Report of the Coastal States Working Group on the distribution of Norwegian spring spawning herring in the North-East Atlantic and the Barents Sea

October 2024

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1. Introduction

At the Coastal States meeting on 23-24 October 2019 between the European Union, the Faroe Islands, Iceland, Norway and the Russian Federation, the Norwegian delegation announced of its initiative where the Institute of Marine Research in Norway would lead a participatory process to update the "Report of the Coastal States Working Group on the distribution of Norwegian spring spawning herring in the North-East Atlantic and the Barents Sea" from 2014.

In the following Coastal states meeting in 2020 it was agreed that the report should be updated on an annual basis. The present report builds on the 2023 report with added information from catches in 2023 and surveys in 2023-2024.

In the agreed record from the 2021 consultations, the work of updating the report was formalized by establishing a working group. From the year 2023 onwards, the group should be chaired by a scientist from the party chairing the Coastal State Consultations, which is Norway in 2024.

1.1. Terms of Reference

The text below is copied from the agreed record from the Coastal States consultations in 2020 (item 5) and is regarded as terms of reference for the present working group:

"The delegations welcomed a presentation from The Norwegian Institute of Marine Research on the progress with the participatory process to update the "Report of the Coastal states Working Group on the distribution of Norwegian Spring Spawning Herring in the North East Atlantic and the Barents Sea, Copenhagen 4-7 March 2014" and the overview of methods for calculations of zonal attachment. Furthermore, methodologies to be used for calculations of zonal attachment for this stock were presented. In this regard, the delegations welcomed the fact that Norway intends to continue this work and to convene other scientific meetings with a view to keep the report up-to-date."

1.2. Approach of the present group

The present report relies on standardised information in the form of output from nationally and internationally coordinated surveys with common databases, most of them annually reported to ICES.

For temporal distribution among zones the present report followed a direct observation approach like the 2014 WG. However, for the survey data after 2013, StoX (Johnsen et al., 2019) replaced the software BEAM that is no longer supported. The group was of the general opinion that the former analysis made using BEAM are comparable with StoX. The exercise to compare the few years of surveys data using both BEAM and StoX has only resulted in minor differences, therefore these can be considered as comparable.

Surveys provide snapshots of distribution of biomass/abundance of the different life stages. The former report used the following stages: early larvae, 0-group, juveniles (ages 0-3) and adults (age 4+), by producing maps and, when the data allowed, tables showing proportions by zones. The surveys provide information about biomass or abundance at specific points in time and space, but the integrated nature of their analysis will give distribution maps within the survey period. The present report contains added survey information from surveys in 2023-2024.

Catch distributions are based on a data call addressing each country with official recorded catches from the stock from logbooks and sales slips. This report contains added information from catches in 2023. The information from the landings statistics was compared to catches provided for ICES WGWIDE (ICES, 2024) and Coastal States. Data were requested and reported by year, month, country and zone as tonnes and proportions (Annex 3).

2. Background

2.1. Main characteristics of the migration patterns of the stock

The Norwegian spring-spawning herring (*Clupea harengus*) is one of the stocks composing the Atlanto-Scandian herring, together with two Icelandic herring stocks; the summer-spawners and spring-spawners (Johansen 1919; Dragesund et al., 1980). It is the largest herring stock in the world. It is widely distributed and highly migratory throughout large parts of the NE Atlantic during its lifespan. By far the majority of the adult stock occurs in Divisions 2a,b, 5a,b and 14a,b (Figure 2.1.1). Juveniles of the stock have their nurseries in Division 1a,b. In some years, Norwegian spring spawning herring have been found in adjacent areas mixing with other herring stocks.

The herring spawns along the Norwegian west coast in February-April. Large variations in the north-south distribution of the spawning areas have been observed through the centuries. The larvae drift north and northeast and distribute as 0–group in fjords along the Norwegian coast and in the Barents Sea. The Barents Sea is by far the most important juvenile area for the large year-classes, which form the basis for the large production-potential of the stock. Some year-classes are in addition distributed into the Norwegian Sea basin as 0–group. Most of the young herring leave the Barents Sea as 3 years old and feed in the north-eastern Norwegian Sea for 1–2 years before recruiting to the spawning stock. With maturation, the young herring start joining the adult feeding migration in the Norwegian Sea. The feeding migration starts just after spawning with the maximum feeding intensity and condition increase occurring from late May to July (Homrum et al., 2022). The feeding migration is in general length dependent; the largest and oldest fish perform longer and typically more western migrations than the younger ones. Young fish of productive year-classes emerging from the Barents Sea can migrate to the northeast of the Norwegian Sea for feeding. After the dispersed feeding migration, the herring aggregates through September-October in one or more wintering areas. These areas are unstable and since 1950 the stock has used at least 6 different wintering areas in different periods. During the 1950s and 1960s they were situated east of Iceland and after around 1970 in Norwegian fjords. In 2001–2002 a new wintering area was established off the Norwegian coast between 69º30'N and 72ºN in addition to the fjords. In 2007-2009, however, no herring was observed in the fjords in winter and a new wintering area was located in the ocean off northern Norway. After wintering, the spawning migration starts around mid-January. In the last almost two decades, the herring has partially stayed in the south-western part of the Norwegian Sea for a prolonged time in autumn.

2.1.1. Early life stages

Norwegian spring spawning herring spawns on the Norwegian coastal banks (Figure 2.1.1.1) during February-April (peak spawning in March). The eggs are deposited on the bottom. After hatching, larvae appear in the upper layers of the sea and drift with the current along the slope of the continental shelf. Larvae are gradually spread along the Norwegian coast and later appear in the Barents Sea along the Russian coast and sometimes the Bear Island-Spitsbergen area. While poor year-classes are mainly restricted to fjords in Norway, abundant ones are predominantly found in the Barents Sea. For instance, the portion brought to the Barents Sea of the abundant herring year-classes 1991, 1992 and 1998, comprised 84, 96 and 98 %, respectively, of the total number of these year-classes at the age of 1 year. Corresponding figures for the medium year-classes of 1990, 1993 and 1996 were 29-48 %, and of the poor year-classes 1995-1997 only 4-9 % (Krysov and Røttingen 2011). The young herring remain in the Barents Sea usually 3 years and then migrate westwards into the Norwegian Sea, but sometimes good year classes, as for example 2016, remain in the Barents Sea for 4-5 years.

Migration of the young herring in the Barents Sea varies seasonally. This has been described in detail for the 1983 year-class (Røttingen 1990) (Figure 2.1.1.2).

2.1.2. Adults

A characteristic feature of this herring stock is an extensive and varying migration pattern. The migration may be relatively stable for periods while periods of large changes occur occasionally at varying time intervals. The changes may be observed on the spawning-, feeding- and/or overwintering grounds both in a single or an interrelated manner.

The usual annual clockwise migration route of adult herring feeding in the Norwegian Sea starting in the south after spawning and ending in the northeast at the wintering areas has persisted through the whole period. However, some changes in the distribution and recently the timing of the migration have been observed through this period.

After the recovery of the NSS herring stock, and until about 2002 the bulk of the adult herring wintered in fjords in northern Norway. The 1998 and 1999 year-classes were expected to enter the fjords around 2002 but were instead observed wintering off the coast in the ocean off Vesterålen/Troms, between 69º30'N and 72ºN. This continued in the years to come and in 2005 also the 2002 year-class was observed wintering in the same area. During these years, the amount of older herring wintering in the fjords decreased rapidly and following the winter of 2007 no herring was observed in the fjords. In the last several years wintering herring have been observed in the oceanic areas and fjords in the Troms region.

The main spawning grounds of NSS herring are along the Norwegian coast from Siragrunnen in the south to Vesterålen in the north, with the main activity off Møre (Dragesund et al. 1980). Historically, the utilization of the different spawning grounds has been highly dynamic. In recent years the spawning has taken place further north than usual, such that in 2023 and 2024 almost no herring spawned south of the Lofoten area (see Figure 4.1.1).

After spawning, in March/April the herring migrate westwards into the Norwegian Sea to start feeding and main concentrations are found in the central part of this area. In July, the herring are spread out over a wide area feeding around the fringes of the Norwegian Sea. In the early period from 1995-1999 the main concentrations of feeding herring utilised the central and southern Norwegian Sea, mainly the southern part of the International and the Norwegian zone. From 1999 a north-eastward displacement of the adult stock took place, which lasted until 2005, with almost no herring observed in the central region. In 2006-2016 they were more pronounced in the southern and south-western area. After 2016, the main concentration again shifted to the central and southern Norwegian Sea and the eastern part also. The last couple of years the southern boundary of the feeding distribution of herring in the Norwegian Sea has again shifted a bit further north to around 65 degrees north (see Figure 4.6.1, that shows the distribution of the feeding herring in July-August 2024).

It is not clear what drives the changes in the migration, but the biomass, age structure and production of zooplankton are likely factors, as well as oceanographic features such as sea temperature. A further factor might be the large pelagic stocks of mackerel and blue whiting occupying the same feeding area. Young herring leaving the nursery areas in Barents Sea or coastal waters in Norway and joining the adult stock for feeding is not as capable of extensive feeding migration as older herring. Correspondingly, when rich year-classes have joined the adult stock from the nursery areas in the Barents Sea a more north–easterly distribution has been observed. The stock is currently dominated by the 2016 year-class which was distributed over much of the Norwegian Sea.

2.2. Mixing with other herring stocks and populations

In the Norwegian Sea (2.a, 2.b), all monitored, sampled, and caught herring are assessed and managed as Norwegian spring-spawners. During the spawning season (1 February – 30 April), the distribution area is extended, and herring caught along the Norwegian coast (within the 12 NM) in divisions 4.a, can be recorded as Norwegian spring-spawners clearly split out from other populations in the North Sea based on maturation, age, length and vertebrae counts, in addition to the very specific spatiotemporal use of historic spawning grounds for NSS herring and evidence from tag-recapture data. During feeding migration, the Norwegian spring-spawners have the potential to mix with herring stocks and populations that have been identified based on spawning time and area, or otolith characteristics. In the Norwegian Sea and adjacent waters, they can mix with the Norwegian autumn-spawners (Husebø et al 2005), the Icelandic summer-spawners, the Icelandic spring-spawners (small component, Óskarsson 2018), the Faroese autumn-spawners (Figure 2.2.1), North Sea herring (Bekkevold et al. 2023) and several local herring populations in Norway: in fjords along the coast (Aasen 1952; Lie et al 1978; Jørstad et al 1994; Libungan et al 2015), in semi-enclosed coastal ecosystems (Johannessen et al 2009; Langård et al 2014) and in the brackish Lake Landvik in the south (Eggers et al 2014; Libungan et al 2015). In Iceland, the Norwegian spring-spawners and Icelandic summer-spawners are separated based on maturity stage for management purposes, and in the Faroes they are separated from local autumn-spawners based on otolith structure and maturity stage, also for management purposes (i.e. splitting of catches).

3. Methods

3.1. Zonal database

In the analyses presented in this report, the same database with EEZ coordinates has been used as in the 2014 report (Anon. 2014). The countries provided their information on catches on NSS herring by EEZ, i.e. it was not necessary to use the database to split catches into EEZs. In the report from 2014 zonal information from the database was applied to survey data (Anon. 2014). However, the method used to produce the estimates of the surveys in the present report has changed. A new estimation software StoX (Johnsen et al., 2019) is now available where biomass estimates are produced directly by EEZs. For the records, please note that the shapefile (MarineRegions.org) used in StoX for the EEZs does not include disputed areas where more than one party claim certain rights. With regards to NSS herring this applies to a disputed area along the boundary between the Icelandic and the Faroese EEZs.

The StoX software is used as the estimation procedure in several ICES-coordinated surveys for the assessment of various stocks (e.g. the International Ecosystem Survey in the Nordic Seas – NSSH, the International blue whiting spawning stock survey – blue whiting, and the International Ecosystem Summer Survey in the Nordic Seas – NEA mackerel). This estimation procedure replaced the BEAM software, which produced biomass estimates on 2x2 squares of 1-degree latitude and 2 degree's longitude (instead of exact location). This new method is considered to provide more accurate estimation and thereby being more adequate than the former one. A comparison between the two methods was made on the estimates for two years for all the international surveys and it showed minor differences in most cases. Re-estimating the whole time series back to 1995 is not currently possible because some of the acoustic data are not available in survey databases/repositories (PGNAPES / ICES acoustic database) prior to 2009.

3.2. Surveys

3.2.1. Methods used when calculating abundance/biomass

Larval index

The herring larval abundance index is based on the number of caught larvae per square metre of surface at each station and is calculated with consideration to measured water volume, depth layers and total number of caught larvae. All larvae are included in the index and herring larvae abundance indices are produced. The surveyed area is delimited by a polygon, which is divided into a grid with cell sizes of 14.5 * 8 km. The herring larval density per grid is estimated and summed over the covered area (Stenevik *et al*. 2012).

0-group index

The geographical distribution of 0-group fishes is estimated by the standard procedure which was first recommended in 1980 (Anon. 1980). All vessels use a small mesh mid-water trawl ("Harstadtrål"). The standard procedure consisted of tows at 3 depths, each of 0.5 nautical miles, with the headline of the trawl located at 0, 20 and 40 m. When the 0-group fish layer was recorded on the echo-sounder deeper than 60m or 80m additional tows at 60 and 80m, of 0.5 NM distance also, were carried out. The history of development of 0-group investigation and assessment method is described in detail for example in the survey report from 2007 (e.g. Anon. 2007). The abundance of 0-group herring is measured in numbers and the index is calculated using the StoX software.

Juveniles

Juveniles are defined as immature herring age 1-3. All regions of the Barents Sea and adjacent areas of the Norwegian Sea are covered, with transects 35 nautical miles apart. Data from pelagic trawl hauls and bottom trawl hauls considered representative for the pelagic component of the stocks, which is measured acoustically, are included in the stock abundance calculations. The StoX software is used to make estimates of total biomass and numbers of individuals by age and length in the whole survey area and within different subareas.

Adults

The survey estimates of the adult part of the stock are based on scientific echosounders combined with trawl catches to identify species and size distribution. The StoX software is used to make estimates of total biomass and numbers of individuals by age and length in the whole survey area and within different subareas.

4. Results derived from surveys

A number of national and international research surveys have been conducted over the period 2014-2024 that can provide information about spatial and temporal variation in distribution and quantity of different life stages of Norwegian spring-spawning herring (Table 4.1). Some of the surveys are constrained to only part of the distribution area, while others provide information for the whole stock and/or the whole period from 2014 to 2023/2024. All surveys are snap shots and representative for the distribution during the survey period. Seven survey series are updated since the 2014 WG (only six from 2017) and these surveys, taking place in the first to third quarters of the year, are considered to provide adequate quantitative information about the distribution of the stock, adult or juveniles. Relative estimates on biomass or number of fish for different EEZs were tabulated. No survey information is available for quarter 4. Below is a short description of each of the surveys, their main results with regards to inter-annual variation in the spatial distribution of the stock, and conclusions that can be derived from them as well as their limitations.

Table 4.1. List of relevant surveys targeting Norwegian spring spawning herring. Indication is given of whether and how the measured abundance/biomass is representative for the distribution of the life-stage. Some surveys may have started earlier, but the first year under consideration in this report is 2014 (the former report includes surveys in the period 1995-2013, see Annex 1).

Survey	Month	Life stage	Complete spatial coverage of life-stage	Year range	Representative for distribution of life-stage
1st quarter					
Acoustic survey on the spawning grounds	Feb/ Mar	Adults	Yes	2015-2024	Whole spawning stock covered
2nd quarter					
Larval survey along the Norwegian coast	Mar/ Apr	Larvae	Yes	2014-2016	Whole distribution area of newly hatched larvae covered
International ecosystem survey in the Nordic Seas (IESNS) – Barents Sea	May	Juveniles ages 1-3	Yes	2014-2024	Main distribution area of juveniles covered
International ecosystem survey in the Nordic Seas (IESNS)	May	Adults	Yes	2014-2024	Adult part of stock spatially covered
3rd quarter					
Ecosystem survey in Barents Sea	Aug/Oct	0-group,	Yes	2014-2023	Main area of 0-group covered
	Aug/Oct	Juveniles age 1-3	Yes	2014-2023	Main area of juveniles covered
International Ecosystem Summer Survey in the Nordic Seas (IESSNS)	Jul/ Aug	Adults	Yes	2014-2024	Northern boundary of distribution area not fully reached in all years Main distribution area covered
4th quarter					**No surveys**

1st quarter

4.1. Adults from acoustic survey on the spawning grounds

A Norwegian acoustic survey has been undertaken to estimate the abundance at age of herring in the spawning areas along the Norwegian coast in February and March. The survey has been carried out since 1988 but not in every year. This survey is conducted during a period when the entire spawning stock is distributed along the Norwegian coast to spawn (Figure 4.1.1). Consequently, 100% of the spawning stock is within Norwegian EEZ in this period. No surveys were conducted during 2009 – 2014. In 2015 the survey was re-introduced, and results from 2015 – 2024 are included in this report.

2nd quarter

4.2. Larvae survey

A Norwegian herring larvae survey was carried out on the Norwegian shelf 1981 – 2016 during March-April. The objectives of the survey were to map the distribution of herring larvae and other fish larvae on the Norwegian shelf and to collect data on hydrography, nutrients, chlorophyll and zooplankton. In 2015 the distribution area was not fully covered due to bad weather conditions. The survey is considered to cover the entire distribution area of newly hatched larvae (Figure 4.2.1). There have been no surveys after 2016.

4.3. Juveniles in Barents Sea from the International ecosystem survey in the Nordic Seas (IESNS)

A part of the international ecosystem survey in the Nordic Seas in May (section 4.6), is focusing on juvenile herring, zooplankton and hydrography in the Barents Sea. The survey is conducted by a Russian vessel and has been carried out in most years since 1995. There was no survey in 2020, 2022 or 2023. Results from 2014 – 2024 are included in this report. The distribution maps are presented in Figure 4.3.1 and percentages by zone in Table 4.3.1. Average percentage distribution (2014 – 2021 and 2024) is: Russia 58.2%, Norway 41.8%.

4.4. Adults from the International ecosystem survey in the Nordic Seas (IESNS)

The international ecosystem survey in the Nordic Seas is aimed at observing the pelagic ecosystem, focusing on herring, blue whiting, zooplankton and hydrography. The survey, carried out in late April and May since 1995, is coordinated by ICES survey planning groups (PGNAPES and currently WGIPS) and is a cooperative effort by Faroes, Iceland, Norway, Russia, and since 1998 the EU (Denmark, Germany, Ireland, The Netherlands, Sweden and UK). Since 2022 the UK has also participated. A good internal consistency among years for age groups 4+ and expert judgment on the whole time-series point out that the survey covers the adult part of the stock adequately each year. Biomass estimates based on the acoustic and trawl samples for the years 2014-2024, shown in Figure 4.4.1 and Table 4.4.1, are therefore considered to be representative for the relative distribution of the adult part of the stock during that month of the year**.**

The average percentage distribution by zones for the whole period 2014 – 2024 give the following (Table 4.4.1): Norway 28.5%, International zone 19.8%, Faroes 21.0%, Iceland 23.6%, Jan Mayen 4.5%, and EU/UK 2.6%.

3rd quarter

4.5. 0-group and juveniles from ecosystem survey in Barents Sea

The survey consists of a trawl survey catching 0–group herring amongst other species and an acoustic survey estimating 1–3-year-old herring. It is difficult to assess the abundance during autumn, for various reasons. The age groups 1 to 3 are found mixed with 0–group herring and are difficult to catch in the sampling trawl used in this survey. The stock size estimates of herring are therefore considered less reliable than those for capelin and polar cod. The survey, however, is assumed to cover the main distribution area of 0-group herring even though it is known that they are found to a lesser extent in Norwegian fjords. In some years there is no coverage in the Russian EEZ. Distribution maps of the 0-group are presented in Figure 4.5.1. The results from this survey, tabulated for the years 2014-2023 for 0-group, shows an average distribution of 49.7% in Norwegian EEZ and 3.8% in Russian EEZ, 38.4% in the Fishery protection zone around Svalbard, and 9.3% in international waters (Table 4.5.1).

For the juveniles, the survey coverage was considered adequate in 2023, and results are presented in Figure 4.5.2. According to Table 4.5.2 an average distribution of the juveniles is 62.0% in Norwegian EEZ, 37.0% in Russian EEZ.

4.6. Adults from the International ecosystem summer survey in Nordic Sea (IESSNS)

This ecosystem survey was initiated in 2004 by Norway and has since been gradually expanded in geographical coverage, especially from 2009 and onwards with participation of vessels from Iceland and the Faroes in addition to two vessels from Norway and in the most recent years Greenlandic and Danish vessels. The main objective of the survey is to study abundance and distribution of Northeast Atlantic mackerel, NSSH, blue whiting and other pelagic species with acoustic and swept-area methods in relation to oceanographic conditions, prey communities and marine mammals. Acoustic estimates of herring are available from the 2014 – 2024 surveys (Figure 4.6.1 and Table 4.6.1). According to Table 4.6.1 the biomass, on average, during July/August (2014-2024) is distributed in the EEZ of Iceland 35.5%, Faroe Island 19.9%, Norway 17.4%, Jan Mayen 10.0%, the International waters in the Norwegian Sea 9.0%, Svalbard 6.2%, EU/UK 1.9% and Greenland 0.2%.

4th quarter

No new survey information is available for 4th quarter.

5. Results derived from catches

5.1. Overview of submitted data

To update the distribution maps of the catches for 2023, a request was formulated on catch data by year, month and ICES statistical square (0.5° latitude, 1° longitude) and by economic zone (EEZ) to the nations fishing for Norwegian spring-spawning herring. The deadline for submission of the catch data was set to 1st June 2024. All countries/parties delivered their catch data in time to be included in the report. The level of detail of the catch data was in line with the request.

The total catch in the years 1995-2023 and the relative catch by zones is shown in Figure 5.1.1. In Table 5.1.1 the catches reported to the Working Group are compared with the catches reported to WGWIDE and catches delivered by Coastal States for each year in 2013-2023 (ICES 2024). Catches reported to the Working Group as percentage of catches reported to WGWIDE by year varies from 97.38 % to 101.7 % (Table 5.1.1). Obviously, the difference can partly be explained with the fact that the catch data were raised in the WGWIDE report to account for changes in the percentages of water content. The proportion is 99.61 % for the whole period. There are however differences in catches reported by Coastal States with other data sources.

All catch data submitted had the requested resolution, i.e. catches reported by year, month, zone and ICES rectangle.

5.2. Description of Fishery

The fishery today is carried out mainly in the beginning of the year and in the autumn. It is mainly by large purse seiners and pelagic trawlers, but also to a smaller degree as a coastal fishery. The catches are used for human consumption and reduction purposes to fish meal and fish oil.

The fishery is regulated and carried out by the Coastal States. The TAC is set by the Coastal States and derived from an agreed long-term management plan (ICES 2018). However, after 2013 no agreement on the sharing of the stock has been reached by the coastal states and thus the catches have been larger than recommended by ICES. The Coastal States have agreed on the TAC, but not the sharing arrangements.

In 2013-2023 the fishing pattern corresponds to the general seasonal distribution of the herring in the Norwegian Sea as the year progresses. The fishery focuses on wintering, pre-spawning, spawning and feeding fish. The fishing activity starts in January on the Norwegian shelf. The fishery in spring and early summer is nearly non-existing. The fishing effort then shifts south-west to Icelandic and Faroese waters in early autumn and expands north-east to International waters and Norwegian zone in late autumn.

In the earlier period until 2010, the traditional fishing activities followed the stock in a north-eastern direction in autumn to the eastern part of the Norwegian Sea. However, in the last decade the fishing activity have been significant also in the southern Norwegian Sea, in international (<68°N), Icelandic and Faroese EEZs in this time of the year. Fishing activities by zones in 2013-2023 is shown in Table 5.2.1 and Table 5.2.2.

The NSSH changed wintering areas from the fjords to more offshore waters off northern Norway during the years 2002-2006. The change in wintering pattern caused a large change in fishing pattern as well. More catches were taken during the spawning migration and at spawning time instead of during the wintering period. These changes applied mostly to the Norwegian fleet. In recent years, part of the herring has been wintering in the fjords of northern Norway again.

Typically, catches in the purse seine and pelagic trawl fishery consist of only herring with limited by-catches. However, due to the changes in the distribution of mackerel in the late 2000s, by-catches of mackerel did increasingly occur on the traditional herring fishing grounds but seem to have decreased again the last decade.

Due to limitations, which are inherent in catch data, e.g. regulation effects, national agreements on zonal access, distance from homeport, area misreporting, technical changes, changes in fishing methods etc., the fisheries do not necessarily depict the distribution of herring in the Norwegian Sea. However, fisheries do show presence of herring while no fishery cannot per se be concluded as absence of herring.

5.3. Seasonal and interannual patterns

Changes have been observed in the fishery through the years since the NSS herring reappeared in the feeding areas in the Norwegian Sea in the mid-1990s. The limitations mentioned in section 5.2 also apply to the seasonal changes in the herring fisheries and therefore the following description. The following description is therefore restricted to general remarks on distribution of the fisheries.

The changes observed in the seasonal pattern since the fishery began in the mid-1990s is depicted in Figure 5.3.1 showing the percentage distribution of the fishery by month for each year since 1995, and in Annex 2 where maps of the fishery per month and per year is shown. From this, four main periods stand out in the seasonal fishing patterns: an early period 1995-1997, a mid-period from 1998-2005, a late period (2006-2012) and a recent period (2013-2023, Figure 5.3.1).

In the early period, up to 1998, the main fisheries were in the spawning area (Norwegian EEZ) in January-March with a peak in February, then a fishery in the Norwegian Sea (ICES Divisions 5.a, 5.b and 2.a) developed with a peak in May, followed by a fishery in the north-eastern areas from September to November (Figure 5.3.1).

In the mid period 1998-2005 the spawning fishery was the same, but the peak in the summer fishery changed from May to June while the autumn fishery continued as usual (Figure 5.3.1). However, the effort shifted with less effort in the summer period to an increase in the autumn fishery. A further change during this period was that the summer fishery had shifted further north into the Jan Mayen, International and Norwegian areas (Figure Annex 2). This northern movement of the feeding stock during the 1998-2005 could be driven by a combination of increased temperature and reduced zooplankton abundance in the Atlantic water masses further south (Eliasen et al., 2021).

In the period after 2005 the summer feeding areas again shifted southwest as was the case in the early period. The fishery, however, did not follow the previous pattern as the May and June fishery has almost disappeared, instead the late autumn and winter fishery dominated (Figure 5.3.1).

The recent fishing pattern is now concentrated in January targeting pre-spawning fish with practically no catches in March. The summer fishery has ceased and the only nations fishing in late summer are the Icelandic and Faroese fleets. In the total picture these quantities are small. The level of the autumn fishery has increased in recent years with a peak in October - November amounting to around 60% of the total annual catches (Figure 5.3.1). This fishery has for some years been mainly in the central Norwegian Sea, north of the Faroes and east of Iceland, whereas before 2015 it used to be stretched out towards the coast of Norway and north towards the Bear Island. Since 2019, however, there was also a fishery on the 2016 year-class off northern Norway during autumn. Changes in migration have also resulted in late arrival at the Norwegian coast for part of the stock (mostly older fish) during the winter in recent years.

There are several possible explanations for these observed changes in the summer fishery for Norwegian spring spawning herring. The distribution of herring has changed throughout the summer months over the years, and thus e.g. accessibility to the fleets may have also changed. The quality and fat content increases throughout the summer season, which may delay the fishery to increase profit. Stock size and consequently quota sizes may also affect where and when the catches are taken. Finally, the quota and fishing opportunities for other pelagic species (blue whiting and mackerel) are also likely to influence the focus put on the herring fishery.

The usual clockwise migration route of adult herring feeding in the Norwegian Sea, starting in the south after spawning, migrating westwards through the Faroese area and moving further north-westwards into Icelandic area in summer, and further north into the Jan Mayen area later in the summer, and ending in the northeast at the wintering areas seem to have stopped in the last decade. Now part of the adult herring seems to prolong their feeding period into the autumn months in the southern and southwestern areas, and the return migration to the wintering areas off northern Norway seems to start in the southern/central Norwegian Sea rather late in the season (October/November) or even later in the year. However, as a fishery was going on in the northern area during autumn at the same time as in the southern area, this indicates that it is not the entire stock that delays the northward migration. This pattern can be seen in the fishery by month from 1995-2023 (Figure Annex 2).

6. Discussion and conclusions

In this report data are presented from 2013-2024, which illustrate the distribution, and changes in distribution, of NSS herring. Annex 1 and Annex 2 includes tables from the previous report (1995-2013) for comparison. The main source of information is surveys. The surveys provide information about the general seasonal migration pattern and distribution of NSSH. Survey information is not available for all months, and some of the survey-series have been terminated**.** For example, there are no surveys covering the adult part of the population in the fourth quarter of the year during the period 2014-2024. The lack of systematic information throughout the year prevents a full assessment of the zonal distribution for all life stages, without making assumptions based on other data than survey data. For adults, survey information is available for February and the summer months (May and July-August), but no survey information was available to the working group for April, when the herring start the feeding migration, and September – December, when the herring is finishing the feeding season and returning to the wintering areas. For larvae and 0-group herring survey information is available in April and August/September, and for juveniles in May and August/September.

There are limitations in using catch-data to describe the seasonal distribution of herring. The most obvious one is that the catch data show presence of herring while absence needs to be based on

judgement. Other limitations include fishery regulation effects, changes in fleet behaviour, national agreements on zonal access and area misreporting. One example of regulation effects is, that there has been no directed fishery in the Barents Sea since 1987 to protect juveniles. However, taking these limitations into account the catch data can be used to some extent to describe the distribution of NSS herring, as a supplement to survey data.

By combining the information from the surveys and the catches, some general conclusions can be made for the adult part of the stock and partly for juveniles, but a full assessment of a zonal distribution is not possible.

Information about the distribution of larvae, 0-group and juvenile stem from surveys only.

Larvae are distributed along the Norwegian coast in spring and drift mainly into the Barents Sea. That is, they are within the EEZ of Norway (larvae survey until 2016).

0-group herring were distributed in the Barents Sea in August in 2014-2023. There was some variability between years, but most being within the Norwegian zone. The rest is, in most years, distributed in the Russian zone, but also in the Fishery protection zone around Svalbard.

Juveniles were primarily distributed in the Barents Sea. In the years 2014-2024 information about the distribution in May comes from the IESNS surveys (the area was not surveyed in 2020, 2022 and 2023) and only the eastern part of the Barents Sea was covered in 2024. According to these surveys most of the biomass was within the EEZs of Russia and Norway. Joint Russian and Norwegian surveys have taken place in August/September in the years 2014-2023 and also in these surveys most of the juveniles were within the EEZs of Russia and Norway.

