Toktrapport/Havforskningsinstituttet/ISSN 1503 6294/Nr. 2 – 2014

Cruise report

Quarter 1 International Bottom Trawl Survey (IBTS Q1)

RV “GO Sars”, 14 January – 19 February 2014

Institute of Marine Research, Bergen / Flødevigen

March 2014

Internal SURVEY REPORT

IBTS Q1 2014
GO SARS, survey no. 2014101
Period: 14.01 – 19.02
Area: Northern North Sea between 56° 50′ N and 61° 50′ N

SUMMARY

The IBTS quarter 1 multispecies bottom trawl survey, coordinated by the ICES IBTS working group, involves 7 countries and covers the North Sea, Skagerrak, and Kattegat. The survey included MIK tows from water ≤ 200 m to provide an index of herring and sprat larvae, bottom trawls in water ≤ 200 m for multiple demersal fish and invertebrate species, and collection of hydrographical data. Also completed were the Utsira W hydrographic transect and MIK-M sampling for fish eggs and gadoid larvae. Guests included seabird observers from JNCC. This report includes a brief summary of only the Norwegian part of the survey. The report for all nations can be found at
http://www.ices.dk/sites/pub/Publication Reports/Expert Group Report/SSGESST/2014/Full Report IBTSWG14.pdf

INTRODUCTION

The IBTS (International Bottom Trawl Survey), coordinated by the ICES International Bottom Trawl Survey Working Group (IBTSWG), is a multi-species trawl survey within the ICES area. The main objectives of the survey are:

1) To determine the distribution and relative abundance of pre-recruits of the main commercial species with a view of deriving recruitment indices;
2) To monitor changes in the stocks of commercial fish species independently of commercial fisheries data;
3) To monitor the distribution and relative abundance of all fish species and selected invertebrates;
4) To collect data for the determination of biological parameters for selected species;
5) To collect hydrographical and environmental information;
6) To determine the abundance and distribution of late herring larvae (February North Sea survey).

Seven countries cooperated in the survey (Table 1). Two countries typically perform one bottom tow and two MIK tows per ICES rectangle, except for in the Skagerrak and Kattegat, where only Sweden surveys (Figure 1). The data from all countries is used to produce a combined age disaggregated abundance index for several demersal species for use in assessments, primarily WGNSSK (ICES Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak), the Herring Assessment Working Group (HAWG), and the Working Group on Multispecies Assessment Methods (WGSAM).

SURVEY DESCRIPTION

Personnel	Role	Period
Martin Dahl	Instrument	14.01-29.01
Ole Sverre Fossheim	Instrument	14.01-29.01
Anne Liv Johnsen	Pelagics	14.01-29.01
Lisbet Solbakken	Demersal	14.01-29.01
Arne Storaker	Demersal	14.01-29.01
Rupert Wienerroither	Demersal	14.01-19.02
Jennifer Devine	Survey leader	14.01-02.02
Arved Staby	Survey leader	02.02-19.02
Asgeir Steinsland	Instrument	29.01-19.02
Bjarte Kvinge	Instrument	29.01-19.02
Janicke Skadal	Demersal	29.01-13.02
Valantine Anthonypillai	Demersal	29.01-19.02
Jennifer Devine	Demersal	29.01-19.02
Ståle Kolbeinson	Pelagics	29.01-19.02
Richard Nash	Fish larvae	29.01-19.02
Lena Omli	Plankton	29.01-02.02
Mona Ring Kleiven	Plankton	29.01-02.02

Guests: JNCC, UK: 4 researchers.

Narrative

The vessel left port on 14 January and headed south. On route, a calibration for the MIK/MIK-M flow meters were performed in a sheltered, low current area (not open sea) at 20 m depth. Weather conditions were exceptionally poor.

This survey was to begin with trawl calibrations for at least two of the GOVs (those rigged on deck) and testing of the various sensors; however, the extremely poor weather and delays in beginning the survey meant this did not occur. Recommendations from the Fish Capture group were to begin without calibrations and make adjustments as needed because of the time constraints generated by the weather conditions. Standards on the GOV were lengthened to 2 m before setting the net. Clamps for holding the speed sensor to the headline were not on board, which meant the speed sensor was not used until the crew rigged an alternative.

On the first tow (16 January), the trawl eye was mounted on the headline, as specified by the manual (ICES 2012), but readings were odd. The trawl eye was moved off center, but still on headline for the second tow (17 January). Recommendations came from Fish Capture group to mount it behind the kite (as usual) and this was done for subsequent tows. This means that the trawl eye is above the ground rope and is used to determine whether the trawl remains in contact with the bottom, but does not give a true reading of the headline height of the trawl;

Norwegian headline height data is always lower than if it was mounted on the headline. A third tow was attempted despite degrading weather conditions, but there were problems with the sensors and the tow was declared invalid. The GO Sars picked up a CEFAS oceanographic buoy, which had broken from its mooring and was drifting north. The ship then headed for port (Hanstholm) due to major storm moving into area and an emergency drop off of one of the ship's crew.

21st January: Left Hanstholm after several days of high winds and a small delay for a crew replacement (second crew emergency). Aimed to be on station to begin towing 22nd January, attempting to align with pockets of low wind and wave height. Were able to begin trawling. Set up the fishlab so that three measuring stations were available for full biological sampling. New method of collecting otoliths, which needed only one individual per measuring station, was in place and running relatively smoothly.

24 January: Echosounder computer crashed, which caused all activities to cease; one drive to the computer failed completely and the backup was not recording properly. The system had to be backed up and rebuilt, which took until 16:00. System failed again as were about to shoot trawl gear. This failure, which was not easily fixable, and another major storm system moving into the area resulted in the vessel sailing to Stavanger for the crew shift change.

Only 7 trawl stations and no MIKs were completed on the first half of the survey due to a combination of weather, crew emergencies, and electronic difficulties.

Left Stavanger 29th January at 15:00 to begin the Utsira W hydrographic transect. Weather was too poor for Mocness tows, but all other sampling could take place until station 29; did not complete final 3 stations due to storm conditions. Were able to complete one GOV tow on the 30th, but several small issues with the gear (trawl eye sensor malfunctioning, wrong sweep lengths) resulted in hauling of the trawl for adjustments to the gear (including lengthening the sweeps to 110m for deep water); tow was completed. German vessel put out call for co-ordination with Norway and Scotland to work together to ensure the northern area (roundfish areas 1 and 2) had at least 1 GOV and 2 MIK samples per ICES rectangle. All IBTS survey vessels were struggling with the weather conditions.

Arrived in port in Lerwick on the 31st January at 19:00. Participants were able to tour the Scotia while in Lerwick and speak with their gear technician about different gear issues. Scotia staff also toured the GO Sars. Because of the rough ground around Shetland, which increases the chance of ripping the trawl, the rubber bobbins on the ground gear were packed tighter and the length of the adjustment chain was shortened to 1.8 m, based on recommendations from the gear technician onboard the Scotia. A new gear code was made to accommodate the 1.8 m standards + 110 m sweeps (3197).

Adverse weather meant the vessel did not leave Lerwick until 6th February at 09:30; the GO Sars managed to leave port well before the Scotia. One bottom trawl was performed in ICES rectangle 49F0, but the trawl displayed varying and low headline height. The trawl master

noticed the sweeps were uneven when shooting the trawl the following day; wires of mismatched lengths had accidentally been loaded on the spare pallet. MIK tows were able to be taken.

Trawl height was low for the next four tows. An additional 6 floats were added to the headline. This increased headline height approximately 30–40 cm. After 3 trawl tows, an additional 2 floats were added to the headline, for a total of 68 floats. Several days were lost to bad weather conditions; however, other IBTS vessels were trawling in the same area at this time (e.g., Germany, Scotland).

The vessel had to make a call into Haugesund on February 12th due to a science staff emergency; storm conditions meant the vessel remained in port until the 14th.

Trawling and MIKing resumed on the 14th, but with variable weather conditions causing delays. No tows were able to be taken in ICES rectangle 51F2; previously trawled positions were no longer accessible due to new oil drilling activities. Bottom trawling ceased on the evening of the 18th. A MIK calibration of the flow meters was performed and the final MIK stations were taken. As the vessel sailed to Bergen, an additional 2 MIK/MIK-M tows were taken; these were not part of the IBTS data. The vessel arrived in port in Bergen at 07:30 on the 19th February.

Norway was not able to complete its survey area; 8 out of 40 rectangles were left without bottom trawls and 14 out of 40 were unsampled with MIKs.

