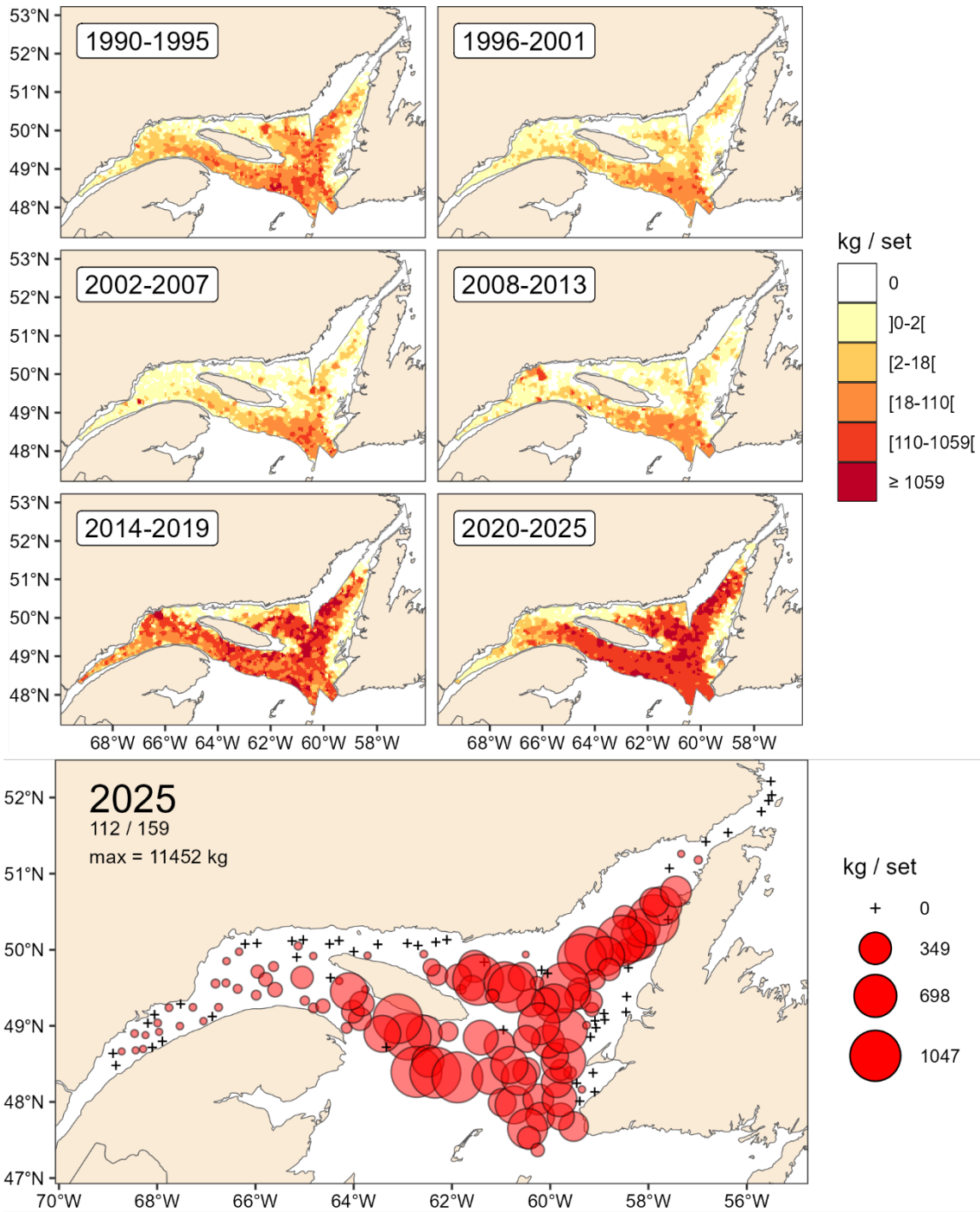


Figure 60. Deepwater Redfish catch rate (kg/15-minute tow) spatial distributions.

Norway King Crab

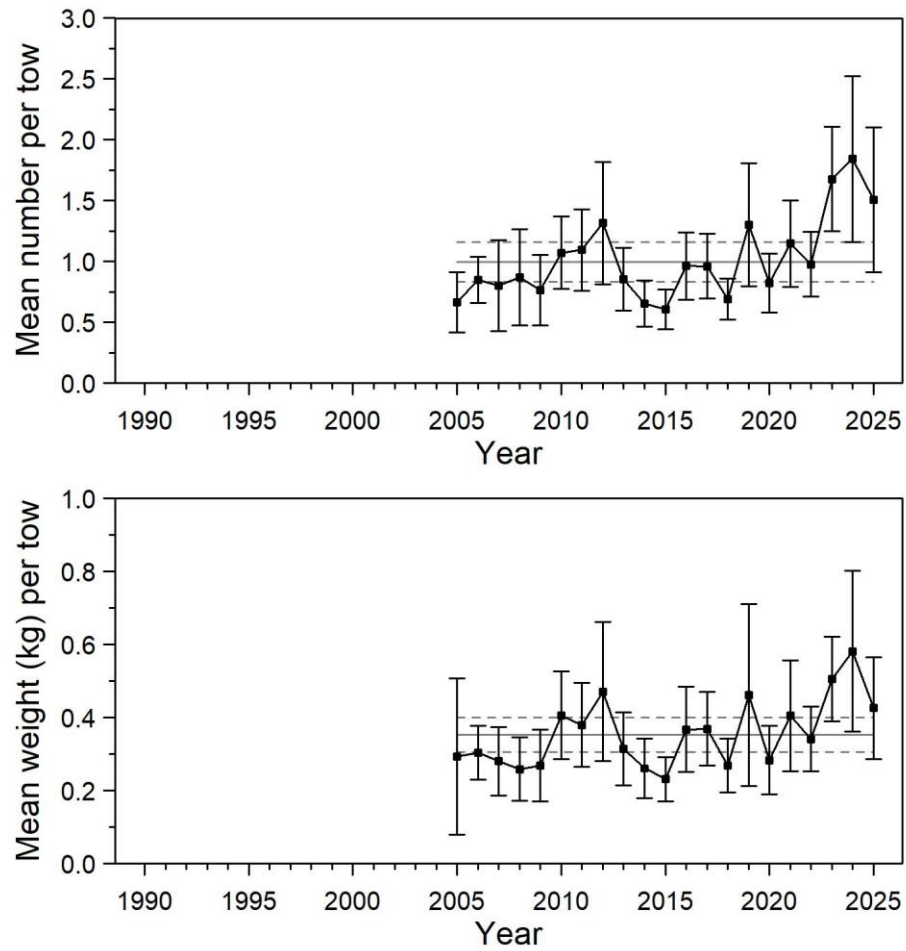


Figure 61. Mean numbers and mean weights per 15-minute tow observed during the survey for Norway King Crab in 4RST. Error bars indicate the 95% confidence interval and the horizontal lines indicate the mean of the 1990-2024 period (solid line) and upper and lower reference (see text) limits (dashed lines).

Norway King Crab

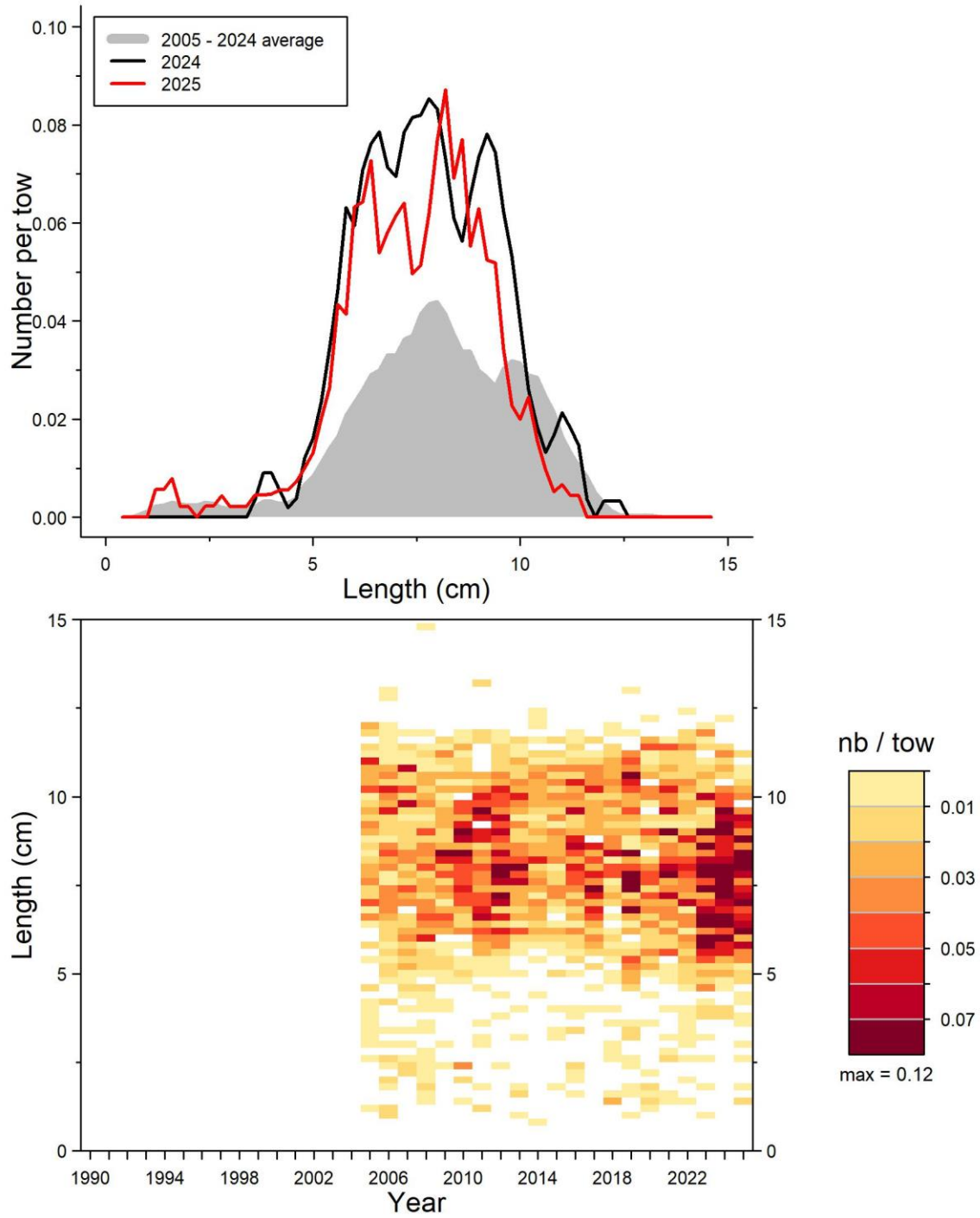


Figure 62. Carapace width frequency distributions (mean number per 15-minute tow) observed during the survey for Norway King Crab in 4RST.

Norway King Crab

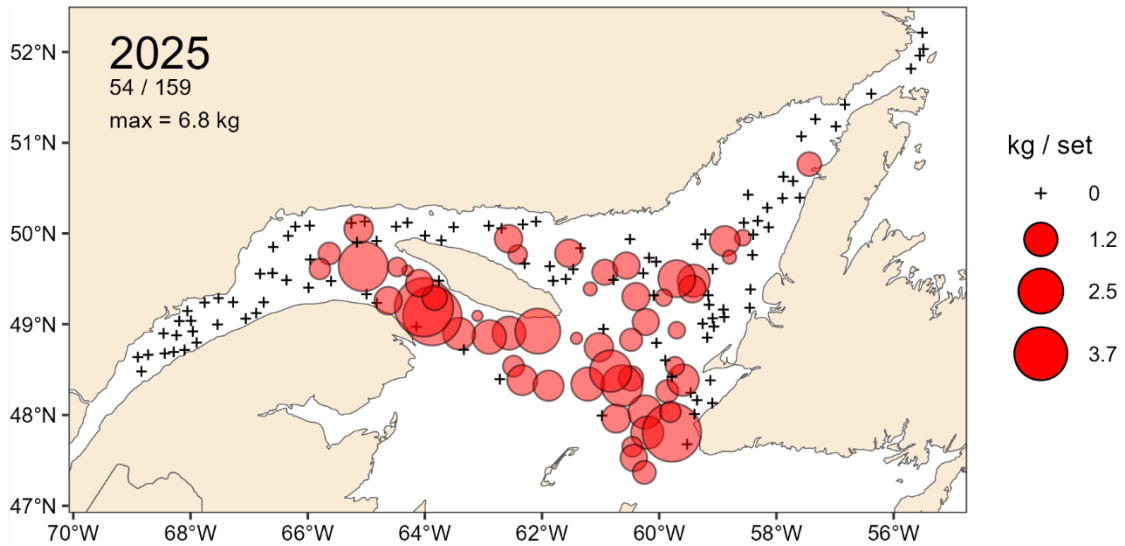
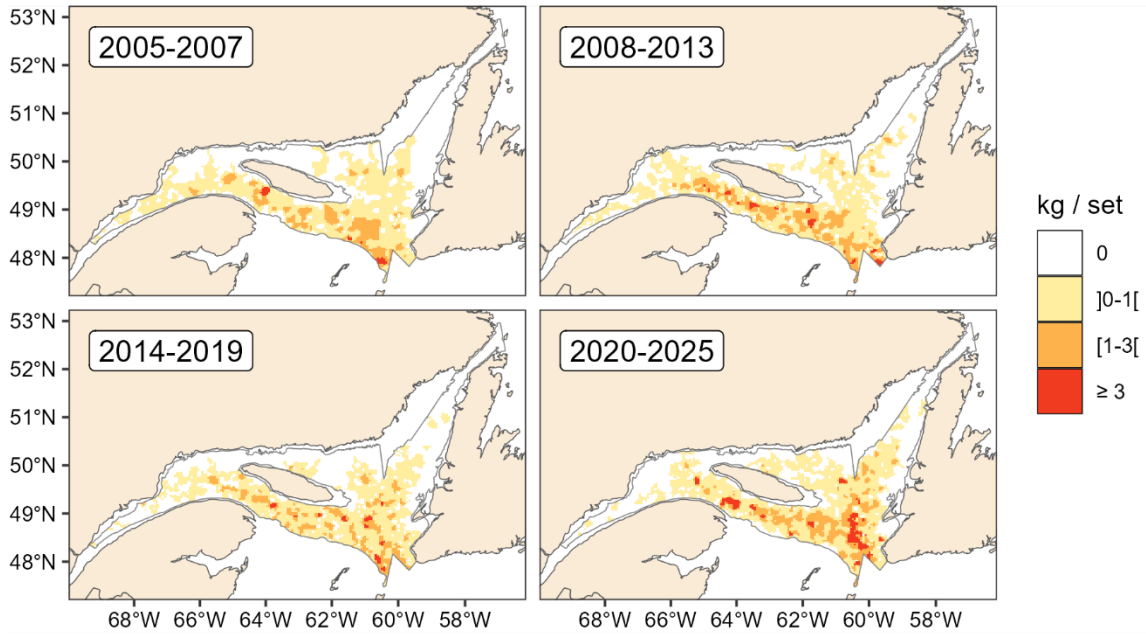


Figure 63. Norway King Crab catch rate (kg/15-minute tow) spatial distributions.

