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Cruise report
North Sea Ecosystem survey
RV "Johan Hjort", 4 July – 2 August 2013

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1 Introduction

Since 2006, this survey has been run as a multi-purpose survey, covering herring (HERAS) and saithe acoustics (NORACU), IBTS 3Q, standard hydrographical transects, as well as process studies for the project "Early life history dynamics of North Sea Fishes". Environmental condition monitoring of the North Sea is included in Ecosystem survey every third year, and was included this year. Earlier, four hydrographic transects were done during the survey, but after an evaluation of transects taken regularly by IMR (Iversen *et al.* 2011), only the Utsira – Start Point section has been covered. In 2009, only a reduced herring acoustic survey (8 days) was done due to lack of vessel time.

1.1 The herring acoustic survey (HERAS)

The acoustic herring survey (HERAS), mapping herring in the North Sea and Skagerrak-Kattegat, has existed since the late 70s, and was standardized in 1984. It is planned and co-ordinated by the Working Group for International Pelagic Surveys (WGIPS from 2010) which meets once a year. Five countries (Denmark, Germany, the Netherlands, Norway, and UK-Scotland) cooperate in surveying the North Sea (Subarea IV) and Skagerrak-Kattegat (Div. IIIa) for an acoustic abundance estimation of herring and sprat. The Norwegian herring acoustic area has been defined as the area between 56°30' and 62°N and between 2° and 6°E (Figure 1, WGIPS 2012).

The data from this survey will be combined with the HERAS surveys of the other countries to provide a combined age disaggregated abundance index for use in the assessments carried out by the ICES Herring Assessment Working Group (HAWG) to be held in March 2014.

Objectives for the HERAS part of the survey with RV "Johan Hjort" were:

a) To conduct an acoustic survey to estimate the abundance and distribution of herring and sprat in the north-eastern part of the North Sea, between 56°30'and 62°N, and between 2° and 6°E.
b) To obtain biological samples. Herring were sampled for data on length, weight, age, sex, maturity, mesenteric fat, vertebrae count and *Ichthyophonus* infection.

1.2 The IBTS Q3 survey

The International Bottom Trawl Survey (IBTS) in the North Sea and Skagerrak is coordinated by the International Bottom Trawl Survey Working Group (IBTSWG). This multi-species groundfish trawl survey has been conducted routinely in the third quarter since 1991. The survey aims to provide ICES assessment and science groups with standardized data for examining the spatial and temporal changes in distribution and abundance of fish and fish assemblages, and biological parameters for stock assessment purposes (ICES-IBTSWG 2013). Six countries take part in the third quarter survey: Denmark, Germany, Sweden, Norway, UK-England, and UK-Scotland (Figure 2).

The data from this survey is used in the autumn stock updates for haddock, whiting, plaice, sole, and saithe; it provides additional information on the incoming year-classes, which is used to adjust the quota accordingly in the current year. The data is also used in the spring assessments for North Sea and Skagerrak stocks (e.g., WGNSSK, WGMIXFISH).

Objectives for the IBTS Q3 part of the survey were:

1. Collect biological parameters (length, weight, sex, maturity status, otoliths) for cod, haddock, whiting, saithe, Norway pout, hake, plaice, sole, herring, mackerel, witch flounder, and sprat.
2. Collect length information on a subsample of all species captured at each station.
3. Collect information (species and counts) on all benthos sampled with the bottom trawl.
4. Record all marine litter captured in the trawl (type, weight, size).
5. Process additional special requests, when time allowed. These included:
    a. Collect hake and saithe stomachs (IFREMER)
    b. Collect stomachs (or whole individuals) from hake, grey gurnard, and mackerel (EU project, Norway is not a part of this project).
    c. Capture of live saithe, 45 cm or larger (IMR).
    d. Collect hake gonad samples (IMR).

1.3 Saithe acoustic survey (NORACU)

NORACU is an acoustic survey for saithe in the North Sea and is used in the stock assessment; it is one of the tuning indices included in the XSA and SAM models. Previously, prior to the merging of IBTS Q3 and the herring survey, acoustic data were collected between IBTS stations. Currently, it combines the transect format of the herring survey with random steams between IBTS stations.

1.4 The transect Utsira – Start Point

The Utsira - Start Point standard plankton sampling transect (along 57^{o} 17'N) is the only regularly sampled transect undertaken across the North Sea by IMR and is usually traversed 6 times per year. The transect consists of 32 CTD stations, 16 plankton stations (which include nutrients and algae) and 3 stations which include MOCNESS sampling for the vertical distribution of zooplankton. Since 2011 MIK-ring trawl sampling for fish larvae has also been undertaken on up to 9 stations.

1.5 Process studies

These were not planned or undertaken this year due to time constraints.

1.6 Environmental condition monitoring

Environmental condition monitoring of the North Sea is included in Ecosystem survey every third year. This monitoring was started in 2002, and sea water, sediments and different fish species are sampled for analysis of environmental pollution and radioactivity. This is the fifth time that the Environmental condition monitoring has been conducted (2002, 2005, 2008, 2010 and 2013).

2 Materials and methods

2.1 Personnel

04 July- 18 July

Else Torstensen	(Cruise leader)
Anne-Liv Johnsen	(Pelagic fish)
Jan de Lange	(Pelagic fish)
Rupert Wienerroither	(Demersal fish / taxonomy – fish and benthos)
Ståle Kolbeinson	(Demersal fish)
Arne Storaker	(Demersal fish)
Anne Sæverud	(Demersal fish)
Arved Staby	(Demersal fish)
Kjell Westrheim	(Chemistry)
Sonnich Meier	(Chemistry)
Bjarte Kvinge	(Acoustic operator)
Terje Haugland	(Acoustic operator)

18 July – 02 August

Cecilie Kvamme	(Cruise leader)
Richard Nash	(Fish larvae and plankton, 18-22 July)
Lena Omli	(Plankton, 18-22 July)
Alina Rey	(Plankton, 18-22 July)
Knut Hansen	(Pelagic fish)
Ståle Kolbeinson	(Pelagic fish, from 22 July)
Else Holm	(Demersal fish)
Harald Larsen	(Demersal fish, from 22 July)
Jennifer Devine	(Demersal fish, from 22 July)
Rupert Wienerroither	(Demersal fish / taxonomy – fish and benthos)
Grethe Tveit	(Chemistry)
Sonnich Meier	(Chemistry)
Jan Erik Nygaard	(Acoustic operator)
Åse Nina Sudman	(Acoustic operator)

Guests: 04.07-18.07: Justin Gwynn (Norwegian Radiation Protection Authority), Bjørnar Andre Beylich (NIVA).

2.2 Narrative

RV "Johan Hjort" left Bergen around 1300 UTC 4 July 2013, heading for the southern course track were we started off at56˚36'N 05˚50' E. The cruise track with all the different stations is given in Figure 3a-c.

As scheduled, the survey started Thursday 4 July, departing from Bergen at 16:00. The first station was the marine pollution station, where surface water samples and bottom grabs were made. Afterwards, proceeded to Egersundbanken (56° 30′ N) to begin the first herring transect. Target identification tows were called when a clear, dense, mark (not necessarily large) was seen on the 38 kHz echosounder. Pelagic tows were typically only surface tows; no semipelagic tows were taken near the bottom. Night 'blind' tows (pelagic tows close to the surface, in an acoustic blindspot) were spaced at approximately 10 nm; tows are not on registrations. Good weather meant there were few delays or weather-related problems.

The first IBTS station was sampled 5 July. A problem was noted with the Scanmar files. The settings must cover the range of the expected trawl opening. With the GOV, this is 2-6 m; therefore the display settings must be 4 m opening +/- 2 m otherwise the data will not be recorded. Sweep length was not correct on the GOV trawl; amount of adjustment chain was shortened to 2.1-2.2 m (3 links) to follow recommendations in IBTS manual (ICES-WGIBTS 2013). Additional gear modifications were made at station 317; floats were added to the headline (now total 60), bridles were uncoiled, the angle of the kite was increased, and adjustment chain was shortened another 2 links. These modifications increased the headline height to 3.9-4.1 m, which is now within the recommended height by the IBTS manual. Problems with headline height were noted at station 321, which may be caused by boat speed dropping below 3.5 knots.

Strong aggregations of small haddock along the bottom were noted on July 9th. These registrations differ from herring in that they have less defined edges are are often close to other diffuse aggregations. Herring marks are very dense, often small, and remain visible at a low threshold (-45 dB). Pelagic tows on strong acoustic marks at 40-50 m on July 11th caught only grey gurnard. Pelagic trawl at 06:00 on 12 July caught saithe.

Strapping was needed on all GOV tows after trawl serial number 24135 (July 12). Strapping is necessary in water > 70 m to maintain a headline height > 3.5 m. Door spread will not conform to the recommended spread in the IBTS manual.

IBTS trawl 24141 (July 13) sampled only length data on plaice due to time constraints. Because the sampling demands on this survey were so high due to tissue sampling for marine pollution, the IBTS sampling was reduced. Full biological sampling on cod (length, weight, sex, maturity, and otoliths) was reduced from 'sample all cod' to 2 samples per 1 cm length group; this is similar to the sampling for other species. When catches from subsequent tows hangs (i.e., multiple tows are on deck, waiting to be processed), a decision was made to sample lengths-only from one (more, if needed) of the eight species which normally have full biological samples taken. This is considered *not* routine procedure and should not be used in future surveys; sampling is under review for this survey.

Blind pelagic surface tows on July 14 caught a large amount of herring. GOV trawl (#8) was torn on July 16; spare GOV (#7) was put into use.

The vessel called for Stavanger for a shift of crew July 17. From Stavanger, the vessel headed straight north to the start position of the hydrographical transect Utsira - Start Point, 59˚17'N 05˚02' E. The weather conditions were good and the transect was finalized (59˚17'N 02˚14' W) in the morning July 21. Also two IBTS trawl hauls (station 381-382) were taken along the transect. On July 22, a new shift of personnel was scheduled in Lerwick. Two IBTS trawl hauls (383-384) were completed on our way, and the vessel called for Lerwick in the early morning 22 July to disembark the plankton personnel and embark three more people for fish sampling.

The vessel left Lerwick in the evening. While heading for resuming the acoustic herring transect, four more IBTS trawl hauls (385-388) were completed. In the evening 23 July, herring acoustics were resumed and the rest of the herring area was more or less continuously covered, only interrupted by picking up IBTS trawl hauls and some hauls for environmental monitoring along the transects. The herring acoustics were finished at 0130 (UTC) July 30. Thereafter trawl hauls for the most northwestern part of the Norwegian IBTS area, for environmental monitoring and for attempts of catching live saithe were done. The GOV was torn while collecting cod for marine pollution sampling, after the last IBTS station. As a last attempt, angling outside Fedje was also attempted to capture live saithe for a reproductive study; fish were caught, but were small. In total, only approximately 22 saithe survived; up to 200 were requested.

The survey concluded in Bergen late in the evening 1 August.

This year the weather conditions were good, except for one day with up to gale force winds. We managed to carry out the survey according to the plans. The present report presents the preliminary results.

2.3 Survey design

The acoustic herring survey was mostly carried out in systematically parallel east-west transects with a spacing of 15 nmi, progressing northwards from N56° 30' to N61°30' and between 2˚ and 6˚ E.

The acoustic saithe survey does not have a survey design. In years prior to the merging of the HERAS and IBTS surveys, acoustic data were collected as the vessel steamed between IBTS stations. This was considered relatively random, as IBTS stations are not fixed. Since the merging of surveys, the design is half transect (see herring survey design) and half random steams between IBTS stations.

For the IBTS survey, stratification of the survey area is based on ICES statistical rectangles of 1° longitude by 0.5° latitude (approximately 30 × 30 nmi; (ICES-IBTSWG 2013). The IBTS manual (revision 8, (ICES-IBTSWG 2012)) stated that bottom tows must be performed as near to the center of the rectangle as possible, but at least 5 nmi from the border, 10 nmi from other IBTS stations, and in waters 200 m depth or less. The amount of area less than 200 m was restricted in rectangles 50F3, 49F3, 44F6, and 45F5, and therefore bottom tows were closer to the edges than mandated in the manual (under 5 nmi). The latest version of IBTS manual, revised autumn 2013, has done away with this restriction, but stipulates hauls must still be 10 nmi apart (ICES-IBTSWG 2013). Fishing is restricted to daylight hours (i.e. 15 minutes before sunrise to 15 minutes after sunset). Gear codes used during the survey

were 3191, GOV with 60 m sweeps, and 3196, GOV with 60 m sweeps and strapping. Strapping was used when water depth was 70 m or greater to stabilize headline height within the range recommended within the manual. CTD casts were taken at each IBTS station.

The Utsira – Start Point standard plankton sampling transect was undertaken along 57^{o} 17'N with a series of 9 MIK-ring trawl samples also taken.

2.4 Acoustic data collection

The last calibration of the echo sounders was done in Byfjorden, Bergen, 3 July 2013. The calibration was done according to standard procedures for each of the frequencies (18, 38, 120 and 200 kHz). The settings used are presented in Table 1 for the 38 kHz transceiver.

The acoustic survey was carried out using a SIMRAD ER60 38 kHz sounder and an ES38B SK transducer mounted on the drop keel. Acoustic data were collected 24 hours per day. Additional data were collected at 18, 120, and 200 kHz (ES120–7 transducer). These data were used to present the frequency responses as guidance in the scrutiny of the acoustic data for species allocations. The mean volume back scattering values (S_V) were integrated per nm intervals from 9-13 m (depending on weather conditions and the use of the lower keel) below the surface to 0.5 m above the seabed. The speed of the vessel during the acoustic sampling was about 10 knots. The acoustic recordings were scrutinized twice per day using the Post Processing System LSSS (ver. 1.7) (Large Scale Survey System, Korneliussen et al. 2006).

2.5 Acoustic data analysis

Data from the post-processing LSSS (sA) were averaged per 1 nm. The acoustic data were allocated to the following categories: herring, saithe, demersal fish, pelagic fish and plankton. To calculate integrator conversion factors, the target strengths of the target species herring and sprat were estimated using the following TS-length relationship:

$$TS = 20\log_{10}L - 71.2 \text{ dB}$$

Herring were separated from other recordings by using catch information, TS and characteristics of the recordings (e.g. frequency response – Korneliussen et al. 2006).

NORACU has used the following generic gadoid TS relationship for saithe:

$$TS = 20\log_{10}\text{Length} - 68 \text{ dB}.$$

Acoustic data were allocated to saithe when saithe were observed in trawl hauls and / or saithe were identified by the shape of acoustic marks. Typical saithe marks are elongated, oval-shaped marks right above the bottom

The length frequency from IBTS station within each rectangle was applied to the amount of sa per rectangle. If neither an IBTS haul nor a saithe target identification tow were taken in a rectangle, a search radius was applied and data from all tows within that radius were used to

generate the length frequency for that rectangle; the radius was expanded until at least two tows were included for the length frequency.

The abundance of both herring (Toresen et al. 1998) and saithe were estimated by ICES rectangle and then summed over the whole survey area. For saithe, this was the area surveyed for herring and IBTS, which is a larger area than surveyed in years prior to 2006.

2.6 Biological data – samples from trawl hauls

During acoustics, trawling was carried out for species identification of acoustic scatter and for biological sampling. A smolt trawl (gear code = 3545, 236 m circumference) or an Aakra trawl (3532 and 3533 (with buoys = surface haul), 538 m circumference) rigged with Egersund trawl doors was used for pelagic trawling, and the hauls were monitored by a trawl eye, Scanmar TE40-2 (PL) (narrow beam), and depth sensor D1200. For pelagic hauls in the surface layer, buoys were attached to the headline. Bottom trawl hauls were done with the GOV trawl (gear code = 3191 / 3196) following standard procedures (http://datras.ices.dk/Documents/Manuals/ManualVII.doc) and monitored by the TE40-2 trawl eye.

Herring sampling

The total catches were sampled for species composition by number and weights. Individual biological samples (length, weight, age, and maturity) of the target species were taken according to the IMR fish sampling manual (Mjanger et al. 2012). Herring were examined for sex, maturity (macroscopic 8 point scale, see Annex 1), fat, stomach content, vertebrae count and macroscopic evidence of *Ichthyophonus* infection. Otoliths were taken for age determination (number of winter rings). Gonad samples of herring were taken for PhD-student Thassya dos Santos Schmidt (IMR). When there was time available, also full mackerel samples were taken.

Herring stock components

North Sea autumn spawners and Western Baltic spring spawners (WBSS) are mixed during summer in the area covered by RV “Johan Hjort” (east of 2°E). No system for workable stock discrimination on individual herring during the survey is available. The proportions of Baltic spring spawners and North Sea autumn spawners by age were calculated by applying the formula

WBSS= ((56.5-VS (sample))/(56.5–55.8)) (p. 29, HAWG 1999)

WBSS is the proportion of WBSS and VS(sample) is the mean vertebrae count of the sample. All samples were worked up on board. The length-at-age and weight-at-age were assumed to be the same in the two stocks. The measured proportions of mature fish were applied equally to calculate the maturing part of each age group in both stocks.

Norwegian spring spawning herring have more distinct otolith rings than North Sea herring, and some individuals were noted by Knut Hansen as possible Norwegian spring spawning herring.

IBTS sampling

The IBTS manual states that full biologicals (length, weight, maturity stage, and age) are to be sampled for cod, haddock, whiting, saithe, plaice, sole, Norway pout, hake, herring, mackerel, and sprat; 8 samples per 1 cm length group must be collected from each roundfish area (defined in the manual; (ICES-IBTSWG 2012). The number of full biological samples collected per station has been 2 fish per 1 cm length group for haddock, whiting, Norway pout, plaice, sole, and hake. All cod have been sampled. For saithe, it has been 5 samples per 5 cm. Cod, haddock, and whiting under 20 cm, sampling was reduced to 1 fish per 1 cm; this is because fish < 20 cm are all age 1 and intensive sampling is not required. Herring and mackerel were fully sampled if more than 25 individuals were captured; otherwise, only length measurements were taken. Up to 100 measurements (full biologicals + length-only data) were recorded for these species. For all other species captured, length measurements were taken on up to 50 individuals. Sex was recorded also for all sharks and skates.

Sampling was reduced due to time constraints. On the first half of the survey, when multiple tows were on deck, only length sampling, not full biologicals, was done for select species; those chosen for reduced sampling varied between tows. Norway pout were sampled infrequently; intensive sampling was not reduced because they were extremely numerous (caught in high number every tow) and typically include only 4 age classes. On the second half of the survey (after Lerwick), sampling was 2 fish per 1 cm length class for plaice, sole, cod, Norway pout, and hake; 1 fish per 1 cm for haddock and whiting (must be sampled every tow); and 5 fish per 5 cm for saithe. Norway pout did not have full biologicals taken every station.

Total catch weight was recorded for all species. Catch was subsampled, if required; subsample weight was used to scale up to total catch weight. Benthos was identified to the lowest level possible; total number and catch weights were recorded. There was a trained taxonomist on board and species identification is assumed correct.

Special request sampling

1. Marine litter – included type, description, size category, weight, and presence of attached organisms.
2. Stomach data for hake, grey gurnard, and mackerel, which was part of an EU DG-mare tender; Norway was not a partner in the project. The request was for 5 stomachs per 5 cm length class from most of the survey area. Stomachs were removed from hake and frozen (not identified on board), while grey gurnard and mackerel were frozen whole. Hake were measured for length, individual weight, sex, stage (if possible), and otoliths were collected. If hake stomachs were empty, gall bladder colour was noted (Table 2). Mackerel samples were sent to Ralf van Hal, IMARES, the Netherlands; grey gurnard and hake samples were mailed to Jens Floeter, IHF, Hamburg.

3. Stomachs were collected from saithe and hake; 10 stomachs and 3 dorsal tissue clips per species from fish under 40 cm, 5 stomachs per species from fish greater than 40 cm. Stomachs were collected from individuals from which full biologicals were taken. Samples were sent to IFREMER Boulogne/Mer.
4. Live capture of up to 200 saithe of 45 cm or larger, collected at the end of the survey. Samples were for an IMR project on growth and mortality of egg and early life history stages.

2.7 Hydrographical data

The Utsira-Start Point, a standard hydrographical transect including plankton stations, were taken from 19 July to 21 July.

A series of 32 standard CTD casts were taken with water samples being processed for nutrients and filtered for chlorophyll at standard depths. At 10 of these stations the water samples were also sampled for microzooplankton. At 16 stations the zooplankton were sampled through the whole water column (bottom to surface) using a WP2 net (180 µm mesh net). These samples were split in half, one part preserved in formalin for later identification of species and the second sieved to give zooplankton >2000, 1000-2000, and 180-1000µm size fractions. These samples gave dry weights of the various size fractions. At three stations in the deeper water additional samples were taken from 200m to surface with the samples being treated in the same way. Ten stations were sampled for phytoplankton using a 10µm net, hauled from 30m to the surface. Three stations were sampled using a MOCNESS (180 µm mesh nets) (Wiebe et al. 1985) in a stepwise manner from near the bottom to the surface. These vertically stratified samples were treated exactly the same way as the WP2 samples. Nine MIK-ring net samples (1.6mm mesh net) (Munk 1993) were taken along the transect using double oblique hauls. All fish larvae were sorted from the sample and stored for later analyses.

In addition, a CTD station was taken at each bottom trawl station, each grab station and some of the pelagic trawl stations, reaching a total of 134 CTD stations.

2.8 Environmental condition monitoring

The environmental condition monitoring is a part of the projects

- 10018; Monitoring of the Norwegian Marine Environment (”Havforskningsinstituttets overvåkningsprogram av forurensning i norske kyst- og havområder”)
- 10018-01; Radioactivity in the Marine Environment (”Overvåkning av radioaktivitet i norske kyst- og havområder”).

Fish (haddock, cod, saithe, ling, herring, mackerel, blue whiting, poor cod, common dab and whiting) and sediment samples were collected at stations in the northern part of the North Sea (Figure 8, Tables 9-10). The samples will be analysed for persistent organic pollution (POPs), poly aromatic hydrocarbons (PAHs) and radionuclide (caesium 137).

Bottom and surface water samples were taken for analysis of a number of radionuclides: Plutonium-238, plutonium-239,240, americium-241 (Pu/Am), Radum-226/polonium-226 (Ra/Po), Strontium-90 (Sr-90), Technetium-99 (Tc-99), Cesium-137 (Cs-137).

Earlier, environmental condition monitoring surveys around Norwegian oil installations have found evidences that haddock can be affected of oil pollution (Balk et al., 2011, Grøsvik et al., 2009, 2012). This year's survey focused on getting a large data material on haddock with a good geographic coverage of the Northern part of the North Sea. 361 fish samples from 31 stations were collected. Samples for a number of different biomarkers were taken; bile (PAH metabolites), liver (DNA adduct, protein and enzyme activity, lipid), muscle and brain (lipids), and stomach (diet analysis).

Part of this material will be analyzed in the regular program of project 10018. The rest will be used in a new proposal to the Norwegian Environment Agency in 2014, to apply for funding to get a better knowledge about the geographical and biological variation of the different biomarkers used in the condition monitoring. Special attention will be given to investigating the condition factor and energy status of the haddock, therefore measurements of liver index (HIS) was taken at all trawl stations with haddock.

In addition to the collection of samples for environmental monitoring, also a large material of fish (46 different species - samples of liver, muscle, brain and stomach/intestines), benthic organism (63 different species), zooplankton and phytoplankton was sampled for lipid analysis (Tables 11-14). Fatty acid analysis have the potential to be used as trophic markers in the marine environment (Dalsgaard et al., 2003) and we want to use this material to establish a database on lipid composition at different trophic levels in the North Sea. A similar fish sample material on fish exists from 2010 and 2011. An internal application to the IMR North Sea program will be written for funding in 2014.

As part of a new EU project (Bioclean, Project 14210), samples of surface water were taken for detection of microplastics. The samples were sent to Italy for future analysis.