For the adults in quarter 1, the main sources of information are from surveys on the spawning grounds in 2015-2024. According to this information the distribution of the adult part of the stock is limited to the eastern part of the Norwegian Sea and the Norwegian fjords, that is predominately within the Norwegian EEZ. Since around 2021, the spawning has been taken place progressively more at the northern spawning grounds with almost no spawning in 2024 on the main grounds in the south. In 2018, 2021 and 2022, catches indicated some herring in the International waters in quarter 1 (in January and February). No survey was conducted in 2014.

In quarter 2, the adult stock migrates from the spawning grounds to the feeding grounds. The IESNS survey in the years 2014-2024 shows some inter-annual variability in the distribution but no apparent trend. The biomass has been mostly distributed in four zones, namely, EEZs of Norway, Iceland, Faroes and International waters in the Norwegian Sea. The large 2016 year class had a more northeasterly distribution than older herring when recruiting to the spawning stock (~2019-2021) but has shown a similar pattern since then, although the distribution of the whole stock has been more northerly in the west the last three years.

Quarter 3 covers the latter half of the feeding season and the period when the stock starts to migrate back to the overwintering grounds. The results from the IESSNS survey in 2014-2024, are considered to be representative for the relative distribution of the adult part of the stock during July/August. The survey shows that herring is distributed mostly in the southwestern part of the Norwegian Sea in July/August, predominately in the EEZs of Iceland, Faroes and Norway. However in 2021 and 2022 a significant proportion was observed in the Jan Mayen area and further north into Svalbard waters in 2023. In 2024 highest proportions were in the Jan Mayen area and in international waters.

In quarter 4 there is no survey information for the period 2014-2024. However, data from the fishery indicate that the herring is widely distributed in several EEZs, at least during October and November. Moreover, the fisheries in the traditional feeding areas in the south-western part of the Norwegian Sea in quarters 3 and 4 have extended further into the autumn months, indicating that herring has been staying longer in this region compared to previous years. The reasons for the prolonged stay in the south-western regions of the feeding area in recent years are most likely linked to extended feeding opportunities into the autumn months; since around 2005 herring put on a large proportion of the weight gain after July and the autumn body condition is generally good (Homrum et al., 2022).

The working group has collated available data from surveys in the period 2014-2024 and analysed distribution of NSS herring based on these surveys. Catch data from 2013 to 2023 have been collated as well and they supplement the survey data. The working group believes that the current report gives a relevant picture of the distribution – and changes in distribution – of NSS herring in the Northeast Atlantic in the period considered.

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8. Tables

Table 4.3.1. Percentages of NSSH by EEZ based on juveniles in Barents Sea during the International ecosystem survey in the Nordic Seas (IESNS) in May/June. No surveys conducted in 2020, 2022 and 2024.

Year	cruise	Norway	Russia	Svalbard	Total
2014		38.8	61.2	0.0	100.0
2015		51.1	48.9	0.0	100.0
2016		93.1	6.9	0.0	100.0
2017		26.3	73.7	0.0	100.0
2018		32.7	67.3	0.0	100.0
2019		30.8	69.2	0.0	100.0
2020					
2021		60.5	39.5	0.0	100.0
2022					
2023					
2024*		1.3	98.7	0.0	100.0

*Minimal coverage of the Norwegian EEZ

Table 4.4.1. Percentages of NSSH by EEZ based on adults during the International ecosystem survey in the Nordic Seas (IESNS) in May/June. *Change from EU to UK EEZ from 2021.

Year	EU/UK	Norway	Iceland	Svalbard	JanMayen	Faroes	InterNorwSea	Total
2014	2.9	21.8	14.0	0.0	0.8	31.0	29.6	100.0
2015	3.0	43.8	15.8	0.0	0.7	17.8	19.0	100.0
2016	9.5	23.7	16.7	0.0	3.6	27.3	19.2	100.0
2017	0.2	25.4	42.7	0.0	2.5	17.7	11.5	100.0
2018	2.3	14.3	30.3	0.0	5.8	28.5	18.8	100.0
2019	2.1	23.0	24.7	0.0	2.7	32.6	15.0	100.0
2020	1.5	43.9	21.4	0.0	0.1	27.8	5.2	100.0
2021	3.3	29.0	27.7	0.0	0.3	27.7	12.1	100.0
2022	1.0	40.2	20.4	0.0	5.1	9.4	23.9	100.0
2023	1.2	2.9	29.2	0.0	26.7	6.0	34.0	100.0
2024	2.1	45.2	16.3	0.0	1.3	5.7	29.3	100.0

Table 4.5.1. Percentages of NSSH by EEZ based on 0-group herring during the ecosystem survey in the Barents Sea in autumn for the years 2014-2023. In some years the Russian EEZ was not covered, and this is indicated by "-" in the table. Survey results from 2024 was not ready in time to be included in the report.

Year	Norway	Russia	Svalbard	International	Total
2014	72.0	0.4	20.6	7.0	100
2015	18.9	0.1	80.9	0.1	100
2016	18.5	5.9	33.8	41.8	100
2017	56.8	8.2	8.1	26.9	100
2018	38.9	-	60.3	0.8	100
2019	91.2	3.3	5.4	0.0	100
2020	86.1	-	13.5	0.4	100
2021	83.8	8.0	7.8	0.4	100
2022	17.7	-	77.9	4.4	100
2023	12.9	0.6	75.7	10.8	100

Table 4.5.2. Percentages of NSSH by EEZ based on juvenile herring during the ecosystem survey in the Barents Sea in autumn for the years 2014-2023. Survey results from 2024 was not ready in time to be included in the report.

Year	Norway	Svalbard	InterBarSea	InterNorwSea	Russia	SpecialAreaBar	Total
2014	8.9	0.0	0.7	0.0	90.4	0.0	100.0
2015	67.5	0.0	0.0	0.0	32.5	0.0	100.0
2016	48.6	0.0	0.0	0.0	51.4	0.0	100.0
2017	44.6	0.0	0.7	0.0	54.7	0.0	100.0
2018	70.7	0.4	0.0	0.0	28.9	0.0	100.0
2019	73.2	0.0	0.0	0.0	26.8	0.0	100.0
2020	83.9	0.0	0.0	0.0	16.1	0.0	100.0
2021	100.0	0.0	0.0	0.0	0.0	0.0	100.0
2022	99.3	0.0	0.3	0.0	0.4	0.0	100.0
2023	22.8	4.1	3.9	0.0	69.1	0.0	100.0

Table 4.6.1. Percentages of NSSH by EEZ based on adults during the International ecosystem summer survey in the Nordic Seas (IESSNS) in July/August. *Change from EU to UK EEZ from 2021.

Year	EU/UK	Norway	Iceland	Svalbard	JanMayen	Greenland	Faeroes	nterNorwSe:	Russia	Total
2014	2.4	3.7	61.8	0.1	8.3	0.0	23.0	0.8	0.0	100.0
2015	0.6	13.4	29.7	0.0	4.7	0.0	47.8	3.7	0.0	100.0
2016	0.1	5.6	66.5	0.0	1.6	0.3	25.6	0.2	0.0	100.0
2017	0.4	24.3	43.7	0.0	0.5	1.1	29.8	0.3	0.0	100.0
2018	6.6	20.6	52.7	0.7	0.4	0.0	18.7	0.3	0.0	100.0
2019	5.3	18.4	39.9	6.2	0.3	0.0	24.8	5.2	0.0	100.0
2020	0.2	26.8	27.5	19.3	2.2	0.0	15.2	8.8	0.0	100.0
2021	3.0	34.3	15.4	3.5	23.4	0.1	2.7	17.7	0.0	100.0
2022	1.2	14.6	14.5	9.2	18.5	0.4	20.6	21.0	0.0	100.0
2023	1.1	20.4	24.1	27.8	6.9	0.2	3.9	15.6	0.0	100.0
2024	0.0	9.5	14.6	1.2	42.9	0.0	6.9	25.0	0.0	100.0

Table 5.1.1. Norwegian spring spawning herring. Comparison (%) of catches reported to the Coastal States Working group (Data 2024) and ICES WGWIDE (ICES. 2024). Coastal States WG catches are also shown (not available yet for 2023), which represent official catches, whereas WGWIDE catches are provided by scientists.

Year	Data 2024	WGWIDE2024	Comparison	Coastal State Data
2013	684,776	684,743	100.00%	687,732
2014	449,199	461,306	97.38%	445,404
2015	320,128	328,740	97.38%	324,995
2016	384,697	383,174	100.40%	384,492
2017	720,081	721,566	99.79%	719,104
2018	594,367	592,899	100.25%	591,401
2019	773,565	777,165	99.54%	774,491
2020	720,796	720,937	99.98%	719,100
2021	848,099	851,813	99.56%	848,836
2022	827,686	813,834	101.70%	835,848
2023	678,583	680,552	99.71%	
Total	**7,001,977**	**7,016,729**	**99.61%**	**6,331,403**

Table 5.2.1. Catches (tonnes) of Norwegian spring spawning herring by zones for each year 2013-2023. Change from EU to UK EEZ from 2021.

Year	EU	Faroes	Greenland	Iceland	JanMayen	NEAFC	Norway	Russia	Svalbard	UK	Total
2013	0	118 526	2 221	60 373	16 602	73 626	375 887	15	37 525	1	684776
2014	0	38 919	11 015	45 418	5 008	31 901	289 665	0	26 961	312	449199
2015	210	41 893	10 026	39 472	656	20 757	202 007	0	4 735	372	320128
2016	109	59 456	16 262	48 624	1	46 649	213 293	0	0	302	384697
2017	0	100 113	9 564	56 577	0	281 186	272 639	0	0	0	720081
2018	0	64 363	329	46 013	0	164 886	318 676	0	0	100	594367
2019	0	48 655	0	115 238	0	281 458	328 211	1	0	1	773565
2020	2	31 780	3	171 390	0	100 912	416 680	0	0	28	720796
2021	0	60 320	0	164 425	6	30 338	592 911	1	0	97	848099
2022	0	26 153	1	164 258	29	91 616	545 615	0	13	1	827686
2023	0	32 366	1	144 382	15	48 386	453 420	1	11	2	678583

Table 5.2.2. Catches (percentages) of Norwegian spring spawning herring by zones for each year 2013-2023. Change from EU to UK EEZ from 2021.

Year	EU	Faroes	Greenland	Iceland	JanMayen	NEAFC	Norway	Russia	Svalbard	UK
2013	0.0	17.3	0.3	8.8	2.4	10.8	54.9	0.0	5.5	0.0
2014	0.0	8.7	2.5	10.1	1.1	7.1	64.5	0.0	6.0	0.1
2015	0.1	13.1	3.1	12.3	0.2	6.5	63.1	0.0	1.5	0.1
2016	0.0	15.5	4.2	12.6	0.0	12.1	55.4	0.0	0.0	0.1
2017	0.0	13.9	1.3	7.9	0.0	39.0	37.9	0.0	0.0	0.0
2018	0.0	10.8	0.1	7.7	0.0	27.7	53.6	0.0	0.0	0.0
2019	0.0	6.3	0.0	14.9	0.0	36.4	42.4	0.0	0.0	0.0
2020	0.0	4.4	0.0	23.8	0.0	14.0	57.8	0.0	0.0	0.0
2021	0.0	7.1	0.0	19.4	0.0	3.6	69.9	0.0	0.0	0.0
2022	0.0	3.2	0.0	19.8	0.0	11.1	65.9	0.0	0.0	0.0
2023	0.0	4.8	0.0	21.3	0.0	7.1	66.8	0.0	0.0	0.0

Table 5.2.3. Catches (tonnes) of Norwegian spring spawning herring by zones in 2013. Change from EU to UK EEZ from 2021.

EEZ / Country	Faroes	Greenland	Iceland	Jan Mayen	NEAFC	Norway	Russia	Svalbard	UK	Total_catch
DEU	0	0	0	0	0	1 922	0	2 322	0	4 244
DNK	0	0	0	0	0	17 159	0	0	1	17 160
FRO	97 741	0	0	0	7 297	0	0	0	0	105 038
GRL	2 070	2 221	3	0	7 840	0	0	0	0	12 133
IRL	0	0	0	0	0	3 165	0	0	0	3 165
ISL	18 534	0	60 371	0	11 798	0	0	0	0	90 703
NLD	0	0	0	0	1	2 317	0	3 302	0	5 620
NOR	0	0	0	0	36 549	323 302	0	0	0	359 851
RUS	181	0	0	16 602	10 141	19 681	15	31 901	0	78 521
UK	0	0	0	0	0	8 342	0	0	0	8 342
Total	**118 526**	**2 221**	**60 373**	**16 602**	**73 626**	**375 887**	**15**	**37 525**	**0.931**	**684 776**

Table 5.2.3. Catches (tonnes) of Norwegian spring spawning herring by zones in 2014. Change from EU to UK EEZ from 2021.

EEZ / Country	Faroes	Greenland	Iceland	Jan Mayen	NEAFC	Norway	Russia	Svalbard	UK	Total_catch
DEU	0	0	0	0	0	384	0	284	0	669
DNK	0	0	0	0	8 893	2 916	0	0	0	11 810
FRO	24 093	0	0	0	2 806	0	0	0	0	26 899
GRL	2 022	11 001	165	0	0	0	0	0	0	13 188
IRL	0	0	0	0	706	0	0	0	0	706
ISL	6 978	14	45 253	0	6 583	0	0	0	0	58 827
NLD	0	0	0	0	72	2 607	0	6 453	312	9 445
NOR	0	0	0	28	7 255	255 847	0	0	0	263 131
RUS	5 826	0	0	4 980	5 586	23 676	0	20 224	0	60 292
UK	0	0	0	0	0	4 233	0	0	0	4 233
Total	**38 919**	**11 015**	**45 418**	**5 008**	**31 901**	**289 665**	**0**	**26 961**	**312**	**449 199**

Table 5.2.3. Catches (tonnes) of Norwegian spring spawning herring by zones in 2015. Change from EU to UK EEZ from 2021.

EEZ / Country	Faroes	Greenland	Iceland	Jan Mayen	NEAFC	Norway	Russia	Svalbard	UK	Total_catch
DEU	1 110	0	0	0	1 547	0	0	0	4	2 660
DNK	649	0	0	0	7 329	14	0	0	0	7 992
FRO	23 053	0	0	0	2 897	0	0	0	180	26 130
GRL	2 058	10 026	231	0	0	124	0	0	135	12 574
IRL	0	0	0	0	999	400	0	0	0	1 400
ISL	3 139	0	39 241	0	246	0	0	0	0	42 626
NLD	2 453	0	0	0	1 977	0	0	0	233	4 663
NOR	0	0	0	0	0	176 176	0	0	0	176 176
RUS	9 433	0	0	656	5 743	25 286	0	4 735	0	45 853
UK	0	0	0	0	19	6	0	0	30	55
Total	**41 893**	**10 026**	**39 472**	**656**	**20 757**	**202 007**	**0**	**4 735**	**582**	**320 128**

Table 5.2.3. Catches (tonnes) of Norwegian spring spawning herring by zones in 2016. Change from EU to UK EEZ from 2021.

EEZ / Country	Faroes	Greenland	Iceland	Jan Mayen	NEAFC	Norway	Russia	Svalbard	UK	Total_catch
DEU	700	0	0	0	1 882	0	0	0	0	2 583
DNK	1 895	0	0	0	219	7 634	0	0	0	9 747
FRO	42 898	0	0	0	1 829	0	0	0	0	44 727
GRL	2 350	16 262	1 495	0	0	0	0	0	0	20 108
IRL	0	0	0	0	1 529	519	0	0	0	2 048
ISL	1 210	0	47 129	0	2 119	0	0	0	0	50 458
NLD	520	0	0	0	1 726	570	0	0	302	3 119
NOR	0	0	0	0	12 341	185 081	0	0	0	197 421
RUS	9 884	0	0	1	24 982	15 589	0	0	0	50 456
UK	0	0	0	0	22	3 900	0	0	109	4 031
Total	**59 456**	**16 262**	**48 624**	**1**	**46 649**	**213 293**	**0**	**0**	**411**	**384 697**

Table 5.2.3. Catches (tonnes) of Norwegian spring spawning herring by zones in 2017. Change from EU to UK EEZ from 2021.

EEZ / Country	Faroes	Greenland	Iceland	Jan Mayen	NEAFC	Norway	Russia	Svalbard	UK	Total_catch
DEU	557	0	0	0	4 607	2	0	0	0	5 166
DNK	0	0	0	0	3 927	13 923	0	0	0	17 850
FRO	57 775	0	0	0	40 388	0	0	0	0	98 163
GRL	2 500	9 564	457	0	48	0	0	0	0	12 570
IRL	1 291	0	0	0	1 179	1 024	0	0	0	3 495
ISL	28 813	0	56 119	0	5 468	0	0	0	0	90 400
NLD	631	0	0	0	5 676	0	0	0	0	6 307
NOR	0	0	0	0	157 794	231 589	0	0	0	389 383
POL	0	0	0	0	0	1	0	0	0	1
RUS	8 514	0	0	0	61 301	21 303	0	0	0	91 118
SWE	0	0	0	0	766	439	0	0	0	1 205
UK	33	0	0	0	31	4 358	0	0	0	4 422
Total	**100 113**	**9 564**	**56 577**	**0**	**281 186**	**272 639**	**0**	**0**	**0**	**720 081**

Table 5.2.3. Catches (tonnes) of Norwegian spring spawning herring by zones in 2018. Change from EU to UK EEZ from 2021.

EEZ / Country	Faroes	Greenland	Iceland	Jan Mayen	NEAFC	Norway	Russia	Svalbard	UK	Total_catch
DEU	0	0	0	0	1 919	0	0	0	2	1 922
DNK	0	0	0	0	2 094	14 958	0	0	0	17 052
FRO	32 377	0	4 920	0	44 155	510	0	0	0	81 962
GRL	2 460	329	10	0	91	0	0	0	0	2 890
IRL	0	0	297	0	122	2 009	0	0	0	2 428
ISL	19 149	0	40 786	0	23 457	0	0	0	0	83 392
NLD	1 557	0	0	0	2 846	0	0	0	32	4 435
NOR	0	0	0	0	34 849	297 177	0	0	0	332 027
POL	50	0	0	0	932	0	0	0	65	1 047
RUS	8 769	0	0	0	54 421	995	0	0	0	64 185
SWE	0	0	0	0	0	445	0	0	0	445
UK	0	0	0	0	0	2 582	0	0	0	2 582
Total	**64 363**	**329**	**46 013**	**0**	**164 886**	**318 676**	**0**	**0**	**100**	**594 367**

Table 5.2.3. Catches (tonnes) of Norwegian spring spawning herring by zones in 2019. Change from EU to UK EEZ from 2021.

EEZ / Country	Faroes	Greenland	Iceland	Jan Mayen	NEAFC	Norway	Russia	Svalbard	UK	Total_catch
DEU	0	0	0	0	4 142	0	0	0	0	4 142
DNK	227	0	0	0	11 049	6 413	0	0	0	17 688
FRO	26 664	0	37 685	0	49 591	0	0	0	0	113 940
GRL	1 747	0	0	0	1 677	0	0	0	0	3 424
IRL	0	0	0	0	1 098	1 677	0	0	0	2 775
ISL	11 152	0	77 553	0	19 341	0	0	0	0	108 046
NLD	512	0	0	0	4 647	0	0	0	1	5 160
NOR	0	0	0	0	113 309	317 195	0	0	0	430 504
POL	0	0	0	0	1 327	0	0	0	0	1 327
RUS	8 353	0	0	0	75 278	406	1	0	0	84 039
SWE	0	0	0	0	0	720	0	0	0	720
UK	0	0	0	0	0	1 801	0	0	0	1 801
Total	**48 655**	**0**	**115 238**	**0**	**281 458**	**328 211**	**1**	**0**	**1**	**773 565**

Table 5.2.3. Catches (tonnes) of Norwegian spring spawning herring by zones in 2020. Change from EU to UK EEZ from 2021.

EEZ / Country	Faroes	Greenland	Iceland	Jan Mayen	NEAFC	Norway	Russia	Svalbard	UK	Total_catch
DEU	27	0	0		2 747	0			28	2 801
DNK	0	0	0		2 974	9 885			0	12 860
FRO	21 720	0	77 363		3 947	0			0	103 029
GRL	1 127	3	1		2 419	0			0	3 550
IRL	0	0	0		1 102	1 601			0	2 704
ISL	204	0	94 027		3 655	287			0	98 173
NLD	501	0	0		3 275	3 039			0	6 815
NOR	0	0	0		29 043	380 394			0	409 436
POL	0	0	0		263	1 089			0	1 352
RUS	8 201	0	0		51 121	15 603			0	74 925
SWE	0	0	0		223	2 947			0	3 170
UK	0	0	0		143	1 836			2	1 981
Total	**31 780**	**3**	**171 390**		**100 912**	**416 680**			**30**	**720 796**

Table 5.2.3. Catches (tonnes) of Norwegian spring spawning herring by zones in 2021. Change from EU to UK EEZ from 2021.

EEZ / Country	Faroes	Greenland	Iceland	Jan Mayen	NEAFC	Norway	Russia	Svalbard	UK	Total_catch
DEU	0	0	0	0	0	3 185	0	0	0	3 186
DNK	0	0	0	0	0	15 854	0	0	0	15 854
FRO	44 821	0	55 779	0	13 682	9	0	0	0	114 290
GRL	6 244	0	1	0	211	0	0	0	0	6 456
IRL	0	0	0	0	0	1 793	0	0	0	1 793
ISL	16	0	108 646	4	5 611	22	0	0	0	114 299
NLD	0	0	0	0	0	7 389	0	0	0	7 389
NOR	0	0	0	0	843	488 790	0	0	0	489 633
POL	0	0	0	0	0	.	0	0	97	97
RUS	9 240	0	0	1	9 991	73 609	1	0	0	92 842
SWE	0	0	0	0	0	1 116	0	0	0	1 116
Total	**60 320**	**0**	**164 425**	**6**	**30 338**	**591 767**	**1**	**0**	**97**	**846 955**

Table 5.2.3. Catches (tonnes) of Norwegian spring spawning herring by zones in 2022. Change from EU to UK EEZ from 2021.

EEZ / Country	Faroes	Greenland	Iceland	JanMayen	NEAFC	Norway	Russia	Svalbard	UK	Total_catch
DEU						5379				5379
DNK					756	14257				15014
FRO	16397		60889		44796					122082
GRL	571		30		6041	176				6818
IRL						3209				3209
ISL			103369		9370					112739
NLD					1741	1873				3615
NOR	1	1	0	29	2955	443281		13	1	446281
RUS	9156				12008	64705	0			85870
SWE						3291				3291
UK						9620				9620
Total	**26126**	**1**	**164288**	**29**	**77669**	**545792**	**0**	**13**	**1**	**813918**

Table 5.2.3. Catches (tonnes) of Norwegian spring spawning herring by zones in 2023. Change from EU to UK EEZ from 2021.

EEZ / Country	Faroes	Greenland	Iceland	Jan Mayen	NEAFC	Norway	Russia	Svalbard	UK	Total_catch
DEU	0	0	0	0	0	2 109	0	0	0	2 109
DNK	0	0	0	0	8 048	2 550	0	0	0	10 598
FRO	20 070	0	54 289	0	16 012	0	0	0	0	90 371
GRL	3 457	0	0	0	7 167	0	0	0	0	10 623
IRL	0	0	0	0	0	1 016	0	0	0	1 016
ISL	0	0	90 092	0	2 105	0	0	0	0	92 197
NLD	0	0	0	0	0	5 920	0	0	0	5 920
NOR	0	1	0	15	10	389 453	0	11	2	389 491
POL	0	0	0	0	1 331	0	0	0	0	1 331
RUS	8 840	0	0	0	13 713	51 592	1	0	0	74 145
SWE	0	0	0	0	0	781	0	0	0	781
Total	**32 366**	**1**	**144 382**	**15**	**48 386**	**453 420**	**1**	**11**	**2**	**678 583**

9. Figures

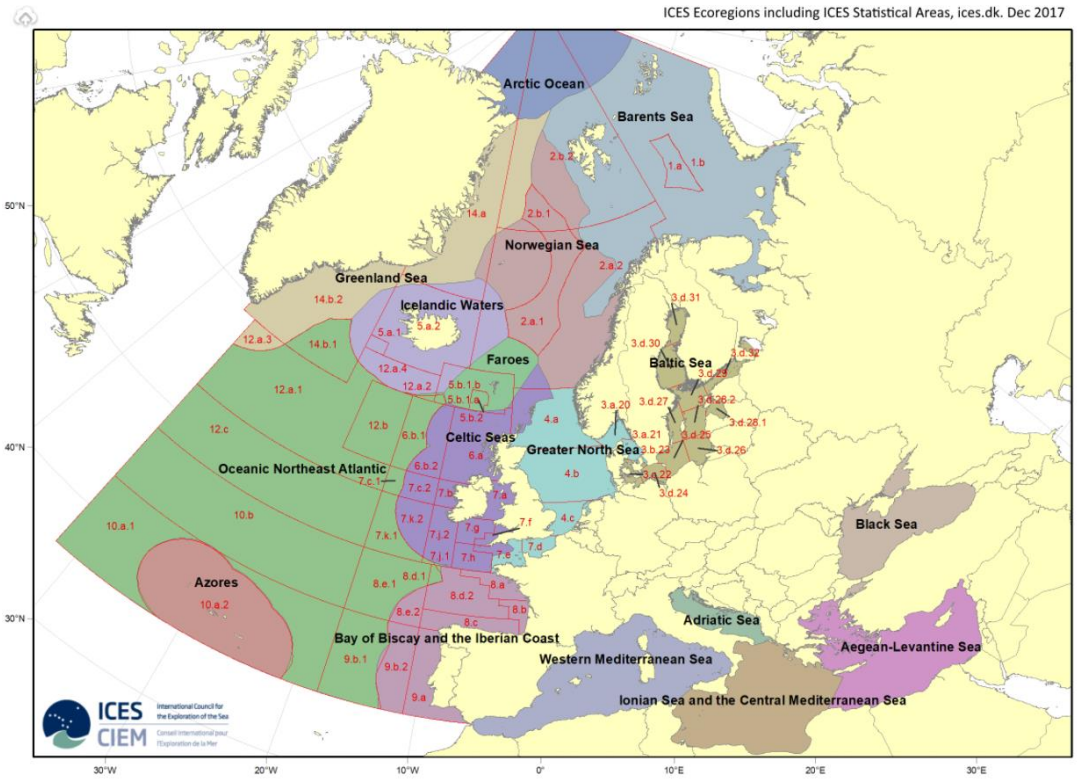


Figure 2.1.1. ICES ecoregions and statistical areas (Divisions), where Norwegian spring spawning herring is distributed. Also, adjacent Divisions are shown.

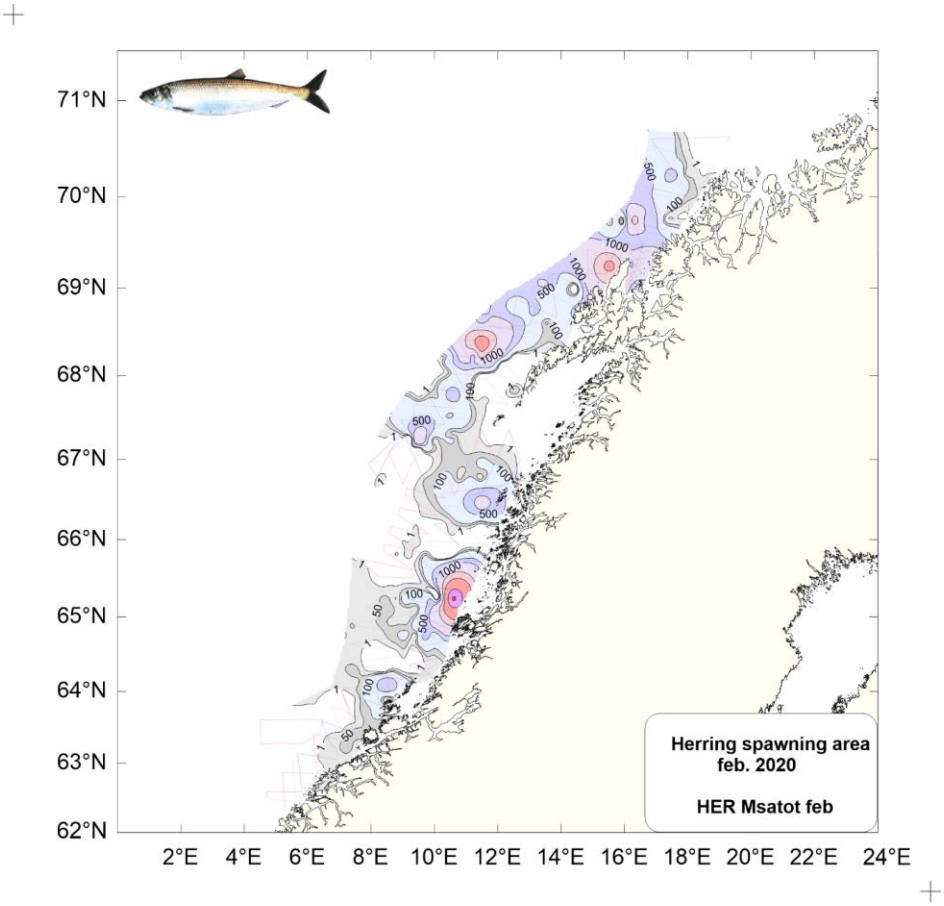


Figure 2.1.1.1. Spawning area of Norwegian Spring Spawning Herring in February 2020. Data from Norwegian Acoustic survey on the spawning grounds.

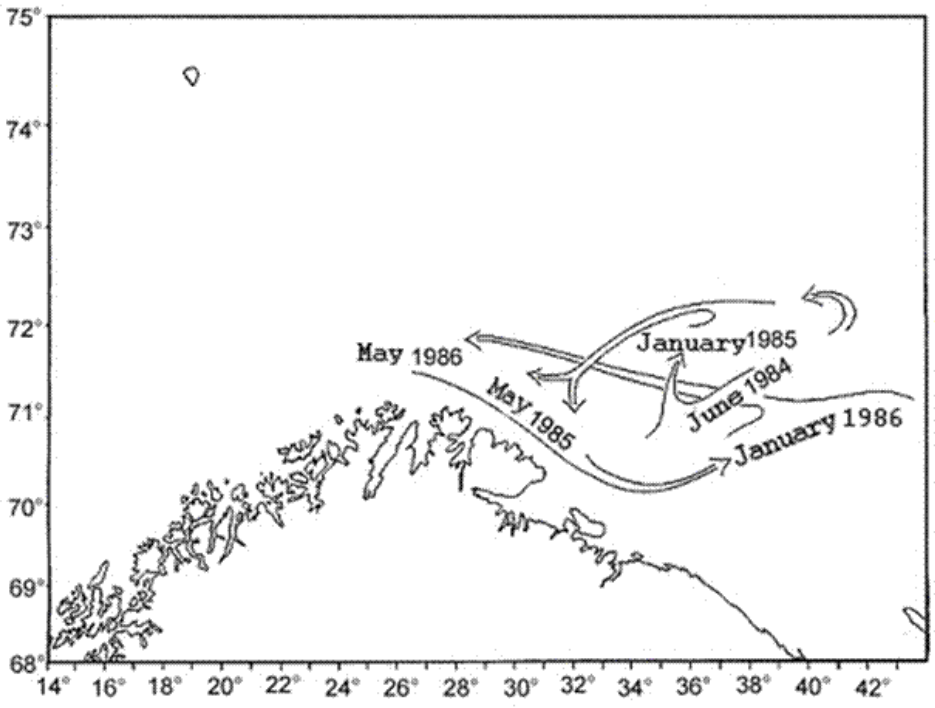


Figure 2.1.1.2. Migration scheme of the 1983 year-class as juveniles in the Barents Sea (from Røttingen 1990).