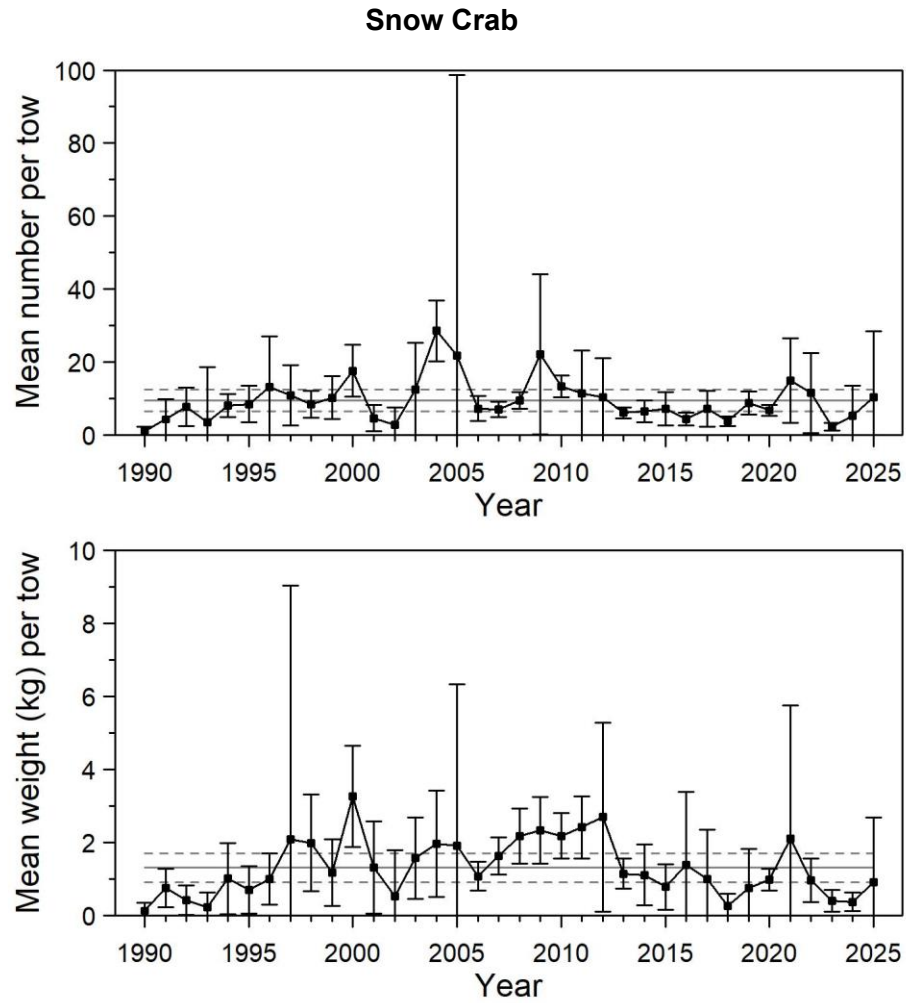


Figure 64. Mean numbers and mean weights per 15-minute tow observed during the survey for Snow Crab in 4RST. Error bars indicate the 95% confidence interval and the horizontal lines indicate the mean of the 1990-2024 period (solid line) and upper and lower reference (see text) limits (dashed lines).

Snow Crab

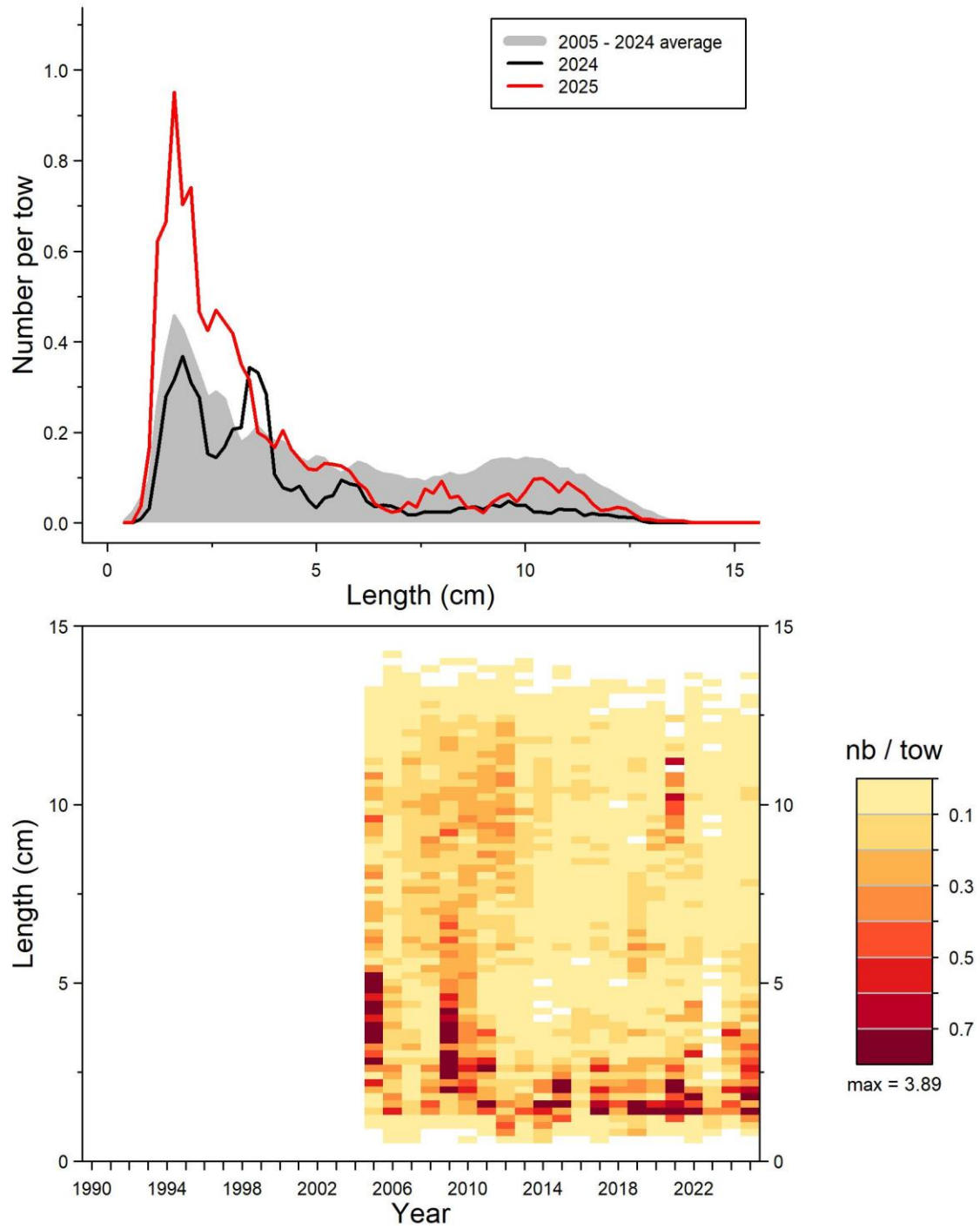


Figure 65. Carapace width frequency distributions (mean number per 15-minute tow) observed during the survey for Snow Crab in 4RST.

Snow Crab

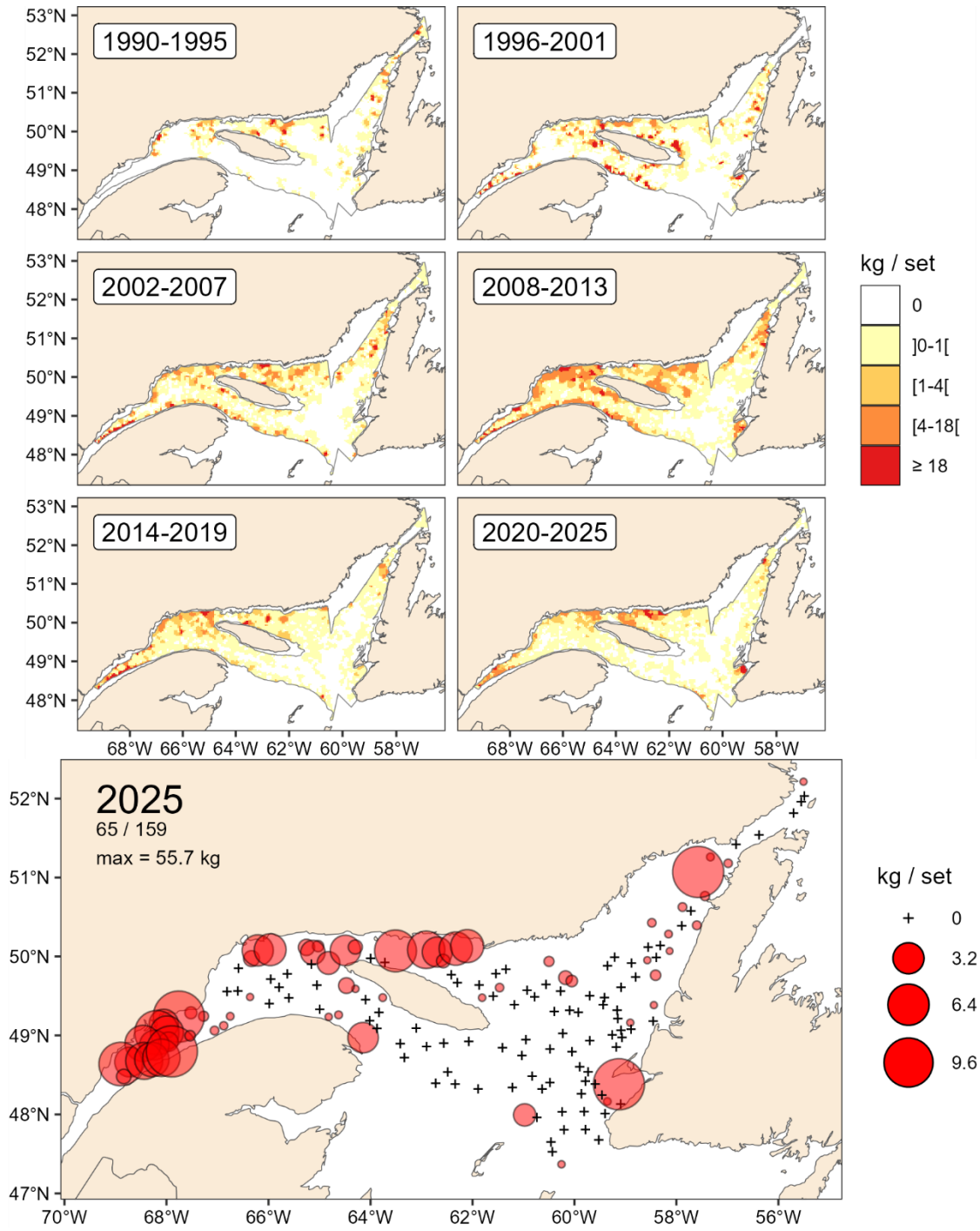


Figure 66. Snow Crab catch rate (kg/15-minute tow) spatial distributions.

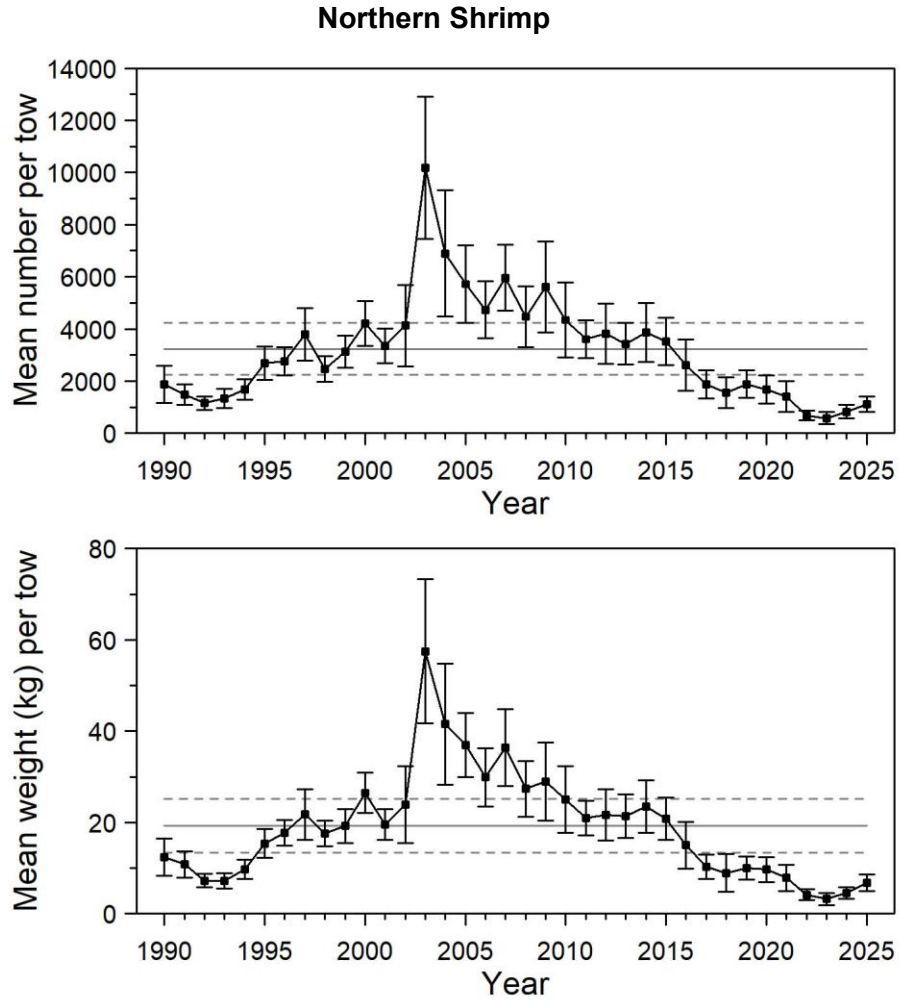


Figure 67. Mean numbers and mean weights per 15-minute tow observed during the survey for Northern Shrimp in 4RST. Error bars indicate the 95% confidence interval and the horizontal lines indicate the mean of the 1990-2024 period (solid line) and upper and lower reference (see text) limits (dashed lines).

