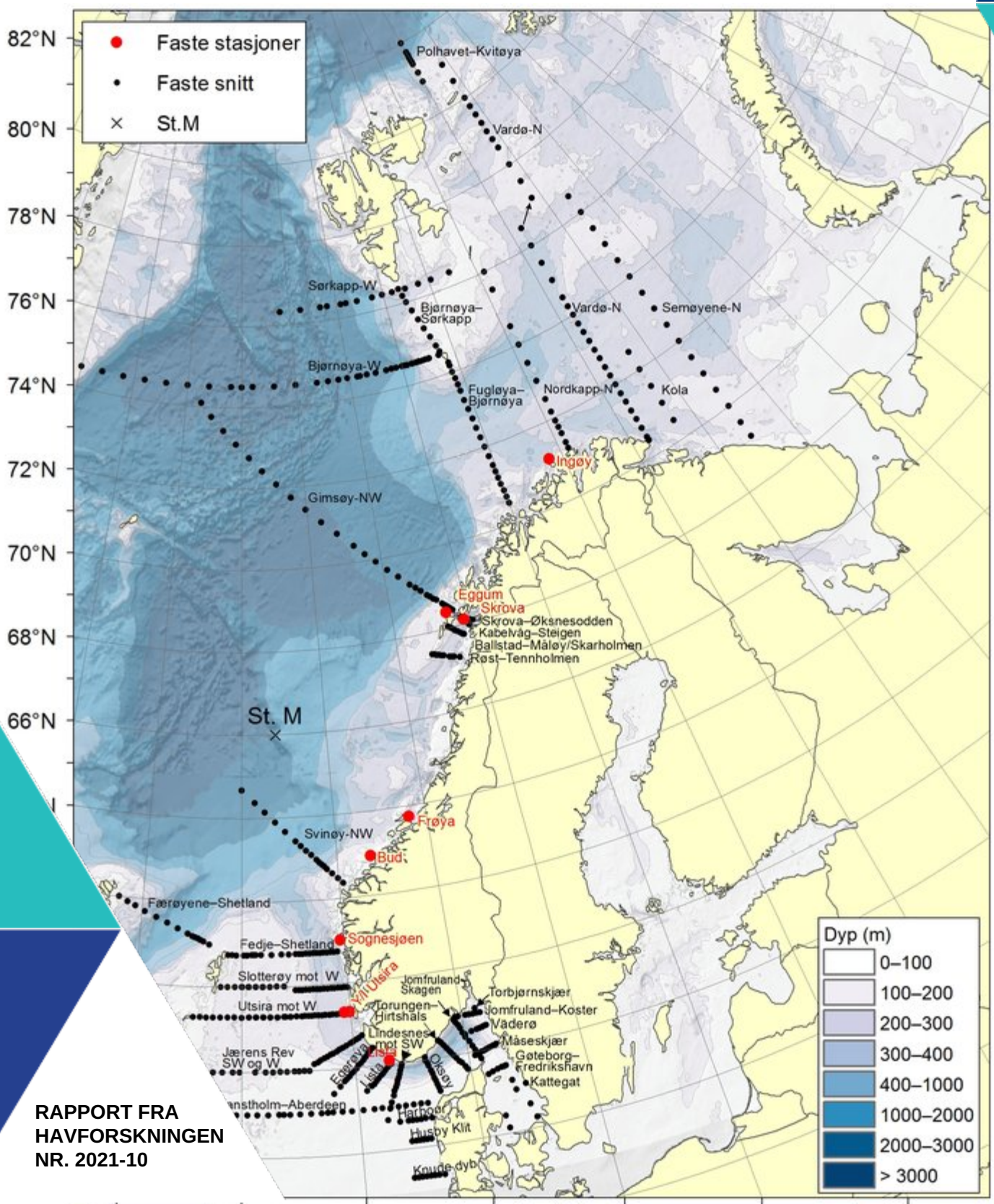
REPORT ON CRUISES AND DATA STATIONS 2020

Oversikt over tokt og stasjoner tatt i 2020



RAPPORT FRA HAVFORSKNINGEN NR. 2021-10

Title (English and Norwegian):

Report on cruises and data stations 2020

Subtitle (English and Norwegian):

Oversikt over tokt og stasjoner tatt i 2020

Report series:	Year - No.:	Date:
Rapport fra havforskningen	2021-10	09.03.2021

ISSN:1893-4536

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Distribution:

Open

Project No.:

14417

On request by:

Havforskningsinstituttet

Program:

Kystøkosystemer
Nordsjøen
Norskehavet
Barentshavet og Polhavet

Research group(s):

Bentiske ressurser og prosesser, Bunnfisk, Bunnsamfunn, Bærekraftig utvikling, Norsk marint datasenter (NMD), Oseanografi og klima, Pelagisk fisk, Plankton, Populasjonsgenetikk, Akustikk og observasjonsmetodikk, Økosystemprosesser

Number of pages:

149

Summary (English):

The report gives an overview of cruises in 2020, by the Institute of Marine Research, University of Bergen and Tromsø and Norwegian Polar Institute, Tromsø on board our research vessels and many of the hired commercial vessels. Each cruise is described by a short description and a track chart mainly showing CTD, plankton and trawl stations. The coverage of the oceanographic sections is listed in a table. Another table shows the number of observations per month for the fixed stations. Meta data about the cruises are reported to the International Council for the Exploration of the Sea (ICES) using the form "Cruise Summary Report": http://www.seadatanet.org/Metadata/CSR . Research data (and chart) are available from the Norwegian Marine Data Centre at Institute of Marine Research. The charts can internally at IMR be downloaded from the Institute Intranet/Archive: http://hinnsiden.imr.no/ressurser/bilder/mediearkiv. Charts are made by Karen E. Gjertsen. Sebastian Bosgraaf made charts for "G.M.Dannevig". There are no overview and maps for the cruises with our vessels "Fangst" and "Hans Brattstrøm".

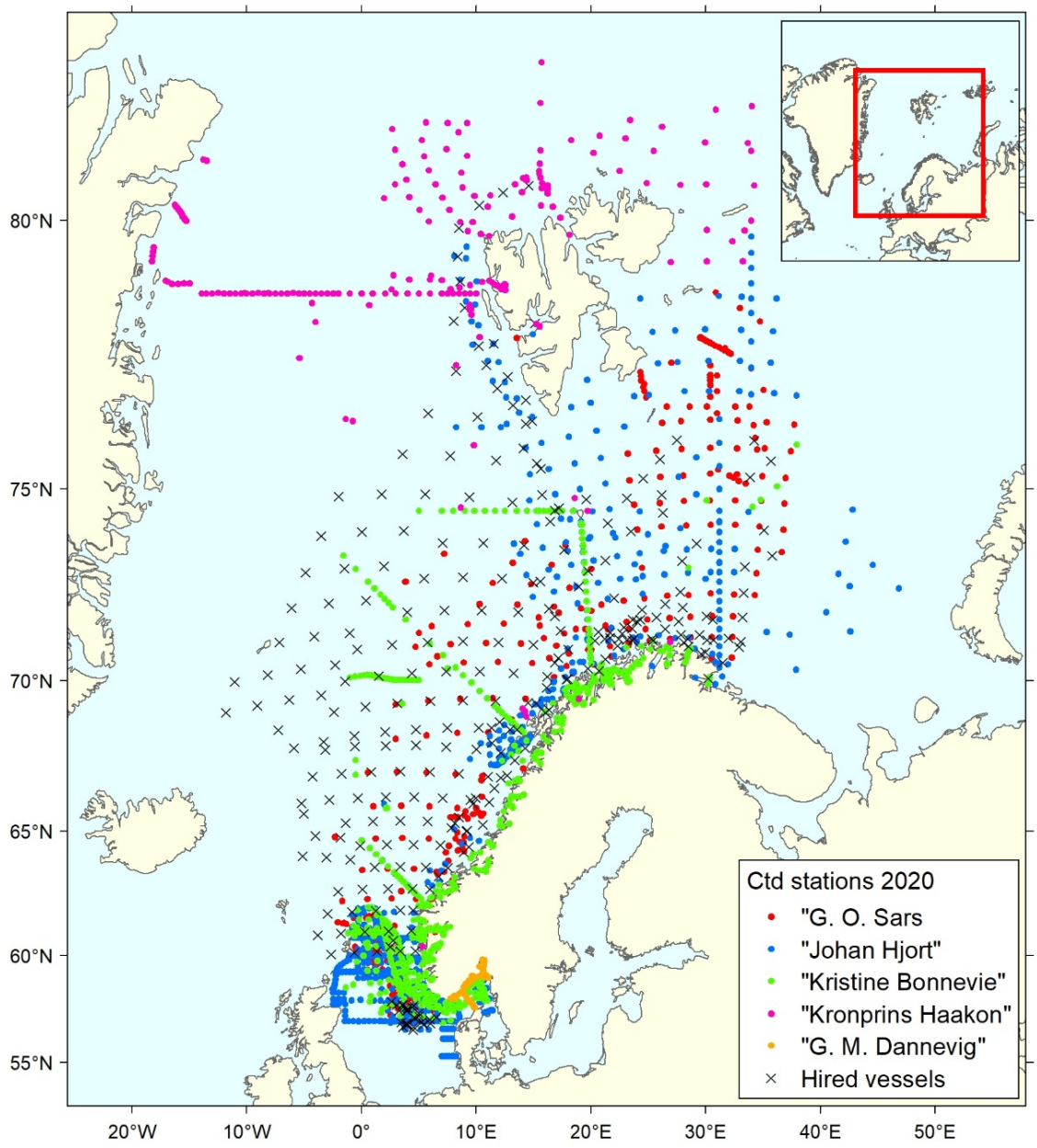
Summary (Norwegian):

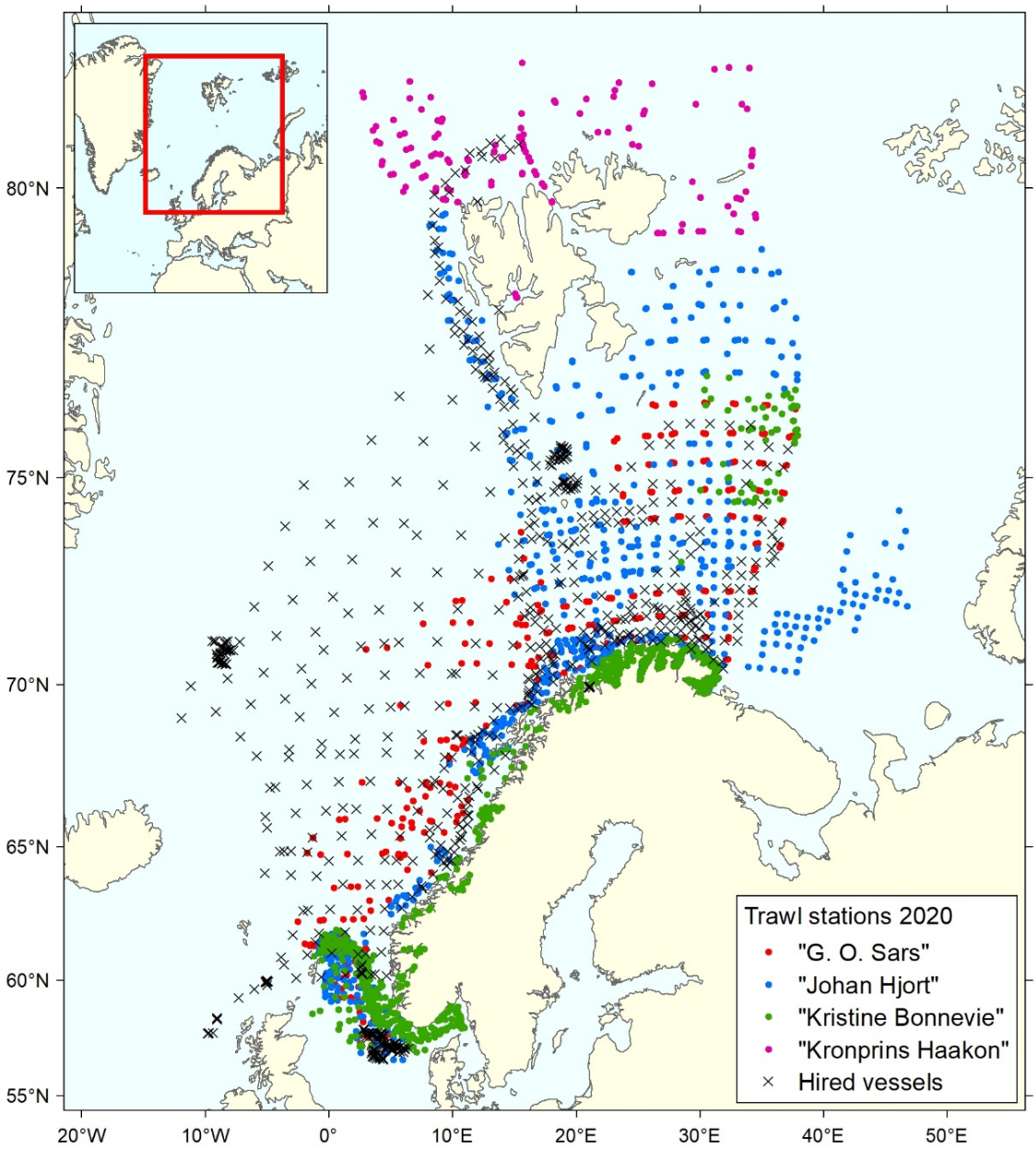
Rapporten gir en oversikt over tokt i 2020 i regi av Havforskningsinstituttet, Universitetet i Bergen og Tromsø, og Norsk Polarinstitutt, Tromsø, med egne og mange av de innleide fartøyer. Den gir en kort beskrivelse av toktet og viser kurs- og stasjonskart – hovedsakelig CTD, plankton og trålstasjoner. Tabeller viser når de faste snittene er tatt og antall observasjoner per måned for de faste stasjonene. Toktene er innrapportert ICES (Det internasjonale råd for havforskning) i skjemaet:"Cruise Summary Report": http://www.seadatanet.org/Metadata/CSR. Data (og kart) fra toktene er tilgjengelig fra Norsk marint datasenter, Havforskningsinstituttet. Kartene kan internt lastes ned fra instituttets intranettside/mediearkiv: http://hinnsiden.imr.no/ressurser/bilder/mediearkiv. Kartene er laget av Karen E. Gjertsen. Sebastian Bosgraaf har laget kartene fra "G.M. Dannevig".

Der er ikke oversikt og kart for toktene med våre båter «Fangst» og «Hans Brattstrøm».

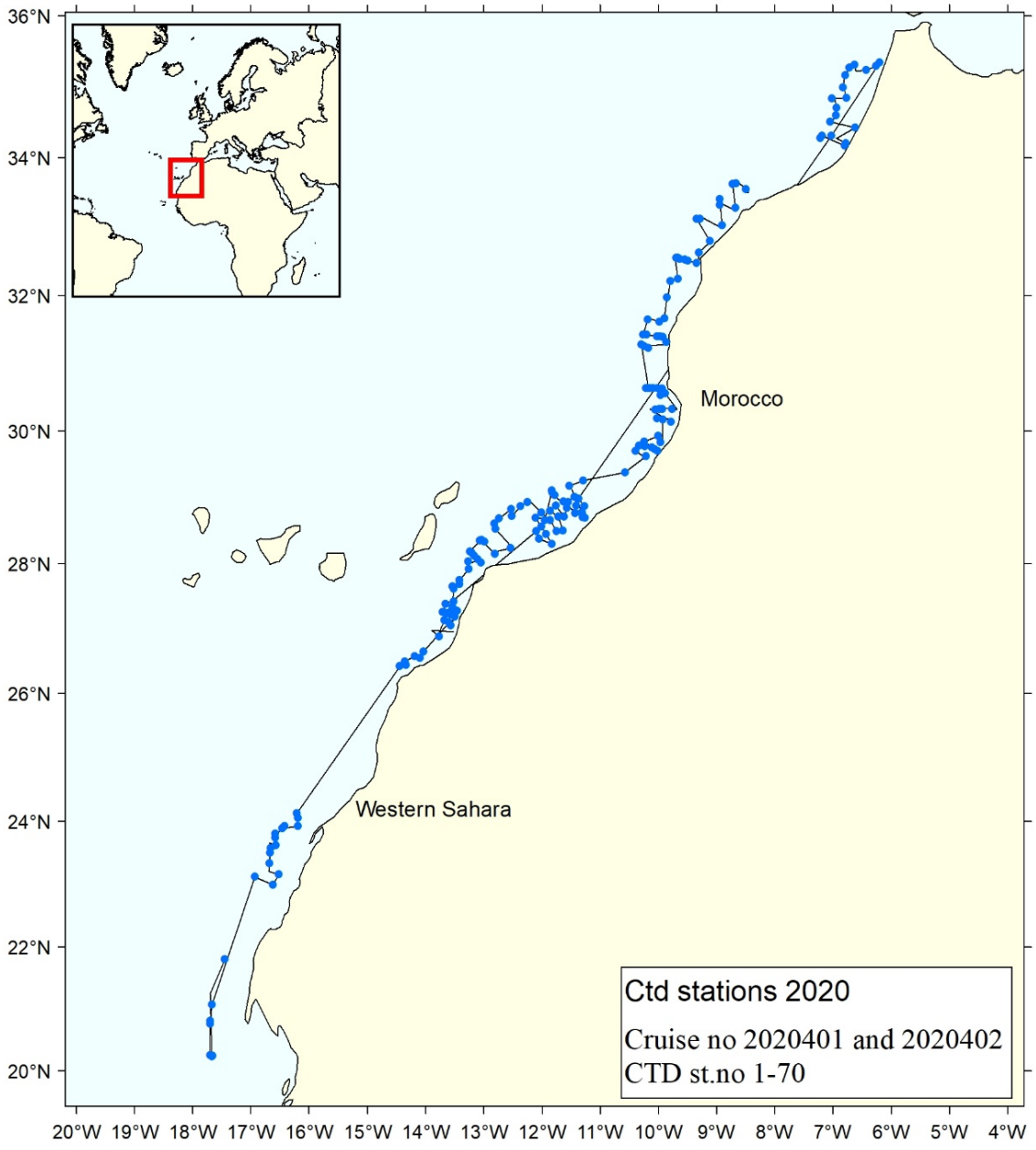
Content

1 - Charts overview 2020 – Ctd stations and trawl stations.





Ctd stations 2020 “Dr. Fridtjof Nansen”

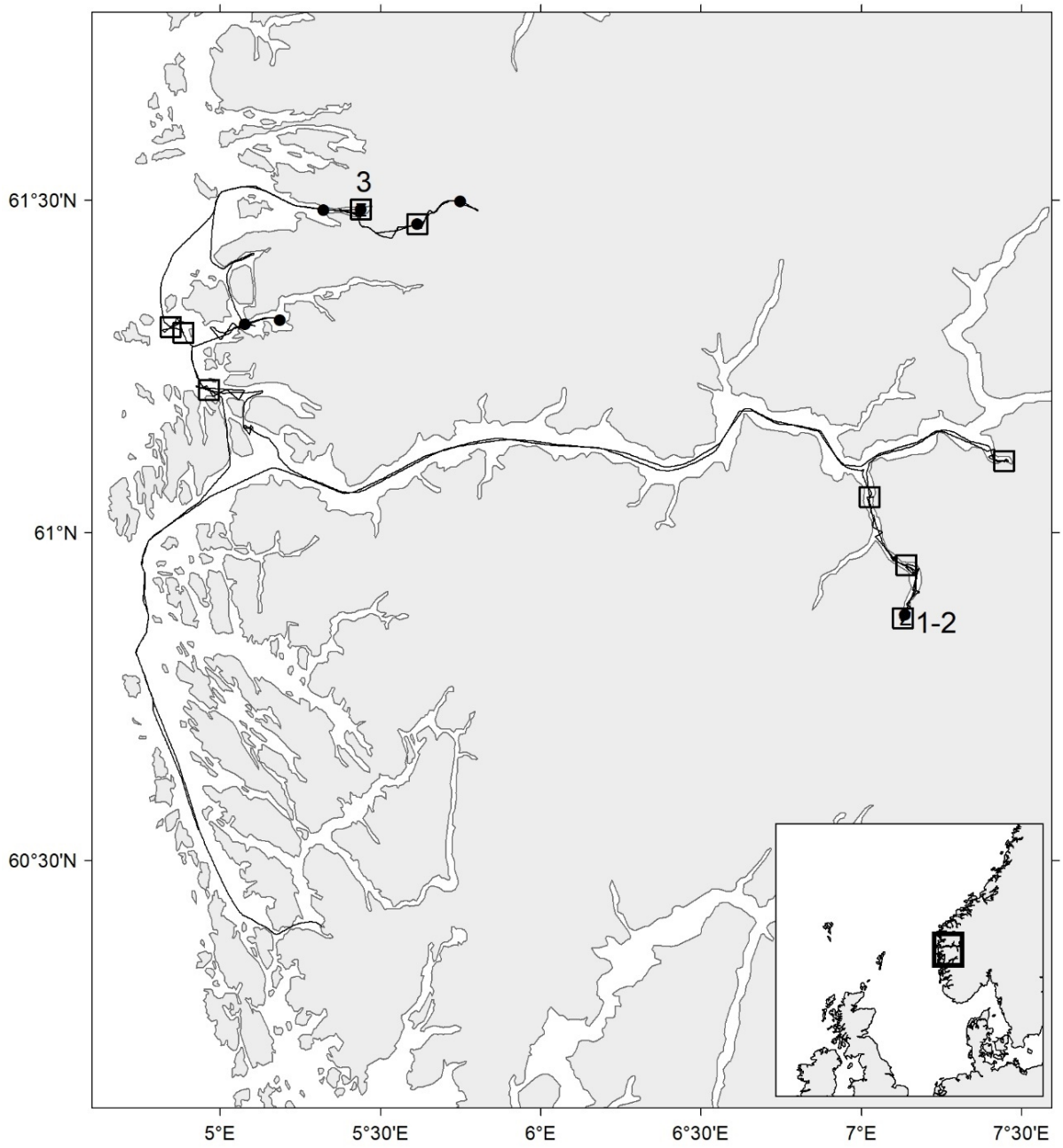

36°N
34°N
32°N
30°N
28°N
26°N
24°N
22°N
20°N
20°W 19°W 18°W 17°W 16°W 15°W 14°W 13°W 12°W 11°W 10°W 9°W 8°W 7°W 6°W 5°W 4°W
Morocco
Western Sahara
Ctd stations 2020
Cruise no 2020401 and 2020402
CTD st.no 1-70

2 - "G. O. Sars" – Cruises 2020

Cruise no	Period	Purpose	Area	CTD st.no	Trawl st.no	Fig. no
2020101	1.2.-5.2.	The marine geological survey is a UiBs training course for students within marine geology and marine geophysics.	Norwegian fjords	1-3	-	1
2020102	6.2.-4.3.	The main objectives of the IBTS Q1 bottom trawl survey coordinated by ICES/IBTSWG are: • to determine the distribution and relative abundance of pre - recruits of the main commercial species with a view of deriving recruitment indices • to monitor changes in the stocks of commercial fish species independently of commercial fisheries data • to monitor the distribution and relative abundance of all fish species and selected invertebrates • to collect data for the determination of biological parameters for selected species • to collect hydrographical and environmental information • to determine the abundance and distribution of herring and other fish larvae as well as fish eggs.	North Sea	4-102	1-55	2-4
2020103	6.3.-7.4.	Combined acoustic and bottom trawl survey along the continental shelf from 62ºN to 74ºN. Main target fish species are greenland halibut, redfish and greater silver smelt.	Northeast Atlantic Ocean	103-105	56-102	5-6
2020104	7.4.-27.4.	To map depth, topography, sediment composition, biodiversity, habitats, biotopes, and pollution in the seabed of the Mid-Norwegian shelf area Frøyabanken, Sula region and Haltenbanken. The mapping was performed using visual seabed observation using hauled video rig. And sampling of sediments, chemical pollution and organisms by using a variety of sampling gears (water sampling bottles, grabs, boxcorer, multicorer, beam trawl and hyperbenthic sledge). Mocness and Multinet Mammoth, for collecting zooplankton. Both gears are multipel nets with open and close mechanisms.	Northeast Atlantic Ocean, Norwegian Sea	106-115	-	7-8
2020105		Cancelled	-	-	-	
2020106	1.5.-2.6.	Provide acoustic estimates of abundance and distribution of pelagic species in the Norwegian Sea. Collect data on hydrography and plankton in the Nowegian Sea. Collect samples for analyses of persistent organic pollutants (POPs), hydrocarbons (PAH, THC), metals (e.g. Hg, Cd, Pb, As), microplastic and radionuclides in seawater, sediments and pelagic fish.	Norwegian Sea	116-181	103-168	9-10
2020108	6.6.-13.6.	The cruise to the Mid_Norwegian margin is organized and funded through the Geological Survey of Norway and focuses on studies of methane leakage at the seafloor on the Mid-Norwegian shelf and continental margin. Cruise 2020108 in June 2020 will be directed to the Mid-Norwegian shelf, where well inspect a recently discovered seep site close to outcropping volcanic structures. From previous cruise we have identified the exact sampling locations for the ROV Ægir 6000. However, depending on time and weather, we will define additional sampling stations.	Norwegian Sea	182-183	-	11
2020107	18.6.-14.7.	Part 1:The objective of the cruise was to perform marine geological and marine biological survey in selected coastal areas from Bergen to Bodø. The marine geological part of the cruise was dedicated to Vartdalsfjorden, Sulafjorden and Halsafjorden to aquire TOPAS profiles, gravity cores and conduct ROV dives and video mapping in cooperation with the Norwegian Public Roads Administration. The main objectives of the marine biolocal part of the cruise was to collect benthic fauna and videomapping the seafloor in selected fjord areas for environmental, habitat and DNA analyses. Part 2 : The objective of this part of the cruise was to collect samples of both geology and biology along the Mohns-Ridge. A large part of leg 2 was to collect high-resolution bathymetry, side-scan and sub-bottom profiler data for selected sub-areas. Two areas was also mapped using the multibeam onboard G.O.Sars. Several CTD were taken to investigate hydrothermal plumes. Gravity cores were collected to investigate the volcanic history of the ridge.	Norwegian Sea	184-203	-	12-13
2020109	-	Cancelled	-	-	-	-

2020110	17.7.-3.8.	Collecting video data, fauna and sediments from the seafloor on the shelf off mid Norway, aiming at mapping benthic biotopes, chemical pollution and testing of eDNA metods in benthic investigations.The mapping was performed using visual seabed observation using hauled video rig, sampling of sediments and organisms using a variety of sampling gears (grab, boxcorer, multicorer, beam trawl and hyperbenthic sled).The survey was collectecing data and samples at the Trænadjupet, Trænabanken off Nordland County; Sklinnabanken, Sklinnadjupet off Trøndelag. The survey was successful.	Norwegian Sea	204-216	-	14
2020111	10.8.-8.9.	The cruise forms part of a multipurpose, multiship ecosystem survey of the Barents Sea, a joint enterprise of IMR in Bergen, Norway and Northern Branch of VNIRO (PINRO) in Murmansk, Russia. Three Norwegian and two Russian research vessels participate. The aim is to conduct a full coverage of the Barents Sea and adjacent areas north of Svalbard, where all compartments of the ecosystem is studied ; physical and chemical oceanography, phytoplankton, zooplankton, pelagic fish, demersal fish, marine litter, sea birds and sea mammals.	Barents Sea	217-290	169-327	15-16
2020112	14.9.-28.9.	Training course in Ocean Science.	North Sea	291-345		17-18
2020113	6.10.-27.10.	The cruise is a mooring service/deployment and process studies cruise of the Nansen LEGACY project.The study region covered 24-35E and 75-79N, with objectives to deploy moorings for process studies (1 year duration), service and redeploy accessible gateway moorings (long term), deploy underwater gliders (cruise duration as well as 3-4 months missions), conduct ocean mixing and water transformation process studies in the Barents Sea Polar Front region east of Svalbard, and sample for biology, nutrients and the carbonate chemistry in the water column at selected stations.	Barents Sea	346-409	-	19-20
2020114	-	Cancelled	-	-	-	-
2020115	6.11.-18.11.	Investigations of sampling trawls.	Barents Sea	-	328-481	21
2020116	19.11-30.11.	Start collecting data for the CRIMAC SFI Center. Measure FM spectre for two sizes of NVG herring for creating a library for machine learning on several categories. Measured herring, blue whiting, krill and zooplankton (sea angel), kruttåte. Wideband settings and calibrations. Try out new ADCP, Simrad EC150-3C, with high resolution echo sounder. Measurements with Scantrol DEEPVIsion and sorting system on codend. Tral on avoidance and spectre changes on herring from KayakDrone and “G.O.Sars” on shallow herring layers. Trilas of new software in sonar SU90. Calibrations.	Norwegian Sea	410-412	548-558	22
2020117	-	Cancelled	-	-	-	-

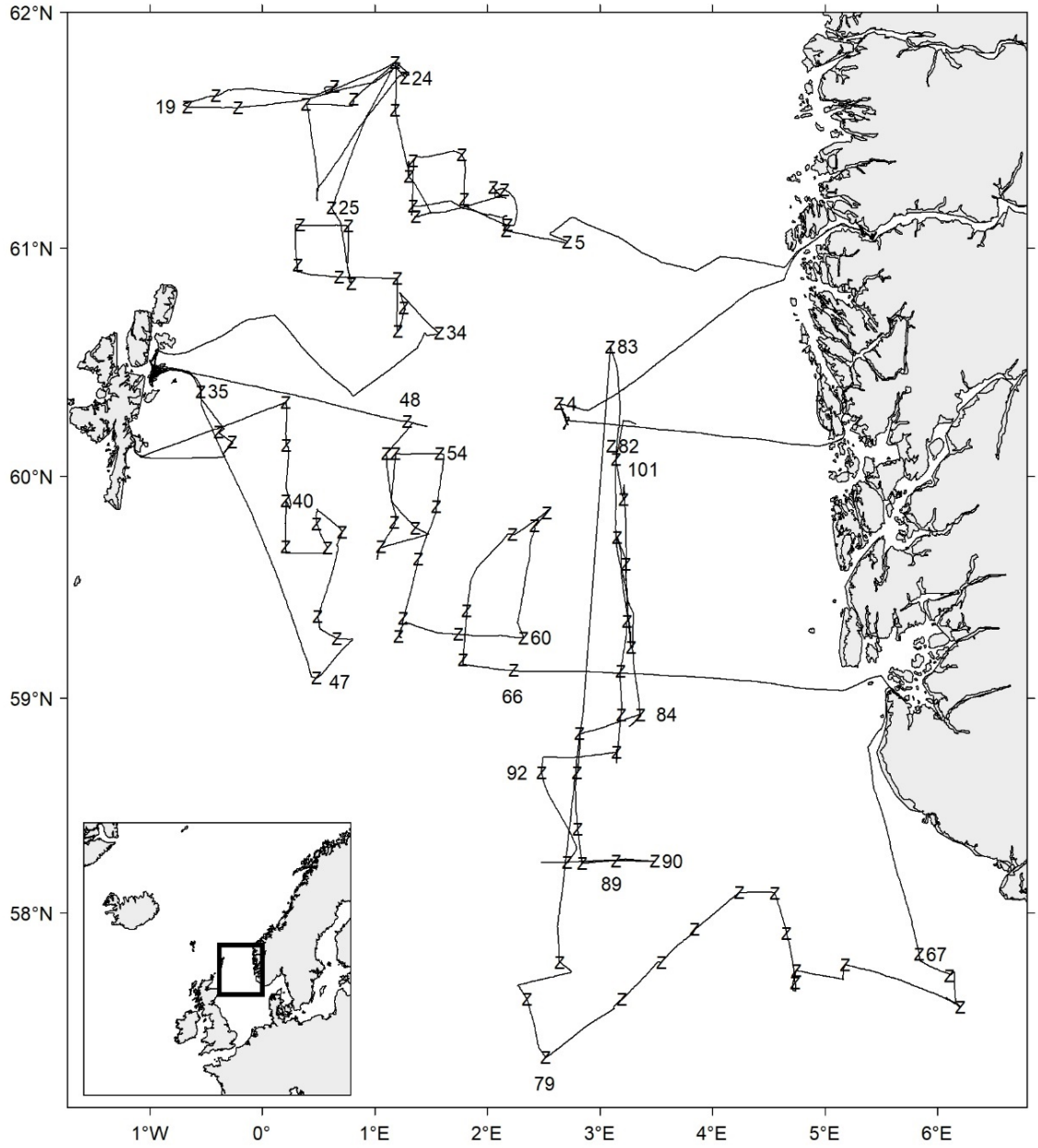
3 - “ G.O. Sars” – Charts for cruises 2020



Cruise no 2020101 "G. O. Sars"
1–5 February 2020

z CTD st.no 1–3
O Gravity core
☐ Multicorer

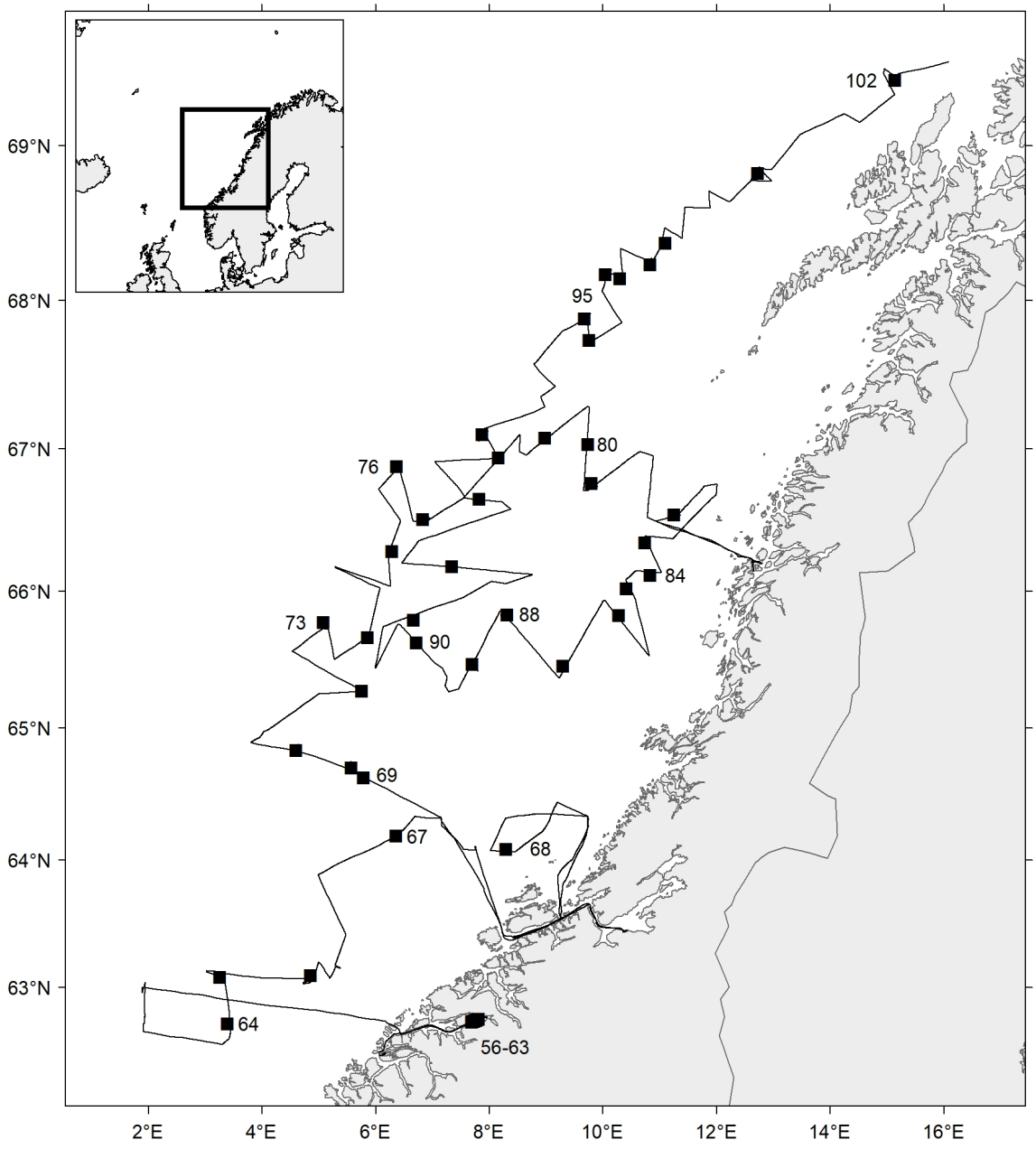
Fig. 1



Cruise no 2020102 "G. O .Sars" (Chart I)
6 February-4 March 2020

z CTD st.no 4-102

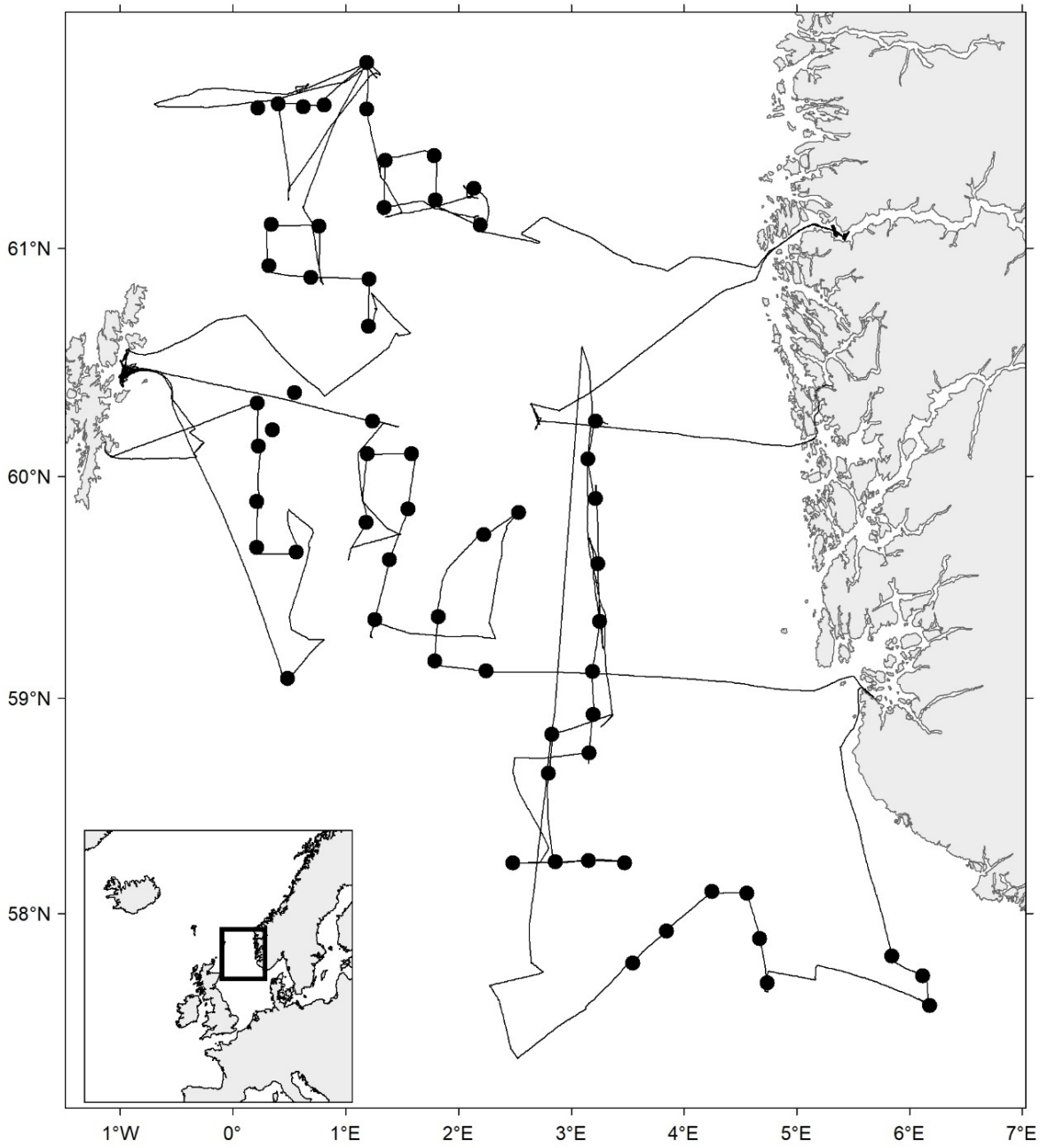
Fig. 2



Cruise no 2020103 "G. O. Sars" (Chart II)
6 March–7 April 2020

■ Bottom trawl st.no 56-102

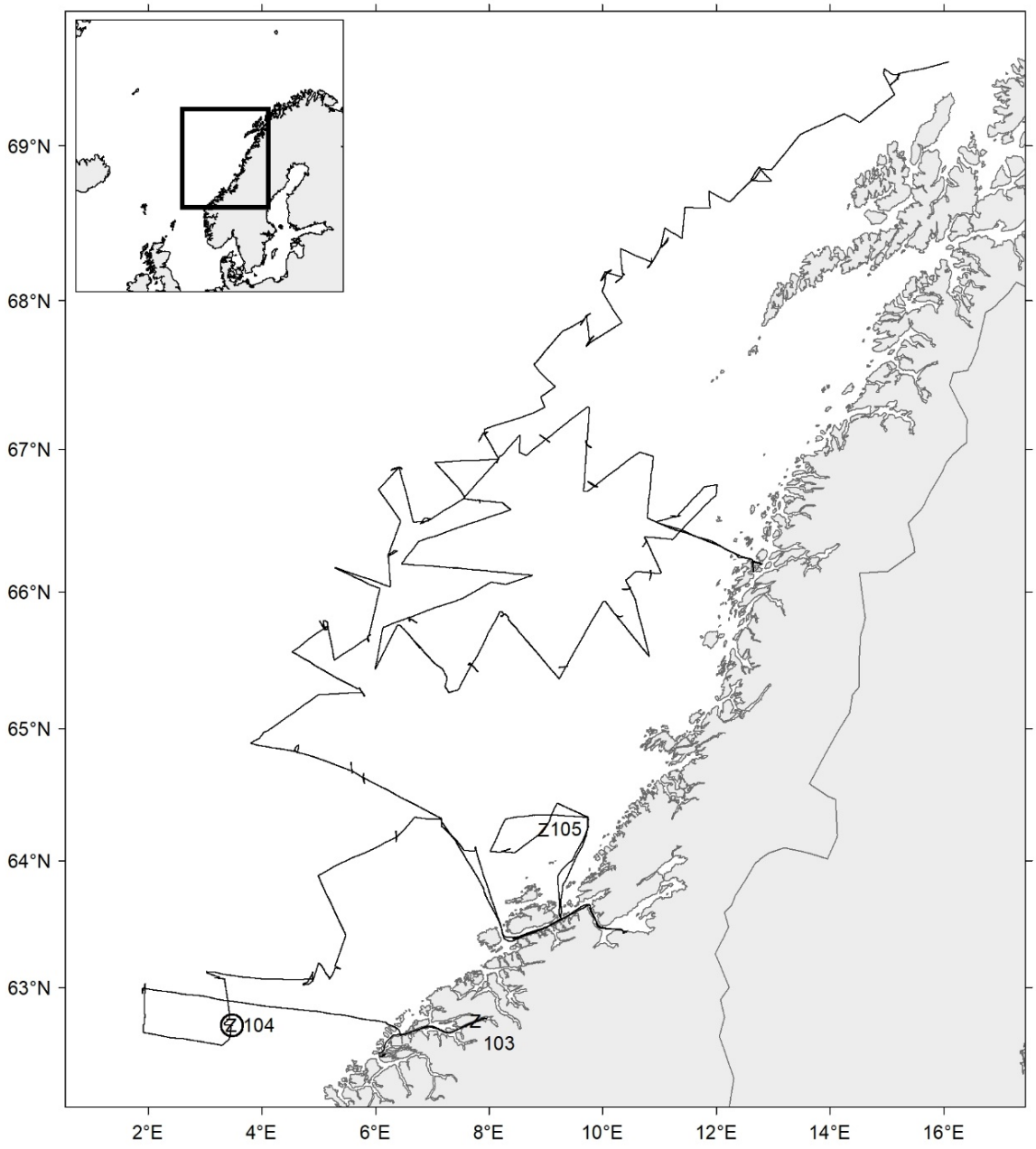
Fig. 3



Cruise no 2020102 "G. O. Sars" (Chart III)
6 February–4 March 2020

● MIK st.

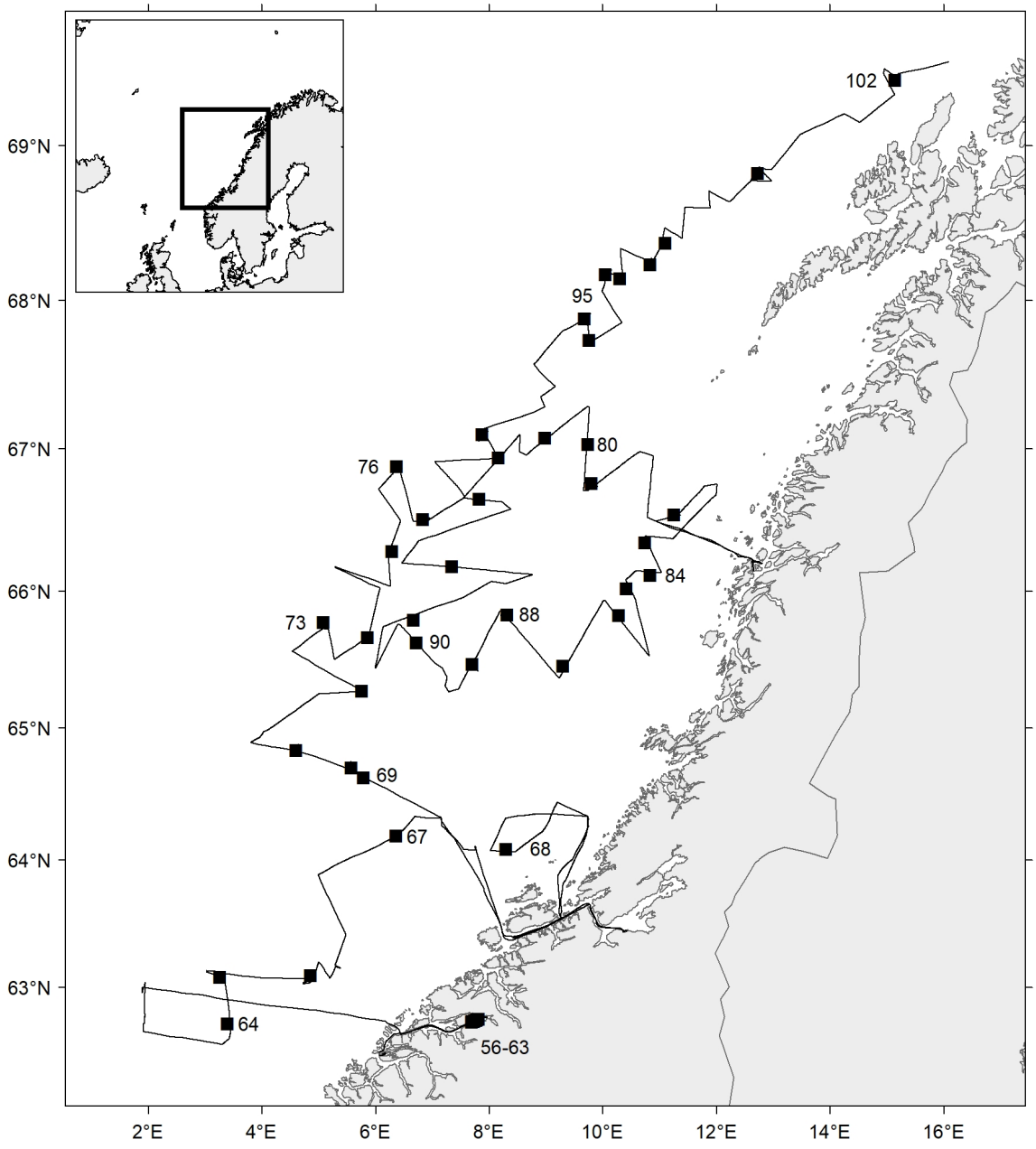
Fig.4



Cruise no 2020103 "G. O. Sars" (Chart I)
6 March–7 April 2020

z CTD st.no 103-105
O Plankton st. (WP-II-net)

Fig. 5



Cruise no 2020103 "G. O. Sars" (Chart II)
6 March–7 April 2020

■ Bottom trawl st.no 56-102

Fig.6

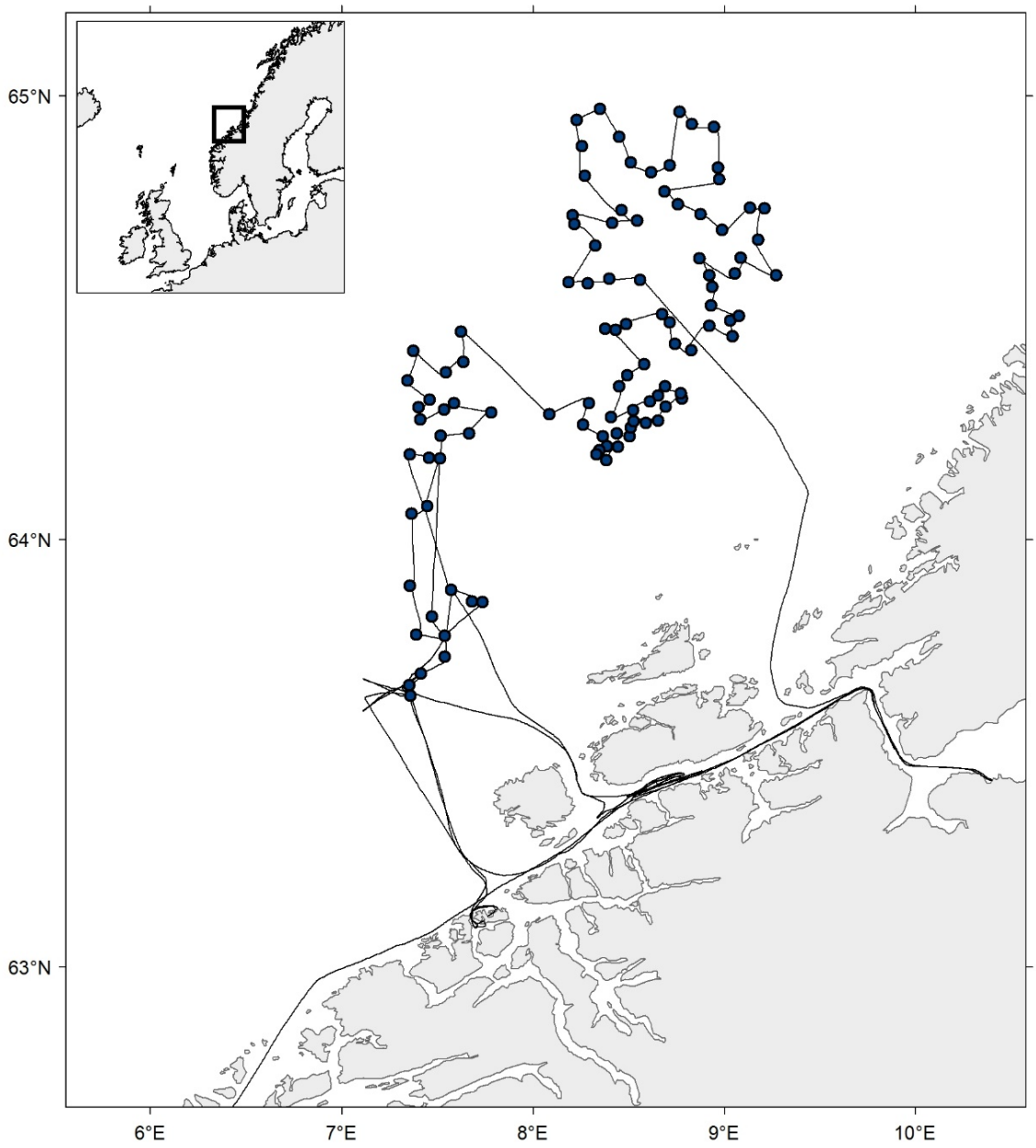
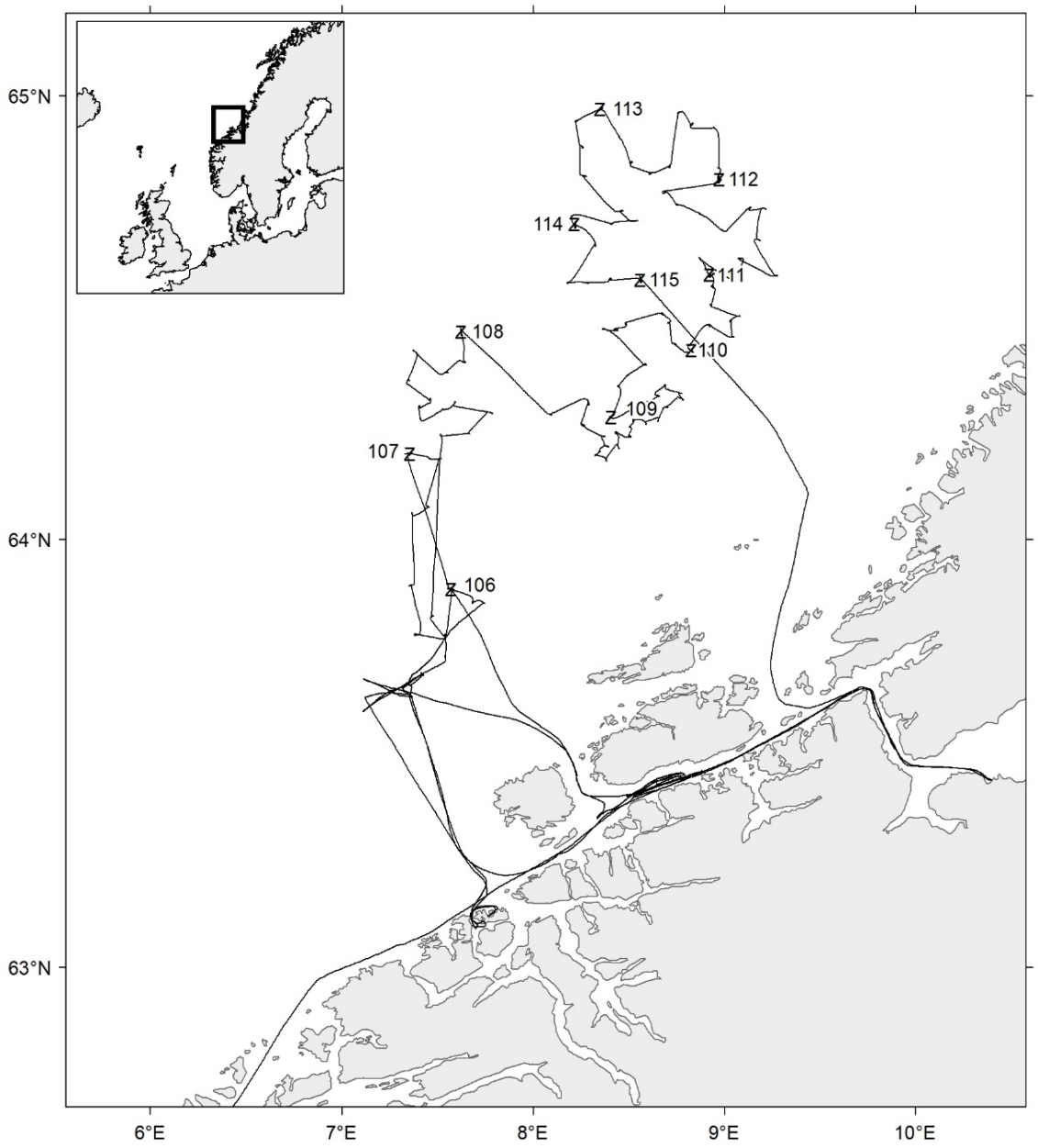

65°N
64°N
63°N
6°E
7°E
8°E
9°E
10°E
Cruise no 2020104 "G. O. Sars" (Chart I)
7–27 April 2020
Video stations

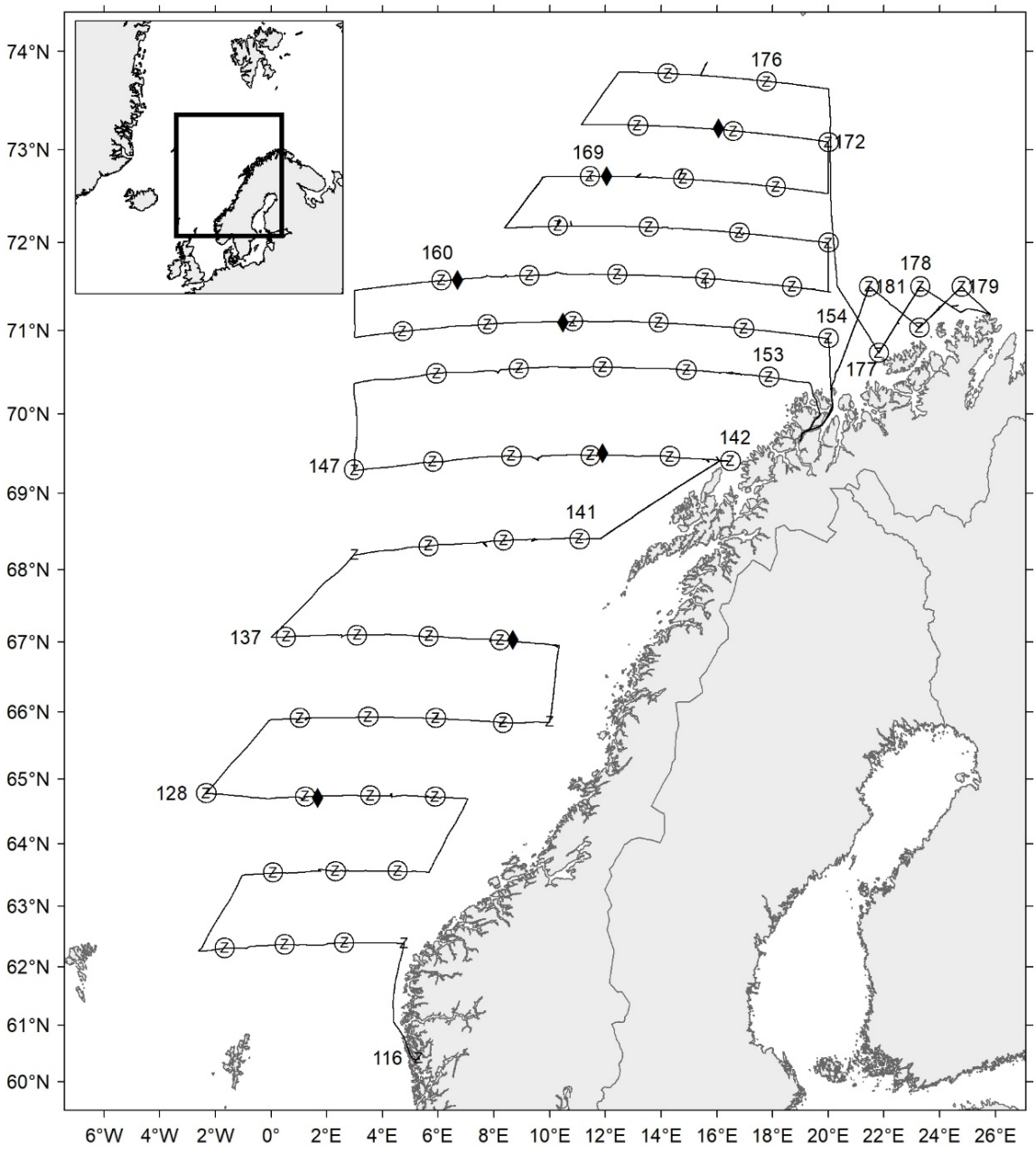
Fig.7



Cruise no 2020104 "G. O. Sars" (Chart II)
7–27 April 2020

z Full stations - Grab, beam trawl, slede, boxcorer, multicorer and ctd st.no. 106-115

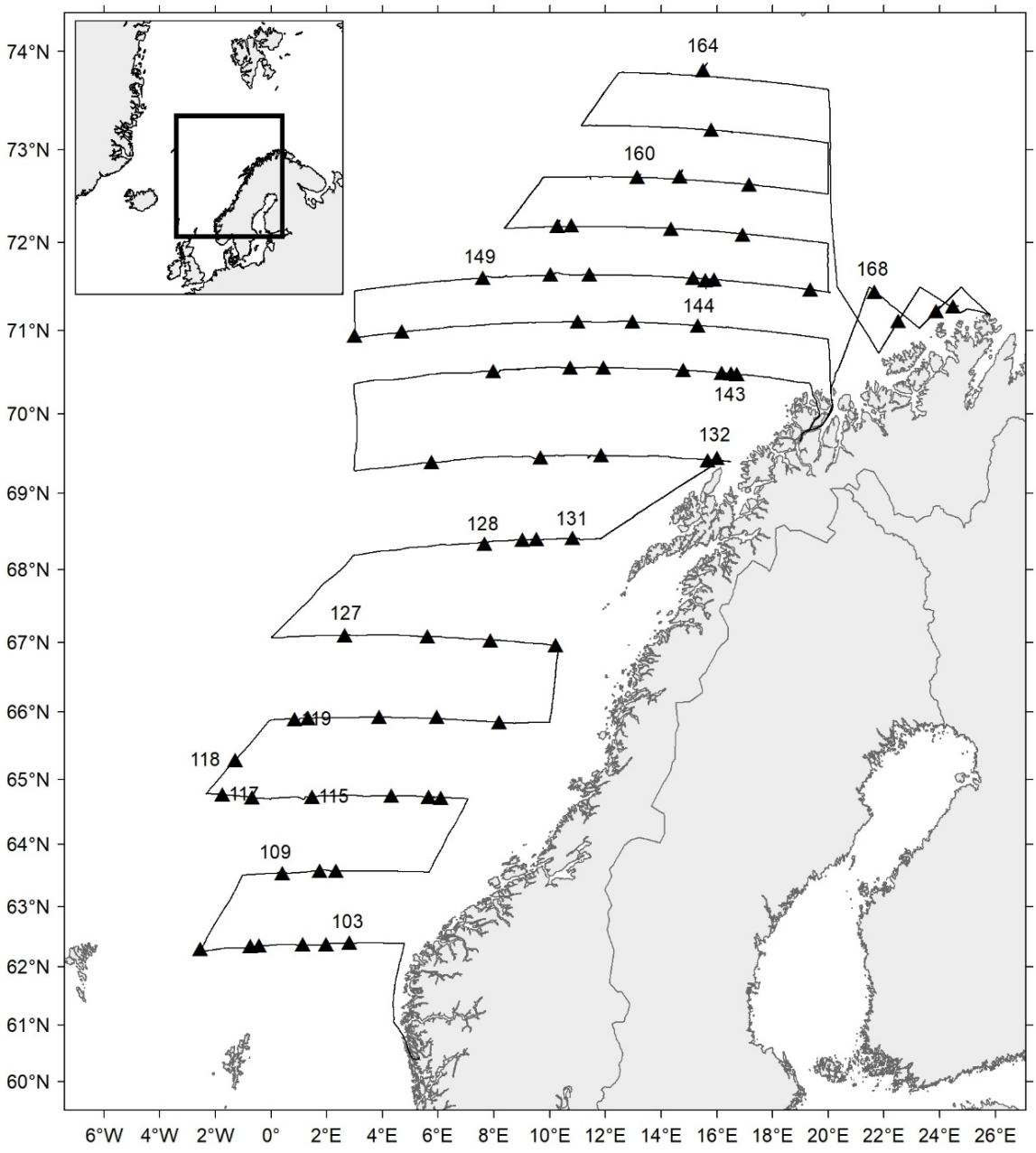
Fig. 8



Cruise no 2020106 "G. O. Sars" (Chart I)
1 May–2 June 2020

z CTD st.no 116-181
○ Plankton st. (WP-II-net)
♦ Multinet

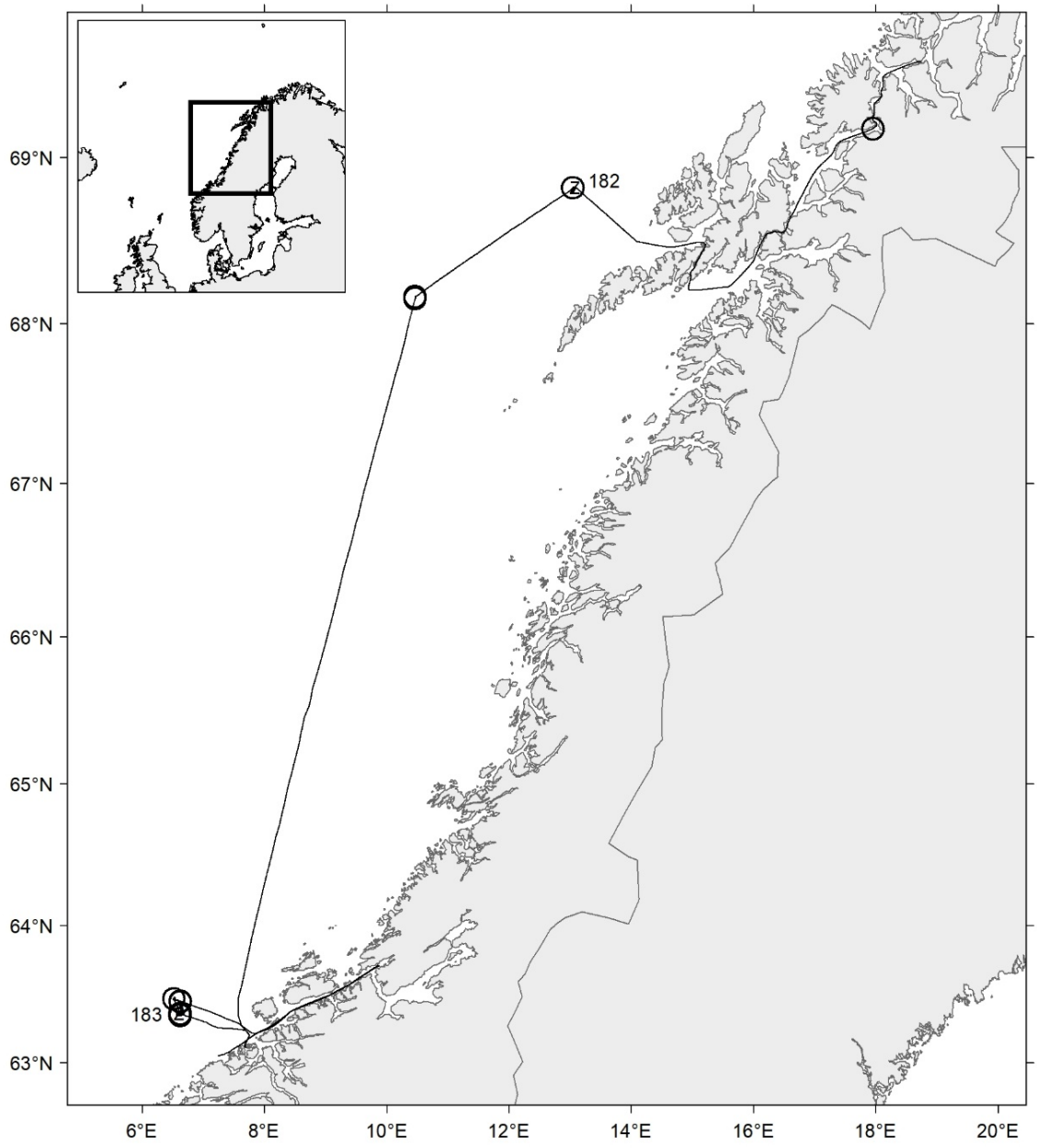
Fig. 9



Cruise no 2020106 "G. O. Sars" (Chart II)
1 May–2 June 2020

▲ Pelagic trawl st.no 103-168

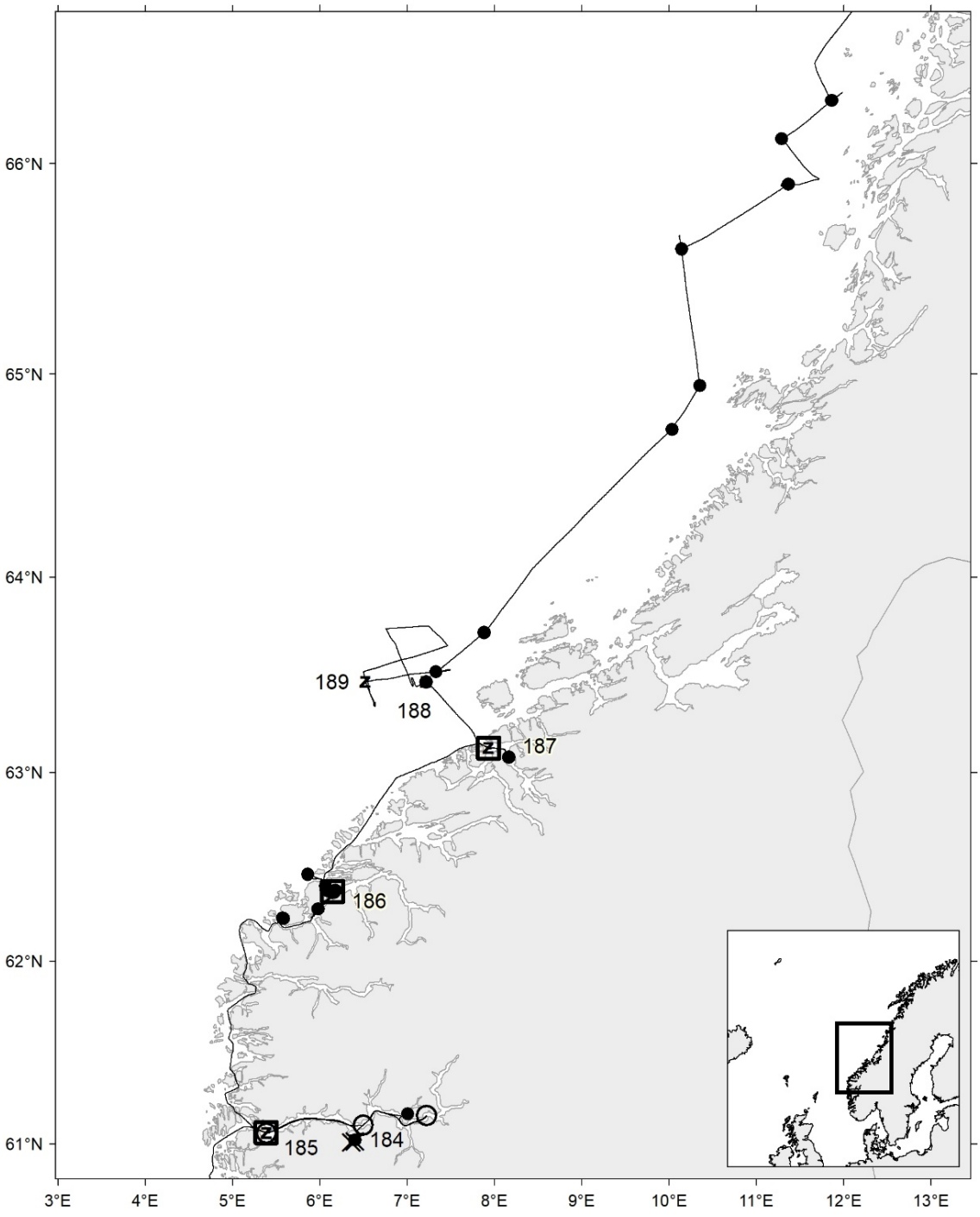
Fig. 10



Cruise no 2020108 "G. O. Sars"
6–13 June 2020

z CTD st.no 182-183
○ROV st.