Survey protocol: problems and changes

Many problems arose with S2D. Several bugs were found and program updates/fixes were made throughout the survey period; however, there was close collaboration with those on shore regarding issues and fixes. The GO Sars server needed rebooting three times.

For most ICES rectangles, the protocol changes implemented in 2013 were followed. Tows were placed at least 10 n. mi. within a rectangle. The amount of area less than 200 m is restricted in ICES rectangles 50F3 and 49F3. Bottom tows were closer to the border (within 5 n. mi.) and the requirement that MIKs must be 10 n. mi. apart had to be relaxed.

ICES rectangle 51F2 can no longer be sampled due to the installation of a new oil platform on the old trawl station. There is no longer any area without oil infrastructure left for towing in this rectangle. This has been raised at the 2014 IBTS working group; *the agreement was that the Norway will try to sample this rectangle in Q3, but if it is not samplable, there is little that can be done.*

Clustering of MIK samples has been an issue in previous years and while attempts were made to avoid this, weather conditions and/or oil platform locations often foiled efforts to spread MIK activity. A list of potential MIK stations will be supplied to the bridge for future surveys to avoid this issue.

Gear issues

The winch typically used for the MIK wire was occupied by fiber optic cable (winch 108), which meant that a winch along the side of the vessel (on the 1st deck) had to be used (winch 107). The placement of this secondary winch meant that the large crane had to be used to set and retrieve the MIK off the back of the vessel. Because of this setup, fewer MIK stations were completed than would have been possible with the old setup. The gear also had to be modified (short bridles) to use the new setup.

Prior to the survey, some of the trawls were measured and inspected. For tows at depths of 70 m and less, the GOV trawl with short sweeps was used; long sweeps were used otherwise. This is standard procedure on this survey. There was a small error in the loading of the spare wire for extending sweep lengths; uneven lengths were left on the pallet, which meant the trawl was rigged improperly for deep tows. The error was caught and corrected after 2 tows.

The length of the standards was 2 m and adjustments were to be made if the trawl did not appear to be operating properly. The length was not adjusted for shallow water (< 70 m) stations or the first station at > 70 m depth because doorspread and headline height appeared to be within the typical range for the Norwegian gear; however, there were some issues with the trawl eye (and therefore headline height information) for the first 10 tows. Standard length was adjusted to 1.8 m after station 9 for the gear with 110 m sweeps based on the recommendations from the gear technician at Marine Scotland (1.8 m would allow for the trawling in rough bottom areas, e.g., areas near Shetland, with less chance of snagging/ripping the trawl).

Scanmar trawl eye manual (p. 23, Scanmar 2007) has info on how to reset where the trawl eye looks for the groundrope; settings should be: Gain 5. Ftrp: 38. Bott: 22, Satt 4m +- 2m.

The MIK must be strapped down rough weather to avoid damage to the MIK-M frames (ears) and flow meters.

Necessary gear for future IBTS surveys: bottom contact sensor, wingspread sensors, a small CTD that can be attached to the net, and three fully operational work stations in the wetlab (2 for demersal sampling, 1 for pelagic; requires a coarse and fine weight scale at each measuring board).

Biological sampling

Total weight was recorded for the entire catch. Sub-sampling of the smaller species (e.g., Norway pout, American plaice, common dab, benthos) was done when the catch of these species was larger than 10 kg.

The number of samples was reduced from previous years because budget cuts meant reduced manning on the survey. Instead of 2 samples per 1 cm, 2 samples per 2 cm were taken for haddock, whiting, hake, plaice, and witch flounder, 2 per 1 cm for Norway pout, and (as in

previous years) 5 per 5 cm for saithe. All cod were sampled for full biologicals in previous years; this was reduced to 2 per 2 cm length class. As in previous years, herring and mackerel were sampled for full biologicals when more than 30 individuals were captured; otherwise, only length and weight measurements were taken. Samples were collected on up to 100 individuals per station per species for species where full biologicals were sampled, otherwise, length-only measurements on up to 50 individuals were recorded.

Sampling protocol was discussed at the 2014 IBTSWG and sampling must be 2 samples per 1 cm length class for haddock, whiting, hake, plaice, and witch flounder. Most countries sample all cod, but the minimum is 2 samples per 1 cm length class. The goal is to have 8 samples per cm per roundfish area.

In previous years, alternate sampling of haddock and whiting was common procedure; this practice has been discontinued. Haddock and whiting were sampled on every tow.

Full biological sampling was not done on every tow for Norway pout, but every few hauls. This species is found throughout the entire survey area in high abundance, but typically has very few age classes. This sampling strategy was approved prior to sailing by the person responsible for the Norway pout assessment and will be reviewed before the IBTS Q3 survey.

Length, weight, and sex were recorded for all elasmobranchs. *The IBTSWG pointed out that this is the minimum for elasmobranches; maturity status, which can also be obtained externally for males, must also be obtained.* Carapace length and sex was recorded for *Nephrops norvegicus* and 2 crab species, *Cancer pagurus* and *Lithodes maja*.

Catch of benthos was also registered in the database. Since a taxonomist was on board, most benthos could be identified to species with confidence in the results. Benthos cannot be used for quantitative studies due to the nature of collection (e.g., bottom trawl). Work was continued on a benthic identification manual.

A change in biological sampling was trialed. Previously, 2 people were required at each work station, one to measure the fish, the other to collect otoliths and record information on the otolith packet. This is impractical for this survey given the sampling demands coupled with budget restrictions. Two types of trays with numbered wells to hold otoliths were trialed during sampling; the smaller tray with deeper wells (24 in total) was deemed easier to use and a better fit for the space near the measuring board. This meant one person could work each measuring board and take full biological on all required species, which resulted in processing stations faster, without skipping species. Otoliths were added to packets (fish id only) at the close of the tow. Six errors were found: otoliths did not match fish length for two stations for saithe and one for haddock, one station of whiting otoliths were lost, and 2 stations with whiting had missing otoliths. Most errors were able to be rectified afterwards by comparison with age-length data from all stations. Given the small amount of errors, the use of the tray was not a failure; however, there are still a few small issues to resolve (e.g., lack of biological data on otolith packets for readers).

Marine litter was recorded as per IBTS protocol and included type, description, size category, weight, and presence of attached organisms.

Other requests:

1. Collection of Sepiolidae for identification to species level, which were mailed to NCB Naturalis, the Netherlands.
2. Stomach samples and/or gallbladder stage for hake. Internal IMR request: Arved Staby.
3. Gonad samples from saithe. Internal IMR request: Jane Godiksen.
4. Plaice – whole fish. NIFES, Bergen.
5. Number, weight, and identification (or samples for later identification) of all jellyfish and salps from the GOV and MIK. Interal IMR request: Tone Falkenhaug.
6. Water sample from 10 m depth at every CTD station associated with a bottom tow, preserved with Lugol's solution. Samples sent to Hamburg, Germany.
7. Barnacle parasites from velvet belly lanternsharks. Henrik Glenner, UiB.

RESULTS AND DISCUSSION

Adverse weather conditions, several staff emergencies, and an echosounder system failure meant the survey area was not completed; eight out of 40 rectangles were not sampled by bottom trawls and 14 out of 40 were unsampled with MIKs (Table 2, Figure 2). The Utsira W transect was not completed; weather was too severe to operate the Mocness and deteriorating conditions resulted in omission of the final 3 stations (Table 3, Figure 3).

Table 4 contain the preliminary results of the MIK sampling. Herring larvae were most abundant east of Shetland and along the northeastern North Sea shelf boundary (Figure 4).

Sixty-two CTDs were taken, 29 on the hydrographic transect and the rest as part of the IBTS survey (Figure 3). Waters were likely well mixed due to the extreme weather and sustained wind conditions from the southwest experienced during the survey. CTD data were used to create an isosurface plot of temperature at 10 m depth, which showed warmer water temperatures to the south and west and cooler zones along the Norwegian trench (Figure 5).

Table 5 contains information on the amount of length and age (or length and sex) material collected for the main species. For the pelagic species (herring, mackerel), 305 otoliths were collected and aged. For the eight required demersal species, 1807 otoliths were collected, of which, 1517 were aged (5 species).