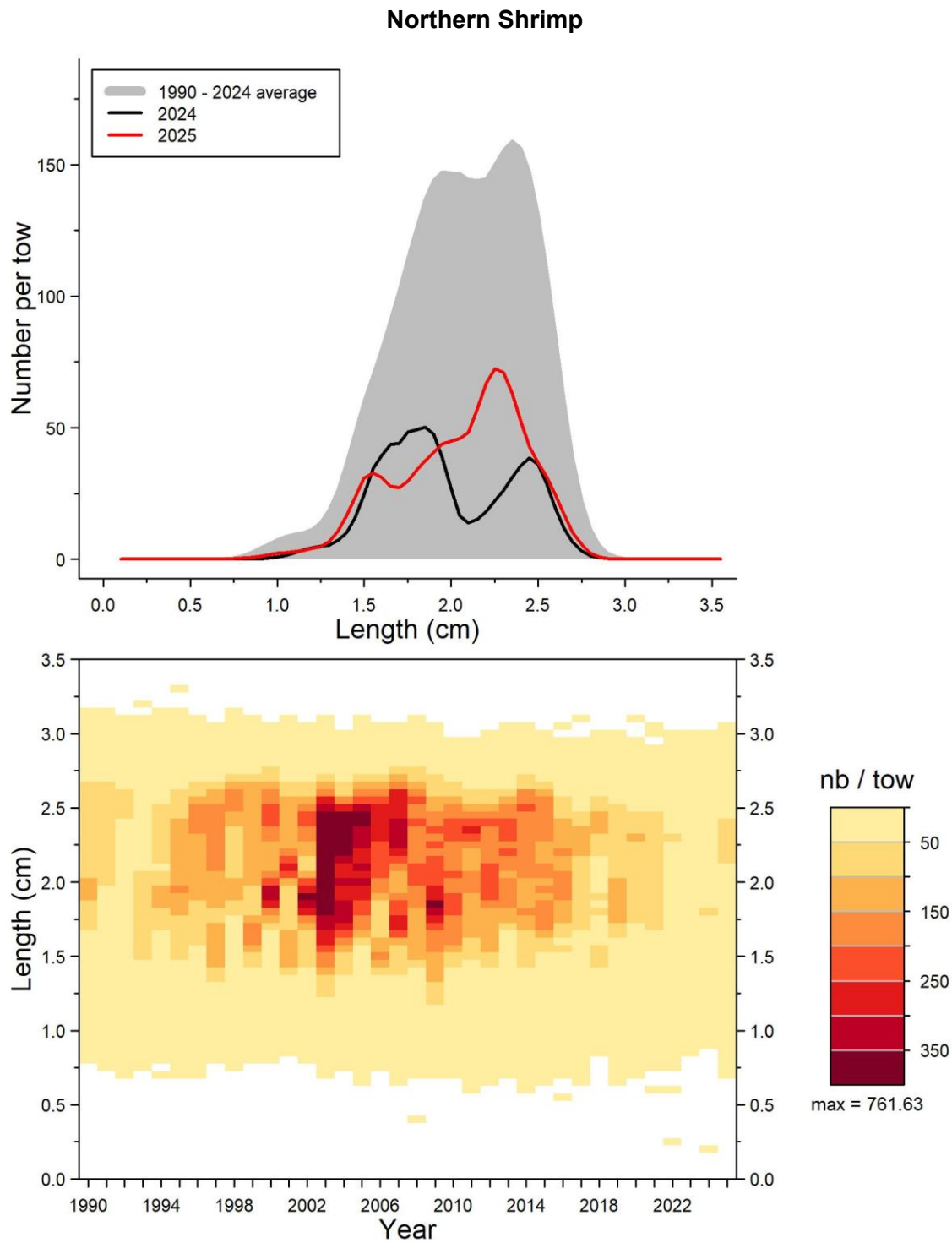


Figure 68. Carapace length frequency distributions (mean number per 15-minute tow) observed during the survey for Northern Shrimp in 4RST.

Northern Shrimp

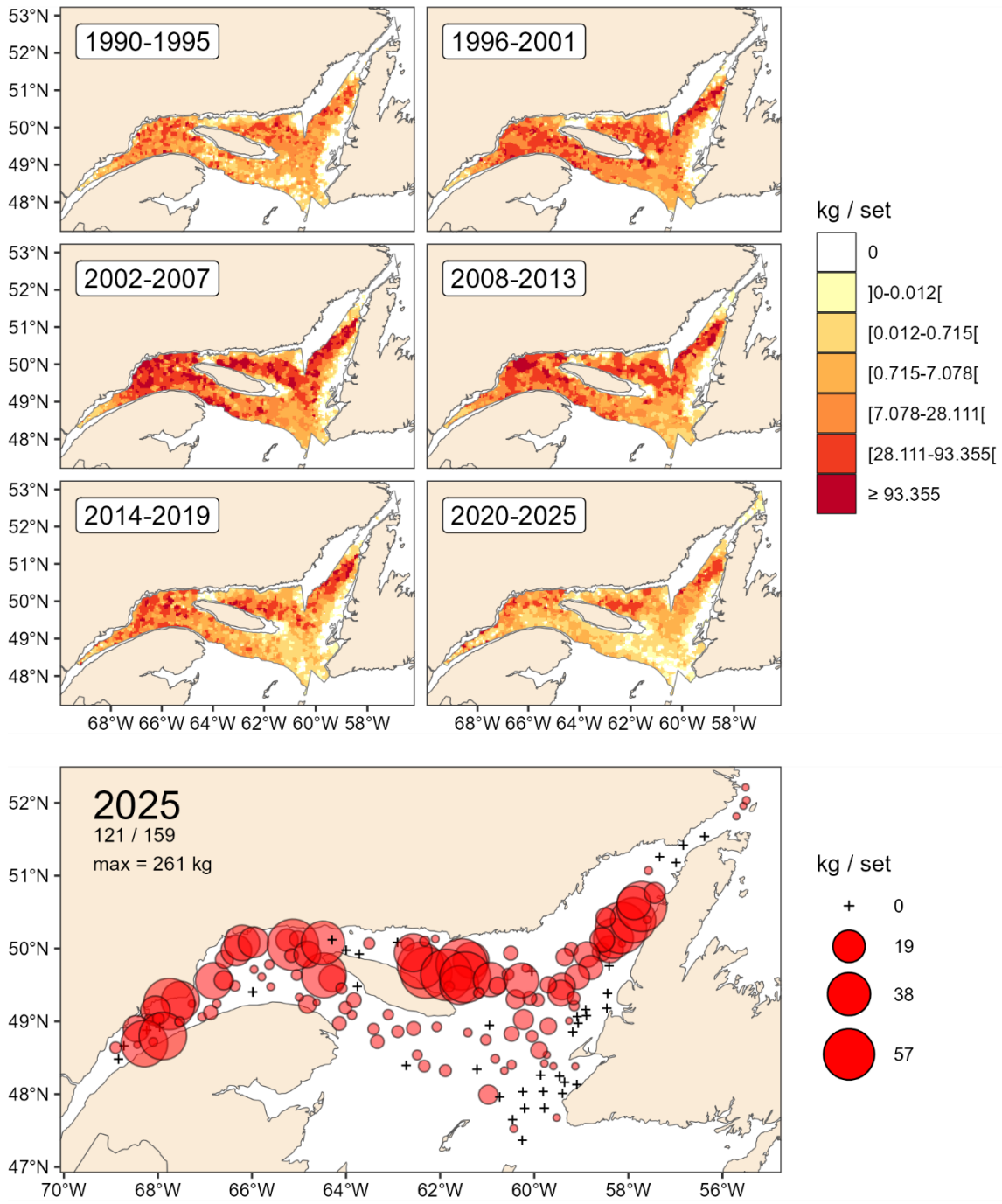


Figure 69. Northern Shrimp catch rate (kg/15-minute tow) spatial distributions.

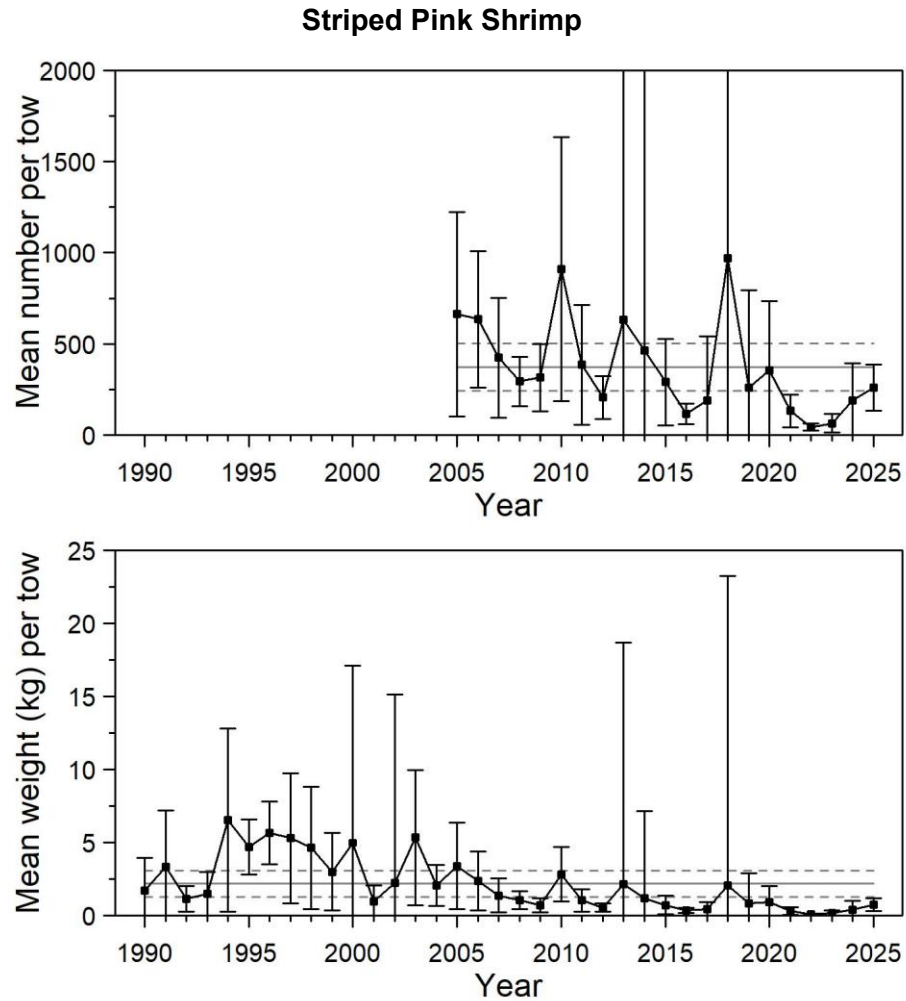


Figure 70. Mean numbers and mean weights per 15-minute tow observed during the survey for Striped Pink Shrimp in 4RST. Error bars indicate the 95% confidence interval and the horizontal lines indicate the mean of the 1990-2024 period (solid line) and upper and lower reference (see text) limits (dashed lines).

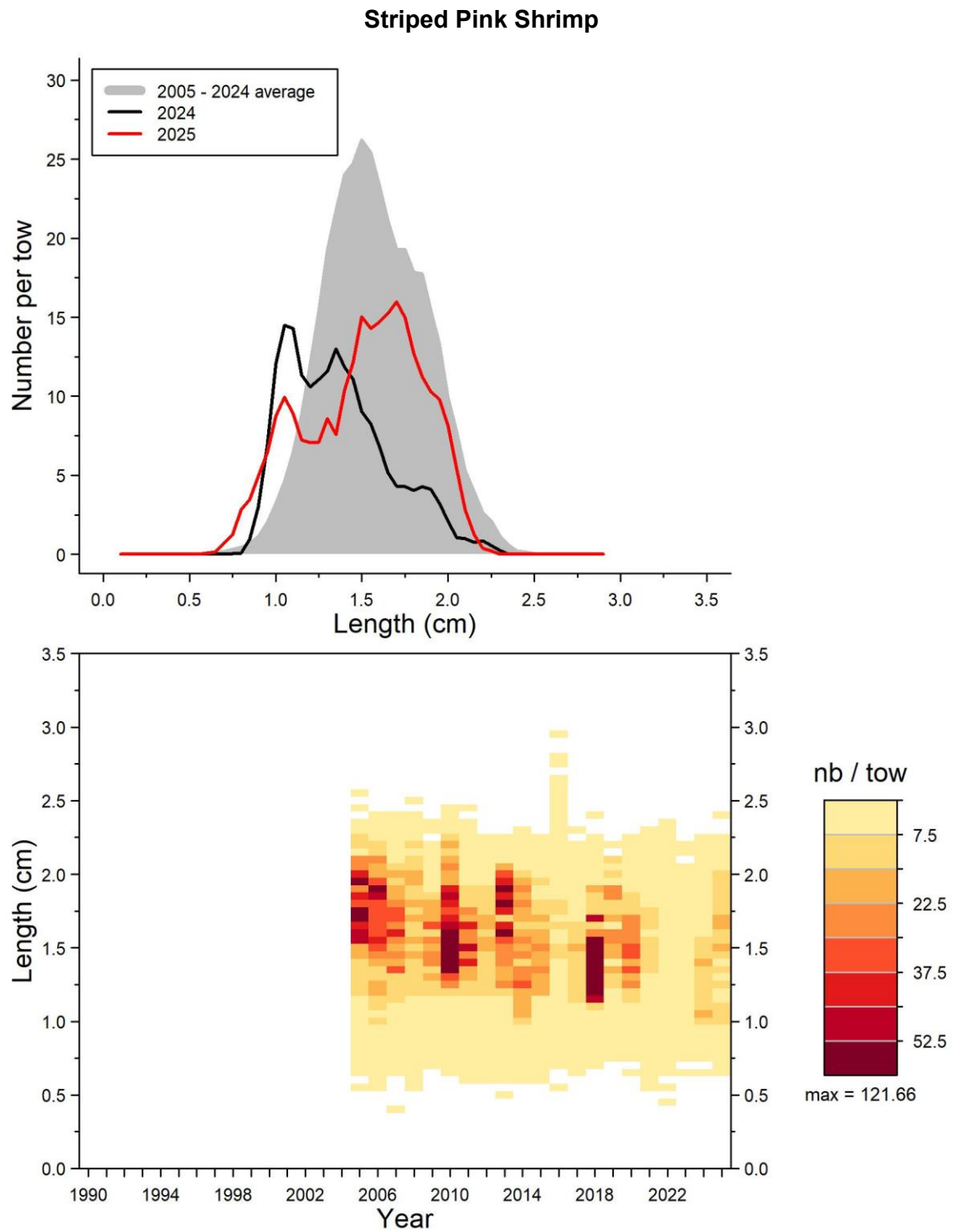


Figure 71. Carapace length frequency distributions (mean number per 15-minute tow) observed during the survey for Striped Pink Shrimp in 4RST.