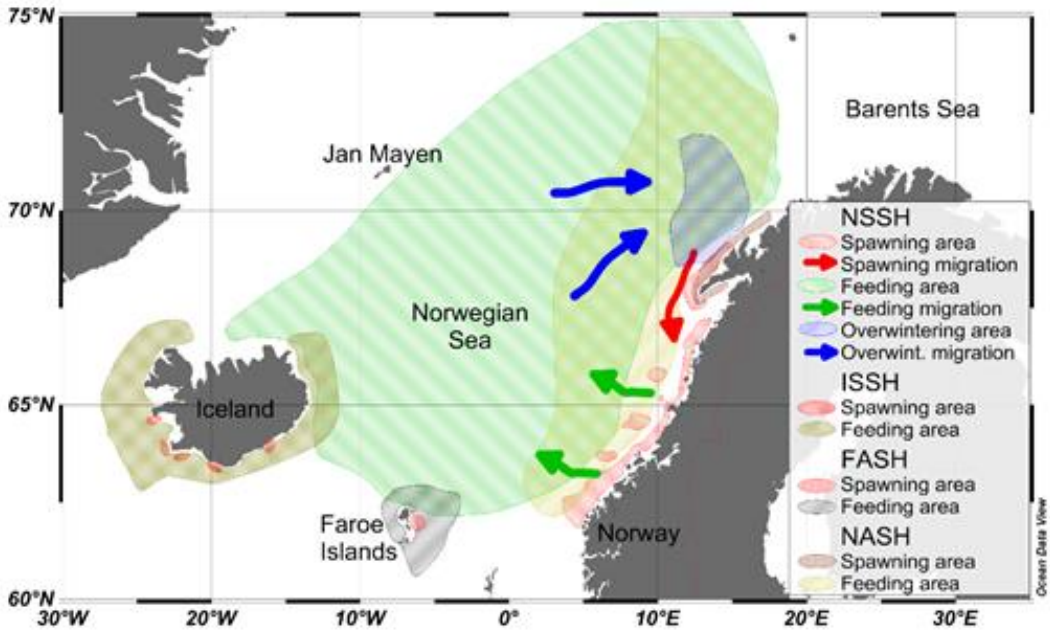


Figure 2.2.1. Current migration pattern of the adult part of Norwegian spring-spawning herring (NSSH) and interactions with other surrounding stocks, i.e. Icelandic summer-spawning herring (ISSH), Faroese autumn-spawning herring (FASH), and Norwegian autumn-spawning herring (NASH) (from Pampoulie et al. 2015).

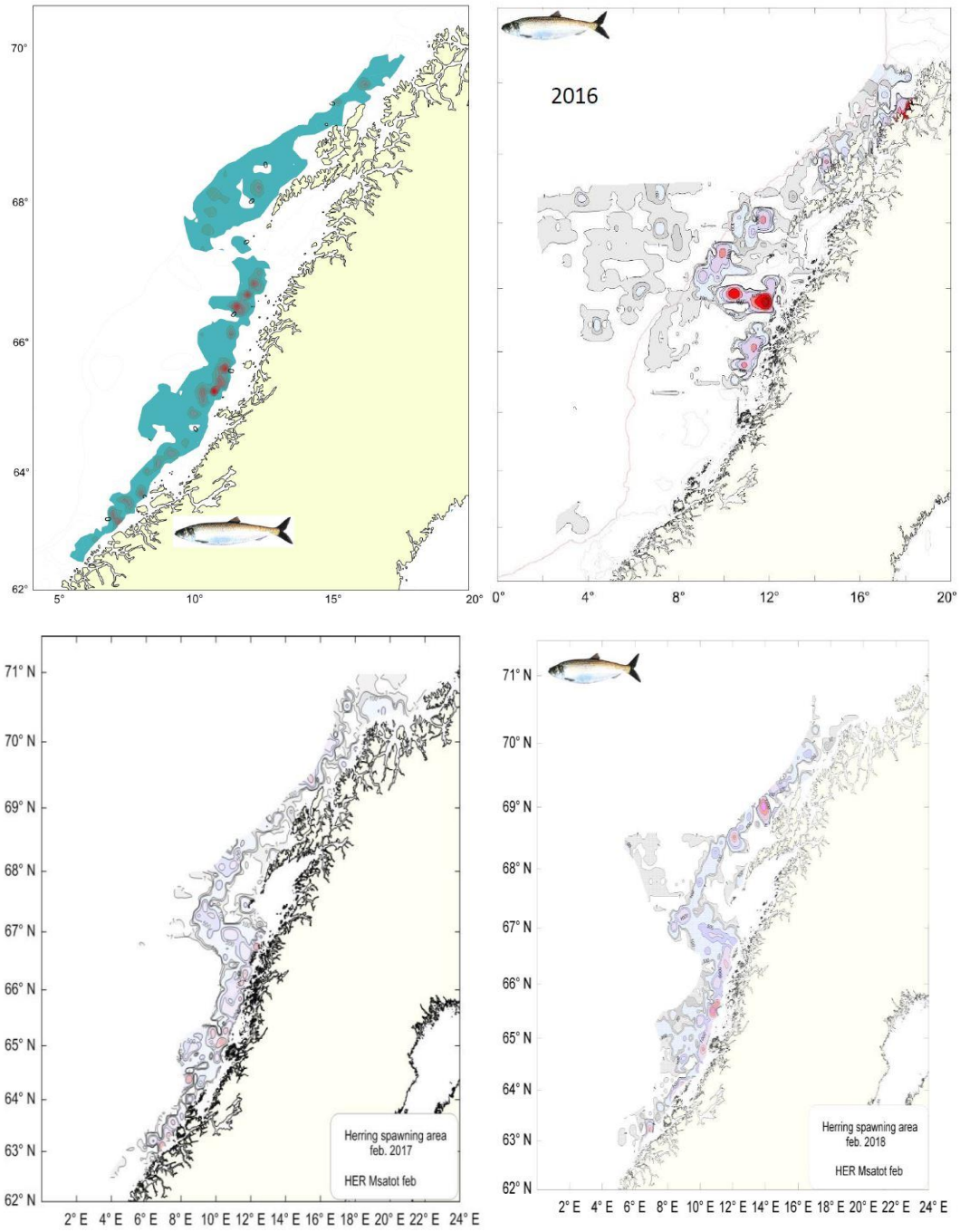


Figure 4.1.1. Distribution of herring from the acoustic survey on the spawning grounds in February 2015-2024 (continues on next page).

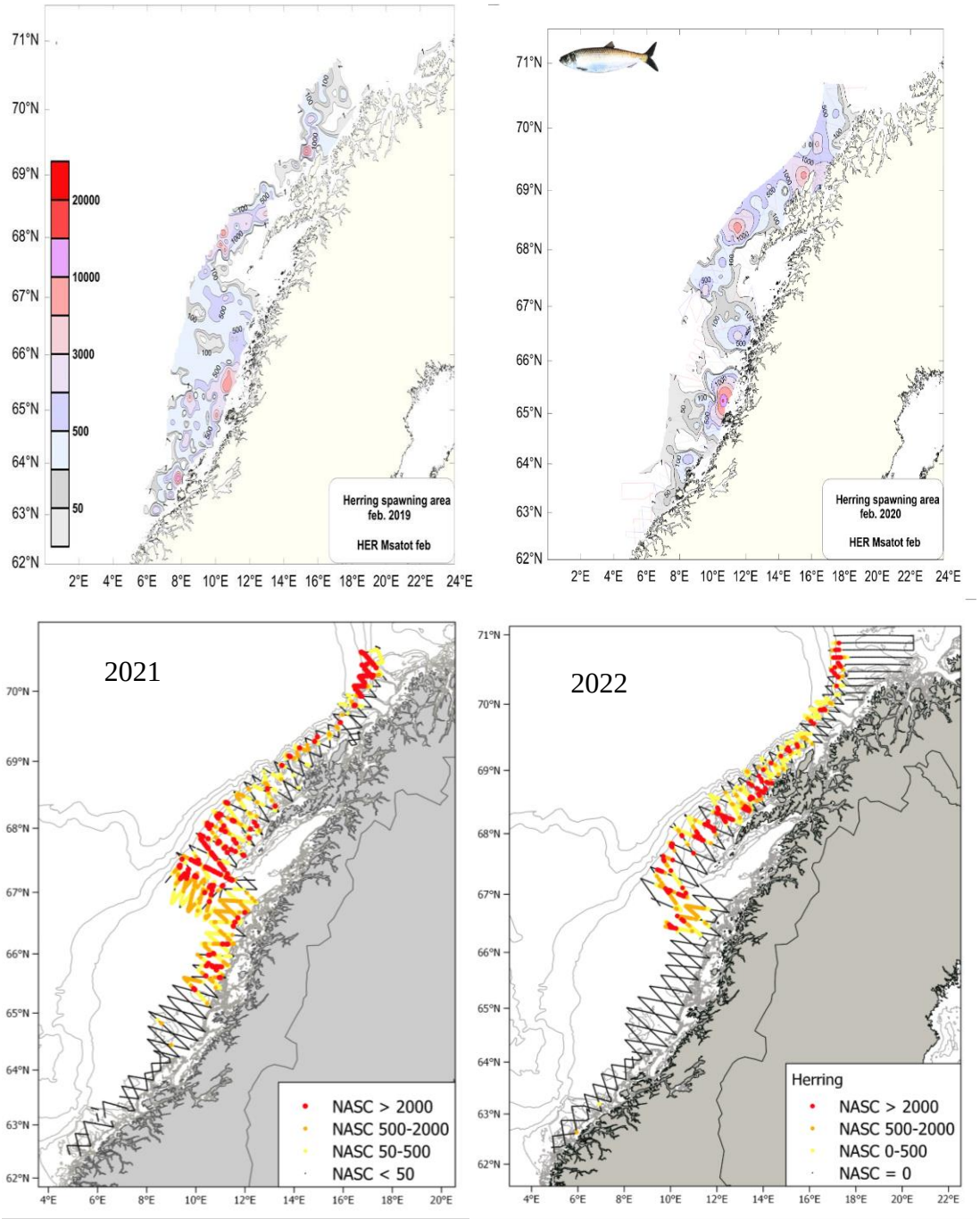


Figure 4.1.1. continues.

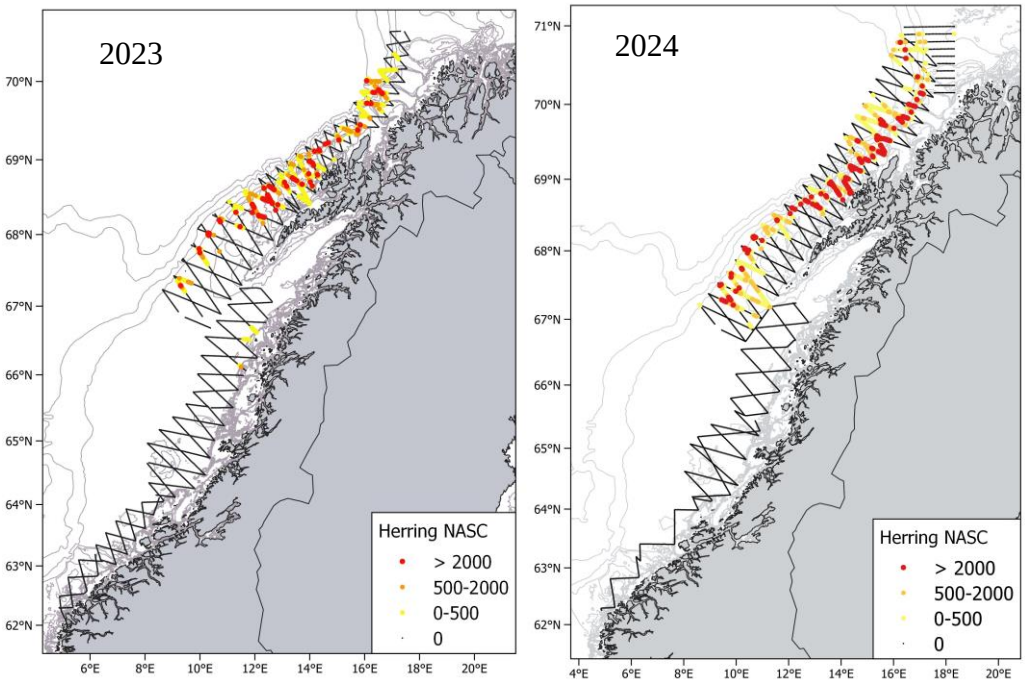


Figure 4.1.1. continues.

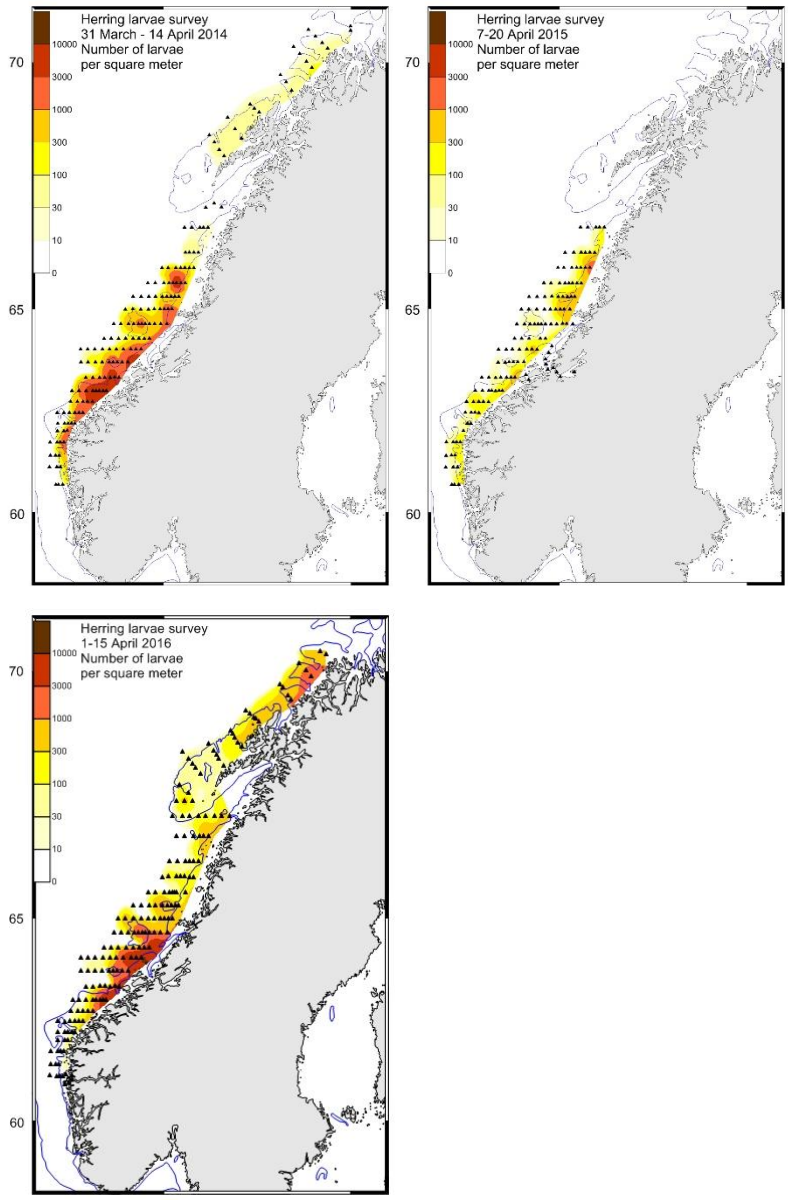


Figure 4.2.1. Distribution of herring larvae in April 2014-2016.

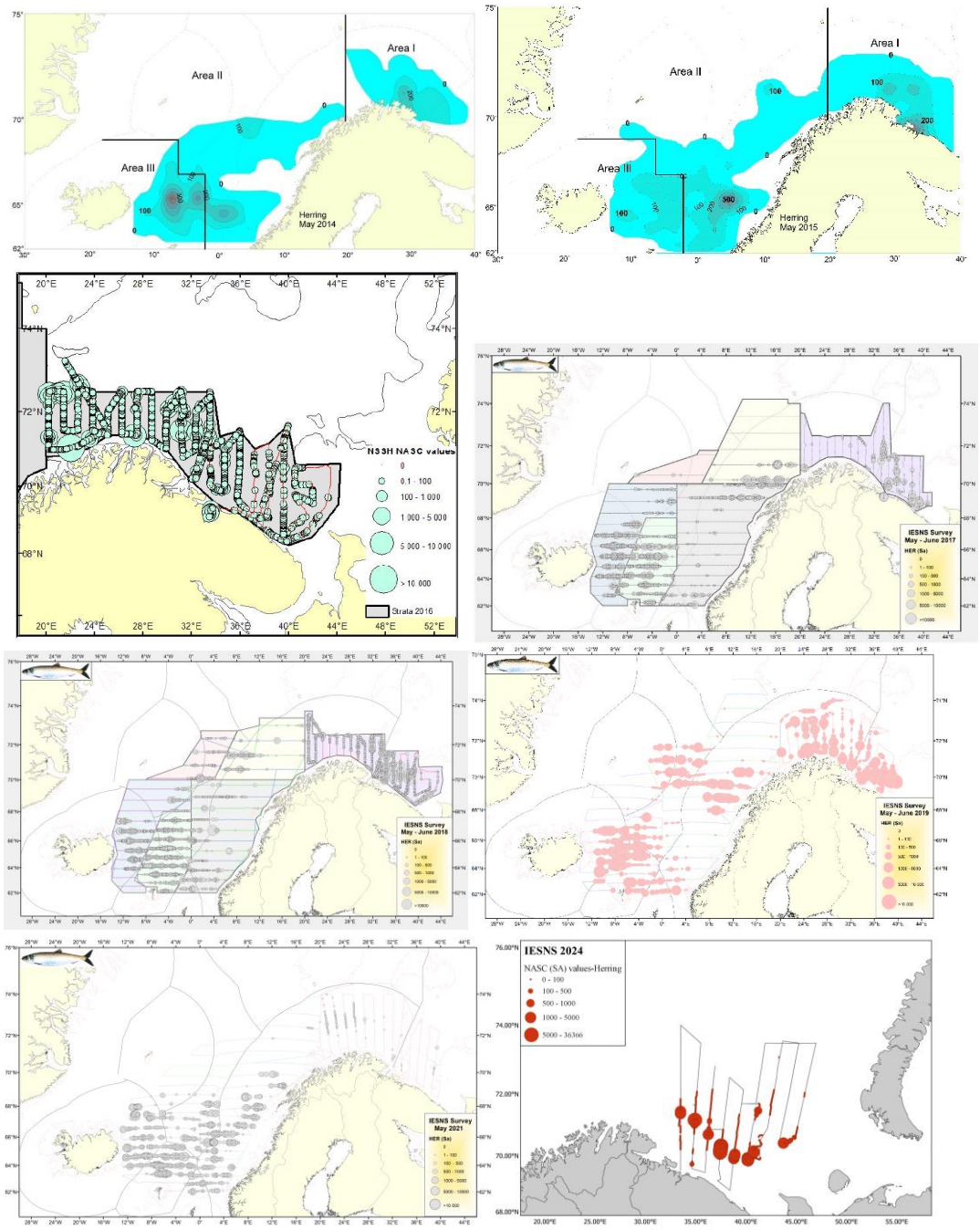


Figure 4.3.1. Distribution of juvenile NSSH in Barents Sea from the International ecosystem survey in the Nordic Seas (IESNS) in May/June 2014-2024. Note that for all years except 2016 and 2024, the map covers also the distribution of adult fish in the Nordic Seas. There was no coverage in the Barents Sea in 2020, 2022 and 2023. The coverage in 2024 was reduced and only the eastern part of the Barents Sea was covered.

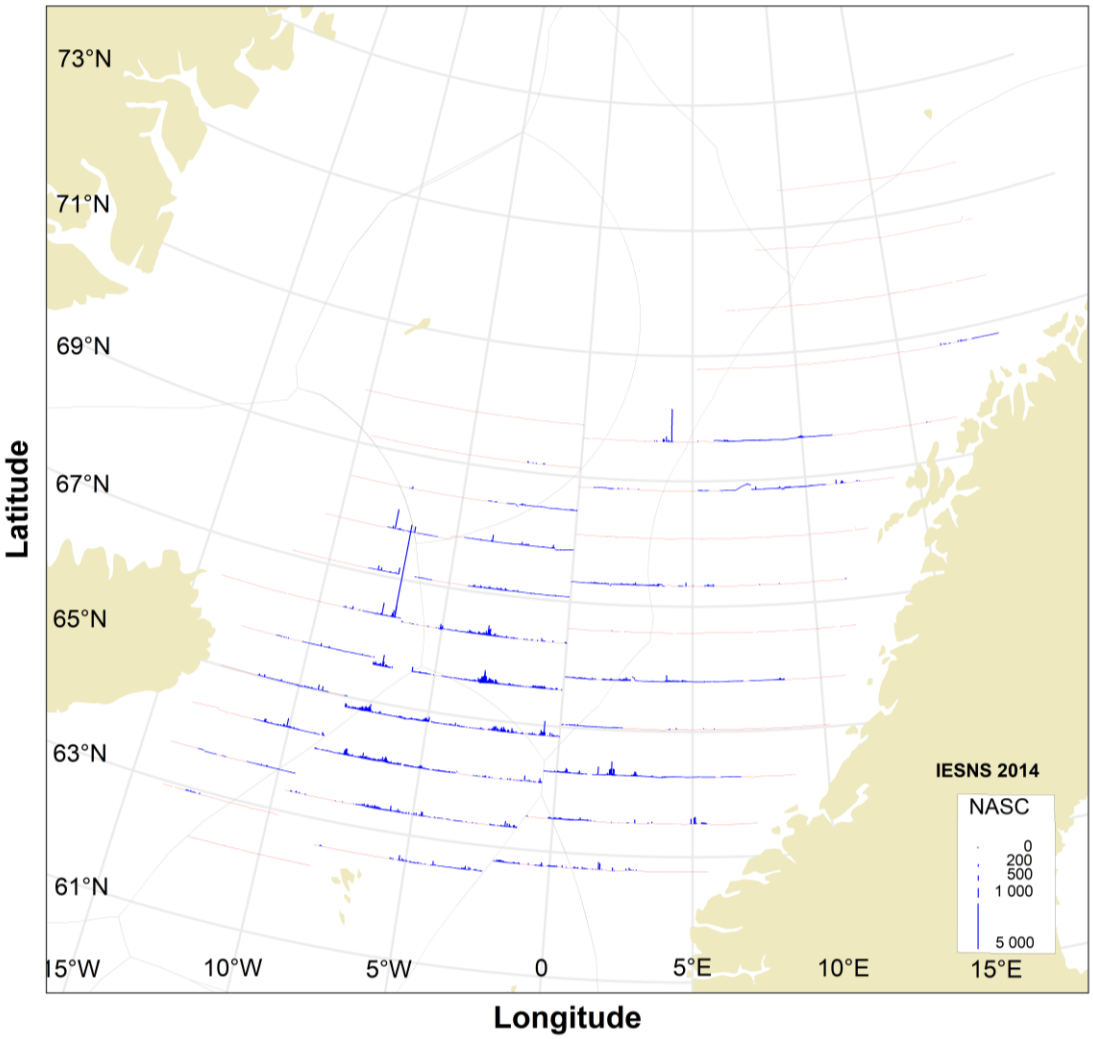


Figure 4.4.1. Distribution of adult NSSH in the Nordic Seas from the International ecosystem survey in the Nordic Seas (IESNS) in May/June 2014.

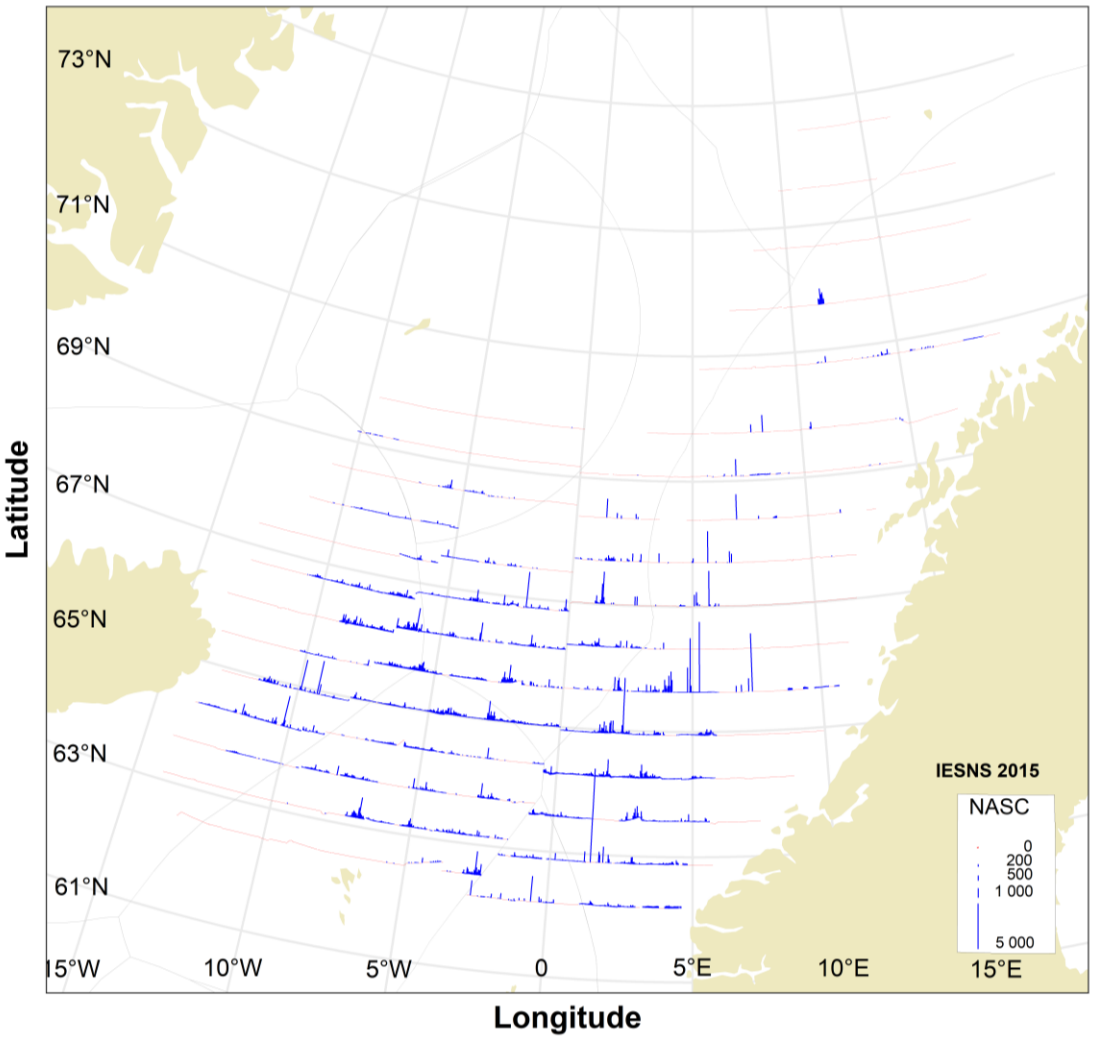


Figure 4.4.1. Distribution of adult NSSH in the Nordic Seas from the International ecosystem survey in the Nordic Seas (IESNS) in May/June 2015.

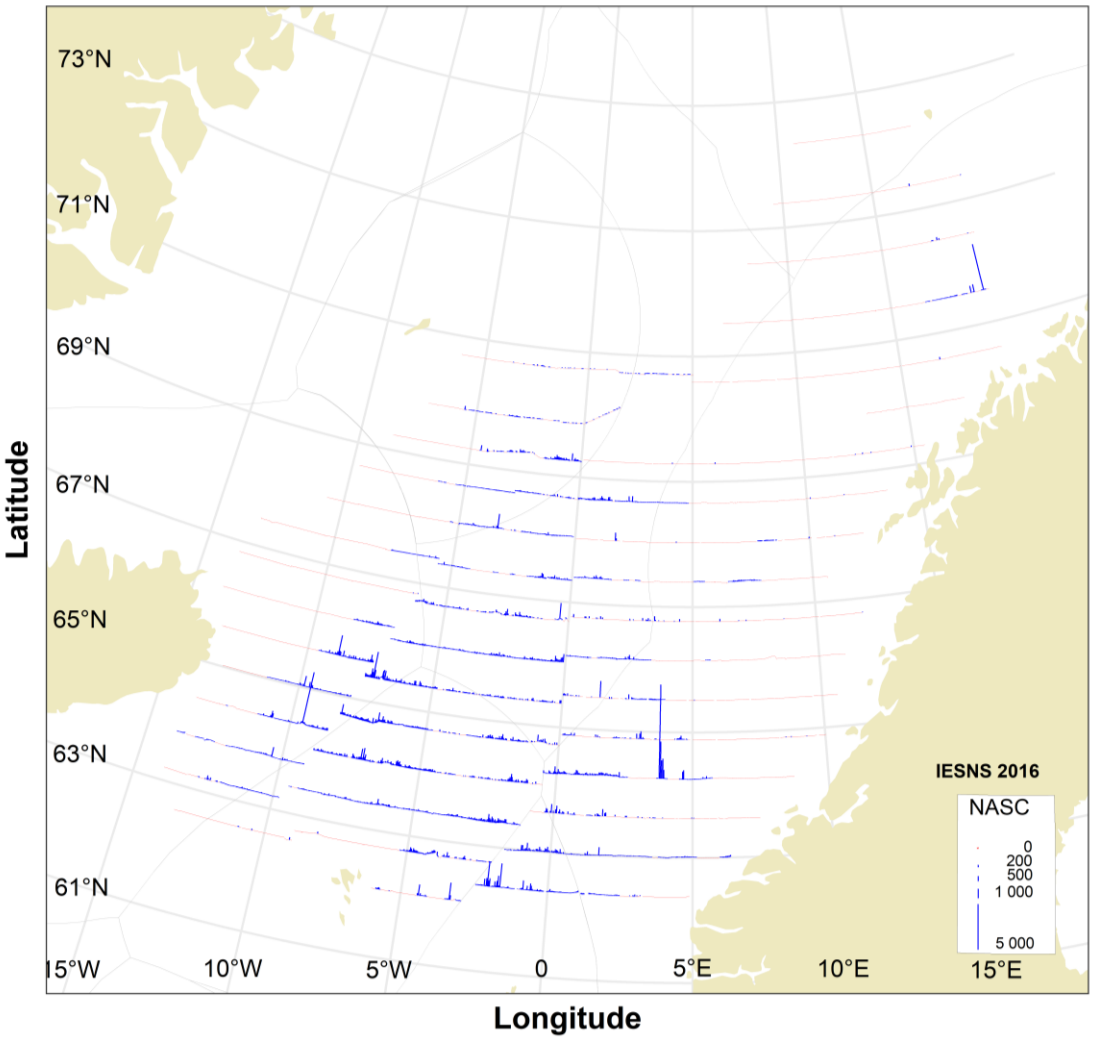


Figure 4.4.1. Distribution of adult NSSH in the Nordic Seas from the International ecosystem survey in the Nordic Seas (IESNS) in May/June 2016.

