

Oversikt over tokt og stasjoner tatt i 2016 *Report on cruises and data stations 2016*

Karen E. Gjertsen, NMD



Oversikt over tokt og stasjoner tatt i 2016

Report on cruises and data stations 2016

By
Karen E. Gjertsen



Photo: Matteo Bernasconi: Mackerel in the trawl!

Bergen, 15.2.2017

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PROSJEKTRAPPORT



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Tittel (norsk/engelsk):
Oversikt over tokt og faste oseanografiske stasjoner tatt i 2016
Report on cruises and fixed oceanographic data stations, 2016

Forfatter(e):
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Charts made by Karen E. Gjertsen and Sebastian Bosgraaf
("G.M. Dannevig")

Sammendrag (norsk): Rapporten gir en oversikt over tokt i 2016 i regi av Havforskningsinstituttet og Universitetet i Bergen med G.O. Sars, Johan Hjort, Håkon Mosby, K. Bonnevie og G.M. Dannevig samt noen innleide fartøyer. En kort beskrivelse av toktet samt, kurs- og stasjonskart – hovedsakelig CTD, plankton og trålstasjoner er vist. Tabeller viser når de faste snittene er tatt, og antall observasjoner pr. måned for de faste stasjonene. Toktene er innrapportert til Det internasjonale råd for havforskning (ICES) i skjemaet: "Cruise Summary Report": <http://www.seadatanet.org/Metadata/CSR>. Data fra toktene er tilgjengelig fra Norsk marint datasenter ved Havforskningsinstituttet. Kartene kan internt lastes ned fra instituttets intranettside/bildearkiv: <http://hinnsiden.imr.no/ressurser/bilder/bildearkiv>. Kart i Mercator projeksjon.

Summary (English): The report gives an overview of cruises in 2016, by the Institute of Marine Research and University of Bergen, on board research vessels: G.O. Sars, Johan Hjort, Håkon Mosby, K. Bonnevie and G.M. Dannevig and some hired commercial vessels. Each cruise is described by a short description and a track chart mainly showing CTD, plankton and trawl stations. The coverage of the oceanographic sections is listed in a table. Another table shows the number of observations per month for the fixed stations. Meta data about the cruises are reported to the International Council for the Exploration of the Sea (ICES) using the form "Cruise Summary Report": <http://www.seadatanet.org/Metadata/CSR>. Research data are available from the Norwegian Marine Data Centre at Institute of Marine Research. The charts can internally at IMR be downloaded from the Institute Intranet/Archive: <http://hinnsiden.imr.no/ressurser/bilder/bildearkiv>. Charts in Mercator projection.

Emneord (norsk):
1. Kurskart
2. Stasjonskart
3. Toktmetadata

Subject heading (English):
1. Cruise track chart
2. Station chart
3. Cruise metadata


Prosjektleder


Faggruppelider

1 Cruises 2016

1.1 G.O. Sars (Ship code no 10)

CRUISE NO	PERIOD OF CRUISES		PURPOSE	AREA	CTD ST		TRAWL ST		PAGE OF CHART	COMMENT
	Start	End			Start	End	Start	End		
2016101	10 Jan	12 Feb	The survey combines the IBTS Q1 bottom trawl survey and the Utsira W hydrographic section (hydrography, chemistry, plankton, fish eggs and larvae).	North Sea	1	179	1	69	30-32	
2016102	13 Feb	15 Feb	The marine geological survey is a training course for students within marine geology and marine geophysics.	Norwegian fjords	180	181	-	-	33	
2016103	19 Feb	02 Mar	1. Development of environmentally friendly trawl technology – testing of trawls, catch release systems, and trawl monitoring systems. 2. Verification of sampling techniques for demersal and pelagic fishes. 3. Development and testing of acoustic techniques to see fish in the acoustic dead zone	Norwegian Sea	182	194	71	109	34-36	
2016104	04 Mar	10 Mar	Investigate biophysical environment and the spatial and temporal variation in acoustic backscattering near the LovE ocean observatory off Lofoten. Project: LoVe.	Norwegian Sea	195	220	110	120	36-37	
2016105	12 Mar	08 Apr	Primary objective: to assess the state of commercial deepwater fish stocks, with focus on redfish, Greater argentine and Greenland halibut. Secondary objective: to monitor the state of deepwater ecosystem along the Norwegian slope. In addition, the survey collected benthos at 2000-2500 m depth for bioprospecting.	Norwegian Sea, Barents Sea	-	-	121	175	38	
2016106	11 Apr	09 May	This cruise is part of the IMR monitoring project «Climate and plankton in the North Sea and Skagerrak». The cruise has been conducted each spring (April/May) since 2006 with the aim to provide one large coverage of the northern North Sea and Skagerrak each year. The cruise provides horizontal and vertical distributions of physical oceanographic parameters, chemistry, phytoplankton and zooplankton in the northern North Sea, Skagerrak and Kattegat.	North Sea, Skagerrak, Kattegat	221	454	-	-	39-41	

1.1 G.O. Sars (Cont)

CRUISE NO	PERIOD OF CRUISES		PURPOSE	AREA	CTD ST		TRAWL ST		PAGE OF CHART	COMMENT
	Start	End			Start	End	Start	End		
2016107	04 Jun	09 Jun	Test methods for quantification of plankton biomass, abundances and production.	Norwegian fjord: Korsfjorden	455	469	176	191	42-43	
2016108	14 Jun	17 Jun	Collecting biological and physical data along LoVe transect. 2. Conduct ROV surveys of nodeloc. 3. Retrieval and release of LoVe platform.	Norwegian coast: Lofoten/Vesterålen	470	471	-	-	44	
2016109	18 Jun	19 Jul	AMOR 2016 + SponGES	Norwegian Sea	472	490	-	-	45-46	
2016110	21 Jul	29 Jul	The cruise will study how coral ecosystems may be affected by ocean acidification and increased ocean temperatures by natural variation in abiotic environment and how this affects the growth, production and energy storage in coral and sponge. Collect data for time series.	Norwegian Sea	491	524	-	-	47	
2016111	02 Aug	13 Aug	The cruise was a part of the Norwegian funded research project VENTILATE. The project focuses on the link between ventilation processes and the oceanic carbon cycle, and how this connection is affected by the anthropogenic climate change.	Greenland Sea	525	565	-	-	48	
2016112	16 Aug	05 Sep	2016 GEO 008: Sampling of sediment cores and water samples to document the rapid climate change in the Nordic Sea-North Atlantic. The cruise is a sequel to ice2ice expedition with G.O.Sars 2015.	Iceland Sea, Labrador Sea, Irminger Sea	566	575	-	-	49	
2016113	13 Sep	04 Oct	Mareano. Sea bottom mapping with video-filming and sampling of benthic fauna and sediments at selected stations.	Barents Sea	576	594	-	-	50-52	
2016114	04 Oct	12 Oct	Collect fine-scale acoustic, biological, and environmental data for assessing the functional response of cod to its target prey species, in particular capelin under various environmental conditions, as part of the NRC funded project CODFUN.	Barents Sea	595	596	192	204	53-54	

1.1 G.O. Sars (Cont)

CRUISE NO	PERIOD OF CRUISES		PURPOSE	AREA	CTD ST		TRAWL ST		PAGE OF CHART	COMMENT
	Start	End			Start	End	Start	End		
2016115	13 Oct	27 Oct	Abundance estimation of plankton and mesopelagic fish. Project: Kofa and Lotromix	Norwegian Sea	596	610	205	232	55-56	
2016116	28 Oct	10 Nov	Collect in situ target strength data on mackerel in lateral aspect for conversion of sonar measurements of mean SV, CRISP project. Collect data on fish close to seabed with FM echo sounders EK80 at different pulse forms and frequencies. Instrument trials of sideways EK80, narrow beam. Instrument trials EK80, WBAT and TS probe. Catch trials on mackerel. Working mainly in the area close to Shetland - Orkneys in the main catching area for mackerel. Instrument trials in Norwegian Fjords close to Bergen.	North Sea	611	615	233	237	57-58	
2016117	12 Nov	23 Nov	The objectives of this cruise were to investigate the abundance zooplankton and phytoplankton as well as measuring the water physics and collecting water samples for chemical analyses using a CTD probe, on two of our regular sections in the Norwegian Sea and Barents Sea.	Norwegian Sea, Barents Sea	616	663	-	-	59	
2016118	24 Nov	01 Dec	Fjord ecosystem studies: Kaldfjord: Herring acoust. and whale observations. Repparfjord: Mapping of bottom fauna before mine sediment dumping. Revsbotn: Control site for Repparfjorden with mapping of bottom fauna. Porsangerfjord: Long Term Monitoring of King crab effect on benthos by mapping historical stations. KELPEX: Kelp export: fuel for adjacent communities in changing arctic ecosystems?	Norwegian Sea, Barents Sea	664	678	-	-	60-61	
2016119	07 Dec	14 Dec	ICES international course in broadband methods in Fisheries Acoustics. Teaching 20 scientists in broadband echo sounder methods. Project: ICES WB	Norwegian fjords	679	679	238	239	62	

1.2 Johan Hjort (Ship code no 12)

CRUISE NO	PERIOD OF CRUISES		PURPOSE	AREA	CTD ST		TRAWL ST		PAGE OF CHART	COMMENT
	Start	End			Start	End	Start	End		
2016201	11 Jan	20 Jan	Monitoring of physical, chemical and biological parameters, on standard sections.	Barents Sea, Greenland Sea, Norwegian Sea	01	46	01	01	63	
2016202	24 Jan	10 Mar	Annual combined acoustic and bottom trawl survey in the Barents Sea in winter to: <ul style="list-style-type: none"> • map the distribution and estimate acoustic and bottom trawl abundances indices, length, weight and maturity at age of cod, haddock and redfish • 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) • stomach sampling of cod • sampling of cod, haddock, saithe, capelin, polar cod and shrimps for NIFES and CEFAS 	Barents Sea	47	160	02	284	64-65	
3332016 203	21 Mar	03 Apr	Acoustic survey targeting spawning cod off Lofoten and Vesterålen including an egg survey.	Norwegian Sea/coast Lofoten and Vesterålen	161	270	285	316	66-67	
2016204	04 Apr	07 Apr	This field campaign will investigate how turbulence, particularly wind-induced mixing, influences vertical distribution of plankton. We will apply a range of novel instrumentation for physics (meteorology and oceanography) and plankton to study the dynamical changes in vertical distribution. The result will be the basis for improved models on transport of fish eggs, larvae and pollutant substances like particulate oil. Relevance: Fish recruitment dynamics, oil pollution, marine plastics.	Norwegian Sea/coast Lofoten and Vesterålen	271	316	-	-	68	
2016205	02 May	25 May	Part of the International Ecosystem Survey of the Nordic Seas (IESNS) where the objectives are (1) to measure the abundance of Norwegian spring-spawning herring and blue whiting using acoustics, (2) collect data on zoo- and phytoplankton, (3) measure the hydrographical conditions.	Norwegian Sea	317	381	317	361	69-70	
2016206	-	-			-	-	-	-		Cancelled

1.2 Johan Hjort (Cont.)

CRUISE NO	PERIOD OF CRUISES		PURPOSE	AREA	CTD ST		TRAWL ST		PAGE OF CHART	COMMENT
	Start	End			Start	End	Start	End		
2016207	27 Jun	14 Jul	<p>HERAS is an international acoustic research cruise on herring and sprat in the North Sea, Skagerrak-Kattegat and West of Scotland. The survey is coordinated by ICES, and Norway covers the northeastern part of the North Sea. Other countries participating are Scotland, the Netherlands, Germany, Denmark and Ireland. Relative indices of abundance and biomass are calculated on an autumn meeting joined by all participating nations. The indices are used in the stock assessments of e.g. North Sea herring, sprat in the North Sea and sprat in the Skagerrak-Kattegat.</p> <p>NORACU is an acoustic research cruise on saithe in the North Sea, when saithe is on the North Sea shelf and slope towards the Norwegian Trench (ICES Subarea 4) during their feeding period in summer. The aim of the survey is to provide a relative abundance index. This index is used in the stock assessment of saithe in the North Sea.</p>	North Sea	382	432	362	431	71-72	
2016208	15 Jul	13 Aug	<p>This survey combines the IBTS Q3 bottom trawl survey, coordinated by ICES/IBTSWG, NORACU acoustic survey for saithe, the Utsira-W transect with sampling for hydrography, chemistry, plankton, fish egg, and fish larvae, with pollution sampling for radioactivity, organic analyses (POPs), markers of contamination, and occurrence of micro plastics. The survey will take: the required GOV trawl stations; target and blind tows for saithe acoustic survey (bottom and pelagic); sediment grabs; micro plastic sampling from surface; water collections; CTDs/temp profiles for all tows + transect; MIK and Multinet tows for eggs and larvae studies; MOCNESS tows for plankton/other organisms; collect water samples for nutrients, radioactivity, and pollution; collect algae information.</p>	North Sea	433	558	432	526	73-76	

1.2 Johan Hjort (cont.)

CRUISE NO	PERIOD OF CRUISES		PURPOSE	AREA	CTD ST		TRAWL ST		PAGE OF CHART	COMMENT
	Start	End			Start	End	Start	End		
2016209	20 Aug	30 Sep	Map the distribution and estimate acoustic abundances of capelin, herring, polar cod and blue whiting. Map the distribution and estimate bottom trawl abundances indices of cod, haddock, redfish and Greenland halibut. Map the distribution and calculate pelagic trawl abundance indices of the main 0-group species. Stomach sampling of cod, capelin and polar cod. Benthos investigations from by-catch in the bottom trawl. Trawl experiments. Test two decontamination procedures for DNA-based diet studies of fish and crabs. Compare results from conventional diet studies and DNA-based diet studies of cod, beaked redfish and snowcrab. CTD-stations with measurement of temperature and salinity. Seabird observations along the cruise tracks.	Barents Sea	559	623	527	747	77-78	
2016210	01 Oct	30 Oct	Annual combined acoustic and bottom trawl survey. Map the distribution and estimate acoustic abundance indices, length, weight and maturity at age of cod, saithe and haddock. 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). Map the distribution and estimate acoustic abundance indices of herring in Kaldfjorden. Sampling of haddock and plaice for analysis of contamination (NIFES). Samples of <i>Pandalus borealis</i> for genetic analysis. Acoustic and hydrographical transect for the LoVe project.	Main Norwegian fjords and coastal banks	624	692	748	845	79-80	

1.3 Håkon Mosby (Ship code no 1)

CRUISE NO	PERIOD OF CRUISES		PURPOSE	AREA	CTD ST		TRAWL ST		PAGE OF CHART	COMMENT
	Start	End			Start	End	Start	End		
2016601	08 Jan	28 Jan	Annual shrimp survey.	North Sea, Skagerrak	01	106	01	108	81-82	
2016602	09 Feb	11 Feb	Student training cruise as part of regular course in practical oceanography and meteorology.	North Sea, Norwegian fjords	107	167	-	-	83	
2016603	15 Feb	19 Feb	Retrieve one fauna lander. Collect fauna for laboratory experiments. Collect water samples	Norwegian fjords	168	176	-	-	84	
2016604	-	-							-	Cancelled
2016605	01 Mar	13 Mar	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 parameters in the Norwegian Sea and Barents Sea. Sampling were made on standard sections and station M. The cruise programme included sampling for physical-chemical oceanographic parameters (CTD casts, nutrients and chlorophyll) and phytoplankton and zooplankton with plankton net and the MOCNESS.	Norwegian Sea, Barents Sea	177	221	-	-	85	
2016606	-	-							-	Cancelled
201607	01 Apr	14 Apr	Estimate the distribution and abundance of herring larvae. Additional environmental sampling of hydrography, nutrients, chlorophyll and zooplankton.	Norwegian Sea	222	399	-	-	86-87	
2016608	17Apr	25 Apr	The goal of the cruise is to collect fish eggs for mapping spawning areas in the project «National program for mapping of marine nature types». The primary targets for the mapping are local stock of coastal cod. The secondary goal is to visually determine all eggs and preserve these for further genetic studies. All eggs are photographed. Stations are located primarily in the inner fjord areas, with less emphasis on the outer coastal areas.	Barents Sea	-	-	-	-	88	
2016609	27 Apr	08 May	Regular monitoring of physical oceanography/climate, nutrients and lower trophic levels in the standard sections: Fugløya-Bjørnøya; Bjørnøya West; Gimsøy NW.	Norwegian Sea, Barents Sea	400	459	-	-	89-90	