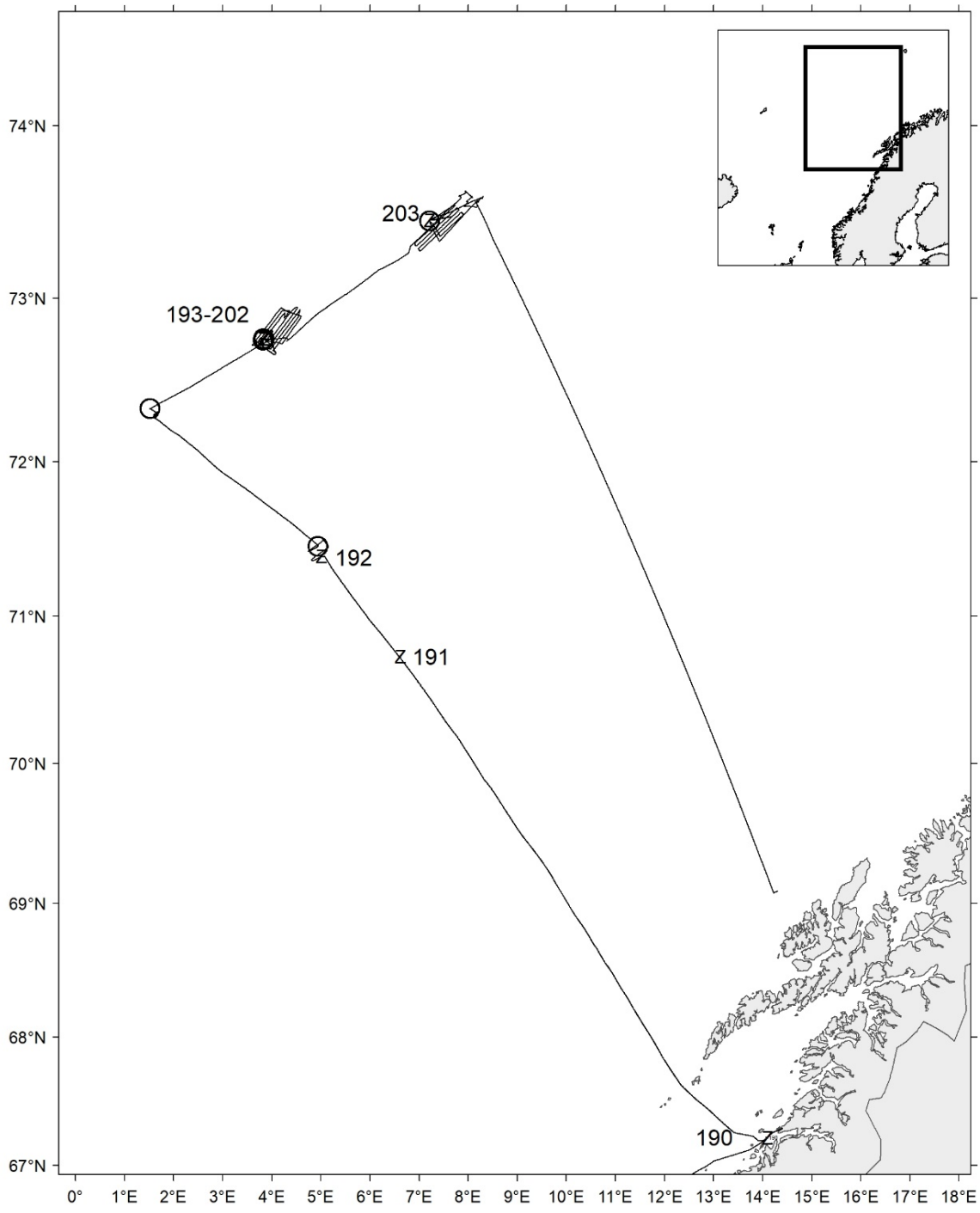
Fig.11



Cruise no 2020107 "G. O. Sars" - Part 1
18–26 June 2020

z CTD st.no 184-189
● Gravity corer
✕ Multicorer
□ Box corer
○ Blade corer

Fig.12



Cruise no 2020107 "G. O. Sars" - Part II
27 June– 14 July 2020

z CTD st.no 190-203
O Blade corer

Fig.13

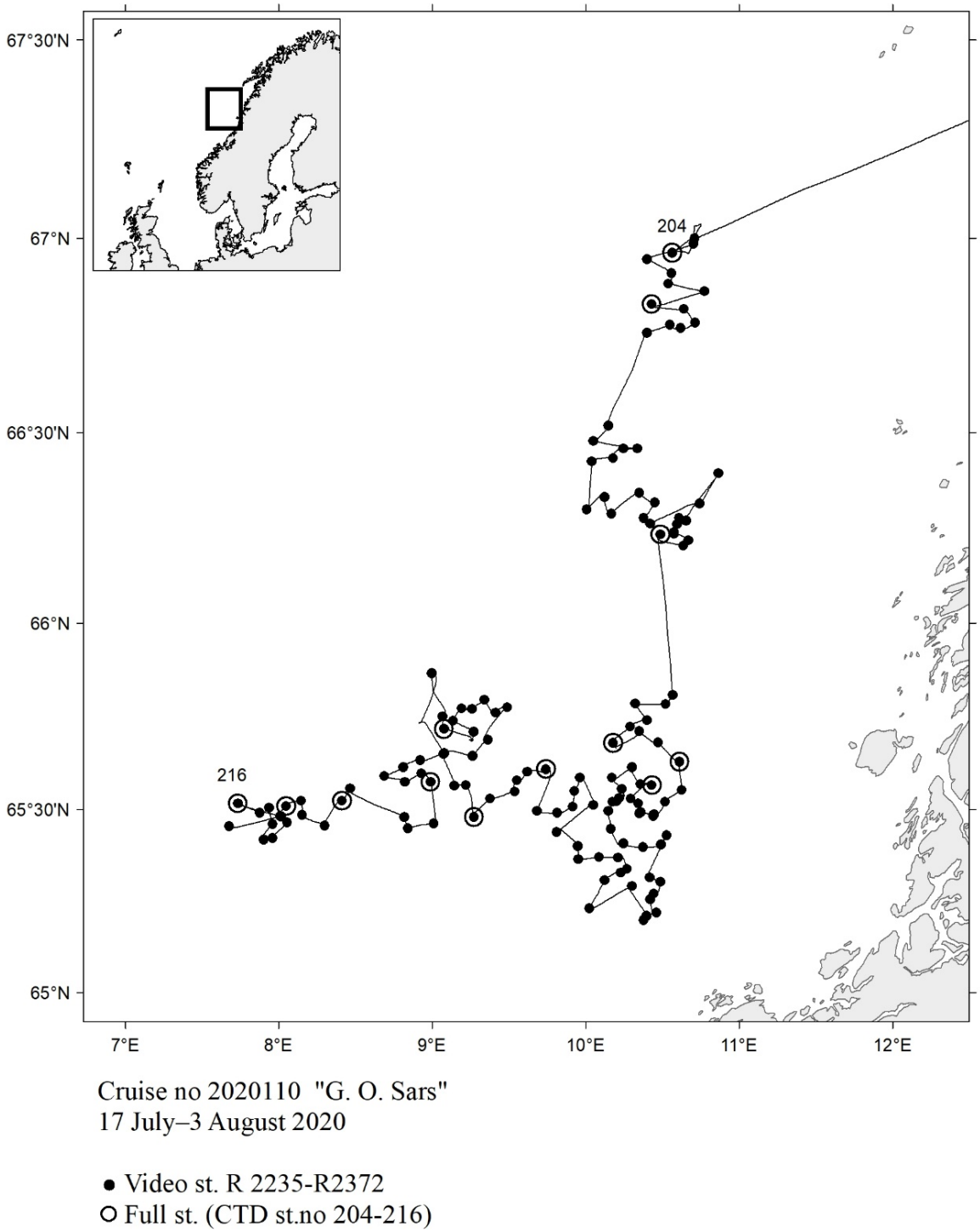
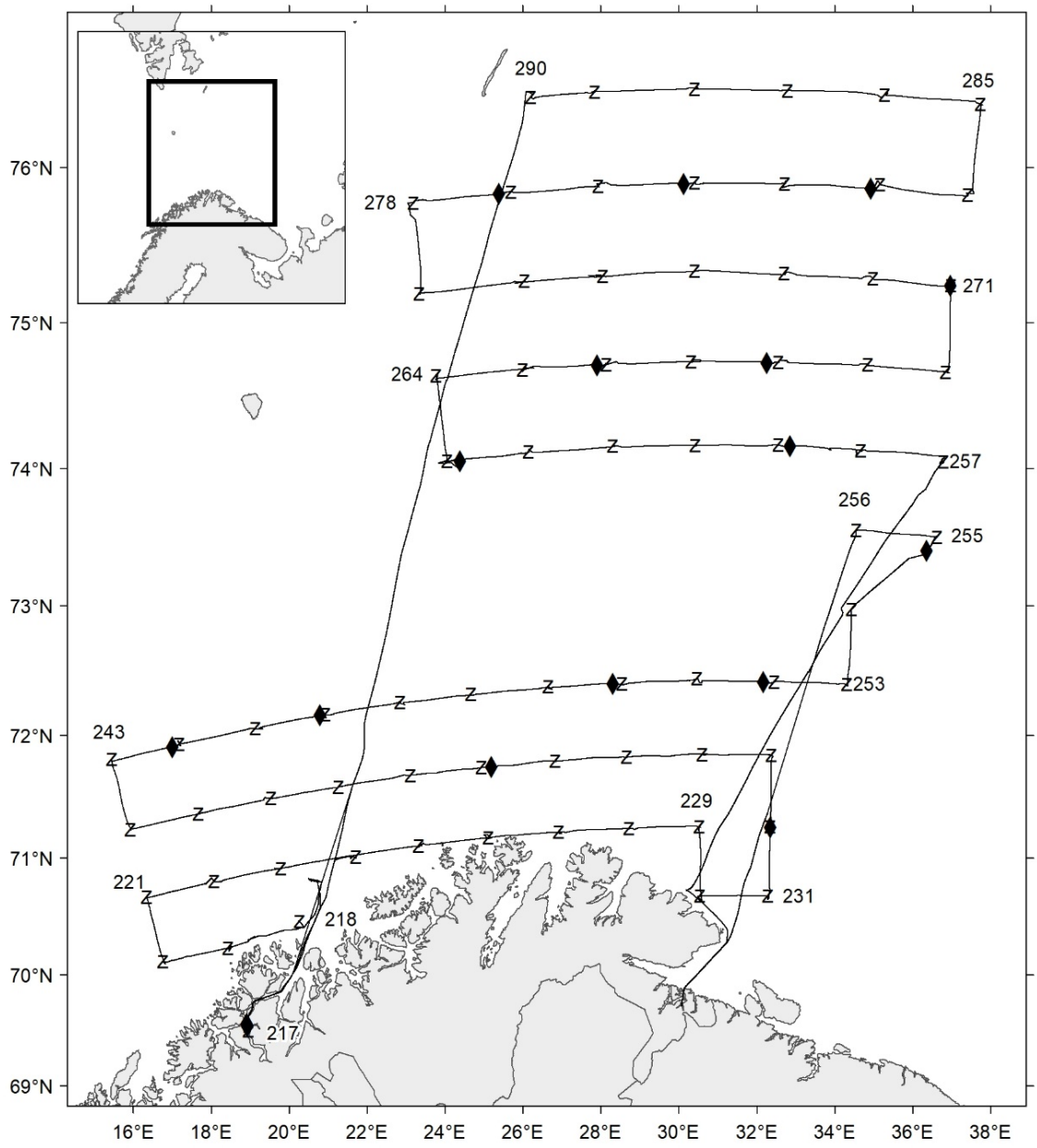

67°30'N
67°N
66°30'N
66°N
65°30'N
65°N
7°E
8°E
9°E
10°E
11°E
12°E
204
216
Cruise no 2020110 "G. O. Sars"
17 July–3 August 2020
● Video st. R 2235-R2372
O Full st. (CTD st.no 204-216)

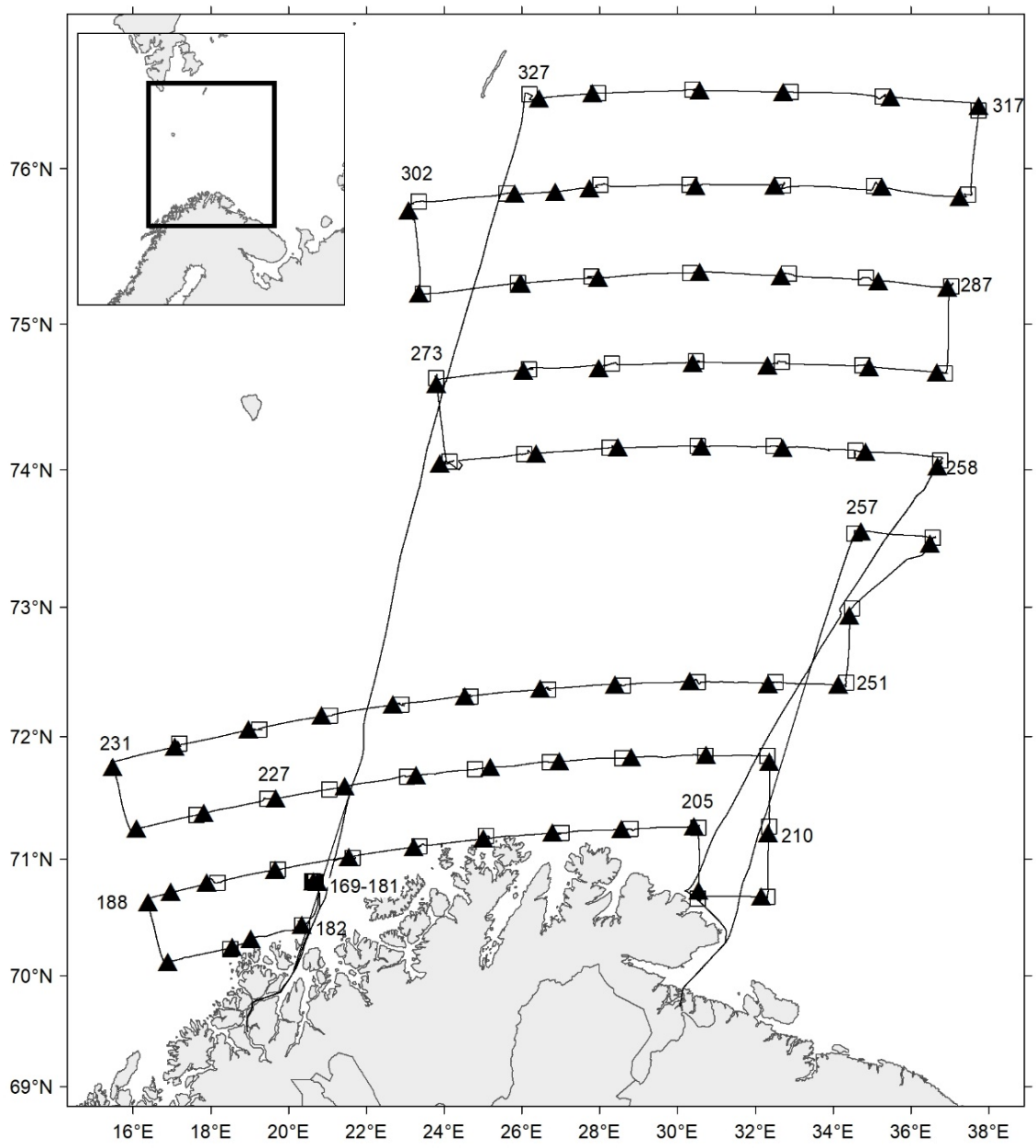
Fig. 14



Cruise no 2020111 "G. O. Sars" (Chart I)
10 August–8 September 2020

z CTD st.no 217-290
Plankton st. (WP-II-net) on every ctd st.
♦ Plankton st. (Multinet)

Fig. 15



Cruise no 2020111 "G. O. Sars" (Chart II)
10 August–8 September 2020

Trawl st.no 169-327
▲ Pelagic tr.
□ Bottom tr.

Fig.16

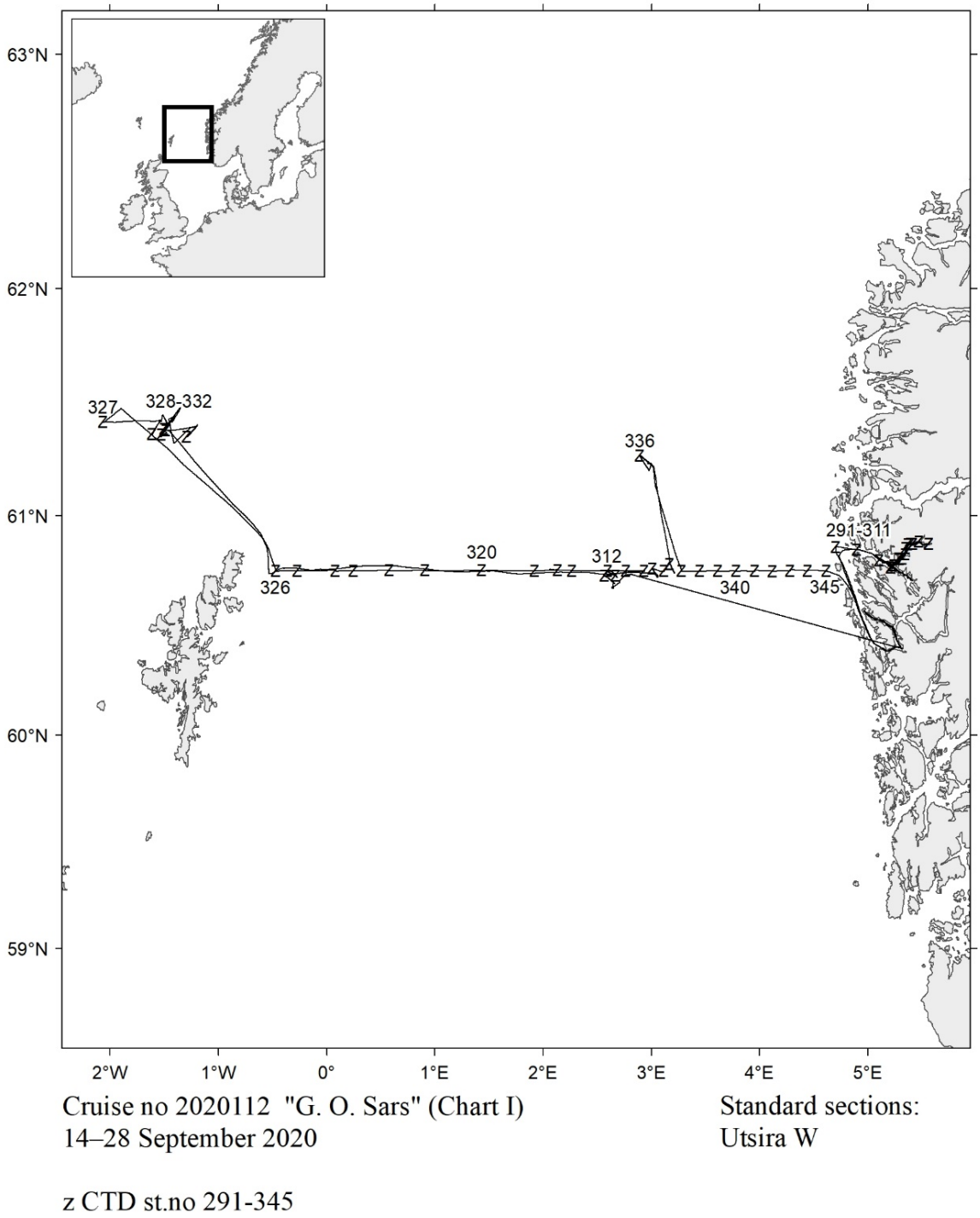

63°N
62°N
61°N
60°N
59°N
2°W
1°W
0°
1°E
2°E
3°E
4°E
5°E
327
328-332
326
320
312
336
340
345
291-311
Cruise no 2020112 "G. O. Sars" (Chart I)
14–28 September 2020
Standard sections:
Utsira W
z CTD st.no 291-345

Fig.17

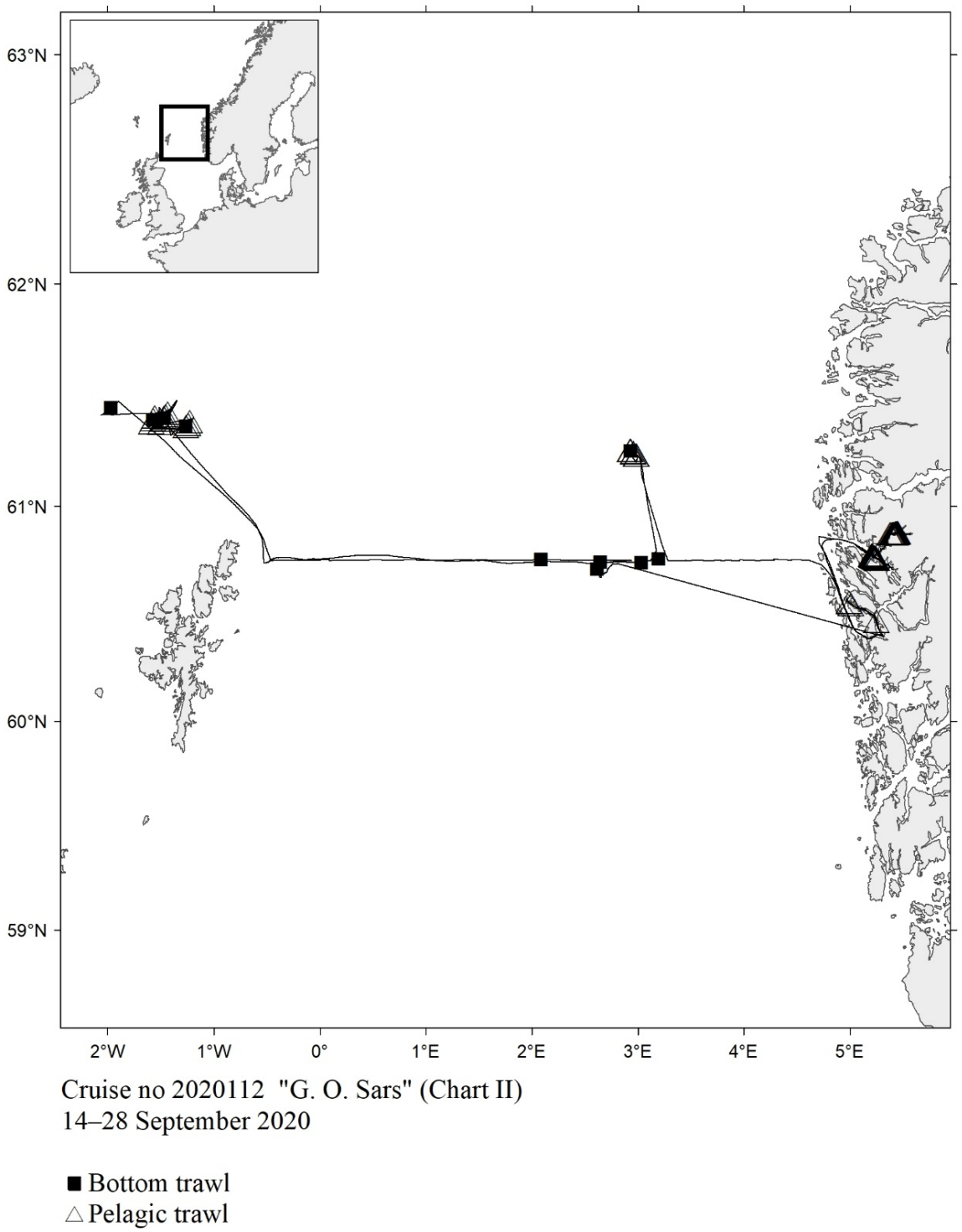
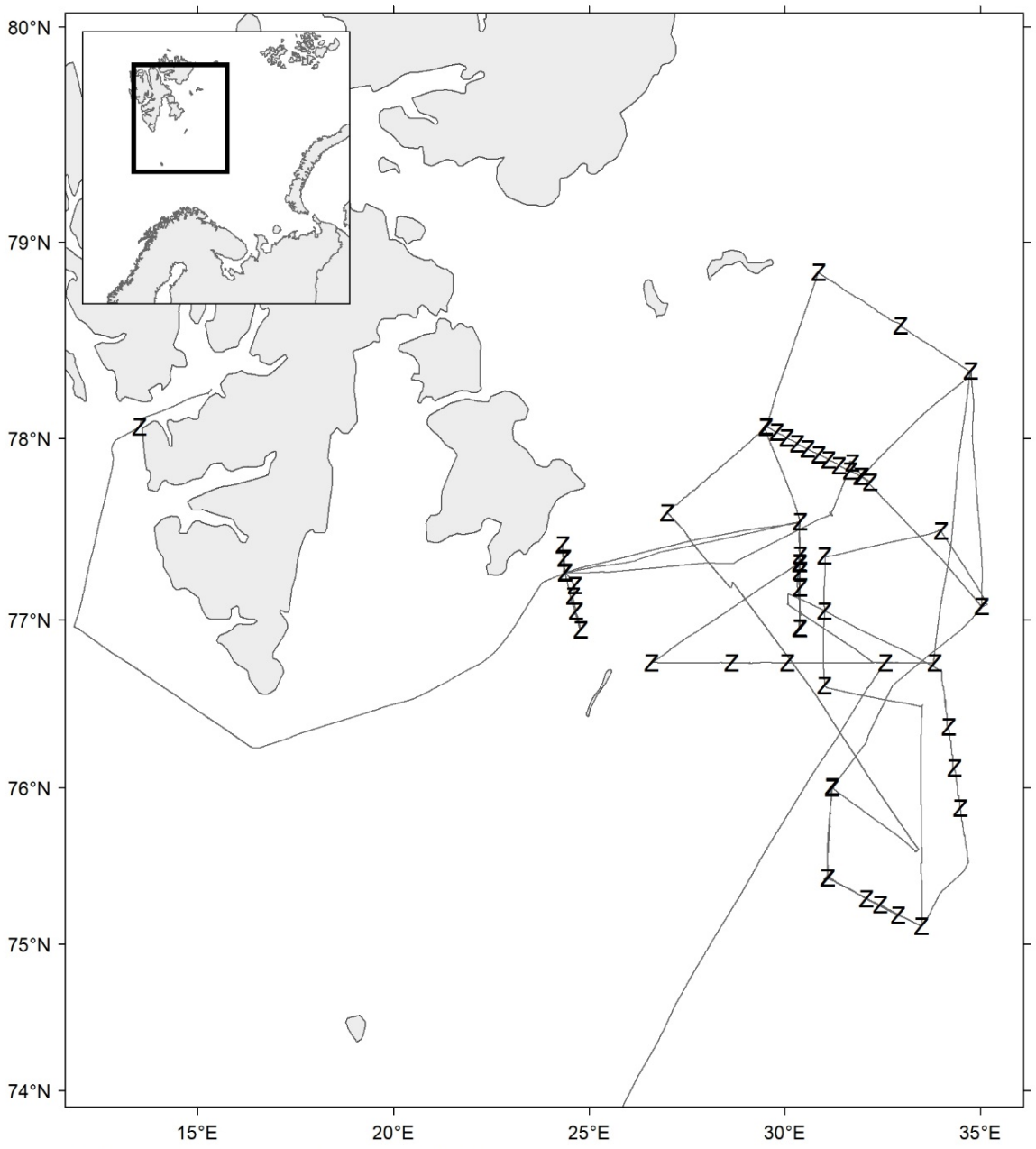

63°N
62°N
61°N
60°N
59°N
2°W
1°W
0°
1°E
2°E
3°E
4°E
5°E
Cruise no 2020112 "G. O. Sars" (Chart II)
14–28 September 2020
■ Bottom trawl
△ Pelagic trawl

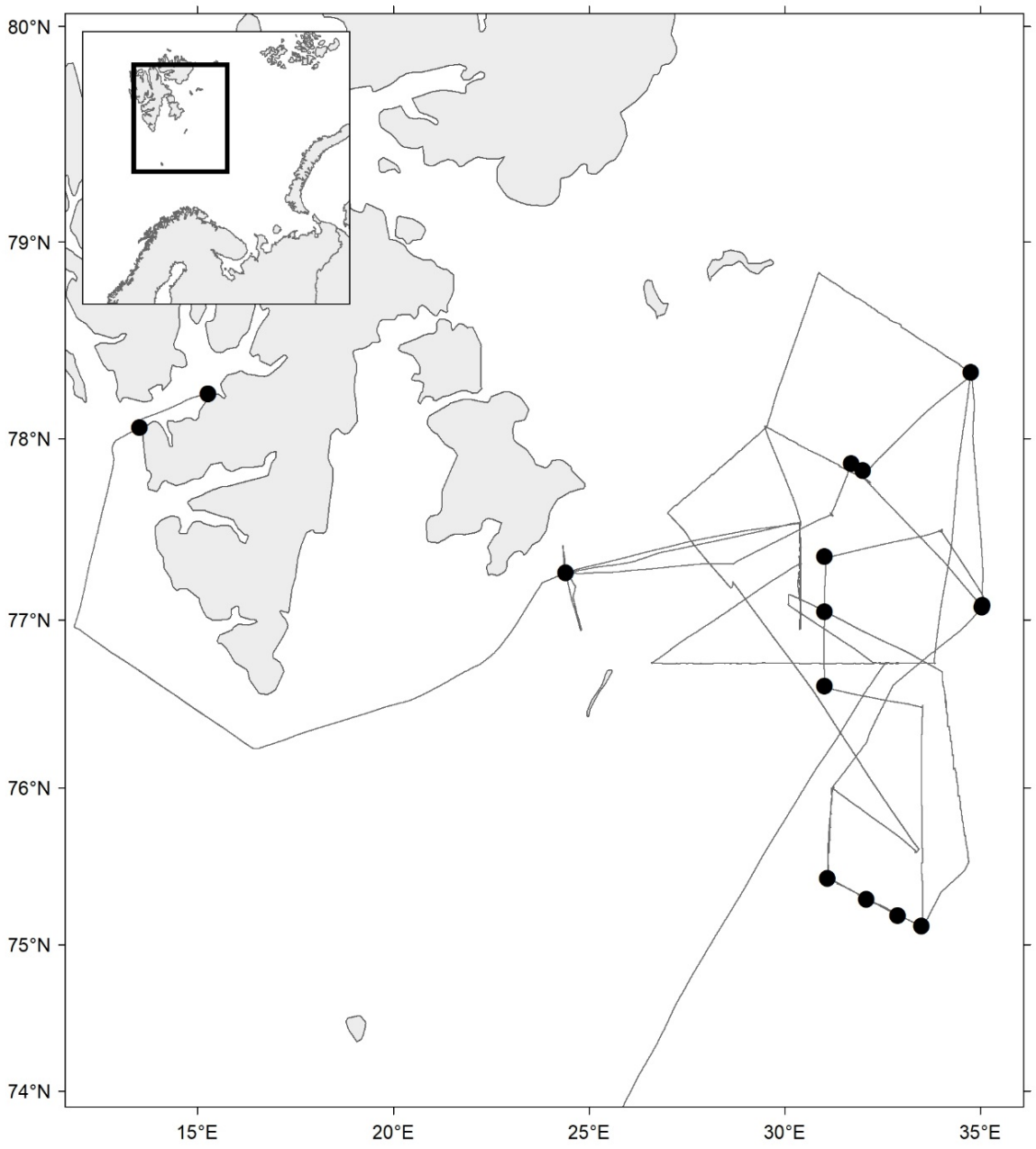
Fig.18



Cruise no 2020113 "G. O. Sars" (Chart I)
6-27 October 2020

z CTD st.no 346-409

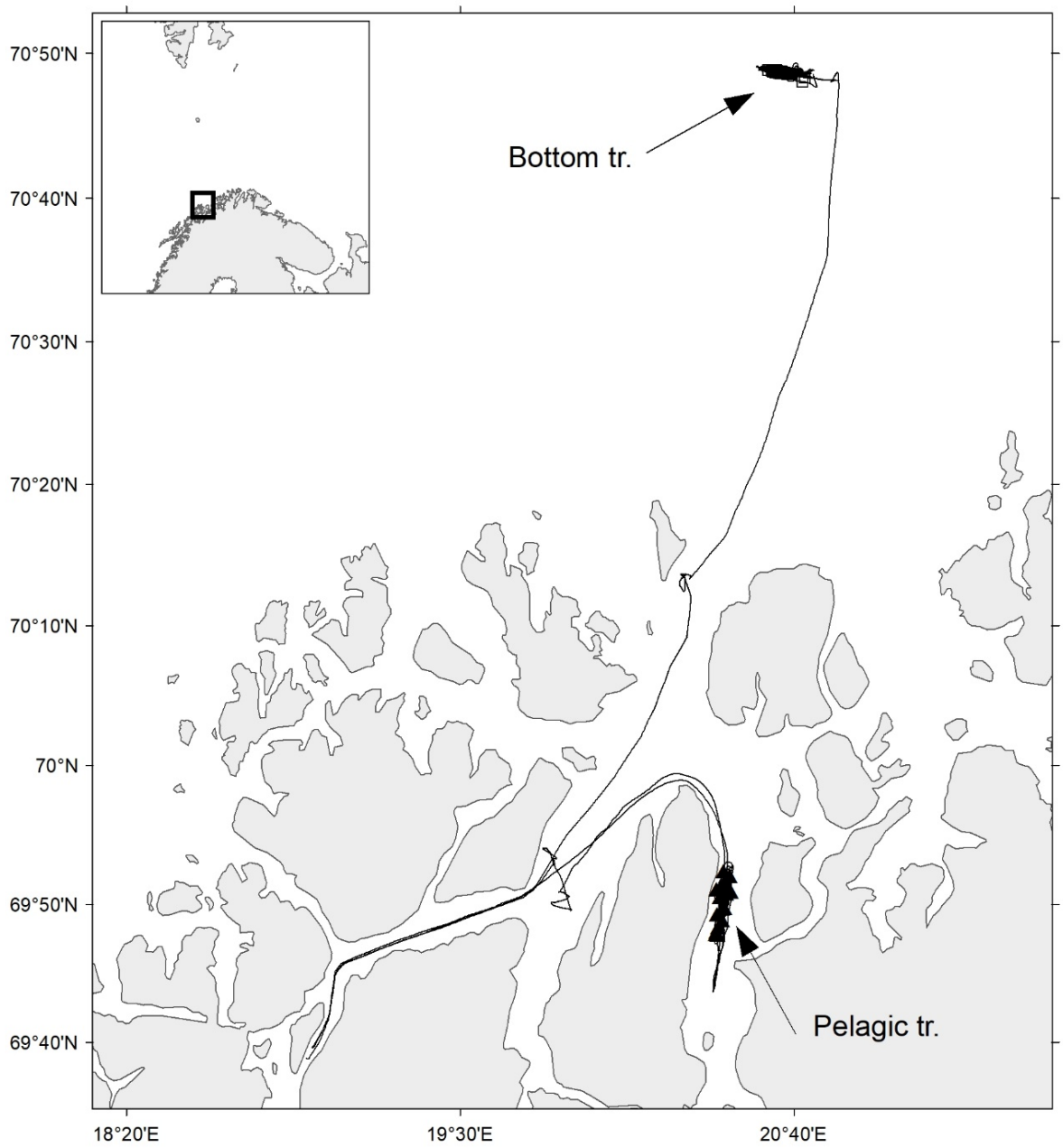
Fig.19



Cruise no 2020113 "G. O. Sars" (Chart II)
6-27 October 2020

● Mooring service/deployment

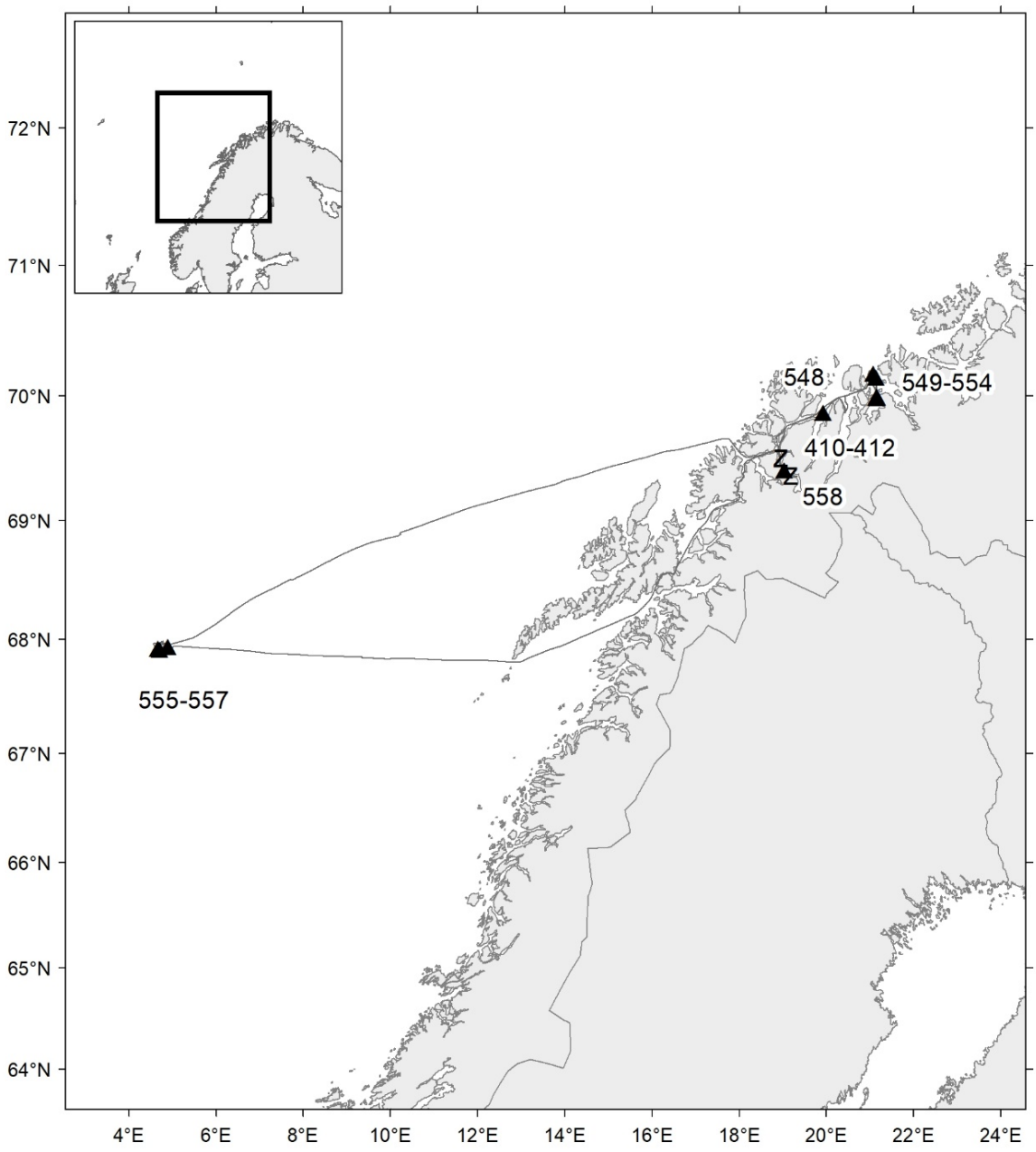
Fig.20



Cruise no 2020115 "G. O. Sars"
6-18 November 2020

Trawl st. no 328-481
▲ Pelagic trawl st.no 328-345
□ Bottom trawl st. no 346-481

Fig.21



Cruise no 2020116 "G. O. Sars"
19-30 November 2020

z CTD st.no 410-412
▲ Pelagic trawl st. no 548-558

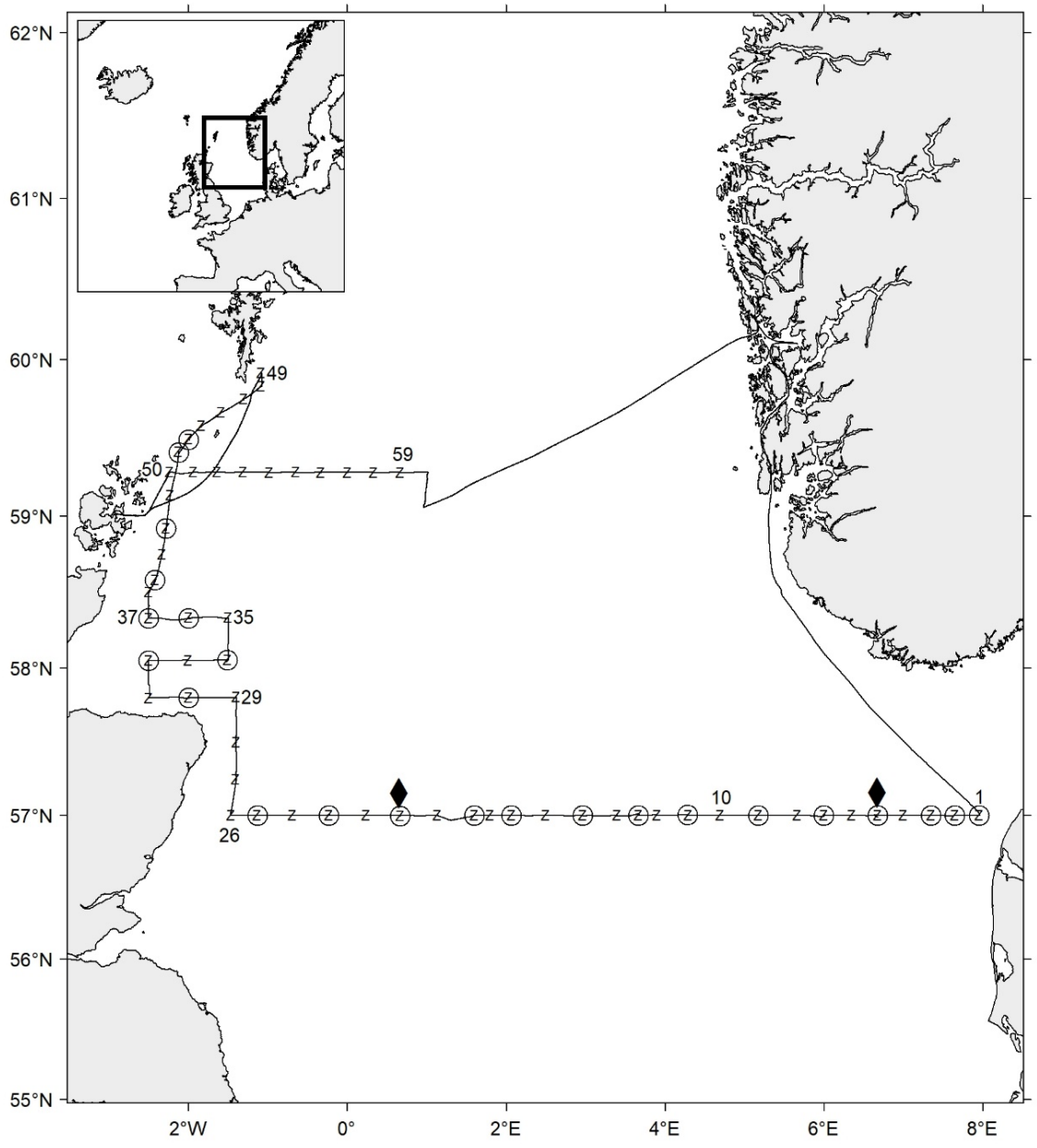
Fig. 22

4 - "Johan Hjort" - Cruises 2020

Cruise no	Period	Purpose	Area	CTD st.no	Trawl st.no	Fig. no
2020201	7.1.-16.1.	The objective of the cruise was to collect data and samples on pre-selected stations as part of the IMR monitoring of physical and biological parametres in the North Sea. Sampling was undertaken on standard sections. The cruise programme included sampling for physical-chemical oceanographic parameters (CTD casts, nutrients and chlorphyll), zooplankton with plankton net and the Multinet Mammoth. A larger plankton net with an associated smaller and finer mesh net was used to sample the fish larvae and fish eggs. Due to inclement weather the stations along the west coast of Norway were not sampled. From the Utsira-Startpoint transect only the 10 first stations on the west were sampled, with CTD casts.	North Sea	1-59	-	23-24
2020202	17.1.-25.1.	Objectives: To collect data and samples on pre-selected stations. To sample standard sections for physical oceanographic parameters (CTD casts, nutrients and chlorophyll) and zooplankton.	Barents Sea Norwegian Sea	60-83	-	25
2020203	27.1.-13.3.	Bottom trawl survey to assess the biomass and geographical distribution of the target species cod and haddock. Acoustic survey to assess the biomass and distribution of the target species cod, haddock and capelin. Joint survey with PINRO, Russia. Two Norwegian vessels (Johan Hjort and Helmer Hanssen) and one Russian vessel (Vilnius) participated.	Barents Sea	84-140	1-205	26
2020204	25.3.-11.4.	The main survey objective is to estimate abundance indices at age of the spawning stock of North East Arctic cod using the trawl acoustic method. The survey area is the shelf area from Malangsgrunnen south to Røsttunga and the shelf are of Vestfjorden connected to the Lofoten islands. Additional observations included the use of CTD and T80 net for sampling density and stage distribution of spawned eggs. The survey is a part of a time series.	Norwegian Sea	141-196	206-238	27-29
2020205	14.4.-12.5	The North Sea Ecosystem spring cruise has been run since 2010 by the Institute of Marine Research (IMR) as a multi-purpose survey. The cruise covers hydrography, chemistry, phytoplankton and zooplankton (IMR project “Monitoring of climate and plankton in the North Sea Skagerrak”) as well as fish eggs and fish larvae (IMR project “Early life history dynamics of North Sea Fishes”). The cruise also includes monitoring of radioactive contamination (IMR project “Monitoring of radioactivity in Norwegian waters” IMR 14379-01).	North Sea	197-453	-	30-31
2020206	27.6.-27.7.	Acoustic survey focusing on herring (HERAS, leg 1) and saithe in the northern North Sea. The herring survey, coordinated by ICES and WGIPS, is part of an international sampling effort (involving also Denmark, Netherlands, Germany and Scotland) and the index is used in the assessment of North Sea herring. NORACU: times series focusing on saithe (both legs) to be used in assessment of the NS saithe after 5 years of consistent sampling (ICES regulation).	North Sea	454-567	239-373	32-33
2020207	28.7.-5.8.	The objective of the cruise was to collect data and samples on pre-selected stations as part of the IMR monitoring of physical and biological parametres in the North Sea. The cruise programme included sampling for physical-chemical oceanographic parameters (CTD casts, nutrients and chlorphyll), zooplankton with plankton net and the Multinet Mammoth. MIK a larger plankton was used to sample the fish larvae and fish eggs.	North Sea	568-648	-	34-35
2020208	7.8.-19.8.	Objectives: To collect data and samples on pre-selected stations. To sample standard sections for physical oceanographic parameters (CTD casts, nutrients and chlorophyll) and zooplankton in the Norwegian sea and the Barents Sea.	Barents Sea Norwegian Sea	649-715	-	36

2020209	20.8.-2.10.	This cruise is part of a multi-purpose ecosystem survey in the Barents Sea, done by several research vessels and carried out jointly by Norway and Russia. The objectives were to collect data at several trophic levels: phyto- and zooplankton, benthos, fish, marine mammals, and seabirds. In addition, hydrography, water chemistry and physics, and acoustics were monitored. Samples of seawater and sediments at the wreck of "Komsomolets" for investigations of Cs-137, Sr-90, Pu isotopes, and H-3 were taken. Two sections were covered.	Barents Sea	716-840	716-871	37-38
2020210	8.10.-15.11.	Annual combined acoustic and bottom trawl survey along the Norwegian coast north of 62˚N. Map the distribution and calculate acoustic abundances indices, length, weight and maturity at age for coastal cod, saithe and haddock. Improve data basis for the assessment of golden redfish, by allocating additional bottom trawls. Map the general hydrographical regime by using a CTD-sonde to monitor the temperature and salinity at one at bottom trawl stations and/or at fixed intervals. Acoustic coverage of pelagic fish in Laksefjord, Tanafjord,and Porsangerfjord. Sampling of golden redfish, cod, saithe, haddock, tusk for analysis of contamination. Collection of frozen samples of selected shark and skate species, deep sea shrimps.	Barents Sea Norwegian Sea	841-890	872-1016	39-40
2020211	16.11-25.11.	The aim of the cruise was to collect samples on 4 transects for physical oceanographic parameters (CTD casts, nutrients and chlorophyll), zooplankton and fish larvae for the IMR projects “Monitoring of climate and plankton in the North Sea Skagerrak”, and “Early life history dynamics of North Sea Fishes”.	North Sea	891-959		41-42
2020212	26.11.-9.12.	Standard sections.	Norwegian Sea Barents Sea	960-1026	-	43

5 - “Johan Hjort” – Charts for cruises 2020



Cruise no 2020201 "Johan Hjort" (Chart I)
7–16 January 2020

z CTD st.no 1–59
○ Plankton st. (WP-II-net)
♦ Multinet

Standard sections:
Hanstholm–Aberdeen st.no: 1–26
Utsira W st.no 50–59
Fair Isle-Pentland st.no 37–49

Fig.23

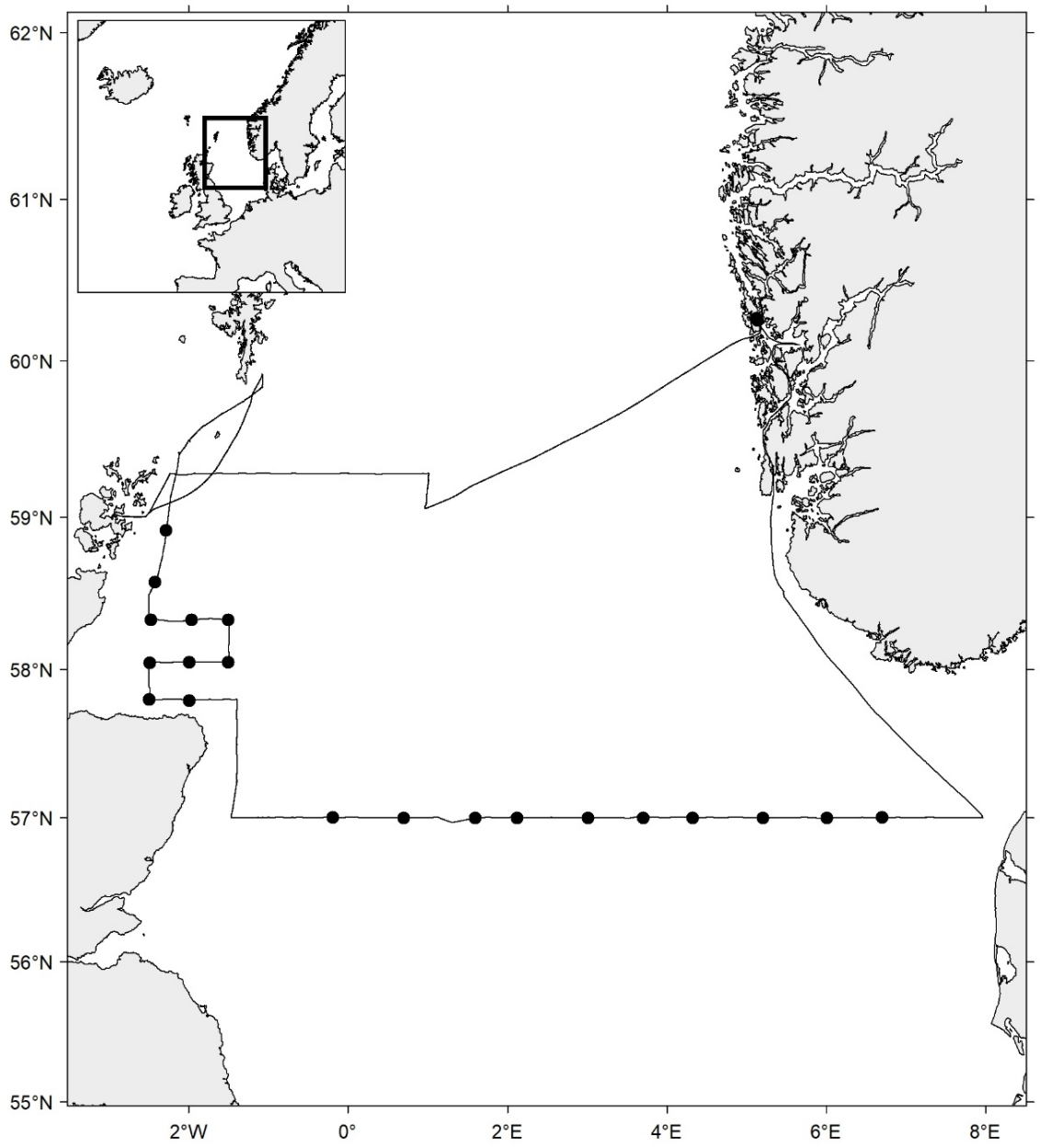
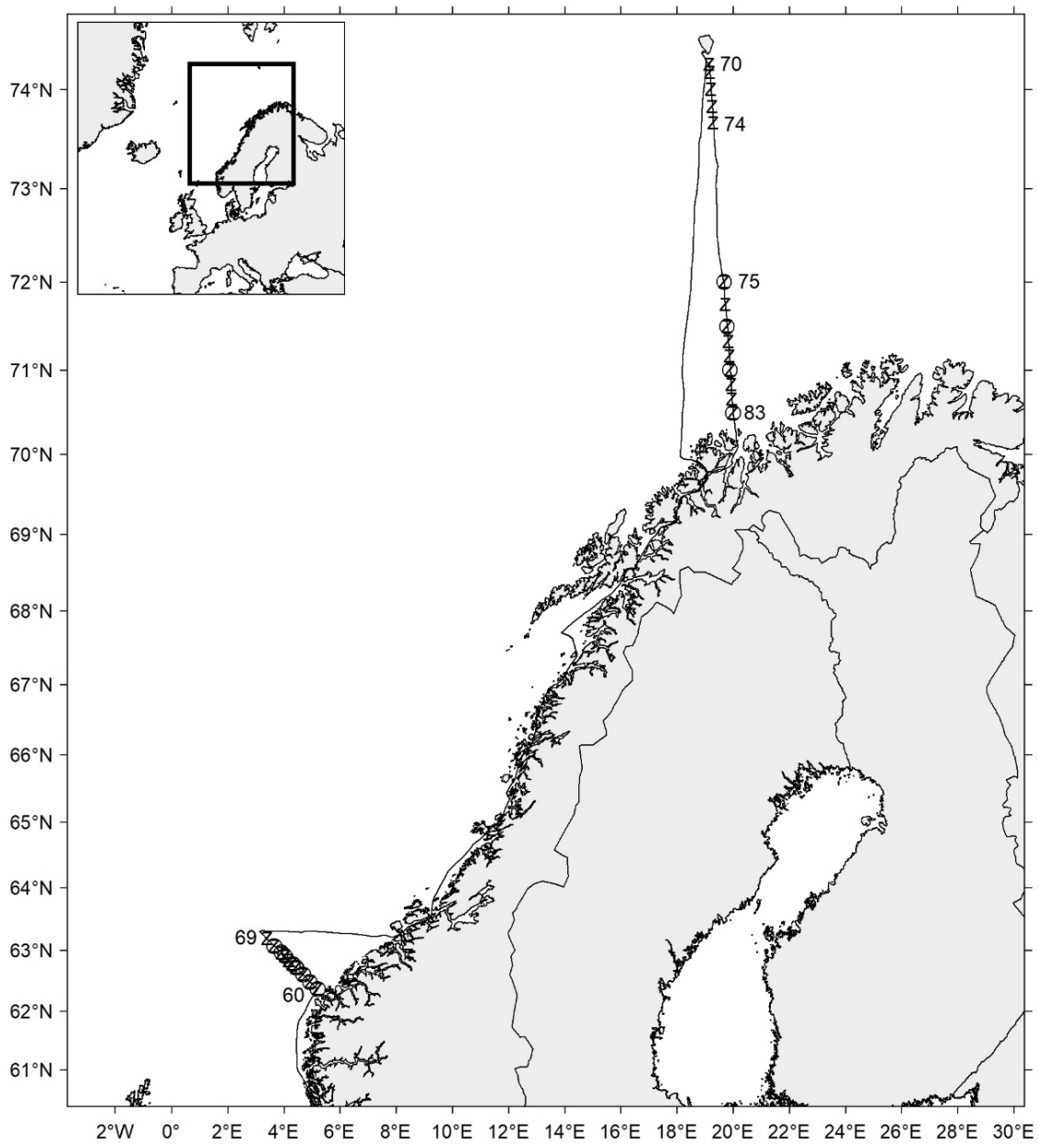

62°N
61°N
60°N
59°N
58°N
57°N
56°N
55°N
2°W
0°
2°E
4°E
6°E
8°E
Cruise no 2020201 "Johan Hjort" (Chart II)
7–16 January 2020
● MIK st.

