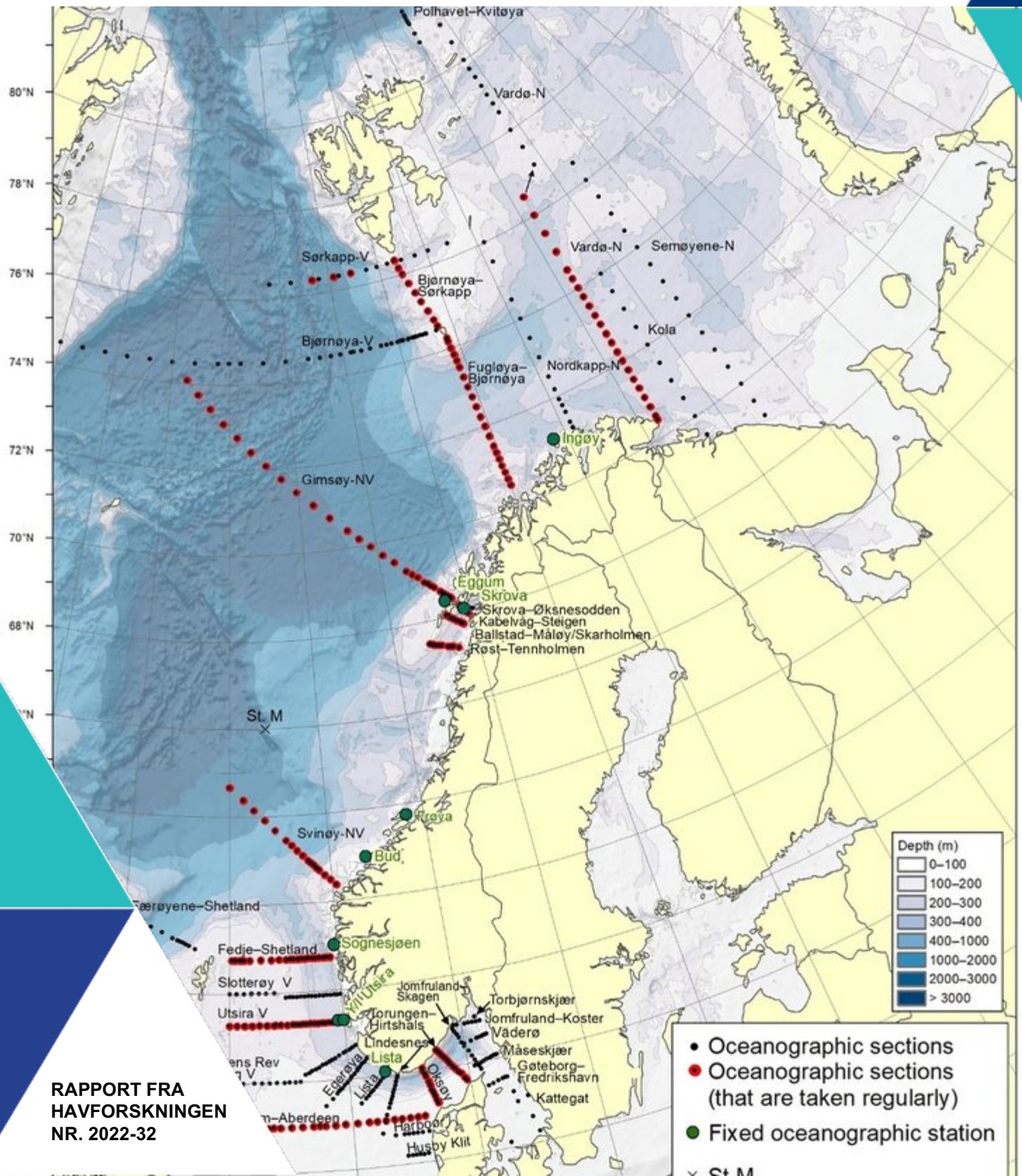
REPORT ON CRUISES AND DATA STATIONS 2021

Silje Smith-Johnsen and Helge Sagen (IMR)
Editor(s): Silje Smith-Johnsen (IMR)



RAPPORT FRA HAVFORSKNINGEN NR. 2022-32

Title (English and Norwegian):

Report on cruises and data stations 2021

Oversikt over tokt og stasjoner tatt i 2021

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Author(s):

Silje Smith-Johnsen and Helge Sagen (IMR)
Editor(s): Silje Smith-Johnsen (IMR)

Approved by: Research Director(s): Geir Huse Program leader(s): Bjørn Erik Axelsen, Henning Wehde, Jan Atle Knutsen og Maria Fossheim

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Number of pages:

196

Summary (English):

The report gives an overview of cruises in 2021, by the Institute of Marine Research, University of Bergen and Tromsø and Norwegian Polar Institute, on board our research vessels and many of the hired commercial vessels. Each cruise has a short description and a track chart showing CTD and trawl stations. A table displaying the coverage of the oceanographic sections in addition to a table showing the number of observations per month for the fixed stations are included at the end of the report. Meta data about the cruises are reported to the International Council for the Exploration of the Sea (ICES) using the form “Cruise Summary Report”: https://www.seadatanet.org/Metadata/CSR-Cruises . Research data (and chart) are available from the Norwegian Marine Data Centre at Institute of Marine Research (https://www.nmdc.no). Charts are generated by Silje Smith-Johnsen using ggOceanMaps by Mikko Vihtakari (IMR). There are no overview or maps for the cruises with our vessels "Fangst" and "Hans Brattstrøm".

Summary (Norwegian):

Rapporten gir en oversikt over tokt i 2021 i regi av Havforskningsinstituttet, Universitetet i Bergen og Tromsø, og Norsk Polarinstitutt, med egne og mange av de innleide fartøyer. Den gir en kort beskrivelse av toktet og viser kurs- og stasjonskart – over CTD 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”: https://www.seadatanet.org/Metadata/CSR-Cruises . Data (og kart) fra toktene er tilgjengelig fra Norsk marint datasenter, Havforskningsinstituttet (https://www.nmdc.no). Kartene er generert av Silje Smith-Johnsen ved hjelp av ggOceanMaps av MikkoVihtakari (HI). Det er ikkeinkludert tabeller eller kart for toktene med våre båter «Fangst» og «Hans Brattstrøm».

Content

1 - Charts overview 2021 – CTD stations and trawl stations.

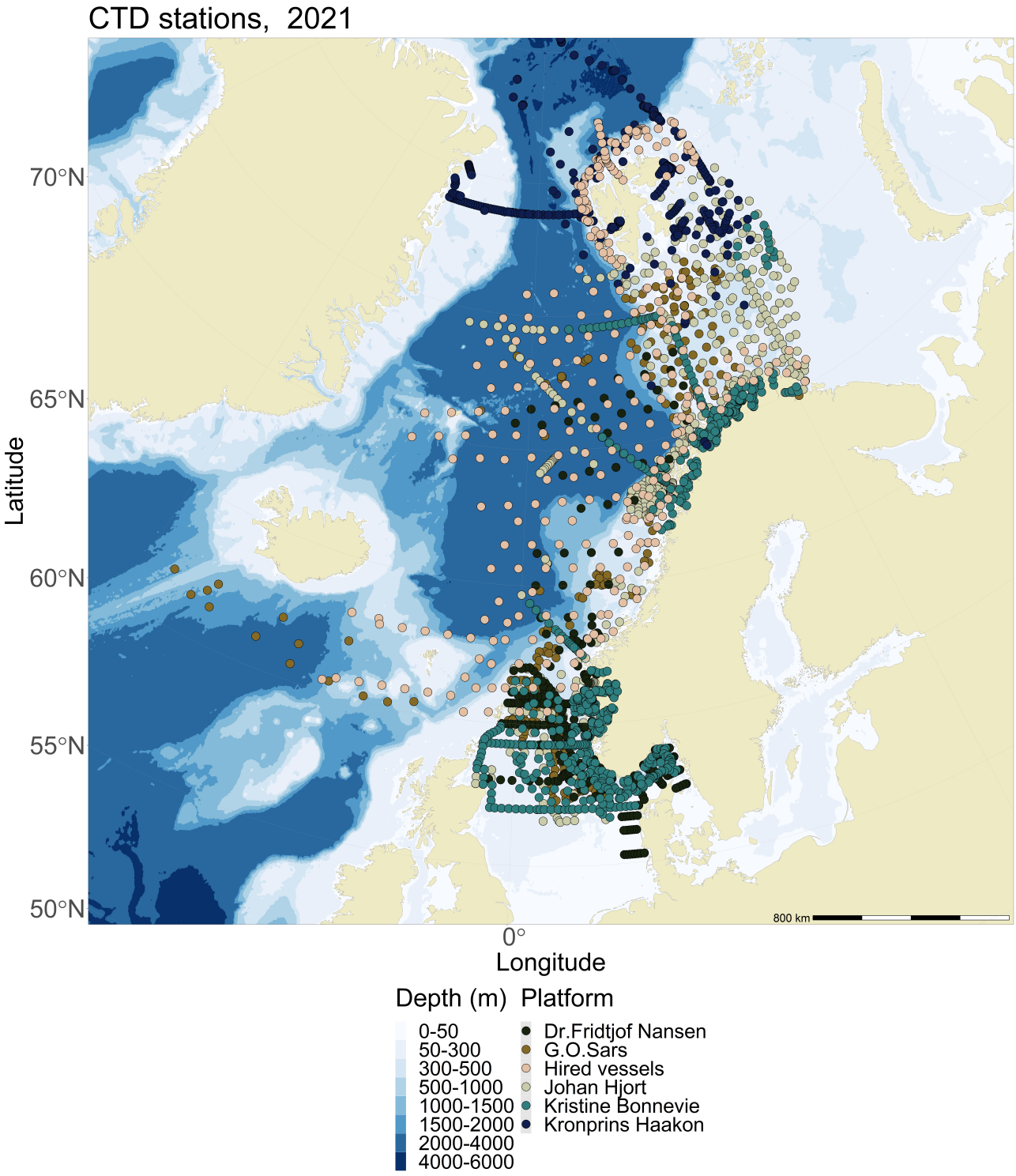


Fig. 1.1 - CTD stations 2021

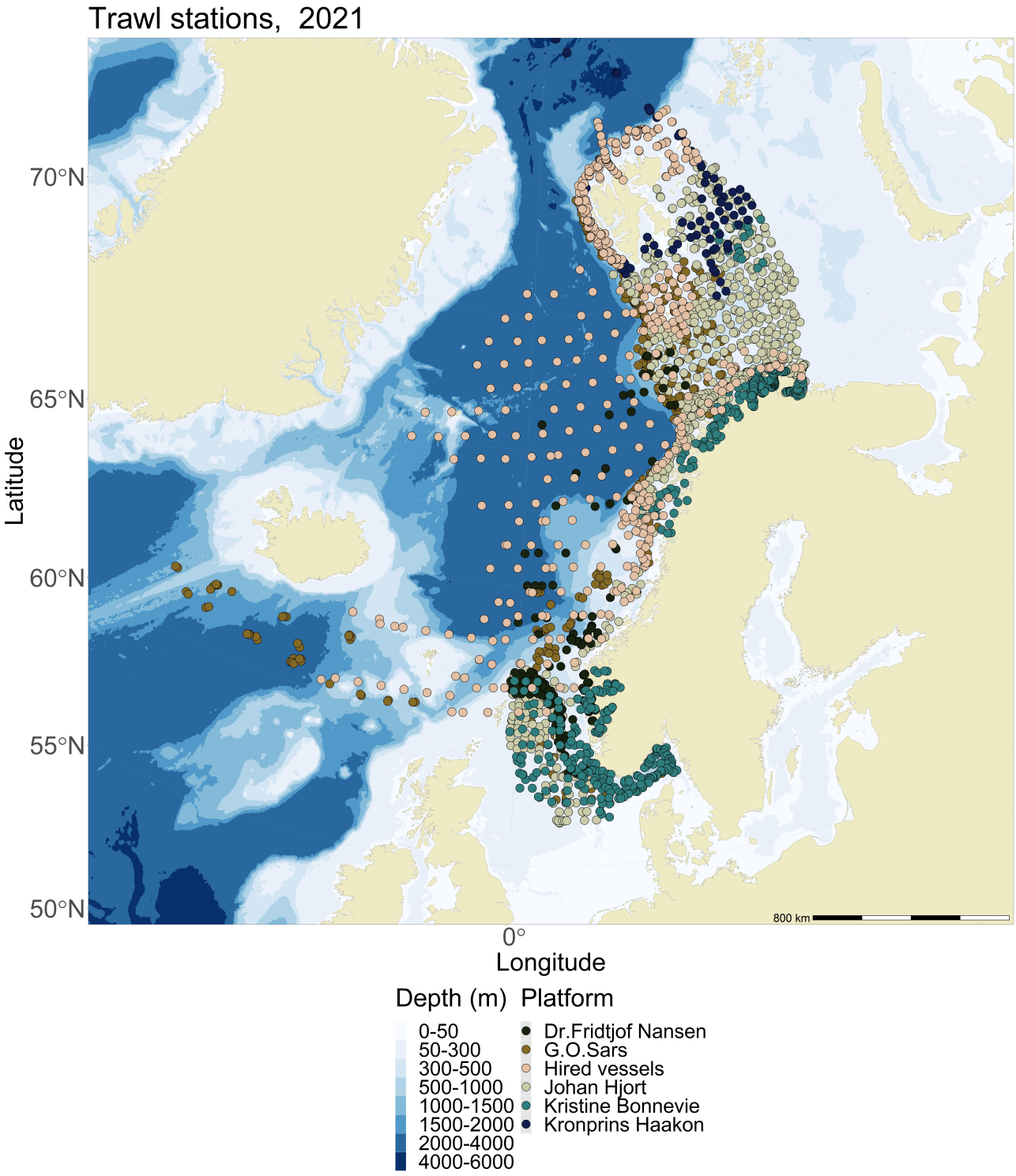


Fig. 1.2 - Trawl stations 2021

2 - "G. O. Sars" – Cruises 2021

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021101	17/01 - 11/02	The main objectives of the IBTS Q1 bottom trawl survey coordinated by ICES/IBTSWG are: 1)to determine the distribution and relative abundance of pre-recruits of the main commercial species with a view of deriving recruitment indices. 2) to monitor changes in the stocks of commercial fish species independently of commercial fisheries data. 3) to monitor the distribution and relative abundance of all fish species and selected invertebrates. 4) to collect data for the determination of biological parameters for selected species. 5) to collect hydrographical and environmental information. 6) to determine the abundance and distribution of herring and other fish larvae as well as fish eggs.	North Sea	1 - 132	1 - 52
2021102	13/02 - 16/02	Cancelled	-	-	-
2021103	04/04 - 26/04	2021-MP-002: Innsamling av vann og bunnprøver for undersøkelse av biologisk mangfold og arters utbredelse, miljøkjemi og bunnsedimenter, i Mareano-programmet. Kunnskap om havbunnen inngår i forvaltningsplaner for havområdene, SVOer spesielt og ev til overvåking.	Norwegian Sea	133 - 144	1 - 12
2021104	28/04 - 24/05	2021-MP-019: Innsamling av vann og bunnprøver for undersøkelse av biologisk mangfold og arters utbredelse, miljøkjemi og bunnsedimenter, i Mareano-programmet. Kunnskap om havbunnen inngår i forvaltningsplaner for havområdene, SVOer spesielt og ev til overvåking.	Norwegian Sea	145 - 162	14 - 31
2021105	01/06 - 29/06	Study mesopelagic ecosystem. Project name: MEESO Coordinating body: Institute of Marine Research, Norway	Norwegian Sea	163 - 180	53 - 119

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021106	03/07 - 28/07	Leg 1 started by going back to Sulafjorden to take sediment cores. Then, to the Norwegian and Greenland Seas to investigate manganese crust. Longer stops at the Fåvne vent field and Loki's castle vent field, where the ROV, gravity cores, CTDs and multibeam echo-sounders were used to explore, take samples and video footage, measure parameters, and map the different zones. Leg 2 revisited several hydrothermal fields along the ridge : Fåvne, Ægir, Jan Mayen and the Seven sisters. The ROV and multibeam echo-sounders were used to explore, take samplesand video footage, and map the different zones.	Greenland Sea	181 - 197	-
2021107	01/08 - 10/08	2021-RED-001: HI er partner i EU-prosjektet Eurofleets Plus hvor Transnational Access (TA) er den største komponenten. Vi er forpliktet til å levere 10 dager tokttid med G.O. Sars. Bruk av ROV Ægir inngår i toktet.	Norwegian Sea	-	-
2021108	19/08 - 12/09	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. 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	225 - 300	125 - 234
2021109	19/09 - 05/10	Cancelled	-	-	-
2021110	07/10 - 30/10	"Norwegian Sea continental slope NOR deep-sea fish cruise in autumn". Bottom trawl survey for deep sea resources on depths 400-1500 along the continental slope of the eastern Norwegian Sea between N 68 and N 80, included Bear Island trench. Bottom trawl stations primarily for biomass estimation of Greenland halibut (Reinhardtius hippoglossoides), along with registrations on beaked redfish (Sebastes mentella) and other deep-sea fish species.	Norwegian Sea	318 - 318	235 - 340

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021111	01/11 - 21/11	The objective of the survey was to test IMRs sampling trawls and to obtain optical and broad banded acoustical measurements of demersal fish. The survey is a joint survey between the CRIMAC SFI and the Trawl methodology project at IMR. Subobjectives: - Further develop video trawling close to seabed for scientific and commercial fishery - Train operators for the FOCUS underwater vehicle for monitoring trawl performance. - Develop and test sensors and methods for trawl positioning and winch steering - Test performance of IMRs standard Harstad sampling trawl performance - Collect broad-banded acoustic data from demersal fish; from both hull-mounted and probing platforms. - Data collection to estimate crosstalk between frequencies using standard settings and validate acoustic FM to CW conversions - Data collection to provide optimal settings for near-seafloor acoustic measurements and broadband data from near sea floor for classification - Data for comparing the combined Simrad EC150 Echosounder and ADCP against the standard onboard ADCP were conducted.	Barents Sea	319 - 324	341 - 383
2021112	24/11 - 28/11	1. Retrievial of ocean observatory platforms 2. Search of the lost marine cable	Norwegian Sea	-	-
2021113	29/11 - 03/12	The cruise to the Lofoten margin is organized and funded through the NFR Norwegian-Polish GRIEG project “ArcticSGD” at NGU in collaboration with Nord University, Stockholm University, and the Institute of Oceanology of Polish Academy of Sciences. It is the first cruise with RV “G.O. Sars” co-ordinated within the “ArcticSGD” project. The G.O. Sars cruise is directed to the canyons identified along the SW Lofoten margin, where groundwater seepage has been documented in 800 m water depth. From previous cruises in 2017 and 2020, we have identified typical features of cold seep sites in two depressions southwest of the most distinct canyon and will investigate them closer during this cruise.	Norwegian Sea	325 - 346	-

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021115	17/09 - 03/10	Sea bottom mapping with video-filming and sampling of benthic fauna and sediments at selected stations in the Barents Sea (south-east in the North European Zone, NEZ). The main aim was mapping of benthic fauna, bio-diversity, biotopes, geological terrain-parameters and chemical pollution. The mapping was performed using visual seabed observation and sampling of sediments and organisms using video-rig, grab, boxcorer, multicorer, beam trawl and hyperbenthic sled.	Barents Sea	301 - 317	32 - 48
2021114	09/12- 22/12	Cancelled	-	-	-

3 - “ G.O. Sars” – Charts for cruises 2021

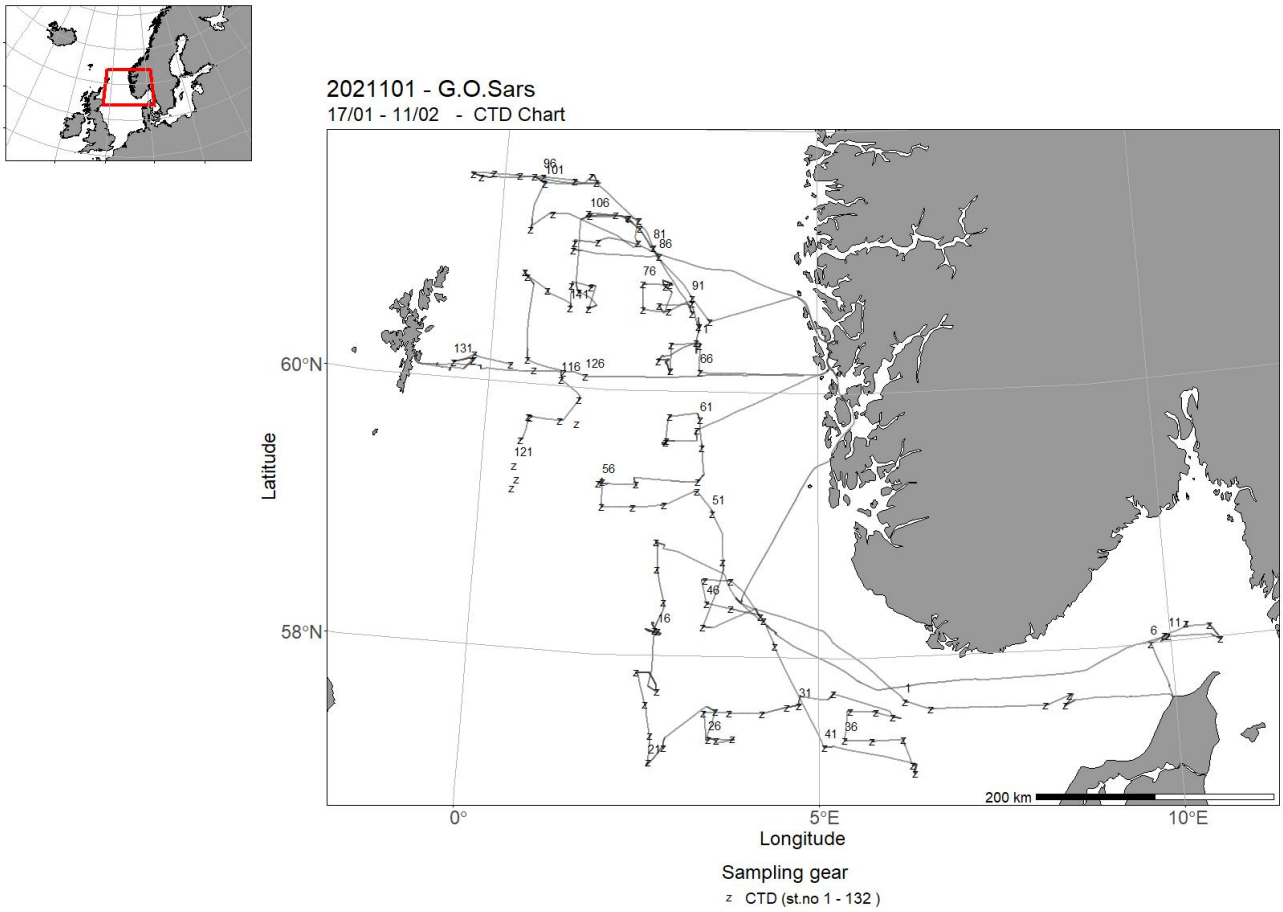


Fig. 3.1

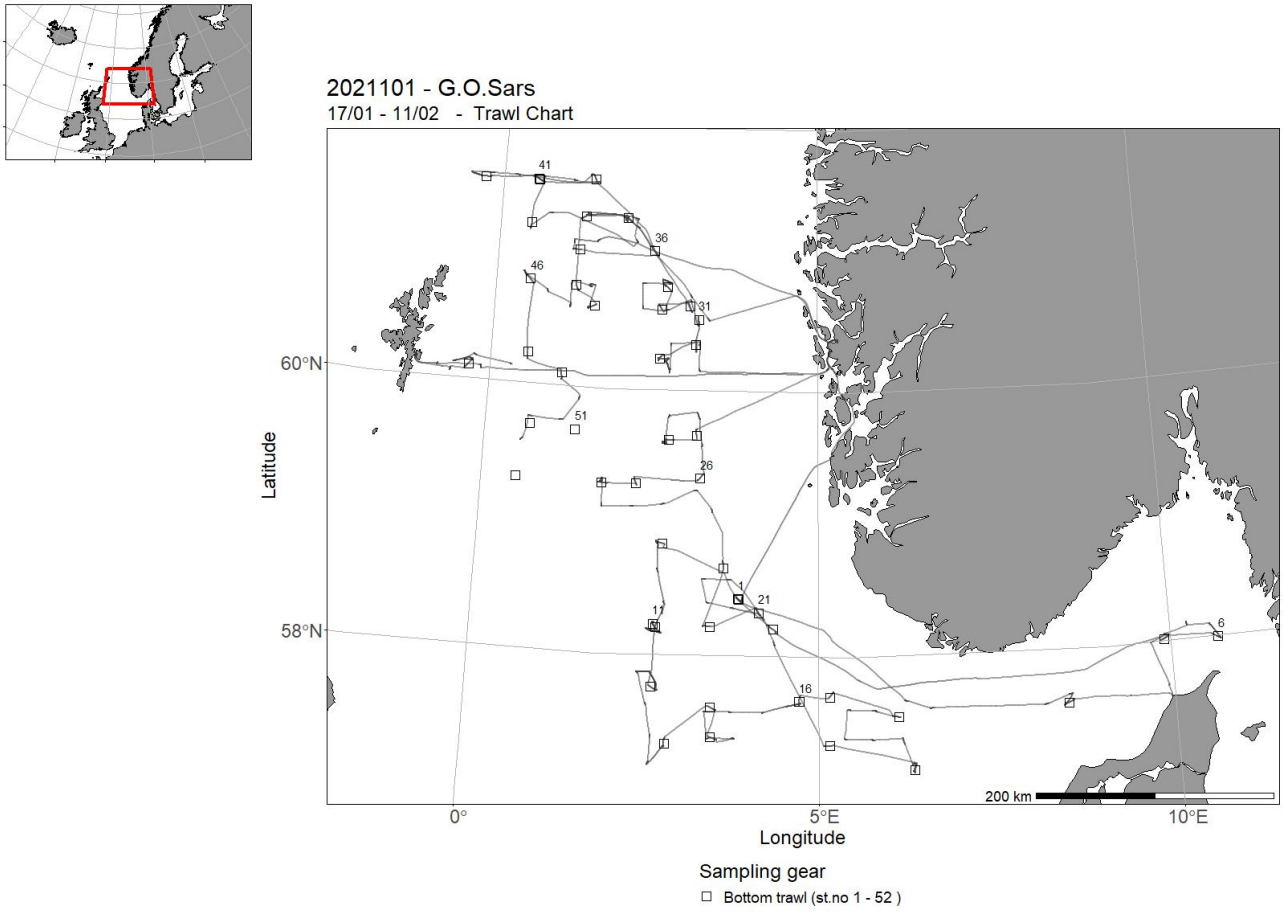

2021101 - G.O.Sars
17/01 - 11/02 - Trawl Chart
41
36
46
31
51
26
1
21
17
6
16
60°N
58°N
Latitude
0°
5°E
10°E
Longitude
200 km
Sampling gear
Bottom trawl (st.no 1 - 52)

Fig. 3.2

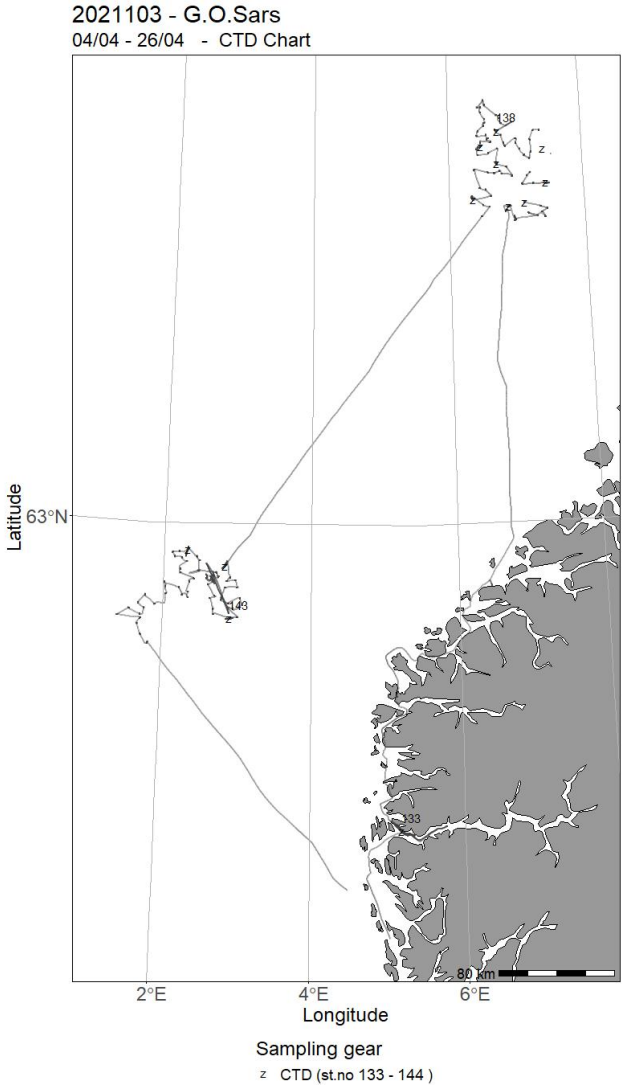

2021103 - G.O.Sars
04/04 - 26/04 - CTD Chart
138
143
133
63°N
Latitude
2°E
4°E
6°E
Longitude
80 km
Sampling gear
CTD (st.no 133 - 144)

Fig. 3.3

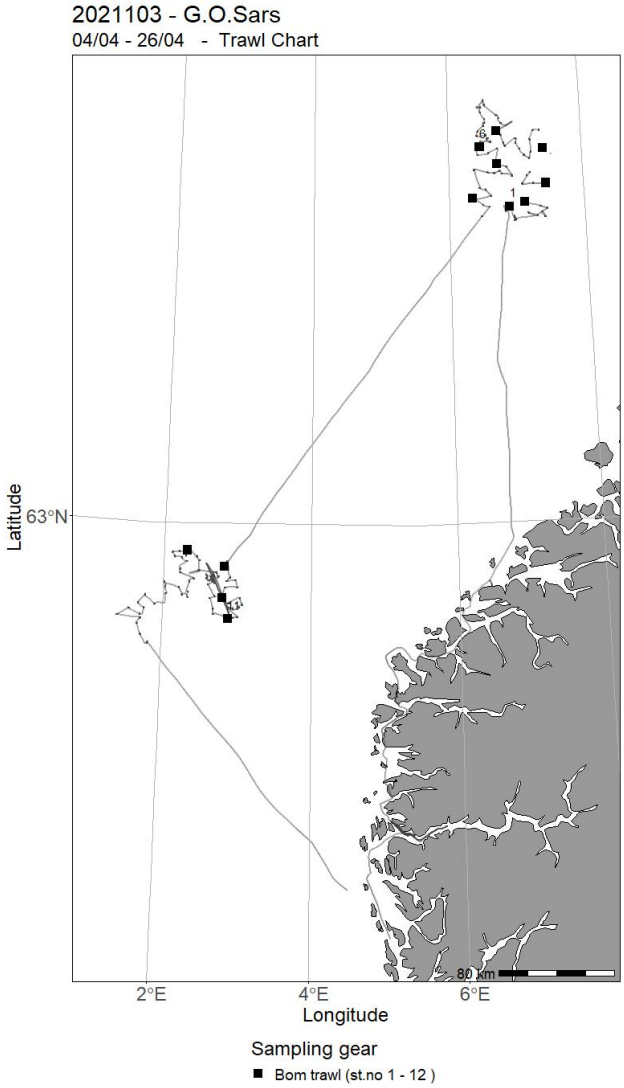
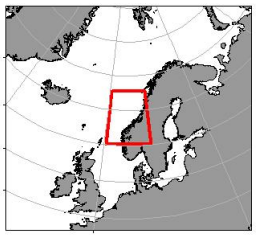

2021103 - G.O.Sars
04/04 - 26/04 - Trawl Chart
Latitude
63°N
2°E
4°E
6°E
Longitude
80 km
Sampling gear
Bom trawl (st.no 1 - 12)

Fig. 3.4



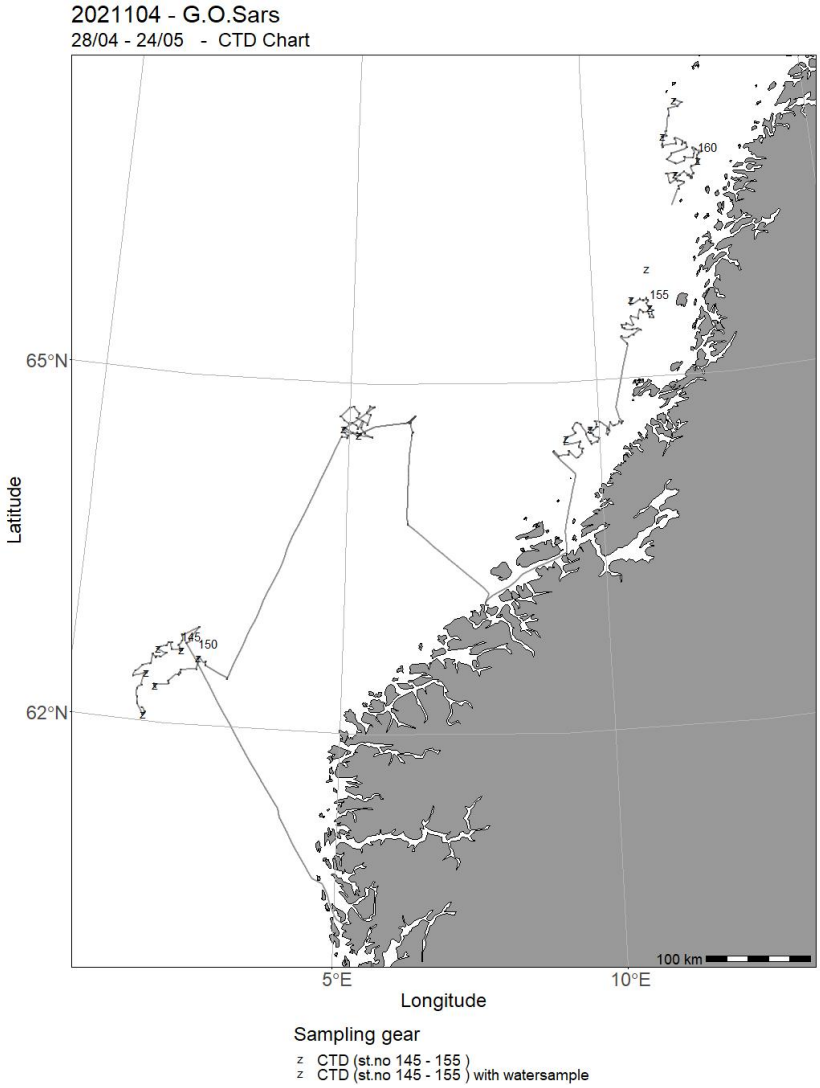
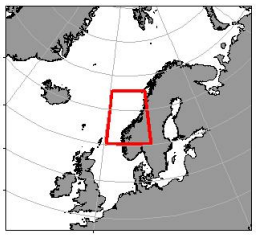

2021104 - G.O.Sars
28/04 - 24/05 - CTD Chart
65°N
62°N
Latitude
5°E
10°E
Longitude
100 km
145
150
155
160
Sampling gear
CTD (st.no 145 - 155)
CTD (st.no 145 - 155) with watersample

Fig. 3.5



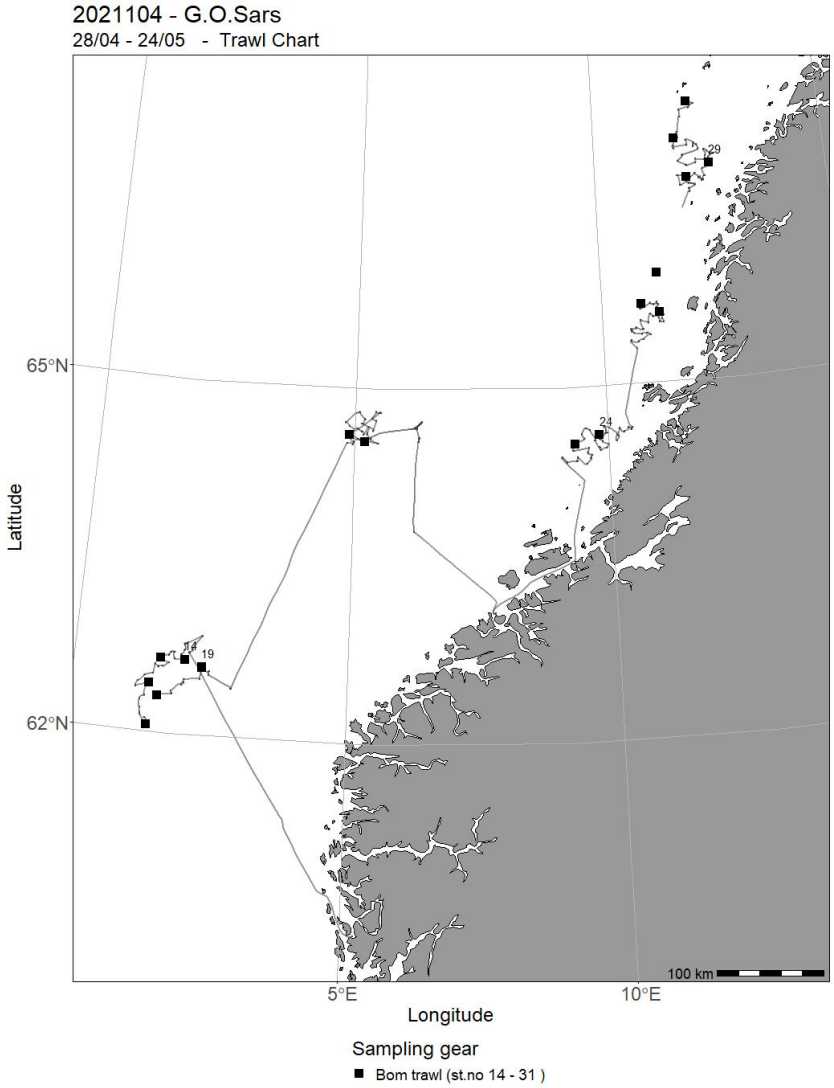
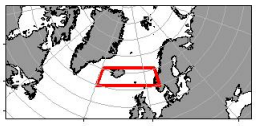

2021104 - G.O.Sars
28/04 - 24/05 - Trawl Chart
65°N
62°N
Latitude
5°E
10°E
Longitude
100 km
29
24
19
Sampling gear
Bom trawl (st.no 14 - 31)

Fig. 3.6



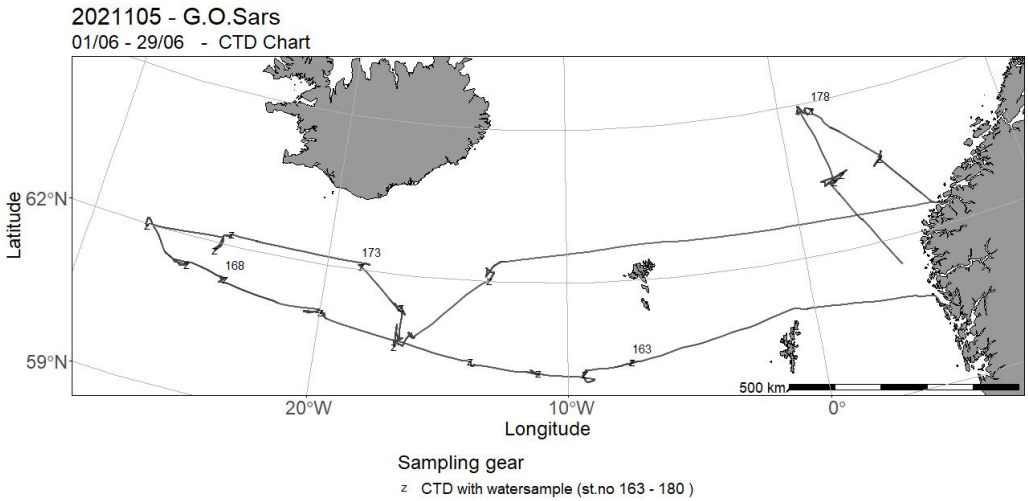
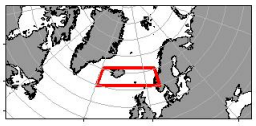

2021105 - G.O.Sars
01/06 - 29/06 - CTD Chart
178
173
168
163
62°N
59°N
Latitude
20°W
10°W
0°
Longitude
500 km
Sampling gear
CTD with watersample (st.no 163 - 180)

Fig. 3.7



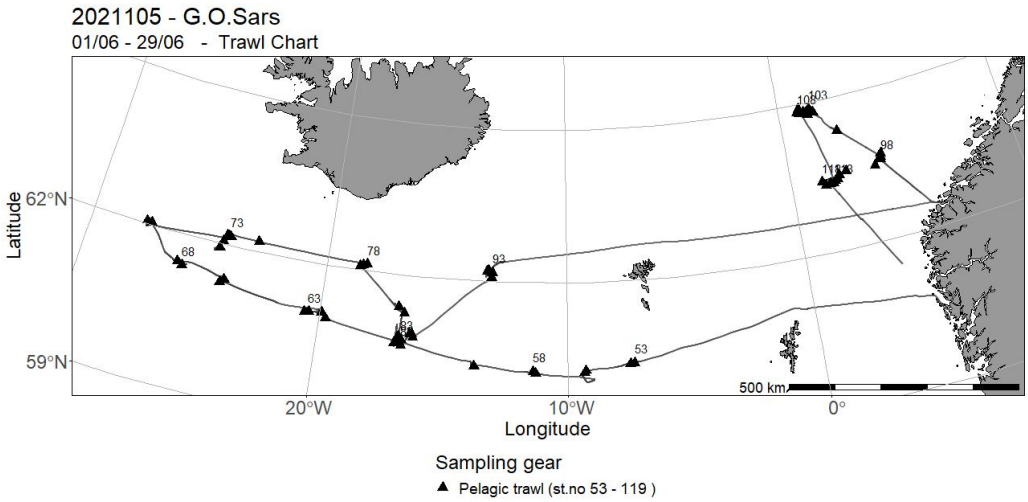

2021105 - G.O.Sars
01/06 - 29/06 - Trawl Chart
Latitude
62°N
59°N
20°W
10°W
0°
Longitude
500 km
73
68
78
93
63
58
53
98
Sampling gear
Pelagic trawl (st.no 53 - 119)

Fig. 3.8

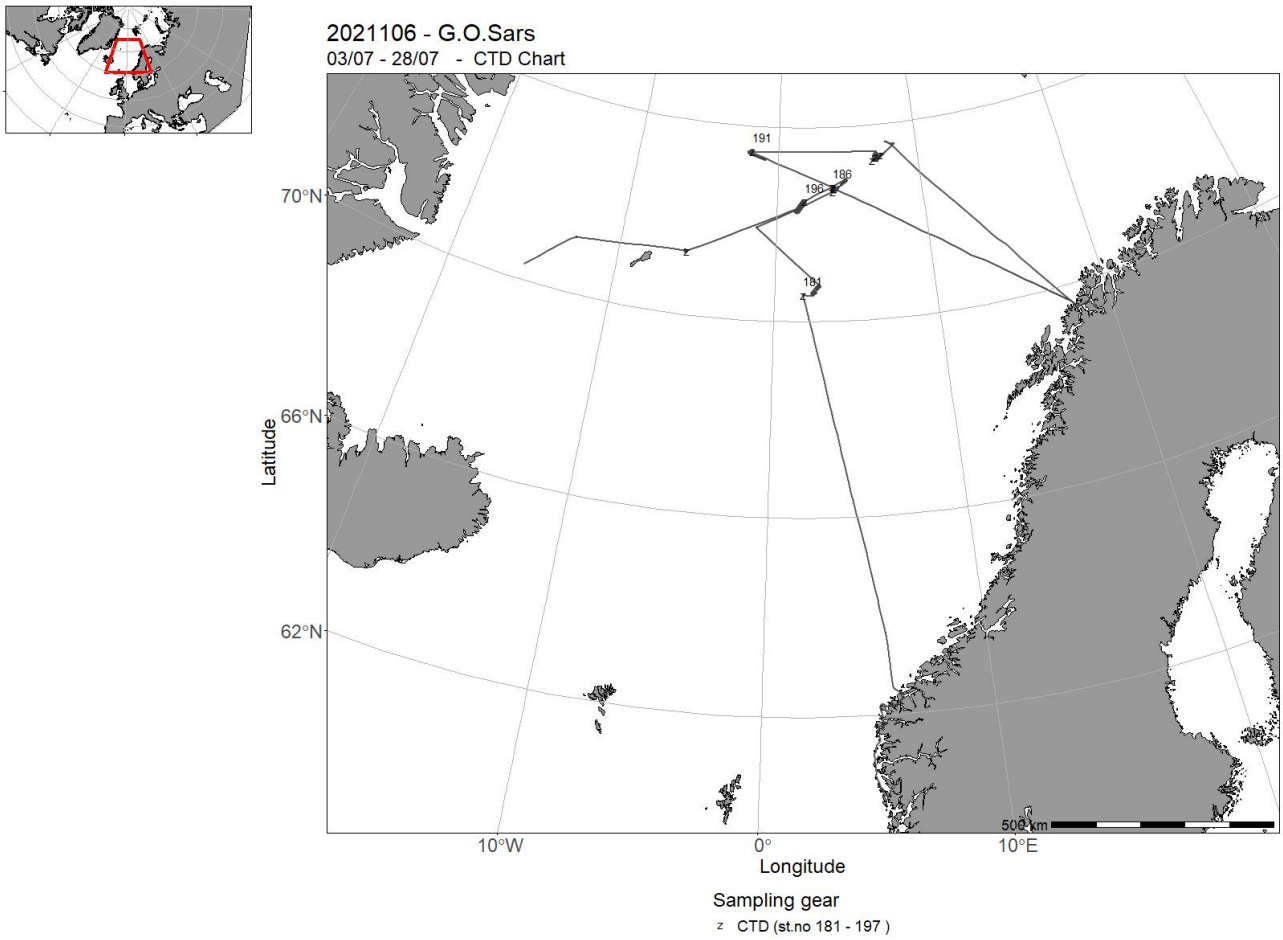

2021106 - G.O.Sars
03/07 - 28/07 - CTD Chart
191
186
196
181
70°N
66°N
62°N
Latitude
10°W
0°
10°E
Longitude
500 km
Sampling gear
CTD (st.no 181 - 197)

Fig. 3.9

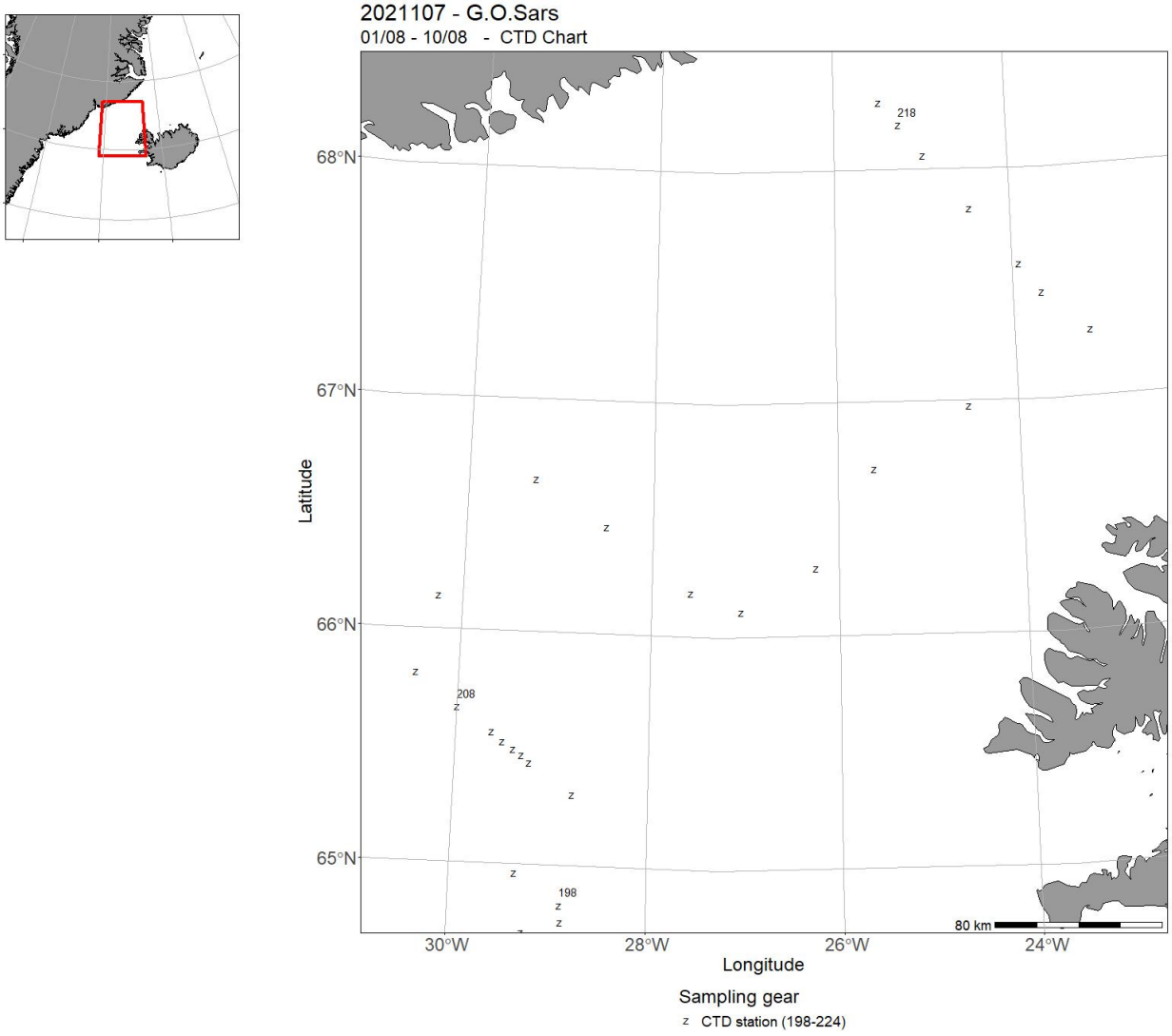
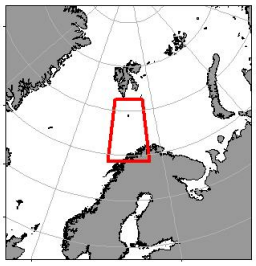

2021107 - G.O.Sars
01/08 - 10/08 - CTD Chart
68°N
67°N
66°N
65°N
Latitude
30°W
28°W
26°W
24°W
Longitude
218
208
198
80 km
Sampling gear
CTD station (198-224)

Fig. 3.10



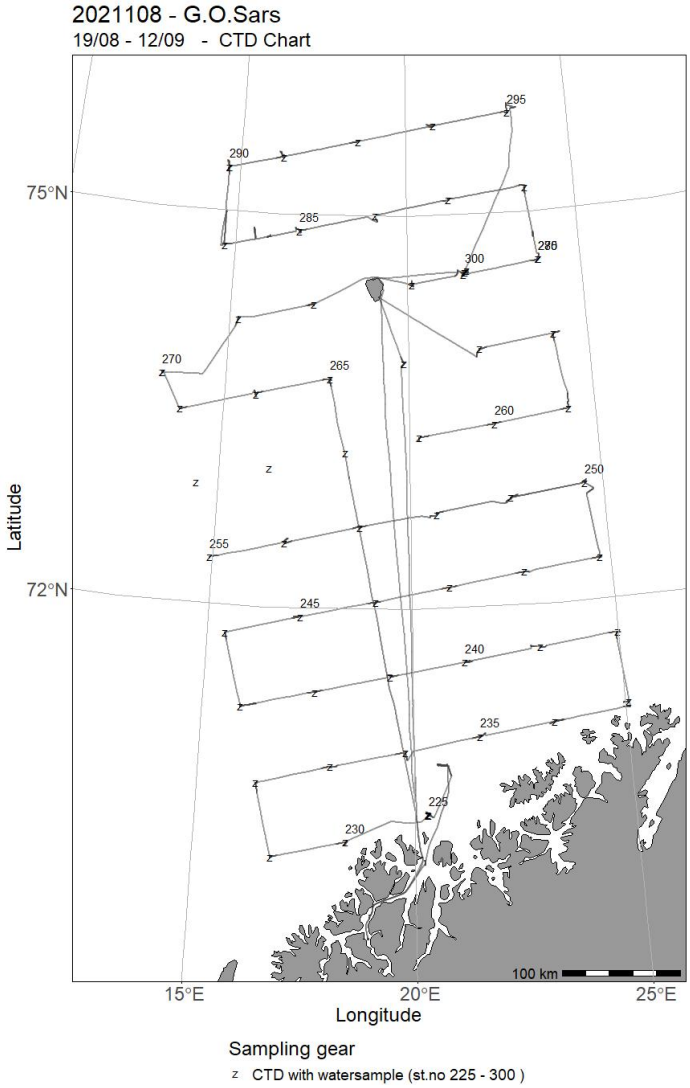
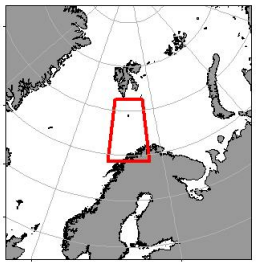

2021108 - G.O.Sars
19/08 - 12/09 - CTD Chart
75°N
72°N
Latitude
15°E
20°E
25°E
Longitude
100 km
295
290
285
280
300
270
265
260
250
255
245
240
235
225
230
Sampling gear
CTD with watersample (st.no 225 - 300)

Fig. 3.11



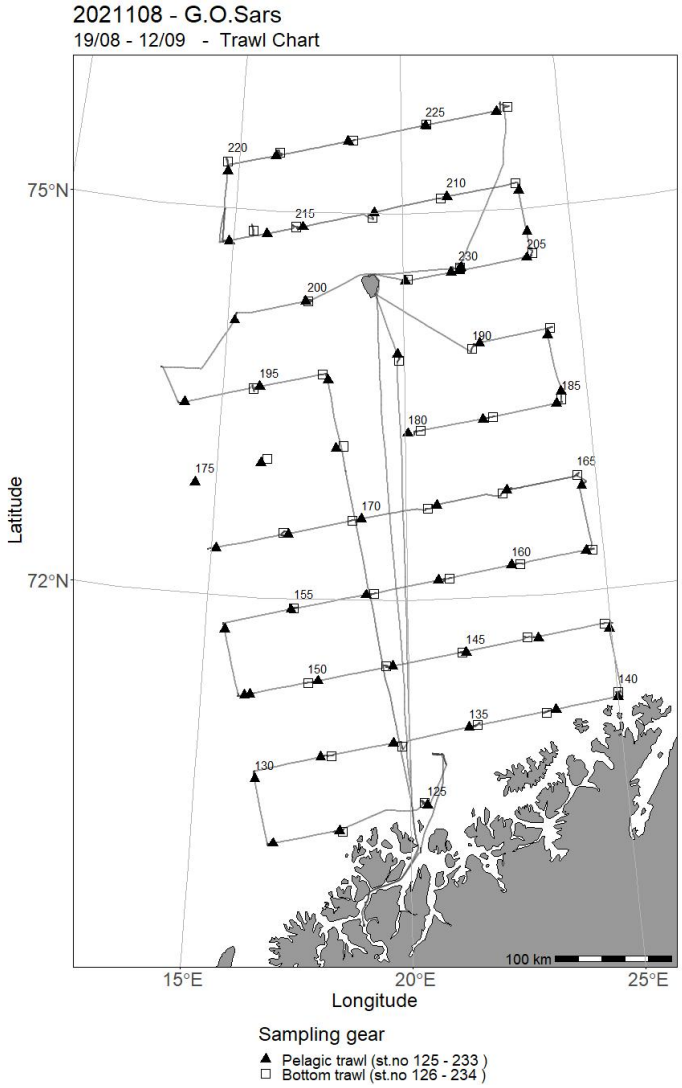
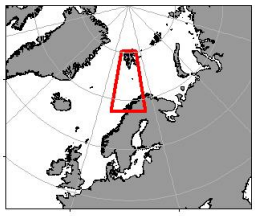

2021108 - G.O.Sars
19/08 - 12/09 - Trawl Chart
75°N
72°N
Latitude
15°E
20°E
25°E
Longitude
100 km
Sampling gear
Pelagic trawl (st.no 125 - 233)
Bottom trawl (st.no 126 - 234)

Fig. 3.12



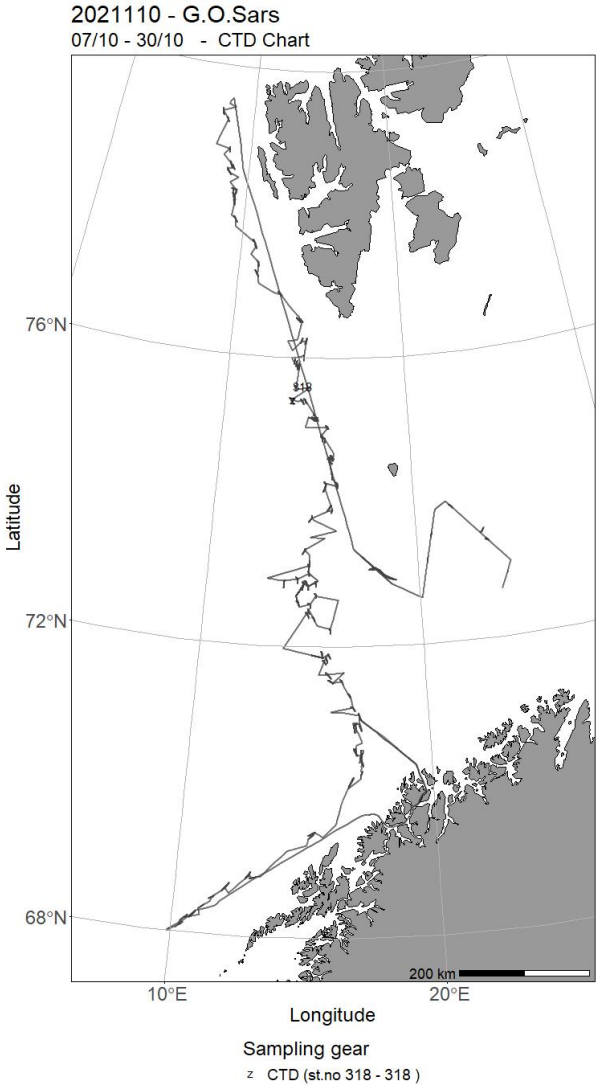
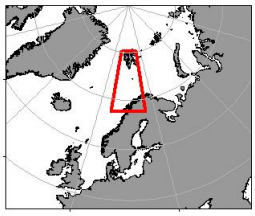

2021110 - G.O.Sars
07/10 - 30/10 - CTD Chart
76°N
72°N
68°N
Latitude
10°E
20°E
Longitude
200 km
Sampling gear
CTD (st.no 318 - 318)

Fig. 3.13



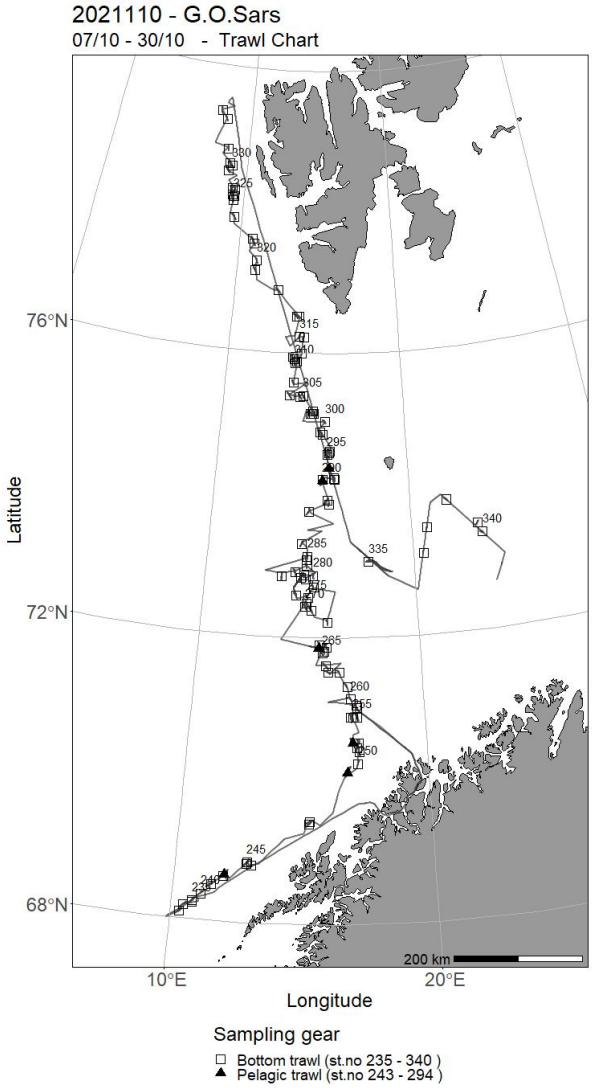

2021110 - G.O.Sars
07/10 - 30/10 - Trawl Chart
76°N
72°N
68°N
Latitude
10°E
20°E
Longitude
200 km
Sampling gear
Bottom trawl (st.no 235 - 340)
Pelagic trawl (st.no 243 - 294)

Fig. 3.14

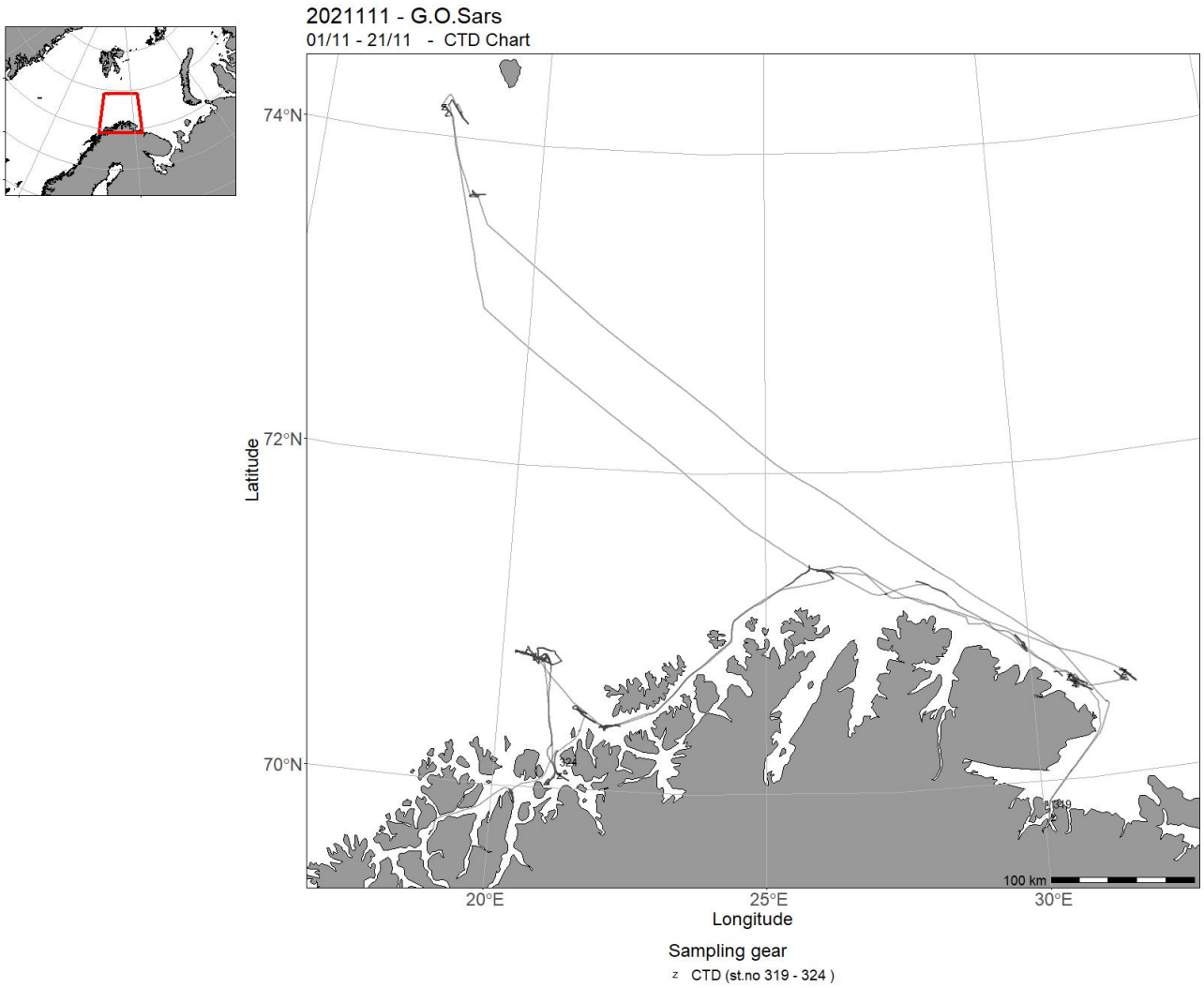

2021111 - G.O.Sars
01/11 - 21/11 - CTD Chart
74°N
72°N
70°N
Latitude
20°E
25°E
30°E
Longitude
100 km
Sampling gear
CTD (st.no 319 - 324)

Fig. 3.15

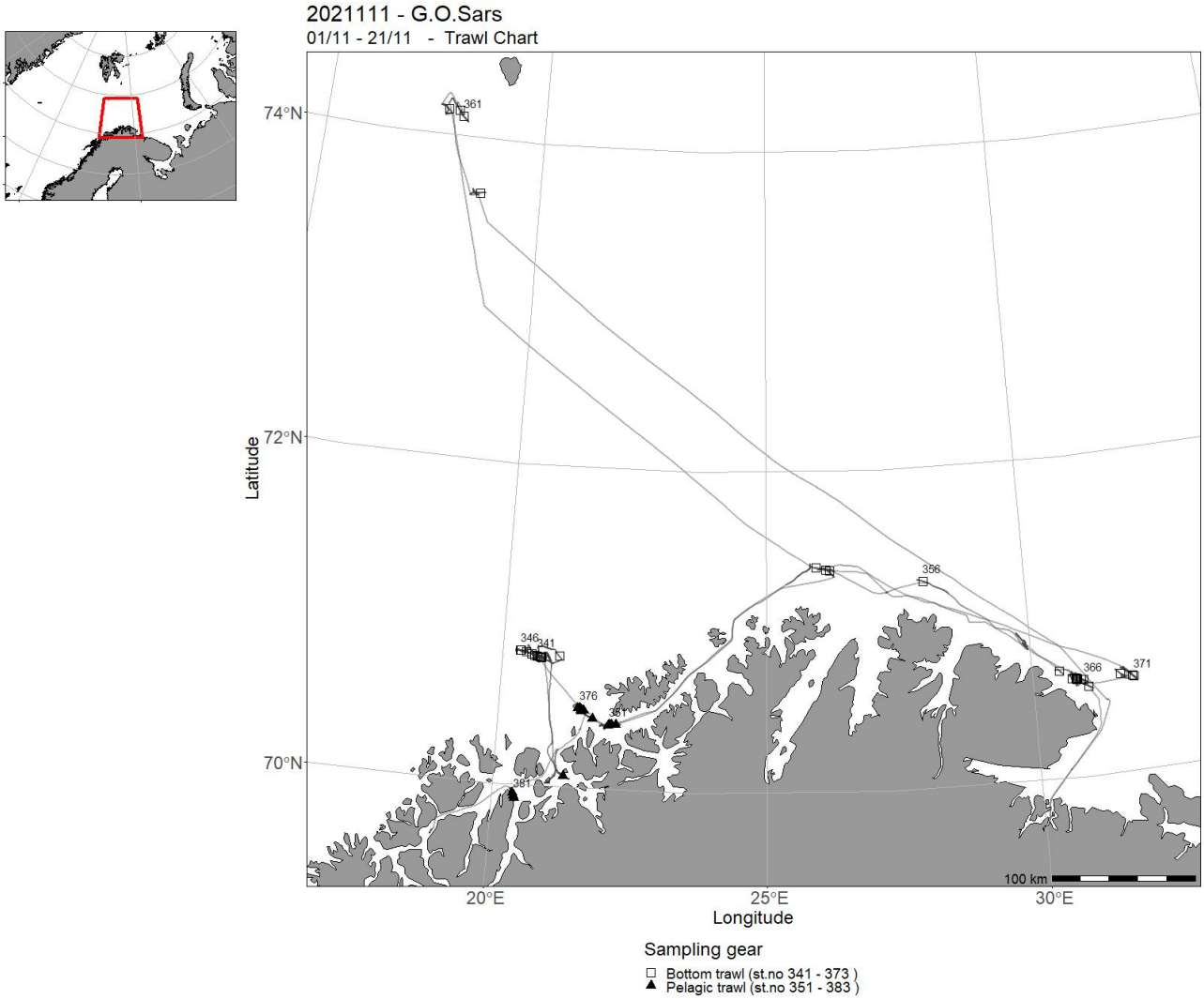

2021111 - G.O.Sars
01/11 - 21/11 - Trawl Chart
74°N
72°N
70°N
Latitude
20°E
25°E
30°E
Longitude
100 km
361
356
346
341
376
371
366
381
Sampling gear
Bottom trawl (st.no 341 - 373)
Pelagic trawl (st.no 351 - 383)