1.3 Håkon Mosby (Cont)

CRUISE NO	PERIOD OF CRUISES		PURPOSE	AREA	CTD ST		TRAWL ST		PAGE OF CHART	COMMENT
	Start	End			Start	End	Start	End		
2016610	-	-							-	Cancelled
2016625	09 May	13 May	Deployment benthic lander (GEOMAR MoLab). Collect fauna for land based laboratory studies. Deployment fauna lander.	Norwegian fjords	460	466	-	-	91	
2016612	21 May	25 May	Polar buoy deployment.	Norwegian Sea	467	467	-	-	92	
2016611	26 May	15 Jun	A physical oceanography cruise for ocean mixing and water transformation process studies in the Lofoten Basin of the Norwegian Sea. The objectives include deployment of moorings, GPS-tracked drifters and acoustically-tracked RAFOS floats, ocean gliders, vertical microstructure sampling and hydrographic and current measurements with focus areas of Lofoten Basin vortex and the Mohn Ridge.	Norwegian Sea	468	513	-	-	93-94	
2016613	-	-			-	-	-	-	-	Cancelled
2016628	03 Jul	06 Jul	Cruise in „The LoVe Observatory Infrastructure“ „The Lofoten-Vesterålen Cabeled Ocean Observatory“.	Norwegian Sea	514	519	-	-	95	
2016614	08 Jul	14 Jul	Geophysical seismic survey, joint with land seismic experiment. Investigation of crustal and upper mantle structure of the ocean-continent transition around Lofoten. Main tasks : Ocean Bottom Seismometers. Multi-channel seismics, Gravity measurments	Vestfjorden, Lofoten area	-	-	-	-	96	
2016615	13 Oct	27 Oct	Video Cruise.	Norwegian fjord: Sognefjorden	-	-	-	-	97	
2016616	25 Jul	06 Aug	Survey of environment and plankton on standard sections and on "weather station M". Measurement of physical, chemical and biological parameters that are of importance to register changes in climate and environment at "weather station M" in the Norwegian Sea. Measure physical variables (ctd casts) on standard section "Sørkapp-W". Take samples for radioactivity on wreck of "Komsomolets".	Norwegian Sea, Barents Sea	520	590	-	-	98	

1.3 Håkon Mosby (Cont)

CRUISE NO	PERIOD OF CRUISES		PURPOSE	AREA	CTD ST		TRAWL ST		PAGE OF CHART	COMMENT
	Start	End			Start	End	Start	End		
2016617	12 Aug	20 Aug	Student cruise for the course AGF-214 Polar Ocean Climate at the University Center in Svalbard	Eastern Fram Strait. Fjords and west coast of Spitsbergen.	591	757	-	-	99	
2016618	21 Aug	6 Sep	The cruise is a part of a project with the objective to investigate modifications of water masses and thus the origins of the overflow water from the Iceland Sea and the inflow of low salinity water from the Iceland Sea to the Norwegian Sea.	Norwegian Sea, Greenland Sea	758	917	-	-	100	
2016619	12 Sep	28 Sep	A) Training cruise in BIO 325 – Ocean Science (Part IV : Fisheries Ecology and Management). Applying Pelagic (multi-sampler) and demersal trawls, including MIK (Juvenile midwater pelagic trawl). Hydroacoustic biomass estimation. B) Hydrographic section Feie – Shetland. C) Training course BIO325 in Masfjorden and Lustrafjorden (Part III : Marine Ecological Field Methods) Applying Pelagic (multi-sampler) and Demersal trawls, including Multinet. D) Measuring light spectrum and intensity by depth.	Norwegian Sea, North Sea	918	958	109	186	101-103	
2016627	28 Sep	29 Sep	The purpose of the cruise was to introduce the students in our « Physics of the Atmosphere and Ocean » GEOF105, to oceanographic and atmospheric field work. The students are divided in two groups, and the two days are quite similar, with the one difference being that we did a CTD cross section of the fjord to the north of Osterøy on the first day (Osterfjorden), and to the south of Osterøy the second day (Sørfjorden).	Norwegian coast, Osterfjorden and Sørfjorden	959	974	-	-	104	
2016620	05 Oct	01 Nov	Distribution and acoustic abundance of cod, saithe and haddock. Environmental stations in main fjords.	Norwegian coast	975	1034	187	289	105-107	

1.4 Kristine Bonnevie (Ship code no 1)

CRUISE NO	PERIOD OF CRUISES		PURPOSE	AREA	CTD ST		TRAWL ST		PAGE OF CHART	COMMENT
	Start	End			Start	End	Start	End		
2016623	25 Nov	04 Dec	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 parameters in the North Sea. Sampling was undertaken on the following standard sections: Utsira W and Aberdeen-Hanstholm. In addition, a series of samplings were undertaken north and west of the Orkney Islands and along the Scottish east coast between the Orkneys and Aberdeen for an investigation of herring larvae distributions. The cruise programme included sampling for physical-chemical oceanographic parameters (CTD casts, nutrients and chlorophyll) and phytoplankton and zooplankton with plankton net and the MOCNESS. A larger plankton net was used to sample the fish larvae.	North Sea	1	71	-	-	108-109	
2016624	06 Dec	16 Dec	Survey and map the distribution of herring and sprat acoustically in the fjords Nordfjord, Sognefjorden and Hardangerfjorden. Also survey the amount of zooplankton (food for sprat and herring) in the surveyed areas by plankton nets.	North Sea	72	101	01	29	110-111	
2016630	18 Dec	20 Dec	Sea testing of all demersal trawls to be used during the annual shrimp survey that will be conducted by the IMR in January 2017.	North Sea	-	-	30	48	112	

1.5 G.M. Dannevig (Ship code no 16)

CRUISE NO	PERIOD OF CRUISES		PURPOSE	AREA	CTD NO		PAGE OF CHART	COMMENT
	Start	End			Start	End		
2016301	13 Jan	19 Jan	Hydrographic standard section "Torungen-Hirtshals", environmental investigation. Long-term environmental monitoring on a near-shore station outside Arendal and in the fjords along the Norwegian Skagerrak coast.	Skagerrak	1	30	113	
2016302	01 Feb	07 Feb	Hydrographic standard section "Torungen-Hirtshals", environmental investigation. Long-term environmental monitoring on a near-shore station outside Arendal and in the fjords along the Norwegian Skagerrak coast.	Skagerrak	31	67	114	
2016303	02 Mar	08 Mar	Hydrographic standard section "Torungen-Hirtshals", environmental investigation. Long-term environmental monitoring on a near-shore station outside Arendal and in the fjords along the Norwegian Skagerrak coast.	Skagerrak	68	103	115	
2016304	14 Mar	25 Mar	Mapping distribution area of coastel cod.	Møre og Romsdal	-	-	-	No chart
2016305	13 Apr	20 Apr	Hydrographic standard section "Torungen-Hirtshals", environmental investigation. Long-term environmental monitoring on a near-shore station outside Arendal and in the fjords along the Norwegian Skagerrak coast.	Skagerrak	104	129	116	
2016306	07 May	13 May	Hydrographic standard section "Torungen-Hirtshals", environmental investigation. Long-term environmental monitoring on a near-shore station outside Arendal and in the fjords along the Norwegian Skagerrak coast.	Skagerrak	130	155	117	
2016307	05 Jun	14 Jun	Hydrographic standard section "Torungen-Hirtshals", environmental investigation. Long-term environmental monitoring on a near-shore station outside Arendal and in the fjords along the Norwegian Skagerrak coast.	Skagerrak	156	193	118	
2016308	01 Jul	08 Jul	Hydrographic standard section "Torungen-Hirtshals", environmental investigation. Long-term environmental monitoring on a near-shore station outside Arendal and in the fjords along the Norwegian Skagerrak coast.	Skagerrak	194	234	119	

G.M. Dannevig (cont.)

CRUISE NO	PERIOD OF CRUISES		PURPOSE	AREA	CTD NO		PAGE OF CHART	COMMENT
	Start	End			Start	End		
2016309/ 310	08 Aug	24 Aug	Hydrographic standard section "Torungen-Hirtshals", environmental investigation. Long-term environmental monitoring on a near-shore station outside Arendal and in the fjords along the Norwegian Skagerrak coast. Monitoring lobster/MPA.	Skagerrak	235	274	120	
2016311	25 Aug	26 Aug	Collecting background data for salmon lice monitoring.				-	
2016312/ 2016613	13 Sep	02 Oct	Hydrographic standard section "Torungen-Hirtshals", environmental investigation. Long-term environmental monitoring on a near-shore station outside Arendal and in the fjords along the Norwegian Skagerrak coast. Beach seine studies to measure recruitment of coastal fish-species.	Skagerrak	275	347	121	
2016314	03 Oct	08 Oct	Hydrographic standard section "Torungen-Hirtshals", environmental investigation. Long-term environmental monitoring on a near-shore station outside Arendal and in the fjords along the Norwegian Skagerrak coast.	Skagerrak	348	371	122	
2016315	09 Nov	14 Nov	Hydrographic standard section "Torungen-Hirtshals", environmental investigation. Long-term environmental monitoring on a near-shore station outside Arendal and in the fjords along the Norwegian Skagerrak coast.	Skagerrak	372	410	123	
2016316	15 Nov	06 Dec	Resource studies in coastal cod.	Skagerrak	411	411	124	
2016317	07 Dec	13 Dec	Hydrographic standard section "Torungen-Hirtshals", environmental investigation. Long-term environmental monitoring on a near-shore station outside Arendal and in the fjords along the Norwegian Skagerrak coast.	Skagerrak	412	434	124	

1.6 Selected cruises carried out by fishing vessels hired by IMR

CRUISE NO	PERIOD OF CRUISES		VESSEL	PURPOSE	AREA	CTD ST		TRAWL ST		PAGE OF CHART	COMMENT
	Start	End				Start	End	Start	End		
2016846	25 Jan	08 Feb	H. Hanssen	Abundance and distribution of cod and haddock. Project: Arctic Winter survey.	Greenland Sea, Barents Sea	01	31	01	82	125-126	
2016838	02 Sep	16 Sep	H. Hanssen	This survey was the third SI_ARCTIC survey. While the surveys in 2014 and 2015 were 3 weeks combination surveys of SI_ARCTIC and the Ecosystem survey, the 2016 survey was a two week SI_ARCTIC survey. The main goal of the survey was: <ul style="list-style-type: none"> • To conduct baseline investigations of the marine ecosystem north of Svalbard • Diet investigations of harp seals • Extend the investigations/sampling in the marginal ice zone on the Yermak Plateau and above the deeper basins (compared to 2014 and 2015) • Obtain data for evaluating inter-annual variations 2014-2018 	Arctic Ocean	32	58	83	127	127-128	
2016847	24 Sep	05 Oct	H. Hanssen	The aim of the Arctic part of the ecosystem survey in the Barents Sea is to monitor the status and changes of the Arctic part of the Barents Sea Ecosystem to support scientific research and management advice. The survey covers the areas around Svalbard and monitoring includes physical properties, organisms from most trophic levels and habitats, pollution and acidification. The output of the survey is used in assessment of several commercial resources in the Barents Sea.	Svalbard area	62	110	81	148	129-130	

1.6 Selected cruises carried out by fishing vessels hired by IMR (cont.)

CRUISE NO	PERIOD OF CRUISES		VESSEL	PURPOSE	AREA	CTD ST		TRAWL ST		PAGE OF CHART	COMMENT
	Start	End				Start	End	Start	End		
2016851	02 Feb	14 Feb	Vendla	Acoustic registrations of Norwegian Spring Spawning Herring at the spawning locations.	Norwegian Sea	-	-	01	14	131	
2016829	01 Jul	31 Jul	Vendla	Primary objective: Swept area trawling for mackerel. Secondary objective: Acoustic registrations and trawling for herring and blue whiting. Sampling of zooplankton and water temperature/salinity. Marine mammals observations.		01	70	15	105	132-133	
2016833	02 Feb	12 Feb	M.Ytterstad	Collection of acoustic data from fisheries sonar for biomass estimation of herring <ul style="list-style-type: none"> • Collection of acoustic data from echo sounder for biomass estimation of herring • Collection of biological samples for estimation of species and size composition in the acoustic observations 	Norwegian Sea	-	-	01	14	134	
2016857	03 Jun	10 Jun	M.Ytterstad	The cruise was part of a joint annual international acoustic trawl survey to monitor the abundance and distribution of Norwegian Spring Spawning herring and blue whiting in the Norwegian Sea.	Norwegian Sea, Barents Sea	01	14	15	25	135-136	
2016828	01 Jul	31 Jul	M.Ytterstad	Part of the International Ecosystem Summer Survey of the Nordic Seas (IESSNS) where the objectives are (1) to measure the abundance of Northeast Atlantic mackerel using swept-area method (2) measure the abundance of Norwegian spring-spawning herring and blue whiting using acoustics, (2) collect data on zooplankton, (3) measure the hydrographical conditions.	Norwegian Sea	16	88	26	112	137-138	

1.6 Selected cruises carried out by fishing vessels hired by IMR (cont.)

CRUISE NO	PERIOD OF CRUISES		VESSEL	PURPOSE	AREA	CTD ST		TRAWL ST		PAGE OF CHART	COMMENT
	Start	End				Start	End	Start	End		
2016834	03 Feb	08 Feb	Libas	Acoustic estimation of Norwegian spring-spawning herring	Norwegian Sea	-	-	01	06	139	
2016843	21 Mar	06 Apr	Brennholm	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: International Blue Whiting Spawning Stock Survey, Coordinating body: WGIPS, ICES.	Northeast Atlantic Ocean	01	28	01	15	140-141	
2016810	19 Sep	02 Oct	Brennholm	<ul style="list-style-type: none"> • Collection of acoustic data from fisheries sonar for biomass estimation of individual mackerel schools • Purse seine catch of individual mackerel schools for comparison with sonar estimates • Measure environmental parameters inside the purse seine during catches • Test transponders mounted in the bottom line of the purse seine 	Norwegian Sea	-	-	-	-	142	
2016837	25 Apr	15 May	Eros	Measuring the abundance, distribution and age composition of sandeel. <ul style="list-style-type: none"> • Dredge sampling for burrowed sandeels, bottom trawls, pelagic trawls, echo sounder sampling, zooplankton sampling, mapping of hydrographical conditions. 	North Sea	01	34	01	40	143-145	
2016842	17 Aug	20 Sep	Eros	Collect acoustic and biological data for assessing the abundance and size structure of the Barents Sea capelin stock for stock advice. As far as possible, collect the same information for other pelagic stocks in the Barents Sea. Undertake standard trawl samples from fixed shallow depths for assessing 0-group abundance in the Barents Sea. In addition, collect data on zooplankton and phytoplankton abundance and composition, nutrients, hydrography and acidification, bird (quantitative) and whale (semi-quantitative) abundance.	Barents Sea	35	149	41	160	146-147	