Fig.24

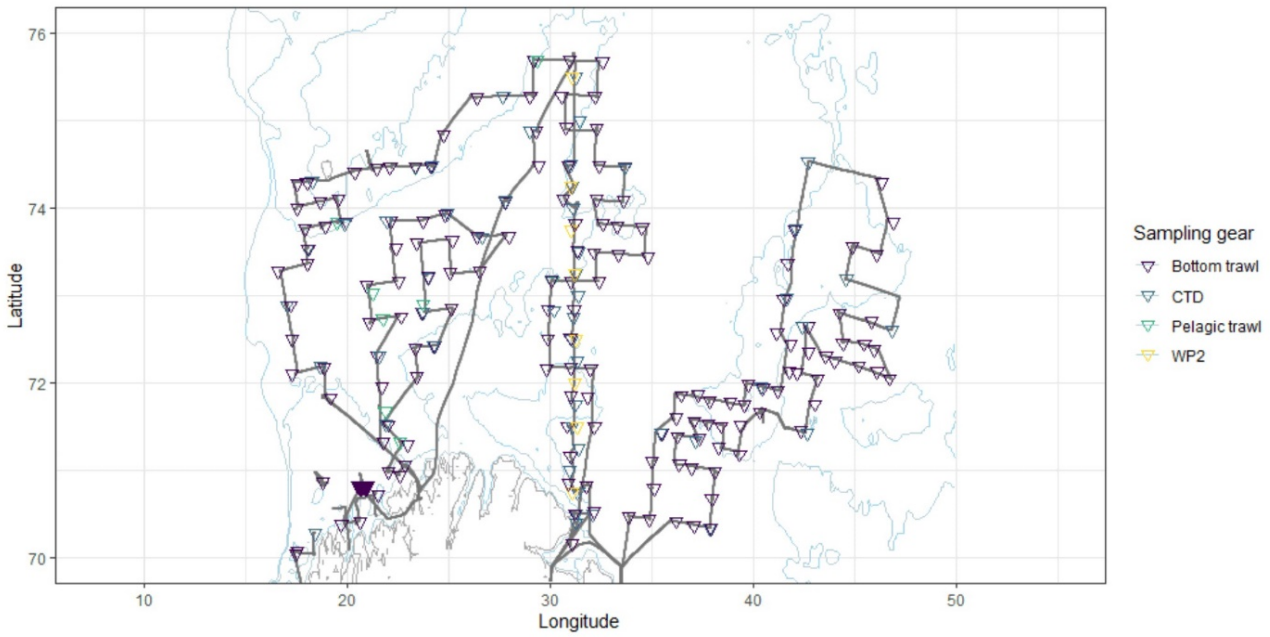


Cruise no 2020202 "Johan Hjort"
17–25 January 2020

z CTD st.no 60–83
○ Plankton st. (WP-II-net)

Standard sections:
Svinøy NW st.no: 60–69
Fugløya–Bjørnøya st.no 70-83
(St. M and LoVe-transect – Cancelled due to bad weather)

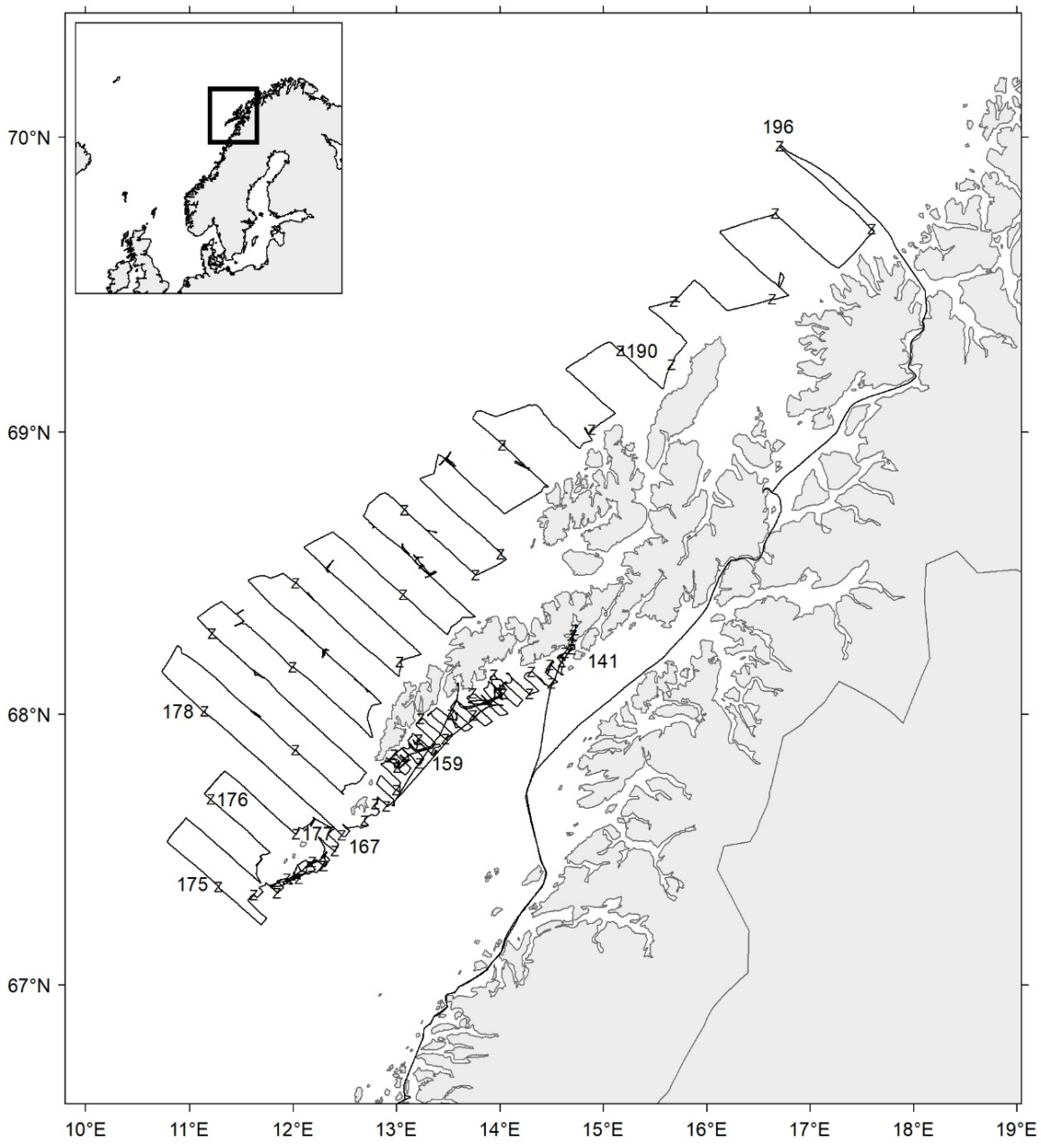
Fig.25



Cruise no 2020203 "Johan Hjort"
27 January–13 March 2020

CTD st.no 84-140
Trawl st.no 1-205

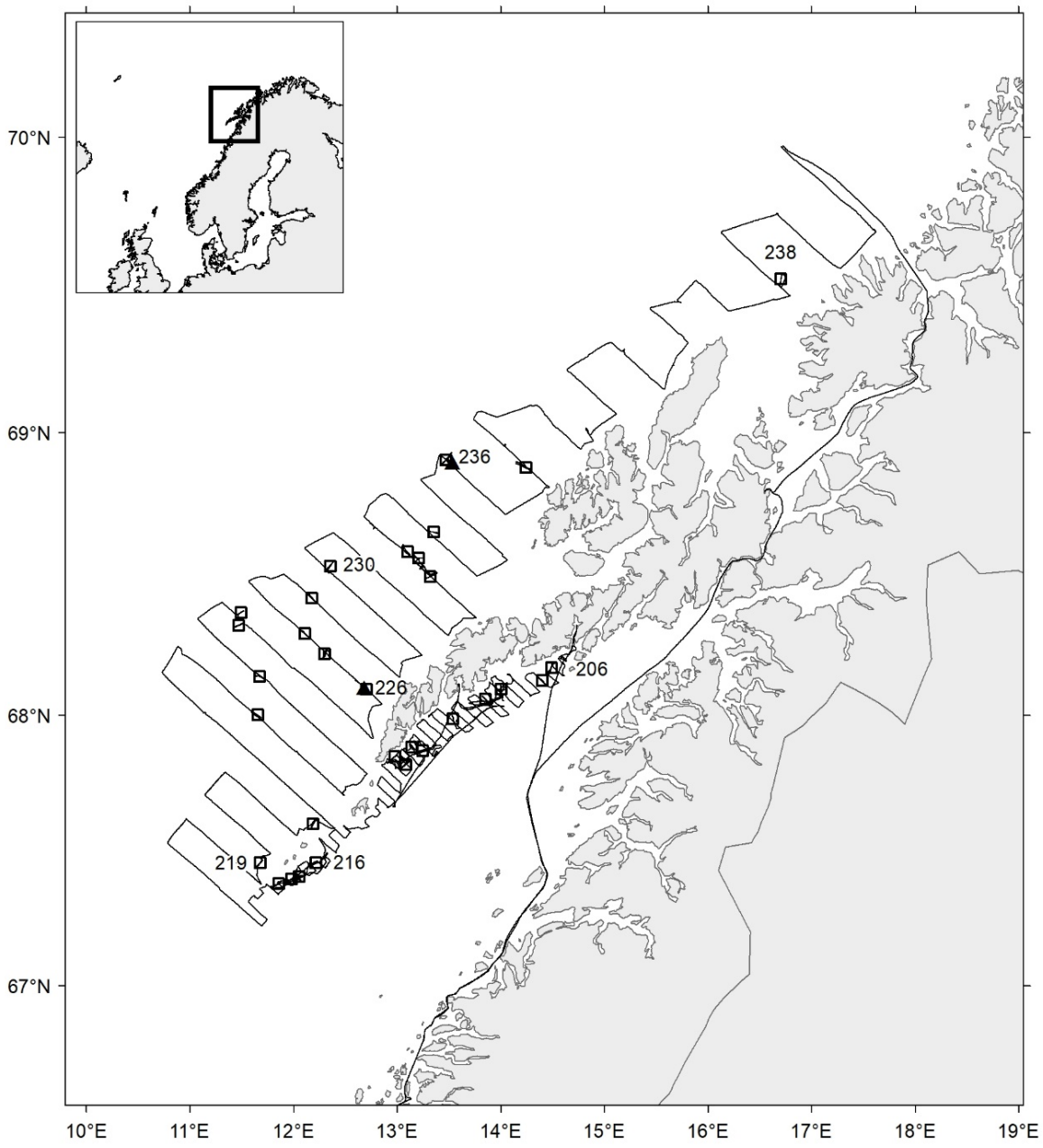
Fig.26



Cruise no 2020204 "Johan Hjort" (Chart I)
25 March–11 April 2020

z CTD st.no 141-196

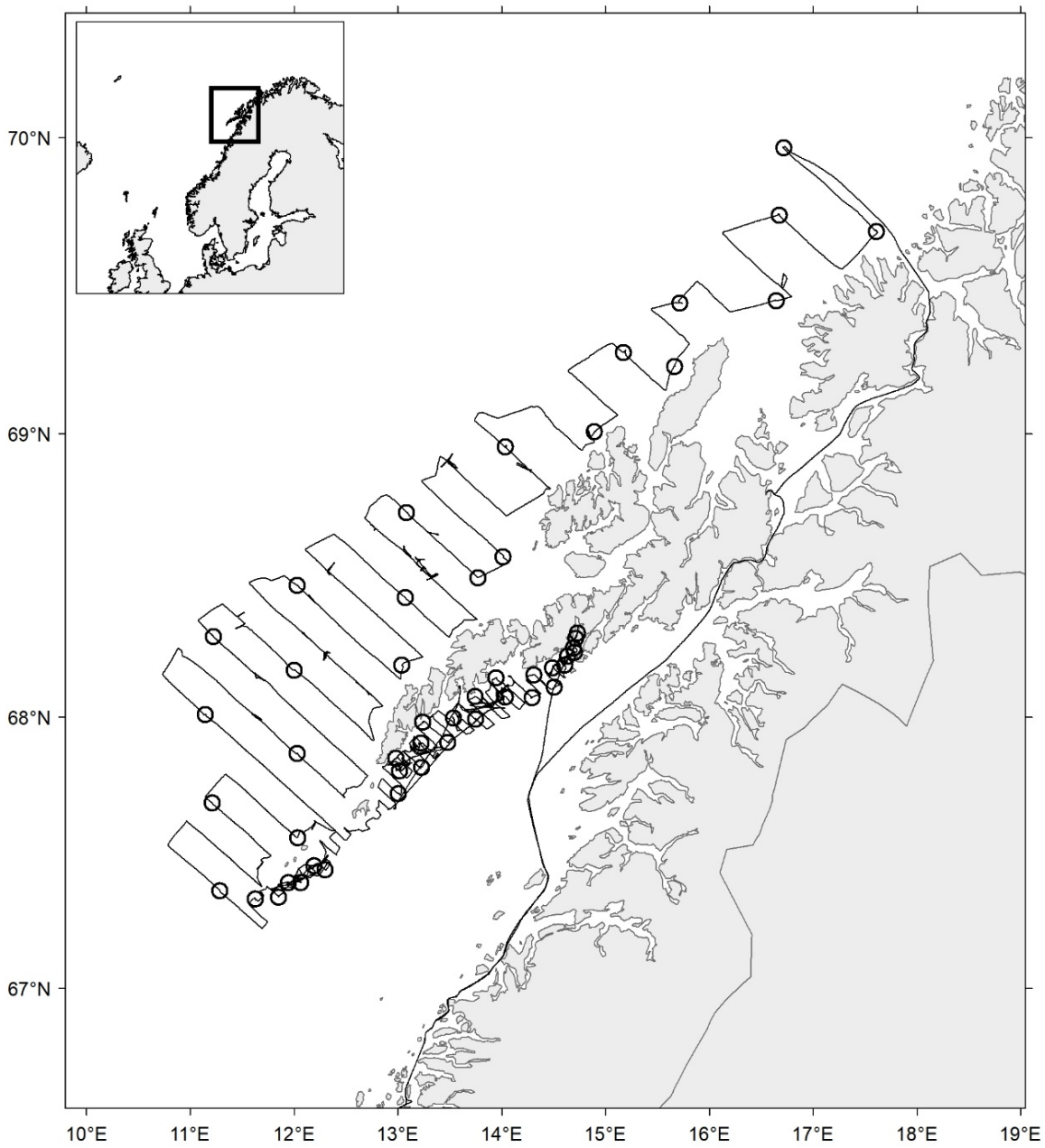
Fig. 27



Cruise no 2020204 "Johan Hjort" (Chart II)
25 March–11 April 2020

Trawl st.no 206-238
- □ Bottom tr.
- ▲ Pelagic tr. (225 and 235)

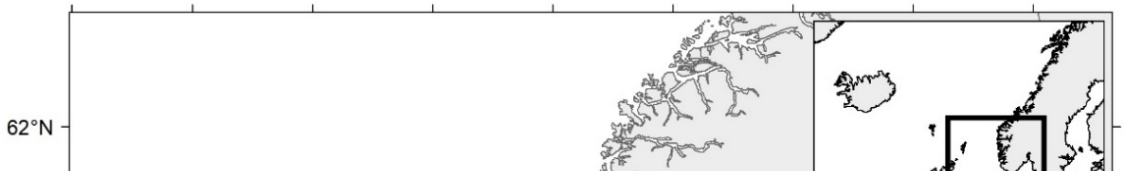
Fig.28

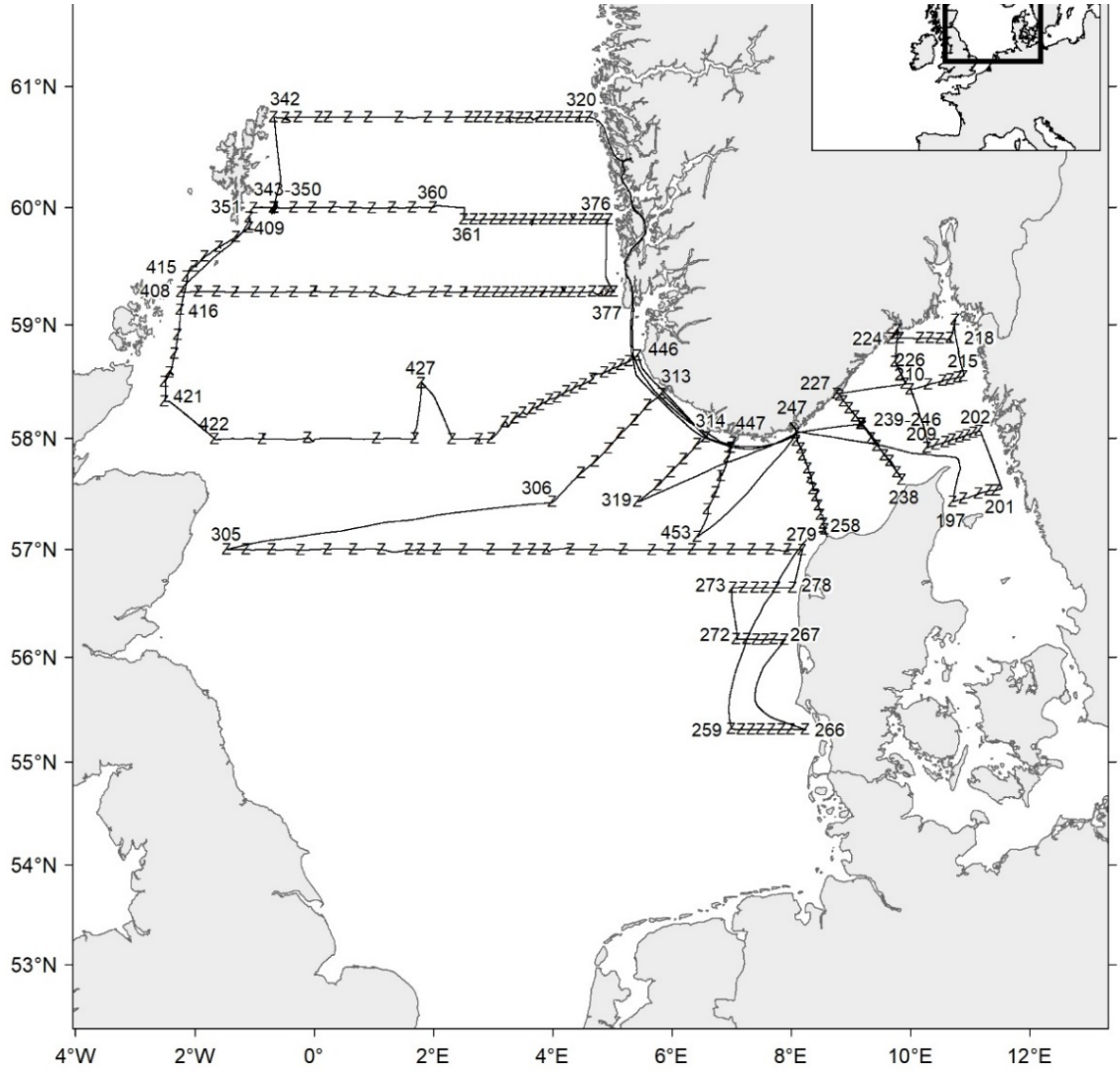


Cruise no 2020204 "Johan Hjort" (Chart III)
25 March–11 April 2020

○ Net for egg and larvae

Fig.29



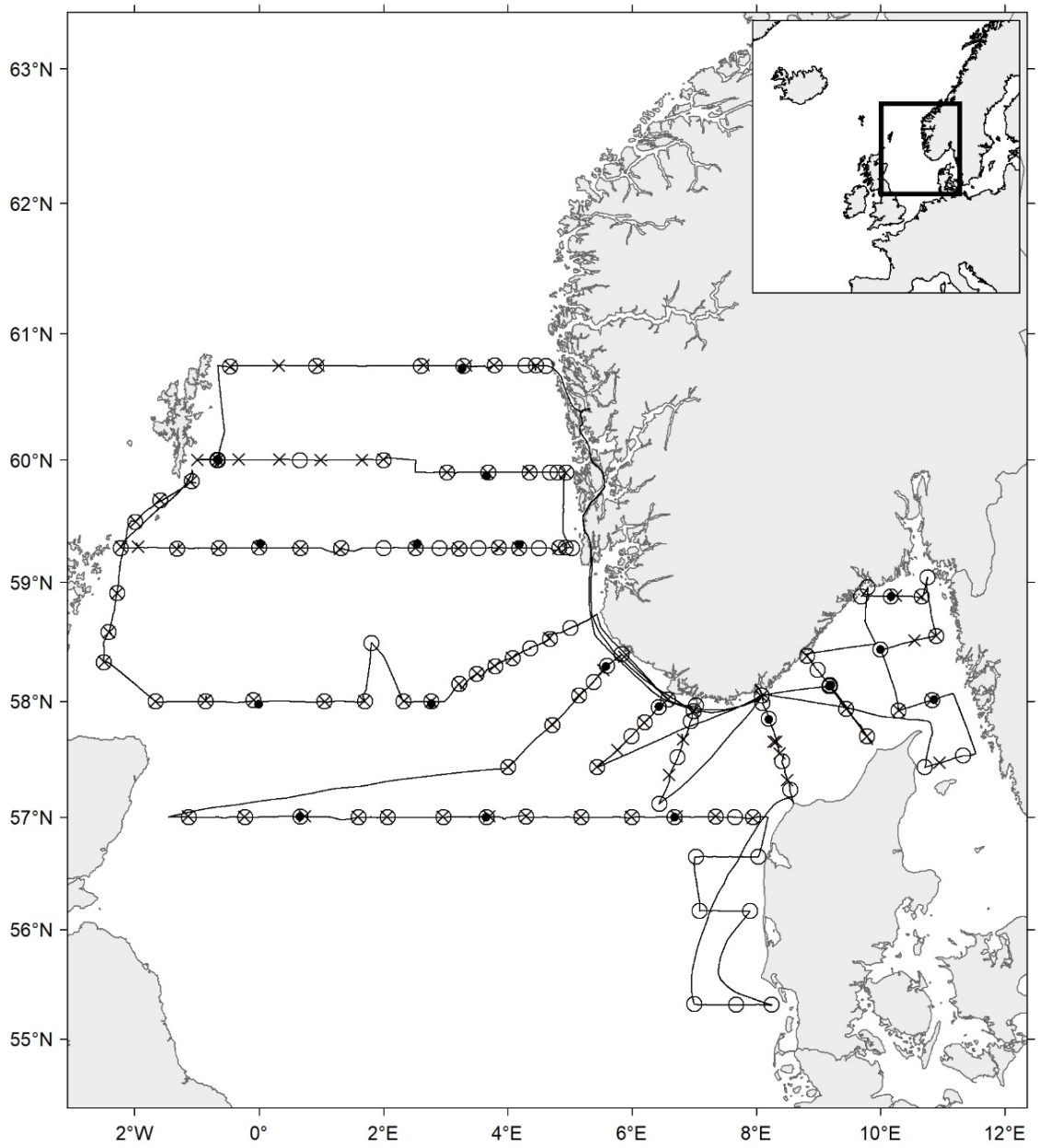


Cruise no 2020205 "Johan Hjort" (Chart I)
14 April–13 May 2020

z CTD st.no 197-453

Standard sections:
Gøteborg-Fr.h: st.no 197-201
Måseskjær: st.no 202-209
Vaderø: st.no 210-215
Jomfruland–Koster: st.no 218-224
Torungen-Hirtshals: st.no 227-238
Oksø–Hanstholm: st.no 247-258
Knude dyb: st.no 259-266
Huseby klit: st.no 267-272
Harboør: st.no 273-278
Hanstholm–Aberdeen: st.no 279-305
Egerøy: st.no 306-313
Lista: st.no 314-319
Fedje-Shetland: st.no 320-342
Utsira W: st.no 351-376
Slotterøy W: st.no 377-408
Lindesnes: st.no 447-453

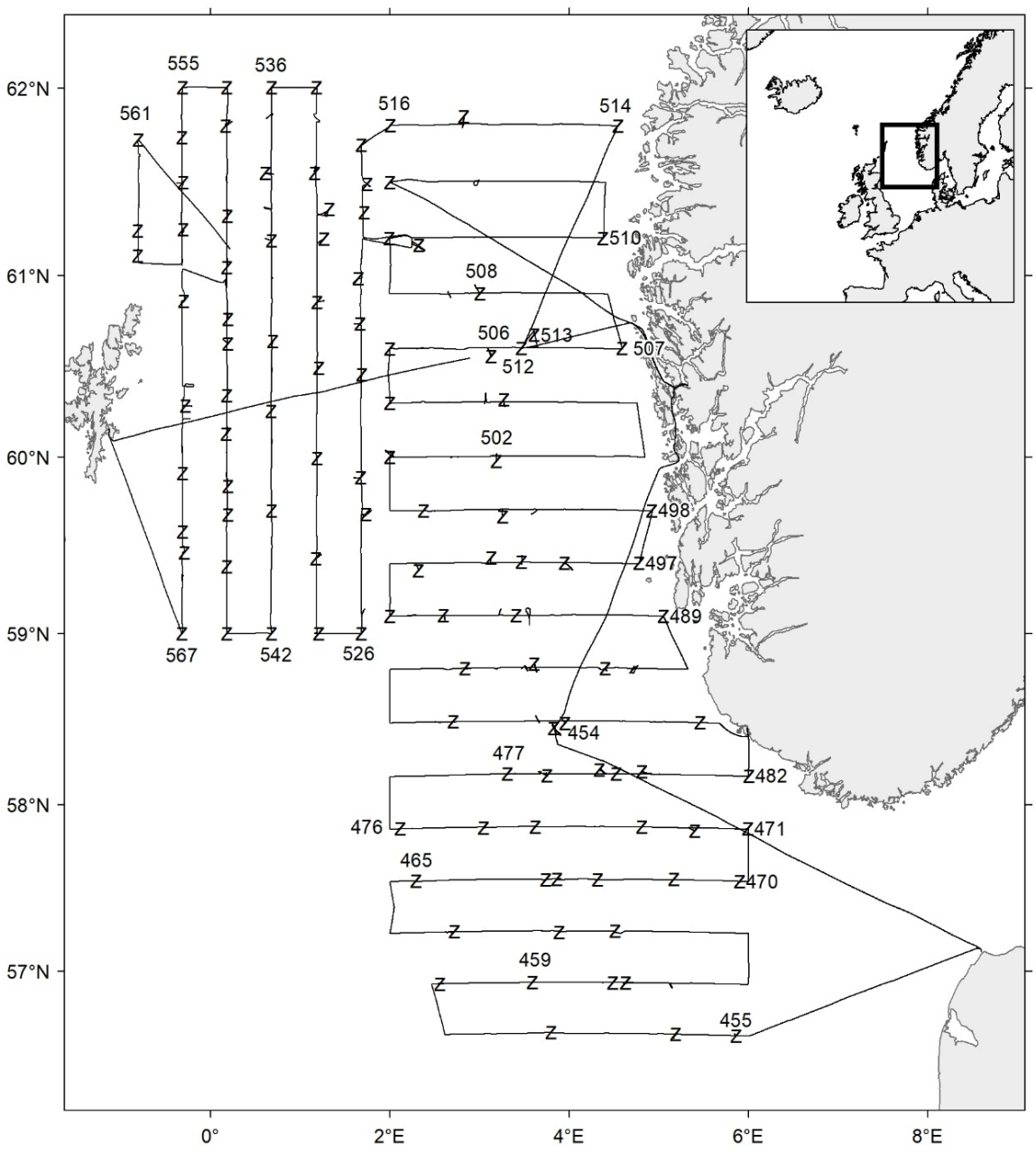
Fig.30



Cruise no 2020205 "Johan Hjort" (Chart II)
14 April–13 May 2020

○ WP-II net
• Multinet
× GULF VII

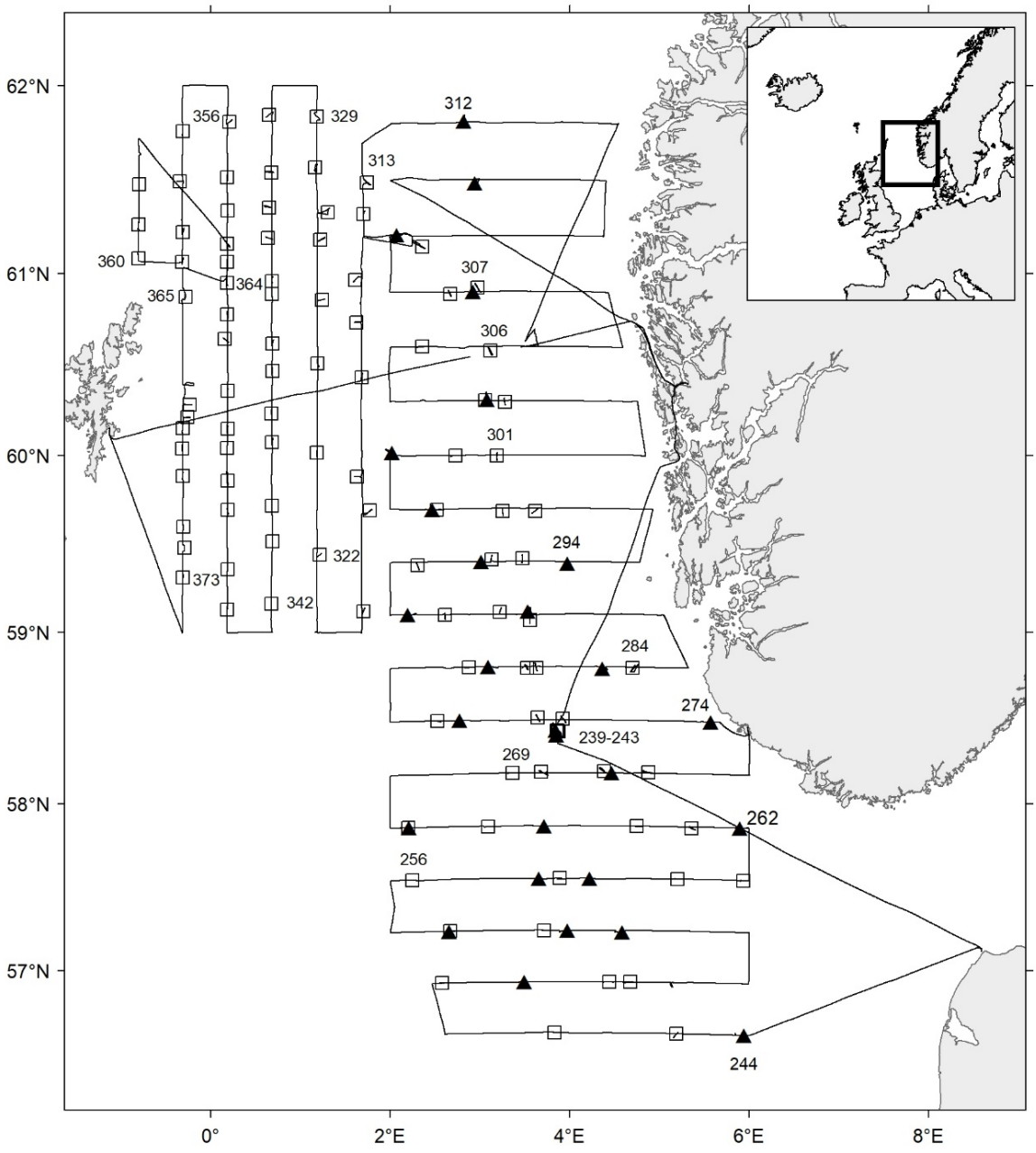
Fig.31



Cruise no 2020206 "Johan Hjort" (Chart I)
27 June– 27 July 2020

z CTD st.no 454-567

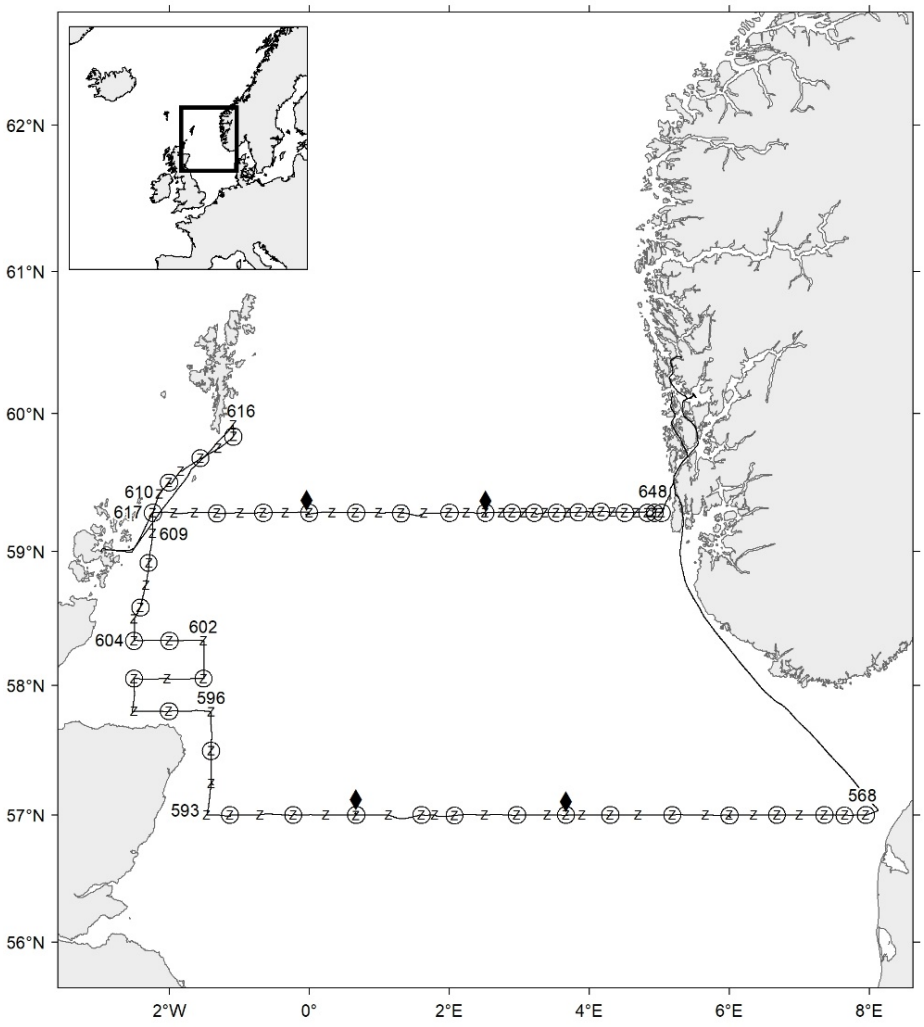
Fig. 32



Cruise no 2020206 "Johan Hjort" (Chart II)
27 June–27 July 2020

Trawl st.no 239-373
▲ Pelagic tr.
□ Bottom tr.

Fig.33

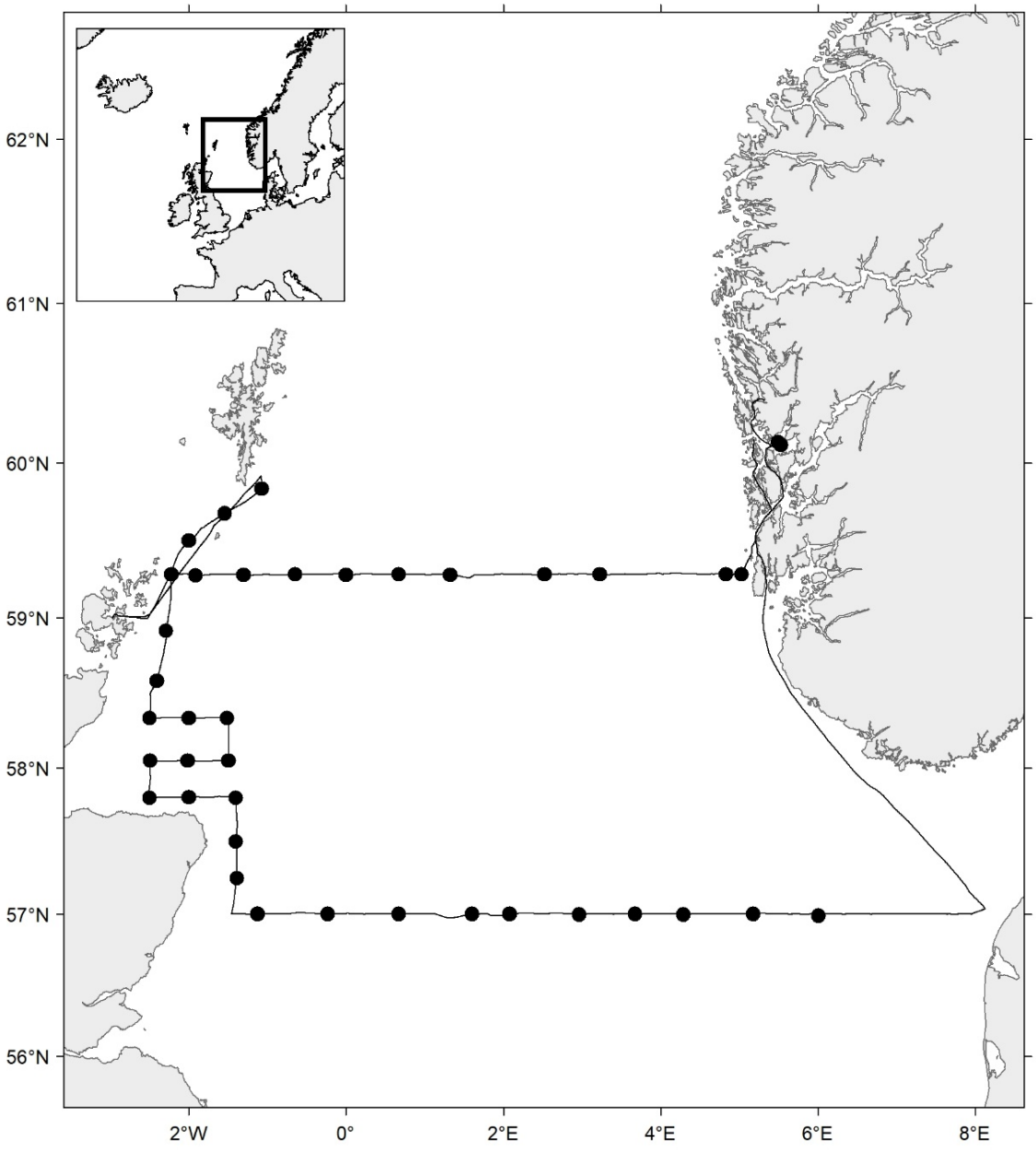


Cruise no 2020207 "Johan Hjort" (Chart I)
28 July–5 August 2020

z CTD st.no 568-648
○ WP-II-net. (Plankton, egg, larvae)
♦ Multinet. (Plankton, egg, larvae)

Standard sections:
Hanstholm Aberdeen st.no 568-593
Utsira W: st.no 617-648
Fair Isle-Pentland st.no 594-616

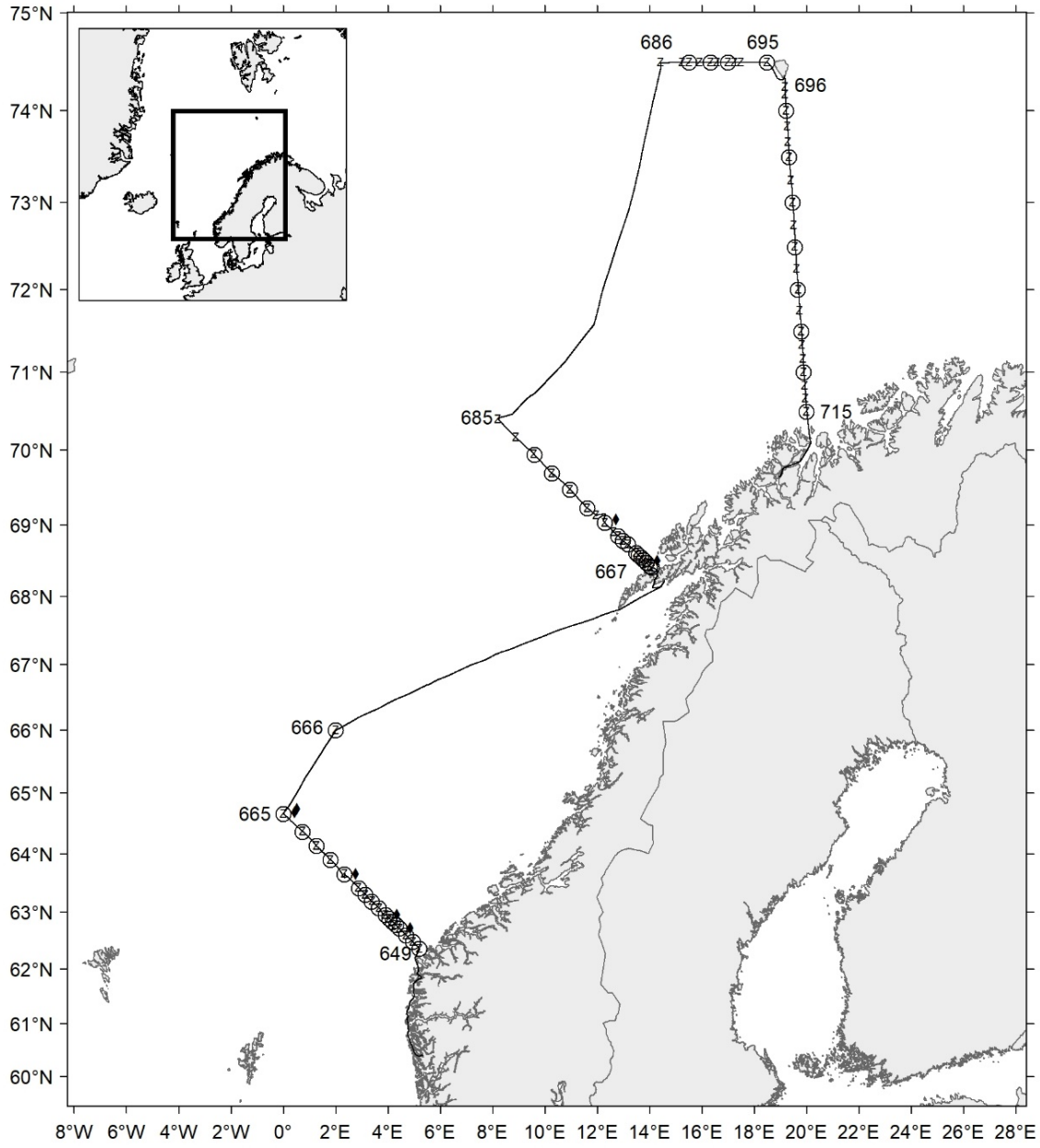
Fig.34



Cruise no 2020207 "Johan Hjort" (Chart II)
28 July–5 August 2020

● MIK station

Fig.35

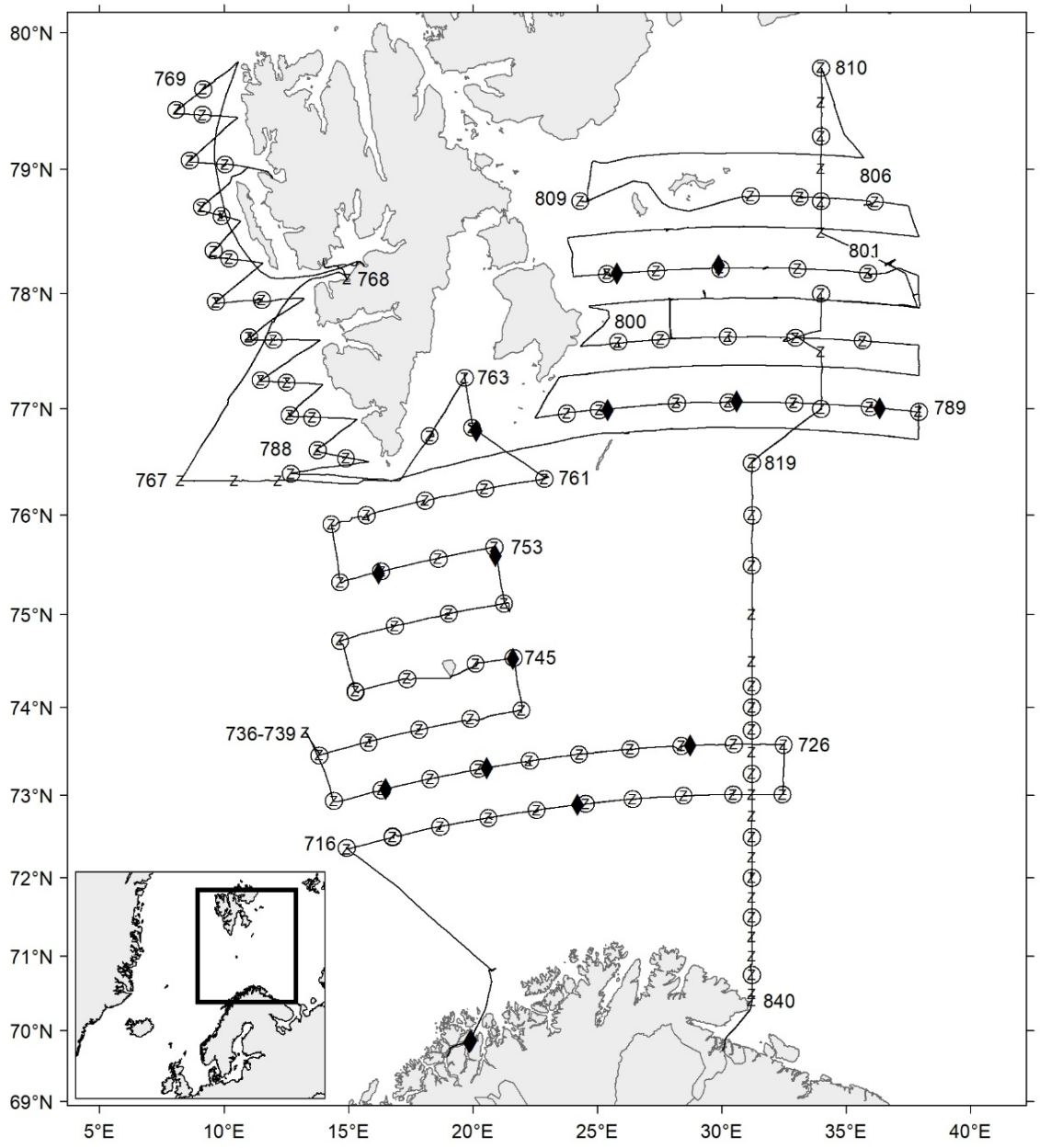


Cruise no 2020208 "Johan Hjort"
7–19 August 2020

z CTD st.no 649-715
○ WP-II-net (Plankton st.)
♦ Multinet (Plankton st.)

Standard sections:
Svinøy NW st.no 649-665
Gimsøy NW st.no 667-685
Bjørnøya W st.no 686-695
Fugløya-Bjørnøya st.no 696-715
St. M st.no 666

Fig.36



Cruise no 2020209 "Johan Hjort"
20 August –2 October 2020

Standard sections:
Vardø N st.no 810-840

z CTD st.no 716-840
○ WP-II-net (Plankton st.)
♦ Multinet (Plankton st.)

Fig.37

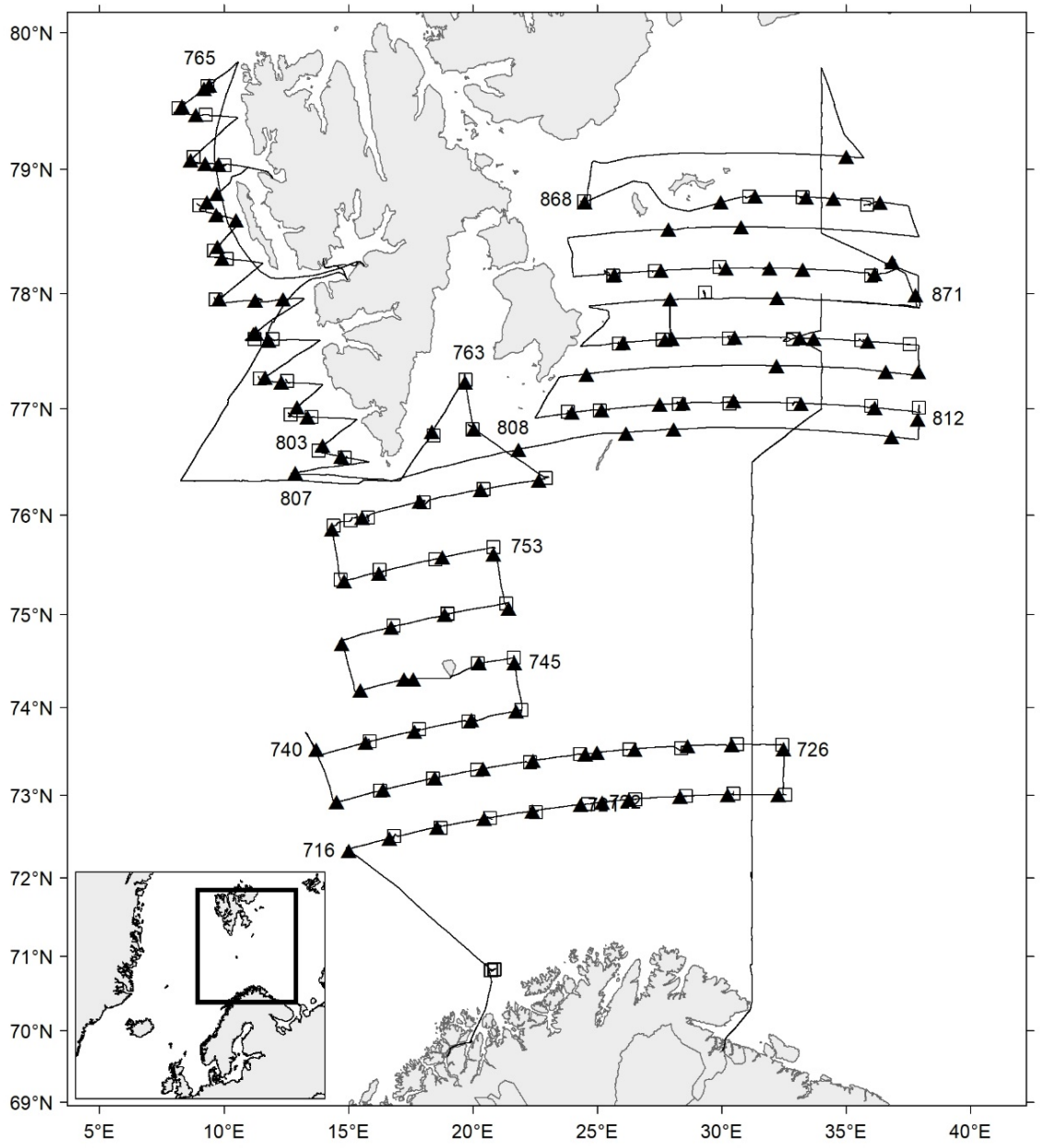
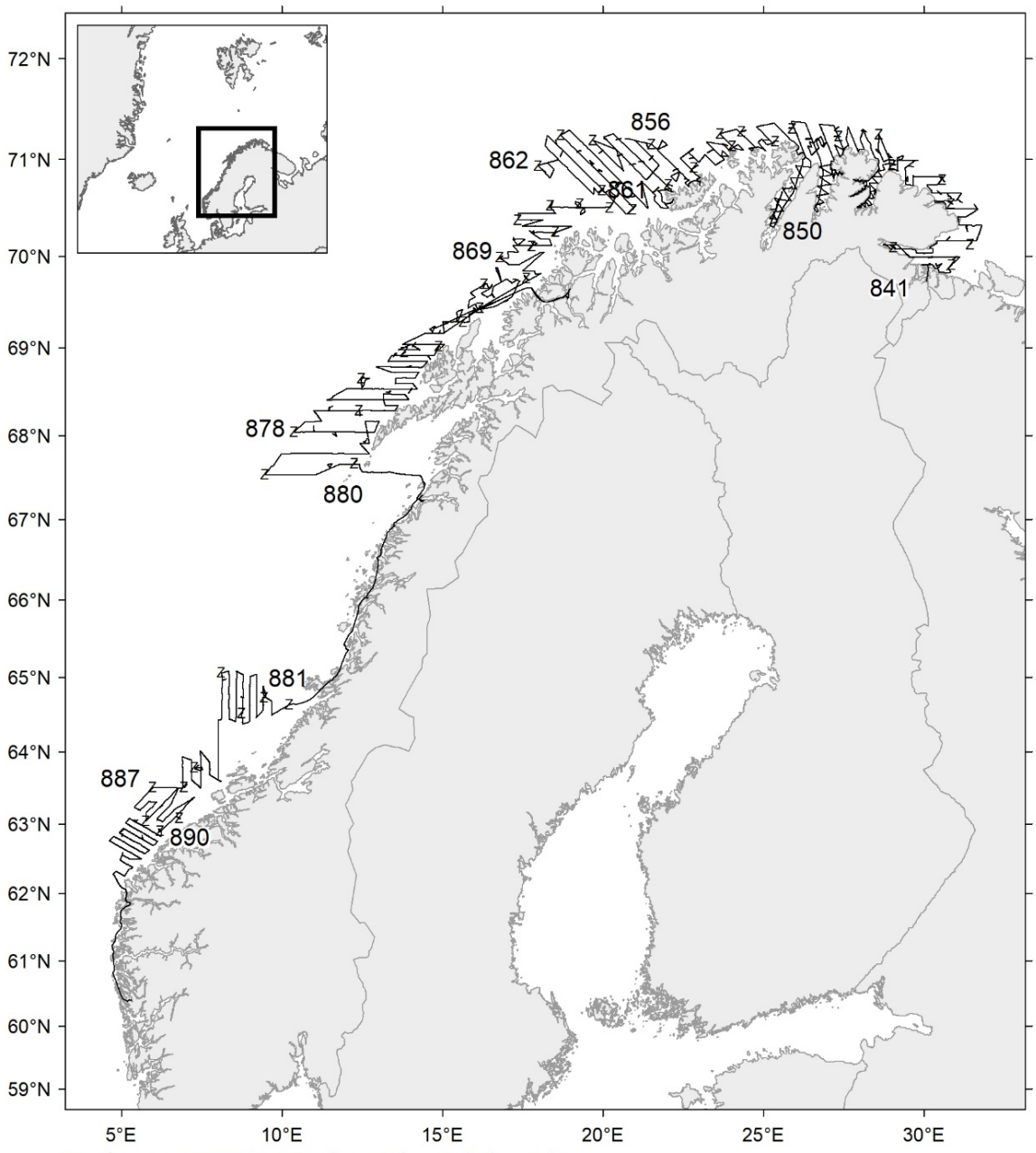

80°N
79°N
78°N
77°N
76°N
75°N
74°N
73°N
72°N
71°N
70°N
69°N
5°E
10°E
15°E
20°E
25°E
30°E
35°E
40°E
765
868
871
763
812
808
803
807
753
745
740
726
716
Cruise no 2020209 "Johan Hjort"
20 August –2 October 2020
Trawl st.no 716-871
○ Pelagic trawl
♦ Bottom trawl

Fig. 38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69°N
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67°N
66°N
65°N
64°N
63°N
62°N
61°N
60°N
59°N
5°E
10°E
15°E
20°E
25°E
30°E
856
862
861
850
869
841
878
880
881
887
890
Cruise no 2020210 "Johan Hjort" (Chart I)
8 October-15 November 2020
z CTD st.no 841-890

Fig.39

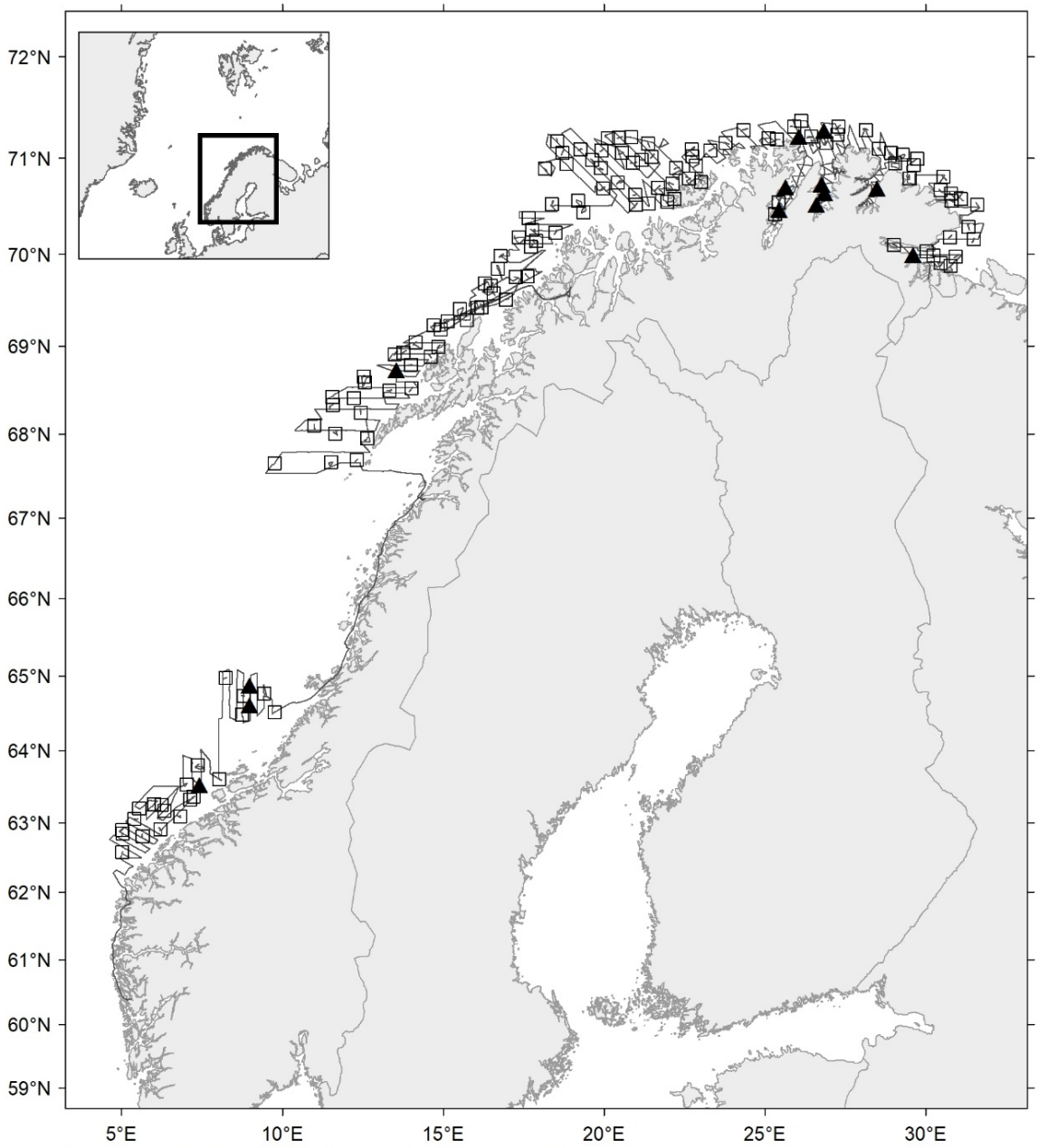
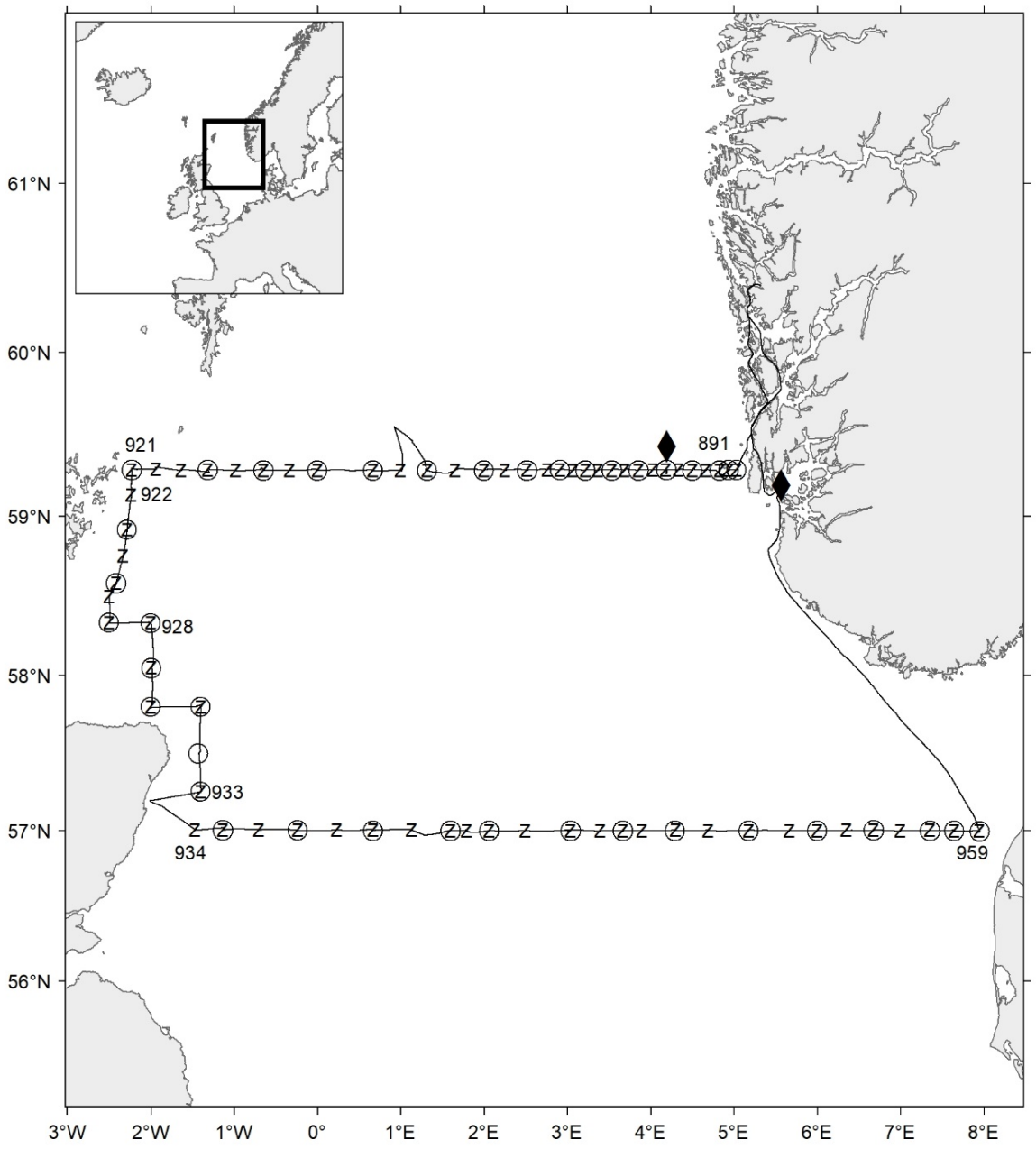

72°N
71°N
70°N
69°N
68°N
67°N
66°N
65°N
64°N
63°N
62°N
61°N
60°N
59°N
5°E
10°E
15°E
20°E
25°E
30°E
Cruise no 2020210 "Johan Hjort" (Chart II)
8 October-15 November 2020
Trawl st.no
▲ Pelagic trawl
□ Bottom trawl

Fig.40



Cruise no 2020211 "Johan Hjort" (Chart I)
16–25 November 2020

z CTD st.no 891-959
○ Plankton st. (WP-II-net)
♦ Multinet

Standard sections:
Utsira W st.no 891-921
Fair Isle-Pentland st.no 922-933
Hanstholm–Aberdeen st.no: 934-959

Fig.41

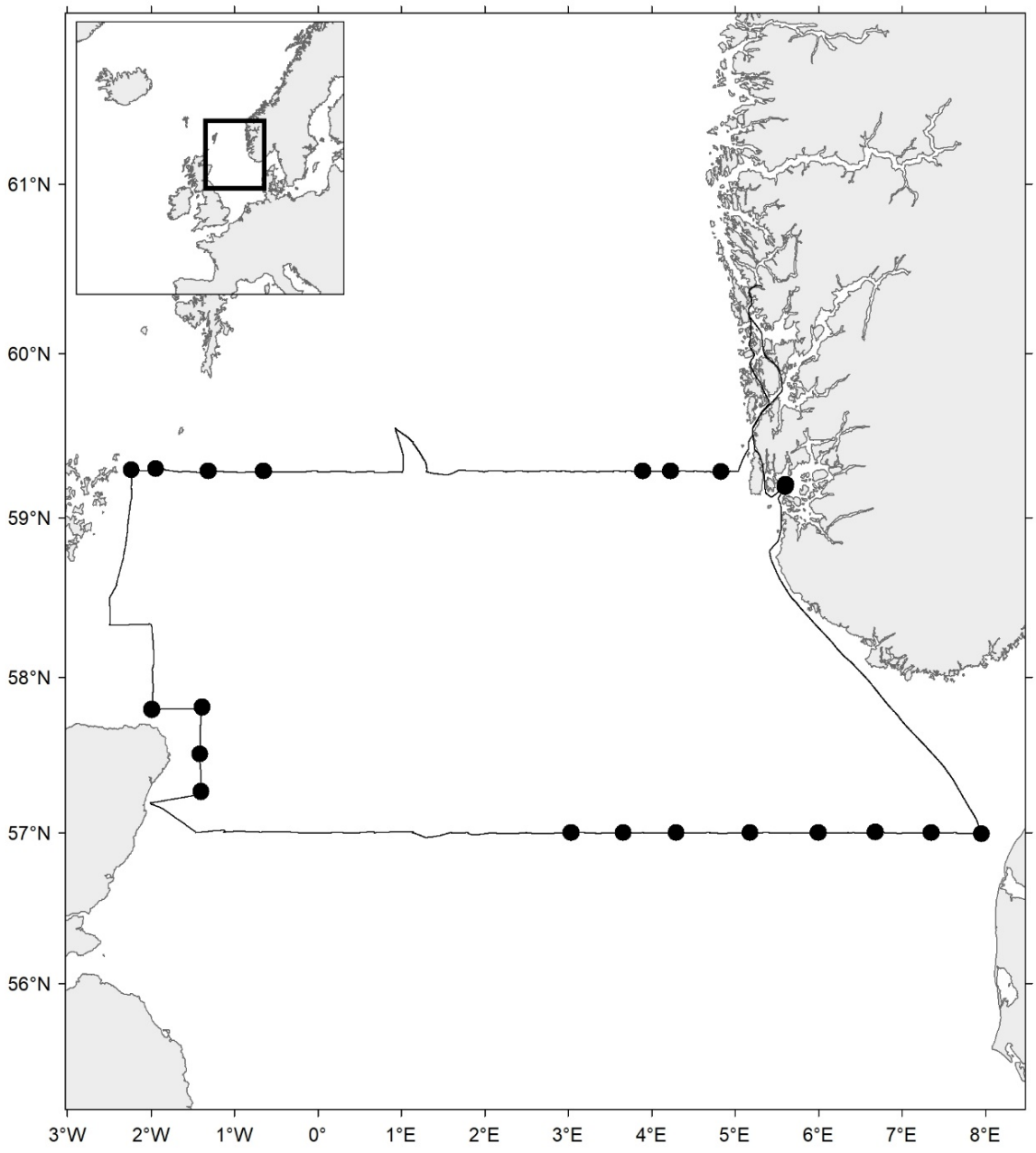
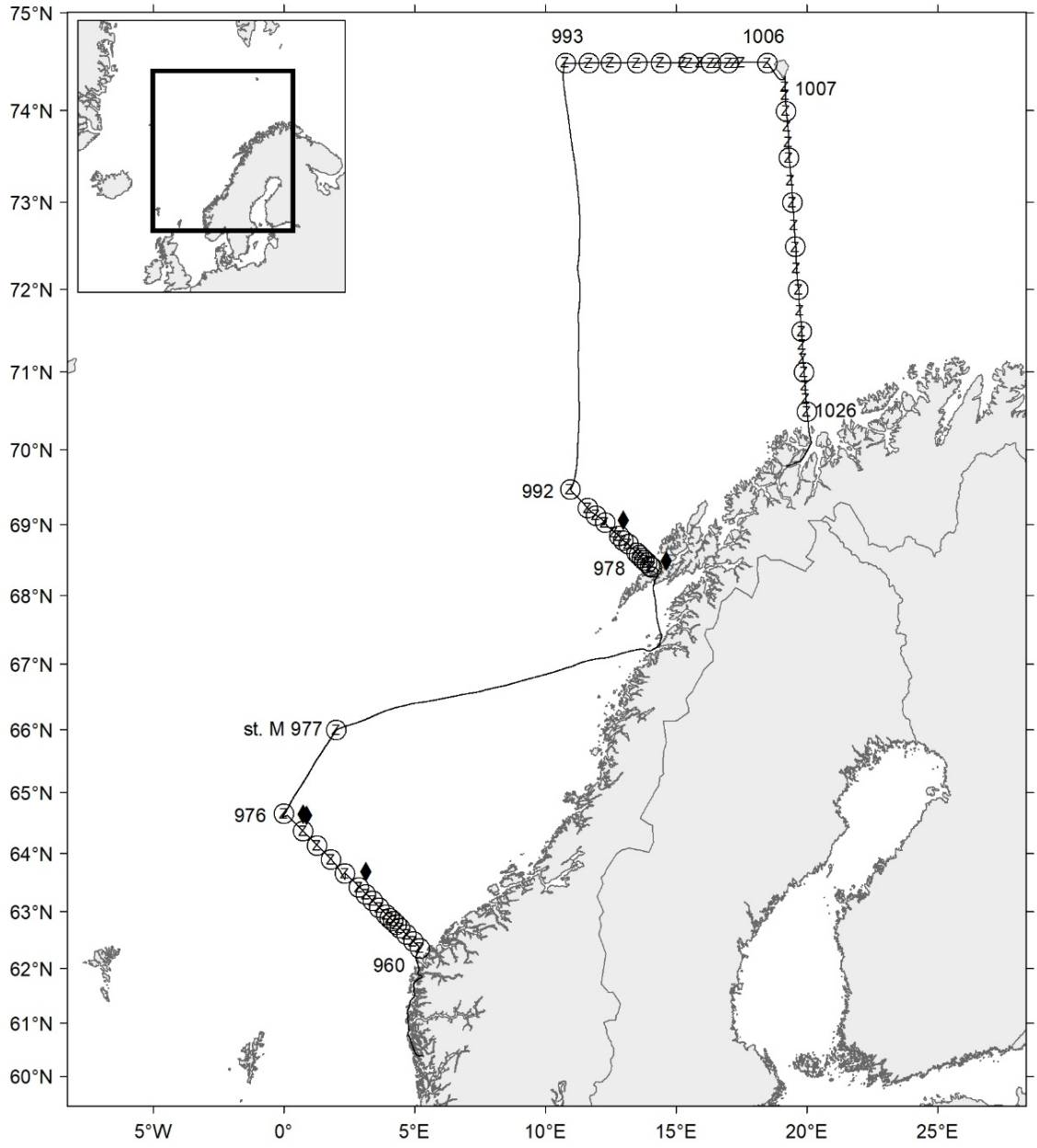

61°N
60°N
59°N
58°N
57°N
56°N
3°W
2°W
1°W
0°
1°E
2°E
3°E
4°E
5°E
6°E
7°E
8°E
Cruise no 2020211 "Johan Hjort" (Chart II)
16–25 November 2020
MIK stations

Fig.42



Cruise no 2020212 "Johan Hjort"
26 November–9 December 2020

z CTD st.no 960-1026
○ Plankton st. (WP-II-net)
♦ Multinet

Standard sections:
Svinøy NW: st.no 960-976
Gimsøy NW: st.no 978-992
Bjørnøya W: st.no 993-1006
Fugløya–Bjørnøya: st.no 1007-1026
St. M. 977

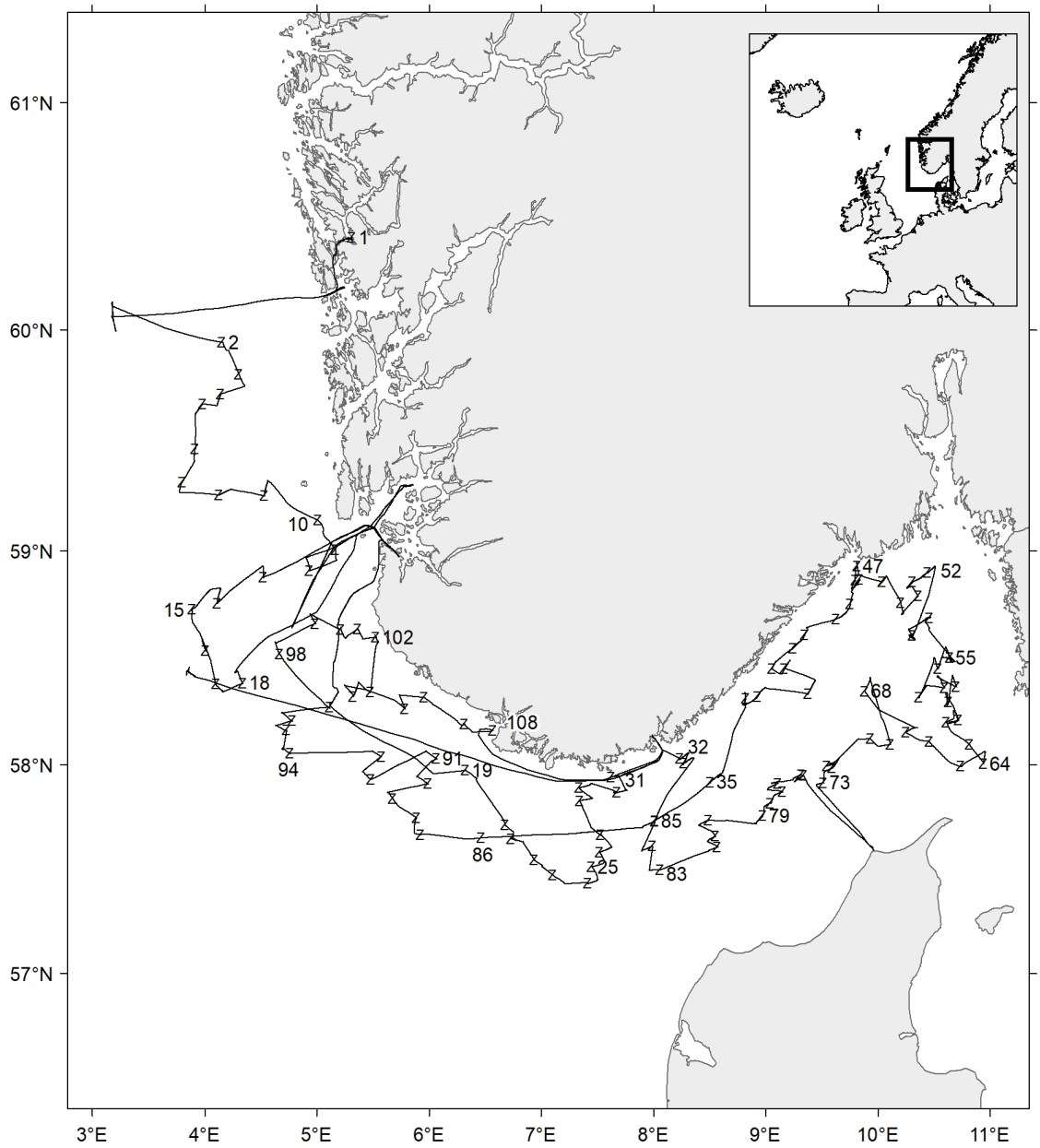
Fig.43

6 - "Kristine Bonnevie" – Cruises 2020

Cruise no	Period	Purpose	Area	CTD st.no	Trawl st.no	Fig. no
2020601	8.1-31.1.	Annual shrimp survey.	North Sea, Skagerrak	1-108	1-111	44-45
2020602	2.2.-1.3.	Acoustic survey of saithe during the spawning period, at time of year when saithe spawning stock (SSB) are highly aggregated. Survey to be used in assessment after 5 years (ICES regulation).	North Sea	109-166	117-206	46-47
2020603	2.3-8.3.	The cruise is part of the course work for students in GEOF337 (Fjord oceanography) and GEOF232 (Practical Meteorology and Oceanography) at GFI, UiB. The aim of the cruise is to make the students aquainted with oceanographic data collection, and to collect data for semester and Master projects.	North Sea, Norwegian fjords	167-273	-	48
2020621	9.3-21.3.	Study the ecology of the mesopelagic community. Explorative survey of Maurolicus.	North Sea	274-284	207-223	49-51
2020604		Cancelled		-	-	
2020605		Cancelled		-	-	
2020606		Cancelled		-	-	
2020607		Cancelled		-	-	
2020622	30.3.-6.4.	Hydrography along regular transects in Hardangerfjord, Masfjord, Sognefjord and Førdefjord. Exchange of batteries on current meter moorings in Hardangerfjord and Sognefjord. Deployment of a current meter mooring in Austevoll. Standard measurements on the standard section Svinøysnittet.	North Sea Norwegian Sea	285-342	-	52
2020608	25.4.-20.5.	The cruise objectives were to occupy the monitoring sections Fugløya-Bjørnøya, extended Bjørnøya vest and extended Gimsøy section and the Svinøy section and deploy Argo floats. The earlier weather ship station M was occupied. On the sections, and at station M, CTD observations measurements were made from surface to bottom. Water samples were drawn for nutrients analysis, carbon system analysis and. Chlorophyll was sampled for the top 100 m. WP2 plankton nets for the top 200 m (100 m in the Barents Sea) was conducted along the sections. Qualitative plankton nets were sampled on selected stations. ADCP, Thermosalinograph and echo sounder data were collected underway, and Argo floats were deployed in selected locations.	Barents Sea, Greenland Sea, Norwegian Sea	343-435	-	53
2020623	23.5.-25.5.	Behaviour of mesopelagic towards trawl and towed platform.	North Sea	-	224-236	54
2020609	29.5.-1.6.	The objective of the cruise was to collect baseline data on major ecosystem components in Førdefjorden before the deposition of mine tailings starts. The amount and diversity of plankton, benthos and demersal fish will be estimated in the basins inside and outside of the basin where tailings will be deposited. Tissue samples for stable isotop analysis and heavy metals will be collected. ROV investigations will be performed to map hard bottom sensitive benthic habitats. The main objective is to gain basline information of the fjord so that possible future impacts of the deposit can be elucidated using a BACI design.	Coastal areas of the North Sea	436-446	-	55-56
2020610	2.6.-8.6.	The survey collected samples in West Norwegian fjords (Lysefjord, Fensfjord, Masfjord and Haugsværsfjord).	Norwegian fjords	447-472	247	57
2020611	12.6.-16.6.	CTD-survey of fjords and coast in Troms and western Finnmark. Water sampling for eDNA analysis of the presence of fish species. Water sampling for chemical analysis over the coral reef at Stjernsundet.	Norwegian fjords	473-588	-	58
2020612	18.6-24.6	Study the spreading area for red king crab in Vest Finnmark, Norway. This is the area for a free fishing for red king crab and the further spreading is monitored.	Barents Sea	-	-	59