Figures 5-13 show the catch in weight and by numbers for cod, whiting, haddock, saithe, Norway pout, plaice, herring, mackerel, and ling. Catches of cod (Fig. 5), whiting (Fig. 6), and haddock (Fig. 7) were highest in the northern part of the Norwegian survey area. Large cod and haddock were found over most of the area (Fig. 5, 7), while large whiting were found mainly in the north or along the shelf edge (Fig. 6). Larger catches of saithe were

predominantly from along the shelf edge or in the northern part of the survey area (Fig. 8). Larger saithe were captured in the north and along the shelf edge, while smaller fish were found in the south (Fig. 8). Large catches of Norway pout were mainly in the central northern part of the survey area (Fig. 9), while plaice were captured mainly from the south (Fig. 10). Herring were captured in relatively small amounts throughout the survey area (Fig. 11). There were relatively few catches of mackerel (Fig. 12). Ling were mainly captured in the northern part of the Norwegian survey area (Fig. 13).

A summary of the number of stations where material was collected for the additional requests is in Table 6. Table 7 contains information on the total (number and weight) of benthic invertebrates as captured with the GOV bottom trawl.

REFERENCES

ICES. 2012. Manual for the International Bottom Trawl Surveys. Series of ICES Survey Protocols. SISP 1-IBTS VIII. 68 pp.

Scanmar. 2007. SCANMAR Fangstkontroll Systemer Brukermanual. 36 pp.

Table 1. IBTS Q1 2014: Countries, vessels, and sampling periods.

COUNTRY	SHIP	DATES
Denmark	Dana	24-1/ 10-2
France	Thalassa II	13-1/ 14-2
Germany	Walther Herwig III	23-1/ 24-2
Netherlands	Tridens 2	27-1/ 28-2
Norway	G.O. Sars	14-1/ 19-2
Scotland	Scotia III	24-1/ 14-2
Sweden	Dana	09-1/ 22-1

Table 2. IBTS Q1 2014: Stations fished.

ICES DIVISIONS	STRATA	GEAR	TOWS PLANNED	VALID	ADDITIONAL	INVALID	% STATIONS FISHED
IVa	ICES rectangles	GOV	30	26	0	1	87%
		MIK	60	52	0	-	87%
IVb	ICES rectangles	GOV	10	6	0	1	60%
		MIK	20	0	0	-	0%
Total		GOV	40	31	0	2	78%
		MIK	80	52	0	-	65%

Table 3. Summary of stations and sampling along the Utsira-West hydrographic transect. Stations in grey text were not completed due to foul weather. Stations marked in orange are stations with quantitative sampling for zooplankton, while those in yellow are plankton. Pl. are quantitative phytoplankton samples from 30–0 m, while Al. indicate phytoplankton sampled for 'qualitative tests' from 30–0 m.

Nr	POSISJON						Dist	Antatt	PRØVETAKING									
	Grad N	Min N	Grad E/W	Min E/W	Decimal N	Decimal E/W	n.m.	dyp	VANNPRØVER CTD	N.salt	O_2	Chl.	Pl.	PLANKTONPRØVER WP2	Al.	Secci	MIK
1	59	17	E	5 2	59.283	5.033		80	x	x		x	30-0*	bunn-0	30-0***	x	
2	59	17	E	4 56	59.283	4.933	3.06	140	x	x		x					
3	59		E	4 50	59.283	4.833	3.06	150	x	x		x		bunn-0		x	X
4	59	17	E	4 40	59.283	4.667	5.10	270	x	x		x					
5	59	17	E	4 30	59.283	4.500	5.10	255	x	x		x	30-0*	bunn-0/ 200-0	30-0***	x	
6	59	17	E	4 20	59.283	4.333	5.10	260	x	x		x					
7	59	17	E	4 11	59.283	4.183	4.59	280	x	x		x		bunn-0/ 200-0	30-0***	x	X
8	59	17	E	4 2	59.283	4.033	4.59	280	x	x		x					
9	59	17	E	3 51	59.283	3.850	5.62	270	x	x		x	30-0*	bunn-0/ 200-0	30-0***	x	X
10	59	17	E	3 41	59.283	3.683	5.10	250	x	x		x					
11	59	17	E	3 32	59.283	3.533	4.59	220	x	x		x		bunn-0		x	
12	59	17	E	3 22	59.283	3.367	5.10	160	x	x		x					
13	59	17	E	3 13	59.283	3.217	4.59	140	x	x		x	30-0*	bunn-0	30-0***	x	X
14	59	17	E	3 4	59.283	3.067	4.59	130	x	x		x					
15	59	17	E	2 54	59.283	2.900	5.10	105	x	x		x		bunn-0		x	
16	59	17	E	2 45	59.283	2.750	4.59	115	x	x		x					
17	59	17	E	2 31	59.283	2.517	7.15	130	x	x		x	30-0*	bunn-0	30-0***	x	X
18	59	17	E	2 15	59.283	2.250	8.17	125	x	x		x					
19	59	17	E	2 0	59.283	2.000	7.66	120	x	x		x		bunn-0		x	
20	59	17	E	1 39	59.283	1.650	10.72	115	x	x		x					
21	59	17	E	1 19	59.283	1.317	10.21	110	x	x		x	30-0*	bunn-0	30-0***	x	X
22	59	17	E	1 0	59.283	1.000	9.70	110	x	x		x					
23	59	17	E	0 40	59.283	0.667	10.21	135	x	x		x		bunn-0		x	
24	59	17	E	0 20	59.283	0.333	10.21	135	x	x		x					
25	59	17	E	0 0	59.283	0.000	10.21	130	x	x		x	30-0*	bunn-0	30-0***	x	X
26	59	17	W	0 20	59.283	-0.333	10.21	135	x	x		x					
27	59	17	W	0 39	59.283	-0.650	9.70	125	x	x		x		bunn-0		x	
28	59	17	W	0 59	59.283	-0.983	10.21	125	x	x		x					
29	59	17	W	1 19	59.283	-1.317	10.21	110	x	x		x	30-0*	bunn-0	30-0***	x	X
30	59	17	W	1 38	59.283	-1.633	9.70	90	x	x		x					
31	59	17	W	1 56	59.283	-1.933	9.19	95	x	x		x					
32	59	17	W	2 14	59.283	-2.233	9.19	70	x	x		x	30-0*	bunn-0		x	X

Table 4. IBTS Q1 2014: Preliminary results of the Norwegian MIK sampling; data are only from the IBTS Q1 MIK samples and do not include the extra MIKs taken as part of the process studies program. Numbers of herring larvae are given in n/m^2.

Haul no	no/m²	Haul no	no/m²	Haul no	no/m²	Haul no	no/m²
5	0.419	18	0.146	31	0.107	44	0.054
6	0.728	19	0.084	32	0.000	45	0.356
7	0.732	20	0.170	33	0.121	46	1.101
8	0.150	21	0.487	34	0.111	47	0.180
9	0.083	22	0.131	35	0.031	48	0.297
10	0.204	23	0.248	36	0.304	50	0.131
11	0.186	24	0.039	37	0.033	51	0.150
12	0.261	25	0.010	38	0.212	52	0.165
13	0.081	26	0.130	39	0.594	53	0.194
14	0.215	27	0.257	40	0.258	54	0.123
15	0.489	28	0.162	41	0.000	55	0.056
16	0.285	29	0.434	42	0.026	59	0.187
17	0.044	30	0.496	43	0.010	60	0.134

Table 5. IBTS Q1 2014: Number of biological samples collected (individual length / aging materials) collected. Species with an asterix (*) indicate samples collected were length / sex (no aging material).

SPECIES	NO. SAMPLES	SPECIES	NO. SAMPLES
Clupea harengus	804 / 205	*Merluccius merluccius*	335 / 167
* *Etmopterus spinax*	11 / 11	*Molva molve*	34 / 33
Eutrigla gurnardus	1134 / 0	* *Nephrops norvegicus*	234 / 202
Gadus morhua	219 / 171	*Pollachius virens*	646 / 308
* *Galeus melastomus*	1 / 1	*Pleuronectes platessa*	198 / 90
Glyptocephalus cynoglossus	40 / 0	* *Raja radiate*	42 / 42
Hippoglossoides platessoides	629 / 0	*Scomber scombrus*	452 / 100
Limanda limanda	899 / 0	* *Scyliorhinus canicula*	15 / 15
* *Lithodes maja*	14 / 13	*Sprattus sprattus*	5 / 0
Melanogrammus aeglefinus	1160 / 448	* *Squalus acanthias*	12 / 11
Merlangius merlangus	1409 / 420	*Trisopterus esmarki*	1578 / 170

Table 6. IBTS Q1 2014: Summary of special requests.