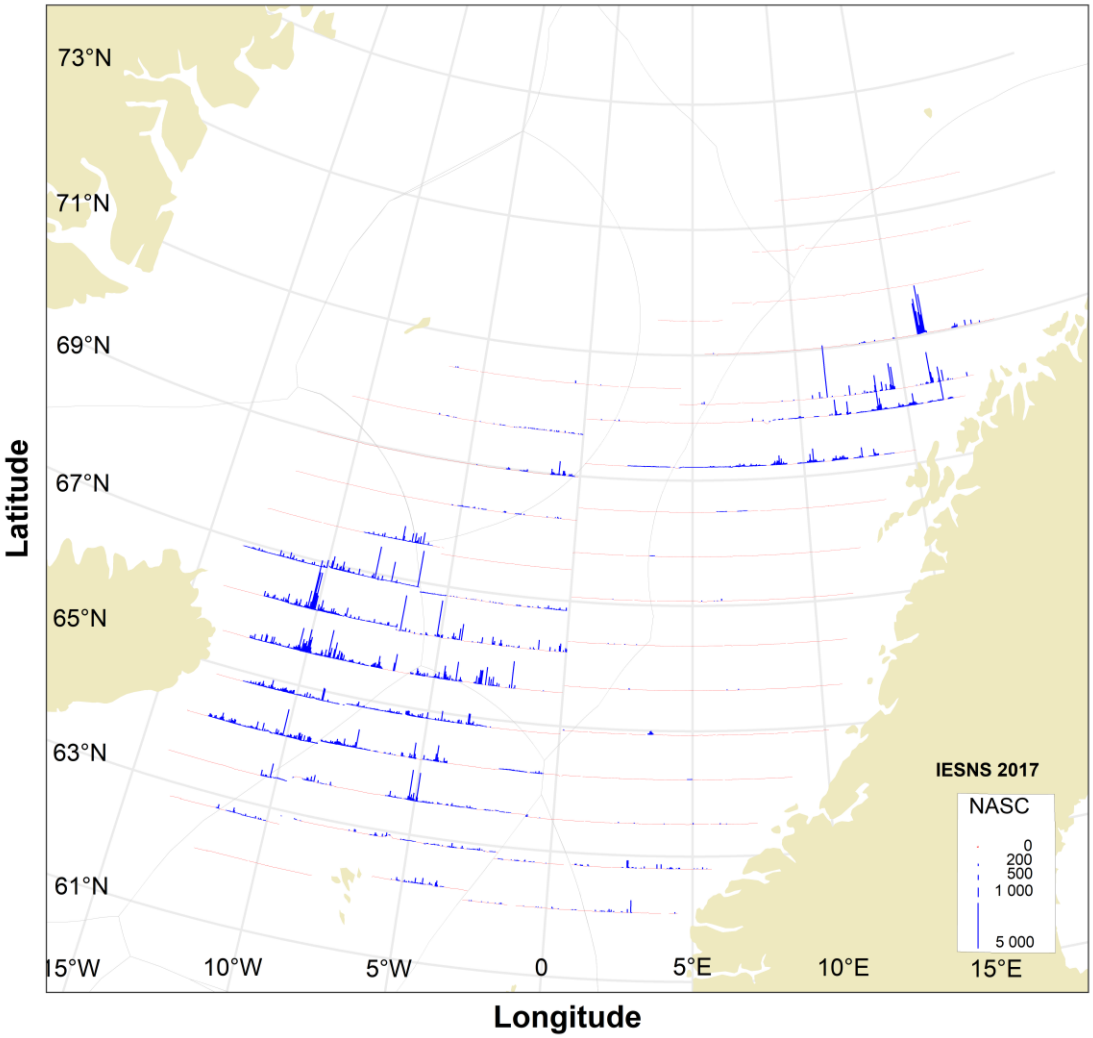


Figure 4.4.1. Distribution of adult NSSH in the Nordic Seas from the International ecosystem survey in the Nordic Seas (IESNS) in May/June 2017.

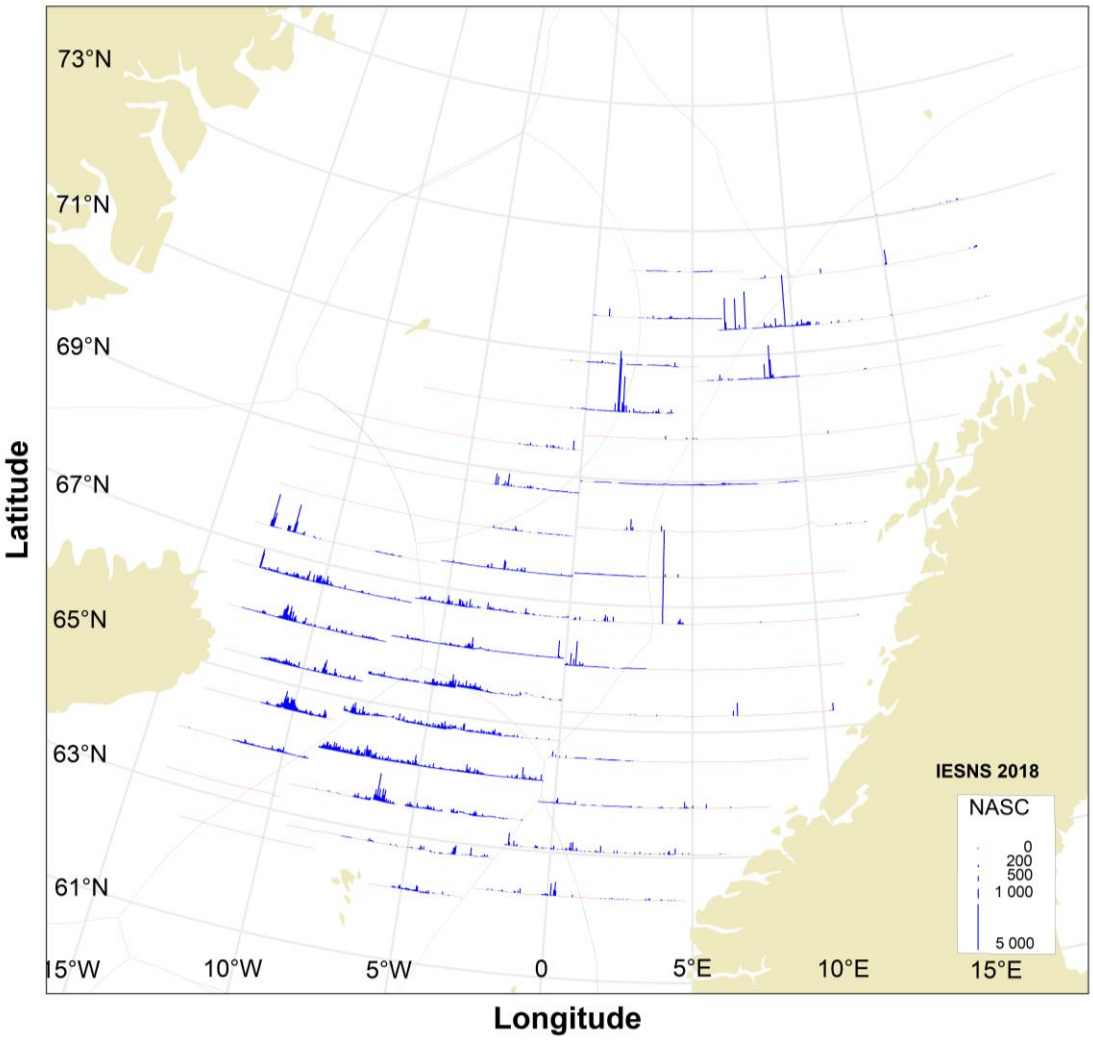


Figure 4.4.1. Distribution of adult NSSH in the Nordic Seas from the International ecosystem survey in the Nordic Seas (IESNS) in May/June 2018.

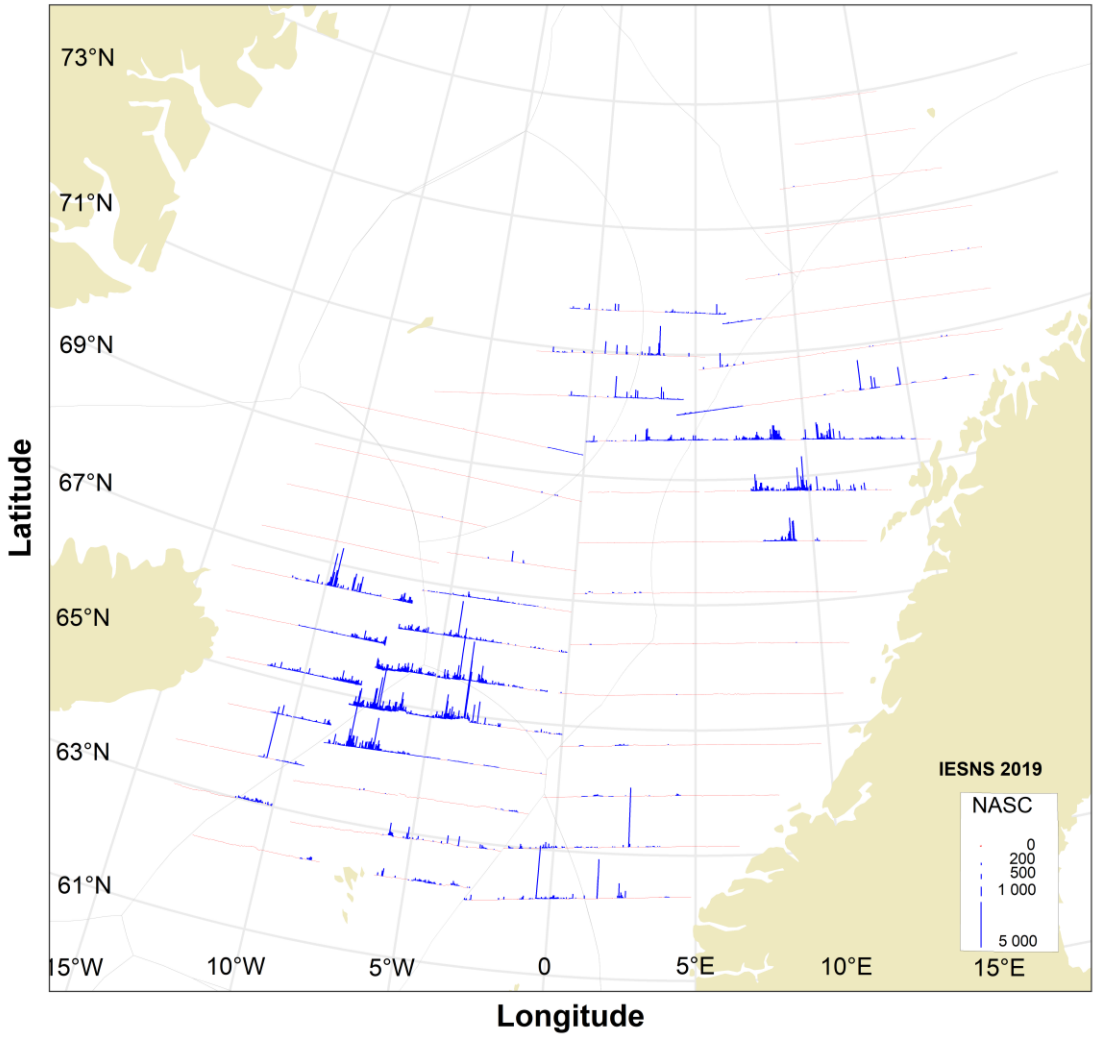


Figure 4.4.1. Distribution of adult NSSH in the Nordic Seas from the International ecosystem survey in the Nordic Seas (IESNS) in May/June 2019.

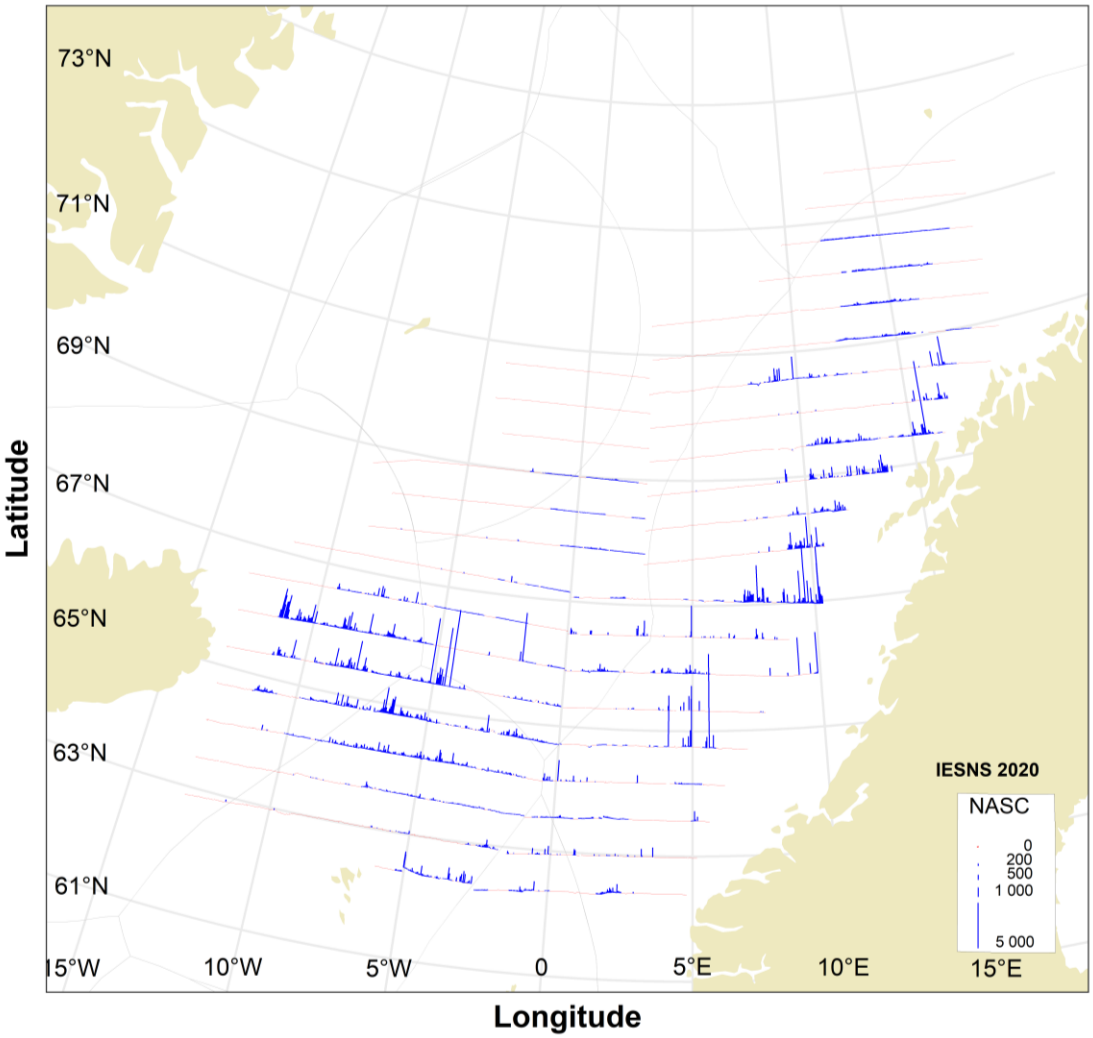


Figure 4.4.1. Distribution of adult NSSH in the Nordic Seas from the International ecosystem survey in the Nordic Seas (IESNS) in May/June 2020.

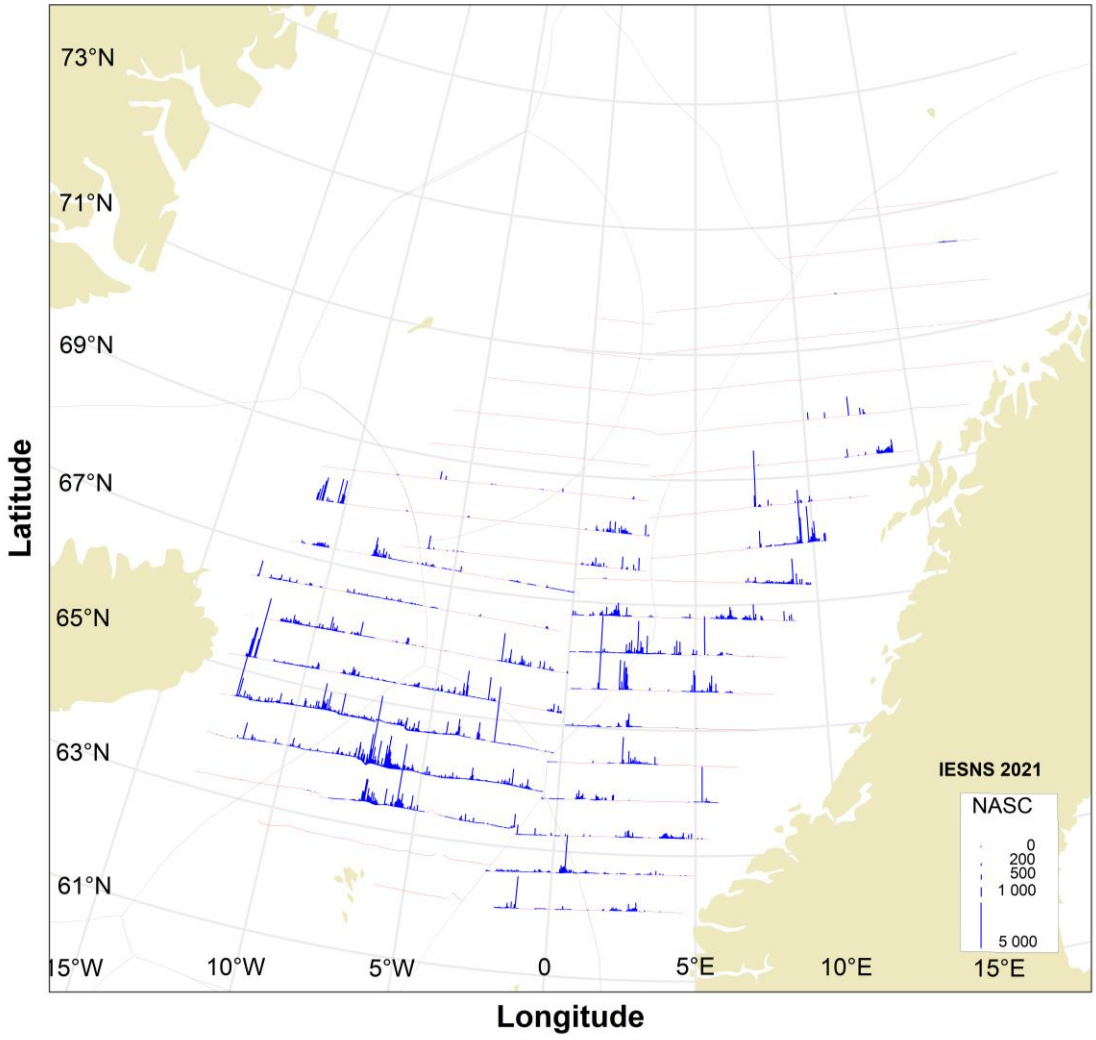


Figure 4.4.1. Distribution of adult NSSH in the Nordic Seas from the International ecosystem survey in the Nordic Seas (IESNS) in May/June 2021.

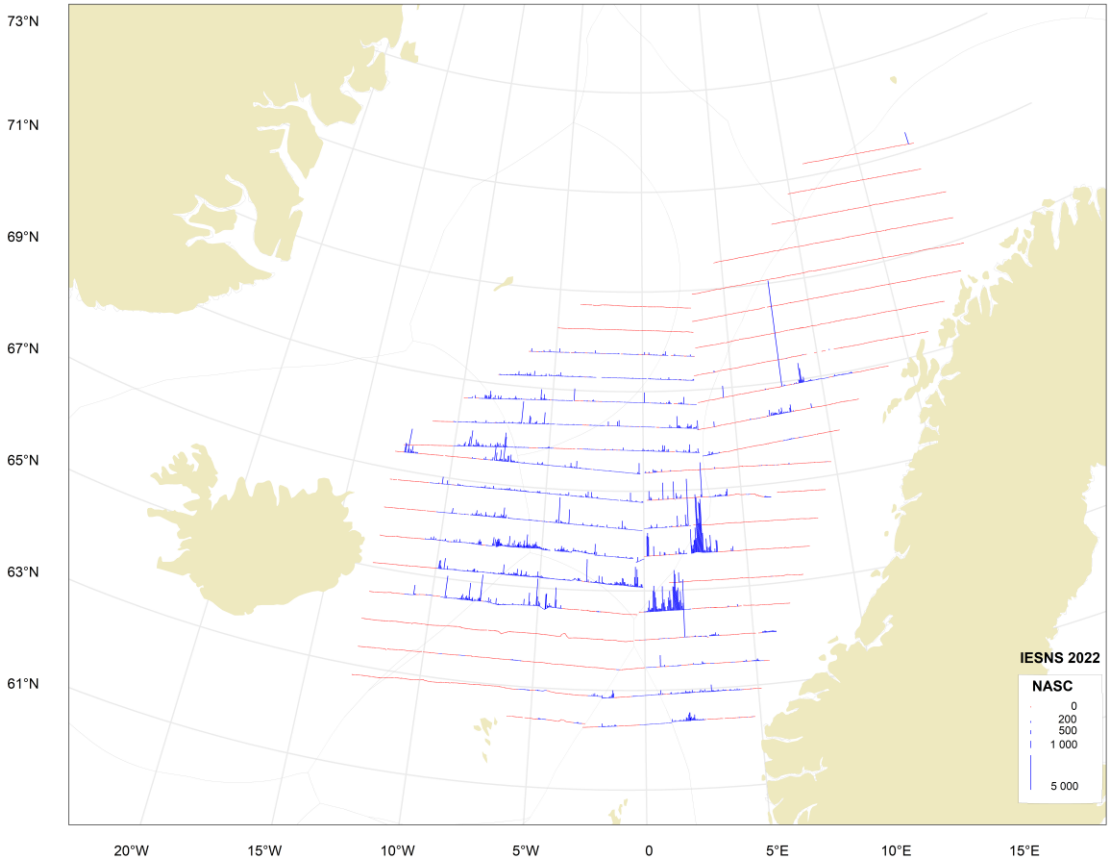


Figure 4.4.1. Distribution of adult NSSH in the Nordic Seas from the International ecosystem survey in the Nordic Seas (IESNS) in May/June 2022.

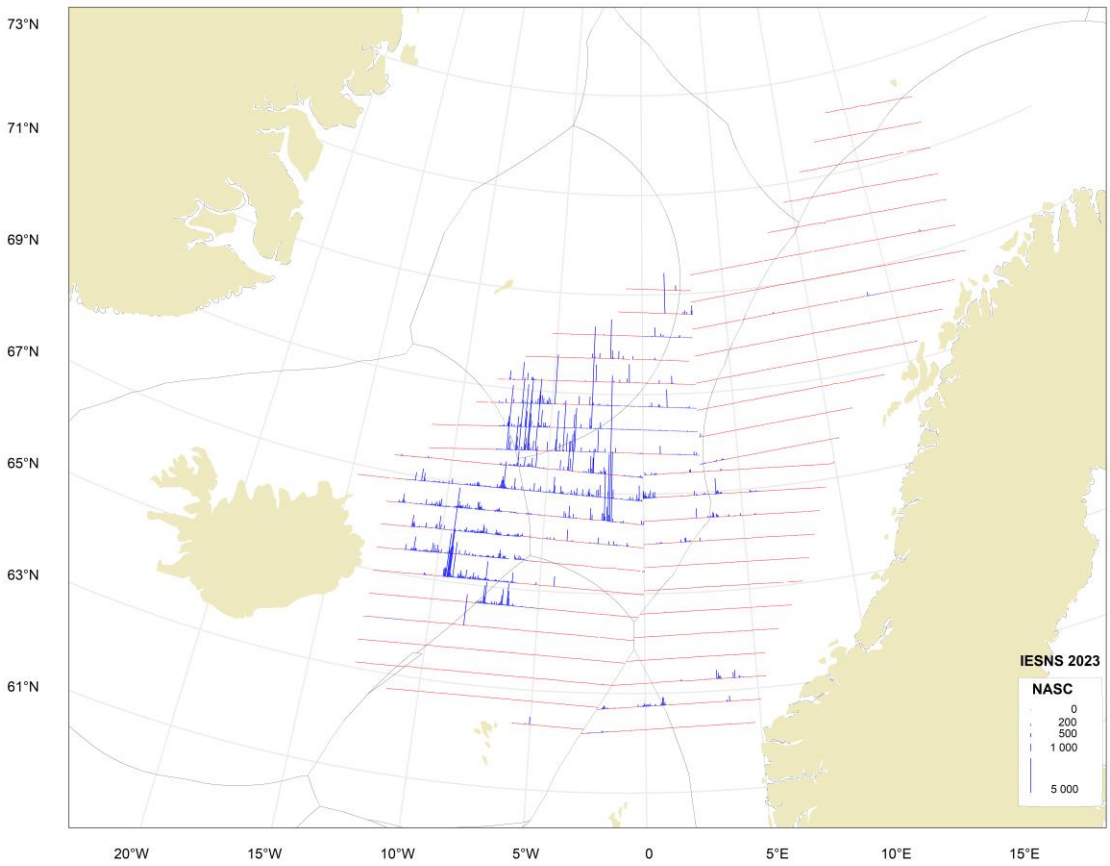


Figure 4.4.1. Distribution of adult NSSH in the Nordic Seas from the International ecosystem survey in the Nordic Seas (IESNS) in May/June 2023.

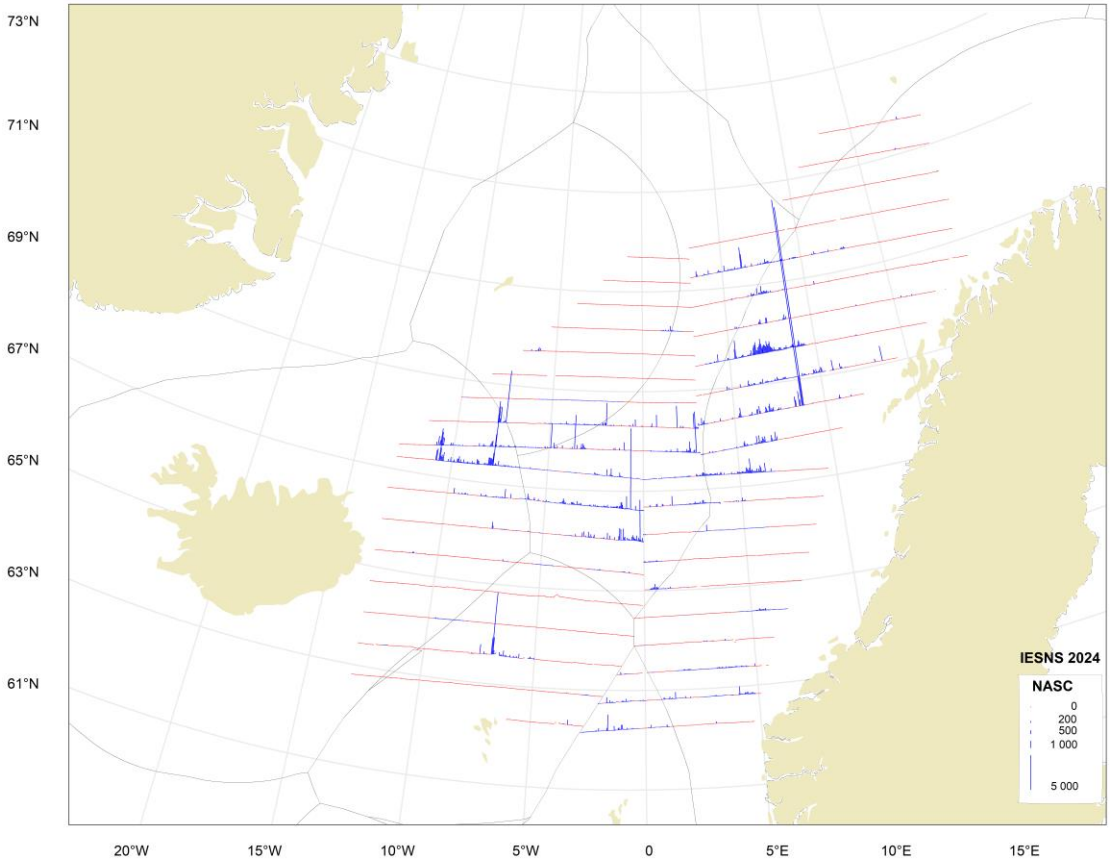


Figure 4.4.1. Distribution of adult NSSH in the Nordic Seas from the International ecosystem survey in the Nordic Seas (IESNS) in May/June 2024.