Sampling of microplastics

3 Results and discussion

The survey track, trawl hauls and the CTD stations are presented in Figure 3 a-c.

3.1 Acoustic data

Herring

Herring were mainly found as small schools in the surface layer in the central and northwestern part of the Norwegian sampling area. The preliminary Sa-values per ICES square are given in Figure 4. The highest mean sA recorded by ICES rectangle was 313

(49F3) followed by 264 in 51F2 and 220 in 46F3. The highest sA-values were higher than last year (Torstensen 2012), and the herring also seemed to have a more northerly distribution. In the most southern areas (south of 58°N), only small amounts of herring were observed. Pelagic trawling was based on both random positions regularly chosen for trawling at the surface, i.e. not based on echo registration (74%), and trawling on acoustic registrations (26%). In the "Norwegian survey area" herring tend to keep close to the surface and may thus be underestimated. Most of the schools were small and occurred scattered throughout the area, either close to the surface or near bottom. Few "classical" herring schools were observed.

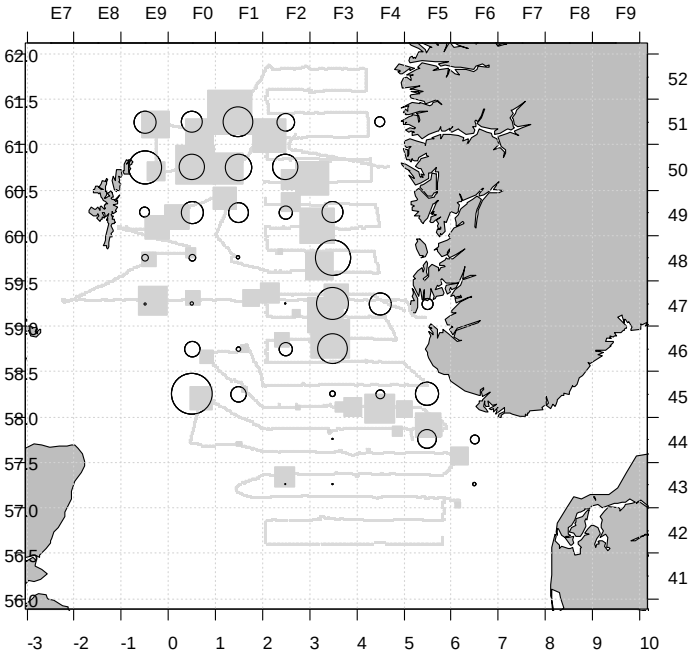
Sprat

No sprat was observed in the Norwegian area. This is the same as last years.

Saithe

No directed target identification tows for saithe were made; the standard for this survey has been to use the IBTS tows to assign backscatter to species. Dense, pelagic schools of saithe were occasionally observed, but most of the backscatter was associated with or near to the bottom.

Saithe were mainly found in the northern North Sea and along the shelf edge, along the Norwegian Trench (Figure 5). There was an extremely large amount of saithe observed in the center of the North Sea, rectangle 45F0. This high abundance is most likely not real because high abundance of saithe was not been observed in this area from surveys 2010–2012 and the tow data from this rectangle included a catch of only 5 large saithe, but extremely large amounts of Norway pout and silvery pout (sølvtorsk). The figure below shows the catch of saithe (weight) in the IBTS survey area, which was used to assign backscatter. High correlation between IBTS catches and amount of backscatter assigned to saithe should be present, but comparison of acoustic backscatter (amount indicated by circles) and total catch in the bottom trawl (amount indicated by squares) in the figure below indicate that this was not the case.



3.2 Biological data

Herring sampling

A total of 35 valid pelagic trawl hauls were taken in the Norwegian survey area (Figure 1, Table 3). In general 30 min hauls were made. Catch composition per haul is given in Table 4-6. Herring were present in 24 pelagic hauls of sample size >20 herring, as well as two bottom trawl hauls. The length and age distributions in the trawl hauls with > 20 herring are presented in Tables 7-8.

From the pelagic hauls, 2022 herring were length measured and 1100 aged by number of winter rings in otoliths. Three individuals of herring were observed to have external evidence of Ichthyophonus infection, one at station 410 (50F2) and two at station 416 (52F2).

IBTS sampling

Forty-nine IBTS stations were completed, of which 47 were valid tows (Table 3). Composition and catch weights for all species are given in Table 4-6.

3.3 Biodiversity

Fish

54 fish species, belonging to 14 orders and 30 families were identified. 52 species were caught with the bottom trawl, with saithe (*Pollachius virens*), Norway pout (*Trisopterus esmarkii*), common dab (*Limanda limanda*), haddock (*Melanogrammus aeglefinus*) and hake (*Merluccius merluccius*) dominating in terms of mass (more than 1000 kg each). There was no clear dominance, but haddock, long rough dab (*Hippoglossoides platessoides*), Atlantic cod (*Gadus morhua*), whiting (*Merlangius merlangus*), grey gurnard (*Eutrigla gurnardus*), hake, saithe, Norway pout, lemon sole (*Microstomus kitt*), and European plaice (*Pleuronectes platessa*) were represented at more than 30 stations. Norway pout was also the most abundant species. 20 species were caught with the pelagic trawl, with Atlantic mackerel (*Scomber scombrus*) and Atlantic herring (*Clupea harengus*) dominating both in terms of mass and number of stations represented, as well as 0-group whiting and haddock (in number of stations represented).

Invertebrates

In total 109 taxa of invertebrates belonging to 9 phyla, 17 classes, and 62 families were identified. Jellyfish were dominating both in terms of mass (ca. 2580 kg) and number of stations (81) represented. Other taxa with a total mass of more than 10 kg were sea urchins (Echinoidea) (ca. 274 kg), Red whelk (*Neptunea antiqua*) (ca. 35 kg), sea anemones (Actiniaria), the starfish *Hippasteria phrygiana* and the crab *Lithodes maja* (ca. 10 kg in each case). Sea urchins (Echinoidea), Sand star (*Astropecten irregularis*), Common starfish (*Asterias rubens*), Red whelk (*Neptunea antiqua*), Woody canoe-bubble (*Scaphander lignarius*), sea anemones (Actiniaria), bristle worms (Polychaeta), and the hermit crab *Pagurus bernhardus* were also found at more than 25 stations. The sea urchins were not identified to species level, but represent most probably also the most abundant species during

the survey. Only few taxa of invertebrates were caught with the pelagic trawl: cephalopods (*Alloteuthis subulata* and sepiolids), jellyfish and krill.

Total catches in pelagic and bottom trawl hauls, for the species with catches > 20 kg in total, are given below.

Pelagic trawl hauls
Species / groups with catches > 20 kg

Species	Total catches, kg
SILD'G05	4491
MANETER	2432
MAKRELL	2046
KOLMULE	91
KNURR	76
ØYEPÅL	26
ROGNKJEKS	24
TAGGMAKRELL	21

Bottom trawl hauls
Species / groups with catches > 20 kg

Species	Total catches, kg
SEI	2225
ØYEPÅL	2004
SANDFLYNDRE	1496
HYSE	1382
LYSING	1097
TORSK	973
SILD'G05	649
HVITTING	429
RØDSPETTE	322
LANGE	276
SJØPIGGSVIN	274
KOLMULE	259
GAPEFLYNDRE	211
MANETER	152
KNURR	139
LOMRE	123
SØLVTORSK	123
STORSKATE	95
BREIFLABB	75
GLASSVAR	71
GRÅSTEINBIT	51
SYPIKE	37
STRØMSILD	36
LYR	35
NEPTUNEA ANTIQUA	35
VASSILD	23

3.4 Hydrography, zooplankton and fish larvae along the Utsira/Start Point transect

The physical conditions along the Utsira to Start Point transect were typical for this time of the year with a marked thermocline around 20m and lower salinity water on the Norwegian (eastern) side of the transect (Figure 7). Dry weights ($g.m^{-2}$) for the two smaller size fractions (180-1000 and 1000-2000µm) were at their highest on the western edge of the Norwegian trench. The smaller size fraction tended to be higher at the western end of the transect (toward the Orkney Islands) where as the middle fraction (1000-2000µm) was generally higher over the central part of the transect.

A total of 9 stations were sampled with the MIK-ring trawl. The distribution of larvae in 2013 was similar to that observed in 2012 with relatively low abundances occurring over the deeper Norwegian trench in the eastern section of the transect (see Figure 8). The maximum abundances of up to 10.6 larvae m^{-2} were over the shallower water at the western end of the transect. Species composition was diverse with numerous flatfish and gadoid species.

3. 5 Hydrography

A total of 134 CTD stations were sampled as part of the IBTS survey (Figure 3b).The temperature and salinity at 10 m depth are presented in Figure 9.

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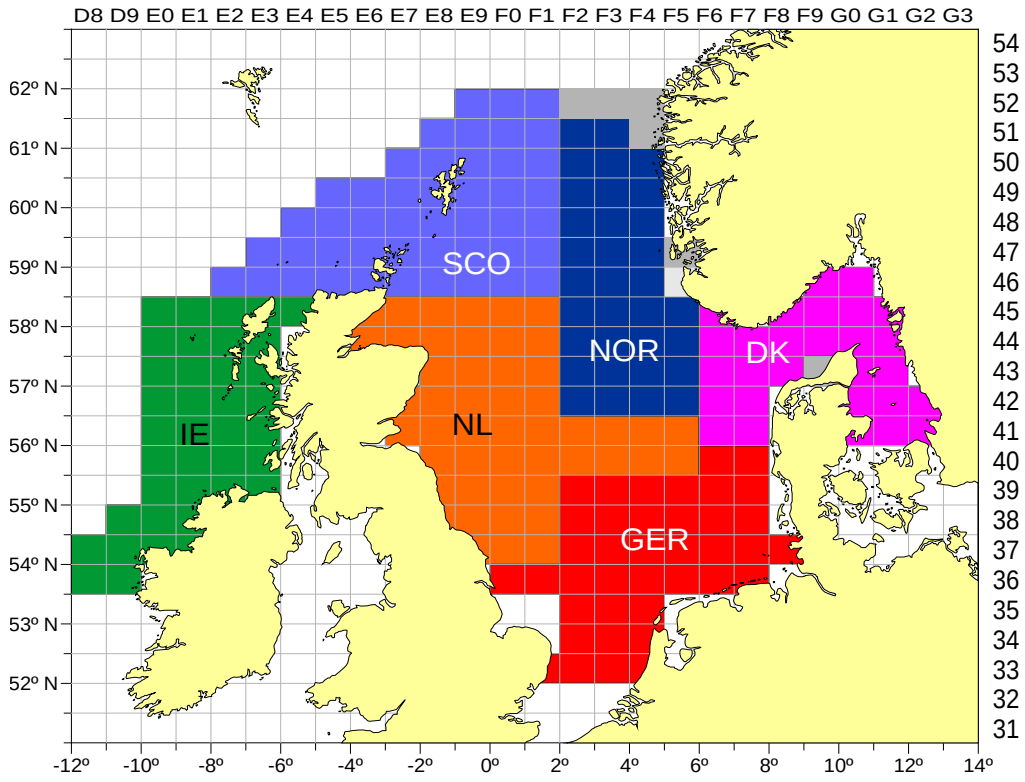

Figure 1. Survey area layouts for all participating vessel in the 2013 herring acoustic survey of the North Sea and adjacent areas. (IE = Celtic Explorer; SCO = Scotia; NOR = Johan Hjort; DK = Dana; NL = Tridens; GER = Solea). The grey areas within the Norwegian area should have been dark blue.

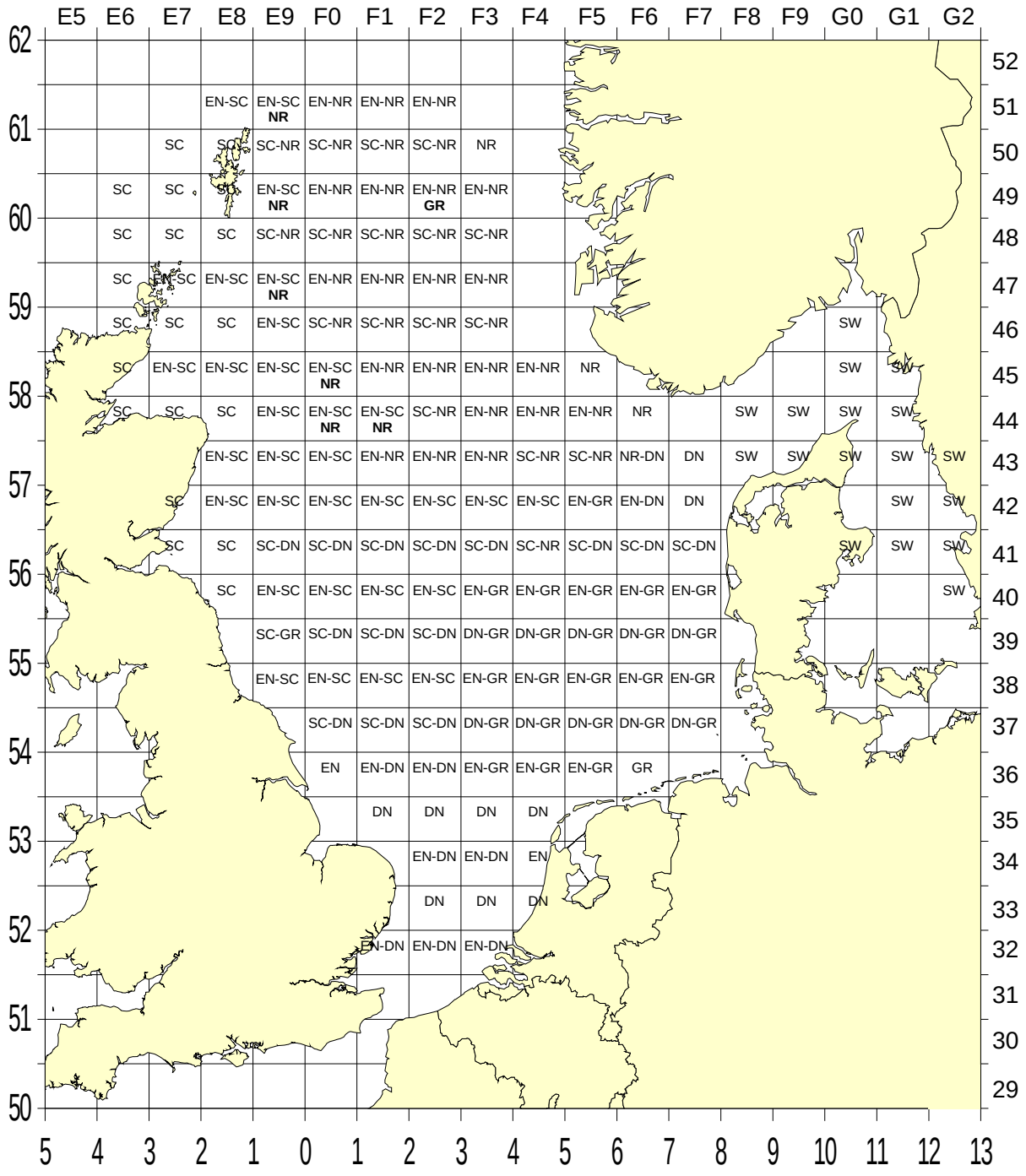

Figure 2. Map of the IBTS quarter 3 survey area listing the countries responsible for sampling each ICES rectangle. SC = Scotland, GR = Germany, NR = Norway, DN = Denmark, EN = England, and SW=Sweden.

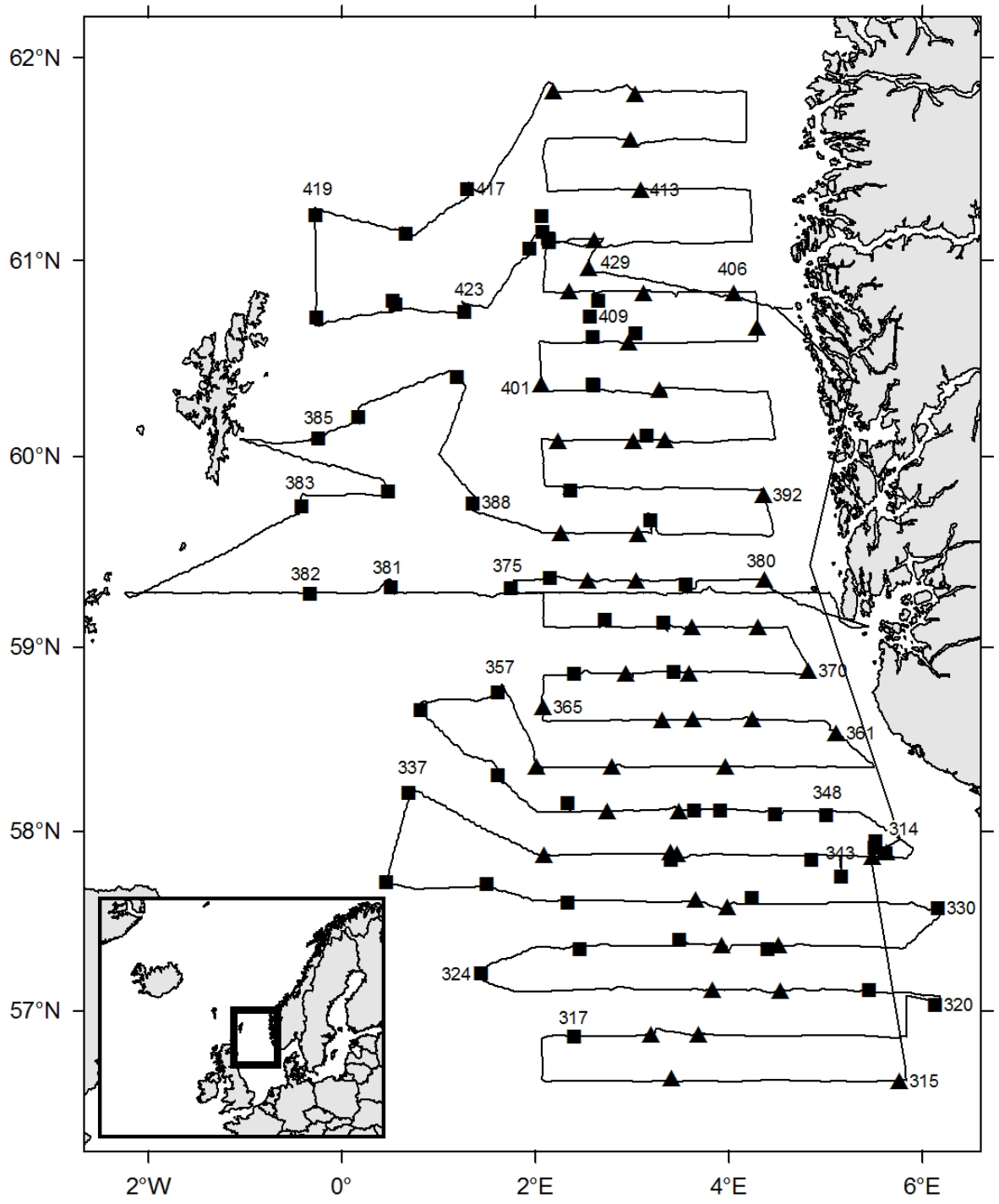

Figure 3a. RV "Johan Hjort", survey 2013206, 4 July – 2 August 2013. Trawl station 314-429. ■ = bottom trawl, ▲ = pelagic trawl.

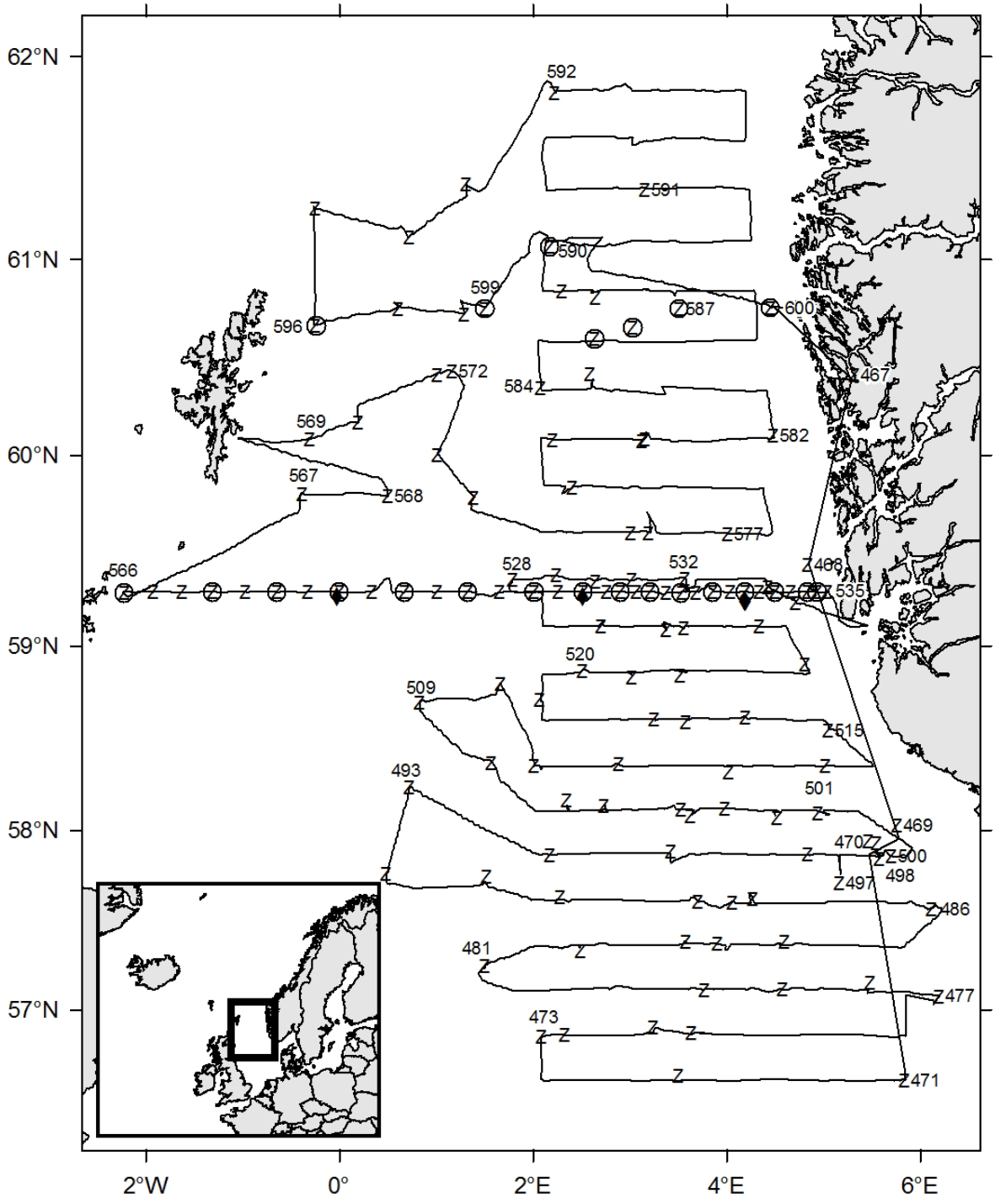

Figure 3b. RV "Johan Hjort", survey 2013206, 4 Jul–2 Aug 2013. z: CTD station (st 467-600), o: Plankton - WP-II-net, ♦: Plankton - Mocness. Standard section: Utsira–W (535-566).