Striped Pink Shrimp

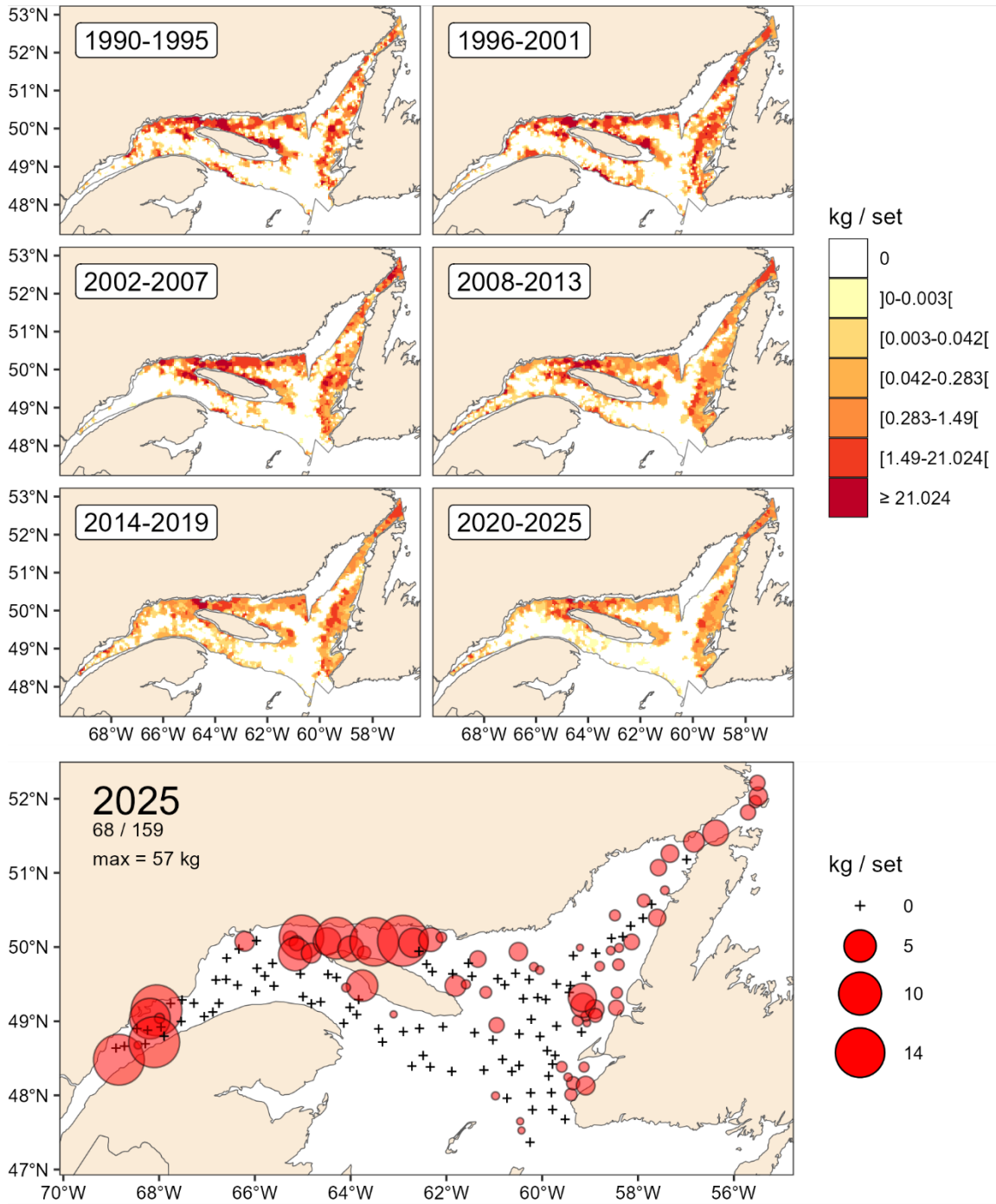


Figure 72. Striped Pink Shrimp catch rate (kg/15-minute tow) spatial distributions.

Pink Glass Shrimp

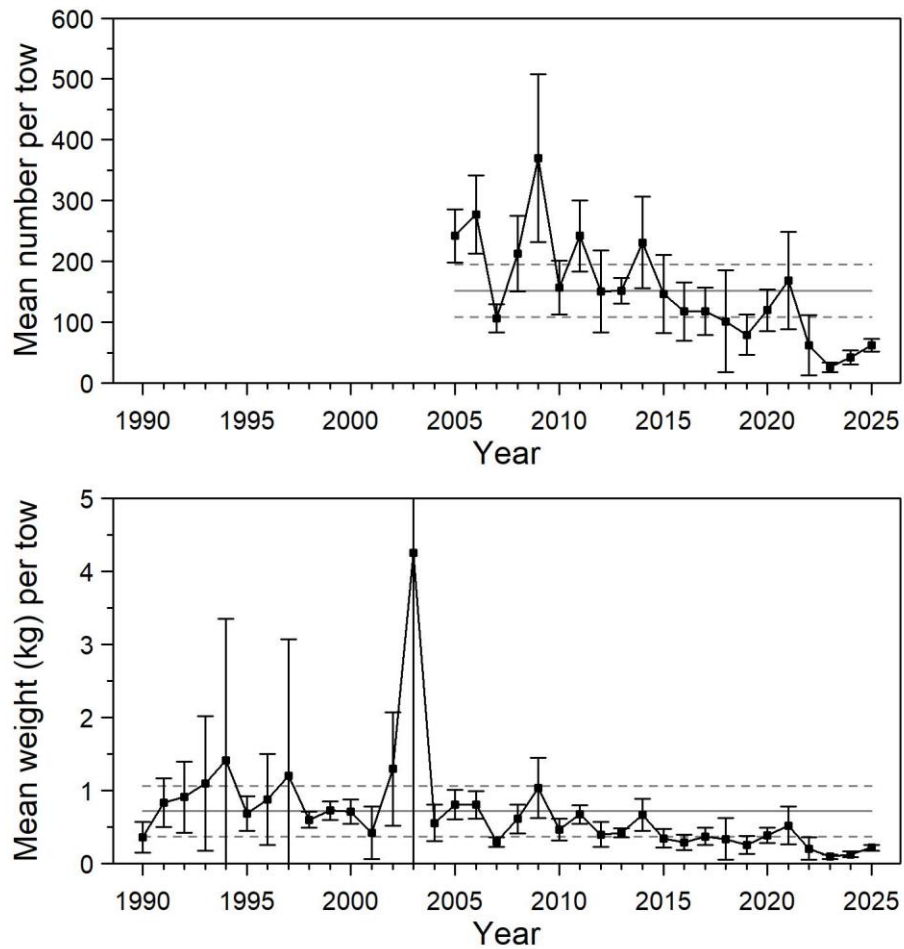


Figure 73. Mean numbers and mean weights per 15-minute tow observed during the survey for Pink Glass Shrimp in 4RST. Error bars indicate the 95% confidence interval and the horizontal lines indicate the mean of the 1990-2024 period (solid line) and upper and lower reference (see text) limits (dashed lines).

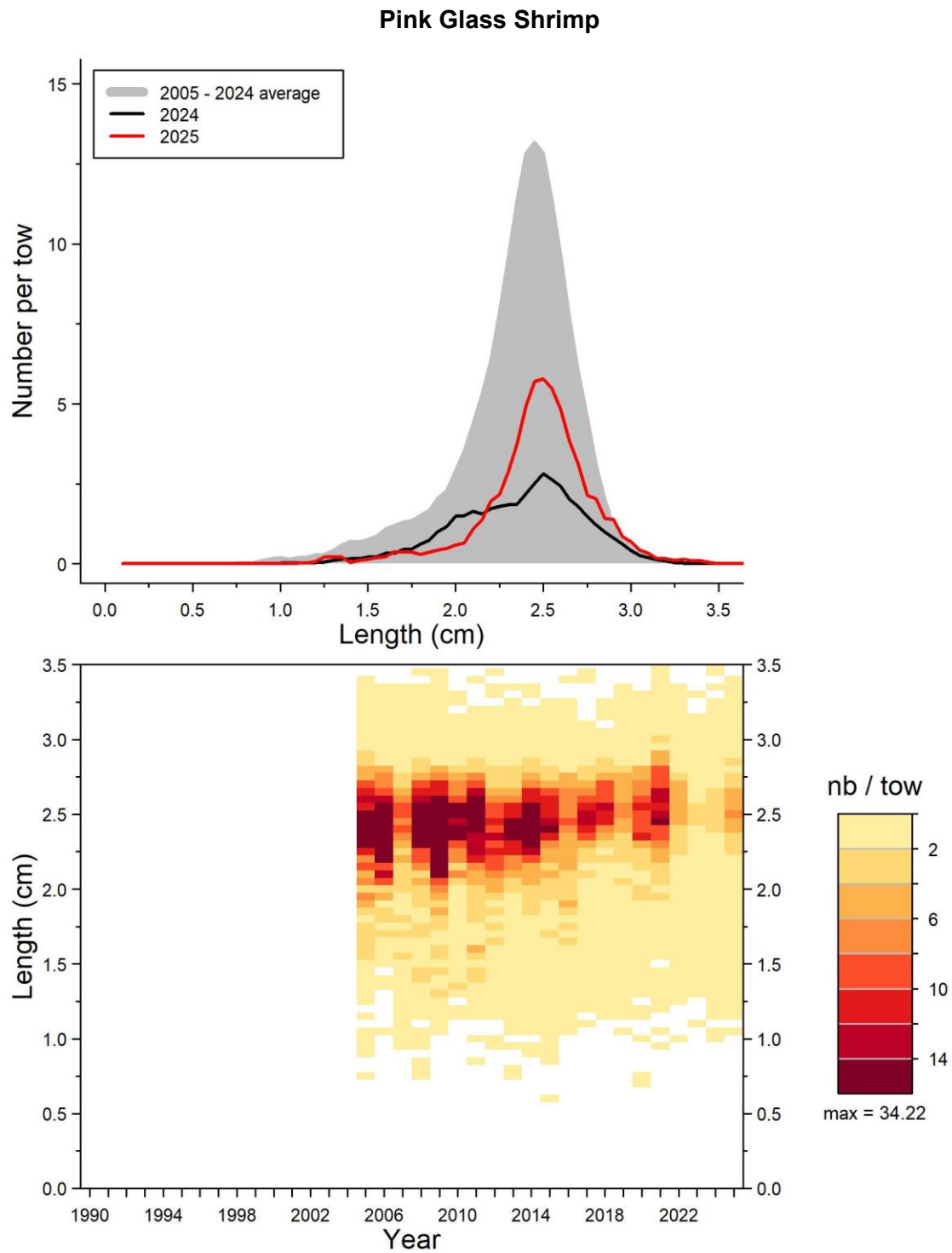


Figure 74. Carapace length frequency distributions (mean number per 15-minute tow) observed during the survey for Pink Glass Shrimp in 4RST.

Pink Glass Shrimp

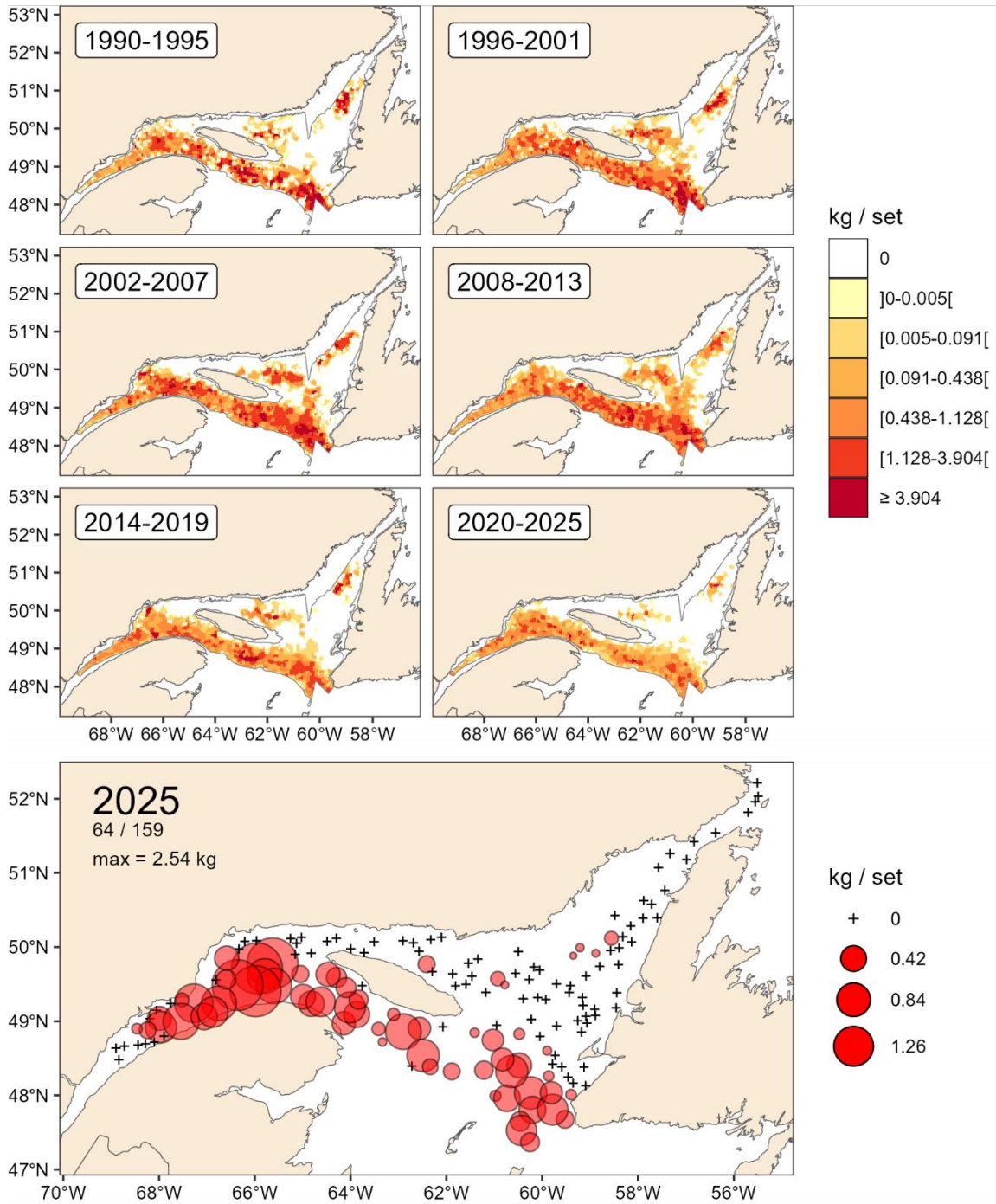


Figure 75. Pink Glass Shrimp catch rate (kg/15-minute tow) spatial distributions.

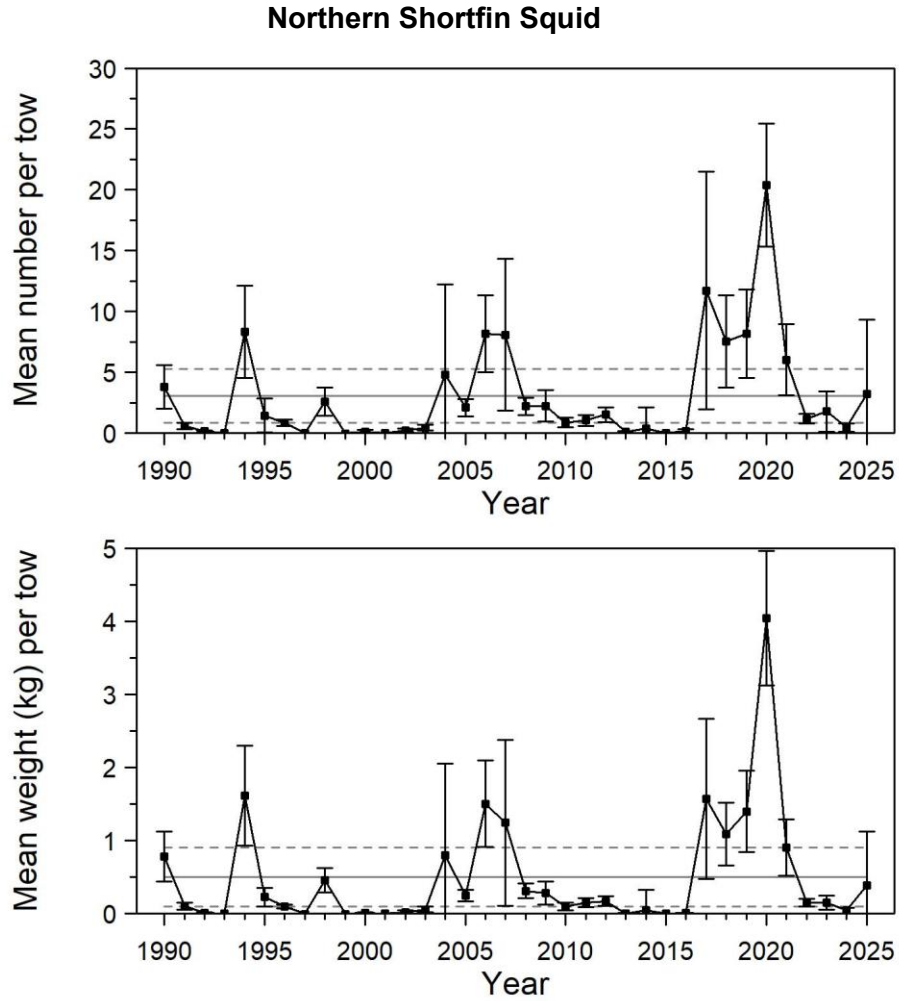


Figure 76. Mean numbers and mean weights per 15-minute tow observed during the survey for Northern Shortfin Squid in 4RST. Error bars indicate the 95% confidence interval and the horizontal lines indicate the mean of the 1990-2024 period (solid line) and upper and lower reference (see text) limits (dashed lines).