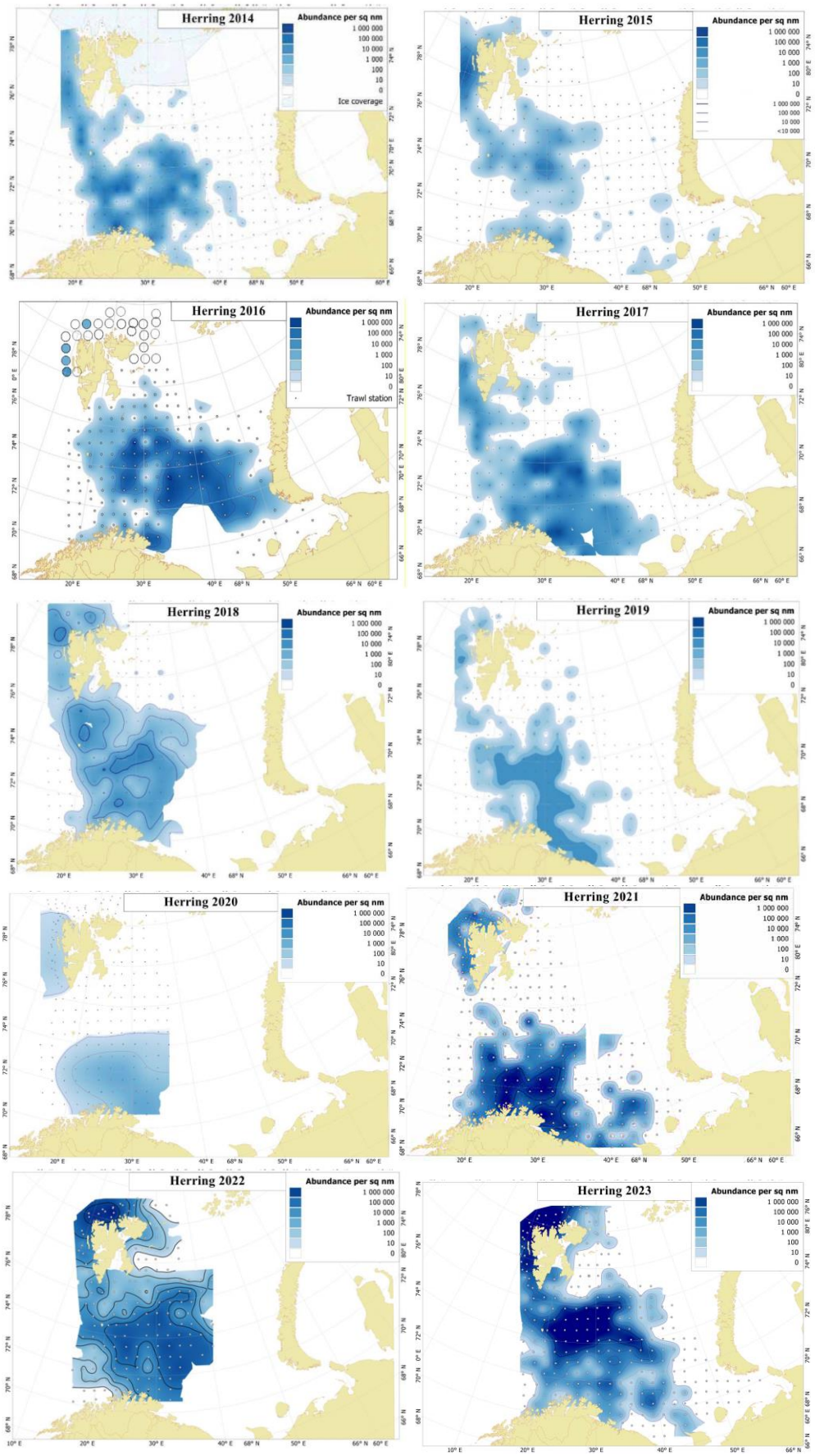
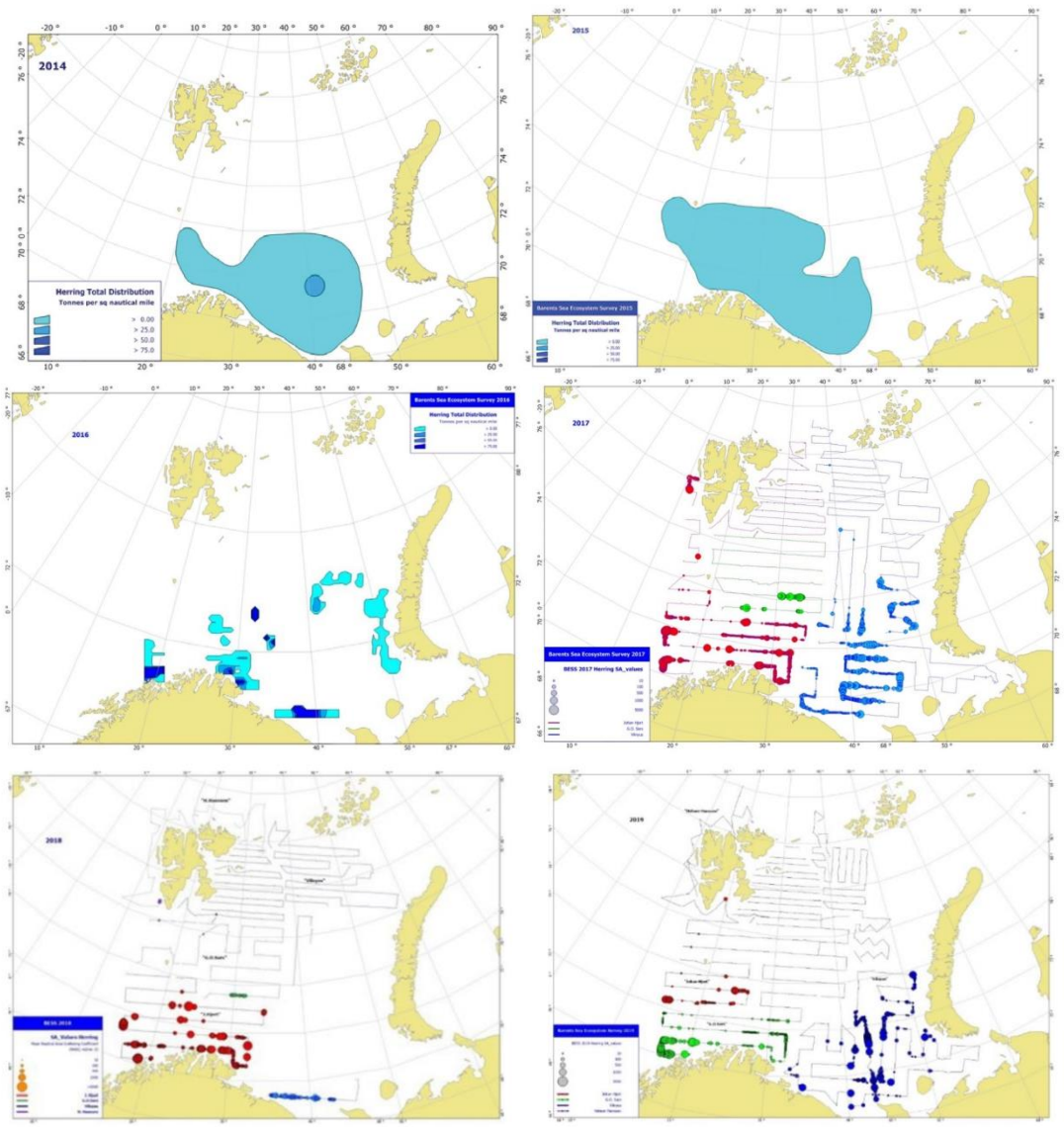


Figure 4.5.1. Distribution of 0-group NSSH from the ecosystem survey in the Barents Sea in autumn 2014-2023. No map for 2024 since the survey is not completed.


2014
Herring Total Distribution
Tonnes per sq nautical mile
2015
2016
2017
2018
2019

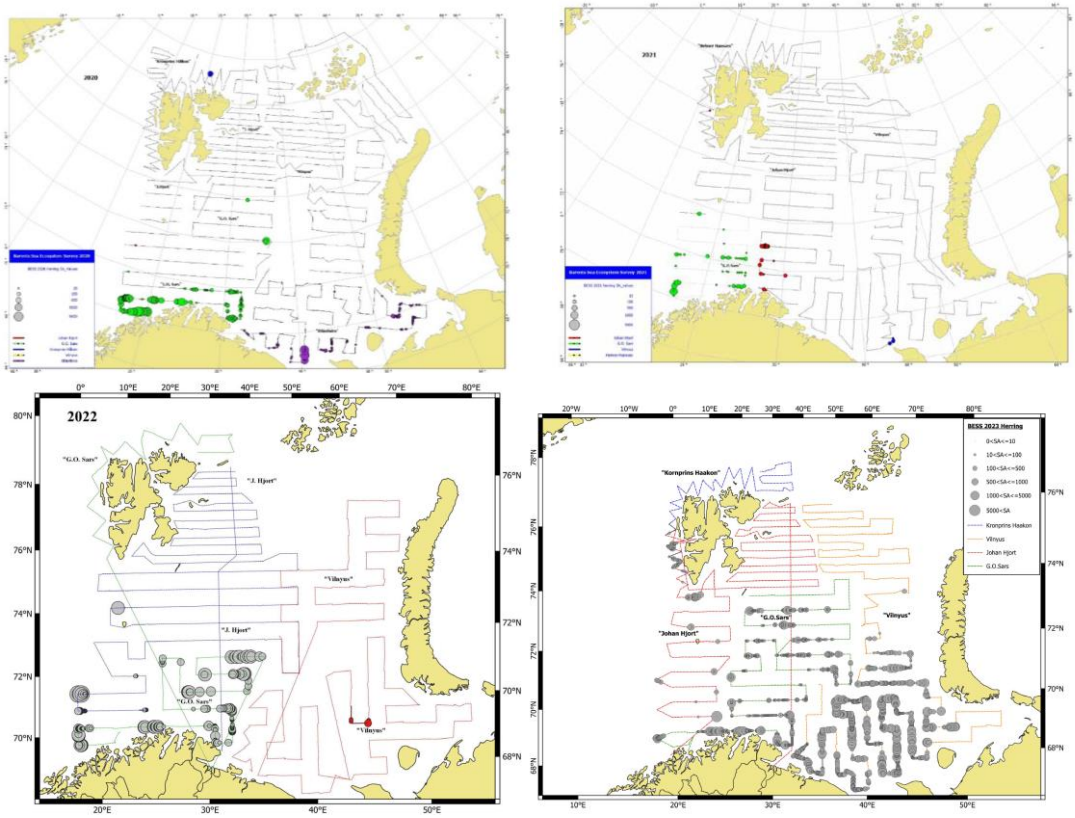


Figure 4.5.2. Distribution of juvenile NSSH from the ecosystem survey in the Barents Sea in autumn 2014-2023. No map for 2024 since the survey is not completed.

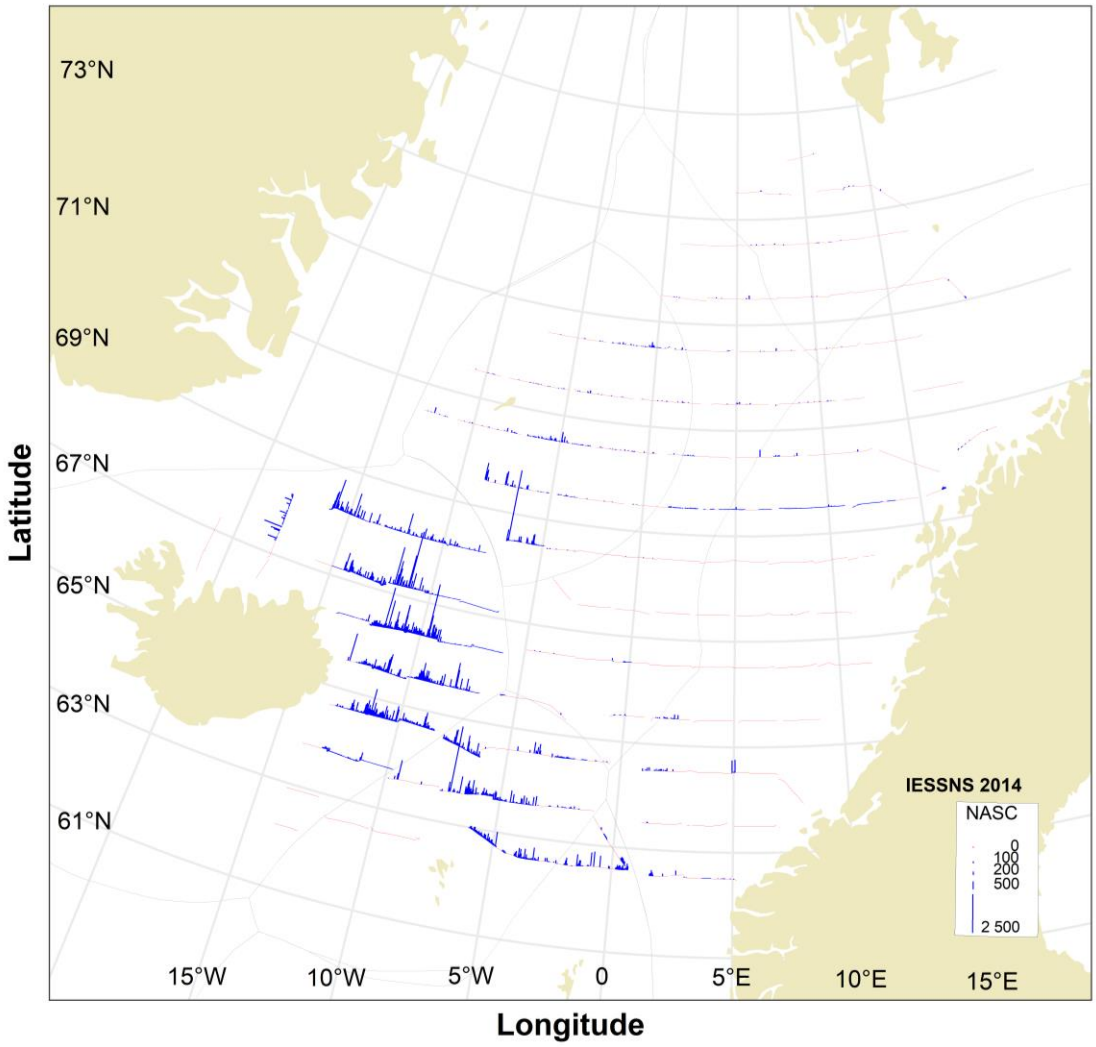


Figure 4.6.1. Distribution of adult NSSH in the Nordic Seas from the International ecosystem summer survey in the Nordic Seas (IESSNS) in July 2014.

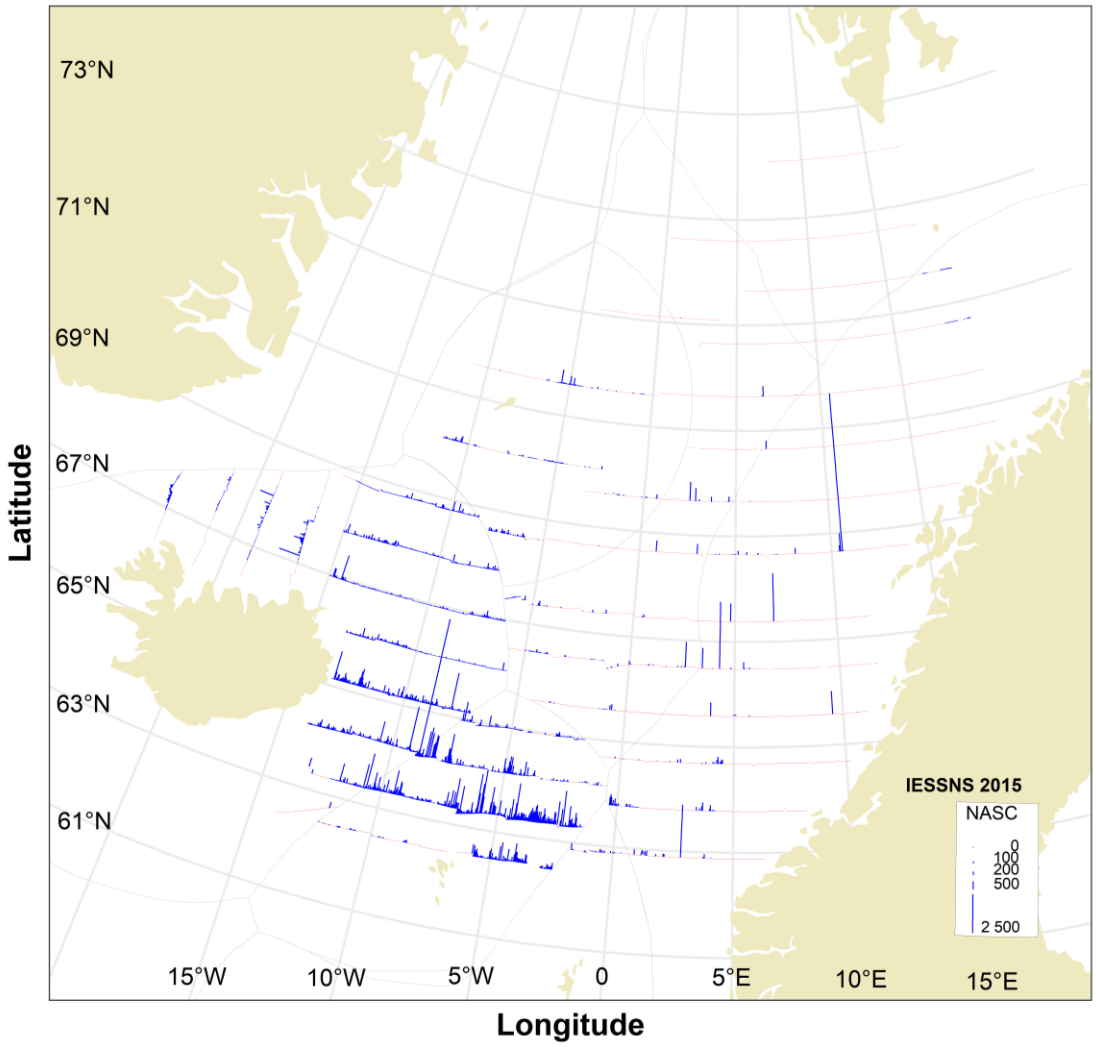


Figure 4.6.1. Distribution of adult NSSH in the Nordic Seas from the International ecosystem summer survey in the Nordic Seas (IESSNS) in July 2015.

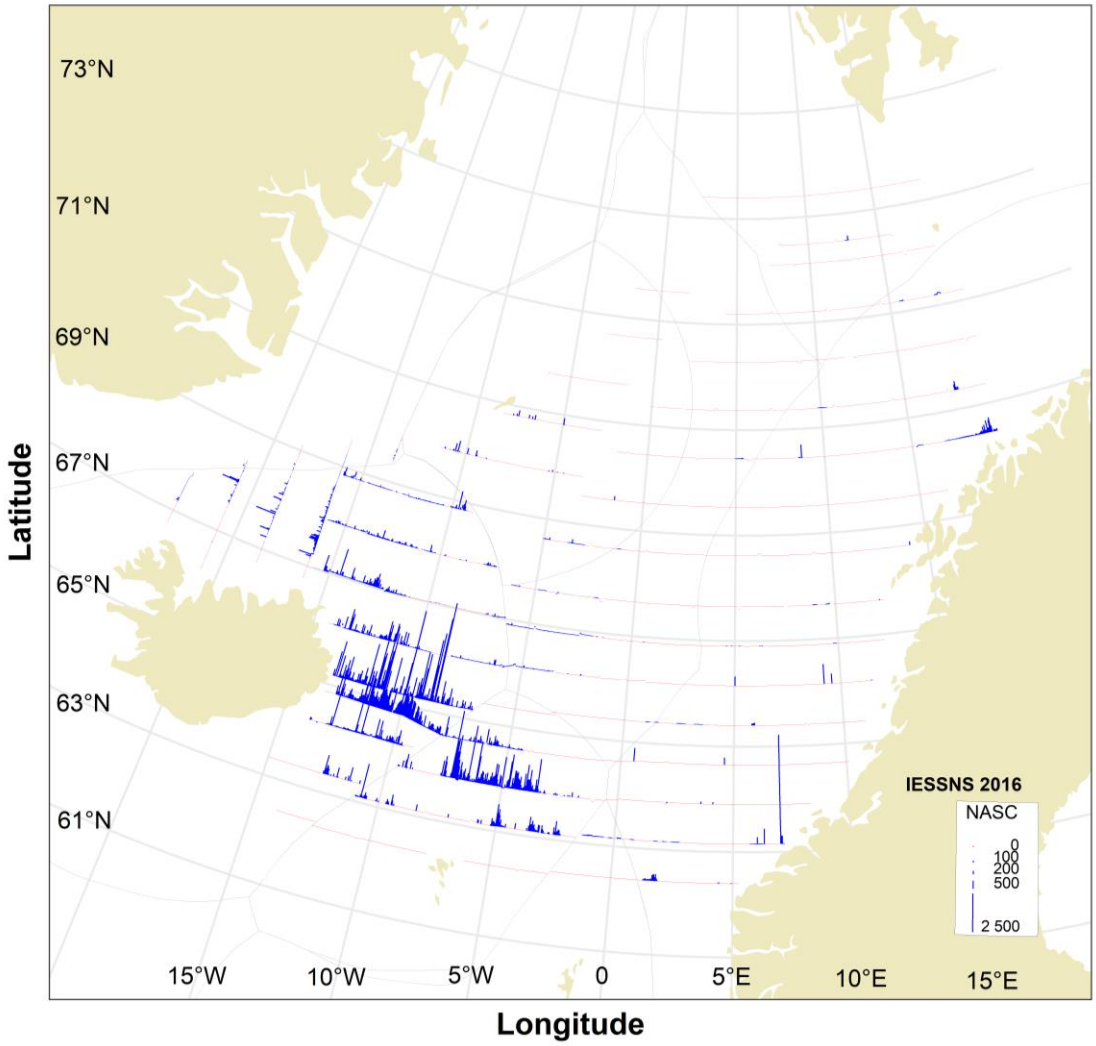


Figure 4.6.1. Distribution of adult NSSH in the Nordic Seas from the International ecosystem summer survey in the Nordic Seas (IESSNS) in July 2016.

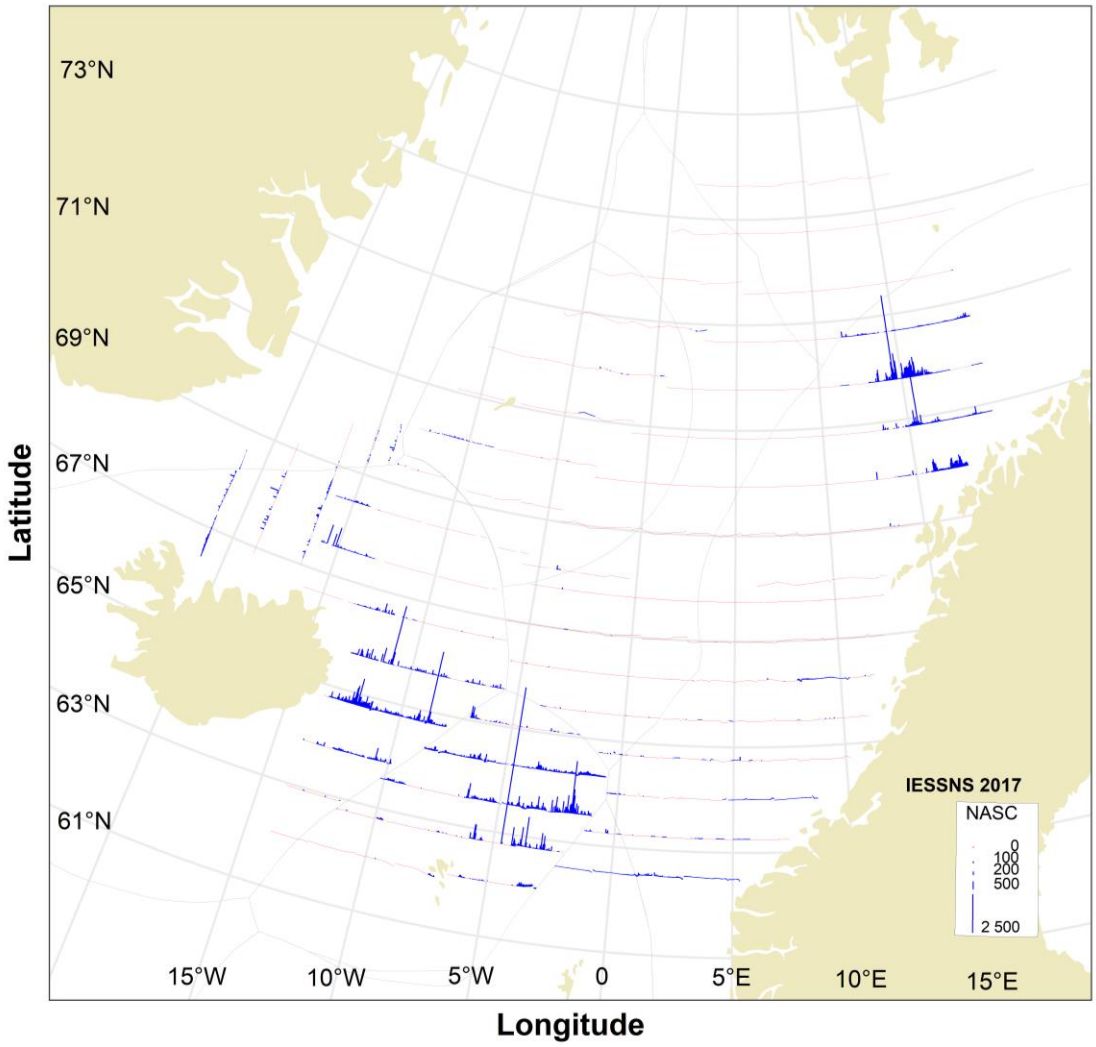


Figure 4.6.1. Distribution of adult NSSH in the Nordic Seas from the International ecosystem summer survey in the Nordic Seas (IESSNS) in July 2017.

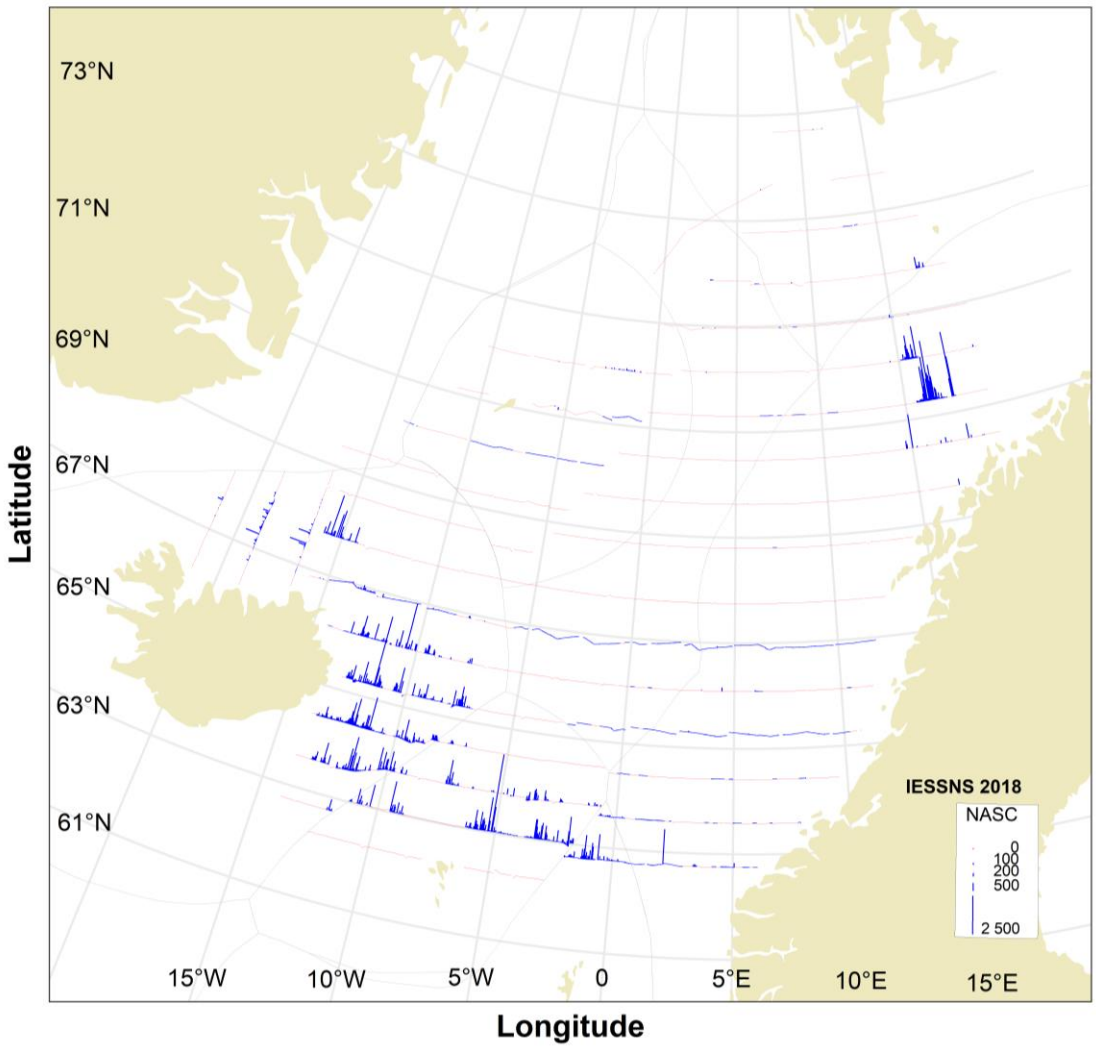


Figure 4.6.1. Distribution of adult NSSH in the Nordic Seas from the International ecosystem summer survey in the Nordic Seas (IESSNS) in July 2018.

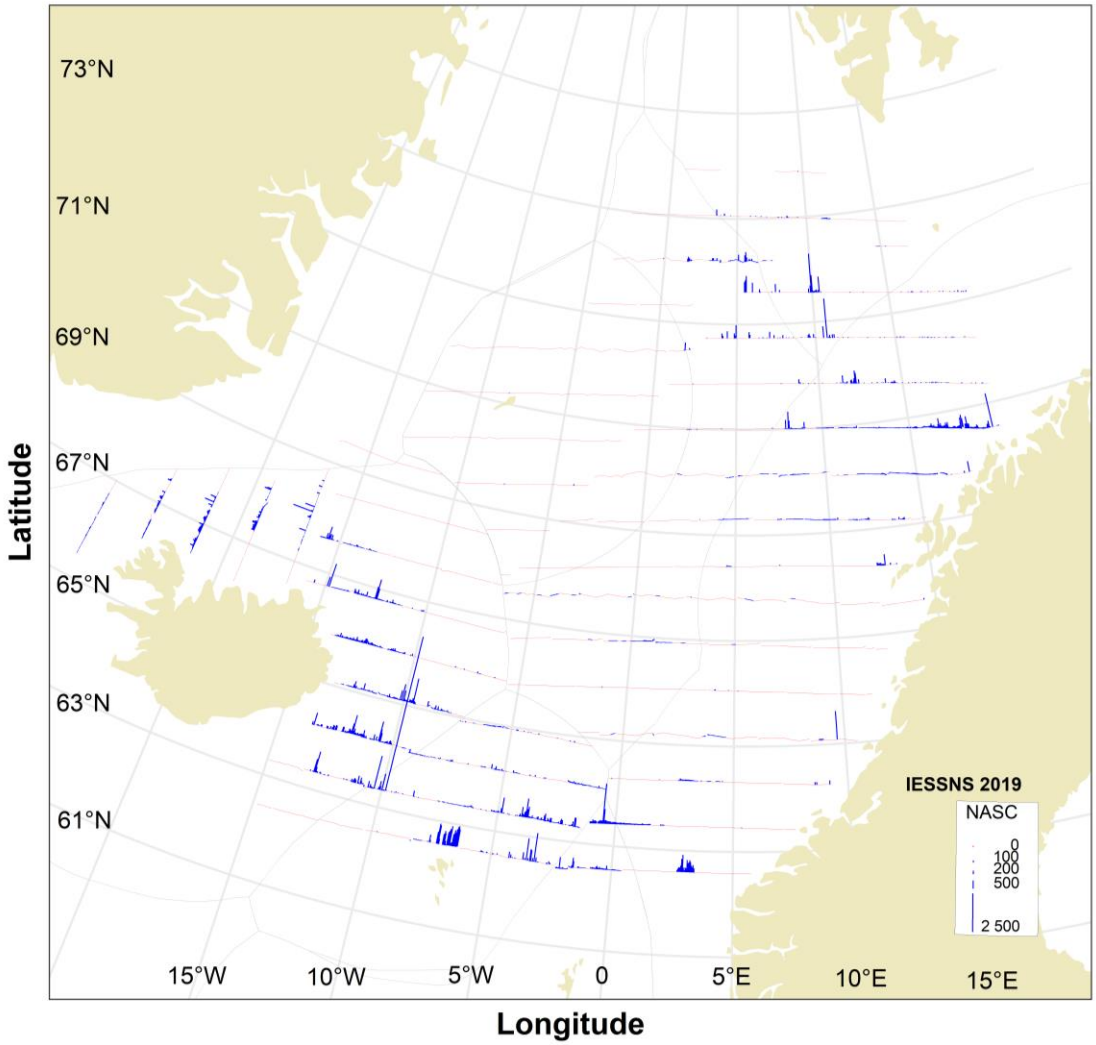


Figure 4.6.1. Distribution of adult NSSH in the Nordic Seas from the International ecosystem summer survey in the Nordic Seas (IESSNS) in July 2019.