Fig. 3.16

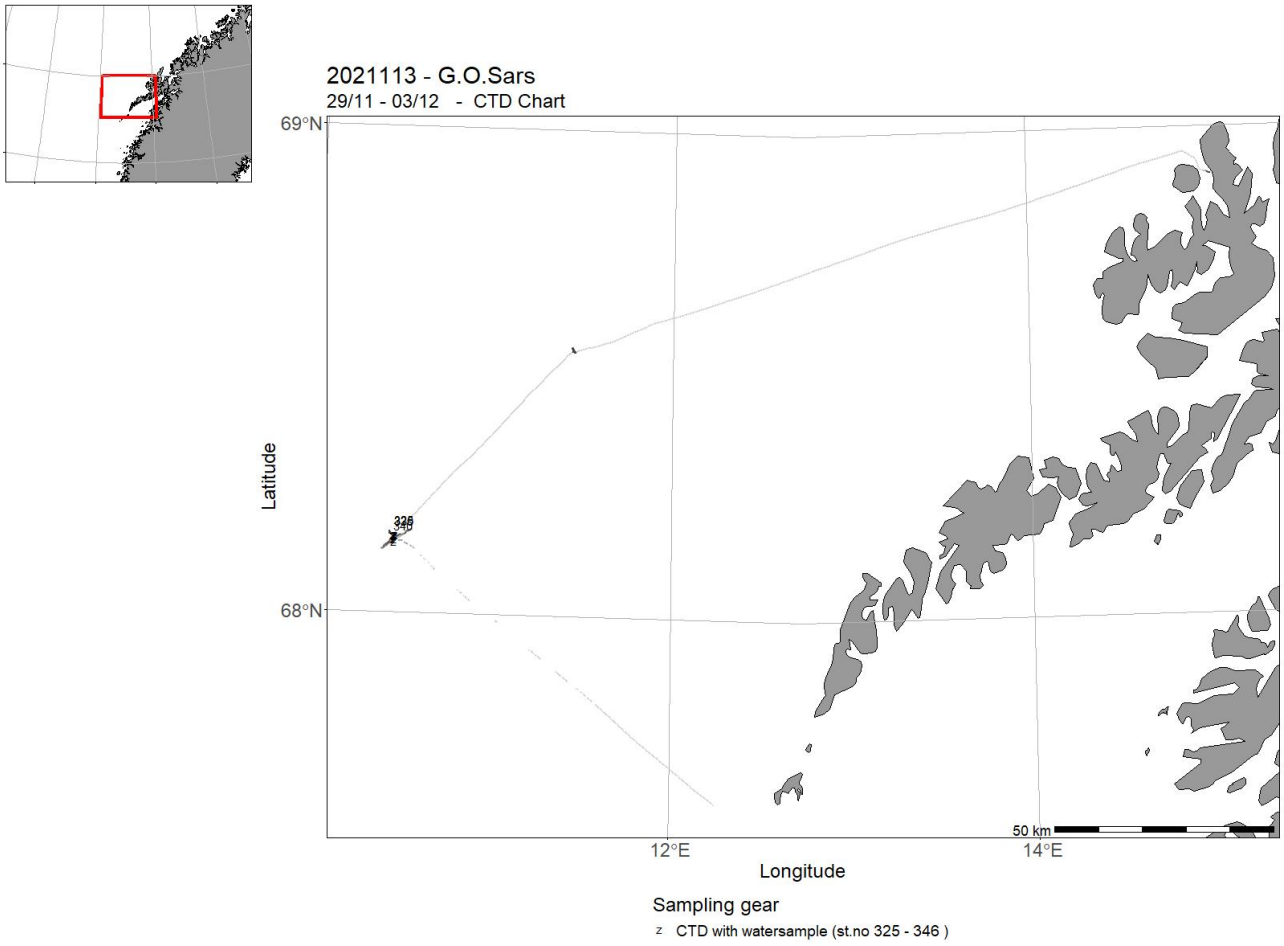
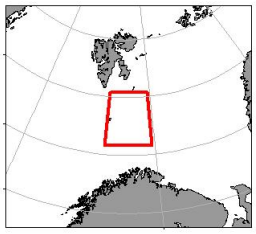

2021113 - G.O.Sars
29/11 - 03/12 - CTD Chart
69°N
68°N
Latitude
12°E
14°E
Longitude
50 km
Sampling gear
CTD with watersample (st.no 325 - 346)

Fig. 3.17



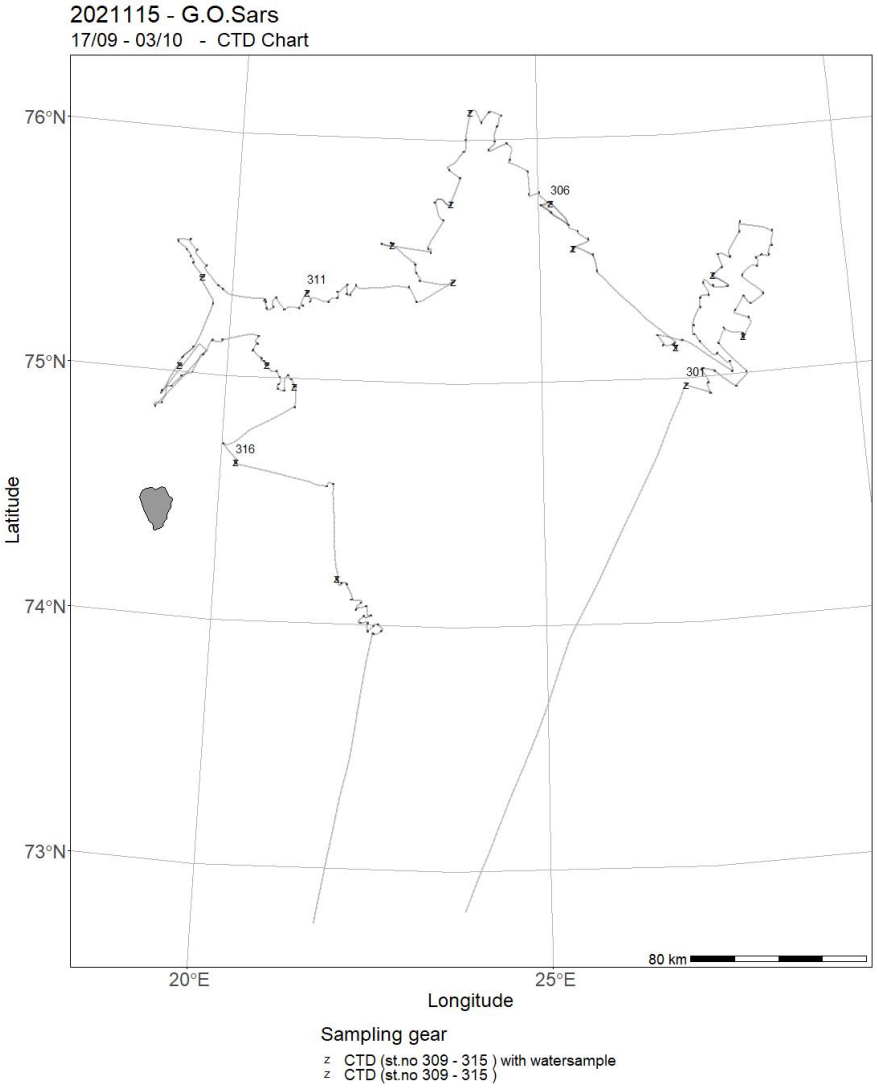
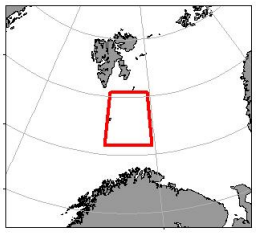

2021115 - G.O.Sars
17/09 - 03/10 - CTD Chart
76°N
75°N
74°N
73°N
Latitude
306
311
301
316
80 km
20°E
25°E
Longitude
Sampling gear
CTD (st.no 309 - 315) with watersample
CTD (st.no 309 - 315)

Fig. 3.18



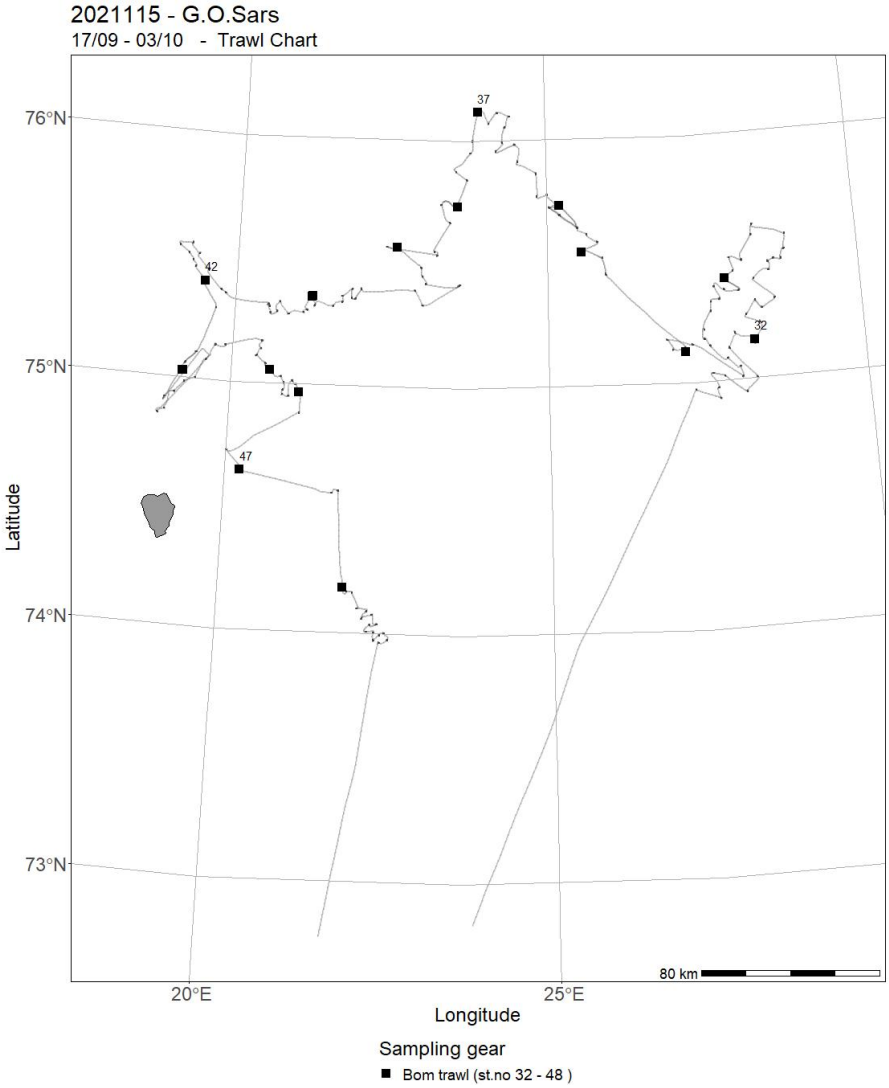

2021115 - G.O.Sars
17/09 - 03/10 - Trawl Chart
76°N
75°N
74°N
73°N
Latitude
37
42
32
47
80 km
20°E
25°E
Longitude
Sampling gear
Bom trawl (st.no 32 - 48)

Fig. 3.19

4 - "Johan Hjort" - Cruises 2021

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021201	07/01 - 15/01	To collect data and samples on pre-selected stations. To sample standard transects for physical oceanographic parameters (CTD casts, nutrients and chlorphyll) and zooplankton in the North Sea. Cruise programme : 1. Utsira-V transect 2. Fair Isle-Pentland transect 3. Scotland East Coast transect 4. Hanstholm-Aberdeen transect	North Sea	1 - 81	-
2021202	17/01 - 24/01	The objective of the cruise was to collect data and samples on pre-selected stations as part of the IMR Monitoring of the environment and plankton on the Svinøy and Fugløya-Bjørnøya sections and at station M in January. Sampling was undertaken on the following standard transects: Svinøy and Fugløya-Bjørnøya sections and at station M. Implementation of transect over LoVe. The cruise programme included sampling for physical-chemical oceanographic parameters (CTD casts, nutrients and chlorphyll), zooplankton with plankton net and the Multinet Mammoth.	Norwegian Sea	82 - 107	-
2021203	27/01 - 19/03	Annual combined acoustic and bottom trawl survey in the Barents Sea in winter to: 1) map the distribution and estimate acoustic and bottom trawl abundances indices, length, weight and maturity at age of cod and haddock. 2) map the acoustic distribution and do biological sampling of capelin, herring, polar cod and blue whiting. 3) map the general hydrographic regime by using a CTD-sonde to monitor the temperature and at about every second-third fixed bottom trawl stations (for about every 40 NM). 4) stomach sampling of cod and haddock. 5) collection of biological data for snow crab. 6) collection of samples for analyses of contaminants.	Barents Sea	108 - 179	1 - 220

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021204	22/03 - 09/04	Anually recurrant acoustic survey to monitor abundance of spawning North-East Arctic cod in the spawning area around Lofoten by systematic parallell transects and with systematic sampling of fish-egg concentrations by vertical nets in the upper 100 m of the water column. Lofoten is the main spawning location for the stock, and the survey index indicate spawning biomass and abundance of the mature stock.	Norwegian Sea	180 - 312	221 - 246
2021205	11/04 - 09/05	The cruise objectives were to occupy the monitoring sections Fugløya-Bjørnøya in the Barents Sea, extended Bjørnøya vest and extended Gimsøy section in the northern Norwegian Sea and the Svinøy section in the southern Norwegian Sea and deploy Argo floats. On the sections, CTD observations measueremenst were made from surface to bottom. Water samples were drawn for nutrients analysis and chlorophyll was sampled for the top 100 m. Carbon system analysis and water samples for oxygen analysis were drawn in selceted stations. WP2 plankton nets for the top 200 m (100 m in the Barents Sea) was conducted along the sections. Qualitative plankton samples were sampled on selected stations. ADCP, Thermosalinograph and echo sounder data were collected underwa, and Argo floats wer deployed in selected locations.	Barents Sea	313 - 430	-
2021206	10/05 - 14/05	The major objective is to document to what extent discharges from the oil and gas installations cause contamination of fish negatively affecting the quality. For both the petroleum industry and the Norwegian fishing industry it is important that safety and quality of Norwegian seafood is documented, as well as environmental health of the marine environment. Water column monitoring with fish from the Norwegian Continental Shelf are conducted every third year and shall document whether fish from Norwegian Seas are affected by pollution from oil and gas industry activities.	North Sea	431 - 437	247 - 260

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021207	24/06 - 23/07	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). Project name: Population estimates of demersal fish stocks in North Sea Coordinating body: Institute of Marine Research	North Sea	438 - 483	261 - 382
2021208	27/07 - 08/08	Monitoring of the environment and plankton on the Svinøy, station M, Gimsøy, Fugløya-Bjørnøya and Bjørnøya-V sections. Measuring physical, chemical and biological parameters important to follow changes in climate and environment at weather station M in the Norwegian Sea. Gliders and rigs.	Norwegian Sea	484 - 559	-
2021209	17/08 - 28/09	The cruise forms part of a multi-ship, multi-purpose ecosystem survey of the Barents Sea, carried out jointly by Norway and Russia. The objective of the cruise was to collect data related to stations and along cruise tracks, on water chemistry and physics, phytoplankton, zooplankton, fish (acoustics and trawl), benthic organisms, sea mammals, and birds.	Barents Sea	560 - 684	383 - 602

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021210	01/10 - 08/11	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 and saithe • 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 (about 30 NM) • acoustic coverage of pelagic fish in Laksefjord, Tanafjord,and Varangerfjord • collection of frozen samples of selected shark and skate species, deep sea shrimps, and hake • collection of tissues samples for genetic study of hake and halibut • collection of frozen hake for analysis of contaminants	Barents Sea	685 - 739	603 - 759
2021211	12/11 - 19/11	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 the following standard transects: Utsira-Start Point, Fair Isle-Pentland, east coast of Scotland and Aberdeen-Hanstholm (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. A larger plankton net with an associated smaller and finer mesh net was used to sample the fish larvae and fish eggs. From the Fair Isle-Pentland transect only the 6 last stations were sampled.	North Sea	740 - 813	-

5 - “Johan Hjort” – Charts for cruises 2021

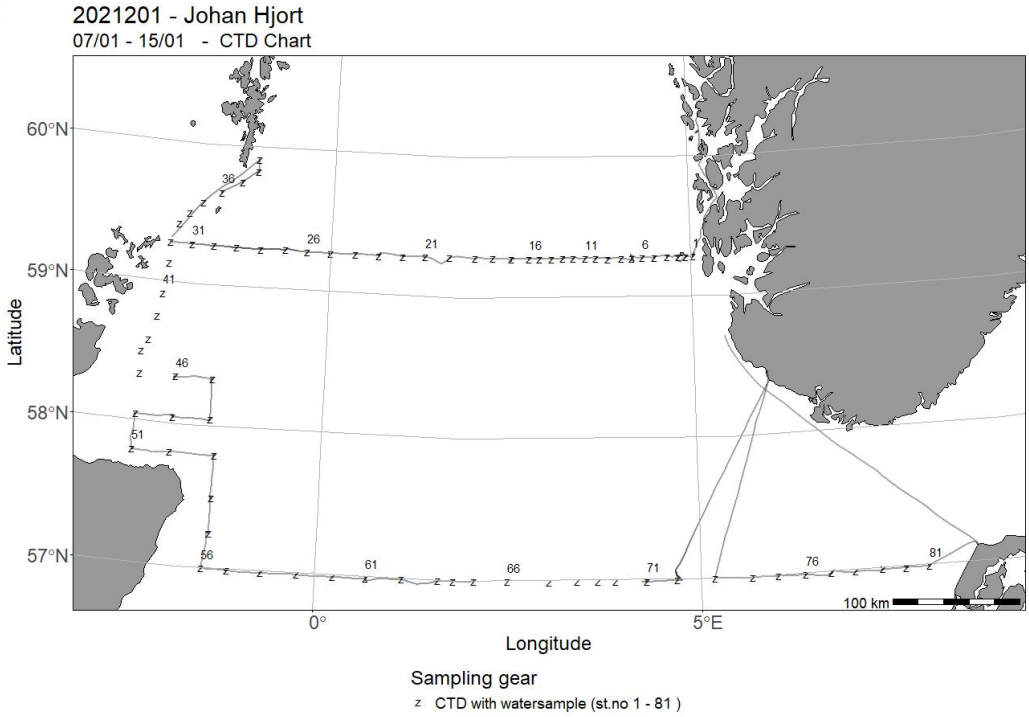
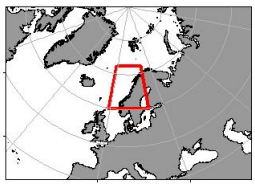


Fig. 5.1



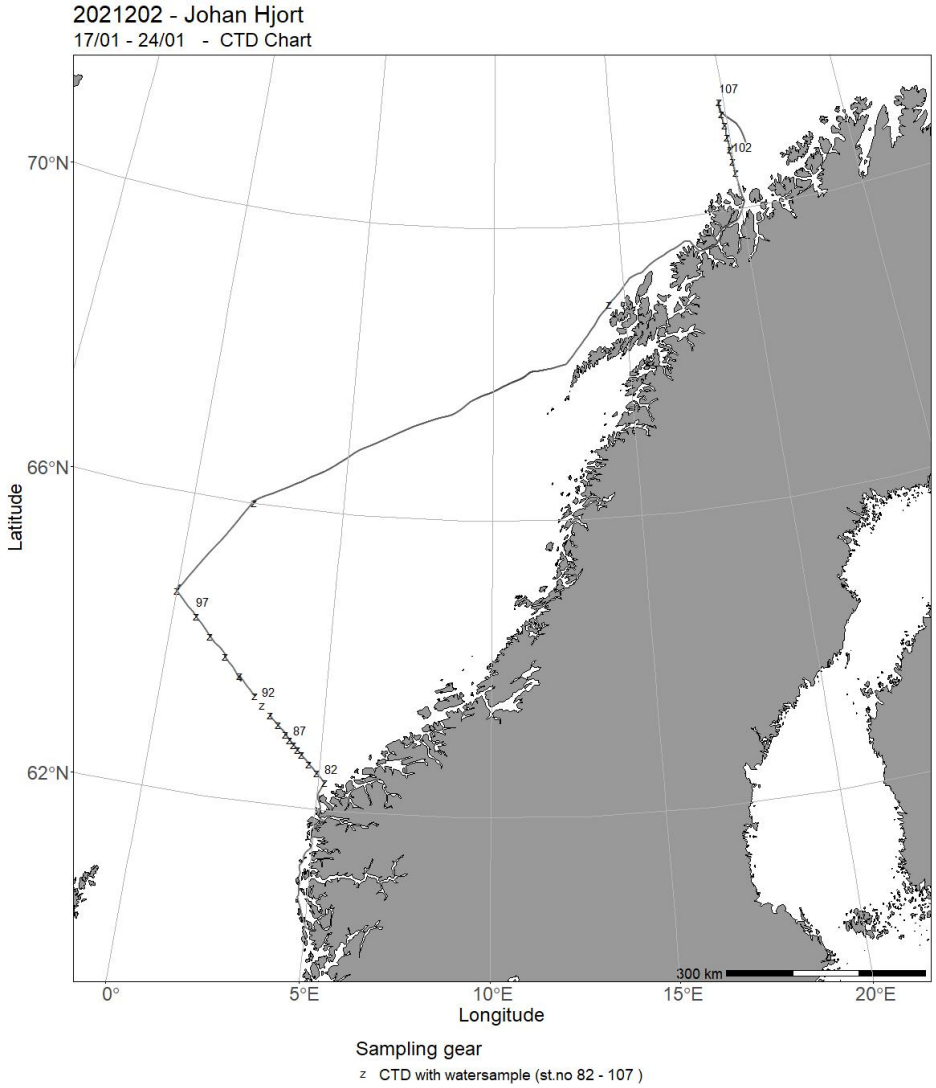

2021202 - Johan Hjort
17/01 - 24/01 - CTD Chart
70°N
66°N
62°N
Latitude
0°
5°E
10°E
15°E
20°E
Longitude
300 km
107
102
97
92
87
82
Sampling gear
CTD with watersample (st.no 82 - 107)

Fig. 5.2

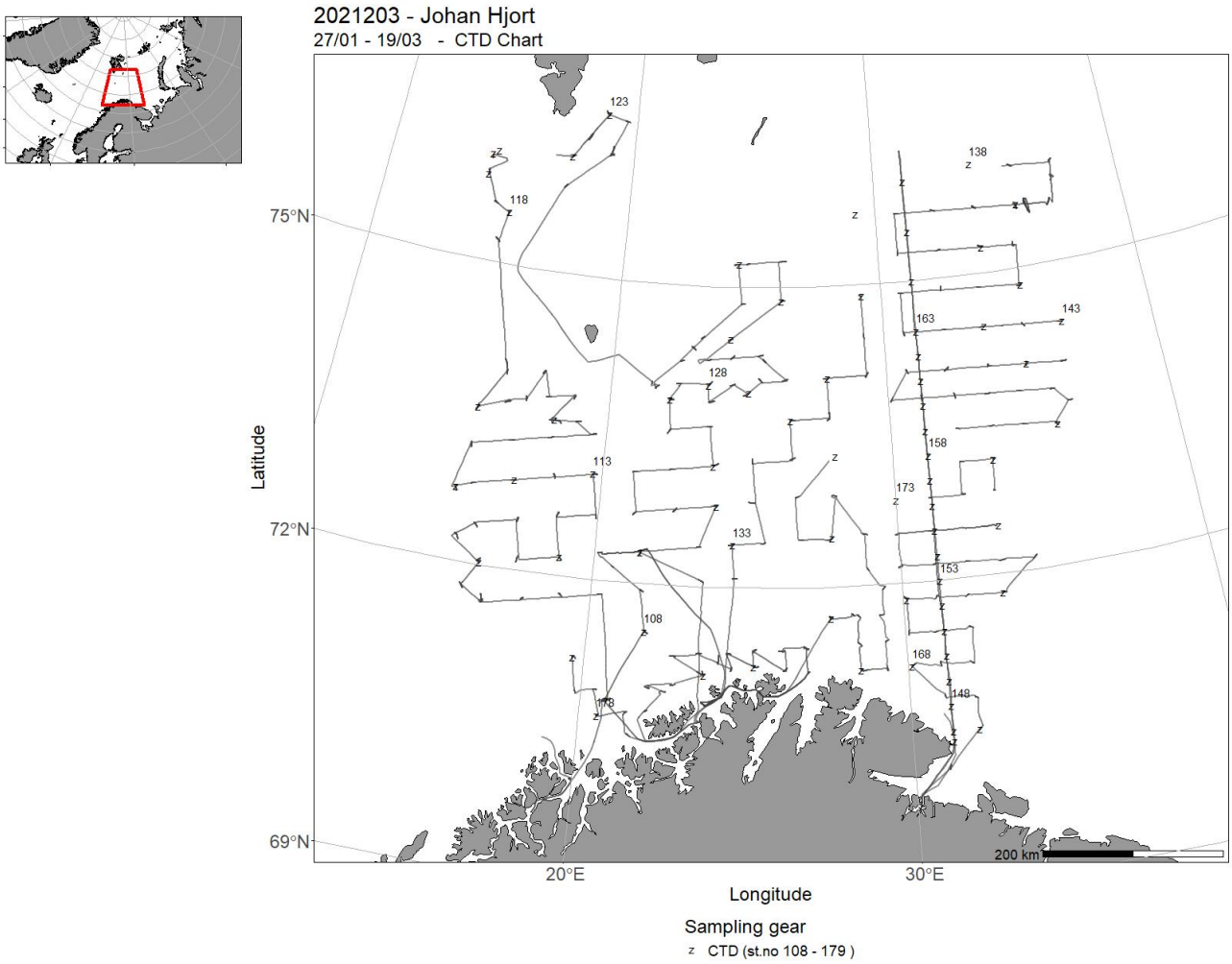

2021203 - Johan Hjort
27/01 - 19/03 - CTD Chart
75°N
72°N
69°N
20°E
30°E
Latitude
Longitude
200 km
Sampling gear
CTD (st.no 108 - 179)

Fig. 5.3

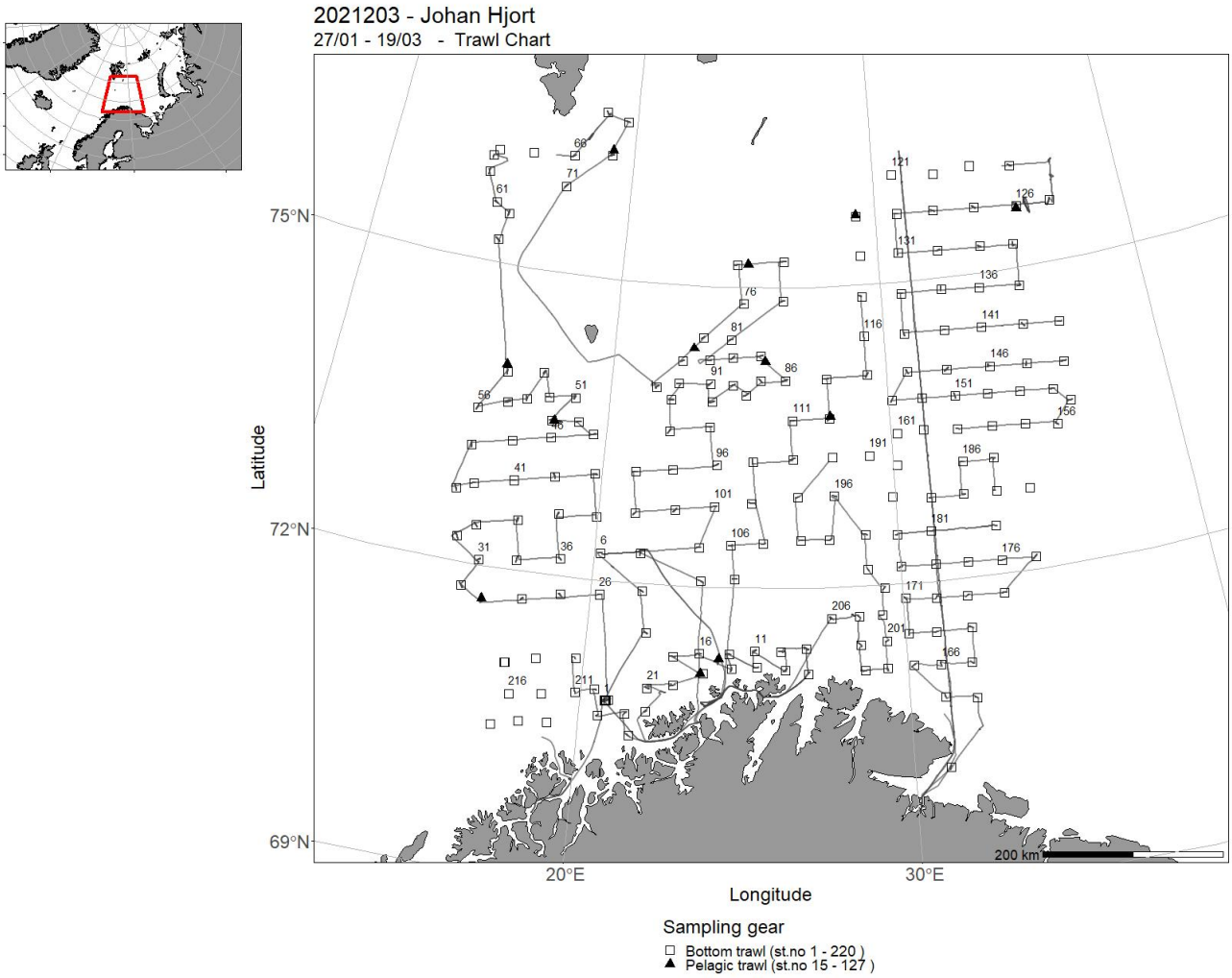

2021203 - Johan Hjort
27/01 - 19/03 - Trawl Chart
75°N
72°N
69°N
20°E
30°E
Latitude
Longitude
200 km
Sampling gear
Bottom trawl (st.no 1 - 220)
Pelagic trawl (st.no 15 - 127)

Fig. 5.4

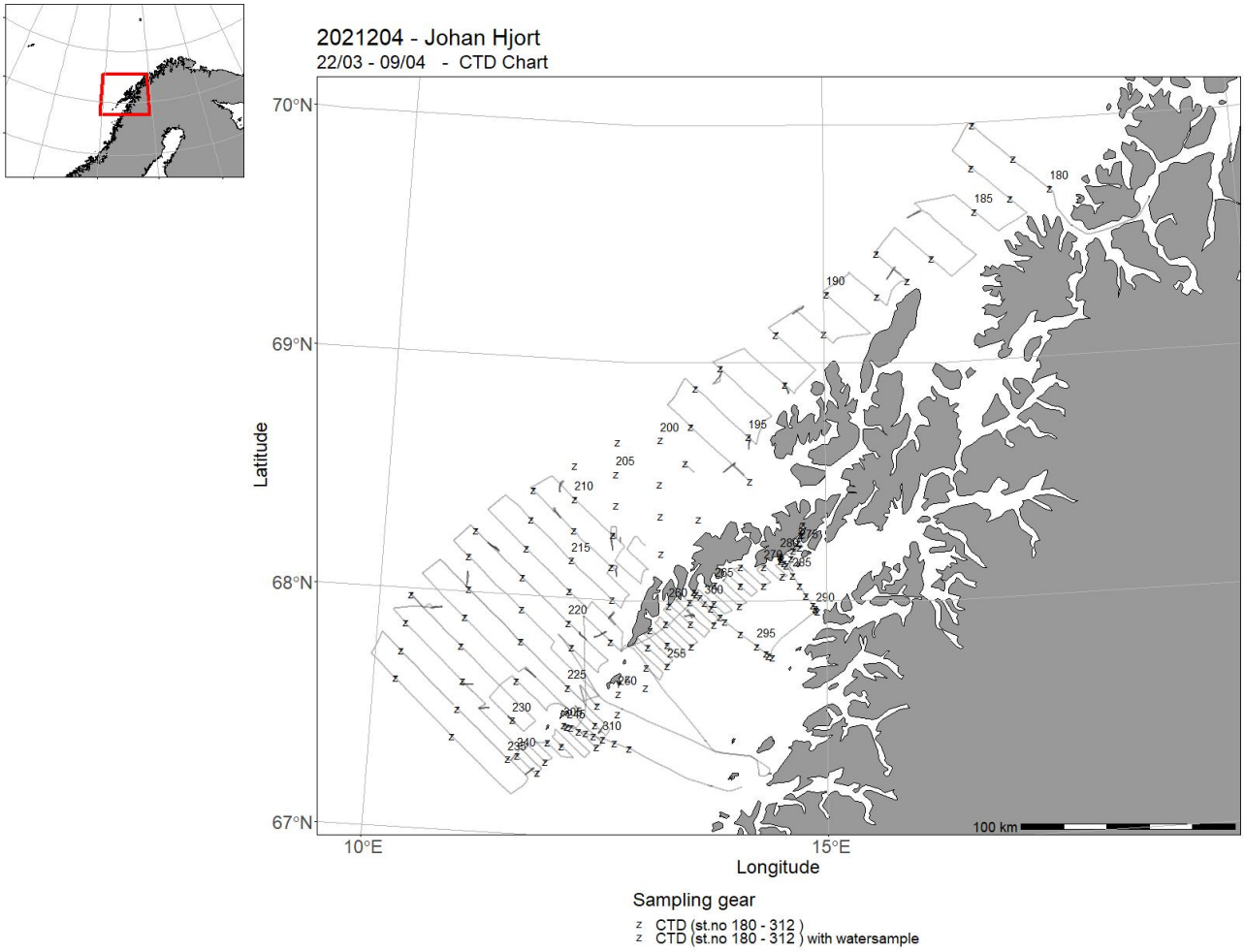

2021204 - Johan Hjort
22/03 - 09/04 - CTD Chart
70°N
69°N
68°N
67°N
Latitude
10°E
15°E
Longitude
100 km
Sampling gear
CTD (st.no 180 - 312)
CTD (st.no 180 - 312) with watersample

Fig. 5.5

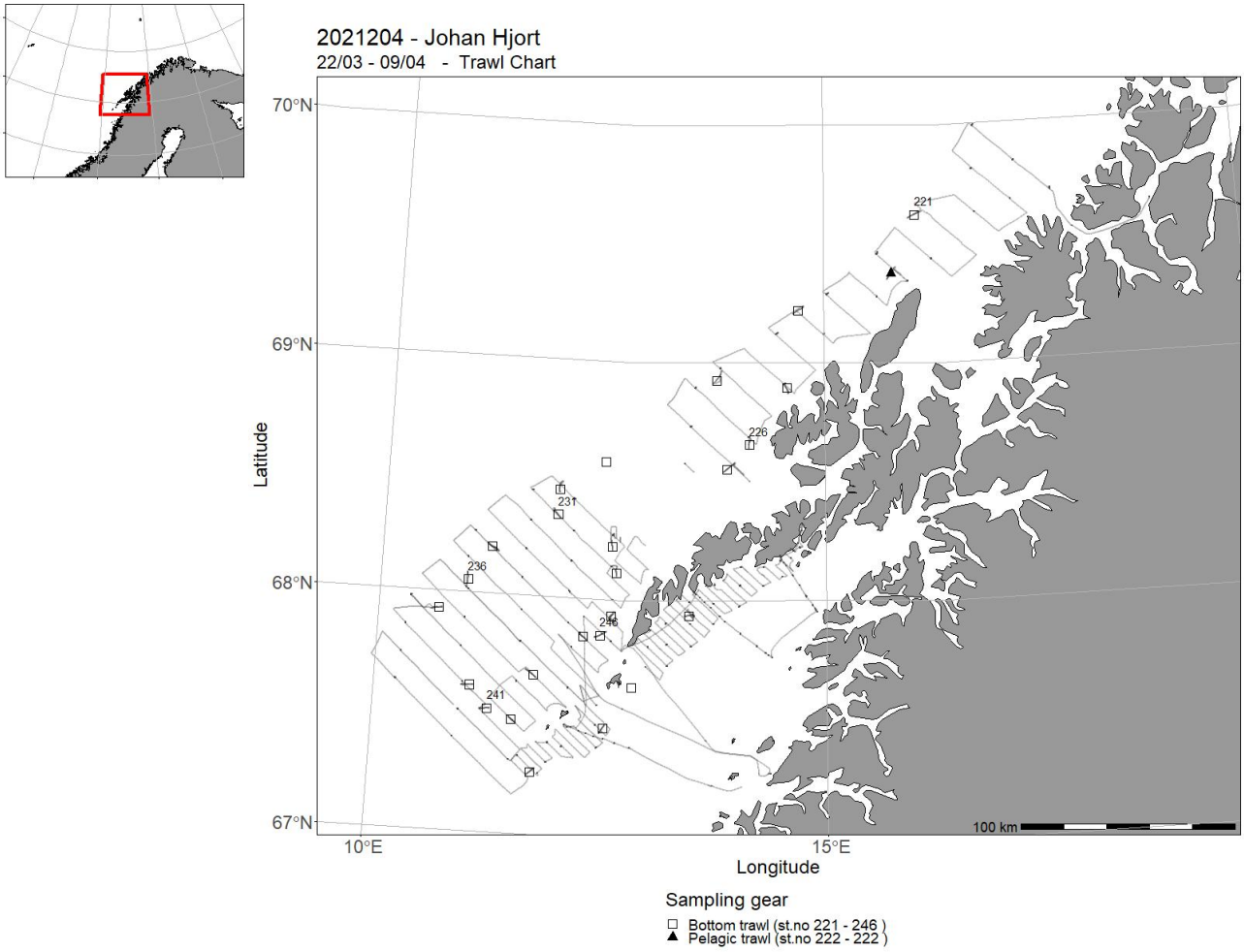

2021204 - Johan Hjort
22/03 - 09/04 - Trawl Chart
70°N
69°N
68°N
67°N
Latitude
10°E
15°E
Longitude
100 km
221
226
231
236
241
246
Sampling gear
Bottom trawl (st.no 221 - 246)
Pelagic trawl (st.no 222 - 222)

Fig. 5.6

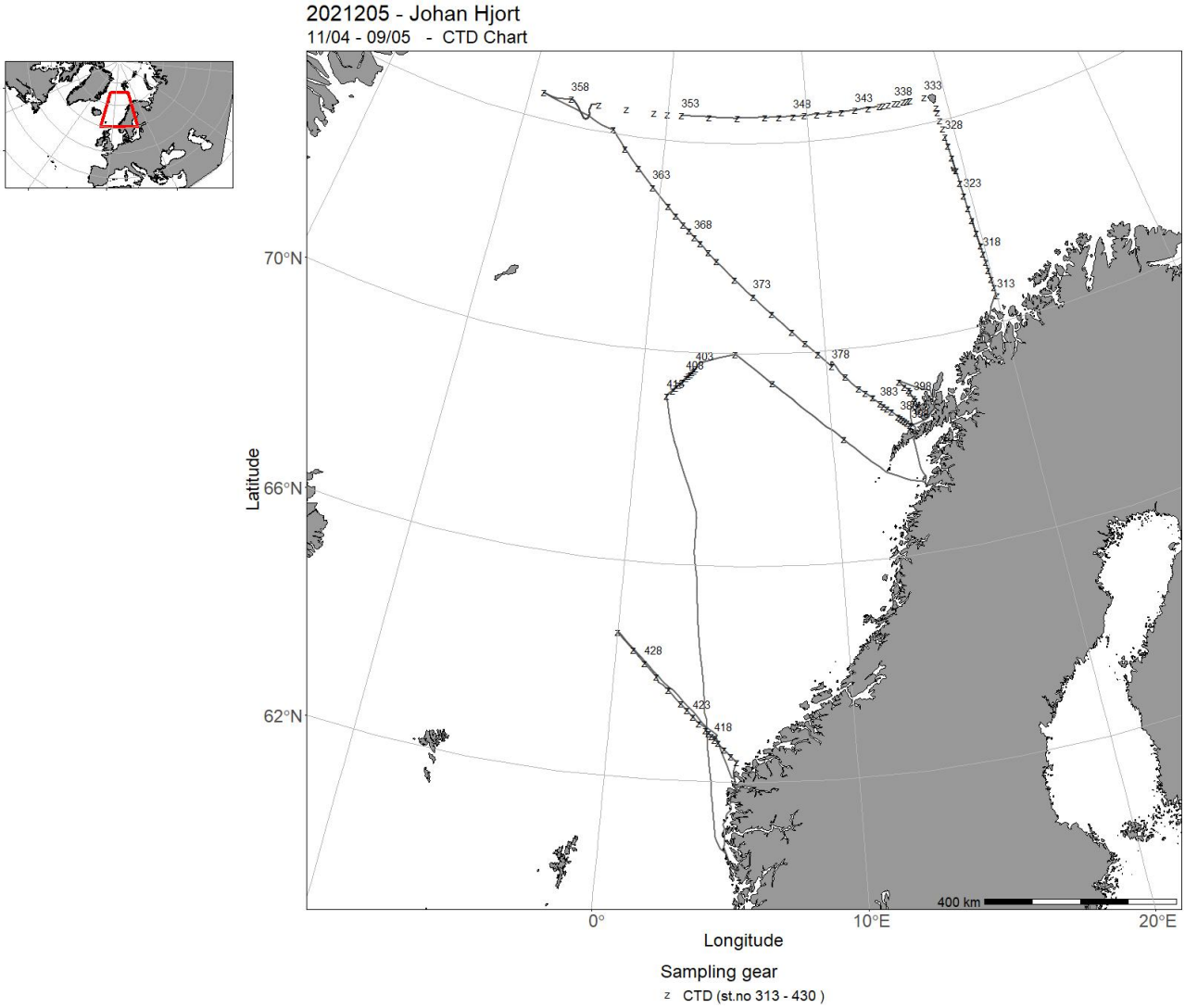

2021205 - Johan Hjort
11/04 - 09/05 - CTD Chart
70°N
66°N
62°N
Latitude
0°
10°E
20°E
Longitude
400 km
Sampling gear
CTD (st.no 313 - 430)

Fig. 5.7

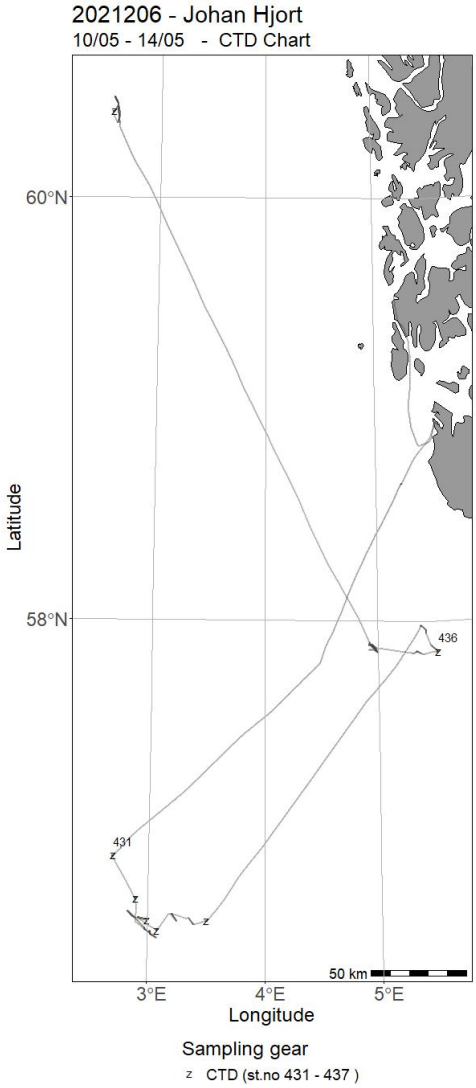
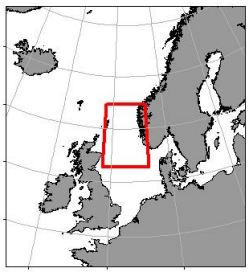

2021206 - Johan Hjort
10/05 - 14/05 - CTD Chart
60°N
58°N
Latitude
436
431
50 km
3°E
4°E
5°E
Longitude
Sampling gear
CTD (st.no 431 - 437)

Fig. 5.8



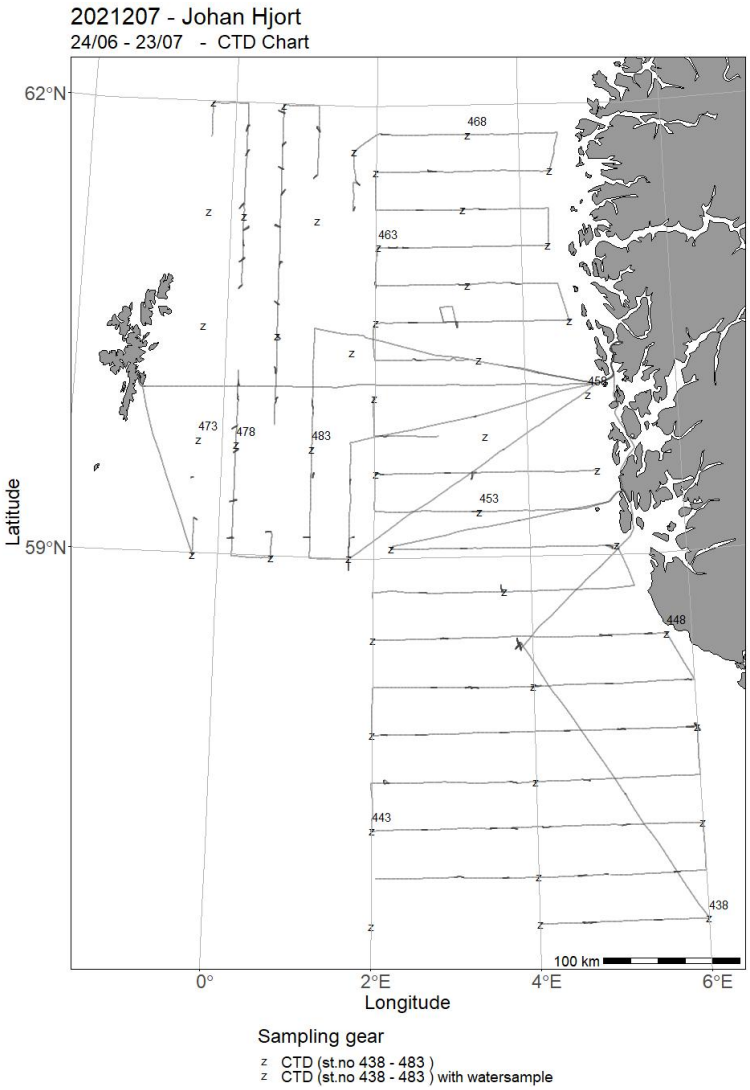
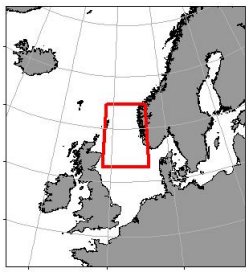

2021207 - Johan Hjort
24/06 - 23/07 - CTD Chart
62°N
59°N
Latitude
0°
2°E
4°E
6°E
Longitude
468
463
458
473
478
483
453
448
443
438
100 km
Sampling gear
CTD (st.no 438 - 483)
CTD (st.no 438 - 483) with watersample

Fig. 5.9



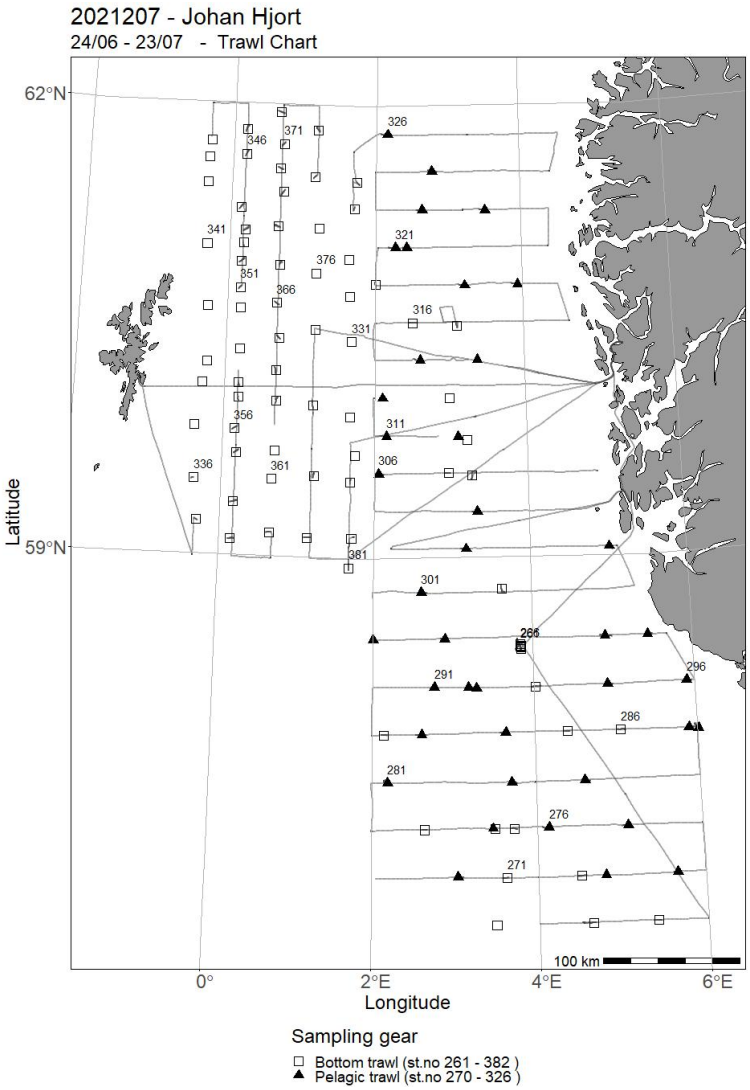
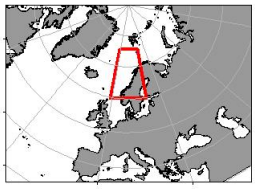

2021207 - Johan Hjort
24/06 - 23/07 - Trawl Chart
62°N
59°N
Latitude
0°
2°E
4°E
6°E
Longitude
100 km
326
371
346
341
321
376
351
366
316
331
356
311
336
361
306
381
301
266
291
296
286
281
276
271
Sampling gear
Bottom trawl (st.no 261 - 382)
Pelagic trawl (st.no 270 - 326)

Fig. 5.10



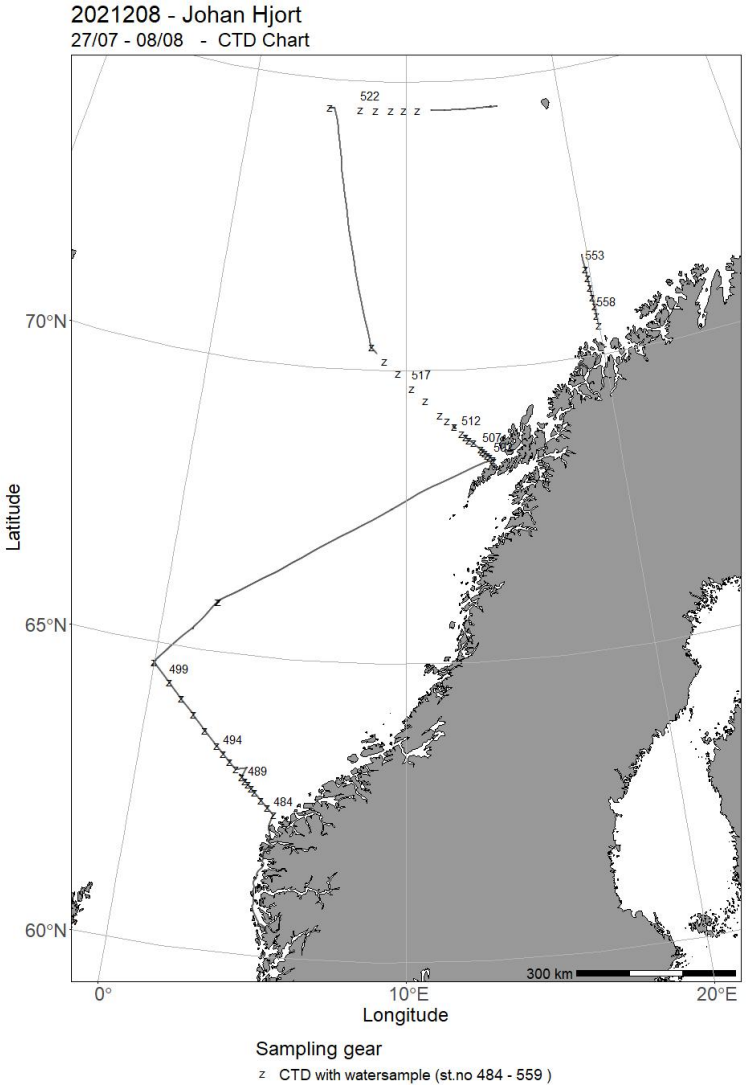

2021208 - Johan Hjort
27/07 - 08/08 - CTD Chart
522
553
558
517
512
507
499
494
489
484
70°N
65°N
60°N
0°
10°E
20°E
Latitude
Longitude
300 km
Sampling gear
CTD with watersample (st.no 484 - 559)

Fig. 5.11

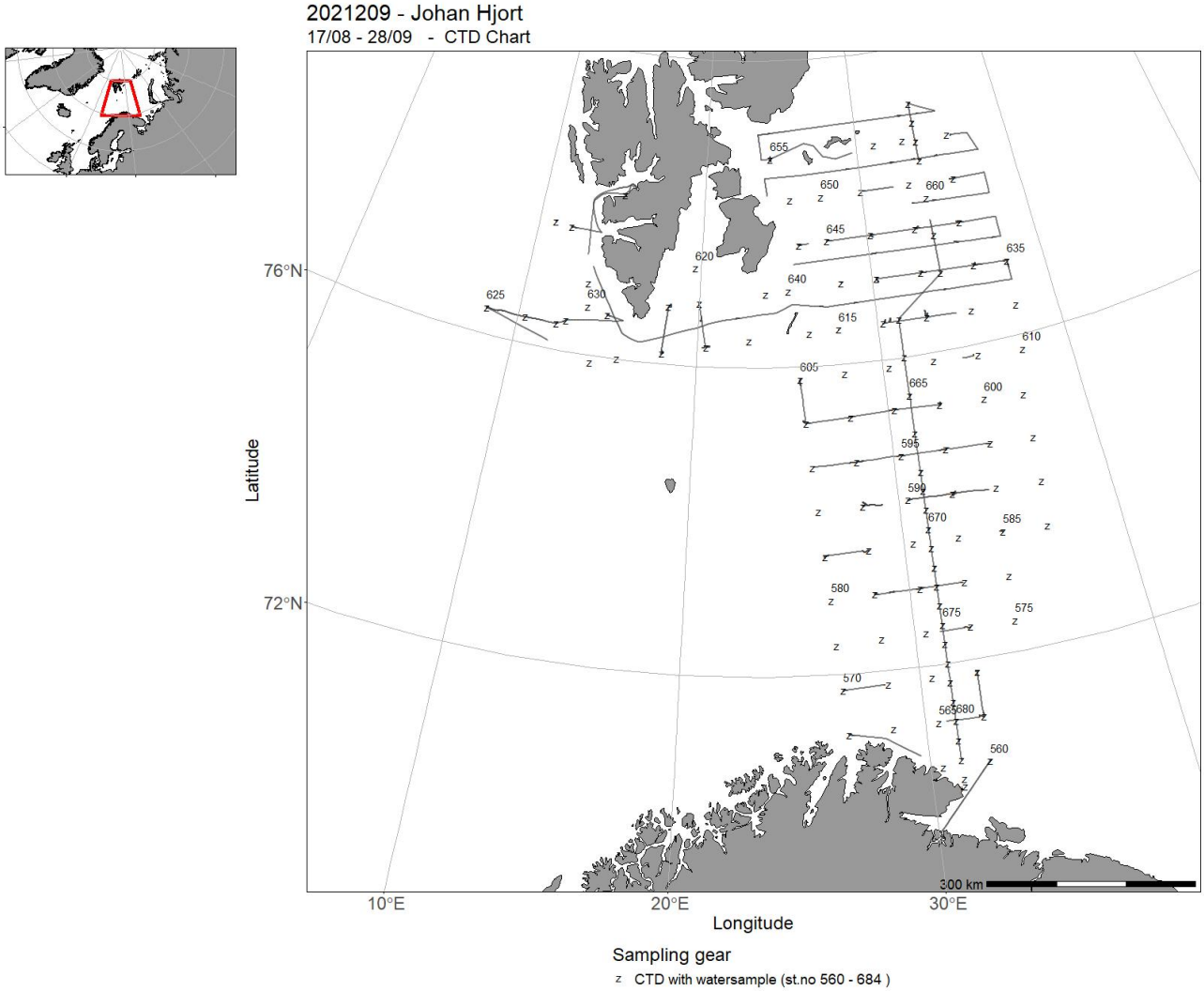

2021209 - Johan Hjort
17/08 - 28/09 - CTD Chart
76°N
72°N
Latitude
10°E
20°E
30°E
Longitude
300 km
Sampling gear
CTD with watersample (st.no 560 - 684)

Fig. 5.12

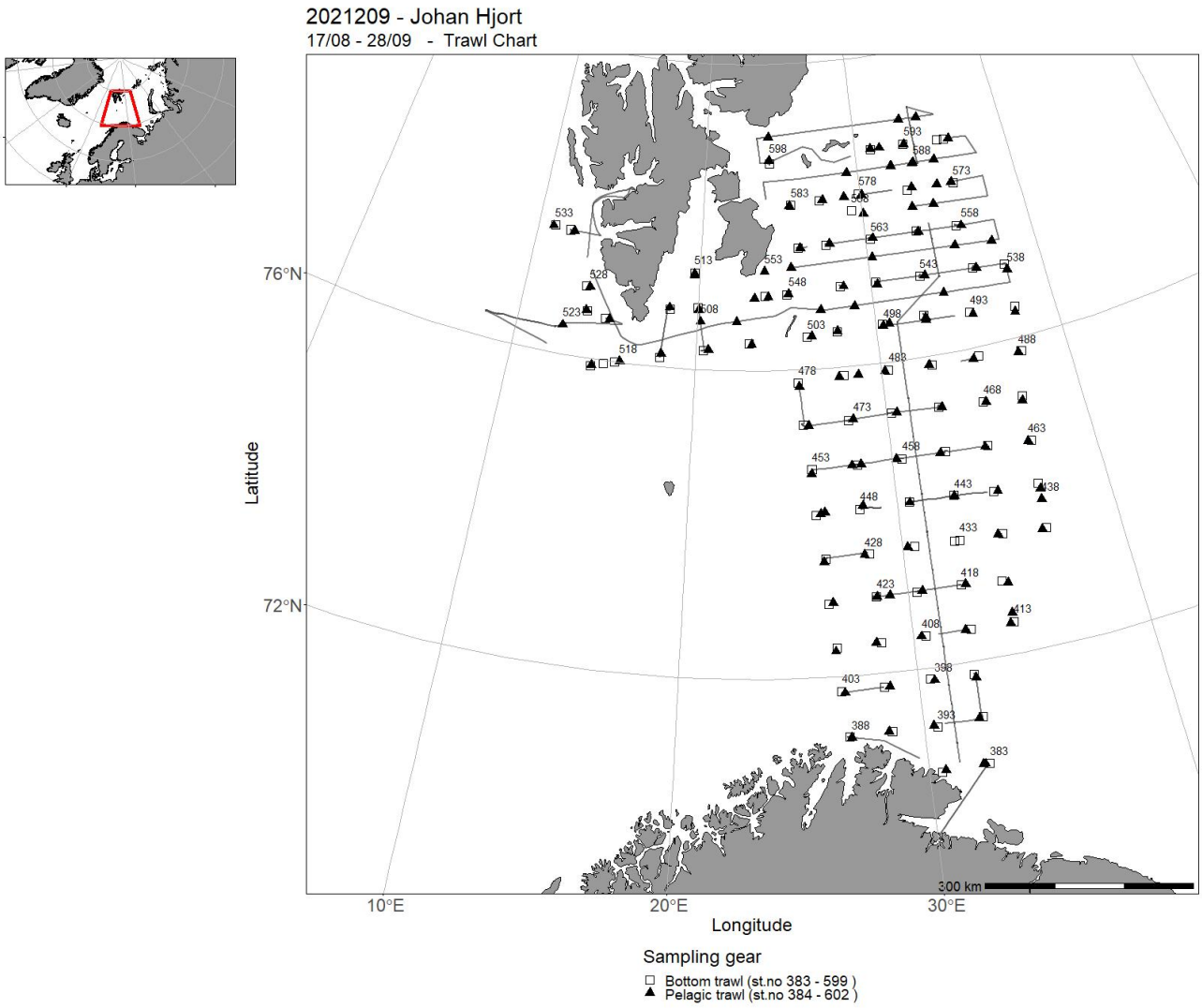

2021209 - Johan Hjort
17/08 - 28/09 - Trawl Chart
76°N
72°N
Latitude
10°E
20°E
30°E
Longitude
300 km
Sampling gear
Bottom trawl (st.no 383 - 599)
Pelagic trawl (st.no 384 - 602)

Fig. 5.13

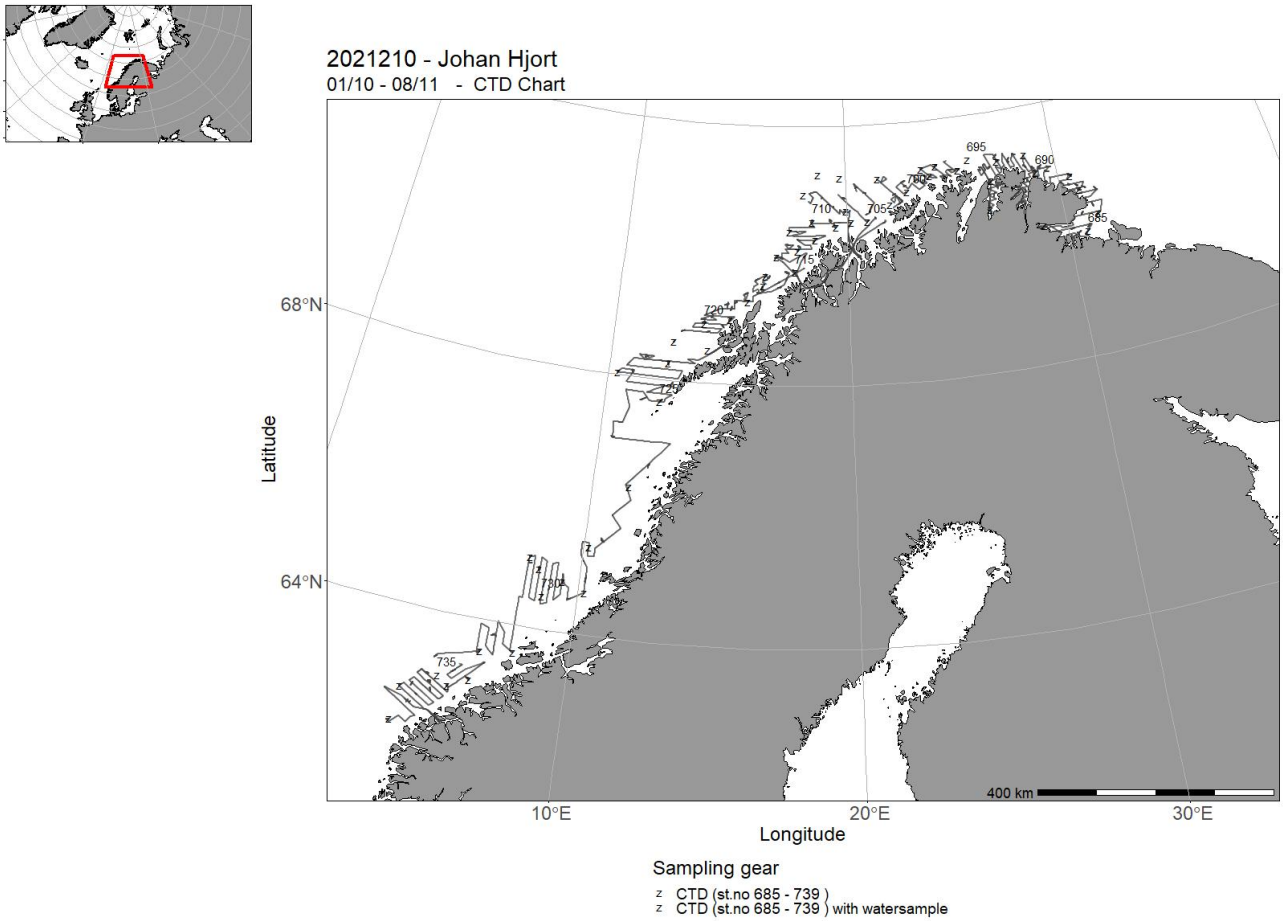

2021210 - Johan Hjort
01/10 - 08/11 - CTD Chart
68°N
64°N
Latitude
10°E
20°E
30°E
Longitude
400 km
Sampling gear
CTD (st.no 685 - 739)
CTD (st.no 685 - 739) with watersample