1.6 Selected cruises carried out by fishing vessels hired by IMR (cont.)

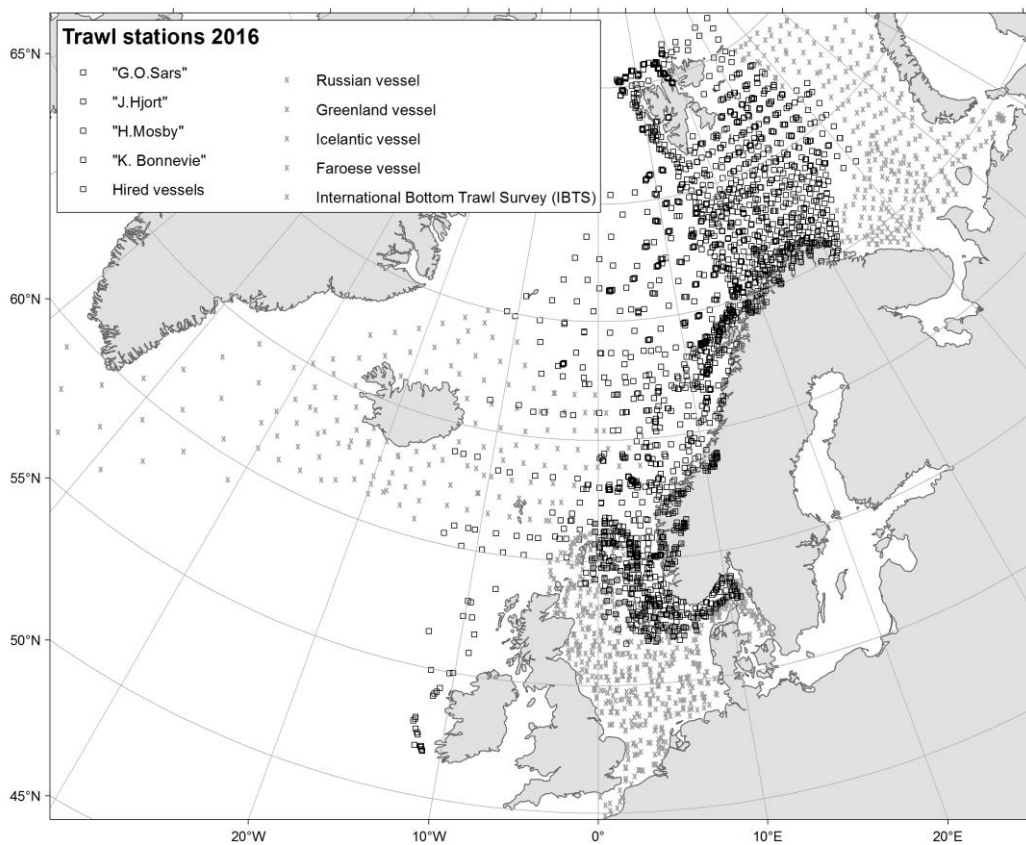
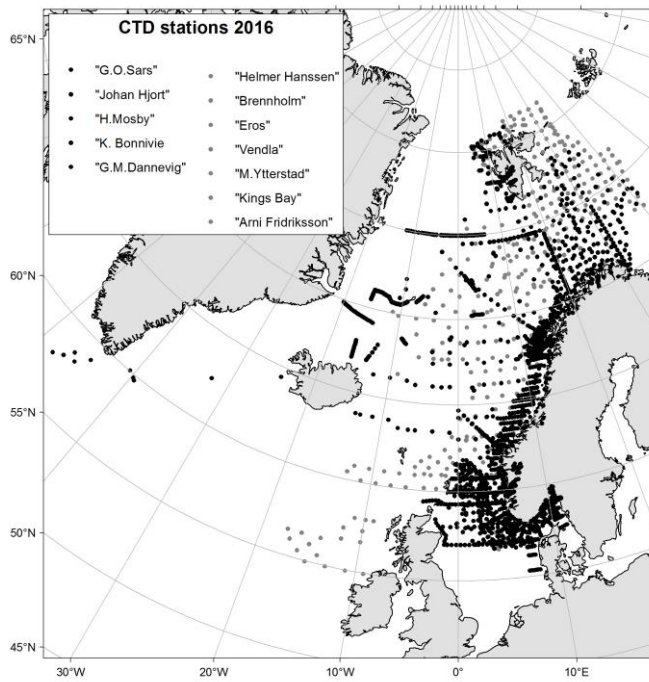
CRUISE NO	PERIOD OF CRUISES		VESSEL	PURPOSE	AREA	CTD ST		TRAWL ST		PAGE OF CHART	COMMENT
	Start	End				Start	End	Start	End		
2016826	26 Sep	30 Sep	Eros	Collection of acoustic data from fisheries sonars for biomass estimation and behavioural studies of mackerel schools during commercial fishing. Monitoring of school and net during commercial fishing operations.	Norwegian Sea	-	-	-	-	-	No chart
2016844	02 May	15 May	Kings Bay	<ul style="list-style-type: none"> • Investigate presence of NSS herring in the echo sounder acoustic blind zone. • Investigate NSS herring avoidance to approaching surveying vessel. • Species identification between NSS herring and blue whiting in deep layers. 	Norwegian Sea	01	06	01	24	148-149	
2016840	06 Oct	17 Jun	Kings Bay	<ul style="list-style-type: none"> • Collection of acoustic data from fisheries sonar for biomass estimation of individual North sea herring schools during normal commercial fishing • Purse seine catch of individual North sea herring schools for comparison with sonar estimates 	North Sea	-	-	-	-	150	
2016832	03 May	02 Jun	Fiskebas	Tagging with RFID technology and biological sampling of mackerel in the spawning areas west of Ireland and Scotland.	Northeast Atlantic Ocean	-	-	-	-	-	No chart
2016852	06 Oct	10 Oct	Fiskebas	<ol style="list-style-type: none"> 1. To document the functionality of a suggested method for slipping (releasing) fish from a purse seine during fishing. This was done by physical measurements of the escape opening as well as studying fish behaviour during release. 2. To test a prototype of float (for the floatline of the seine) equipped with LED light to improve the visibility of the seine during dark hours. 3. To measure physical conditions (oxygen) inside a seine in the late phases of a seine cast. 	Norwegian Sea	-	-	-	-	151	
2016825	02 Jun	13 Jun	Reinebuen	Collecting samples from Minke whales, blubber, muscle, liver, eye and ovaries. Briefly checking stomach contents.	Greenland Sea	-	-	-	-	-	No chart

1.6 Selected cruises carried out by fishing vessels hired by IMR (cont.)

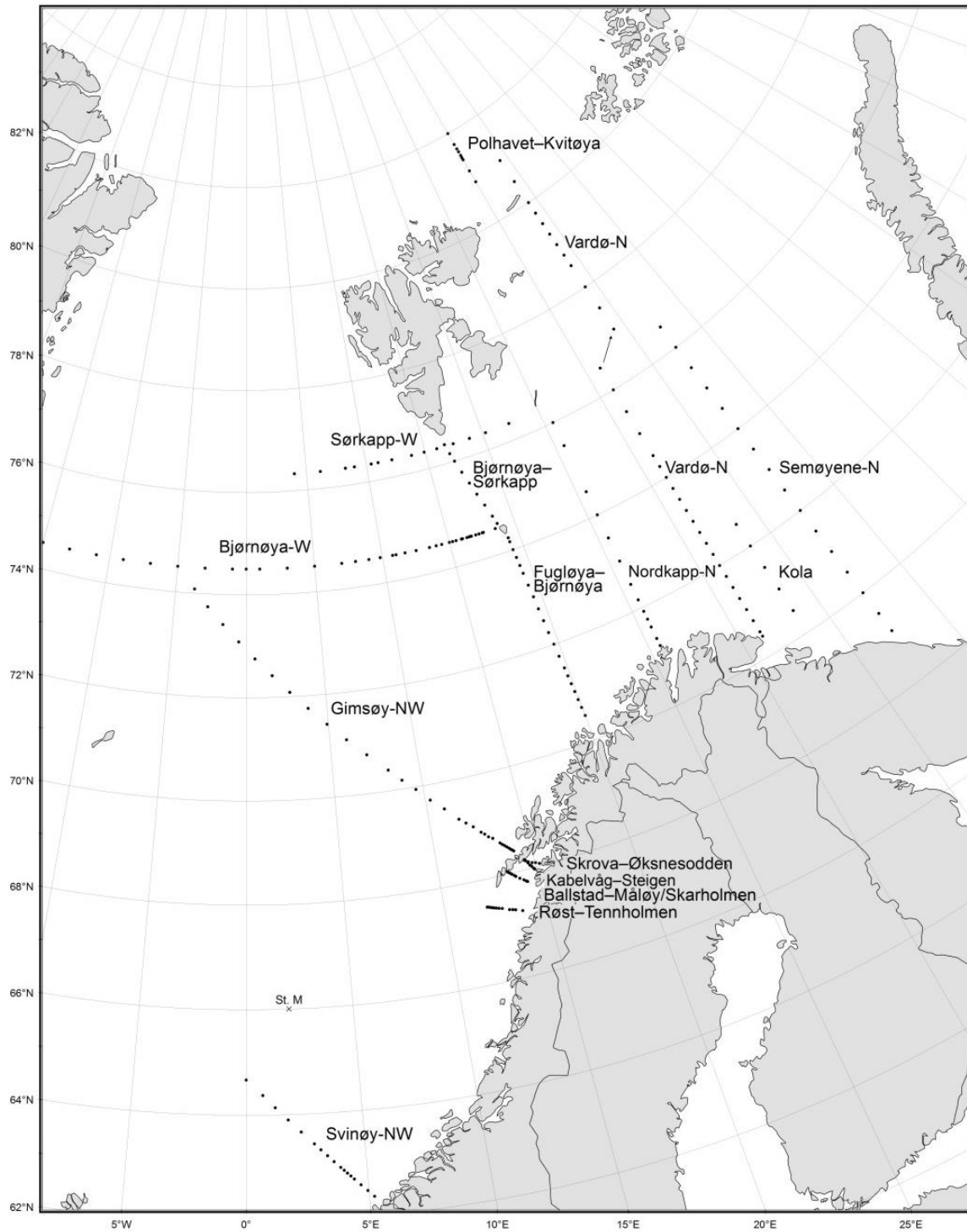
CRUISE NO	PERIOD OF CRUISES		VESSEL	PURPOSE	AREA	CTD ST		TRAWL ST		PAGE OF CHART	COMMENT
	Start	End				Start	End	Start	End		
2016848	06 Jun	12 Jun	Johan Ruud	Study the spreading area for red king crab in Vest Finnmark, Norway. This is the area for a free fishing for red king crab and the further spreading is monitored. Sampling eggs and hydrographical data in Repparfjorden and Revsbotn	Barents Sea, coastal area	-	-	-	-	152	
2016849	22Aug	09 Sep	Johan Ruud	Stock assessment study for red king crab in East Finnmark, Norway. This is the quota regulated area for red king crab. The first part of the cruise was conducted in the three selected fjords; Varangerfjorden, Porsangerfjorden and Laksefjorden. Thereafter the cruise went on between Vardø in east to Slettnes in west, an area called Østhavet, here we only used traps.	Barents Sea, coastal area	-	-	-	-	153	
2016845	11 Aug	01 Sep	Arni Fredriksson	To assess the stock of <i>Sebastes mentella</i> in the open Norwegian Sea. To collect biological and hydrological data in support to integrated ecosystem in the open Norwegian Sea, as part of the international deep pelagic ecosystem surveys (ICES-WGIDEEPS).	Norwegian Sea	-	-	-	-	-	No chart
2016827	10 Oct	12 Oct	A.Selsbane	Collection of acoustic data from fisheries sonar for biomass estimation of individual mackerel schools. Purse seine catch of individual mackerel schools for comparison with sonar estimates. Dynamics of school before, during and after the purse seine haul. Project: REDSLIP	Norwegian Sea	-	-	-	-	-	No chart
2016845	11 Aug	01 Sep	Arni Fridriksson	To assess the stock of <i>Sebastes mentella</i> in the open Norwegian Sea. To collect biological and hydrological data in support to integrated ecosystem in the open Norwegian Sea, as part of the international deep pelagic ecosystem surveys (ICES-WGIDEEPS).	Norwegian Sea	-	-	-	-	154	

2 Charts – overview

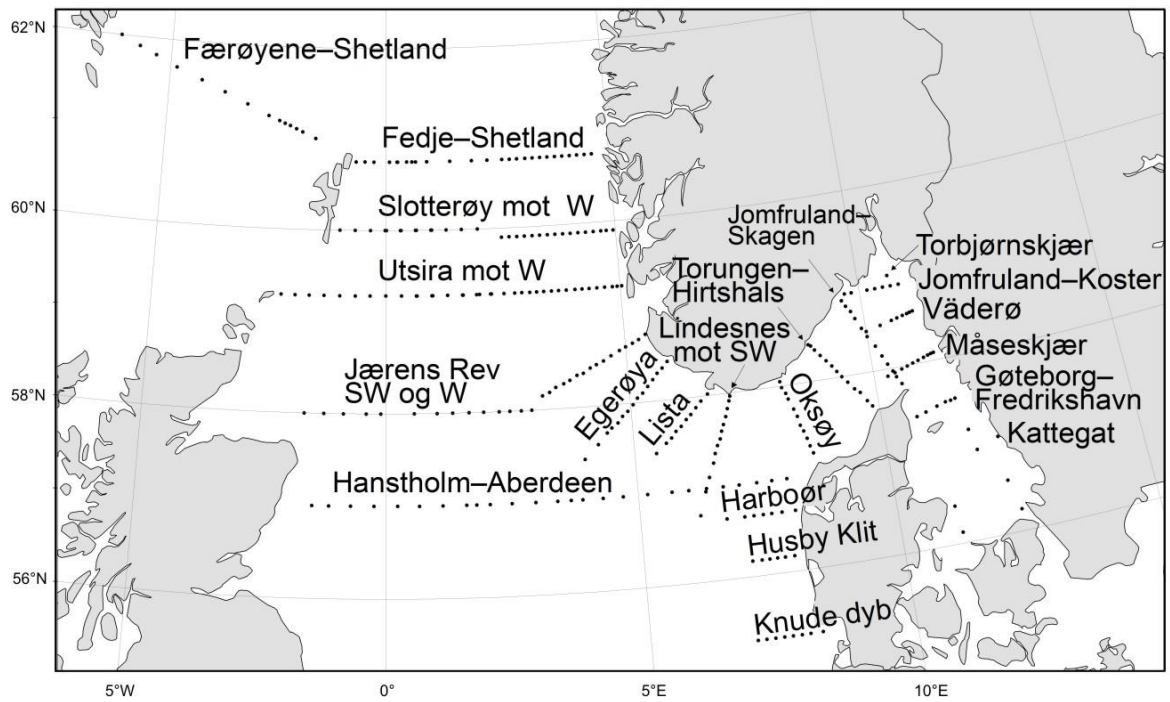
2.1 CTD and trawlstations 2016



2.2 Oceanographic sections



Norwegian Sea and Barents Sea



North Sea, Skagerrak and Kattegat

2.3 Fixed oceanographic stations



3 Tables – Observations in 2016

3.1 Oceanographic sections 2016 (Cruise no)

Area	Oceanogr. sec.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
North Sea	Fedje–Shetland				2016106					2016619				
	Slotterøy-West													
	Utsira-West	2016101			2016106				2016208			2016623		
	Jærens Rev-SW and W				2016106									
	Egerøya-SW				2016106									
	Lista-SW				2016106									
	Lindesnes-SSW				2016106									
	Hanstholm–Aberdeen				201606									2016623
	Harboør													
	Hysby Klit													
Knude-Dyb														
Skagerrak and Kattegat	Torungen–Hirtshals	2016301	2016302	2016303	2016305	2016306	2016307	2016308	2016309	2016312	2016314	2016315	2016316	
	Oksøy–Hanstholm				2016106									
	Jomfruland–Skagen													
	Jomfruland–Koster				2016106									
	Torbjørnskjær													
	Väderø				2016106									
	Måseskjær				2016106									
	Gøteborg–Fredrikshavn				2016106									
	Kattegat													

Area	Oceanogr. sec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
The Norwegian Sea and Vestfjorden	Svinøy-North/West	2016201		2016605		2016205		2016616				2016117	
	Gimsøy-North/West			2016605		2016609		2016616				2016117	
	Bjørnøya-West				2016609				2016616				
	Sørkapp-West								2016616				
	Færøyene–Shetland												
	Skrova–Øksnesodden												
	Kabelvåg–Steigen			2016203									
	Ballstad–Måløy/Skarholmen			2016203									
	Røst–Tennholmen			2016203									
The Barents Sea	Fugløya–Bjørnøya	2016201		2016605	2016609				2016616			2016117	
	Vardø-North		2016202						2016842				
	Semøyene-North												
	Bjørnøya–Sørkapp												
	Nordkapp-North												
	Polhavet–Kvitøya												
	Kola												