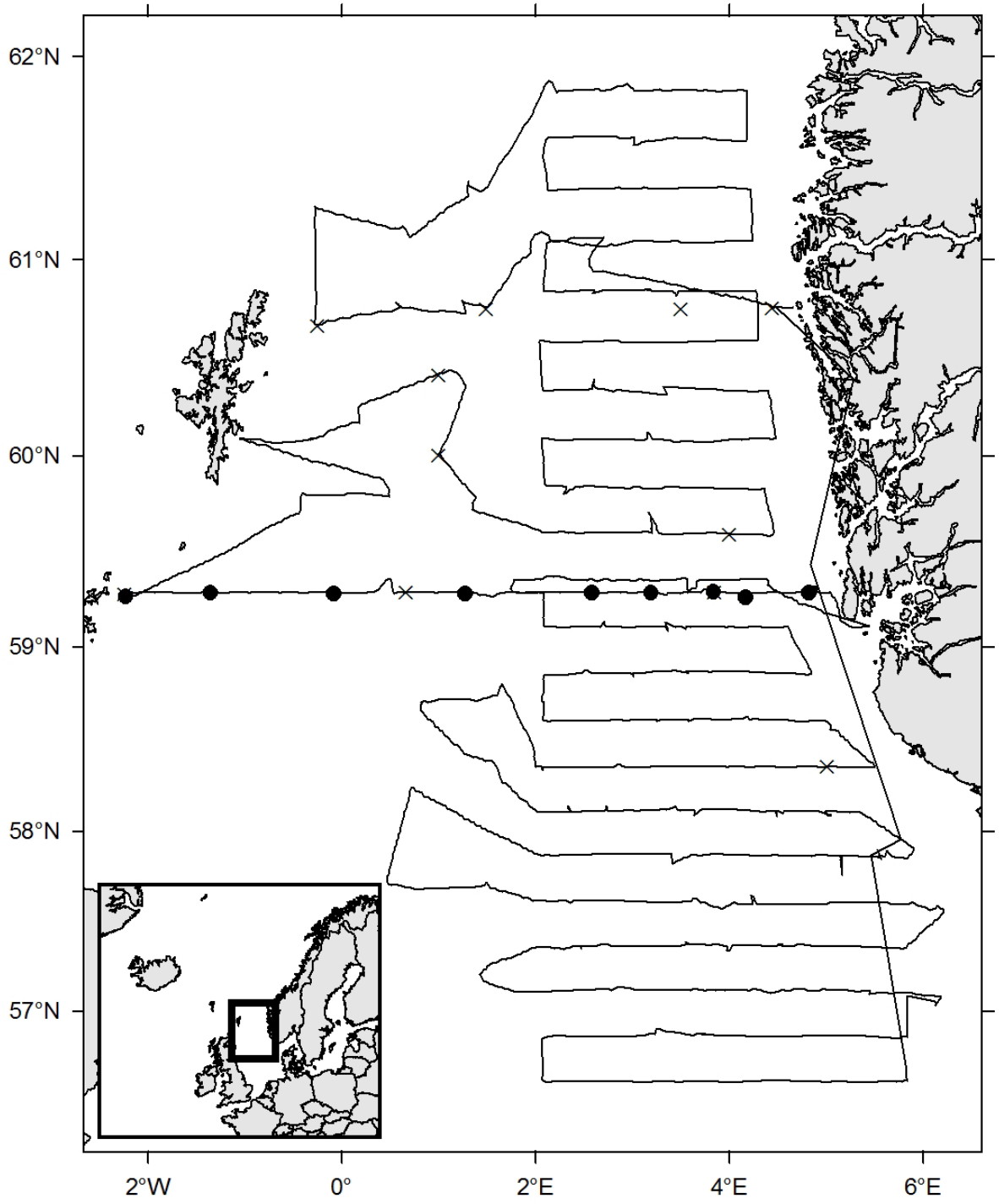

Figure 3c. RV "Johan Hjort", survey 2013206, 4 Jul–2 Aug 2013. z: CTD station (st 467-600), •: MIK-station, x: grab station.

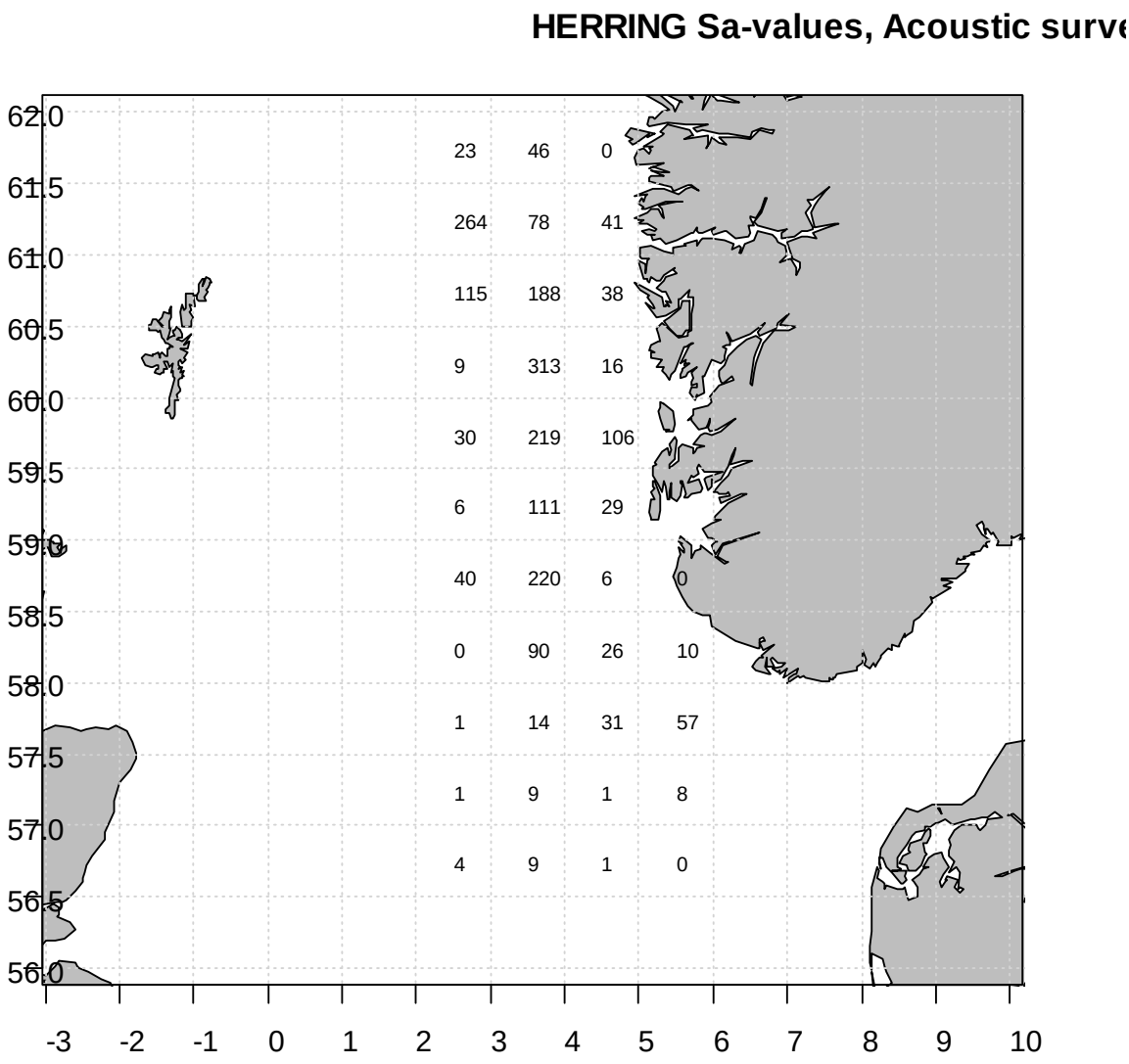

Figure 4. RV "Johan Hjort" 4 July – 2 August 2013. Ecosystem survey - North Sea.
Preliminary herring sA-values by ICES rectangle.

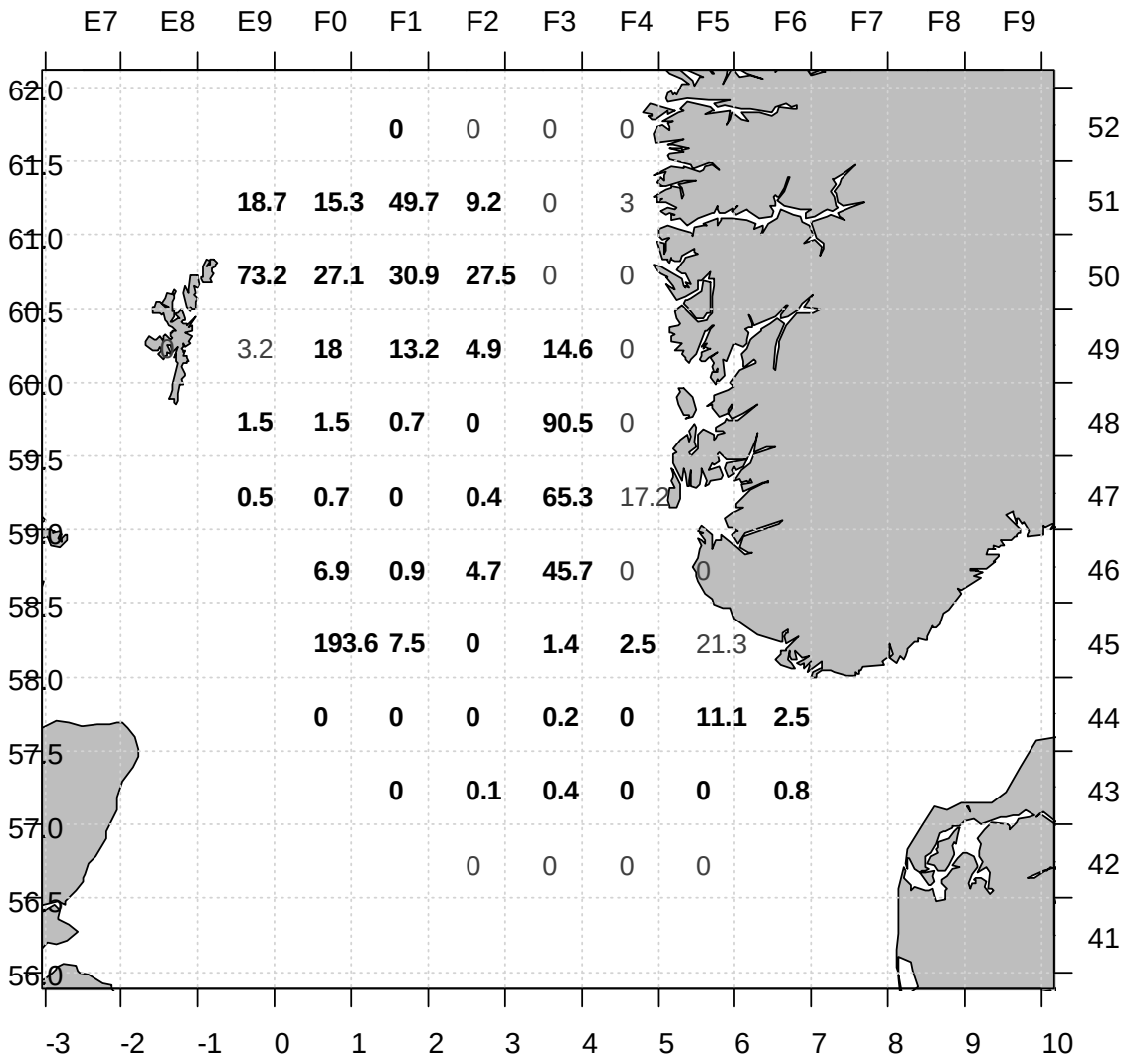

Figure 5. Preliminary saithe sA values by ICES rectangle. Numbers in bold lie in the original NORACU survey area; non-bold numbers are from the expanded survey area (since 2006).

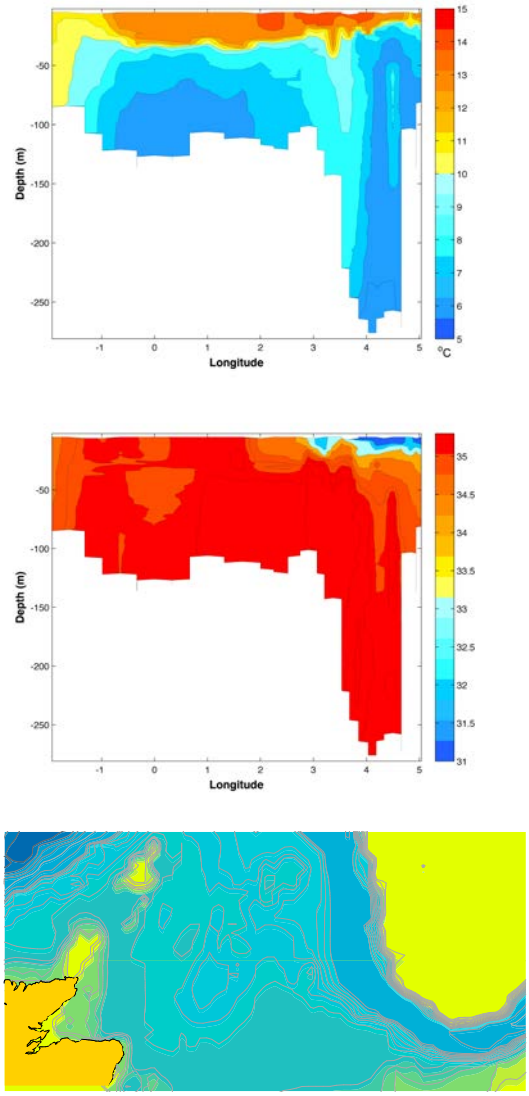

Figure 6. RV "Johan Hjort" 4 July – 2 August 2013. Ecosystem survey-North Sea. a. Temperature and b. Salinity profile, c. Biomass of three zooplankton size classes ($g.m^{-2}$).

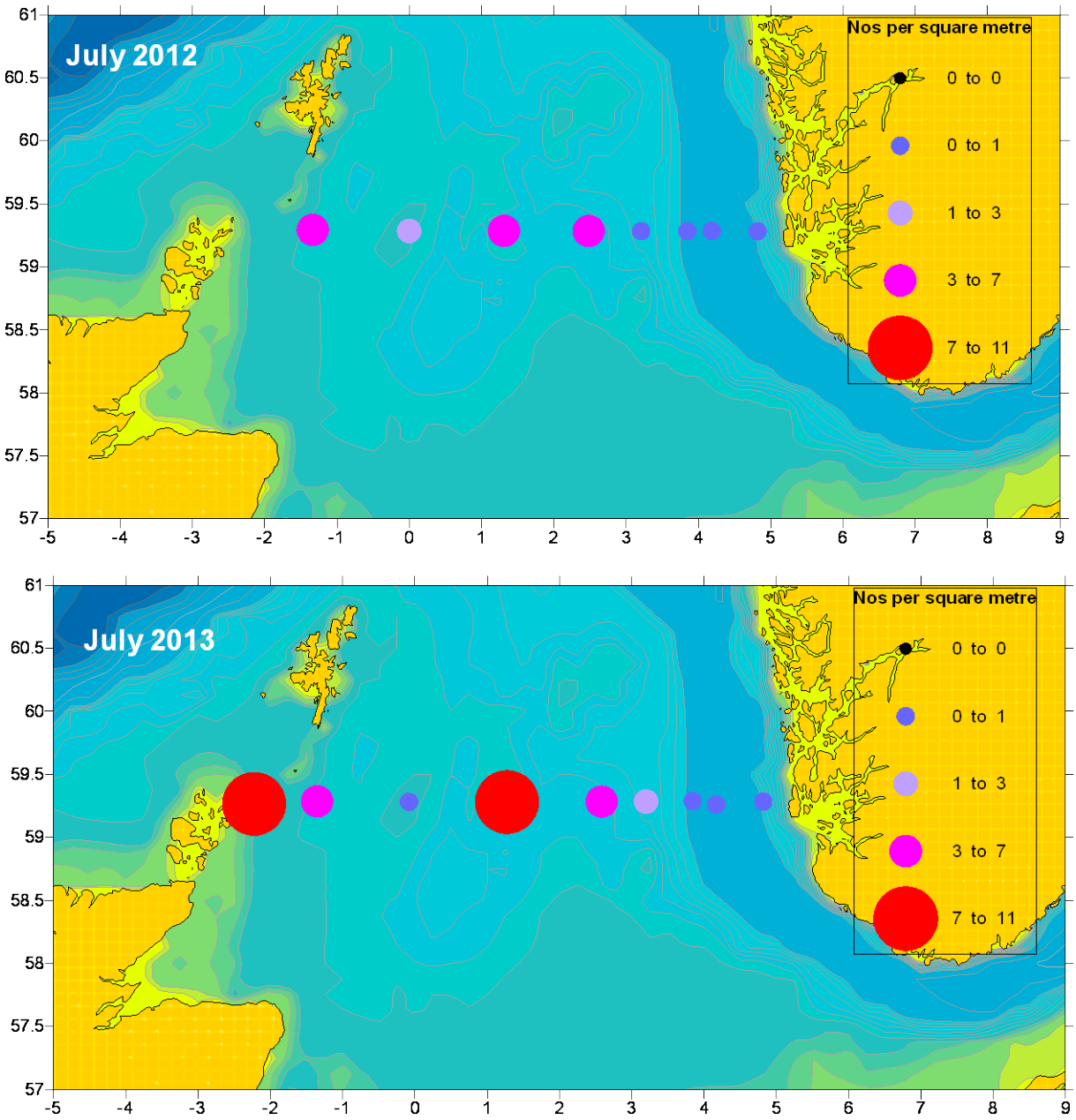

Figure 7. RV "Johan Hjort" 4 July – 2 August 2013. Ecosystem survey - North Sea. Abundance of fish larvae sampled using an MIK-ring trawl (2m diameter) in July 2012 and 2013. Sampling consisted of double oblique tows to a maximum of 130m depth.

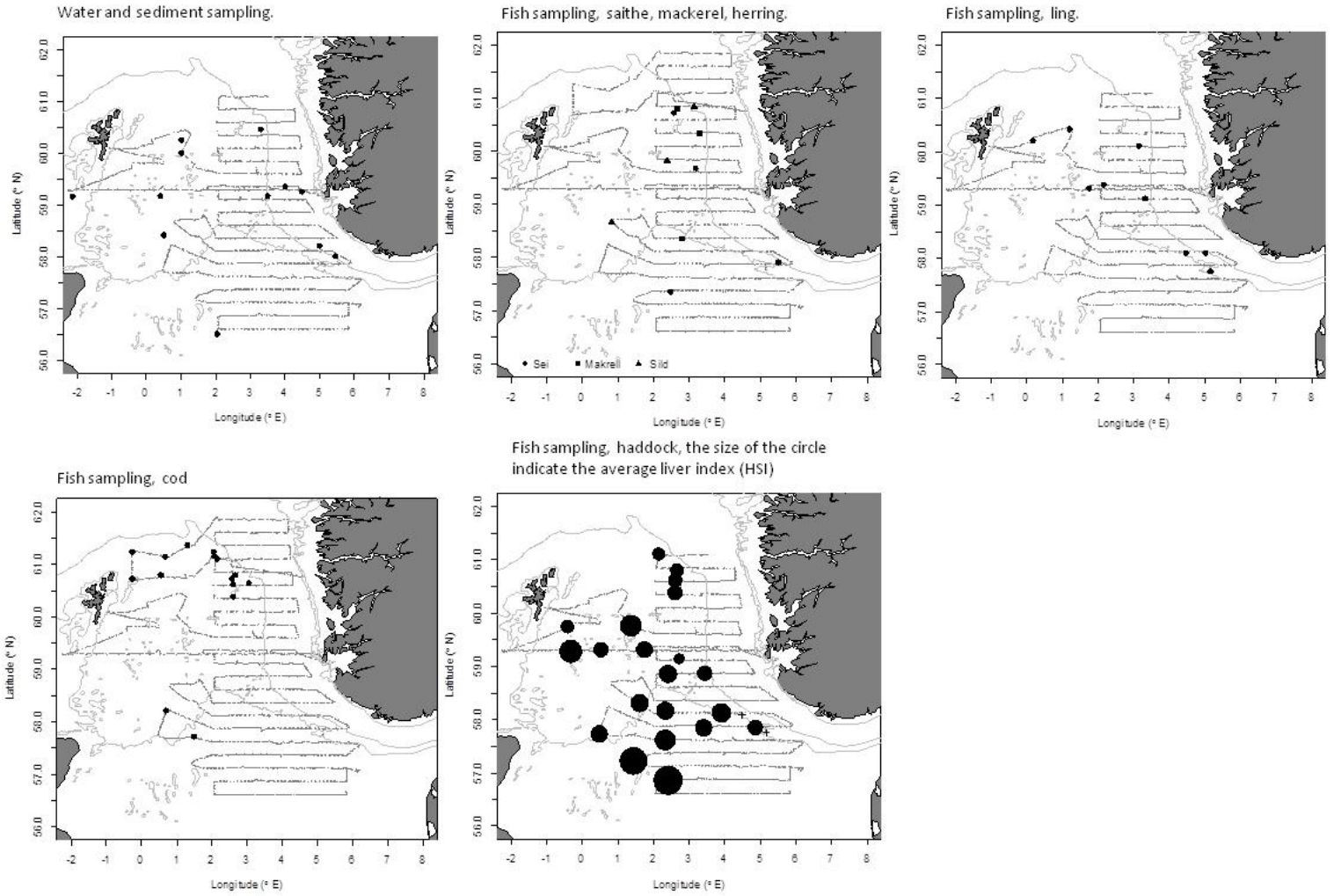

Figure 8. RV "Johan Hjort", survey 2013206, 4 Jul–2 Aug 2013. Sampling stations for the environmental condition monitoring (details in Tables 9-10).

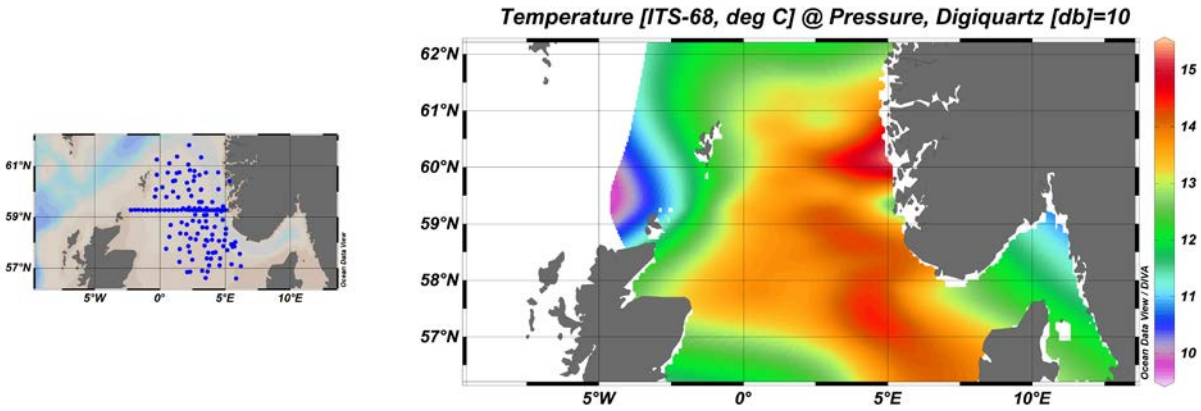

Figure 9. (right) Position of CTD casts. (left) Temperature at 10 m depth.

Table 1. RV "Johan Hjort" 4 July – 2 August 2013. Ecosystem survey - North Sea. Simrad ER60 and analysis settings used.