INSTITUTE	SPECIES	SAMPLE TYPE	NO. STATIONS
NCB Naturalis	Sepiolidae	Whole organism	23
NIFES	Plaice	Whole fish	3
IMR	Saithe	Gonad	15
IMR	Hake	Stomach	18
IMR	Jellyfish, salps	Identification/organism	–
University of Bergen	Velvet belly lanternshark	Barnacle parasites	0
University of Hamburg	–	Water	31

Table 7. Benthic invertebrates recorded on IBTS Q1 2014.

Phylum	Class	Order	Family	Species	Total catch number	Total weight [kg]
Annelida	Polychaeta	Phyllodocida	Aphroditidae	*Aphrodita aculeata*	158	3.539
		Phyllodocida (suborder Aphroditiforma) indet.			8	0.014
		Sabellida	Serpulidae	*Ditrupa arietina*	49	0.01
	Polychaeta indet.				104	0.055
Arthropoda	Malacostraca	Decapoda	Cancridae	*Cancer pagurus*	3	1.236
			Corystidae	*Corystes cassivelaunus*	71	0.802
			Crangonidae	*Crangon allmanni*	35	0.025
				Pontophilus norvegicus	35	0.024
				Pontophilus spinosus	8	0.007
			Crangonidae indet.		6	0.004
			Galatheidae	*Galathea* spp.	2	0.001
			Hippolytidae	*Spirontocaris liljeborgii*	3	0.004
			Inachidae	*Inachus dorsettensis*	3	0.007
				Macropodia tenuirostris	1	0.001
			Lithodidae	*Lithodes maja*	14	4.967
			Munididae	*Munida* spp.	6	0.017
			Nephropidae	*Nephrops norvegicus*	234	11.16
			Oregoniidae	*Hyas coarctatus*	17	0.044
			Paguridae	*Pagurus bernhardus*	93	1.339
				Pagurus prideaux	231	0.885
				Pagurus pubescens	80	0.434
			Pandalidae	*Dichelopandalus bonnieri*	46	0.047
				Pandalus borealis	11	0.085
				Pandalus montagui	1073	2.587
				Pandalus spp.	14	0.022
			Pasiphaeidae	*Pasiphaea* spp.	345	0.479
			Polybiidae	*Liocarcinus depurator*	267	1.701
				Liocarcinus holsatus	2813	8.406
		Euphausiacea	Euphausiidae	*Meganyctiphanes norvegica*	227	0.086
		Isopoda indet.			7	0.028
	Maxillopoda	Sessilia	Archaeobalanidae	*Semibalanus balanoides*	15	-
			Balanidae	*Balanus* spp.	40	-
		Sessilia indet.			77	-
Bryozoa	Gymnolaemata	Cheilostomatida	Flustridae	*Flustra foliacea*	-	4.017
				Securiflustra securifrons	-	0.054
			Membraniporidae	*Membranipora membranacea*	-	0.0004
Chordata	Ascidiacea	Phlebobranchia	Ascidiidae	*Ascidia virginea*	127	0.458
			Corellidae	*Corella parallelogramma*	198	0.67
	Ascidiacea indet.				5	0.02

Phylum	Class	Order	Family	Species	Total catch number	Total weight [kg]
Cnidaria	Anthozoa	Actiniaria	Hormathiidae	*Adamsia palliata*	162	0.258
				Hormathia spp.	145	0.975
		Actiniaria indet.			71	6.128
		Alcyonacea	Alcyoniidae	*Alcyonium* spp.	-	0.547
		Scleractinia	Caryophylliidae	*Caryophyllia smithii*	32	0.048
		Zoantharia	Epizoanthidae	*Epizoanthus papillosus*	21	0.023
			Parazoanthidae	*Parazoanthus anguicomus*	-	0.004
	Hydrozoa	Leptothecata	Aequoreidae	*Aequorea* spp.	10	1.491
			Lafoeidae	*Lafoea* sp.	-	0.00001
			Sertulariidae	*Diphasia* sp.	-	0.00001
Echinodermata	Asteroidea	Forcipulatida	Asteriidae	*Asterias rubens*	2625	11.425
		Paxillosida	Astropectinidae	*Astropecten irregularis*	828	44.028
			Luidiidae	*Luidia sarsii*	50	0.352
				Luidia spp.	10	0.084
		Spinulosida	Echinasteridae	*Henricia* spp.	8	0.019
		Valvatida	Asterinidae	*Anseropoda placenta*	1	0.004
			Goniasteridae	*Hippasteria phrygiana*	87	4.559
	Echinidea	Camarodonta	Echinidae	*Echinus* spp.	9	0.581
		Spatangoida	Spatangidae indet.		3	0.014
	Echinidea indet.				45211	2039.294
	Holothuroidea	Aspidochirotida	Stichopodidae	*Parastichopus tremulus*	9	2.812
	Ophiuroidea	Ophiurina	Ophiactidae	*Ophiopholis aculeata*	4	0.003
			Ophiotrichidae	*Ophiothrix fragilis*	6	0.009
			Ophiuridae	*Ophiura albida*	8	0.083
				Ophiura ophiura	140	0.415
				Ophiura sarsii	3	0.015
Mollusca	Bivalvia	Pectinoida	Pectinidae	*Pseudamussium peslutrae*	24	0.078
	Cephalopoda	Myopsida	Loliginidae	*Alloteuthis subulata*	8493	29.446
				Loligo spp.	9	2.315
		Octopoda	Octopodidae	*Eledone cirrhosa*	9	1.473
		Oegopsida	Ommastrephidae	*Todarodes sagittatus*	2	0.54
				Todaropsis elbanae	3	0.142
		Sepiida	Sepiolidae	*Rondeletiola minor*	2	0.004
				Rossia macrosoma	7	0.295
				Sepietta neglecta	2	0.011
				Sepietta oweniana	7	0.048
				Sepiola ligulata	4	0.011
				Sepiola tridens	10	0.02
	Gastropoda	Cephalaspidea	Scaphandridae	*Scaphander lignarius*	56	0.294
		Littorinimorpha	Velutinidae	*Lamellaria perspicua*	1	0.0003
				Velutina velutina	5	0.004
		Neogastropoda	Buccinidae	*Buccinum undatum*	71	3.143
				Colus spp.	10	0.21
				Neptunea antiqua	195	37.916
Porifera	Demospongiae	Halichondrida	Axinellidae	*Axinella infundibuliformis*	44	0.683
Porifera indet.					255	1.291