2020613	25.6.-9.7.	The aim of the cruise was to study the spreading and collect density data on the snow crab in the Svalbard Fishery Protection Zone by using a research vessel. Our main study area was in the present area for commercial fishing. Also testing of different traps were performed during the cruise.	Barents Sea	589-594	-	60-61
2020614	16.7.-8.8.	The main objectives of the survey coordinated by ICES/IBTSWG are: • to determine the distribution and relative abundance of the main commercial species (cod, haddock, saithe, whiting, Norway pout, plaice, herring, mackerel and sprat). • to monitor changes in the stocks of commercial fish species independently of commercial fisheries data. • to monitor the distribution and relative abundance of all fish species and selected invertebrates. • to collect data for the determination of biological parameters for selected species. • to collect hydrographical and environmental information.	North Sea	595-650	255-316	62-63
2020618	11.8.-17.8.	Acoustic trawl survey for surveying sprat and herring in zooplankton and hydrography in western Norwegian fjords. Provide abundance indices for sprat for giving fishery advice. Comparisons of acoustic observations with a research vessel and a kayak drone.	North Sea	651-669	317-330	64-65
2020615	18.8.-20.8.	Training cruise in BIO 102 part 2 – Organismal Biology.	Norwegian fjords	670-677	331-344	66
2020616	21.8.-30.8.	The cruise objectives were deploy monitoring buoy and mooring at the earlier weather ship station M position and deploy Argo floats. At station M, CTD observations were made from surface to bottom and samples for carbon system was sampled at standard depths. CTD observations were made from surface to 2000 m at Argo deployment positions. Oxgen samples were drawn in all these positions and carbon system and nutrient samples were drawn on one of the positions.	Norwegian Sea	678-715	-	67
2020617		Cancelled		-	-	-
2020619	31.8.-20.9.	Stock assessment of the red king crab in Eastern Finnmark (quota-regulated area).	Barents Sea	716-733	-	68-69
2020620	2.10.-9.11.	Annual combined acoustic and bottom trawl survey along the Norwegian coast	Norwegian Coast	735-842	1-137	70-72

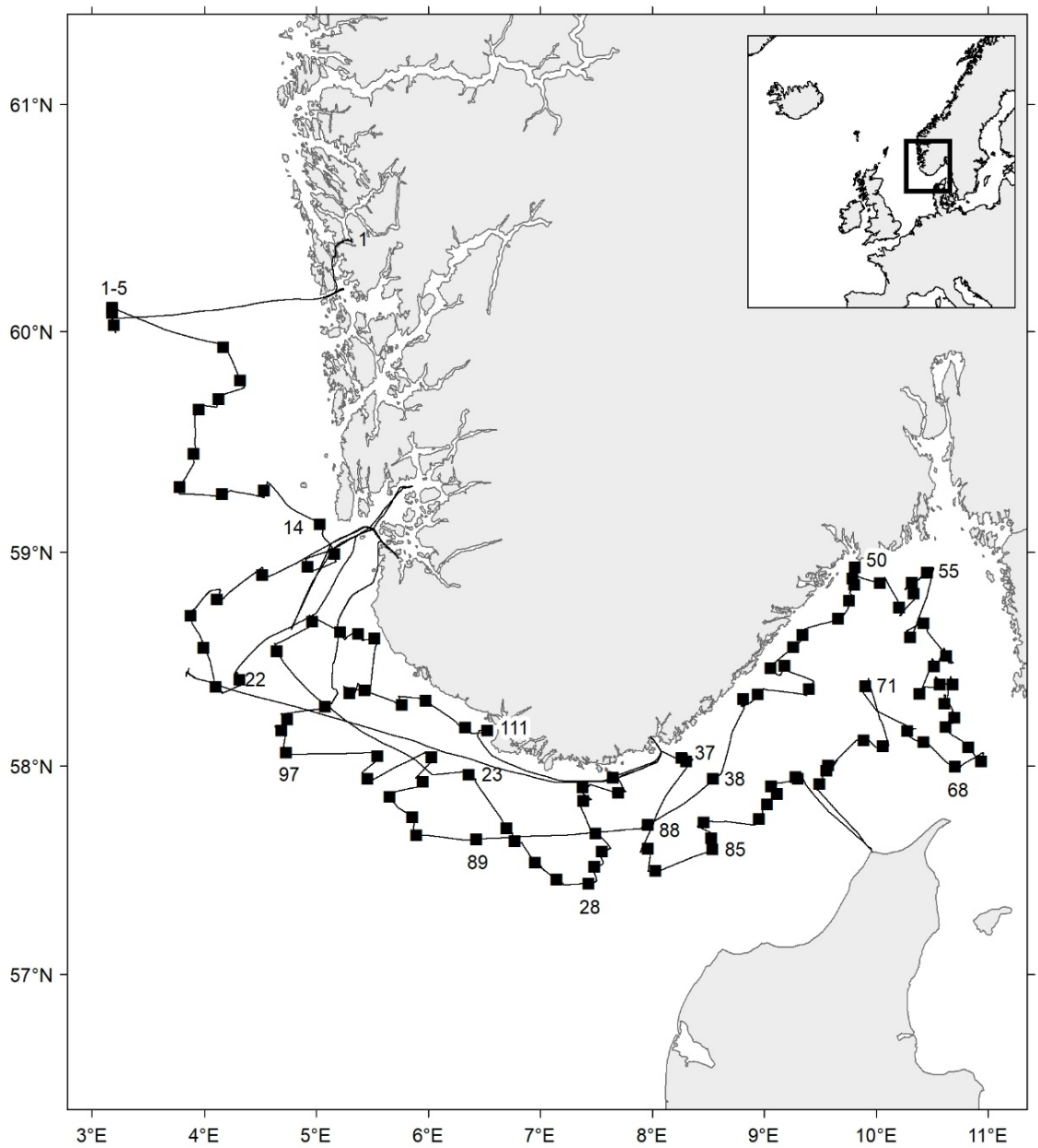
7 - "Kristine Bonnevie" – Charts for 2020



Cruise no 2020601 "K. Bonnevie" (Chart I)
8–31 January 2020

z CTD st.no 1–108

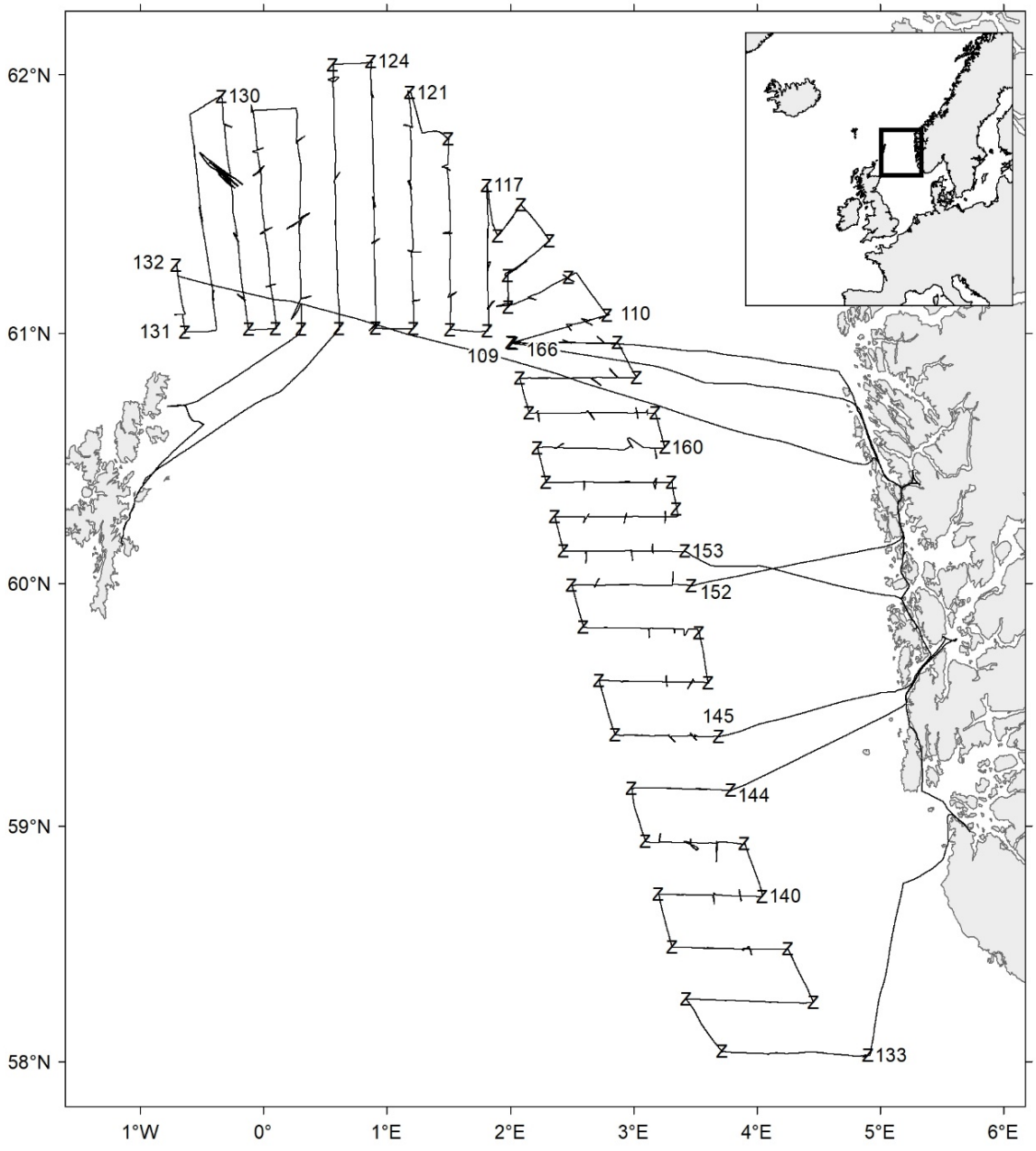
Fig.44



Cruise no 2020601 "K. Bonnevie" (Chart II)
8–31 January 2020

□ Bottom trawl st.no 1–111

Fig. 45



Cruise no 2020602 "K. Bonnevie" (Chart I)
2 February–1 March 2020

z CTD st.no 109–166

Fig. 46

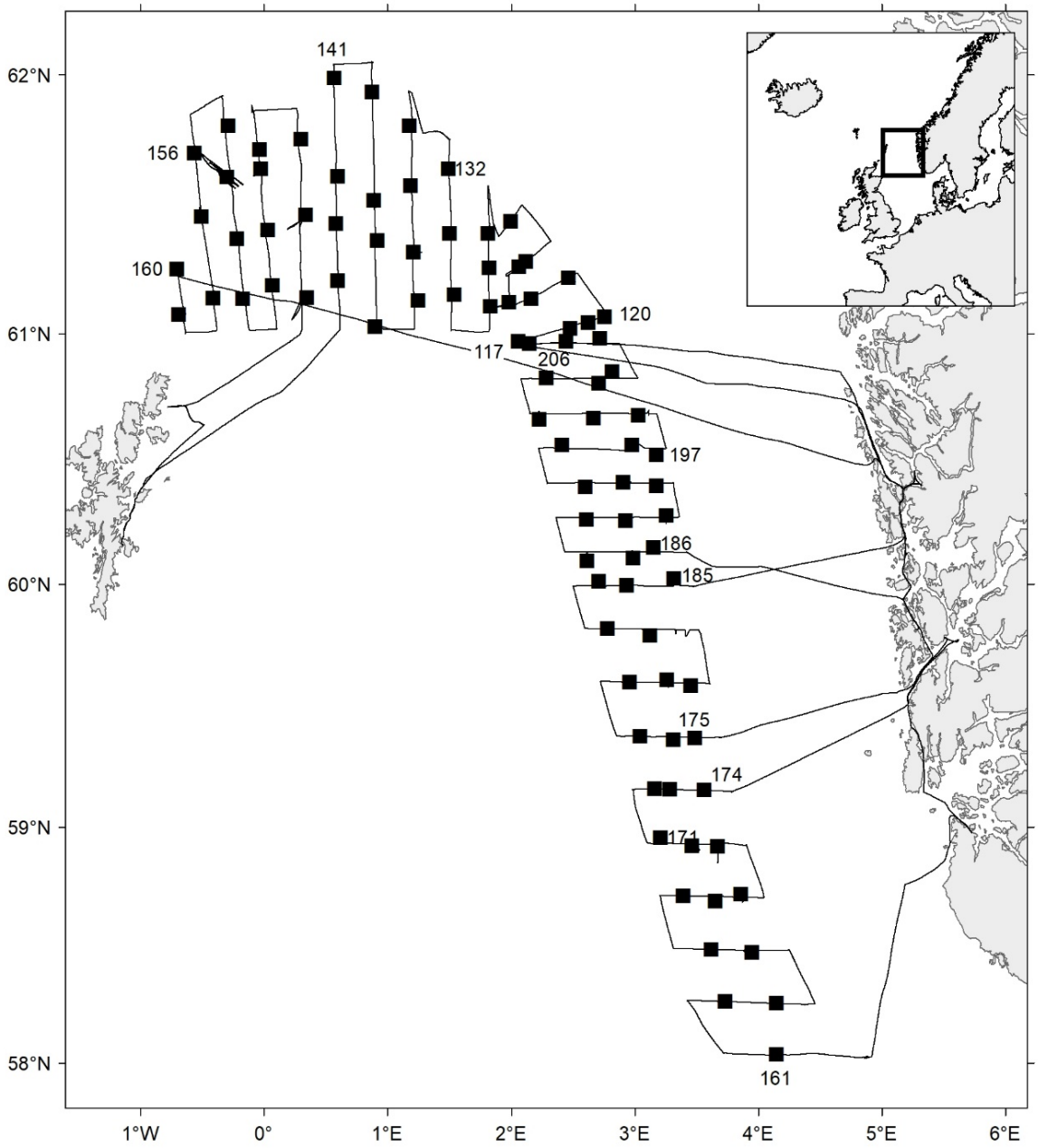
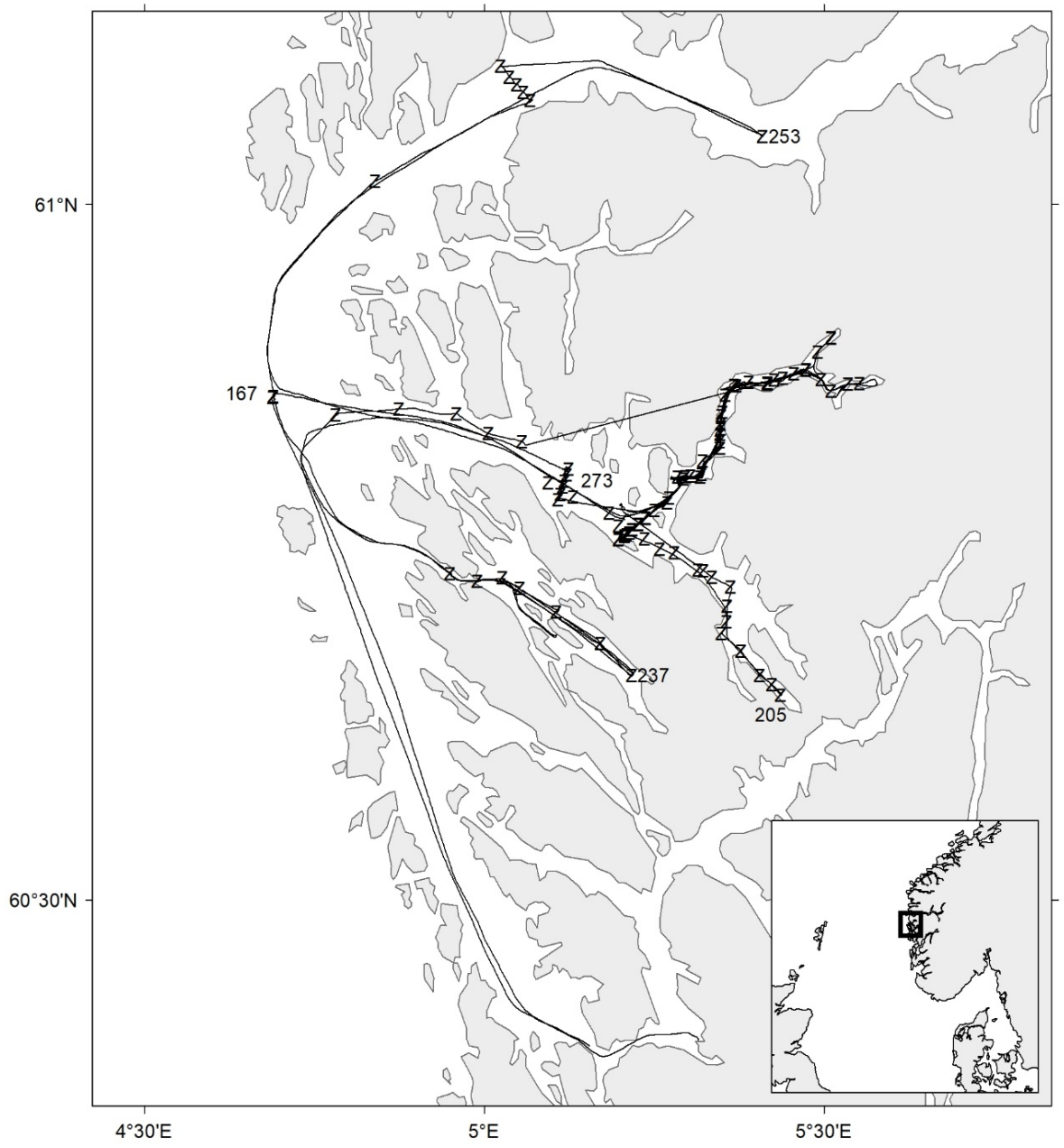

62°N
61°N
60°N
59°N
58°N
1°W
0°
1°E
2°E
3°E
4°E
5°E
6°E
141
156
132
160
120
117
206
197
186
185
175
174
171
161
Cruise no 2020602 "K. Bonnevie" (Chart II)
2 February–1 March 2020
■ Bottom trawl st.no 117–206

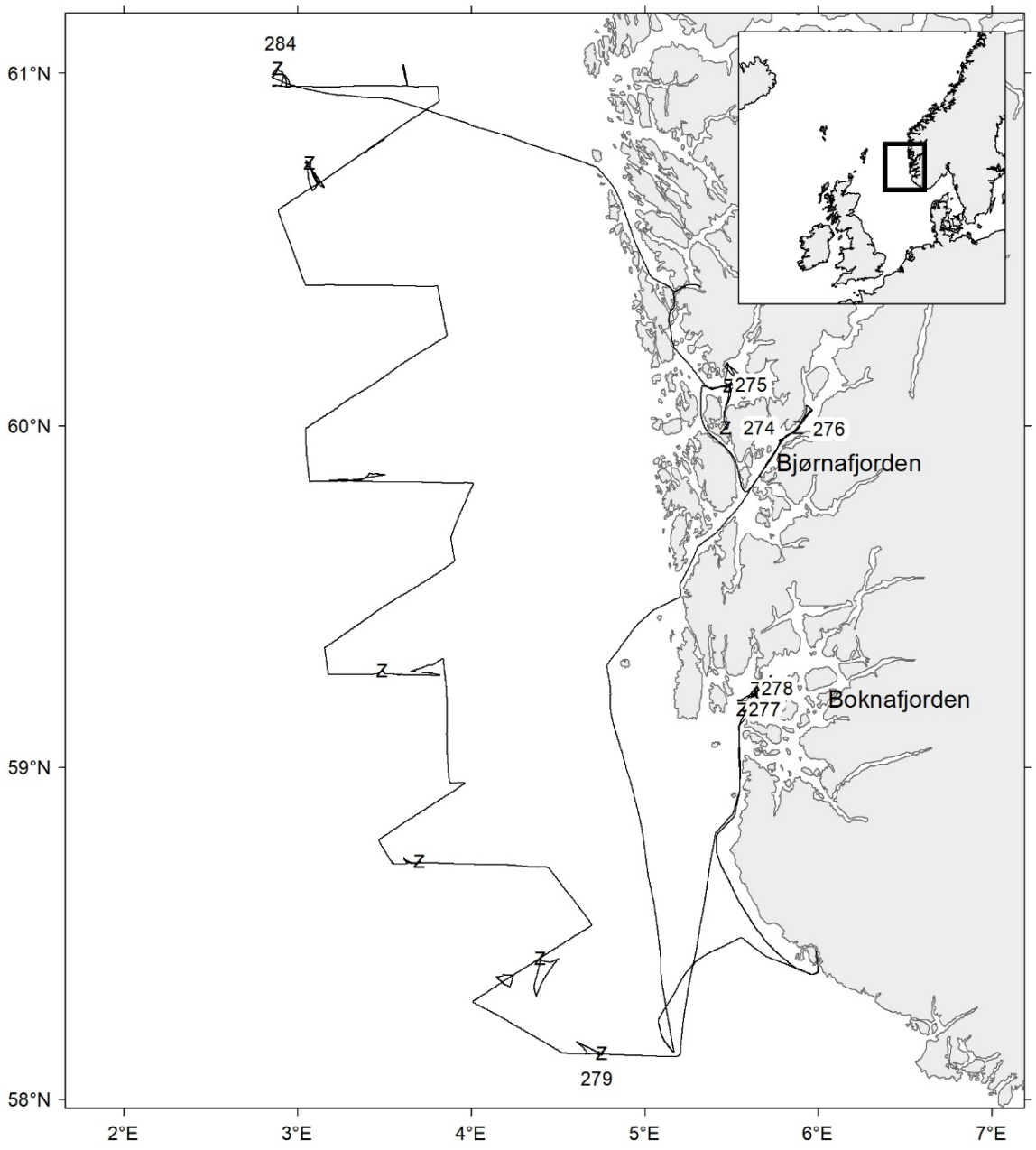
Fig. 47



Cruise no 2020603 "K. Bonnevie"
2–8 March 2020

z CTD st.no 167–273 (some stations are missing)

Fig. 48

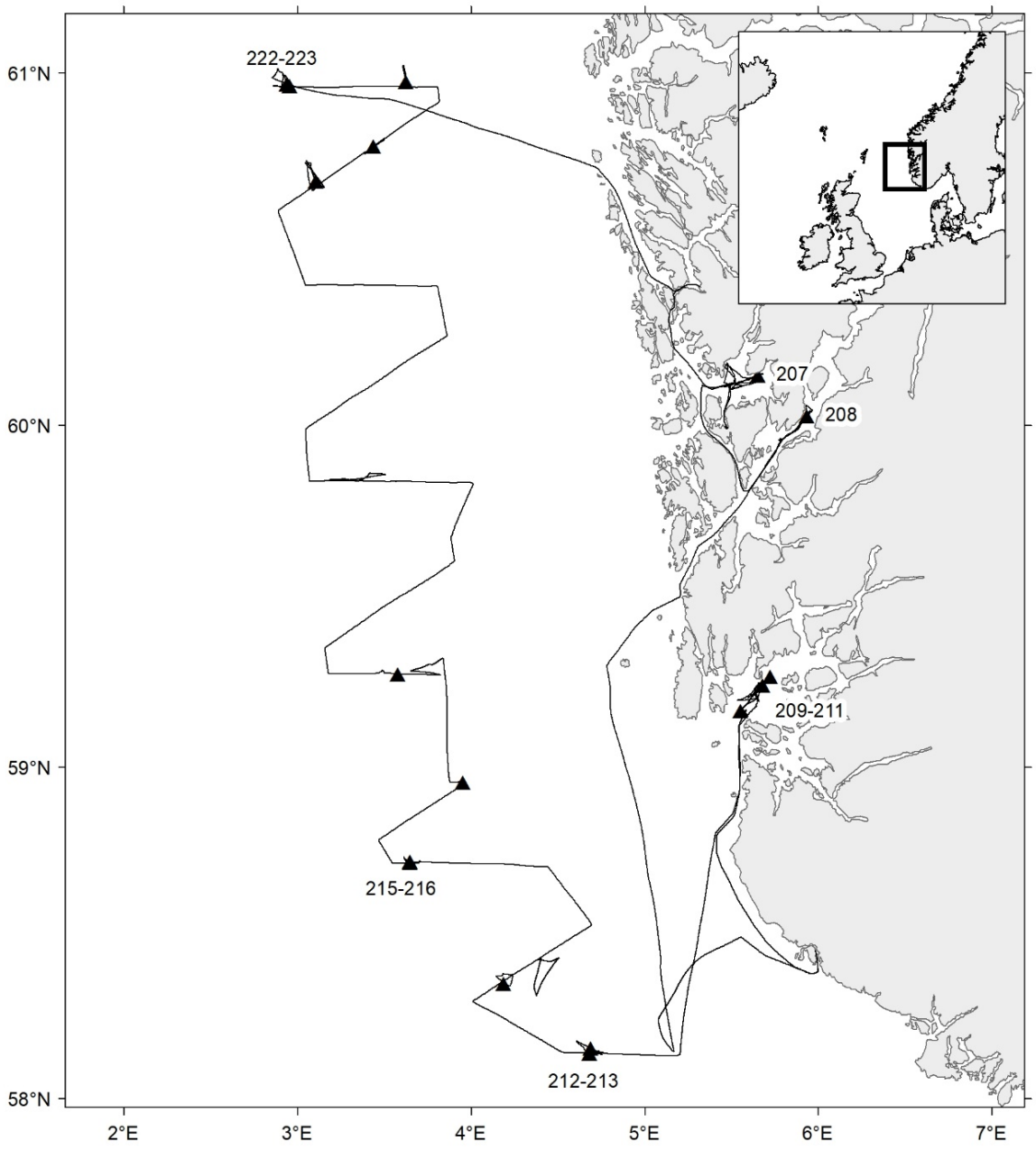


Cruise no 2020621 "K. Bonnevie" (Chart I)
9–21 March 2020

z CTD st.no 274–284

Drifters set out and retreived in Bjørnafjorden and in Boknafjorden.

Fig. 49



Cruise no 2020621 "K. Bonnevie" (Chart II)
9–21 March 2020

▲ Pelagic trawl st.no 207–223

Fig. 50

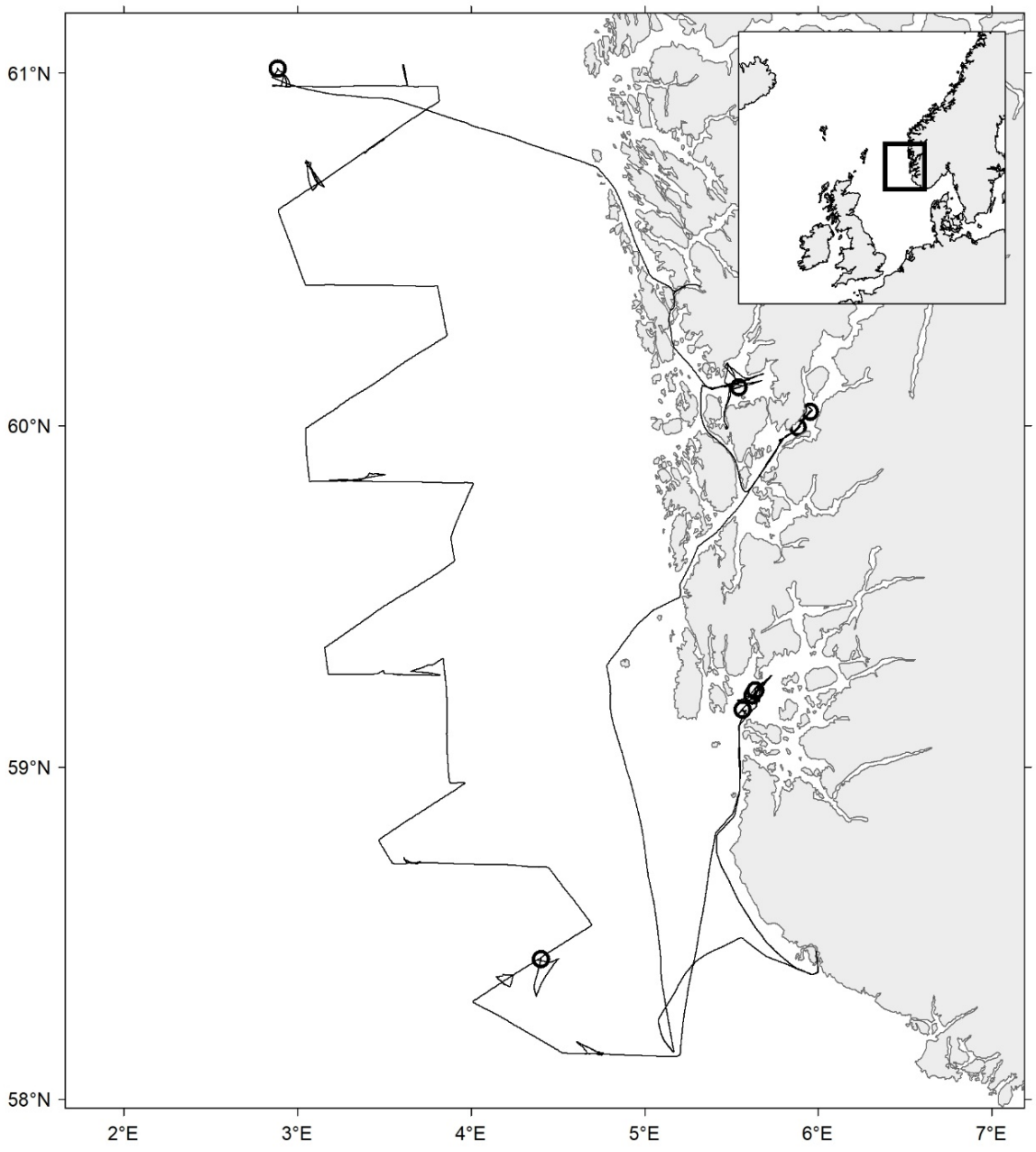
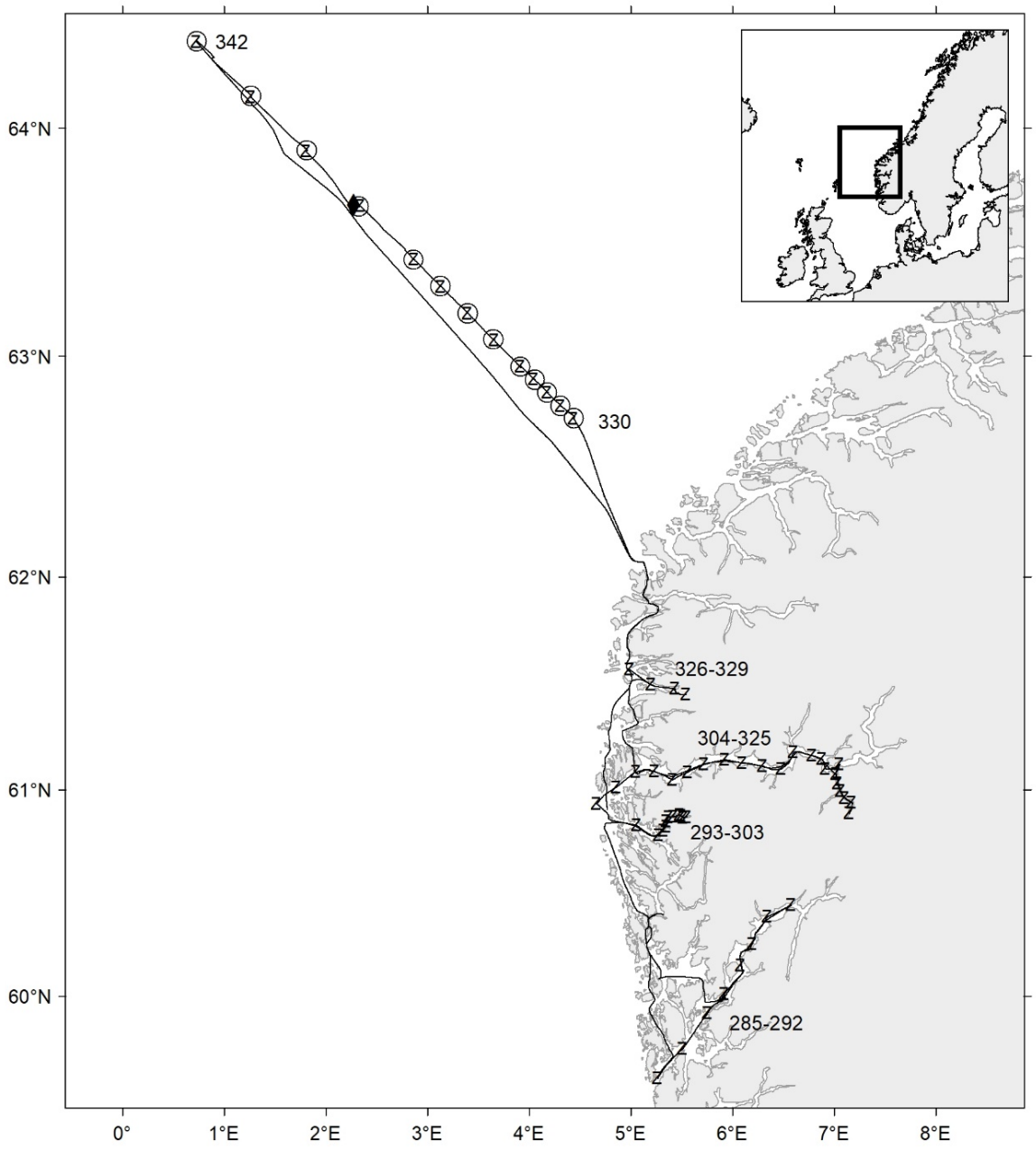

61°N
60°N
59°N
58°N
2°E
3°E
4°E
5°E
6°E
7°E
Cruise no 2020621 "K. Bonnevie" (Chart III)
9–21 March 2020
Multinet and Micron net

Fig. 51

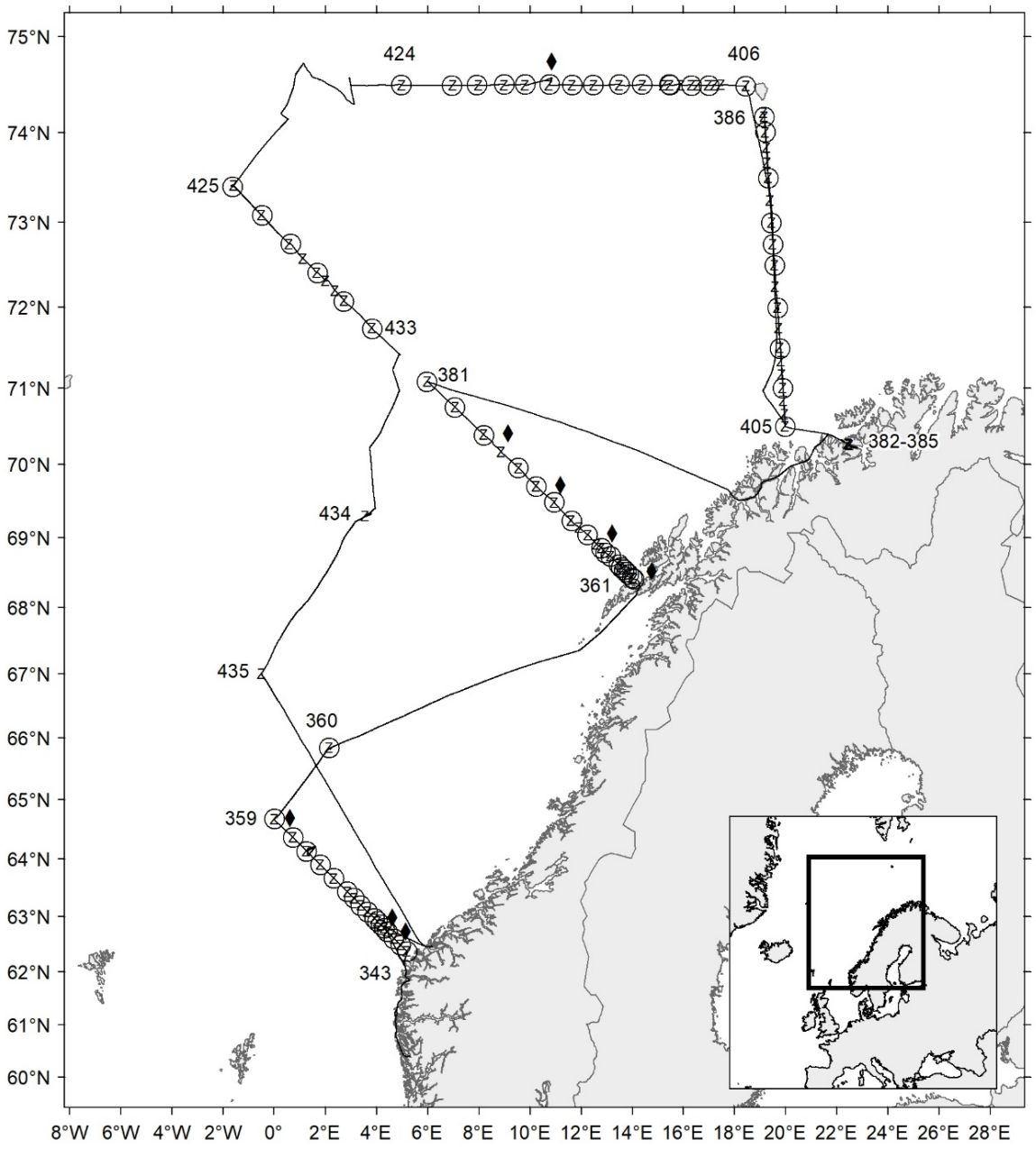


Cruise no 2020622 "K. Bonnevie" (Chart I)
30 March–6 April 2020

z CTD st.no 285–342
○ WP–II–net
♦ Multinet

Standard section Svinøy NW st.no 330–342

Fig. 52



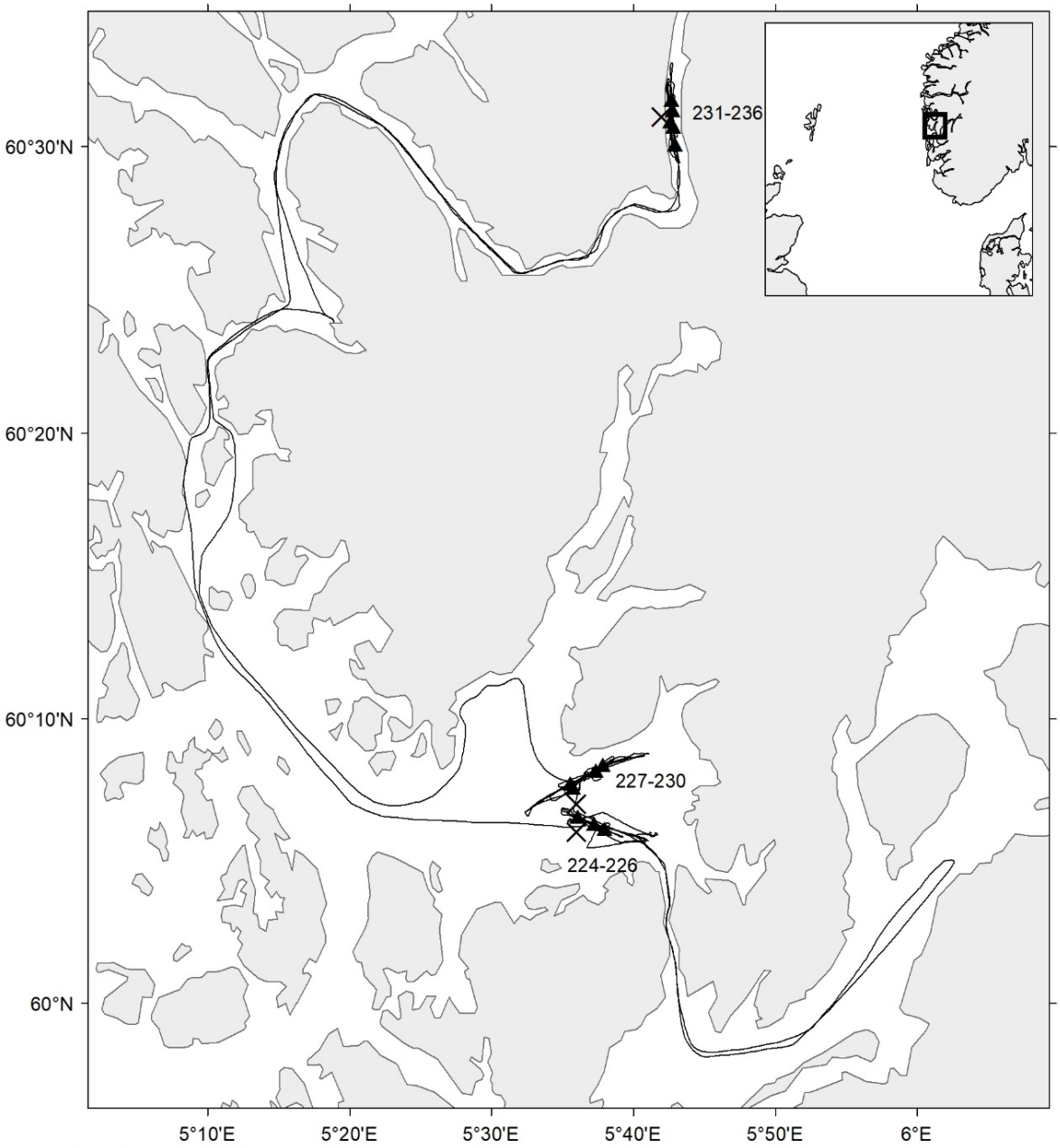
Cruise no 2020608 "K. Bonnevie" (Chart I)
25 April–20 May 2020

z CTD st.no 343-435
○ Plankton st. (WP-II-net)
♦ Multinet

Standard sections:
Svinøy NW st.no 343-359
Gimsøy NW st.no 361-381 and 725-433
Fugløya–Bjørnøya st.no 386-405
Bjørnøya W st.no 406-424

St. M st.no 360

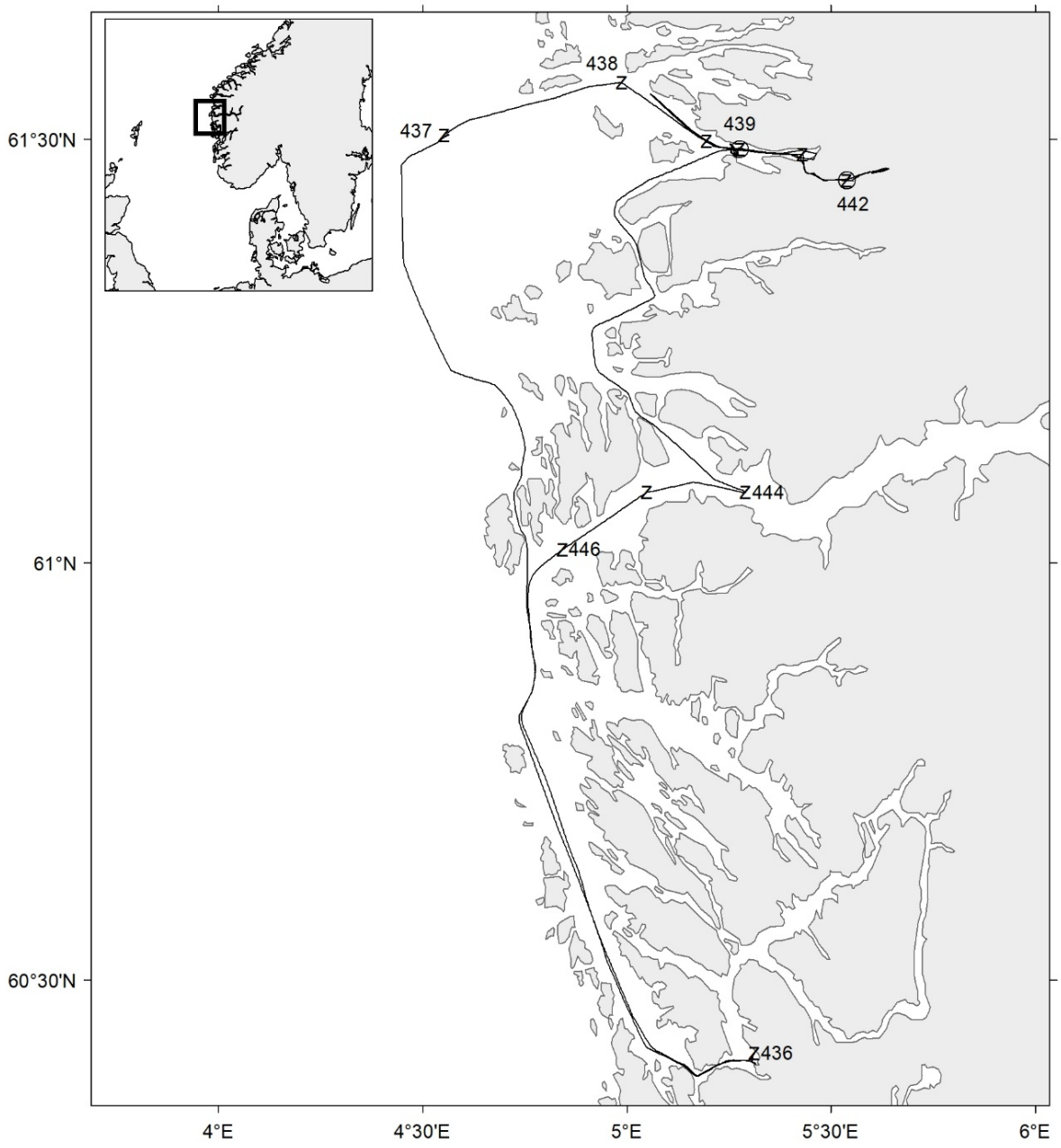
Fig. 53



Cruise no 2020623 "K. Bonnevie"
23–25 May 2020

▲ Pelagic trawl st.no 224-236
× Bottom rig set out and retreived in Bjørnafjorden and in Sørfjorden

Fig. 54



Cruise no 2020609 "K. Bonnevie" (Chart I)
29 May–1 June 2020

z CTD st.no 436-446
○ Plankton st. (WP-II-net)

Fig. 55

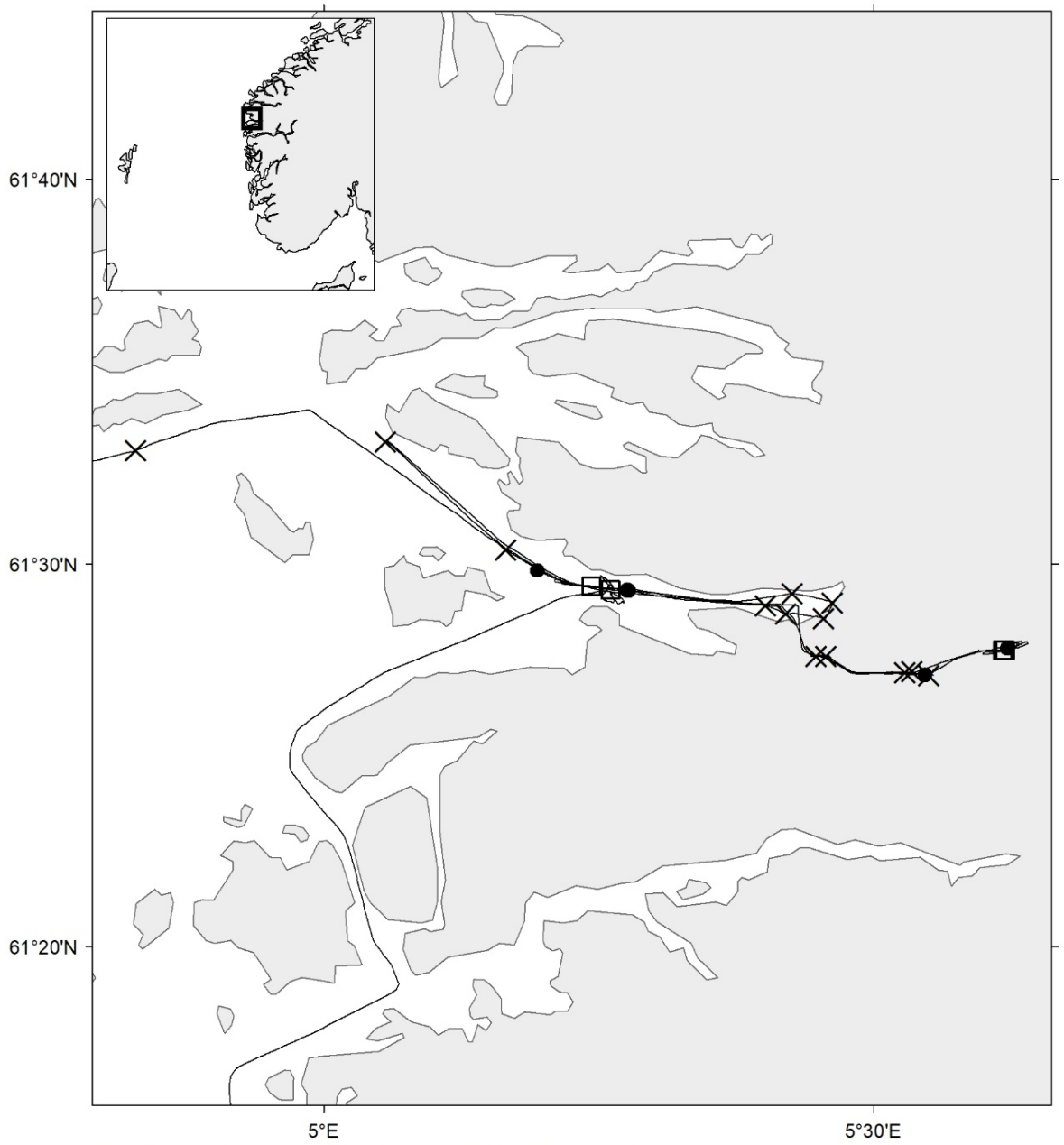
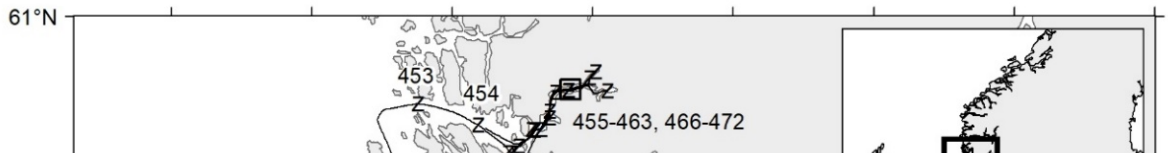
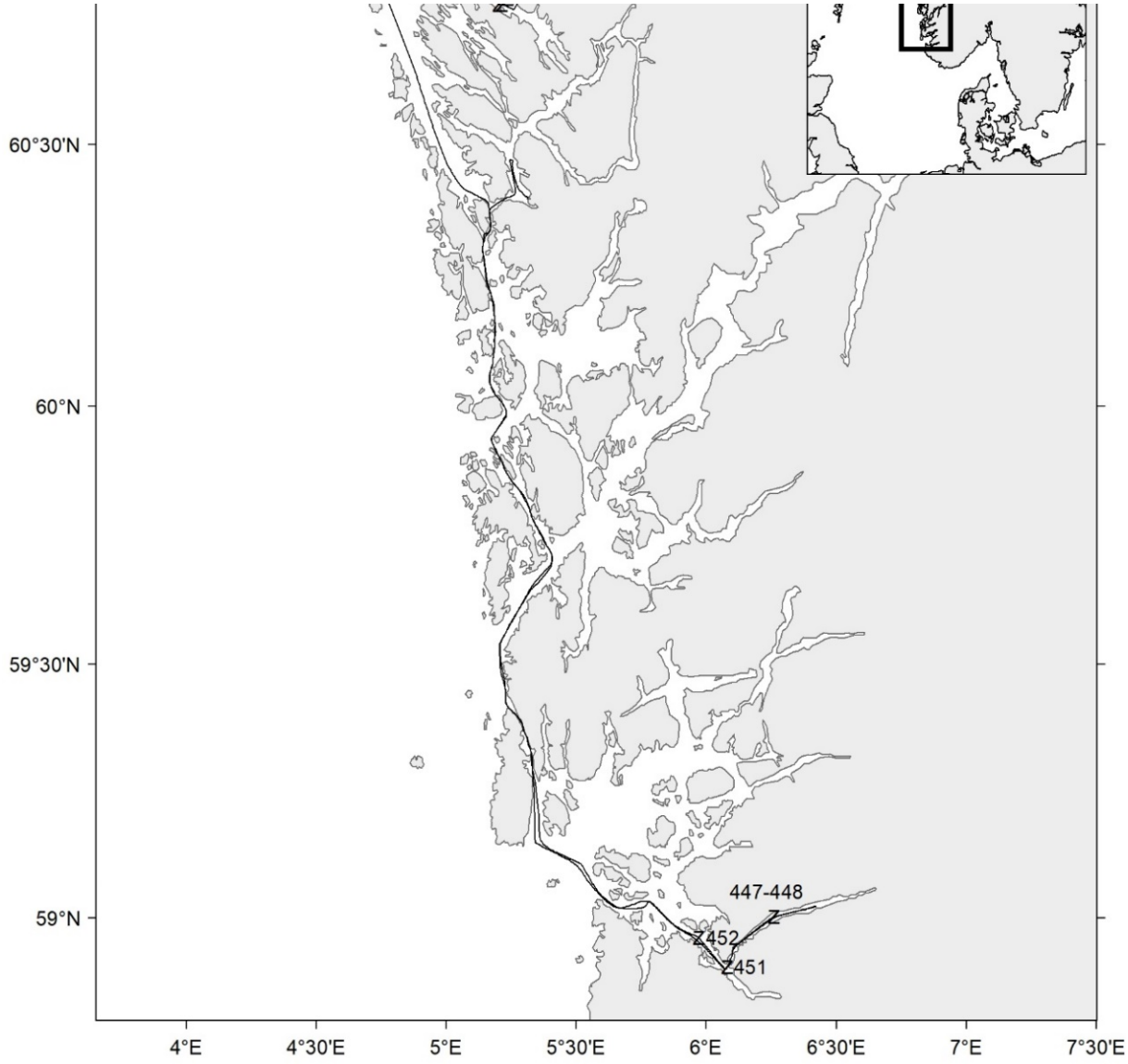

61°40'N
61°30'N
61°20'N
5°E
5°30'E
Cruise no 2020609 "K. Bonnevie" (Chart II)
29 May–1 June 2020
● Grab st.
× Rov st.
□ Beam trawl

Fig. 56


61°N
453
454
455-463, 466-472



Cruise no 2020610 "K. Bonnevie"
2–8 June 2020

z CTD st.no 447-472
□Bottom trawl st.no 247

The equipment used was :
CTD and water bottles
Harstad Pelagic trawl 320 with MultiSampler (3 cod-ends)
Demersal campelen 1800 trawl.
Multinet Midi (5 codends)
Spectroradiometer
Ship mounted Acoustics
Autonomous acoustics (WBAT)
TRIOS Ligthmeter
LOL Ligthmeter

Fig. 57

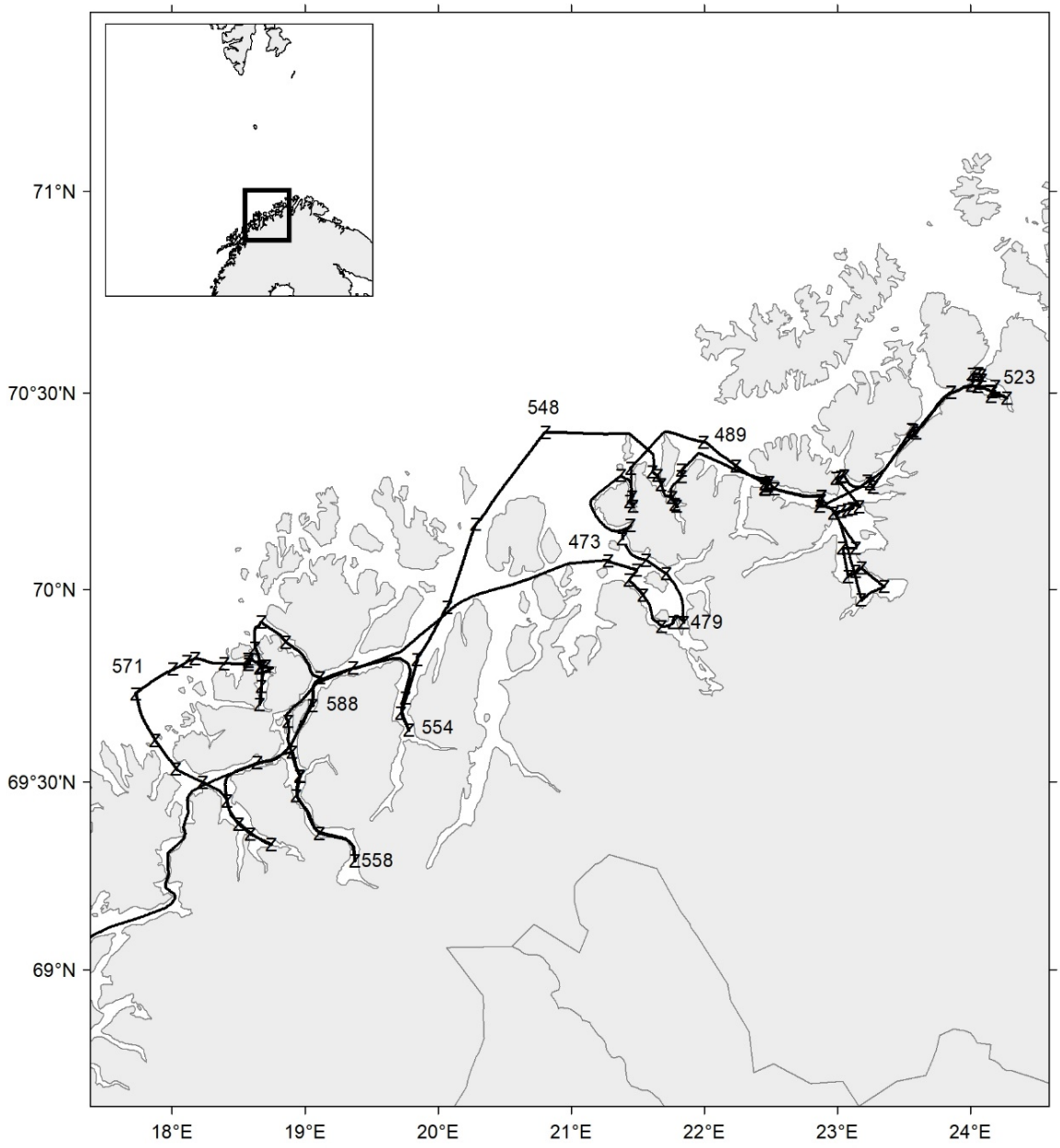
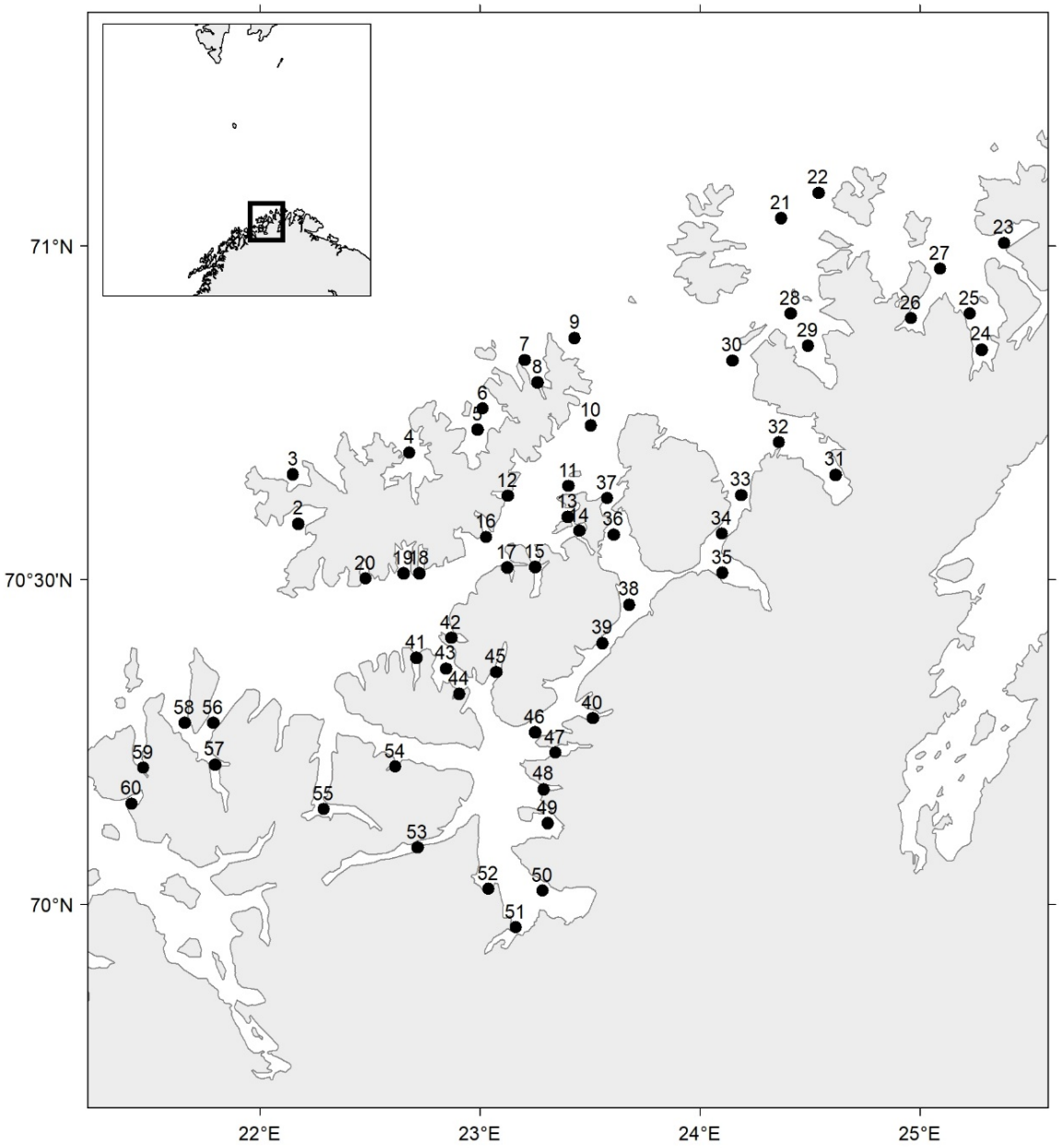

71°N
70°30'N
70°N
69°30'N
69°N
18°E
19°E
20°E
21°E
22°E
23°E
24°E
548
489
523
473
479
571
588
554
558
Cruise no 2020611 "K. Bonnevie"
12–16 June 2020
z CTD st.no 473-588