Fig. 5.14

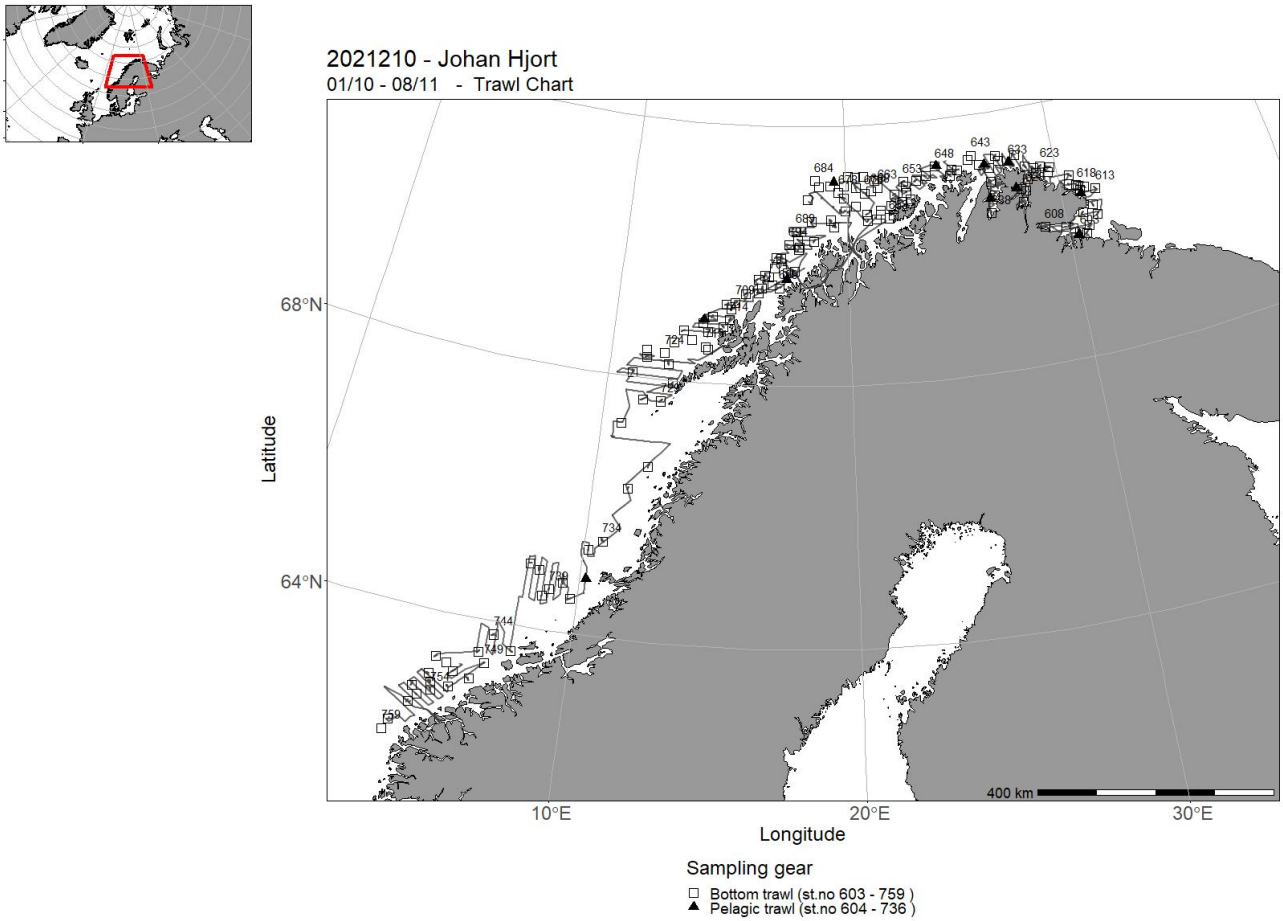

2021210 - Johan Hjort
01/10 - 08/11 - Trawl Chart
68°N
64°N
Latitude
10°E
20°E
30°E
Longitude
400 km
Sampling gear
Bottom trawl (st.no 603 - 759)
Pelagic trawl (st.no 604 - 736)

Fig. 5.15

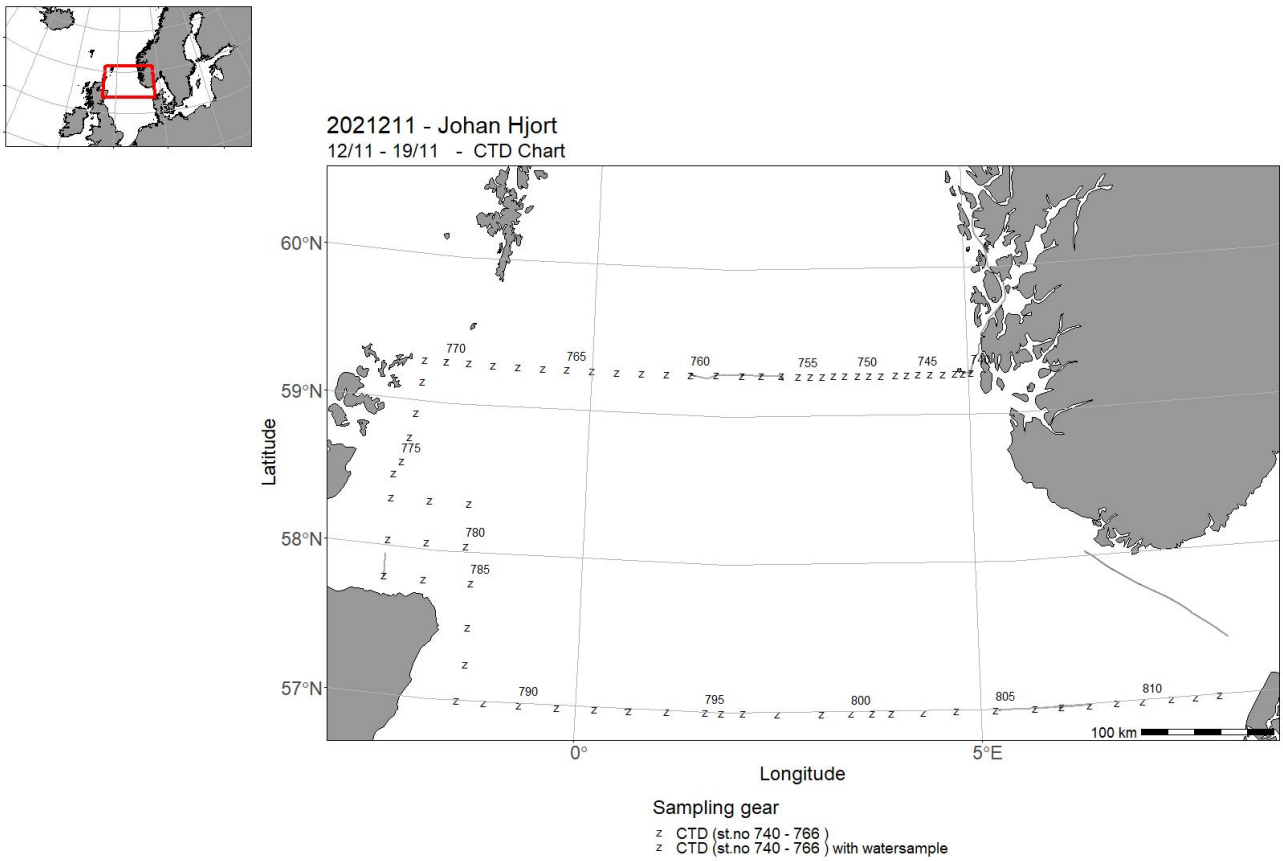
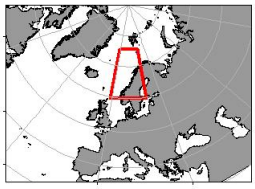

2021211 - Johan Hjort
12/11 - 19/11 - CTD Chart
60°N
59°N
58°N
57°N
Latitude
0°
5°E
Longitude
100 km
Sampling gear
CTD (st.no 740 - 766)
CTD (st.no 740 - 766) with watersample

Fig. 5.16



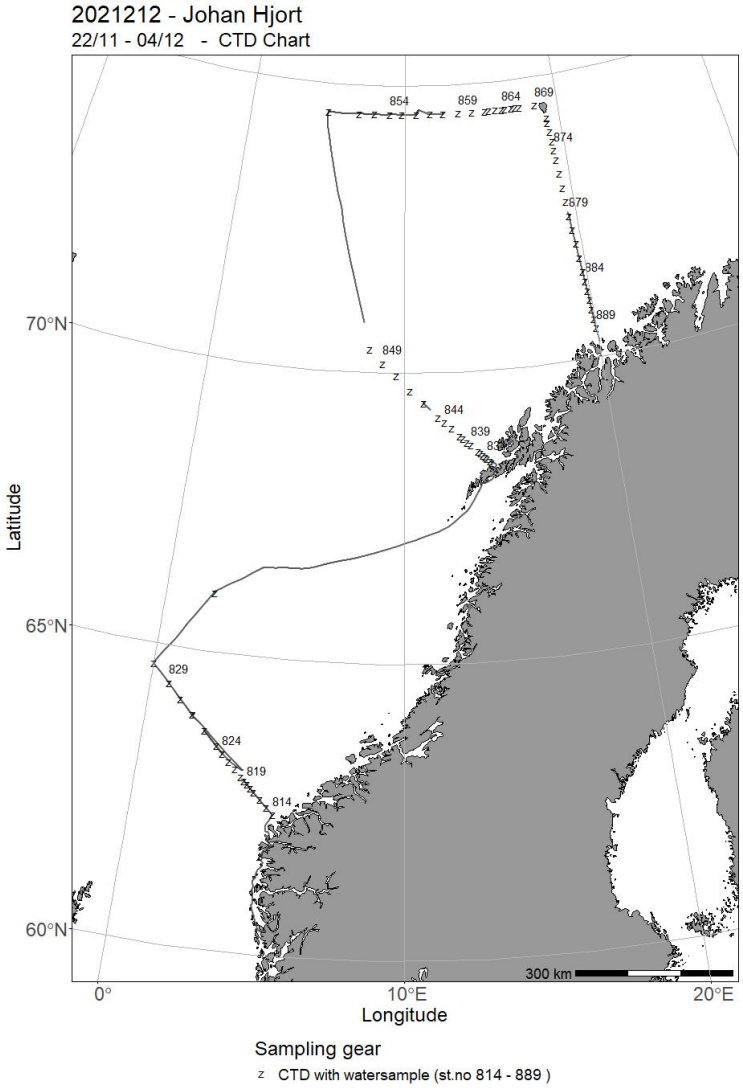

2021212 - Johan Hjort
22/11 - 04/12 - CTD Chart
854
859
864
869
874
879
884
889
849
844
839
829
824
819
814
70°N
65°N
60°N
Latitude
0°
10°E
20°E
Longitude
300 km
Sampling gear
CTD with watersample (st.no 814 - 889)

Fig. 5.17

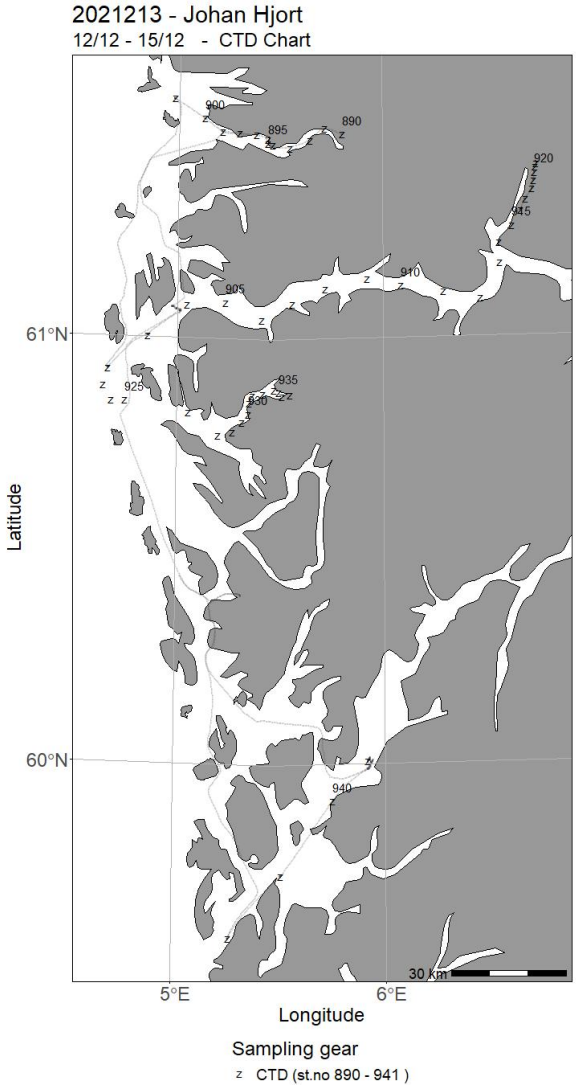

2021213 - Johan Hjort
12/12 - 15/12 - CTD Chart
61°N
60°N
Latitude
5°E
6°E
Longitude
30 km
Sampling gear
CTD (st.no 890 - 941)

Fig. 5.18

6 - "Kristine Bonnevie" – Cruises 2021

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021601	07/01 - 31/01	Annual shrimp survey conducted by the IMR : 1. Fixed trawl stations (bottom trawl) for northern shrimp (Pandalus borealis) and fish. Data on shrimp biomass, abundance, and recruitment: total weight, length, sex, maturity 2. CTD (temperature, salinity) on all trawl stations 3. Length and total weight of all fish species.	Skagerrak	2 - 122	1 - 141
2021602	05/02 - 09/02	Hydrography along regular transects in Hardangerfjord, Masfjord and Sognefjord. Hydrography at the coast outside Bergen. Exchange of batteries and new deployments of current meter moorings in Hardangerfjord.	Norwegian Sea	123 - 202	-
2021603	10/02 - 15/02	Many animals can produce weak light, so-called bioluminescence, and this is potentially very important in the deep sea where there is a complete lack of sunlight. The importance is supported by studies finding up to 80% of deep-sea species being bioluminescent and many deep-sea animals also have eyes to detect the emitted light. This project will through behavioral and physiological experiments test our hypothesis on a novel function of bioluminescence based on our recent unique observation that a species of deep sea starfish has bioluminescent eggs, which putatively light up to be eaten and thereby dispersed. Another goal is for the first time to document natural bioluminescence from deep sea benthic living animals in their habitat in combination with observations of the correlated behaviors. The project will add new important knowledge about the functional significance of bioluminescence along with unique insight into life in the deep sea. Project name: LIGHT UP TO BE EATEN	Norwegian Sea	203 - 206	1 - 146
2021604	16/02 - 23/02	The survey collected samples in West Norwegian fjords (Osterfjord, Sørfjord, Fensfjord, Masfjord). The equipment used was : - CTD - Harstad Pelagic trawl 320 with and without MultiSampler (3 cod-ends) - Spectroradiometer - Acoustics - TRIOS Ligthmeter - LOL Ligthmeter Project name: HypOnFjordFish Coordinating body: Department of Biological Sciences, University of Bergen	Norwegian Sea	207 - 219	147 - 163

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021605	24/02 - 02/03	The cruise on board the Research Vessel Kristine Bonnevie was undertaken as a part of the GEOF232, Practical Meteorology and Oceanography course and the GEOF337 Fjord oceanography course offered at the Geophysical Institute (GFI), University of Bergen. The site of study was Sørfjorden, Osterfjorden, Lurefjorden, Masfjorden, Fensfjorden, and the coastal area west of Bergen. The data set collected aimed to address processes related to fjord circulation and the observed deoxygenation of the inner basins in the fjords. The students are familiarized with typical and state-of-the-art measurement systems, including ship-based measurements (CTD and Ship-ADCP), weatherstations, and measurements of oxygen concentrations, isotiopes, nutrients and CO2 in collected water samples. We redeployed two moorings in Masfjord, at the sill and in the inner, deep basin. We also deployed surface drifters in Osterfjord, Masfjord, and on the open coast. The students participated in planning of the cruise and the sampling, and contributed substantially to the cruise report.	Norwegian Sea	220 - 266	-
2021625	04/03 - 05/03	Training of students at University of Bergen, Course BIO356, in fishery acoustic and trawl methods. Echo sounder sampling . Trawling with DeepVision camera system.	Norwegian Sea	-	164
2021606	06/03 - 21/03	Monitoring the environment and plankton condition on Svinøy, station M, Gimsøy, Fugløya-Bjørnøya and Bjørnøya-V sections in March 2021. Measuring physical, chemical and biological parameters, important to follow changes in climate and environment at weather station M in the Norwegian Sea. Monitoring Ocean acidification (carbon) on Svinøy, Gimsøy, Fugløya-Bjørnøya sections and on station M. Deployment and recovering of gliders.	Norwegian Sea	384 - 453	-

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021607	22/03 - 28/03	CTD-survey of fjords and coast in Troms and western Finnmark (Malangen-Porsanger). Water sampling for analysis of eDNA, nutrients, dissolved oxygen, and the carbonate system. Deploy current meter moorings in Kaldfjorden Project name: Fjord oceanography and coastal climate (FOKK), FishDiv & SalCod Coordinating body: Institute of Marine Research, Lars Asplin	Norwegian Sea	454 - 559	-
2021608	01/04 - 10/04	This research cruise is aimed at gathering fish eggs in and around the fjords in Troms as part of a bigger, long-term program on the mapping of spawning and nursery areas for commercially important fish species in Norway. As a « value-added » to the cruise, we also collected plankton on 21 previously established stations in the study area, as well as CTD (conductivity, temperature and depth) data for a majority of the stations we used for egg sampling. Project name: Program om gytefelt og oppvekst område kartlegging Coordinating body: Fisheries Dynamics Research Group/Institute of Marine Research (IMR) Cruise coordinator: Sigurd Heiberg Espeland (Fisheries Dynamics Research Group, IMR)	Norwegian Sea	560 - 578	-
2021609	11/04 - 17/04	The objective of this cruise was to generate new knowledge on the distribution and characteristics of vulnerable marine ecosystems buildt by coral and sponges in Northern Norweigan fjords. Project name: Mapping of vulnerable marine ecosystems in Norway Coordinating body: Institute of Marine Research	Norwegian Sea	579 - 588	-

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021610	18/04 - 27/04	The objective of the cruise was to survey reefs and collect corals from a few selected deep-sea coral reefs to assess the biological and physiological health status of reefs in the Northern part of the Norwegian coast and shelf. In addition, water samples were collected to assess water quality parameters and food availability for organisms living in the reefs. Carbon chemistry parameters were measured to assess temporal variability in ocean chemistry and to create a basline data base for the OA monitoring in Norway. Fugløya, Stjernsund, Steinavær and Rotværrevet were sampled. Project name: Monitoring of sponges and corals Coordinating body: Institute of Marine Research	Norwegian Sea	589 - 611	-
2021611	29/04 - 08/05	A cruise to collect biological data for ecological seafloor maps in the Skjervøy and Kvænangen, Troms, one of three areas that are part of the national pilot coastal mapping program Marine Grunnkart I Kystsonen. The primary aims of the project are to develop coastal mapping methods and to generate maps for sustainable coastal planning. The cruise data collection will be used in combination with seafloor bathymetry and substrate data collected by Kartverket and NGU in 2021 in the same area. Task: ROV and towed seafloor camera transects over 50 m to record seafloor biological diversity and nature types in accordance to the Natur i Norge classification system. CTDs throughout the area to validate oceanography models. Beams trawls to collect biological specimens for identification. Project name: Marine økologiske grunnkart i kystsonen Coordinating body: Kartverket	Norwegian Sea	612 - 625	149 - 152

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021612	27/05 - 12/06	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. Project name: 14422 Snøkrabbe and 15560 Fangstteknologi snøkrabbe	Barents Sea	626 - 639	22 - 83
2021613	13/06 - 22/06	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. Project name: 15594 Bestandsrådgivning kongkrabbe	Norwegian Sea	-	-
2021614	24/06 - 29/06	CTD-SURVEY OF FJORDS AND COAST IN TROMS AND WESTERN FINNMARK (MALANGEN TO REVSBOTN). WATER SAMPLING FOR ANALYSIS OF eDNA, NUTRIENTS, AND THE CARBONATE SYSTEM. Project name: FJORD OCEANOGRAPHY AND COASTAL CLIMATE (FOKK) and FISHDIV Coordinating body: IMR (CONTACT: LARS ASPLIN, OCEAN AND CLIMATE RESEARCH GROUP)	Norwegian Sea	640 - 772	-
2021615	30/06 - 03/07	The cruise objectives were to deployr CTD and current meter moorings off the Vesterålen Islands. The moorings are part of a process study of breaking internal waves generating turbulence.	Norwegian Sea	773 - 776	-

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021616	04/07 - 10/07	The objective of this cruise was to assess the impact of effluents from fish farms on the cold-water coral Lophelia pertusa and the demosponge Geodai barretti. This was achieved by documenting the distribution and health of natural coral communities around fish farms and recovering transplanted coral and sponge fragments (from cruise 2018612) from a gradient away from a fish farm where the organisms had been exposed to fish farm effluents for 3 years. Mortality, growth, cellular stress, and energy stores were compared. In addition, water sample were collected off two wall reefs in Langenuen, Hordaland and video transects were run around 4 sites with bamboo corals in the deep Hardagnerfjord to assess the effects on fish farming on bamboo coral forests. Exploratory dives were made to assess the distribution of bamboo corals in Norwegian fjords. Project name: Monitoring of sponges and corals Coordinating body: Institute of Marine Research	Norwegian Sea	777 - 797	-
2021617	12/07 - 15/08	The aim of the first part of the cruise (12th to 21st of July 2021) was to sample 4 standard transects for physical oceanographic parameters (CTD casts, nutrients and chlorphyll), phyto- and 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 Fishe". Data and samples were collected on pre-selected stations along the 4 standard transects «Utsira-StartPoint» between Norway and the Orkney Islands, «Hanstholm-Aberdeen» between Denmark and UK and «Shetland - Pentland» and «Scotland East Coast» between the southern tip of the Shetland Islands till the east coast of Scotland. During the second part of the cruise (21st of July to 15th August) the IBTS, International Bottom Trawl Survey, took place, coordinated by the ICES International Bottom Trawl Survey Working Group (IBTSWG).The main objective of the IBTS quarter 3 survey was to monitor changes in herring, cod, haddock, whiting, saithe, Norway pout, mackerel, sprat independently of commercial fisheries data, and to collect data for the determination of biological parameters relevant to stock assessments. Parallel to trawling, hydrographic data (salinity, temperature) were collected. Project name: ICES Coordinated 3rd Quarter International Bottom Trawl Survey (IBTS) in the North Sea Coordinating body: ICES	North Sea	798 - 939	153 - 224

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021618	17/08 - 20/08	Training course for BIO102 students (biology bachelor).	Norwegian Sea	941 - 945	225 - 231
2021619	21/08 - 24/08	Acoustic trawl survey for surveying sprat and herring, zooplankton and hydrography in western Norwegian fjords. Provide abundance indices for sprat for giving fishery advice. The survey covered the outer part Hardangerfjord.	Norwegian Sea	946 - 952	232 - 239
2021620	24/08 - 26/08	Training course for BIO102 students (biology bachelor).	Norwegian Sea	953 - 959	240 - 245
2021621	26/08 - 07/09	Acoustic trawl survey for surveying sprat and herring, 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. The survey covered Nordfjord, Sognefjorden and the inner part of Hardangerfjord.	Norwegian Sea	960 - 989	246 - 273
2021622	08/09 - 12/09	The cruise objectives were to recover CTD and current meter moorings deployed off the Vesterålen Islands early July 2021 (cruise 2021615). The moorings are part of a process study of breaking internal waves generating turbulence.	Norwegian Sea	990 - 993	-
2021623	13/09 - 02/10	Stock assessment study for red king crab in quota regulated area in East Finnmark, Norway. Project name: 15594 - Kongekrabbe	Norwegian Sea	994 - 1017	6 - 1001

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021624	05/10 - 26/10	Annual combined acoustic and bottom trawl survey along the Norwegian coast north of 62˚N • map the distribution and estimate acoustic abundances indices, length, weight and maturity at age of cod, saithe and haddock • improve data basis, by allocating additional bottom trawls, for the assessment of golden redfish • map the general hydrographical regime by using a CTD-sonde to monitor the temperature and salinity at bottom trawl stations and/or at fixed intervals (about 30 NM) • in selected fjord systems – Lyngen, Malangen, Ulsfjord, and Nordland - collect additional biological – and catch data for monitoring purposes and the establishment of a time series of deep water shrimps • collect zooplankton samples in selected fjords, as well as water for chemical analysis • collect sediment samples in Lakse-, Vefsn-, Namse-, and Trondheimsfjord • acoustic coverage of sprat in Trondheimsfjord and Romsdalsfjords • acoustic coverage of 0 and1-group heering in Finmark fjords • collect eDNA samples on selected CTD stations • collect frozen fish for analysis of contaminants	Norwegian Sea	1018 - 1103	239 - 367

7 - "Kristine Bonnevie" – Charts for 2021

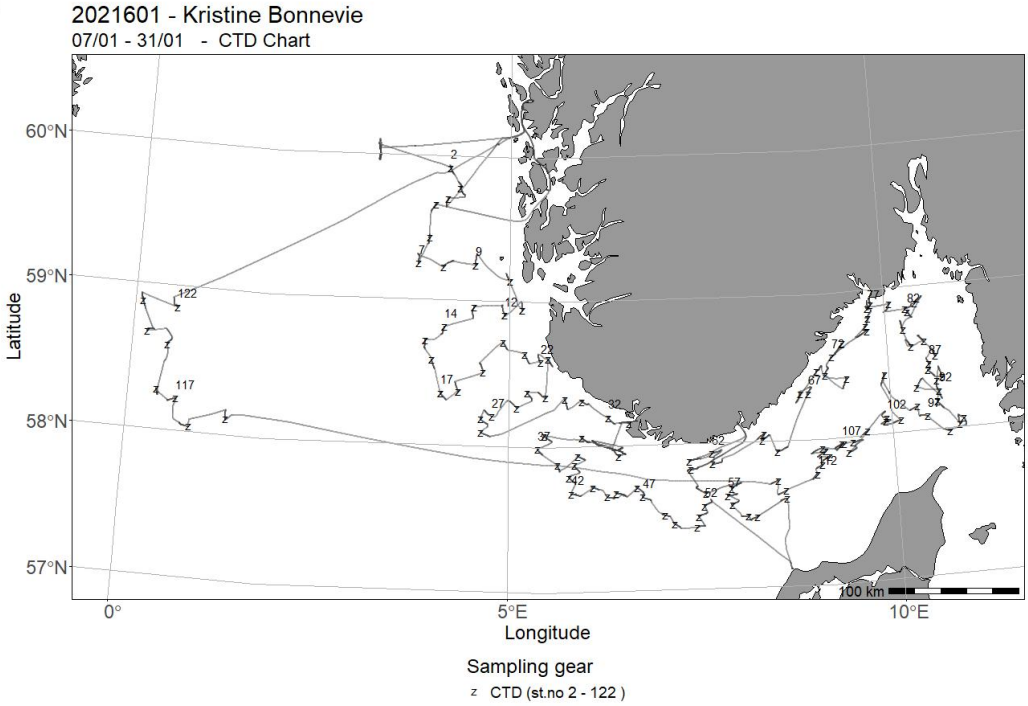


Fig. 7.1

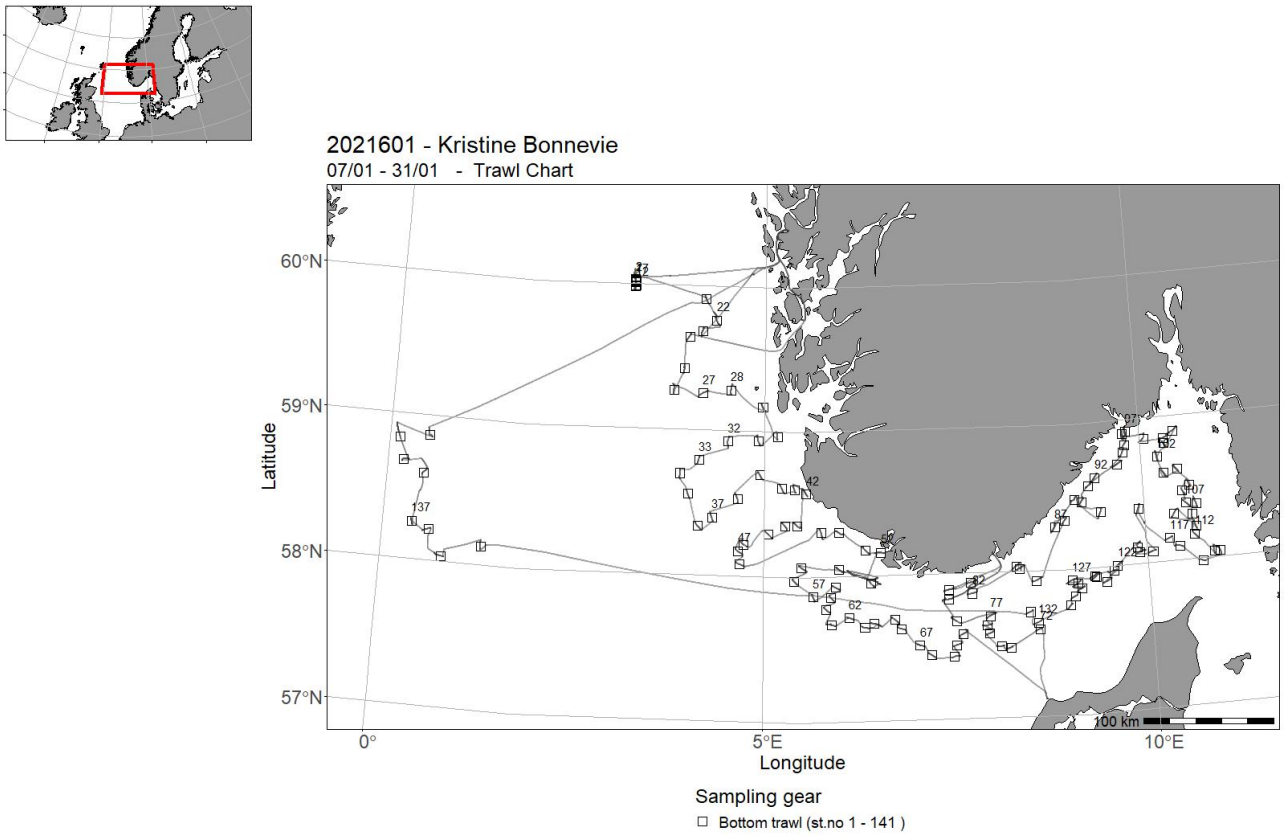

2021601 - Kristine Bonnevie
07/01 - 31/01 - Trawl Chart
60°N
59°N
58°N
57°N
Latitude
0°
5°E
10°E
Longitude
100 km
Sampling gear
Bottom trawl (st.no 1 - 141)

Fig. 7.2

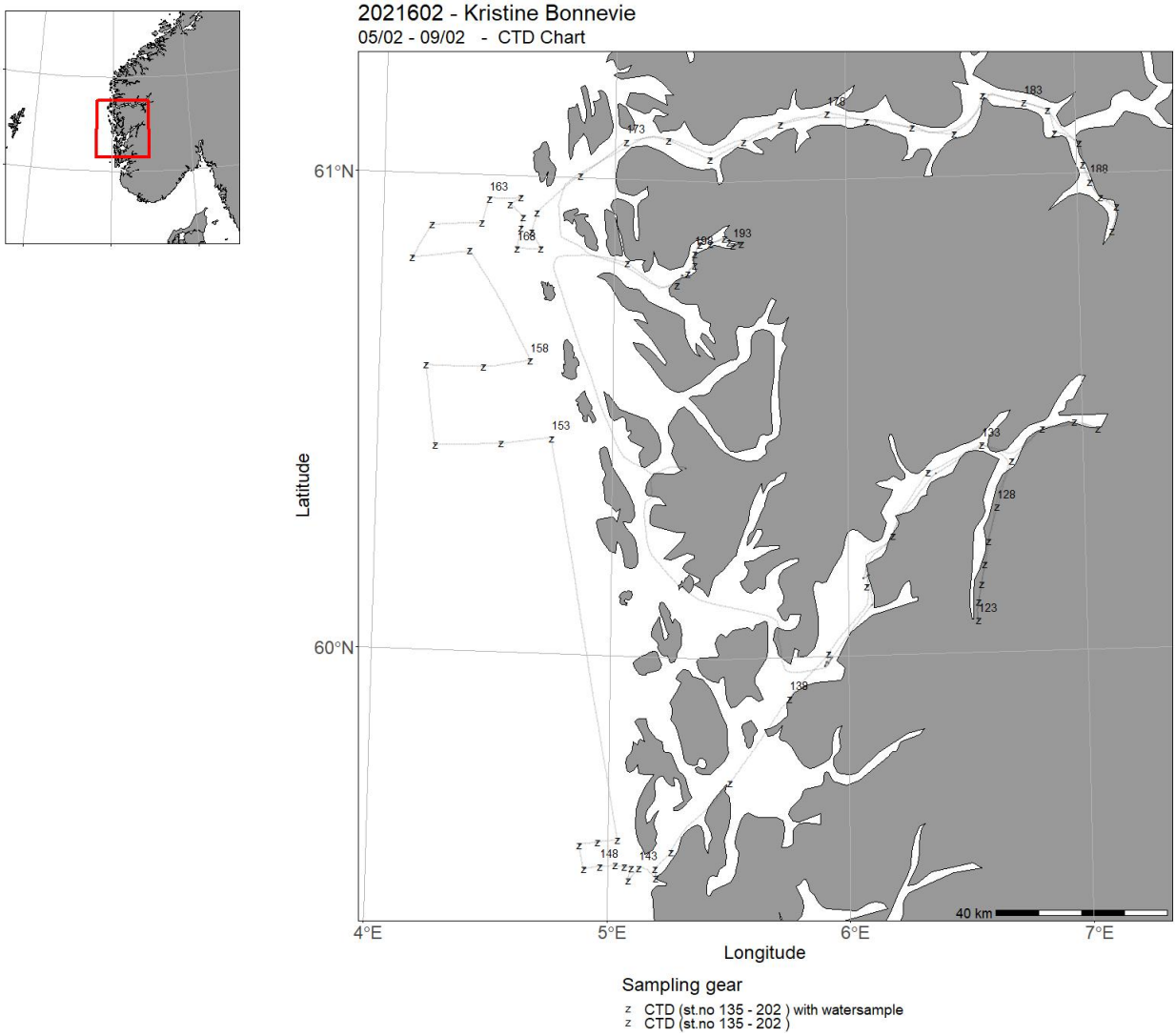

2021602 - Kristine Bonnevie
05/02 - 09/02 - CTD Chart
61°N
60°N
4°E
5°E
6°E
7°E
Latitude
Longitude
40 km
Sampling gear
CTD (st.no 135 - 202) with watersample
CTD (st.no 135 - 202)

Fig. 7.3

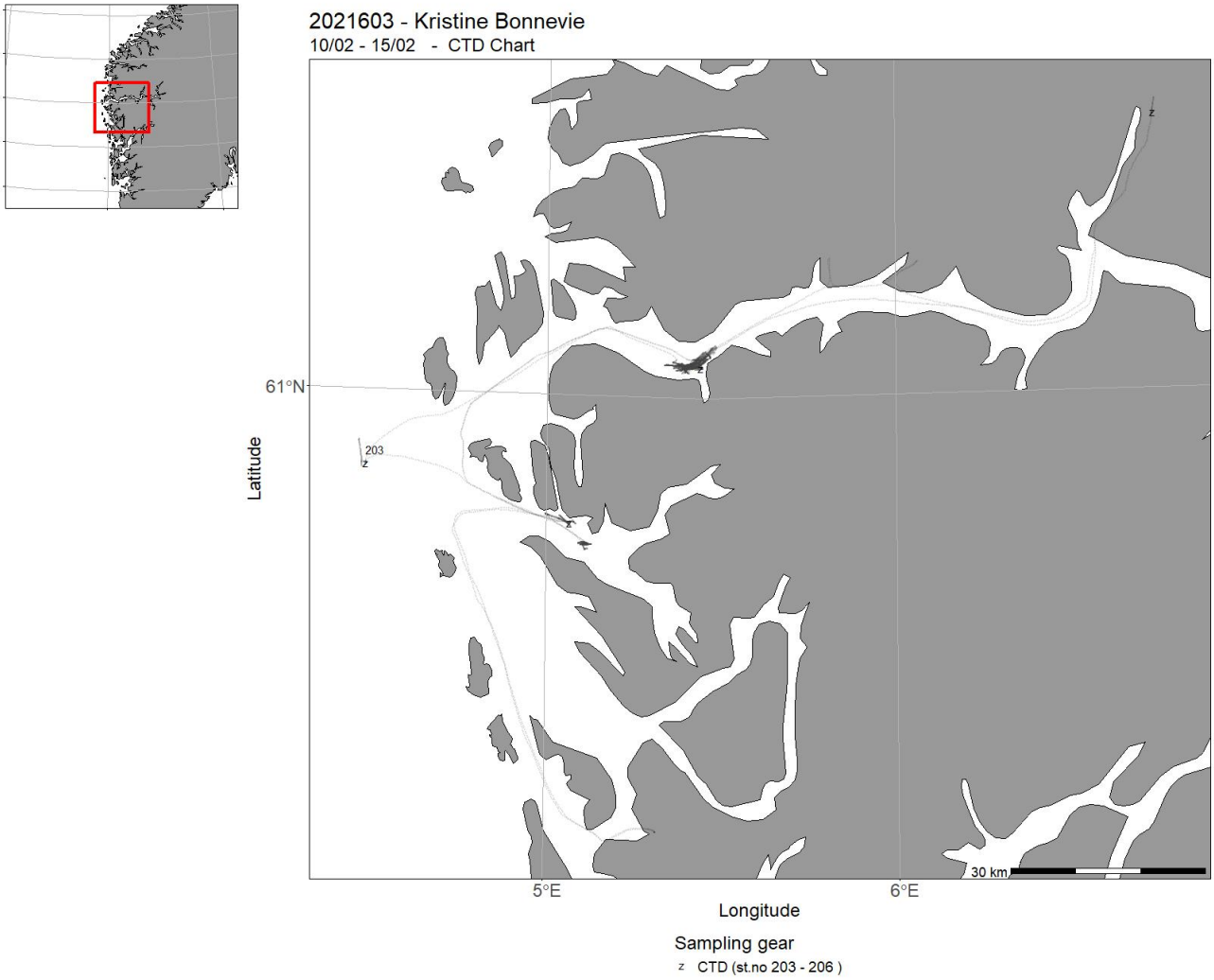

2021603 - Kristine Bonnevie
10/02 - 15/02 - CTD Chart
61°N
Latitude
203
5°E
6°E
Longitude
30 km
Sampling gear
CTD (st.no 203 - 206)

Fig. 7.4

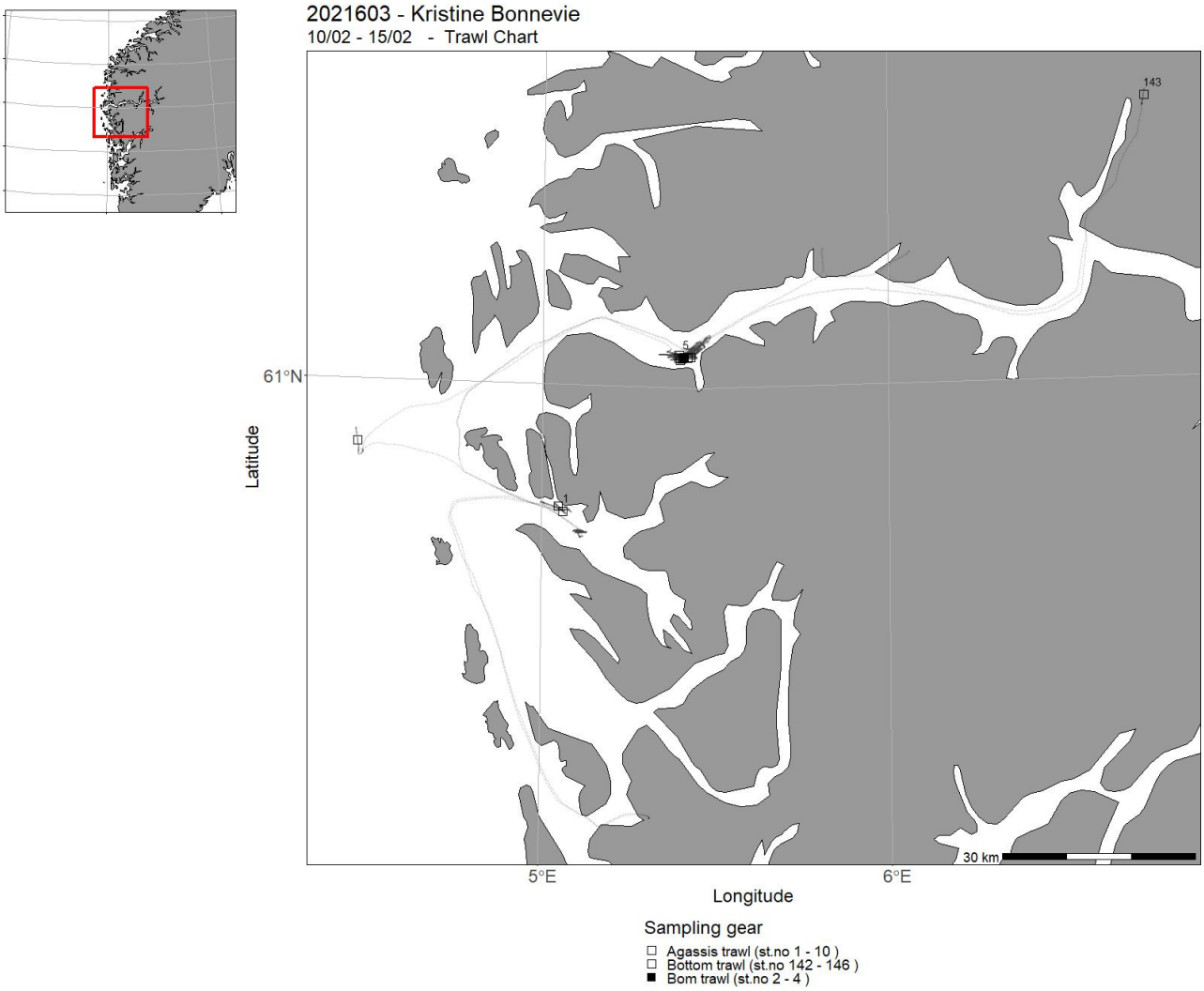

2021603 - Kristine Bonnevie
10/02 - 15/02 - Trawl Chart
143
61°N
Latitude
5°E
6°E
Longitude
30 km
Sampling gear
Agassis trawl (st.no 1 - 10)
Bottom trawl (st.no 142 - 146)
Bom trawl (st.no 2 - 4)

Fig. 7.5

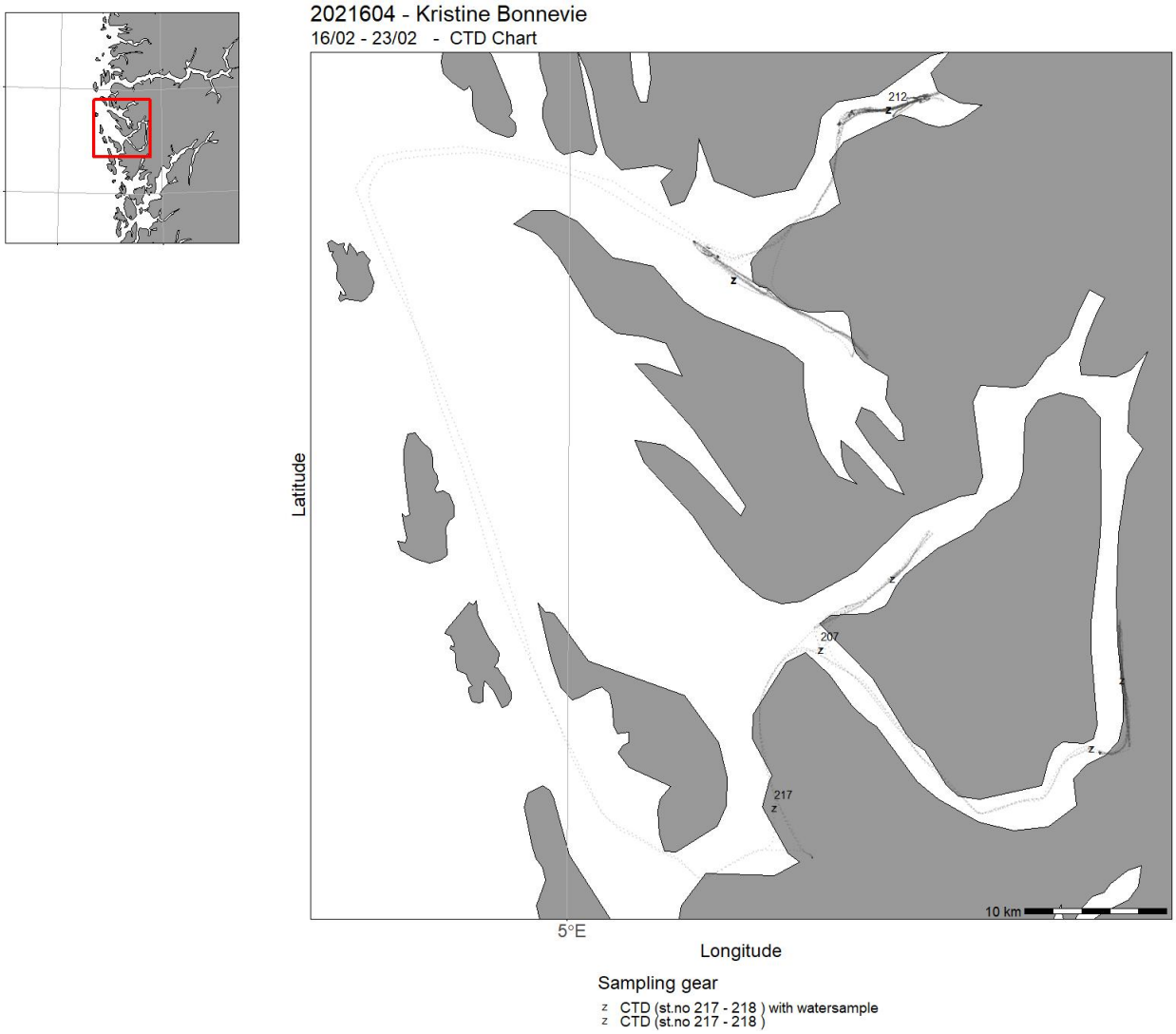

2021604 - Kristine Bonnevie
16/02 - 23/02 - CTD Chart
212
207
217
10 km
Latitude
5°E
Longitude
Sampling gear
CTD (st.no 217 - 218) with watersample
CTD (st.no 217 - 218)

Fig. 7.6

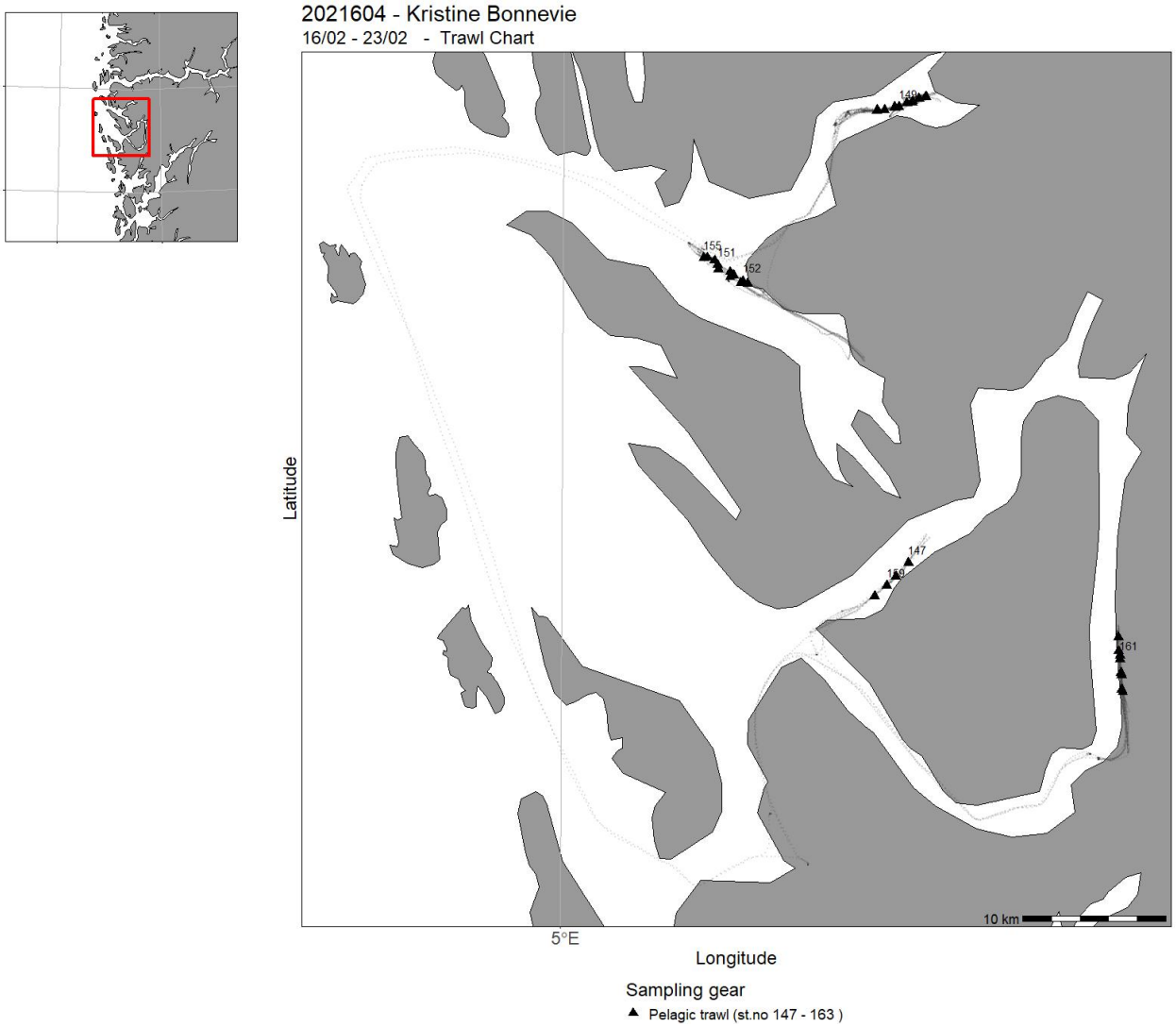

2021604 - Kristine Bonnevie
16/02 - 23/02 - Trawl Chart
149
155
151
152
147
161
10 km
Latitude
5°E
Longitude
Sampling gear
Pelagic trawl (st.no 147 - 163)

Fig. 7.7

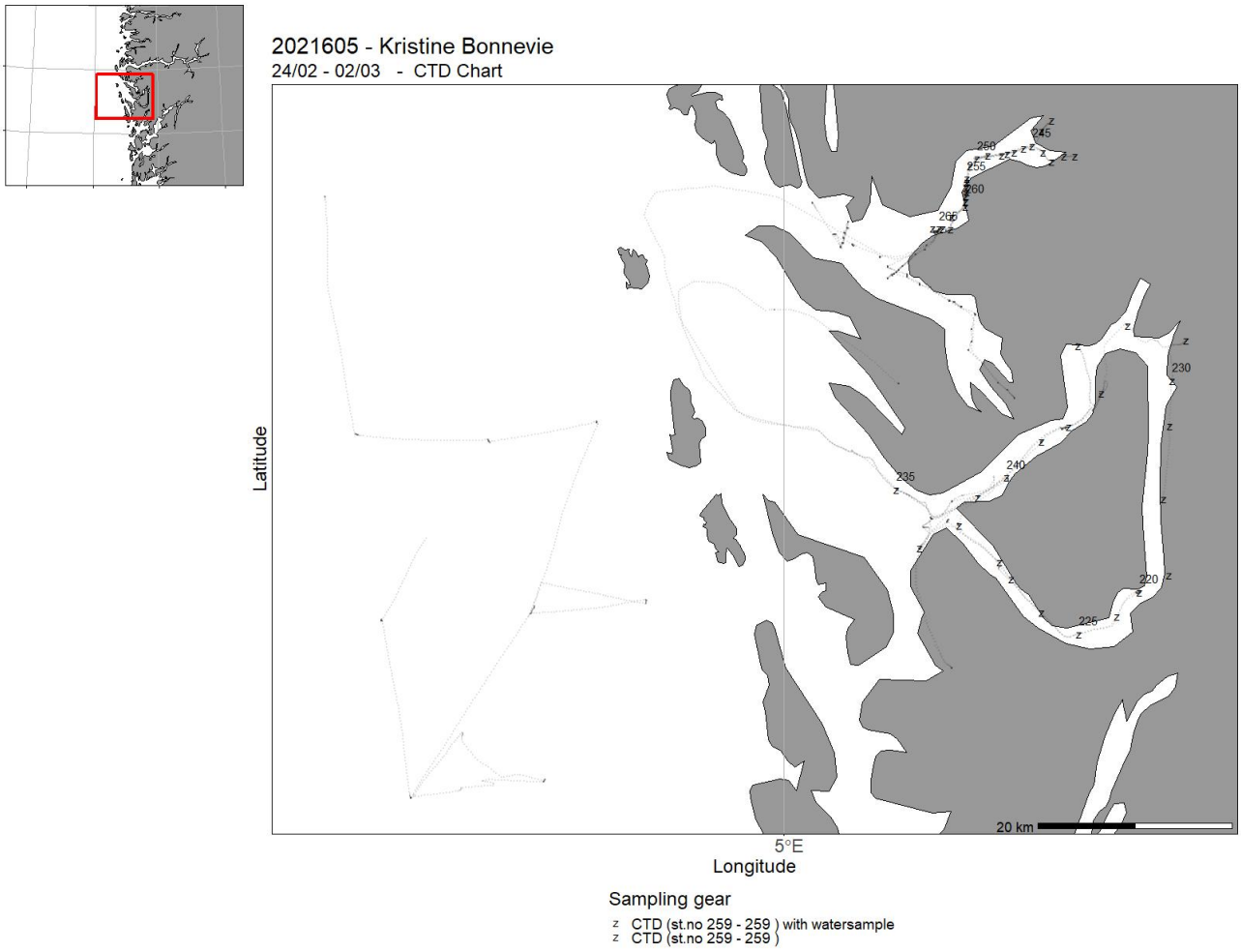
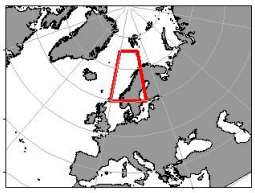

2021605 - Kristine Bonnevie
24/02 - 02/03 - CTD Chart
Latitude
5°E
Longitude
20 km
Sampling gear
CTD (st.no 259 - 259) with watersample
CTD (st.no 259 - 259)

Fig. 7.8



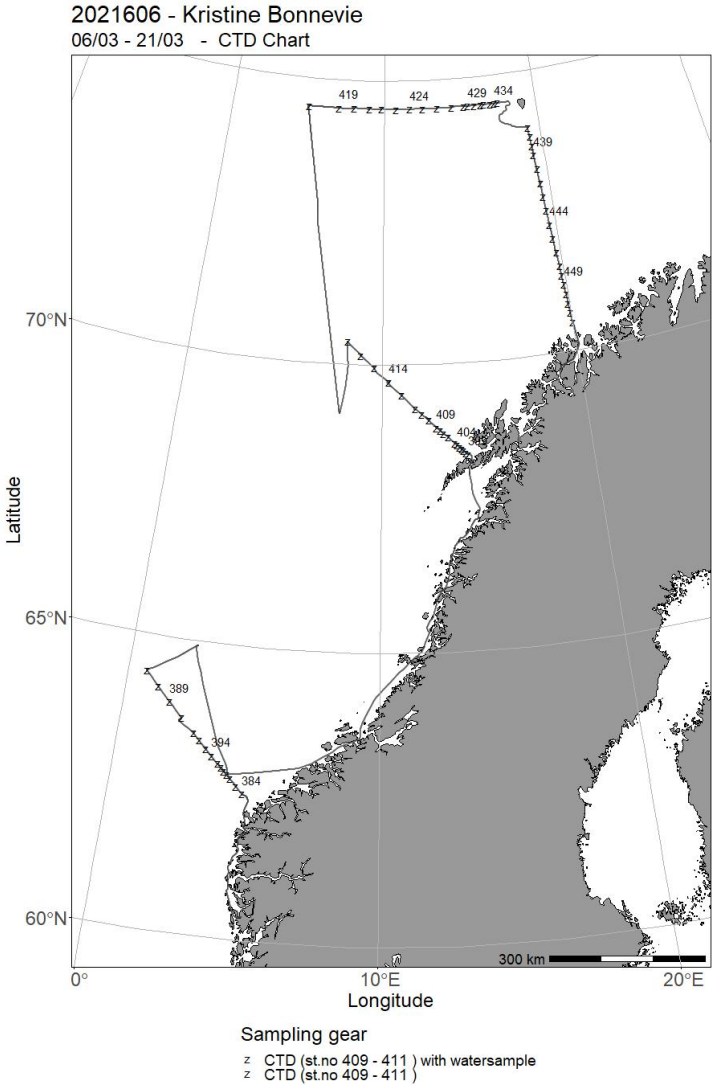
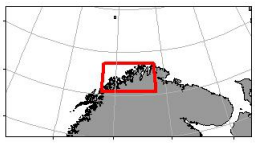

2021606 - Kristine Bonnevie
06/03 - 21/03 - CTD Chart
419
424
429
434
439
444
449
414
409
404
389
394
384
70°N
65°N
60°N
0°
10°E
20°E
Latitude
Longitude
300 km
Sampling gear
CTD (st.no 409 - 411) with watersample
CTD (st.no 409 - 411)

Fig. 7.9



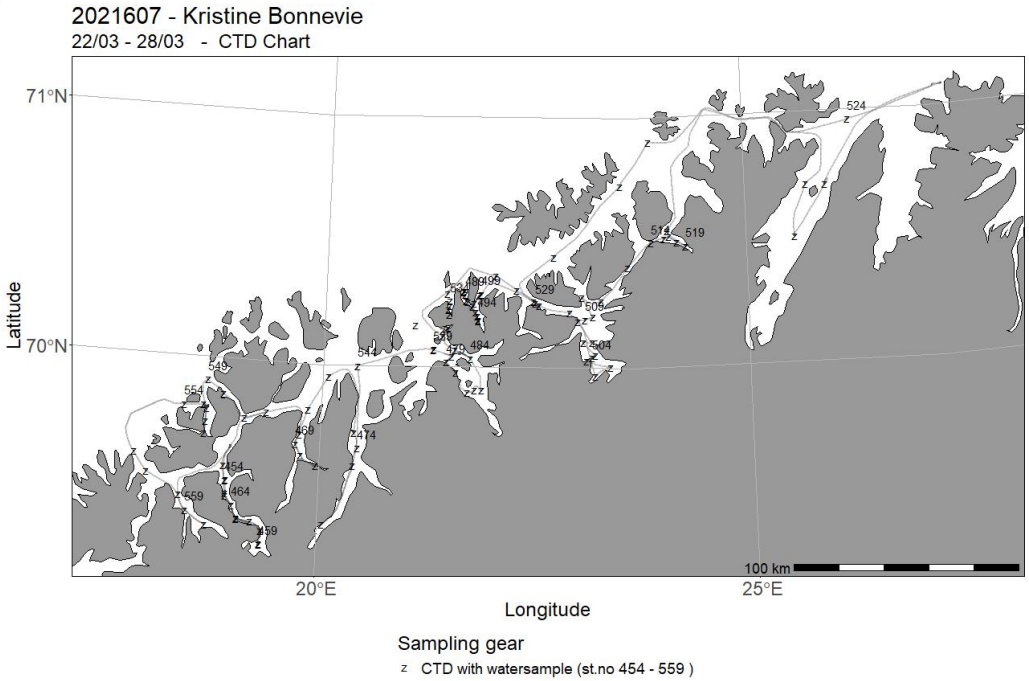

2021607 - Kristine Bonnevie
22/03 - 28/03 - CTD Chart
71°N
70°N
Latitude
20°E
25°E
Longitude
100 km
Sampling gear
CTD with watersample (st.no 454 - 559)

Fig. 7.10

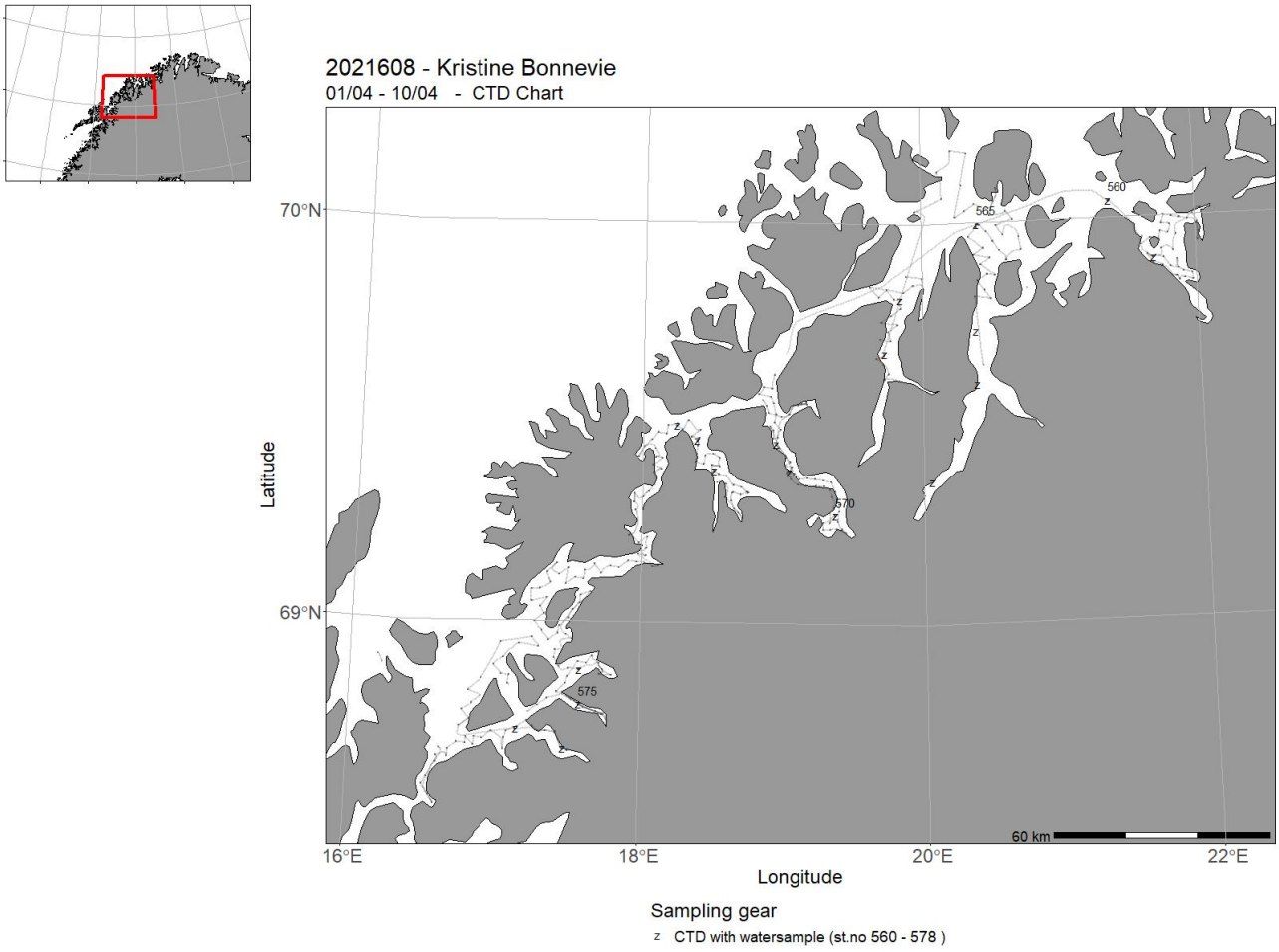

2021608 - Kristine Bonnevie
01/04 - 10/04 - CTD Chart
70°N
69°N
Latitude
16°E
18°E
20°E
22°E
Longitude
560
565
570
575
60 km
Sampling gear
CTD with watersample (st.no 560 - 578)

Fig. 7.11

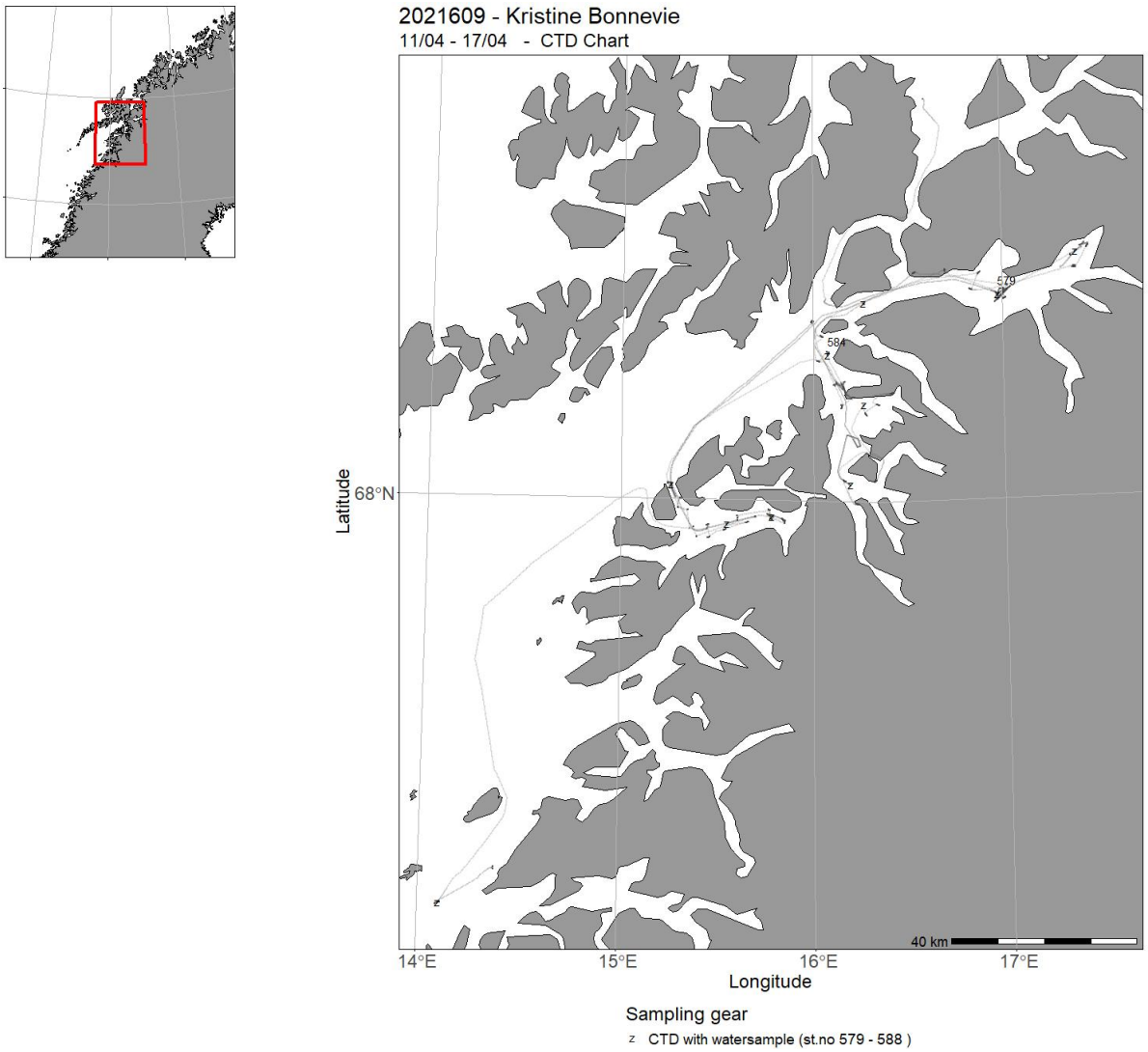

2021609 - Kristine Bonnevie
11/04 - 17/04 - CTD Chart
579
584
Latitude
68°N
40 km
14°E
15°E
16°E
17°E
Longitude
Sampling gear
CTD with watersample (st.no 579 - 588)