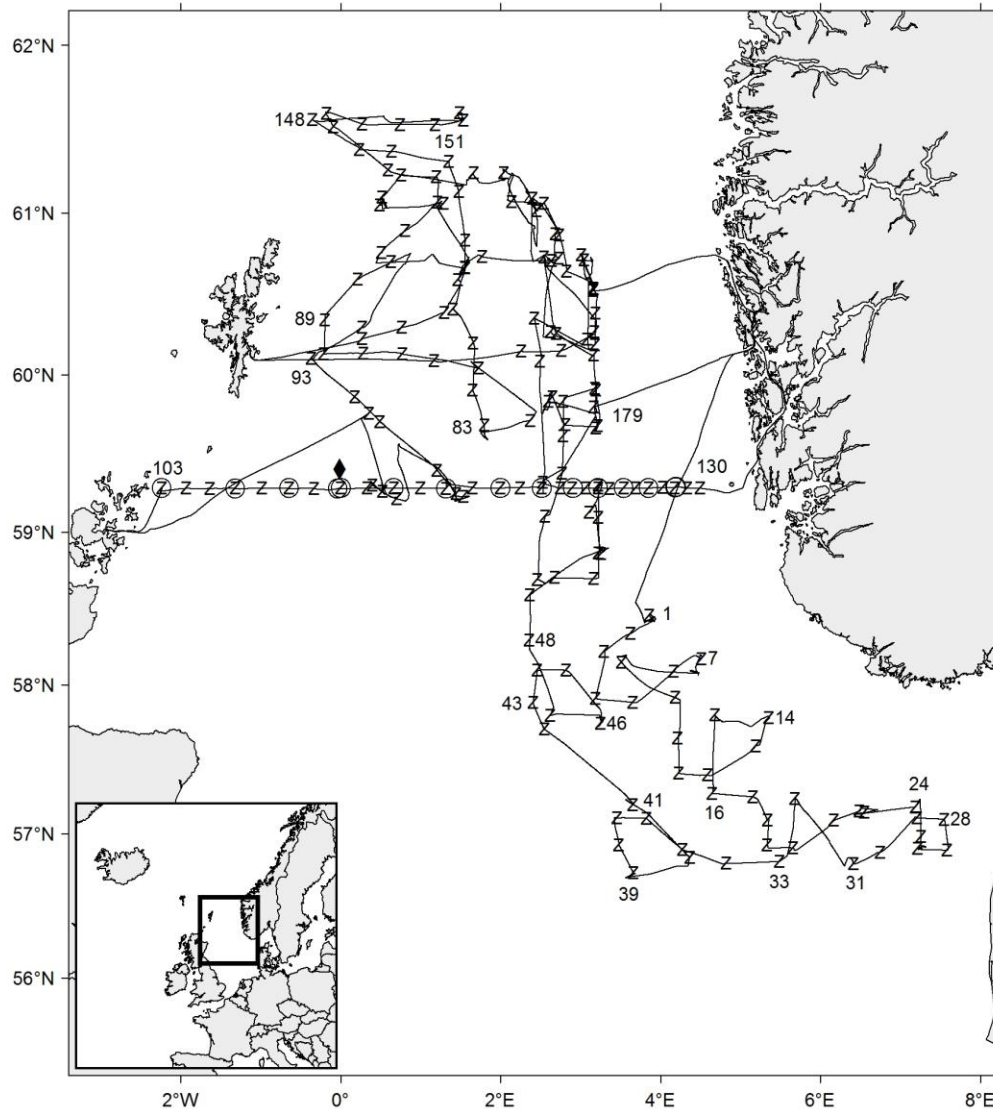
3.2 Fixed oceanographic stations 2016

(No of observations)

Fixed stations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
LISTA N58° 05,1' E06° 32,5'	3	3	3	3	3	3	3	3	4	3	2	4	37
UTSIRA Y N59° 19' E04° 44'	2	3	2	1	3	4	3	3	-	1	2	1	25
UTSIRA I N59° 19' E04° 59'	2	3	2	1	4	5	3	3	-	1	2	1	27
SOGNESJØEN N61° 01' E04° 50'	1	3	2	2	3	2	3	4	2	2	1	-	25
BUD N62° 56' E06° 47'	-	1	1	1	1	1	-	-	1	1	-	1	8
SKROVA N68° 07' E14° 39'	3	2	2	3	3	4	5	3	4	4	6	2	41
EGGUM N68° 23' E13° 38'	3	1	1	3	3	2	3	3	3	4	2	-	28
INGØY N71° 08' E24° 01'	2	2	3	2	2	2	-	-	-	3	2	2	20
Frøya N63° 44,6' E09° 05,1'	1	1	2	1	1	1	-	1	-	3	1	-	12

4 Charts for cruises 2016

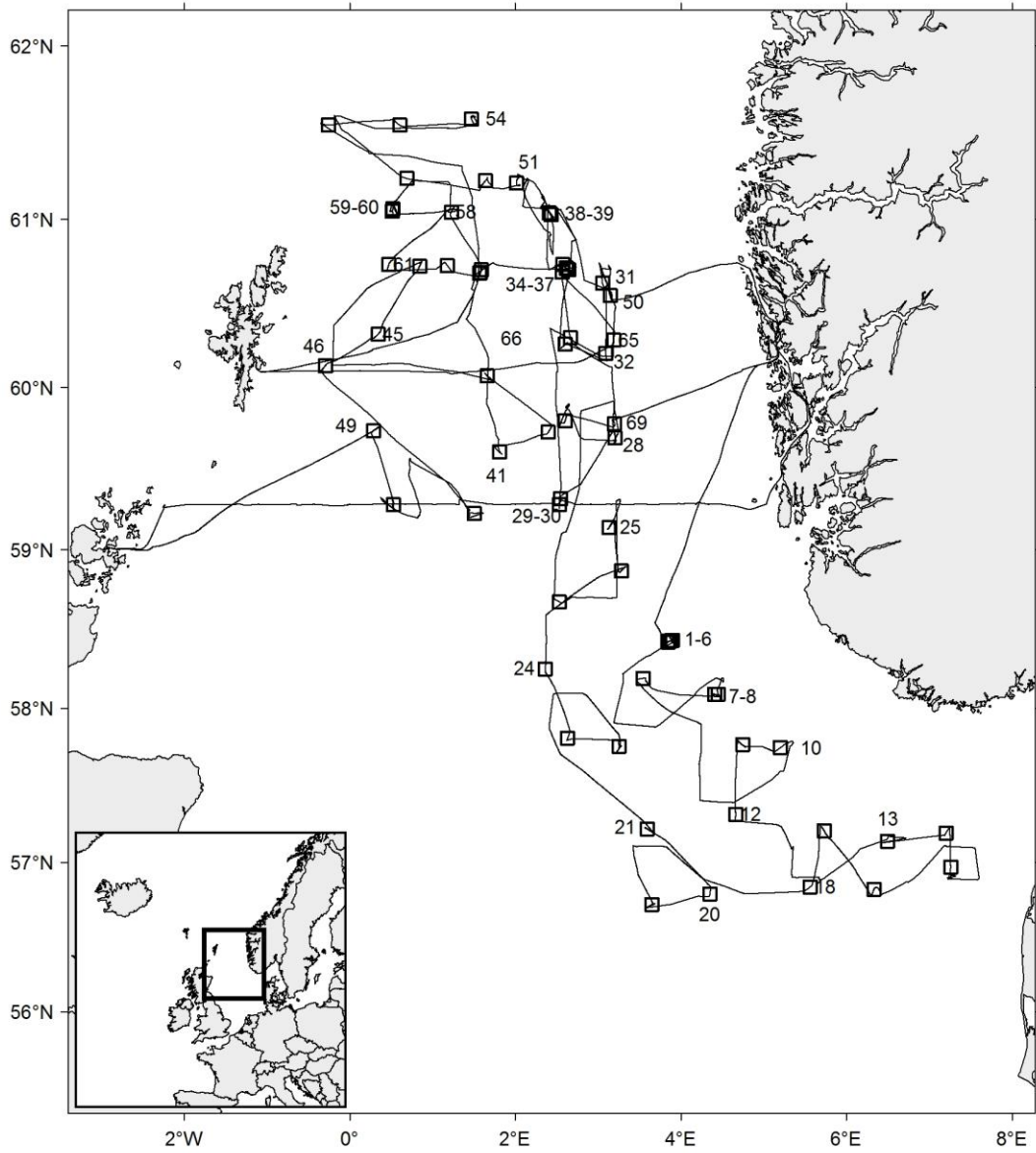
4.1 G.O. Sars



Cruise no 2016101 "G.O.Sars"
10 January–12 February 2016

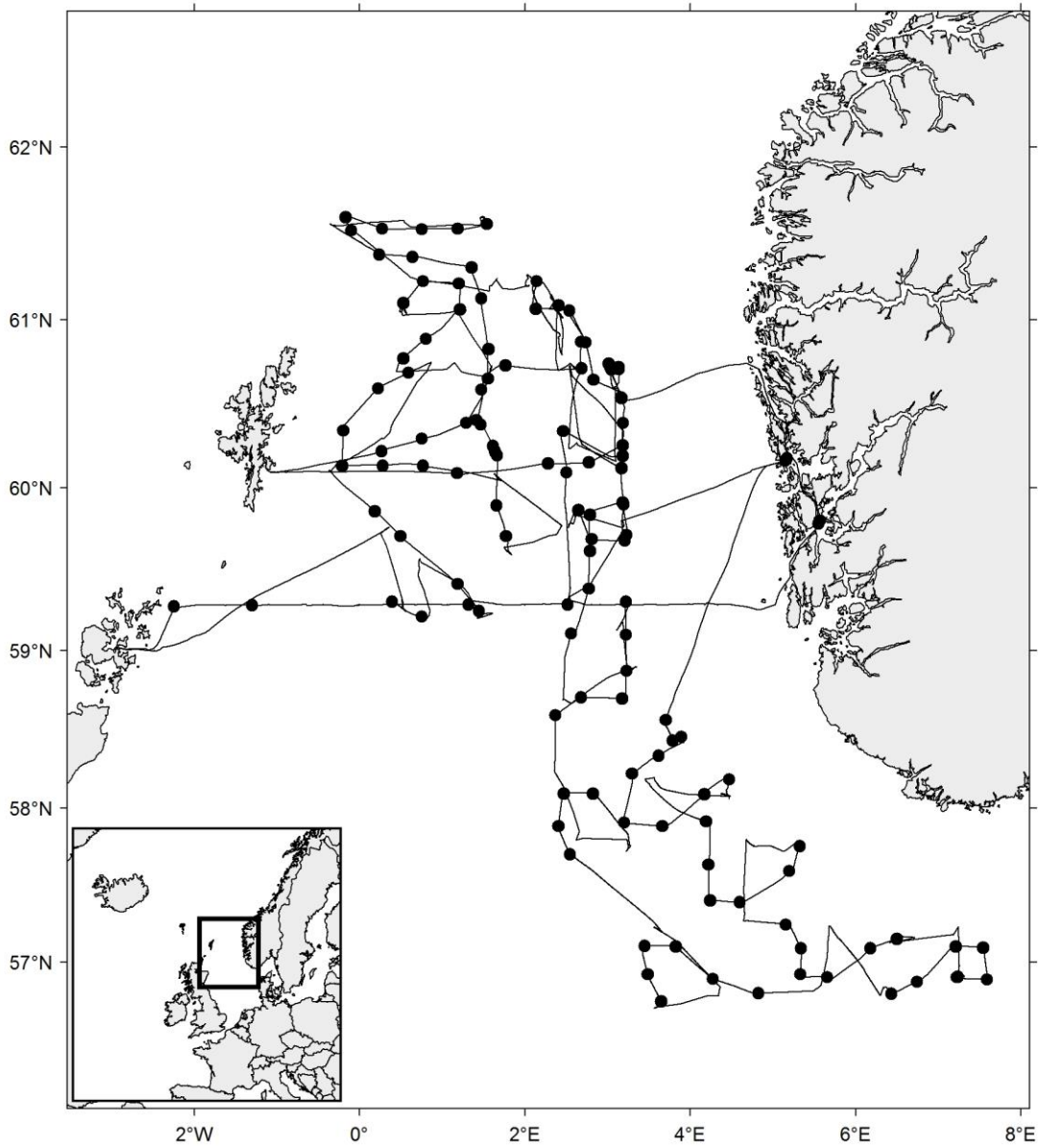
z CTD st.no 1–179
○ Plankton st. (WP-II-net)
◆ Plankton st. (Mocness)

Standard section Utsira W st.no 103–130



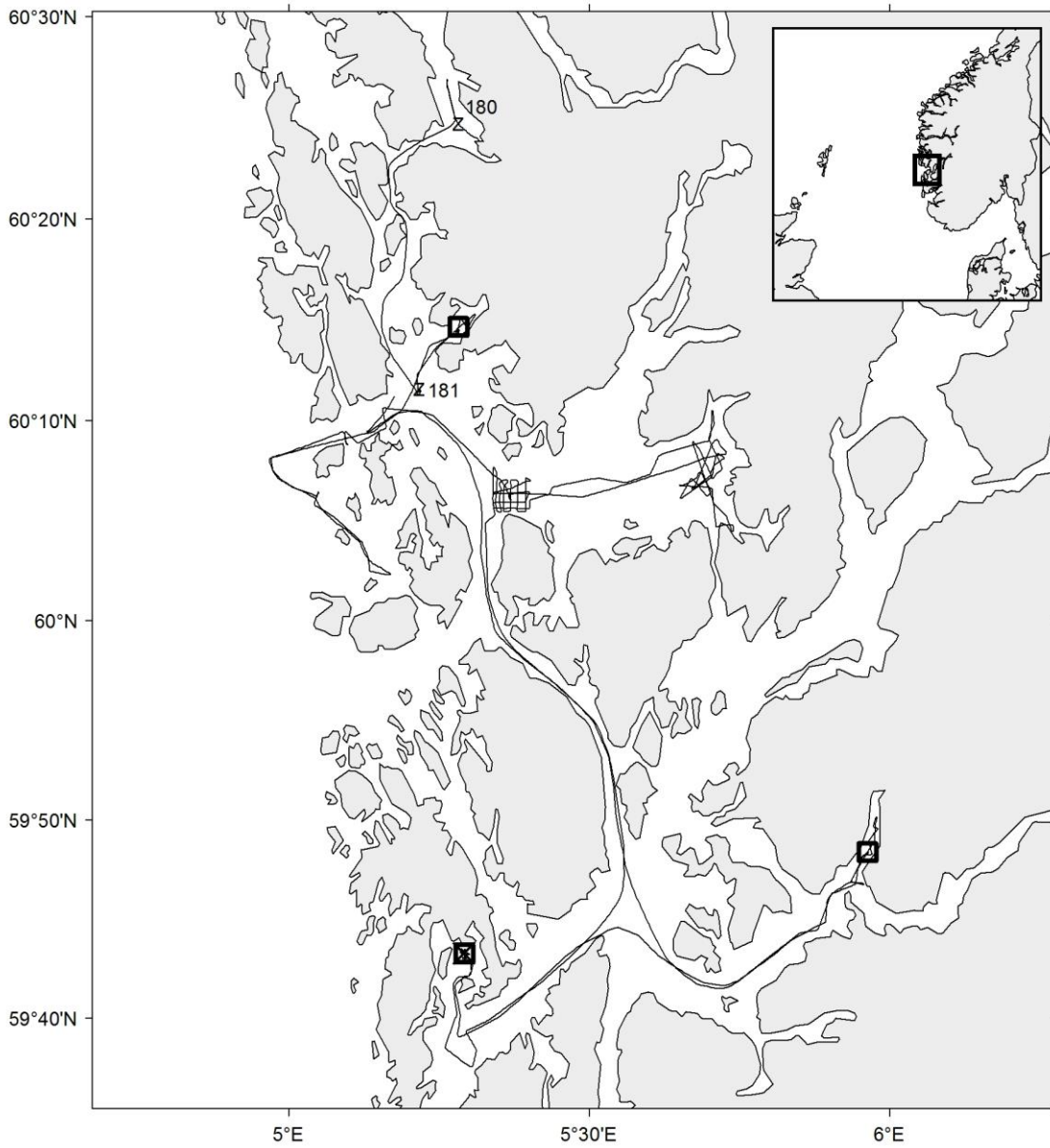
Cruise no 2016101 "G.O.Sars"
 10 January–12 February 2016