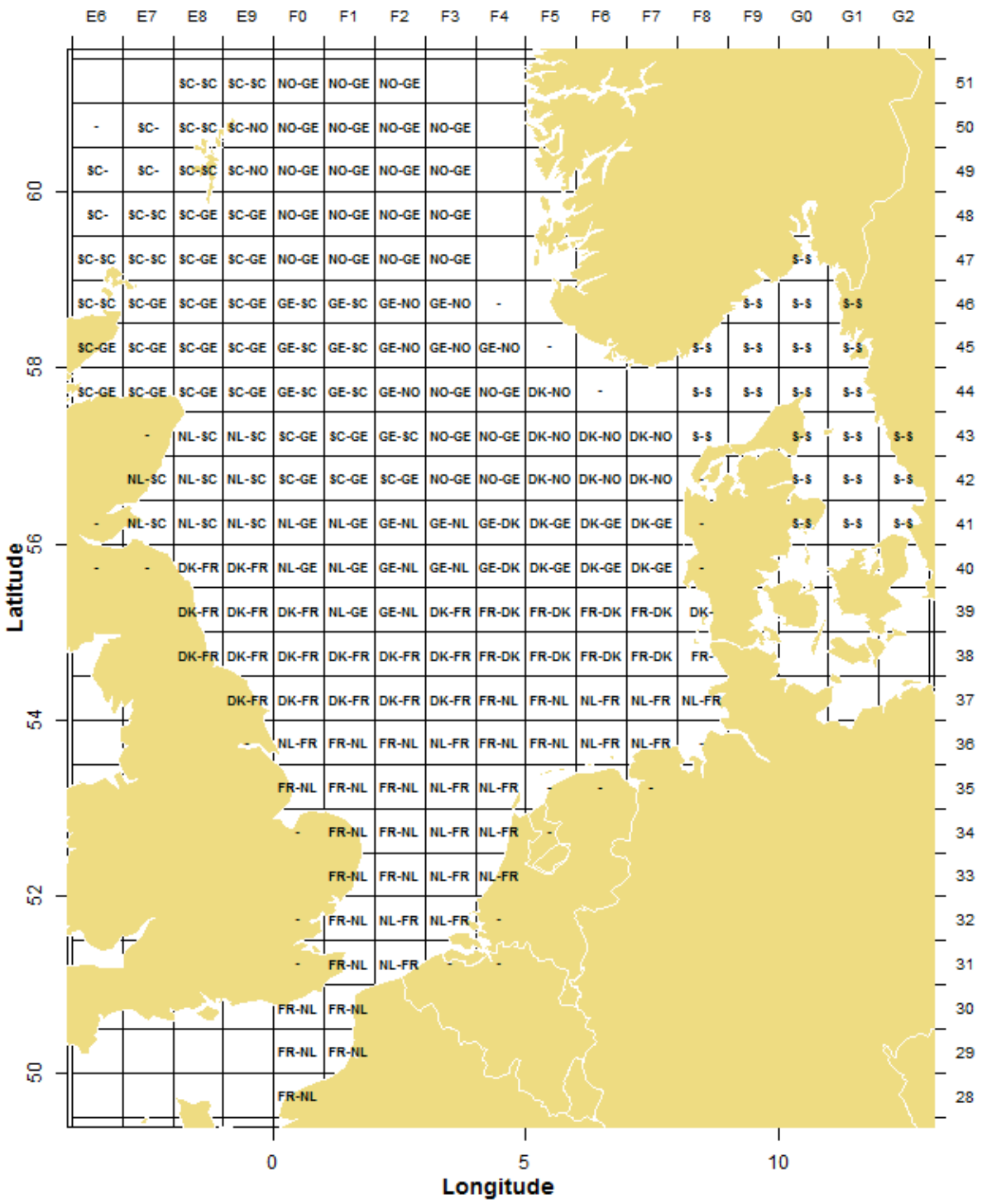

Figure 1. Map of the IBTS Q1 survey area listing the countries responsible for sampling each ICES rectangle. SC = Scotland, GE = Germany, NO = Norway, DK = Denmark, FR = France, NL = The Netherlands, S = Sweden.

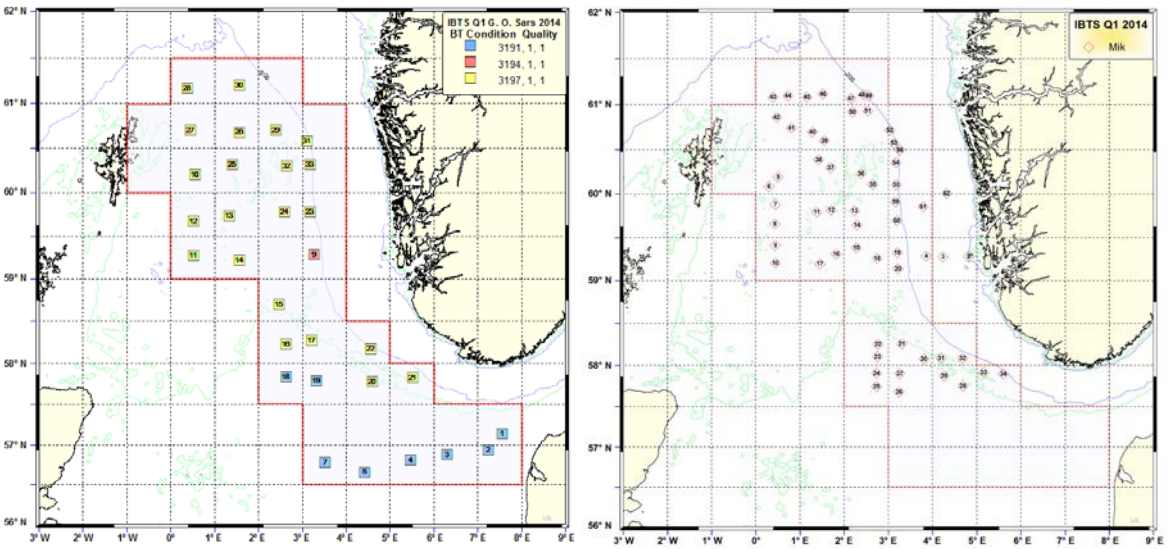

Figure 2. Bottom trawl (left) and MIK (right) stations completed in IBTS Q1 2014. Numbers indicate station number and colors indicate different trawl gear configurations (3191: 60 m sweeps, 2 m adjustment chain; 3194: 110 m sweeps, 2 m adjustment chain; 3197: 110 m sweeps, 1.8 m adjustment chain). MIK stations 2–4, 49, 56, 61, and 62 were taken for additional egg and larvae samples and were not part of the IBTS survey.Contour lines are 100 m (green) and 200 m (blue) depth.

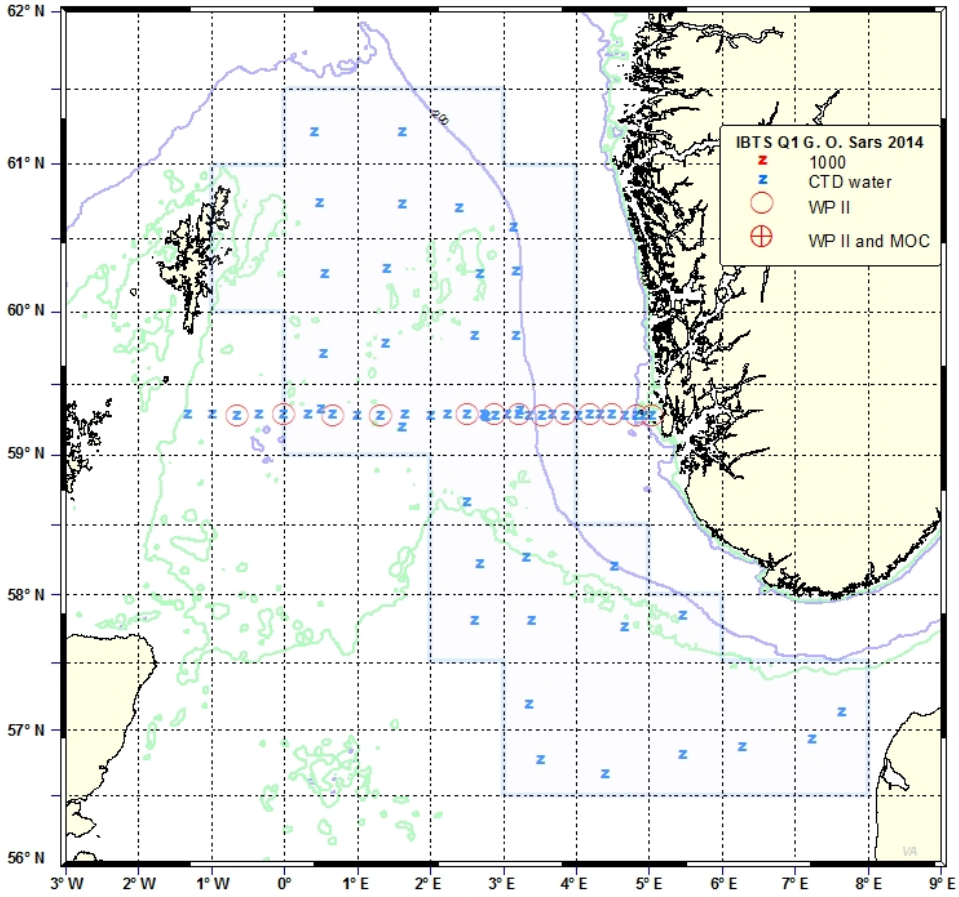

Figure 3. Hydrographic transect (WPII and CTD stations) and locations of all CTDs taken at bottom trawl and, where needed, MIK stations.