Transceiver Menu	
Frequency	38 kHz
Absorption coefficient	9.1 dB/km
Sound velocity	1485.0 m/s
Pulse duration	1.024 ms
Bandwidth	2.43 kHz
Max power	2000 W
Two-way beam angle	-20.6 dB
3 dB Beam width (deg) - along ship	6.98 deg
3 dB Beam width (deg) - athwart ship	6.96 deg
Calibration details	
TS of sphere	-33.60 dB
Range to sphere in calibration	19-25 m
Transducer gain	26.73 dB
sA correction	-0.62 dB
Log/Navigation Menu	
Speed	Serial from ship's GPS
Operation Menu	
Ping interval	1 s

Table 2. Feeding stage description

Stage	Gallbladder description	Bile colour	Hind gut description	State
1	Shrunken, empty, or with small amount of bile	Pale	Contains large amounts of bile and digested food material	Feeding
2	Elongate	Pale green to light emerald green	Contains some bile and digested food particles	Feeding
3	Elongate	Dark green	Empty or contains some food particles	Empty
4	Round	Dark green	Empty	Empty

Table 3. RV "Johan Hjort" 4 July – 2 August 2013. Ecosystem survey - North Sea. Trawl stations. H/S: herring/saithe sample (≥ 50 /20 ind.), h/s: h/s present (< 50/20 ind.). Quality: 1 = random position at surface, 2 = trawling on acoustic registration, 5 = problems with gear. State: 1 = gear in perfect condition, 2 = small damage of no concern, 3-4: damage influencing catch. Type: C = station for samples for environmental monitoring – not representative. na = not recorded. Time = hhmm. In summer, Norwegian local time is UTC + 2 hours.

Date	Time (UTC)	Trawl haul no	Ser no	Lat	Long	ICES square	Log	Bottom depth (m)	Trawl depth (m)	Gear	Duration (min)	Total catch (kg)	Herring	Saithe	State	Quality	Type
705	1349	BT-314	24101	57.90	5.51	44 F5	9760.5	164	165	3191	29	154.8		S	1	1	
705	2325	PT-315	24102	56.60	5.78	42 F5	9841.1	53	0	3545	32	38.4	h		1	1	
706	819	PT-316	24103	56.61	3.42	42 F3	9915.9	66	0	3545	31	0.9			1	1	
706	1804	BT-317	24104	56.85	2.40	42 F2	9989.9	74	74	3191	36	247.4			1	2	
706	2225	PT-318	24105	56.86	3.20	42 F3	20.1	68	0	3545	30	1.1	h		1	1	
707	0217	PT-319	24106	56.86	3.69	42 F3	41.1	60	20	3545	28	0			1	1	
707	1313	BT-320	24107	57.03	6.14	43 F6	136.9	47	48	3191	31	88.6		s	1	1	
707	1725	BT-321	24108	57.11	5.45	43 F5	164.4	46	42	3191	30	635.8			1	1	
707	2201	PT-322	24109	57.11	4.54	43 F4	196.9	61	0	3545	31	14.4			1	1	
708	0058	PT-323	24110	57.11	3.84	43 F3	218.4	61	0	3545	31	3.3			1	2	
708	0946	BT-324	24111	57.21	1.44	43 F1	294.9	94	94	3191	31	84.8	H		1	1	
708	1425	BT-325	24112	57.34	2.46	43 F2	329.3	81	81	3191	30	293.1		s	1	1	
708	1952	BT-326	24113	57.39	3.49	43 F3	372.6	62	0	3191	30	253.1			1	1	
708	2237	PT-327	24114	57.36	3.93	43 F3	387.1	66	0	3545	31	16.2			1	1	
709	0149	PT-328	24115	57.36	4.52	43 F4	408.0	68	0	3545	30	142.9			1	1	
709	0355	BT-329	24116	57.34	4.40	43 F4	417.3	67	67	3191	31	248.2			1	1	
709	1143	BT-330	24117	57.57	6.17	44 F6	483.2	142	140	3191	23	144.7	h	s	1	1	
709	1946	BT-331	24118	57.63	4.24	44 F4	543.1	67	67	3191	31	150.9			1	1	C
709	2238	PT-332	24119	57.58	3.99	44 F3	557.8	67	0	3545	31	40.4			1	1	
710	0055	PT-333	24120	57.61	3.67	44 F3	568.6	77	0	3545	34	97			1	1	
710	0616	BT-334	24121	57.60	2.34	44 F2	610.2	79	79	3191	31	132.3			1	1	
710	1025	BT-335	24122	57.70	1.50	44 F1	640.4	92	0	3191	31	211.1	h	s	1	5	
710	1525	BT-336	24123	57.72	0.46	44 F0	677.0	106	108	3191	21	187.6	h		1	1	
710	1921	BT-337	24124	58.21	0.69	45 F0	705.3	150	150	3191	20	125.6		s	1	1	
711	0125	PT-338	24125	57.86	2.09	44 F2	753.3	85	0	3545	29	32.4			1	1	
711	0658	BT-339	24126	57.84	3.41	44 F3	795.9	68	68	3191	31	86.7	h	s	1	1	
711	0819	PT-340	24127	57.88	3.40	44 F3	799.8	72	40	3545	21	2.2			1	1	
711	0946	PT-341	24128	57.87	3.47	44 F3	806.2	74	30	3545	64	0.8			1	1	
711	1613	BT-342	24129	57.84	4.86	44 F4	855.9	96	95	3191	29	125.5	h	s	1	1	
711	1901	BT-343	24130	57.75	5.16	44 F5	873.7	107	102	3191	31	7.7			1	1	C
711	2236	PT-344	24131	57.85	5.49	44 F5	895.1	133	0	3545	31	340.5	H		1	1	
712	0108	BT-345	24132	57.94	5.53	44 F5	904.0	195	192	3191	32	54.9		s	1	1	C
712	0346	PT-346	24133	57.88	5.63	44 F5	917.4	180	140	3545	7	69.8		s	1	1	
712	0455	BT-347	24134	57.88	5.62	44 F5	920.1	176	176	3191	33	134.5		s	1	1	C
712	1125	BT-348	24135	58.08	5.01	45 F5	966.6	199	198	3196	29	113.4		s	1	1	
712	1426	BT-349	24136	58.09	4.48	45 F4	985.4	117	112	3196	29	402.5	h	S	1	1	
712	1749	BT-350	24137	58.11	3.91	45 F3	1009.5	95	95	3196	23	196.2		S	1	1	C
712	1952	BT-351	24138	58.11	3.65	45 F3	1021.6	83	83	3196	30	93.4		s	1	1	
712	2201	PT-352	24139	58.10	3.49	45 F3	1030.8	85	0	3545	40	18.6			1	1	
713	0131	PT-353	24140	58.10	2.75	45 F2	1054.5	70	0	3545	31	33.8		s	1	1	
713	0452	BT-354	24141	58.15	2.34	45 F2	1074.1	73	73	3196	32	176.4			1	1	
713	0831	BT-355	24142	58.30	1.61	45 F1	1103.3	105	104	3196	30	348.3	h	s	1	1	
713	1249	BT-356	24143	58.66	0.81	46 F0	1135.9	134	134	3196	28	225	H	s	1	1	
713	1755	BT-357	24144	58.75	1.61	46 F1	1163.1	108	104	3196	32	153.8	H	s	1	1	
713	2215	PT-358	24145	58.35	2.02	45 F2	1193.8	78	0	3545	32	69.9	h		1	1	
714	0142	PT-359	24146	58.35	2.79	45 F2	1218.9	80	0	3545	30	71.9	h		1	1	
714	0627	PT-360	24147	58.35	3.97	45 F3	1254.2	142	0	3545	33	146.7	H		1	1	
714	1507	PT-361	24148	58.53	5.12	46 F5	1320.1	281	0	3545	30	136.7	H		1	1	
714	1919	PT-362	24149	58.60	4.25	46 F4	1348.1	282	0	3545	31	201.9	h		1	1	
714	2233	PT-363	24150	58.60	3.64	46 F3	1366.9	144	0	3545	30	458.8	H		1	1	
715	0046	PT-364	24151	58.60	3.32	46 F3	1377.8	109	0	3545	31	126.8	h		1	1	
715	0628	PT-365	24152	58.67	2.09	46 F2	1419.0	97	0	3545	31	0.3			1	1	
715	0934	BT-366	24153	58.85	2.41	46 F2	1439.0	111	109	3196	30	190.5	h	s	1	1	
715	1215	PT-367	24154	58.85	2.95	46 F2	1455.2	120	0	3545	31	33.1	h		1	1	
715	1516	BT-368	24155	58.86	3.43	46 F3	1473.6	137	135	3196	30	422.4	h	S	1	1	
715	1719	PT-369	24156	58.85	3.60	46 F3	1483.0	231	14	3545	32	59	H		1	2	
715	2216	PT-370	24157	58.86	4.83	46 F4	1523.8	238	0	3545	31	500.8	h		1	1	
716	0222	PT-371	24158	59.10	4.31	47 F4	1547.2	265	0	3545	31	293.7	H		1	1	

Table 3. cont.

Date	Time (UTC)	Trawl haul no	Ser no	Lat	Long	ICES square	Log	Bottom depth (m)	Trawl depth (m)	Gear	Duration (min)	Total catch (kg)	Herring	Saithe	State	Quality	Type
716	0525	PT-372	24159	59.10	3.63	47 F3	1567.0	250	20	3545	30	67.3	h		1	2	
716	0752	BT-373	24160	59.12	3.33	47 F3	1579.7	165	165	3196	32	226.1		S	1	1	
716	1139	BT-374	24161	59.14	2.72	47 F2	1606.7	120	120	3196	30	46.6	h	s	3	1	C
716	1703	BT-375	24162	59.31	1.75	47 F1	1647.9	117	117	3196	30	140.9	h	s	1	1	
716	1915	BT-376	24163	59.36	2.15	47 F2	1661.0	124	124	3196	29	198.5	h	s	1	1	
716	2131	PT-377	24164	59.34	2.55	47 F2	1672.8	126	0	3545	31	94.9	h		1	1	
717	0003	PT-378	24165	59.35	3.05	47 F3	1687.3	132	0	3545	31	385.8	H		1	1	
717	0352	BT-379	24166	59.33	3.56	47 F3	1704.3	223	222	3196	31	165		s	1	1	C
717	0724	PT-380	24167	59.35	4.37	47 F3	1731.6	261	0	3545	30	294.2	H		1	1	
720	1352	BT-381	24168	59.31	0.51	47 F0	1960.4	131	130	3196	31	286.4	H	s	1	1	
720	1953	BT-382	24169	59.28	-0.33	47 E9	1988.9	140	136	3196	32	439.1	H	S	1	1	
721	1422	BT-383	24170	59.73	-0.42	48 E9	2111.3	130	129	3196	31	229.6	H	s	1	1	
721	1851	BT-384	24171	59.81	0.48	48 F0	2141.7	134	124	3196	30	372.8	H	s	1	1	
723	0346	BT-385	24172	60.09	-0.24	49 E9	2227.4	131	128	3196	29	302.4		S	1	1	
723	0616	BT-386	24173	60.20	0.17	49 F0	2242.1	156	151	3196	30	237	h	s	1	1	
723	1137	BT-387	24174	60.41	1.19	49 F1	2276.0	144	135	3196	31	193.7	h	s	1	1	
723	1755	BT-388	24175	59.75	1.35	48 F1	2319.3	105	0	3196	30	124.6	H		2	1	
723	2152	PT-389	24176	59.60	2.27	48 F2	2349.3	120	0	3545	32	232.2	H		1	1	
724	0149	PT-390	24177	59.59	3.07	48 F4	2372.2	126	0	3545	30	140.7	H		1	1	
724	0431	BT-391	24178	59.66	3.19	48 F3	2381.8	146	144	3196	30	184.4		S	1	1	
724	1150	PT-392	24179	59.79	4.36	48 F4	2438.5	282	0	3545	29	106.6			1	2	
724	1852	BT-393	24180	59.82	2.37	48 F2	2500.1	107	106	3196	33	161.6	H	s	1	1	
724	2303	PT-394	24181	60.07	2.24	49 F2	2531.2	105	0	3545	30	76.7	h		1	1	
725	0207	PT-395	24182	60.07	3.02	49 F3	2553.1	121	0	3545	30	50.9	H		1	1	
725	0413	BT-396	24183	60.10	3.15	49 F3	2558.7	151	150	3196	31	502.5		S	1	1	
725	0646	PT-397	24184	60.08	3.35	49 F3	2573.5	258	10	3545	29	21.1	h		1	2	
725	1725	PT-398	24185	60.34	3.29	49 F3	2658.6	231	0	3532	17	1945.4	H		1	2	
725	2021	BT-399	24186	60.37	2.60	49 F2	2683.4	84	84	3196	31	136.9	H	s	1	1	
725	2222	BT-400	24187	60.36	2.61	49 F2	2692.5	90	86	3196	32	na			1	1	C
726	0204	PT-401	24188	60.37	2.06	49 F2	2716.9	98	0	3545	29	13.5	h		1	1	
726	0635	BT-402	24189	60.61	2.60	50 F2	2747.9	111	111	3196	30	121.4	h	s	1	1	
726	1046	BT-403	24190	60.63	3.04	50 F3	2774.0	164	162	3196	30	430.3		S	1	1	
726	1801	PT-404	24191	60.58	2.97	50 F2	2833.6	131	0	3532	23	1256.4	H		1	2	
726	2300	PT-405	24192	60.65	4.30	50 F4	2874.2	308	0	3532	30	43.9	h		1	2	
727	0125	PT-406	24193	60.83	4.06	50 F4	2889.7	326	0	3545	29	115.2	h		1	1	
727	0740	PT-407	24194	60.83	3.13	50 F3	2927.5	290	18	3532	14	120.4	H		1	2	
727	1056	BT-408	24195	60.79	2.66	50 F2	2948.6	121	121	3196	31	na			1	1	C
727	1304	BT-409	24196	60.71	2.57	50 F2	2960.0	117	117	3196	31	na			1	1	C
727	1603	PT-410	24197	60.84	2.35	50 F2	2979.4	123	0	3532	21	56.3	h		1	2	
727	1934	BT-411	24198	61.10	2.14	51 F2	3009.0	135	0	3196	30	352.2	h	S	1	1	
728	0003	BT-412	24199	61.22	2.06	51 F2	3022.1	138	136	3196	31	na			1	1	C
728	1340	PT-413	24200	61.35	3.09	51 F3	3138.4	379	17	3532	30	108.5	H		1	2	
728	2118	PT-414	24201	61.59	2.99	52 F2	3203.2	401	0	3545	30	388.8	H		1	1	
729	2138	PT-415	24202	61.82	3.04	52 F3	3315.4	404	0	3545	31	344.4	H		1	1	
730	0140	PT-416	24203	61.83	2.19	52 F2	3339.8	374	0	3545	28	89.7	H		1	1	
730	0743	BT-417	24204	61.35	1.30	51 F1	3387.3	156	153	3196	30	654.8		S	1	1	
730	1120	BT-418	24205	61.13	0.66	51 F0	3411.9	150	148	3196	31	362.3		S	1	1	
730	1558	BT-419	24206	61.22	-0.27	51 E9	3445.9	163	156	3196	31	139.5		S	1	1	
730	1941	BT-420	24207	60.71	-0.27	50 E9	3474.7	94	87	3196	31	348.8	h	s	1	1	
731	0338	BT-421	24208	60.78	0.56	50 F0	3503.7	138	135	3196	32	402.3		S	1	1	
731	0500	BT-422	24209	60.79	0.53	50 F0	3508.2	138	0	3196	17	na			1	1	C
731	0839	BT-423	24210	60.74	1.27	50 F1	3531.4	143	143	3196	30	402.6		S	1	1	
731	1346	BT-424	24211	61.05	1.95	51 F1	3563.2	135	0	3196	12	na			1	1	C
731	1613	BT-425	24212	61.14	2.07	51 F2	3573.0	137	0	3196	9	na			1	1	C
731	1819	BT-426	24213	61.09	2.15	51 F2	3581.2	136	0	3196	8	na			1	1	C
731	1919	BT-427	24214	61.11	2.13	51 F2	3584.9	136	0	3196	8	na			4	1	C
731	2155	PT-428	24215	61.09	2.61	51 F2	3598.9	244	0	3532	33	335.1	H		1	1	

Table 4. RV "Johan Hjort" 4 July – 2 August 2013. Ecosystem survey - North Sea. Catch composition (kg) in the trawl hauls. Fish.

					BT-314	PT-315	PT-316	BT-317	PT-318	BT-320	BT-321	PT-322	PT-323	BT-324	BT-325	BT-326	BT-327	PT-328	BT-329	BT-330	BT-331	PT-332	PT-333	BT-334	BT-335
Order	Family	Norwegian	English	Latin	24101	24102	24103	24104	24105	24107	24108	24109	24110	24111	24112	24113	24114	24115	24116	24117	24118	24119	24120	24121	24122
Myxiniformes	Myxinidae	SLIMÅL	Hagfish	Myxine glutinosa							0.02														0.03
Squaliformes	Squalidae	PIGGHÅ	Picked dogfish	Squalus acanthias							11.48														
Rajiformes	Rajidae	KLOSKATE	Starry ray	Amblyraja radiata				0.36		1.53					1.59	1.12			0.35		0.74			1.54	
Rajiformes	Rajidae	SKATE - EGGKAPSLER	Egg capsules - skate	Rajidae				0.02		0.01											0.01			0.02	
Clupeiformes	Clupeidae	SILD'G05	Atlantic herring	Clupea harengus		0.08			0.08					7.62						0.11					0.53
Osmeriformes	Argentinidae	VASSILD	Greater argentine	Argentina silus	1.42															0.49					
Osmeriformes	Argentinidae	STRØMSILD	Argentine	Argentina sphyraena										0.18											2.74
Gadiformes	Gadidae	SØLVTORSK	Silvery pout	Gadiculus argenteus	0.02																				
Gadiformes	Gadidae	TORSK	Atlantic cod	Gadus morhua	16.08	0.01		0.59		5.18	0.11	0.02	0.001	2.78	4.94					23.75	0.21			0.42	22.87
Gadiformes	Gadidae	HYSE	Haddock	Melanogrammus aeglefinus	0.72			170.36			0.04	0.01		27.36	15.78		0.01	0.01	0.01	11.46	0.23	0.02	0.01	18.36	72.08
Gadiformes	Gadidae	HVITTING	Whiting	Merlangius merlangus		0.02		11.78		0.97	0.24	0.05	0.03	8.43	51.90	2.09	0.16	0.04	0.63	6.96		0.09	0.02	11.28	7.97
Gadiformes	Gadidae	KOLMULE	Blue whiting	Micromesistius poutassou	53.44																				
Gadiformes	Gadidae	LYR	Pollack	Pollachius pollachius	2.05																				
Gadiformes	Gadidae	SEI	Saithe	Pollachius virens	31.06					1.26					16.57					11.05					0.95
Gadiformes	Gadidae	ØYEPÅL	Norway pout	Trisopterus esmarkii	27.76							0.06		0.02	3.50					36.76		0.002	0.01		0.16
Gadiformes	Gadidae	SYPIKE	Poor cod	Trisopterus minutus	0.07															2.44					
Gadiformes	Lotidae	LANGE	Ling	Molva molva										0.39											0.63
Gadiformes	Merlucciidae	LYSING	European hake	Merluccius merluccius	8.97					1.17				2.09						34.49					
Lophiiformes	Lophiidae	BREIFLABB	Angler	Lophius piscatorius	4.90											1.94									
Beloniformes	Belonidae	HORNGJEL	Garfish	Belone belone		0.25																			
Scorphaeniformes	Triglidae	KNURR	Grey gurnard	Eutrigla gurnardus		1.58		8.26		3.90	1.91	1.18	2.75	3.75	16.00	1.42	16.11	3.49	8.53	0.16	3.39	9.12	6.61	2.11	4.56
Scorphaeniformes	Agonidae	PANSERULKE	Hooknose	Agonus cataphractus				0.03					0.003						0.03						
Scorphaeniformes	Cyclopteridae	ROGNKJEKS	Lumpfish	Cyclopterus lumpus																		3.60			
Perciformes	Zoarcidae	VANLIG ÅLEBROSME		Lycodes gracilis	0.23															0.01					
Perciformes	Stichaeidae	LANGHALET LANGEBARN	Snakeblenny	Lumpenus lampretaeformis																0.02					
Perciformes	Anarhichadidae	GRÅSTEINBIT	Atlantic wolffish	Anarhichas lupus				1.01						1.77						3.90					2.26
Perciformes	Ammodytidae	HAVSIL	Lesser sandeel	Ammodytes marinus						0.50	4.10								0.03		0.09				
Perciformes	Callionymidae	VANLIG FLØYFISK	Dragonet	Callionymus lyra						0.02															0.001
Perciformes	Callionymidae	FLEKKET FLØYFISK	Spotted dragonet	Callionymus maculatus										0.01						0.02					
Perciformes	Gobiidae	SANDKUTLING	Sand goby	Pomatoschistus minutus									0.003										0.002		
Perciformes	Gobiidae	KUTLINGFAM.	Gobies	Gobiidae																	0.001				
Perciformes	Scombridae	MAKRELL	Atlantic mackerel	Scomber scombrus		28.50	0.70		1.05		0.42	12.27	0.28	1.35				106.70				10.85	73.30		
Pleuronectiformes	Pleuronectidae	SMØRFLYNDRE	Witch flounder	Glyptocephalus cynoglossus										0.18	1.77	1.57			3.56	0.63				1.03	0.27
Pleuronectiformes	Pleuronectidae	GAPEFLYNDRE	American plaice	Hippoglossoides platessoides	0.23			1.01		0.34				5.95	9.86	15.22			5.79	4.43	6.59		0.08	3.12	1.99
Pleuronectiformes	Pleuronectidae	SANDFLYNDRE	Common dab	Limanda limanda				43.52		21.66	599.17				133.04	195.09	0.01		176.76		128.39			63.00	7.71
Pleuronectiformes	Pleuronectidae	LOMRE	Lemon sole	Microstomus kitt	0.30			1.75		0.13	5.74			3.79	15.38	11.26			13.58	1.99				4.53	36.82
Pleuronectiformes	Pleuronectidae	RØDSPETTE	European plaice	Pleuronectes platessa				7.06		49.93	11.96			7.87	11.66	16.99			35.33		9.78			23.64	36.92
				Fish (kg)	147	30	0.7	246	1	87	635	14	3	74	282	247	16	110	245	139	149	24	80	129	198
				Evert & algae (kg)	8	8	0.3	2	0	2	1	1	0.3	11	11	6	0.01	33	4	6	2	17	17	3	13
				% evert & algae	5	21	28	1	0	2	0.1	6	9	13	4	3	0.04	23	1	4	1	41	18	3	6

Table 4. Cont.