□ Bottom trawl st.no 1-69



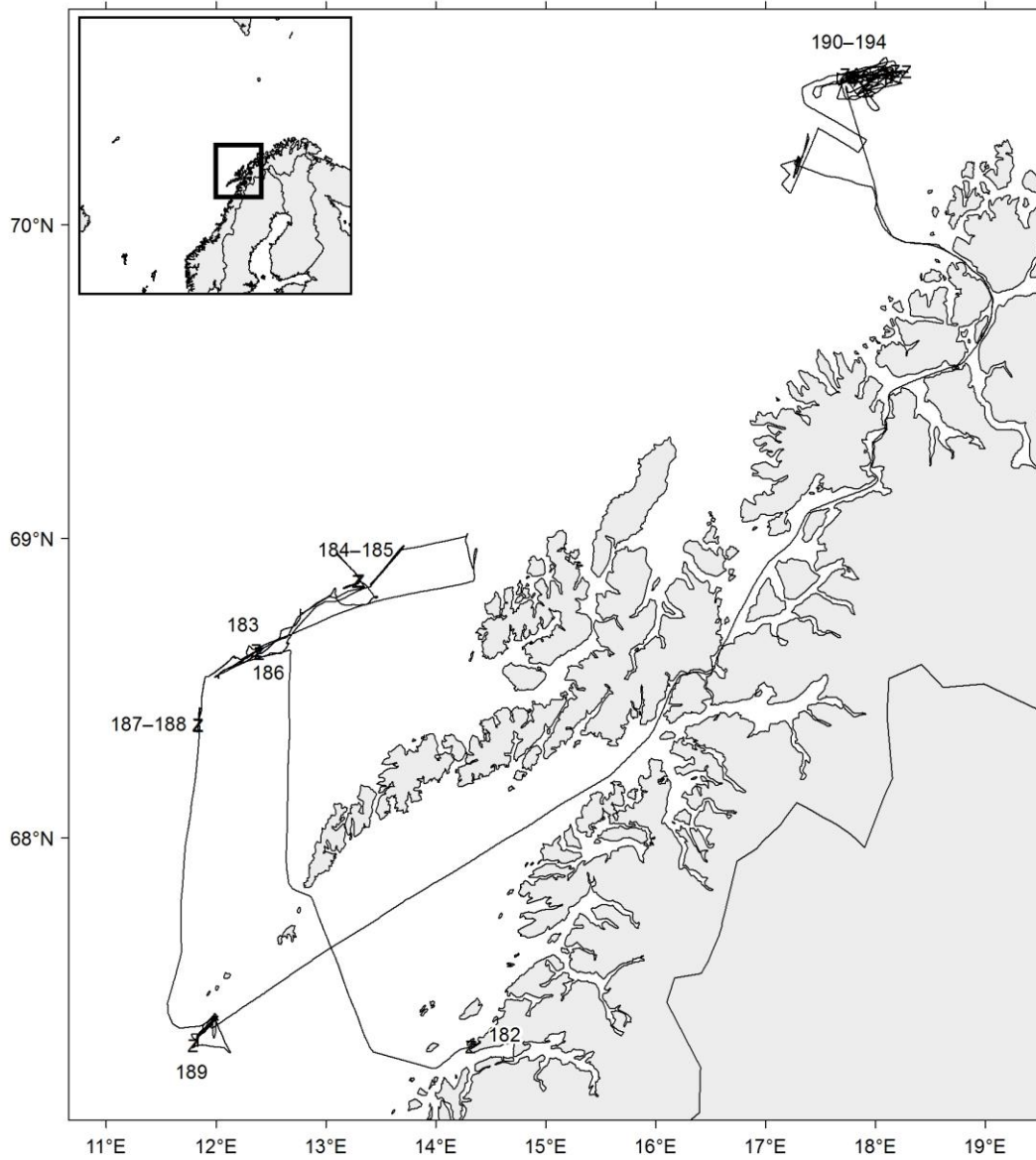
Cruise no 2016101 "G.O.Sars"
11 January–12 February 2016

● MIK stations



Cruise no 2016102 "G.O.Sars"
13–15 February 2016

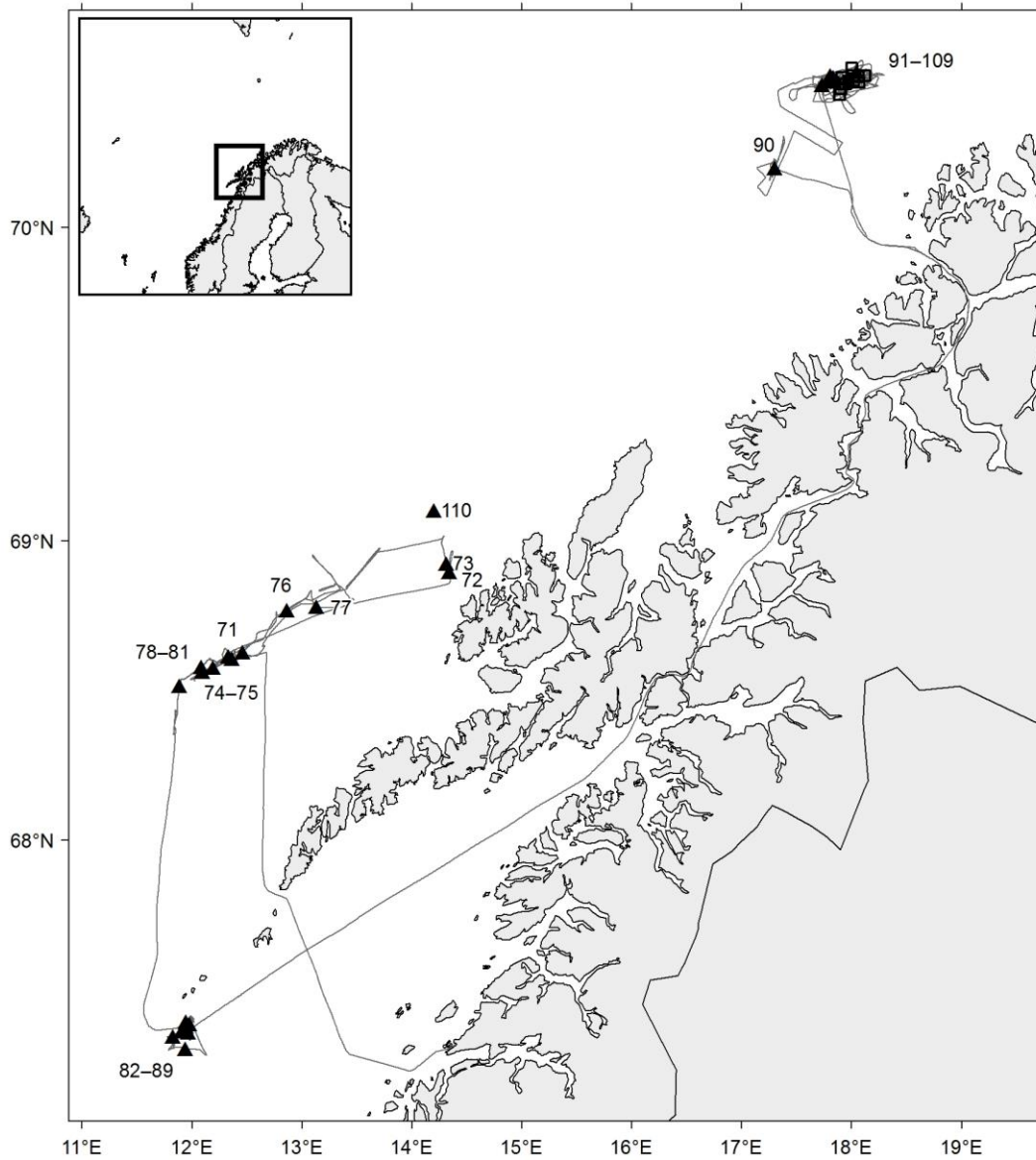
z CTD st.no 180–181
X Box core
■ Multicores



Cruise no 2016103 "G.O.Sars"

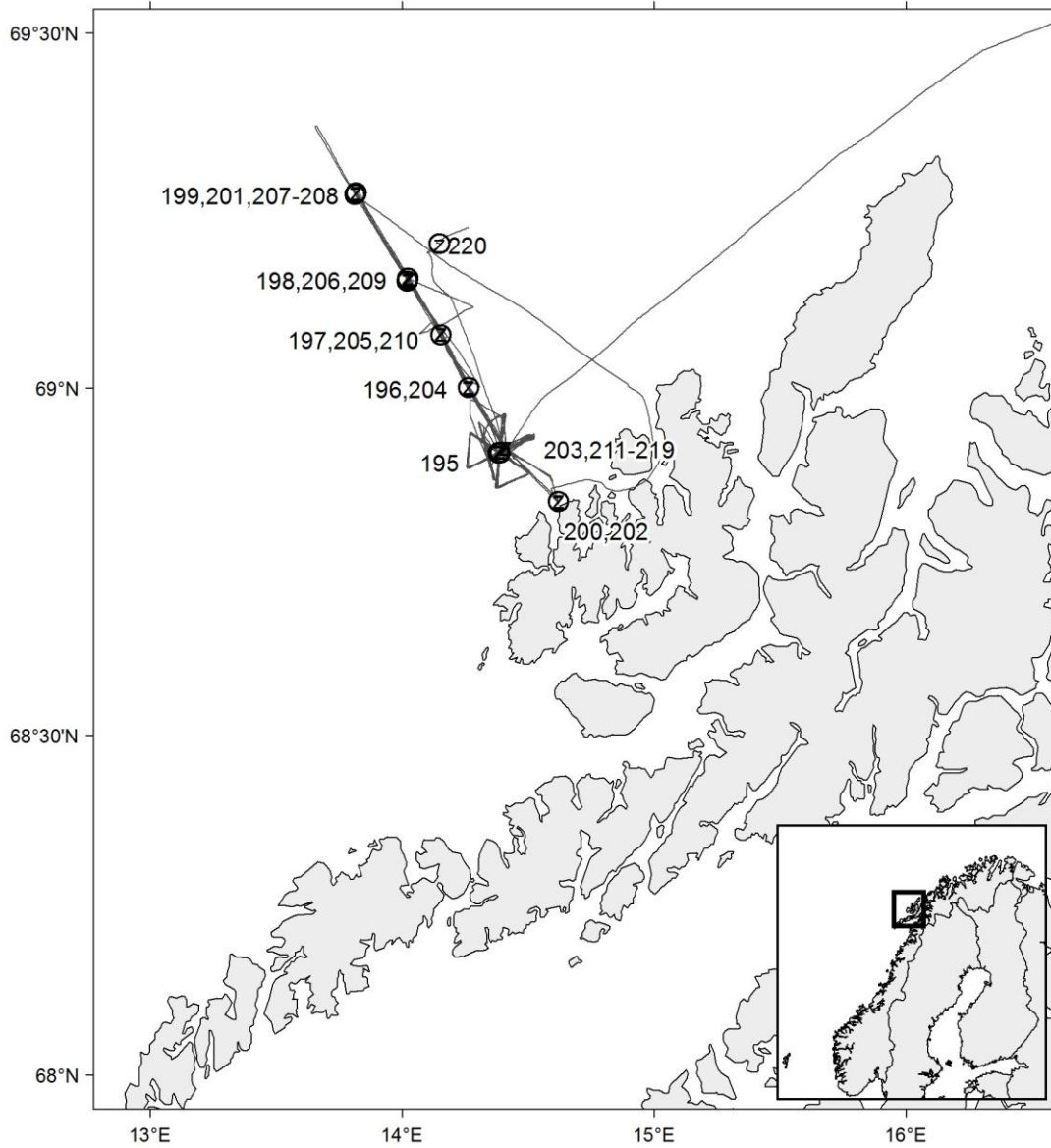
19 Feb–2 Mar 2016

z CTD st.no 182–194



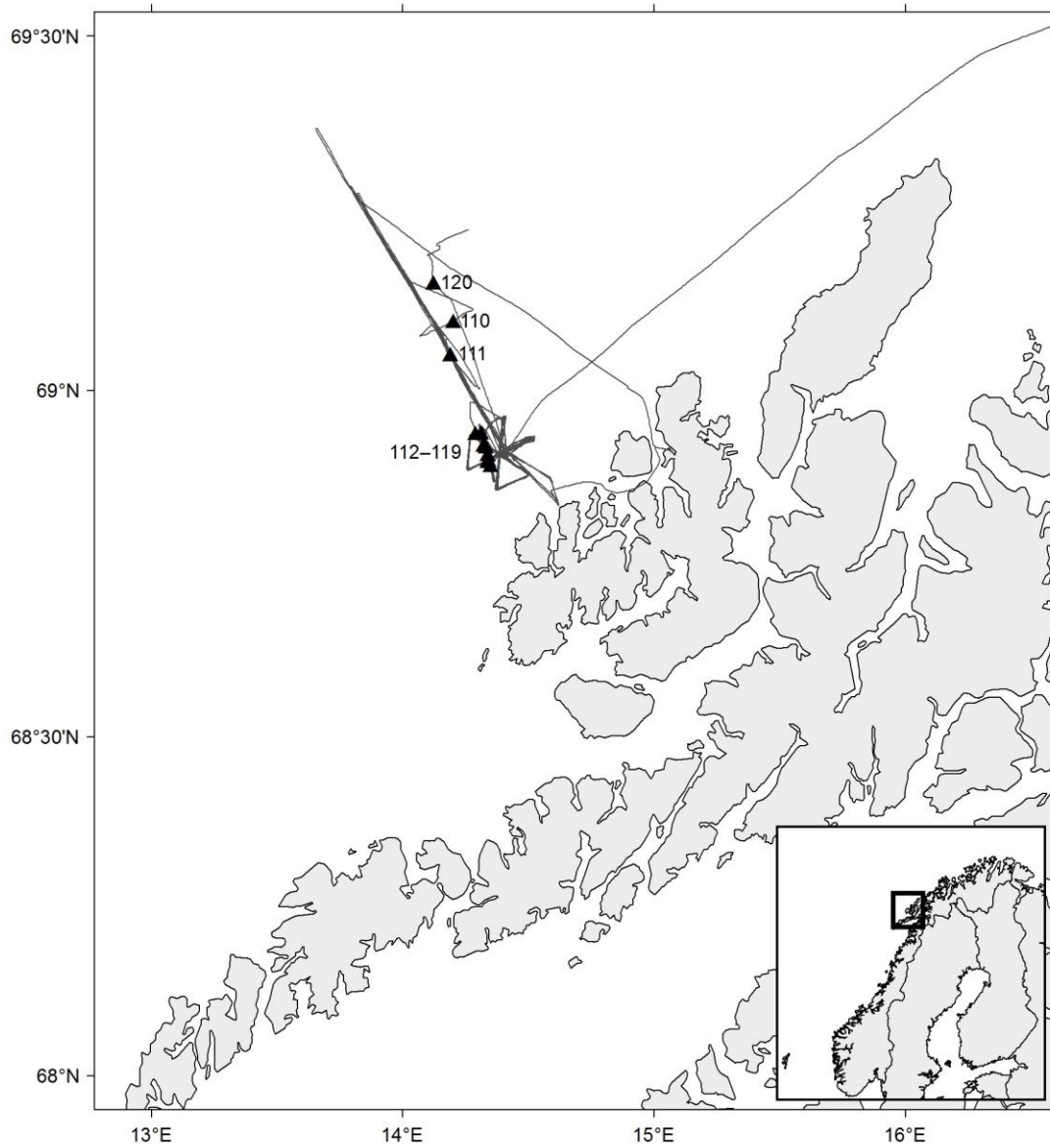
Cruise no 2016103 "G.O.Sars"
19 Feb–2 Mar 2016