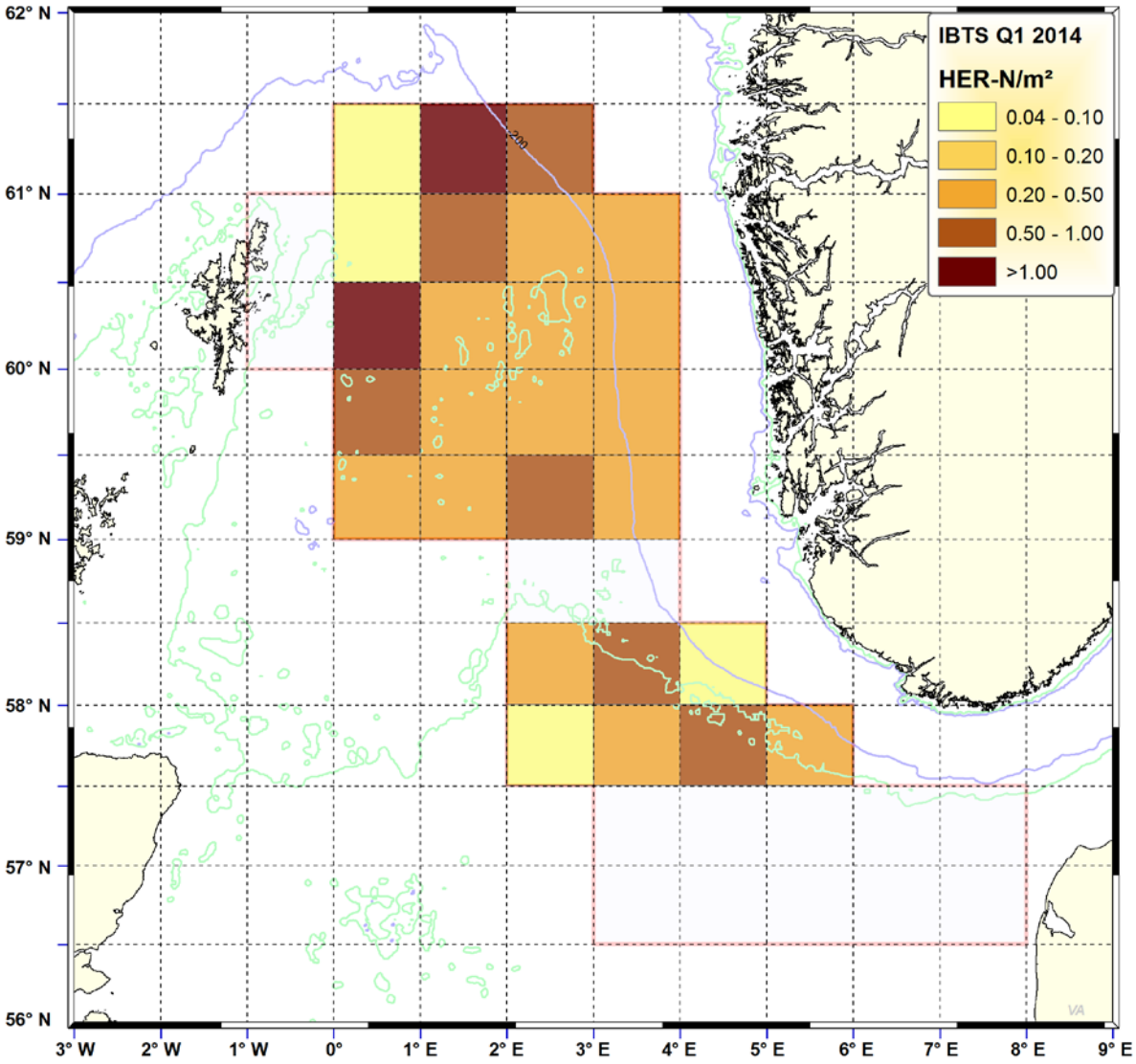

Figure 4. Abundance (number m^{-2}) of herring larvae in the Norwegian part of the 2014 IBTS survey area.

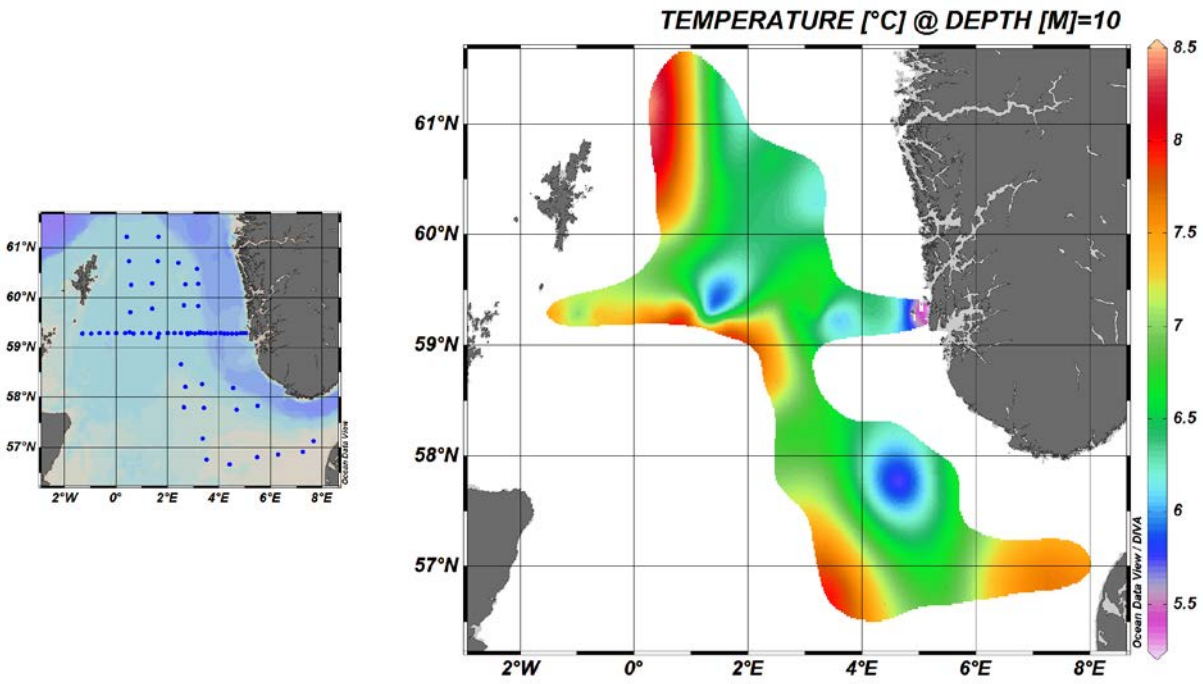

Figure 5. Location of CTDs (right) used for plotting (left) temperature at 10 m depth (extrapolated using 20 x 20 bins).

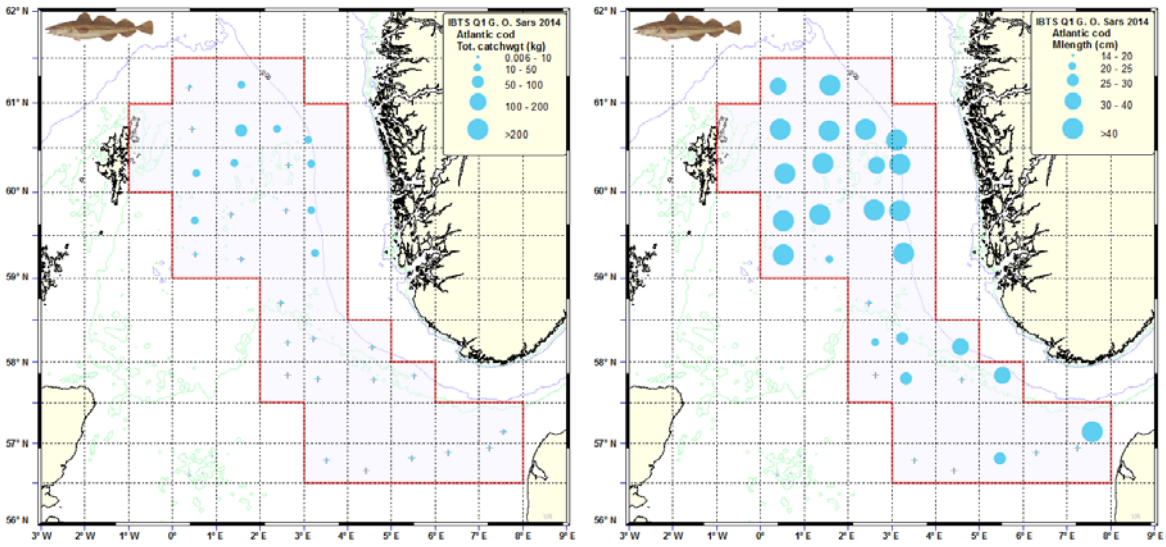

Figure 5. (left) Total catch weight (kg) and (right) mean length (cm) of cod from IBTS Q1 stations in 2014.