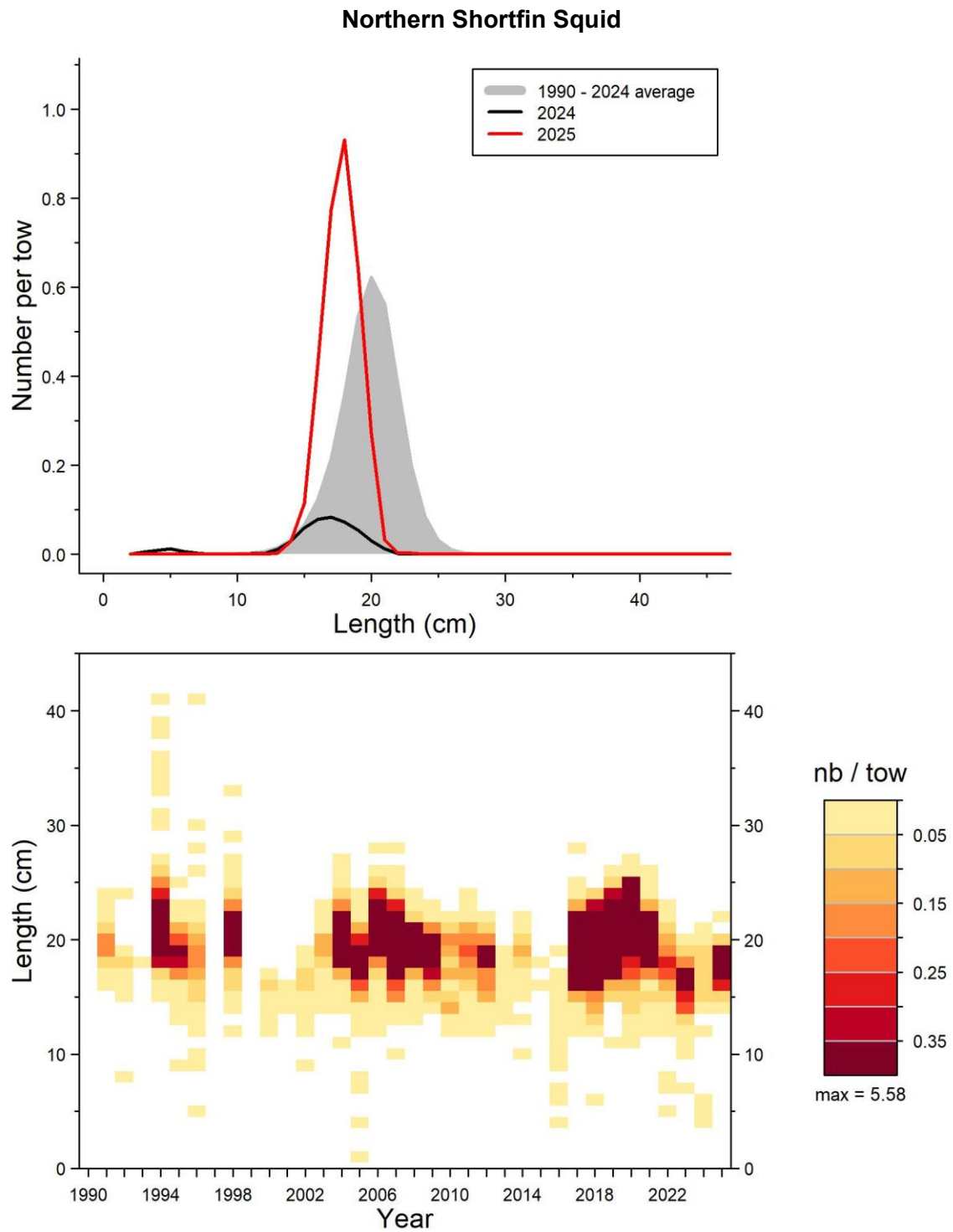


Figure 77. Mantle length frequency distributions (mean number per 15-minute tow) observed during the survey for Northern Shortfin Squid in 4RST.

Northern Shortfin Squid

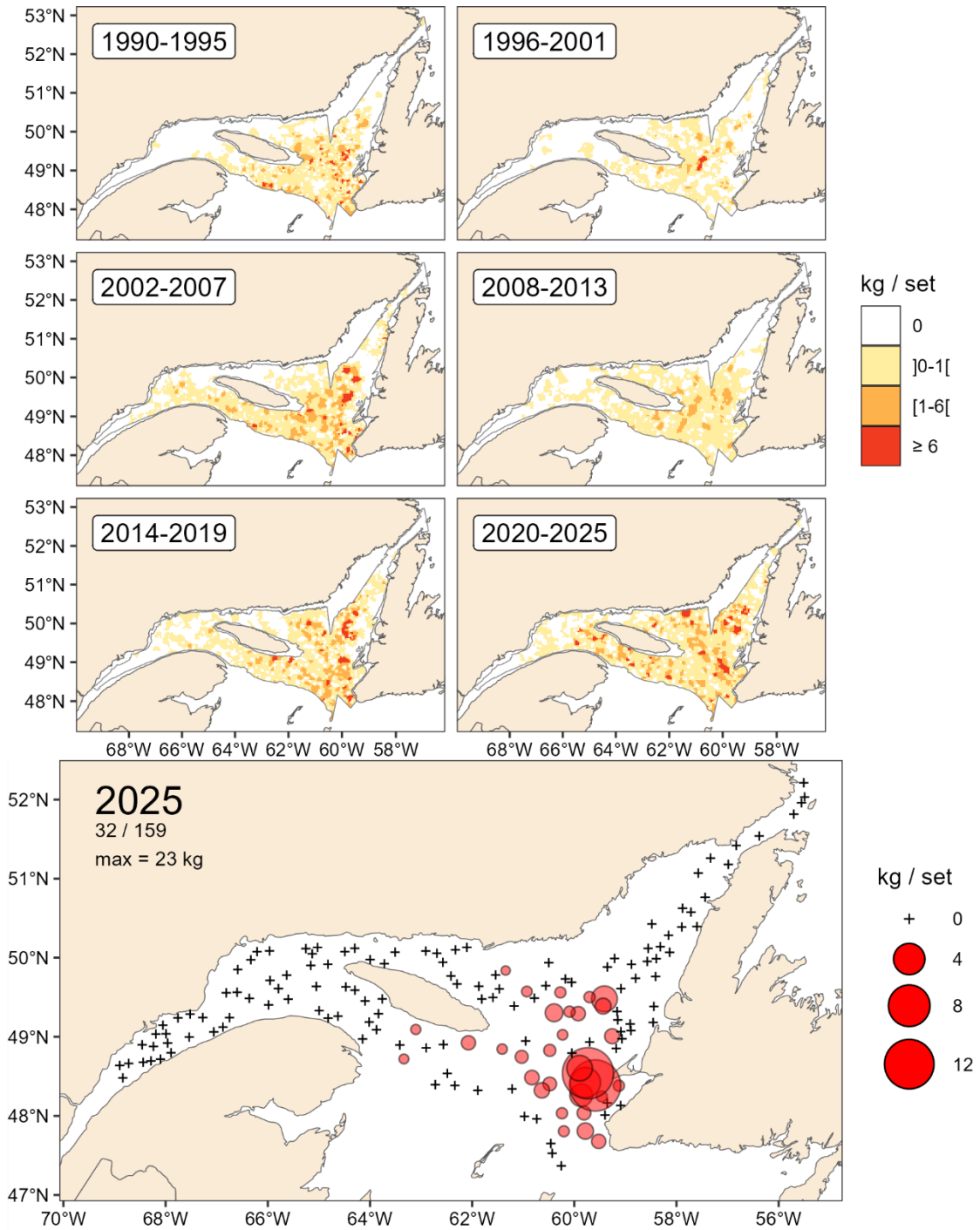


Figure 78. Northern Shortfin Squid catch rate (kg/15-minute tow) spatial distributions.

Sea pen (*Anthoptilum grandiflorum*)

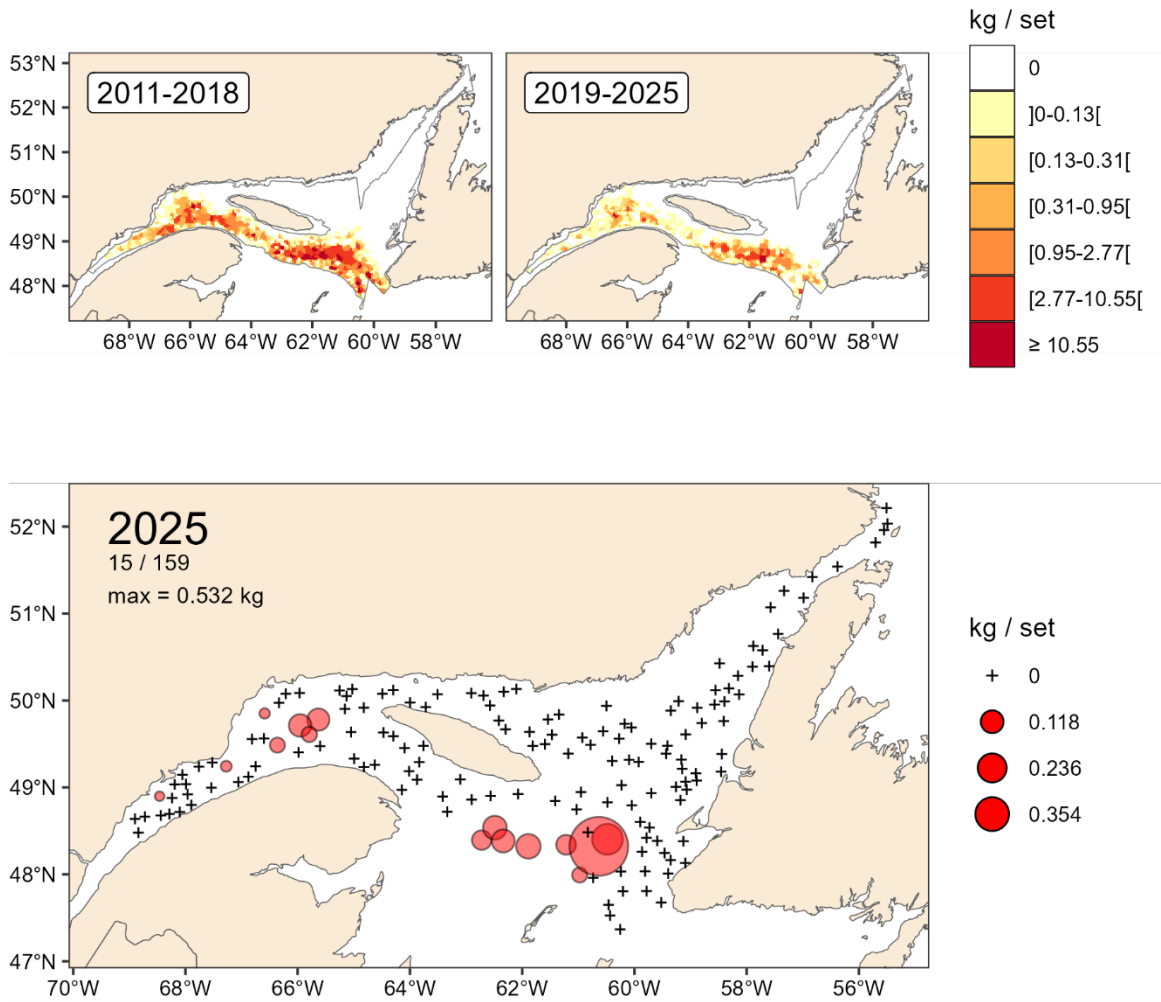


Figure 79. Sea pen (*Anthoptilum grandiflorum*) catch rates (kg/15-minute tow) distribution.

Sea pen (*Balticina finmarchica*)

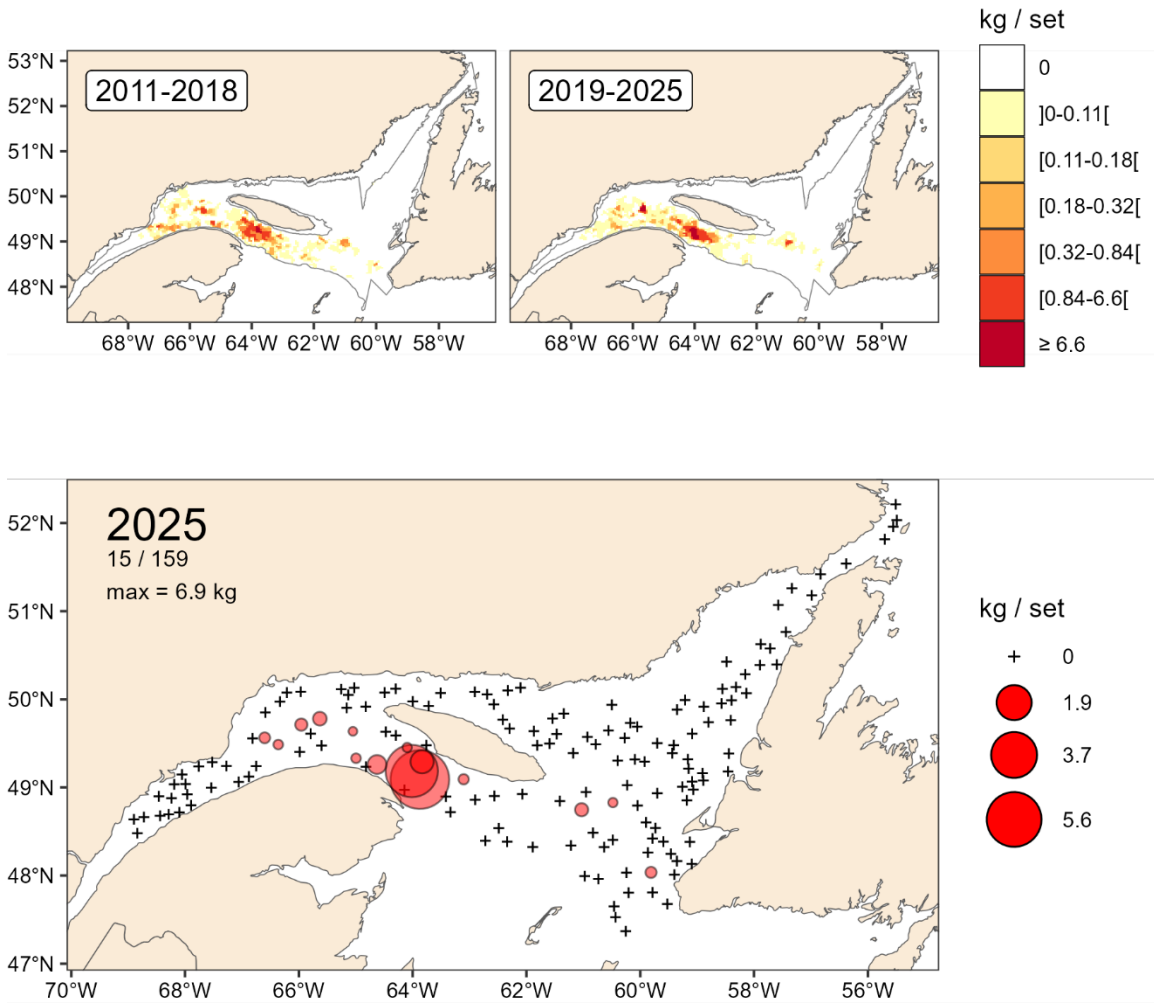


Figure 80. Sea pen (*Balticina finmarchica*) catch rates (kg/15-minute tow) distribution.