					BT-336	BT-337	PT-338	BT-339	PT-340	PT-341	BT-342	BT-343	PT-344	BT-345	PT-346	BT-347	BT-348	BT-349	BT-350	BT-351	PT-352	PT-353	BT-354	BT-355	BT-356
Order	Family	Norwegian	English	Latin	24123	24124	24125	24126	24127	24128	24129	24130	24131	24132	24133	24134	24135	24136	24137	24138	24139	24140	24141	24142	24143
Myxiniformes	Myxinidae	SLIMÅL	Hagfish	Myxine glutinosa		0.10										0.05			0.04					0.03	0.03
Carchariniformes	Scyliorhinidae	HÅGJEL	Blackmouth catshark	Galeus melastomus										0.01											
Squaliformes	Etmopteridae	SVARTHÅ	Velvet belly	Etmopterus spinax										0.38											
Rajiformes	Rajidae	KLOSKATE	Starry ray	Amblyraja radiata	0.54						0.60							0.68					0.97	0.40	
Clupeiformes	Clupeidae	SILD'G05	Atlantic herring	Clupea harengus	5.82			0.09			0.03		8.27					0.03						4.16	94.48
Osmeriformes	Argentinidae	VASSILD	Greater argentine	Argentia silus	0.20											1.25	0.38	0.29							
Osmeriformes	Argentinidae	STRØMSILD	Argentine	Argentina sphyraena	0.94									4.50		0.04		0.07		0.25				4.70	0.81
Stomiiformes	Sternoptychidae	LAKSESILD	Silvery lightfish	Maurolicus muelleri											0.18	0.002	0.06								
Gadiformes	Gadidae	SØLVTORSK	Silvery pout	Gadiculus argenteus		2.15								1.68		0.40	11.20								
Gadiformes	Gadidae	TORSK	Atlantic cod	Gadus morhua	0.75	47.15		3.34			11.63			4.78		5.00		48.18	1.79	3.57			12.29	39.29	11.92
Gadiformes	Gadidae	HYSE	Haddock	Melanogrammus aeglefinus	21.54	11.00		25.60			4.21	7.74		0.01	0.01	0.04	0.02	239.09	29.72	59.45		0.004	47.84	48.60	9.07
Gadiformes	Gadidae	HVITTING	Whiting	Merlangius merlangus	9.34	3.22		12.17			2.36		0.13		0.16	0.03	0.03	10.89	6.60	9.89	7.23	0.21	5.28		16.65
Gadiformes	Gadidae	KOLMULE	Blue whiting	Micromesistius poutassou		0.16							0.32	13.92		79.58	43.31								
Gadiformes	Gadidae	LYR	Pollack	Pollachius pollachius																					
Gadiformes	Gadidae	SEI	Saithe	Pollachius virens		23.47		0.71			2.69			10.48	3.50	10.45	8.37	64.96	12.93	3.06		0.84		0.97	5.48
Gadiformes	Gadidae	ØYEPÅL	Norway pout	Trisopterus esmarkii	102.63	28.43					49.07		19.10	5.15		6.02	1.82	0.86	79.68	0.26	4.02	3.13		68.89	53.68
Gadiformes	Gadidae	SYPIKE	Poor cod	Trisopterus minutus	14.13											0.02		0.30							
Gadiformes	Lotidae	SØLVTANGBROSME	Arctic rockling	Gaidropsarus argentatus										0.18											
Gadiformes	Lotidae	FIRETRÅDET TANGBROSME	Fourbeard rockling	Enchelyopus cimbrius		0.07											0.32								0.04
Gadiformes	Lotidae	BLÅLANGE	Blue ling	Molva dypterygia										0.03											
Gadiformes	Lotidae	LANGE	Ling	Molva molva													13.56	1.75							
Gadiformes	Lotidae	SKJELLBROSME	Greater forkbeard	Phycis blennoides		1.02										0.18	2.60								
Gadiformes	Merlucciidae	LYSING	European hake	Merluccius merluccius	14.34	0.07		4.34			9.71		0.12	6.06		14.32	4.19	7.99		0.41			14.47	96.95	17.58
Lophiiformes	Lophiidae	BREIFLABB	Angler	Lophius piscatorius		1.44		0.22						3.47			5.12						1.33	2.14	
Scorpaeniformes	Triglidae	KNURR	Grey gurnard	Eutrigla gurnardus	4.18	0.30		6.35	1.80	0.49	0.98								0.42	4.02	6.03	23.76	0.80		1.91
Scorpaeniformes	Cyclopteridae	ROGNKJEKS	Lumpfish	Cyclopterus lumpus									6.85												
Perciformes	Zoarcidae	VANLIG ÅLEBROSME		Lycodes gracilis										0.13		0.36	0.82	0.05		0.03			0.01		
Perciformes	Stichaeidae	LANGHALET LANGEBARN	Snakeblenny	Lumpenus lampretaeformis		0.02																			0.01
Perciformes	Anarhichadidae	GRÅSTEINBIT	Atlantic wolffish	Anarhichas lupus							8.29							11.30	5.48	5.62					
Perciformes	Callionymidae	FLEKKET FLØYFISK	Spotted dragonet	Callionymus maculatus							0.01							0.01						0.16	
Perciformes	Scombridae	MAKRELL	Atlantic mackerel	Scomber scombrus	0.73		31.78				0.21		3.50								0.80	4.91			
Pleuronectiformes	Pleuronectidae	SMØRFLYNDRE	Witch flounder	Glyptocephalus cynoglossus	0.17									0.50		0.08	1.53	0.10						0.42	
Pleuronectiformes	Pleuronectidae	GAPEFLYNDRE	American plaice	Hippoglossoides platessoides	6.83	5.24		0.31			1.01			0.07		0.28	2.09	3.87	1.44	1.32			1.40	17.42	1.33
Pleuronectiformes	Pleuronectidae	KVEITE	Atlantic halibut	Hippoglossus hippoglossus																					10.20
Pleuronectiformes	Pleuronectidae	SANDFLYNDRE	Common dab	Limanda limanda	1.25			12.18			5.72								3.98	2.56			72.61	3.98	
Pleuronectiformes	Pleuronectidae	LOMRE	Lemon sole	Microstomus kitt	0.96	0.17		1.06								0.19		1.37		1.21			1.96	1.35	0.59
Pleuronectiformes	Pleuronectidae	RØDSPETTE	European plaice	Pleuronectes platessa	2.96			13.95			5.29							0.50	2.29	1.34			14.90	9.99	
				Fish (kg)	187	124	32	80	2	0.5	102	8	38	51	4	118	95	392	144	93	18	33	174	299	224
				Evert & algae (kg)	0.4	2	1	6	0.4	0.4	24	0	302	4	66	16	18	10	52	0.5	1	1	3	49	1
				% evert & algae	0.2	1	2	7	19	45	19	0	89	7	94	12	16	3	26	1	3	3	1	14	1

Table 4. Cont.

					BT-357	PT-358	PT-359	PT-360	PT-361	PT-362	PT-363	PT-364	PT-365	BT-366	PT-367	BT-368	PT-369	PT-370	PT-371	PT-372	BT-373	BT-374	BT-375	BT-376	PT-377
Order	Family	Norwegian	English	Latin	24144	24145	24146	24147	24148	24149	24150	24151	24152	24153	24154	24155	24156	24157	24158	24159	24160	24161	24162	24163	24164
Myxiniformes	Myxinidae	SLIMÅL	Hagfish	Myxine glutinosa	0.05																				
Rajiformes	Rajidae	KLOSKATE	Starry ray	Amblyraja radiata												0.61					0.71				
Rajiformes	Rajidae	SKATE - EGGKAPSLER	Egg capsules - skate	Rajidae												0.03									
Clupeiformes	Clupeidae	SILD'G05	Atlantic herring	Clupea harengus	22.76	1.27	0.87	73.32	38.23	0.97	344.57	4.06		0.53	0.51	0.88	38.81	5.80	15.47	0.25		0.36	2.16	0.47	11.00
Osmeriformes	Argentinidae	VASSILD	Greater argentine	Argentia silus										0.33		15.35					0.46				
Osmeriformes	Argentinidae	STRØMSILD	Argentine	Argentina sphyraena												0.75							0.54	1.31	
Stomiiformes	Sternoptychidae	LAKSESILD	Silvery lightfish	Maurolicus muelleri														0.03							
Gadiformes	Gadidae	SØLVTORSK	Silvery pout	Gadiculus argenteus																	29.48				
Gadiformes	Gadidae	TORSK	Atlantic cod	Gadus morhua	21.23									12.87		14.02					4.68	23.73	3.15	34.72	
Gadiformes	Gadidae	HYSE	Haddock	Melanogrammus aeglefinus	67.46			0.03	0.01	0.05	0.01			31.15		15.67	0.03	0.12	0.08	0.02	0.01	8.27	23.07	30.95	
Gadiformes	Gadidae	HVITTING	Whiting	Merlangius merlangus	22.10			0.09	0.09	0.58	0.12			14.23	0.03	8.50		1.80	0.85	0.22	0.63	0.01	9.79	11.92	0.14
Gadiformes	Gadidae	KOLMULE	Blue whiting	Micromesistius poutassou							0.74					2.89		4.20			1.49				
Gadiformes	Gadidae	SEI	Saithe	Pollachius virens	2.18									6.63		244.07					144.18	1.98	9.27	14.93	
Gadiformes	Gadidae	ØYEPÅL	Norway pout	Trisopterus esmarkii										38.73		88.83					7.04	0.73	7.91	20.30	
Gadiformes	Lotidae	LANGE	Ling	Molva molva																	13.18		6.32		
Gadiformes	Lotidae	SKJELLBROSME	Greater forkbeard	Phycis blennoides																	0.22			0.23	
Gadiformes	Merlucciidae	LYSING	European hake	Merluccius merluccius	0.16									11.96		0.72					7.69	3.38	41.58	14.67	
Lophiiformes	Lophiidae	BREIFLABB	Angler	Lophius piscatorius																			2.56	2.55	
Beloniformes	Belonidae	HORNGJEL	Garfish	Belone belone								0.50			1.80										
Scorpaeniformes	Triglidae	KNURR	Grey gurnard	Eutrigla gurnardus	3.00	0.36				0.24				0.95		1.25					0.32		1.50	0.88	
Scorpaeniformes	Cyclopteridae	ROGNKJEKS	Lumpfish	Cyclopterus lumpus				4.60		0.05	2.97				0.11		0.85			0.95					
Perciformes	Anarhichadidae	GRÅSTEINBIT	Atlantic wolffish	Anarhichas lupus												5.48									
Perciformes	Callionymidae	VANLIG FLØYFISK	Dragonet	Callionymus lyra																				0.01	
Perciformes	Callionymidae	FLEKKET FLØYFISK	Spotted dragonet	Callionymus maculatus	0.01									0.09							0.01		0.01		
Perciformes	Scombridae	MAKRELL	Atlantic mackerel	Scomber scombrus		68.34	68.96	17.61		0.10	7.44	101.01	0.17		0.14		0.70	10.66	107.34	19.62	1.97				31.60
Pleuronectiformes	Pleuronectidae	SMØRFLYNDRE	Witch flounder	Glyptocephalus cynoglossus																				0.38	
Pleuronectiformes	Pleuronectidae	GAPEFLYNDRE	American plaice	Hippoglossoides platessoides	3.20									4.80		2.66					0.09		3.58	16.95	
Pleuronectiformes	Pleuronectidae	SANDFLYNDRE	Common dab	Limanda limanda	3.35									4.69									0.20	1.80	
Pleuronectiformes	Pleuronectidae	LOMRE	Lemon sole	Microstomus kitt	1.01									0.40		2.31							1.21		
Pleuronectiformes	Pleuronectidae	RØDSPETTE	European plaice	Pleuronectes platessa	4.78									7.68		1.88							1.15	7.02	
				Fish (kg)	151	70	70	96	38	2	356	106	0.17	135	3	406	40	23	124	21	212	38	114	159	43
				Evert & algae (kg)	3	0	2	51	98	200	103	21	0.23	55	31	17	19	478	170	46	14	8	27	39	52
				% evert & algae	2	0	3	35	72	99	22	17	58	29	92	4	32	95	58	69	6	18	19	20	55

Table 4. Cont.

					PT-378	BT-379	PT-380	BT-381	BT-382	BT-383	BT-384	BT-385	BT-386	BT-387	BT-388	PT-389	PT-390	BT-391	PT-392	BT-393	PT-394	PT-395	BT-396	PT-397	PT-398
Order	Family	Norwegian	English	Latin	24165	24166	24167	24168	24169	24170	24171	24172	24173	24174	24175	24176	24177	24178	24179	24180	24181	24182	24183	24184	24185
Myxiniformes	Myxinidae	SLIMÅL	Hagfish	Myxine glutinosa					0.10														0.02		
Carchariniformes	Scyliorhinidae	HÅGJEL	Blackmouth catshark	Galeus melastomus		9.17																			
Squaliformes	Etmopteridae	SVARTHÅ	Velvet belly	Etmopterus spinax		14.54																			
Rajiformes	Rajidae	KLOSKATE	Starry ray	Amblyraja radiata					0.69			0.88	0.46		0.52			0.65							
Rajiformes	Rajidae	STORSKATE	Blue skate	Dipturus batis							95.00														
Rajiformes	Rajidae	SKATE - EGGKAPSLER	Egg capsules - skate	Rajidae						0.01															
Clupeiformes	Clupeidae	SILD'G05	Atlantic herring	Clupea harengus	34.66		150.45	169.00	66.00	21.57	122.00		4.60	0.25	33.60	171.83	45.98			51.50	0.55	19.87		1.50	1860
Osmeriformes	Argentinidae	VASSILD	Greater argentine	Argentia silus		1.86		0.05							0.02								0.04		
Osmeriformes	Argentinidae	STRØMSILD	Argentine	Argentina sphyraena				1.79		1.30		1.95	1.50	0.05	1.90			0.08		0.14			0.03		
Gadiformes	Macrouridae	SPIRITIST	Hollowsnout grenadier	Coelorinchus caelorhincus		0.09																			
Gadiformes	Gadidae	SØLVTORSK	Silvery pout	Gadiculus argenteus		68.87		0.02	0.55		0.11		1.94	0.01									0.02		
Gadiformes	Gadidae	TORSK	Atlantic cod	Gadus morhua		2.90		14.37	118.08	90.65	38.12	68.69	54.17	1.82	5.24			24.48		2.57			28.35		
Gadiformes	Gadidae	HYSE	Haddock	Melanogrammus aeglefinus				13.28	5.45	21.85	11.65	37.06	2.75	4.13	42.50	0.01		0.05	0.02	27.40		0.004	1.21		
Gadiformes	Gadidae	HVITTING	Whiting	Merlangius merlangus	0.94		0.14	3.28	50.35	7.83	8.45	9.45	8.57	1.04	3.03	0.21	0.15	2.60	0.51	8.22	2.18	0.04	4.96	0.10	
Gadiformes	Gadidae	KOLMULE	Blue whiting	Micromesistius poutassou		10.18				0.58		0.12						0.19					48.60		
Gadiformes	Gadidae	LYR	Pollack	Pollachius pollachius														1.79					28.17		
Gadiformes	Gadidae	SEI	Saithe	Pollachius virens		27.13		6.24	55.56	6.76	3.18	26.66	28.81	25.29				48.36		0.98			145.47		
Gadiformes	Gadidae	ØYEPÅL	Norway pout	Trisopterus esmarkii				39.61	104.50	23.19	38.84	70.28	53.31	102.61				66.68		0.07			87.37		
Gadiformes	Gadidae	SYPIKE	Poor cod	Trisopterus minutus				0.22				1.53						0.13					0.48		
Gadiformes	Lotidae	FIRETRÅDET TANGBROSME	Fourbeard rockling	Enchelyopus cimbrius					1.06		0.05	0.10	0.04												
Gadiformes	Lotidae	BLÅLANGE	Blue ling	Molva dypterygia		0.18																			
Gadiformes	Lotidae	LANGE	Ling	Molva molva		1.59				6.13	3.43	10.18	8.73	6.24									118.26		
Gadiformes	Lotidae	SKJELLBROSME	Greater forkbeard	Phycis blennoides		1.71																			
Gadiformes	Merlucciidae	LYSING	European hake	Merluccius merluccius		15.01		12.64	13.79	2.66	13.31	33.81	39.33	36.58	5.89			22.60		41.66			26.20		
Lophiiformes	Lophiidae	BREIFLABB	Angler	Lophius piscatorius		6.01				13.54		11.53			4.52			1.01							
Beloniformes	Belonidae	HORNGJEL	Garfish	Belone belone	4.06																				
Scorpaeniformes	Scorpaenidae	BLÅKJEFT	Blackbelly rosefish	Helicolenus dactylopterus														0.08							
Scorpaeniformes	Triglidae	KNURR	Grey gurnard	Eutrigla gurnardus				0.11		0.48	0.45	3.06	0.10	0.33	1.22			7.38		5.84			5.35		
Scorpaeniformes	Cyclopteridae	ROGNKJEKS	Lumpfish	Cyclopterus lumpus															0.01		0.02	0.10			
Perciformes	Carangidae	TAGGMAKRELL	Atlantic horse mackerel	Trachurus trachurus													0.25								
Perciformes	Anarhichadidae	GRÅSTEINBIT	Atlantic wolffish	Anarhichas lupus				5.81																	
Perciformes	Callionymidae	VANLIG FLØYFISK	Dragonet	Callionymus lyra								0.002	0.02	0.002				0.02							
Perciformes	Callionymidae	FLEKKET FLØYFISK	Spotted dragonet	Callionymus maculatus						0.01								0.04		0.002			0.02		
Perciformes	Scombridae	MAKRELL	Atlantic mackerel	Scomber scombrus	192.24		53.63	0.84				0.36				39.28	56.88		6.08		2.60	12.42	2.99	2.91	85.40
Pleuronectiformes	Scophthalmidae	GLASSVAR	Megrim	Lepidorhombus whiffiagonis					3.49	1.91	2.07	14.12	5.79	1.95	0.74			1.02					0.69		
Pleuronectiformes	Scophthalmidae	PIGGVAR	Turbot	Scophthalmus maximus											3.74										
Pleuronectiformes	Pleuronectidae	SMØRFLYNDRE	Witch flounder	Glyptocephalus cynoglossus		0.22				0.30	0.75		0.44	1.06											
Pleuronectiformes	Pleuronectidae	GAPEFLYNDRE	American plaice	Hippoglossoides platessoides				3.35	4.87	10.15	13.44	8.86	17.28	3.13	1.13			0.10		1.63			0.90		
Pleuronectiformes	Pleuronectidae	SANDFLYNDRE	Common dab	Limanda limanda								0.73			1.28					2.97					
Pleuronectiformes	Pleuronectidae	LOMRE	Lemon sole	Microstomus kitt				0.93		1.04	1.38	0.60	0.22		0.31			0.36					0.31		
Pleuronectiformes	Pleuronectidae	RØDSPETTE	European plaice	Pleuronectes platessa				4.57		0.31	3.10				8.11					7.76			0.81		
				Fish (kg)	232	159	204	276	424	210	355	300	228	184	114	211	103	178	7	151	5	32	500	5	1945
				Evert & algae (kg)	154	6	90	10	15	19	17	2	9	9	11	21	38	7	100	11	71	19	2	17	0
				% evert & algae	40	3	31	4	3	8	5	1	4	5	9	9	27	4	94	7	93	36	0.5	79	0

Table 4. Cont.

					BT-399	PT-401	BT-402	BT-403	PT-404	PT-405	PT-406	PT-407	PT-410	BT-411	PT-413	PT-414	PT-415	PT-416	BT-417	BT-418	BT-419	BT-420	BT-421	BT-423	PT-428
Order	Family	Norwegian	English	Latin	24186	24188	24189	24190	24191	24192	24193	24194	24197	24198	24200	24201	24202	24203	24204	24205	24206	24207	24208	24210	24215
Carchariniformes	Scyliorhinidae	HÅGJEL	Blackmouth catshark	Galeus melastomus																					
Carchariniformes	Scyliorhinidae	SMÅFLEKKET RØDHAI	Small-spotted catshark	Scyliorhinus canicula																	2.08	6.41	2.97	1.04	
Rajiformes	Rajidae	KLOSKATE	Starry ray	Amblyraja radiata	0.23			0.78															0.61		
Rajiformes	Rajidae	GJØKSKATE	Cuckoo ray	Leucoraja naevus																			1.62	1.26	
Rajiformes	Rajidae	EGGKAPSLER - SKATE	Egg capsules - skate	Rajidae			0.01												0.004						
Clupeiformes	Clupeidae	SILD'G05	Atlantic herring	Clupea harengus	36.75	1.12	2.79		1100	3.41	0.83	112.50	8.14	0.25	105.00	39.65	104.05	47.10				0.26			140.97
Osmeriformes	Argentinidae	VASSILD	Greater argentine	Argentia silus			0.03							0.27						0.17	0.04				
Osmeriformes	Argentinidae	STRØMSILD	Argentine	Argentina sphyraena			1.26							2.18					0.26	0.74	0.42	2.37	1.85	1.18	
Salmoniformes	Salmonidae	LAKS	Atlantic salmon	Salmo salar					1.25																
Stomiiformes	Sternoptychidae	LAKSESILD	Silvery lightfish	Maurolicus muelleri																					0.14
Gadiformes	Gadidae	SØLVTORSK	Silvery pout	Gadiculus argenteus				6.22												0.02			0.02	0.20	
Gadiformes	Gadidae	TORSK	Atlantic cod	Gadus morhua	6.16		11.57	4.76						36.85					5.41	12.71	1.18	22.63	24.34	17.08	
Gadiformes	Gadidae	HYSE	Haddock	Melanogrammus aeglefinus	21.67	0.003	21.34	0.56		0.01			0.003	26.04		0.02		0.01	0.03	8.50	7.66	109.82	18.08	4.17	
Gadiformes	Gadidae	HVITTING	Whiting	Merlangius merlangus	5.11	0.10	5.52	3.54		0.58	0.35		0.02	14.31		0.09		0.02	11.64	3.76	0.49	14.67	9.13	7.59	
Gadiformes	Gadidae	KOLMULE	Blue whiting	Micromesistius poutassou				1.25											0.94	1.38	1.20		0.04		85.62
Gadiformes	Gadidae	LYR	Pollack	Pollachius pollachius				2.86																	
Gadiformes	Gadidae	SEI	Saithe	Pollachius virens	13.13		16.64	108.33						107.55					544.26	52.00	45.85	13.08	248.79	73.59	
Gadiformes	Gadidae	ØYEPÅL	Norway pout	Trisopterus esmarkii	0.02		5.26	152.76						99.86					6.92	167.90	35.26	68.46	27.61	224.82	
Gadiformes	Gadidae	SYPIKE	Poor cod	Trisopterus minutus				2.35						4.06					0.38	0.10	0.57	9.83			
Gadiformes	Lotidae	BROSME	Tusk	Brosme brosme															0.87					1.81	
Gadiformes	Lotidae	LANGE	Ling	Molva molva			2.50	0.15						3.95					62.12	2.29	11.25	0.41	2.68		
Gadiformes	Merlucciidae	LYSING	European hake	Merluccius merluccius	39.93		43.91	134.15						41.88					11.34	94.20	16.51	69.28	38.24	27.14	3.46
Lophiiformes	Lophiidae	BREIFLABB	Angler	Lophius piscatorius																	4.38		1.75	6.94	
Beloniformes	Belonidae	HORNGJEL	Garfish	Belone belone		0.22					1.69						0.05								
Scorpaeniformes	Scorpaenidae	BLÅKJEFT	Blackbelly rosefish	Helicolenus dactylopterus										0.08											
Perciformes	Triglidae	TVERRSTRIPET KNURR	Red gurnard	Chelidonichthys cuculus																0.04		1.50			
Scorpaeniformes	Triglidae	KNURR	Grey gurnard	Eutrigla gurnardus	3.66		1.46	2.37					1.72	2.31	0.49				1.87	2.41	2.93	10.38	5.52	0.97	0.01
Scorpaeniformes	Cyclopteridae	ROGNKJEKS	Lumpfish	Cyclopterus lumpus		0.04							1.87		1.32		0.05	0.46							
Perciformes	Labridae	BERGGYLT	Ballan wrasse	Labrus bergylta																		0.27			
Perciformes	Carangidae	TAGGMAKRELL	Atlantic horse mackerel	Trachurus trachurus					4.63			0.56			0.82	5.46	1.90								7.39
Perciformes	Callionymidae	VANLIG FLØYFISK	Dragonet	Callionymus lyra																		0.03			
Perciformes	Callionymidae	FLEKKET FLØYFISK	Spotted dragonet	Callionymus maculatus			0.01	0.003			0.01								0.003	0.01	0.01		0.02		
Perciformes	Gobiidae	KUTLINGFAM.	Gobies	Gobiidae	0.01		0.001																		
Perciformes	Scombridae	MAKRELL	Atlantic mackerel	Scomber scombrus		0.97		0.98	149.50	1.71	44.13	7.31	44.60	1.99	0.88	281.29	228.05	30.15						0.37	97.23
Pleuronectiformes	Scophthalmidae	GLASSVAR	Megrim	Lepidorhombus whiffiagonis	0.32			1.08						1.01					2.43	11.93	7.55	1.99	3.96	8.75	
Pleuronectiformes	Pleuronectidae	SMØRFLYNDRE	Witch flounder	Glyptocephalus cynoglossus																				3.21	
Pleuronectiformes	Pleuronectidae	GAPEFLYNDRE	American plaice	Hippoglossoides platessoides	1.79		2.59	2.52						1.64					0.44	0.61	0.33	0.25	2.97	5.06	
Pleuronectiformes	Pleuronectidae	SANDFLYNDRE	Common dab	Limanda limanda	1.45		3.00	0.13														0.79	5.39		
Pleuronectiformes	Pleuronectidae	LOMRE	Lemon sole	Microstomus kitt				0.99						3.58					0.50	0.81	0.04	1.97	1.31		
Pleuronectiformes	Pleuronectidae	RØDSPETTE	European plaice	Pleuronectes platessa	1.85																	10.41			
				Fish (kg)	132	2	118	426	1255	6	47	120	56	348	109	327	334	78	649	360	138	345	397	385	335
				Evert & algae (kg)	5	11	4	5	1	38	68	0.1	0	4	0	62	10	12	6	3	2	4	5	18	0.4
				% evert & algae	4	82	3	1	0.1	87	59	0.1	0	1	0	16	3	13	1	1	1	1	1	4	0.1

Table 5. RV "Johan Hjort" 4 July – 2 August 2013. Ecosystem survey - North Sea. Catch composition (kg) in the trawl hauls. Invertebrates and algae. Only species / groups present in at least 4 stations shown.