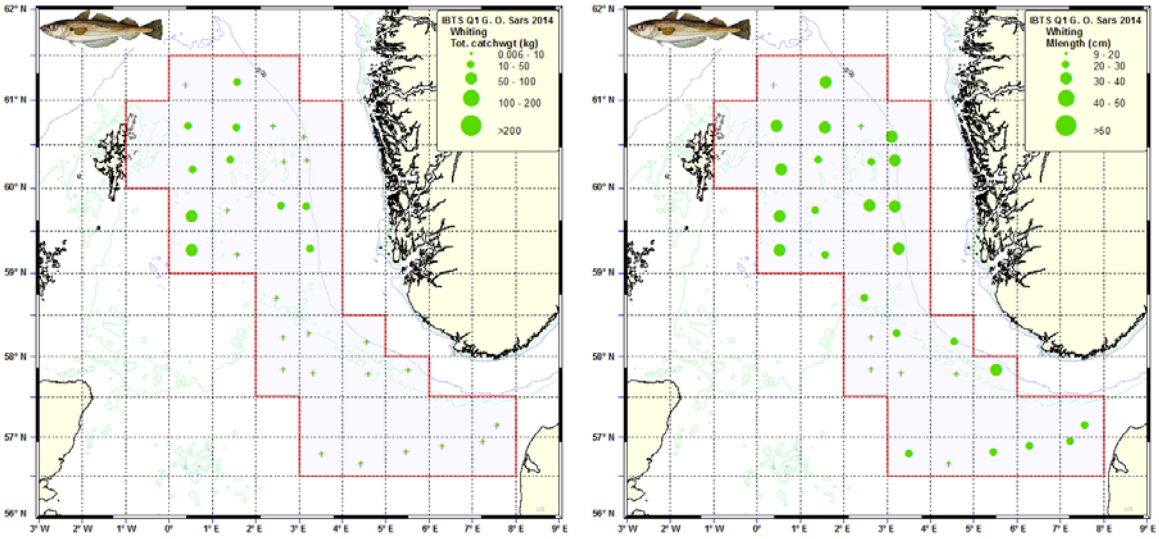

Figure 6. (left) Total catch weight (kg) and (right) mean length (cm) of whiting from IBTS Q1 stations in 2014.

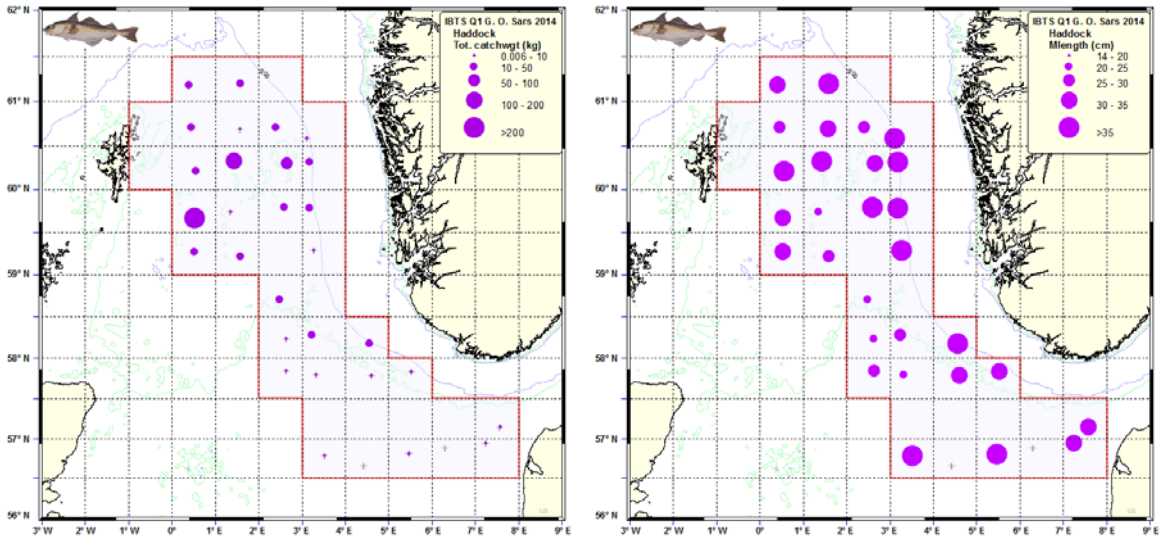

Figure 7. (left) Total catch weight (kg) and (right) mean length (cm) of haddock from IBTS Q1 stations in 2014.

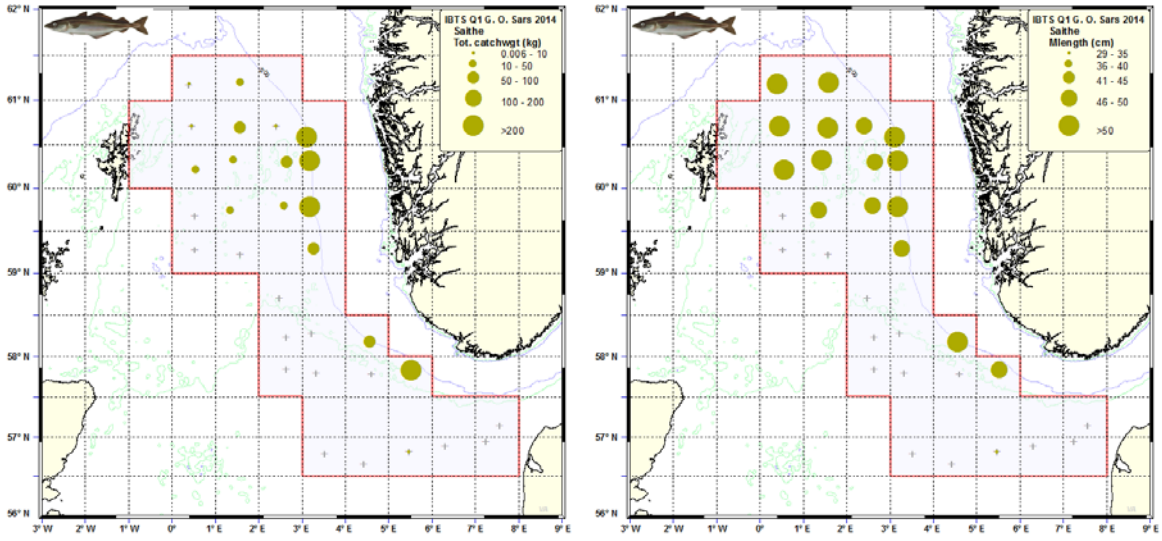

Figure 8. (left) Total catch weight (kg) and (right) mean length (cm) of saithe from IBTS Q1 stations in 2014.

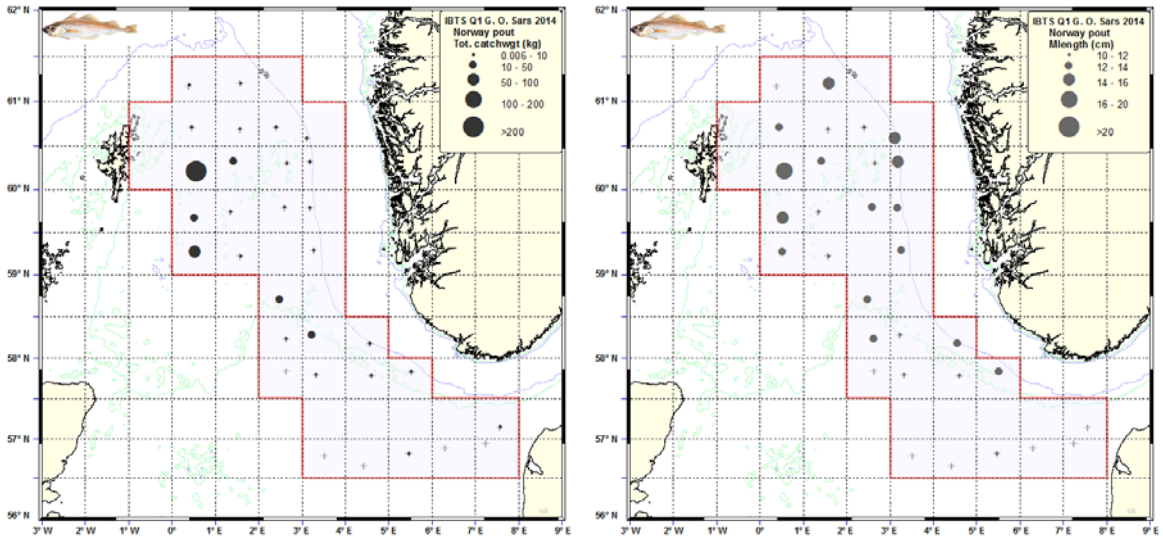

Figure 9. (left) Total catch weight (kg) and (right) mean length (cm) of Norway pout from IBTS Q1 stations in 2014.