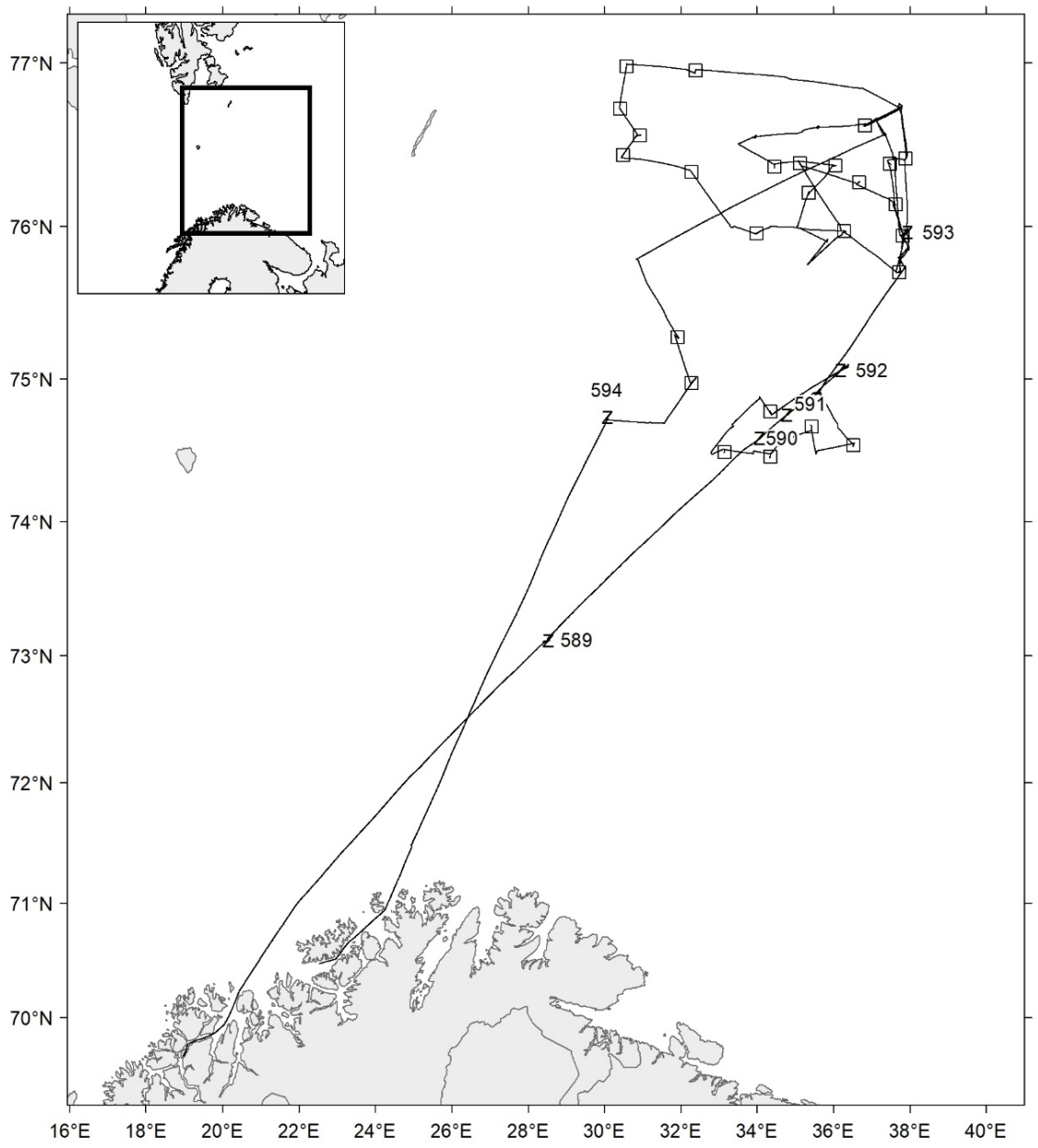
Fig. 58



Cruise no 2020612 "K. Bonnevie"
18–24 June 2020

● King crab traps

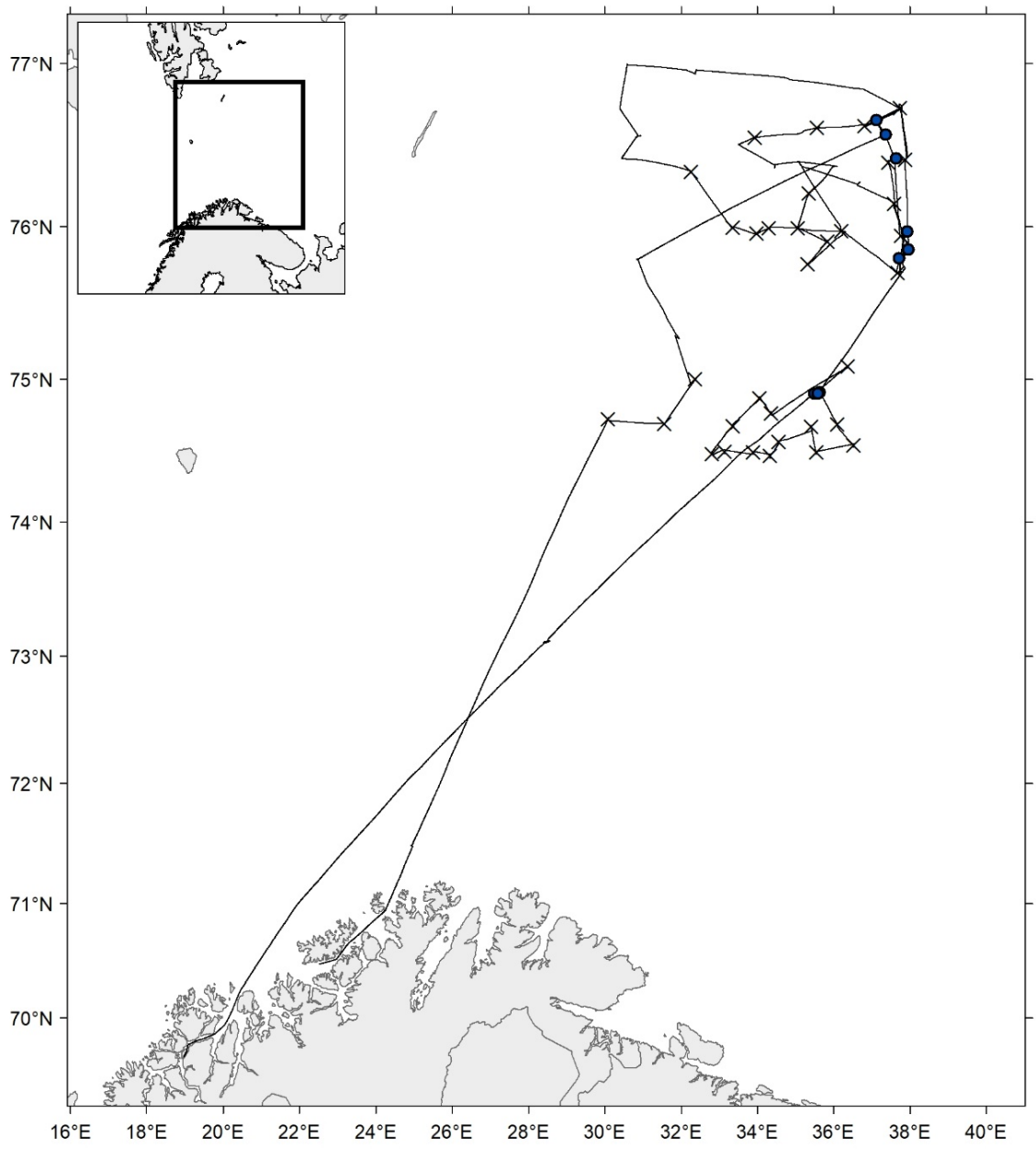
Fig. 59



Cruise no 2020613 "K. Bonnevie" (Chart I)
25 June–9 July 2020

z CTD st.no 589-594
□ Trawl

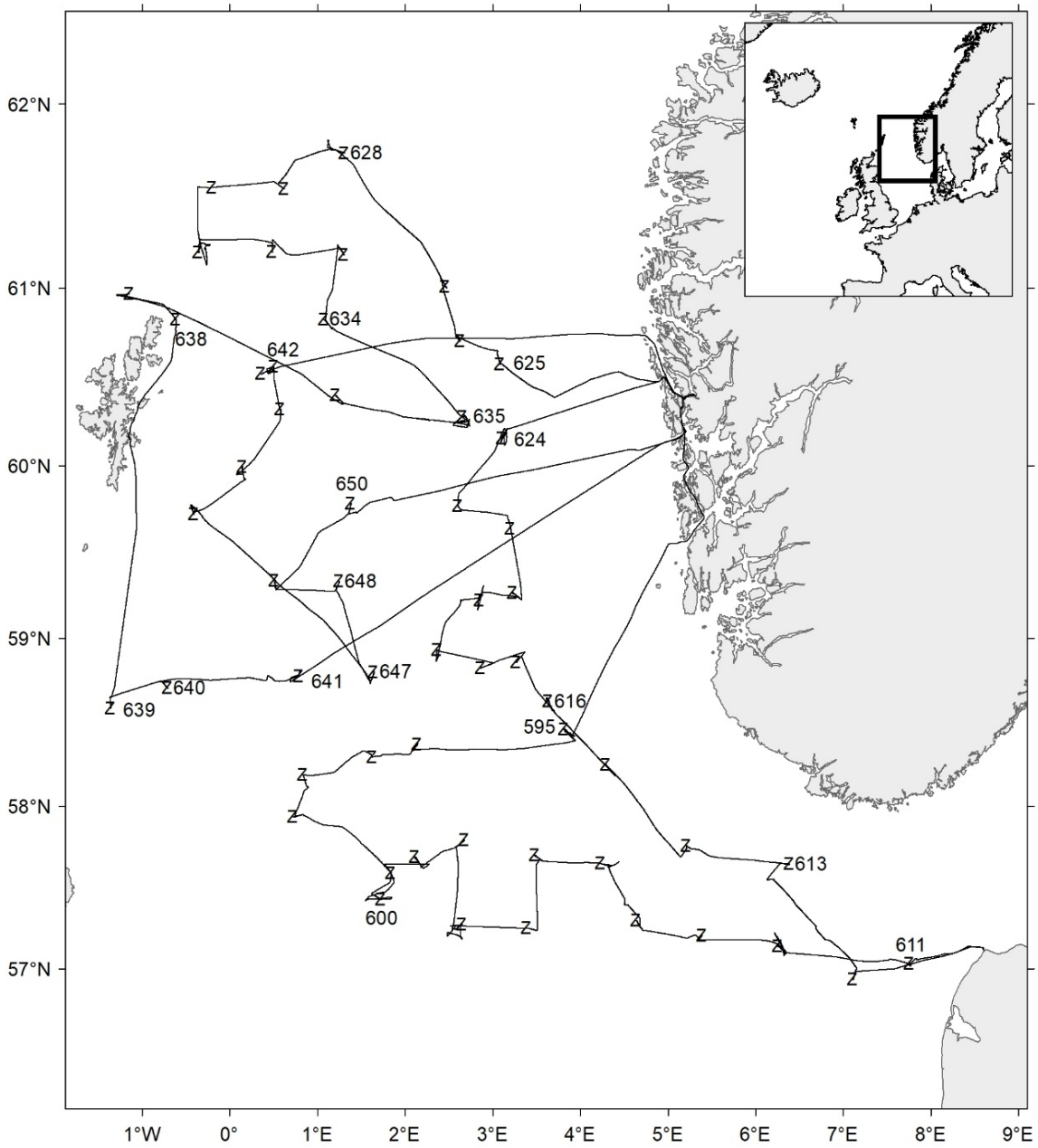
Fig. 60



Cruise no 2020613 "K. Bonnevie" (Chart II)
25 June–9 July 2020

× Video st.
● Snow crab pots

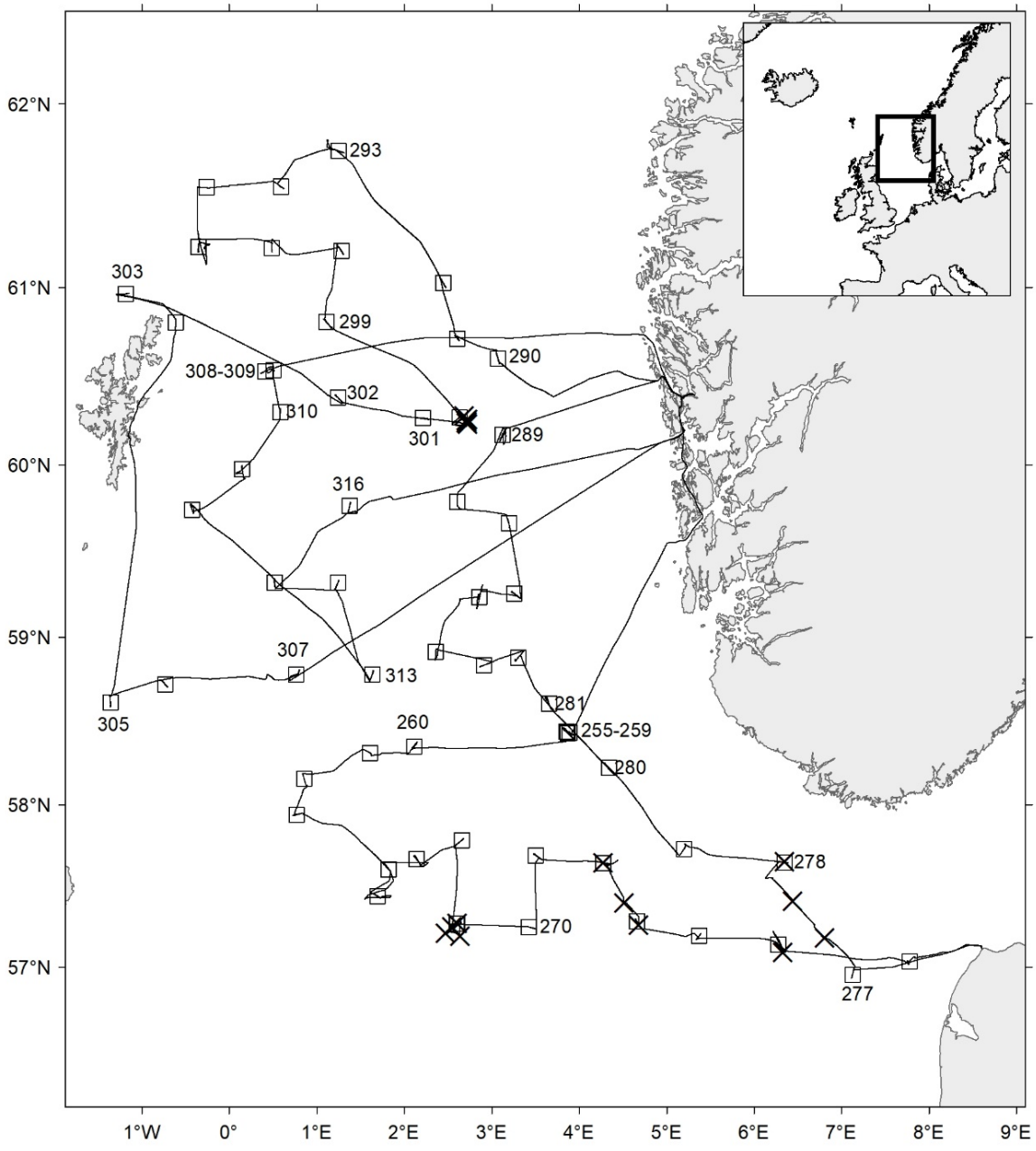
Fig 61



Cruise no 2020614 "K. Bonnevie" (Chart I)
16 July–8 August 2020

z CTD st.no 595-650

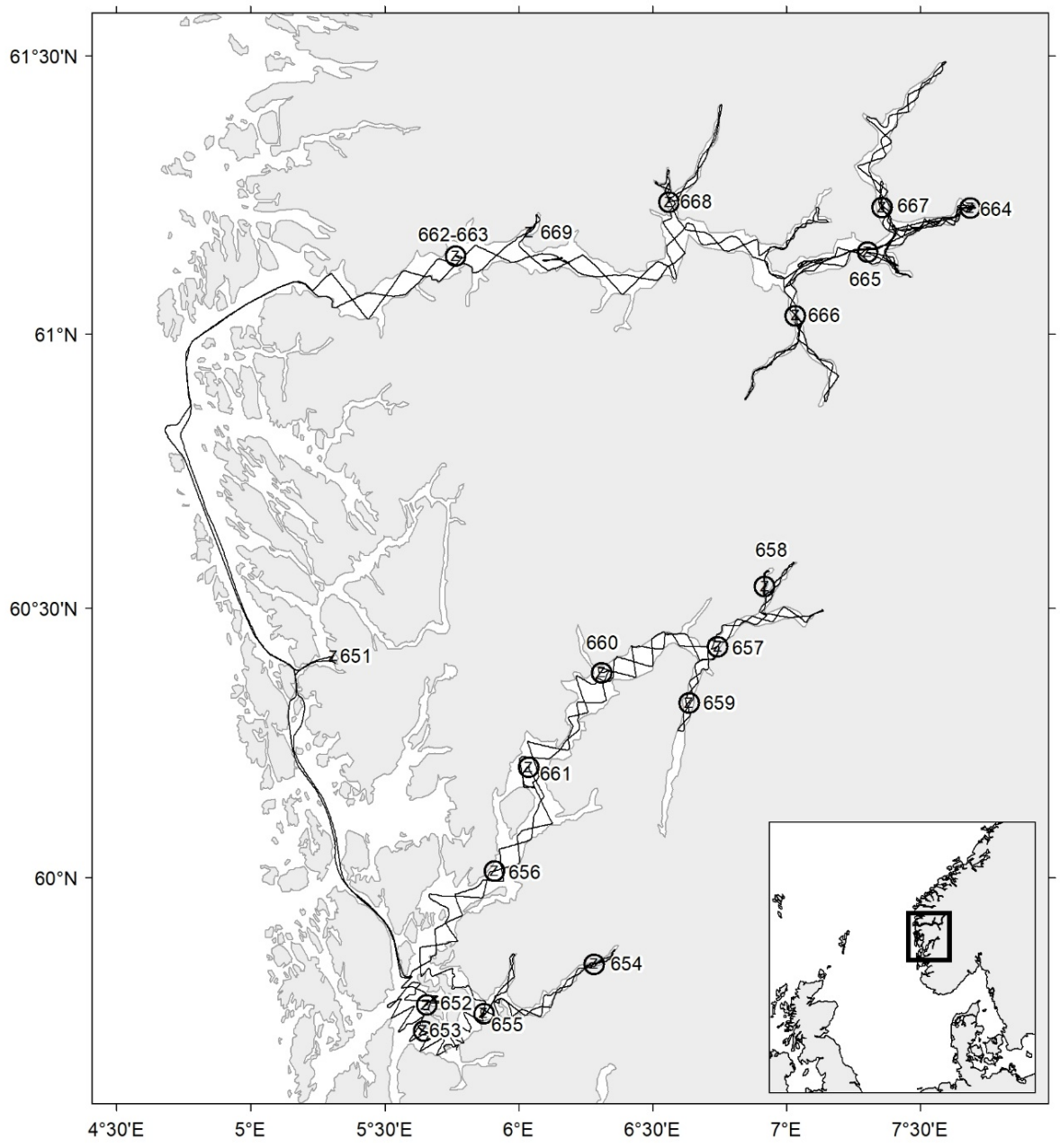
Fig. 62



Cruise no 2020614 "K. Bonnevie" (Chart II)
16 July–8 August 2020

□ Bottom trawl st.no 255-316
× Sledge st. 1-18

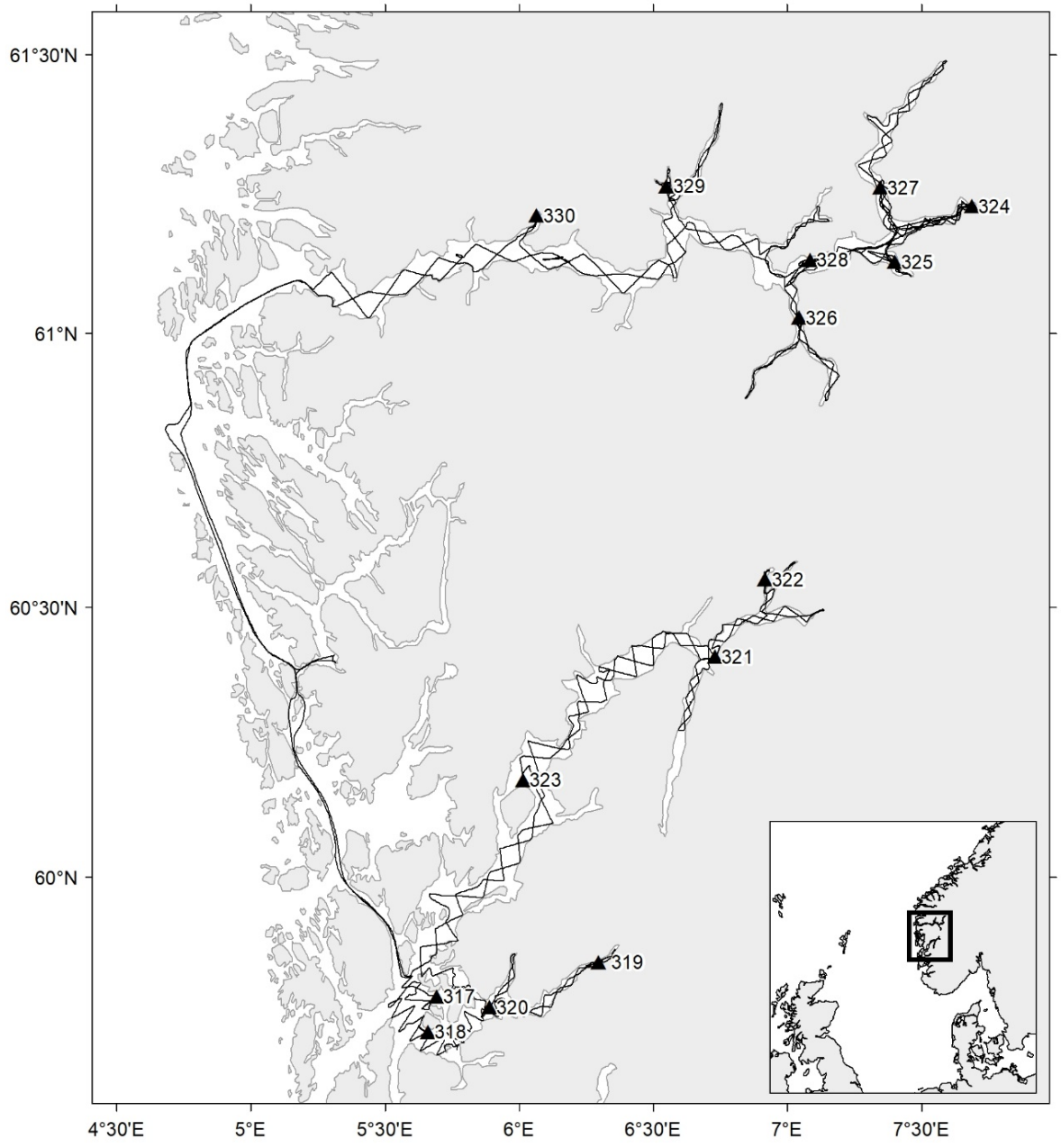
Fig. 63



Cruise no 2020618 "K. Bonnevie" (Chart I)
11-17 August 2020

z CTD st.no 651-669
○ Plankton st. (WP-2 net)

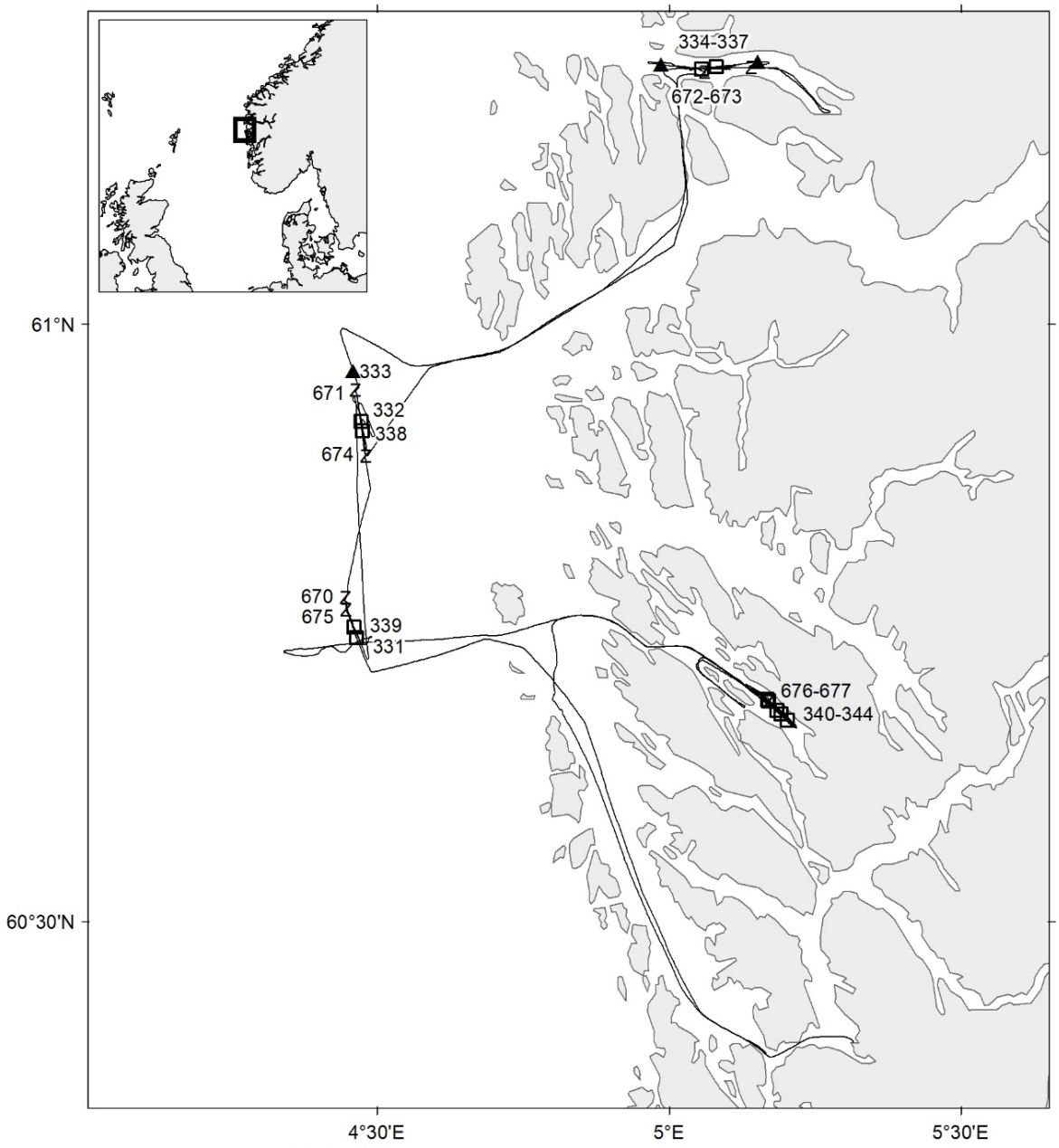
Fig. 64



Cruise no 2020618 "K. Bonnevie" (Chart II)
11-17 August 2020

▲ Pelagic trawl st.no. 317-330

Fig. 65



Cruise no 2020615 "K. Bonnevie"
18–20 August 2020

z CTD st.no 670-677
Trawl st.no 331-344
▲ Pelagic tr.
□ Bottom tr.

Fig. 66

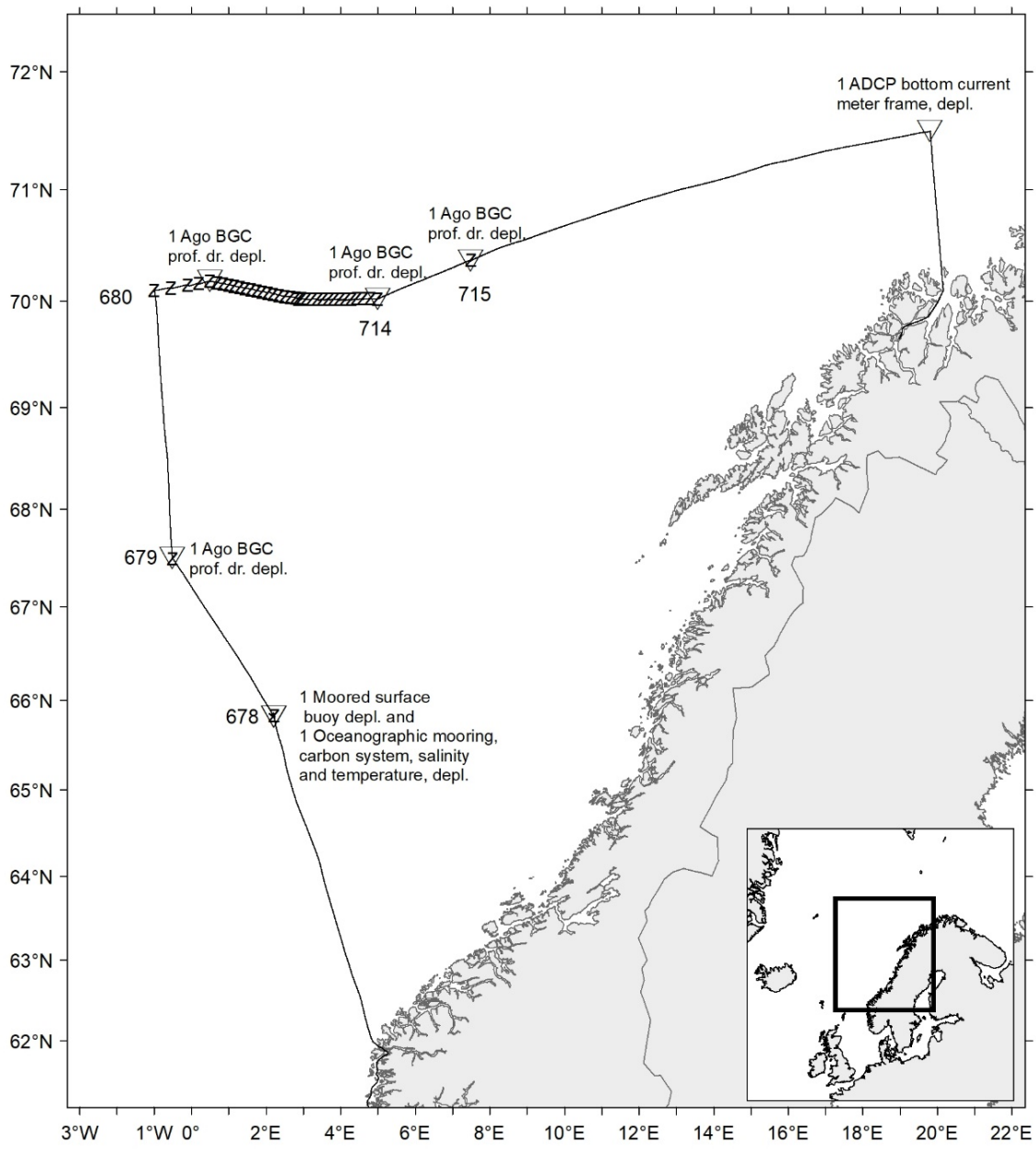
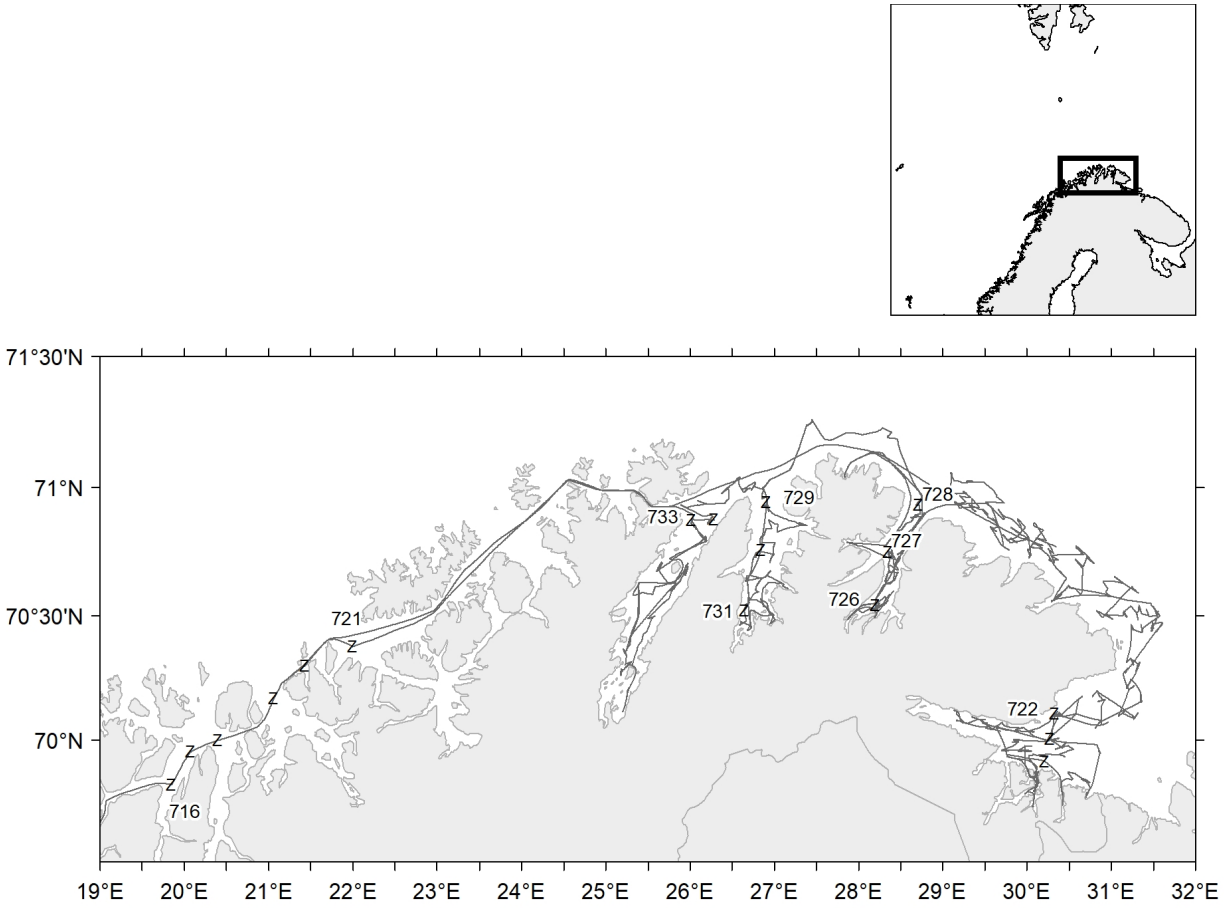

72°N
71°N
70°N
69°N
68°N
67°N
66°N
65°N
64°N
63°N
62°N
3°W
1°W
0°
2°E
4°E
6°E
8°E
10°E
12°E
14°E
16°E
18°E
20°E
22°E
1 ADCP bottom current meter frame, depl.
1 Ago BGC prof. dr. depl.
1 Ago BGC prof. dr. depl.
1 Ago BGC prof. dr. depl.
680
714
715
679
1 Ago BGC prof. dr. depl.
678
1 Moored surface buoy depl. and
1 Oceanographic mooring, carbon system, salinity and temperature, depl.
Cruise no 2020616 "K. Bonnevie"
21–30 August 2020
z CTD st.no 678-715

Fig. 67



Cruise no 2020619 "K. Bonnevie" (Chart I)
31 August–20 September 2020

z CTD st.no 716-733

Fig. 68

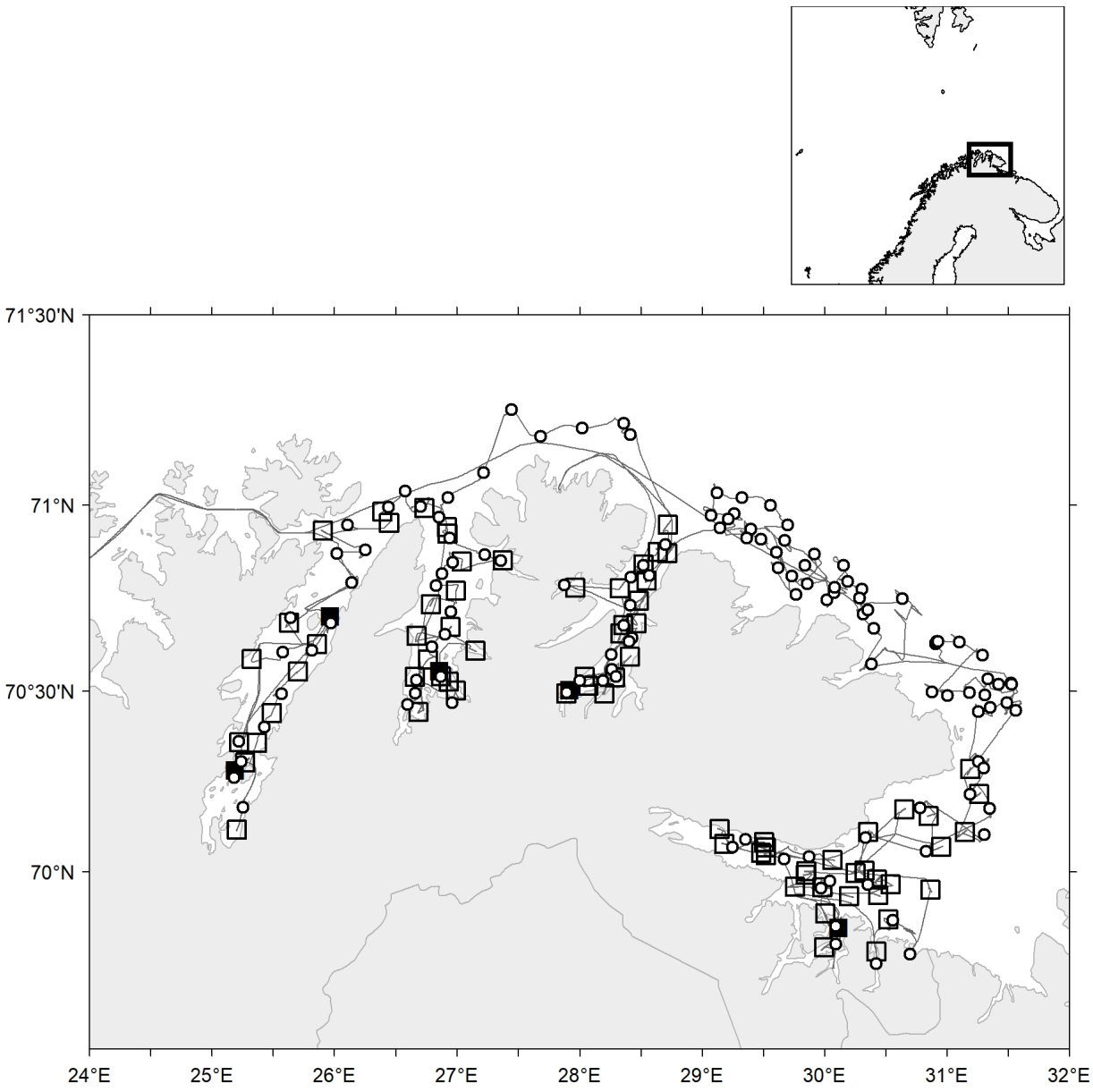
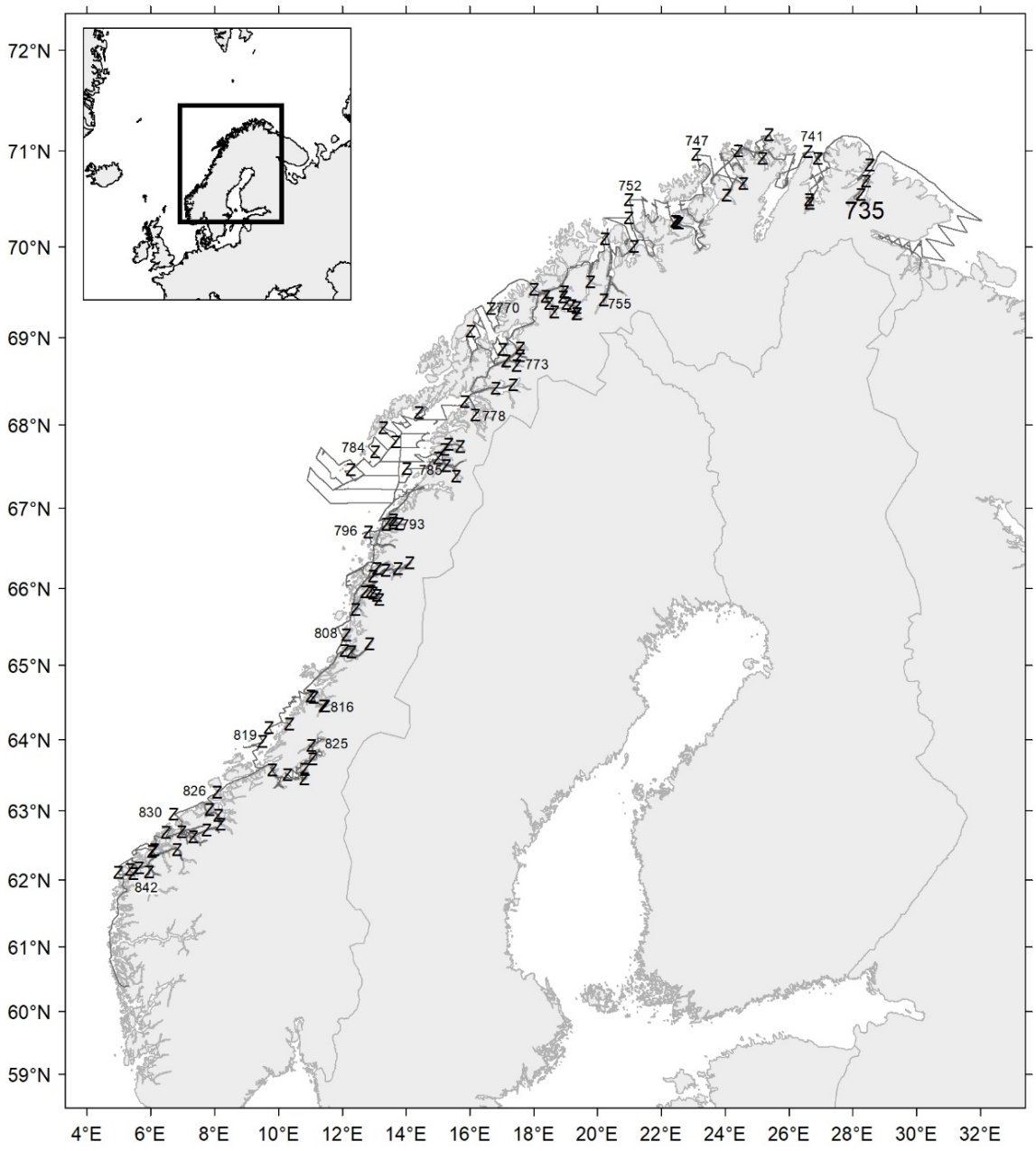

71°30'N
71°N
70°30'N
70°N
24°E
25°E
26°E
27°E
28°E
29°E
30°E
31°E
32°E
Cruise no 2020619 "K. Bonnevie" (Chart II)
31 August–20 September 2020
Agassis trawl
Boom trawl
Video st.

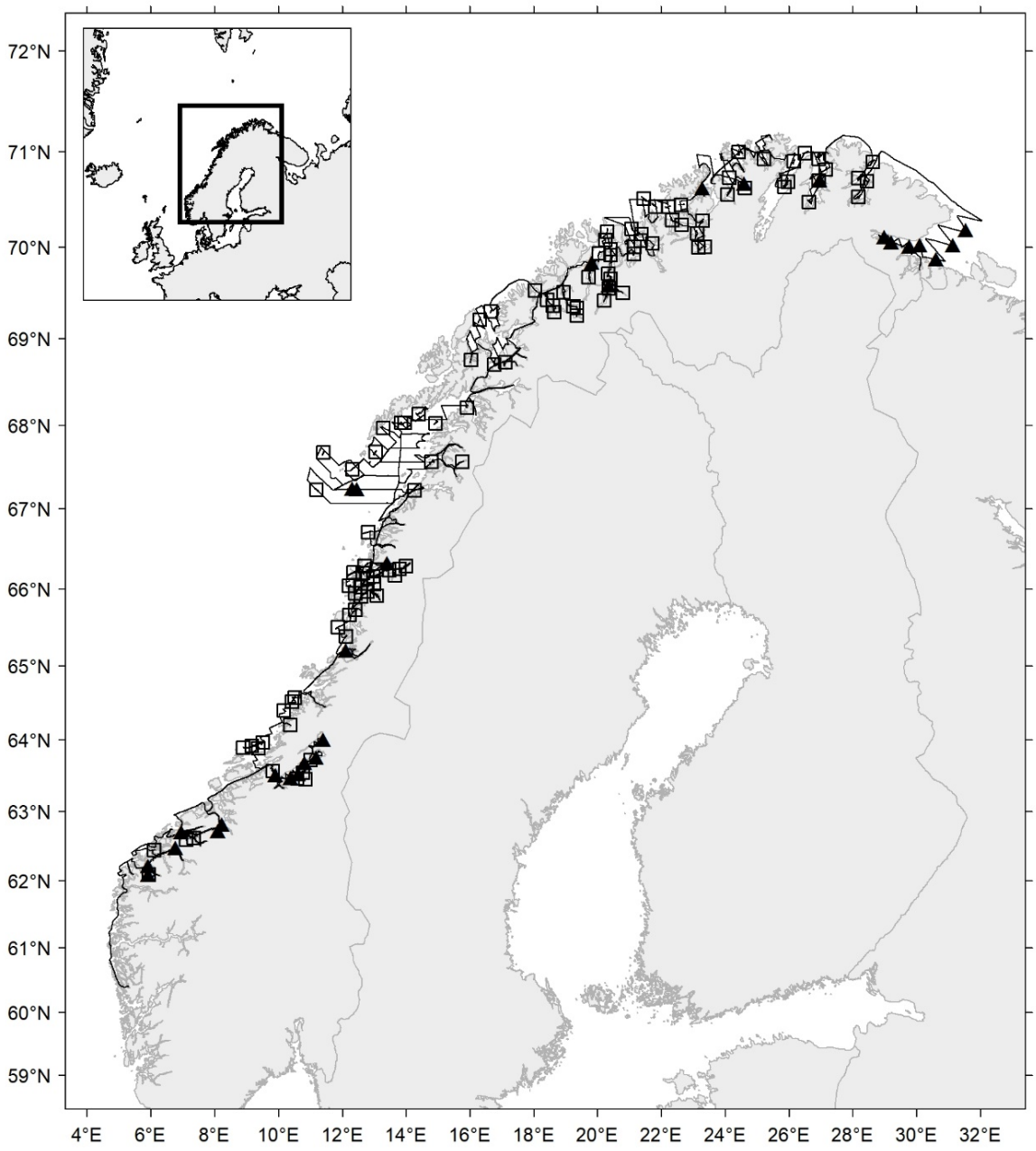
Fig. 69



Cruise no 2020620 "K. Bonnevie" (Chart I)
2 October-9 November 2020

z CTD st.no 735-842

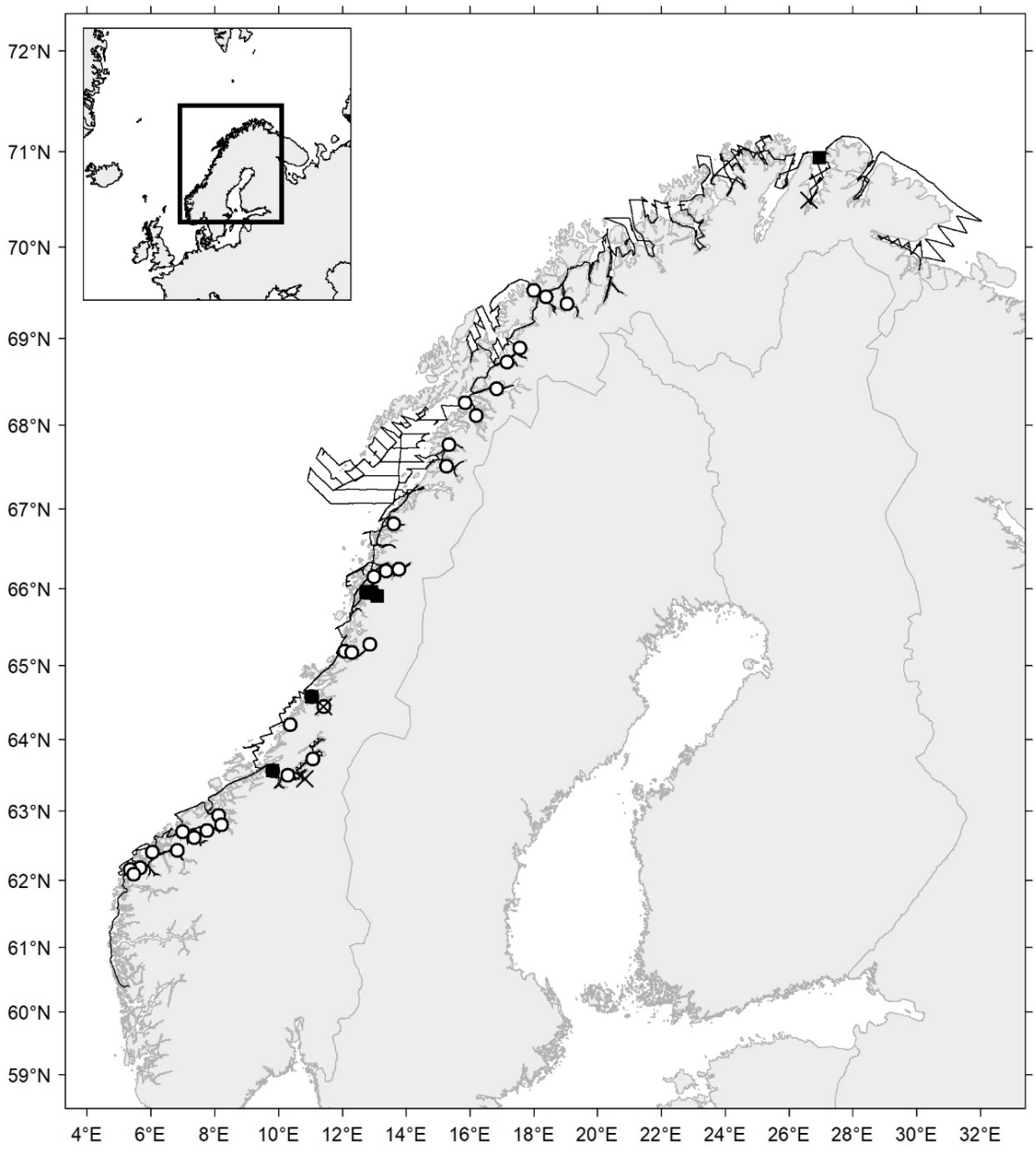
Fig. 70



Cruise no 2020620 "K. Bonnevie" (Chart II)
2 October-9 November 2020

Trawl st.no 1-137
▲ Pelagic trawl
□ Bottom trawl

Fig. 71



Cruise no 2020620 "K. Bonnevie" (Chart III)
2 October-9 November 2020

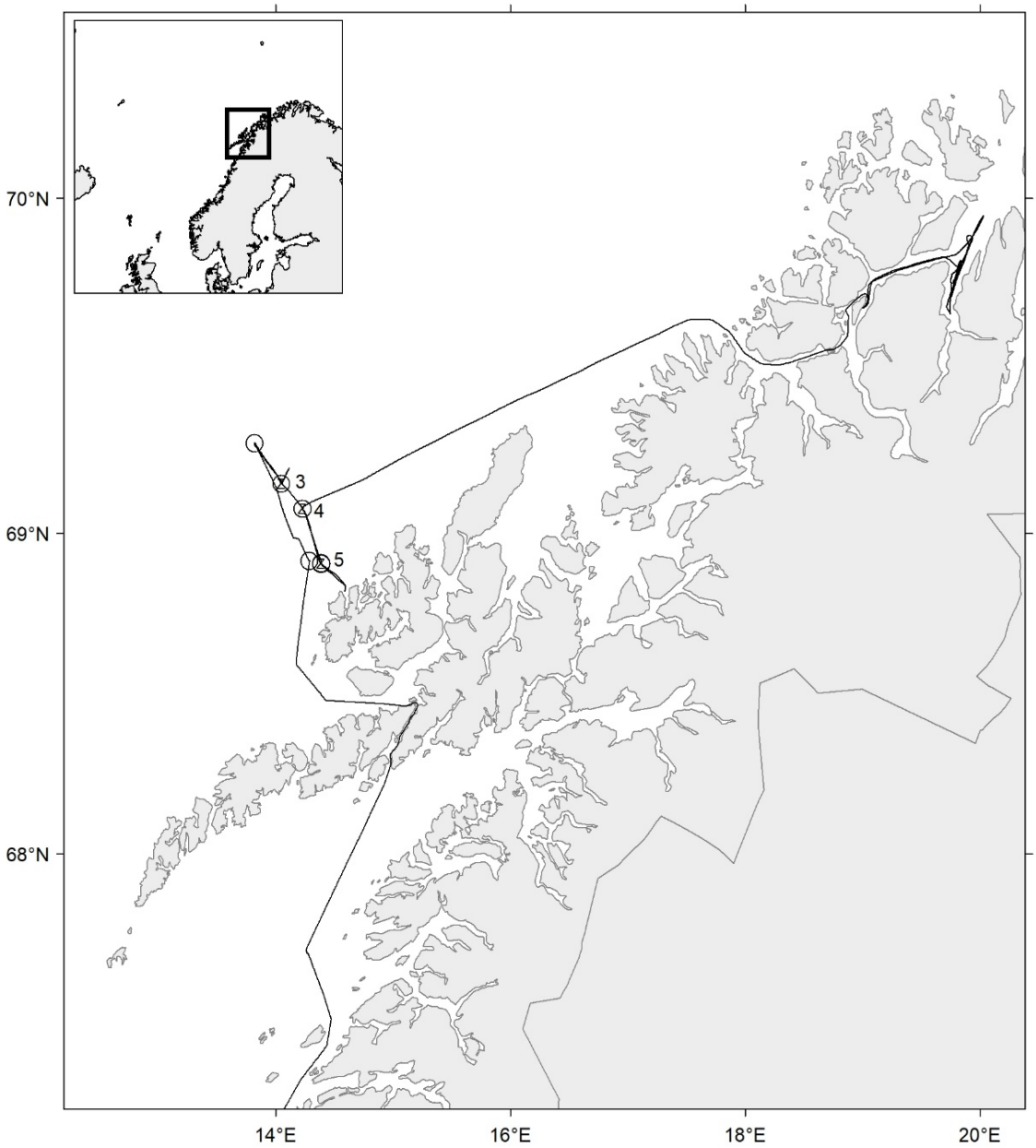
○ Plankton st (WP-II-net)
× Grab st.
■ Box corer

Fig. 72

8 - "Kronprins Haakon" – Cruises 2020

Cruise no	Period	Purpose	Area	CTD st.no	Trawl st.no	Fig. no
2020701	-	Cancelled	-	-	-	-
2020702	-	Cancelled	-	-	-	-
2020703	-	Cancelled	-	-	-	-
2020714	16.5.-27.5.	Installation of LoVe observatory's node and mooring.	-	3-5	-	73
2020713	4.6.-18.6.	Acquisition of swath-bathymetry and sub-bottom profiler data along Knipovich Ridge with the purpose of obtaining an understanding of the morphology of the ridge system and the distribution of sediments. Data were acquired along profiles in NNW-SSE and N-S directions.	Greenland Sea	6	-	74
2020704	-	Cancelled	-	-	-	-
2020707	24.7.-2.8.	The annual Kongsfjorden cruise monitor the watermasses, water chemistry, phyto and zooplankton allong a section from the inner Kongsfjorden to the deep fram strait.	Barents Sea	7-33	1-6	75
2020708	-	Cancelled	-	-	-	-
2020705	4.8.-23.8.	Collection of water, bentic organisms and sediments for bioprospecting purposes.	Arctic Ocean	34-45	-	76
2020709	24.8.-13.9.	Yearly service sea rigs. Ctd stations.	Arctic Ocean Fram Strait	46-129	-	77
20206706	15.9.-13.10.	Ecosystem survey, looking at several different trofic levels.	Arctic Ocean, Barents Sea	130-198	9-137	78-79
2020710	15.10.-31.10.	The cruise main objective was to sample in-situ sediment pressure and temperatures to investigate the distribution of overpressure zones and high heat flow zones along the west-Svalbard continental margin. For this we had on board Ifremer’s piezometer (for in situ pressure and temperature meassurments) and the newly acquired UiT temperature and heat conductivity lance.	Barents Sea	-	-	80
2020711	2.11.-16.11.	We investigated 2 areas Northern Svalbard (Norskebanken and Hinlopen Trough) as well as the shelf edge offshore Prins Karls Forland. Norskebanken and offshore Prins Karls Forland are known for their numerous methane seepages, but we discovered many more flares in Hinlopen Trough. The main objective of the research cruise was to characterize the water column and the sediment near flares in Norskebanken (Geissler et al., 2016), as well as some targeted flares for gas composition, DNA and bubble size distribution.	Arctic Ocean	200-238	-	81
2020715	16.11.-28.11.	Explore known and unknown methane sources on the northeast Greenland continental margin, and check if methane from methane seepage is reaching the atmosphere at this location.	Greenland Sea	239-246	-	82
2020712	-	Cancelled	-	-	-	-

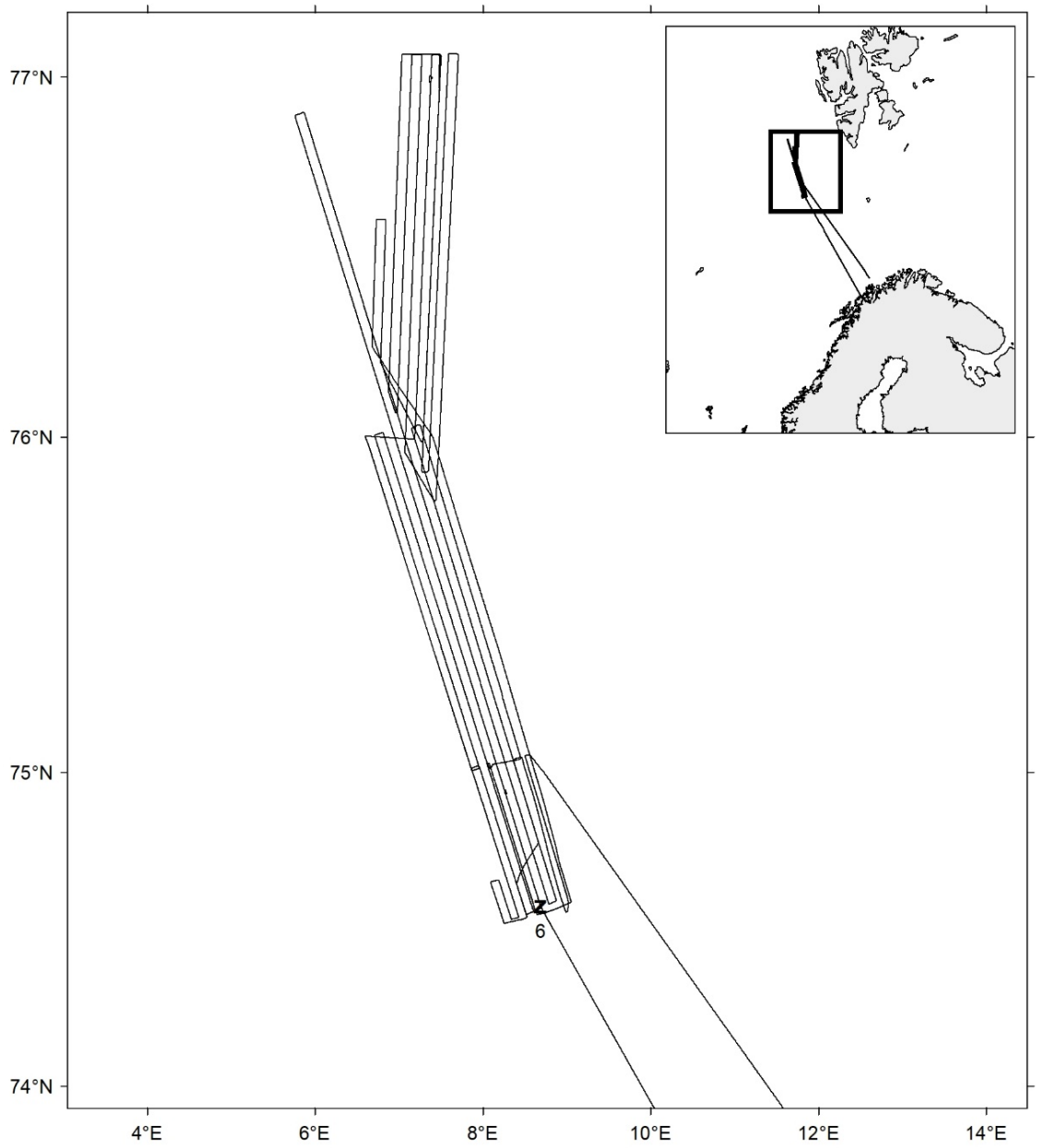
9 - “ Kronprins Haakon” – Charts for cruises 2020



Cruise no 2020714 "Kronprins Haakon"
16–27 May 2020

z CTD st.no 3-5
○ ROV st. (12 stations)

Fig. 73

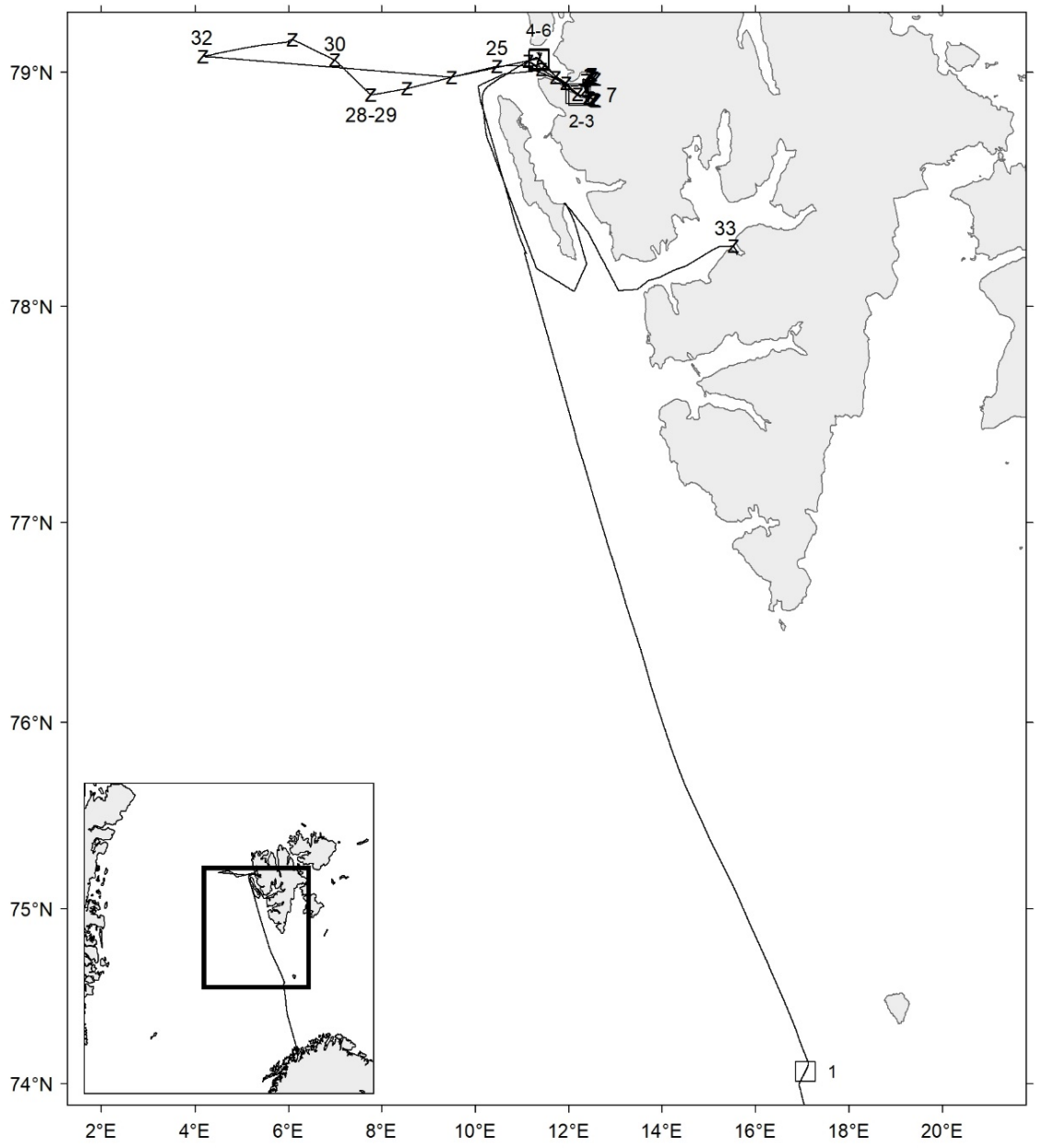


Cruise no 2020713 "Kronprins Haakon"
4–18 June 2020

Acquisition of swath-bathymetry and sub-bottom profiler data along Knipovich Ridge with the purpose of obtaining an understanding of the morphology of the ridge system and the distribution of sediments.

z CTD st.no 6

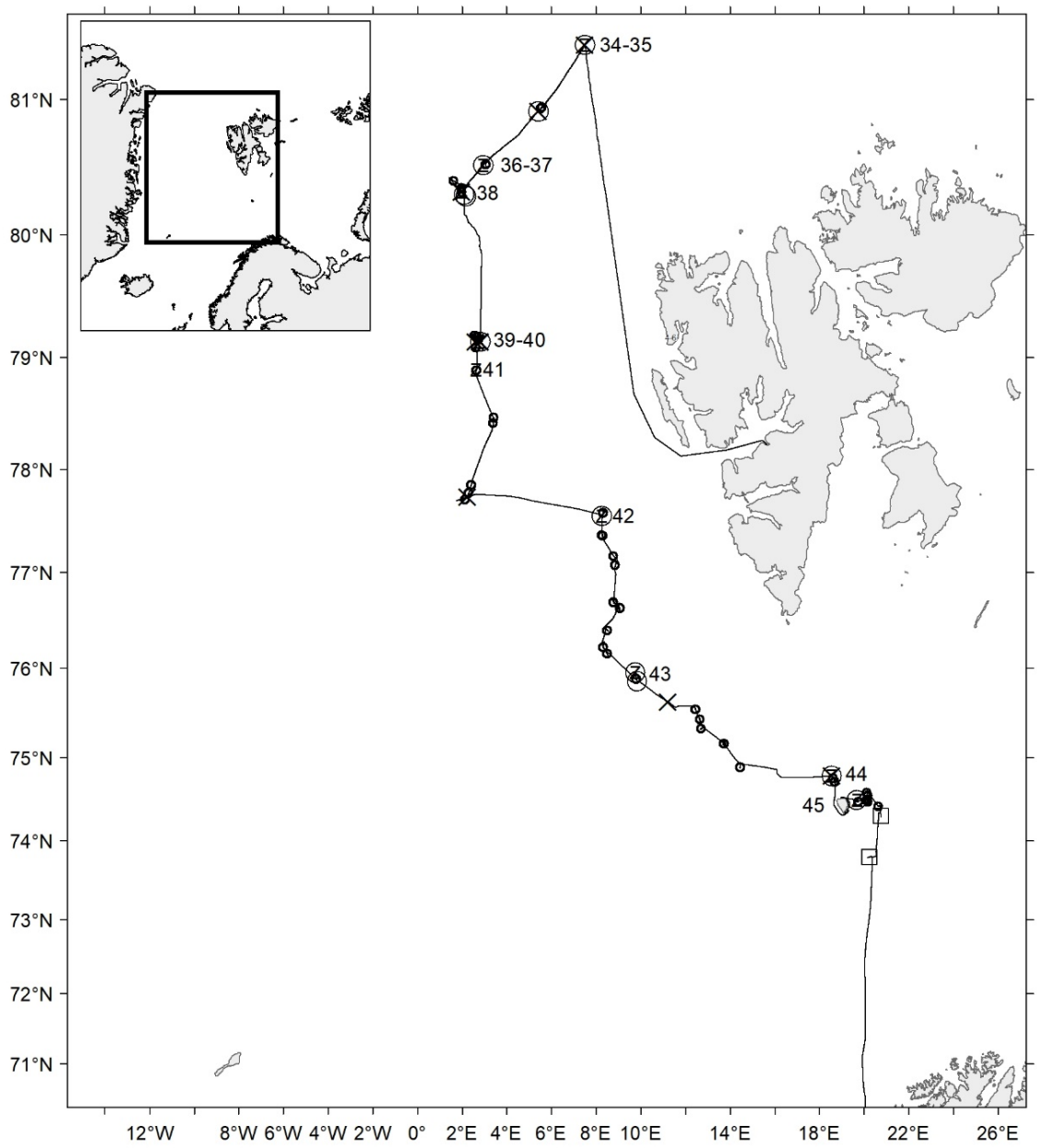
Fig. 74



Cruise no 2020707 "Kronprins Haakon"
24 July–2 August 2020
The annual Kongsfjorden cruise monitor the watermasses, water chemistry, phyto and zooplankton allong a section from the inner Kongsfjorden to the deep fram strait.

z CTD st.no 7-33
□ Trawl st.no 1-6

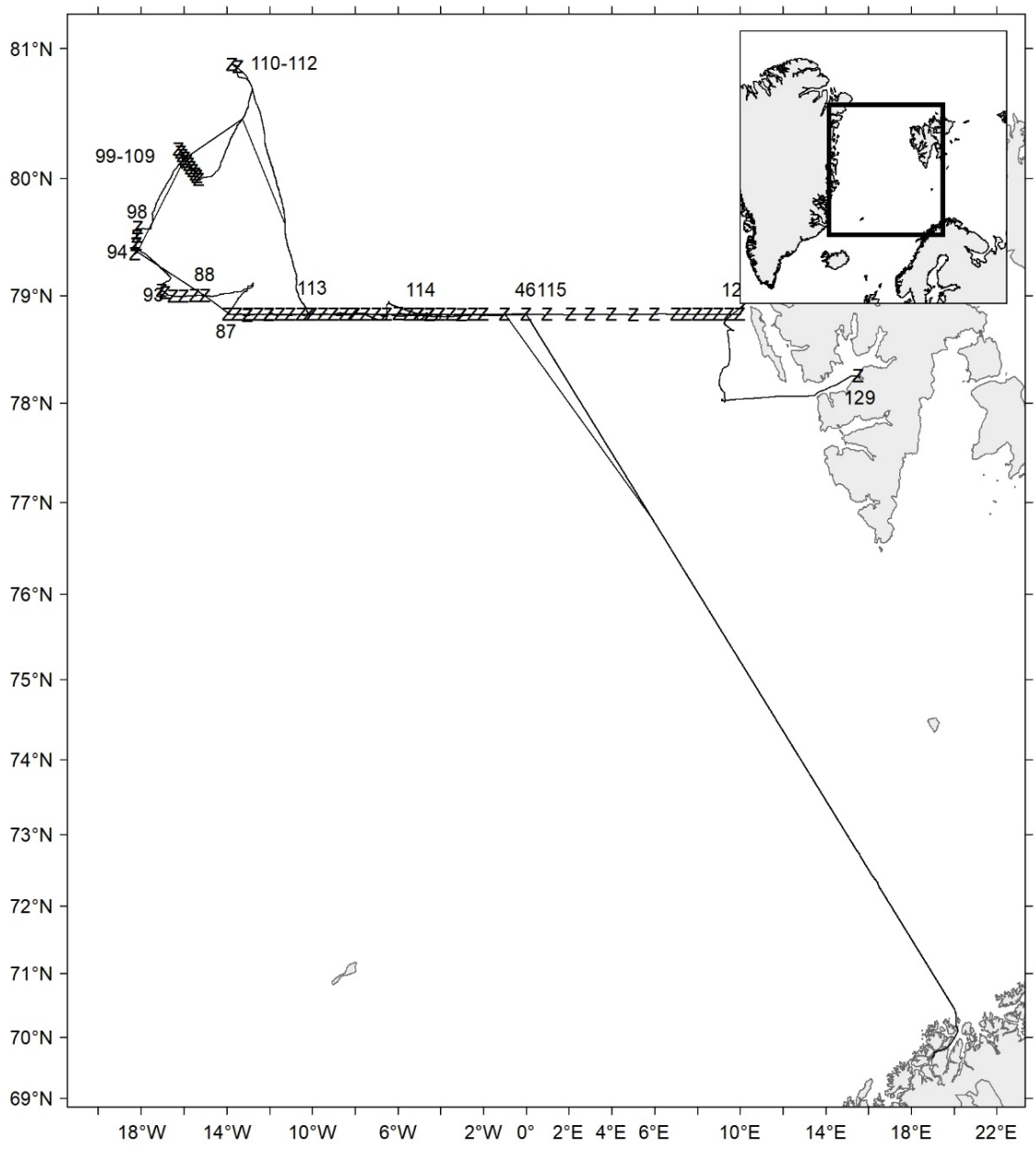
Fig. 75



Cruise no 2020705 "Kronprins Haakon"
4–23 August 2020

z CTD st.no 34-45
○ Plankton st. (WP-II-net)
□ Bottom trawl st.no 7-8
● Beam trawl
× Box corer

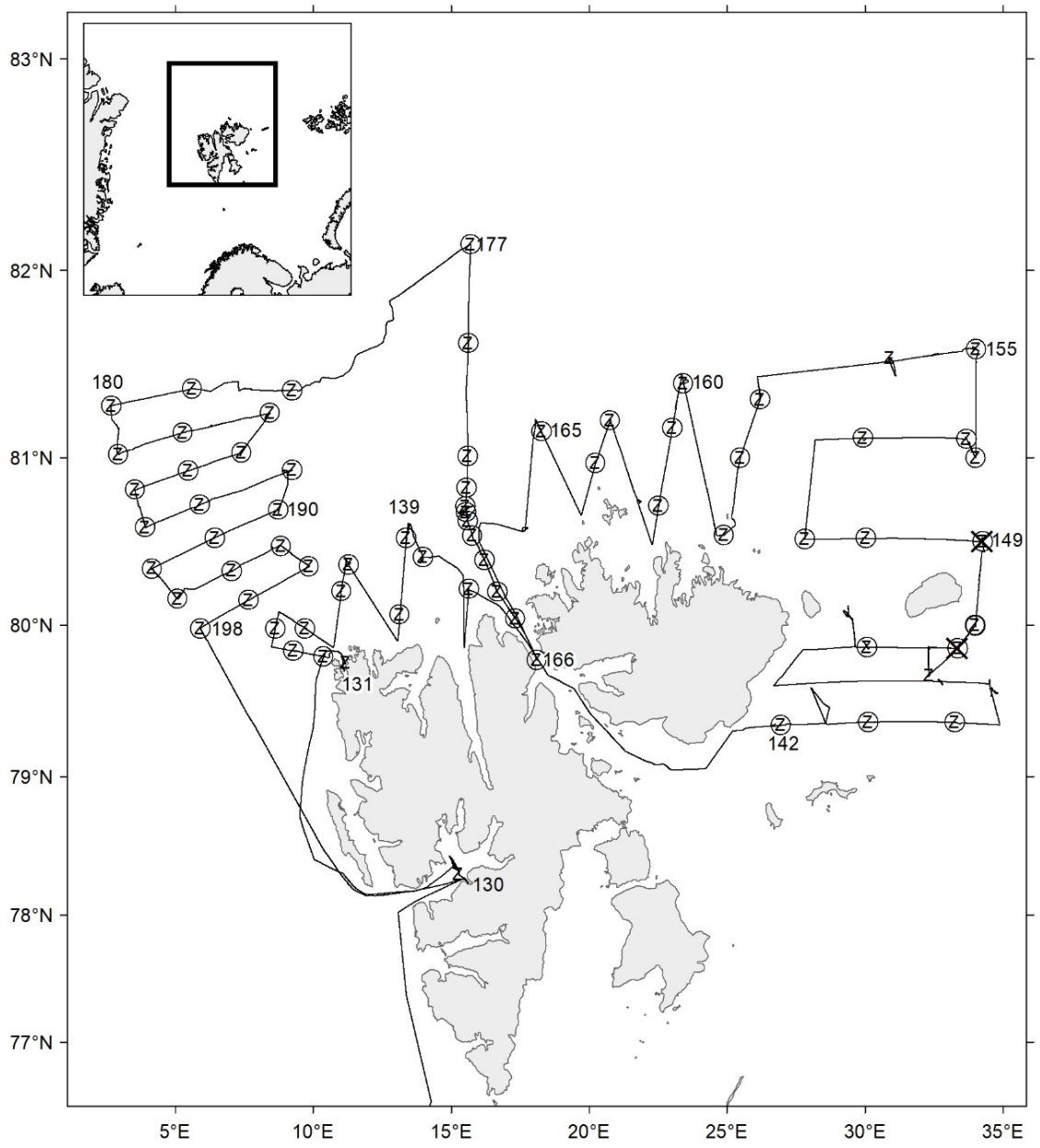
Fig. 76



Cruise no 2020709 "Kronprins Haakon"
24 August-13 September 2020

z CTD st.no 46-129

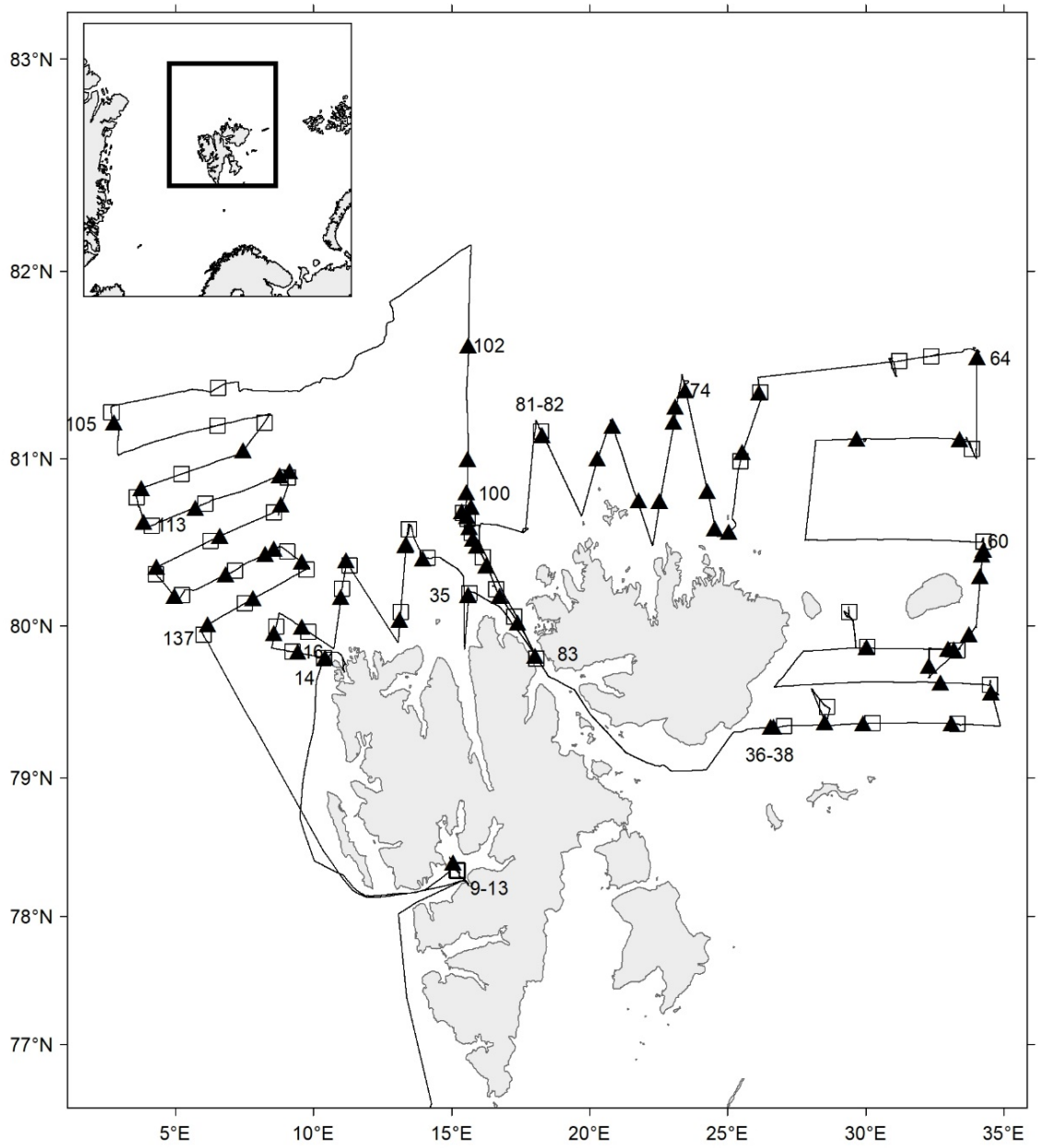
Fig. 77



Cruise no 2020706 "Kronprins Haakon" (Chart I)
15 September–13 October 2020

z CTD st.no 130-198
○Plankton st. (WP-II-net)
×Grab st.