						BT-314	PT-315	PT-316	BT-317	BT-320	BT-321	PT-322	PT-323	BT-324	BT-325	BT-326	PT-327	PT-328	BT-329	BT-330	BT-331	PT-332	PT-333	BT-334	BT-335
Phylum	Class	Family	Norwegian	English	Latin	24101	24102	24103	24104	24107	24108	24109	24110	24111	24112	24113	24114	24115	24116	24117	24118	24119	24120	24121	24122
Annelida	Polychaeta	Aphroditidae	GULLMUS	Sea mouse	Aphrodita aculeata														0.037		0.082			0.256	
Annelida	Polychaeta		BØRSTEORMER	Bristle worms	Polychaeta															0.012	0.0003				0.003
Arthropoda	Malacostraca	Atelecyclidae		Circular crab	Atelecyclus rotundatus									0.015											0.006
Arthropoda	Malacostraca	Lithodidae	TROLLKRABBE		Lithodes maja									0.850	2.005	0.352			0.389	0.165				1.369	0.808
Arthropoda	Malacostraca	Nephropidae	SJØKREPS	Norway lobster	Nephrops norvegicus	0.059																			
Arthropoda	Malacostraca	Oregoniidae	SMÅPYNTEKRABBE		Hyas coarctatus					0.002				0.004										0.011	0.001
Arthropoda	Malacostraca	Paguridae	VANLIG EREMITTKREPS		Pagurus bernhardus					0.104	0.060				0.260				0.048		0.158			0.123	0.031
Arthropoda	Malacostraca	Paguridae		Deep hermit crab	Pagurus prideaux																				0.033
Arthropoda	Malacostraca	Paguridae			Pagurus pubescens										0.164									0.081	
Arthropoda	Malacostraca	Paguridae		Hermit crabs	Pagurus spp.																				0.006
Arthropoda	Malacostraca	Portunidae		Swimming crabs	Portunidae					0.009															
Arthropoda	Pycnogonida	Nymphonidae			Nymphon gracile					0.001										0.004					0.019
Bryozoa	Gymnolaemata	Flustridae			Flustridae														0.043	0.005	0.003			0.001	
Chordata	Ascidiacea		SEKKEDYR	Sea squirts	Ascidiacea															0.016					0.028
Cnidaria	Anthozoa	Hormathiidae		Mantle anemone	Adamsia palliata																				0.020
Cnidaria	Anthozoa		SJØANEMONER	Sea anemones	Actiniaria	0.068			0.998	0.005					1.972					0.772	0.111			0.754	0.006
Cnidaria	Scyphozoa		MANETER	Jellyfish	Medusozoa	6.120	8.050	0.273		1.545	0.440	0.862	0.298	8.700		0.410		32.700	0.934	2.550	0.001	16.740	17.000	0.001	
Echinodermata	Asteroidea	Asteriidae	VANLIG KORSTROLL	Common starfish	Asterias rubens					0.089				0.020	0.734				0.191	0.016	0.175			0.011	
Echinodermata	Asteroidea	Astropectinidae		Sand star	Astropecten irregularis	0.080			0.170	0.092	0.005			0.293					0.458	0.124	0.044			0.281	
Echinodermata	Asteroidea	Echinasteridae	BLODSJØSTJERNE		Henricia spp.																				0.002
Echinodermata	Asteroidea	Goniasteridae	HESTESTJERNE		Hippasteria phrygiana																0.153				0.470
Echinodermata	Asteroidea	Luidiidae			Luidia sarsi															0.016				0.005	
Echinodermata	Echinoidea	Spatangidae			Spatangidae	0.008										3.950									
Echinodermata	Echinoidea		SJØPIGGSVIN	Sea urchins	Echinoidea	0.735			0.154	0.011	0.019			0.005		0.097			0.410	0.332	0.004				7.280
Echinodermata	Holothuroidea	Stichopodidae	RØDPØLSE		Parastichopus tremulus															1.210	0.177				
Echinodermata	Ophiuroidea	Ophiocomidae	SVARTSTJERNE		Ophiocomina nigra	0.204																			
Echinodermata	Ophiuroidea	Ophiuridae		Serpent's table brittlestar	Ophiura albida					0.001										0.012					
Mollusca	Bivalvia		MUSLINGER		Bivalvia	0.052			0.032							0.047									
Mollusca	Cephalopoda	Loligonidae		European common squid	Alloteuthis subulata									0.012		0.025			0.011				0.028	0.027	
Mollusca	Cephalopoda	Octopodidae		Horned octopus	Eledone cirrhosa																				1.330
Mollusca	Cephalopoda	Sepiolidae		Stout bobtail	Rossia macrosoma	0.074														0.079					
Mollusca	Cephalopoda	Sepiolidae			Sepietta spp.									0.003											
Mollusca	Cephalopoda	Sepiolidae			Sepiolidae							0.004	0.006				0.007	0.002							
Mollusca	Gastropoda	Buccinidae			Colus spp.										0.392									0.110	
Mollusca	Gastropoda	Buccinidae		Red whelk	Neptunea antiqua						0.172				3.992				0.224		0.260			0.233	0.041
Mollusca	Gastropoda	Scaphandridae		Woody canoe-bubble	Scaphander lignarius	0.044								0.023						0.772					
Mollusca	Gastropoda		SNEGLER	Gastropods	Gastropoda				0.150							0.910			0.063	0.008					
Porifera			SVAMPER	Sponges	Porifera					0.016				0.015					0.005		0.340			0.025	0.063
					Sum (kg)	7.444	8.050	0.273	1.504	1.875	0.696	0.866	0.304	9.940	9.519	5.791	0.007	32.702	2.813	6.093	1.508	16.740	17.028	3.288	10.147

Table 5. Cont.

						BT-336	BT-337	PT-338	BT-339	PT-340	PT-341	BT-342	PT-344	BT-345	PT-346	BT-347	BT-348	BT-349	BT-350	BT-351	PT-352	PT-353	BT-354	BT-355	BT-356
Phylum	Class	Family	Norwegian	English	Latin	24123	24124	24125	24126	24127	24128	24129	24131	24132	24133	24134	24135	24136	24137	24138	24139	24140	24141	24142	24143
Annelida	Polychaeta	Aphroditidae	GULLMUS	Sea mouse	Aphrodita aculeata	0.033			0.088					0.041		0.068	0.231	0.155							0.027
Annelida	Polychaeta	Aphroditidae	SKJELLRYGGER	Scaleworms	Aphroditidae											0.002	0.004								
Annelida	Polychaeta		BØRSTEORMER	Bristle worms	Polychaeta									0.001				0.059						0.078	
Arthropoda	Malacostraca	Atelecyclidae		Circular crab	Atelecyclus rotundatus	0.032	0.003																		
Arthropoda	Malacostraca	Crangonidae	SANDREKE		Crangon allmanni									0.002		0.007								0.013	
Arthropoda	Malacostraca	Crangonidae	NIPIGGMUDDERREKE	Norwegian shrimp	Pontophilus norvegicus									0.010		0.026									
Arthropoda	Malacostraca	Hippolytidae			Spirontocaris liljeborgii				0.001							0.001							0.003		
Arthropoda	Malacostraca	Lithodidae	TROLLKRABBE		Lithodes maja				1.401			0.680		0.535			0.202								
Arthropoda	Malacostraca	Nephropidae	SJØKREPS	Norway lobster	Nephrops norvegicus											0.965	2.670								
Arthropoda	Malacostraca	Oregoniidae	SMÅPYNTEKRABBE		Hyas coarctatus				0.017									0.012	8.000						
Arthropoda	Malacostraca	Paguridae	VANLIG EREMITTKREPS		Pagurus bernhardus	0.025			0.127			0.020											0.223	0.013	
Arthropoda	Malacostraca	Paguridae		Deep hermit crab	Pagurus prideaux	0.040																			
Arthropoda	Malacostraca	Paguridae			Pagurus pubescens				0.048														0.003		
Arthropoda	Malacostraca		KRILL	Krill	Euphausiacea												0.022								
Arthropoda	Pycnogonida	Nymphonidae			Nymphon gracile	0.002										0.001			8.000				0.003	0.013	
Bryozoa	Gymnolaemata	Flustridae			Flustridae	0.002			0.034					0.002											
Chordata	Ascidiacea		SEKKEDYR	Sea squirts	Ascidiacea				0.225									0.155							
Cnidaria	Anthozoa	Epizoanthidae		American zoanthid	Epizoanthus papillosus																		0.016	0.013	
Cnidaria	Anthozoa	Hormathiidae		Mantle anemone	Adamsia palliata	0.010																			
Cnidaria	Anthozoa		SJØANEMONER	Sea anemones	Actiniaria				0.035					0.038		0.047	0.037	0.262	0.520				0.020		
Cnidaria	Scyphozoa		MANETER	Jellyfish	Medusozoa	0.007		0.650		0.420	0.400	0.225	302.245	2.480	65.985	14.225	10.190	6.895	2.700	0.480	0.545	1.000			
Echinodermata	Asteroidea	Asteriidae	VANLIG KORSTROLL	Common starfish	Asterias rubens	0.001			0.256			0.071		0.049				0.178	0.164				0.818	1.331	0.091
Echinodermata	Asteroidea	Astropectinidae		Sand star	Astropecten irregularis	0.025	0.033		0.162			0.071		0.006		0.147	0.087	0.071	0.036				0.674	1.292	0.245
Echinodermata	Asteroidea	Echinasteridae	BLODSJØSTJERNE		Henricia spp.													0.012							
Echinodermata	Asteroidea	Goniasteridae	HESTESTJERNE		Hippasteria phrygiana	0.167						0.035				0.200								1.579	
Echinodermata	Asteroidea	Luidiidae			Luidia sarsi	0.020						0.091												0.039	
Echinodermata	Echinoidea	Spatangidae			Spatangidae									0.100				0.155							
Echinodermata	Echinoidea		SJØPIGGSVIN	Sea urchins	Echinoidea		0.012		0.061			18.666		0.022		0.242	3.155	1.095	29.780					43.970	0.848
Echinodermata	Holothuroidea	Stichopodidae	RØDPØLSE		Parastichopus tremulus									0.195			0.345								
Echinodermata	Ophiuroidea	Ophiocomidae	SVARTSTJERNE		Ophiocomina nigra									0.004		0.011	0.010								
Echinodermata	Ophiuroidea	Ophiuridae		Serpent's table brittlestar	Ophiura albida				0.001					0.001		0.001	0.040	0.036							
Echinodermata	Ophiuroidea	Ophiuridae		Serpent star	Ophiura ophiura				0.010							0.003									
Mollusca	Bivalvia		MUSLINGER		Bivalvia									0.029		0.058	0.246	0.048						0.509	
Mollusca	Cephalopoda	Loligonidae		European common squid	Alloteuthis subulata															0.011			0.017		
Mollusca	Cephalopoda	Ommastrephidae		Lesser flying squid	Todaropsis elbanae				0.116			0.248													0.046
Mollusca	Cephalopoda	Sepiolidae		Stout bobtail	Rossia macrosoma											0.039	0.256	0.005							
Mollusca	Cephalopoda	Sepiolidae			Sepietta spp.										0.004										
Mollusca	Cephalopoda	Sepiolidae			Sepiolidae									0.051											
Mollusca	Gastropoda	Buccinidae			Colus spp.				0.063									0.190							
Mollusca	Gastropoda	Buccinidae		Red whelk	Neptunea antiqua				3.366			3.419				0.119		0.785	2.516				0.060		
Mollusca	Gastropoda	Scaphandridae		Woody canoe-bubble	Scaphander lignarius									0.014		0.012	0.071	0.178							
Mollusca	Gastropoda		SNEGLER	Gastropods	Gastropoda												0.004								
Porifera			SVAMPER	Sponges	Porifera				0.412			0.141											0.681	0.026	
					Sum (kg)	0.364	0.048	0.650	6.423	0.420	0.400	23.667	302.245	3.580	65.989	16.174	17.570	10.291	51.716	0.491	0.545	1.000	2.518	48.876	1.257

Table 5. Cont.

						BT-357	PT-359	PT-360	PT-361	PT-362	PT-363	PT-364	PT-365	BT-366	PT-367	BT-368	PT-369	PT-370	PT-371	PT-372	BT-373	BT-374	BT-375	BT-376	PT-377
Phylum	Class	Family	Norwegian	English	Latin	24144	24146	24147	24148	24149	24150	24151	24152	24153	24154	24155	24156	24157	24158	24159	24160	24161	24162	24163	24164
Annelida	Polychaeta	Aphroditidae	SKJELLRYGGER	Scaleworms	Aphroditidae																0.069				
Annelida	Polychaeta		BØRSTEORMER	Bristle worms	Polychaeta	0.280										0.249					1.357	0.006			
Arthropoda	Malacostraca	Atelecyclidae		Circular crab	Atelecyclus rotundatus											0.108									
Arthropoda	Malacostraca	Crangonidae	SANDREKE		Crangon allmanni																0.004				
Arthropoda	Malacostraca	Crangonidae	NIPIGGMUDDERREKE	Norwegian shrimp	Pontophilus norvegicus																0.005				
Arthropoda	Malacostraca	Lithodidae	TROLLKRABBE		Lithodes maja	0.950																			
Arthropoda	Malacostraca	Paguridae	VANLIG EREMITTKREPS		Pagurus bernhardus									0.010		0.448									
Arthropoda	Malacostraca	Paguridae		Deep hermit crab	Pagurus prideaux											0.017					0.023				
Arthropoda	Malacostraca	Paguridae			Pagurus pubescens	0.022										0.141									
Arthropoda	Malacostraca		KRILL	Krill	Euphausiacea																0.020				
Arthropoda	Pycnogonida	Nymphonidae			Nymphon gracile																0.002	0.001			
Chordata	Ascidiacea		SEKKEDYR	Sea squirts	Ascidiacea	0.022								0.070		0.124							0.027		
Cnidaria	Anthozoa	Epizoanthidae		American zoanthid	Epizoanthus papillosus											0.025									
Cnidaria	Anthozoa	Hormathiidae		Mantle anemone	Adamsia palliata											0.017					0.018				
Cnidaria	Anthozoa		SJØANEMONER	Sea anemones	Actiniaria											0.600									
Cnidaria	Scyphozoa		MANETER	Jellyfish	Medusozoa		2.100	51.060	98.450	200.000	103.040	21.300	0.230	2.980	30.560	11.700	18.700	478.200	170.000	46.300	7.060	8.160	20.925	3.515	52.200
Echinodermata	Asteroidea	Asteriidae	VANLIG KORSTROLL	Common starfish	Asterias rubens											0.050						0.028	0.009		
Echinodermata	Asteroidea	Astropectinidae		Sand star	Astropecten irregularis	0.202								0.399		0.100					0.082	0.006	0.115		
Echinodermata	Asteroidea	Echinasteridae	BLODSJØSTJERNE		Henricia spp.	0.022										0.017					0.005				
Echinodermata	Asteroidea	Goniasteridae	HESTESTJERNE		Hippasteria phrygiana																1.467				
Echinodermata	Asteroidea	Luidiidae			Luidia sarsi	0.028								0.010							0.014				
Echinodermata	Echinoidea	Spatangidae		Violet heart-urchin	Spatangus purpureus									0.580		1.065									
Echinodermata	Echinoidea		SJØPIGGSVIN	Sea urchins	Echinoidea									48.216		0.299					2.669		5.835	34.998	
Echinodermata	Holothuroidea	Stichopodidae	RØDPØLSE		Parastichopus tremulus																0.571			0.976	
Echinodermata	Ophiuroidea	Ophiuridae		Serpent's table brittlestar	Ophiura albida																0.030				
Echinodermata	Ophiuroidea	Ophiuridae		Serpent star	Ophiura ophiura																0.016				
Mollusca	Bivalvia		MUSLINGER		Bivalvia																0.046				
Mollusca	Cephalopoda	Loligonidae		European common squid	Alloteuthis subulata																0.037				
Mollusca	Cephalopoda	Ommastrephidae		Lesser flying squid	Todaropsis elbanae											0.152									
Mollusca	Cephalopoda	Sepiolidae		Stout bobtail	Rossia macrosoma																0.069				
Mollusca	Gastropoda	Buccinidae			Colus spp.											0.033									
Mollusca	Gastropoda	Buccinidae		Red whelk	Neptunea antiqua	0.920								3.184		0.815									
Mollusca	Gastropoda	Scaphandridae		Woody canoe-bubble	Scaphander lignarius	0.101								0.039		0.100					0.434	0.002			
Porifera			SVAMPER	Sponges	Porifera											0.548									
					Sum (kg)	2.547	2.100	51.060	98.450	200.000	103.040	21.300	0.230	55.488	30.560	16.608	18.700	478.200	170.000	46.300	13.998	8.203	26.911	39.489	52.200

Table 5. Cont.

						PT-378	BT-379	PT-380	BT-381	BT-382	BT-383	BT-384	BT-385	BT-386	BT-387	BT-388	PT-389	PT-390	BT-391	PT-392	BT-393	PT-394	PT-395	BT-396	PT-397
Phylum	Class	Family	Norwegian	English	Latin	24165	24166	24167	24168	24169	24170	24171	24172	24173	24174	24175	24176	24177	24178	24179	24180	24181	24182	24183	24184
Annelida	Polychaeta	Aphroditidae	GULLMUS	Sea mouse	Aphrodita aculeata														0.183						
Annelida	Polychaeta	Aphroditidae	SKJELLRYGGER	Scaleworms	Aphroditidae											0.001								0.019	
Annelida	Polychaeta		BØRSTEORMER	Bristle worms	Polychaeta				0.002		0.031	0.010			0.011	0.007			0.607		0.128			0.016	
Arthropoda	Malacostraca	Atelecyclidae		Circular crab	Atelecyclus rotundatus																			0.006	
Arthropoda	Malacostraca	Crangonidae	NIPIGGMUDDERREKE	Norwegian shrimp	Pontophilus norvegicus									0.005										0.001	
Arthropoda	Malacostraca	Hippolytidae			Spirontocaris liljeborgii																0.001				
Arthropoda	Malacostraca	Inachidae	LANGFOTKRABBE	Scorpion spider crab	Inachus dorsettensis											0.002			0.001						
Arthropoda	Malacostraca	Lithodidae	TROLLKRABBE		Lithodes maja					0.449		0.005		0.432					0.011						
Arthropoda	Malacostraca	Nephropidae	SJØKREPS	Norway lobster	Nephrops norvegicus		3.980			0.145															
Arthropoda	Malacostraca	Oregoniidae	SMÅPYNTEKRABBE		Hyas coarctatus														0.001						
Arthropoda	Malacostraca	Paguridae	VANLIG EREMITTKREPS		Pagurus bernhardus						0.062	0.010	0.006	0.002	0.010						0.065				
Arthropoda	Malacostraca	Paguridae		Deep hermit crab	Pagurus prideaux														0.219		0.017			0.154	
Arthropoda	Malacostraca	Paguridae			Pagurus pubescens						0.089										0.007				
Arthropoda	Malacostraca	Paguridae		Hermit crabs	Pagurus spp.											0.138									
Arthropoda	Malacostraca	Portunidae		Swimming crabs	Portunidae						0.017		0.098	0.041	0.033										
Chordata	Ascidiacea		SEKKEDYR	Sea squirts	Ascidiacea				0.023			0.060	0.029			0.113			0.022		0.059			0.002	
Cnidaria	Anthozoa	Epizoanthidae		American zoanthid	Epizoanthus papillosus														0.007						
Cnidaria	Anthozoa	Hormathiidae		Mantle anemone	Adamsia palliata						0.011				0.022				0.029		0.005			0.020	
Cnidaria	Anthozoa		SJØANEMONER	Sea anemones	Actiniaria					1.153		0.020	0.029	0.828	0.033	0.611					0.226				
Cnidaria	Scyphozoa		MANETER	Jellyfish	Medusozoa	154.000	1.000	90.040	5.770	1.825		1.620	0.852	3.927	1.500	6.125	20.950	37.530	4.140	100.000	6.455	71.387	18.570	0.215	16.600
Echinodermata	Asteroidea	Asteriidae	VANLIG KORSTROLL	Common starfish	Asterias rubens					1.019	0.002	0.050	0.025	0.049		0.015			0.022		0.027			0.152	
Echinodermata	Asteroidea	Astropectinidae		Sand star	Astropecten irregularis				0.260	0.078	0.095			0.349	0.132				0.146		0.030			0.227	
Echinodermata	Asteroidea	Echinasteridae	BLODSJØSTJERNE		Henricia spp.											0.002									
Echinodermata	Asteroidea	Goniasteridae	HESTESTJERNE		Hippasteria phrygiana						0.128					0.400			0.146					0.076	
Echinodermata	Asteroidea	Luidiidae			Luidia sarsi						0.004										0.090			0.021	
Echinodermata	Echinoidea	Spatangidae		Violet heart-urchin	Spatangus purpureus											0.110					0.050				
Echinodermata	Echinoidea		SJØPIGGSVIN	Sea urchins	Echinoidea				2.505	8.844	16.619	12.945	0.529	3.027	6.275	0.090			1.023		3.305			0.723	
Echinodermata	Holothuroidea	Stichopodidae	RØDPØLSE		Parastichopus tremulus																			0.610	
Echinodermata	Ophiuroidea	Ophiuridae		Serpent star	Ophiura ophiura						0.017	0.040				0.008			0.037		0.001			0.003	
Mollusca	Bivalvia		MUSLINGER		Bivalvia				0.009					0.041					0.007					0.004	
Mollusca	Cephalopoda	Octopodidae		Horned octopus	Eledone cirrhosa		0.586																		
Mollusca	Cephalopoda	Sepiolidae			Sepietta spp.					0.008															
Mollusca	Gastropoda	Buccinidae			Colus spp.							0.050		0.219		0.022									
Mollusca	Gastropoda	Buccinidae		Red whelk	Neptunea antiqua				1.762	1.086	1.048	2.539	0.744		1.042	3.070					0.354				
Mollusca	Gastropoda	Scaphandridae		Woody canoe-bubble	Scaphander lignarius				0.032		0.173	0.139	0.114	0.081	0.186	0.038			0.175		0.026			0.046	
Porifera			SVAMPER	Sponges	Porifera						0.047		0.069			0.142					0.032				
					Sum (kg)	154.000	5.566	90.040	10.363	14.607	18.343	17.488	2.495	9.001	9.244	10.894	20.950	37.530	6.776	100.000	10.878	71.387	18.570	2.295	16.600

Table 5. Cont.