Fig. 7.12

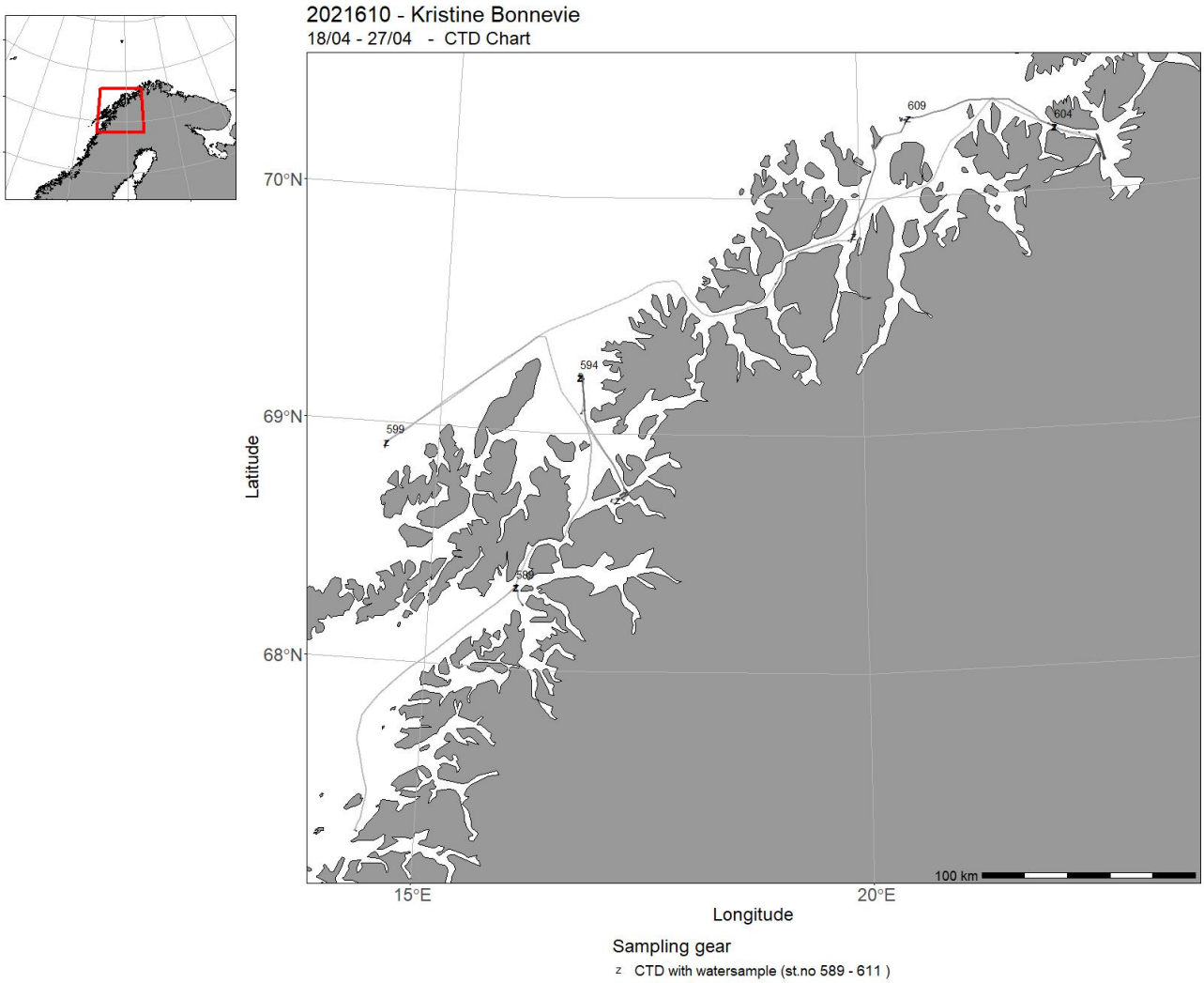
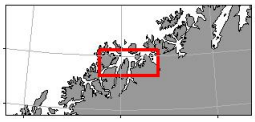

2021610 - Kristine Bonnevie
18/04 - 27/04 - CTD Chart
609
604
70°N
594
69°N
599
Latitude
589
68°N
100 km
15°E
20°E
Longitude
Sampling gear
z CTD with watersample (st.no 589 - 611)

Fig. 7.13



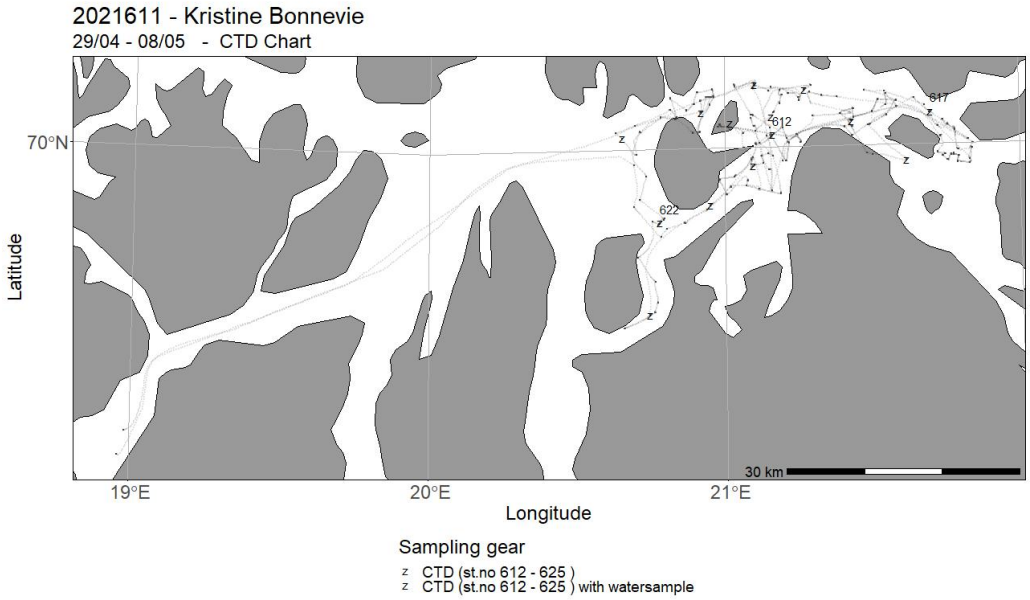
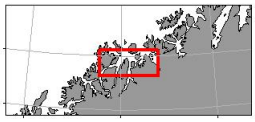

2021611 - Kristine Bonnevie
29/04 - 08/05 - CTD Chart
70°N
Latitude
617
612
622
30 km
19°E
20°E
21°E
Longitude
Sampling gear
CTD (st.no 612 - 625)
CTD (st.no 612 - 625) with watersample

Fig. 7.14



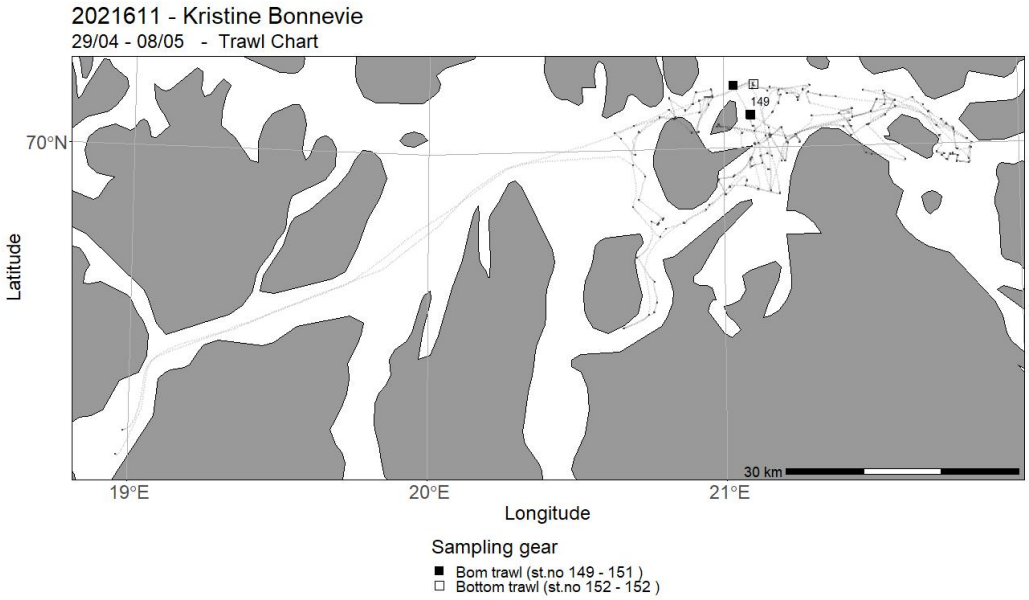

2021611 - Kristine Bonnevie
29/04 - 08/05 - Trawl Chart
70°N
Latitude
149
30 km
19°E
20°E
21°E
Longitude
Sampling gear
Bom trawl (st.no 149 - 151)
Bottom trawl (st.no 152 - 152)

Fig. 7.15

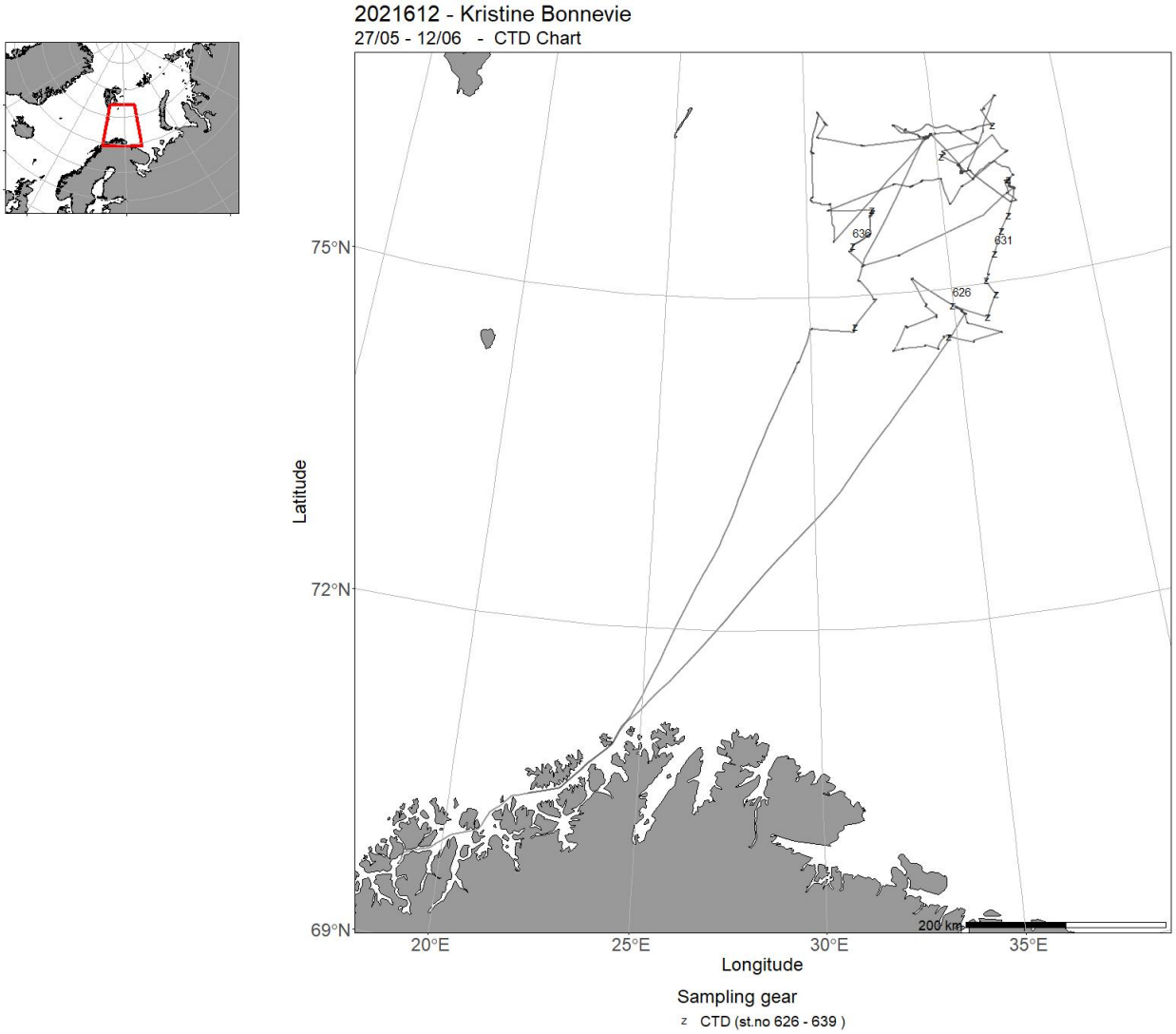
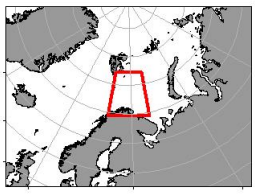

2021612 - Kristine Bonnevie
27/05 - 12/06 - CTD Chart
75°N
72°N
69°N
20°E
25°E
30°E
35°E
Latitude
Longitude
636
631
626
200 km
Sampling gear
CTD (st.no 626 - 639)

Fig. 7.16



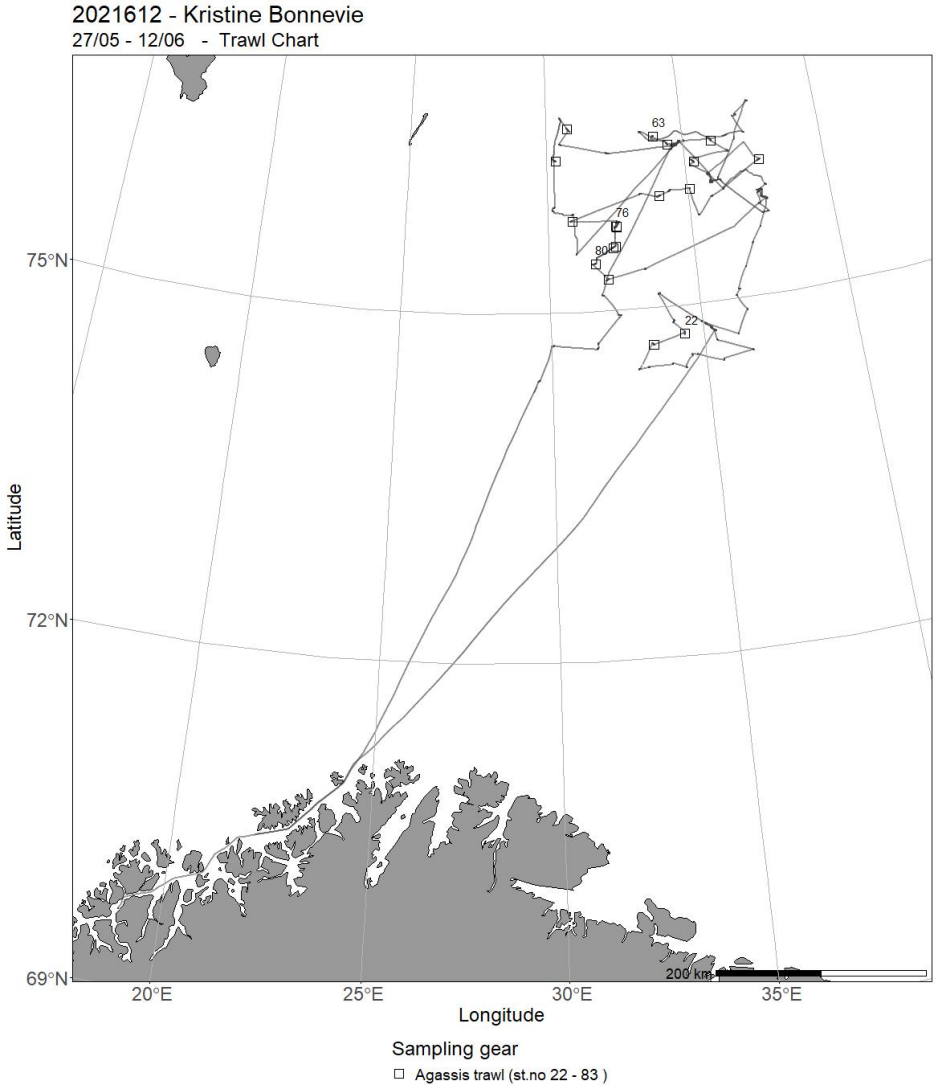

2021612 - Kristine Bonnevie
27/05 - 12/06 - Trawl Chart
63
76
80
22
75°N
72°N
69°N
Latitude
20°E
25°E
30°E
35°E
Longitude
200 km
Sampling gear
Agassis trawl (st.no 22 - 83)

Fig. 7.17

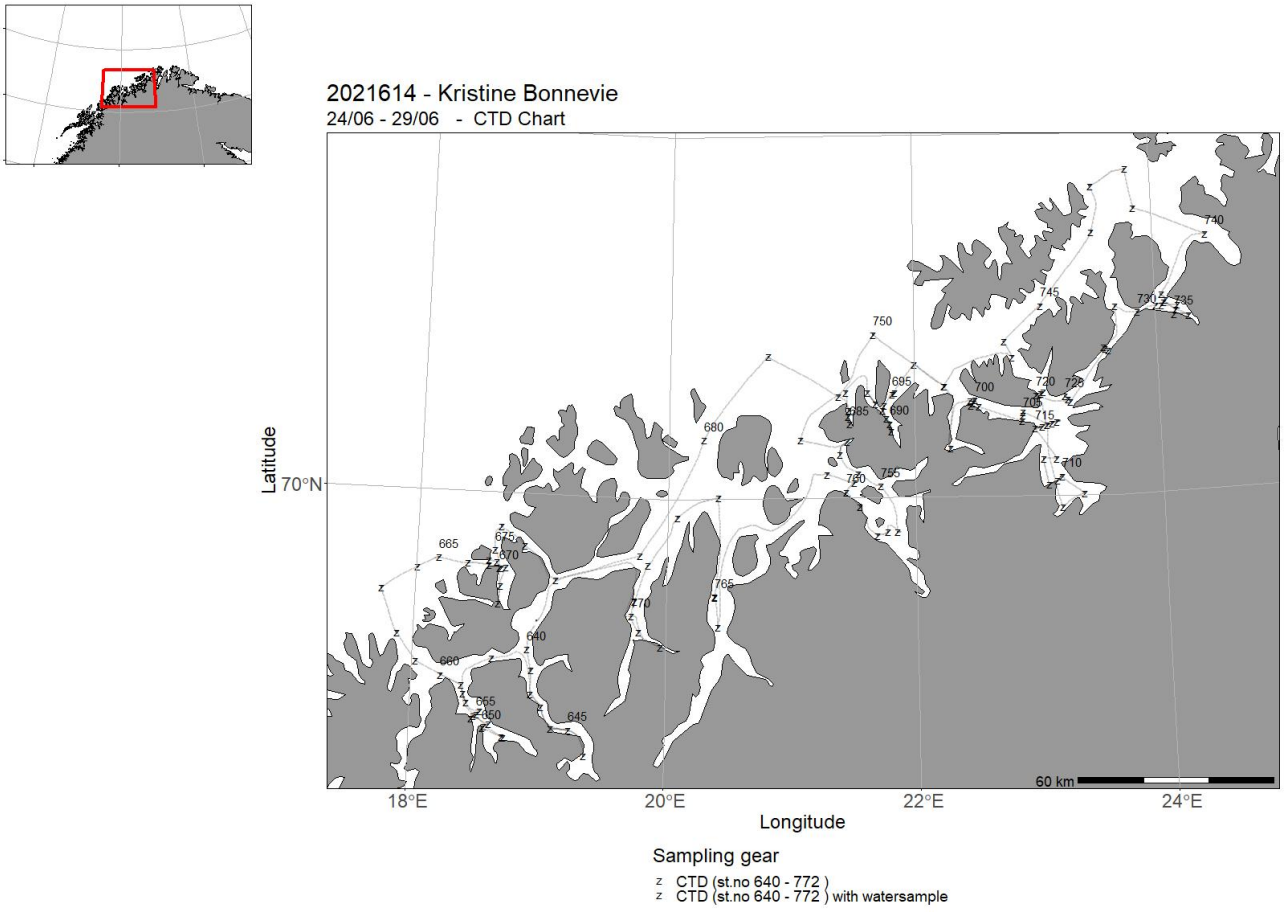

2021614 - Kristine Bonnevie
24/06 - 29/06 - CTD Chart
Latitude
70°N
18°E
20°E
22°E
24°E
Longitude
60 km
Sampling gear
CTD (st.no 640 - 772)
CTD (st.no 640 - 772) with watersample

Fig. 7.18

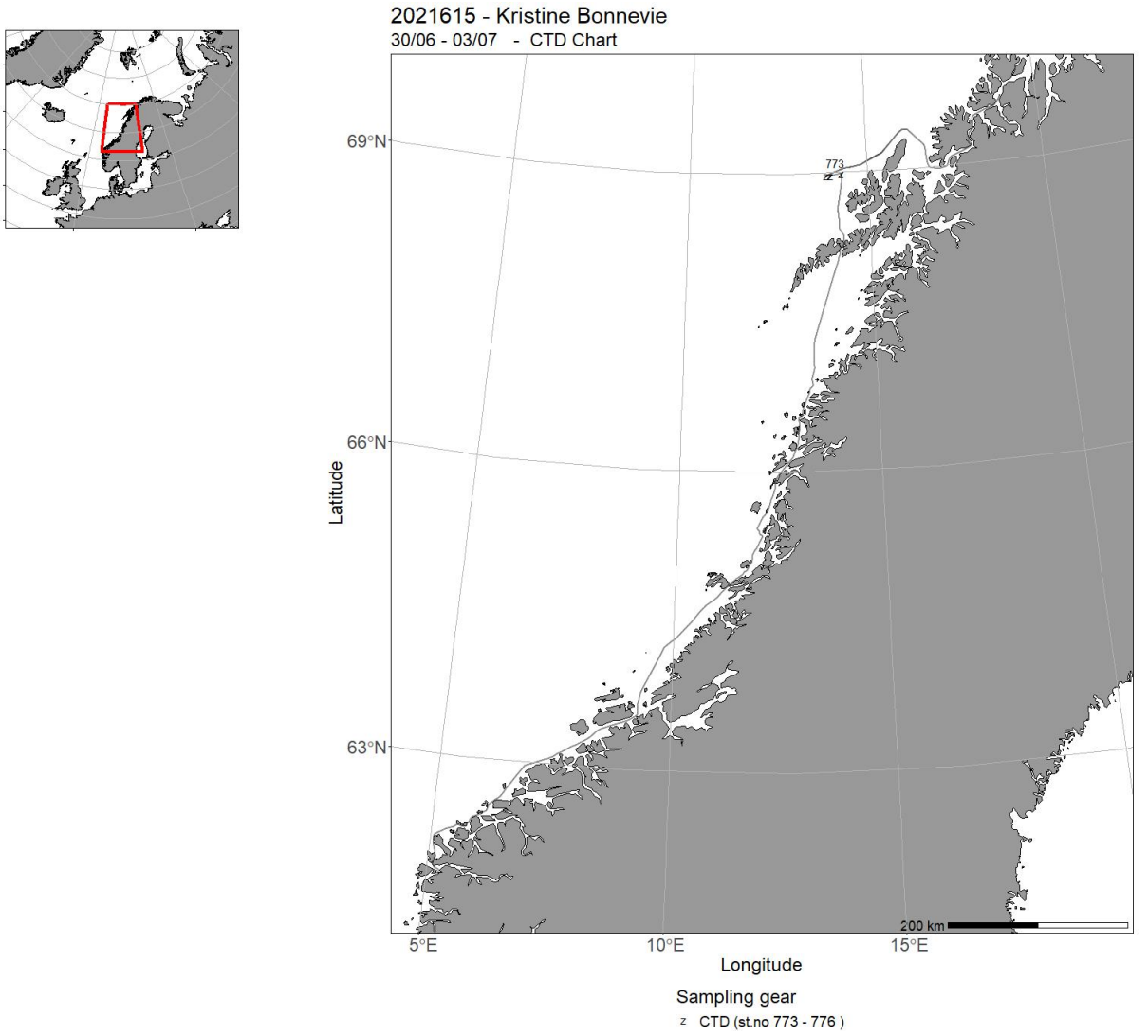
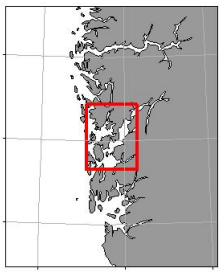

2021615 - Kristine Bonnevie
30/06 - 03/07 - CTD Chart
69°N
66°N
63°N
Latitude
773
200 km
5°E
10°E
15°E
Longitude
Sampling gear
CTD (st.no 773 - 776)

Fig. 7.19



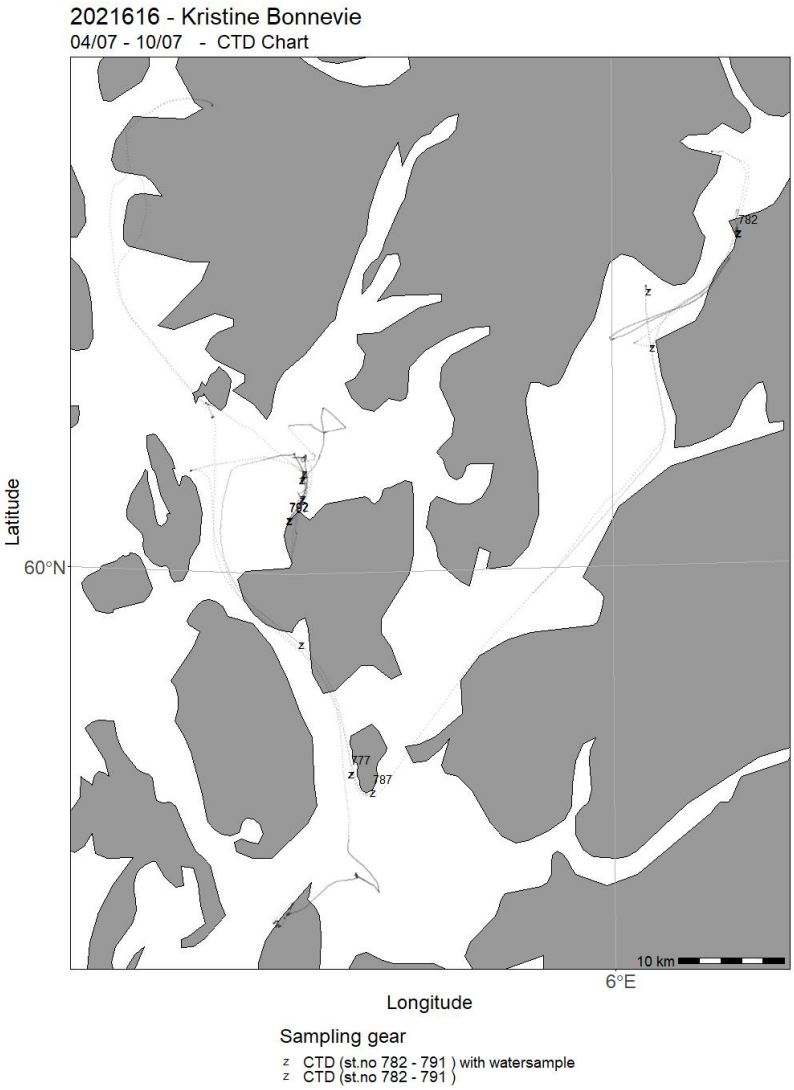

2021616 - Kristine Bonnevie
04/07 - 10/07 - CTD Chart
Latitude
60°N
6°E
Longitude
10 km
782
787
777
Sampling gear
CTD (st.no 782 - 791) with watersample
CTD (st.no 782 - 791)

Fig. 7.20

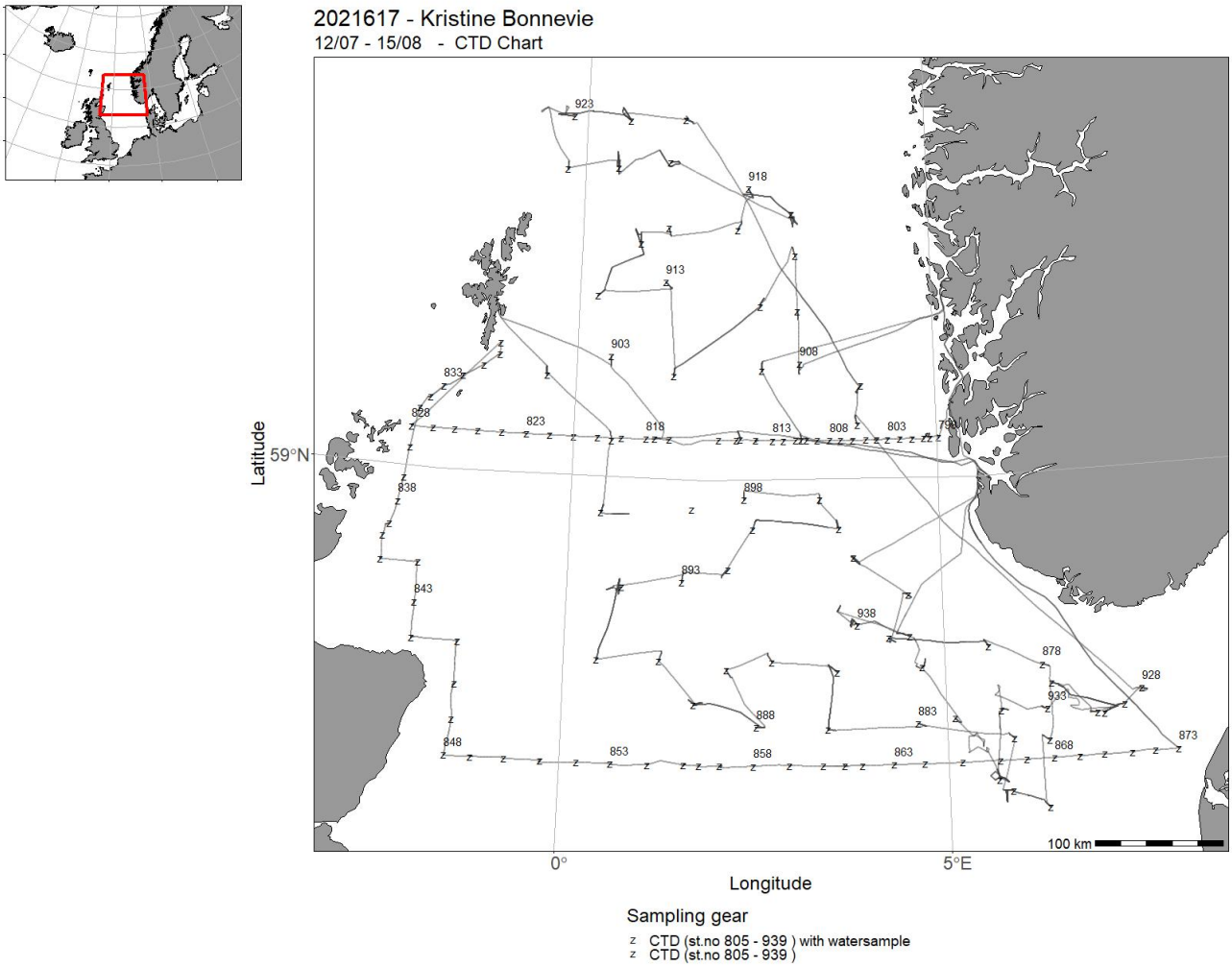

2021617 - Kristine Bonnevie
12/07 - 15/08 - CTD Chart
Latitude
59°N
0°
5°E
Longitude
100 km
Sampling gear
CTD (st.no 805 - 939) with watersample
CTD (st.no 805 - 939)

Fig. 7.21

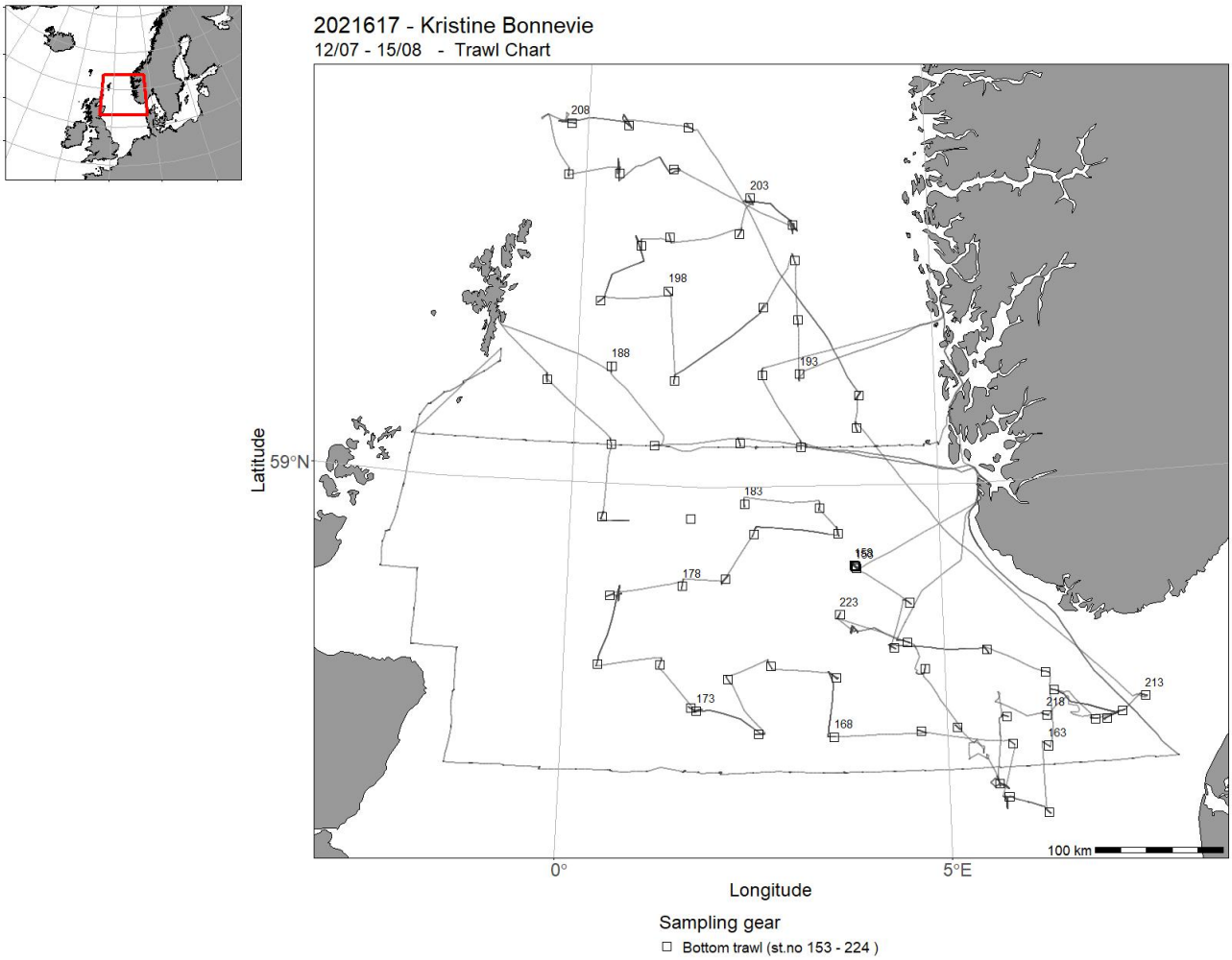

2021617 - Kristine Bonnevie
12/07 - 15/08 - Trawl Chart
208
203
198
188
193
183
178
223
213
218
173
168
163
59°N
Latitude
0°
5°E
Longitude
100 km
Sampling gear
Bottom trawl (st.no 153 - 224)

Fig. 7.22

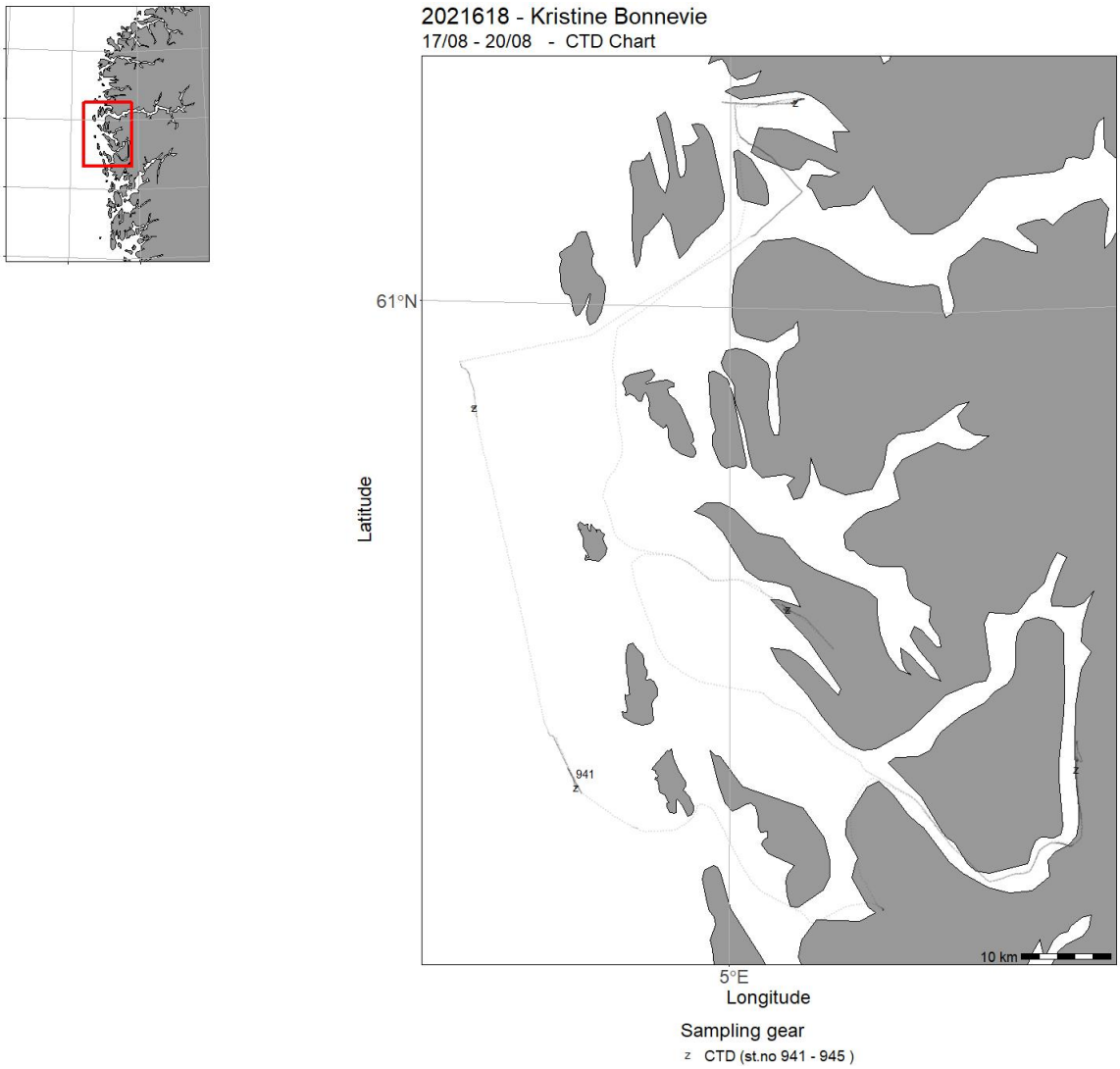

2021618 - Kristine Bonnevie
17/08 - 20/08 - CTD Chart
61°N
Latitude
941
10 km
5°E
Longitude
Sampling gear
CTD (st.no 941 - 945)

Fig. 7.23

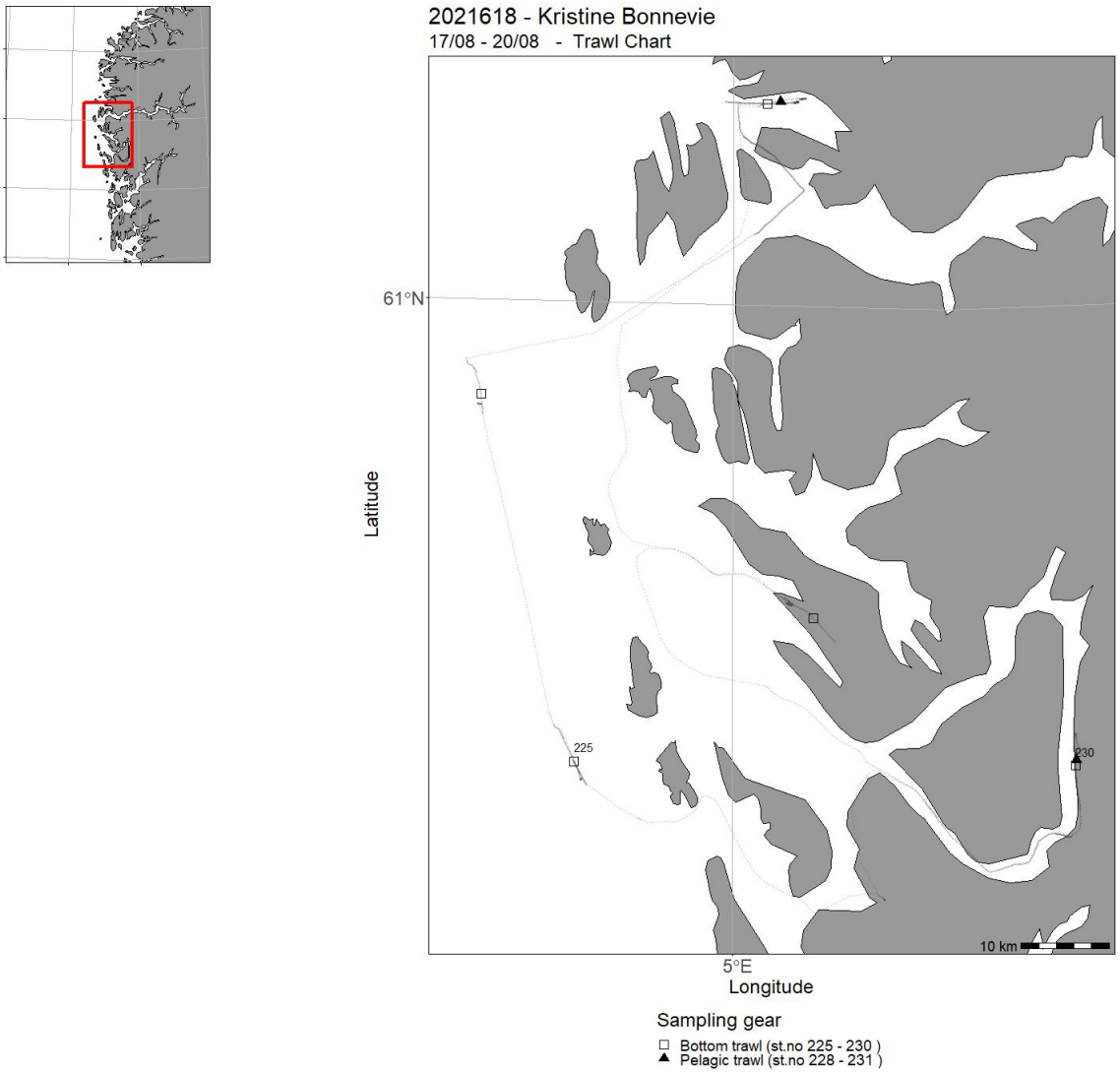
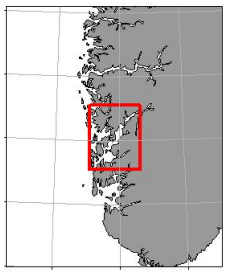

2021618 - Kristine Bonnevie
17/08 - 20/08 - Trawl Chart
61°N
Latitude
225
230
10 km
5°E
Longitude
Sampling gear
Bottom trawl (st.no 225 - 230)
Pelagic trawl (st.no 228 - 231)

Fig. 7.24



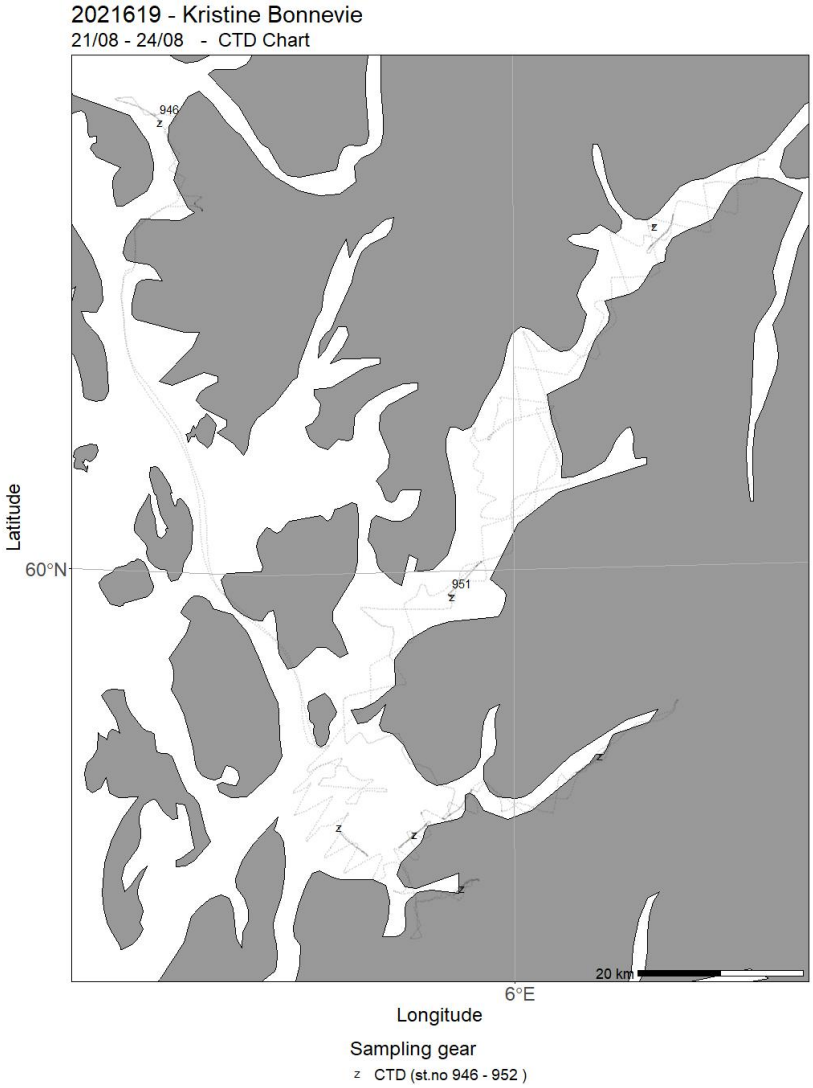
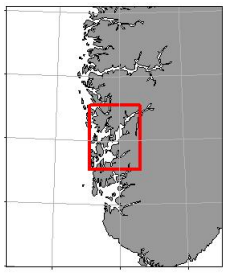

2021619 - Kristine Bonnevie
21/08 - 24/08 - CTD Chart
946
951
Latitude
60°N
6°E
Longitude
20 km
Sampling gear
CTD (st.no 946 - 952)

Fig. 7.25



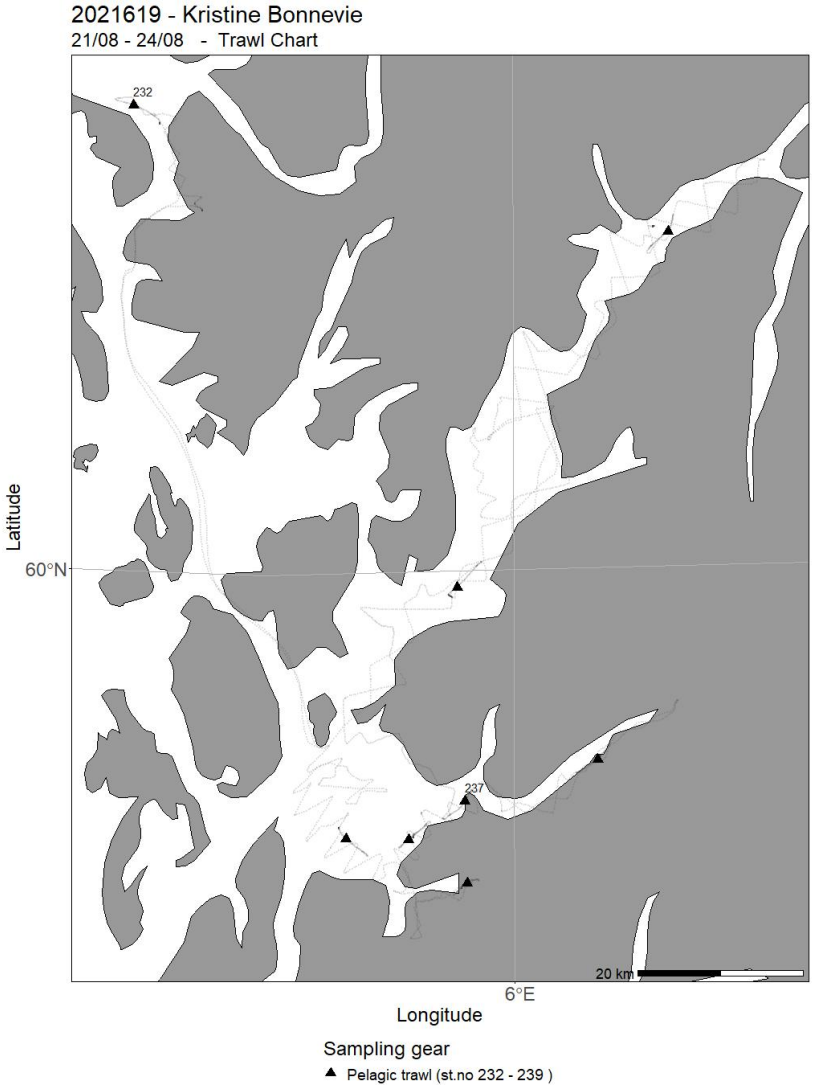

2021619 - Kristine Bonnevie
21/08 - 24/08 - Trawl Chart
232
237
Latitude
60°N
6°E
Longitude
20 km
Sampling gear
Pelagic trawl (st.no 232 - 239)

Fig. 7.26

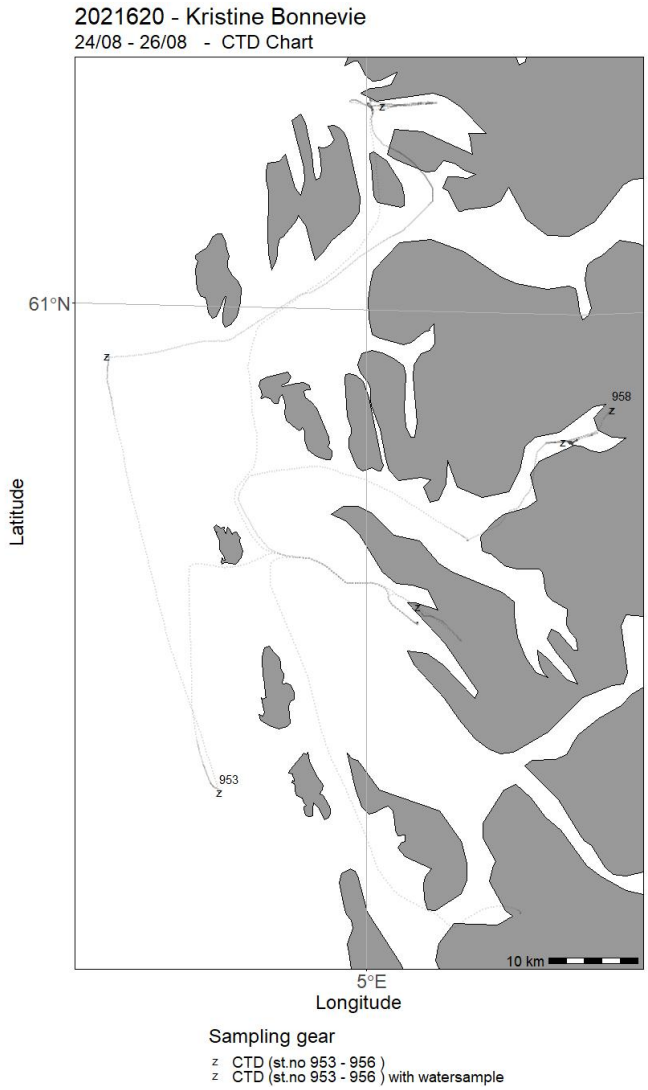

2021620 - Kristine Bonnevie
24/08 - 26/08 - CTD Chart
61°N
Latitude
958
953
10 km
5°E
Longitude
Sampling gear
CTD (st.no 953 - 956)
CTD (st.no 953 - 956) with watersample

Fig. 7.27

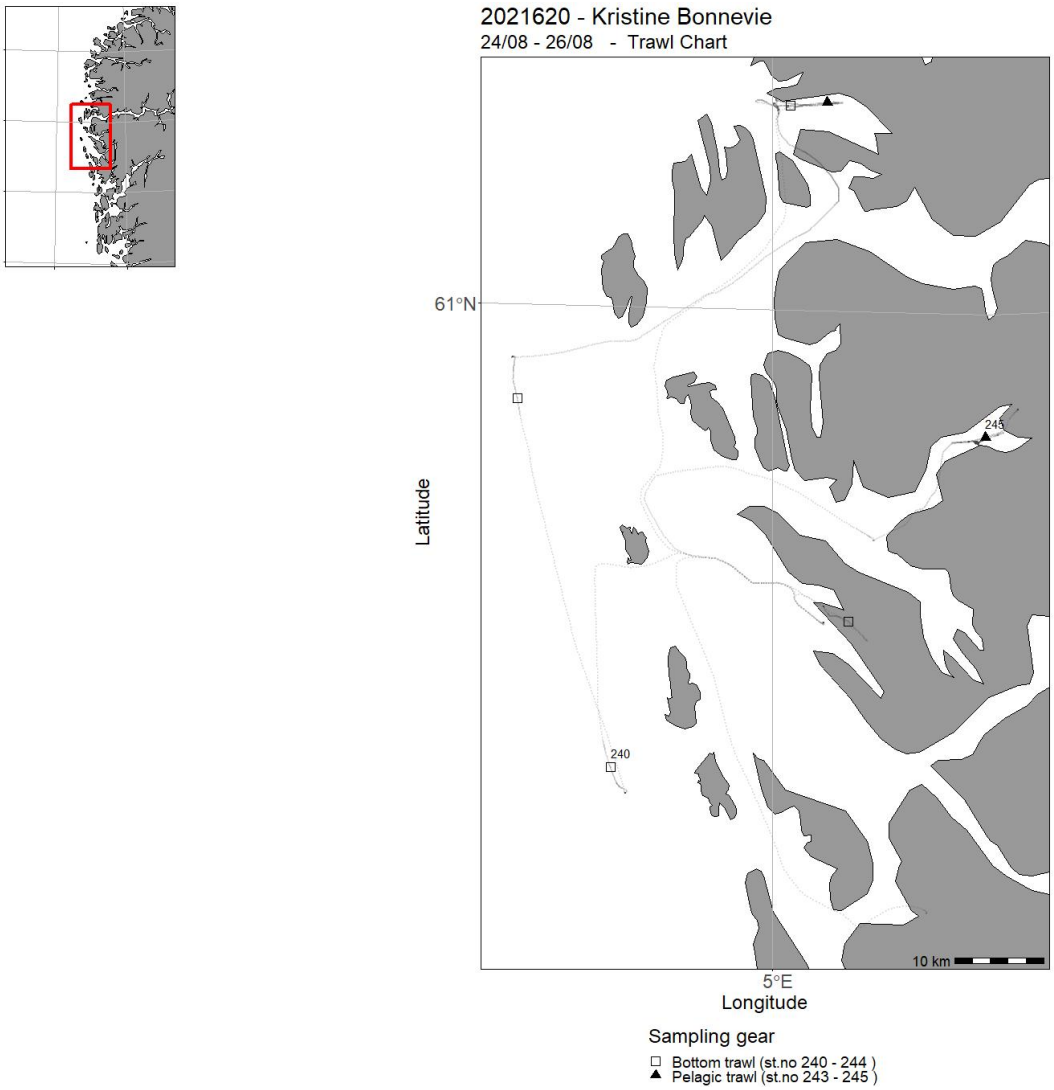
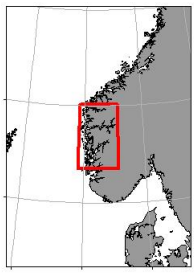

2021620 - Kristine Bonnevie
24/08 - 26/08 - Trawl Chart
61°N
Latitude
245
240
10 km
5°E
Longitude
Sampling gear
Bottom trawl (st.no 240 - 244)
Pelagic trawl (st.no 243 - 245)

Fig. 7.28



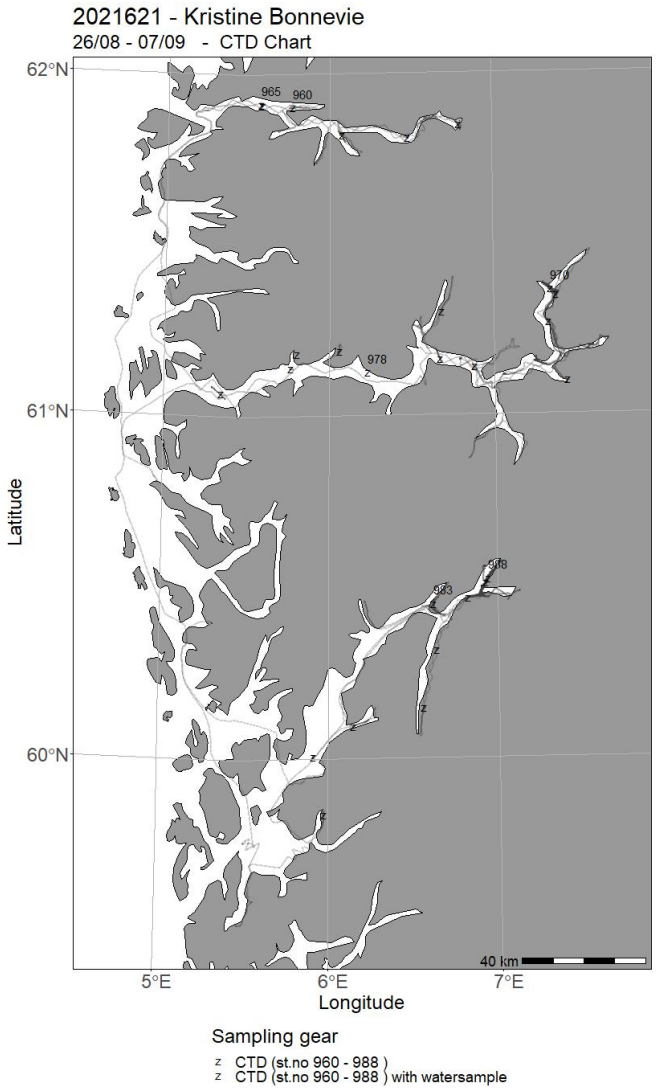
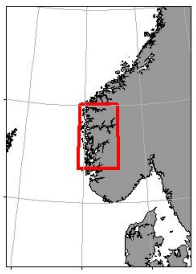

2021621 - Kristine Bonnevie
26/08 - 07/09 - CTD Chart
62°N
61°N
60°N
Latitude
965
960
970
978
973
40 km
5°E
6°E
7°E
Longitude
Sampling gear
CTD (st.no 960 - 988)
CTD (st.no 960 - 988) with watersample

Fig. 7.29



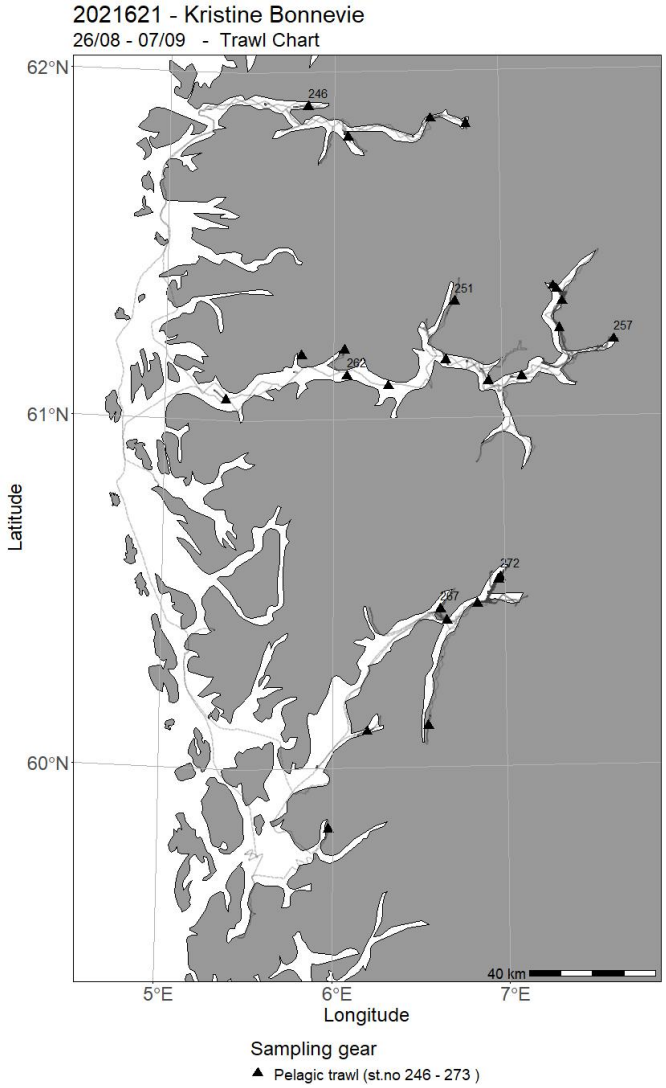
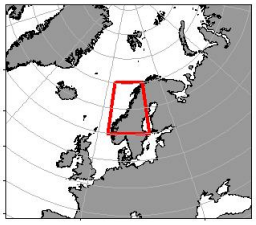

2021621 - Kristine Bonnevie
26/08 - 07/09 - Trawl Chart
62°N
61°N
60°N
Latitude
246
251
257
262
272
267
40 km
5°E
6°E
7°E
Longitude
Sampling gear
Pelagic trawl (st.no 246 - 273)

Fig. 7.30



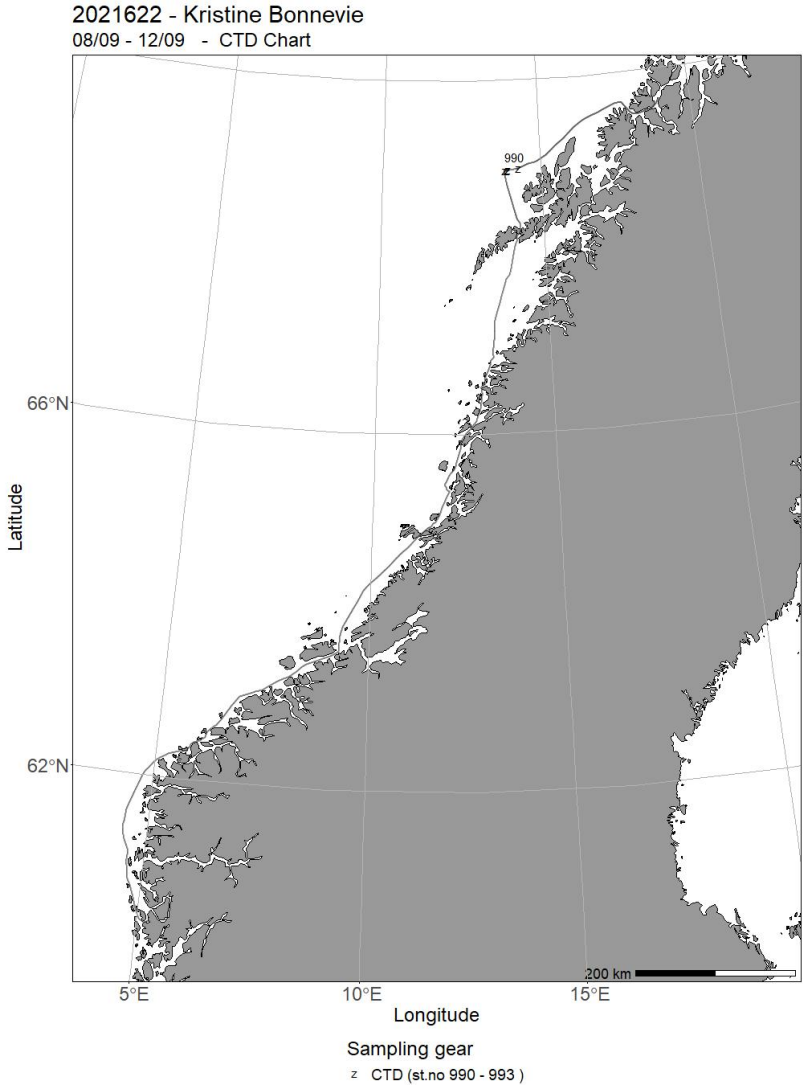
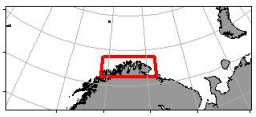

2021622 - Kristine Bonnevie
08/09 - 12/09 - CTD Chart
990
66°N
62°N
Latitude
200 km
5°E
10°E
15°E
Longitude
Sampling gear
CTD (st.no 990 - 993)

Fig. 7.31



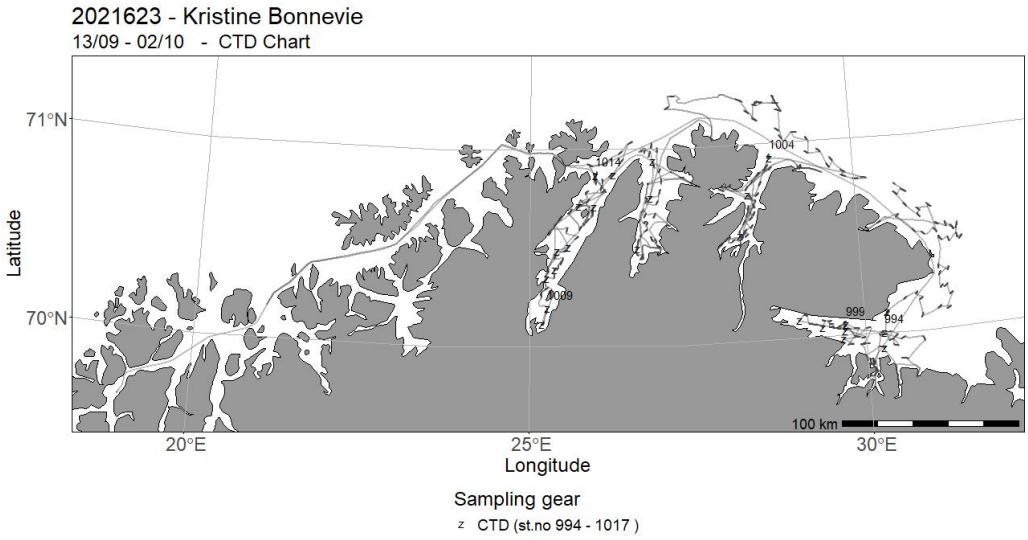
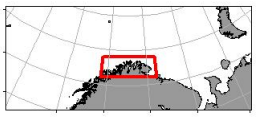

2021623 - Kristine Bonnevie
13/09 - 02/10 - CTD Chart
71°N
70°N
Latitude
20°E
25°E
30°E
Longitude
1004
1014
1009
999
994
100 km
Sampling gear
z CTD (st.no 994 - 1017)