Sea pen (*Pennatula aculeata*)

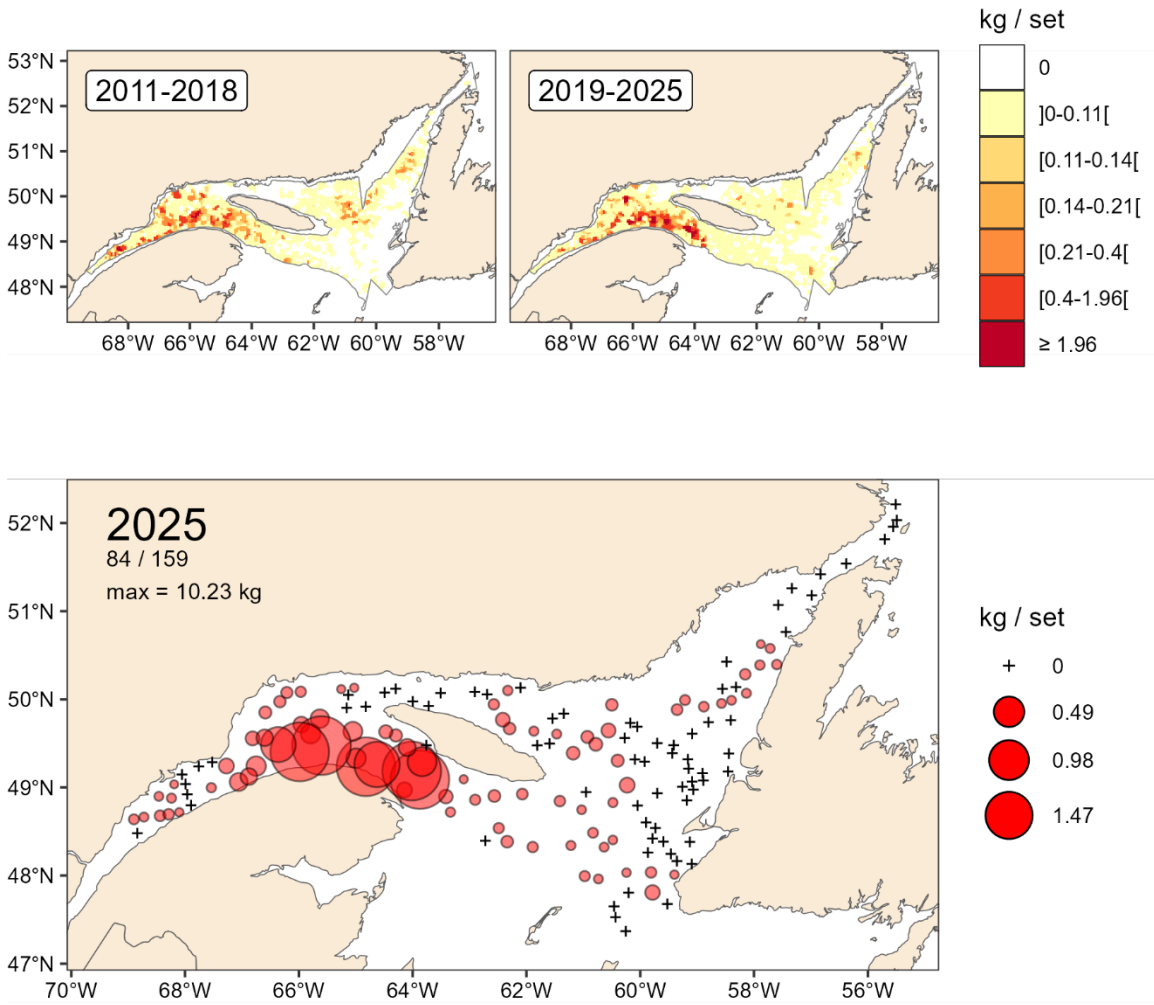


Figure 81. Sea pen (*Pennatula aculeate*) catch rates (kg/15-minute tow) distribution.

Sea pen (*Ptilella grandis*)

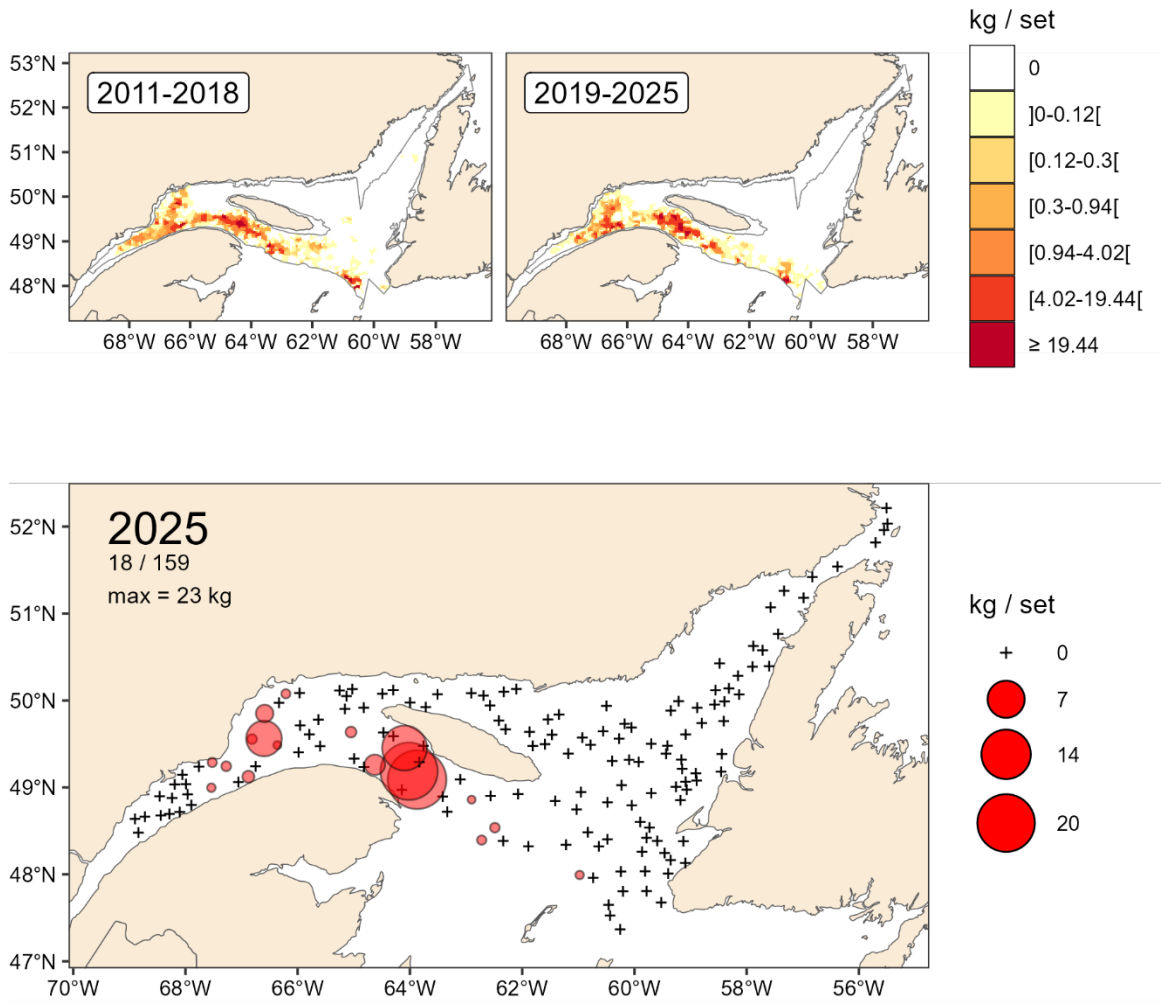


Figure 82. Sea pen (*Ptilella grandis*) catch rates (nb/15-minute tow) distribution. .

Invertebrates

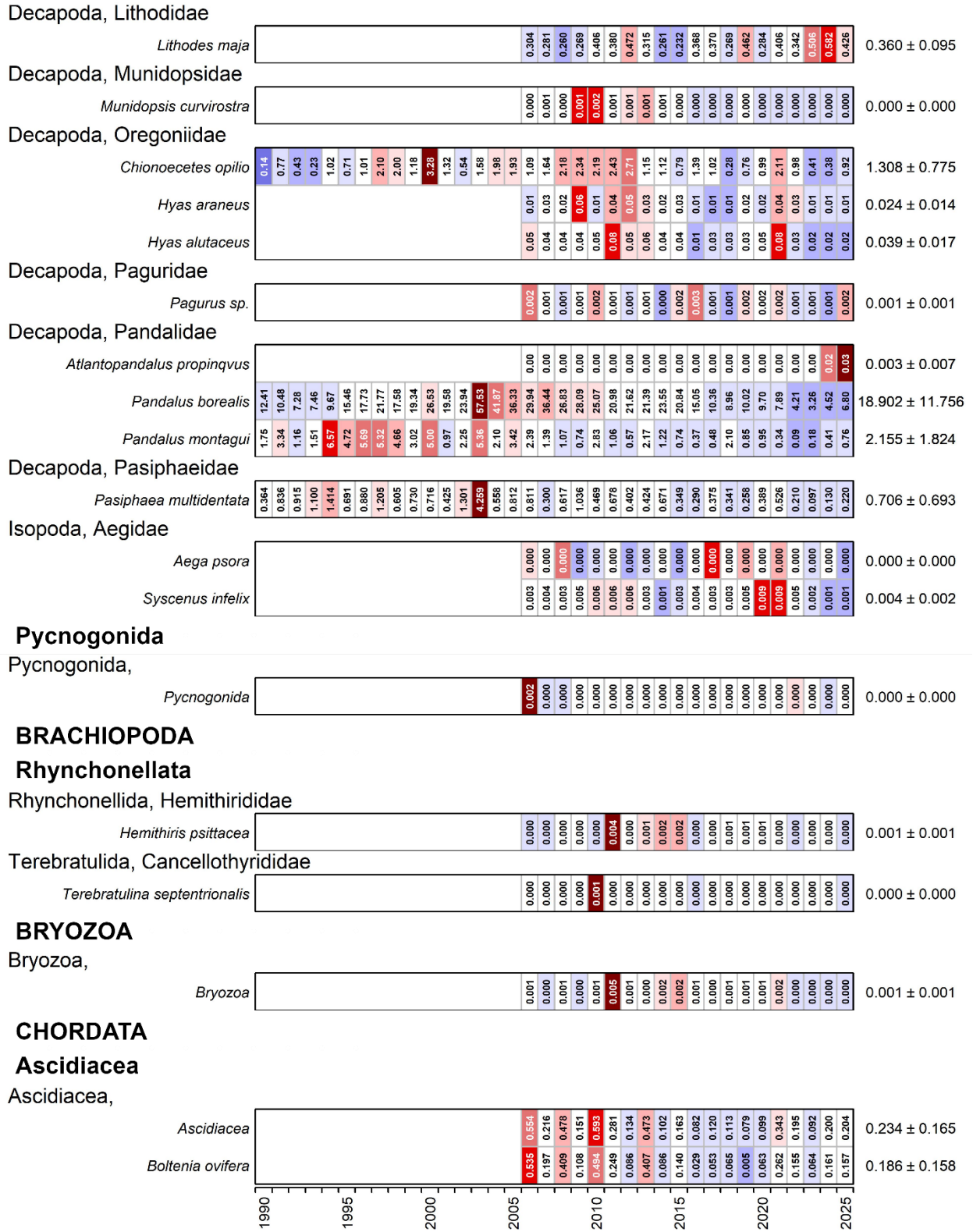


Figure 84. Continued.