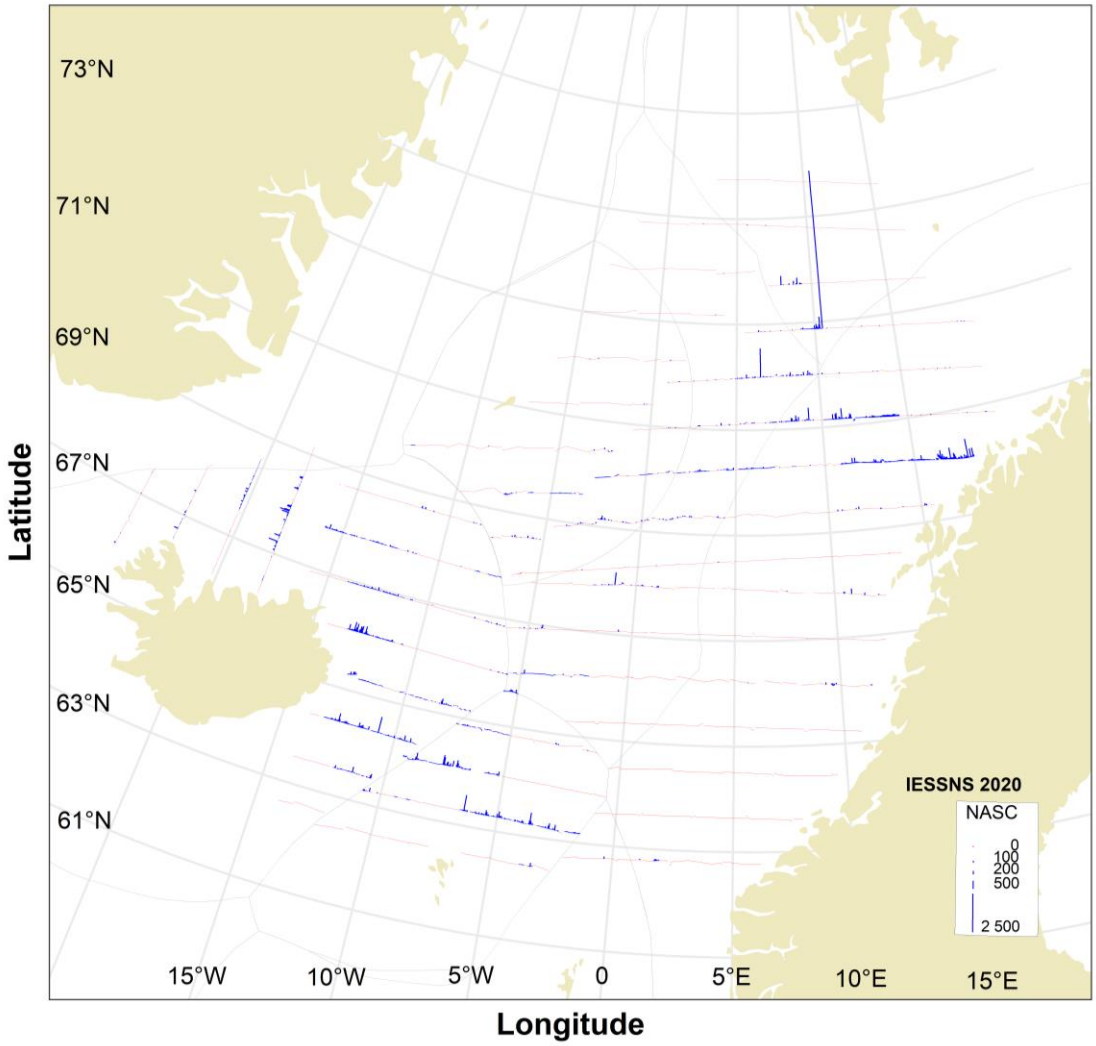


Figure 4.6.1. Distribution of adult NSSH in the Nordic Seas from the International ecosystem summer survey in the Nordic Seas (IESSNS) in July 2020.

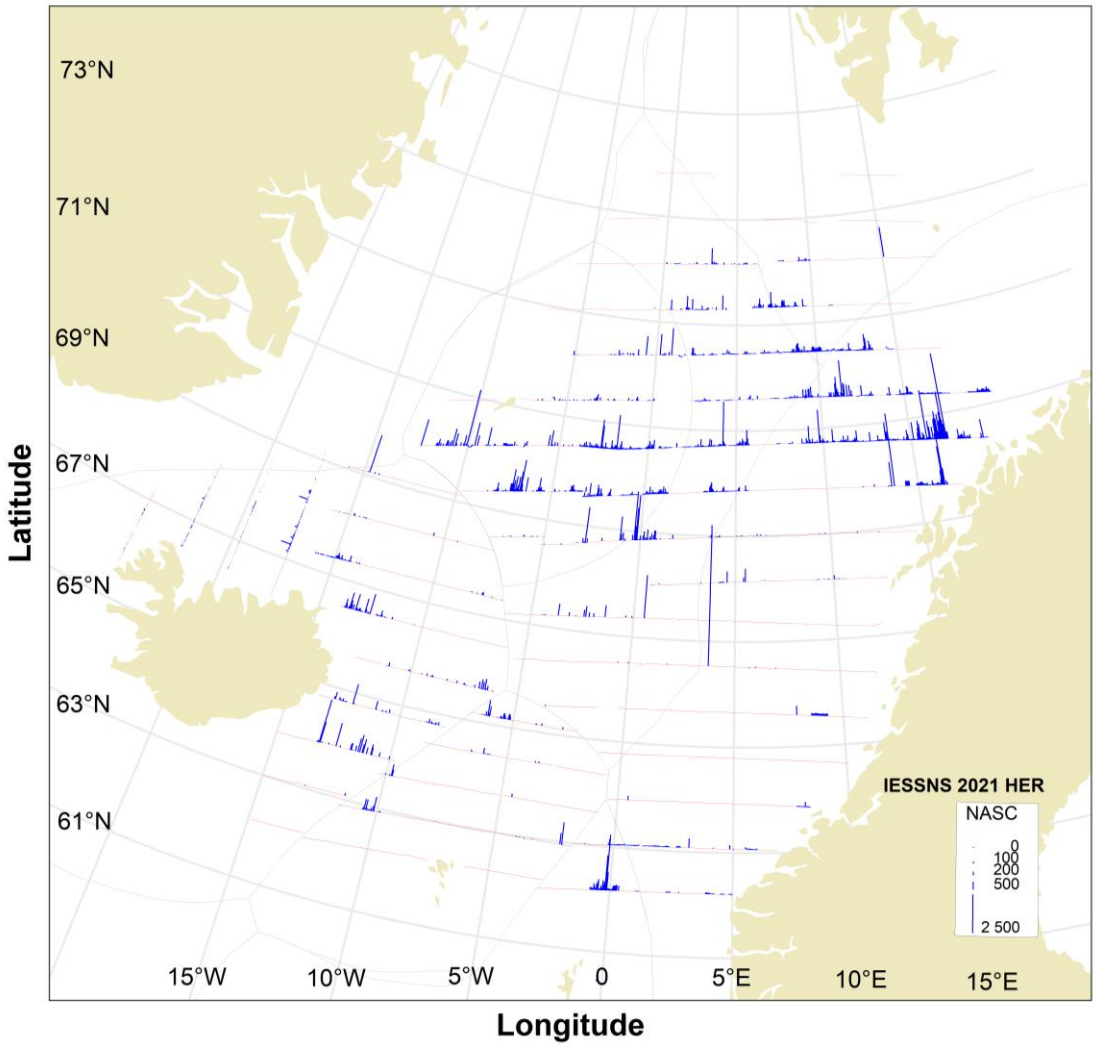


Figure 4.6.1. Distribution of adult NSSH in the Nordic Seas from the International ecosystem summer survey in the Nordic Seas (IESSNS) in July 2021.

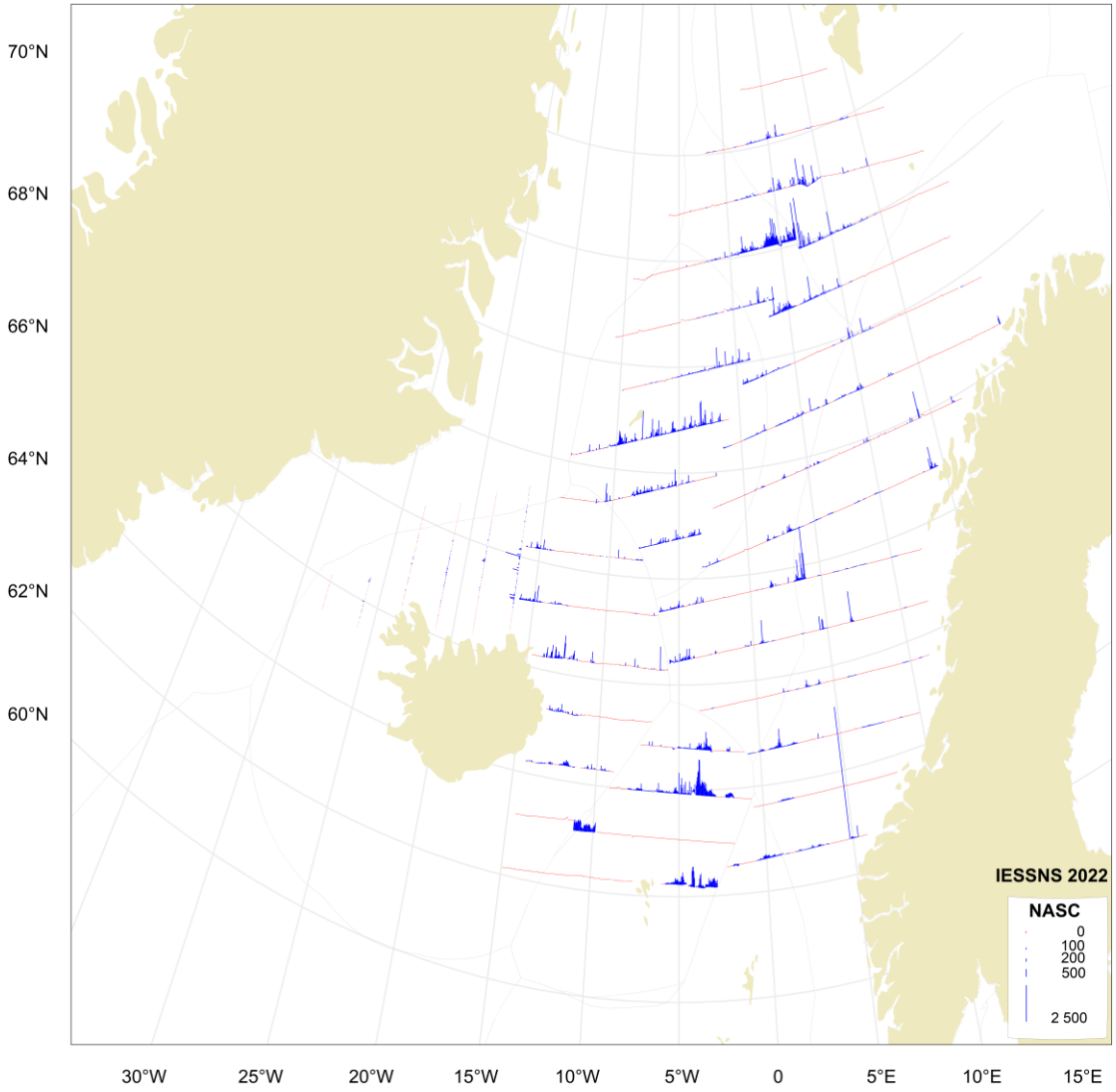


Figure 4.6.1. Distribution of adult NSSH in the Nordic Seas from the International ecosystem summer survey in the Nordic Seas (IESSNS) in July 2022.

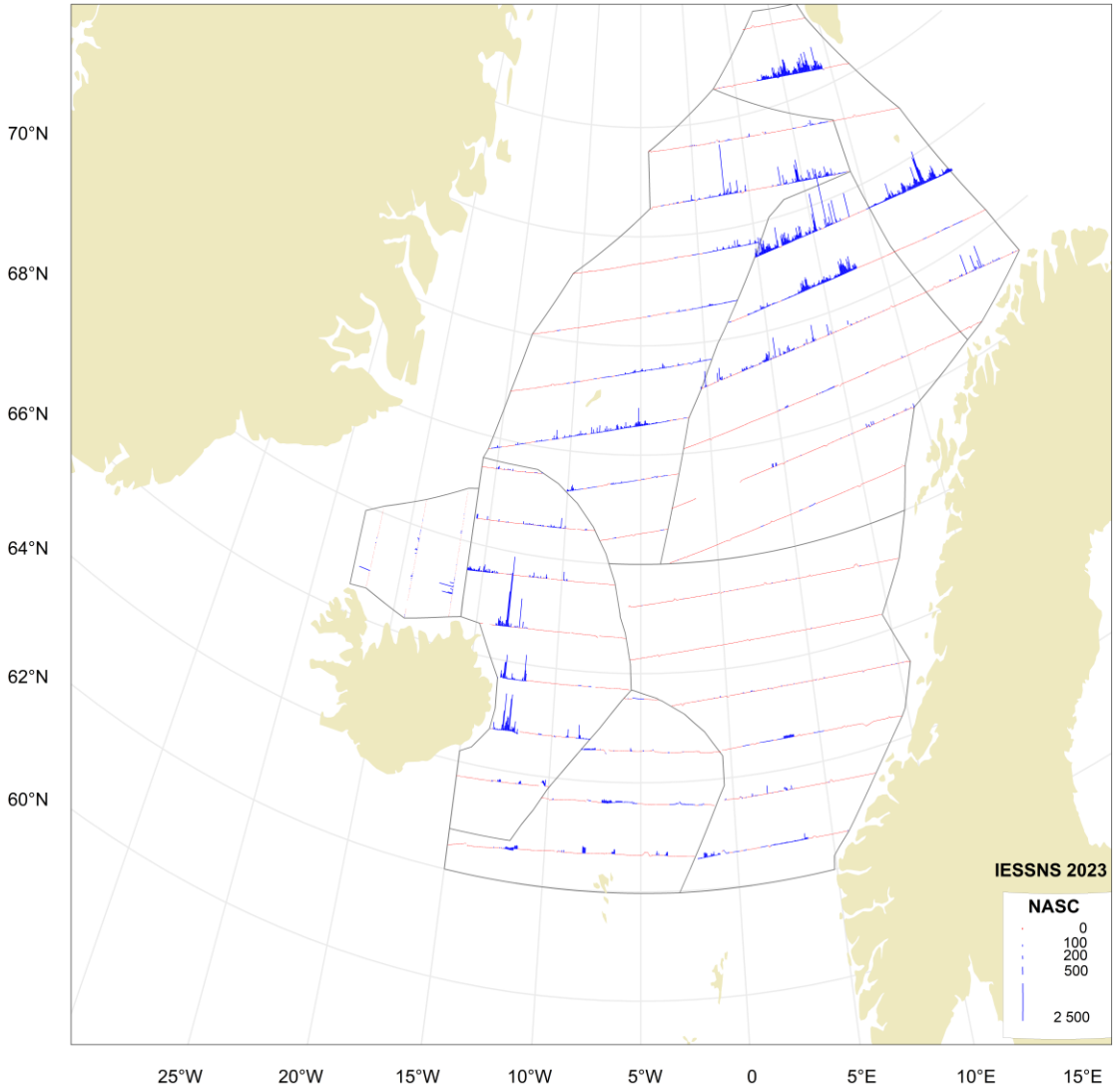


Figure 4.6.1. Distribution of adult NSSH in the Nordic Seas from the International ecosystem summer survey in the Nordic Seas (IESSNS) in July 2023.

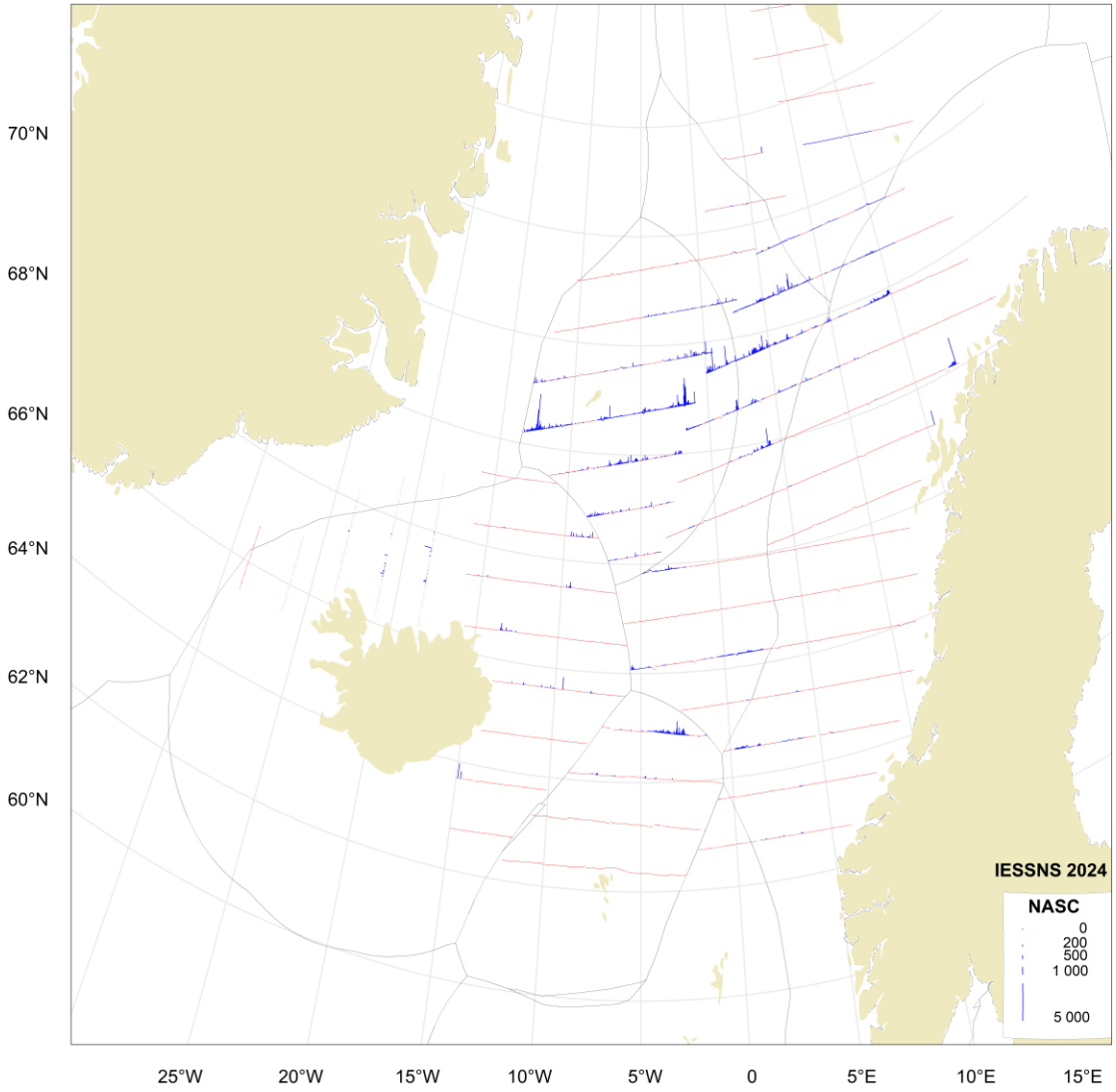


Figure 4.6.1. Distribution of adult NSSH in the Nordic Seas from the International ecosystem summer survey in the Nordic Seas (IESSNS) in July 2024.

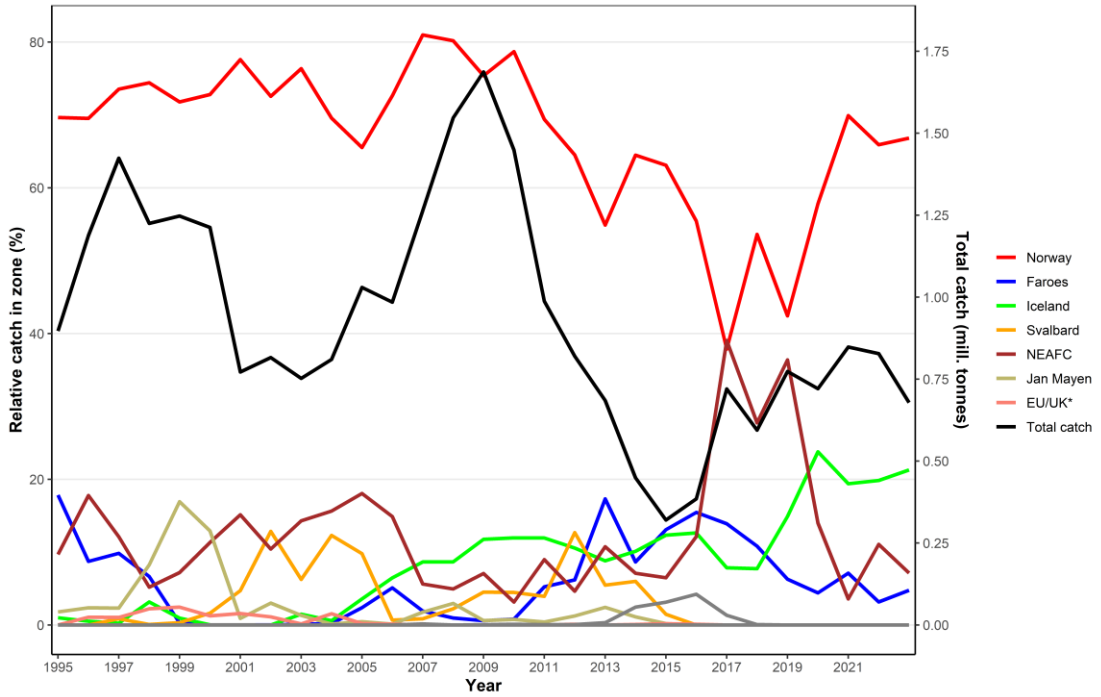


Figure 5.1.1. Relative catch by EEZs in the period 1995-2023.*Change from EU to UK EEZ from 2021.

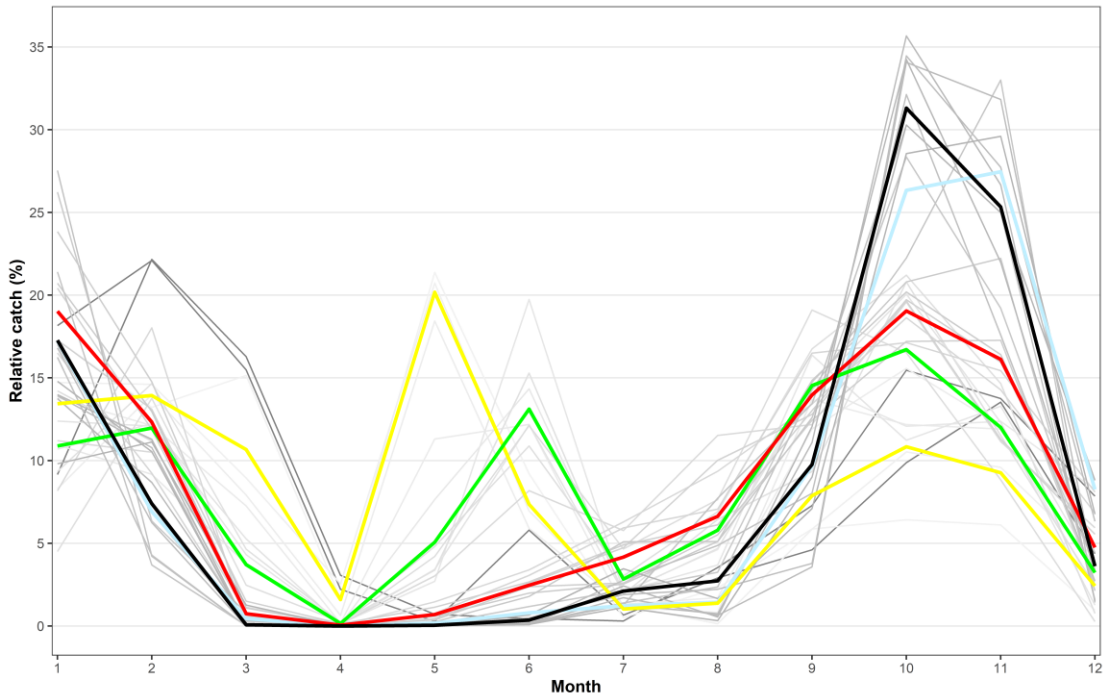


Figure 5.3.1. Relative catch per month for the years 1995-2023. The coloured bold lines are averages over different periods (yellow 1995-1997, green 1998-2005, red 2006-2012, and black 2013-2023).

Annexes

Annex 1 – Survey and catch tables from the 2014 report

Table A.1. Percentages of Norwegian spring spawning herring by zone from spawning ground survey in February/March (chapter 4.2). *= incomplete coverage. - = region not covered.

Year	Norway	Iceland	Russia	EU	Faroe Islands
1995	100	-	-	-	-
1996	100	-	-	-	-
1997	-	-	-	-	-
1998	100	-	-	-	-
1999	100	-	-	-	-
2000	100	-	-	-	-
2001	-	-	-	-	-
2002	-	-	-	-	-
2003	-	-	-	-	-
2004	-	-	-	-	-
2005	100	-	-	-	-
2006	100*	-	-	-	-
2007	100*	-	-	-	-
2008	100*	-	-	-	-
2009	-	-	-	-	-
2010	-	-	-	-	-
2011	-	-	-	-	-
2012	-	-	-	-	-
2013	-	-	-	-	-

Table A.2. Percentages of Norwegian spring spawning herring by zone from wintering survey in January (chapter 4.3). - = region not covered.

Year	**Norway**	**Iceland**	**Russia**	**EU**	**Faroe Islands**
1995	100	-	-	-	-
1996	100	-	-	-	-
1997	100	-	-	-	-
1998	100	-	-	-	-
1999	100	-	-	-	-
2000	-	-	-	-	-
2001	-	-	-	-	-
2002	-	-	-	-	-
2003	-	-	-	-	-
2004	-	-	-	-	-
2005	-	-	-	-	-
2006	-	-	-	-	-
2007	-	-	-	-	-
2008	-	-	-	-	-
2009	-	-	-	-	-
2010	-	-	-	-	-
2011	-	-	-	-	-
2012	-	-	-	-	-
2013	-	-	-	-	-

Table A.3. Percentages of Norwegian spring spawning herring larvae by zone from larval survey in March/April (chapter 4.4). *= incomplete coverage. - = region not covered.

Year	Norway	Iceland	Russia	EU	Faroe Islands
1995	100	-	-	-	-
1996	100	-	-	-	-
1997	100	-	-	-	-
1998	100	-	-	-	-
1999	100	-	-	-	-
2000	100	-	-	-	-
2001	100	-	-	-	-
2002	100	-	-	-	-
2003	100*	-	-	-	-
2004	100	-	-	-	-
2005	100	-	-	-	-
2006	100	-	-	-	-
2007	100*	-	-	-	-
2008	100	-	-	-	-
2009	100*	-	-	-	-
2010	100	-	-	-	-
2011	100	-	-	-	-
2012	100	-	-	-	-
2013	100	-	-	-	-

Table A.4. Percentages of Norwegian spring spawning herring juveniles by zone from International Ecosystem Survey in the Norwegian Sea (IESNS) in the Barents Sea in May (chapter 4.5). - = region not covered.

Year	Norway	Russia
1998	9.6	90.4
1999	-	-
2000	90.2	9.8
2001	97.8	2.2
2002	84.9	15.1
2003	-	-
2004	-	-
2005	83.4	16.6
2006	87.8	12.2
2007	98.8	1.2
2008	-	-
2009	99.6	0.4
2010	67.4	32.6
2011	66.3	33.7
2012	100.0	0.0
2013	95.8	4.2

Table A.5. Percentages of Norwegian spring spawning herring adults by zone from the International Ecosystem Survey in the Norwegian Sea (IESNS) in May (chapter 4.6).

Year	EU	Norway	Iceland	Svalbard	JanMayen	Faroes	InterNorwSea
1996	0.8	33.8	1.9	0.0	8.3	3.0	52.3
1997	0.8	42.8	0.0	0.0	0.3	3.4	52.6
1998	0.4	80.6	0.0	0.0	0.2	0.3	18.6
1999	0.0	44.9	0.0	0.0	7.7	0.0	47.3
2000	0.3	65.4	0.0	1.3	3.7	0.0	29.3
2001	0.0	56.5	0.0	2.8	5.3	0.2	35.2
2002	0.0	62.2	0.0	6.1	7.5	0.0	24.2
2003	0.0	49.9	1.2	10.8	11.8	5.1	21.3
2004	0.0	49.0	2.3	0.6	15.1	5.0	28.0
2005	0.0	49.1	7.5	2.2	2.6	15.0	23.6
2006	0.0	24.7	20.8	3.2	4.8	24.9	21.6
2007	0.4	31.1	20.5	0.8	2.0	16.2	29.0
2008	1.3	19.9	15.0	0.1	3.0	18.4	42.3
2009	2.3	26.6	15.7	0.0	6.8	10.9	37.8
2010	2.8	34.5	14.8	0.8	1.4	21.0	24.7
2011	3.0	31.2	8.9	0.2	2.4	19.6	34.7
2012	2.7	36.5	10.0	0.0	0.8	21.4	28.6
2013	1.2	30.5	9.8	0.0	3.1	23.5	31.9

Table A.6. Percentages of 0-group Norwegian spring spawning herring by zone from the Ecosystem Survey in the Barents Sea (chapter 4.8).