Fig. 7.32



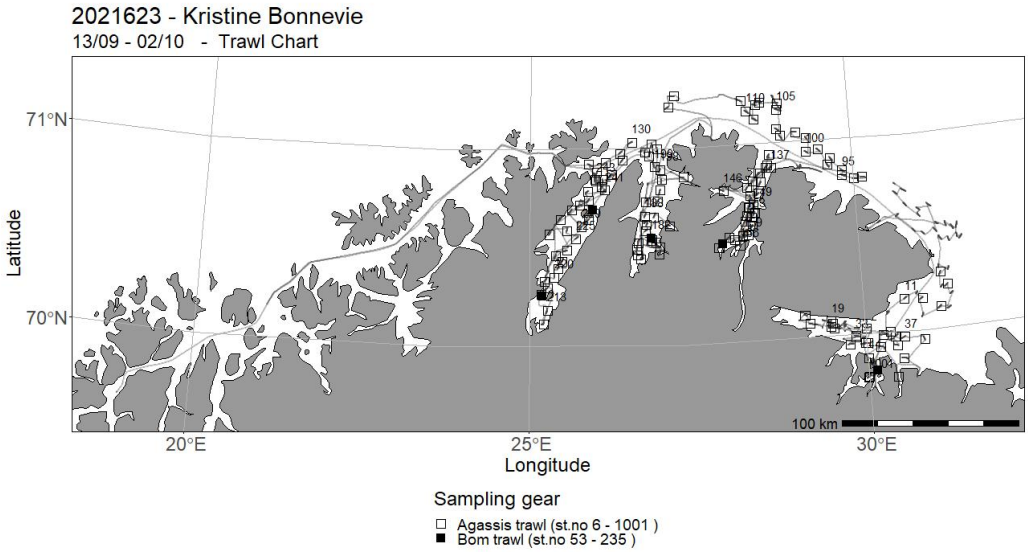

2021623 - Kristine Bonnevie
13/09 - 02/10 - Trawl Chart
71°N
70°N
Latitude
20°E
25°E
30°E
Longitude
100 km
Sampling gear
Agassis trawl (st.no 6 - 1001)
Bom trawl (st.no 53 - 235)

Fig. 7.33

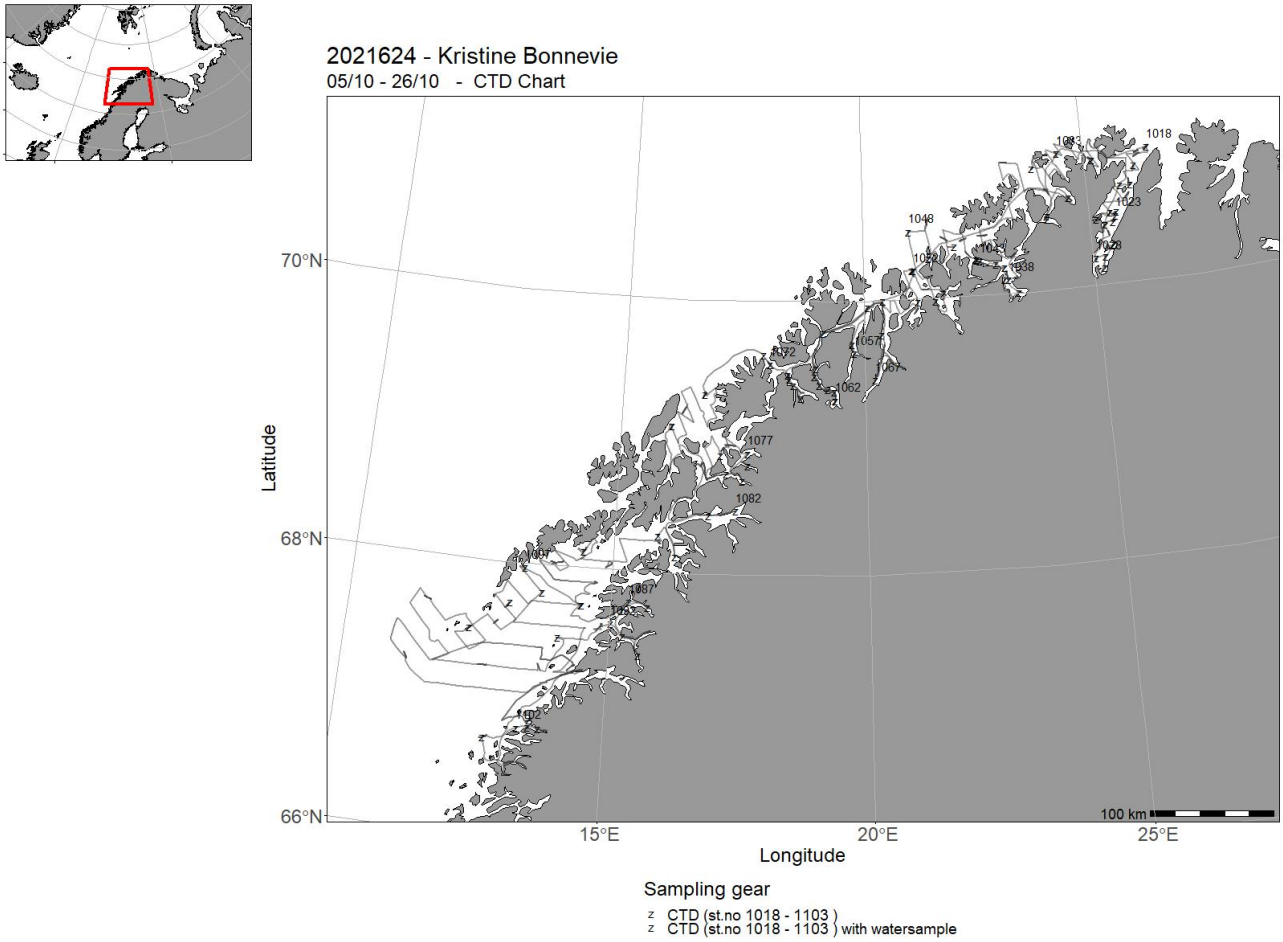

2021624 - Kristine Bonnevie
05/10 - 26/10 - CTD Chart
70°N
68°N
66°N
15°E
20°E
25°E
Latitude
Longitude
100 km
Sampling gear
CTD (st.no 1018 - 1103)
CTD (st.no 1018 - 1103) with watersample

Fig. 7.34

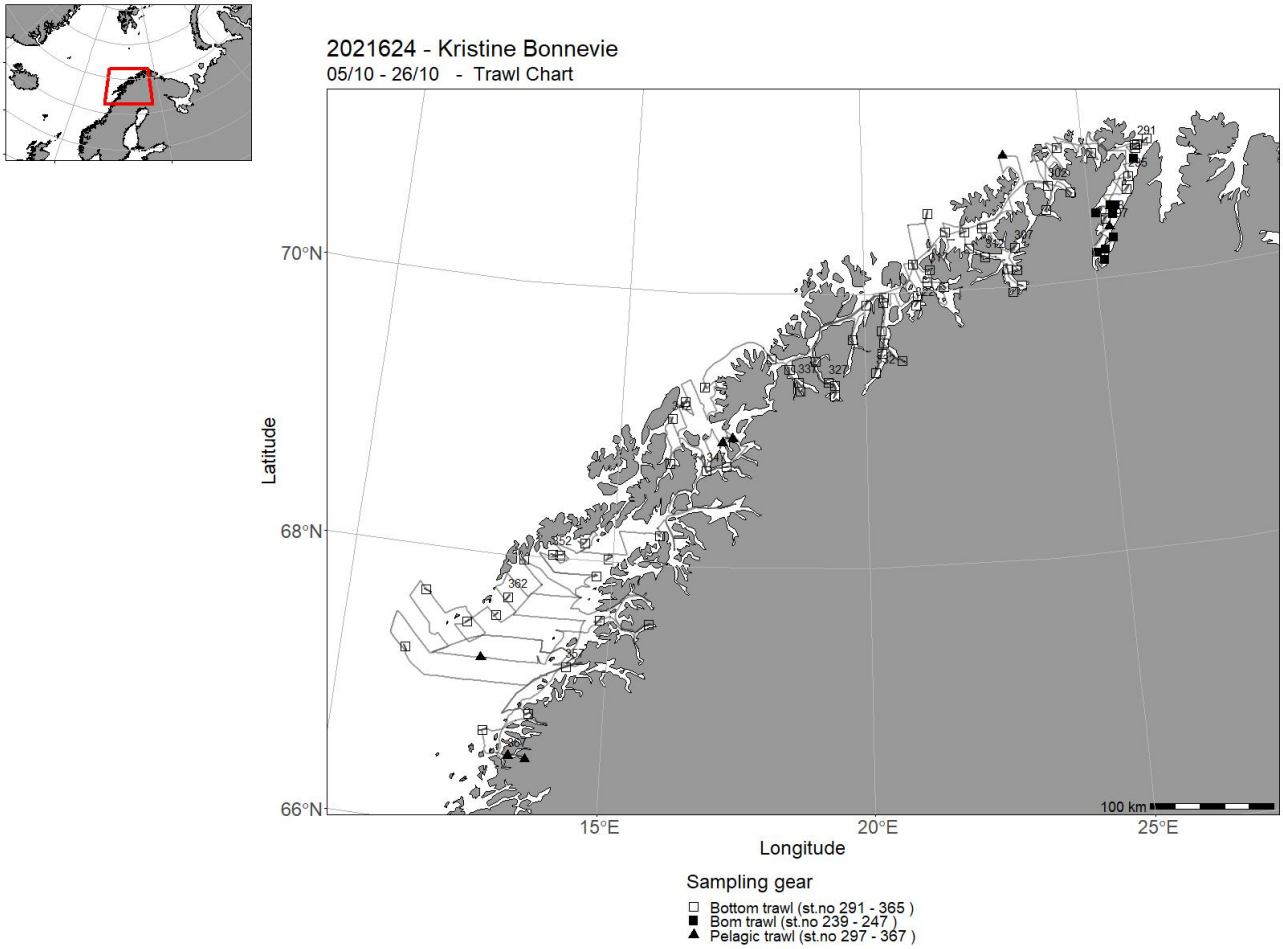
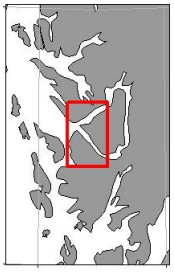

2021624 - Kristine Bonnevie
05/10 - 26/10 - Trawl Chart
70°N
68°N
66°N
Latitude
15°E
20°E
25°E
Longitude
100 km
Sampling gear
Bottom trawl (st.no 291 - 365)
Bom trawl (st.no 239 - 247)
Pelagic trawl (st.no 297 - 367)

Fig. 7.35



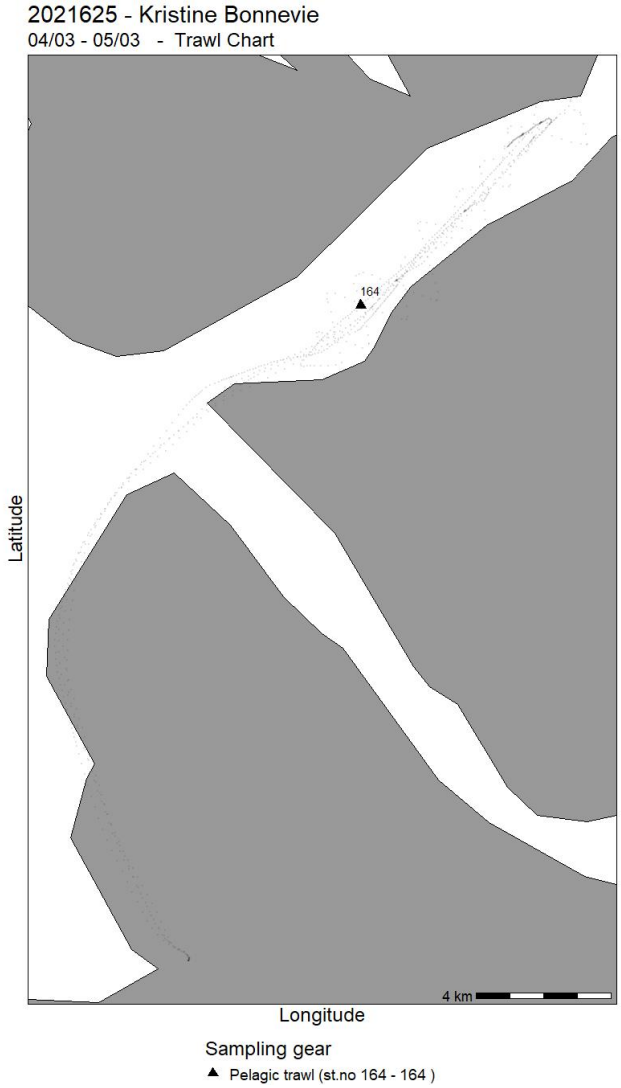

2021625 - Kristine Bonnevie
04/03 - 05/03 - Trawl Chart
164
Latitude
4 km
Longitude
Sampling gear
Pelagic trawl (st.no 164 - 164)

Fig. 7.36

8 - "Kronprins Haakon" – Cruises 2021

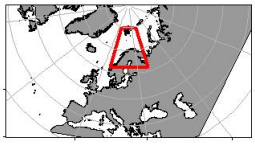
Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021701	09/01 - 07/02	Mengdemåling av bunnfisk, med hovedfokus på torsk og hyse. Data brukes i bestandsberegning (AFWG). Innsamling av sjømatprøver. Prøvetaking av snøkrabbe. Project name: Vintertoktet / 15569	Barents Sea	1 - 24	1 - 45
2021702	09/02 - 28/02	The Winter Process Cruise (WPC) aboard RV Kronprins Haakon (KH2021702) is primarily a physical oceanography cruise with objectives to conduct wintertime hydrographic- and current profiling surveys, and ocean mixing and water transformation process studies within the northwestern Barents Sea region and in the gateways to the northwestern Barents Sea, both with shipborne instrumentation and from a drifting sea ice floe. Meteorological measurements were also made. Activities included: recovery and deployment of oceanographic moorings and gliders, an AUV, a remotely piloted unmanned aircraft and weather balloons: collecting underway measurements from ship-mounted ocean current profilers, wind profilers, radiometer and wave sensors: and collecting ocean stratification, currents, and microstructure profiles along selected transects across the Atlantic water pathways in the northwestern Barents Sea.	Barents Sea	25 - 113	-
2021703	01/03 - 23/03	The Nansen Legacy cruise Q1 (Q1: 1st quarter of the year) addressed objectives of the Nansen Legacy work packages ‘Physical drivers’ (Research Focus 1), ‘Human impact’ (Research Focus 2) and ‘The living Barents Sea’ (Research Focus 3). In total, seven process stations (P1, P2, P3, P4, P5, P6 and P7) were conducted, with some more additional (NLEG) stations in-between. The station P1 was the only open water station, all other stations were in ice covered waters at the shelf, on the slope and in the deep basin.	Barents Sea	114 - 160	46 - 47
2021704	26/04 - 19/05	The Nansen Legacy cruise Q1 (Q1: 1st quarter of the year) addressed objectives of the Nansen Legacy work packages ‘Physical drivers’ (Research Focus 1), ‘Human impact’ (Research Focus 2) and ‘The living Barents Sea’ (Research Focus 3). In total, seven process stations (P1, P2, P3, P4, P5, P6 and P7) were conducted, with some more additional (NLEG) stations in-between. The station P1 was the only open water station, all other stations were in ice covered waters at the shelf, on the slope and in the deep basin.	Arctic Ocean	161 - 215	48 - 50

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021705	22/05 - 09/06	The research expedition cruise CAGE21-1 (UiT internal name) is a major component of the project AKMA (Advancing Knowledge of Methane in the Arctic, NFR INTPART programme) and it is organized under the helm of the Norwegian Centre of Excellence for Arctic Gas Hydrate, Environment and Climate, CAGE at UiT The Arctic University of Norway in Tromsø. CAGE investigates Arctic gas hydrate and methane seepage systems to better understand the effects they may have on our oceans, ecosystems and global climate. The projects aim is to advance collective knowledge about methane activity in the seabed, on the seafloor and in the ocean in Arctic regions.	Barents Sea	216 - 234	-
2021706	11/06 - 27/06	The Arctic is affected by plastic pollution. The general knowledge about plastic pollution and microplastics throughout the Arctic is limited and fragmented. Therefore, it is very important to obtain good quantitative data and robust methods in order to establish monitoring and management of plastic poll uti on in the Arctic. During this cruise we have ai med to I) test methods when sampling different media for microplastic analysis, and 2) obtain samples from different media: air, sea ice, sea water, biota and sediments.	Arctic Ocean	235 - 270	51 - 52
2021707	28/06 - 11/07	During this cruise, we collected 1. surface sediments (multicores) for establishing an Arctic sedimentary DNA database 2. sediment records (gravity cores) for investigating the Arctic sea-ice history 3. water samples (CTD), plankton tows (0-50 m) and sea ice for assessing phytoplankton biodiversity 4. CTD profiles and water samples (CTD) for assessing the isotopic signature of the prevailing water masses. Project name: AGENS I (www.agensi.eu) - "A Genetic View into Past Sea lee Variability in the Arctic"	Longyearbyen	271 - 287	-
2021708	12/07 - 29/07	The Nansen Legacy (NLEG) joint cruise (JC2-1) followed up the seasonal investigations of the northern Barents Sea and adjacent Arctic Basin, as well as investigations of interannual variability in the late summer period. The transect represents an environmental gradient through the northern Barents Sea, and included 7 process stations (P1-P7) lasting 10-39 hrs. Additional CTD stations (NLEG) were taken between the process stations to increase the hydrographic resolution along the transect.	Barents Sea	288 - 350	53 - 68

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021709	31/07 - 19/08	The objective of the annual cruise of the Norwegian Polar Institute to Fram Strait is to service the Arctic Outflow Observatory in the western Fram Strait. This observing system monitors the properties of the Arctic freshwater, sea ice, and returning Atlantic water, as well as the state of ocean acidification, CDOM and nutrients in the East Greenland Current. The main priority was to recover and redeploy seven NPI moorings across the East Greenland Current at 78°50' N, and to carry out the CTD/LADCP section including extensive water sampling for various tracers across the whole Fram Strait along the 78°50'N line. Project name: Fram Strait Arctic Outflow Observatory (NPI), ARICE (EU), NorEMSO (NFR) Coordinating body: Norwegian Polar Institute	Arctic Ocean	351 - 463	-
2021710	23/08 - 25/09	The Arctic Basin (JC2-2) cruise addressed objectives of the Nansen Legacy project on the physical environment, on human impact through ecotoxicology, ocean acidification and impact of fisheries, and on community,distribution, ecology and interactions of the organisms in the Arctic Basin. The main scientific goal of JC2-2 was to extend the project's research activities from the northern Barents Sea shelf into the central Arctic Ocean. Specifically, JC2-2 addressed objectives of the research foci by jointly collecting interdisciplinary samples and data at five process (P7-P11) along a transect from 81.46 to 87.51°N in the Nansen and Amundsen basins and in-between at NLEG stations.	Arctic Ocean	464 - 507	69 - 80
2021711	28/09 - 20/10	Cruise 2021711 is a major component of the FRINATEK HACON project, which aims at investigating the role of the Gakkel Ridge and Arctic Ocean in biological connectivity amongst ocean basins and global biogeography of chemosynthetic ecosystems. The HACON study area is centered in the Aurora seamount and Aurora vent field.	Arctic Ocean	508 - 515	-
2021712	21/10 - 30/10	The aim of the cruise was to measure in-situ sediment properties (e.g., horizontal pressure, shear strength, pore fluid pressure, temperature) at methane seeping sites offshore west Svalbard. We rented, through a tender, instrumentation from Marine Sampling Holland (MSH) and the Marchetti Lab for conducting such measurements. Project name: SEAMSTRESS – Tectonic stress effect on Arctic methane seepage Coordinating body: UiT – The Arctic University of Norway	Arctic Ocean	-	-

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021713	05/11 - 16/11	This was a joint cruise between the projects Nansen Legacy, A-TWAIN and SIOS InfraNor. The main objectives were to recover and redeploy a number of moorings a) in the northern Barents Sea for the Nansen Legacy project and b) over the continental slope north of Svalbard for A-TWAIN/SIOS InfraNor, including project partner moorings.	Barents Sea	516 - 545	-
2021716	18/11 - 15/02	Supply Cruise Troll	Atlantic Ocean	547 - 552-	-
2021714	29/11 - 03/12	Cancelled	-	-	-
2021715	04/12 - 15/12	Cancelled	-	-	-

9 - “ Kronprins Haakon” – Charts for cruises 2021



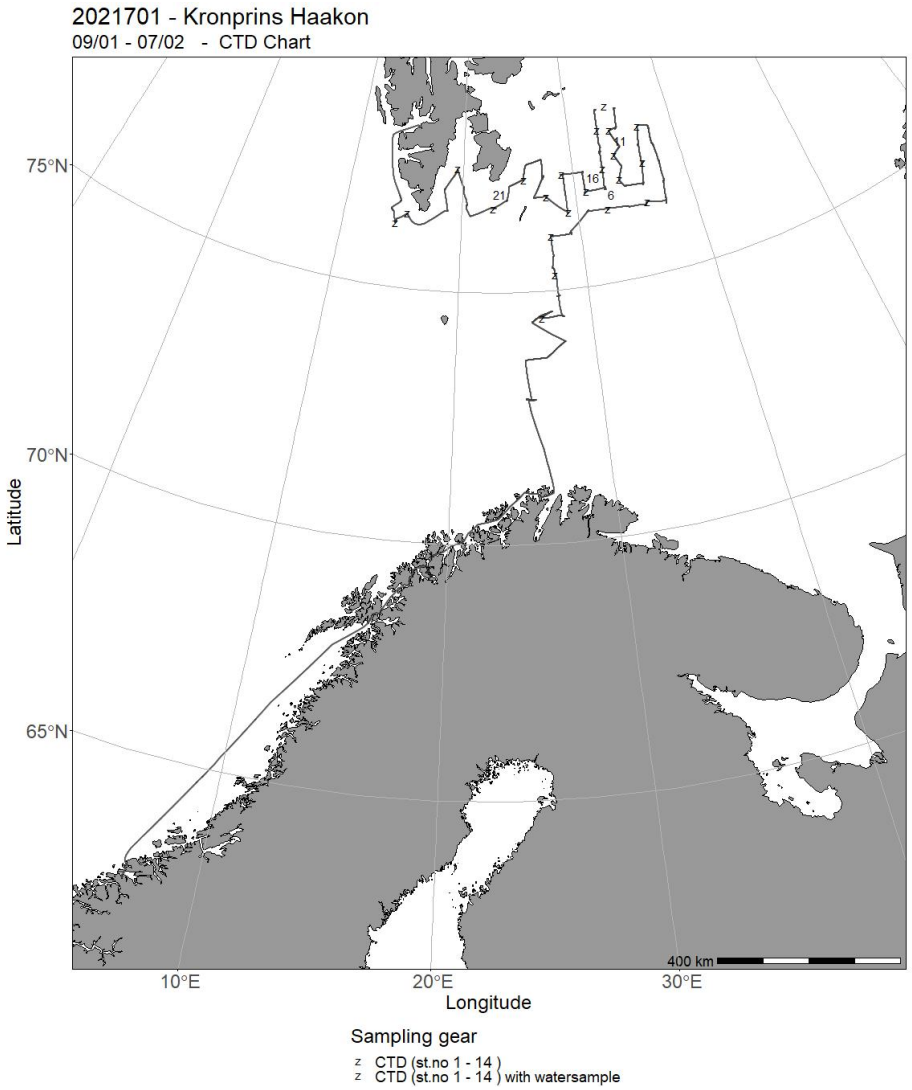
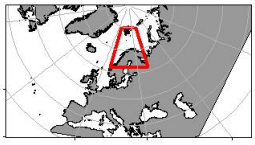


Fig. 9.1



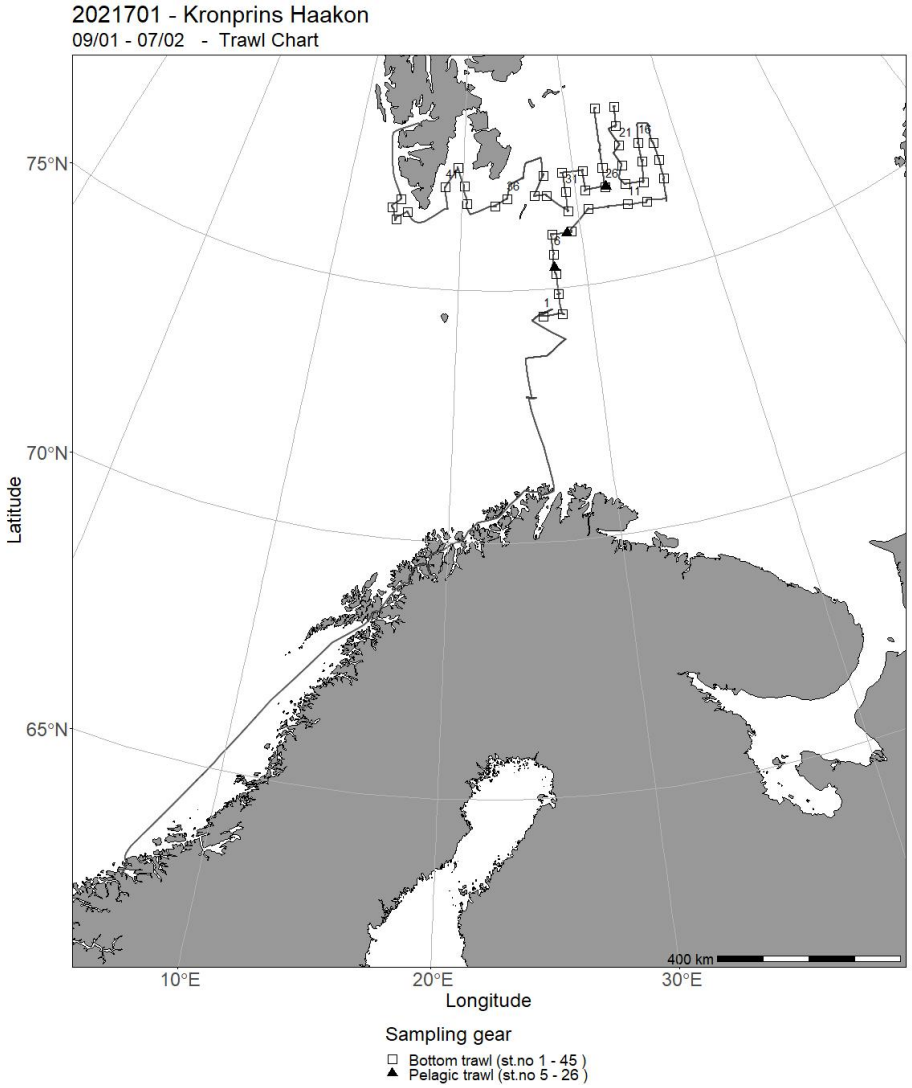
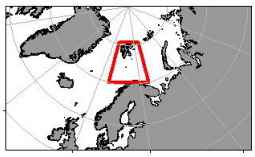

2021701 - Kronprins Haakon
09/01 - 07/02 - Trawl Chart
75°N
70°N
65°N
Latitude
10°E
20°E
30°E
Longitude
400 km
Sampling gear
Bottom trawl (st.no 1 - 45)
Pelagic trawl (st.no 5 - 26)

Fig. 9.2



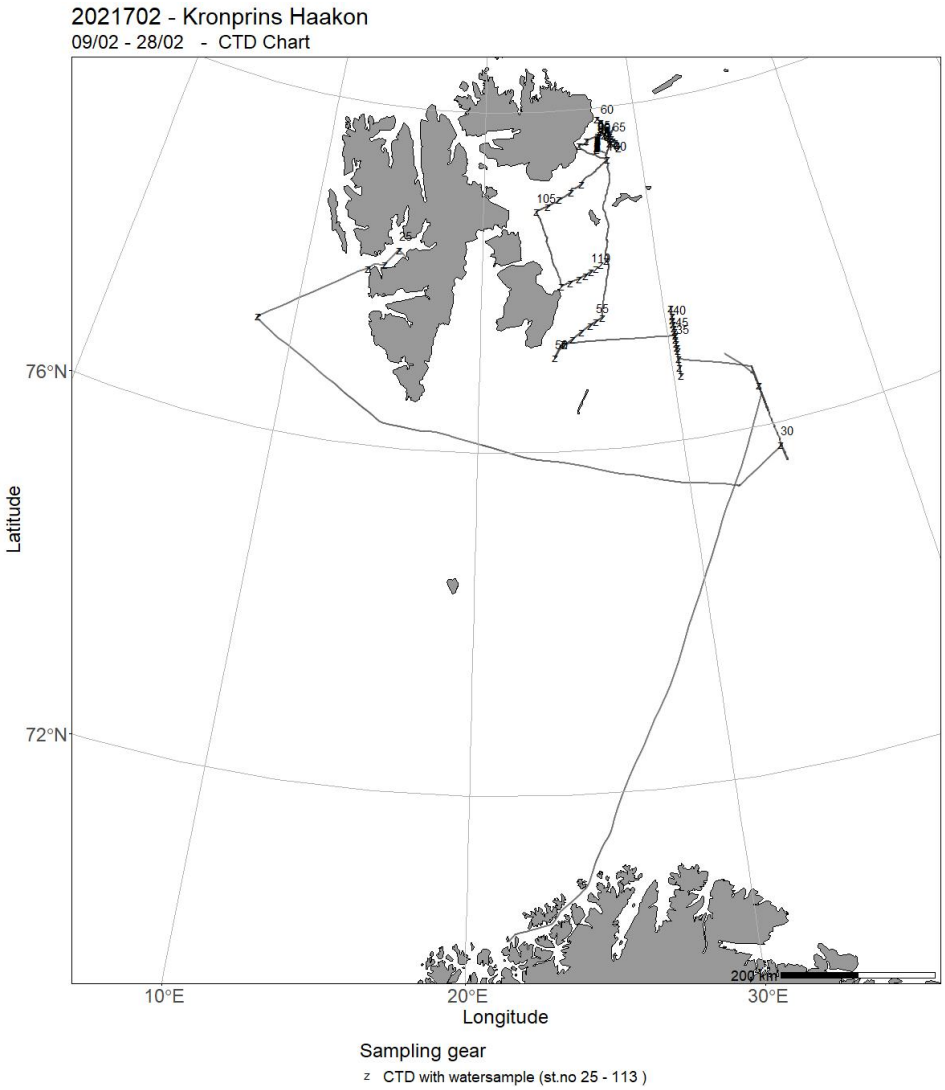
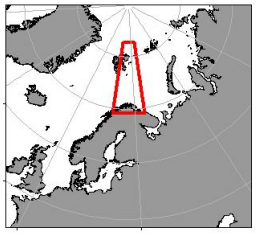

2021702 - Kronprins Haakon
09/02 - 28/02 - CTD Chart
60
65
105
112
55
140
145
135
30
76°N
72°N
Latitude
10°E
20°E
30°E
Longitude
200 km
Sampling gear
CTD with watersample (st.no 25 - 113)

Fig. 9.3



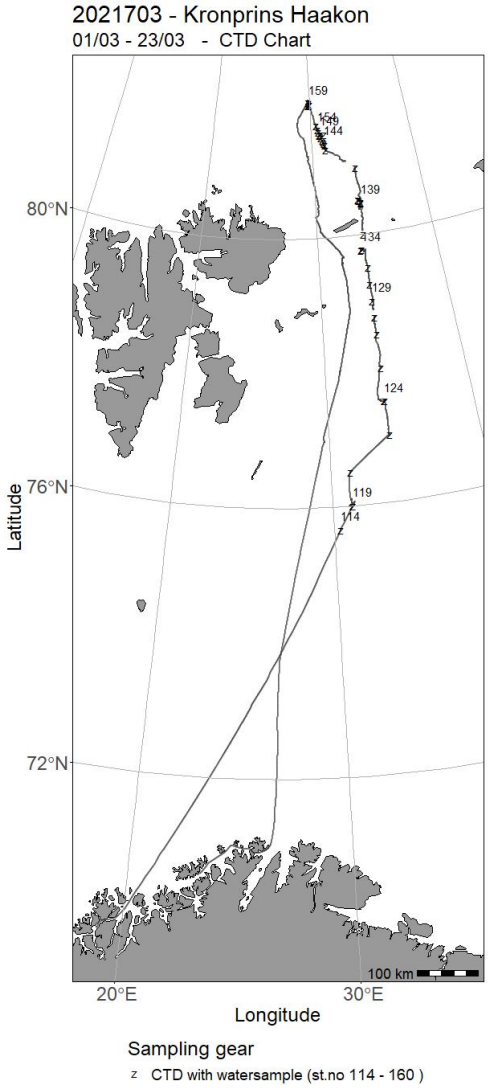
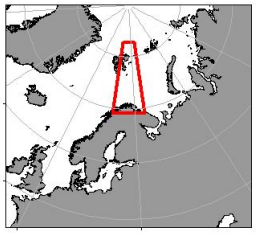

2021703 - Kronprins Haakon
01/03 - 23/03 - CTD Chart
159
154
149
144
139
134
129
124
119
114
80°N
76°N
72°N
Latitude
100 km
20°E
30°E
Longitude
Sampling gear
CTD with watersample (st.no 114 - 160)

Fig. 9.4



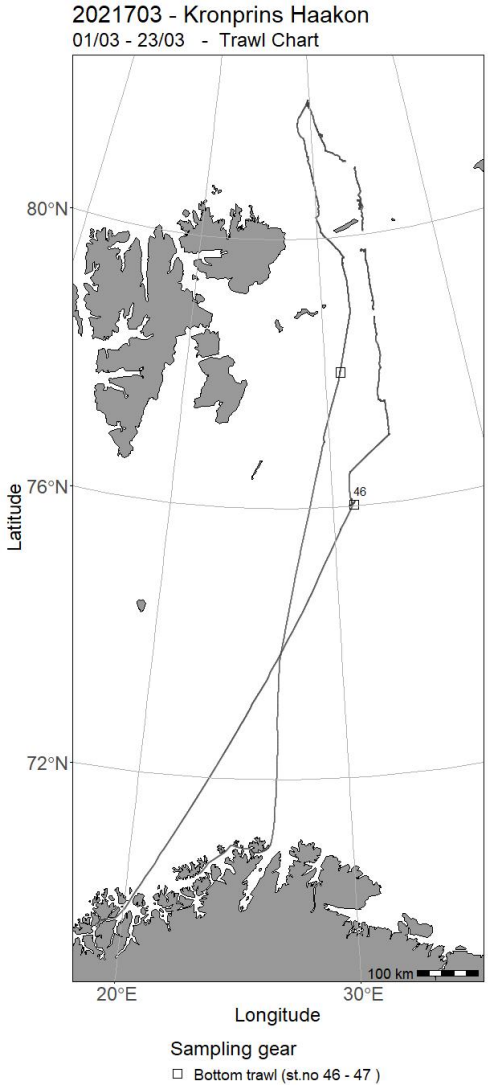
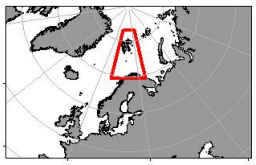

2021703 - Kronprins Haakon
01/03 - 23/03 - Trawl Chart
80°N
76°N
72°N
Latitude
46
100 km
20°E
30°E
Longitude
Sampling gear
Bottom trawl (st.no 46 - 47)

Fig. 9.5



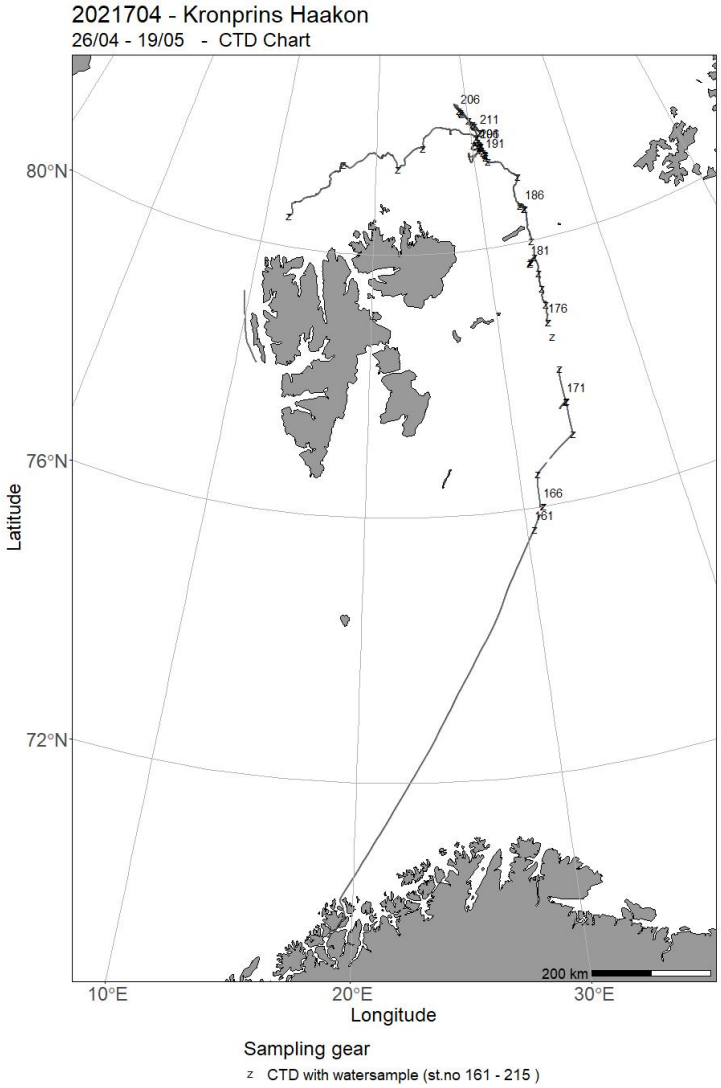
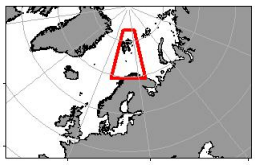
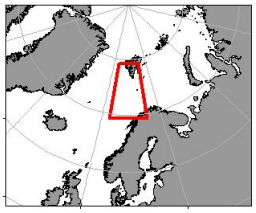

2021704 - Kronprins Haakon
26/04 - 19/05 - CTD Chart
206
211
191
186
181
176
171
166
161
80°N
76°N
72°N
Latitude
10°E
20°E
30°E
Longitude
200 km
Sampling gear
CTD with watersample (st.no 161 - 215)

Fig. 9.6




2021704 - Kronprins Haakon
26/04 - 19/05 - Trawl Chart
80°N
76°N
72°N
Latitude
48
200 km
10°E
20°E
30°E
Longitude
Sampling gear
Bottom trawl (st.no 48 - 49)
Pelagic trawl (st.no 50 - 50)

Fig. 9.7



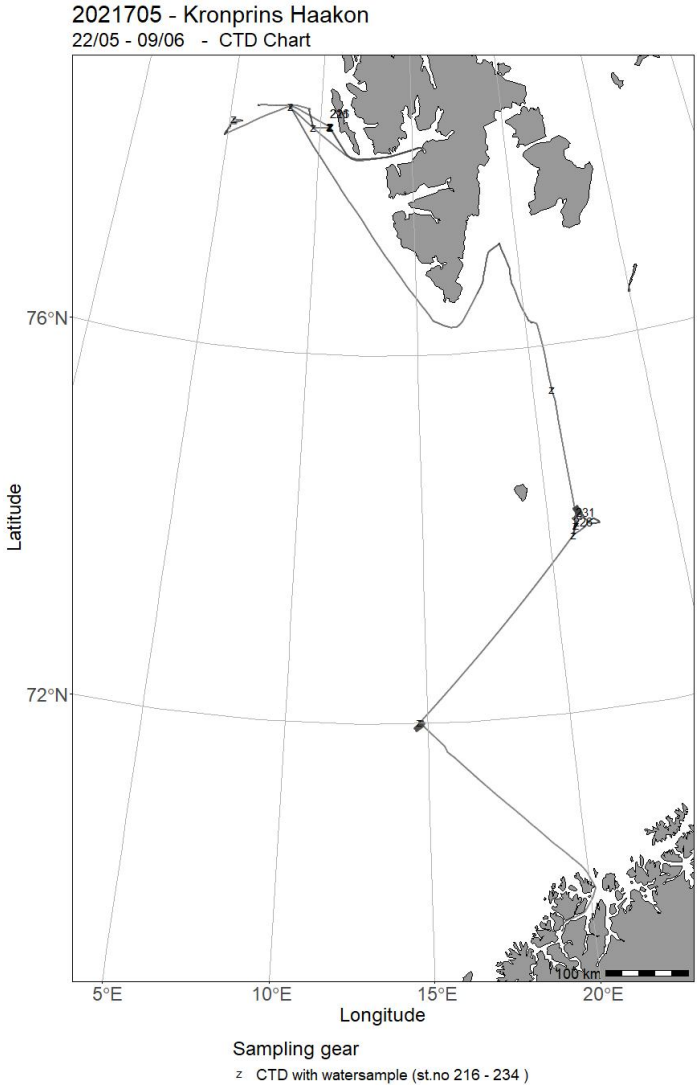
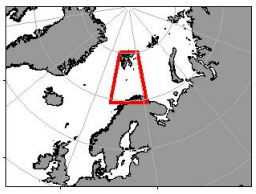

2021705 - Kronprins Haakon
22/05 - 09/06 - CTD Chart
76°N
72°N
Latitude
5°E
10°E
15°E
20°E
Longitude
100 km
Sampling gear
CTD with watersample (st.no 216 - 234)

Fig. 9.8



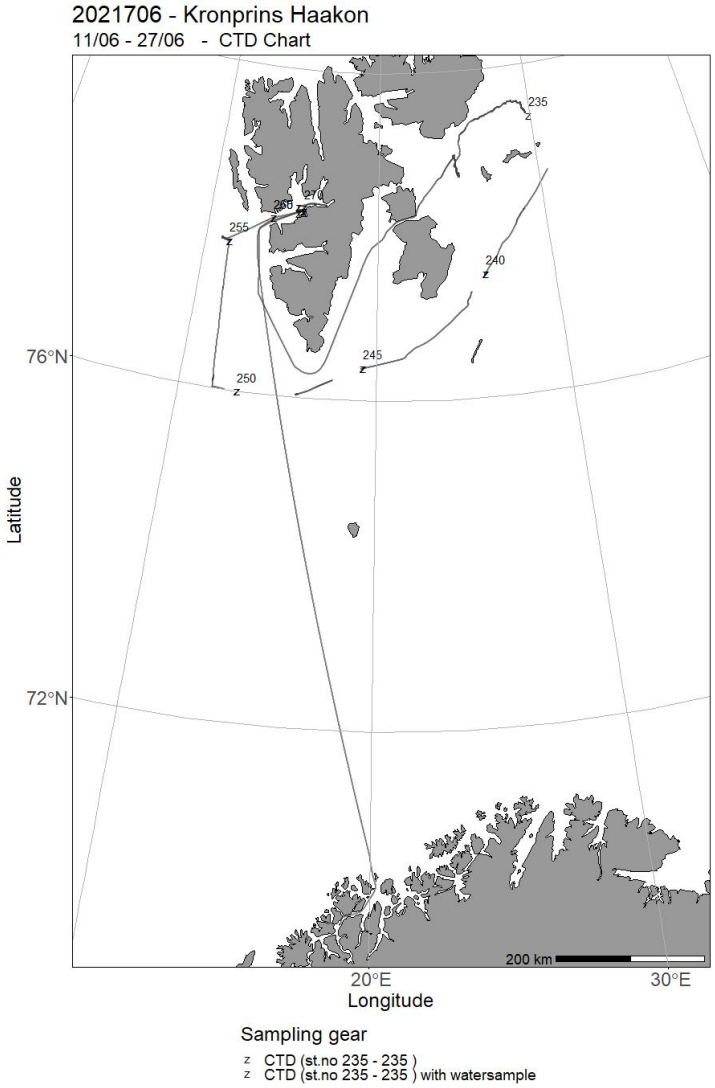
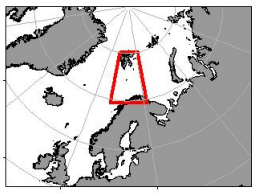

2021706 - Kronprins Haakon
11/06 - 27/06 - CTD Chart
235
270
265
255
240
245
250
76°N
72°N
Latitude
200 km
20°E
30°E
Longitude
Sampling gear
CTD (st.no 235 - 235)
CTD (st.no 235 - 235) with watersample

Fig. 9.9



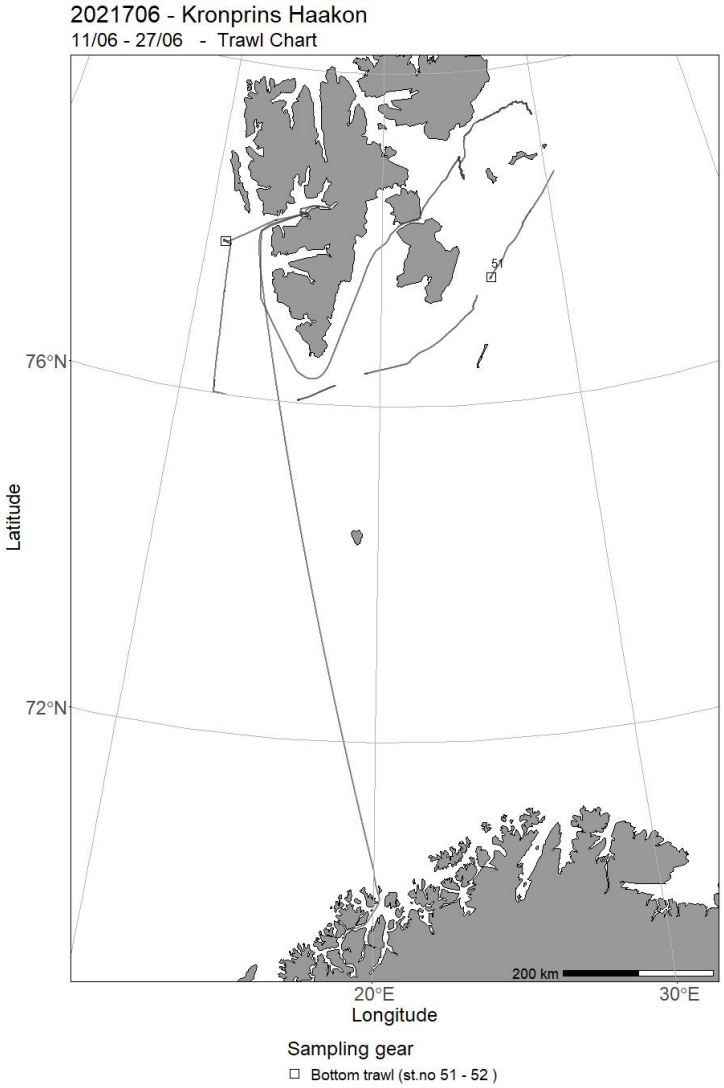

2021706 - Kronprins Haakon
11/06 - 27/06 - Trawl Chart
76°N
72°N
Latitude
51
200 km
20°E
30°E
Longitude
Sampling gear
Bottom trawl (st.no 51 - 52)

Fig. 9.10

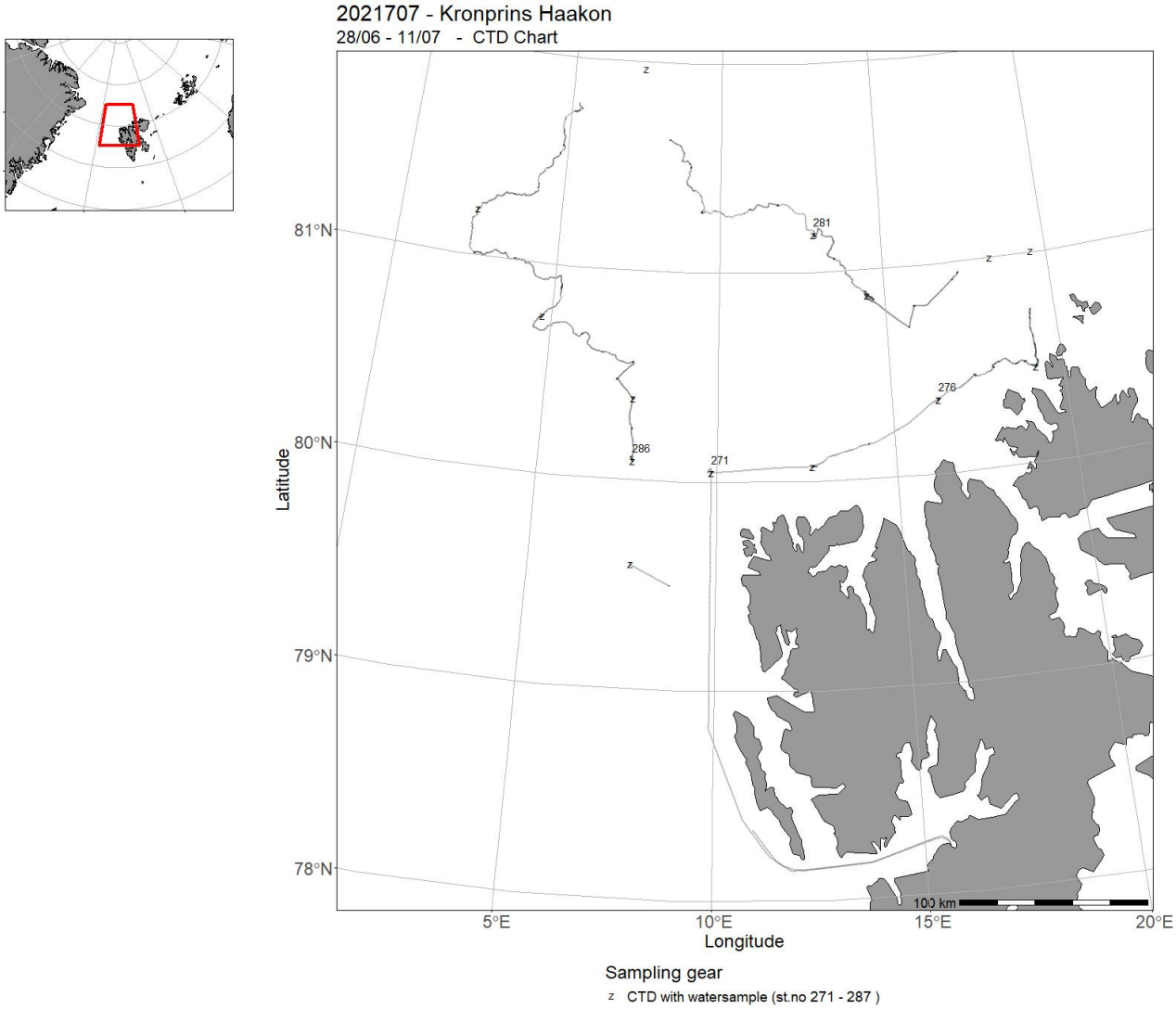
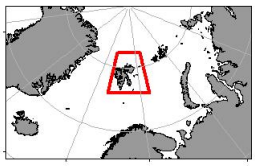

2021707 - Kronprins Haakon
28/06 - 11/07 - CTD Chart
81°N
80°N
79°N
78°N
Latitude
5°E
10°E
15°E
20°E
Longitude
281
276
286
271
100 km
Sampling gear
CTD with watersample (st.no 271 - 287)

Fig. 9.11



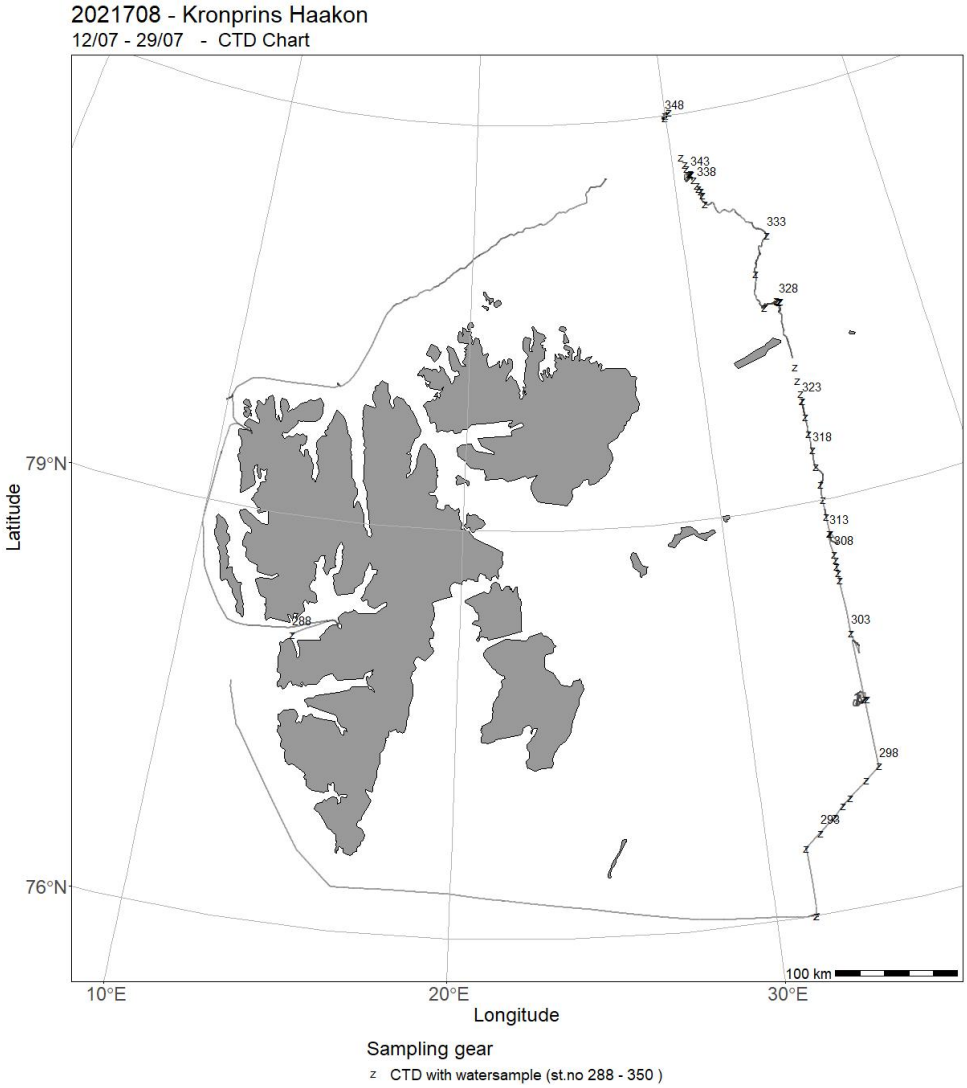
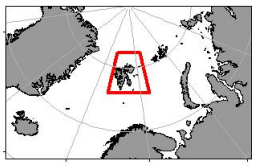

2021708 - Kronprins Haakon
12/07 - 29/07 - CTD Chart
348
343
338
333
328
323
318
313
308
303
298
293
288
79°N
76°N
Latitude
10°E
20°E
30°E
Longitude
100 km
Sampling gear
CTD with watersample (st.no 288 - 350)

Fig. 9.12



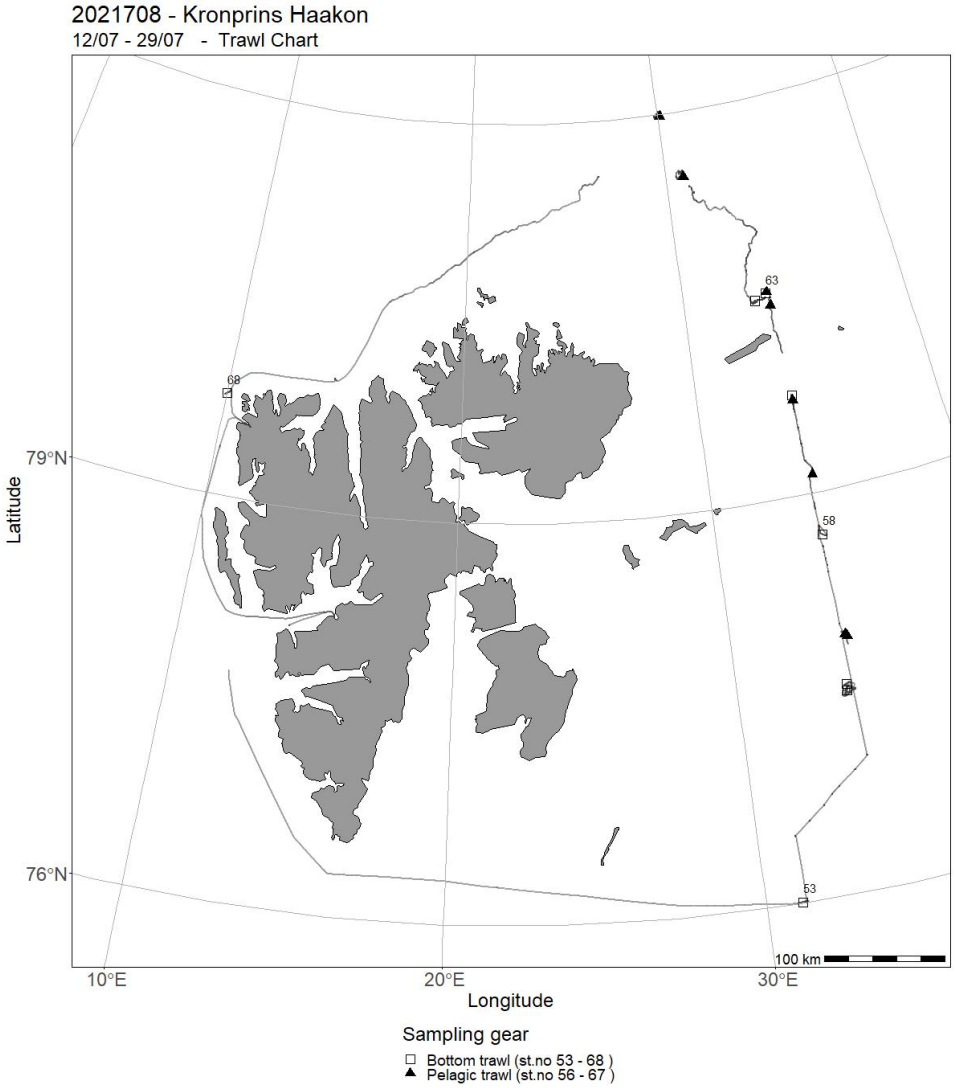
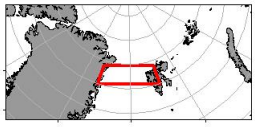

2021708 - Kronprins Haakon
12/07 - 29/07 - Trawl Chart
63
68
58
53
79°N
76°N
Latitude
10°E
20°E
30°E
Longitude
100 km
Sampling gear
Bottom trawl (st.no 53 - 68)
Pelagic trawl (st.no 56 - 67)

Fig. 9.13



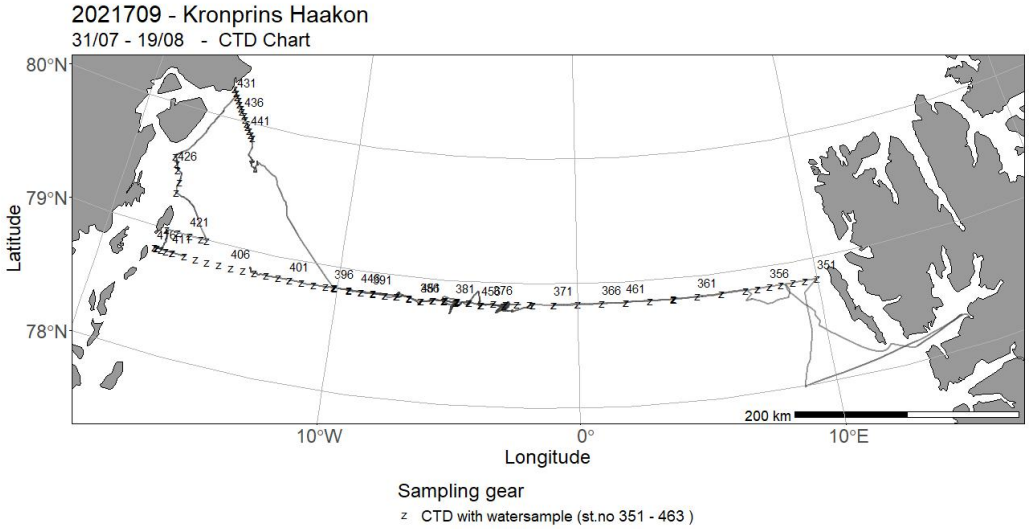

2021709 - Kronprins Haakon
31/07 - 19/08 - CTD Chart
80°N
79°N
78°N
Latitude
10°W
0°
10°E
Longitude
200 km
Sampling gear
CTD with watersample (st.no 351 - 463)

Fig. 9.14

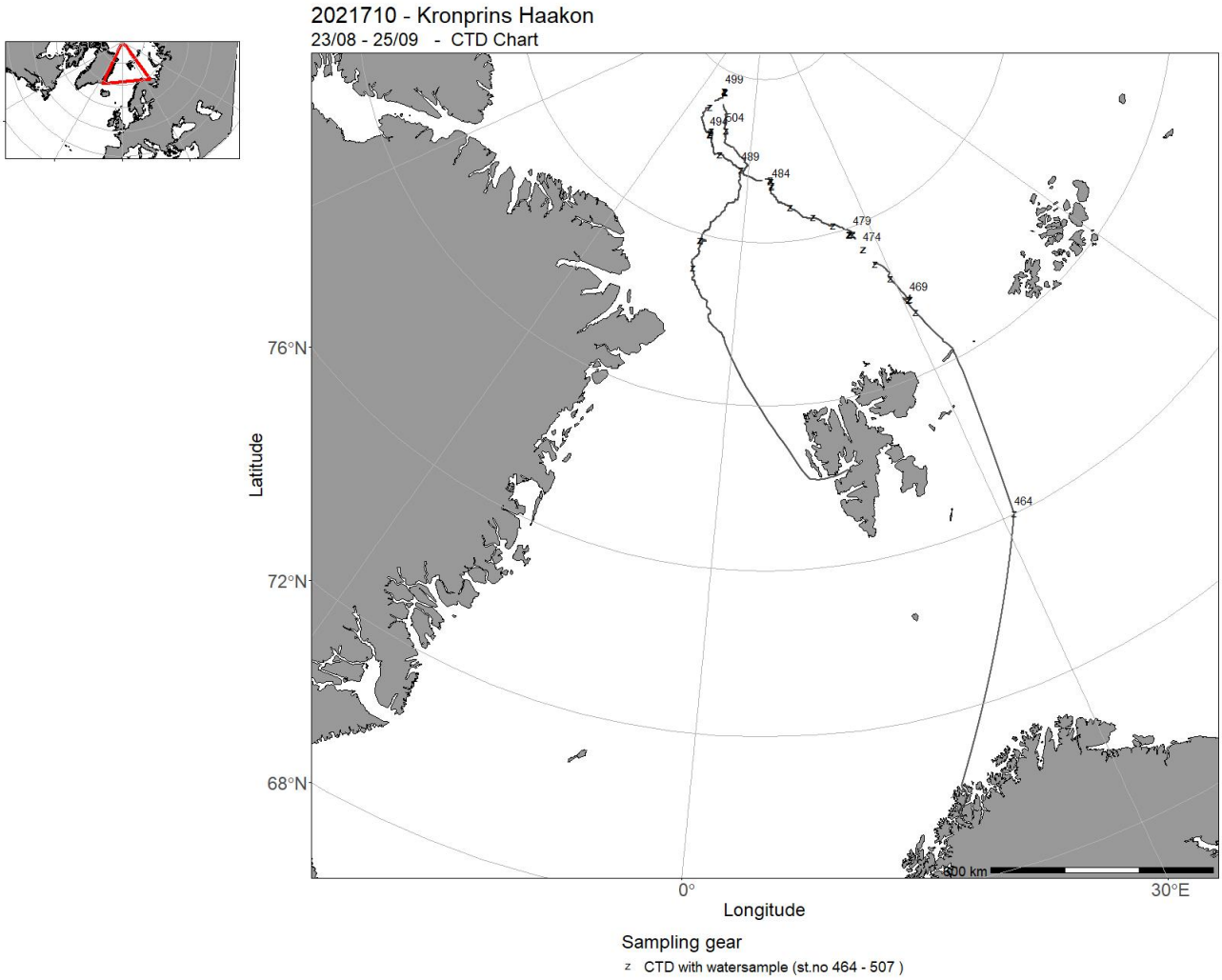

2021710 - Kronprins Haakon
23/08 - 25/09 - CTD Chart
499
494
504
489
484
479
474
469
464
76°N
72°N
68°N
Latitude
0°
30°E
Longitude
200 km
Sampling gear
CTD with watersample (st.no 464 - 507)

Fig. 9.15

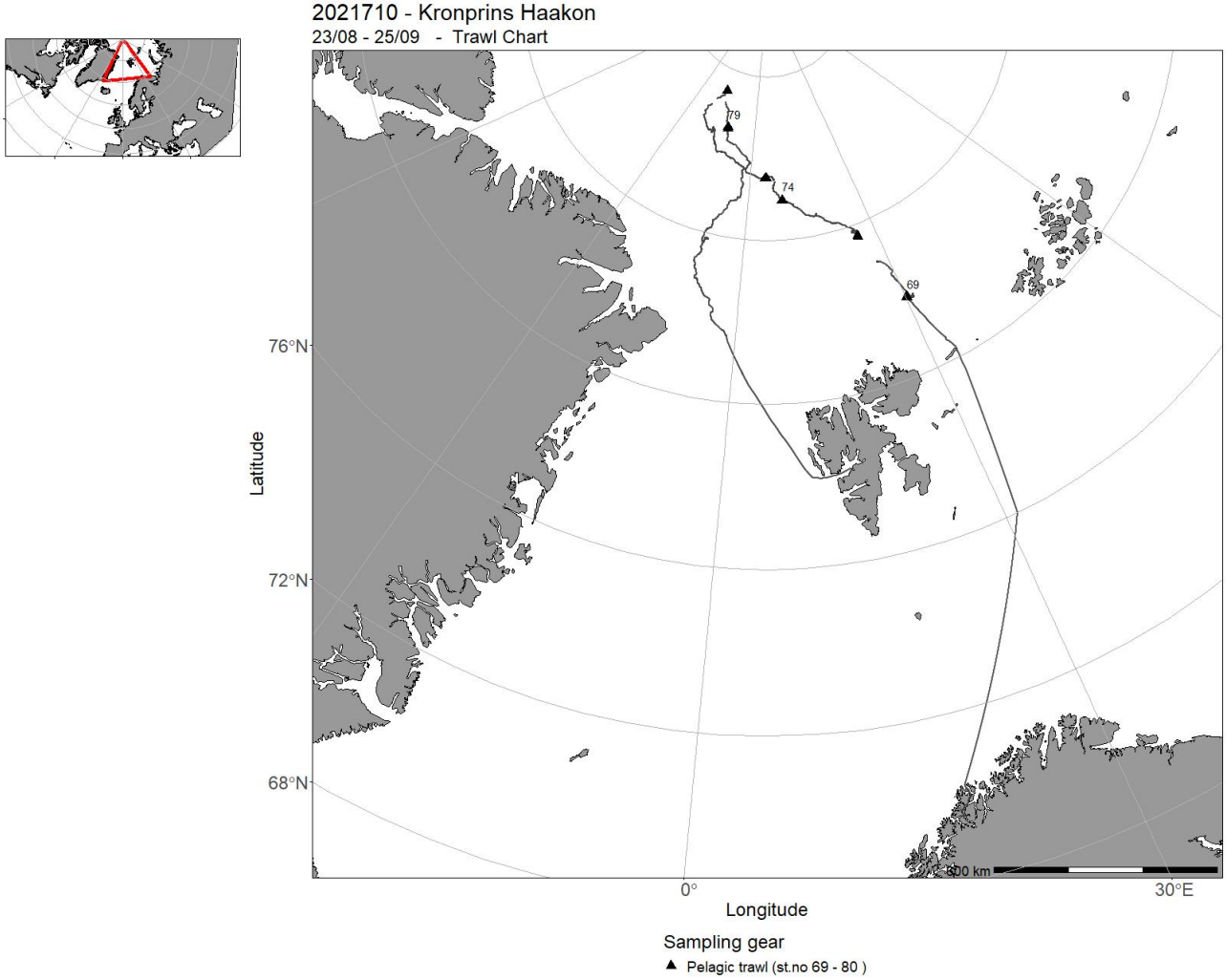

2021710 - Kronprins Haakon
23/08 - 25/09 - Trawl Chart
79
74
69
76°N
72°N
68°N
Latitude
0°
30°E
Longitude
200 km
Sampling gear
Pelagic trawl (st.no 69 - 80)