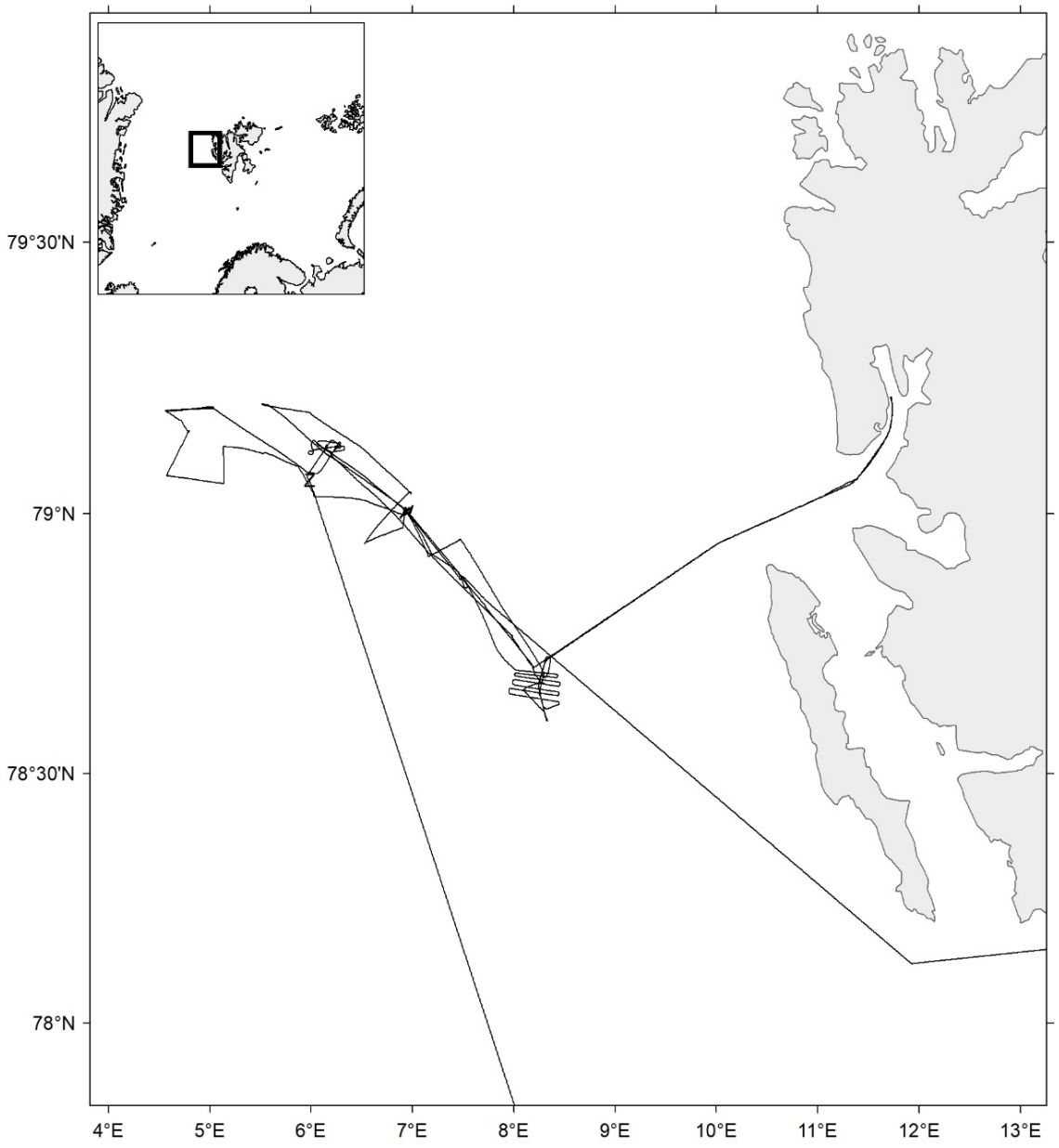
Fig. 78



Cruise no 2020706 "Kronprins Haakon" (Chart II)
15 September–13 October 2020

Trawl st.no 9-137
▲ Pelagic tr.
□ Bottom tr.

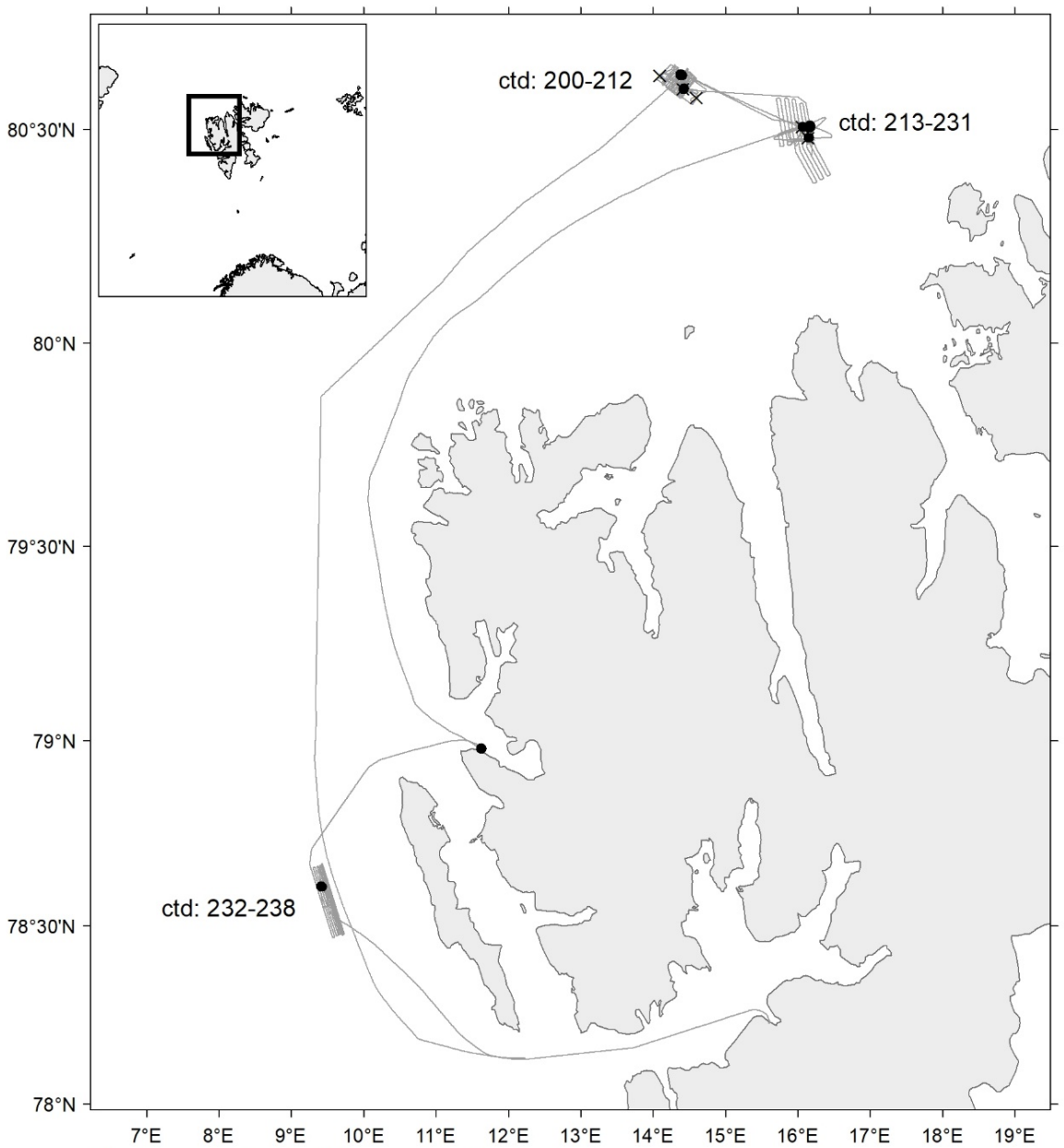
Fig. 79



Cruise no 2020710 "Kronprins Haakon"
15–31 October 2020
— Cruise line

Lines of multi-beam and chirp profile, 6 st. gravity core (down to 6 meters),
1 ctd st.,heat flow measurements at the seafloor using heat flow probe device.
Piezometer for in situ pore fluid pressure and temperature on the sediment down to 10 meters.
Ocean bottom seismometer 1-5

Fig. 80


ctd: 200-212
ctd: 213-231
ctd: 232-238
80°30'N
80°N
79°30'N
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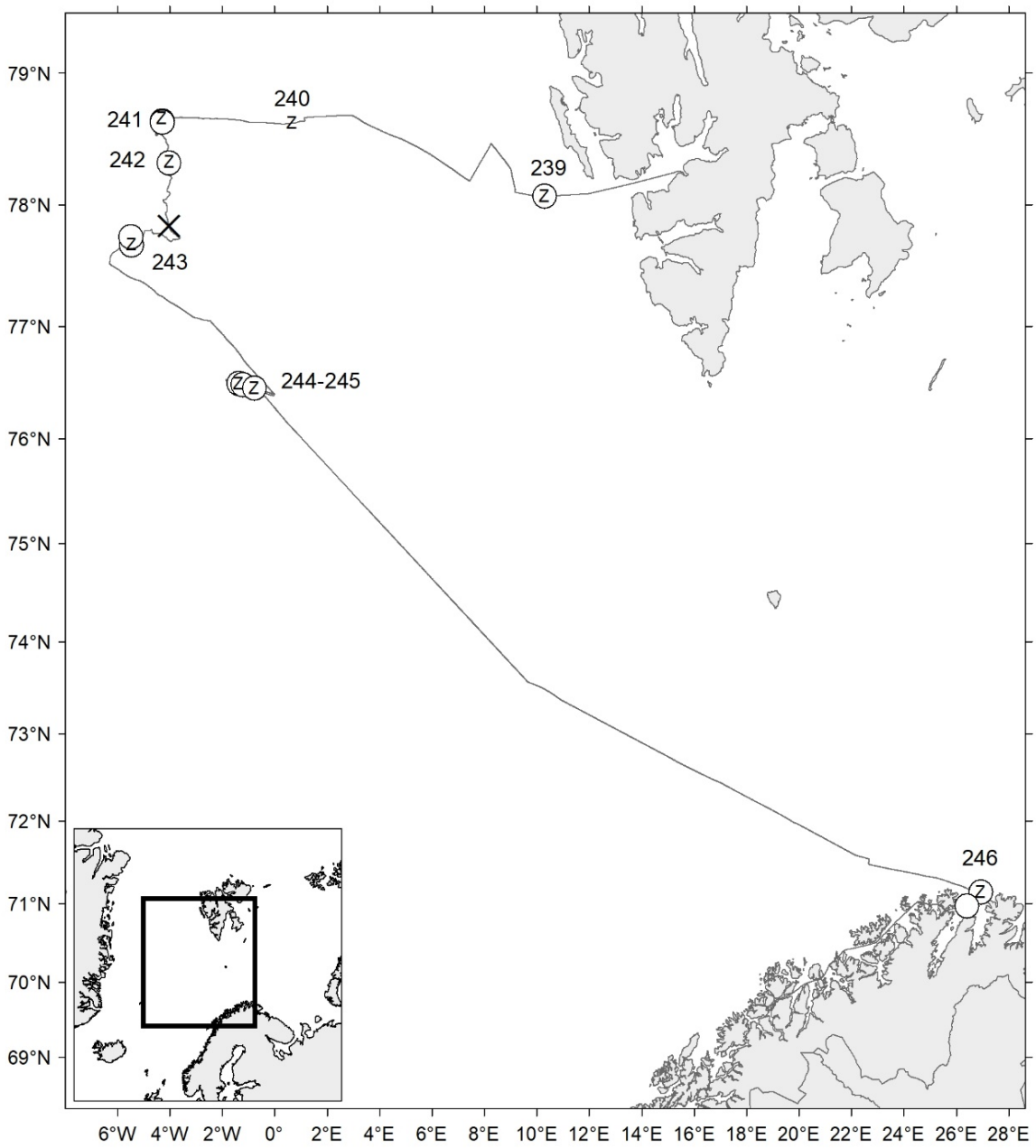
18°E
19°E
Cruise no 2020711 "Kronprins Haakon"
2-16 November 2020
— Cruise line
CTD st.no 200-238
● ROV stations
× Multicorer

Fig. 81



Cruise no 2020715 "Kronprins Haakon"
16-28 November 2020
— Cruise line

z CTD st.no 239-246
○ Multicorer
× Video station

Fig. 82

10 - "G. M. Dannevig" – Cruises 2020

Cruise no	Period	Purpose	Area	CTD st.no	Fig. no
2020301	19.1.-25.1.	Hydrographic standard section “Torungen-Hirtshals” environmental investigation. Long-term environmental monitoring on a near-shore station outside Arendal and in the fjords along the Norwegian Skagerrak coast.	Skagerrak	1-32	83
2020302	1.2.-7.2.	Hydrographic standard section “Torungen-Hirtshals” environmental investigation. Long-term environmental monitoring on a near-shore station outside Arendal and in the fjords along the Norwegian Skagerrak coast.	Skagerrak	33--58	84
2020303	7.3.-13.3.	Hydrographic standard section “Torungen-Hirtshals” environmental investigation. Long-term environmental monitoring on a near-shore station outside Arendal and in the fjords along the Norwegian Skagerrak coast.	Skagerrak	59-76	85
2020304	16.-28.3.	Spawning ground mapping.	Norwegian Coast	-	No chart
2020305		Cancelled			
2020306		Cancelled			
		Stations taken with a small boat during lockdown.	Skagerrak	77-79	No chart
2020307	1.6.-9.6.	Long-term environmental monitoring on a near-shore station outside Arendal and in the fjords along the Norwegian Skagerrak coast.	Skagerrak	80-110	86
2020308	2.7.-8.7.	Hydrographic standard section “Torungen-Hirtshals” environmental investigation. Long-term environmental monitoring on a near-shore station outside Arendal and in the fjords along the Norwegian Skagerrak coast.	Skagerrak	111-138	87
2020309	4.8.-8.8.	Hydrographic standard section “Torungen-Hirtshals” environmental investigation. Long-term environmental monitoring on a near-shore station outside Arendal and in the fjords along the Norwegian Skagerrak coast.	Skagerrak	139-165	88
2020310	9.-15.8.	Ecosystems Skagerrak coast – interactions between coast and ocean	Skagerrak	-	No chart
2020311	16.-23.8.	Marine Protected Areas – lobster.	Norwegian coast	-	No chart
2020312	26.-28.8.	Student cruise UiA.	Norwegian coast	-	No chart
2020313	13.9.-14.9.	Hydrographic standard section “Torungen-Hirtshals” environmental investigation. Long-term environmental monitoring on a near-shore station outside Arendal and in the fjords along the Norwegian Skagerrak coast.	Skagerrak	166-168	89
2020314	15.9.-5.10.	Beach seine studies to measure recruitment of coastal fish-species.	Skagerrak	169-224	90
2020315	6.10.-8.10.	Hydrographic standard section “Torungen-Hirtshals” environmental investigation. Long-term environmental monitoring on a near-shore station outside Arendal and in the fjords along the Norwegian Skagerrak coast.	Skagerrak	225-235	91
2020316	13.11.-15.11.	Hydrographic standard section “Torungen-Hirtshals” environmental investigation. Long-term environmental monitoring on a near-shore station outside Arendal and in the fjords along the Norwegian Skagerrak coast.	Skagerrak	236-247	92
2020317	16.11.-3.12.	Monitoring of the cod population, and other species in Skagerrak.	Skagerrak	248--249	93

2020318	4.12-10.12.	Hydrographic standard section “Torungen-Hirtshals” environmental investigation. Long-term environmental monitoring on a near-shore station outside Arendal and in the fjords along the Norwegian Skagerrak coast.	Skagerrak	250-271	94

11 - "G. M. Dannevig" – Charts for cruises 2020

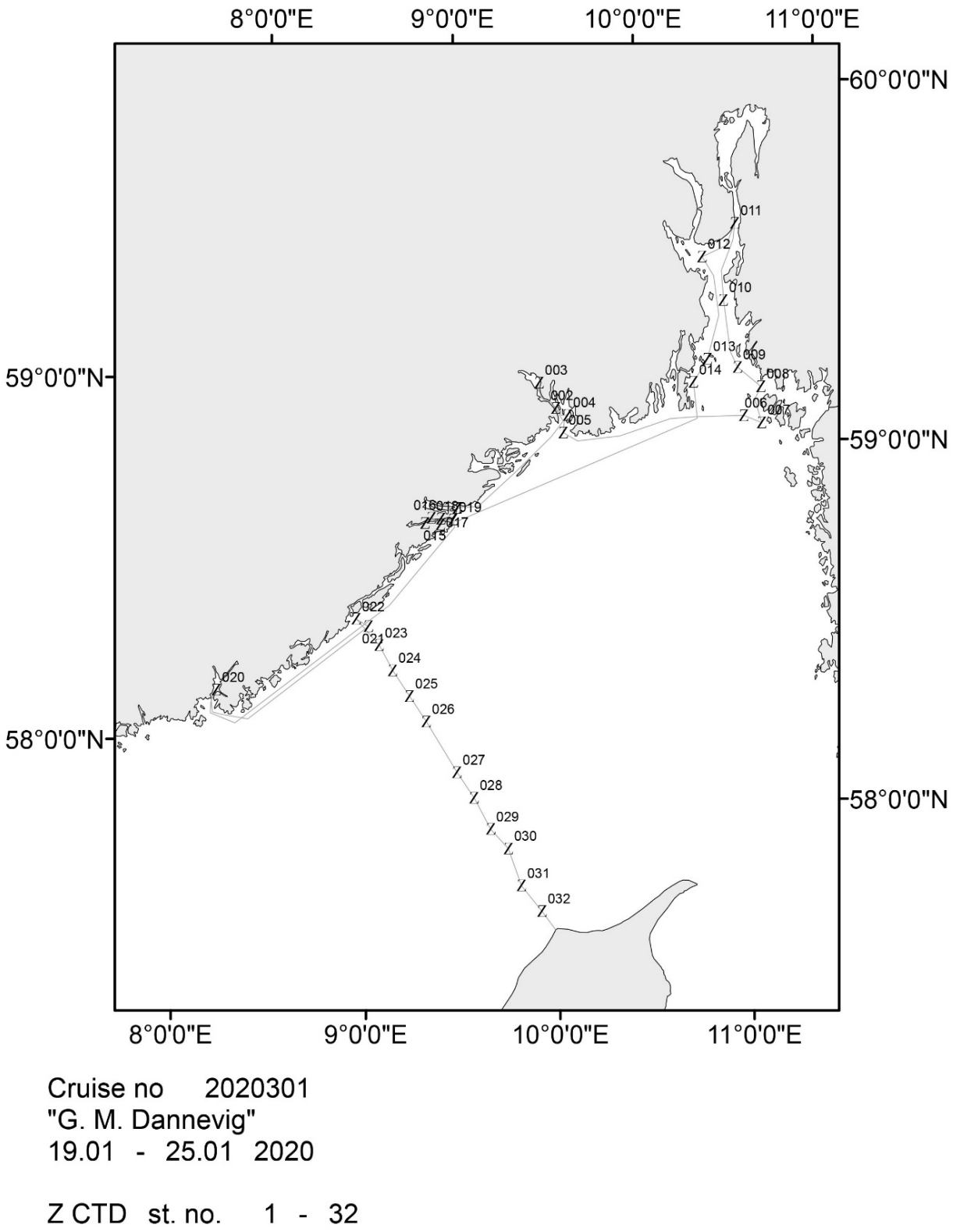
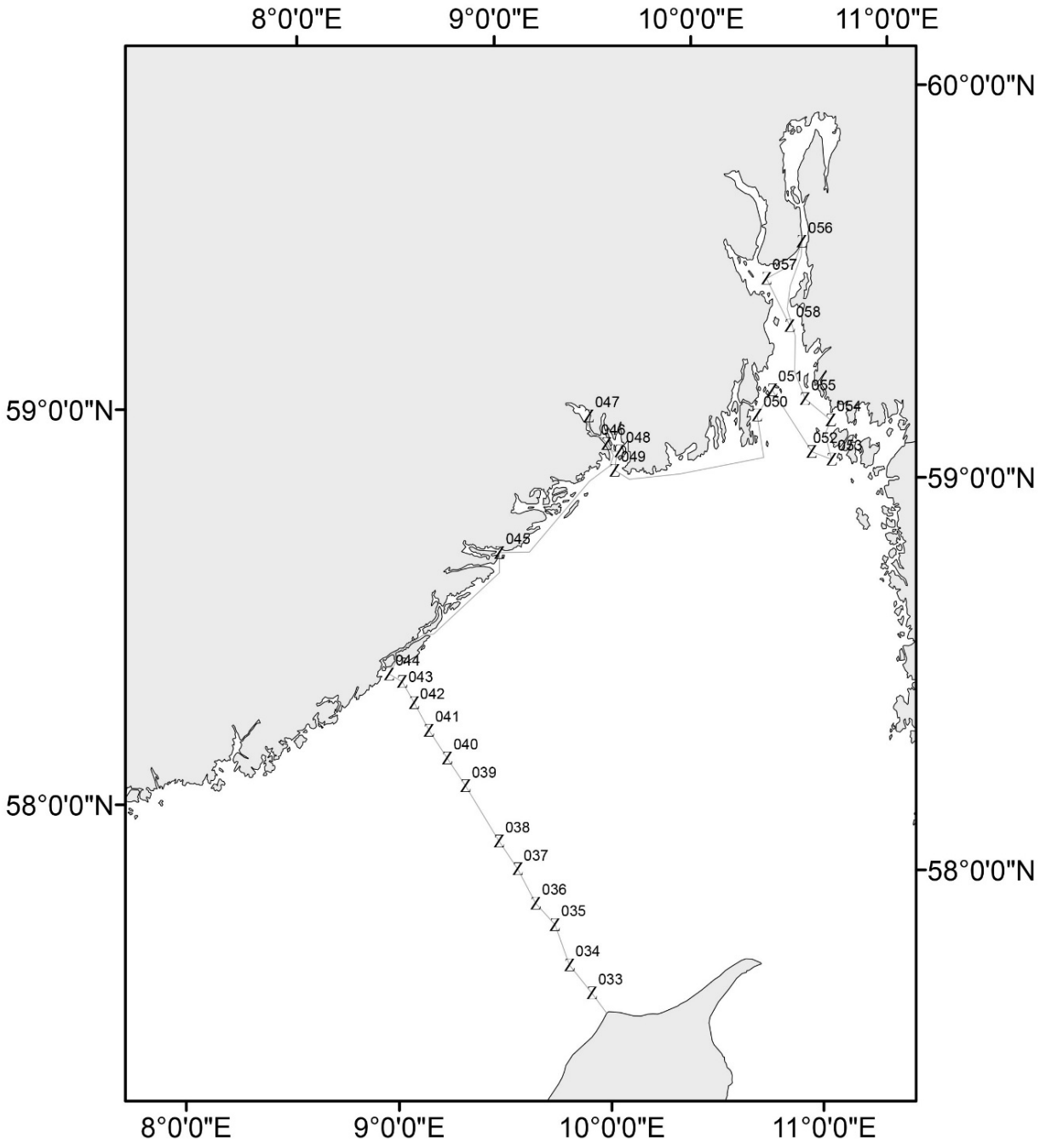


Fig. 83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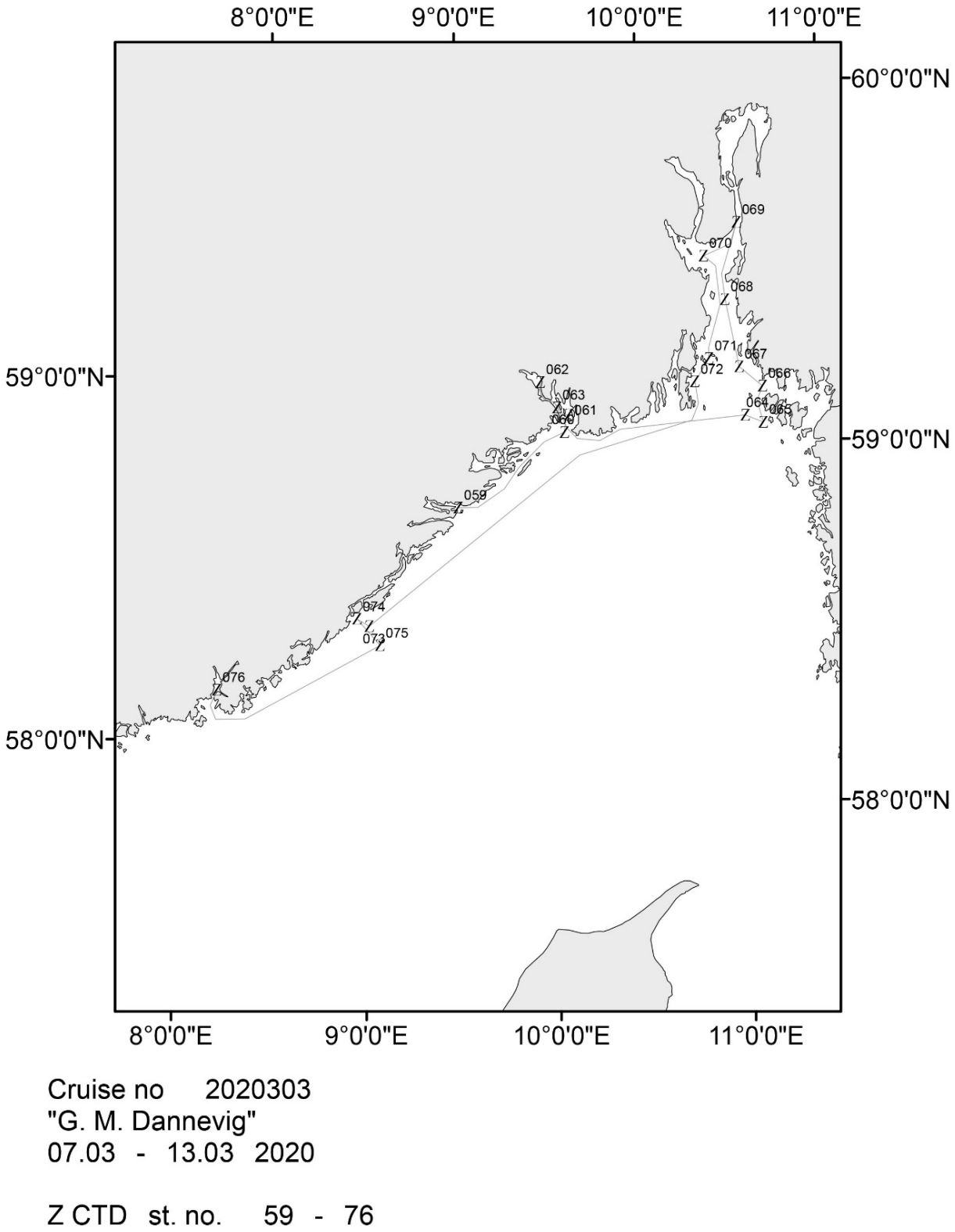
Cruise no 2020302
"G. M. Dannevig"
01.02 - 07.02 2020
Z CTD st. no. 33 - 58

Fig. 84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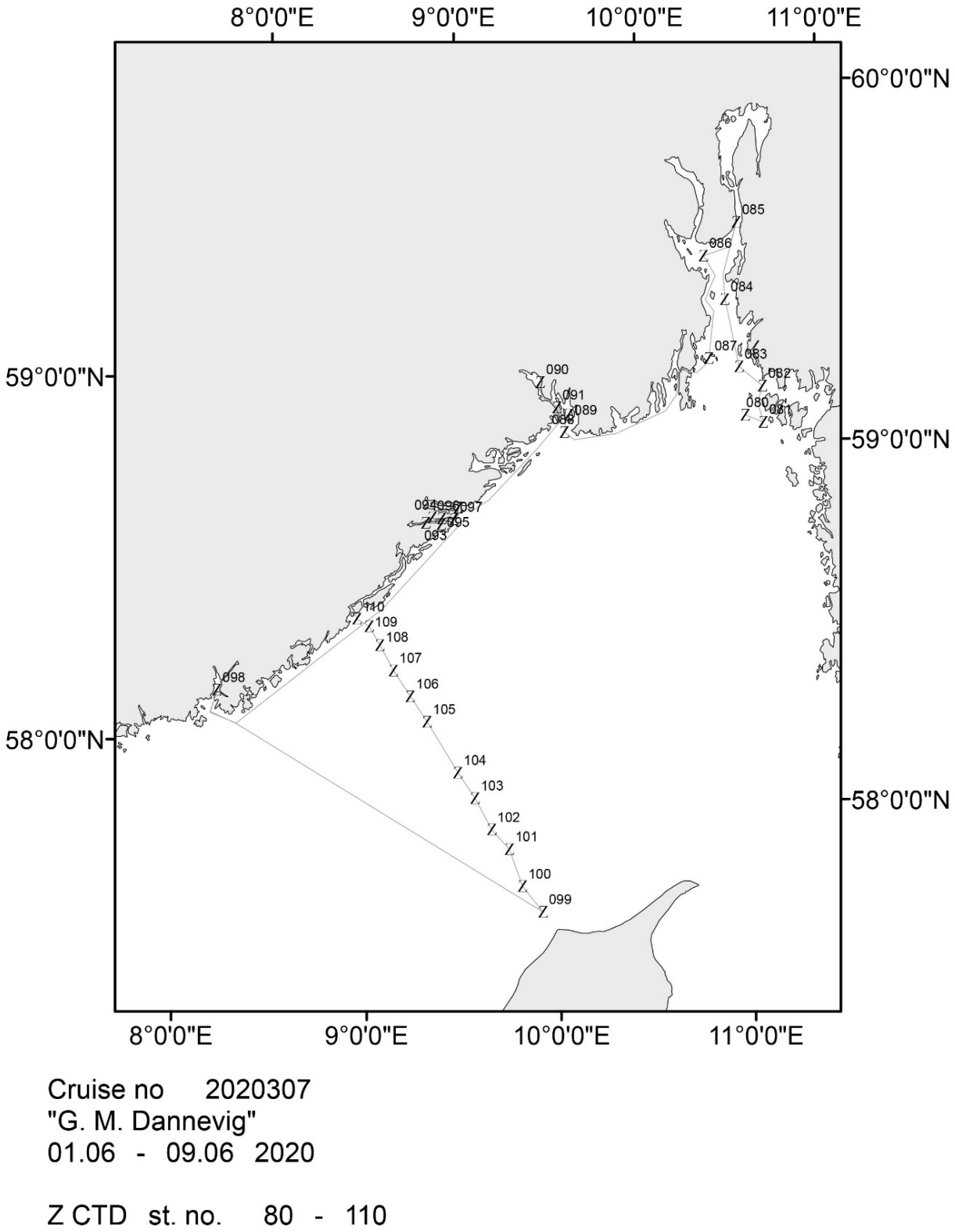
Cruise no 2020303
"G. M. Dannevig"
07.03 - 13.03 2020
Z CTD st. no. 59 - 76

Fig. 85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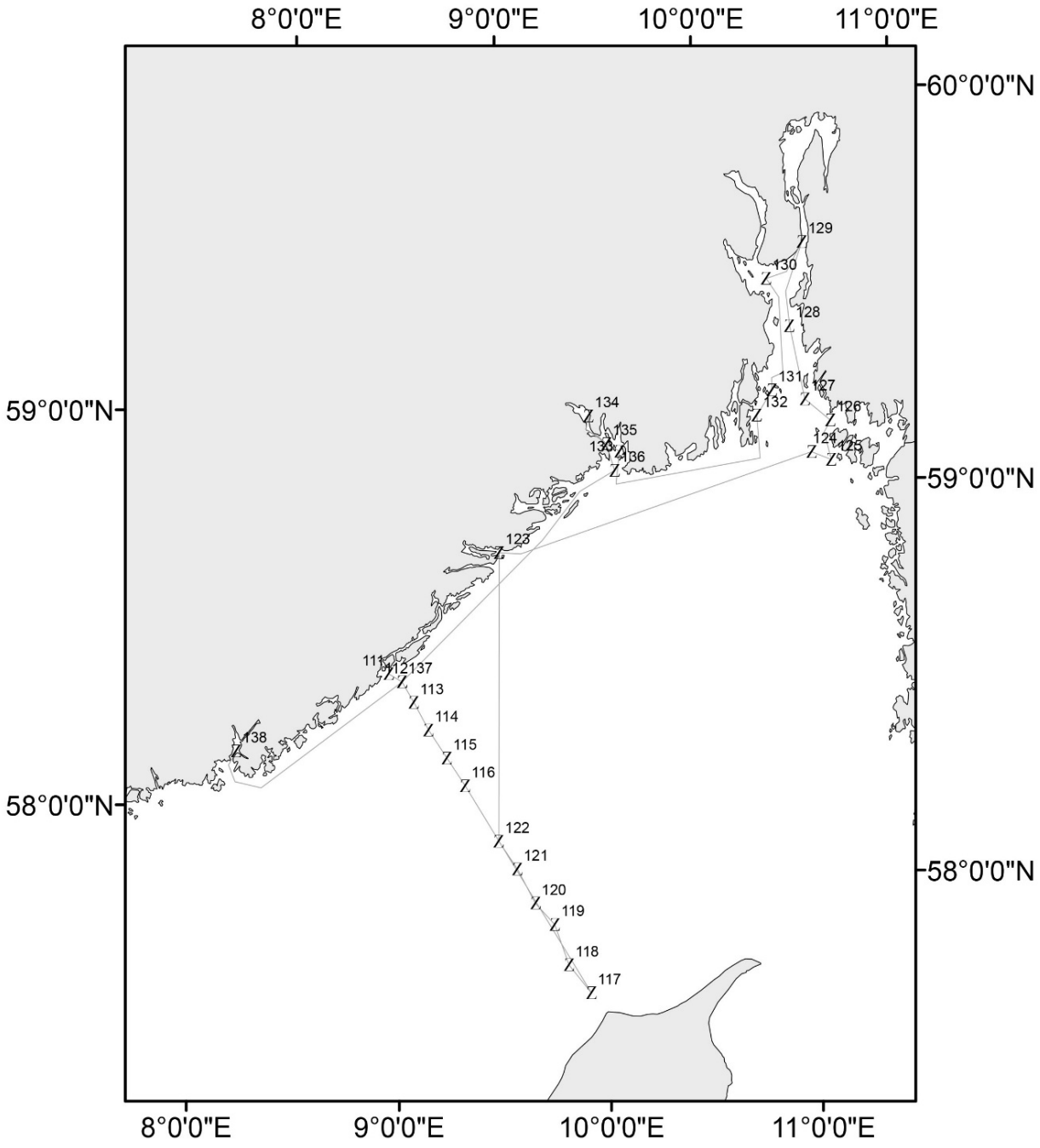
Cruise no 2020307
"G. M. Dannevig"
01.06 - 09.06 2020
Z CTD st. no. 80 - 110

Fig. 86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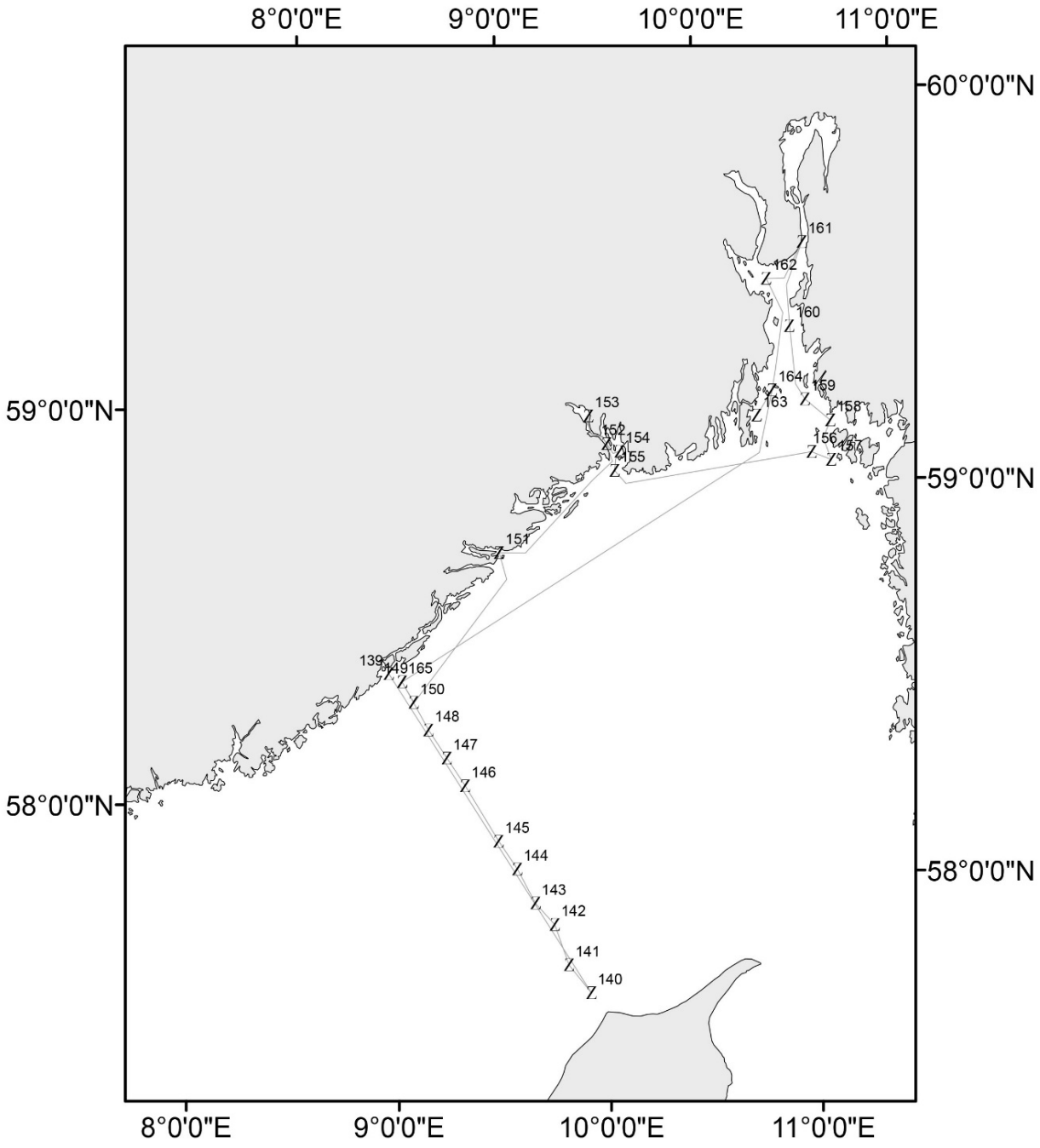
Cruise no 2020308
"G. M. Dannevig"
02.07 - 08.07 2020
Z CTD st. no. 111 - 138

Fig. 87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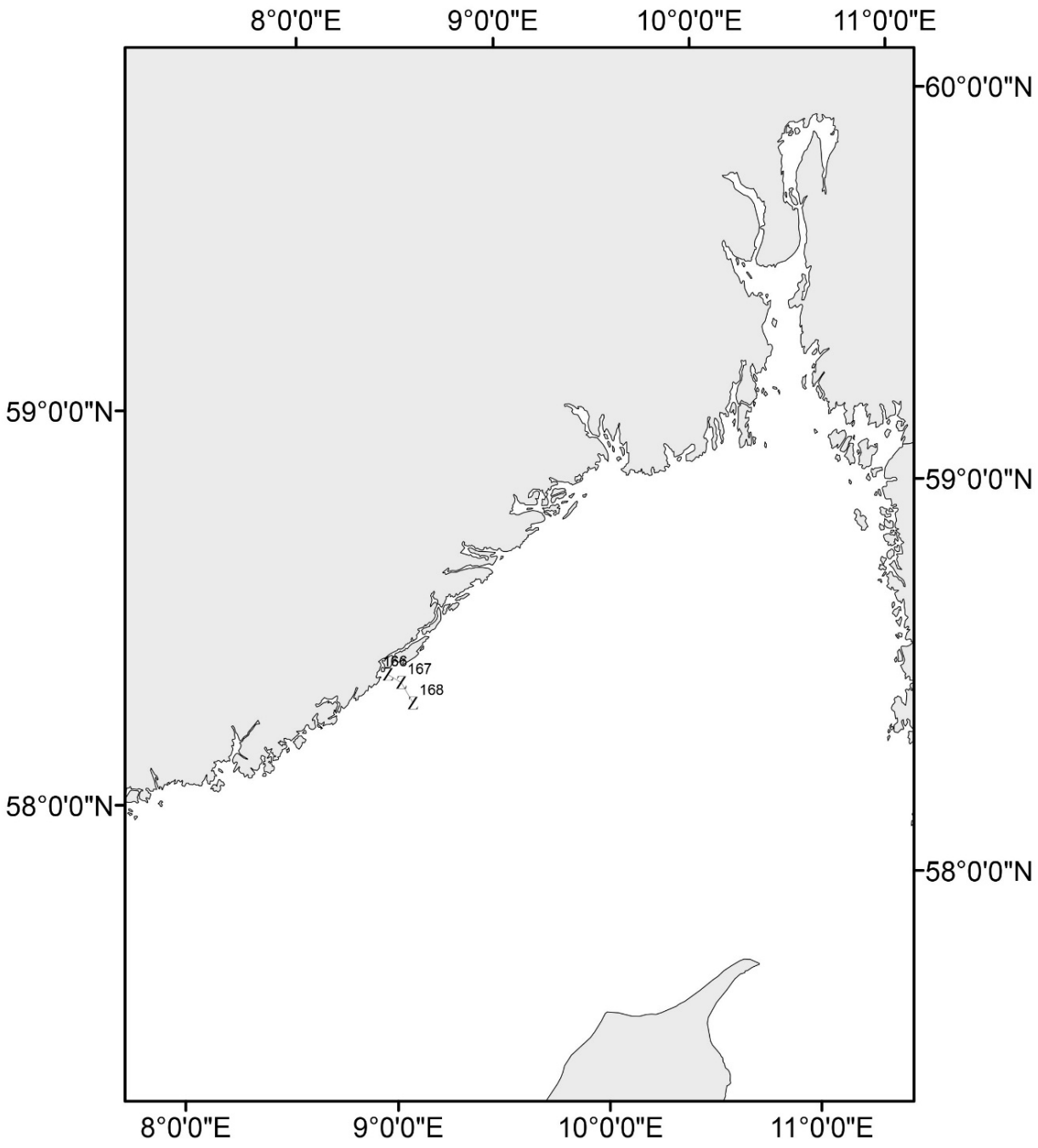
Cruise no 2020309
"G. M. Dannevig"
04.08 - 08.08 2020
Z CTD st. no. 139 - 165

Fig. 88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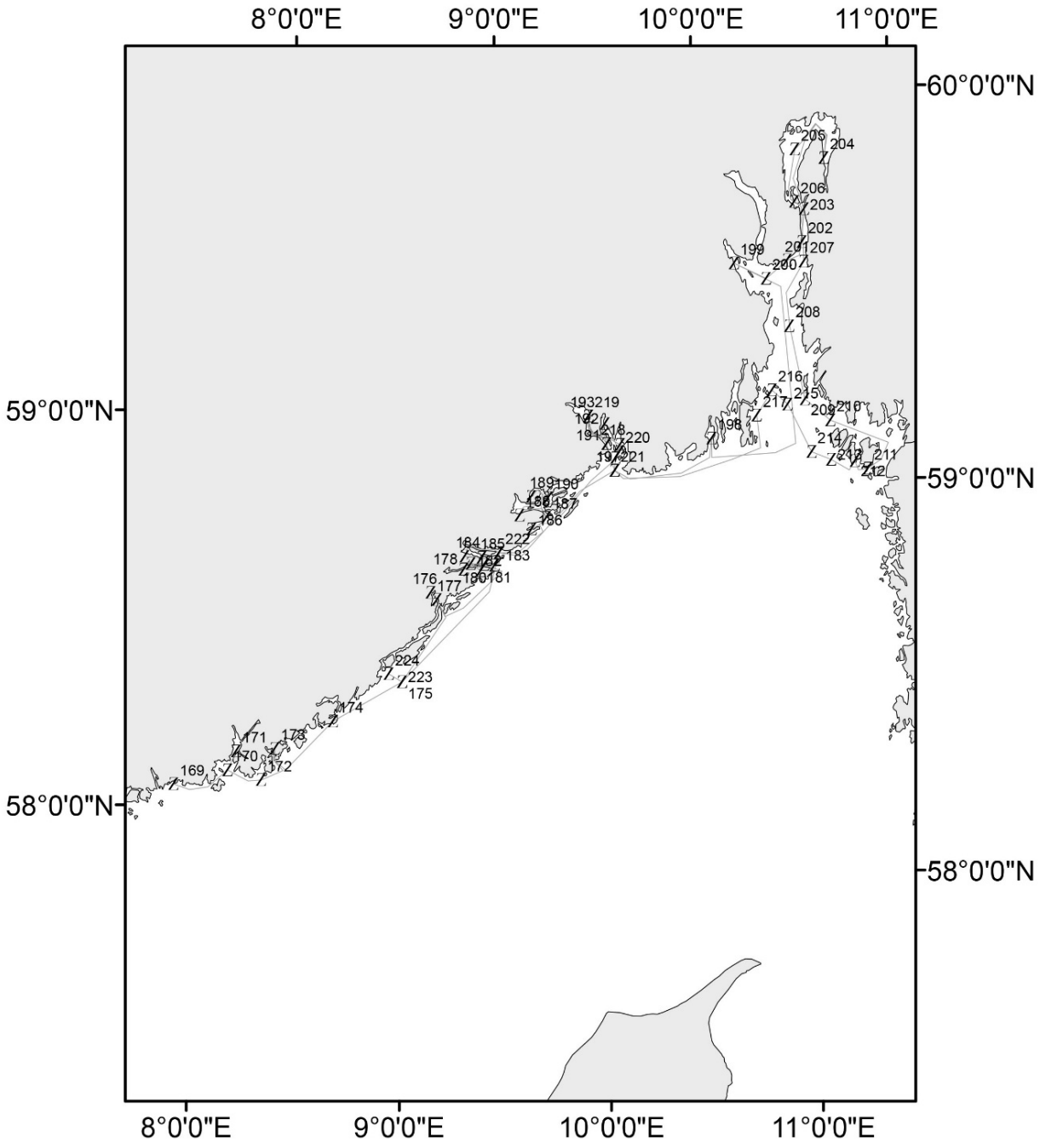
Cruise no 2020313
"G. M. Dannevig"
13.09 - 14.09 2020
Z CTD st. no. 166 - 168

Fig. 89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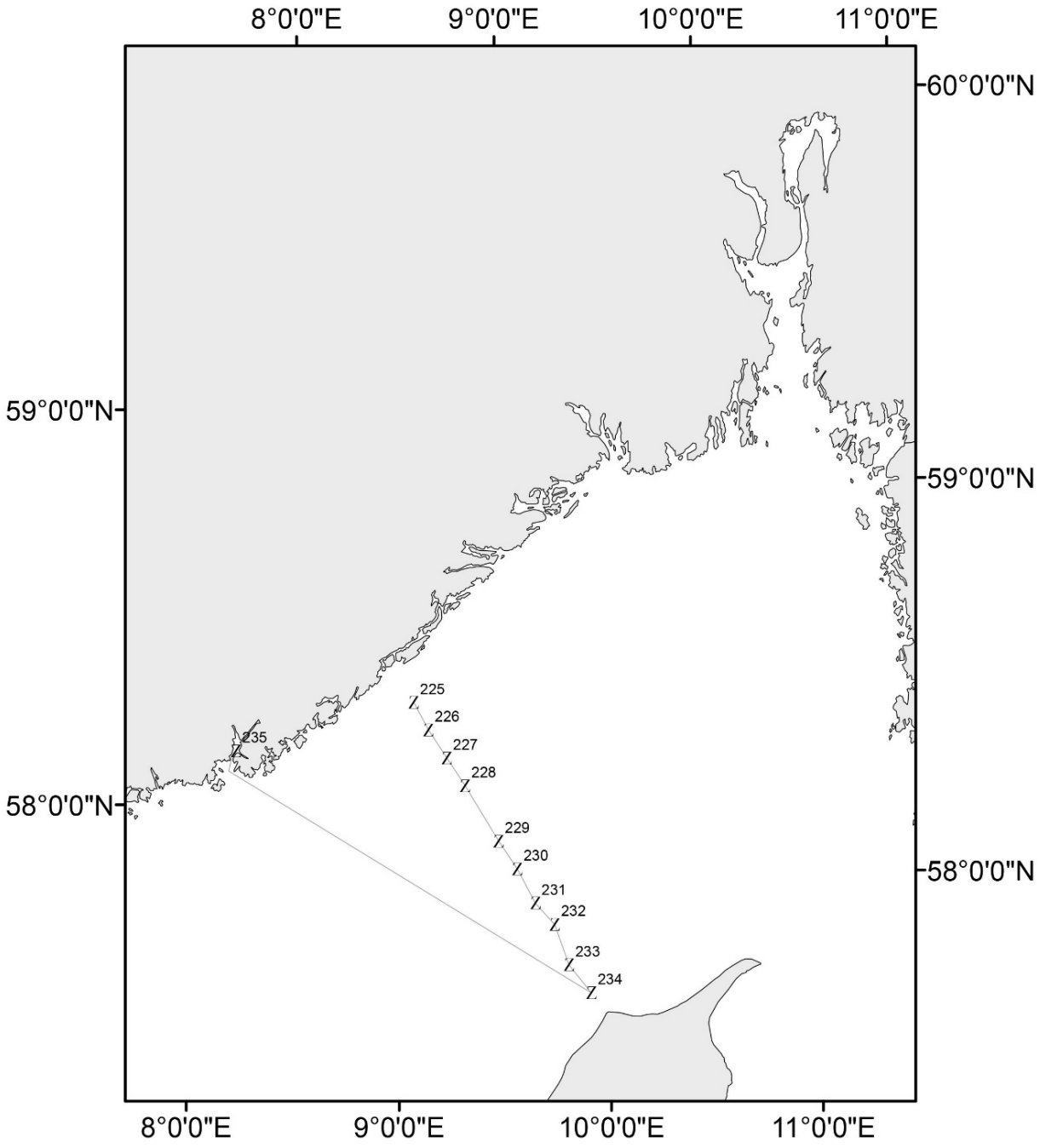
Cruise no 2020314
"G. M. Dannevig"
15.09 - 05.10 2020
Z CTD st. no. 169 - 224

Fig. 90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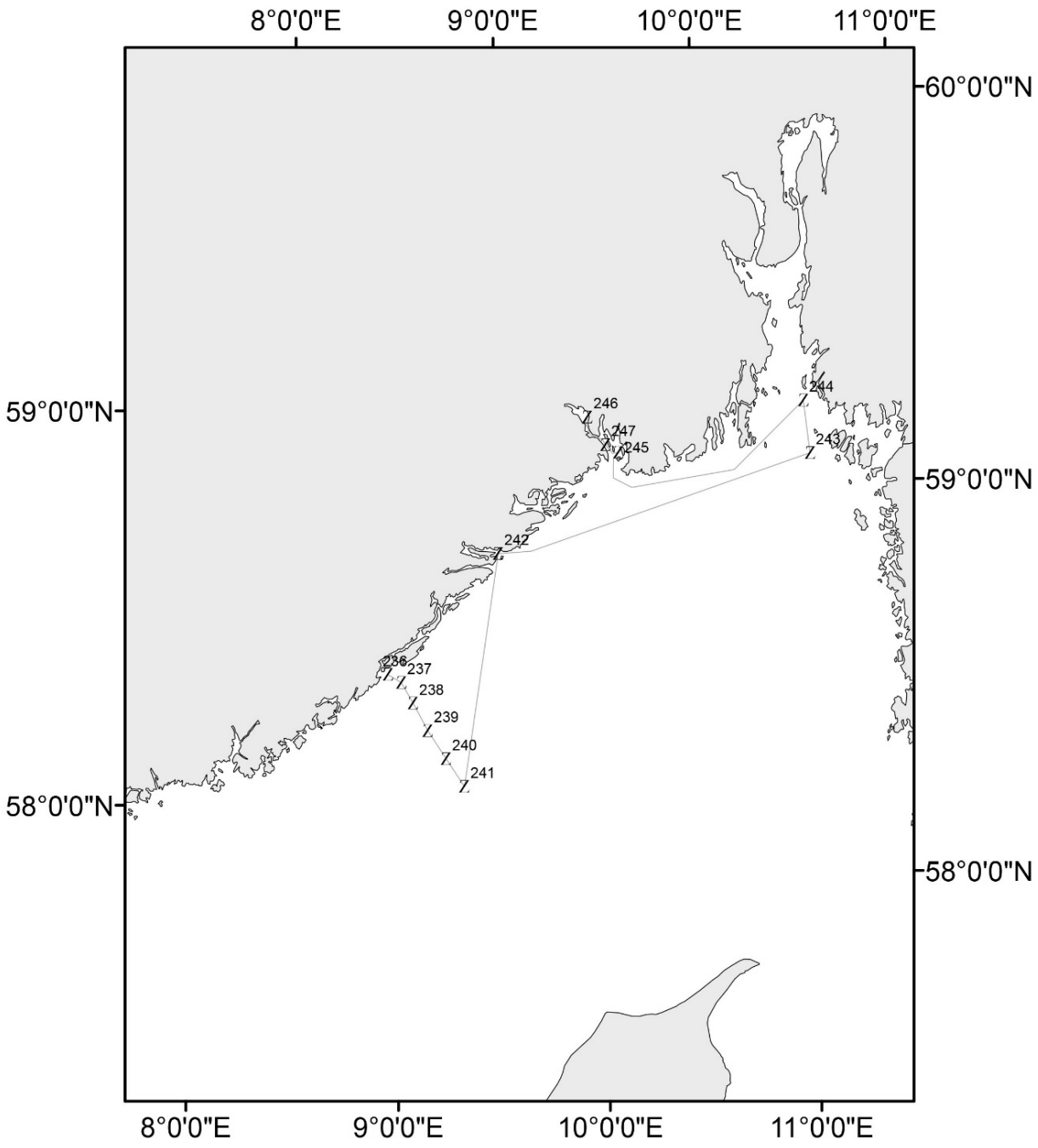
Cruise no 2020315
"G. M. Dannevig"
06.10 - 08.10 2020
Z CTD st. no. 225 - 235

Fig. 91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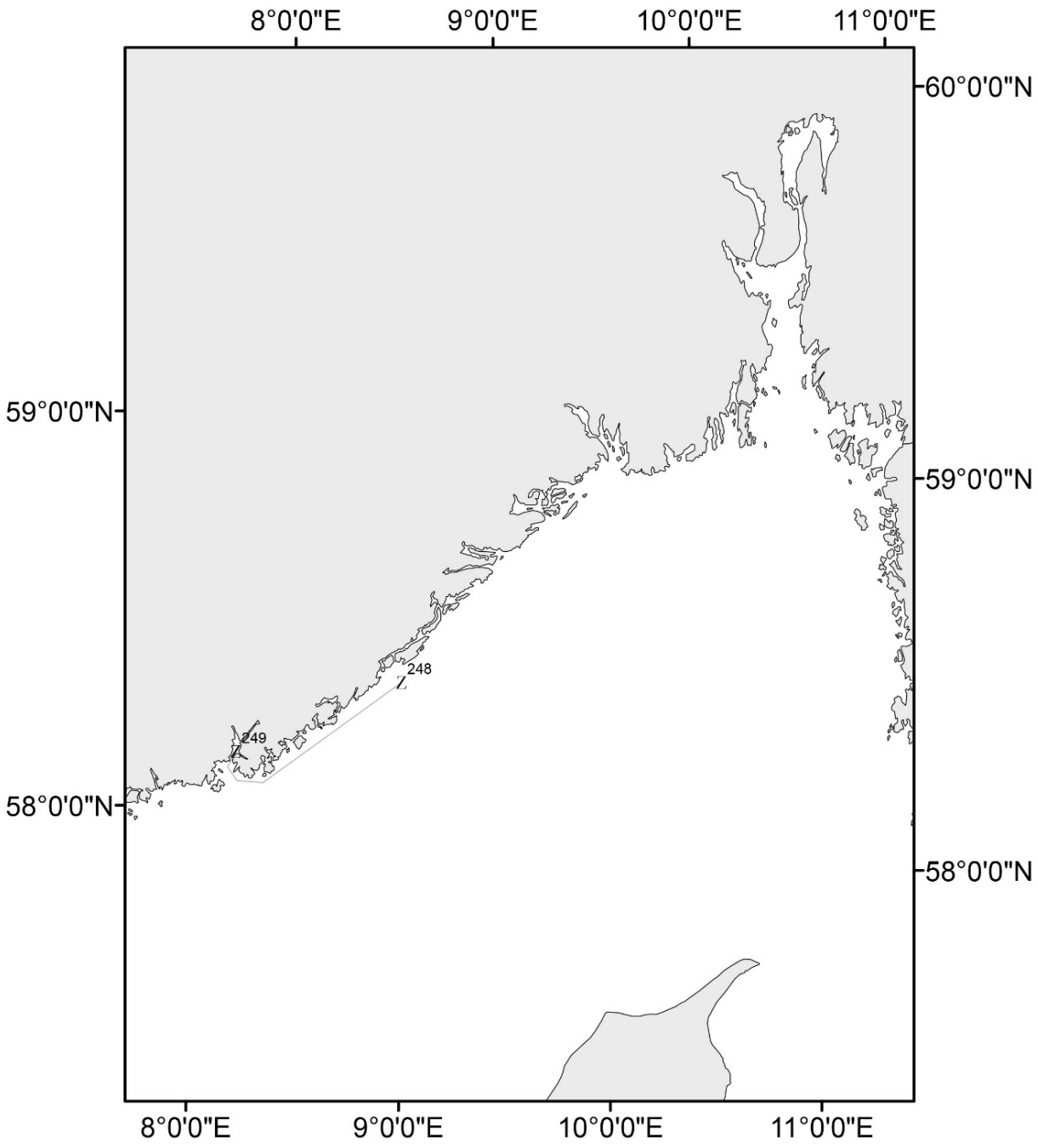
Cruise no 2020316
"G. M. Dannevig"
13.11 - 15.11 2020
Z CTD st. no. 236 - 247

Fig. 92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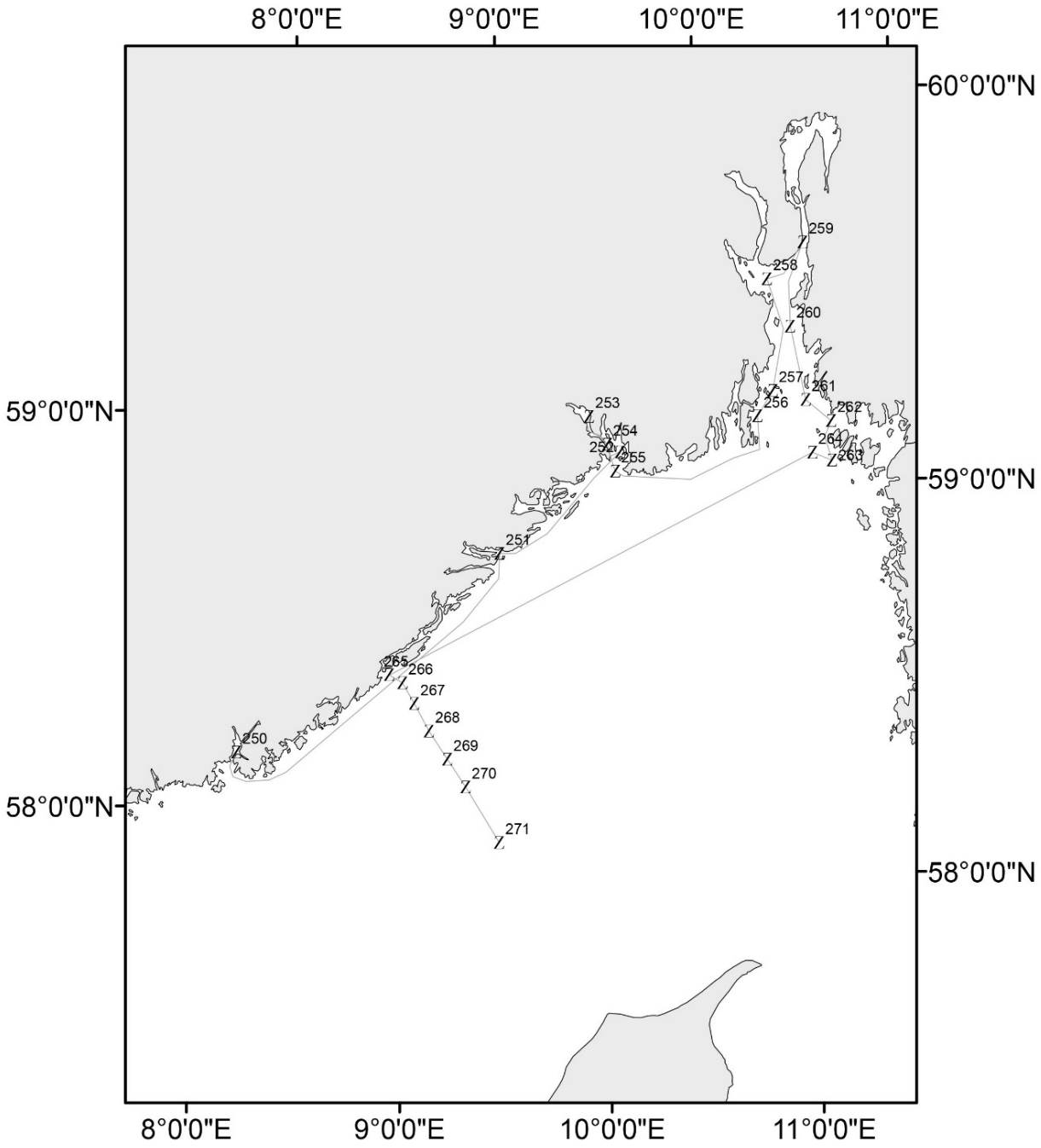
Cruise no 2020317
"G. M. Dannevig"
16.11 - 03.12 2020
Z CTD st. no. 248 - 249

Fig. 93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Cruise no 2020318
"G. M. Dannevig"
04.12 - 10.12 2020
Z CTD st. no. 250 - 271