Trawl st.no 71–109
 ◻ Bottom trawl
 ▲ Pelagic trawl



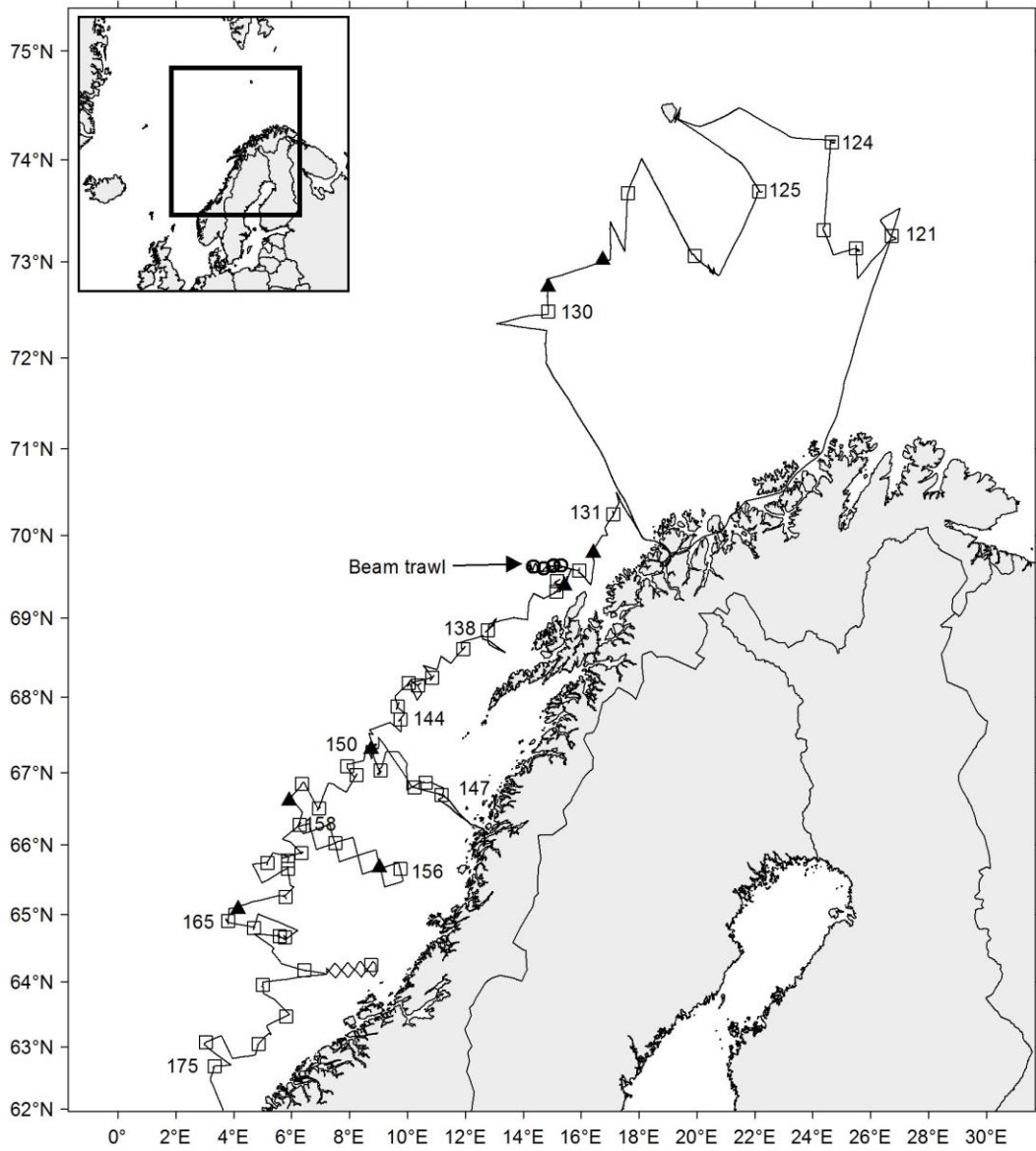
Cruise no 2016104 "G.O.Sars"
 4–11 March 2016

z CTD st.no 195–220
 ○ Plankton st. (WP-II-net)



Cruise no 2016104 "G.O.Sars"
4–11 March 2016

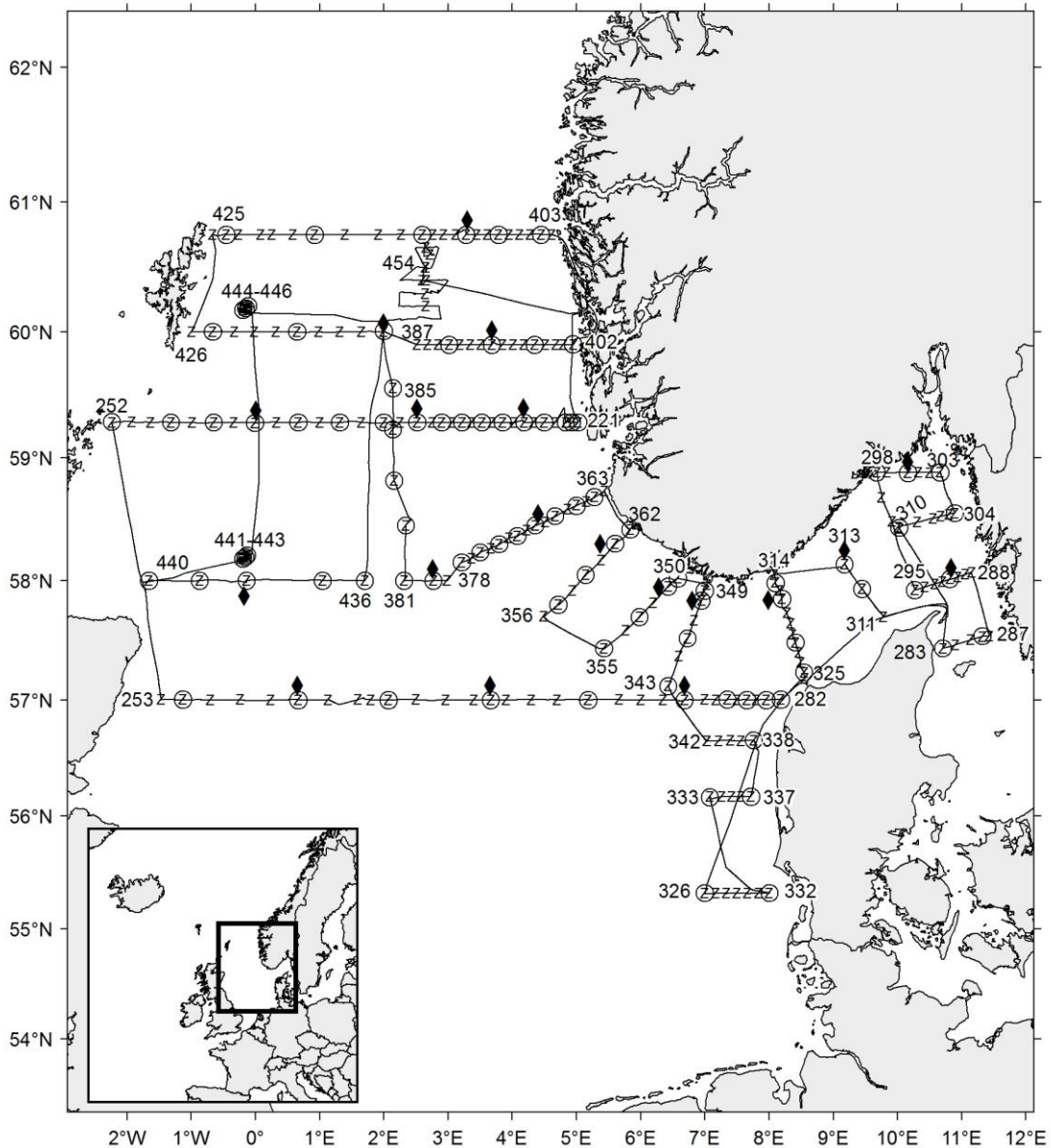
▲ Pelagic trawl st.no 110–120



Cruise no 2016105 "G.O.Sars"
 12 Mar–8 Apr 2016

Trawl st.no 121–175

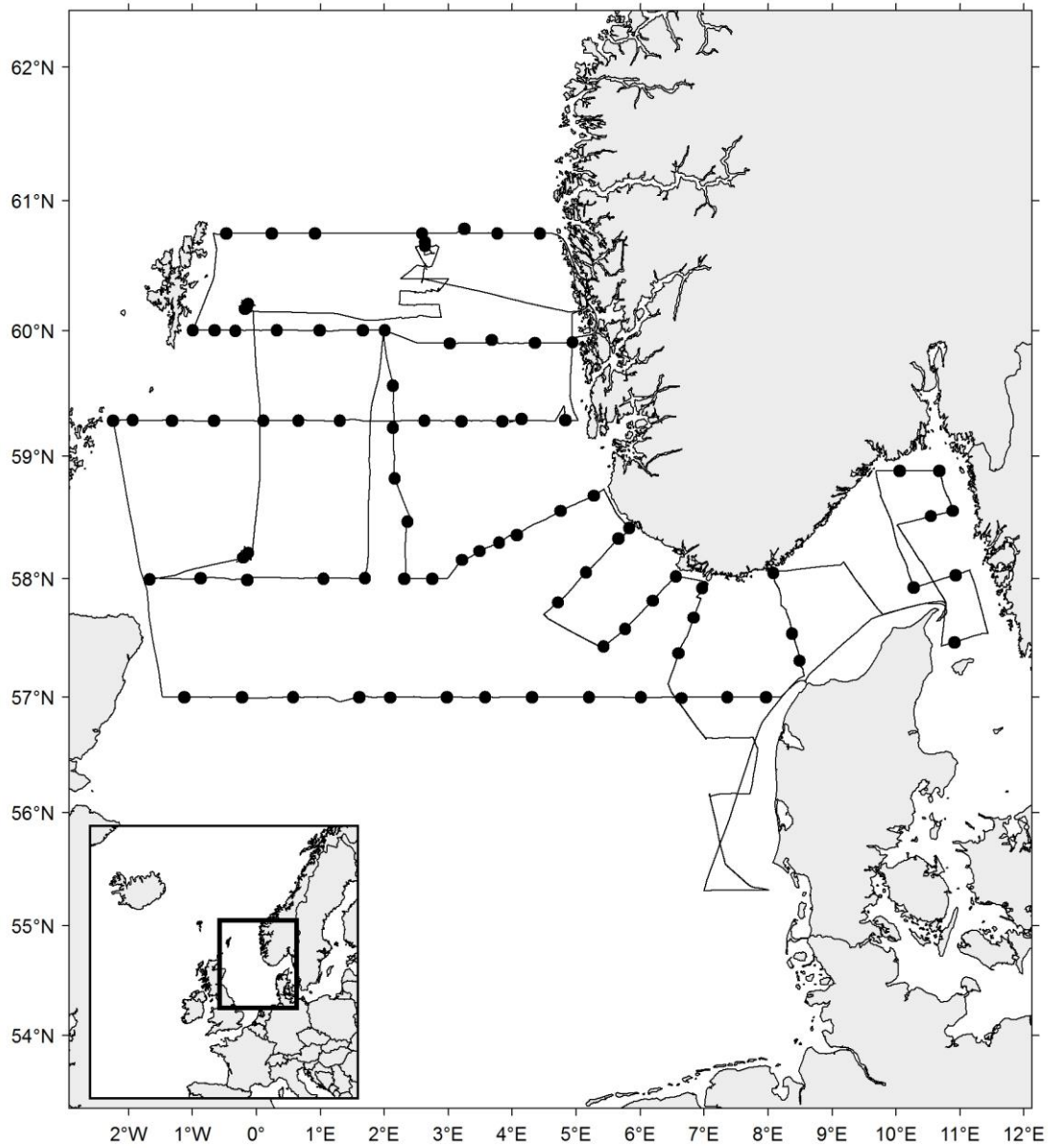
- Bottom trawl
- ▲ Pelagic trawl
- Beam trawl



Cruise no 2016106 "G.O.Sars"
11 April–9 May 2016

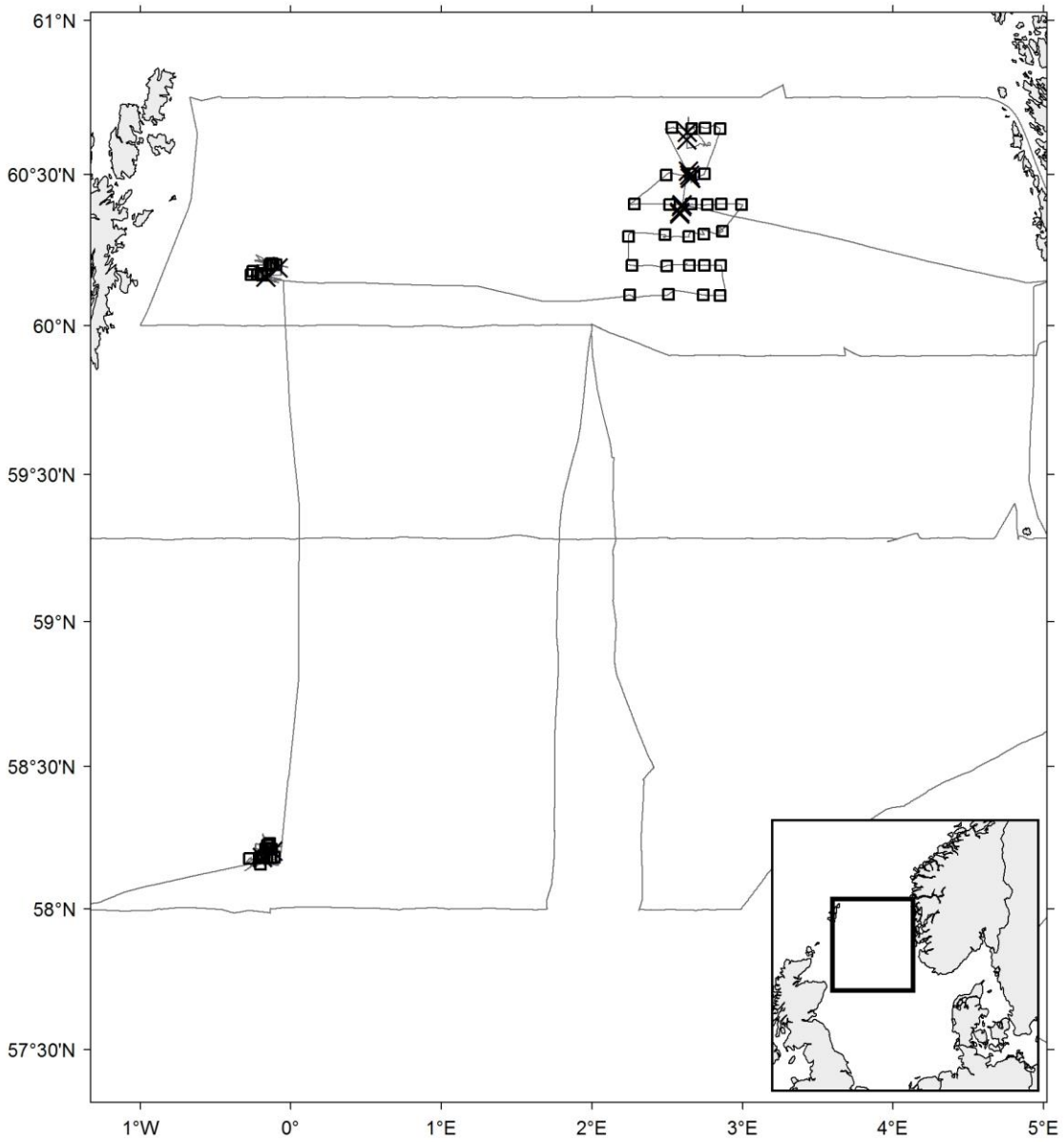
z CTD st.no 221–454
○ Plankton st. (WP-II-net)
◆ Plankton st. (Mocness)