						BT-399	PT-401	BT-402	BT-403	PT-404	PT-405	PT-406	PT-407	BT-411	PT-414	PT-415	PT-416	BT-417	BT-418	BT-419	BT-420	BT-421	BT-423	PT-428
Phylum	Class	Family	Norwegian	English	Latin	24186	24188	24189	24190	24191	24192	24193	24194	24198	24201	24202	24203	24204	24205	24206	24207	24208	24210	24215
Annelida	Polychaeta	Aphroditidae	GULLMUS	Sea mouse	Aphrodita aculeata				0.082															
Annelida	Polychaeta	Aphroditidae	SKJELLRYGGER	Scaleworms	Aphroditidae				0.015					0.009				0.020						
Annelida	Polychaeta		BØRSTEORMER	Bristle worms	Polychaeta	0.003		0.003						0.020				0.067	0.004	0.005	0.021	0.025	0.006	
Arthropoda	Malacostraca	Inachidae	LANGFOTKRABBE	Scorpion spider crab	Inachus dorsettensis	0.003															0.004			
Arthropoda	Malacostraca	Lithodidae	TROLLKRABBE		Lithodes maja																	0.191		
Arthropoda	Malacostraca	Oregoniidae	SMÅPYNTEKRABBE		Hyas coarctatus			0.001																
Arthropoda	Malacostraca	Paguridae	VANLIG EREMITTKREPS		Pagurus bernhardus	0.125		0.036						0.123						0.030	0.029		0.864	
Arthropoda	Malacostraca	Paguridae		Deep hermit crab	Pagurus prideaux	0.105		0.275						0.102					0.100	0.145	0.500	0.058		
Arthropoda	Malacostraca	Paguridae			Pagurus pubescens	0.055		0.018						0.010										
Arthropoda	Malacostraca	Paguridae		Hermit crabs	Pagurus spp.													0.003	0.025	0.008		0.013		
Arthropoda	Malacostraca		KRILL	Krill	Euphausiacea						0.144													0.375
Chordata	Ascidiacea		SEKKEDYR	Sea squirts	Ascidiacea			0.172						0.235				0.033			0.058	0.004		
Cnidaria	Anthozoa	Caryophylliidae		Devonshire cup-coral	Caryophyllia smithii			0.003										0.007	0.001	0.024		0.019		
Cnidaria	Anthozoa	Hormathiidae		Mantle anemone	Adamsia palliata	0.020		0.050											0.033	0.018	0.052	0.027		
Cnidaria	Anthozoa		SJØANEMONER	Sea anemones	Actiniaria			0.099	1.428					0.593					0.024					
Cnidaria	Scyphozoa		MANETER	Jellyfish	Medusozoa	2.300	11.130	1.770	1.780	1.060	38.070	68.285	0.075		62.320	10.300	12.000			0.335				
Echinodermata	Asteroidea	Asteriidae	VANLIG KORSTROLL	Common starfish	Asterias rubens	0.009		0.038														0.001		
Echinodermata	Asteroidea	Astropectinidae		Sand star	Astropecten irregularis	0.010		0.034	0.094									0.002	0.011			0.119	0.121	
Echinodermata	Asteroidea	Echinasteridae	BLODSJØSTJERNE		Henricia spp.			0.006						0.001					0.006	0.003	0.008	0.023		
Echinodermata	Asteroidea	Goniasteridae	HESTESTJERNE		Hippasteria phrygiana	0.100								0.150				0.505	0.735	0.063	0.942	1.744	2.122	
Echinodermata	Asteroidea	Luidiidae			Luidia sarsi			0.016																
Echinodermata	Echinoidea	Spatangidae		Violet heart-urchin	Spatangus purpureus									1.950					0.050			0.116		
Echinodermata	Echinoidea		SJØPIGGSVIN	Sea urchins	Echinoidea	0.555		0.180	0.981					0.015								2.945	14.326	
Echinodermata	Holothuroidea	Stichopodidae	RØDPØLSE		Parastichopus tremulus	0.060			0.175									0.700	0.250					
Echinodermata	Ophiuroidea	Ophiuridae		Serpent star	Ophiura ophiura									0.041					0.005					
Mollusca	Cephalopoda	Loligonidae		European common squid	Alloteuthis subulata	0.004																		
Mollusca	Cephalopoda	Octopodidae		Horned octopus	Eledone cirrhosa													0.570			0.190	0.004		
Mollusca	Cephalopoda	Sepiolidae		Stout bobtail	Rossia macrosoma									0.023				0.017						
Mollusca	Cephalopoda	Sepiolidae			Sepietta spp.													0.004						
Mollusca	Gastropoda	Buccinidae			Colus spp.	0.095		0.044						0.560							0.178			
Mollusca	Gastropoda	Buccinidae		Red whelk	Neptunea antiqua	1.385		0.723						0.260				0.328	0.201					
Mollusca	Gastropoda	Scaphandridae		Woody canoe-bubble	Scaphander lignarius			0.005						0.061				0.053	0.004	0.005			0.083	
Porifera			SVAMPER	Sponges	Porifera	0.115		0.118						0.102				0.010	0.204	0.341	0.079	0.090		
					Sum (kg)	4.944	11.130	3.591	4.555	1.060	38.214	68.285	0.075	4.255	62.320	10.300	12.000	2.319	1.653	0.977	2.061	5.379	17.522	0.375

Table 6. RV "Johan Hjort" 4 July – 2 August 2013. Ecosystem survey - North Sea. List over invertebrate species found in 1-3 stations. Stations were present given. Grey fields show possible occurrences of latin names used as input into Sea2Data, and then probably being removed after exporting to the spd-format.

Phylum	Class	Family	Norwegian	English	Latin	Count	Stations	Catch (kg)
Annelida	Polychaeta	Serpulidae			Ditrupa arietina	1	396	0.01
Arthropoda	Malacostraca	Caridea	REKER	Shrimps	Caridea	2	314, 337	1.569
Arthropoda	Malacostraca	Cirolanidae			Cirolanidae	1	345	0.001
Arthropoda	Malacostraca	Crangonidae			Crangonidae	2	324, 348	0.04
Arthropoda	Malacostraca	Crangonidae	MUDDERREKER		Crangonidae	3	335, 355, 373	0.02
Arthropoda	Malacostraca	Galatheidae		Squat lobster	Galathea dispersa	3	339, 393, 402	0.003
Arthropoda	Malacostraca	Inachidae		Slender spider crab	Macropodia tenuirostris	1	419	0.002
Arthropoda	Malacostraca	Leucosiidae		Bryer's nut crab	Ebalia tumefacta	1	388	0.001
Arthropoda	Malacostraca	Munididae	LANGFINGERKRABBE		Munida spp.	3	345, 347, 411	0.031
Arthropoda	Malacostraca	Paguridae	EREMITTKREPS	Hermit crabs	Paguridae	2	317, 326	0.33
Arthropoda	Malacostraca	Pandalidae	DYPVANNSREKE	Northern shrimp	Pandalus borealis	2	381, 382	0.138
Arthropoda	Malacostraca	Pandalidae	BLOMSTERREKE	Ping shrimp	Pandalus montagui	2	330, 393	0.013
Arthropoda	Malacostraca	Pandalidae			Pandalus spp.	3	345, 348, 386	0.032
Arthropoda	Malacostraca	Polybiidae	SVØMMEKRABBE		Liocarcinus depurator	3	320, 336, 348	0.025
Arthropoda	Malacostraca			Swimming crabs	Portunoidea	1	421	0.008
Arthropoda	Malacostraca		KRABBER	Crabs		1	326	0.009
Bryozoa	Gymnolaemata	Alcyonidiidae			Alcyonidiidae	2	320, 339	0.041
Chlorophyta			SJØGRESS			1	317	0.003
Chordata	Ascidiacea	Ascidiidae		Hairy sea-squirt	Ascidiella scabra	2	320, 324	0.813
Chordata	Ascidiacea	Polyclinidae			Polyclinum auratium	1	329	0.853
Cnidaria	Anthozoa	Alcyoniidae		Dead men's fingers	Alcyonium digitatum	1	334	0.007
Cnidaria	Anthozoa	Funiculinidae		Tall seapen	Funiculina quadrangularis	3	314, 345, 348	0.173
Cnidaria	Anthozoa		ÅTTEARMETE KORALLER		Octocorallia	2	329, 334	0.031
Cnidaria	Anthozoa		SJØFJÆR	Sea pens	Pennatulacea	1	324	0.57
Cnidaria	Hydrozoa			Hydrozoans	Hydrozoa	2	320, 339	0.004
Echinodermata	Asteroidea	Asteriidae	LITE KORSTROLL		Leptasterias muelleri	1	417	0.033
Echinodermata	Asteroidea	Benthopectinidae			Pontaster tenuispinus	1	411	0.012
Echinodermata	Asteroidea	Luidiidae			Luidia ciliaris	1	411	0.08
Echinodermata	Asteroidea	Poraniidae	SYPUTE		Porania pulvillus	2	419, 420	0.698
Echinodermata	Asteroidea	Pseudarchasteridae			Pseudarchaster parelii	1	379	0.025
Echinodermata	Asteroidea	Solasteridae	BLÅSOL	Purple sun star	Solaster endeca	2	335, 383	1.583
Echinodermata	Asteroidea	Stichasteridae	FINPIGGET SJØSTJERNE	Rosy starfish	Stichastrella rosea	3	411, 417, 418	0.027
Echinodermata	Asteroidea		SJØSTJERNER	Sea stars	Asteroidea	1	326	0.355
Echinodermata	Echinoidea	Echinidae			Echinus spp.	3	418, 419, 420	2.141
Echinodermata	Echinoidea	Echinidae	LANGPIGGET KRÅKEBOLLE		Echinus spp.	2	325, 335	1.888
Echinodermata	Echinoidea	Loveniidae	VANLIG SJØMUS		Echinocardium cordatum	1	329	0.004
Echinodermata	Echinoidea	Parechinidae			Psammechinus spp.	1	335	1.186
Echinodermata	Holothuroidea	Synaptidae	ORMEPØLSER		Synaptidae	1	347	0.07
Echinodermata	Holothuroidea		SJØPØLSER	Sea cucumbers	Holothuroidea	1	335	0.011
Echinodermata	Ophiuroidea	Amphiuridae			Amphiura chiajei	1	320	0.002
Echinodermata	Ophiuroidea	Ophiactidae	KAMELEONSLANGE	Crevice brittlestar	Ophiopholis aculeata	3	349, 373, 417	0.018
Mollusca	Bivalvia	Cardiidae		Prickly cockle	Acanthocardia echinata	1	350	0.132
Mollusca	Bivalvia	Pectinidae	HARPESKJELL	Queen scallop	Aequipecten opercularis	2	339, 420	0.414
Mollusca	Bivalvia	Teredinidae		Norway shipworm	Nototeredo norvagica	1	417	3.1
Mollusca	Bivalvia	Veneridae		Rayed artemis	Dosinia exoleta	2	320, 329	0.01
Mollusca	Bivalvia		KAMMUSLINGER			2	396, 403	0.008
Mollusca	Cephalopoda	Loligonidae			Loligo spp.	2	348, 420	1.043
Mollusca	Cephalopoda	Ommastrephidae			Ommastrephidae	2	326, 337	0.302
Mollusca	Cephalopoda	Sepiidae		Elegant cuttlefish	Sepia elegans	1	418	0.012
Mollusca	Cephalopoda	Sepiolidae		Warty bobtail squid	Rossia palpebrosa	1	349	0.014
Mollusca	Cephalopoda	Sepiolidae			Rossia sp.	1	391	0.1
Mollusca	Gastropoda	Aporrhaidae			Aporrhais spp.	2	339, 374	0.006
Mollusca	Gastropoda	Buccinidae	KONGESNEGL			3	320, 325, 354	0.706
Mollusca	Gastropoda	Buccinidae	KONGESNEGLSL.			1	373	0.007
Mollusca	Gastropoda	Velutinidae	SJØPUNGSNEGL	Velvet shell	Velutina velutina	3	339, 345, 388	0.004
Porifera	Demospongiae	Axinellidae			Axinellidae	3	411, 417, 421	0.182
Porifera	Demospongiae	Axinellidae			Phakellia spp.	1	383	0.043
			BRULGER = Brunalger?			3	331, 339, 342	0.141
					Totalt	102		19.084

Table 7. RV "Johan Hjort" 4 July – 2 August 2013. Ecosystem survey - North Sea.
Herring (*Clupea haregus*). Length distribution, mean length, weight and vertebrae number by station. Stations with more than 20 herring.

	324	336	344	355	356	357	360	361	363	364	369	370	371	377	378	380	381	382
Length (cm)	24111	24123	24131	24142	24143	24144	24147	24148	24150	24151	24156	24157	24158	24164	24165	24167	24168	24169
19.5			1															
21.0								2										
21.5								8					1			1		
22.0	1							12					2			4		
22.5			2				5	14					4					
23.0	2					1	6	22				5	10			11		
23.5	4	2	5	1		3	29	16	1	1		8	10			9		
24.0	9	2	8	2	1	2	23	10	1			8	8			12		
24.5	5	5	5			5	21	11	5	1	4	5	26			19		
25.0	9	6	6		3	3	8	2	8		7	8	13			7		
25.5	14	3	4	1	1		3	2	10	1	10	3	8			9	2	
26.0	5	6	9	1	2	6			7	1	13	2	4			7		
26.5	4	6	4	1	2	11	4		8	1	8	3	7	2	2	6	2	1
27.0	1	3	3	5	9	17	1		11	2	8	2	2	2	1	3	3	1
27.5		1	1		4	19			7	2	13	1	1	2	3	2	10	2
28.0	2	1	3	1	19	11		1	10	2	15	1		4	9	1	13	6
28.5	1	1	1	4	18	9			9	3	7		1	7	7	1	16	12
29.0		1	1	6	12	3			5	2	7			7	14	2	16	21
29.5			1	2	13	7			7	2	7		1	10	20	2	9	11
30.0			2		3	3			6	3		1	1	7	20	3	8	14
30.5			2		9				4		1			2	12	1	10	16
31.0			1		1								1	2	6		2	3
31.5					2					1		1		2	4		5	8
32.0					1				1									3
32.5														1			4	2
33.0																		
33.5														1				
34.0																		
34.5																		
35.0															1			
35.5															1			
Sum	57	37	59	24	100	100	100	100	100	22	100	48	100	49	100	100	100	100
Mean L (cm)	25.1	25.8	25.8	27.5	28.5	27.2	24.1	23.1	27.3	28.0	27.1	24.9	24.7	29.3	29.6	25.0	29.0	29.7
Mean W (g)	134	157	140	173	207	183	130	102	190	185	207	121	135	225	230	139	218	257

	383	384	388	389	390	393	395	398	399	404	405	407	410	413	414	415	416	428	All
Length (cm)	24170	24171	24175	24176	24177	24180	24182	24185	24186	24191	24192	24194	24197	24200	24201	24202	24203	24215	Sum
19.5																			1
21.0																			2
21.5																			10
22.0																			19
22.5																			25
23.0											1		1						59
23.5											2	1			2	1			95
24.0								1			1				5	3			96
24.5	1							3			2	6		1	12	10	1		148
25.0	1				1		1	5		1	4	6		2	9	4		2	116
25.5	1	1		1				8		1	3	5		6	7	8		4	116
26.0	4	2			4			7		3	2	16		10	10	8		1	130
26.5	7	1			2	1	1	7		1	2	9		9	11	12	1	7	143
27.0	11	2	3	1	5	2	2	6		5	2	12		14	3	11	4	5	162
27.5	17	7	7	3	10	5	1	8	3	5		10		9	4	2	4	8	171
28.0	17	15	6	10	11	6	7	10	13	16	1	12	6	6	7	12	5	14	273
28.5	10	5	14	7	12	4	9	10	17	18		4	8	6	5	4	10	15	255
29.0	13	19	16	11	18	19	20	10	13	14		10	5	9	8	3	21	7	313
29.5	12	9	12	7	17	20	11	13	25	12	1	3	4	11	6	4	12	9	280
30.0	4	14	14	7	7	20	16	7	14	13		2	5	6	5	7	16	15	243
30.5	1	9	12	2	6	15	4	4	4	6	1	2	2	4	2	3	6	5	145
31.0	1	6	7	1	4		6		2	4	1	1	1	2		3	7	1	63
31.5		6	4		3	4	3	1	5	1			2	2	1	2	2	2	61
32.0		3	1			3			3				1	1		1	1	3	22
32.5		1	1			1	1							1		1			13
33.0														1	1	1			3
33.5									1			1			1		5	1	10
34.0																	3	1	4
34.5			1												1		2		4
35.0			1																2
35.5			1																2
Sum	100	100	100	50	100	100	82	100	100	100	23	100	35	100	100	100	100	100	2986
Mean L (cm)	28.0	29.3	29.6	28.8	28.8	29.5	29.3	27.8	29.4	28.8	26.0	27.2	29.1	28.0	27.0	27.3	29.7	28.7	27.7
Mean W (g)	205	245	248	225	228	231	242	198	270	229	148	188	233	204	183	191	251	228	201

Table 8. RV "Johan Hjort" 4 July – 2 August 2013. Ecosystem survey - North Sea.
Herring (*Clupea haregus*). Age (wr) distribution. Stations with more than 20 herring.

	324	336	344	355	356	357	360	361	363	369	370	371	377	378	380	381	382	383
Age (ringers)	24111	24123	24131	24142	24143	24144	24147	24148	24150	24156	24157	24158	24164	24165	24167	24168	24169	24170
1			2				2	6				1			1			
2	16	11	19	1	1	3	38	29	24	14	16	23	1		8	1		1
3	10	12	15	4	7	5	10	12	5	13	20	18	5	3	20	4	2	9
4	2	5	4	5	10	9		3	3	16	4	5	15	3	7	5	11	12
5	1	1	3	8	4	6			9	4	3	1	10	4	8	6	5	3
6	1		1	4	3				2	2	2		8	13	2	7	6	2
7		1			2					1	1		5	6	2	2	4	1
8			2			1			1				3	7	1	2	1	1
9			1	2		3			1		1			9		1		
10			1		2	1			2			1	1	1	1	1	1	
11						1			2				1	3		1		
12			2		1	1			1		1			1				1
Sum	30	30	50	24	30	30	50	50	50	50	48	49	49	50	50	30	30	30
Mean age	2.7	3.0	3.6	4.8	4.9	5.2	2.2	2.2	4.1	3.4	3.4	2.8	5.2	7.1	3.8	5.5	5.2	4.4

	384	388	389	390	393	395	398	399	404	405	407	410	413	414	415	416	428	All
Age (ringers)	24171	24175	24176	24177	24180	24182	24185	24186	24191	24192	24194	24197	24200	24201	24202	24203	24215	Sum
1																		12
2		1	1	2	1	1	6		1	2	4			2	2	2	2	233
3	5		1	7		3	15		8	9	21	2	14	15	26	5	8	313
4	7	16	3	15	3	17	5	15	10	5	12	19	8	13	10	12	8	297
5	7	4	10	6	5	6	7	8	12	3	4	4	4	5	2	5	8	176
6		2	10	6	4	12	10	15	6	1	3	5	7	4	1	7	7	153
7	6	2	5	4	3	3	4	6	1		3	2	7	4	2	4	4	85
8	1	1	6	3	2	2		4	2				4	2		4	1	51
9	1	3	2	3	12	2	1	1	2			1	2	3	3	5	3	62
10	1		4	1	10	2	1		3	1	1	2	1		1	4	5	49
11	1	1	6	2	9	2			2		1		2	2	1	2	3	42
12	1		1		1			1	3	2	1		1		1		1	21
Sum	30	30	49	49	50	50	49	50	50	23	50	35	50	50	49	50	50	1494
Mean age	5.7	5.3	7.1	5.3	8.4	5.6	4.5	5.7	5.8	4.6	4.2	5.0	5.6	4.9	4.3	6.0	6.0	4.8

Table 9. Biological samples for environmental condition monitoring.

Dato	Station nr	CTD-st.	dyp (m)	Bredde N	Lengde E	Hyse	Torsk	Sei	Hvitting	Lange	Sild	Makrell	Sandflynder	Øjepål	Kolmule	Hågjel	sypige
05.07.2013	24101	470	1471	5756.29N	00527.27E			S1 (13 stk)									
06.07.2013	24104	?				1H (25 stk-329 stk)											
07.07.2013	24107	477	47	5704.54N	00611.44E								Samle prøve 2 x 25 stk				
08.07.2013	24111	481	96	5714.88N	00129.82E	H1 (10 stk-71 stk)											
08.07.2013	24112	482	82	5719.76N	00228.85E			S1 (12 stk)									
08.08.2013	24113	483	62	5723.07N	00334.21E				Hi1-6 (NIVA tog prøve)								
09.07.2013	24117	486	124	5733.69N	00606.58E				14 stk, NIVA					Samle prøve 2 x 25 stk			
10.07.2013	24121	490	80	5737.90N	00216.44E	H2 (10 stk - 52 stk)											
10.07.2013	24122	491	93	5744.75N	00130.69E		1T (19 stk)										
10.07.2013	24123	492	112	5745.47N	00028.40E	H3 (10 stk - 56 stk)											
10.07.2013	24124	493	150	5814.21N	00042.84E		1T (6 stk)		5 stk, NIVA								
11.07.2013	24126	495	71	5753.15N	00324.89E	H4 (10 stk - 62 stk)											
11.07.2013	24129	496	100	5752.22N	00450.16E	2H (6 stk - 10 stk))											
11.07.2013	24130	497	111	5742.51N	00509.72E	2H (13 stk - 10 stk))				1 stk							
12.07.2013	24134	500	182	5751.34N	00541.86E										2 x 25 samle prøve		
12.07.2013	24135	501	188	5805.61N	00456.32E					2 stk							
12.07.2013	24136	502	115	5804.27N	00430.57E					1 stk							
12.07.2013	24137	503	95	5807.13N	00358.58E	H5 (10 stk - 53 stk)											
13.07.2013	24141	507	74	5809.97N	00220.12E	H6 (10 stk - 172 stk)											
13.07.2013	24142	508	113	5822.02N	00133.61E	H7 (10 stk - ? Ikke på skjemaet)											
13.07.2013	24143	509	136	5841.50 N	0049.13 E						1Si (25 stk)						
14.07.2013	24146	512	92	5821.48N	00252.69E							1M (25 stk)					
15.07.2013	24153	520	113	5851.77N	00230.21E	H8 (10 stk - 56 stk)											
15.07.2013	24155	522	138	5850.22N	00330.83E	H9 (10 stk - 23 stk)											
16.07.2013	24160	526	169	5904.84N	00322.14E					3 stk							
16.07.2013	24161	527	125	5905.95N	00241.61E	H10 (10 stk - 13 stk)											
16.07.2013	24162	528	118	5920.78N	00146.92E	H11 (10 stk - 61 stk)				1 stk							
16.07.2013	24163	529	125	5922.29N	00214.16E					1 stk							
17.07.2013	24166	532	225	5921.32N	00333.96E											Samle prøve RAD 10 stk	
20.07.2013	24168	557	133	5917.01N	00040.01E	H12 (10 stk)											
20.07.2013	24169	560	140	5916.97N	00019.98W	H13 (8 stk)											
21.07.2013	24170	567	126	5947.94N	00023.49W	H14 (10 srk - 31stk)											
23.07.2013	24173	570	152	6010.21N	00011.02E					2 stk							
23.07.2013	24174	571	157	6024.86N	00100.04E					2 stk							
23.07.2013	24175	574	110	5946.66N	00122.71E	H15 (10 stk - 94stk)											
24.07.2013	24178	576	140	5935.48N	00311.16E			S2 (25 stk)									
24.07.2013	24180	578	103	5950.03N	00223.91E						2Si (25 stk)						
25.07.2013	24183	581	146	6004.93N	00309.00E					1L (25 stk) NIVA							
25.07.2013	24185	583	285	6025.09N	00234.94E							2M (25 stk)					
25.07.2013	24186	584	95	6020.91N	00204.20E	3H (25 stk - 67stk)	2T (2 stk)										
26.07.2013	24189	585	113	6035.99N	00237.82E	H16 (10 stk - 98stk)	2T (3 stk)										
26.07.2013	24190	586	165	6039.24N	00301.36E		2T (1 stk)							Samle prøve 2 x 25 stk			
27.07.2013	24194	587	320	6044.94N	00330.31E						3Si (25 stk)						
27.07.2013	24195	588	122	6048.50N	00238.63E	H17 (7 stk)	2T (1 stk)					3M (25 stk)					
27.07.2013	24196	"-"					2T (1 stk)	S3 (23 stk)									
27.07.2013	24198	590	133	6103.73N	00210.23E	4H (25 stk - 40stk)	3T (7 stk)							Samle prøve 25 stk			Samle prøve 25 stk
27.07.2013	24199	"-"				0-gruppe hyse (16 stk)	3T (2 stk)										
30.07.2013	24205	594	149	6106.44N	00042.93E	H18 (7 stk)	2T (3 stk)										
30.07.2013	24206	595	162	6115.20N	00015.32E	H19 (6 stk)	2T (1 stk)										
30.07.2013	24207	596	84	6039,91N	00015.22W	H20 (10 stk - 175stk)	2T (4 stk)										
31.07.2013	24208	597	145	6044.83N	00035.87E	H21 (10 stk - 28stk)	2T (6 stk)										
31.07.2013	24209	"-"				H22 (4 stk)	2T (2 stk)										
31.07.2013	24212	Som 590				H23 (3 stk)	3T (1 stk)										
31.07.2013	24213	Som 590				H23 (8 stk)	3T (2 stk)										
31.07.2013	24214	Som 590				H23 (6 stk)											

Table 10. Sediment and water samples for the environmental condition monitoring.