Fig. 94

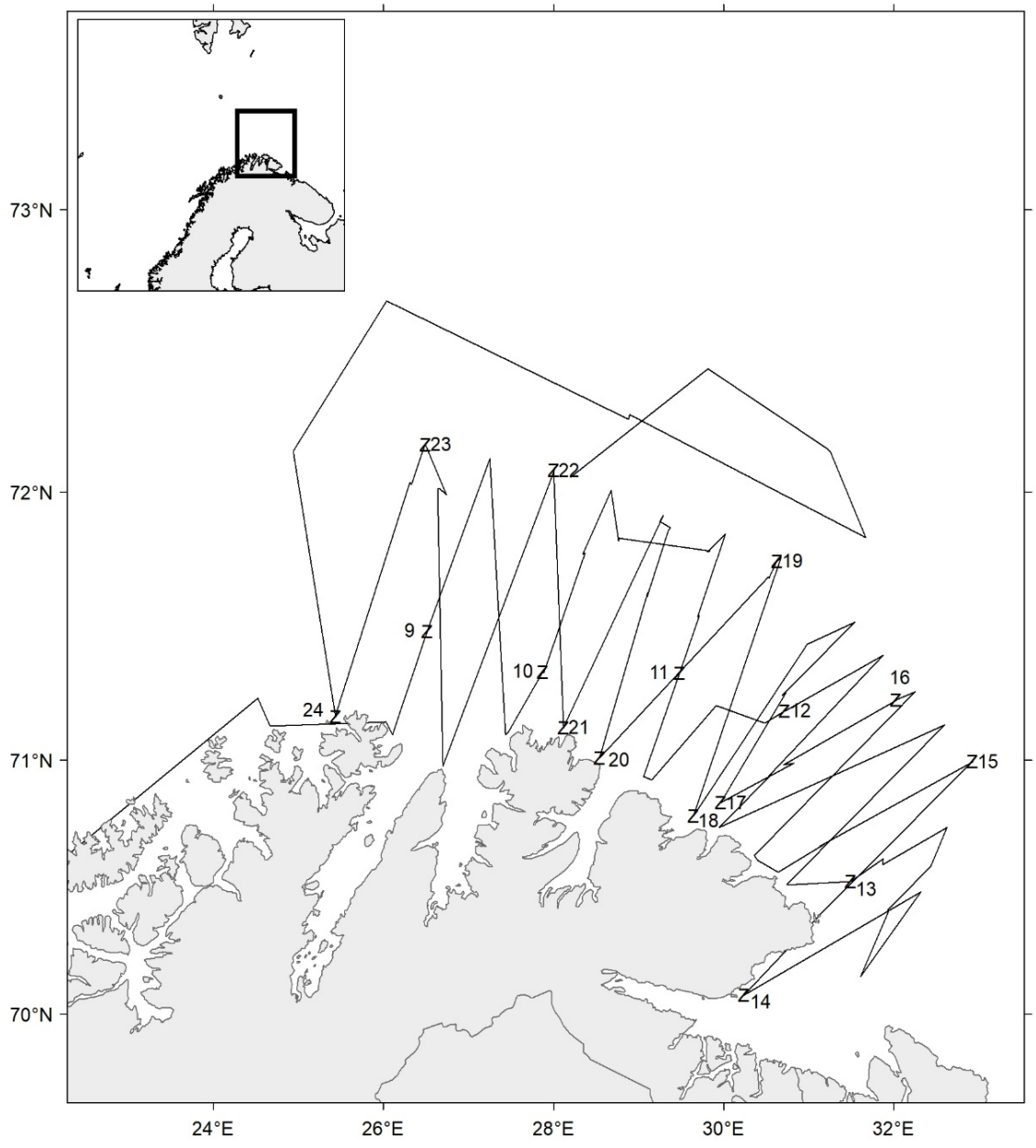
12 - Hired vessels – Cruises 2020

Cruise no	Period	Vessel	Purpose	Area	CTD st.no	Trawl st.no	Fig. no
2020802	26.2.-11.3.	«Eros»	Acoustic trawl monitoring survey for biomass estimation of the capelin spawning stock.	Barents Sea	9-24	18-35	95-97
2020803	26.2.-11.3.	«Vendla»	Acoustic trawl survey on Capelin spawning stock. Methodological survey using a stratified survey design aiming to measure the abundance of Capelin during the spawning season.	Norwegian Sea	12-29	1-24	98-99
2020807	30.1.-20.2.	“ Saga Sea”	Conduct an annual survey (commenced in 2011) to collect acoustic and biological data on Antarctic krill, other macrozooplankton and krill predators from sector 48.2 in the Southern Ocean. The study uses the same design as surveys conducted by the US AMLR Program and the British Antarctic Survey in areas 48.1 and 48.3. Data is reported to the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR). Integrated monitoring links these three main areas where active krill fishing is conducted. IMR depend on the logistics offered by Aker Biomarine AS; a vessel with crew free of charge for implementing the survey on annual basis.	Southern Ocean South Orkney Islands plateau, CCAMLR Subarea 48.2	-	-	100
2020813	2.7.-4.8.	“ Vendla”	Trawl survey to monitor the stock of Atlantic mackerel using swept area methodology. Acoustic survey to monitor the spawning stock of Norwegian spring spawning herring and the stock of blue whiting in the Nordic Seas. Ecological studies (temperature, plankton, whale observations) in relation to pelagic fish.	Northeast Atlantic Ocean Norwegian Sea	30-107	40-129	101-102
2020814	2.7.-4.8.	«Kings Bay»	Primary objectives:Large-scale mapping and abundance estimation of Northeast Atlantic (NEA) mackerel, Norwegian Spring-Spawning (NSS) herring and Atlantic blue whiting. Swept area trawling for mackerel and acoustic recordings and trawling for NSS herring and blue whiting. Secondary objectives: Mapping distribution of Atlantic salmon, lumpfish and other pelagic species. Sampling of zooplankton and water temperature/salinity profiles. Tagging of 100 lumpfish. Opportunistic marine mammals observations along the transects and survey lines.	Greenland Sea Iceland Sea Norwegian Sea	1-74	14-99	103-104
2020817	14.2.-26.6.	«Kings Bay»	Collection of acoustic data from fisheries sonar for study of herring schools. • Collection of acoustic data from echo sounder for biomass estimation of herring. • Collection of biological samples for estimation of species and size composistion in the acoustic observations.	Norwegian Sea	-	1-13	105
2020818	14.2.-26.2.	«Eros»	Provide acoustic estimates of abundance and distribution of Norwegian spring spawning herring during the spawning migration along the Norwegian coast.	Norwegian Coast	1-8	1-17	106
2020819	14.2.-26.2.	«Vendla»	Collection of acoustic data from fisheries sonar for study og herring schools. • Collection of acoustic data from echo sounder for biomass estimation of herring. • Collection of biological samples for estimation of species and size composistion in the acoustic observations. • Collection of hydrographic data (CTD).	Norwegian Sea	1-11	1-15	107
2020821	23.4.-13.5.	«Eros»	Measuring the abundance, distribution and age composition of lesser sandeel. • Dredge sampling for burrowed sandeels. • Bottom trawls. • Pelagic trawls. • Echo sounder sampling. • Zooplankton sampling. • Mapping of hydrographical conditions.	North Sea	25-54	36-148	108-110
2020822	24.2.-29.2.	«Fiskebas»	Develop and test methods for monitoring fish behaviour, catch composition and gear performance during purse seine capture. Investigate the effect of capture process on fish welfare and thereby quality and survival following slipping from purse seine.	Norwegian Sea	-	-	No chart

2020826	9.9.-18.9.	«M. Ytterstad»	Acoustic survey for testing methods for abundance estimation of Bluefin tuna in Norwegian waters.	Norwegian Sea	-	-	111
2020830	9.2.-14.2.	“ H. U. Sverdrup II”	The objective of the SpawnSeis project is to study effects of seismic exposures on the behaviour of wild, free ranging, spawning cod using acoustic telemetry in Austevoll, Norway. The objective of the cruise is to deploy airguns from the vessel and expose the experimental area and to monitor the resulting noise patterns in the area where the cod is tagged. CTD stations were also taken in the area to characterise the propagation properties of the water column. The behavioural data will be downloaded from the listening buoys for the fish tags later and is not part of this survey.	Norwegian Sea	-	-	112
2020831	6.6.-26.6.	“ Kato”	The main purpose of the cruise was to obtain data for ecological monitoring of the minke whale stock. Samples were collected for the project “Arven etter Nansen”, with special focus on diet and dietary changes over time. Diets (stomach content); fatty acids (blubber, muscle, liver); stable isotopes (blubber, muscle, liver, eye, baleens); pollutants (blubber, muscle, liver), fertility (ovaries); age determination (eye and baleens); nutrients and micronutrients (faeces). There was a complete sampling from all whales. All material was frozen to be analysed later.	Barents Sea	-	-	113
2020840	18.5.-27.5.	“ Rind”	Mapping fish communities in coastal areas of Hitra and Frøya by using Baited stereo-video rigs (BRUVs) and fish traps. Fish traps also used to tag cod with floy tags.	Norwegian Sea	130-198	-	114
2020841	15.6.-21.6.	“ Helmer Hanssen”	Mapping of Iceland scallop stocks in the Svalbard Fishery Protection Zone. Monitoring spread of snow crab in coastal water in west and north of Spitsbergen.	Barents Sea	-	-	115
2020842	21.1.-27.2.	“ Helmer Hanssen”	Abundance and distribution of cod and haddock.	Barents Sea Greenland Sea	1-54	1-96	116-117
2020843	18.10.-15.11.	«Tenor»	Sorting of fish and shrimp in shrimp trawls.	North Sea	1-42	-	118
2020844	20.5.-2.6.	«Tangen»	The objective of the cruise was to obtain data on size selectivity of codends of two and four panel designs, 150 meshes in circumference.	North Sea	-	1-24	119
2020852	18.6.-24.6.	«Tangen»	The objective of the cruise was to obtain data on size selectivity of codend of four panel design, 150 meshes in circumference with 10% shorter lastridge ropes. This was done by pair-trawling with one trawl with codend of 6 mm mesh size (control) and one with the test codends of ~37 mm mesh sizes. The cruise was conducted without any serious interruptions. A sample of shrimp were measured from each codend, usually >400 specimen. Bycatches were separated and weighted, Norway pout, blue whiting, Silvery cod, silver belly, flatfish (dab and witch) were measured. Other species are accounted for; counted and weighed. Fishing depth and temperature were logged for every haul.	North Sea	-	1-10	120
2020842	13.2.-25.2.	«Vendla»		Norwegian Sea	1-11	1-13	142-143
2020843	19.11.-10.12.	“ Nystrøm”		Northeast Atlantic Ocean	-	-	No Chart

2020844	18.6.-12.8.	“ ACC Mosby”		Barents Sea, Greenland Sea, Norwegian Sea	-	-	No Chart
2020847	23.4.-13.5.	“ Eros”		North Sea	11-35	15-48	144-145
2020849	28.4.-10.5.	“ Tangen”	.	North Sea	-	1-17	146

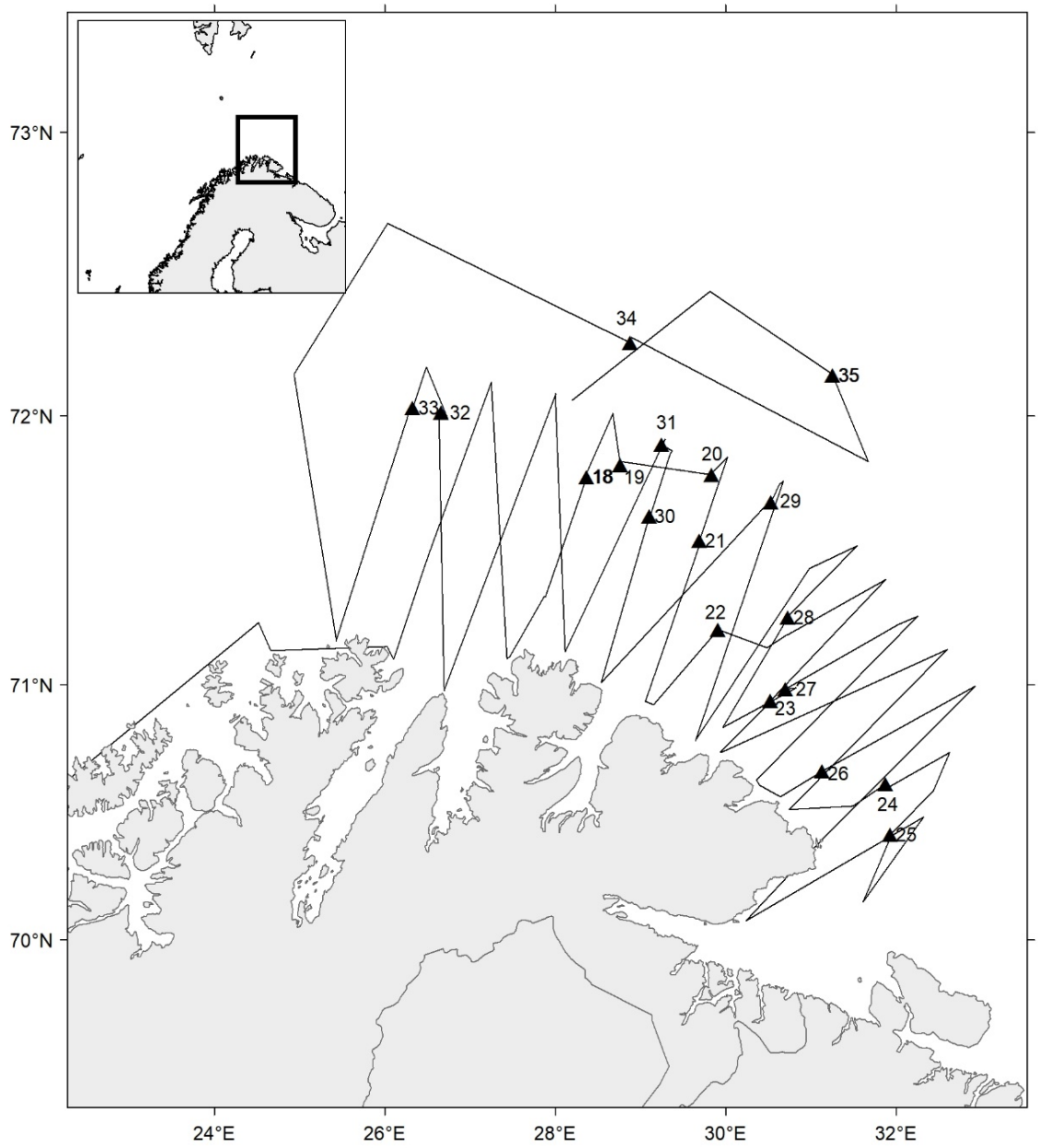
13 - Hired vessels – Charts for hired vessels 2020



Cruise no 2020802 "Eros" (Chart I)
26 February–11 March 2020

z CTD st.no 9-24

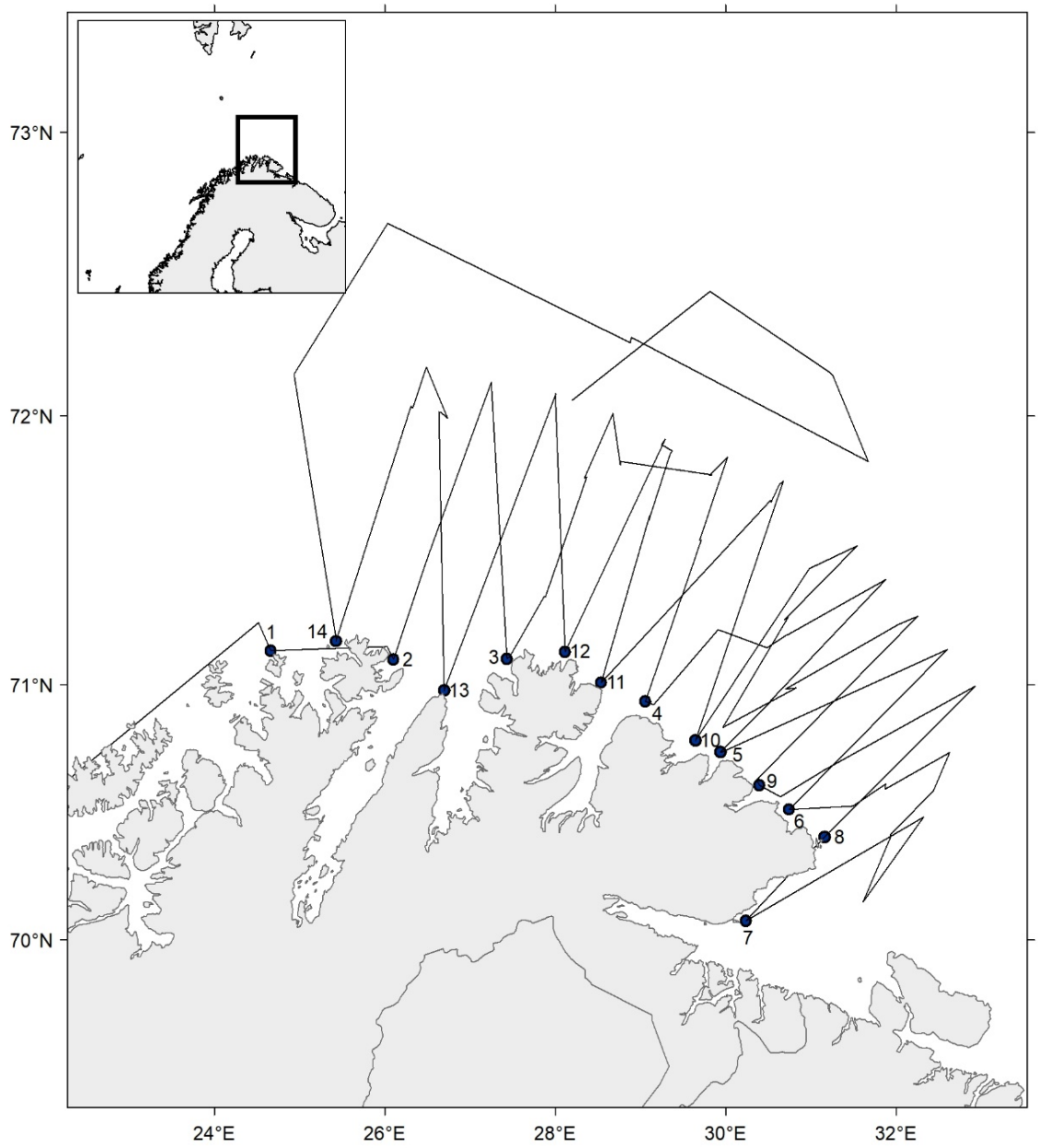
Fig. 95



Cruise no 2020802 "Eros" (Chart II)
26 February–11 March 2020

▲ Pelagic trawl st.no 18–35

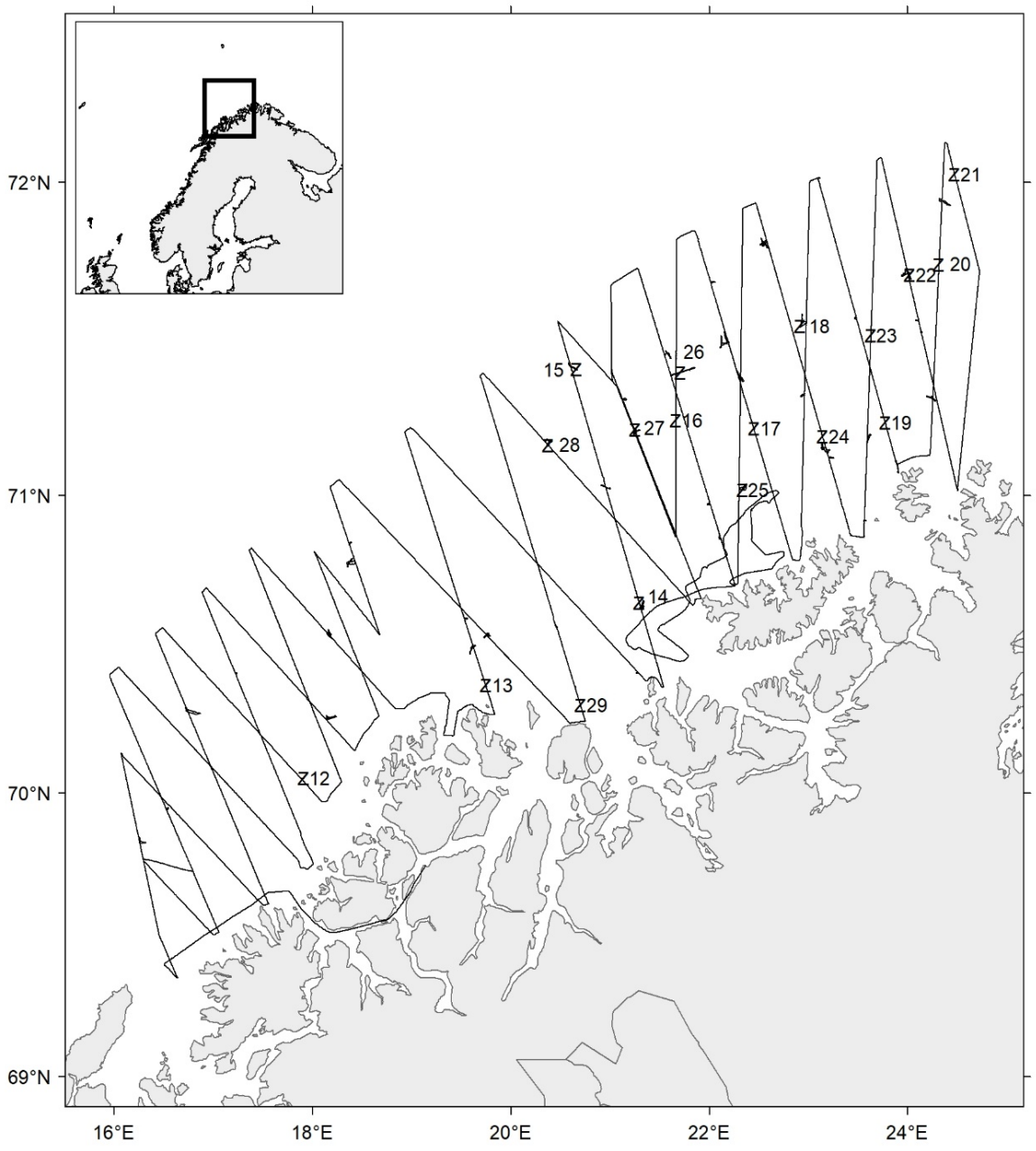
Fig. 96



Cruise no 2020802 "Eros" (Chart III)
26 February–11 March 2020

● Video stations 1–14

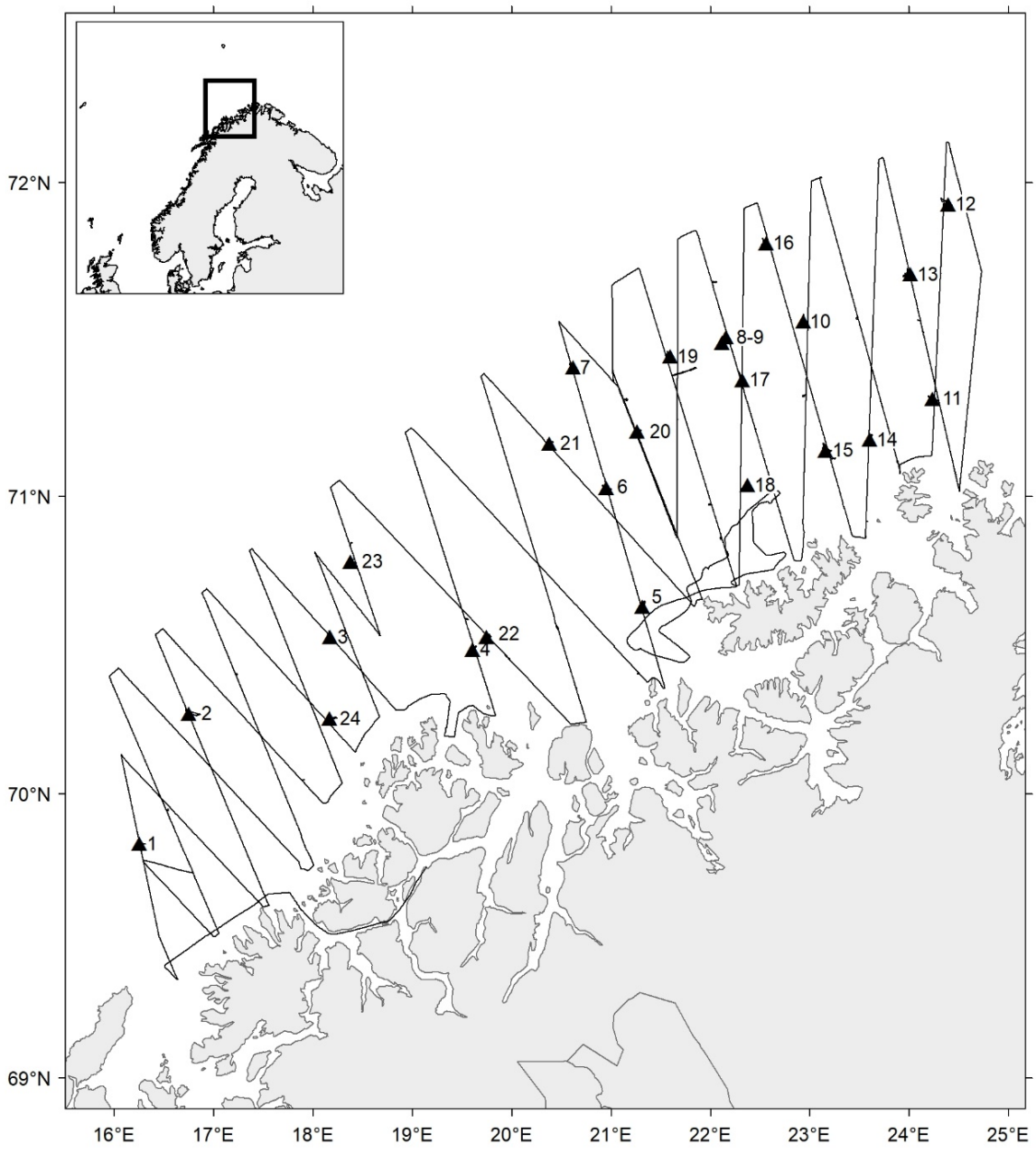
Fig. 97



Cruise no 2020803 "Vendla" (Chart I)
26 Februar–11 March 2020

z CTD st.no 12-29

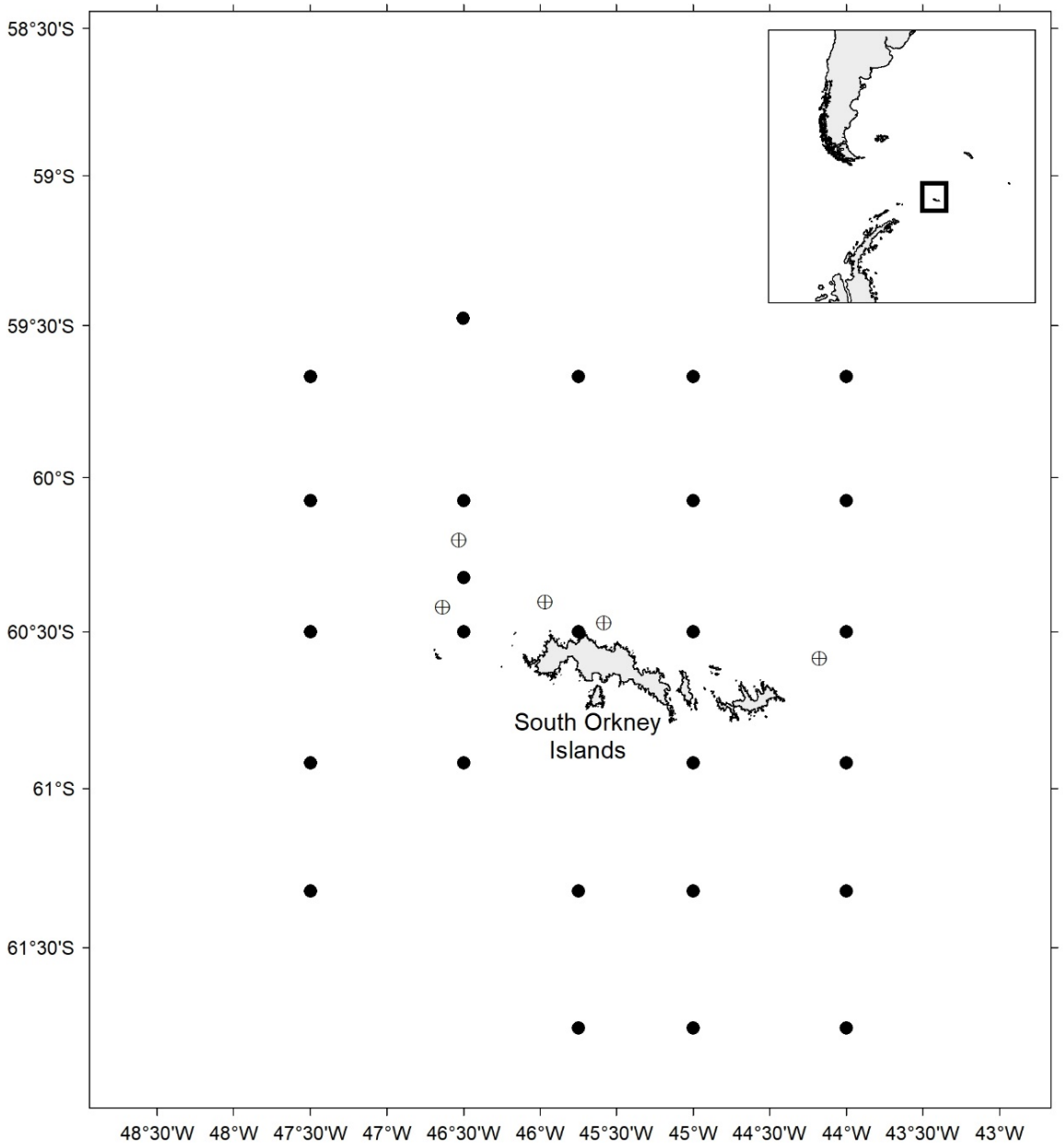
Fig. 98



Cruise no 2020803 "Vendla" (Chart II)
26 Februar–11 March 2020

▲ Pelagic trawl st.no 1-24

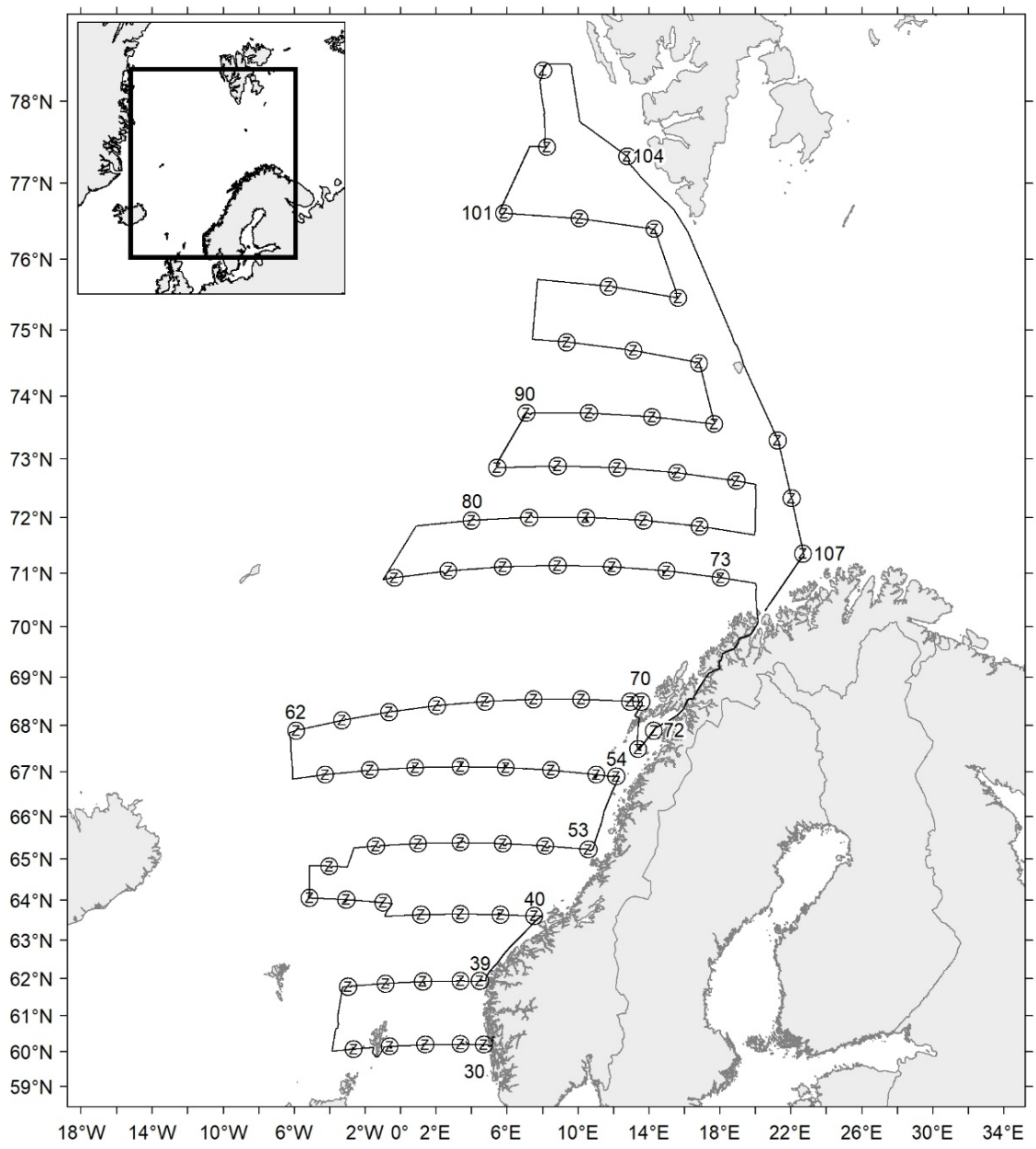
Fig. 99



Cruise no 2020807 "Saga Sea"
30 January–20 February 2020

● Zooplankton from trawl stations (macrozooplankton trawl)
⊕ Moorings

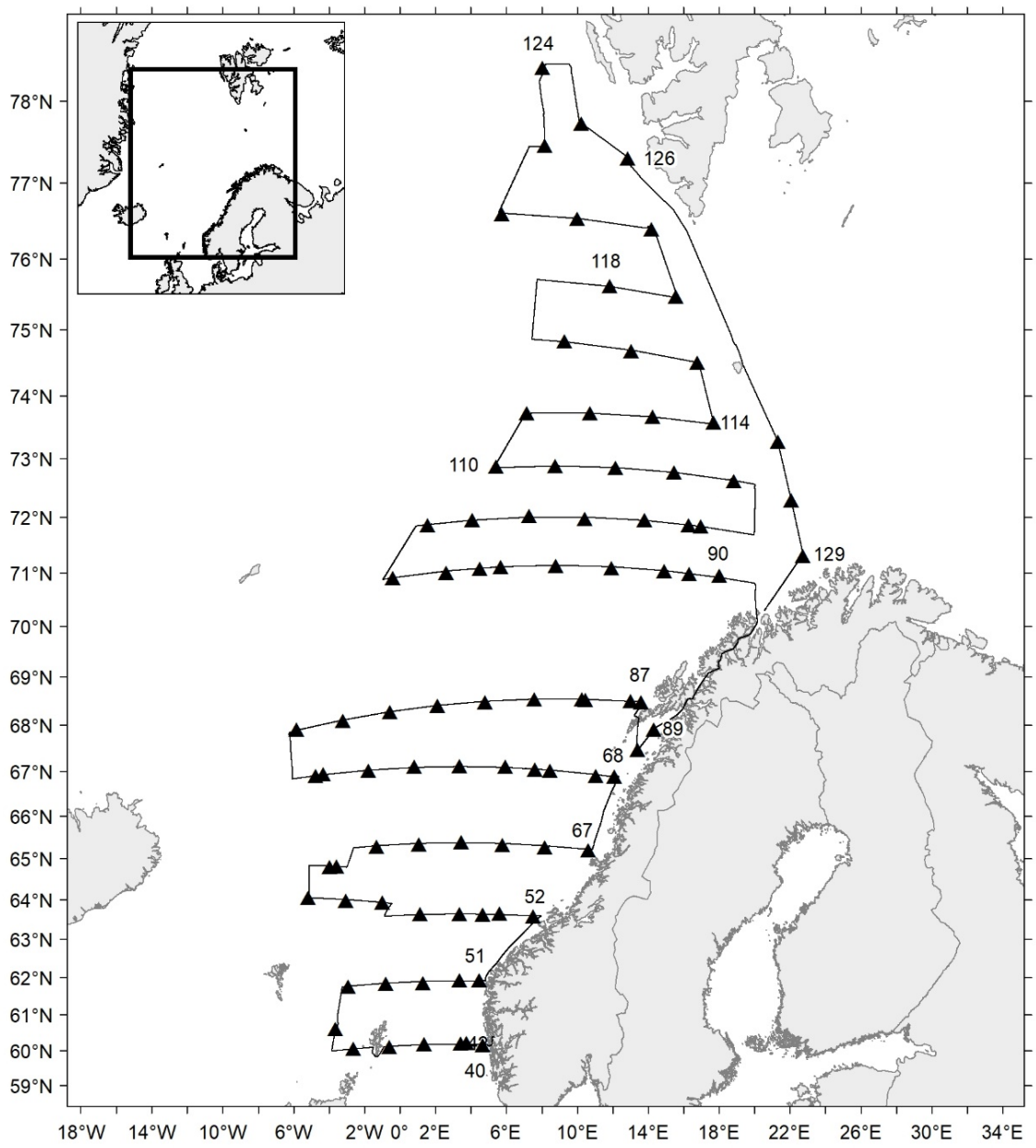
Fig. 100



Cruise no 2020813 "Vendla" (Chart I)
2 July–4 August 2020

z CTD st.no 30-107
○ Plankton st. (WP-II-net)

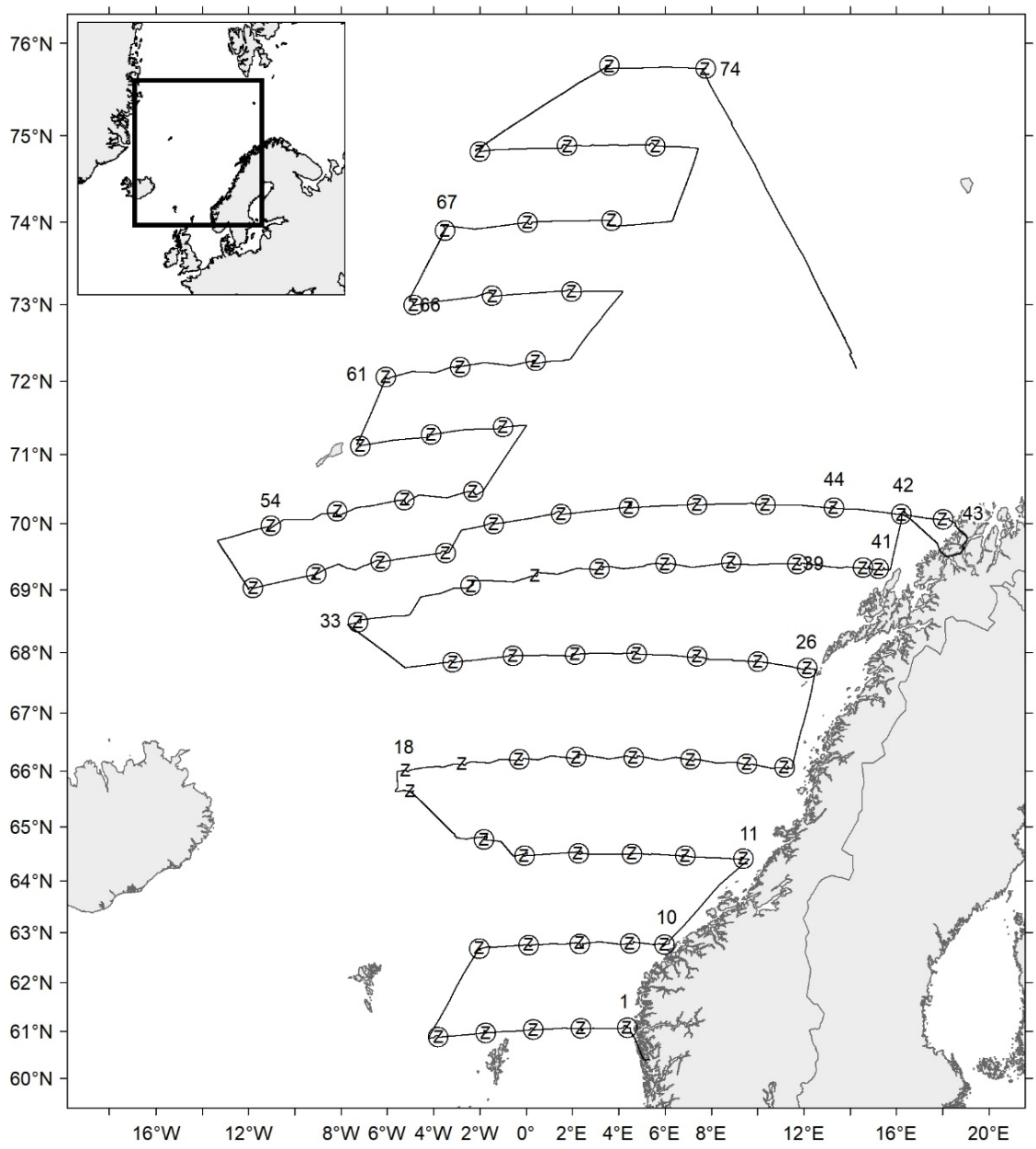
Fig. 101



Cruise no 2020813 "Vendla" (Chart II)
2 July–4 August 2020

▲ Pelagic trawl st.no 40-129

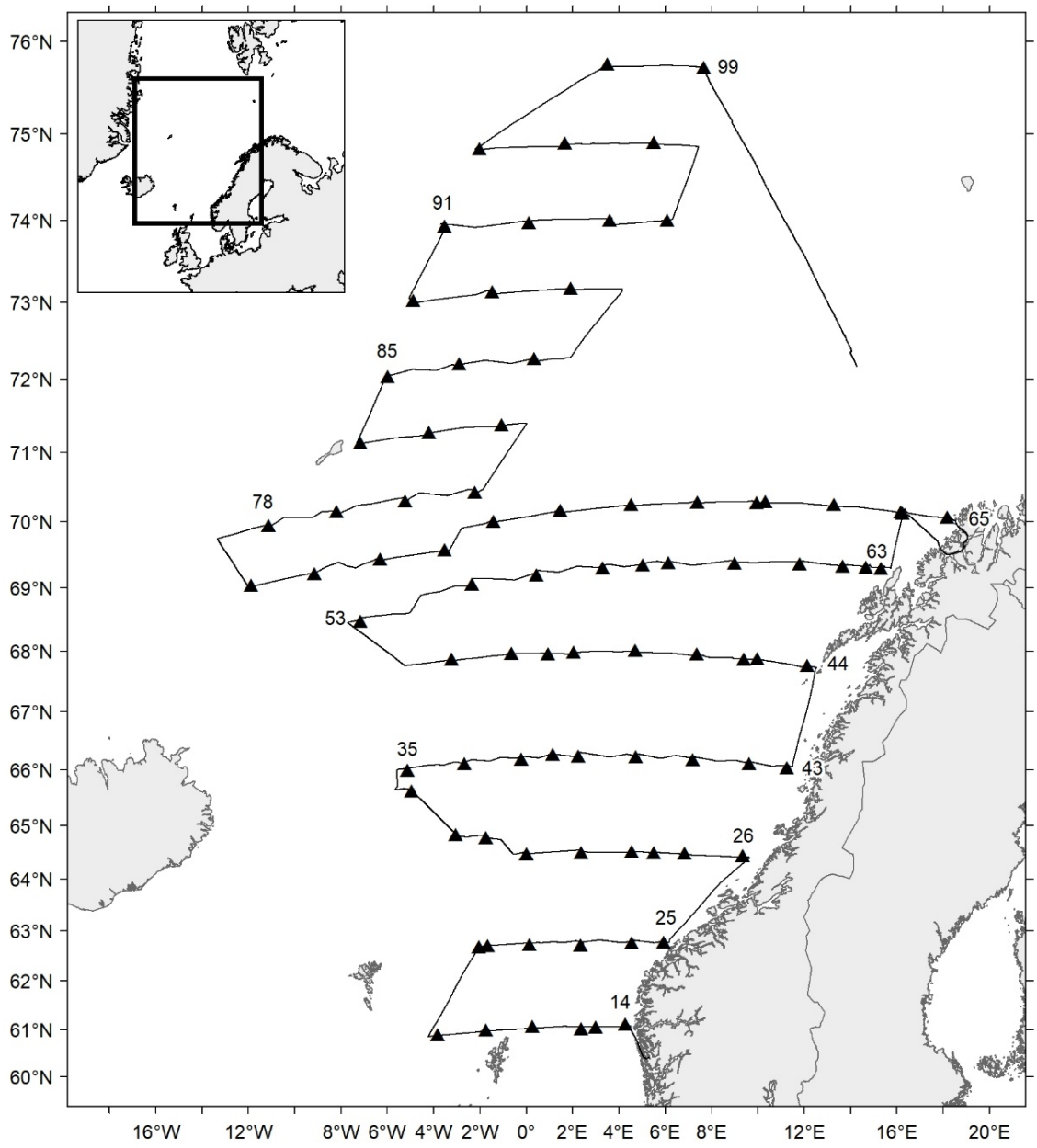
Fig. 102



Cruise no 2020814 Kings Bay (Chart I)
2 July–4 August 2020

z CTD st.no 1-74
○ Plankton st. (WP-II-net)

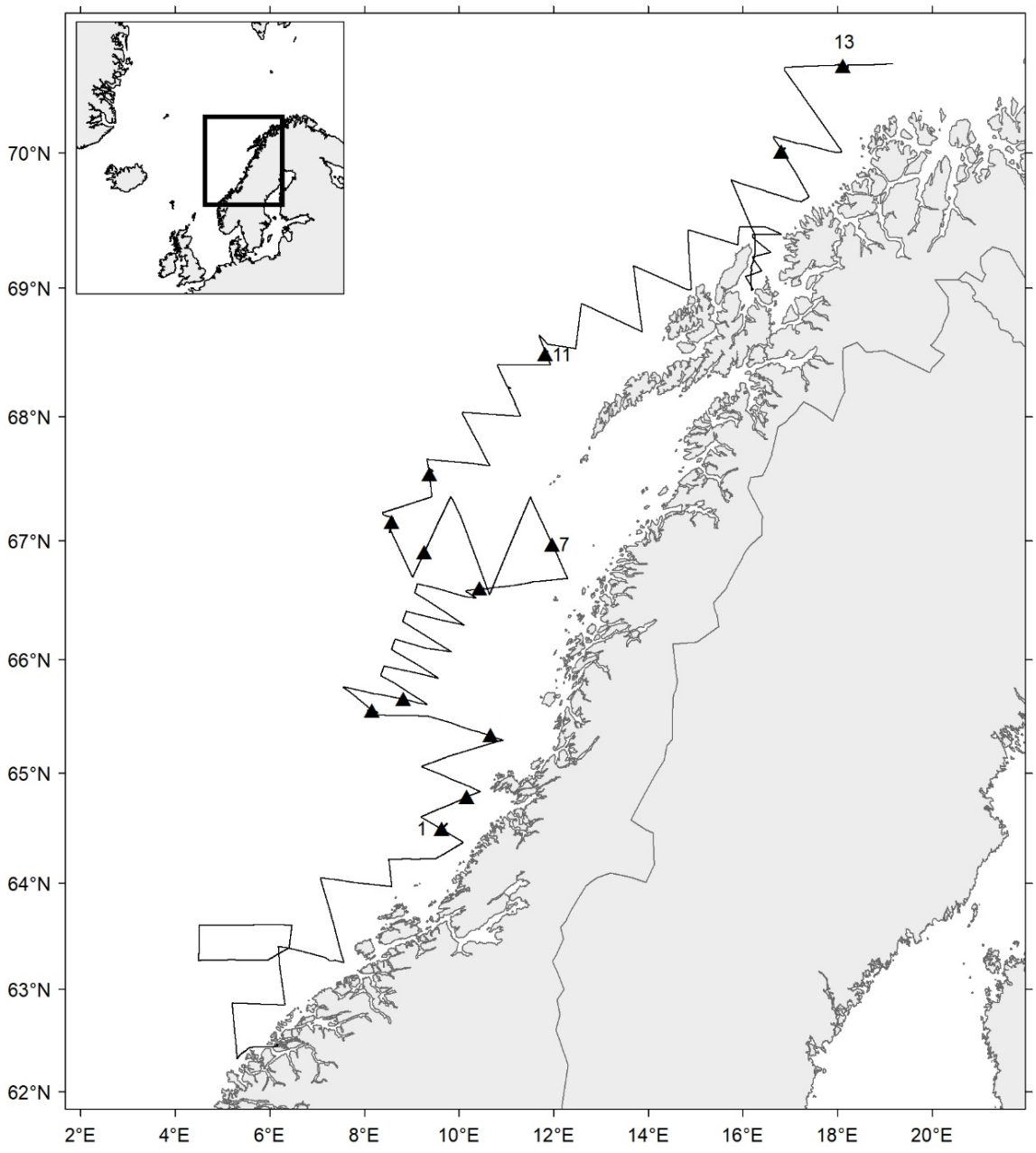
Fig. 103



Cruise no 2020814 "Kings Bay" (Chart II)
3 July–4 August 2020

▲ Pelagic trawl st.no 14-99

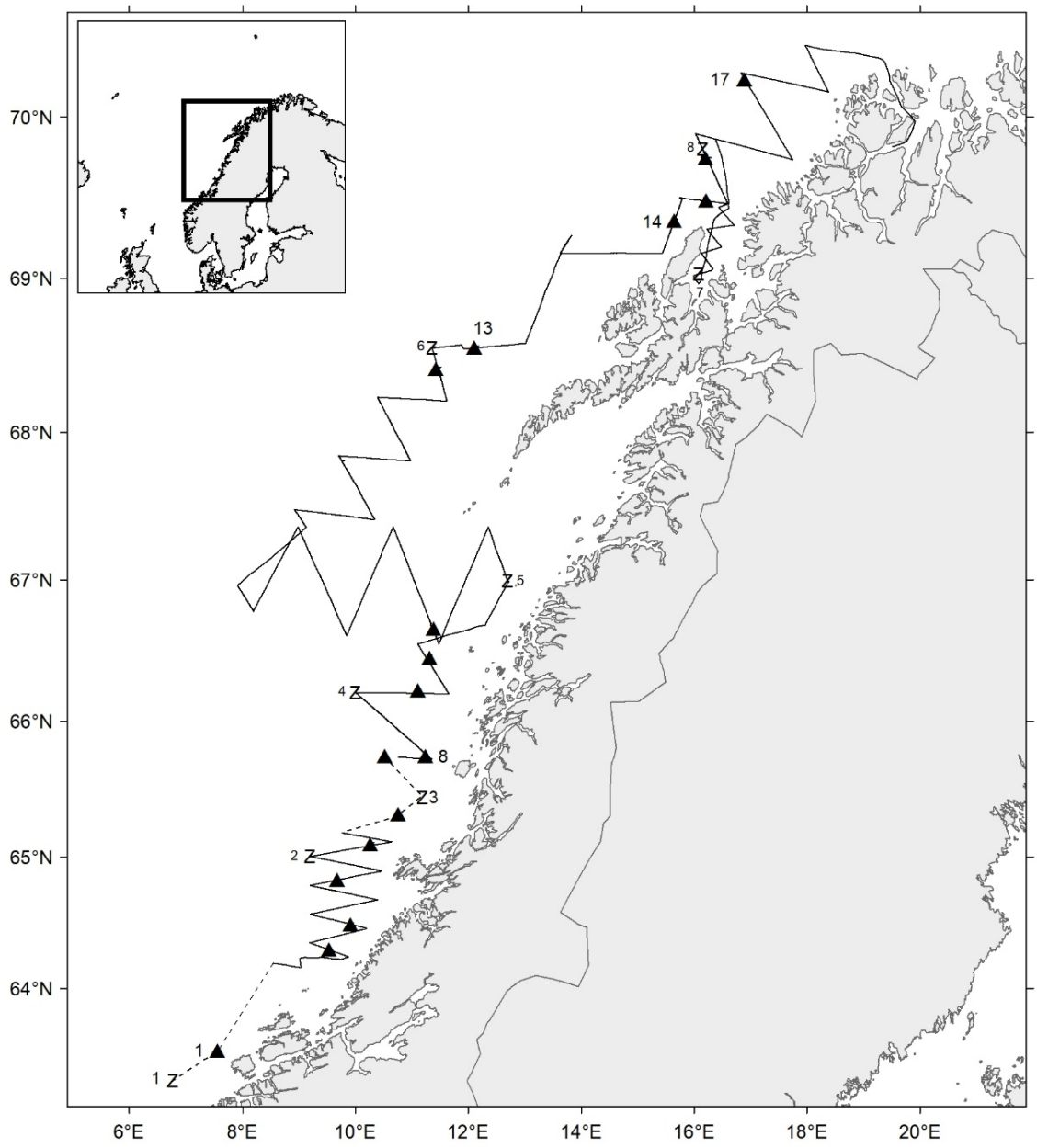
Fig. 104



Cruise no 2020817 "Kings Bay"
14–26 February 2020

▲ Pelagic trawl st.no 1–13

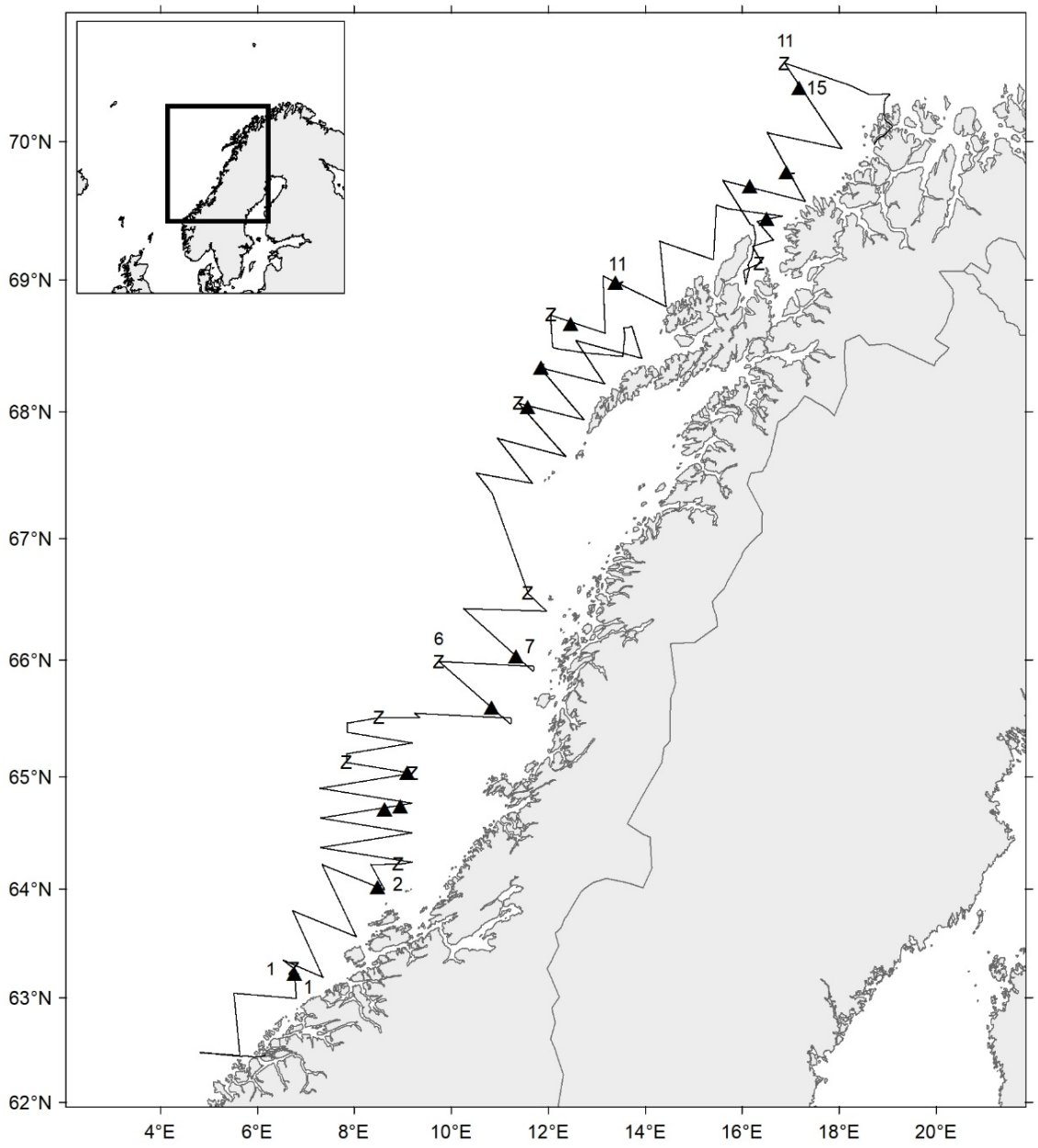
Fig. 105



Cruise no 2020818 "Eros"
14–26 Februar 2020

z CTD st.no 1-8
▲ Pelagic trawl st.no 1-17

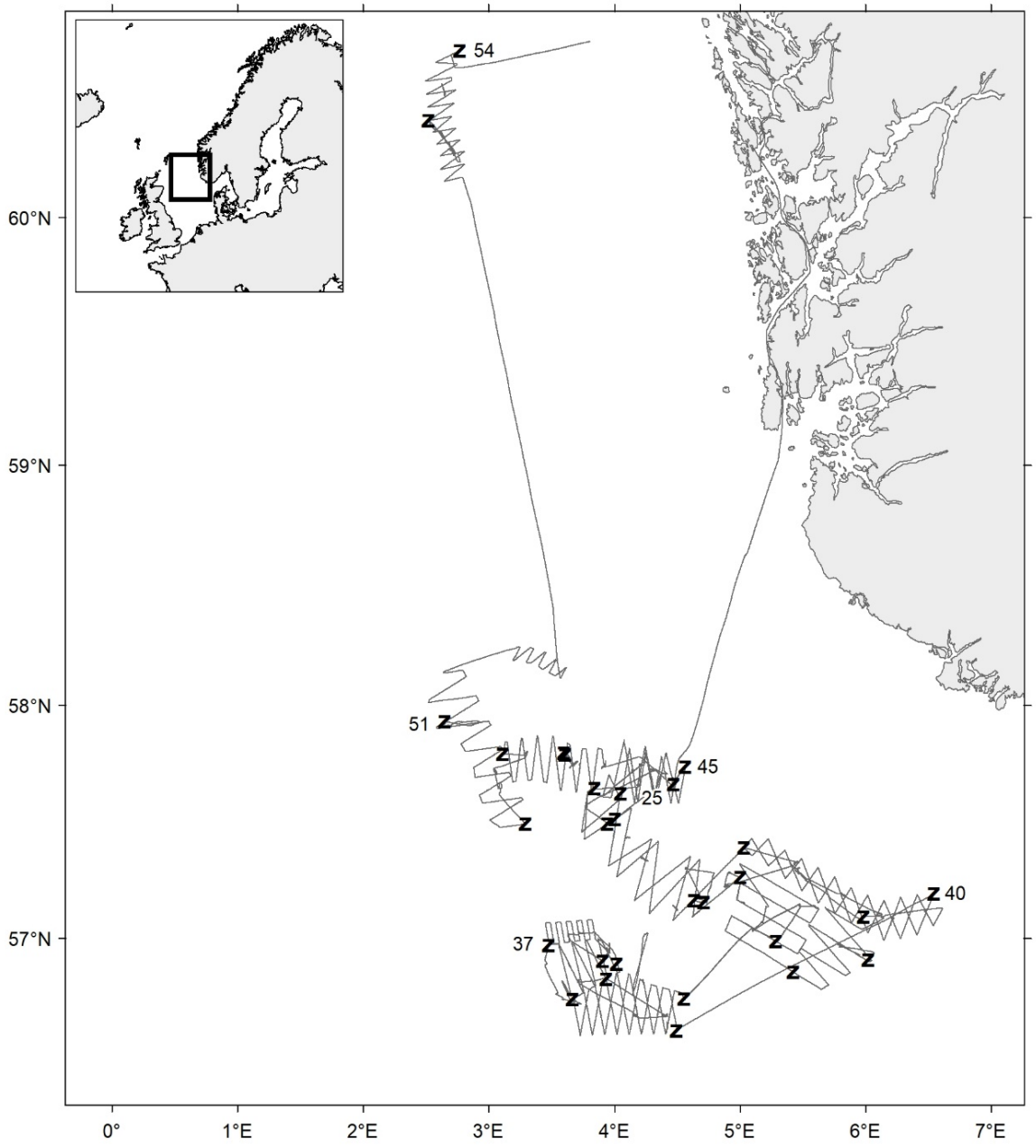
Fig. 106



Cruise no 2020819 "Vendla"
14–26 February 2020

z ctd st.no 1–11
▲ Pelagic trawl st.no 1–15

Fig. 107



Cruise no 2020821 "Eros" (Chart I)
23 April–13 May 2020

z CTD st.no 25-54

Fig. 108

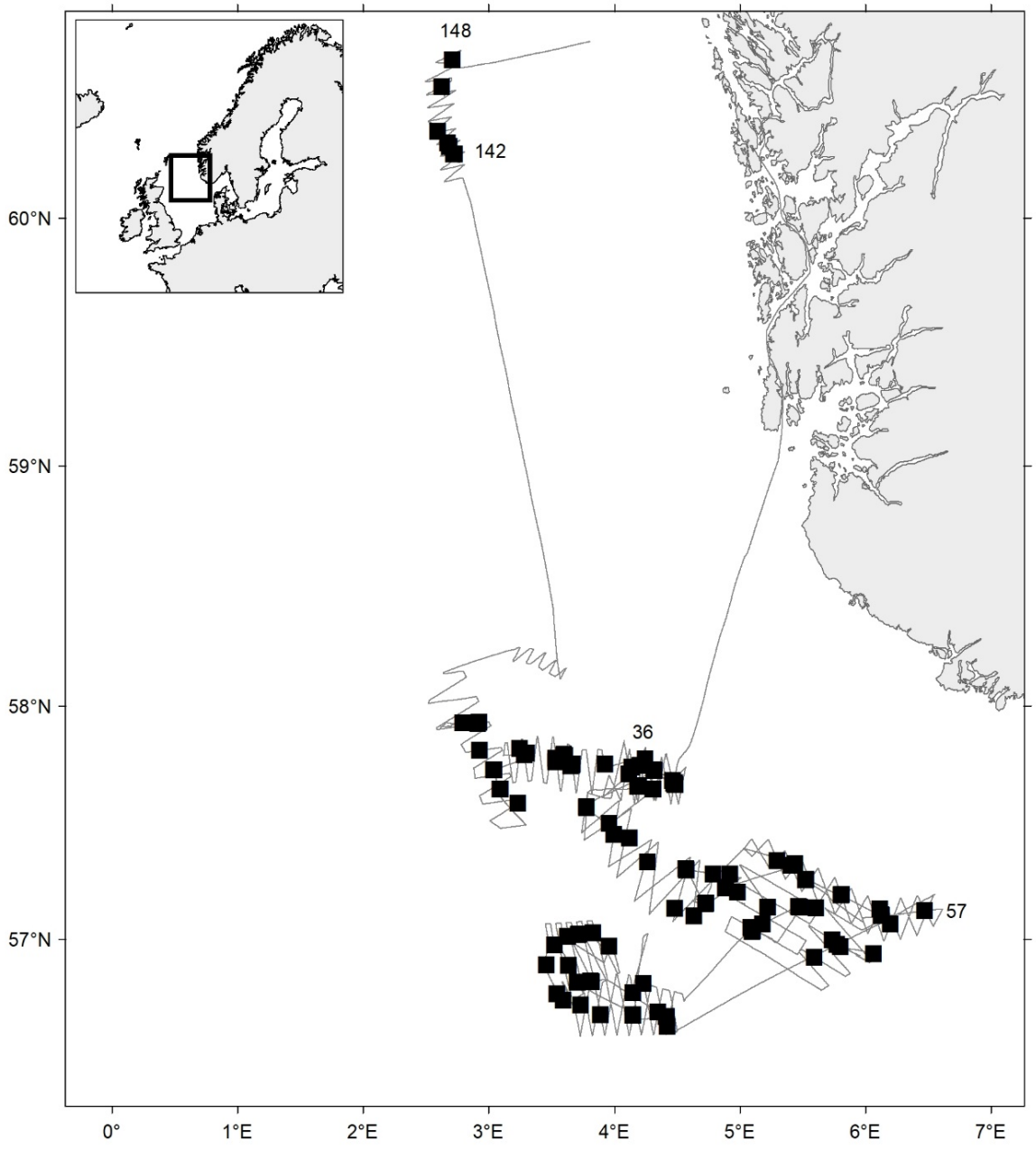

148
142
36
57
60°N
59°N
58°N
57°N
0°
1°E
2°E
3°E
4°E
5°E
6°E
7°E
Cruise no 2020821 "Eros" (Chart II)
23 April–13 May 2020
Bottom trawl st.no 36–148

Fig. 109

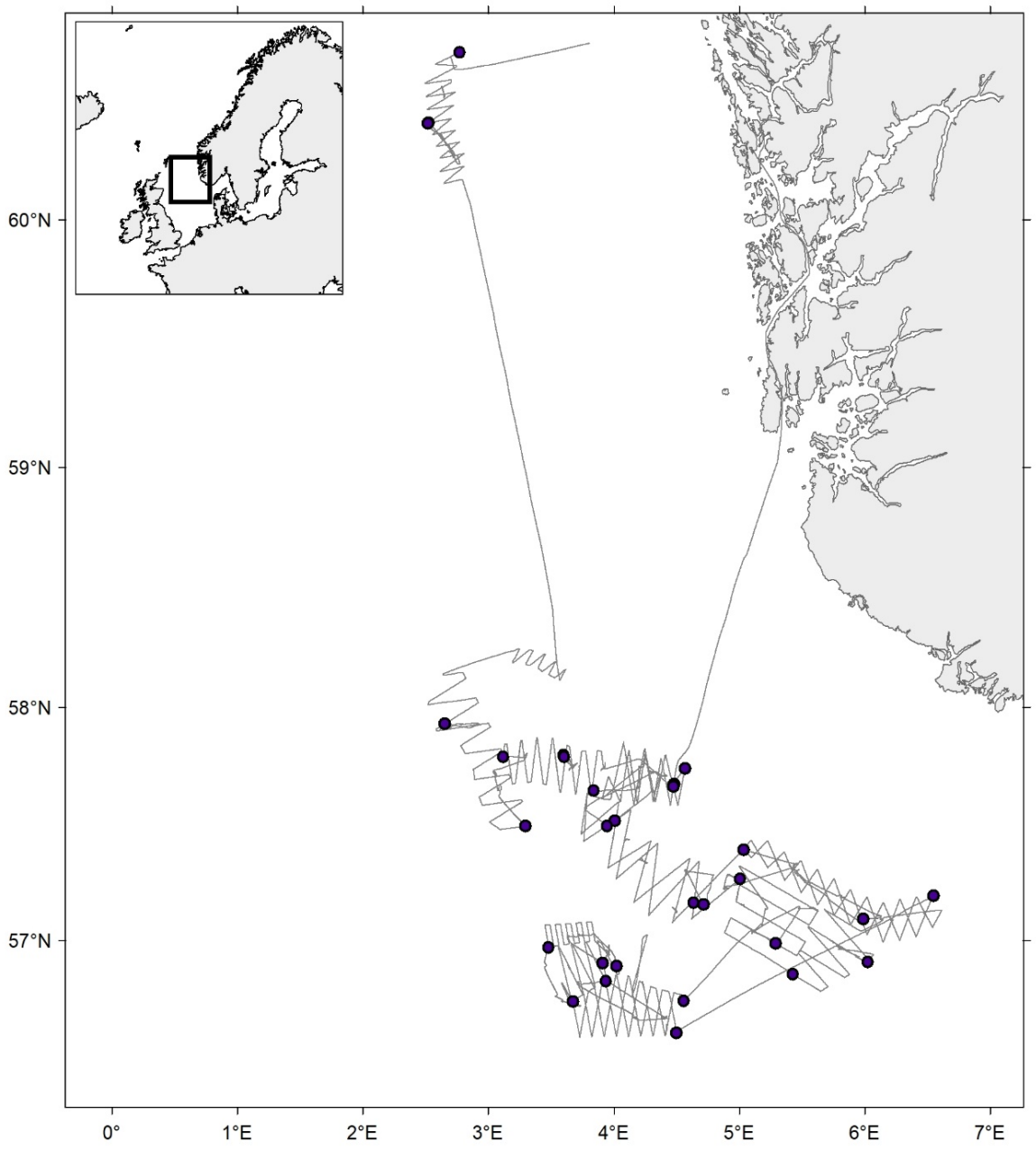
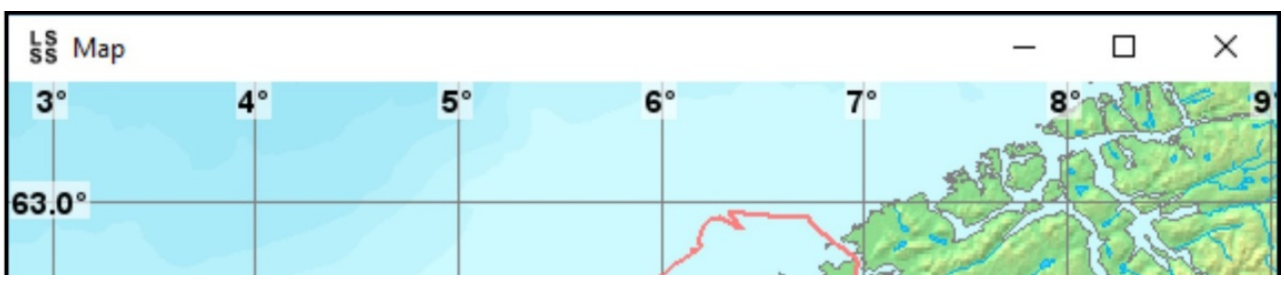
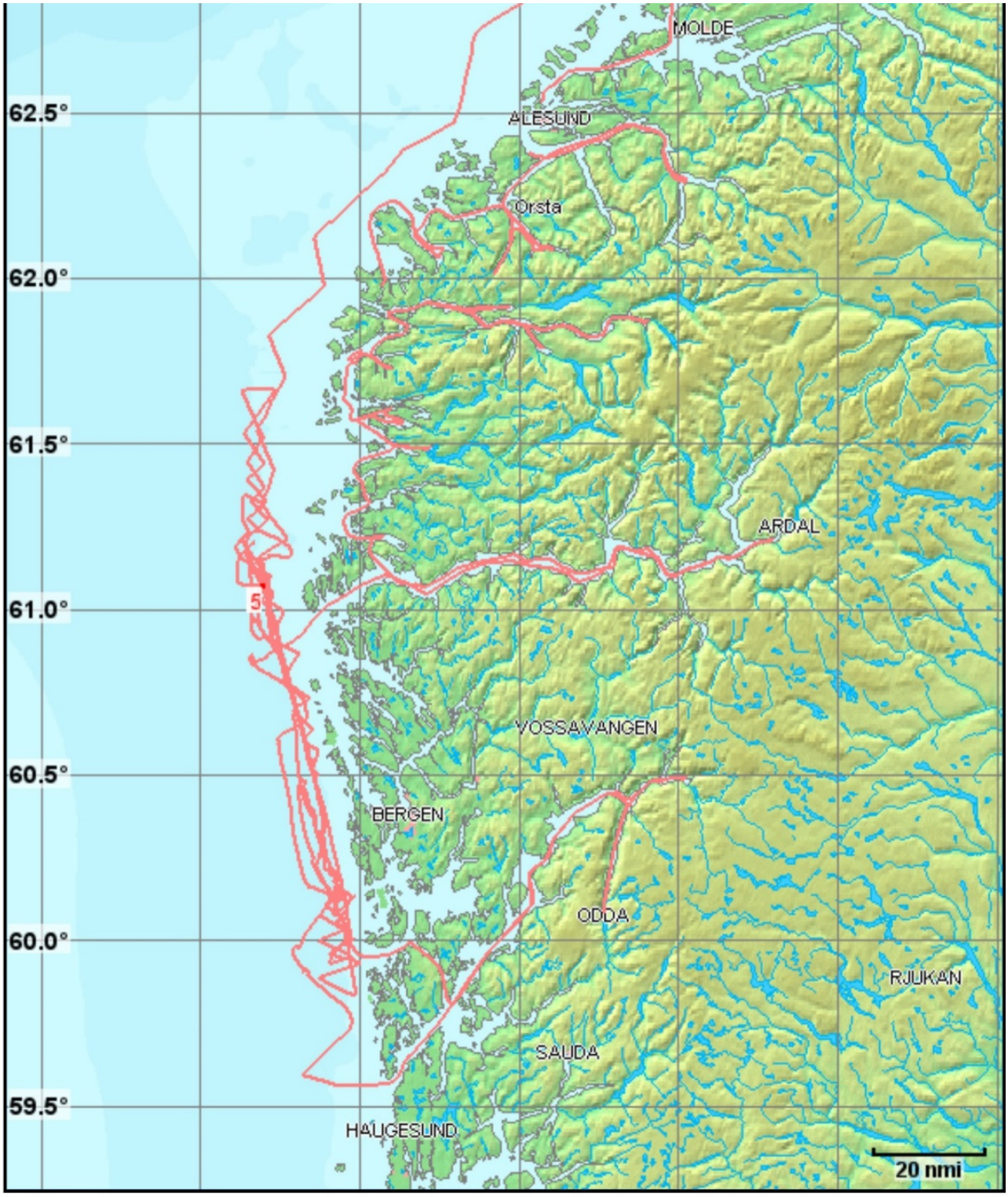

60°N
59°N
58°N
57°N
0°
1°E
2°E
3°E
4°E
5°E
6°E
7°E
Cruise no 2020821 "Eros" (Chart III)
23 April–13 May 2020
Plankton st. (WP-II-net)

Fig. 110

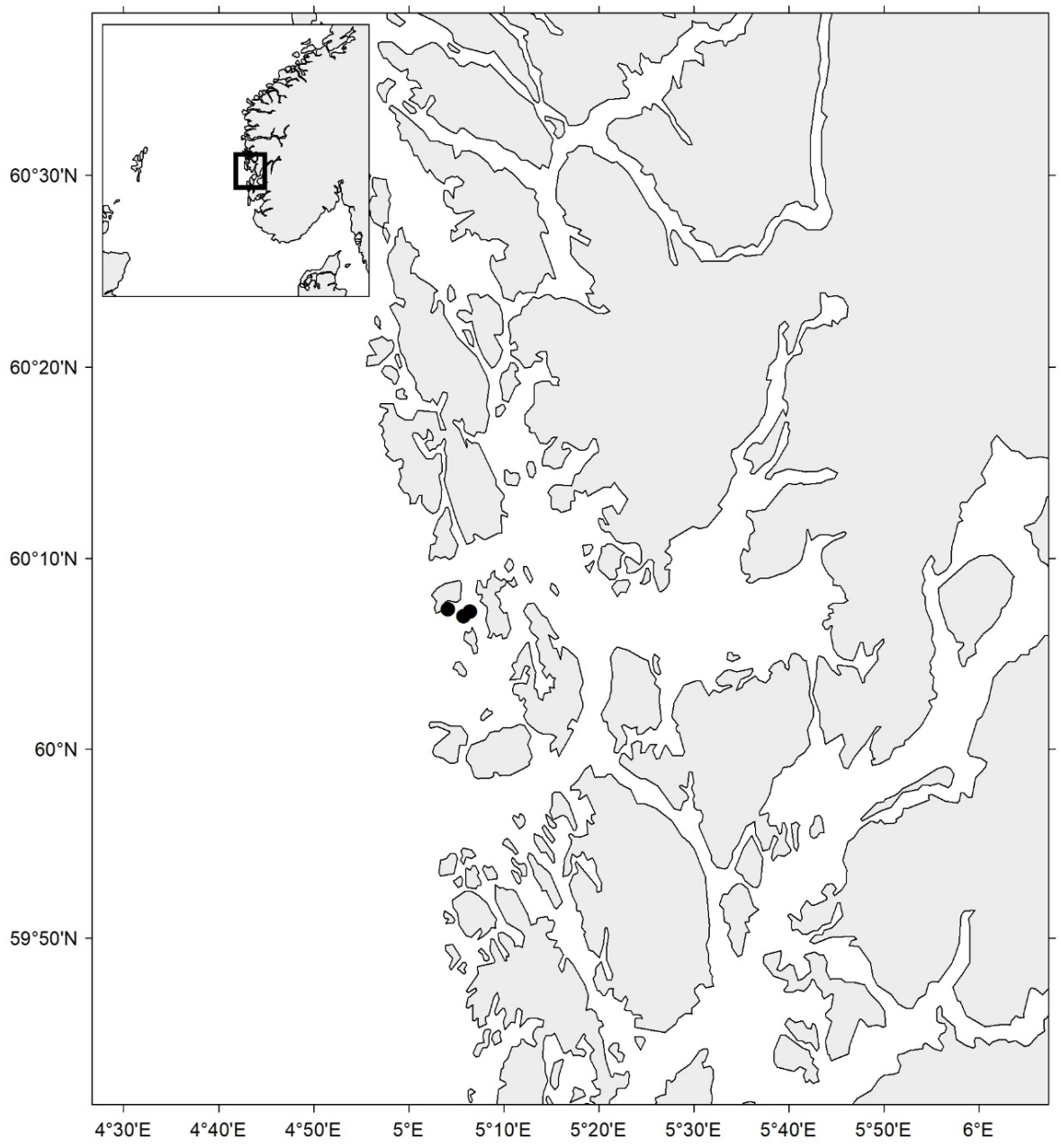

Map
3°
4°
5°
6°
7°
8°
9
63.0°



Cruise no 2020826 "M. Ytterstad"
9–18 September 2020

Acoustic survey for testing methods for abundance estimation of Bluefin tuna in Norwegian waters.