Fig. 9.16

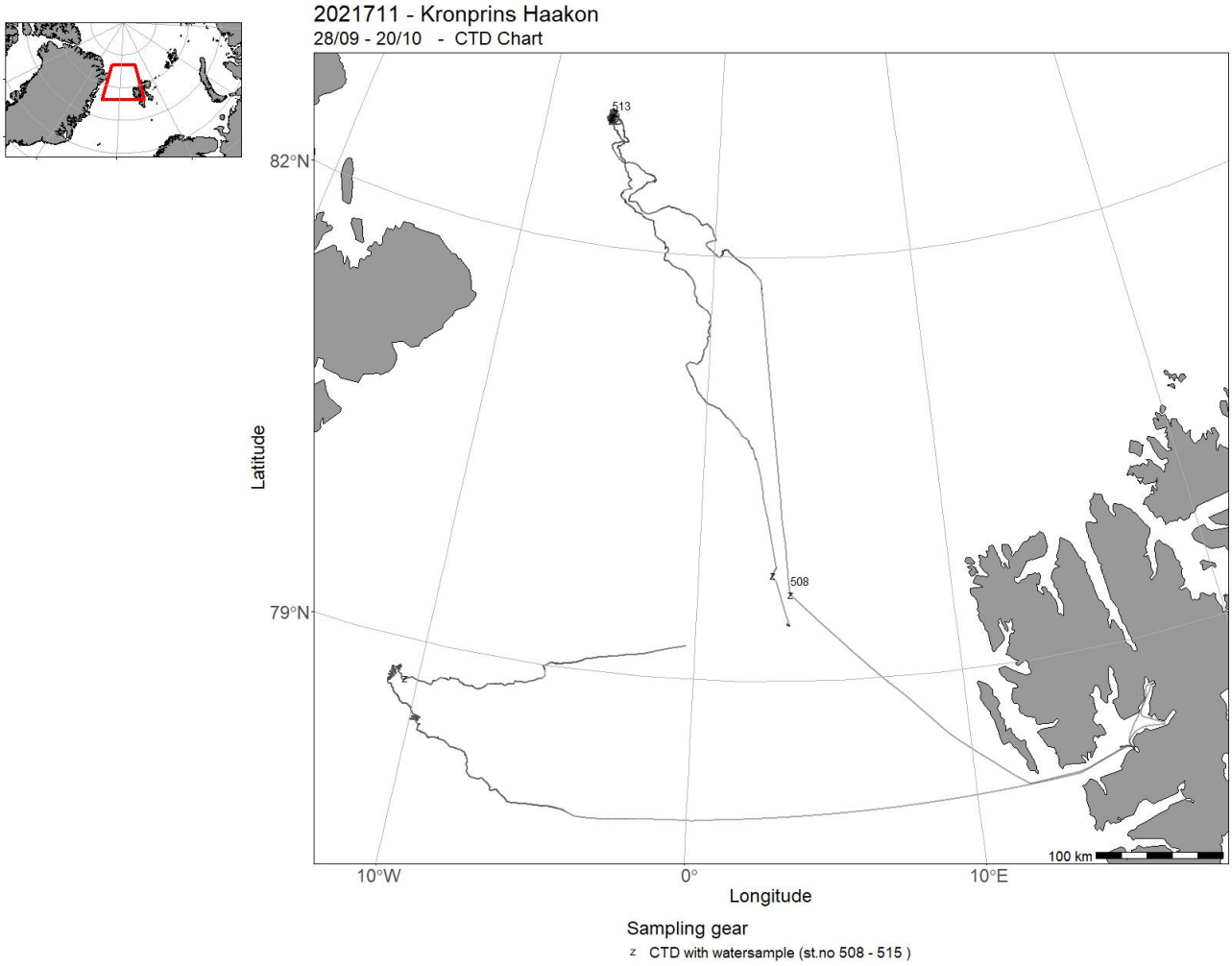
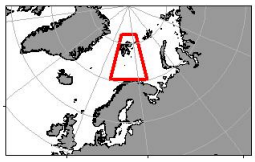
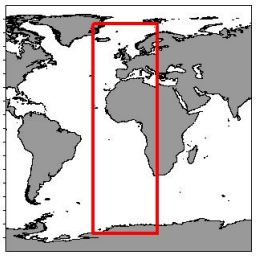

2021711 - Kronprins Haakon
28/09 - 20/10 - CTD Chart
513
508
82°N
79°N
Latitude
10°W
0°
10°E
Longitude
100 km
Sampling gear
CTD with watersample (st.no 508 - 515)

Fig. 9.17




2021713 - Kronprins Haakon
05/11 - 16/11 - CTD Chart
516
521
526
531
541
536
80°N
76°N
72°N
Latitude
10°E
20°E
30°E
Longitude
200 km
Sampling gear
CTD with watersample (st.no 516 - 545)

Fig. 9.18



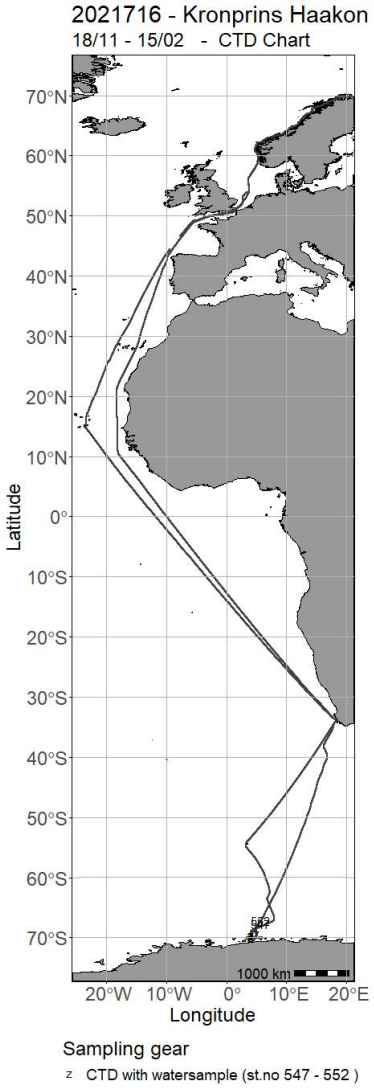

2021716 - Kronprins Haakon
18/11 - 15/02 - CTD Chart
70°N
60°N
50°N
40°N
30°N
20°N
10°N
0°
10°S
20°S
30°S
40°S
50°S
60°S
70°S
Latitude
552
1000 km
20°W
10°W
0°
10°E
20°E
Longitude
Sampling gear
CTD with watersample (st.no 547 - 552)

Fig. 9.19

10 - "G. M. Dannevig" – Cruises 2021

Cruise No	Period	Purpose	Area	CTD st.no
2021301	18/01 - 23/01	2021-KST-013: Miljøtilstandvurdering/rådgivning for Skagerrak: Havforsurning, oseanografi, HAB, mikroplast, miljø, klima lavere trofiske nivå langs Skagerrakkysten og fast snitt Torungen-Hirtshals. Videreføring av 4 tidsserier (Torungen, Oslofjord, Grenland, Arendal)	Norwegian Sea	1-9
2021302	29/01 - 03/02	2021-KST-014: Miljøtilstandvurdering/rådgivning for Skagerrak: Havforsurning, oseanografi, HAB, mikroplast, miljø, klima lavere trofiske nivå langs Skagerrakkysten og fast snitt Torungen-Hirtshals. Videreføring av 4 tidsserier (Torungen, Oslofjord, Grenland, Arendal)	Norwegian Sea	26-49
2021303	01/03 - 06/03	2021-KST-015: Miljøtilstandvurdering/rådgivning for Skagerrak: Havforsurning, oseanografi, HAB, mikroplast, miljø, klima lavere trofiske nivå langs Skagerrakkysten og fast snitt Torungen-Hirtshals. Videreføring av 4 tidsserier (Torungen, Oslofjord, Grenland, Arendal)	Norwegian Sea	50 - 69
2021304	10/03 - 23/03	2021-KST-007: Toktet vil kartleggge gytefelt for kystnære bestander gjennom innsamling av egg. Toktet betjener prosjektet: "Program for kartlegging av gyte- og oppvekstområder for kystnære kommersielle bestander".2021-KST-025: Prøvetaking av hydrografi, kjemi, phytoplankton og zooplankton i kyst. Toktet bidrar til prosjekt "Langtidsovervåkning og forskning på kystmiljø og plankton (15593)".	Norwegian Sea	70 - 90

Cruise No	Period	Purpose	Area	CTD st.no
2021305	07/04 - 16/04	2021-KST-016: Miljøtilstandvurdering/rådgivning for Skagerrak: Havforsurning,oseanografi,HAB,mikroplast,miljø,klima lavere trofiske nivå langs Skagerrakkysten og fast snitt Torungen-Hirtshals. Videreføring av 4 tidsserier (Torungen, Oslofjord, Grenland, Arendal)2021-KST-042: Hensikten med toktet er å undersøke påvirkning fra kyststrømmen på plankton innsamlet ved vår nylig etablerte tidsserie i Farsunds skjærgård. Dette toktet kan koordineres med og organiseres i samarbeid med HI sin Miljøovervåking av Skagerrak.	Norwegian Sea	102 - 130
2021306	04/05 - 09/05	2021-KST-017: Miljøtilstandvurdering/rådgivning for Skagerrak: Havforsurning, oseanografi, HAB, mikroplast, miljø, klima lavere trofiske nivå langs Skagerrakkysten og fast snitt Torungen-Hirtshals. Videreføring av 4 tidsserier (Torungen, Oslofjord, Grenland, Arendal)	Norwegian Sea	131-152
2021307	12/06 - 17/06	2021-KST-018: Miljøtilstandvurdering/rådgivning for Skagerrak: Havforsurning, oseanografi, HAB, mikroplast, miljø, klima lavere trofiske nivå langs Skagerrakkysten og fast snitt Torungen-Hirtshals. Videreføring av 4 tidsserier (Torungen, Oslofjord, Grenland, Arendal)	Norwegian Sea	153-173
2021308	30/06 - 05/07	2021-KST-019: Miljøtilstandvurdering/rådgivning for Skagerrak: Havforsurning, oseanografi, HAB, mikroplast, miljø, klima lavere trofiske nivå langs Skagerrakkysten og fast snitt Torungen-Hirtshals. Videreføring av 4 tidsserier (Torungen, Oslofjord, Grenland, Arendal)	Norwegian Sea	174-200
2021309	09/08 - 13/08	2021-KST-020: Miljøtilstandvurdering/rådgivning for Skagerrak: Havforsurning, oseanografi, HAB, mikroplast, miljø, klima lavere trofiske nivå langs Skagerrakkysten og fast snitt Torungen-Hirtshals. Videreføring av4 tidsserier (Torungen, Oslofjord, Grenland, Arendal)	Norwegian Sea	201-227
2021310	14/08 - 22/08	2021-KST-048: Overvåkingsfiske hummerreservater Bolærne og Kvernskjær, ytre Oslofjord	Skagerrak	-

Cruise No	Period	Purpose	Area	CTD st.no
2021311	24/08 - 26/08	2021-KST-047: Havforskningsinstituttet og UiA samarbeider om et undervisningstokt. Formålet med toktet er å gi studenter (master grad)gjenskap med ulike innsamlingsmetoder for bentsike undersøkelser og planktoniske organismer (zoo-plant-plankton, maneter)	Norwegian Sea	228
2021317	12/09 - 13/09	2021-KST-021: Miljøtilstandvurdering/rådgivning for Skagerrak: Havforsurning, oseanografi, HAB, mikroplast, miljø, klima lavere trofiske nivå langs Skagerrakkysten og fast snitt Torungen-Hirtshals. Videreføring av 4 tidsserier (Torungen, Oslofjord, Grenland, Arendal)	Norwegian Sea	229-240
2021312	15/09 - 09/10	2021-KST-021: Miljøtilstandvurdering/rådgivning for Skagerrak: Havforsurning, oseanografi, HAB, mikroplast, miljø, klima lavere trofiske nivå langs Skagerrakkysten og fast snitt Torungen-Hirtshals. Videreføring av 4 tidsserier (Torungen, Oslofjord, Grenland, Arendal) 2021-KST-022: Miljøtilstandvurdering/rådgivning for Skagerrak: Havforsurning, oseanografi, HAB, mikroplast, miljø, klima lavere trofiske nivå langs Skagerrakkysten og fast snitt Torungen-Hirtshals. Videreføring av 4 tidsserier (Torungen, Oslofjord, Grenland, Arendal))2021-KST-029: Strandnotundersøkelser for å måle rekrutteringen av torskefisk og annen fisk i strand/kystsonen. Videre formål er å kartlegge utbredelsen av fisk i strand/kystsonen. Data/arbeid fra toktet benyttes i flere eksterntfinansierte prosjekt.	Norwegian Sea	241-304
2021313	09/10 - 10/10	2021-NSJ-012: Miljøtilstandvurdering/rådgivning for Skagerrak: Havforsurning,oseanografi,HAB,mikroplast,miljø,klima lavere trofiske nivå på det fast snitt Torungen-Hirtshals. Videreføring av tidsserie	Norwegian Sea	305-316

Cruise No	Period	Purpose	Area	CTD st.no
2021314	08/11 - 13/11	2021-NSJ-013: Miljøtilstandvurdering/rådgivning for Skagerrak: Havforsurning,oseanografi,HAB,mikroplast,miljø,klima lavere trofiske nivå på det fast snitt Torungen-Hirtshals. Videreføring av tidsserie2021-KST-023: Miljøtilstandvurdering/rådgivning for Skagerrak: Havforsurning,oseanografi,HAB,mikroplast,miljø,klima lavere trofiske nivå langs Skagerrakkysten og fast snitt Torungen-Hirtshals. Videreføring av 4 tidsserier (Torungen, Oslofjord, Grenland, Arendal)	Norwegian Sea	317-333
2021315	14/11 - 01/12	2021-KST-034: Overvåker bestander av kysttorsk og andre kystarter. Driver og forskning på data, da tokt inngår i eksterne prosjekt	Norwegian Sea	334
2021316	02/12 - 07/12	2021-KST-024: Miljøtilstandvurdering/rådgivning for Skagerrak:Havforsurning,oseanografi,HAB,mikroplast,miljø,klima lavere trofiske nivå langs Skagerrakkysten og fast snitt Torungen-Hirtshals. Videreføring av 4 tidsserier (Torungen, Oslofjord, Grenland, Arendal)	Norwegian Sea	335-362

11 - "G. M. Dannevig" – Charts for cruises 2021

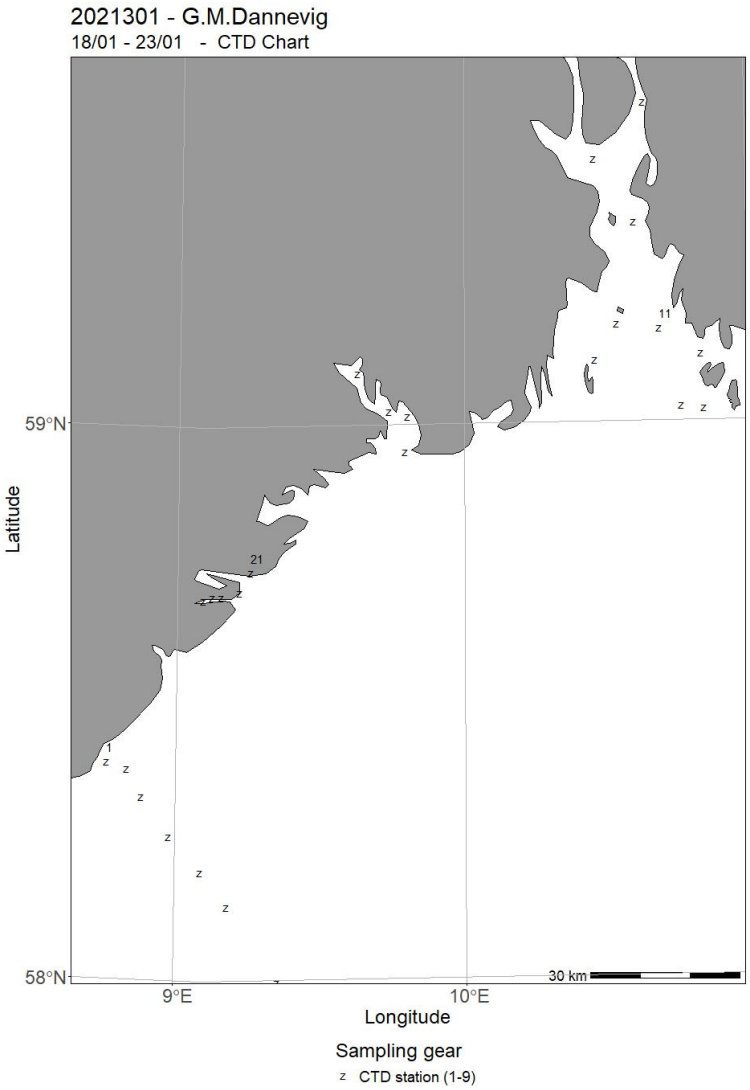


Fig. 11.1

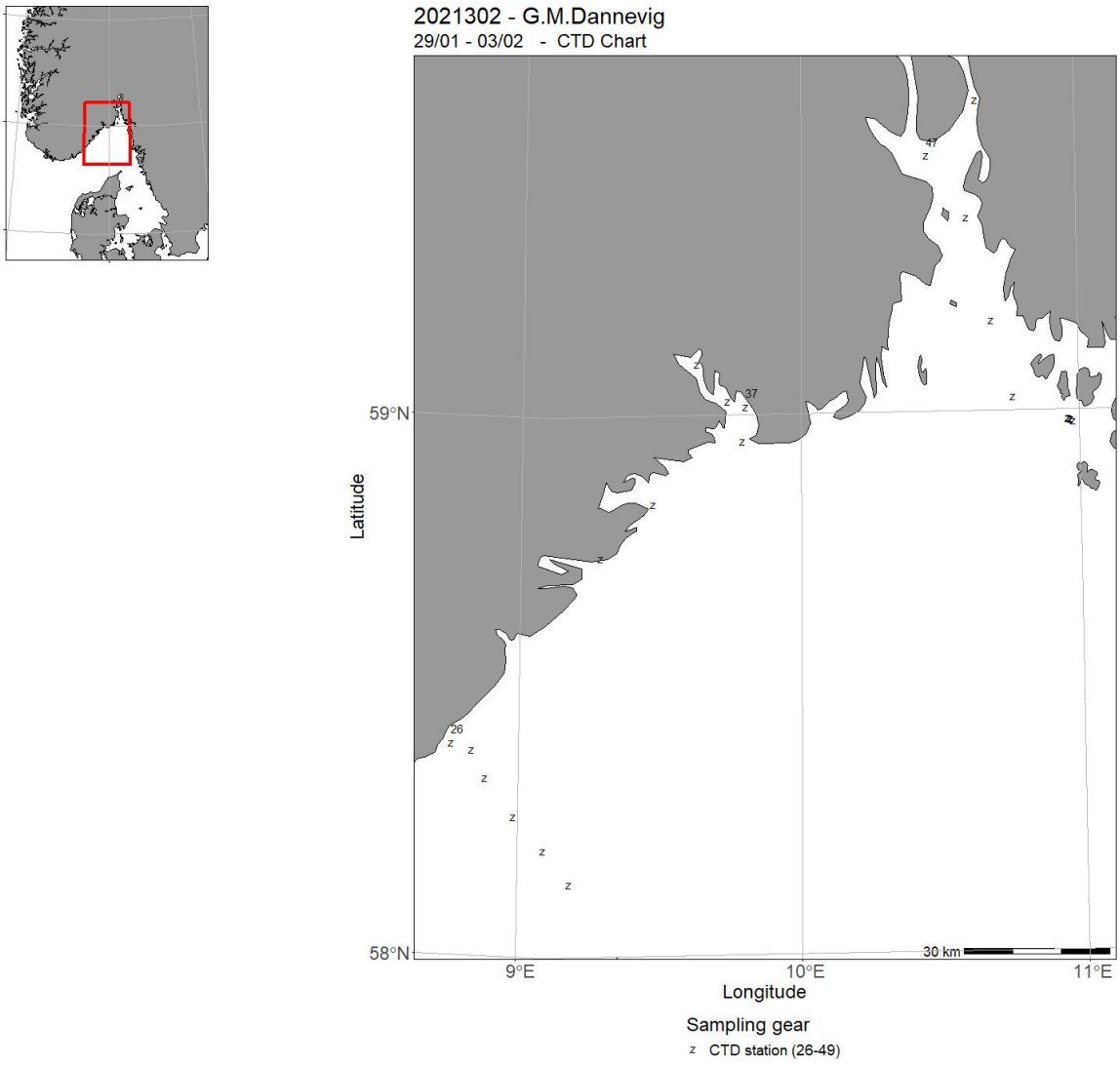

2021302 - G.M.Dannevig
29/01 - 03/02 - CTD Chart
59°N
58°N
9°E
10°E
11°E
Latitude
Longitude
30 km
Sampling gear
CTD station (26-49)

Fig. 11.2

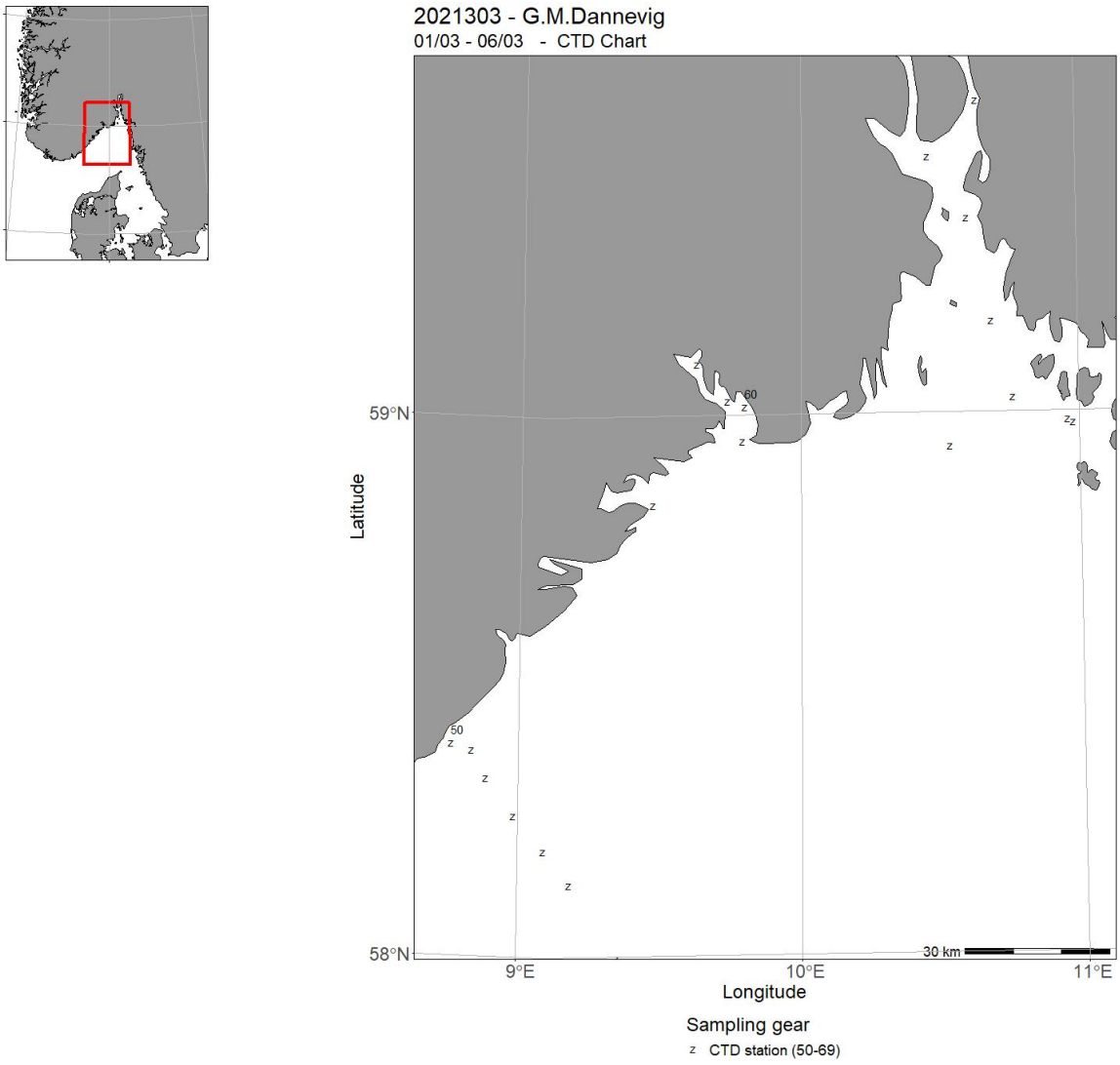
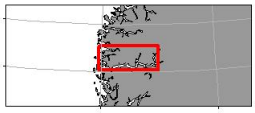

2021303 - G.M.Dannevig
01/03 - 06/03 - CTD Chart
59°N
58°N
Latitude
9°E
10°E
11°E
Longitude
30 km
Sampling gear
CTD station (50-69)

Fig. 11.3



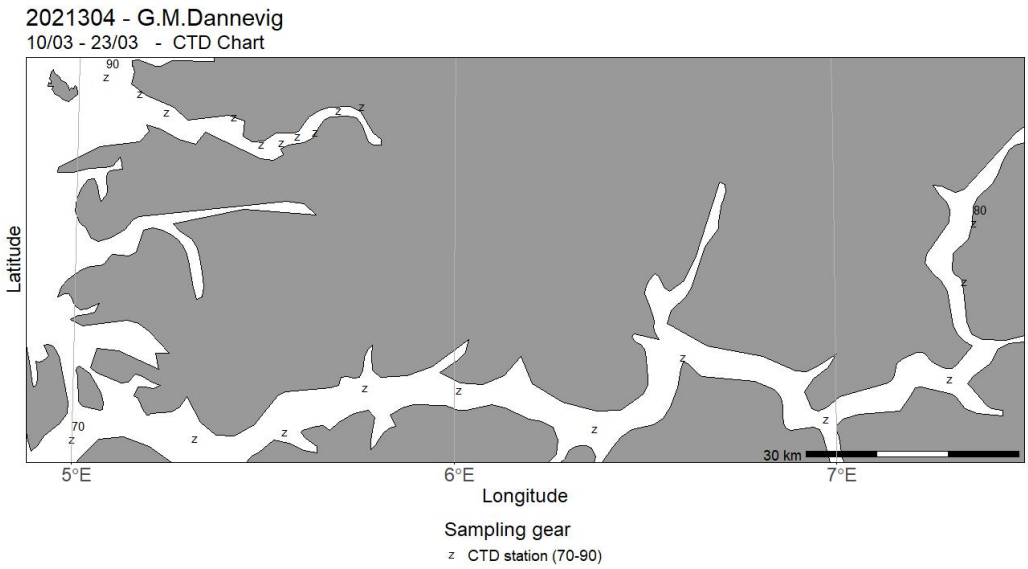

2021304 - G.M.Dannevig
10/03 - 23/03 - CTD Chart
Latitude
90
70
30 km
5°E
6°E
7°E
Longitude
Sampling gear
CTD station (70-90)

Fig. 11.4

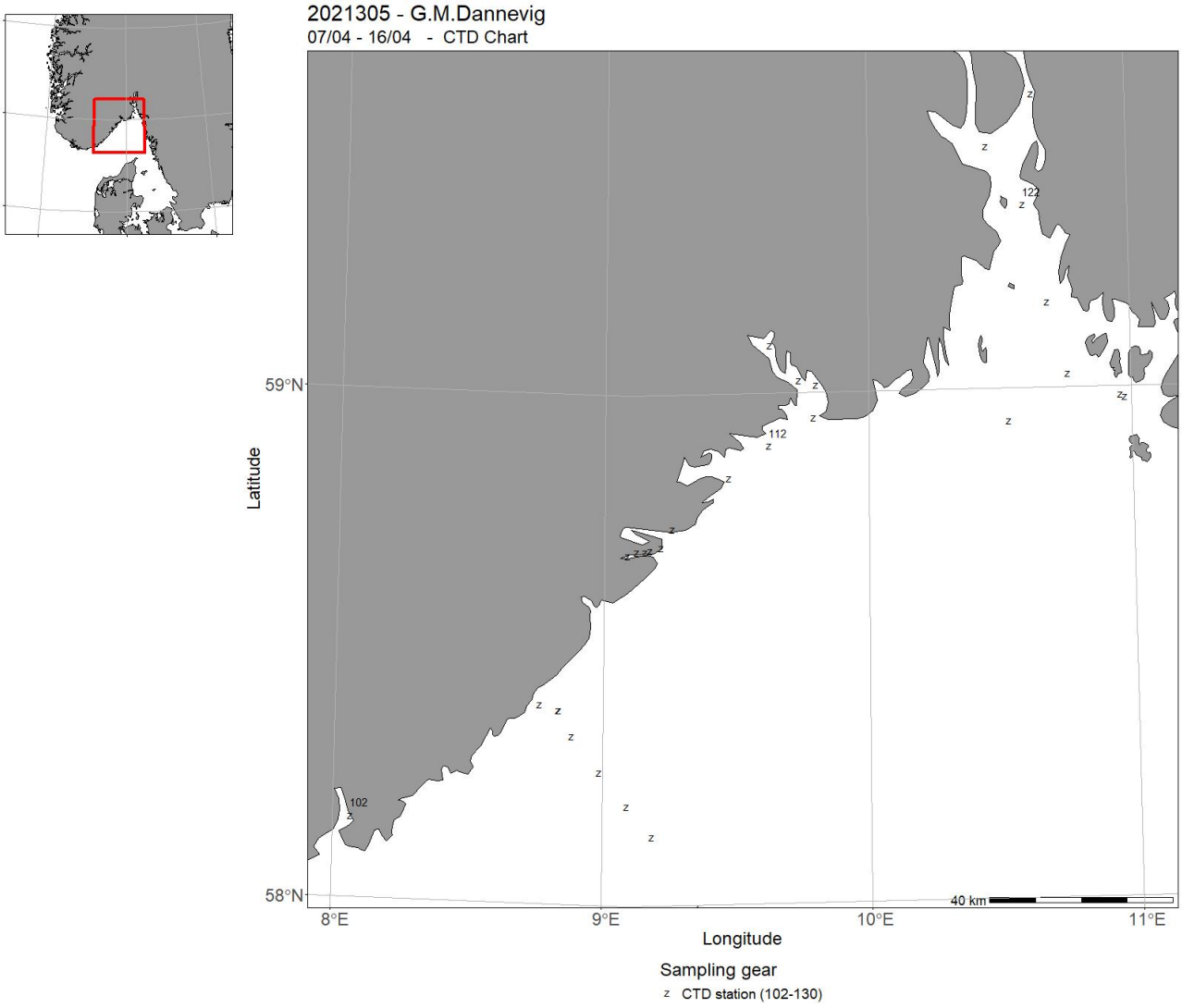

2021305 - G.M.Dannevig
07/04 - 16/04 - CTD Chart
59°N
58°N
8°E
9°E
10°E
11°E
Latitude
Longitude
102
112
122
40 km
Sampling gear
CTD station (102-130)

Fig. 11.5

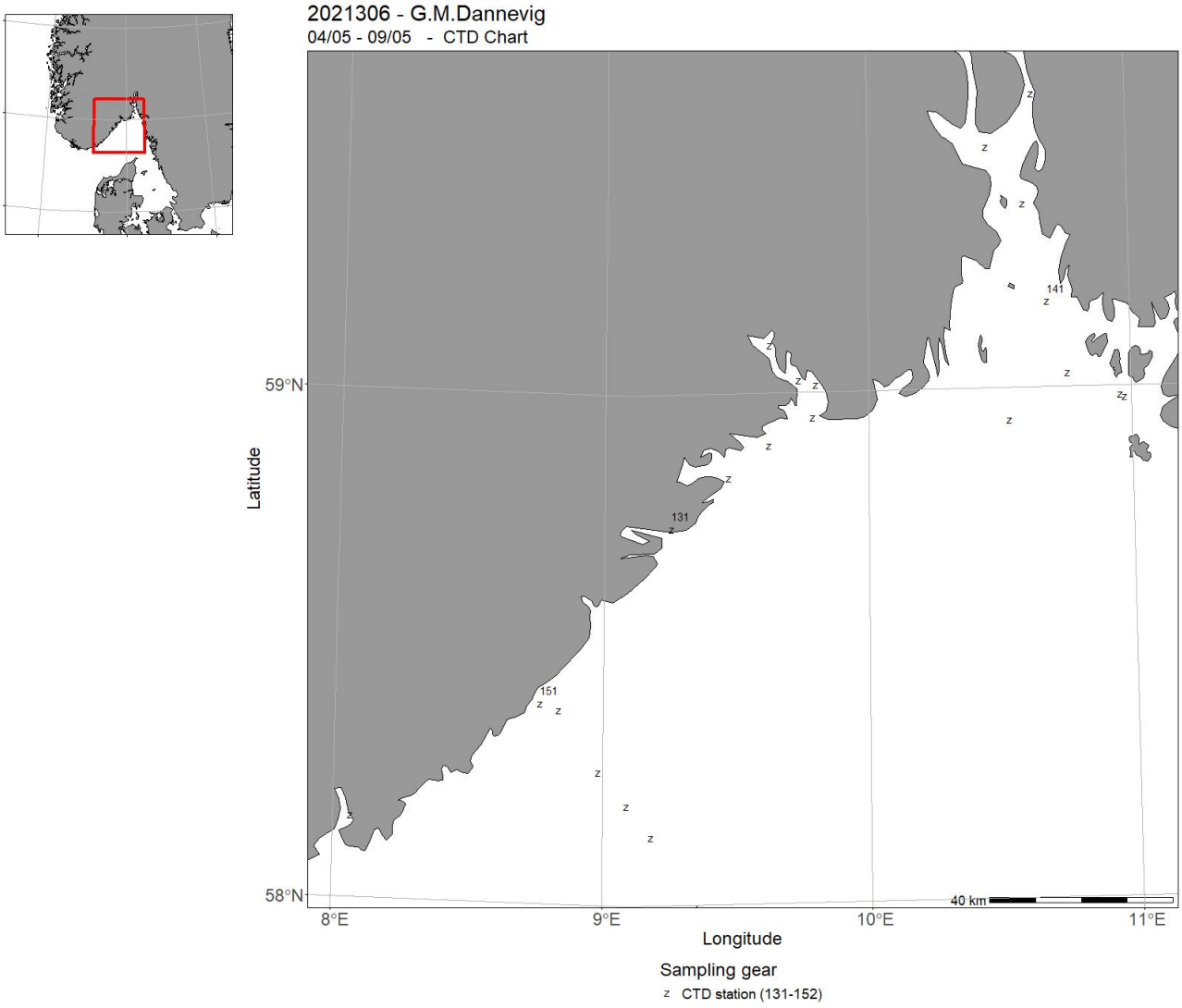

2021306 - G.M.Dannevig
04/05 - 09/05 - CTD Chart
59°N
58°N
8°E
9°E
10°E
11°E
Latitude
Longitude
131
141
151
40 km
Sampling gear
CTD station (131-152)

Fig. 11.6

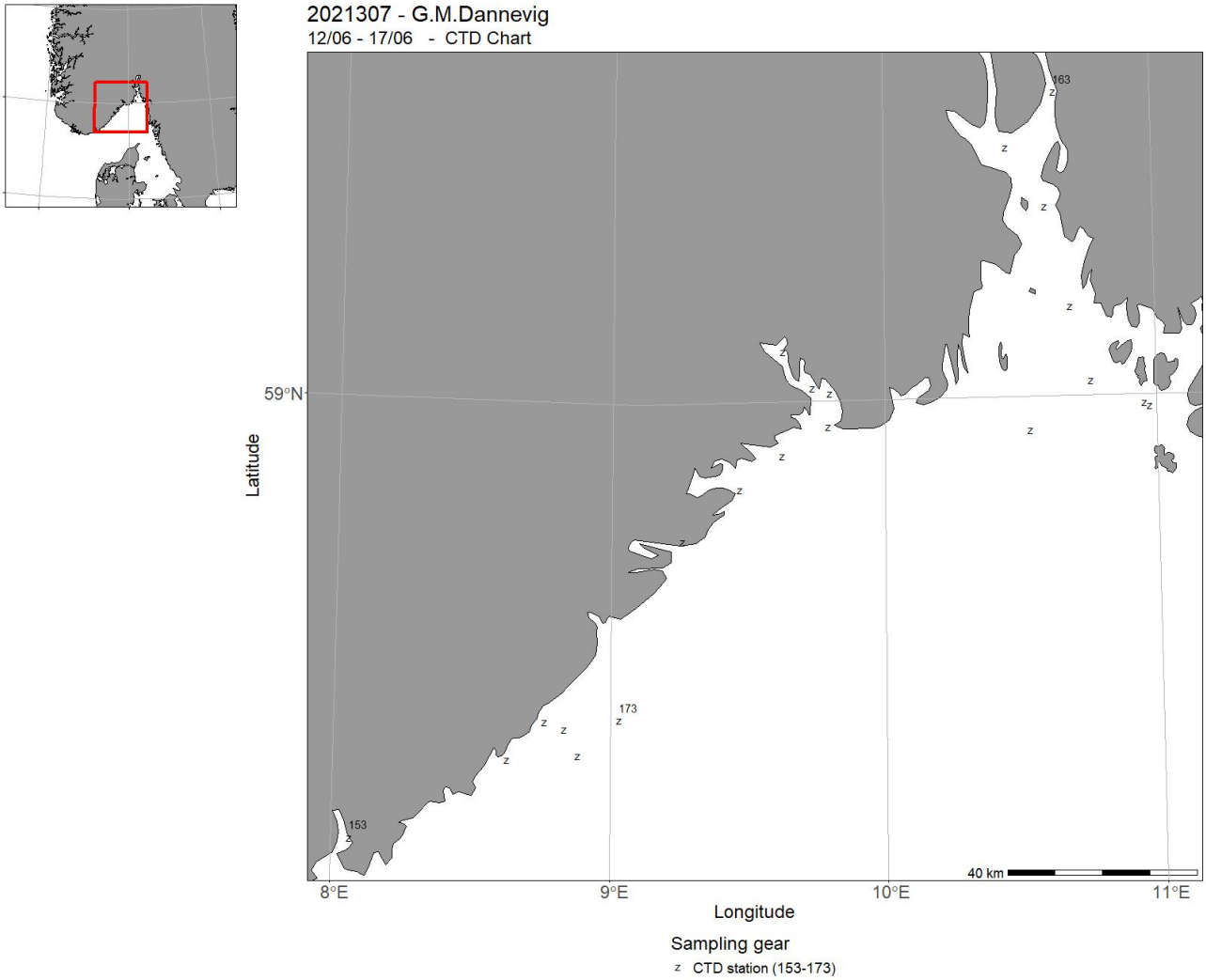

2021307 - G.M.Dannevig
12/06 - 17/06 - CTD Chart
163
153
173
59°N
Latitude
8°E
9°E
10°E
11°E
Longitude
40 km
Sampling gear
CTD station (153-173)

Fig. 11.7

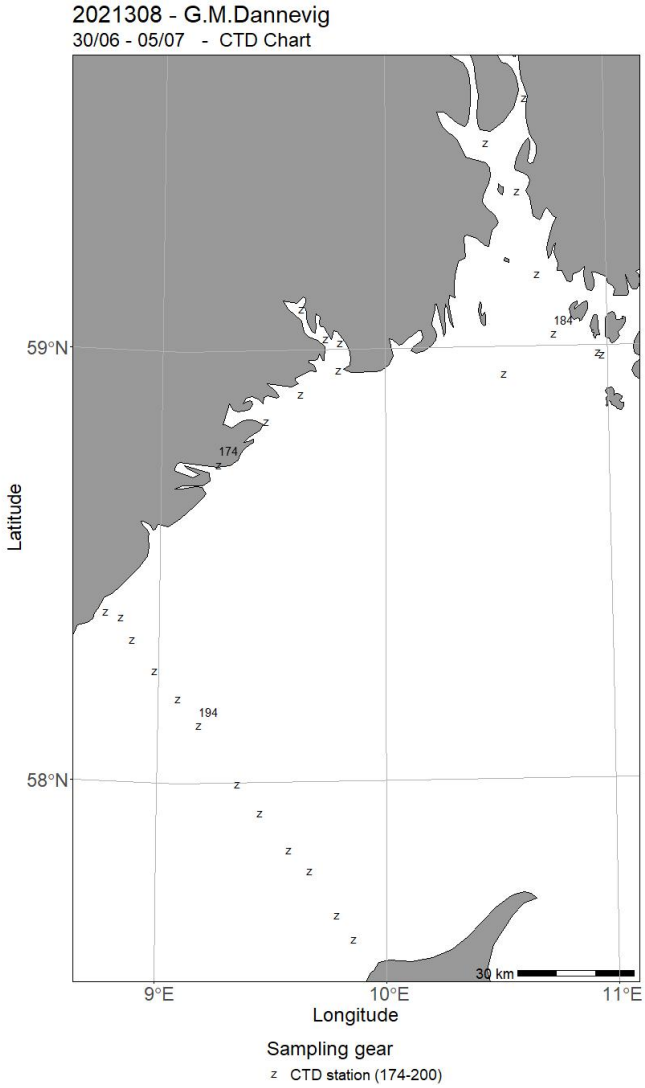

2021308 - G.M.Dannevig
30/06 - 05/07 - CTD Chart
59°N
58°N
Latitude
9°E
10°E
11°E
Longitude
174
184
194
30 km
Sampling gear
CTD station (174-200)

Fig. 11.8

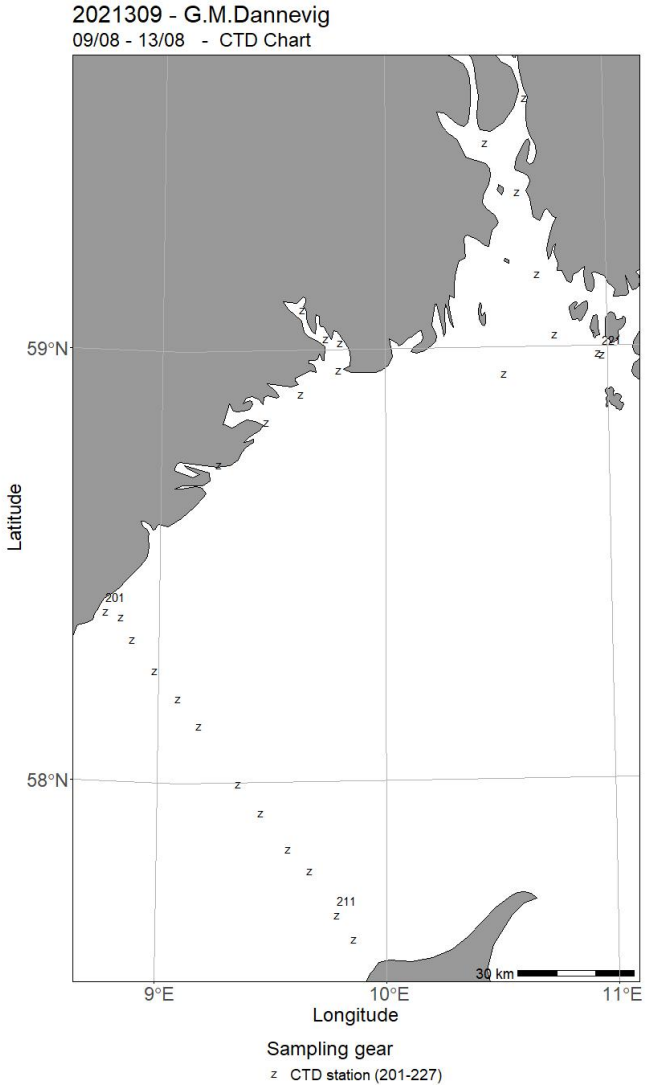

2021309 - G.M.Dannevig
09/08 - 13/08 - CTD Chart
59°N
58°N
Latitude
9°E
10°E
11°E
Longitude
30 km
Sampling gear
CTD station (201-227)

Fig. 11.9

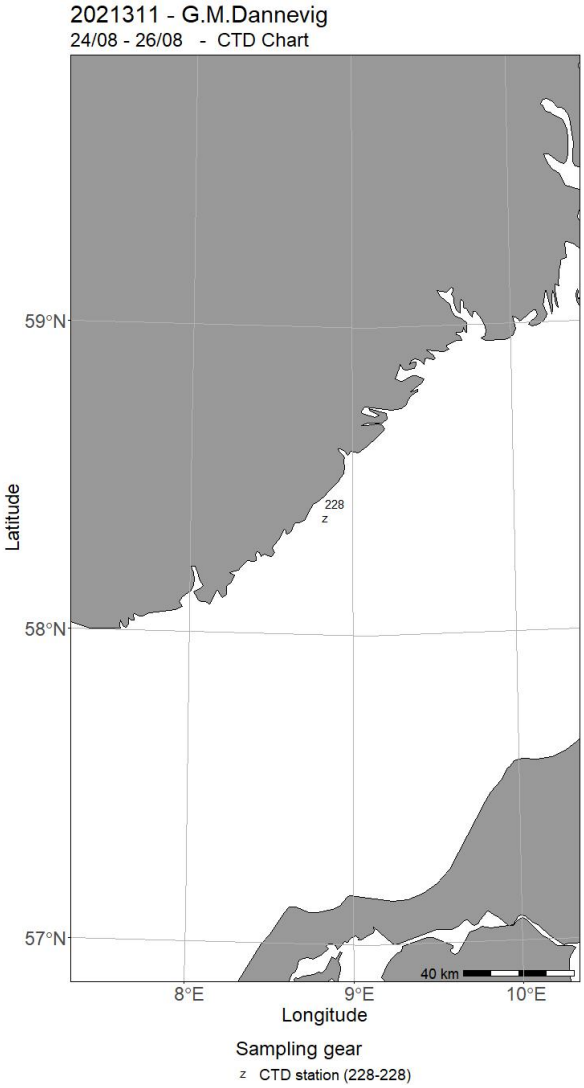

2021311 - G.M.Dannevig
24/08 - 26/08 - CTD Chart
59°N
58°N
57°N
Latitude
228
z
40 km
8°E
9°E
10°E
Longitude
Sampling gear
z CTD station (228-228)

Fig. 11.10

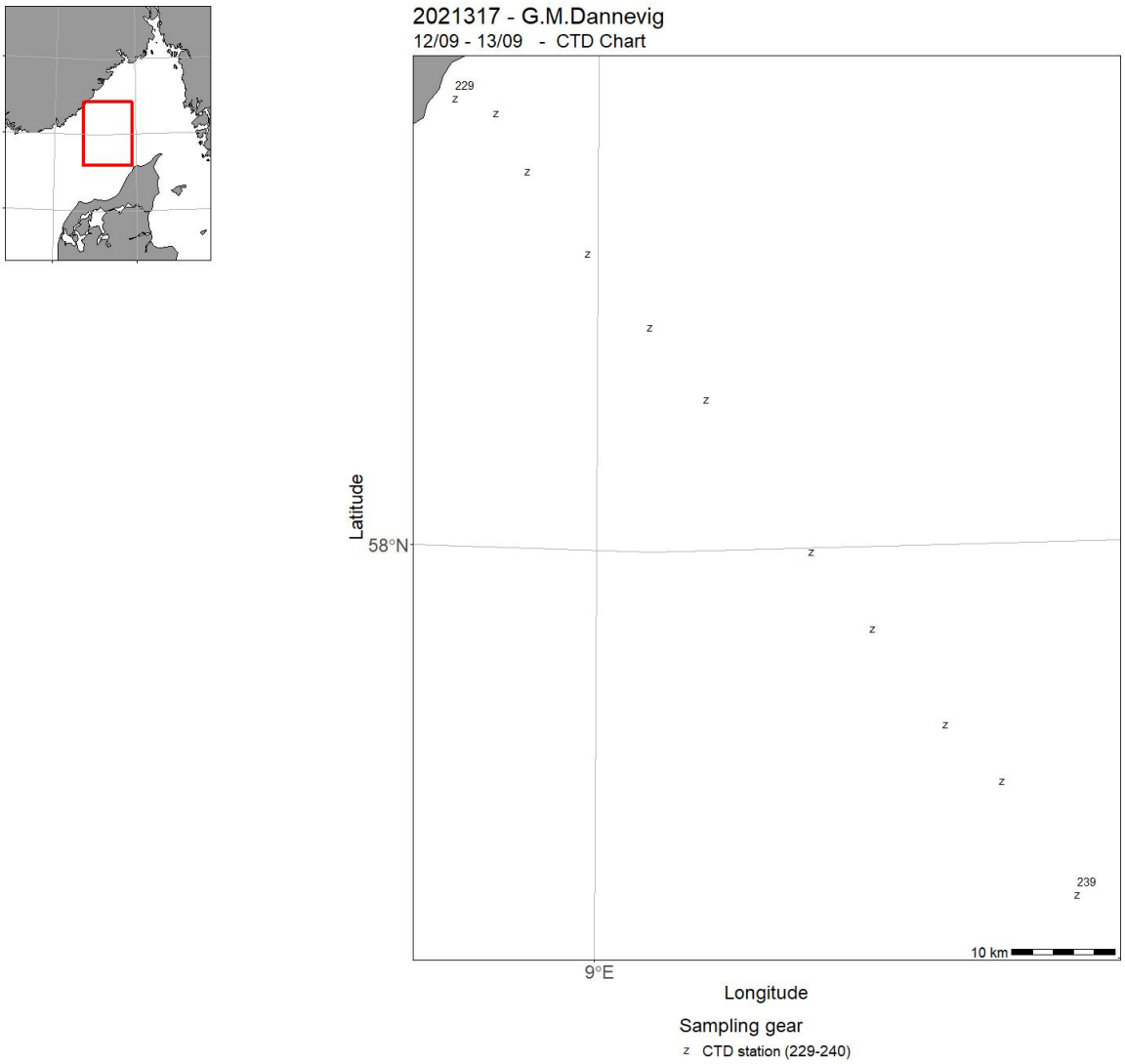

2021317 - G.M.Dannevig
12/09 - 13/09 - CTD Chart
229
239
Latitude
58°N
9°E
Longitude
10 km
Sampling gear
CTD station (229-240)

Fig. 11.11

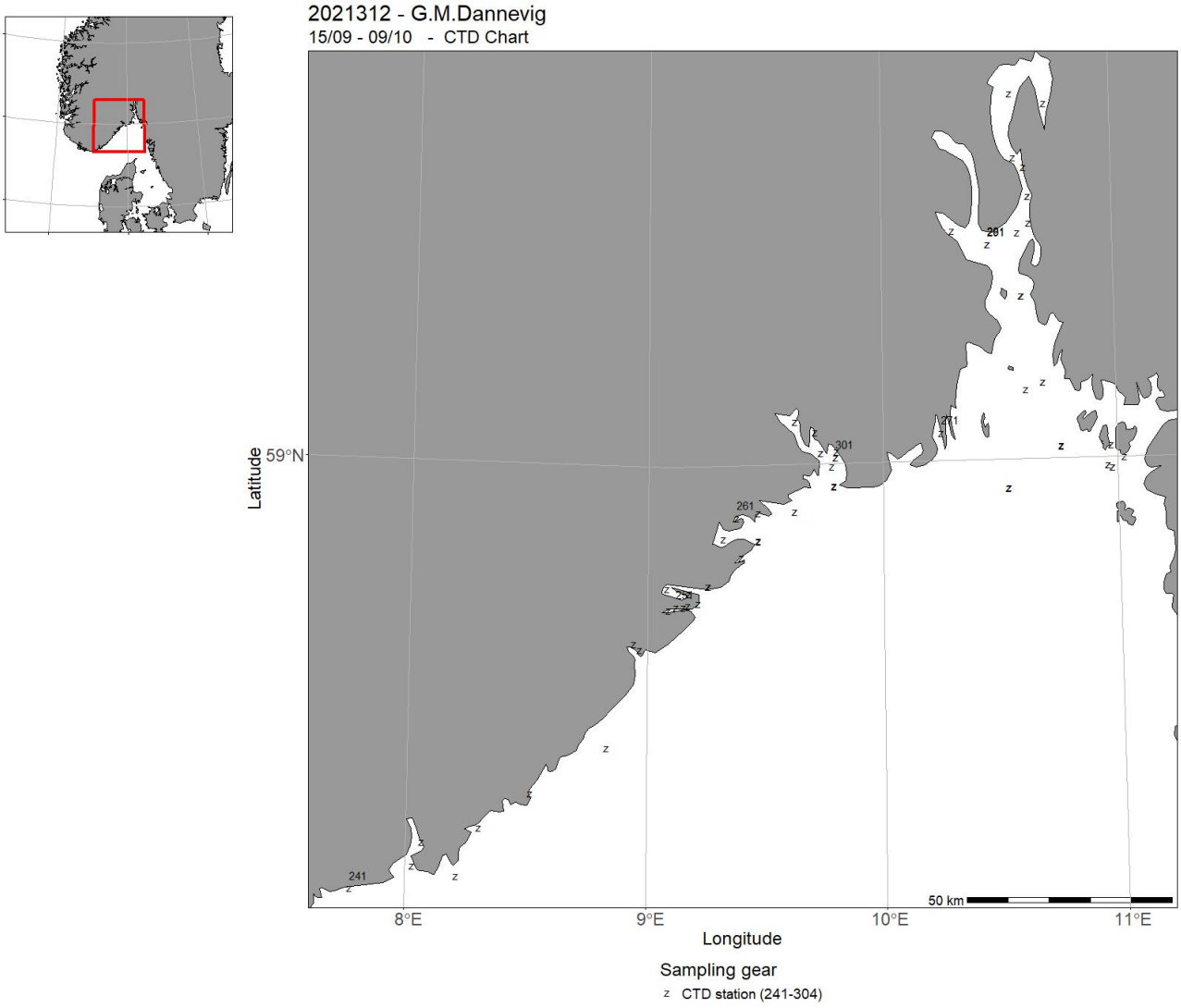

2021312 - G.M.Dannevig
15/09 - 09/10 - CTD Chart
Latitude
59°N
8°E
9°E
10°E
11°E
Longitude
50 km
241
261
301
271
Sampling gear
CTD station (241-304)

Fig. 11.12

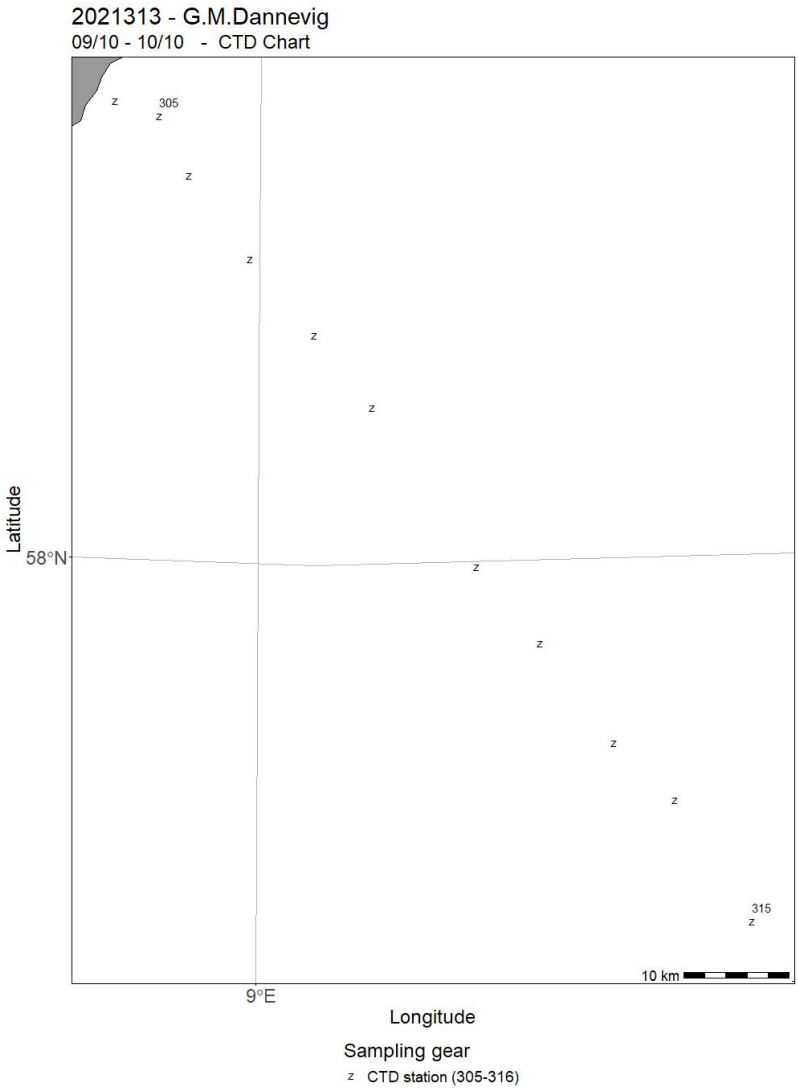

2021313 - G.M.Dannevig
09/10 - 10/10 - CTD Chart
305
315
58°N
9°E
Latitude
Longitude
10 km
Sampling gear
CTD station (305-316)

Fig. 11.13

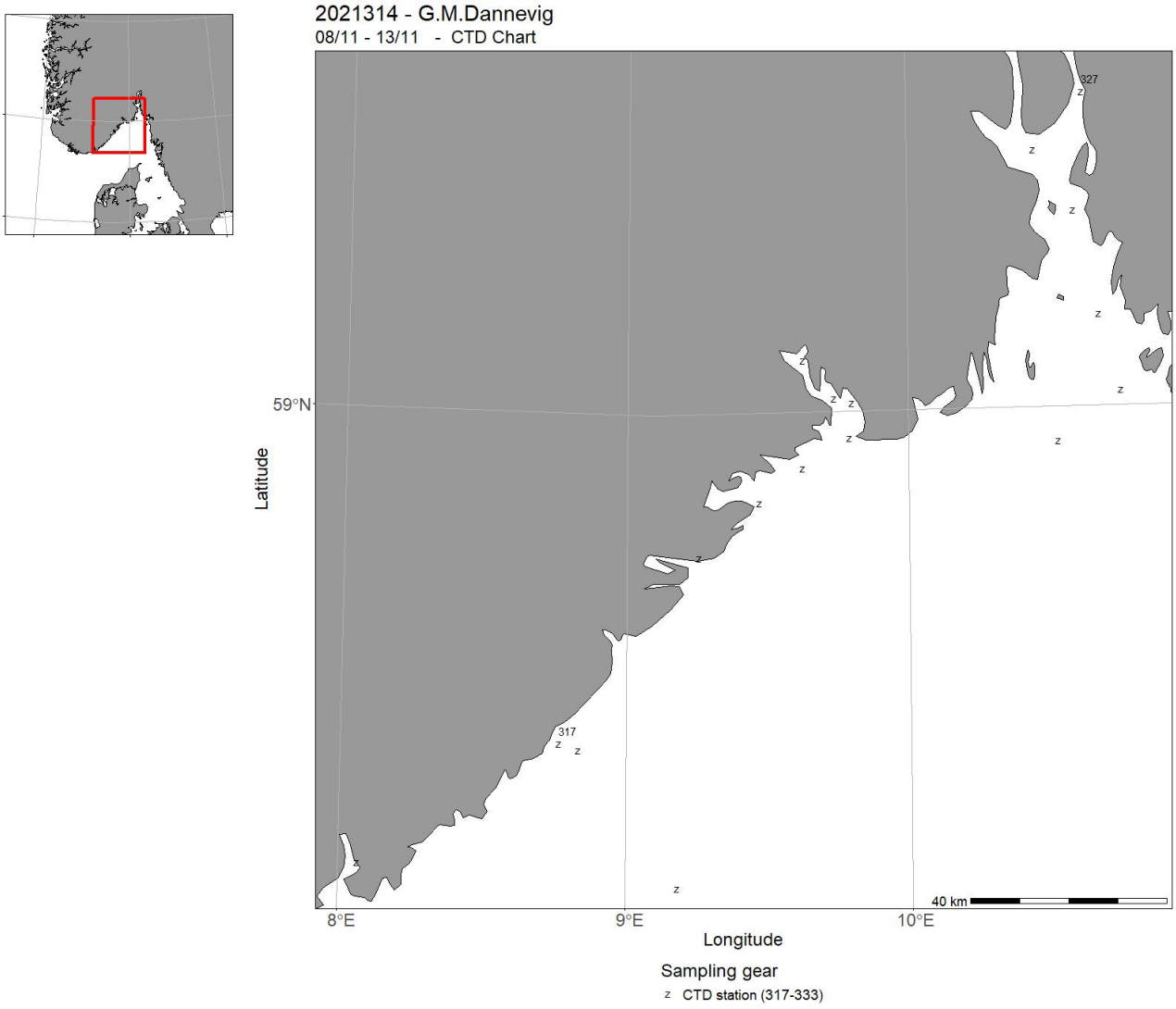

2021314 - G.M.Dannevig
08/11 - 13/11 - CTD Chart
327
317
59°N
Latitude
8°E
9°E
10°E
Longitude
40 km
Sampling gear
CTD station (317-333)

Fig. 11.14

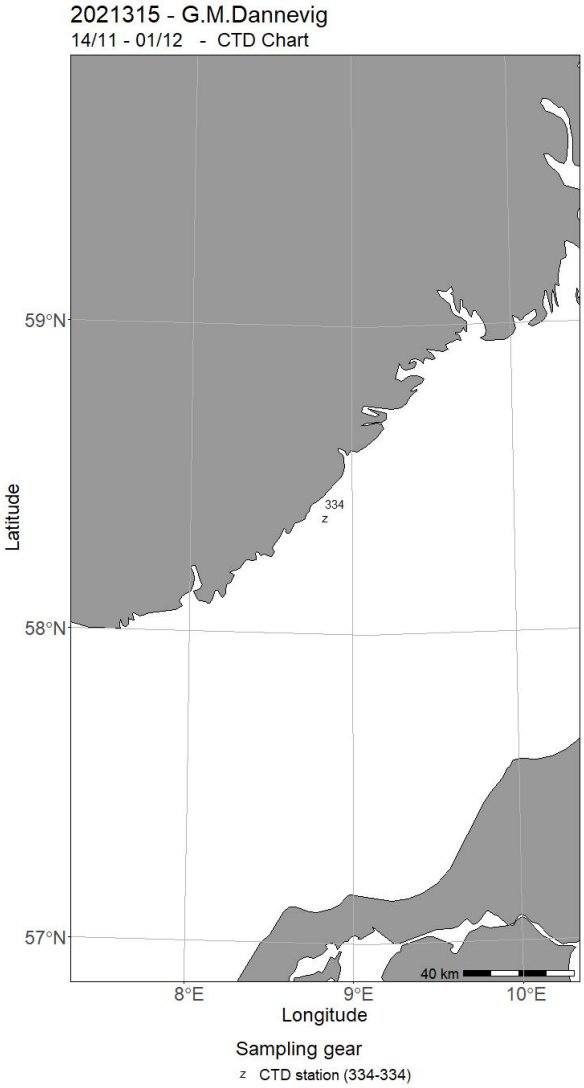
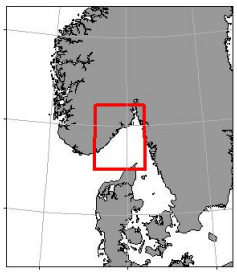

2021315 - G.M.Dannevig
14/11 - 01/12 - CTD Chart
59°N
58°N
57°N
Latitude
334
z
40 km
8°E
9°E
10°E
Longitude
Sampling gear
z CTD station (334-334)

Fig. 11.15



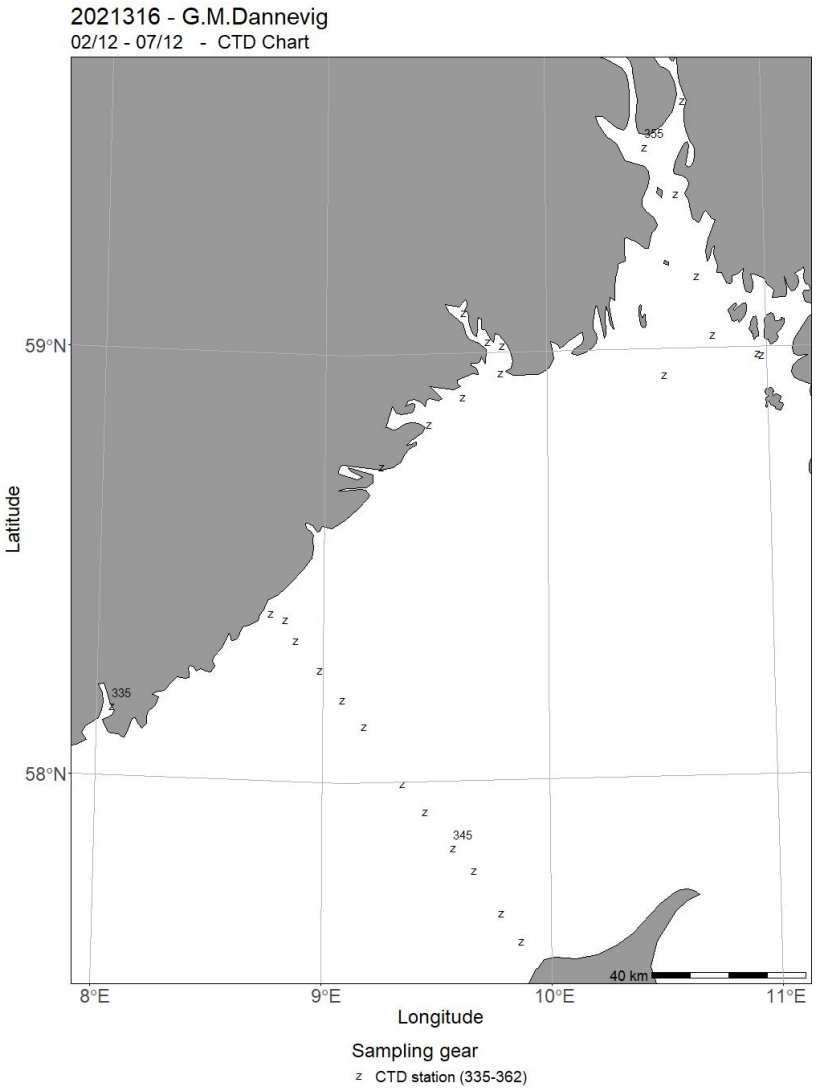

2021316 - G.M.Dannevig
02/12 - 07/12 - CTD Chart
59°N
58°N
Latitude
335
345
355
40 km
8°E
9°E
10°E
11°E
Longitude
Sampling gear
CTD station (335-362)