			Ekko	Posisjon		OF sed	OF sed	OF sed	kjerne	Bunn	OF vann	Filtrering	Sjøvann	Microplast	
Dato	sed st	CTD-st.	dyp (m)	Bredde N	Lengde E	Org	Met./kornstr	Rad	rad	vann	Tc	Cs	1 m		Kommentar
30.07.2013	1	596	84	6039.91N	00015.22W	-	-	-	-						Der blev gjort 2 forsøk men ingen ting i grappen, sikket hård bund
31.07.2013	2	599	146	6045.04N	00129.80E	x	x	x	-						20 cm mudder
27.07.2013	3	587	320	6044.94N	00330.31E	x	x	x	-						mudder 10-20 cm
01.08.2013	4	600	373	6045.16N	00426.94E	x	x	-	x	x	x				50 cm mudder + 1 stor sten som dækket halve overflaten
23.07.2013	5	571	157	6024.86N	00100.04E	x	x	x	-						Mudder 10 cm
23.07.2013	6	573	120	6000.10N	00100.07E	x	x	x	-						Mudder 10 cm, der blev gjort 2 forsøk, men med samme resultat, lite prøve
24.07.2013	7	577	274	5935.37N	00400.20E	x	x		x						mudder 50 cm
04.07.2013	8	468	209	5925.68 N	00449.82E	x	x	-	x		x	x	x	x	mudder bund, ca 20 cm
19.07.2013	9	543	270	5917.02 N	00350.99E	x	x	-	x						40-50 cm med mudder
21.07.2013	10	566	72	5916.82N	00213.79W	(x)	(x)	(x)		x	x				Dårlig prøve, skjell sand, frøs lidt,
19.07.2013	11	557	133	5917.01N	0040.01E	x	x	x	-						15 cm mudder
-	12	-	-	-	-	-	-	-	-	-	-	-	-	-	Blev droppet
13.07.2013	13	509	140	5841.50 N	0049.13 E	x	x	-	x						15 cm mudder
14.07.2013	14	514	303	5821.14 N	0501.22 E	x	x	-	x	x					60 cm mudder, forsøkte med metalhov *
05.07.2013	15	469	282	5801.65 N	0545.70 E	x	x	-	x					x	50 cm mudder
06.07.2013	16	473	89	5651.06 N	0204.68E	x	x	x	-		x		x		10 cm mudder

Table 11. Fish samples for lipid database. 48 different species were sampled. From each fish liver, muscle and brain samples (– 80°C freezer) and stomach samples (-20°C freezer) were taken.

Fisk		Antal prøver
Torskefisker		
Torsk	*gardus morhua*	10
Lysing	*Merluccius merluccius*	10
Sei	*Pollachius virens*	10
Hyse	*elanogrammus aeglefinu*	10
Lyr	*Pollachius pollachius*	2
Brosme	*Brosme brosme*	2
Hvitting	*Merlangius merlangus*	10 stk + 6 stk miljø
Lange	*Molva molva*	8
Sypike	*Trisopterus minutus*	10
Øyepål	*Trisopterus esmarkii*	10
Øyepål	*Trisopterus esmarkii*	5 hele yngel
Kolmule	*licromesistius poutasso*	10
Sølv torsk	*Gadiculus argentus thori*	10
Blå lange	*Molva dypterygia*	1 frosset hel + 2 prøver
Pelagiske fisk		
Sild	*Clupea harengrus*	10
Makrell	*Scomber scombrus*	10
Taggmakrell	*Trachurus trachurus*	10
Hornfisk	*Belone belone*	8
Flyndre		
Gape flyndre	*poglossoides platessoic*	10 stk frosset hele
Lomre	*Microstomus kitt*	10
Glassvar	*pidorhombus Whiffiagor*	10
Rødspette	*Pleuronectes platessa*	10
Sandflyndre	*Limanda limanda*	10
Piggvar	*Psetta maxima*	2
Bruskfisk		
Kloskate	*Raja radiata*	10
Gjøkskate	*Leucoraja naevus*	2
Pigghå	*Squalus acanthias*	6 stk
hågjel	*Galeus melastomus*	1 frosset hel + 10 stk
Svarthå	*Etmopterus spinax*	1 frosse hel
Småflekket rødhai	*Scyliorhinus canicula*	5
Div andre fisk		
Vassild	*Argentina silus*	10
Strømsild	*Argentina sphyraena*	10
storsil	*Hyperoplus lanceolatus*	4
Topis (storsil)		3-5 cm
Tverrstripet knur	*Aspitrigla cuculus*	8
Knurr	*Eutrigla gurnardus*	10
vanlig fløyfisk	*Callionymus lyra*	1
Flekket fløyfisk	*Callionymus marculatus*	3 prøver 7 frosset hele
Laksesild	*Maurolicus muelleri*	10 stk frosset hele
Skjell brosme	*Phycis blennoides*	2
Firtrådet TangBrosme	*Enchelyopus cimbrius*	1 prøve + 5 frosset hele
Langhalet langebarn	*umpenus lampretaeform*	2
vanlig ålbrosme	*Lycodes gracilis*	1 prøve + 10 frosset hele
Panserulk	*Agonus cataphractus*	2 frosset hele
Rognkjeks	*Cyclopterus lumpus*	3 stk
Spiritist	*elorhinchus caelorhinch*	3 stk
Blåkjeft	*Helicolenus dactylopterus*	2
lysuer	*Sebastes marinus*	2
grå steinbit	*Anarhichas lupus*	8
	Lipid database	
	Total antal fisk	334
	Total antal prøver	852

Table 12. Samples of benthic organisms for lipid database. 63 different species were sampled (106 samples in total). The samples were stored in a – 20°C freezer.

"Grove gruppe"	Phylum	Class	Order	Family	Species - latin	Art/Takson - norsk	Serienummer
Flerbørstemarker	Annelida	Polychaeta	Phyllodocida	Aphroditidae	Aphrodita aculeata	Gullmus	24126
Flerbørstemarker	Annelida	Polychaeta	Phyllodocida	Aphroditidae		Skjellrygger	24134
Flerbørstemarker	Annelida	Polychaeta	Phyllodocida	Aphroditidae			24198
Flerbørstemarker	Annelida	Polychaeta	Sabellida	Serpulidae	Ditrupa arietina	Sjøtannorm	24183
Flerbørstemarker	Annelida	Polychaeta					24155
Flerbørstemarker	Annelida	Polychaeta					24198
Krabber	Arthropoda	Malacostraca	Decapoda	Atelecyclidae	Atelecyclus rotundatus		24183
Reker	Arthropoda	Malacostraca	Decapoda	Crangonidae	Crangon allmanni		24134
Reker	Arthropoda	Malacostraca	Decapoda	Crangonidae	Pontophilus norvegicus	Nipiggmudderreke	24134
Reker	Arthropoda	Malacostraca	Decapoda	Crangonidae	Pontophilus norvegicus	Nipiggmudderreke	24183
Reker	Arthropoda	Malacostraca	Decapoda	Crangonidae	Pontophilus spinosus	Trettenpiggmudderreke	24142
Krepsdyr	Arthropoda	Malacostraca	Decapoda	Galatheidae	Galathea dispersa		24126
Krabber	Arthropoda	Malacostraca	Decapoda	Galatheidae	Galathea dispersa		24180
Krabber	Arthropoda	Malacostraca	Decapoda	Galatheidae	Galathea dispersa		24189
Reker	Arthropoda	Malacostraca	Decapoda	Hippolytidae	Spirontocaris liljeborgii	Kamuflasjereke	24134
Reker	Arthropoda	Malacostraca	Decapoda	Hippolytidae	Spirontocaris liljeborgii	Kamuflasjereke	24180
Krabber	Arthropoda	Malacostraca	Decapoda	Inachidae	Inachus dorsettensis	Langfotkrabbe	24178
Krepsdyr	Arthropoda	Malacostraca	Decapoda	Inachidae	Macropodia tenuirostris		24206
Krabber	Arthropoda	Malacostraca	Decapoda	Lithodidae	Lithodes maja	Trollkrabbe	24126
Krabber	Arthropoda	Malacostraca	Decapoda	Lithodidae	Lithodes maja	Trollkrabbe	24171
Krepsdyr	Arthropoda	Malacostraca	Decapoda	Munididae	Munida rugosa	Langfingerkreps	24134
Krepsdyr	Arthropoda	Malacostraca	Decapoda	Munididae	Munida rugosa	Langfingerkreps	24198
Krepsdyr	Arthropoda	Malacostraca	Decapoda	Nephropidae	Nephrops norvegicus	Sjøkreps	24134
Pyntekrabber	Arthropoda	Malacostraca	Decapoda	Oregoniidae	Hyas coarctatus	Gitarpyntekrabbe	24126
Krabber	Arthropoda	Malacostraca	Decapoda	Oregoniidae	Hyas coarctatus	Gitarpyntekrabbe	24178
Krabber	Arthropoda	Malacostraca	Decapoda	Oregoniidae	Hyas coarctatus	Gitarpyntekrabbe	24189
Eremittkreps	Arthropoda	Malacostraca	Decapoda	Paguridae	Pagurus bernhardus	Bernakeremittkreps	24126
Eremittkreps	Arthropoda	Malacostraca	Decapoda	Paguridae	Pagurus bernhardus	Bernakeremittkreps	24180
Eremittkreps	Arthropoda	Malacostraca	Decapoda	Paguridae	Pagurus bernhardus	Bernakeremittkreps	24189
Eremittkreps	Arthropoda	Malacostraca	Decapoda	Paguridae	Pagurus bernhardus	Bernakeremittkreps	24198
Eremittkreps	Arthropoda	Malacostraca	Decapoda	Paguridae	Pagurus prideauxi	Anemoneeremittkreps	24160
Eremittkreps	Arthropoda	Malacostraca	Decapoda	Paguridae	Pagurus prideauxi	Anemoneeremittkreps	24180
Eremittkreps	Arthropoda	Malacostraca	Decapoda	Paguridae	Pagurus prideauxi	Anemoneeremittkreps	24198
Eremittkreps	Arthropoda	Malacostraca	Decapoda	Paguridae	ıurus prideauxi + Adamsia pall	nemoneeremittkreps + Anemon	24189
Eremittkreps	Arthropoda	Malacostraca	Decapoda	Paguridae	Pagurus pubescens		24126
Eremittkreps	Arthropoda	Malacostraca	Decapoda	Paguridae	Pagurus pubescens		24180
Eremittkreps	Arthropoda	Malacostraca	Decapoda	Paguridae	Pagurus pubescens		24189
Eremittkreps	Arthropoda	Malacostraca	Decapoda	Paguridae	Pagurus pubescens		24198
Eremittkreps	Arthropoda	Malacostraca	Decapoda	Paguridae	Pagurus sp.	Eremittkreps	24171
Eremittkreps	Arthropoda	Malacostraca	Decapoda	Paguridae	Pagurus variabilis		24206
Reker	Arthropoda	Malacostraca	Decapoda	Pandalidae	Pandalus montagui	Blomsterreke	24180
Svømmekrabbe	Arthropoda	Malacostraca	Decapoda	Polybiidae	Liocarcinus depurator	Vanlig svømmekrabbe	24135
Krabber	Arthropoda	Malacostraca	Decapoda				24171
Havedderkopp	Arthropoda	Pycnogonida	Pantopoda	Nymphonidae	Nymphon gracile		24130
Mosdyr	Bryozoa	Gymnolaemata	Cheilostomatida	Flustridae			24126
Sekkdyr	Chordata	Ascidiacea					24198
Koralldyr	Cnidaria	Anthozoa	Actinaria	Hormathiidae	Adamsia palliata		24160
Koralldyr	Cnidaria	Anthozoa	Alcyonacea	Alcyoniidae			24126
Koralldyr	Cnidaria	Anthozoa	Pennatulacea	Funiculinidae	Funiculina quadrangularis	Stor piperenser	24135
Koralldyr	Cnidaria	Anthozoa	Zoanthidea	Epizoanthidae	Epizoanthus papillosus		24141
Koralldyr	Cnidaria	Anthozoa				Sjøanemoner (Hexacorallia)	24126
Koralldyr	Cnidaria	Anthozoa				Sjøanemoner (Hexacorallia)	24198

Table 12 (cont.). Samples of benthic organisms for lipid database.

"Grove gruppe"	Phylum	Class	Order	Family	Species - latin	Art/Takson - norsk	Serienummer
Sjøstjerner	Echinodermata	Asteroidea	Forcipulatida	Asteriidae	Asterias rubens	Vanlig korstroll	24126
Sjøstjerner	Echinodermata	Asteroidea	Forcipulatida	Asteriidae	Asterias rubens	Vanlig korstroll	24189
Sjøstjerner	Echinodermata	Asteroidea	Forcipulatida	Stichasteridae	Stichastrella rosea	Rødsjøstjerne	24198
Sjøstjerner	Echinodermata	Asteroidea	Forcipulatida	Stichasteridae	Stichastrella rosea	Rødsjøstjerne	24214
Sjøstjerner	Echinodermata	Asteroidea	Notomyotida	Benthopectinidae	Pontaster tenuispinus		24198
Sjøstjerner	Echinodermata	Asteroidea	Paxillosida	Astropectinidae	Astropecten irregularis	Kamsjøstjerne	24126
Sjøstjerner	Echinodermata	Asteroidea	Paxillosida	Luidiidae	Luidia ciliaris	Sjuarmsjøstjerne	24198
Sjøstjerner	Echinodermata	Asteroidea	Paxillosida	Pseudarchasteridae	Pseudarchaster parelii		24166
Sjøstjerner	Echinodermata	Asteroidea	Spinulosida	Echinasteridae	Henricia sp.	Blodsjøstjerner	24136
Sjøstjerner	Echinodermata	Asteroidea	Spinulosida	Echinasteridae	Henricia sp.	Blodsjøstjerner	24189
Sjøstjerner	Echinodermata	Asteroidea	Spinulosida	Echinasteridae	Henricia sp.	Blodsjøstjerner	24198
Sjøstjerner	Echinodermata	Asteroidea	Valvatida	Goniasteridae	Hippasteria phrygiana	Knuddersjøstjerne	24129
Sjøstjerner	Echinodermata	Asteroidea	Valvatida	Goniasteridae	Hippasteria phrygiana	Knuddersjøstjerne	24198
Sjøstjerner	Echinodermata	Asteroidea	Valvatida	Goniasteridae	Hippasteria phrygiana	Knuddersjøstjerne	24214
Sjøstjerner	Echinodermata	Asteroidea	Valvatida	Poraniidae	Porania pulvillus	Glattsypute	24206
Sjøstjerner	Echinodermata	Asteroidea	Valvatida	Solasteridae	Solaster endeca	Glattsolstjerne	27170
Sjøpiggsvin	Echinodermata	Echinoidea	Spatangoida	Spatangidae	Spatangus purpureus	Purpursjømus	24153
Sjøpiggsvin	Echinodermata	Echinoidea	Spatangoida	Spatangidae	Spatangus purpureus	Purpursjømus	24198
Sjøpiggsvin	Echinodermata	Echinoidea	Spatangoida	Spatangidae	Spatangus purpureus	Purpursjømus	24214
Sjøpiggsvin	Echinodermata	Echinoidea				Sjøpiggsvin (regulære, små)	24129
Sjøpiggsvin	Echinodermata	Echinoidea				Sjøpiggsvin (regulære, små)	24178
Sjøpiggsvin	Echinodermata	Echinoidea				Sjøpiggsvin (regulære, små)	24189
Sjøpiggsvin	Echinodermata	Echinoidea				Sjøpiggsvin (regulære, små)	24198
Sjøpølser	Echinodermata	Holothuroidea	Apodida	Synaptidae		Glasspølser	24134
Sjøpølser	Echinodermata	Holothuroidea	Aspidochirotida	Stichopodidae	Parastichopus tremulus	Rødpølse	24135
Slangestjerner	Echinodermata	Ophiuroidea	Ophiurida	Ophiocomidae	Ophiocomina nigra	Svartslangestjerne	24134
Slangestjerner	Echinodermata	Ophiuroidea	Ophiurida	Ophiuridae	Ophiura albida	Hvitflekket slangestjerne	24126
Slangestjerner	Echinodermata	Ophiuroidea	Ophiurida	Ophiuridae	Ophiura ophiura	Gråbrun slangestjerne	24126
Slangestjerner	Echinodermata	Ophiuroidea	Ophiurida	Ophiuridae	Ophiura ophiura	Gråbrun slangestjerne	24198
Muslinger	Mollusca	Bivalvia	Pectinoida	Pectinidae	Aequipecten opercularis	Harpeskjell	24126
Muslinger	Mollusca	Bivalvia	Pectinoida	Pectinidae	Aequipecten opercularis	Harpeskjell	24207
Muslinger	Mollusca	Bivalvia	Pectinoida	Pectinidae	Palliolum tigerinum	Tigerskjell	24183
Muslinger	Mollusca	Bivalvia	Pectinoida	Pectinidae	Pseudamussium peslutrae	Sjustripeskjell	24134
Muslinger	Mollusca	Bivalvia	Veneroida	Cardiidae	Acanthocardia echinata	Pigghjerteskjell	24137
Blekksprut	Mollusca	Cephalopoda	Octopoda	Octopodidae	Eledone cirrhosa		24166
Blekksprut	Mollusca	Cephalopoda	Oegopsida	Ommastrephidae	Todaropsis ebleane		24126
Blekksprut	Mollusca	Cephalopoda	Oegopsida	Ommastrephidae	Todaropsis ebleane		24143
Blekksprut	Mollusca	Cephalopoda	Sepiida	Sepiidae	Sepia elegans		24205
Blekksprut	Mollusca	Cephalopoda	Sepiolida	Sepiolidae	Rossia macrosoma		24134
Blekksprut	Mollusca	Cephalopoda	Sepiolida	Sepiolidae	Rossia macrosoma		24198
Blekksprut	Mollusca	Cephalopoda	Sepiolida	Sepiolidae	Rossia palpebrosa		24136
Blekksprut	Mollusca	Cephalopoda	Sepiolida	Sepiolidae	Rossia sp.		24178
Snegler	Mollusca	Gastropoda	Cephalaspidea	Scaphandridae	Scaphander lignarius		24134
Snegler	Mollusca	Gastropoda	Cephalaspidea	Scaphandridae	Scaphander lignarius		24198
Snegler	Mollusca	Gastropoda	Littorinimorpha	Velutinidae	Velutina velutina		24132
Snegler	Mollusca	Gastropoda	Neogastropoda	Buccinidae	Colus sp.		24126
Snegler	Mollusca	Gastropoda	Neogastropoda	Buccinidae	Colus sp.		24198
Snegler	Mollusca	Gastropoda	Neogastropoda	Buccinidae	Neptunea antiqua		24153
Snegler	Mollusca	Gastropoda	Neogastropoda	Buccinidae	Neptunea antiqua		24198
Svamper	Porifera	Demospongiae	Halichondrida	Axinellidae			24170
Svamper	Porifera	Demospongiae	Halichondrida	Axinellidae			24198
Svamper	Porifera						24126
Svamper	Porifera						24198

Table 13. Filter samples of phytoplankton for fatty acids analysis.

Dato	tokt.	St nr	Echodepth (m)	Latitude	Longitude	Prøver
19.07.2013	535		87	5917.00 N	00501.97E	5, 10 og 20 m (264 ml)
19.07.2013	543		270	5917.02 N	00350.99E	5, 10 og 20 m (529 ml)
20.07.2013	555		114	5916.99 N	00118.98E	5, 10 og 20 m (529 ml)
20.07.2013	559		130	5916.98N	00000.26W	5, 10 og 20 m (529 ml)
21.07.2013	566		72	5916.82N	00213.79W	5, 10 og 20 m (529 ml)
25.07.2013	582		285	6006.03N	00428.56E	5 og 10 m (529 ml)
26.07.2013	585		113	6035.99N	00237.82E	5, 10 og 20 m (529 ml)
26.07.2013	586		165	6039.24N	00301.36E	5, 10 og 20 m (529 ml)
27.07.2013	587		320	6044.94N	00330.31E	5, 10 og 20 m (529 ml)
27.07.2013	588		122	6048.50N	00238.63E	5, 10 og 20 m (529 ml)
27.07.2013	589		127	6050.36N	00217.78E	5, 10 og 20 m (529 ml)
30.07.2013	593		164	6122.57N	00118.31E	5, 10 og 20 m (529 ml)
30.07.2013	594		149	6106.44N	00042.93E	5, 10 og 20 m (529 ml)
30.07.2013	595		162	6115.20N	00015.32W	5, 10 og 20 m (529 ml)
30.07.2013	596		84	6039.91N	00015.22W	5, 10 og 20 m (529 ml)
31.07.2013	597		145	6044.83N	00035.87E	5 og 10 m (529 ml)
31.07.2013	598		146	6043.31N	000117.20E	5, 10 og 20 m (529 ml)
31.07.2013	599		146	6045.04N	00129.80E	5, 10 og 20 m (529 ml)
01.08.2013	600		373	6045.16N	00426.94E	5, 10 og 20 m (529 ml)

Table 14. Zooplankton samples for fatty acids analysis.

Dato	tokt.	St nr	Echodepth (m)	Latitude	Longitude	Udstyr	prøver 1	prøver 2
19.07.2013	535		87	5917.00N	00501.97E	WP II	180 µm	1000 µm
19.07.2013	541					MOC + MIC	180 µm	1000 µm
19.07.2013	543		270	5917.02 N	00350.99E	WP II	180 µm	1000 µm
20.07.2013	555		114	5916.99 N	00118.98E	WP II	180 µm	1000 µm
20.07.2013	555		114	5916.99 N	00118.98E	MIC	small cod fish (5 stk)	small cod fish (5 stk)
20.07.2013	559		130	5916.98N	00000.26W	WP II	180 µm	1000 µm
21.07.2013	566		72	5916.82N	00213.79W	WP II	180 µm	1000 µm
26.07.2013	585		113	6035.99N	00237.82E	WP II	180 µm	1000 µm
26.07.2013	586		165	6039.24N	00301.36E	WP II	180 µm	1000 µm
27.07.2013	587		320	6044.94N	00330.31E	WP II	180 µm	1000 µm
27.07.2013	590		133	6103.73N	00210.23E	WP II	180 µm	1000 µm
30.07.2013	596		84	6039.91N	00015.22W	WP II	180 µm	1000 µm
31.07.2013	599		146	6045.04N	00129.80E	WP II	180 µm	1000 µm
01.08.2013	600		373	6045.16N	00426.94E	WP II	180 µm	1000 µm