Fig. 111

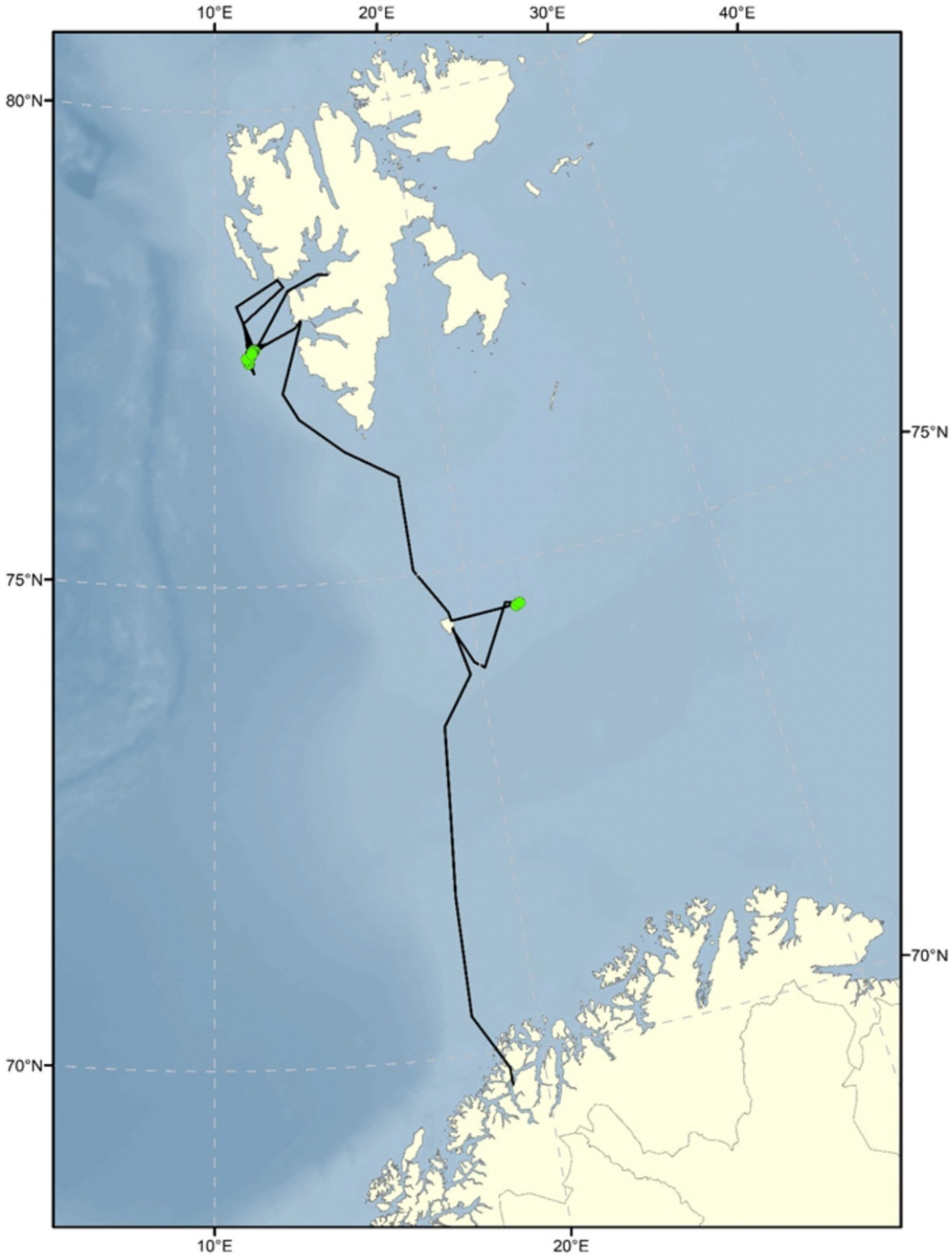


Cruise no 2020830 "H.U. Sverdrup"
9–14 February 2020

Study effects of seismic exposures on the behaviour of wild,
free ranging, spawning cod using acoustic telemetry in Austevoll, Norway.
CTD casts in the exposure area.

● Hydrophone buoy

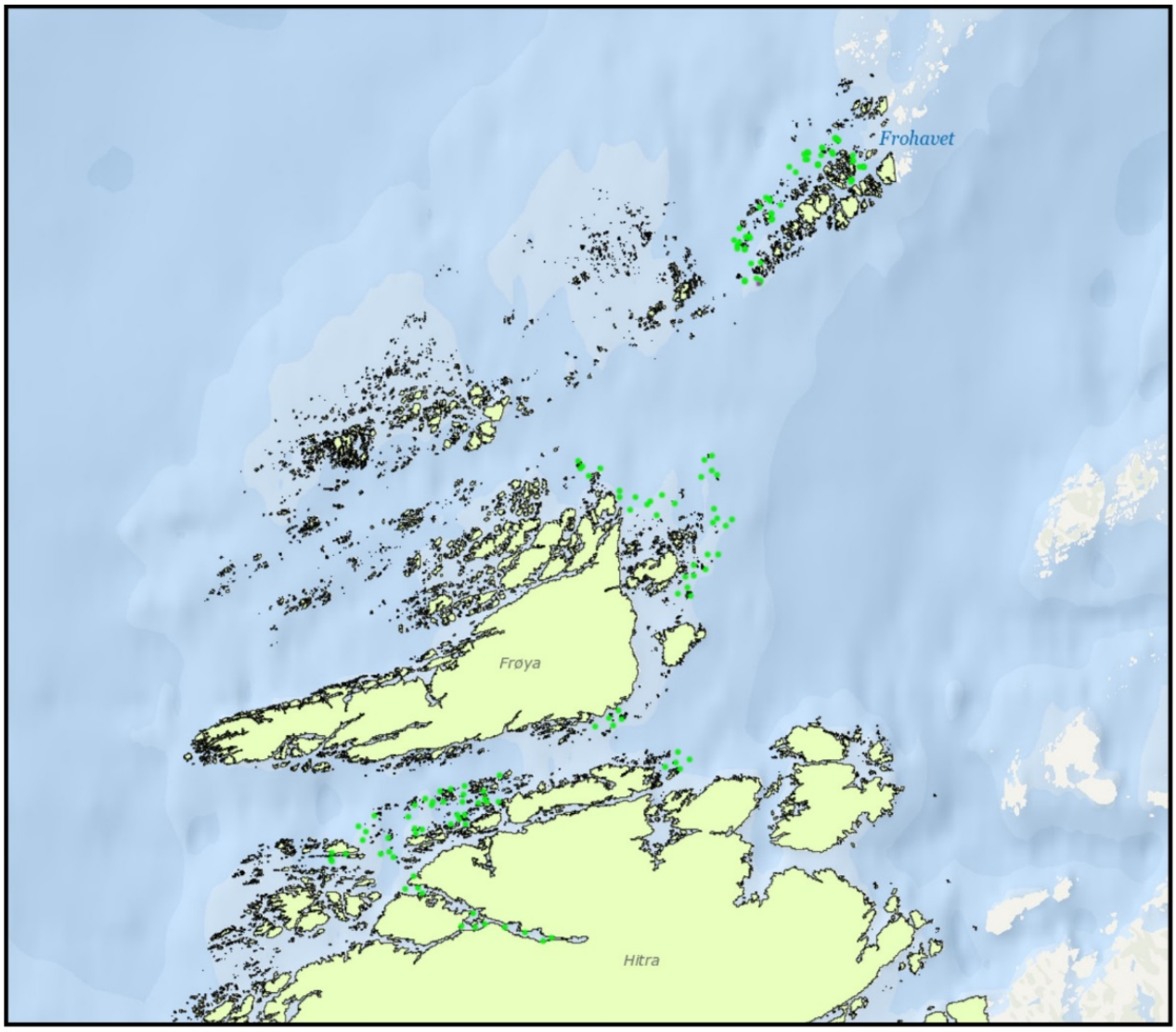
Fig. 112



Cruise no 2020831 M/S «Kato»
6–26 June 2020

Circles marks harvested whales.

Fig. 113



Cruise no 2020840 "Rind"
18–27 May 2020

Mapping fish communities in coastal areas of Hitra and Frøya by using Baited stereo-video rigs (BRUVs) and fish traps.
Fish traps also used to tag cod with floy tags. CTD st.no 130-198.

Fig. 114

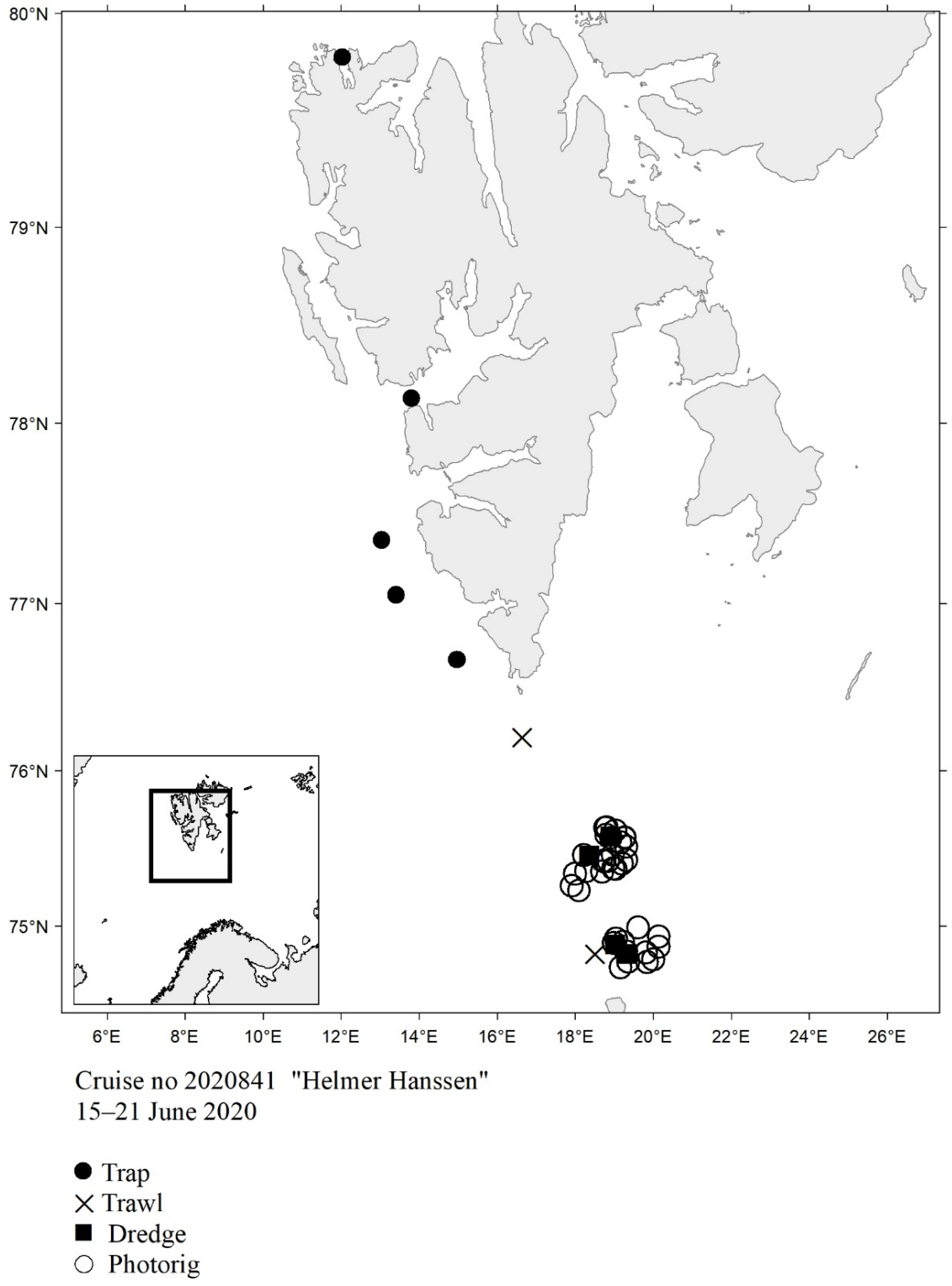
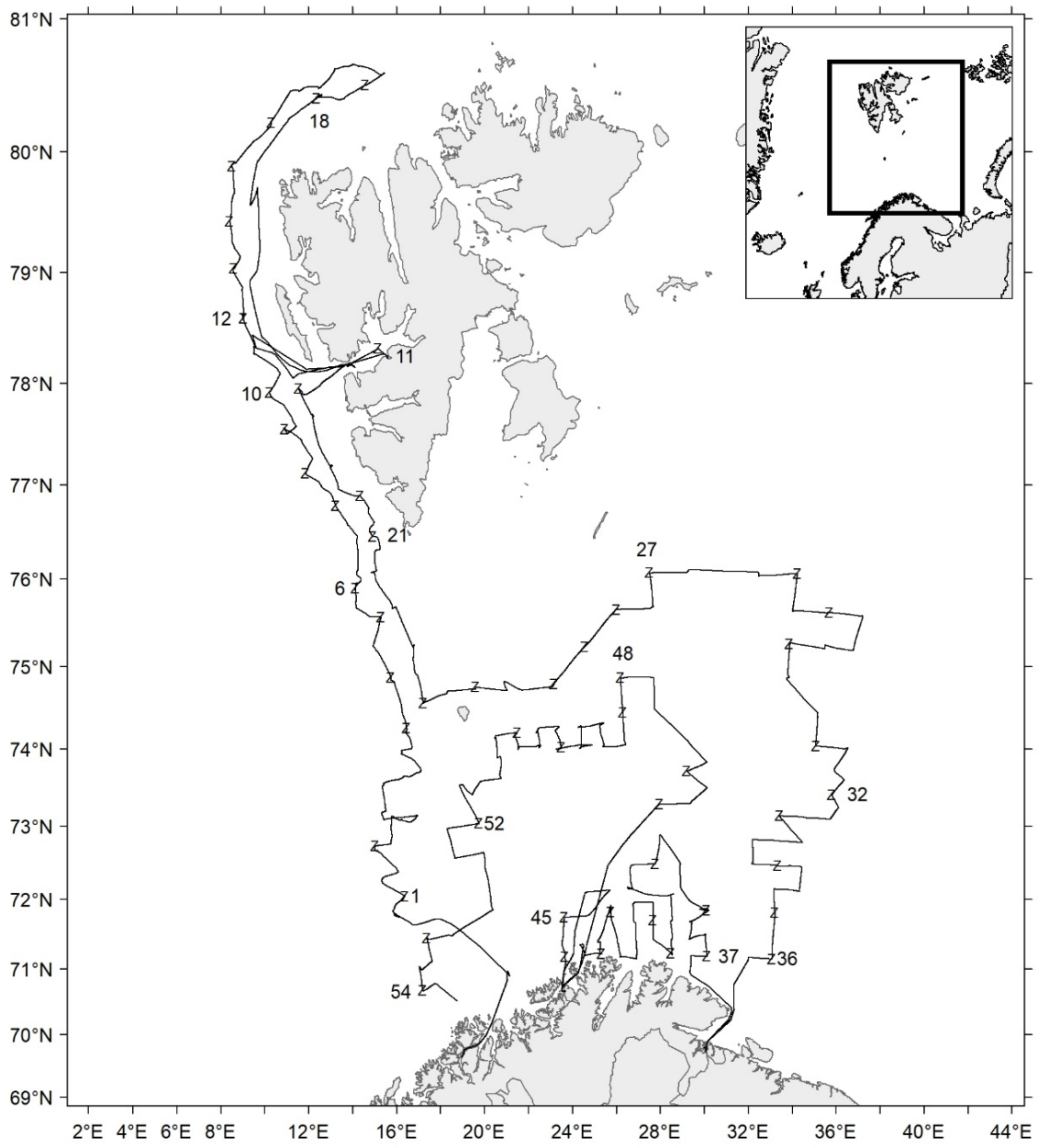

80°N
79°N
78°N
77°N
76°N
75°N
6°E
8°E
10°E
12°E
14°E
16°E
18°E
20°E
22°E
24°E
26°E
Cruise no 2020841 "Helmer Hanssen"
15–21 June 2020
Trap
Trawl
Dredge
Photorig

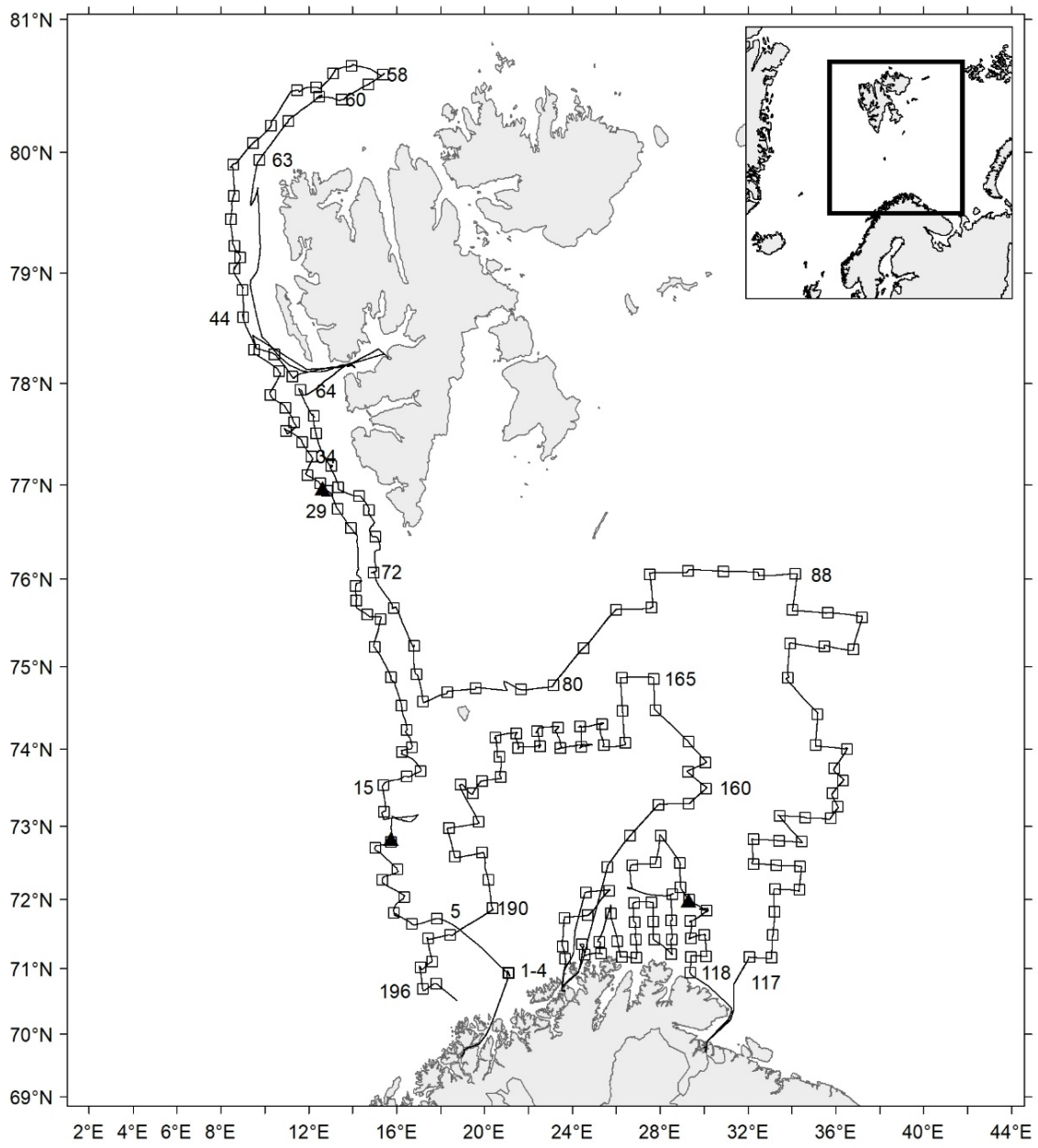
Fig. 115



Cruise no 2020842 "Helmer Hanssen" (Chart I)
21 January–27 February 2020

z CTD st.no 1-54

Fig. 116



Cruise no 2020842 "Helmer Hanssen" (Chart II)
21 January–27 February 2020

Trawl st.no 1-196
□ Bottom tr.
▲ Pelagic tr.

Fig. 117

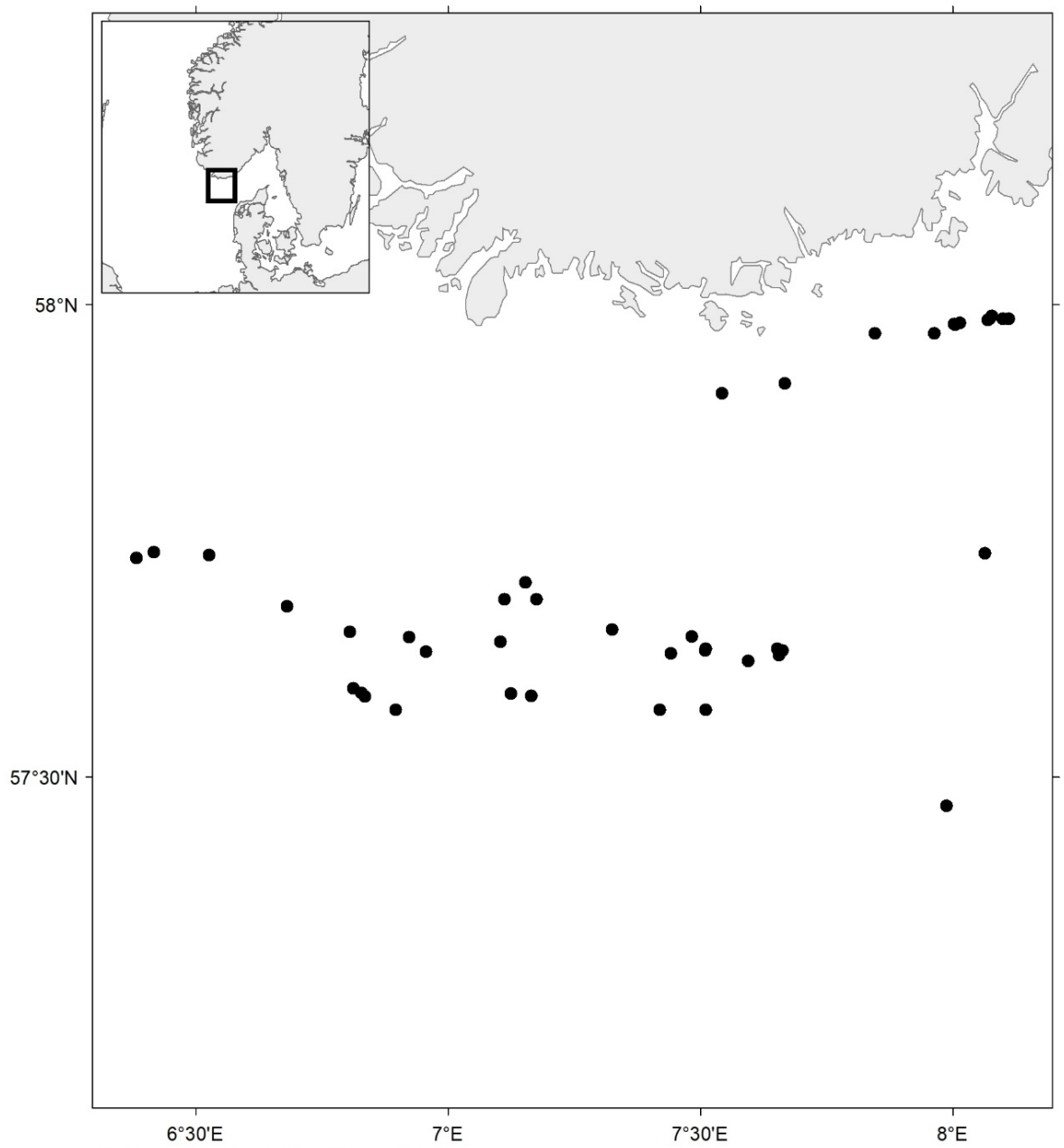

58°N
57°30'N
6°30'E
7°E
7°30'E
8°E
Cruise no 2020843 "Tenor"
18 October-15 November 2020
St.no 1-42

Fig. 118

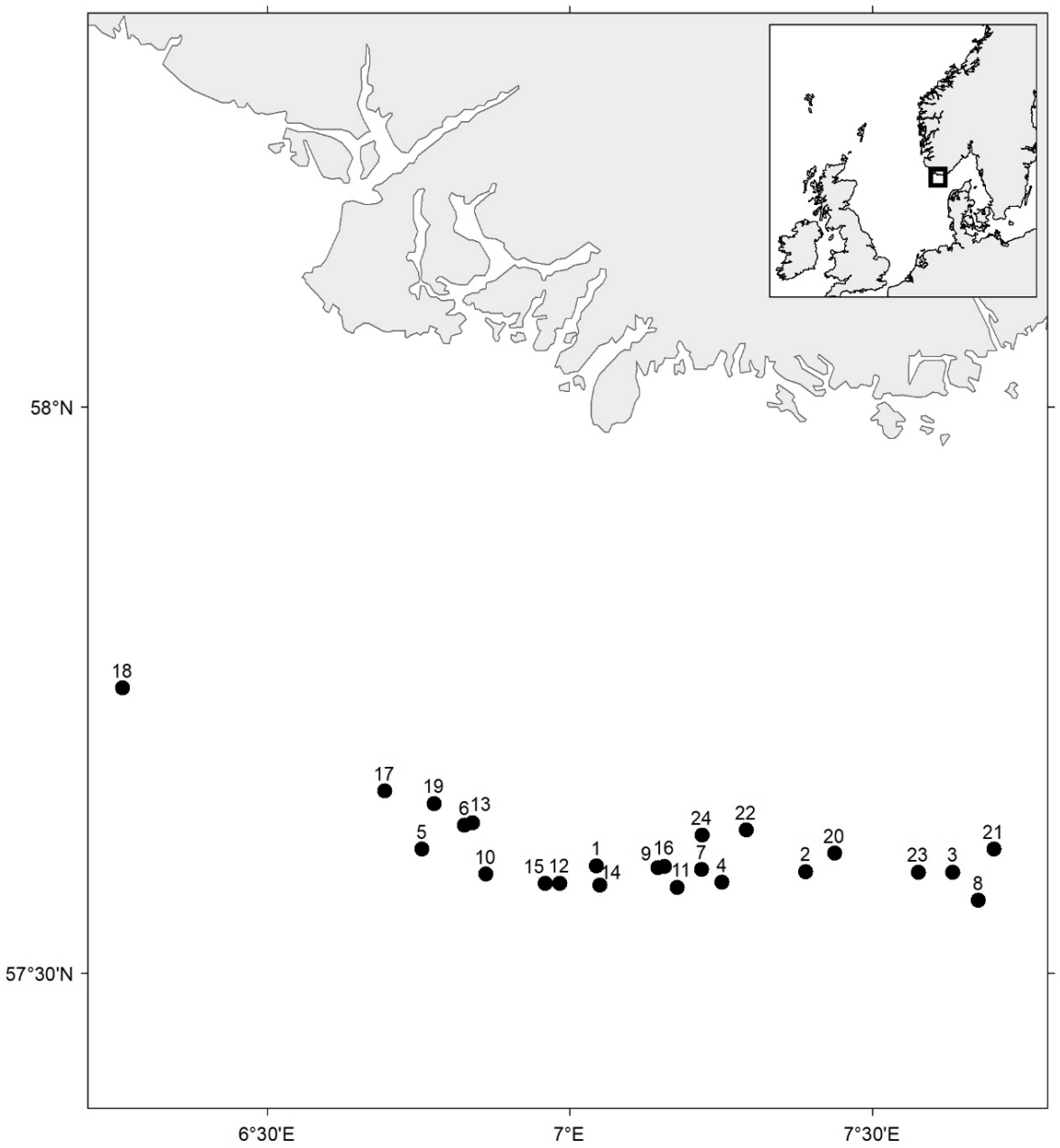

58°N
57°30'N
6°30'E
7°E
7°30'E
18
17
19
6
13
5
10
15
12
1
14
9
16
11
7
4
24
22
2
20
23
3
8
21
Cruise no 2020844 "Tangen"
20 May–2 June 2020
Trawl st.no 1-24

Fig. 119

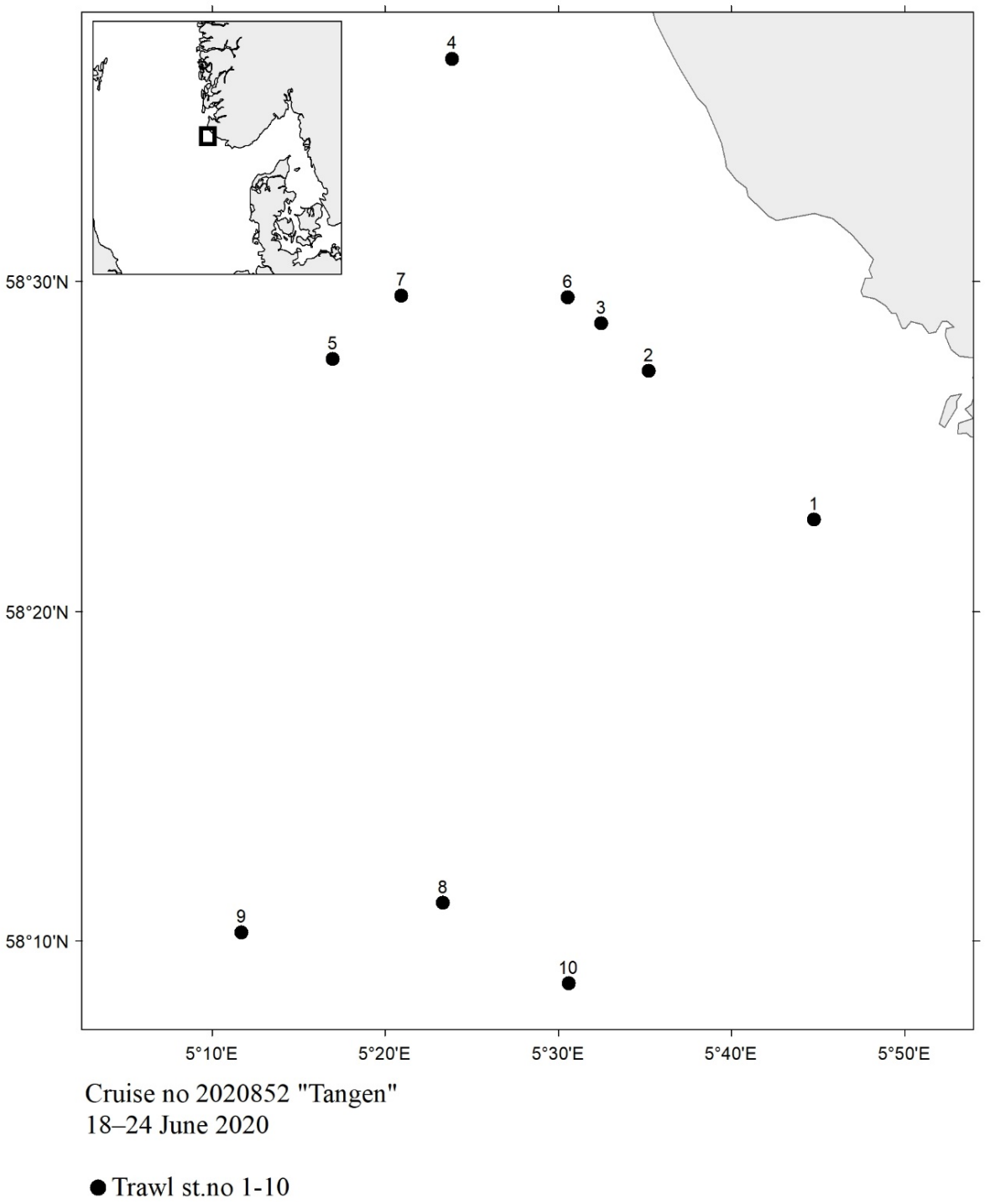
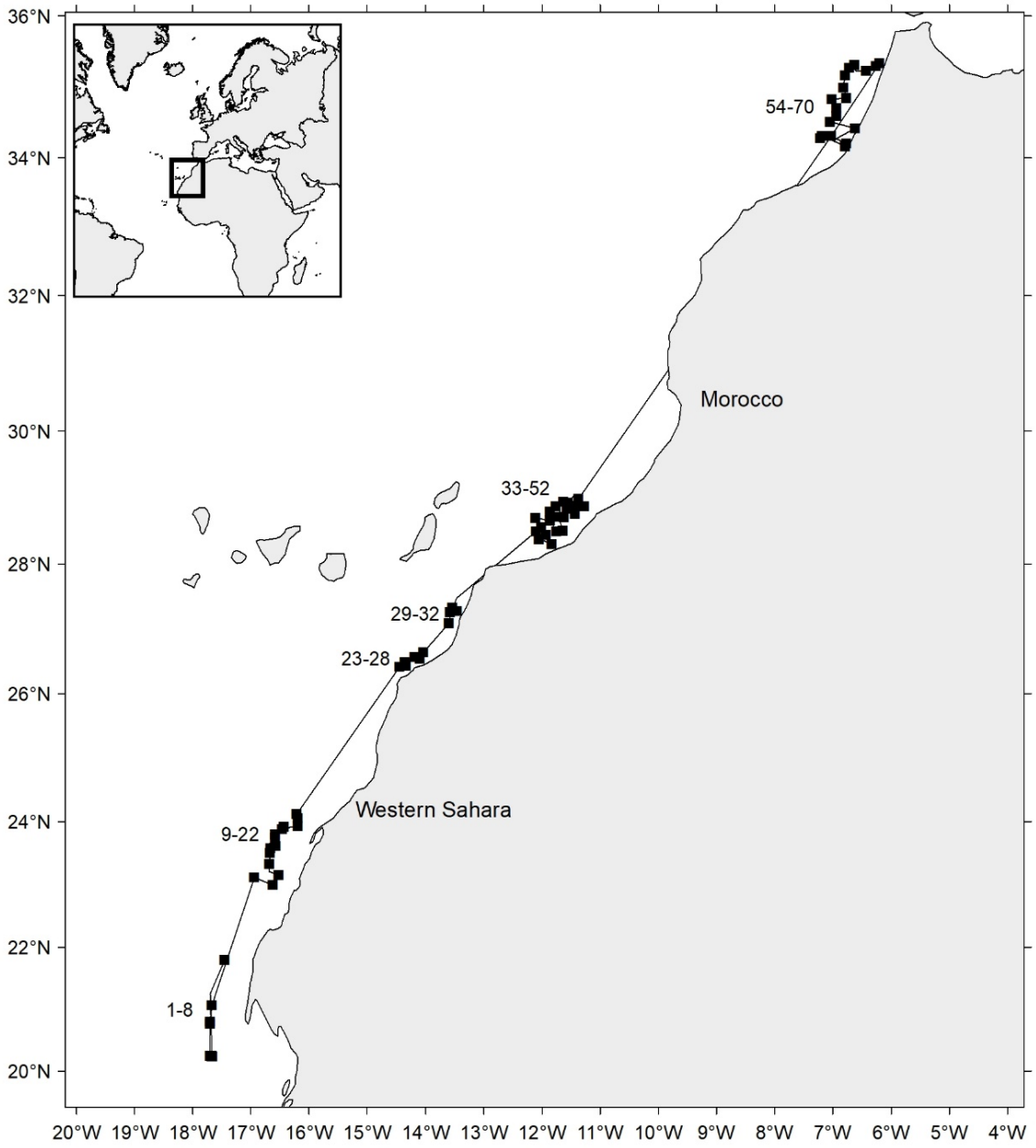

4
7
6
3
5
2
1
8
9
10
58°30'N
58°20'N
58°10'N
5°10'E
5°20'E
5°30'E
5°40'E
5°50'E
Cruise no 2020852 "Tangen"
18–24 June 2020
● Trawl st.no 1-10

Fig. 120

14 - "Dr. Fridtjof Nansen" – Cruises 2020

Cruise no	Period	Purpose	Area	CTD st.no	Trawl st.no	Fig. no
2020401	29.1.-20.2.	The survey is related to mapping bottom habitats and their ecology in six predefines areas off Northwest Africa to improve the habitat knowledge within protected areas and fishery management. The survey objectives for the selected areas include: a) Improve information on bathymetry using Multibeam echosounding b) Detailed study of the bottom by sub-bottom profiler c) Improve knowledge on associated macro- and mega epibenthic organisms by videos, photos and beam trawling. d) Genetic samples for cold water corals. e) Improve knowledge on sediment characteristics, including infauna, by collecting grab samples, as appropriate f) Study oceanographic conditions with CTD and currents by ADCP/LADCP, including nutrients and pH..	Atlantic Ocean	1-70	-	121-122
2020402	27.2.-15.3.	TRANSBOUNDARY DEMERSAL SURVEY, NORTHWEST AFRICA (Leg 2.1 Casablanca to Cap Blanc) **The survey was planned to last until 31 March, but was cancelled already on 13 March due to the Covid-19 pandemic.** Therefore, the survey only covered the stretch between Casablance to 70 nautical miles south of Cap Juby (27°N). Leg 2.2 of the survey, from Cap Blanc to the southern border of Senegal, was also cancelled. The end of the survey was set to 15 March, upon the arrival of Agadir, Morocco, where the Moroccan scientists disembarked. “Dr. Fridtjof Nansen” arrived in Bergen, Norway, on 27 March.	North Atlantic Ocean	71-173	1-73	123-125

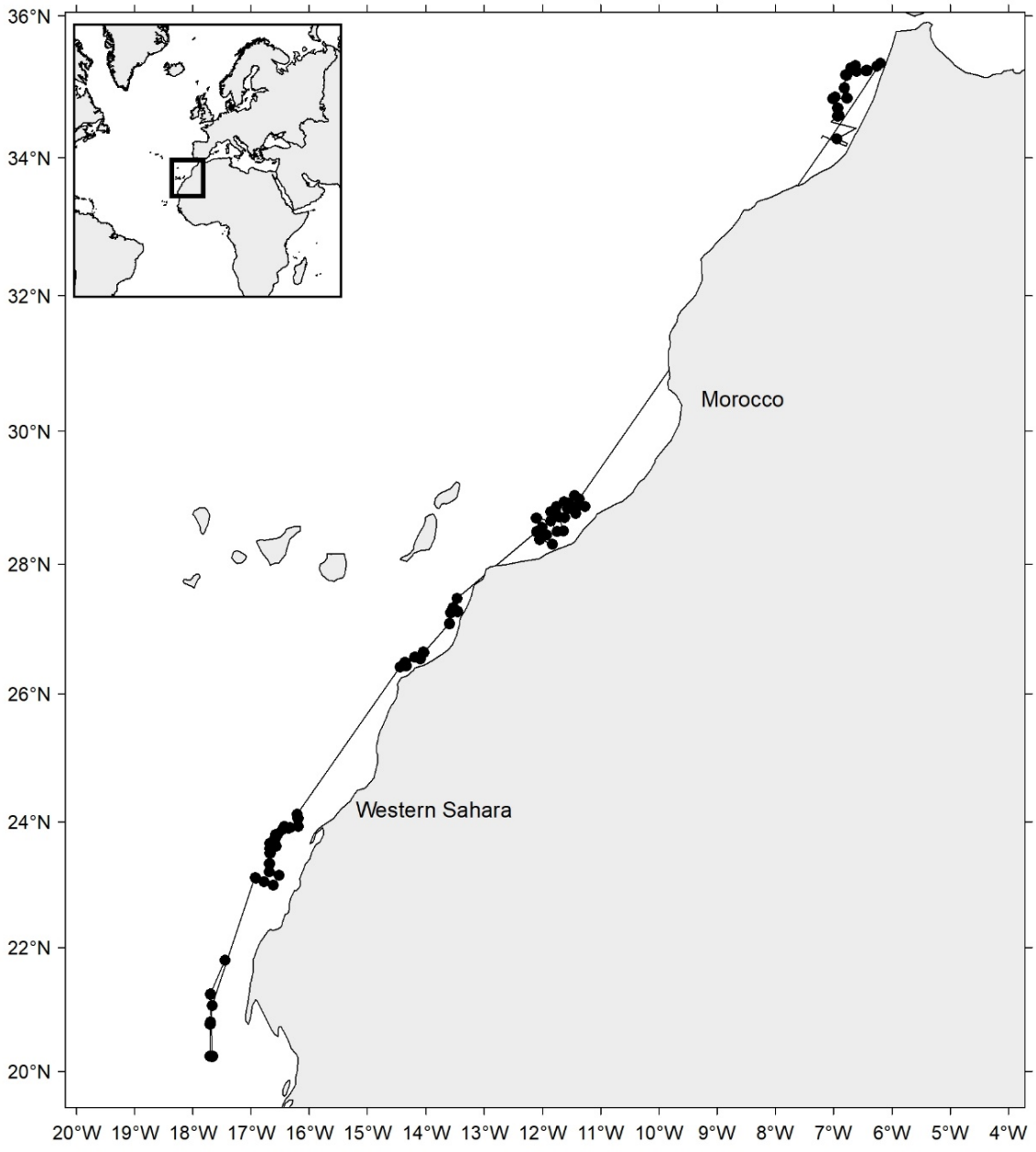
15 - "Dr. Fridtjof Nansen" Charts for 2020



Cruise no 2020401 "Dr. Fridtjof Nansen" (Chart I)
29 January–20 February 2020

■ CTD st.no 1-70

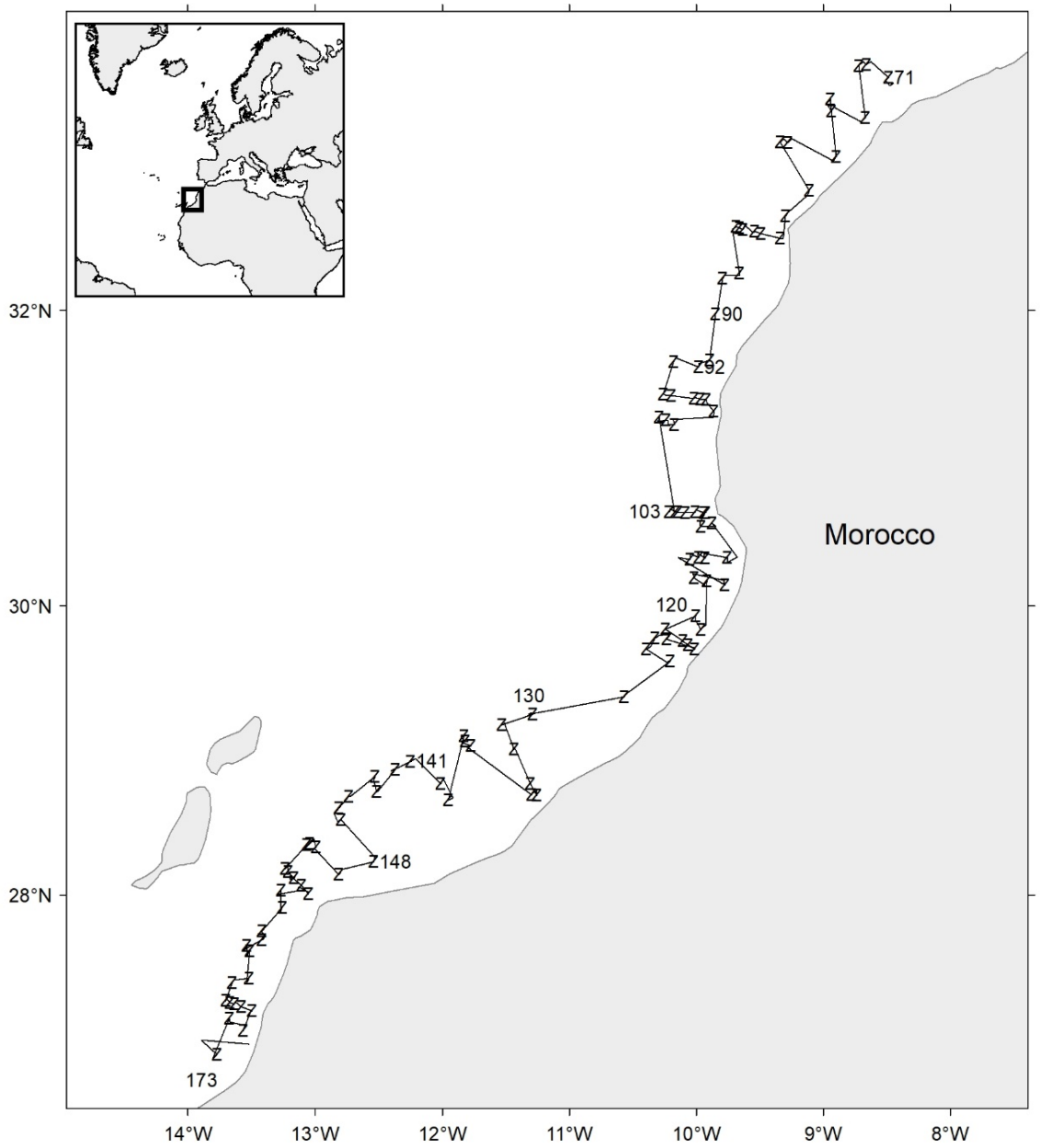
Fig. 121



Cruise no 2020401 "Dr. Fridtjof Nansen" (Chart II)
29 January–20 February 2020

● Video transects using VAMS rig, inclusive of grab and beamtrawl samples.

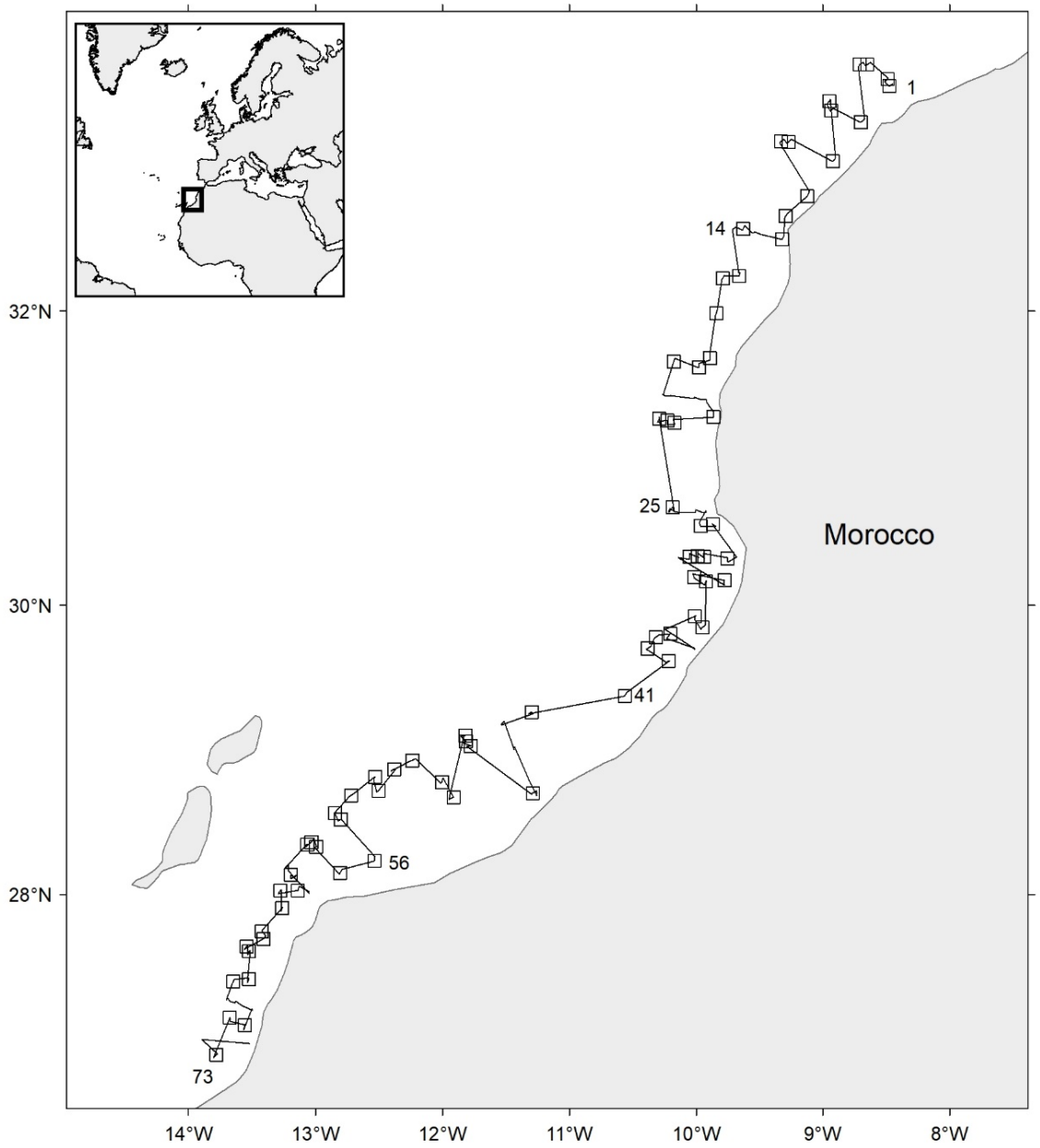
Fig. 122



Cruise no 2020402 "Dr. Fridtjof Nansen" (Chart I)
27 February–15 March 2020

z CTD st.no 71-173

Fig. 123



Cruise no 2020402 "Dr. Fridtjof Nansen" (Chart II)
27 February–15 March 2020

□ Bottom trawl st.no 1-73

Fig. 124

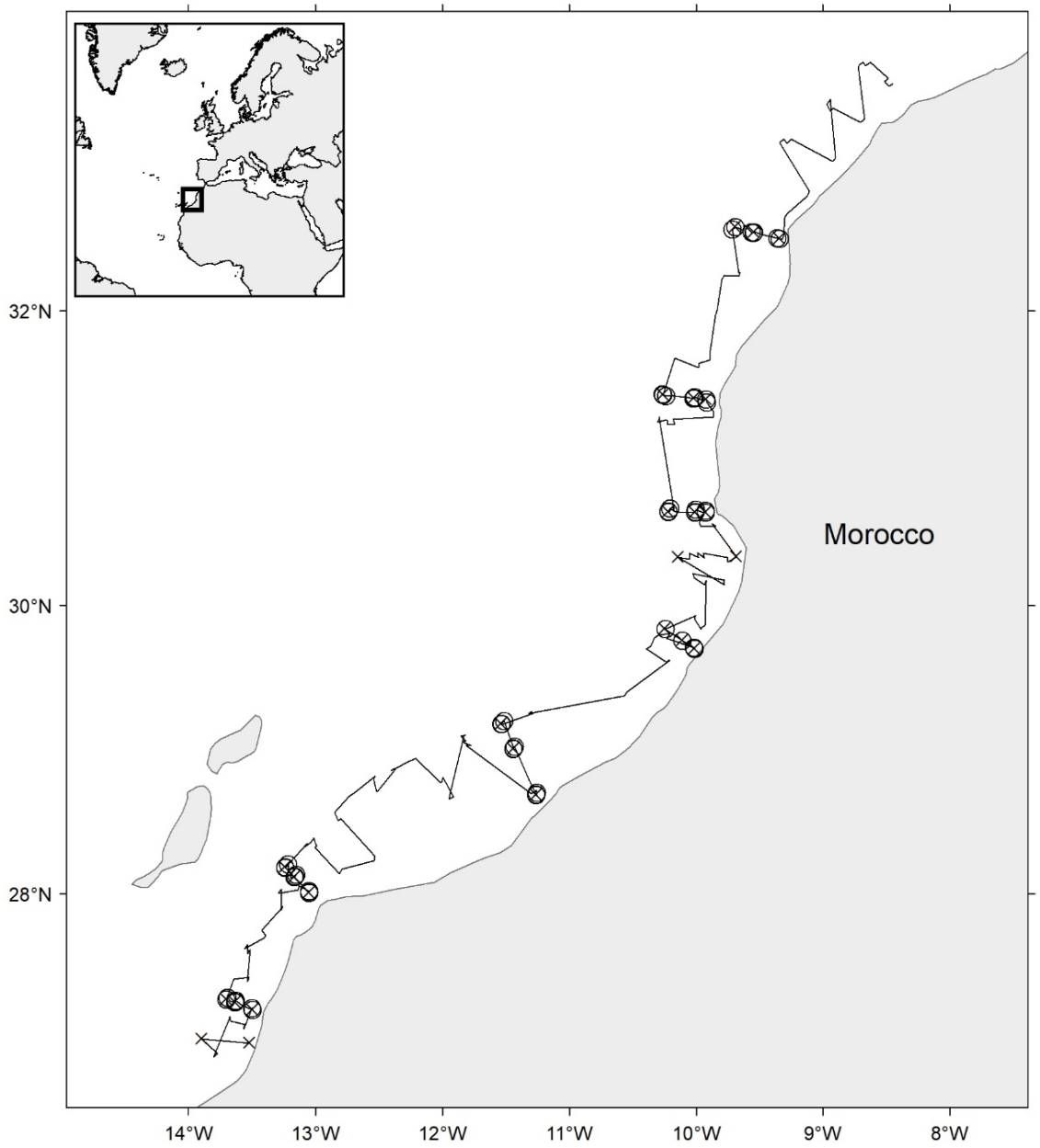
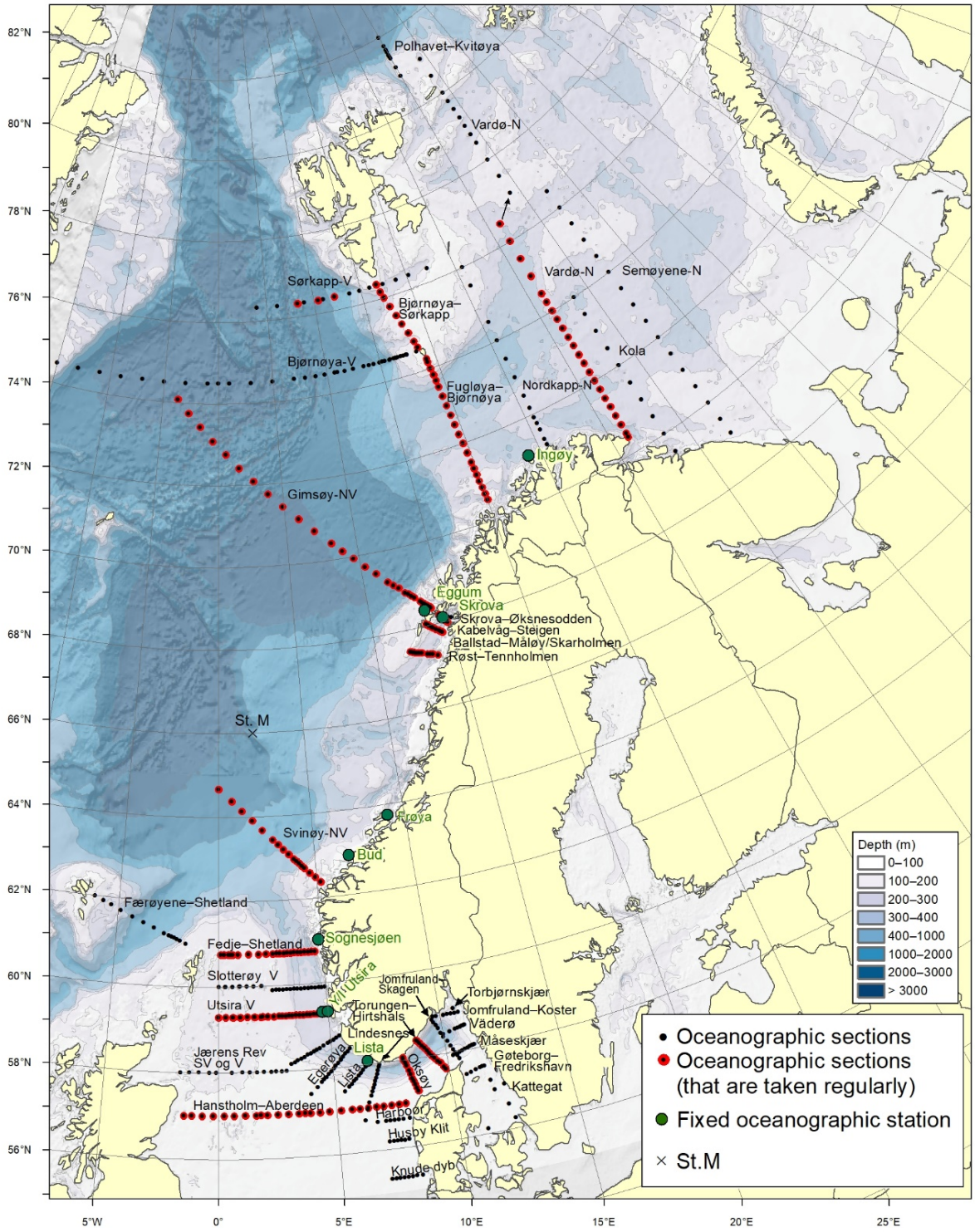

32°N
30°N
28°N
14°W
13°W
12°W
11°W
10°W
9°W
8°W
Morocco
Cruise no 2020402 "Dr. Fridtjof Nansen" (Chart III)
27 February–15 March 2020
○ Plankton st.
× Grab st.

Fig. 125

16 - Oceanographic sections and Fixed oceanographic stations – map.



17 - Tables – Observations in 2020. Oceanographic sections and fixed oceanographic stations.

Oceanographic sections 2020 (Cruise no)

Area	Oceanogr. sec.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
North Sea	Fedje–Shetland				2020205					
	Slotterøy-West				2020205					
	Utsira-West	2020201			2020205				2020207	2020112
	Jærens Rev-SW and W									
	Egerøya-SW				2020205					
	Lista-SW				2020205					
	Lindesnes-SSW				2020205					
	Hanstholm–Aberdeen	2020201			2020205			2020207		
	Harboør				2020205					
	Hysby Klit				2020205					
	Knude-Dyb				2020205					
Skagerrak and Kattegat	Torungen–Hirtshals	2020301	2020302	2020303	2020205	2020306	2020307	2020308	2020309	2020313
	Oksøy–Hanstholm				2020205					
	Jomfruland–Skagen									
	Jomfruland–Koster				2020205					
	Torbjørnskjær									
	Väderø				2020205					
	Måseskjær				2020205					
	Gøteborg–Fredrikshavn				2020205					
	Kattegat									
Area	**Oceanogr. sec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**
The Norwegian Sea and Vestfjorden	Svinøy-North/West	2020202			2020622/608				2020208	
	Gimsøy-North/West					2020608			2020208	
	Bjørnøya-West					2020608			2020208	
	Sørkapp-West									
	Færøyene–Shetland									

	Skrova–Øksnesodden									
	Kabelvåg–Steigen									
	Ballstad–Måløy/Skarholmen									
	Røst–Tennholmen									
The Barents Sea	Fugløya–Bjørnøya	2020202				2020608			2020208	
	Vardø-North		2020203							2020209
	Semøyene-North									
	Bjørnøya–Sørkapp									
	Nordkapp-North									
	Polhavet–Kvitøya									
	Kola									
	Fair Isle-Pentland	2020201							2020207	

Fixed stations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
LISTA N58 □ 05,1 □ E06 □ 32,5 □	3	2	3	3	3	3	3	3	3	3	2	3	34
UTSIRA Y N59 □ 19 □ E04 □ 44 □	1	2	3	3	3	4	1	4	3	4	3	3	34
UTSIRA I N59 □ 19 □ E04 □ 59 □	1	2	3	3	3	4	1	4	3	4	3	4	35
SOGNESJØEN N61 □ 01 □ E04 □ 50 □	1	1	2	1	3	4	2	3	3	3	2	2	27
BUD N62 □ 56 □ E06 □ 47 □	2	1	3	2	1	2	2	2	3	3	2	3	26
SKROVA N68 □ 07 □ E14 □ 39 □	3	2	4	3	4	4	3	4	4	3	2	3	39
EGGUM N68 □ 23 □ E13 □ 38 □	3	2	3	5	4	4	5	4	4	5	3	4	46
INGØY N71 □ 08 □ E24 □ 01 □	2	x	2	3	2	3	2	2	2	3	3	2	26

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