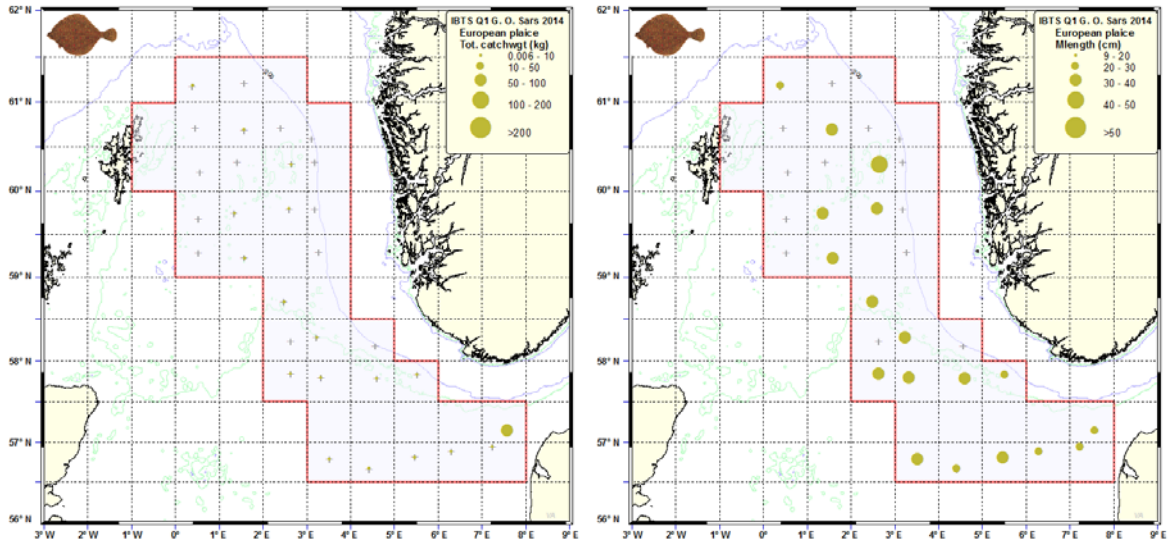

Figure 10. (left) Total catch weight (kg) and (right) mean length (cm) of plaice from IBTS Q1 stations in 2014.

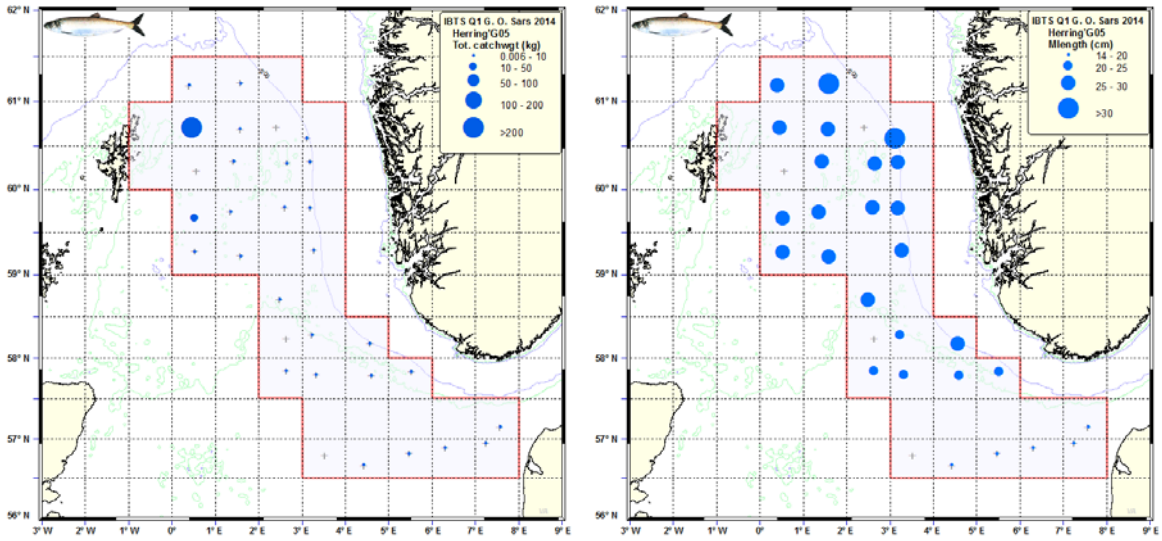

Figure 11. (left) Total catch weight (kg) and (right) mean length (cm) of herring from IBTS Q1 stations in 2014.

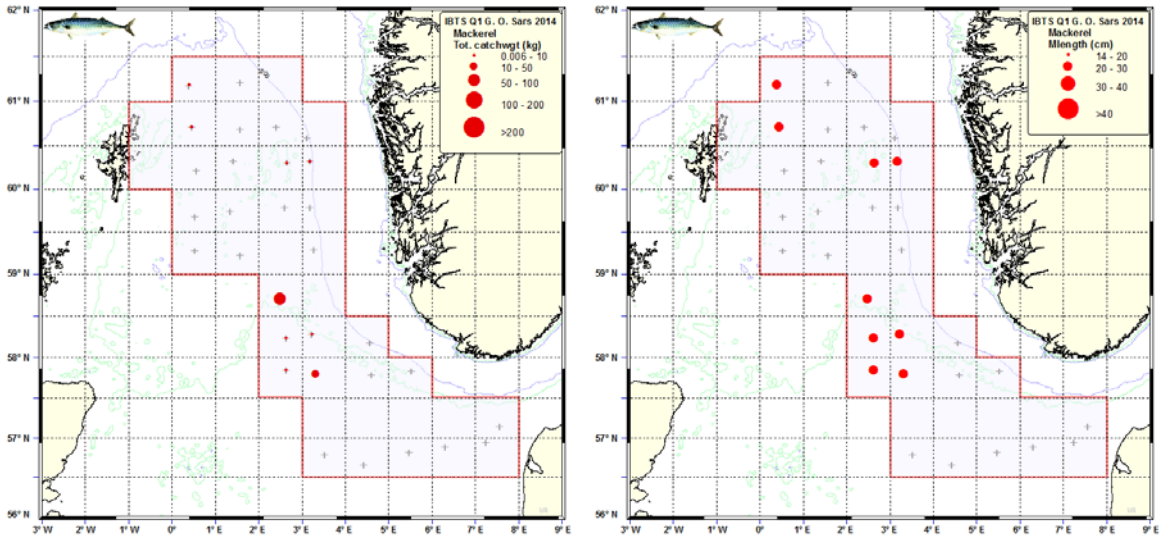

Figure 12. (left) Total catch weight (kg) and (right) mean length (cm) of mackerel from IBTS Q1 stations in 2014.

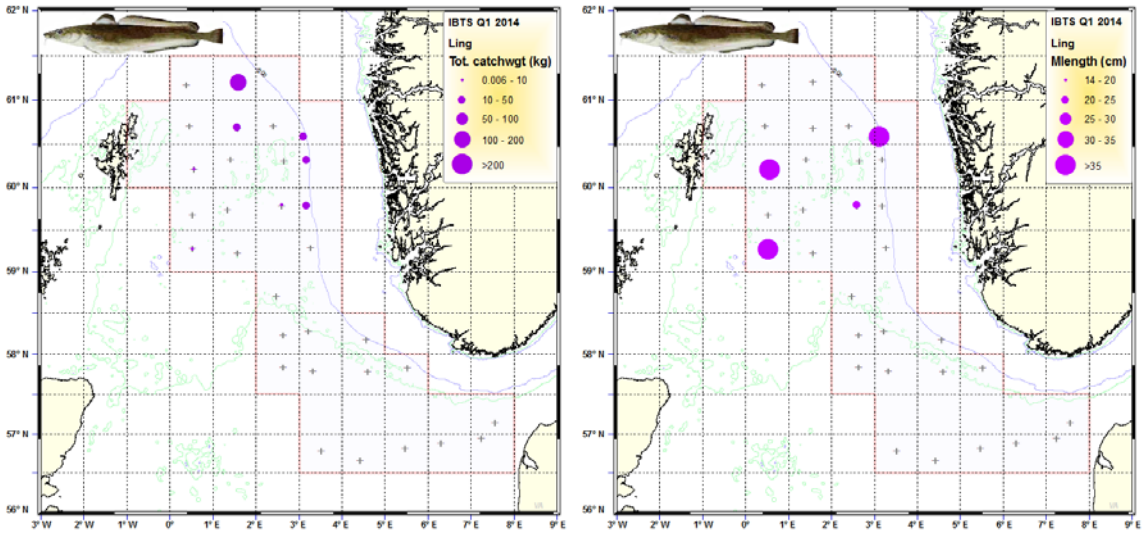

Figure 13. (left) Total catch weight (kg) and (right) mean length (cm) of ling from IBTS Q1 stations in 2014.