Year	Norway	Svalbard	InterBarSea	Russia	SpecialAreaBar
1995	72.1	18.5	3.4	6.0	0.0
1996	93.7	0.6	0.0	5.7	0.0
1998	68.2	4.3	0.4	26.8	0.4
1999	83.1	2.0	0.0	14.9	0.0
2000	99.6	0.1	0.0	0.3	0.0
2001	24.2	32.8	29.7	13.3	0.0
2002	42.9	17.6	0.2	39.3	0.0
2003	97.9	0.4	0.2	1.5	0.0
2004	78.1	7.3	1.0	12.8	0.9
2005	88.2	0.6	3.7	7.5	0.0
2006	74.4	1.4	0.3	23.8	0.2
2007	99.5	0.2	0.0	0.2	0.0
2008	78.0	5.1	3.9	13.1	0.0
2009	79.5	8.0	0.0	12.4	0.1
2010	80.3	1.4	4.3	14.0	0.0
2011	68.4	19.0	6.1	6.4	0.1
2012	96.8	1.5	0.0	1.7	0.0
2013	71.7	21.2	5.1	2.0	0.0

Table A.7. Percentages of Norwegian spring spawning herring juveniles by zone from the Ecosystem Survey in the Barents Sea in August/September (chapter 4.8). *= incomplete coverage.

Year	Norway	Svalbard	InterBarSea	InterNorwSea	Russia	SpecialAreaBar
1998*	0.0	0.0	0.0	0.0	100.0	0.0
1999*	3.3	0.0	0.5	0.0	96.2	0.0
2000*	0.0	0.0	1.1	0.0	98.9	0.0
2001*	0.0	0.0	0.4	0.0	99.6	0.0
2002*	0.0	52.7	0.0	0.0	47.3	0.0
2003*	62.2	0.0	0.2	0.0	37.5	0.0
2004	63.4	5.1	0.7	0.0	30.5	0.3
2005	37.2	11.7	2.7	20.7	27.7	0.1
2006	50.9	0.1	0.4	0.0	48.0	0.6
2007	3.0	0.0	0.0	0.0	97.0	0.0
2008	10.0	29.3	0.0	0.0	60.7	0.0
2009	54.3	43.7	0.0	0.0	2.0	0.0
2010	63.7	36.3	0.0	0.0	0.0	0.0
2011	71.3	0.0	0.0	0.0	28.7	0.0
2012	79.5	2.6	0.0	0.0	17.9	0.0
2013	21.4	0.0	0.9	0.0	77.7	0.0

Table A.8. Percentages of Norwegian spring spawning herring adults by zone from the International Ecosystem Summer Survey in the Norwegian Sea (IESSNS) in July (chapter 4.10). *= incomplete coverage.

Year	EU	Norway	Iceland	Svalbard	JanMayen	Greenland	Faroes	InterNorwSea
2009	0.2	25.9	23.5	4.1	21.7	0.2	9.7	14.8
2010	1.3	22.1	20.8	12.5	16.7	0.7	16.5	9.4
2011*	2.9	2.9	24.5	0.0	2.9	0.0	60.6	6.2
2012	3.8	7.0	35.3	0.1	10.5	0.0	36.6	6.6
2013	2.7	5.5	43.8	0.6	8.8	0.1	32.2	6.3

Table A.9. Percentages of Norwegian spring spawning herring adults by zone from spawning ground survey in November/December (chapter 4.12). *= incomplete coverage. - = region not covered.

Year	Norway	Iceland	Russia	EU	Faroe Islands
1995	100	-	-	-	-
1996	100	-	-	-	-
1997	100	-	-	-	-
1998	100	-	-	-	-
1999	100	-	-	-	-
2000	100	-	-	-	-
2001	100	-	-	-	-
2002	100*	-	-	-	-
2003	100*	-	-	-	-
2004	100*	-	-	-	-
2005	100*	-	-	-	-
2006	100*	-	-	-	-
2007	100*	-	-	-	-
2008	-	-	-	-	-
2009	-	-	-	-	-
2010	-	-	-	-	-
2011	-	-	-	-	-
2012	-	-	-	-	-
2013	-	-	-	-	-

Table A.10. Norwegian spring spawning herring catches - data availability and quality as used in the Coastal States Working Group report and in the database file.

Year	Denmark	Faroe Islands	France	Germany	Greenland	Iceland	Netherlands	Norway	Poland	Russia	Sweden	UK
1995								3		2		1
1996	1	1				1	2	3		2	1	1
1997	1	1	NA	2		1	2	3		2	1	1
1998	1	1	NA	2		1	2	3		2	1	1
1999	1	1		2		1	2	3		2	1	1
2000	1	1		2		1	2	3		2	1	1
2001	1	1		2		1	2	3		2	1	1
2002	1	1		2		1	2	3	4	2	1	1
2003	1	1		2		1	2	3		2	1	1
2004	1	1	NA	2		1	2	3	2	2	1	1
2005	1	1		2		1	2	3	2	2	1	
2006	1	1	NA	2		1	2	3	2	2	1	1
2007	1	1		2	4	1	2	3	2	2		1
2008	1	1		2	4	1	2	3		2		1
2009	1	1		2	4	1	2	3		2		1
2010	1	1		2	4	1	2	3		2		1
2011	1	1		2	4	1	2	3		2		1
2012	1	1		2	4	1	2	3		2		1

1= spatially disaggregated data (rectangles) on a monthly basis and derived from logbooks with zonal information
2= spatially disaggregated data (rectangles) on a monthly basis and derived from logbooks without zonal information
3= spatially disaggregated data (rectangles) on a monthly basis with zonal information and derived from sources other than logbooks
4= catch data, usually on an annual basis, assigned to arbitrary ICES rectangles
NA= no data available, but fishery

Table A.11. Norwegian spring spawning herring. Catch reported to the Coastal States Working Group as percentage of catch reported to WGWIDE. Coastal States WG catches are official catches, whereas WGWIDE catches are provided by scientists.

Year	CS WG 2014	WGWIDE	Comparison
1993	229,066	232,457	98.5 %
1994	498,420	479,228	104.0 %
1995	896,882	905,501	99.0 %
1996	1,187,992	1,220,283	97.4 %
1997	1,423,968	1,426,507	99.8 %
1998	1,225,097	1,223,131	100.2 %
1999	1,247,181	1,235,433	101.0 %
2000	1,212,631	1,207,201	100.4 %
2001	771,632	766,136	100.7 %
2002	813,544	807,795	100.7 %
2003	749,187	789,510	94.9 %
2004	805,594	794,066	101.5 %
2005	1,026,314	1,003,243	102.3 %
2006	968,223	968,958	99.9 %
2007	1,264,053	1,266,993	99.8 %
2008	1,546,513	1,545,656	100.1 %
2009	1,686,912	1,687,371	100.0 %
2010	1,447,340	1,457,015	99.3 %
2011	987,717	992,997	99.5 %
2012	818,960	826,000	99.1 %
Total	**20,807,226**	**20,835,481**	**99.9 %**

Table A.12. Catches (tonnes) of Norwegian spring spawning herring by zones for each year 1995-2012

EEZ / Year	EU	Faroes	Greenland	Iceland	Inter.Norw. Sea	Inter. West	Jan Mayen	Norway	Russia	Special area EU/FO	Svalbard	Total
1995	613	164,083		12,979	92,856		7,035	619,164	152			896,882
1996	10,495	101,757		1,759	221,691		29,381	822,893		16		1,187,992
1997	14,828	145,501		3,407	169,208		32,111	1,046,687	51	0	12,174	1,423,968
1998	29,463	85,235		42,157	68,986		96,021	903,216	0		19	1,225,097
1999	32,860	3,874	150	12,310	96,792		206,633	892,606	8	198	1,751	1,247,181
2000	15,369	14		400	145,793	1	150,566	881,187	181		19,121	1,212,631
2001	13,882	275			123,812	0	6,996	594,733	165		31,768	771,631
2002	10,029	130			86,459		24,558	595,213			97,155	813,544
2003	1,577	902		11,821	109,682	0	6,464	571,686	0		47,053	749,187
2004	12,226	1,078		5,425	134,529	0	653	556,846	0		94,836	805,594
2005	4,408	22,069		38,506	197,145		2,970	668,006	2	0	93,208	1,026,314
2006	1,134	51,295		62,999	138,474		163	707,448		10	6,700	968,223
2007	585	20,585	1,552	113,737	77,283	3	22,176	1,017,243	0		10,890	1,264,053
2008	20	10,932		139,289	82,216		45,557	1,235,768	25		32,705	1,546,513
2009	74	6,479		203,576	118,501		9,151	1,270,568			78,564	1,686,912
2010	257	12,914	155	173,194	46,106		10,657	1,141,051	1		63,004	1,447,340
2011	4	52,168		117,112	91,630		4,097	686,425	0		36,282	987,717
2012	2	53,734	162	85,800	36,541		10,161	527,358	0		105,200	818,960
Total	**147,825**	**733,024**	**2,019**	**1,024,473**	**2,037,704**	**5**	**665,351**	**14,738,099**	**587**	**224**	**730,429**	**20,079,739**

Table A.13. Catches (percentages) of Norwegian spring spawning herring by zones for each year 1995-2012

EEZ / Year	EU	Faroes	Greenland	Iceland	Inter.Norw. Sea	Inter. West	Jan Mayen	Norway	Russia	Special area EU/FO	Svalbard	Total
1995	0.07 %	18.29 %	0.00 %	1.45 %	10.35 %	0.00 %	0.78 %	69.04 %	0.02 %	0.00 %	0.00 %	**100.00 %**
1996	0.88 %	8.57 %	0.00 %	0.15 %	18.66 %	0.00 %	2.47 %	69.27 %	0.00 %	0.00 %	0.00 %	**100.00 %**
1997	1.04 %	10.22 %	0.00 %	0.24 %	11.88 %	0.00 %	2.26 %	73.50 %	0.00 %	0.00 %	0.85 %	**100.00 %**
1998	2.40 %	6.96 %	0.00 %	3.44 %	5.63 %	0.00 %	7.84 %	73.73 %	0.00 %	0.00 %	0.00 %	**100.00 %**
1999	2.63 %	0.31 %	0.01 %	0.99 %	7.76 %	0.00 %	16.57 %	71.57 %	0.00 %	0.02 %	0.14 %	**100.00 %**
2000	1.27 %	0.00 %	0.00 %	0.03 %	12.02 %	0.00 %	12.42 %	72.67 %	0.01 %	0.00 %	1.58 %	**100.00 %**
2001	1.80 %	0.04 %	0.00 %	0.00 %	16.05 %	0.00 %	0.91 %	77.07 %	0.02 %	0.00 %	4.12 %	**100.00 %**
2002	1.23 %	0.02 %	0.00 %	0.00 %	10.63 %	0.00 %	3.02 %	73.16 %	0.00 %	0.00 %	11.94 %	**100.00 %**
2003	0.21 %	0.12 %	0.00 %	1.58 %	14.64 %	0.00 %	0.86 %	76.31 %	0.00 %	0.00 %	6.28 %	**100.00 %**
2004	1.52 %	0.13 %	0.00 %	0.67 %	16.70 %	0.00 %	0.08 %	69.12 %	0.00 %	0.00 %	11.77 %	**100.00 %**
2005	0.43 %	2.15 %	0.00 %	3.75 %	19.21 %	0.00 %	0.29 %	65.09 %	0.00 %	0.00 %	9.08 %	**100.00 %**
2006	0.12 %	5.30 %	0.00 %	6.51 %	14.30 %	0.00 %	0.02 %	73.07 %	0.00 %	0.00 %	0.69 %	**100.00 %**
2007	0.05 %	1.63 %	0.12 %	9.00 %	6.11 %	0.00 %	1.75 %	80.47 %	0.00 %	0.00 %	0.86 %	**100.00 %**
2008	0.00 %	0.71 %	0.00 %	9.01 %	5.32 %	0.00 %	2.95 %	79.91 %	0.00 %	0.00 %	2.11 %	**100.00 %**
2009	0.00 %	0.38 %	0.00 %	12.07 %	7.02 %	0.00 %	0.54 %	75.32 %	0.00 %	0.00 %	4.66 %	**100.00 %**
2010	0.02 %	0.89 %	0.01 %	11.97 %	3.19 %	0.00 %	0.74 %	78.84 %	0.00 %	0.00 %	4.35 %	**100.00 %**
2011	0.00 %	5.28 %	0.00 %	11.86 %	9.28 %	0.00 %	0.41 %	69.50 %	0.00 %	0.00 %	3.67 %	**100.00 %**
2012	0.00 %	6.56 %	0.02 %	10.48 %	4.46 %	0.00 %	1.24 %	64.39 %	0.00 %	0.00 %	12.85 %	**100.00 %**
Total	**0.76 %**	**3.75 %**	**0.01 %**	**4.62 %**	**10.73 %**	**0.00 %**	**3.06 %**	**72.89 %**	**0.00 %**	**0.00 %**	**4.16 %**	**100.00 %**

Table A.14. Total catches (tonnes) of Norwegian spring spawning herring by country in each zone for the years 1995-2012

EEZ Country	EU	Faroes	Greenland	Iceland	Inter.Norw. Sea	Inter. West	Jan Mayen	Norway	Russia	Special area EU/FO	Svalbard	Total
Denmark	30,188	5,939			263,442			254,301				553,870
Faroe Island		228,513		72,965	228,554		54,731	353,100			67,887	1,005,751
Germany	27,390	2,065			34,988		1,820	43,289			38,531	148,083
Greenland		1,514	1,552		6,496			10,755			489	20,805
Iceland		395,480		945,735	826,795		497,959	192,685			172,863	3,031,517
Netherland	40,460	2,845	155	113	95,951		13,170	77,080			41,091	270,866
Norway	6	3,144		3,207	171,041		39,696	11,819,197			20,775	12,057,065
Poland	1,514	1			1,937			3,680		0	47	7,178
Russia	1,483	19,343	312	2,452	316,230	5	53,565	1,800,349	587	224	382,881	2,577,431
Sweden		1,095			86,399		2,108	28,756			5,865	124,223
UK	46,784	73,085			5,870		2,302	154,908				282,949
Total	**147,825**	**733,024**	**2,019**	**1,024,473**	**2,037,704**	**5**	**665,351**	**14,738,099**	**587**	**224**	**730,429**	**20,079,739**

Annex 2. Distribution of NSSH fishing per month and year

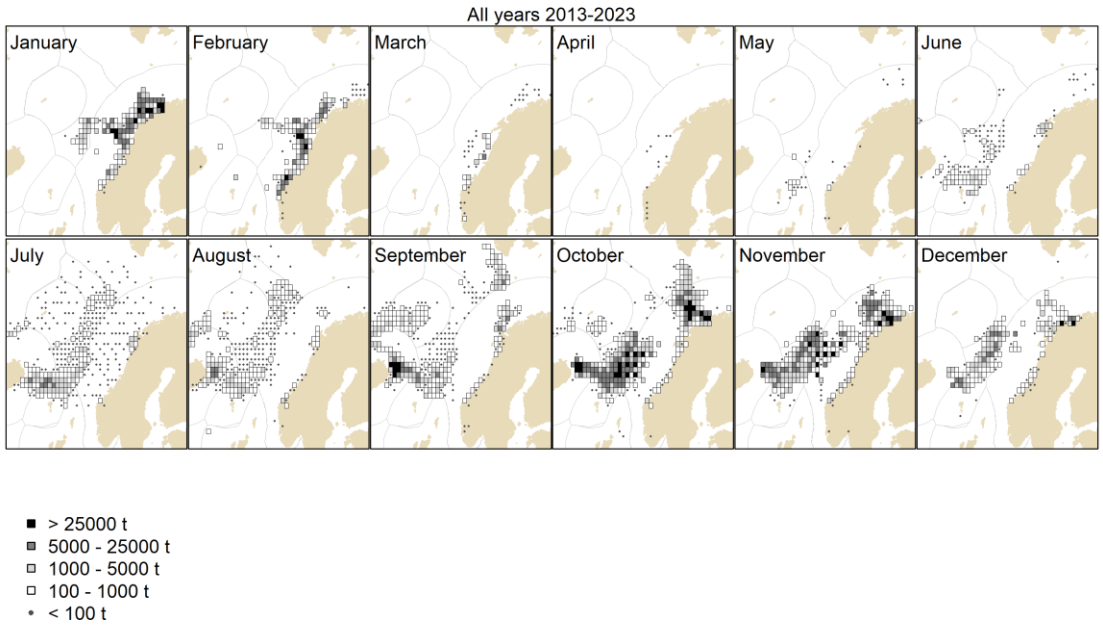


Figure A2.1. Total catches combined for years 2013-2023 by month.

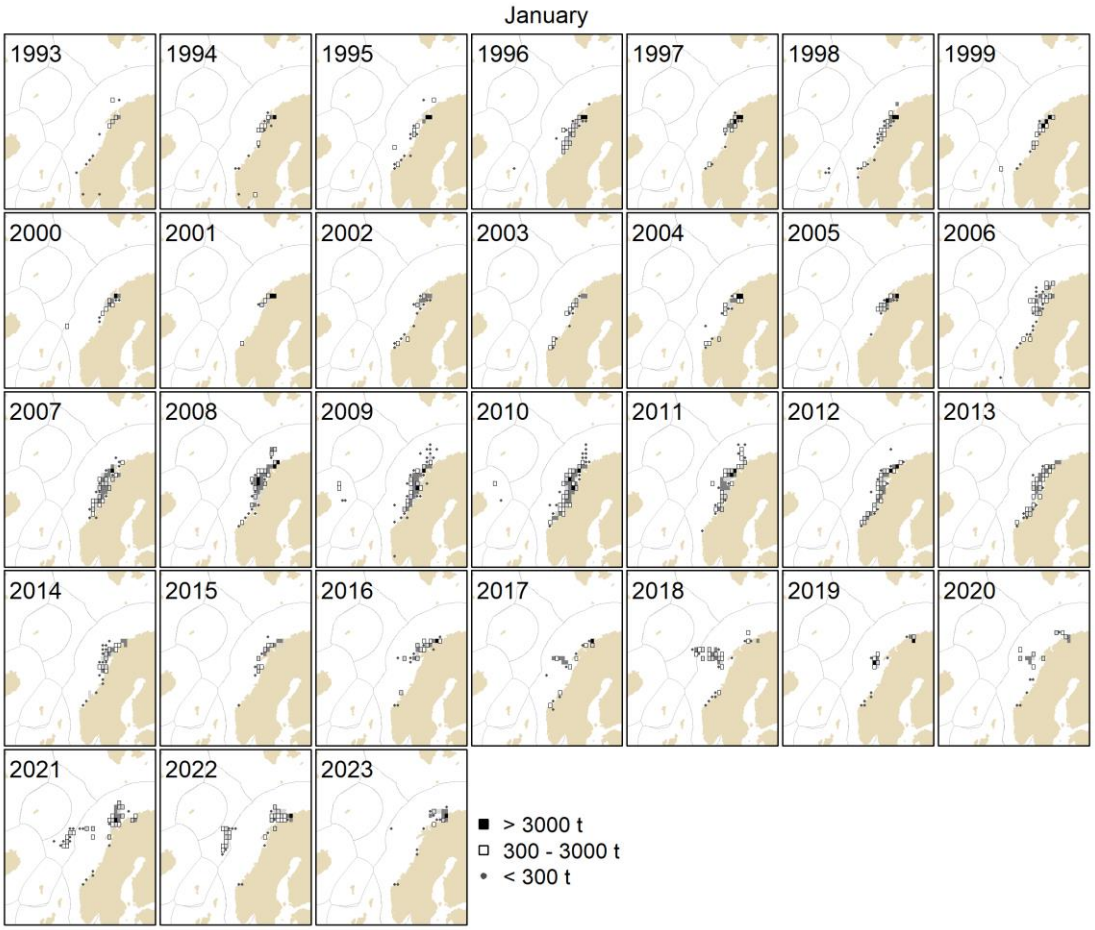


Figure A2.2. Total catches 1993-2023 in January.

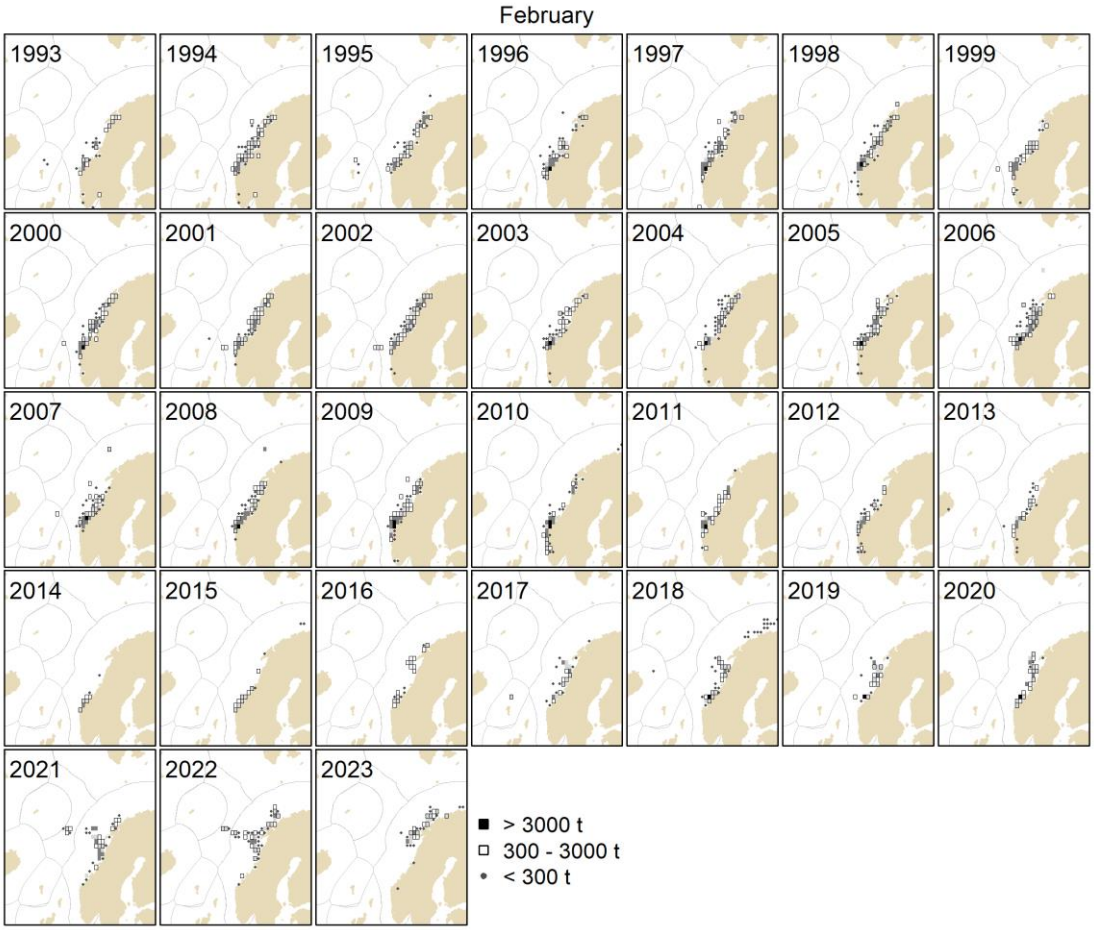


Figure A2.2. Total catches 1993-2023 in February.

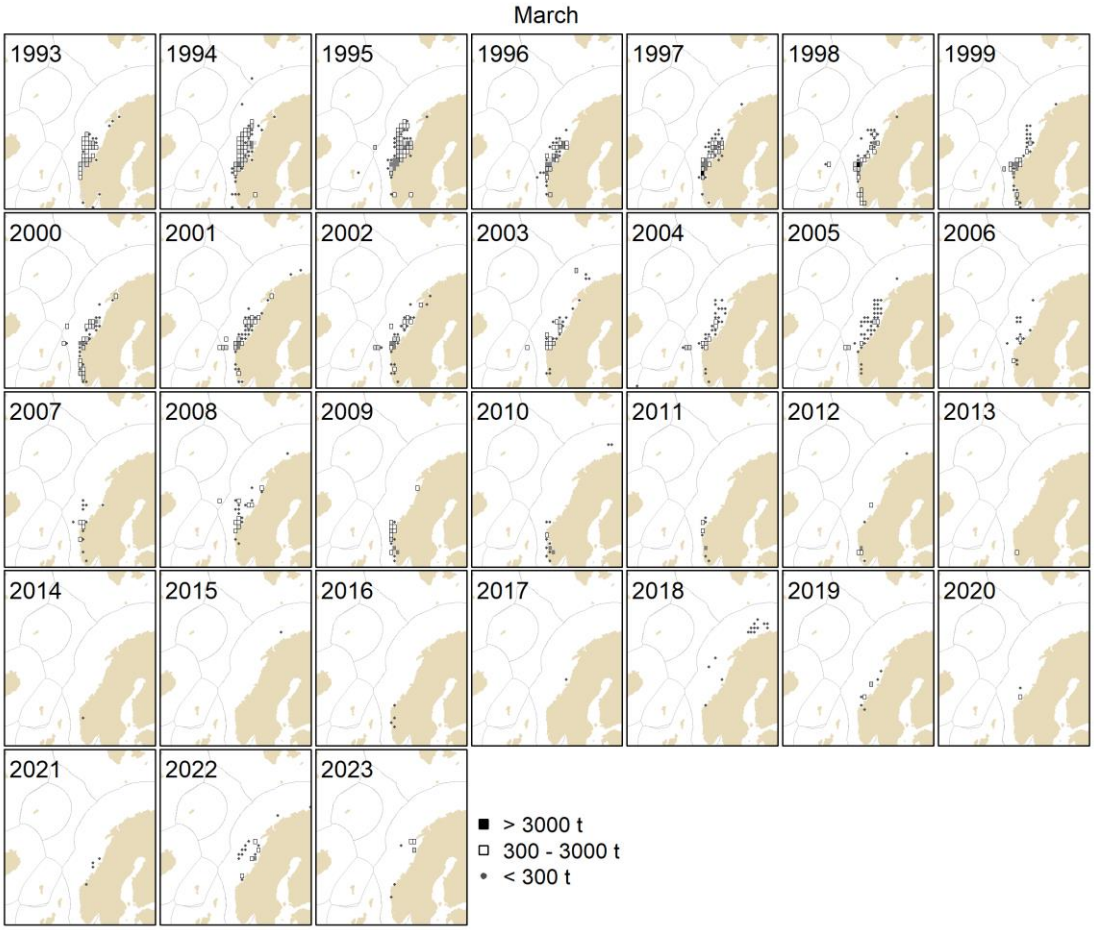


Figure A2.2. Total catches 1993-2023 in March.

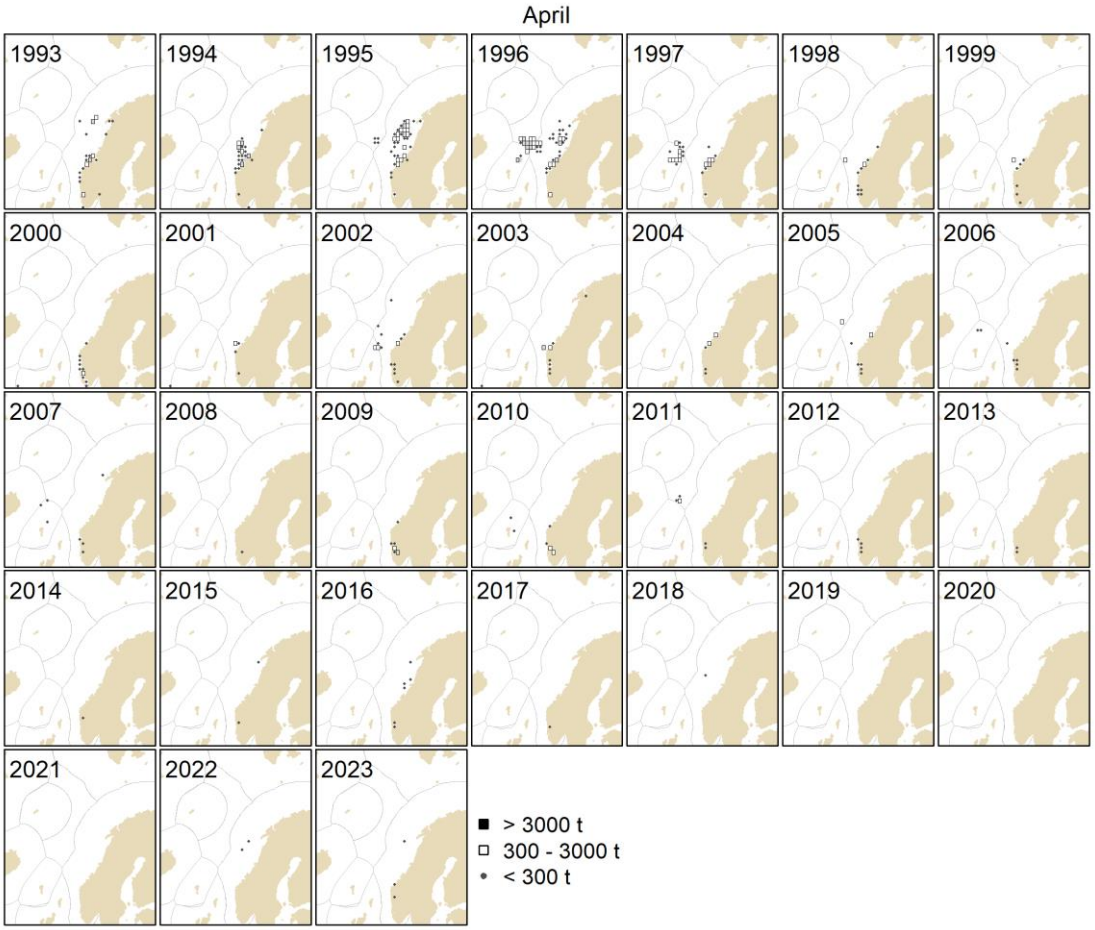


Figure A2.2. Total catches 1993-2023 in April.