Fig. 11.16

12 - Hired vessels – Cruises 2021

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021846	20/01 - 07/02	Abundance and distribution of cod and haddock. Project name: Arctic Winter survey (Vintertoktet) Coordinating body: Institute of Marine Research	Barents Sea	1 - 60	1 - 111
2021822	12/02 - 25/02	Provide acoustic estimates of abundance and distribution of Norwegian spring spawning heting during the spawning migration along the Norwegian coast. Cruise coordinator: Are Salthaug, Institute of Marine Research, Norway.	Norwegian Sea	1 - 12	1 - 26
2021821	13/02 - 25/02	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 - 12	1 - 24
2021826	13/02 - 19/02	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. Project name: SpawnSeis Coordinating body: Institute of Marine Research, Norway	North Sea	-	-

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021849	14/02 - 20/02	A demersal seine was applied with pelagic trawl doors for live capture of cod. Catch limitation devices were tested and filmed with underwater cameras. Fishing was conducted at various depths and fishing densities and viability of the fish evaluated. Project name: Pelagic trawling for live capture of cod. Coordinating body: Institute of Marine Research Bergen, Norway	Norwegian Sea	-	-
0153_2021_UFJN_VILN	23/02 - 19/03	-	-	-	-
2021802	26/02 - 11/03	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. Project name: Managing strategies for the Barents Sea Coordinating body: Havforskningsinstituttet	Norwegian Sea	13 - 25	1 - 14
2021803	26/02 - 11/03	Acoustic trawl monitoring survey for biomass estimation of the capelin spawning stock. Project name: Forvaltningsstrategiar for Barentshavet (15568) Coordinating body: Institute of Marine Research, Norway	Barents Sea	13 - 26	25 - 44

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021825	08/03 - 21/03	The aim of this research cruise was to further develop the catch control methods and technologies initially investigated in cruise No. 2019862 by addressing the following objectives: 1. Investigate the effectiveness of three designs of catch control rigs to retain target catch during fishing operations and then release excess catch once the catch limited is reached. 2. Investigate the effectiveness of the catch limit release mechanism on the trawl codend (Prototype by Foss Tech). 3. Monitor the geometry of the trawl and codend, particularly during haulback. 4. Develop methods for the rapid release of the pump from the trawl codend, as a countermeasure to sinking codends. 5. Develop methods to assess the vitality and injuries of fish being release from the catch control rigs.	Celtic Sea	-	-
2021818	21/03 - 08/04	International blue whiting spawning stock survey. Acoustic survey to monitor the spawning stock of blue whiting on the spawning grounds west of the British Isles. Project name: International Blue Whiting Spawning Stock Survey Coordinating body: WGIPS, ICES	Atlanterhavet/Vest for de Britiske øyer	-	-
2021812	11/04 - 14/05	It is established a long-term data set of reproductive data for the Harp Seal population in the East Ice/Barents Sea. The main purpose of the cruise was to obtain data to continue this work and to collect samples to get updated data for the populations condition. The methodological approach was to collect jaws, ovaries and body measurements of female harp seals. The sampled seals were animals that were part of the commercial catch of the sealing vessel MS Salarøy.	Norwegian Sea	-	-

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021823	04/04 - 09/04	The objective of the cruise was to test technical solutions to release sharks and other large fish from pelagic trawls in the Great Argentine (Argentina silus) fisheries. The devices tested were 7 and 14 m four panel sections with a 600 mm square mesh panel obliquely mounted in the sections, with large escape opening in the bottom, just in front of the square mesh section. The cruise was conducted without any serious interruptions. Under water filming was conducted using GoPro cameras in aluminium housings with dive lights.	Norwegian Sea	-	-
2021830	06/04 - 14/05	2021-BAR-019: Prøvetaking av kommersielle fangstar av bunnfisk (særleg torsk, sei, hyse, blåkveite, uer) landa på strekninga Helgeland-Varanger. Prøvetaking 180 døgn per år fordelt på alle kvartal, men med hovudvekt på 1 og 2 kvartal.	Norwegian Sea	-	-
2021847	21/04 - 16/05	. 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	-	-
2021844	24/04 - 07/05	2021-MP-017: Å samle inn data med fiskefartøy med full EK80 utrustning på full spectrum av tobis, sild og øyepål, med fartøyet selv, samt med medbrakt overflate drone, KM Sounder og eller KayakDrone Bruke Drone for å måle unnvikelse, og forbedre dekningsgrad.	North Sea	-	-

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021820	04/05 - 04/06	Tagging with RFID technology and biological sampling of mackerel in the spawning areas west of Shetland and the Hebrides, Scotland and west of Ireland. Project name: Tagging and biological sampling of mackerel as part of studies on the European mackerel stocks. Coordinating body: Institute of Marine Research, Bergen, Norway.	Atlantic Ocean	-	-
2021831	24/05 - 08/06	2021-BAR-020: Prøvetaking av kommersielle fangstar av bunnfisk (særleg torsk, sei, hyse, blåkveite, uer) landa på strekninga Helgeland-Varanger. Prøvetaking 180 døgn per år fordelt på alle kvartal, men med hovudvekt på 1 og 2 kvartal.	Norwegian Sea	-	-
2021851	30/05 - 12/06	Beregne hvor stor andel av totalseleksjonen av reker som skjer på hhv fiskedypet og i overflaten.	Skagerrak	-	-
2021809	31/5-5/6	Survey of potentially human pathogenic (i. e. anisakids nematodes) and other important parasites (i.e. Ichthyophonus) in North Sea herring intended for human consumption. In addition, a small sample of bycatch (i.e. haddock and saithe) was studied.	Norwegian Sea	-	-
2021813	05/06 - 29/06	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 and urine). There was a complete sampling from all whales. All material was frozen to be analysed later.	Norwegian Sea	-	-

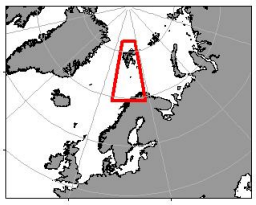
Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021824	7/6 - 1/8	The objective of the cruise is to collect sightings information for estimating abundance of whales, especially minke whales, as part of a long-term survey program to cover the Northeast Atlantic over the years 2020-2025. The survey vessel has followed predetermined tracklines on which observations of whales have been recorded by dedicated observers. Data collected for each observation include: Species, position, position relative to vessel, weather data and other covariates. In total, around 2600 nautical miles were surveyed in the waters around Jan Mayen. Combined for the two platforms, 85 minke whale observations were recorded. Other species recorded were fin whale (31 observations), blue whale (6 observations), sei whale (3 observations), humpback whale (26 observations), harbor porpoise (2 observations), killer whales (18 observations), white-beaked dolphin (6 observations), pilot whale (2 observations), Northern bottlenose whale (67 observations) and sperm whale (25 observations).	Norwegian Sea	-	-
2021853	23/06 - 24/06	Klargjøre og teste deep vision (DV) stereo-kamerasystem til makrell-økosystemtoktet. Sikre at håndtering inkludert av og påmontering i trålen og utsetting og ombortaking fungerer bra. Sikre at DV ikke påvirker trålgeometri og andre trålegenskaper. I tillegg er målet å gi praktisk opplæring i bruk av DV på HI tokt.	Norwegian Sea	-	-

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021816	30/06 - 02/08	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.	Norwegian Sea	46 - 120	54 - 149
2021817	30/06 - 01/08	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. Genetic sampling of herring populations. Opportunistic marine mammals observations along the transects and survey lines.	Norwegian Sea	15 - 87	28 - 105
0154_2021_UFJN_VILN	12/08 - 25/09	-	-	-	-
2021810	31/08 - 04/09	Survey of potentially human pathogenic anisakid nematodes and other important parasites (i.e. Ichthyophonus, Kudoa and didymozoid trematodes) of Atlantic mackerel intended for human consumption.	Norwegian Sea	-	-

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021852	31/08 - 13/09	Collect echo sounder broadband data from mackerel during comercial operations. Project name: Center for Research Based Innovation in Marine Acoustic Abundance Estimation and Backscatter Classification. Coordinating body: Institute of Marine Research, Norway	North Sea	-	-
2021848	12/09 - 30/09	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, pelagic invertebrates, fish, and marine mammals. In addition, hydrography, water chemistry and physics, and acoustics were monitored. Two sections (Hinlopen and the northernmost part of Vardø-Nord) were covered. Project name: BESS - Barents Sea Ecosystem Survey Coordinating body: IMR (Norway) and PINRO (Murmansk, Russia)	Svalbardsonen	61 - 114	112 - 223
2021856	28/09 - 01/10	Tidsserie med trollgarn på grunnt vatn, Ryfylke - Florø, del Austevoll	-	-	-
2021815	3/10 - 13/10	Methodological survey to evaluate best acoustic methods for detection, identification and quantification of bluefin tuna in Norwegian waters. Project name: Acoustic and visual monitoring of BFT in Norwegian waters Coordinating body: Institute of Marine Research, Norway	Norwegian Sea	-	-
2021857	04/10 - 07/10	Prøvefiske på grunt vatn med trollgarn. Oktober 2021	-	-	-

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021855	18/10 - 22/10	Innsamling av biologiske data på sjøkrepsbestanden i Frohavet, et viktig sjøkrepsområde (lengde, modning, kjønnsfordeling). Merkeforsøk for undersøkelser av vandring og estimering av vekst og overlevelse. Det arbeides med å få etablert et marint verneområde for sjøkreps i Frohavet, og data samles inn både fra et potensielt verneområde (før-data) og et kontrollområde.	North Sea	-	-
2021841	18/10 - 31/10	Gill-net survey in shallow waters along the coast. Main objective is to monitor the abundance of cod and other species in the coastal region.	North Sea	-	-
2021811	31/10 - 04/11	2021-FRES-004: Kartlegging av forekomst og ditto endringer av humanpatogene og kvalitetsreduserende parasitter hos NVG-sild, med hovedvekt på kveis med de to aktuelle Anisakis-artene A. simplex og A. pegreffii, i tillegg til "sildesoppen" Ichthyophonus sp.	Norwegian Sea	-	-
2021854	15/11 - 30/11	1) Undersøke nåværende utbredelse til dypvannsreke og kysttorsk på rekefelt i vestlandsfjordene, 2) oppnå estimater (med usikkerhet) av biomasse og mengde av dypvannsreke og bunnfisk, 3) kartlegge bunndyr som blir berørt av reketrål og 4) samle inn oseanografiske data (temperatur, saltholdighet og O2-innhold i bunnvannet).	Norwegian Sea	-	-
2021819	18/11 - 09/12	2021-NOR-011: Merking og utsetting av Nvg-sild med RFID-teknologi i overvintringsområdene	Norwegian Sea	-	-

13 - Hired vessels – Charts for hired vessels 2021



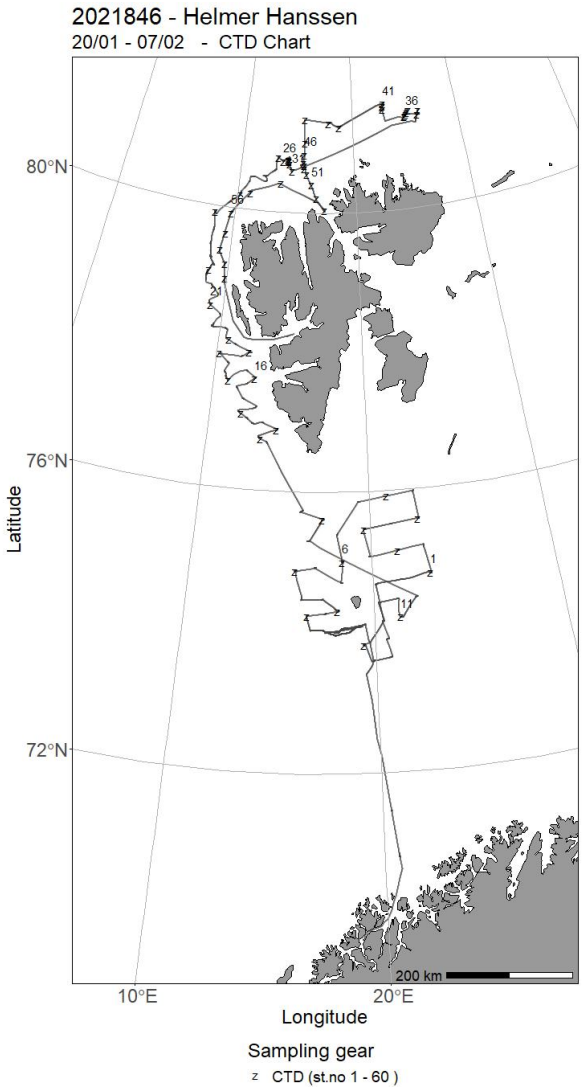
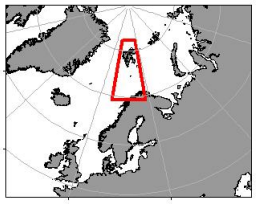


Fig. 13.1



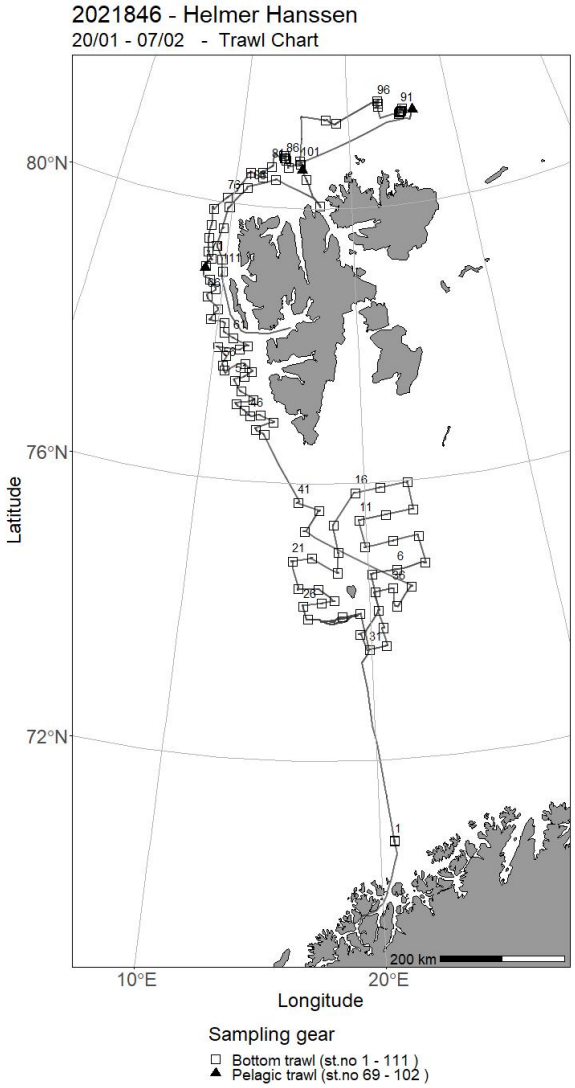
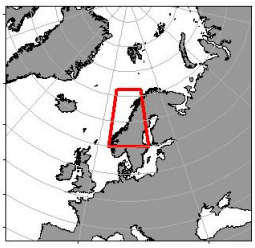

2021846 - Helmer Hanssen
20/01 - 07/02 - Trawl Chart
80°N
76°N
72°N
Latitude
10°E
20°E
Longitude
200 km
Sampling gear
Bottom trawl (st.no 1 - 111)
Pelagic trawl (st.no 69 - 102)

Fig. 13.12



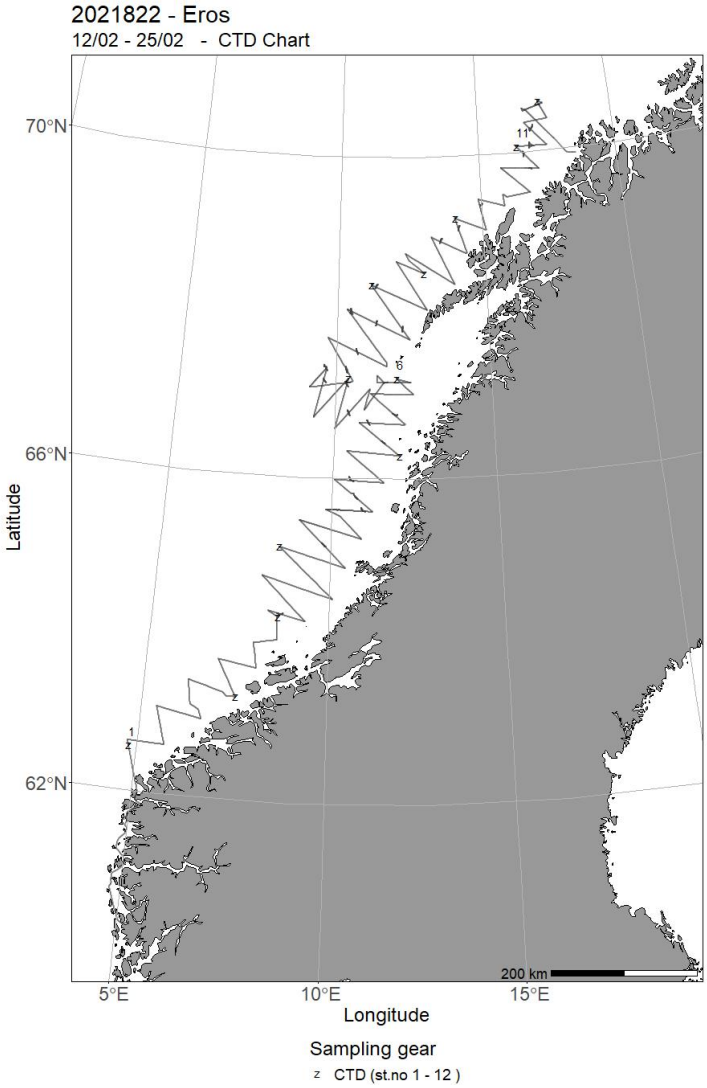
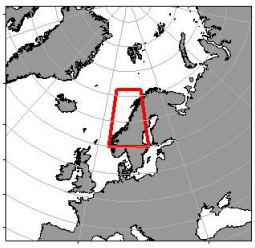

2021822 - Eros
12/02 - 25/02 - CTD Chart
70°N
66°N
62°N
Latitude
5°E
10°E
15°E
Longitude
200 km
Sampling gear
CTD (st.no 1 - 12)

Fig. 13.13



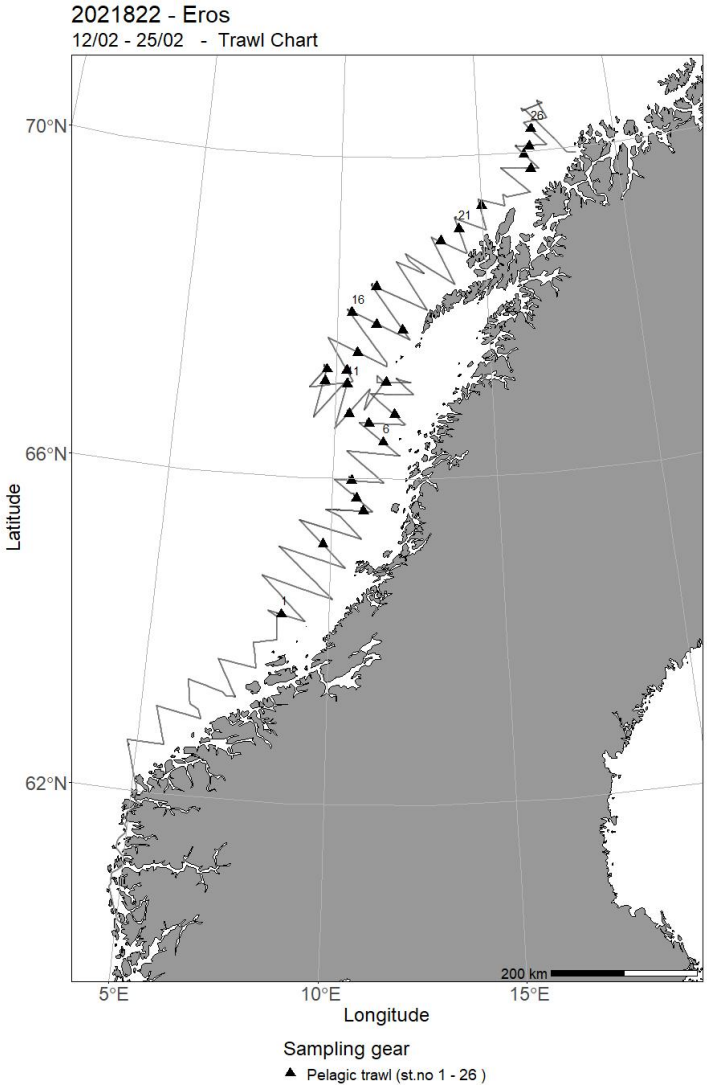

2021822 - Eros
12/02 - 25/02 - Trawl Chart
70°N
66°N
62°N
Latitude
5°E
10°E
15°E
Longitude
200 km
26
21
16
11
6
1
Sampling gear
Pelagic trawl (st.no 1 - 26)

Fig. 13.14

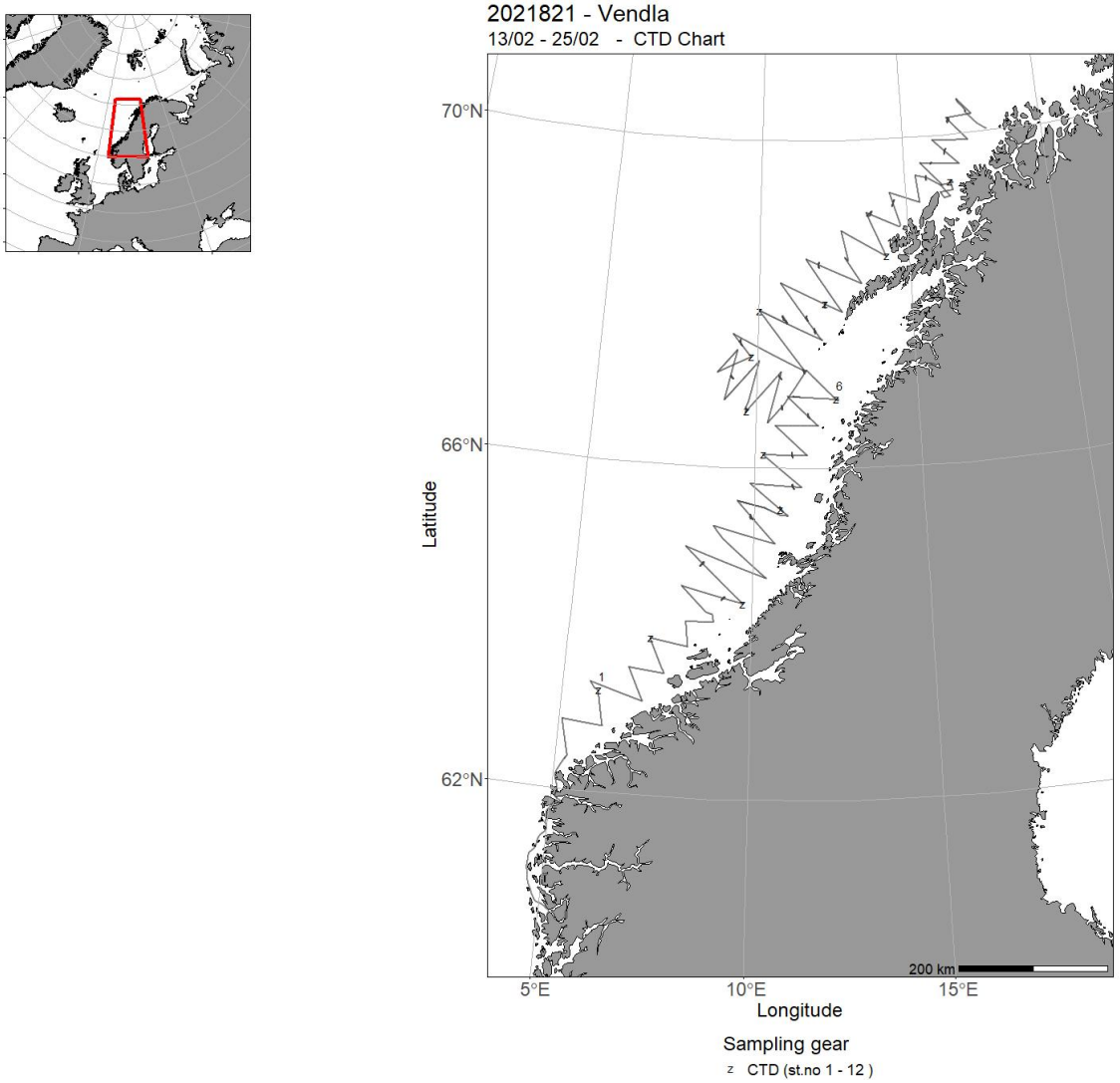

2021821 - Vendla
13/02 - 25/02 - CTD Chart
70°N
66°N
62°N
Latitude
5°E
10°E
15°E
Longitude
200 km
Sampling gear
CTD (st.no 1 - 12)

Fig. 13.15

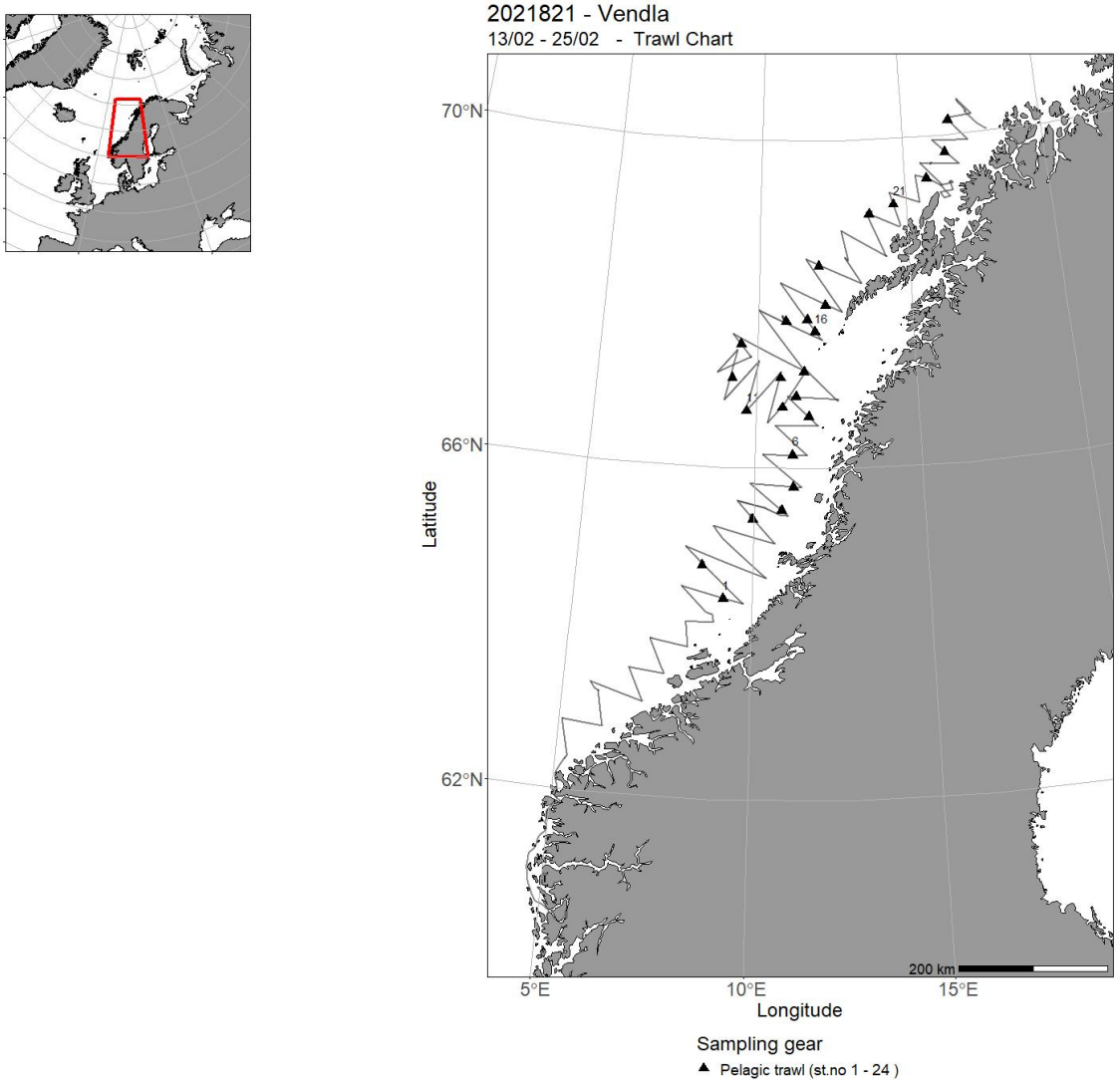

2021821 - Vendla
13/02 - 25/02 - Trawl Chart
70°N
66°N
62°N
Latitude
5°E
10°E
15°E
Longitude
200 km
Sampling gear
Pelagic trawl (st.no 1 - 24)

Fig. 13.16

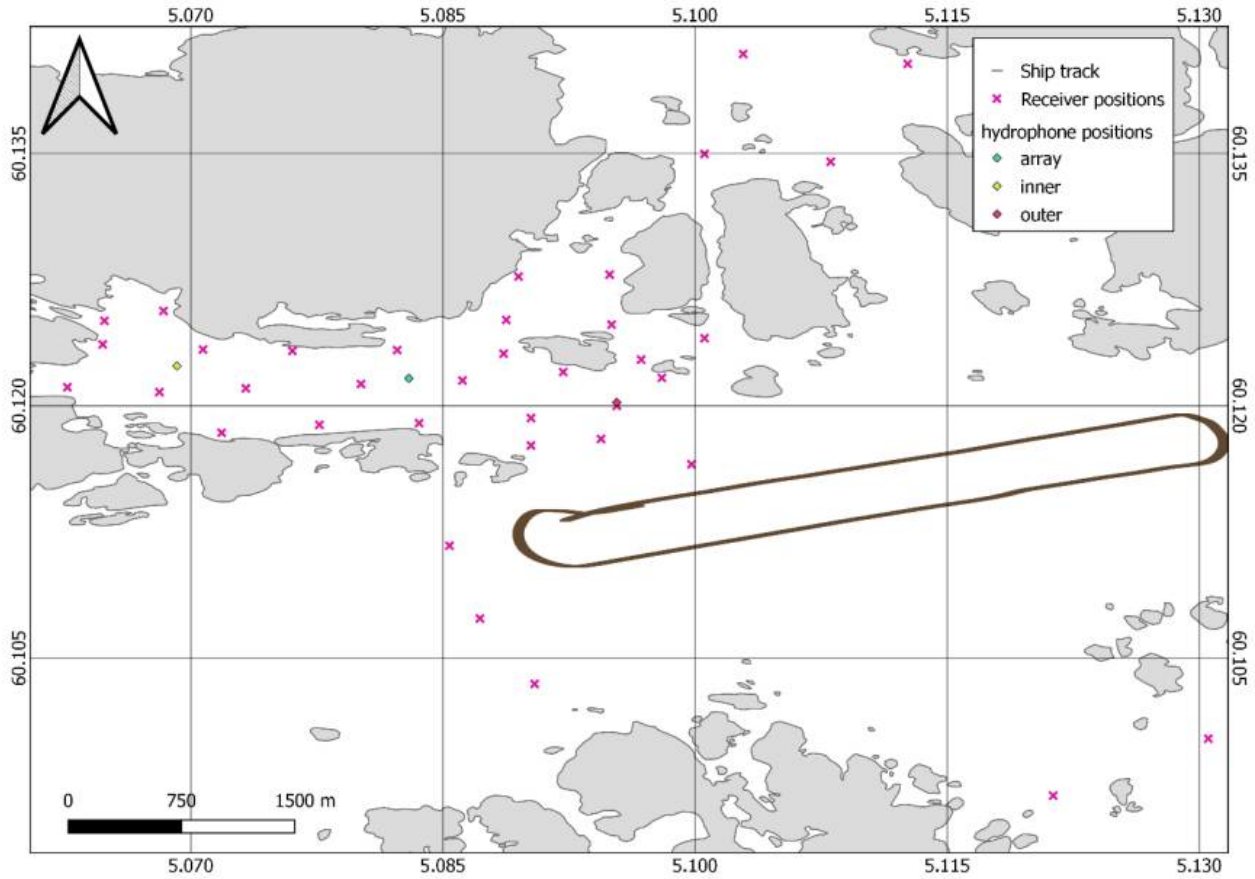


Fig. 13.17 - Hydrophone positions for cruisenumber 2021826, H.U.Sverdrup II

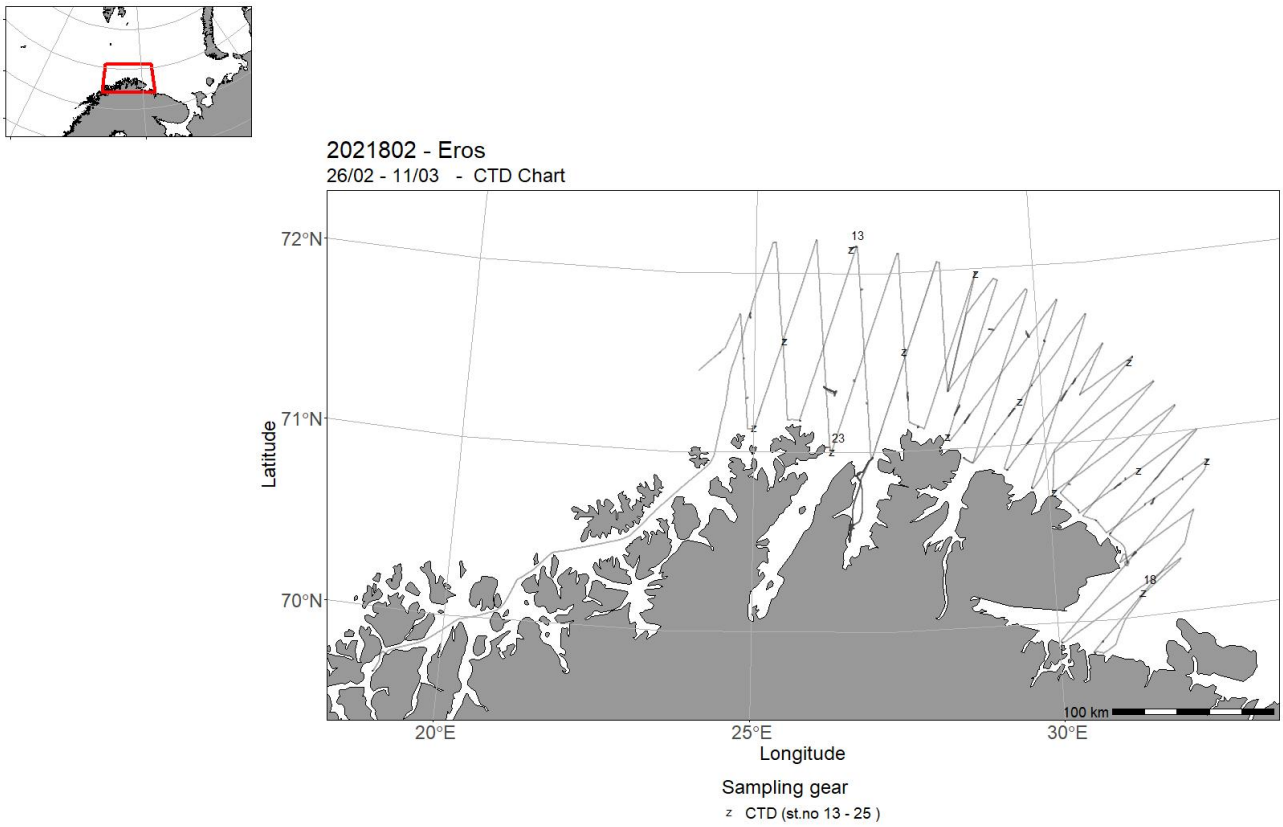

2021802 - Eros
26/02 - 11/03 - CTD Chart
72°N
71°N
70°N
Latitude
20°E
25°E
30°E
Longitude
13
23
18
100 km
Sampling gear
CTD (st.no 13 - 25)

Fig. 13.18

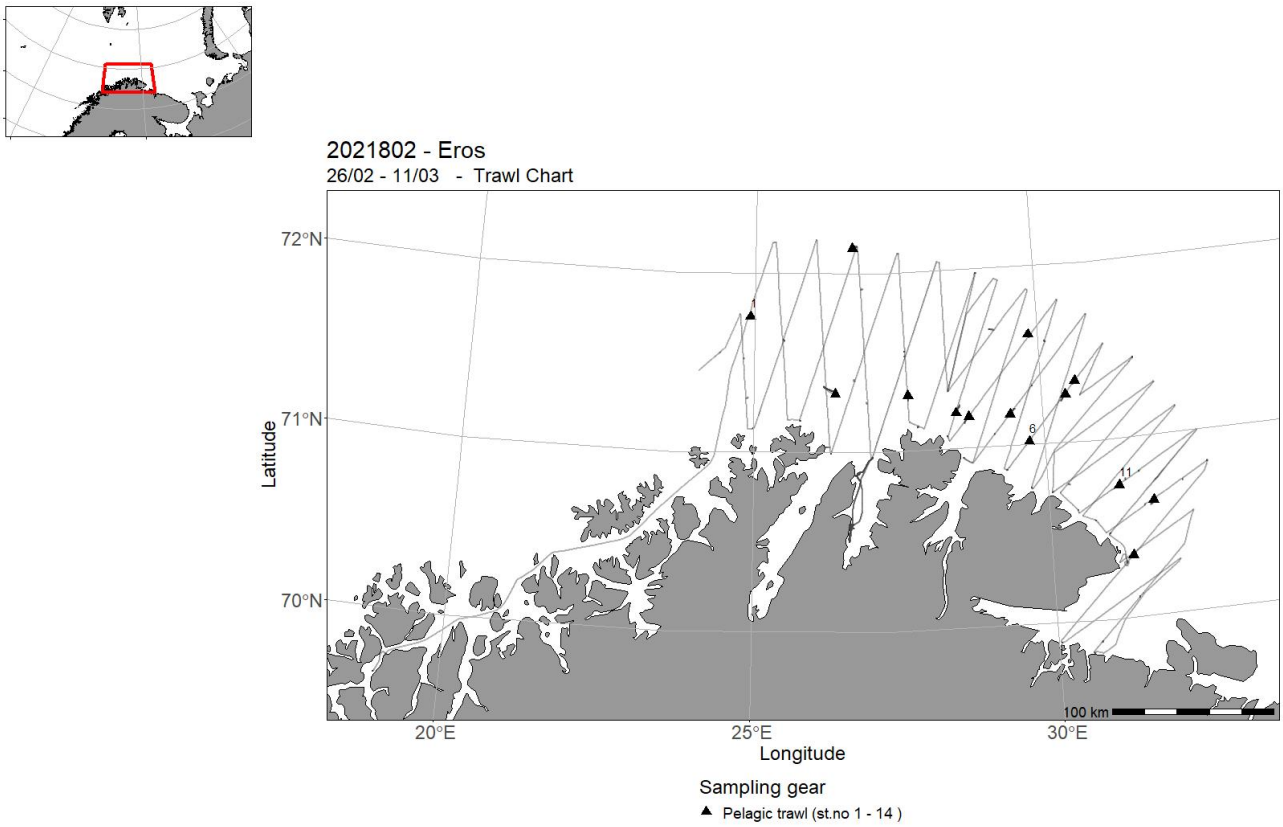

2021802 - Eros
26/02 - 11/03 - Trawl Chart
72°N
71°N
70°N
Latitude
20°E
25°E
30°E
Longitude
100 km
Sampling gear
Pelagic trawl (st.no 1 - 14)

Fig. 13.19

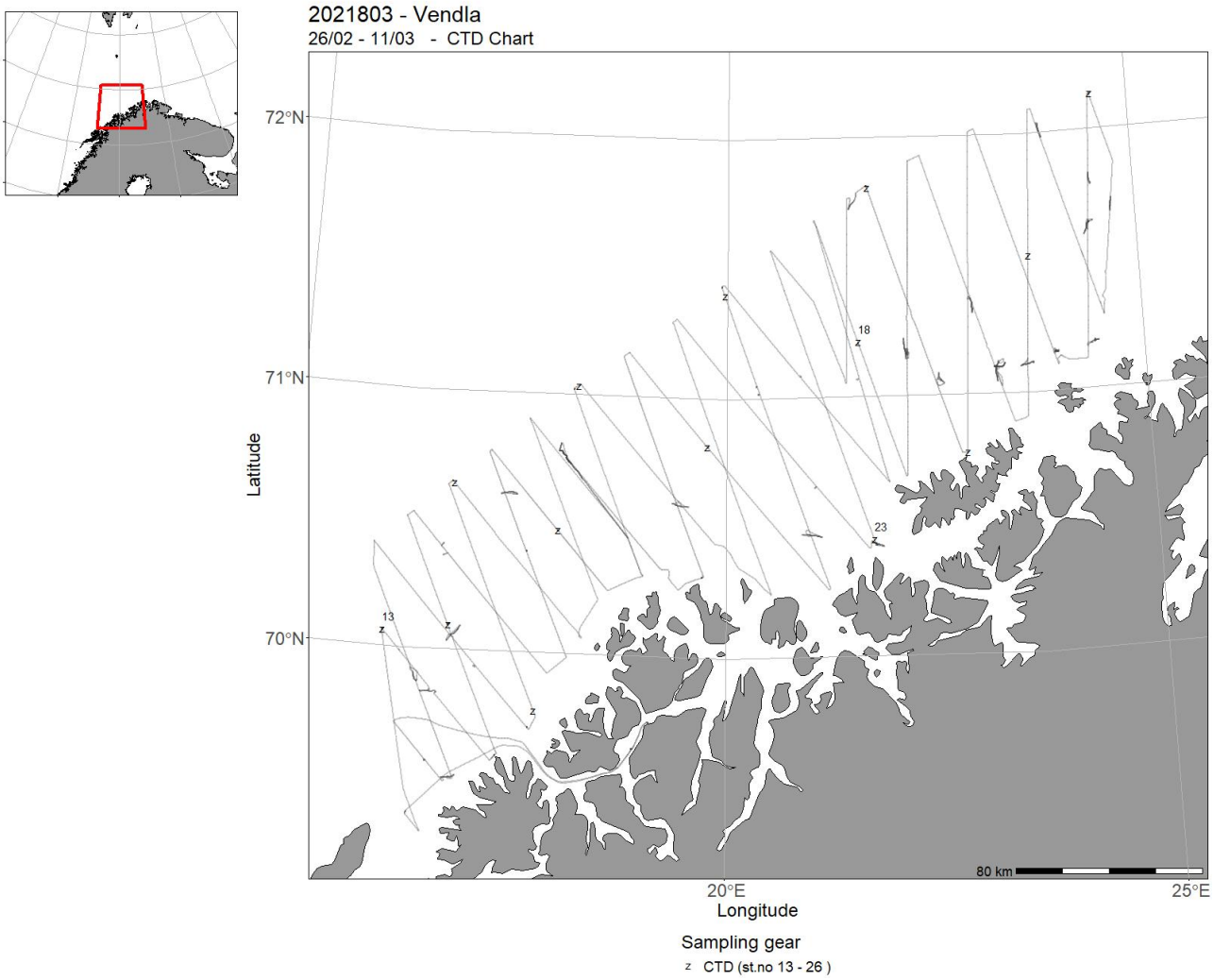

2021803 - Vendla
26/02 - 11/03 - CTD Chart
72°N
71°N
70°N
Latitude
20°E
25°E
Longitude
80 km
Sampling gear
CTD (st.no 13 - 26)

Fig. 13.20

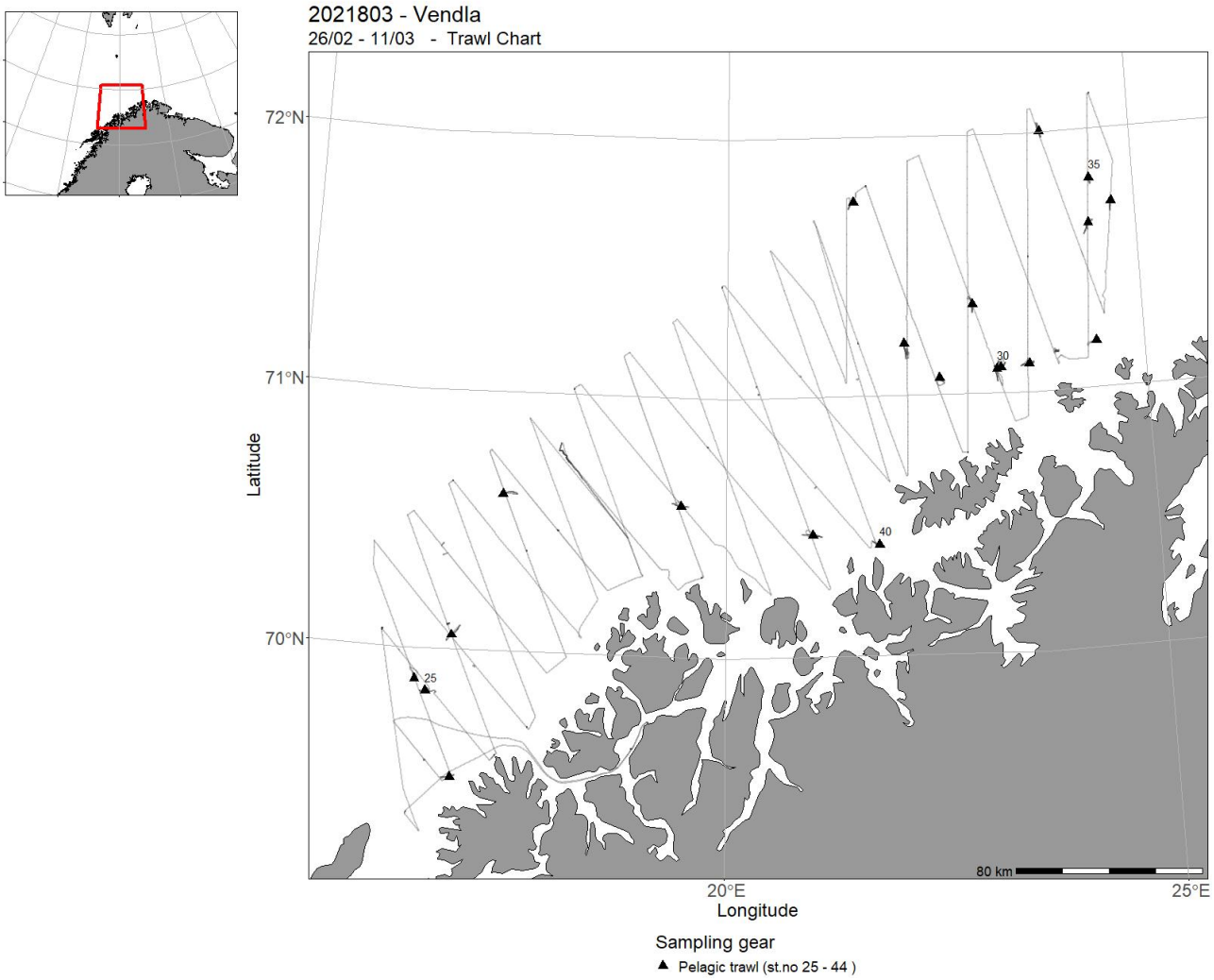

2021803 - Vendla
26/02 - 11/03 - Trawl Chart
72°N
71°N
70°N
Latitude
35
30
40
25
80 km
20°E
25°E
Longitude
Sampling gear
Pelagic trawl (st.no 25 - 44)

Fig. 13.21

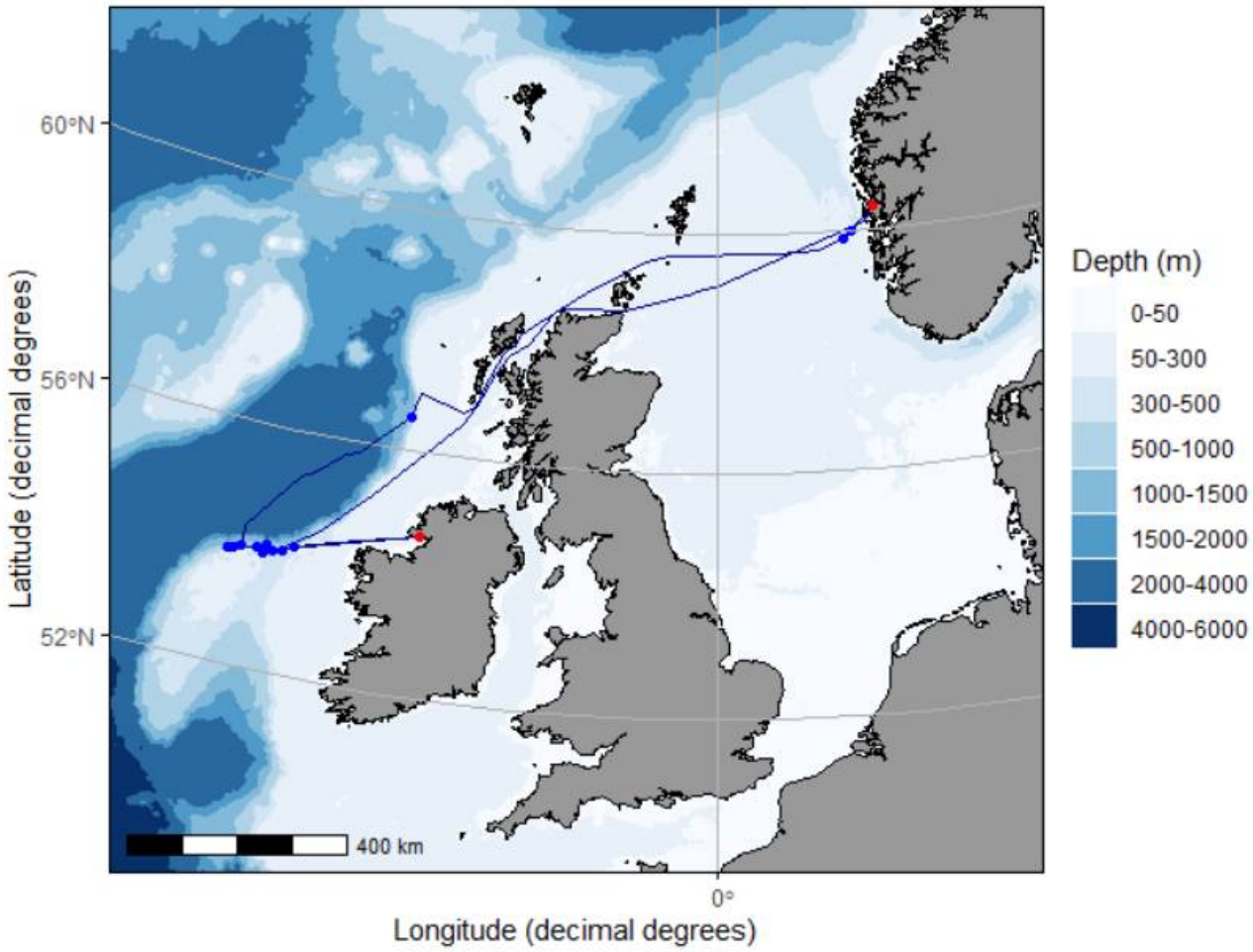


Fig. 13.22 - Cruise track for cruisenumber 2021825, Vikingbank. Trawl hauls are indicated with blue points and red points indicate harbours visited (Bergen, Norway, and Killybegs, Eire).

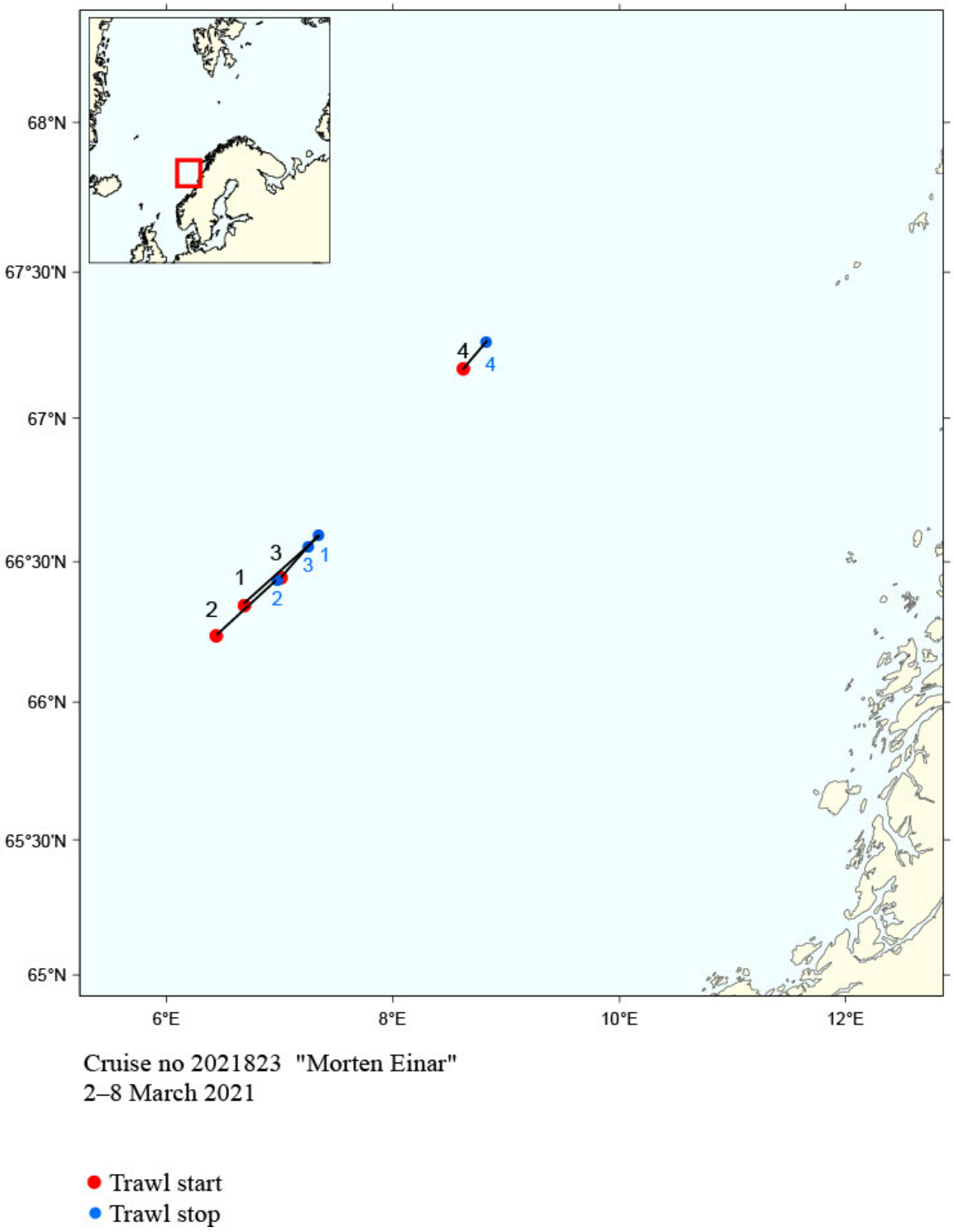

68°N
67°30'N
67°N
66°30'N
66°N
65°30'N
65°N
6°E
8°E
10°E
12°E
1
2
3
4
Cruise no 2021823 "Morten Einar"
2–8 March 2021
Trawl start
Trawl stop

Fig. 13.23

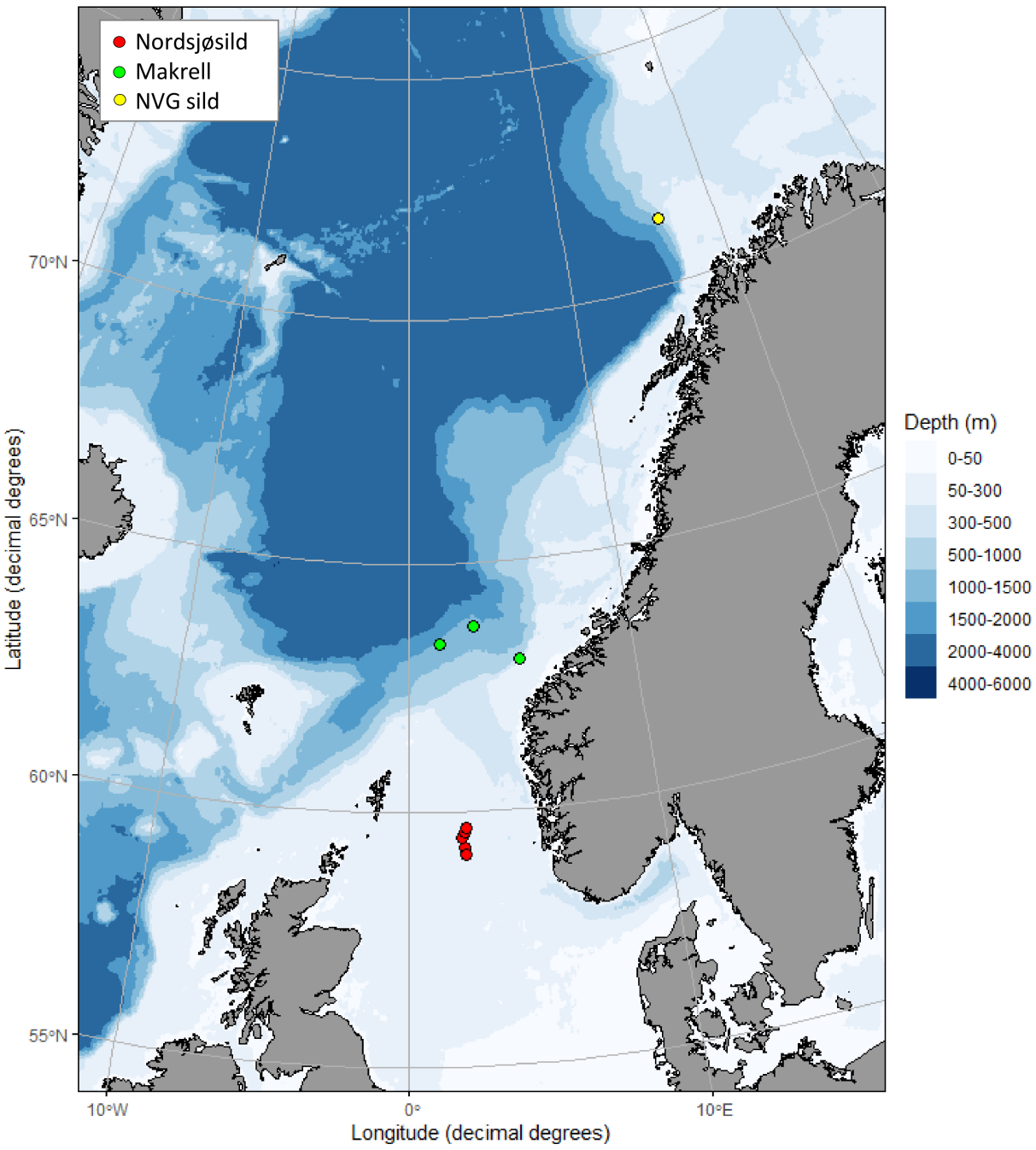
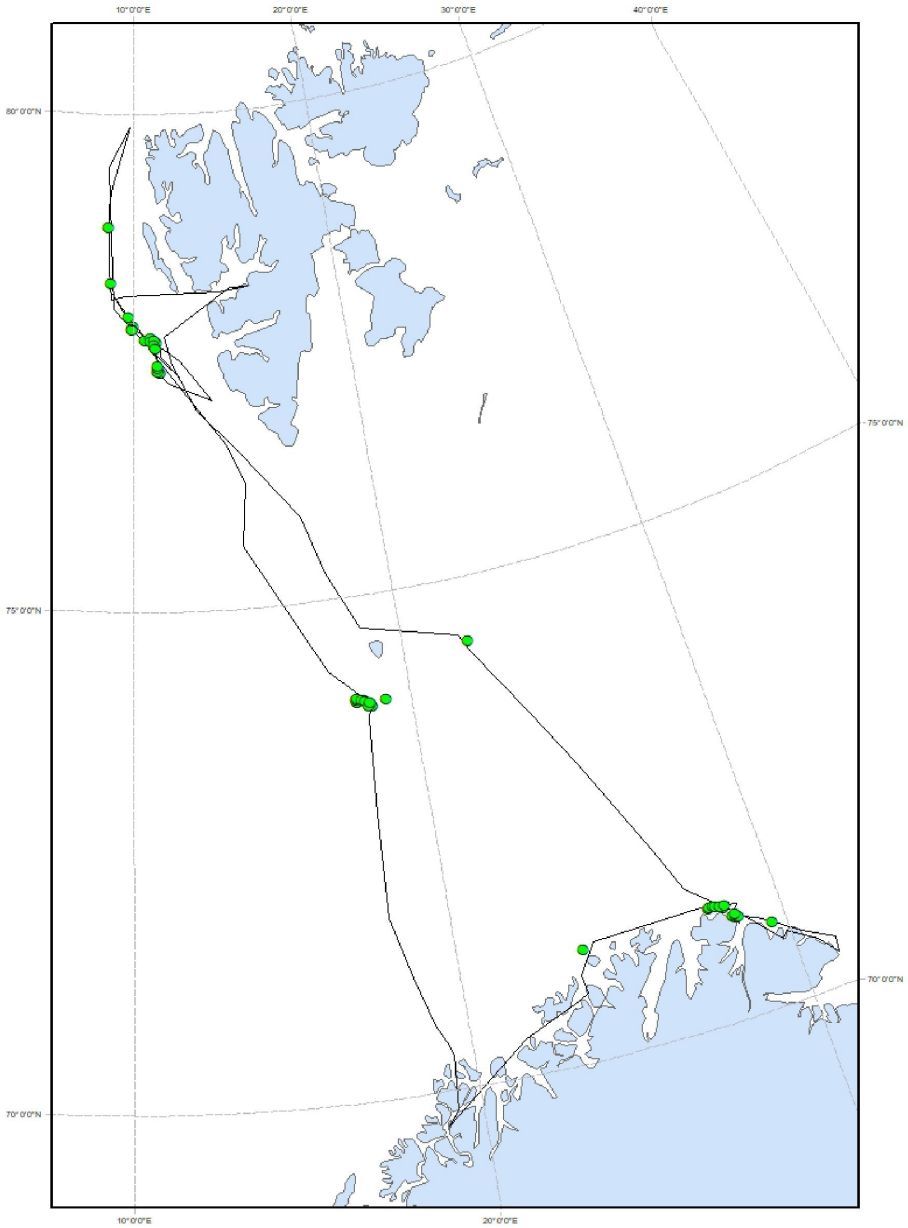
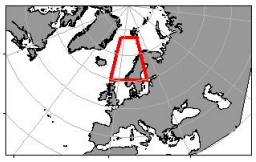


Fig. 13.24 - Stations for cruises 2021809, 2021810 and 2021811, Kings Bay



Cruise track of MS Kato, leaving from Tromsø on June 8 until arriving to Tromsø on July 10, 2021. Circles marks harvested whales.