Invertebrates

CNIDARIA

Anthozoa

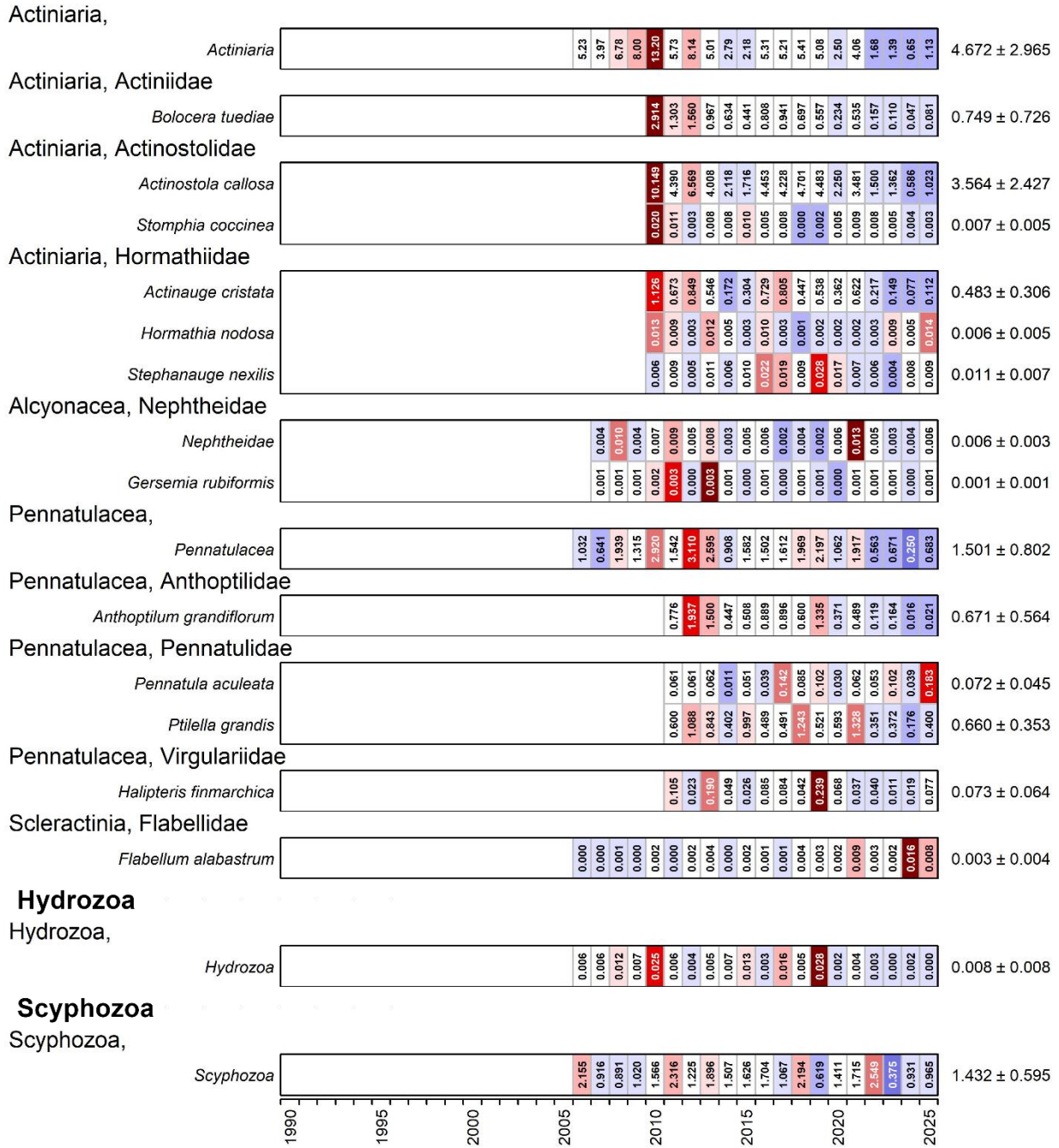


Figure 84. Continued.

Invertebrates

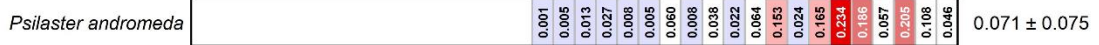
ECHINODERMATA

Asteriidea

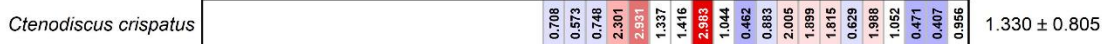
Forcipulatida, Asteriidae



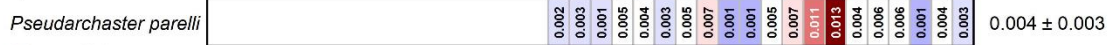
Paxillosida, Astropectinidae



Paxillosida, Ctenodiscidae



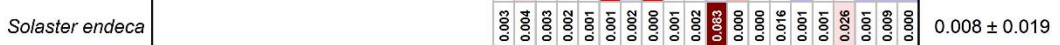
Paxillosida, Pseudarchasteridae



Valvatida, Poraniidae



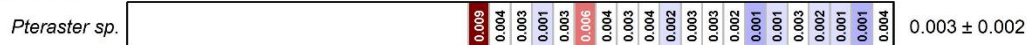
Valvatida, Solasteridae



Valvatida, Goniasteridae



Velatida, Pterasteridae

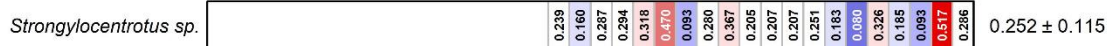


Spinulosida, Echinasteridae



Echinoidea

Echinoidea, Camarodontae

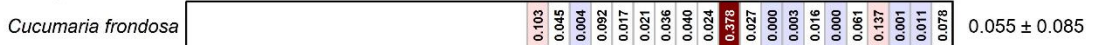


Spatangoida, Schizasteridae

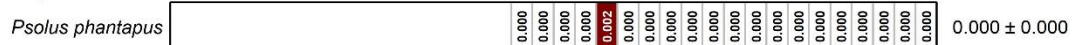


Holothuroidea

Dendrochirotida, Cucumariidae



Dendrochirotida, Psolidae



Ophiuroidea

Euryalida, Gorgonocephalidae

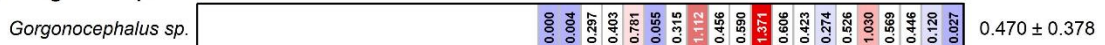
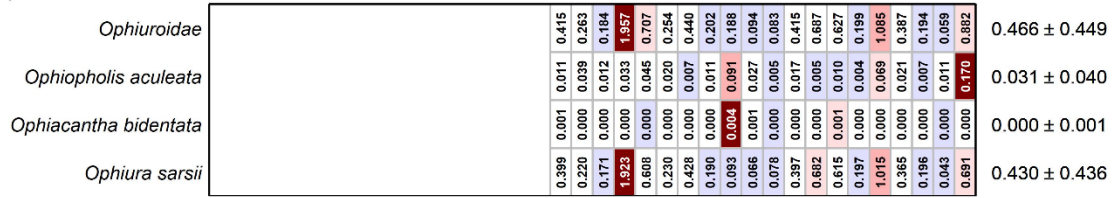


Figure 84. Continued.

Invertebrates

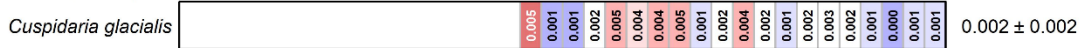
Ophiurida,



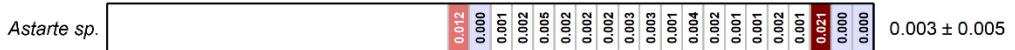
MOLLUSCA

Bivalvia

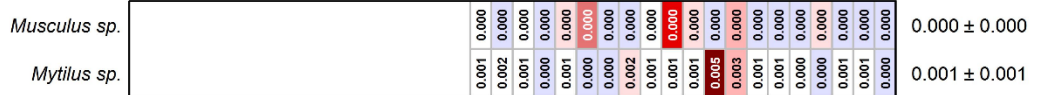
Anomalodesmata, Cuspidariidae



Carditoida, Astartidae



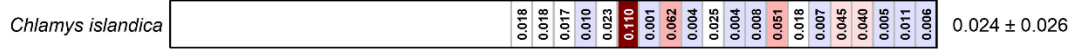
Mytiloidea, Mytilidae



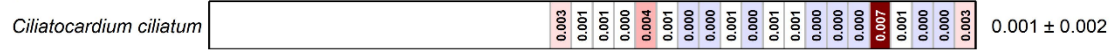
Nuculanoida, Yoldiidae



Pectinoida, Pectinidae



Veneroida, Cardiidae



Cephalopoda

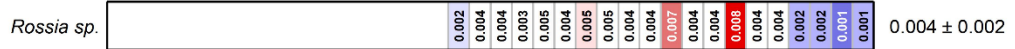
Octopoda, Octopodidae



Oegopsida, Ommastrephidae

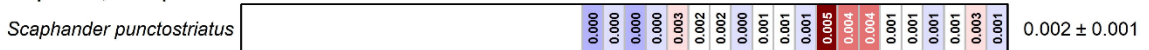


Sepiida, Sepiolidae

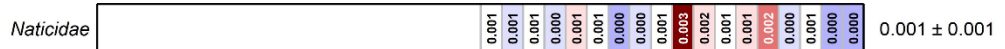


Gastropoda

Cephalaspidea, Scaphandridae



Littorinimorpha, Naticidae



Neogastropoda, Buccinidae

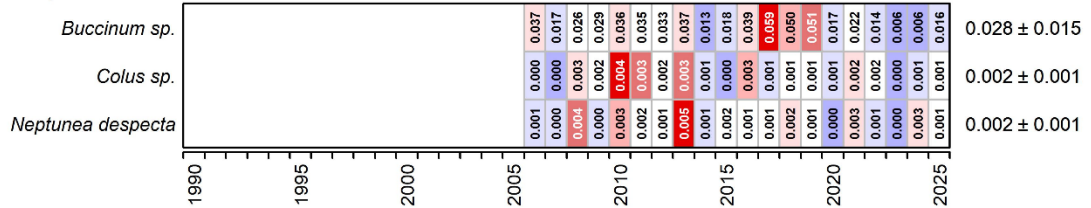


Figure 84. Continued.

Invertebrates

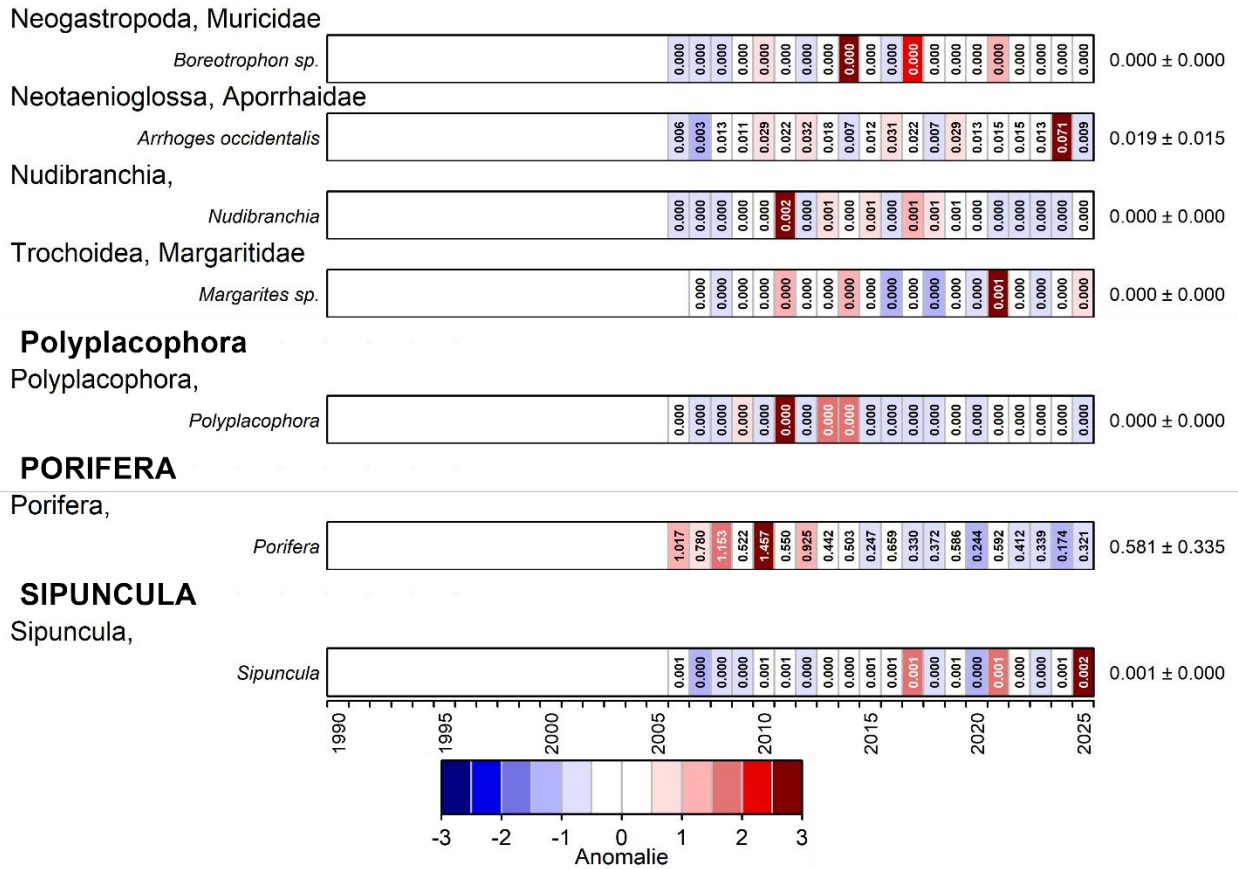


Figure 84. Continued.

Water temperatures in the Gulf

August-September 2025

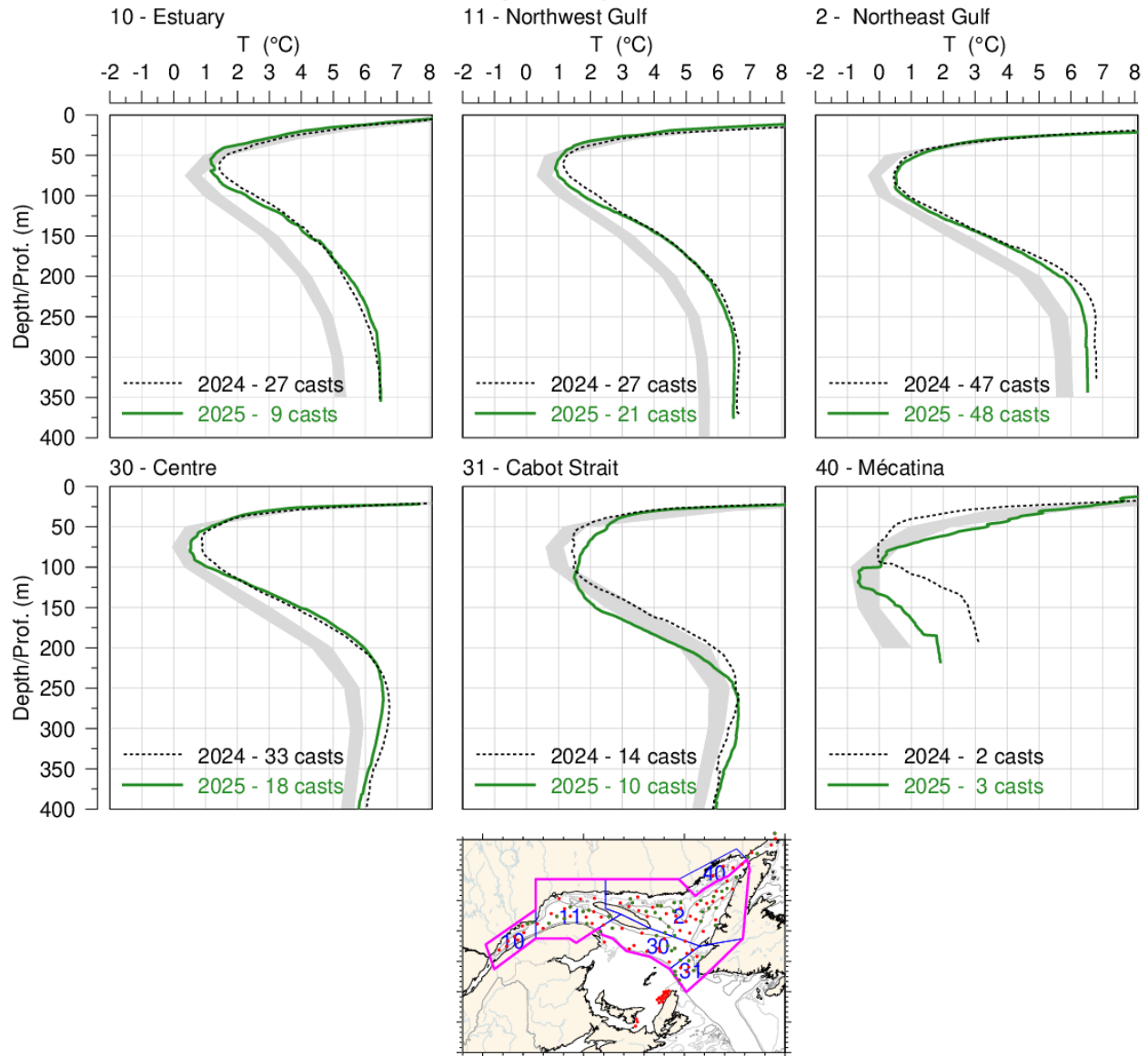


Figure 85. Mean temperature profiles observed in each region of the Gulf during August 2025 obtained from rosette profiles (red dots on the map) as well as from the trawl-mounted instrument when no rosettes were sampled within a 10 nautical mile radius (green dots). The shaded area represents the 1991–2020 climatological monthly mean ± 0.5 SD for August. Mean profiles for August and September 2024 are also shown for comparison. The violet outline on the map shows the area over which sea surface temperature is averaged for Figure 85.