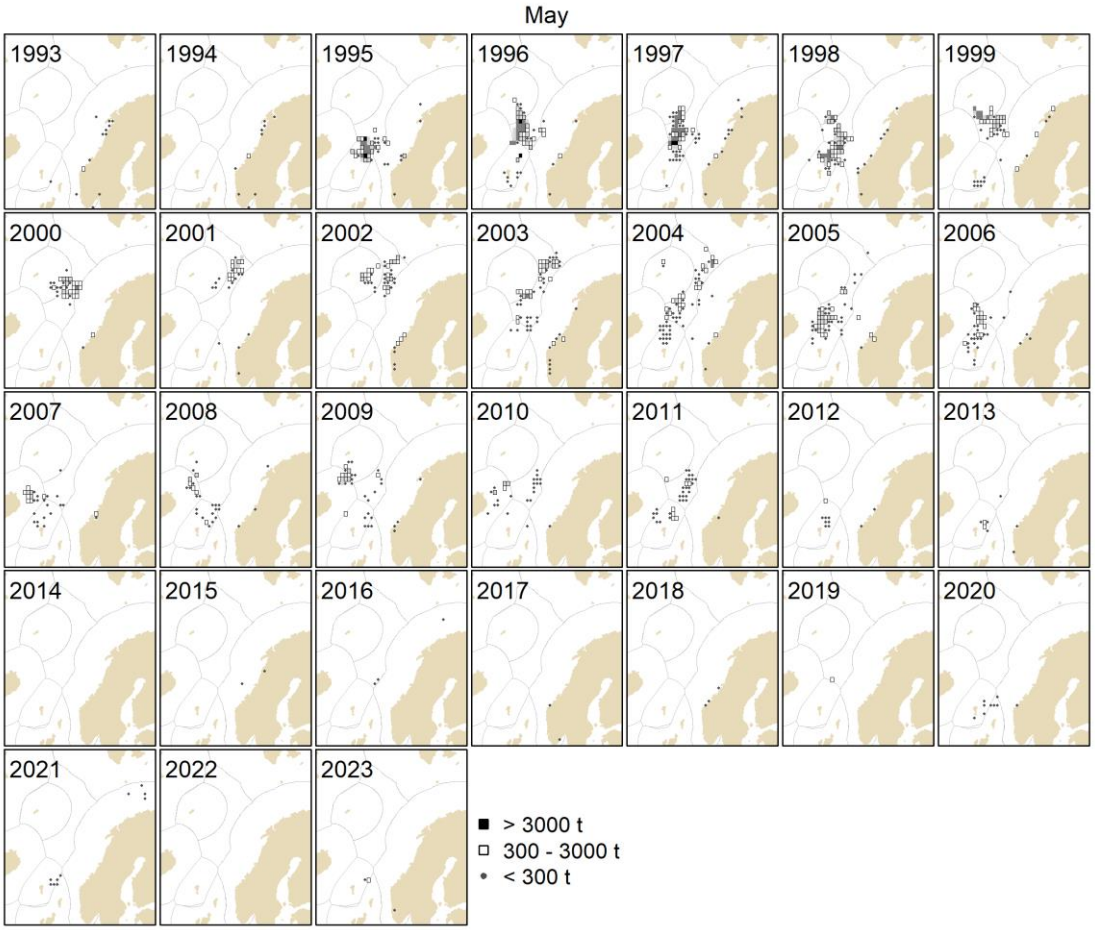


Figure A2.2. Total catches 1993-2023 in May.

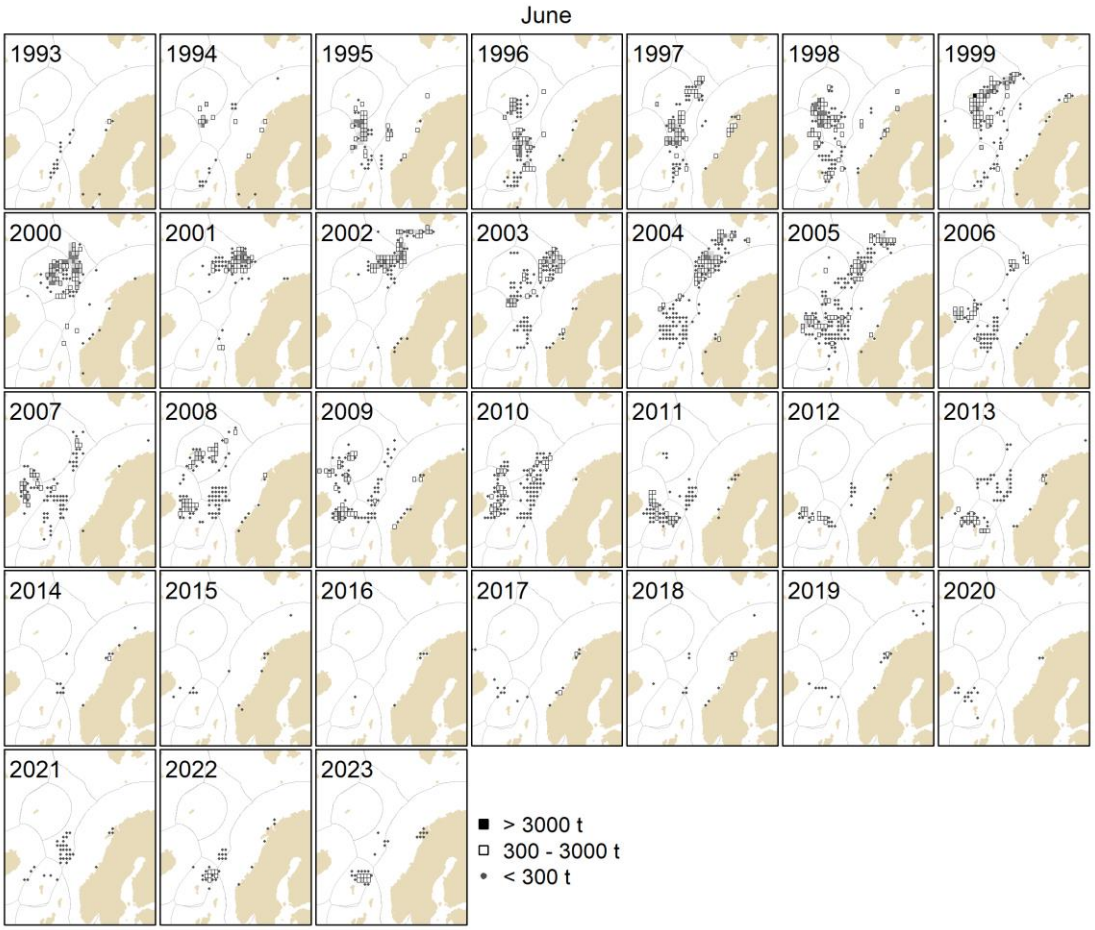


Figure A2.2. Total catches 1993-2023 in June.

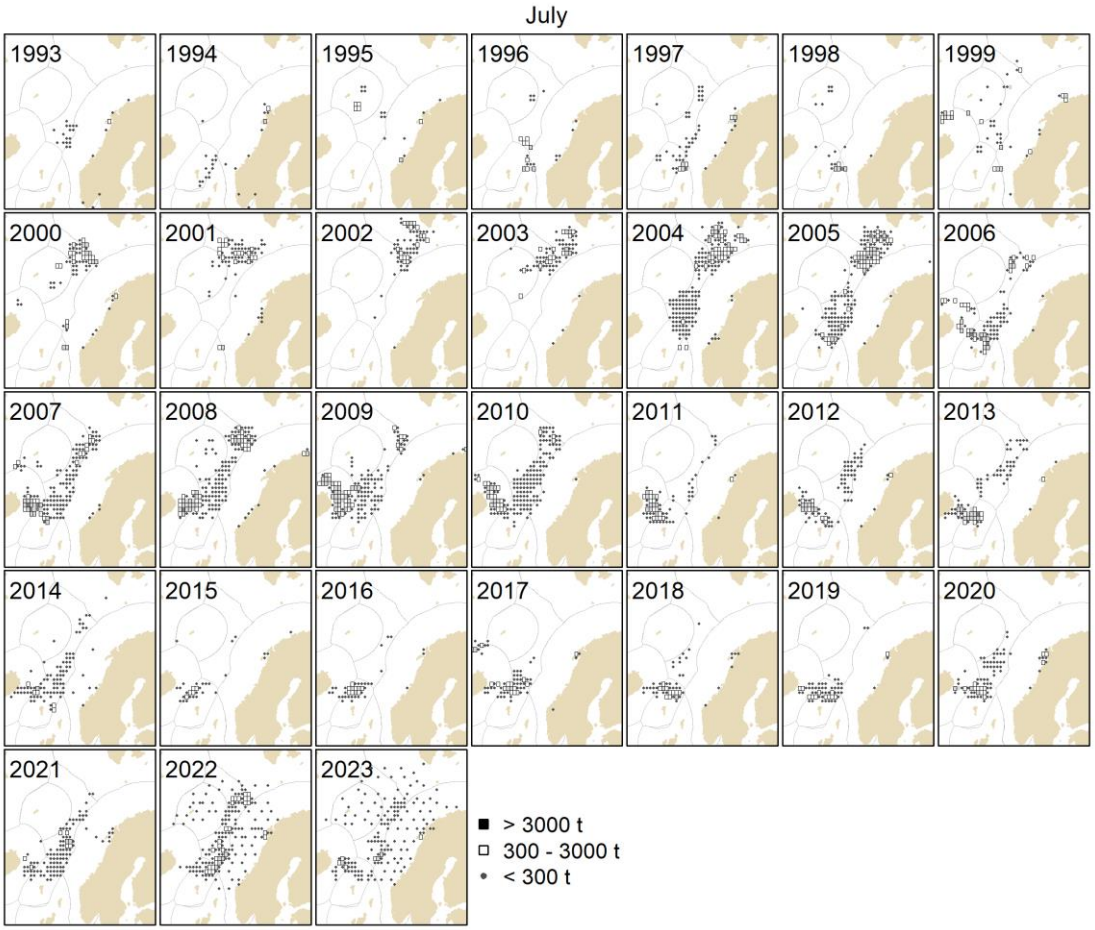


Figure A2.2. Total catches 1993-2023 in July.

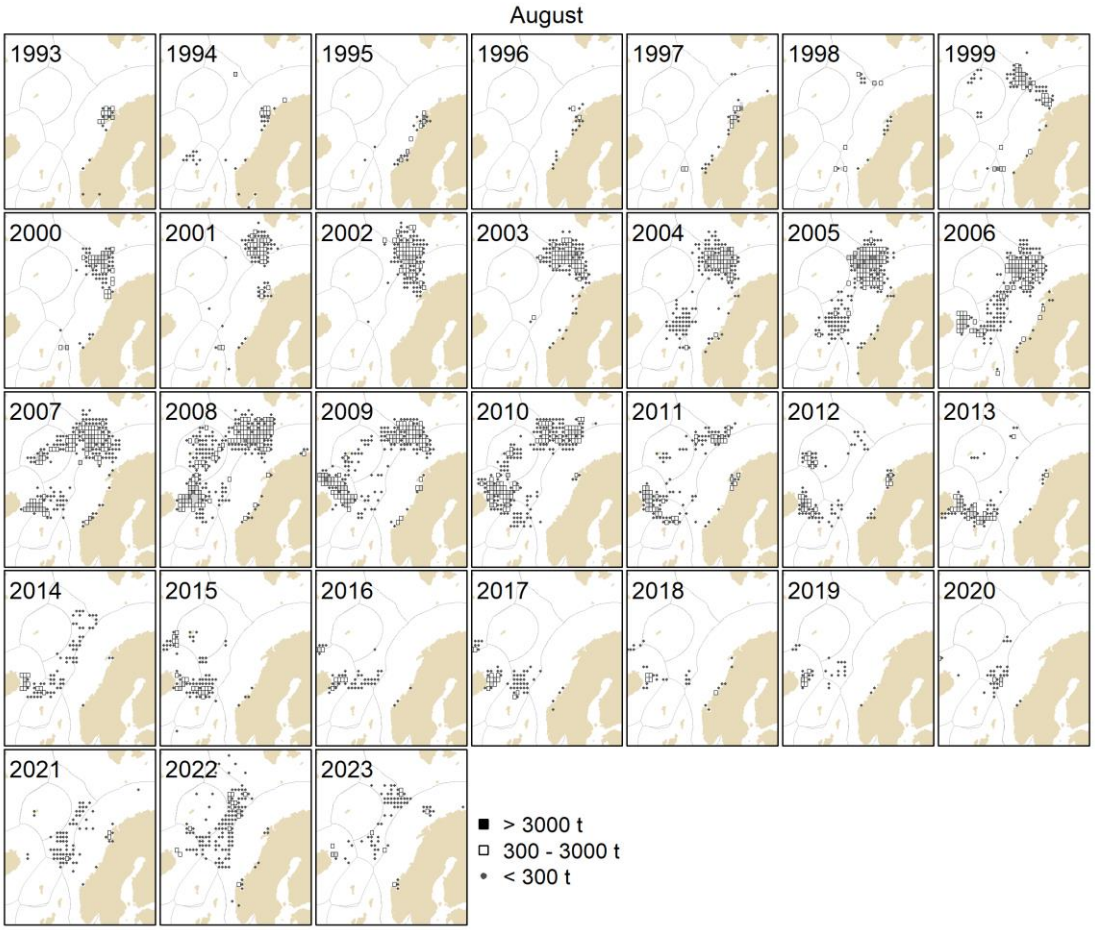


Figure A2.2. Total catches 1993-2023 in August.

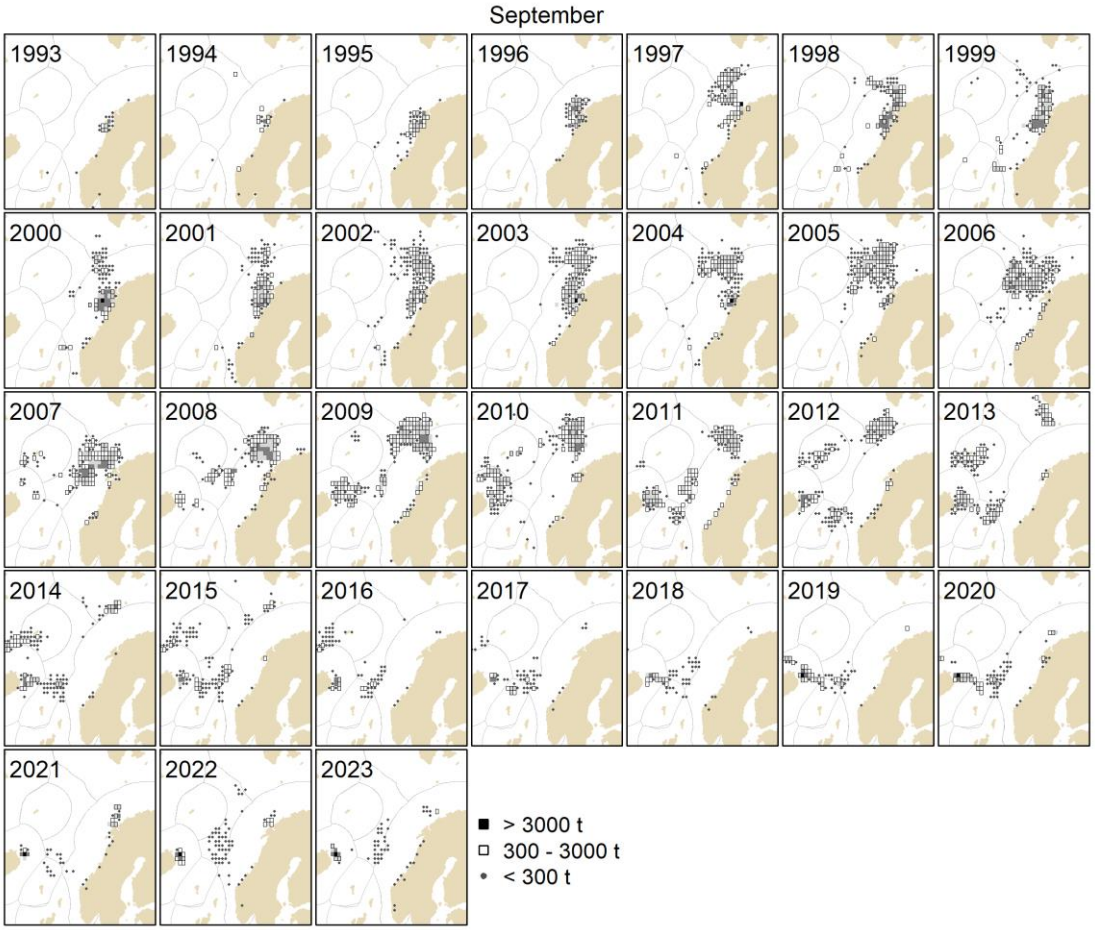


Figure A2.2. Total catches 1993-2023 in September.

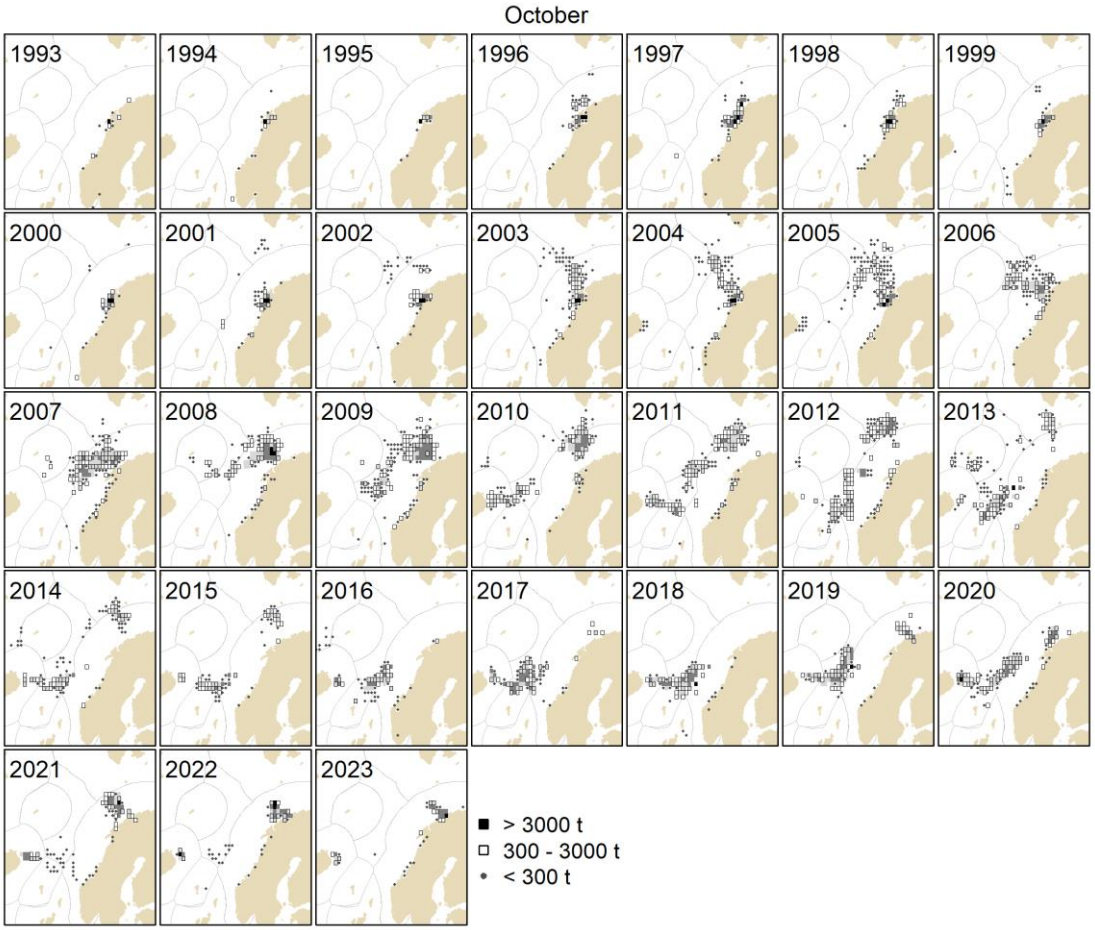


Figure A2.2. Total catches 1993-2023 in October.

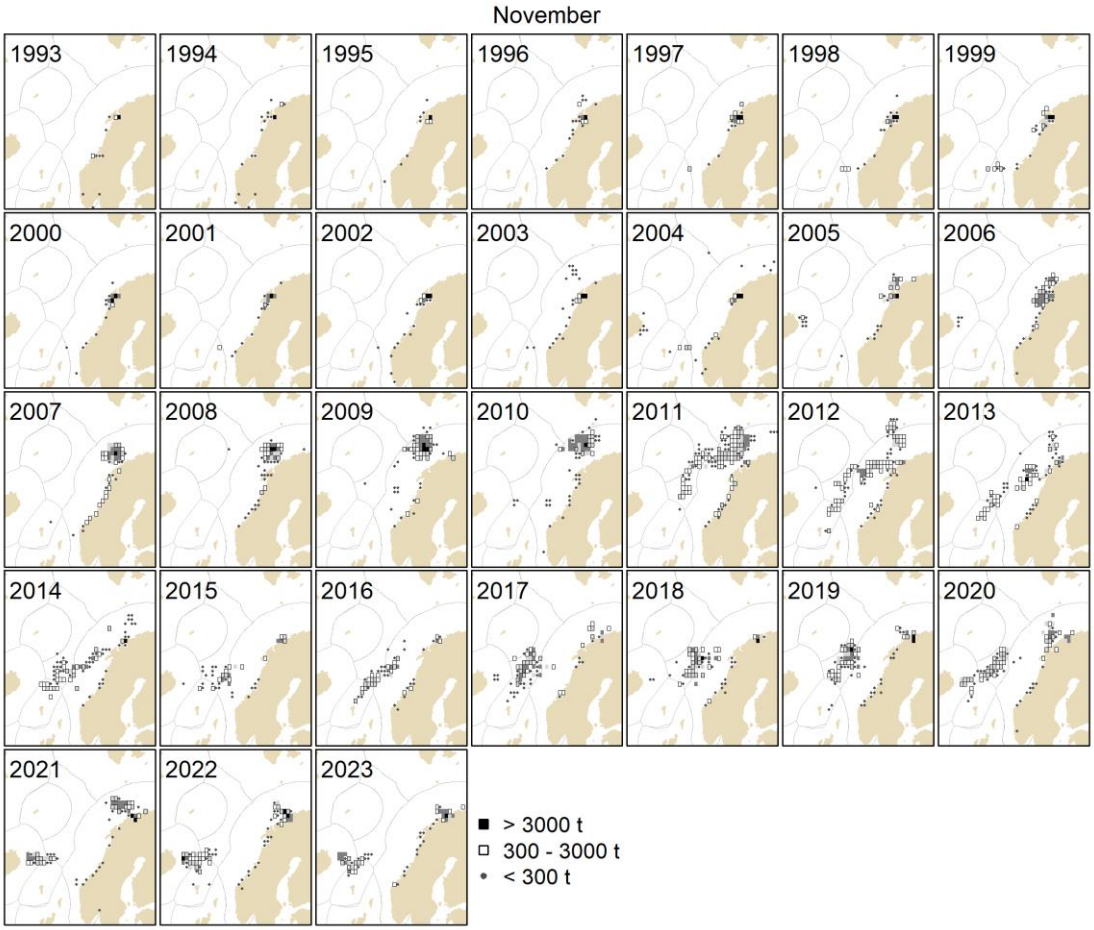


Figure A2.2. Total catches 1993-2023 in November.

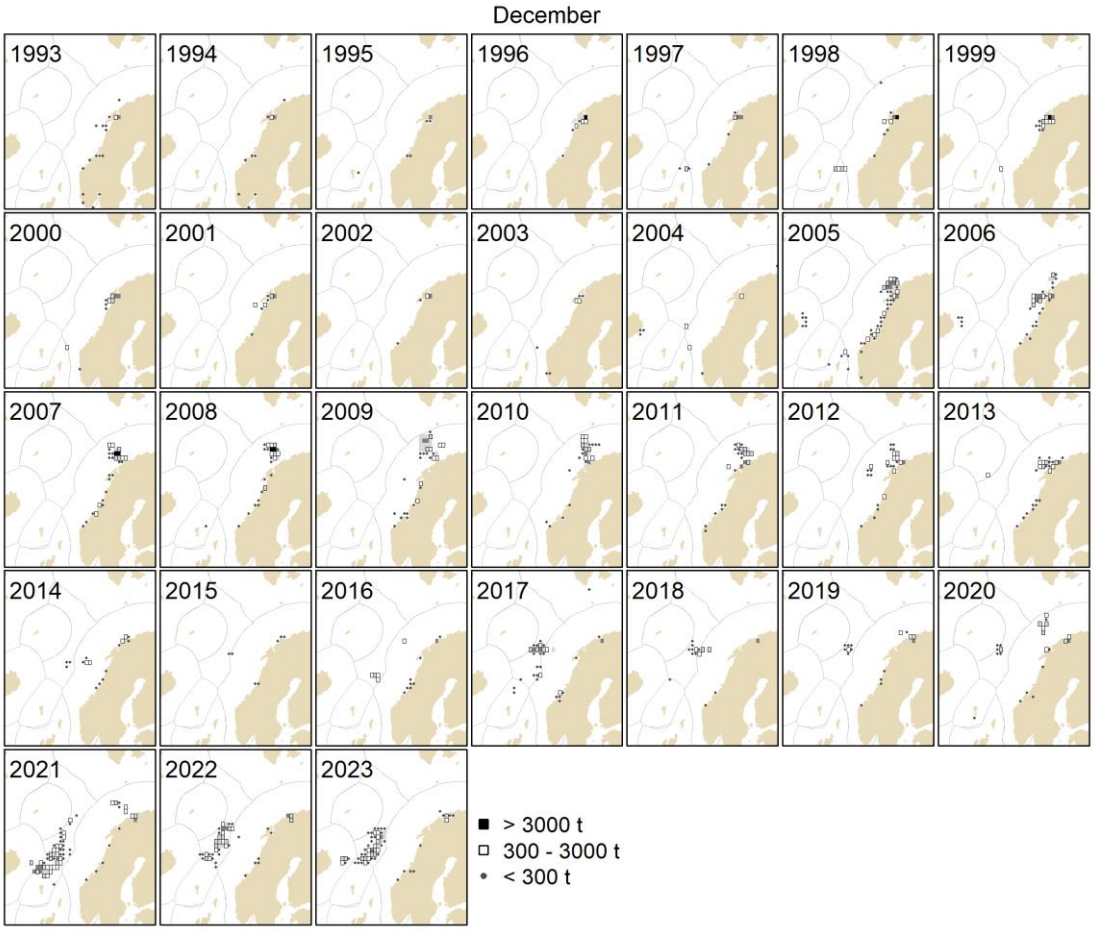


Figure A2.2. Total catches 1993-2023 in December.

Annex 3. Data call and formats

As stated in the agreed record in 2022 on management of Norwegian spring-spawning herring, the coastal States agreed to update the 'Report of the Coastal states Working Group on the distribution of Norwegian Spring Spawning Herring in the Northeast Atlantic and the Barents Sea in 2023, and the worked should be chaired by Iceland.

The survey data will be accessible from the survey groups -and those will be collected to update the survey tables. However, updating the catch data requires your attention now, and is the reason for this data call.

The participants from the different parties are therefore requested to provide information on their respective catches/by-catches of NSSH/ASH by ICES statistical squares and months and by exclusive economic zones (EEZs) and international waters for 2022 (see in details in the attached document). The participants are asked to provide this data by 1 June 2023.

This information should be submitted to Gudmundur Óskarsson (gjos@hafogvatn.is), which will be responsible for compiling the information and make it available for the participants.

The WG will aim for an online meeting in early autumn to finish the updated report. If anyone wants us to meet before then to clarify issues, please be in contact. Please inform Gudmundur of additional participant you think should be added.

Content of attached document:
Catch data by ICES statistical rectangle submission:

Catch data should be submitted in a text file with 7 columns:
year, species, country, ices_rect, month, catch, zone

It is important that:

- The columns are comma-separated
- The parameters are put in the file without any "
- The file is saved as .txt or .csv
- Only upper case letters are used

  Countries are indicated with the three letterscode (alpha-3 code, https://www.nationsonline.org/oneworld/country_code_list.htm). ***See separate designations for the United Kingdom at the bottom of the Table below.***
- Rectangle names are without spaces or hyphens
- Month is given in numbers: 1,2, ..., 12
- Landings/catches are given in tonnes (with three decimal places and use *point* as the decimal separator (not *coma*) e.g. 15000.123)
- Economic zones are given as three letter codes (see examples below)

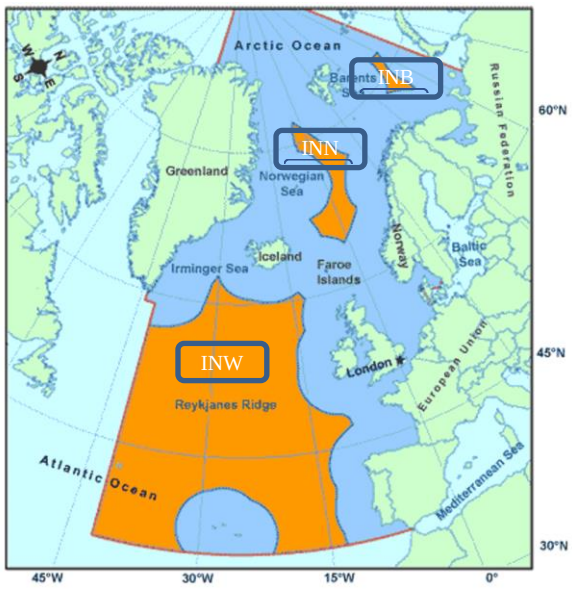
Example of submission file. (The first line is the header line):
year,species,country,ices_rect,month,catch, zone
2021,HER,DEU,55E8,3,99.000,IRL
2021,HER,DEU,55E8,4,4.210,IRL
2021,HER,DEU,55E9,4,54.321,IRL
(catch numbers given in the example do not correspond to true values)

From EEZ / MarineRegions:

Territory1	ISO_Ter1
International Barents Sea	INB
International North	INN
International West	INW
Belgium	BEL
Germany	DEU
Denmark	DNK
Spain	ESP
Alhucemas Islands	ESP
Perejil Island	ESP
Ceuta	ESP
Peñón de Vélez de la Gomera	ESP
Chafarinas Islands	ESP
France	FRA
Faeroe	FRO
United Kingdom*	GBR
Guernsey	GGY
Gibraltar	GIB
Greenland	GRL
Ireland	IRL
Iceland	ISL
Jersey	JEY
Netherlands	NLD
Norway	NOR
Poland	POL
Azores	PRT
Madeira	PRT
Portugal	PRT
Russia	RUS
Svalbard	SVA
Jan Mayen	SJM
Sweden	SWE

*Separate regions in the United Kingdom

UK/Scotland	UKS
UK/England	UKE
UK/Wales	UKW
UK/Northern Ireland	UKN


Arctic Ocean
Barents Sea
INB
INN
Greenland
Norwegian Sea
Russian Federation
Norway
Baltic Sea
Irminger Sea
Iceland
Faroe Islands
INW
Reykjanes Ridge
London
European Union
Atlantic Ocean
Mediterranean Sea
60°N
45°N
30°N
45°W
30°W
15°W
0°

Annex 4. List of participants

Åge Høines, Norway
Alexander I. Krysov, Russia
Erling Kåre Stenevik, Norway
Guðmundur J. Óskarsson, Iceland (chair)
Sigurvin Bjarnason, Iceland
Jan Arge Jacobsen, Faroe Island
Eydna í Homrum, Faroe Island
Søren Post, Greenland
Richard Nash, UK
Stanislovas Jonusas, EU Commission