Standard sections:
Utsira W st.no 221-252
Hanstholmen–Aberdeen st.no 253-282
Göteborg–Fr.havn st.no 283-287
Måseskjær st.no 288-295
Jomfruland–Koster st.no 298-303
Vaderø st.no 304-310
Oksøy st.no 314-325
Lindesnes st.no 343-349
Lista st.no st.no 350-355
Egerøy SW st.no 356-362
Jærens Rev SW/Wst.no 363-381, 436-440
Slotterøy W st.no 387-402, 426-435
Fedje-Shetland st.no 403-425



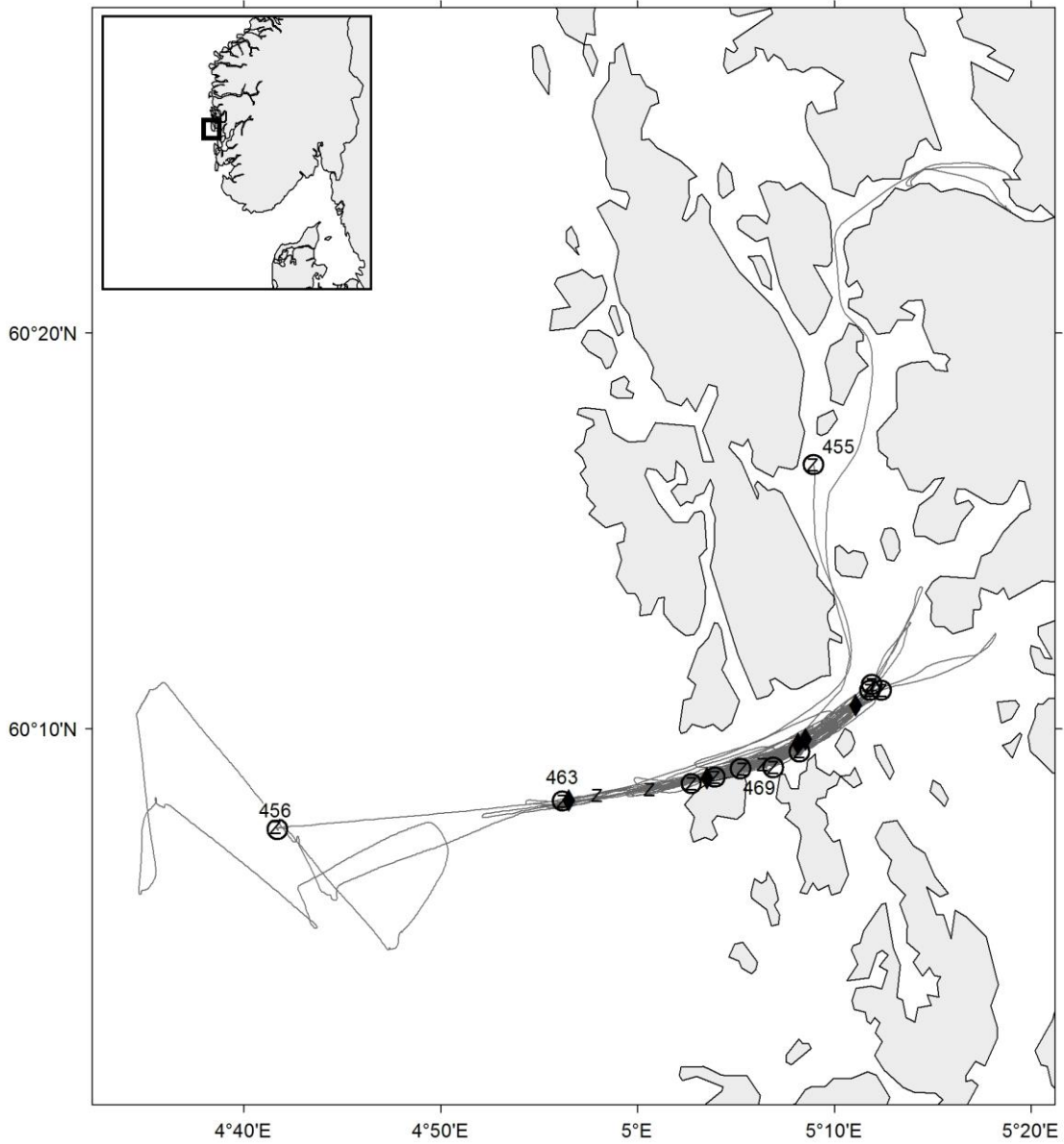
Cruise no 2016106 "G.O.Sars"
11 April–9 May 2016

- Gulf VII (280 μ m), Pup sampler (90 μ m)



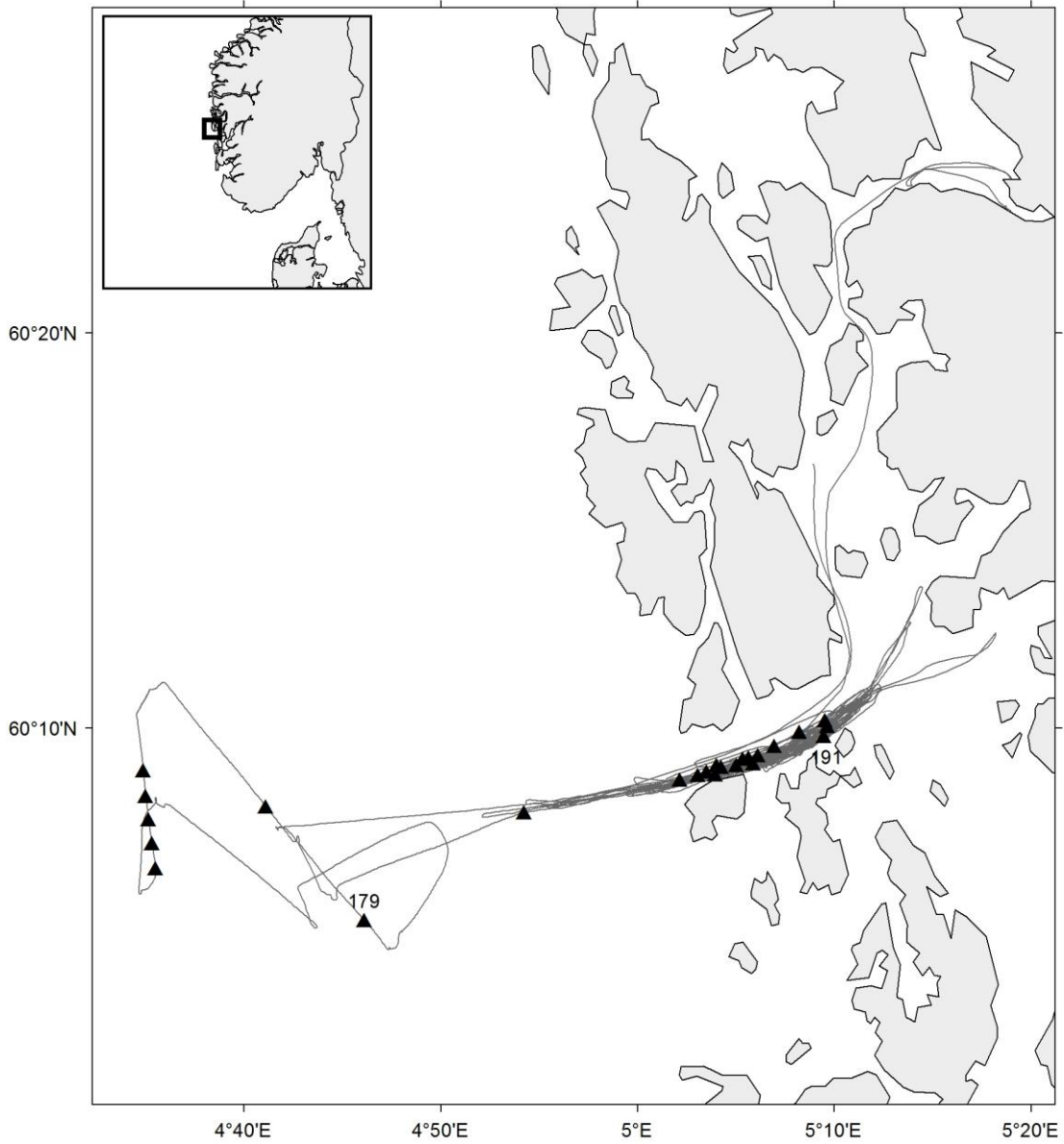
Cruise no 2016106 "G.O.Sars"
11 April–9 May 2016

- MIK midwater ring trawl
- Multisampler



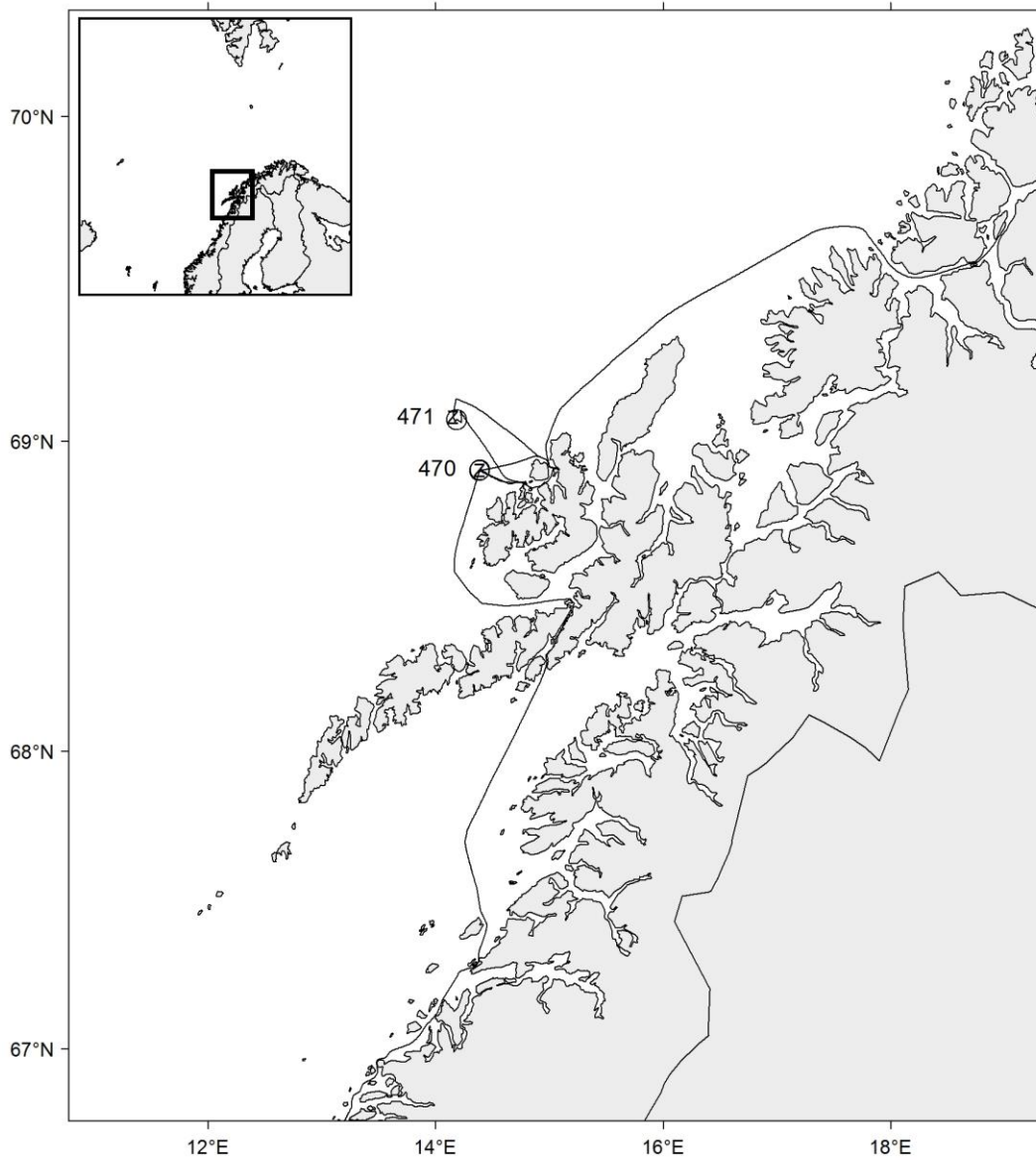
Cruise no 2016107 "G.O.Sars"
4–9 June 2016

- z CTD st.no 455–469
- Plankton st. (WP-II-net)
- ◆ Plankton st. (Mocness)



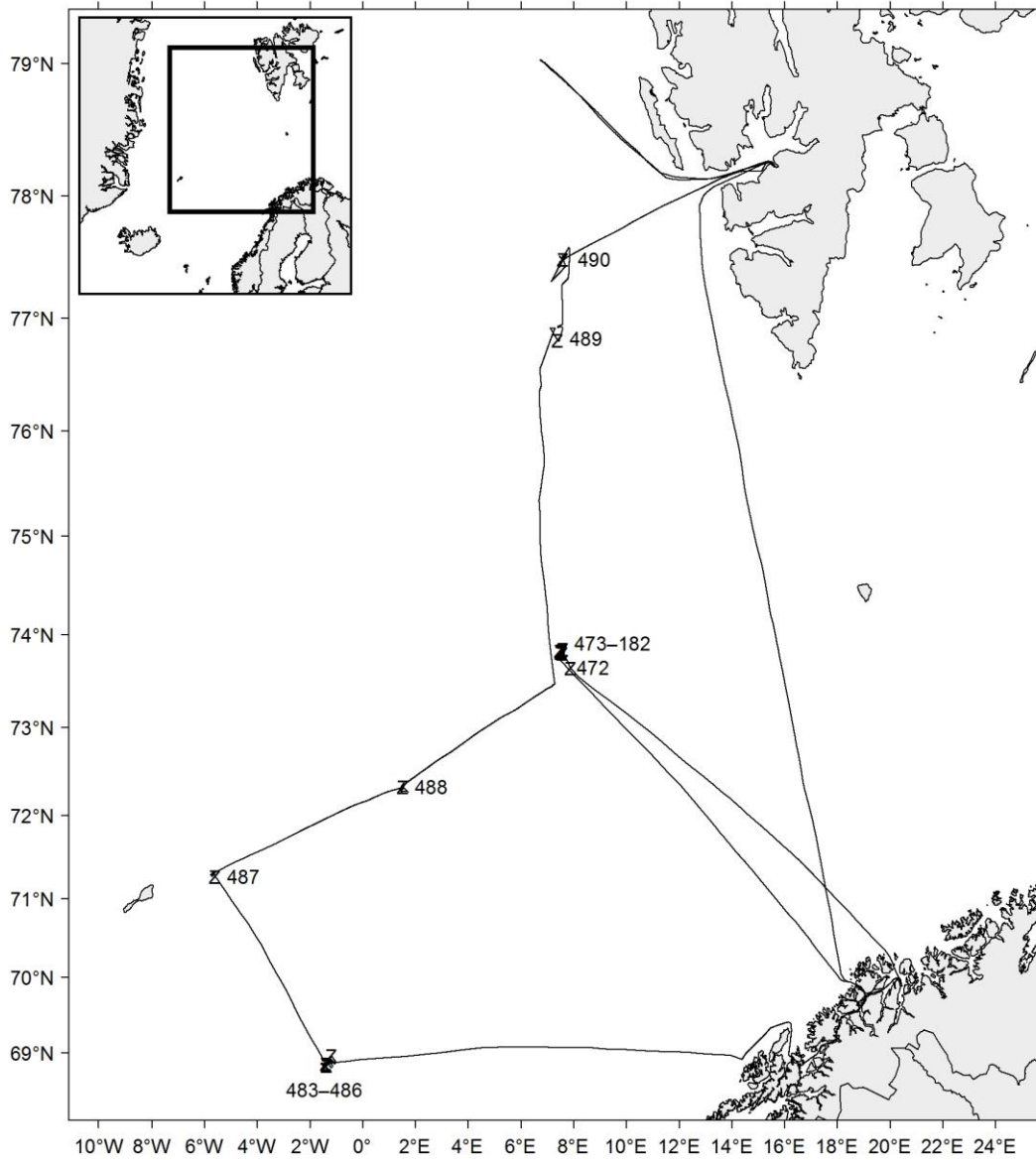
Cruise no 2016107 "G.O.Sars"
4–9 June 2016