Water temperatures in the Gulf

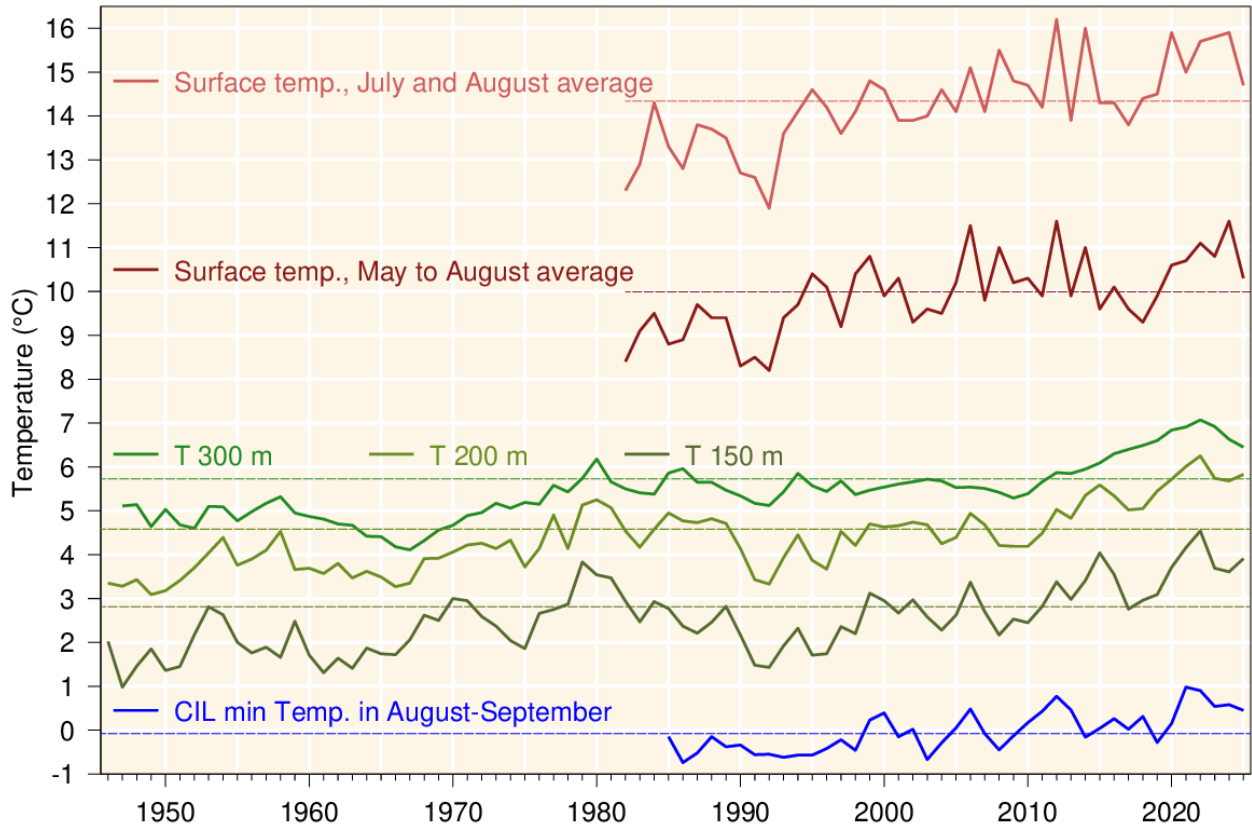


Figure 86. Water temperatures in the Gulf. Sea-surface temperature averaged over the estuary and the northern Gulf (see violet outline on map of Figure 85) for July–August and May–August (1982–2025) (red lines). Layer-averaged temperature for the Gulf of St. Lawrence at 150, 200 and 300 m (green lines). The values for 2025 are preliminary as the data from the PMZA autumn survey have not yet been included. Spatial average of the minimum temperature of the cold intermediate layer in August–September in the estuary and the northern gulf (blue line).

APPENDIX

Appendix 1. Equations of estimators of the mean, variance and confidence intervals for random stratified sampling (Cochran 1977) used for computing annual indices.

$$N = \sum_{h=1}^H N_h$$

$$f_h = \frac{n_h}{N_h}$$

$$W_h = \frac{N_h}{N}$$

$$\bar{y}_h = \frac{\sum_{i=1}^{n_h} y_{hi}}{n_h}$$

$$s_h^2 = \frac{\sum_{i=1}^{n_h} (y_{hi} - \bar{y}_h)^2}{n_h - 1}$$

$$\bar{y} = \sum_{h=1}^H W_h \bar{y}_h$$

$$s_{\bar{y}}^2 = \sum_{h=1}^H \frac{W_h^2 s_h^2 (1 - f_h)}{n_h}$$

Where

H : Total number of strata ($h = 1, 2, \dots, H$)

n_h : Stratum h sample size, that is total number of sampled units

N_h : Stratum h size (here expressed as the number of trawlable units)

N : Survey area size

f_h : Sampling fraction in stratum h

W_h : Weight of stratum h (proportion of survey area in stratum h)

y_{hi} : Observation i of stratum h

\bar{y}_h : Mean of stratum h

s_h^2 : Variance of stratum h

\bar{y} : Annual estimate of the mean

$s_{\bar{y}}^2$: Estimated variance of \bar{y}

With confidence intervals and degrees of freedom given by

$$\bar{y} - t_{(\alpha/2, d)} s_{\bar{y}} < \bar{Y} < \bar{y} + t_{(\alpha/2, d)} s_{\bar{y}} \text{ and}$$

$$d = \left(\sum_{h=1}^H a_h s_h^2 \right) / \left[\sum_{h=1}^H (a_h s_h^2)^2 / (n_h - 1) \right]$$

where $a_h = N_h (N_h - n_h) / n_h$

Appendix 2: Conversion factors between DW and TL for Thorny and Smooth Skates.

In 2024, measurements of total length (TL) and disc width (DW) were taken on individuals of Thorny Skate and Smooth Skate. These data were used to establish conversion factors between these two morphometric variables. TL can be biased because the tip of the tail is sometimes missing in these species. Therefore, DW measurement was prioritized in the 2025 NGSL survey.

Conversion factors were estimated using simple linear regressions. For each species, an initial regression was calculated between TL (mm, dependent variable) and DW (mm, independent variable). A second regression was then performed after excluding observations whose absolute Studentized residual exceeded two. Overdispersion was assessed by visually inspecting residuals versus predicted values. Normality of residuals was evaluated using a quantile-quantile plot generated by the 'qqPlot' function from the car package (Fox and Weisberg 2019). For smooth skate, a log-log regression including a quadratic term was used because the residuals exhibited overdispersion and a non-linear pattern.

In 2024, 914 thorny skates and 286 smooth skates were measured for TL and DW to estimate conversion factors. The first regression identified and subsequently excluded 20 and 6 pairs of outliers for thorny and smooth skates, respectively (Figure A1).

For thorny skate, residuals versus predicted values did not indicate any major pattern, and according to the quantile-quantile plot, the residuals had a symmetric distribution but with slightly longer tails than expected under a normal distribution (Figure A2). The adjusted coefficient of determination for the linear relationship was very high (Adj. $R^2 = 0.992$). For these reasons, the relationship was deemed adequate for predicting missing lengths. The equation used to predict TL (mm) from DW (mm) in 2025 is as follows:

$$TL = 14.814144 + 1.293289 * DW$$

For Smooth Skate, the residuals from the quadratic regression between log-transformed TL and log-transformed DW were considered adequate (Figure A3). The adjusted coefficient of determination for the linear relationship was very high (Adj. $R^2 = 0.997$). The equation used to predict TL (mm) from DW (mm) in 2025 is as follows:

$$LT = \exp(-0,58392875 + 1,51765121 * \log(LD) - 0,05865993 * \log(LD)^2)$$

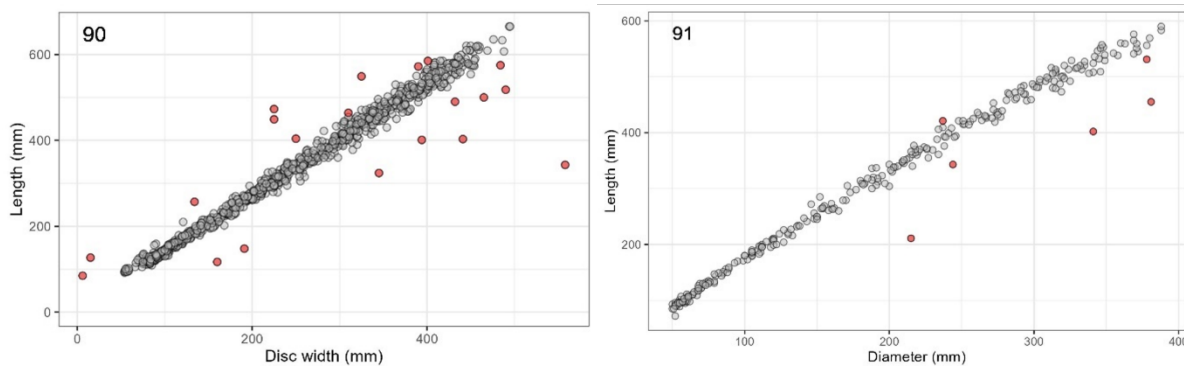


Figure A1. Total length as a function of disc width for Thorny (STRAP code 90, left) and Smooth Skates (STRAP code 91, right). Red points represent pairs of values excluded from the calculation of the conversion factors.

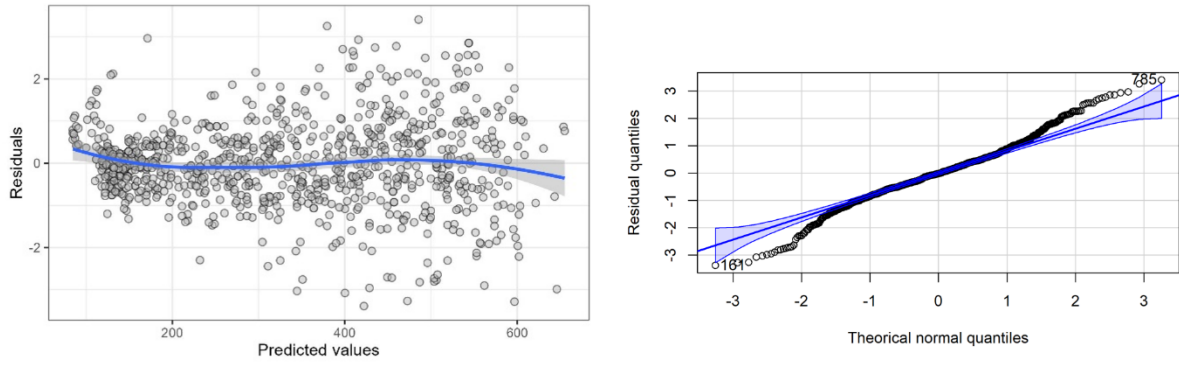


Figure A2. Diagnostics of the linear regression model between DW and TL for Thorny Skate.

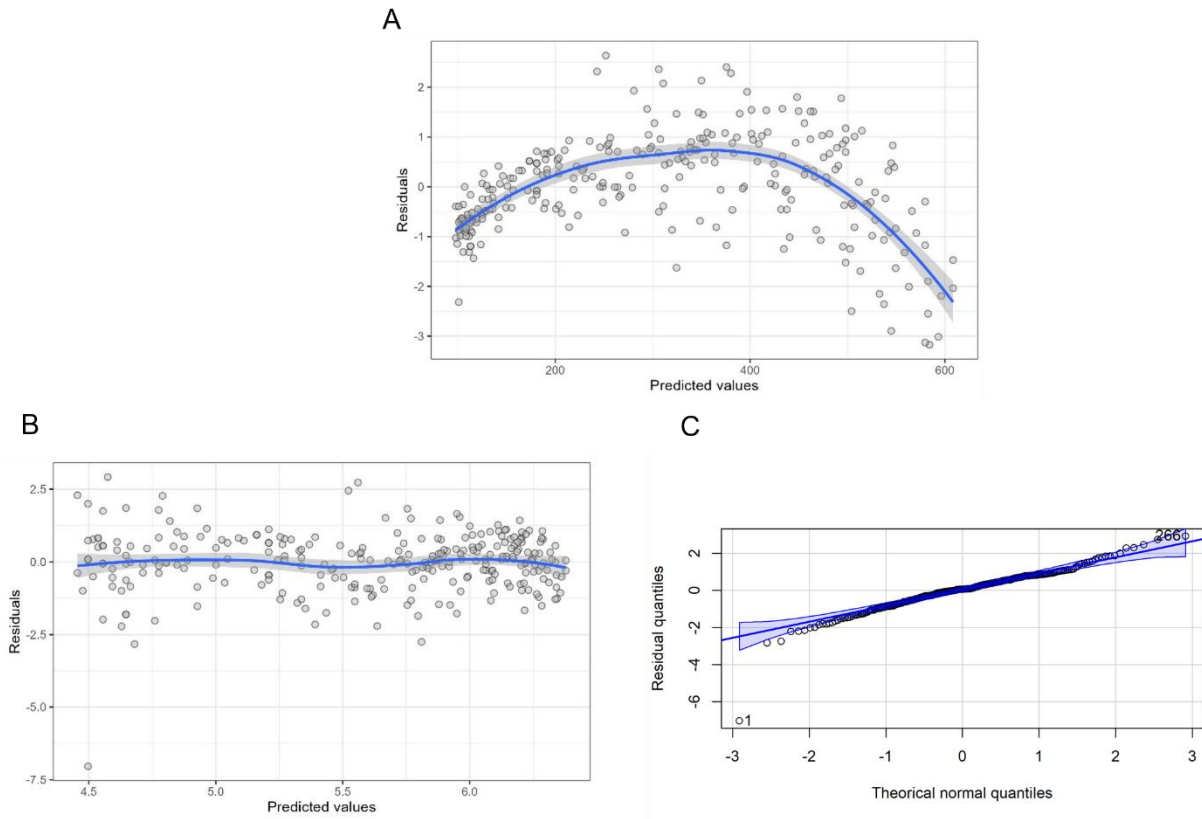


Figure A3. Diagnostics of the simple linear regression model between TL and DW (A) and of the quadratic regression model between log TL and log DW (B and C) for smooth skate.