Fig. 13.25 - Cruise track for cruise number 2021813, MS Kato



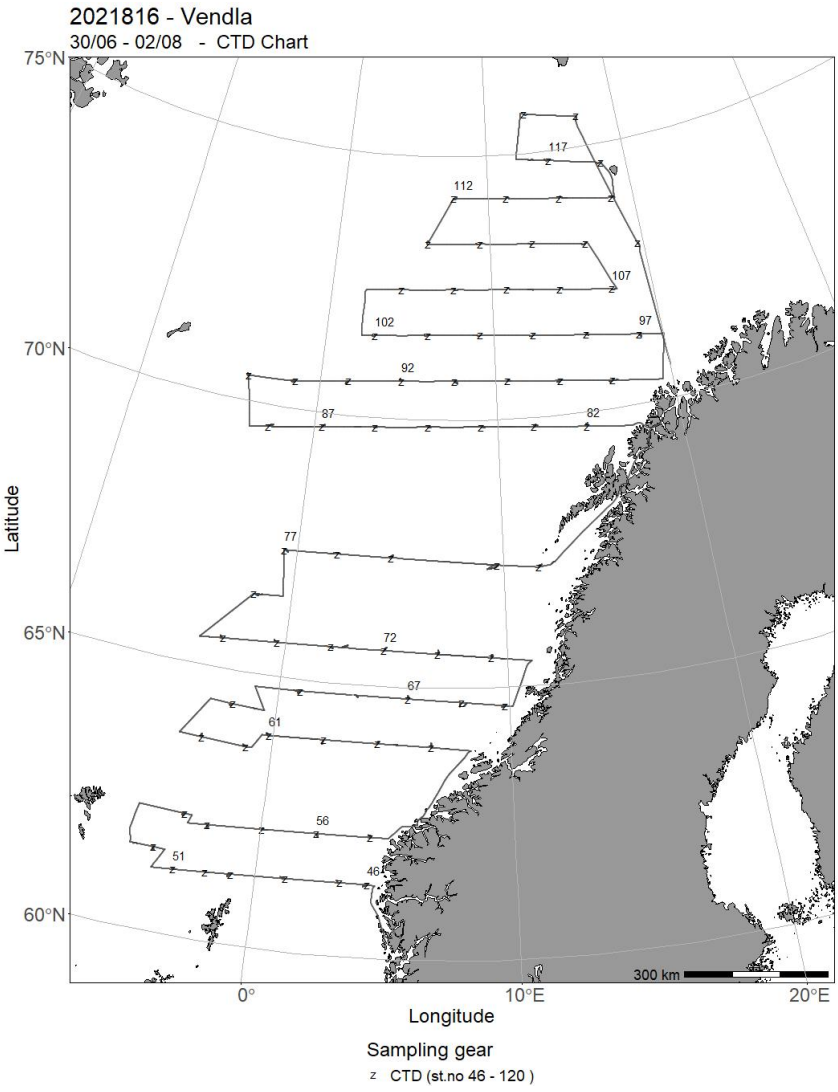
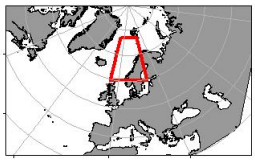

2021816 - Vendla
30/06 - 02/08 - CTD Chart
75°N
70°N
65°N
60°N
Latitude
0°
10°E
20°E
Longitude
300 km
117
112
107
102
97
92
87
82
77
72
67
61
56
51
46
Sampling gear
CTD (st.no 46 - 120)

Fig. 13.26



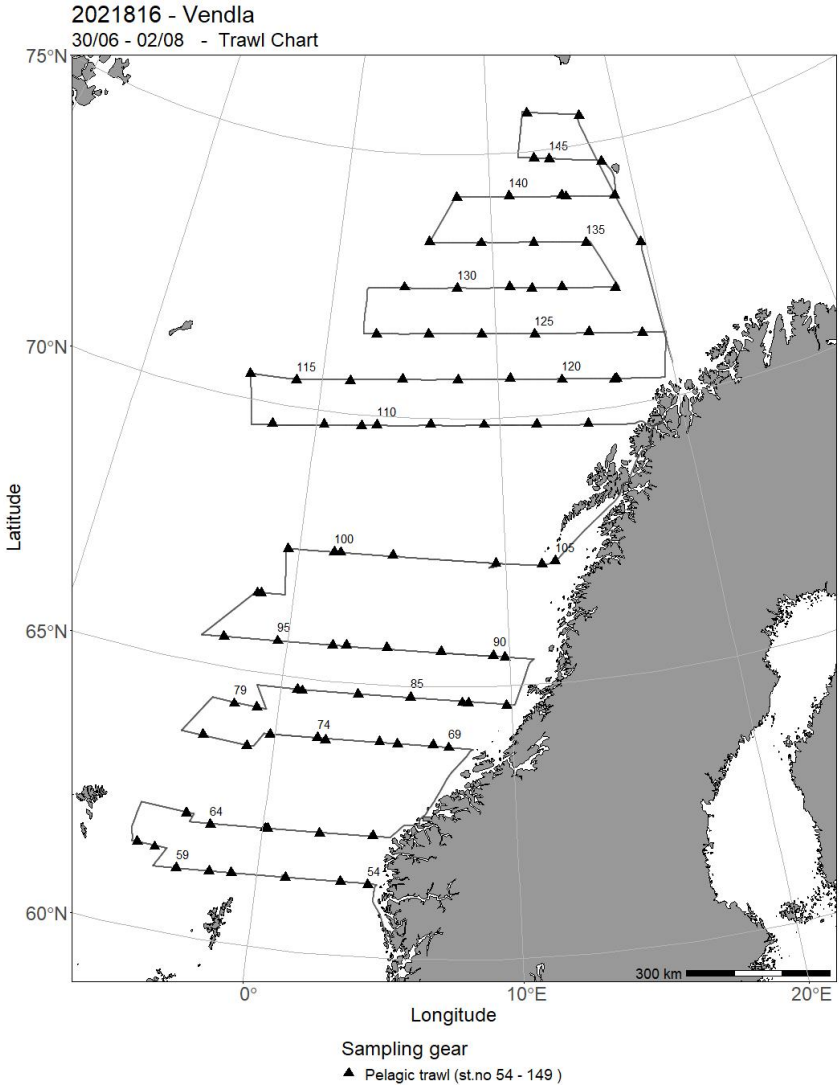

2021816 - Vendla
30/06 - 02/08 - Trawl Chart
75°N
70°N
65°N
60°N
Latitude
0°
10°E
20°E
Longitude
300 km
145
140
135
130
125
120
115
110
105
100
95
90
85
79
74
69
64
59
54
Sampling gear
Pelagic trawl (st.no 54 - 149)

Fig. 13.27

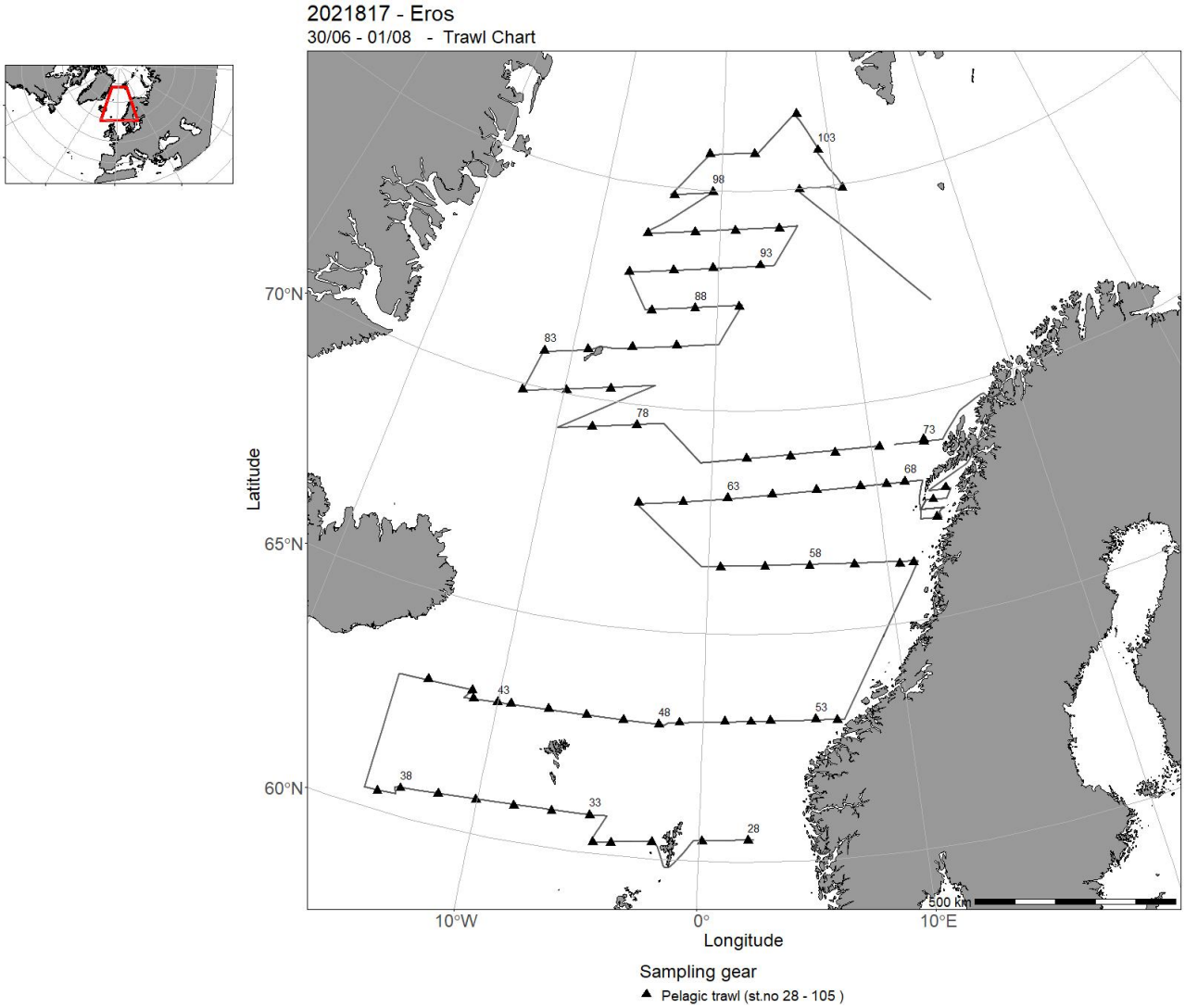

2021817 - Eros
30/06 - 01/08 - Trawl Chart
70°N
65°N
60°N
Latitude
10°W
0°
10°E
Longitude
500 km
103
98
93
88
83
78
73
68
63
58
53
48
43
38
33
28
Sampling gear
Pelagic trawl (st.no 28 - 105)

Fig. 13.28

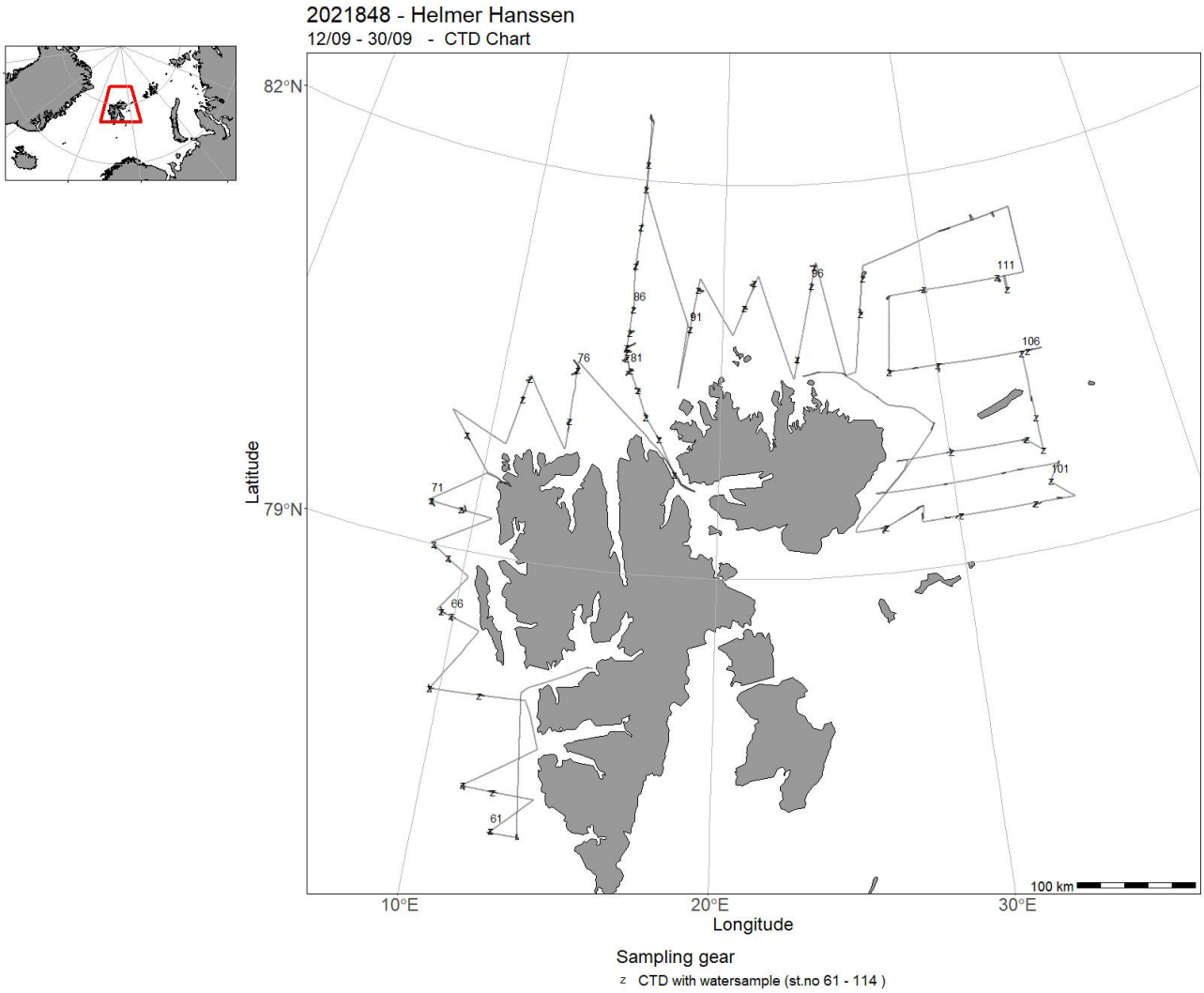

2021848 - Helmer Hanssen
12/09 - 30/09 - CTD Chart
82°N
79°N
Latitude
10°E
20°E
30°E
Longitude
100 km
111
106
101
96
91
86
81
76
71
66
61
Sampling gear
CTD with watersample (st.no 61 - 114)

Fig. 13.29

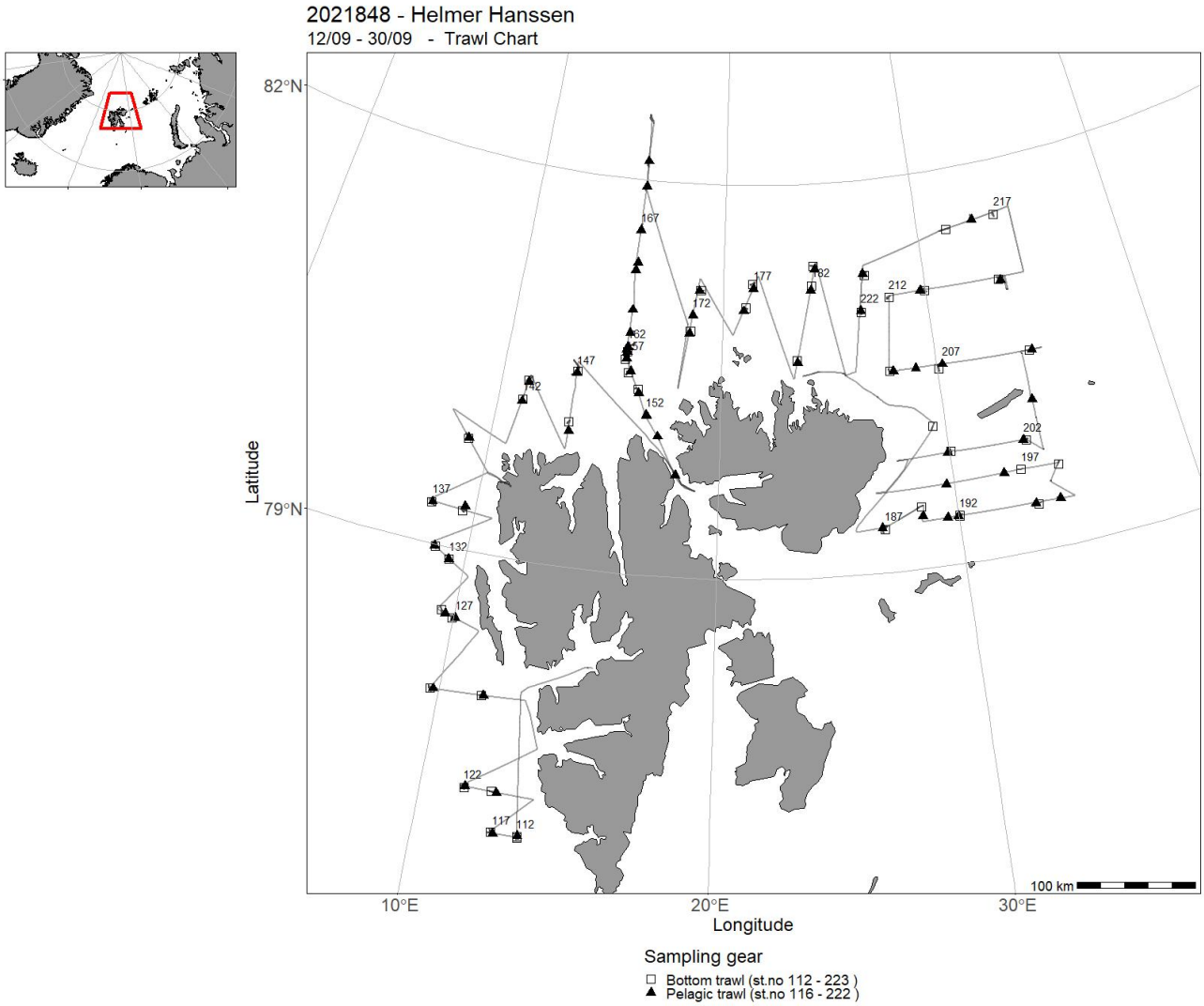

2021848 - Helmer Hanssen
12/09 - 30/09 - Trawl Chart
82°N
79°N
Latitude
10°E
20°E
30°E
Longitude
100 km
Sampling gear
Bottom trawl (st.no 112 - 223)
Pelagic trawl (st.no 116 - 222)

Fig. 13.30

14 - "Dr. Fridtjof Nansen" – Cruises 2021

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021451	22/1 - 24/1	Calibrate acoustics. Project name: Mesopelagic project Coordinating body: IMR	North Sea	-	-
2021452	02/02 - 05/02	1. Installation of ocean observatory platforms 2. Retrievial of ocean observatory platforms	Norwegian Sea	1 - 4	-
2021453	13/02 - 04/03	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). Project name: Population estimates of demersal fish stocks in North Sea Coordinating body: Institute of Marine Research	North Sea	5 - 51	4 - 62
2021458	05/03 - 08/03	The marine geological survey is a UiBs training course for students within marine geology and marine geophysics: The GEOV231 marine geological field course aims to demonstrate how acquisition and processing of seismic data and sea bottom sample data takes place and give students practical experience in marine-geological/geophysical methods and laboratory investigations. It also aims to create an understanding of how field studies can be utilized to understand geological processes in marine environment.	Norwegian Sea	52 - 56	-
2021457	08/03 - 10/03	The main objectives of the cruise are training of instrument technicians in operating the Video Assisted Multi Sampler VAMS, both at stations using the grabs and at transect flying the ROV.	Norwegian Sea	-	-
2021454	12/03 - 22/03	Compare mesopelagic trawls Study avoidans from trawls Conduct acoustic trawl survey of Maurolicus in the North Sea Project name: Mesopegaic project Coordinating body: IMR	-	57 - 64	63 - 105
2021459	24/03 - 28/03	1) Teste ut Multpelt 832 pelagisktrål som brukt på makrell-økosystemtokt i Norskehavet om sommeren med Deep Vision kamera system for å sikre at Deep Vision ikke påvirker trålens geometri. Også teste ut sorteringsmekanisme for Deep Vision. 2) Teste Gisund super bunntrål med endret rigging av fløyt i overtelne. Etablere mål for Gisund super trålens geometri (åpningshøyde, dørspredning) under sjøtesting for å ferdigstille trålmanual	-	-	106 - 136

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021455	30/03 - 26/04	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 as well as fish eggs and fish larvae . The cruise also includes monitoring of radioactive contamination. The survey area of the North Sea Ecosystem cruise 2020 includes northern North Sea and the Skagerrak (57-60.8oN, 2.2oW- 8.6oE). Sampling were made at pre-selected stations on the IMR standard hydrographic transects. The cruise provides horizontal and vertical distributions of physical oceanographic parameters, chemistry, phytoplankton and zooplankton in the northern North Sea, Skagerrak and Kattegat. The cruise also provides depth integrated distribution of fish eggs and larvae that can be related to the zooplankton and physical oceanographic data from the standard sections.	North Sea	66 - 307	-
2021456	29/04 - 27/05	Provide acoustic estimates of abundance and distribution of pelagic species in the Norwegian Sea. Collect data on hydrography and plankton in the Nowegian Sea.	Norwegian Sea	309 - 356	137 - 184
2021402	16/07 - 29/07	Cancelled	-	-	-
2021403	01/08 - 17/08	Cancelled	-	-	-
2021404	21/08 - 20/09	Cancelled	-	-	-
2021460	19/09 - 05/10	Training course in Ocean Science (BIO325): The survey collected samples in West Norwegian fjords (Byfjord, Masfjord, Fensfjord, Åfjorde and Førdefjorden), and on the Møre plateau North of Ålesund, down to 1000m. The equipment used was: Demersal campelen 1800 trawl. Åkra Pelagic trawl 320 with MultiSampler (3 cod-ends) Åkra Pelagic trawl with one codend Deep-Vision Multinet Spectroradiometer Acoustics CTD Grab Longlines Traps	North Sea	360 - 397	188 - 237
2021405	23/09 - 19/10	Cancelled	-	-	-
2021401	22/10 - 16/11	Leg 1 Bottom habitat studies NW Africa, incl calibration of echosounders	Atlantic Ocean	-	-
2021406	24/10 - 16/11	Cancelled	-	-	-

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no
2021407	19/11 - 13/12	The overall objectives of the surveys were as follows: Obtain an assessment of the demersal and pelagic resources of the continental shelf and upper slope. In addition, to determine distribution and abundance of demersal and pelagic species and communities, and collecting biological samples as specified below. Sampling was also carried out to determine oceanographic conditions (physical, chemical and biological), as well as sampling for microplastics, recording the occurrence of marine debris and mapping of nutrients and contaminants in commercial fish, regarding food safety.	Atlantic Ocean	-	-

15 - "Dr. Fridtjof Nansen" Charts for 2021

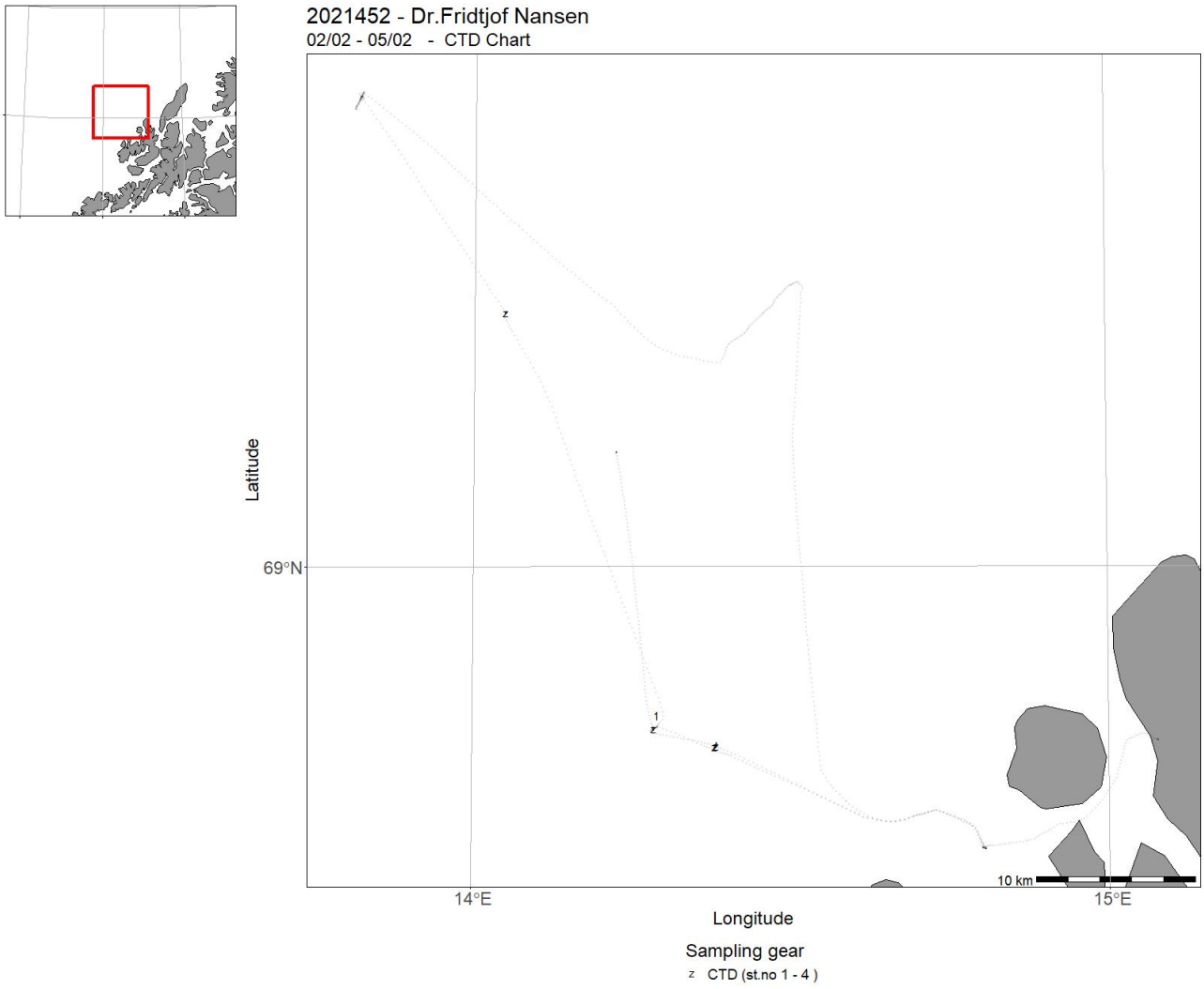
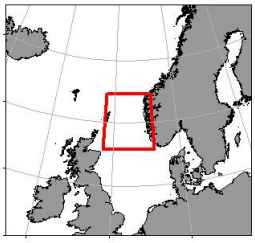


Fig. 15.1



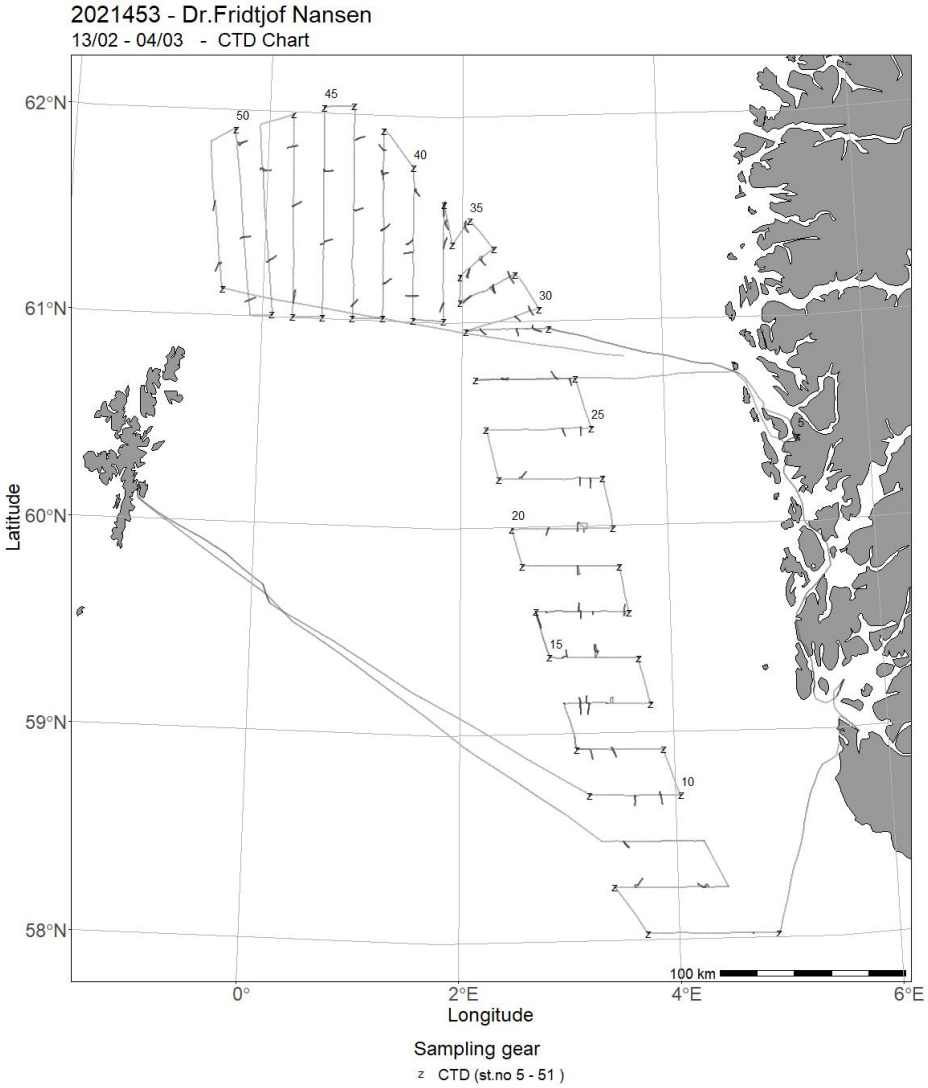
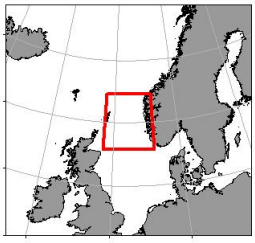

2021453 - Dr.Fridtjof Nansen
13/02 - 04/03 - CTD Chart
62°N
61°N
60°N
59°N
58°N
Latitude
0°
2°E
4°E
6°E
Longitude
100 km
45
50
40
35
30
25
20
15
10
5
Sampling gear
CTD (st.no 5 - 51)

Fig. 15.2



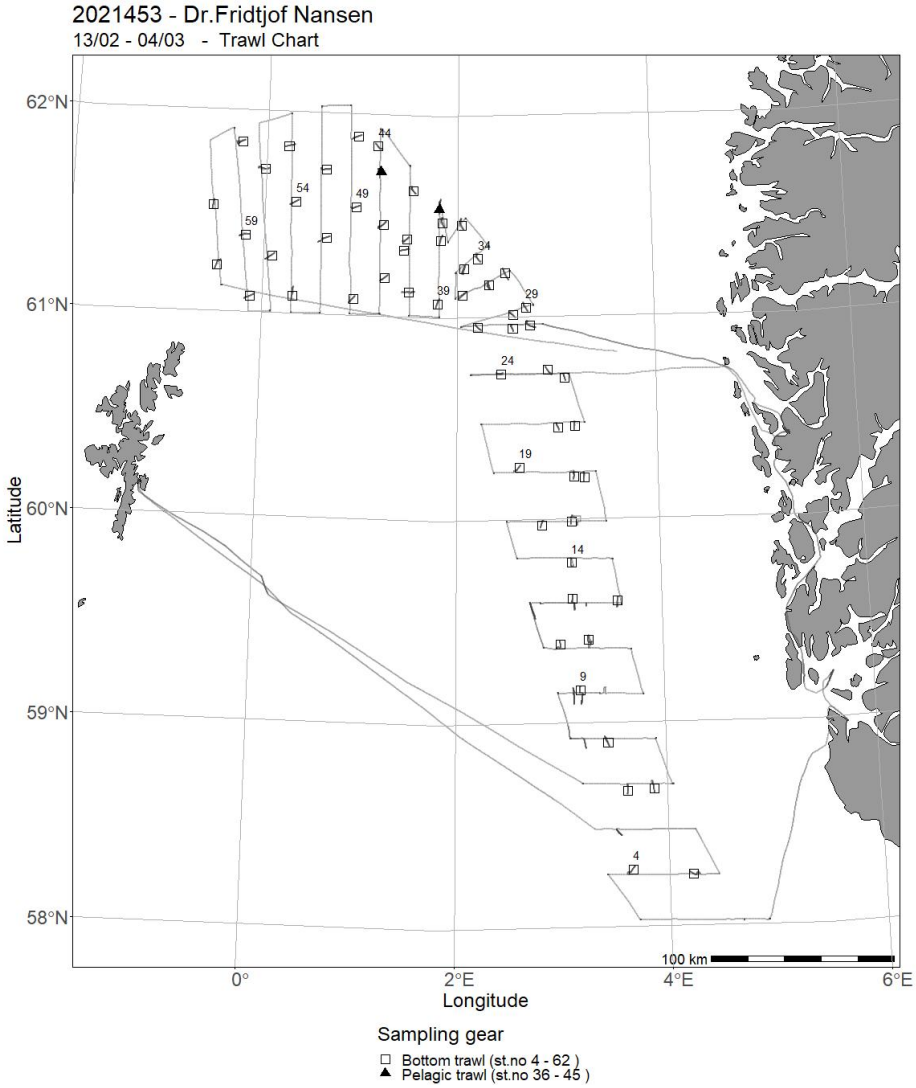
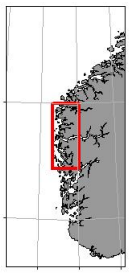

2021453 - Dr.Fridtjof Nansen
13/02 - 04/03 - Trawl Chart
62°N
61°N
60°N
59°N
58°N
Latitude
0°
2°E
4°E
6°E
Longitude
100 km
44
54
49
59
34
39
29
24
19
14
9
4
Sampling gear
Bottom trawl (st.no 4 - 62)
Pelagic trawl (st.no 36 - 45)

Fig. 15.3



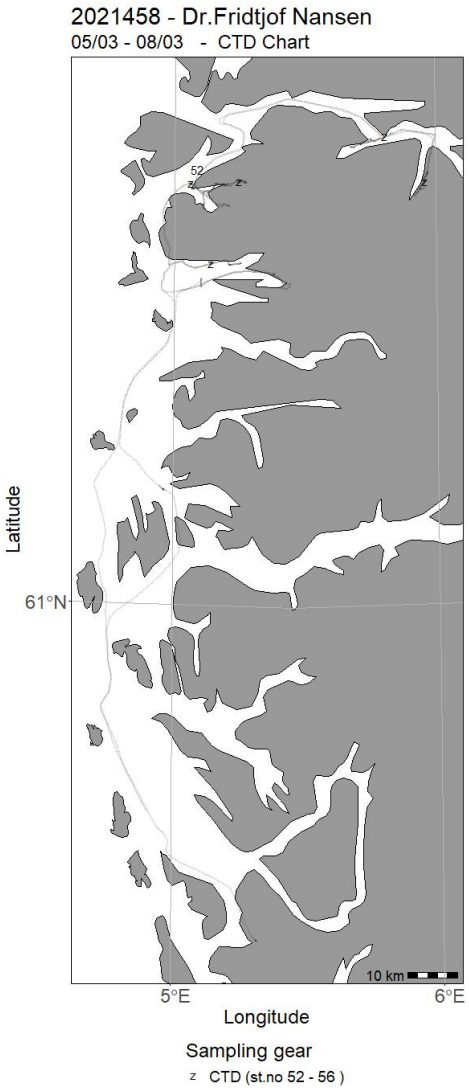

2021458 - Dr.Fridtjof Nansen
05/03 - 08/03 - CTD Chart
52
Latitude
61°N
10 km
5°E
6°E
Longitude
Sampling gear
CTD (st.no 52 - 56)

Fig. 15.4

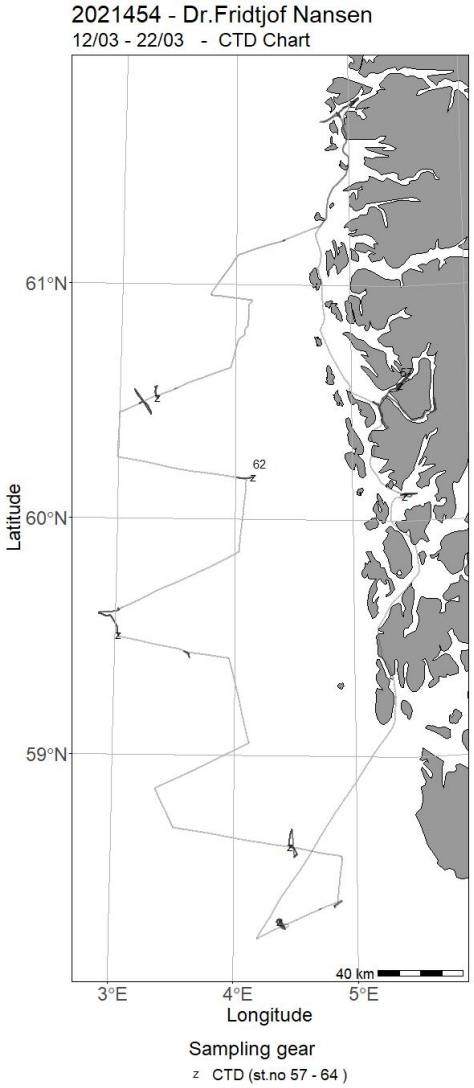

2021454 - Dr.Fridtjof Nansen
12/03 - 22/03 - CTD Chart
61°N
60°N
59°N
Latitude
62
40 km
3°E
4°E
5°E
Longitude
Sampling gear
CTD (st.no 57 - 64)

Fig. 15.5

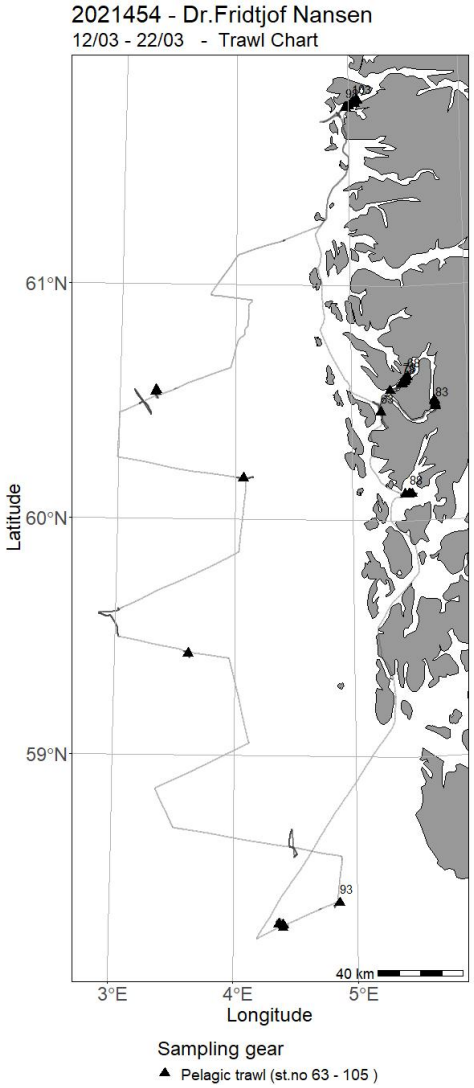

2021454 - Dr.Fridtjof Nansen
12/03 - 22/03 - Trawl Chart
61°N
60°N
59°N
Latitude
3°E
4°E
5°E
Longitude
40 km
Sampling gear
Pelagic trawl (st.no 63 - 105)

Fig. 15.6

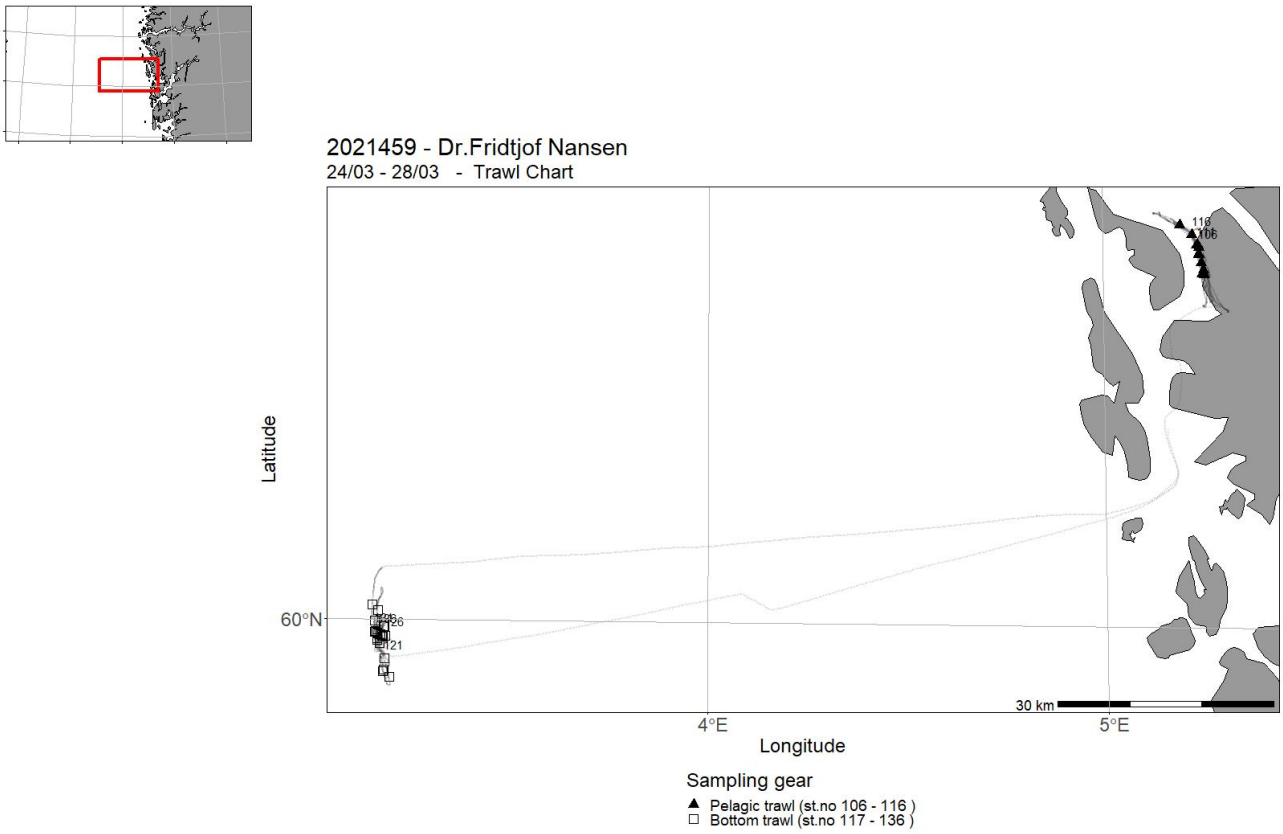

2021459 - Dr.Fridtjof Nansen
24/03 - 28/03 - Trawl Chart
Latitude
60°N
4°E
5°E
Longitude
30 km
Sampling gear
Pelagic trawl (st.no 106 - 116)
Bottom trawl (st.no 117 - 136)

Fig. 15.7

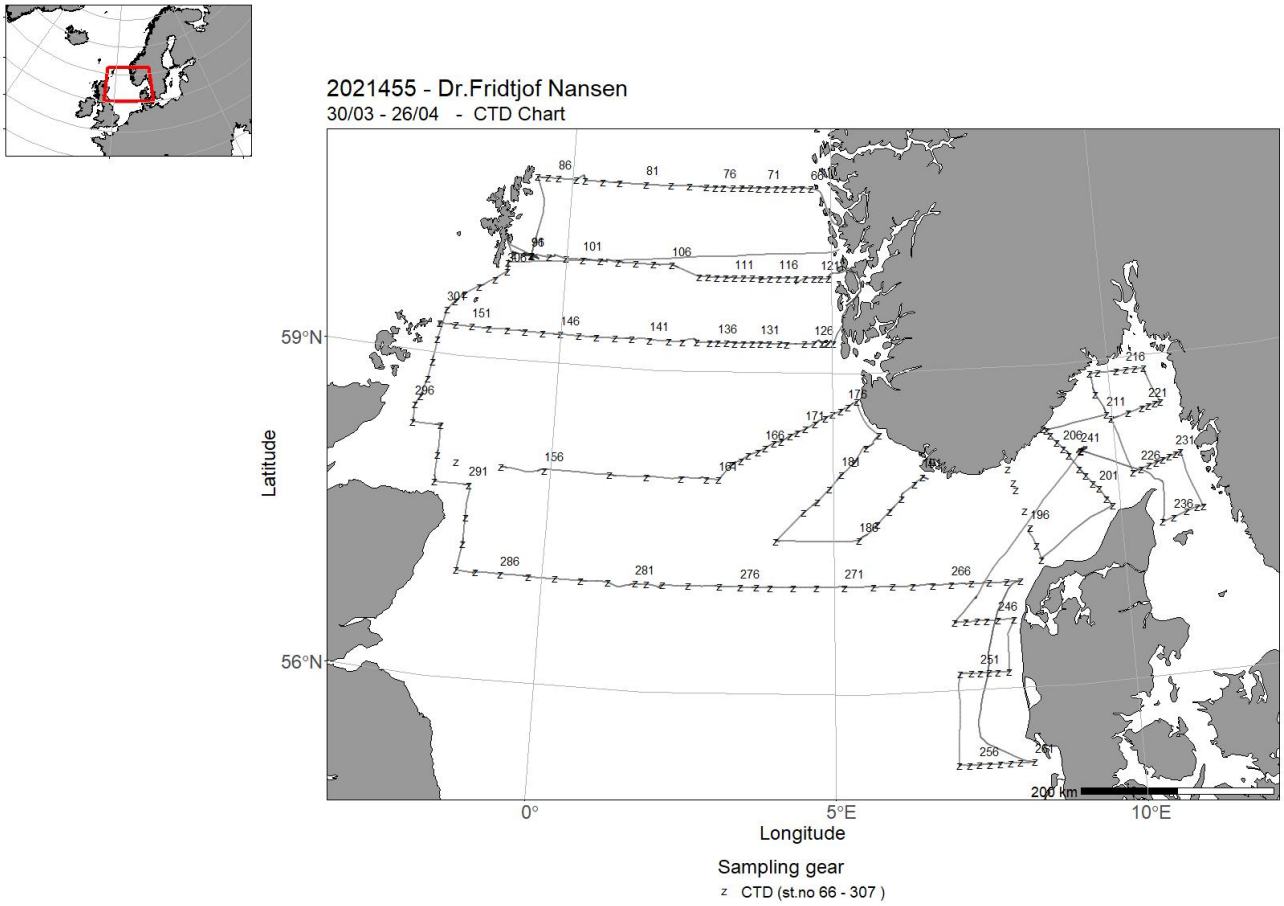
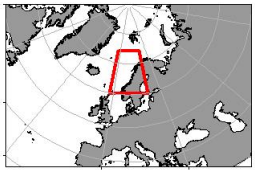

2021455 - Dr.Fridtjof Nansen
30/03 - 26/04 - CTD Chart
59°N
56°N
Latitude
0°
5°E
10°E
Longitude
200 km
Sampling gear
CTD (st.no 66 - 307)

Fig. 15.8



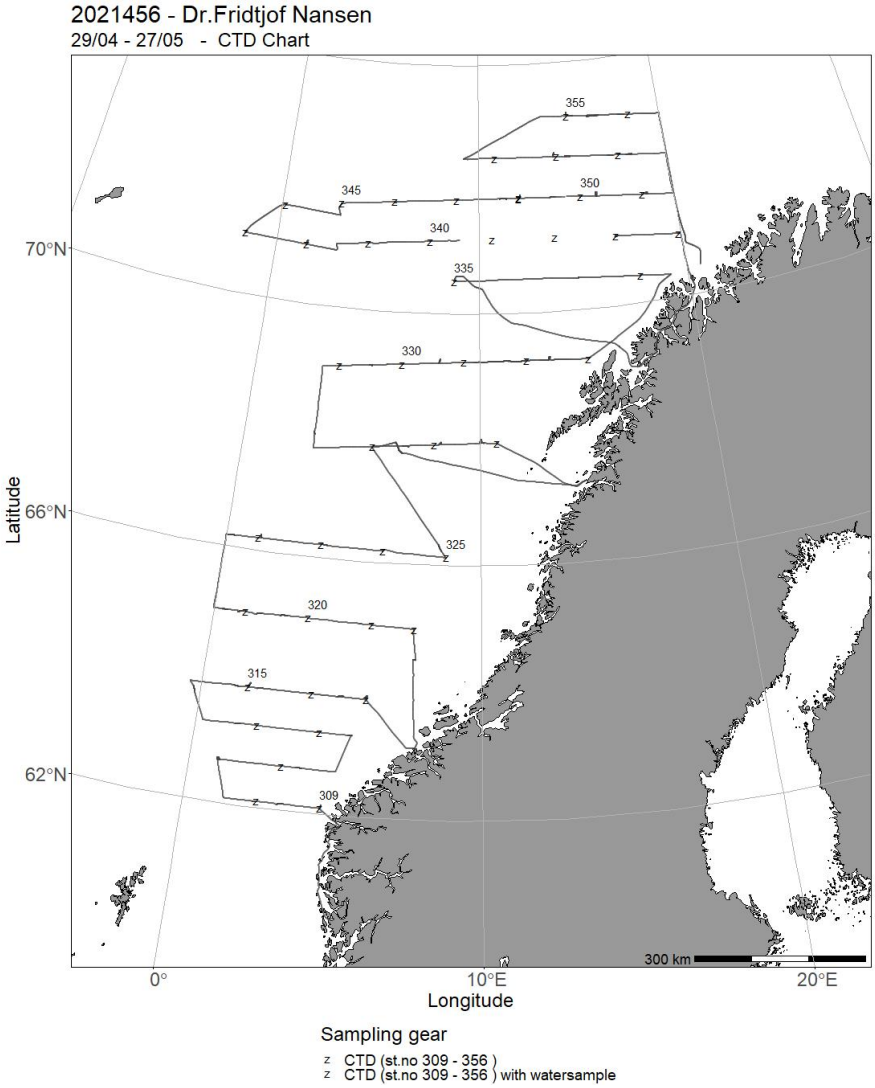
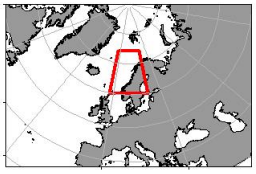

2021456 - Dr.Fridtjof Nansen
29/04 - 27/05 - CTD Chart
355
345
350
340
335
330
325
320
315
309
70°N
66°N
62°N
Latitude
0°
10°E
20°E
Longitude
300 km
Sampling gear
CTD (st.no 309 - 356)
CTD (st.no 309 - 356) with watersample

Fig. 15.9



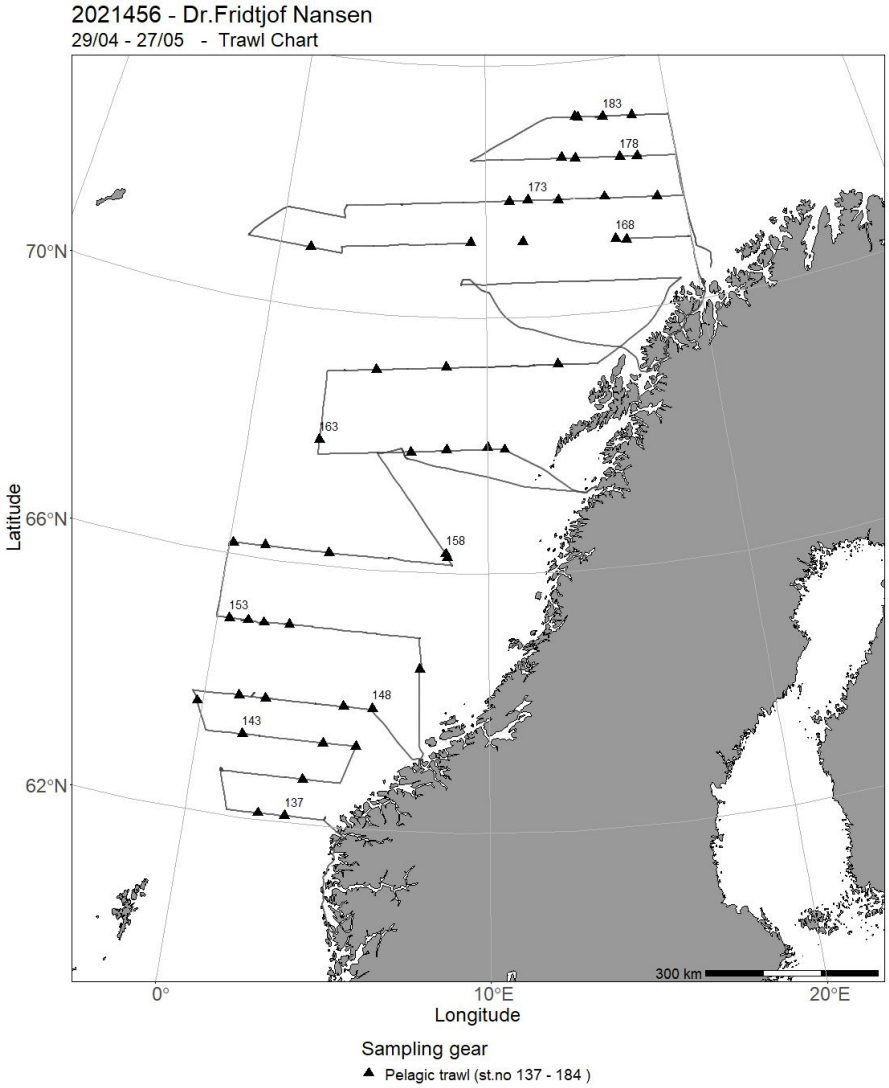
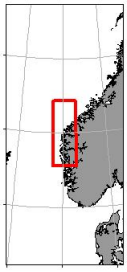

2021456 - Dr.Fridtjof Nansen
29/04 - 27/05 - Trawl Chart
183
178
173
168
163
158
153
148
143
137
70°N
66°N
62°N
Latitude
0°
10°E
20°E
Longitude
300 km
Sampling gear
Pelagic trawl (st.no 137 - 184)

Fig. 15.10



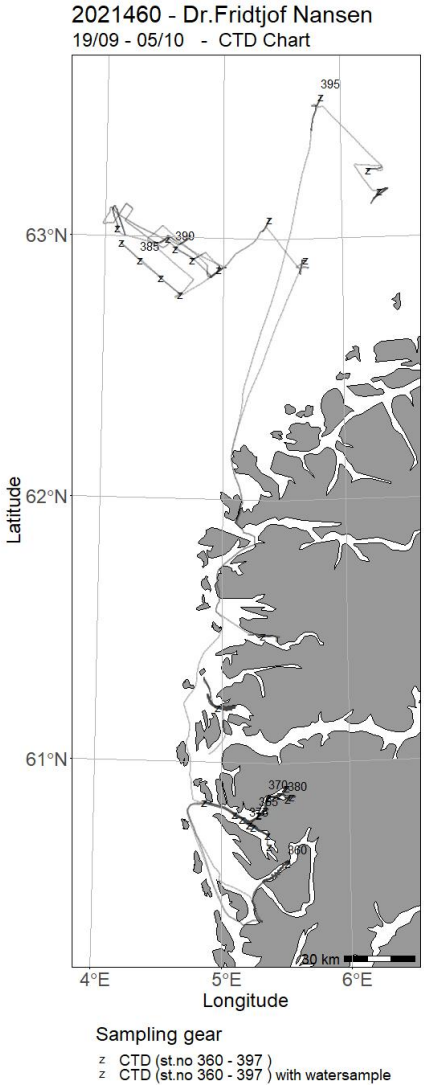
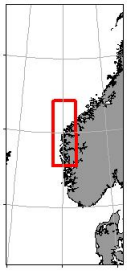

2021460 - Dr.Fridtjof Nansen
19/09 - 05/10 - CTD Chart
395
390
385
63°N
62°N
61°N
Latitude
370
380
360
30 km
4°E
5°E
6°E
Longitude
Sampling gear
CTD (st.no 360 - 397)
CTD (st.no 360 - 397) with watersample

Fig. 15.11



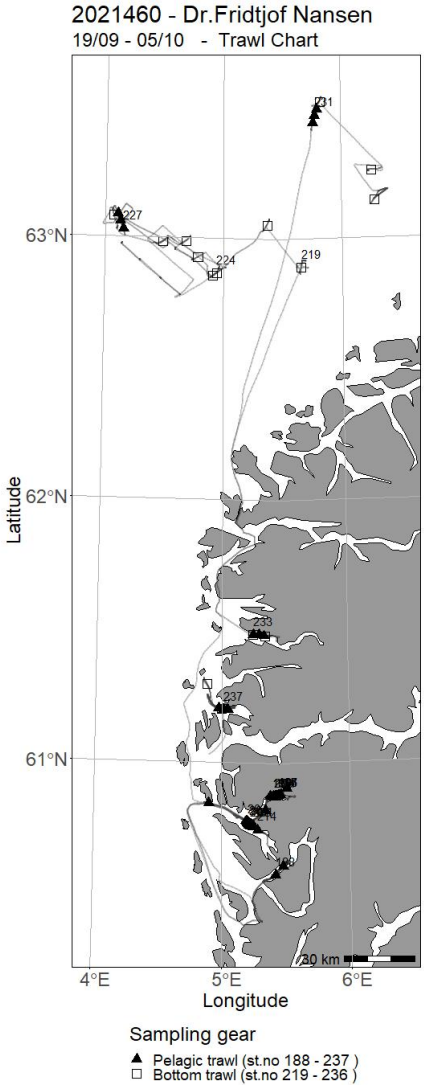
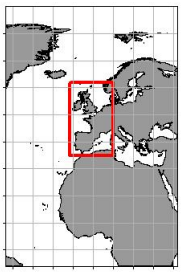

2021460 - Dr.Fridtjof Nansen
19/09 - 05/10 - Trawl Chart
63°N
62°N
61°N
Latitude
4°E
5°E
6°E
Longitude
30 km
Sampling gear
Pelagic trawl (st.no 188 - 237)
Bottom trawl (st.no 219 - 236)

Fig. 15.12

16 - "Statsraad Lehmkuhl" - Cruises 2021

Cruise No	Period	Purpose	Area	CTD st.no	Trawl st.no	Fig. no
2021051	19/08 - 15/09	One Ocean Expedition - Leg 1	Atlantic Ocean	4 - 18	-	
2021052	30/09 - 28/11	One Ocean Expedition - Leg 2	Atlantic Ocean	23 - 62	-	
2021053	25/11 - 17/12	One Ocean Expedition - Leg 3	Caribbean	67 - 93	-	

17 - "Statsraad Lehmkuhl" Charts for 2021



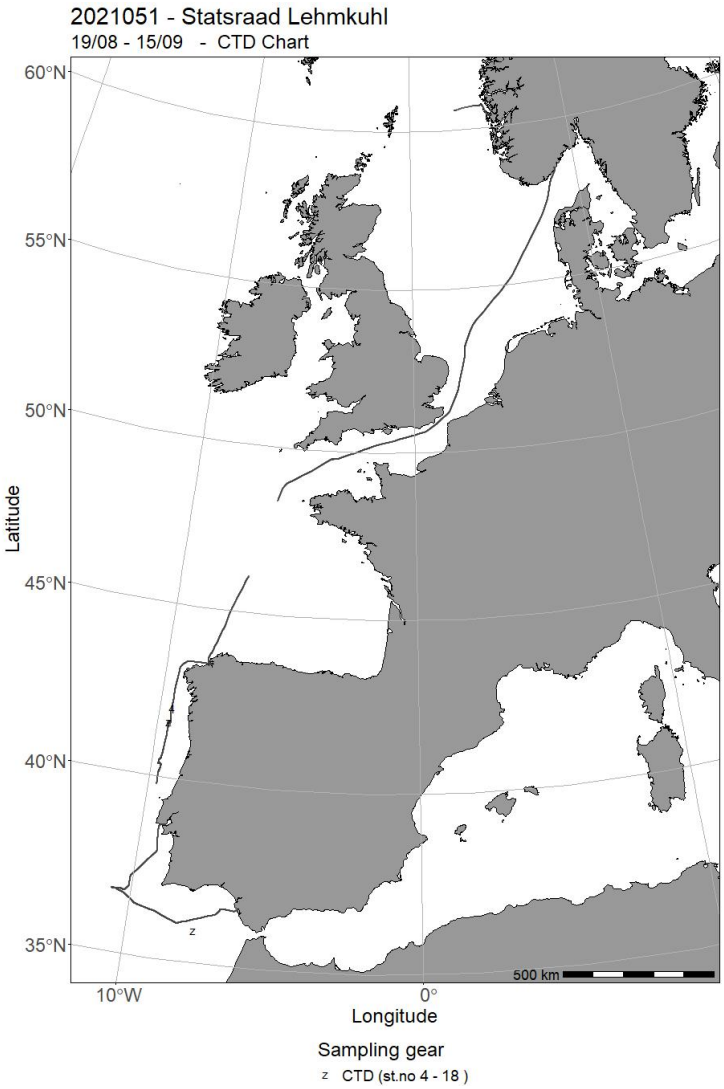
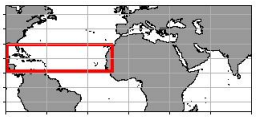


Fig. 17.1



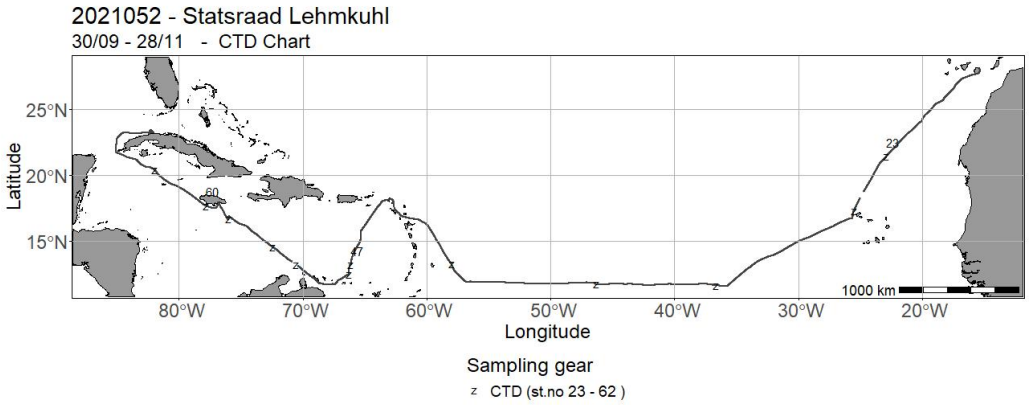

2021052 - Statsraad Lehmkuhl
30/09 - 28/11 - CTD Chart
25°N
20°N
15°N
Latitude
80°W
70°W
60°W
50°W
40°W
30°W
20°W
Longitude
1000 km
Sampling gear
CTD (st.no 23 - 62)

Fig. 17.2

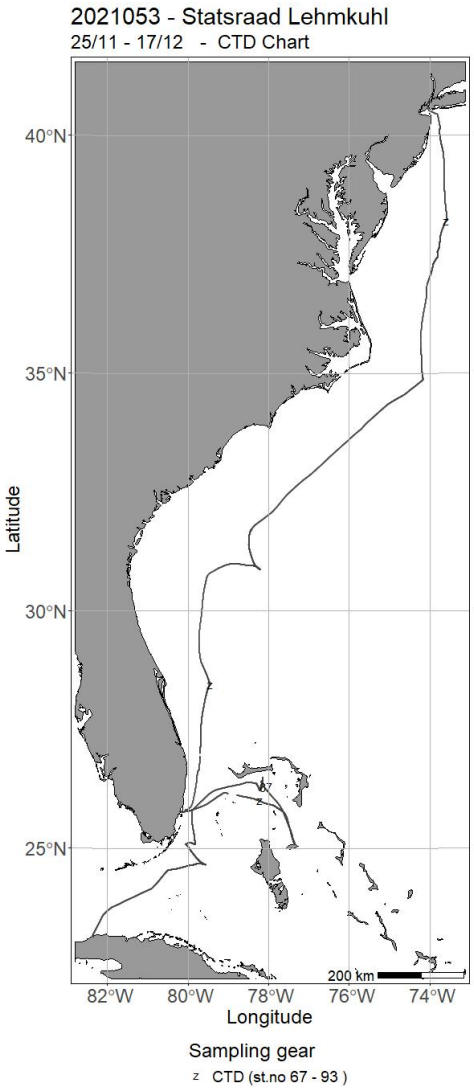
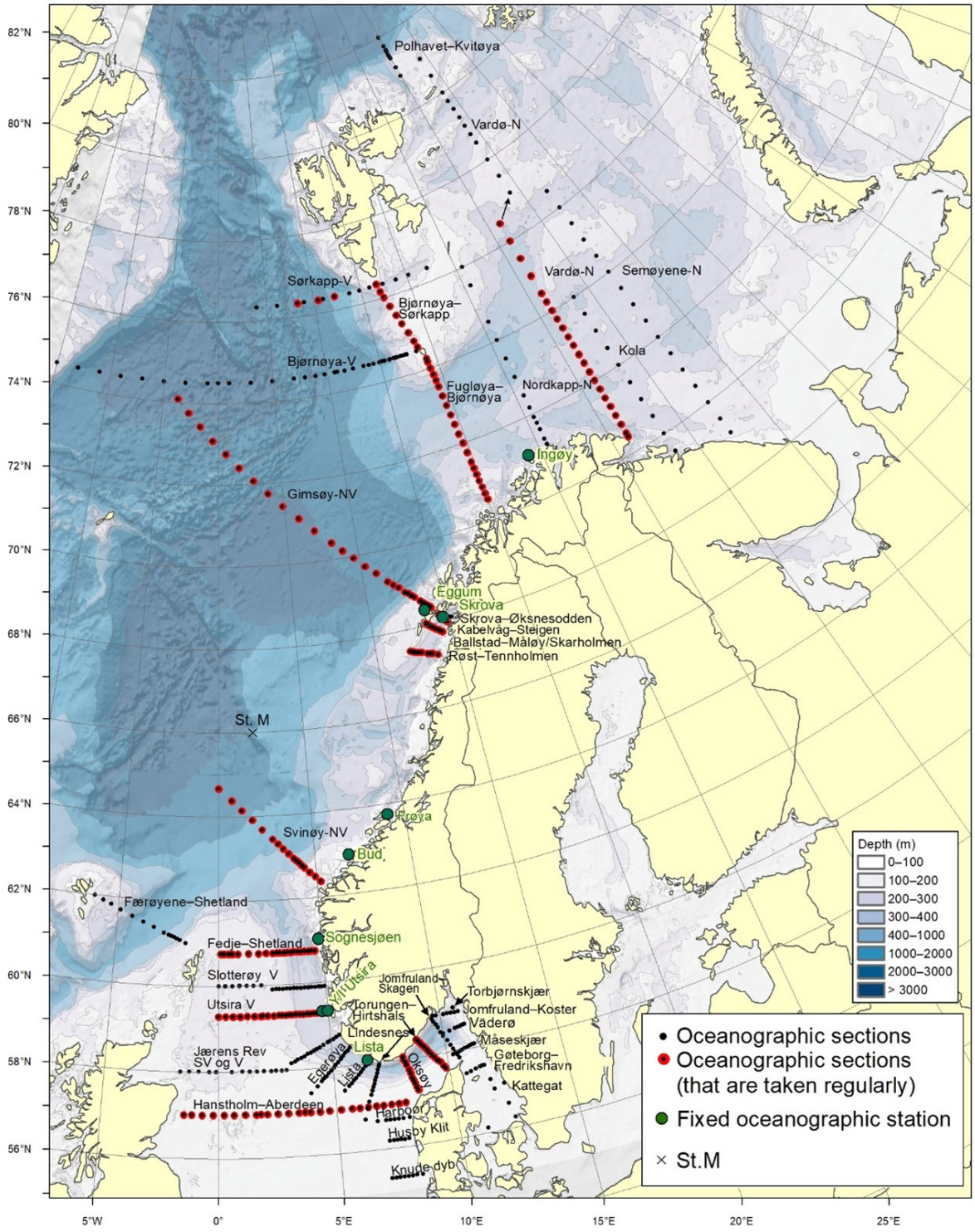

2021053 - Statsraad Lehmkuhl
25/11 - 17/12 - CTD Chart
40°N
35°N
30°N
25°N
Latitude
200 km
82°W
80°W
78°W
76°W
74°W
Longitude
Sampling gear
CTD (st.no 67 - 93)

Fig. 17.3

18 - Oceanographic sections and Fixed oceanographic stations map



19 - Tables – Observations in 2021. Oceanographic sections and fixed oceanographic stations

Oceanogr. sec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
North Sea												
Fedje–Shetland												
Slotterøy-West												
Utsira-West	2021201						2021207	2021617				
Jærens Rev-SW and W												
Egerøya-SW	2021201											
Lista-SW												
Lindesnes-SSW												
Hanstholm–Aberdeen	2021201							2021617				
Harboør												
Hysby Klit												
Knude-Dyb												

Oceanogr. sec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Skagerrak and Kattegat												
Torungen–Hirtshals	2021301	2021302	2021303	2021305	2021306	2021307	2021308	2021309	2021317	2021313	2021314	2021316
Oksøy–Hanstholm												
Jomfruland–Skagen												
Jomfruland–Koster												
Torbjørnskjær												
Väderø												
Måseskjær												
Gøteborg–Fredrikshavn												
Kattegat												

Oceanogr. sec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
The Norwegian Sea and Vestfjorden												
Svinøy-North/West	2021202		2021606		2021205		2021106 /208				2021212	
Gimsøy-North/West			2021606	2021205			2021106	2021208			2021212	
Bjørnøya-West			2021606	2021205				2021208				2021212
Sørkapp-West												
Færøyene–Shetland												
Skrova–Øksnesodden												
Kabelvåg–Steigen												
Ballstad–Måløy /Skarholmen												
Røst–Tennholmen												

Oceanogr. sec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
The Barents Sea												
Fugløya–Bjørnøya	2021202		2021606	2021205				2021208				
Vardø-North			2021203						2021209			
Semøyene-North												
Bjørnøya–Sørkapp												
Nordkapp-North												
Polhavet–Kvitøya												
Kola												
Fair Isle -Pentland												

Fixed stations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
LISTA N58º 05,1' E06º 32,5'	3	3	3	3	3	3	3	3	3	3	3	3	36
UTSIRA Y N59º 19' E04º 44'	4	3	3	2	0	2	5	3	3	3	4	4	36
UTSIRA I N59º 19'E04º 59'	4	3	3	2	0	2	5	3	3	3	4	4	36
SOGNESJØEN N61º 01' E04º 50'	1	2	1	2	3	2	2	2	3	0	2	1	21
BUD N62º 56' E06º 47'	2	3	2	2	2	2	3	3	3	4	3	3	32
SKROVA N68º 07' E14º 39'	3	3	4	2	1	4	3	1	4	3	4	3	35
EGGUM N68º 23' E13º 38'	4	3	4	3	5	4	2	4	4	5	4	2	44
INGØY N71º 08' E24º 01'	1	2	1	2	2	2	2	2	2	0	2	2	20

HAVFORSKNINGSINSTITUTTET

Postboks 1870 Nordnes
5817 Bergen
Tlf: 55 23 85 00
E-post: post@hi.no
www.hi.no