◆ Pelagic trawl st.no 176–191



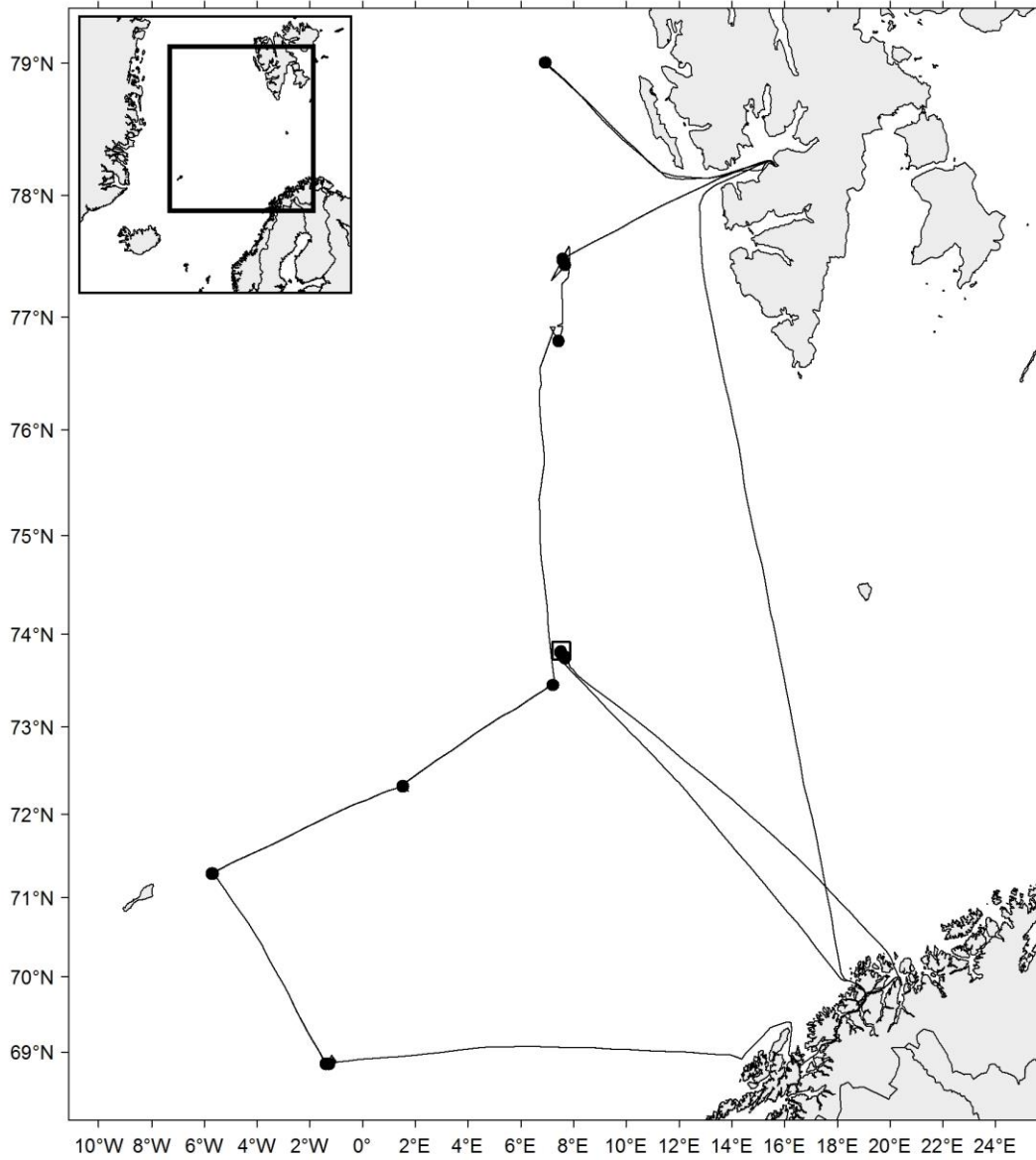
Cruise no 2016108 "G.O.Sars"
14–17 June 2016

z CTD st.no 470–471
○ ROV stations



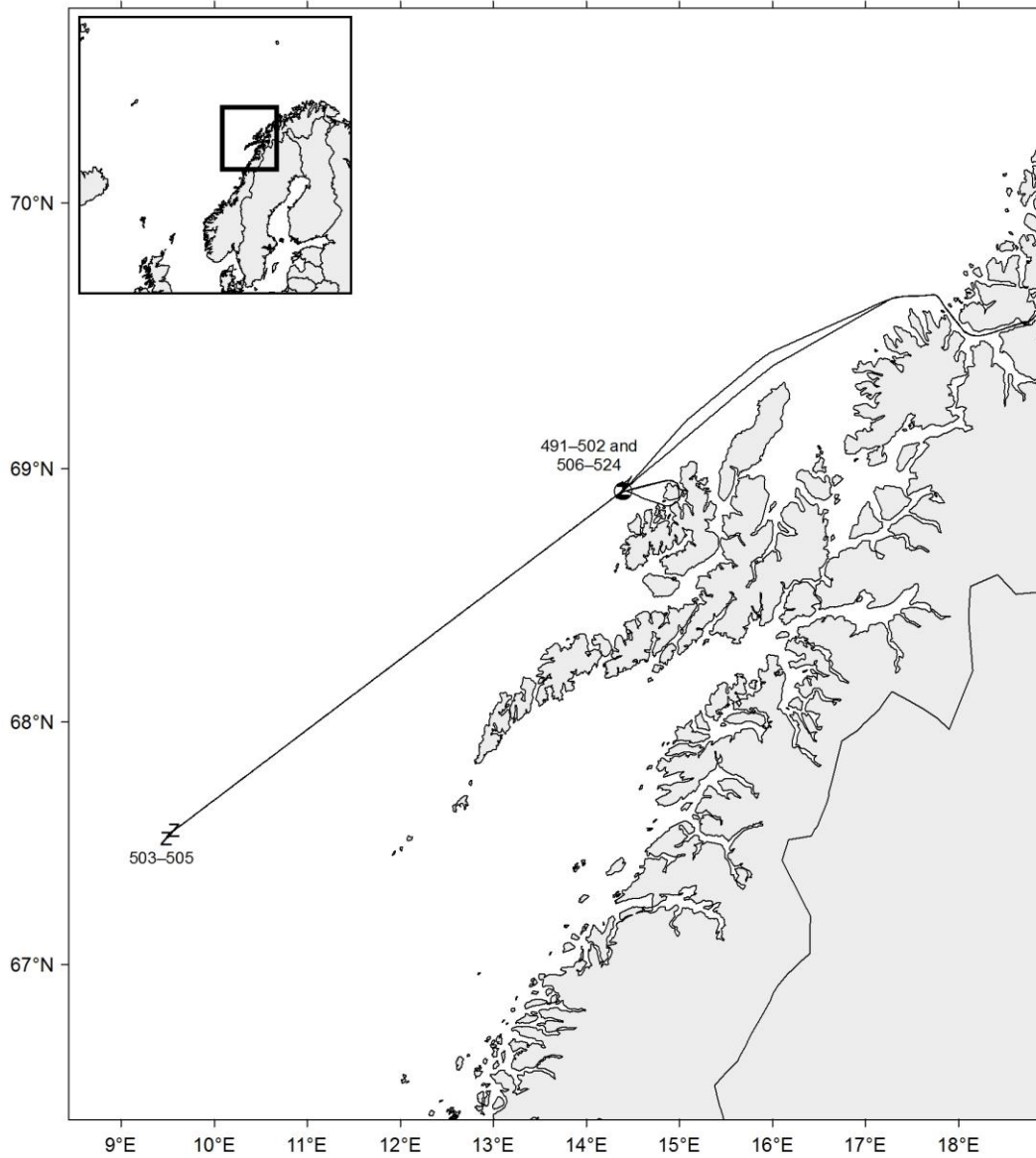
Cruise no 2016109 "G.O.Sars"
18 June–19 July 2016

z CTD st.no 472–490



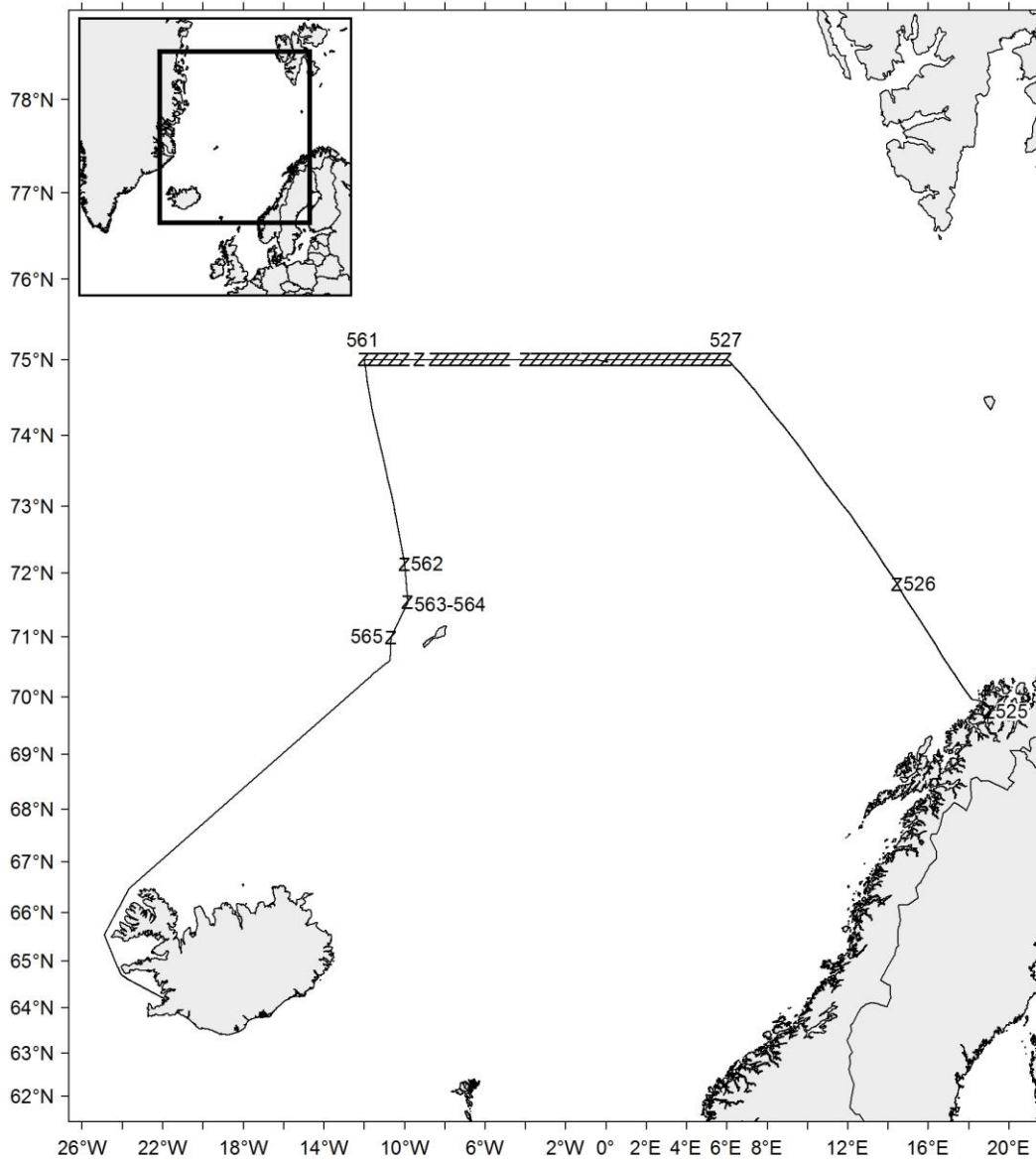
Cruise no 2016109 "G.O.Sars"
 18 June–19 July 2016

- ROV stations
- Agassiz tr.



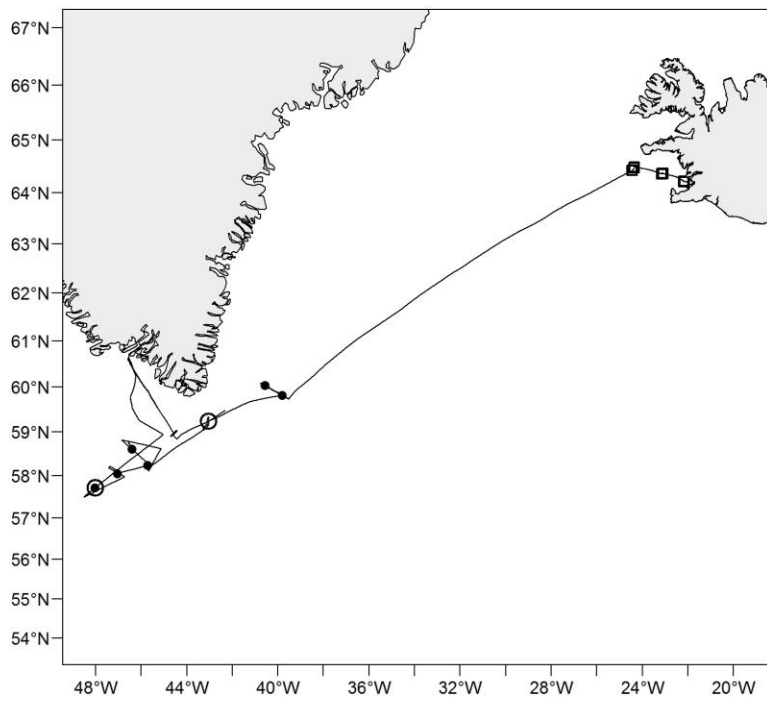
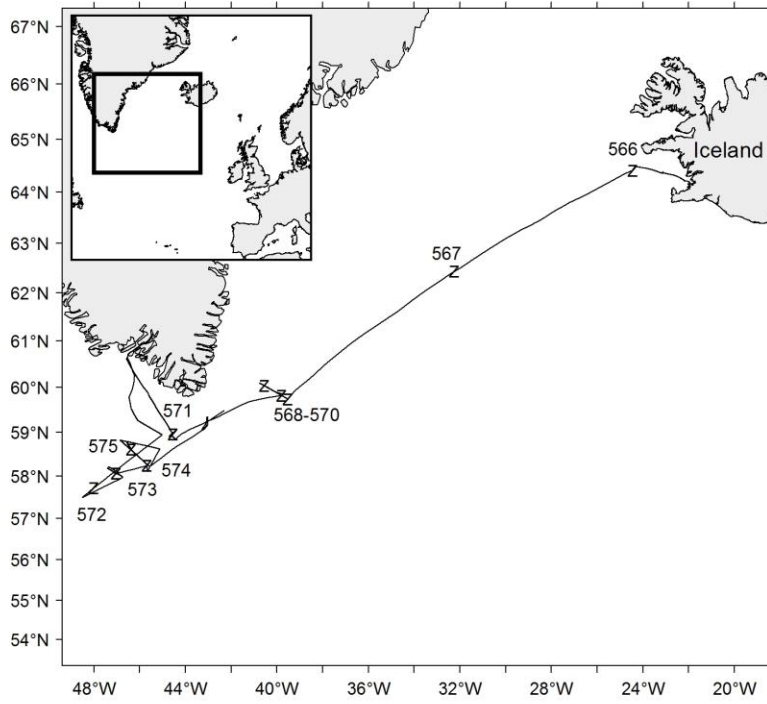
Cruise no 2016110 "G.O.Sars"
21-29 Juli 2016

z CTD st.no 491-524
○ Plankton st. (WP-II-net)



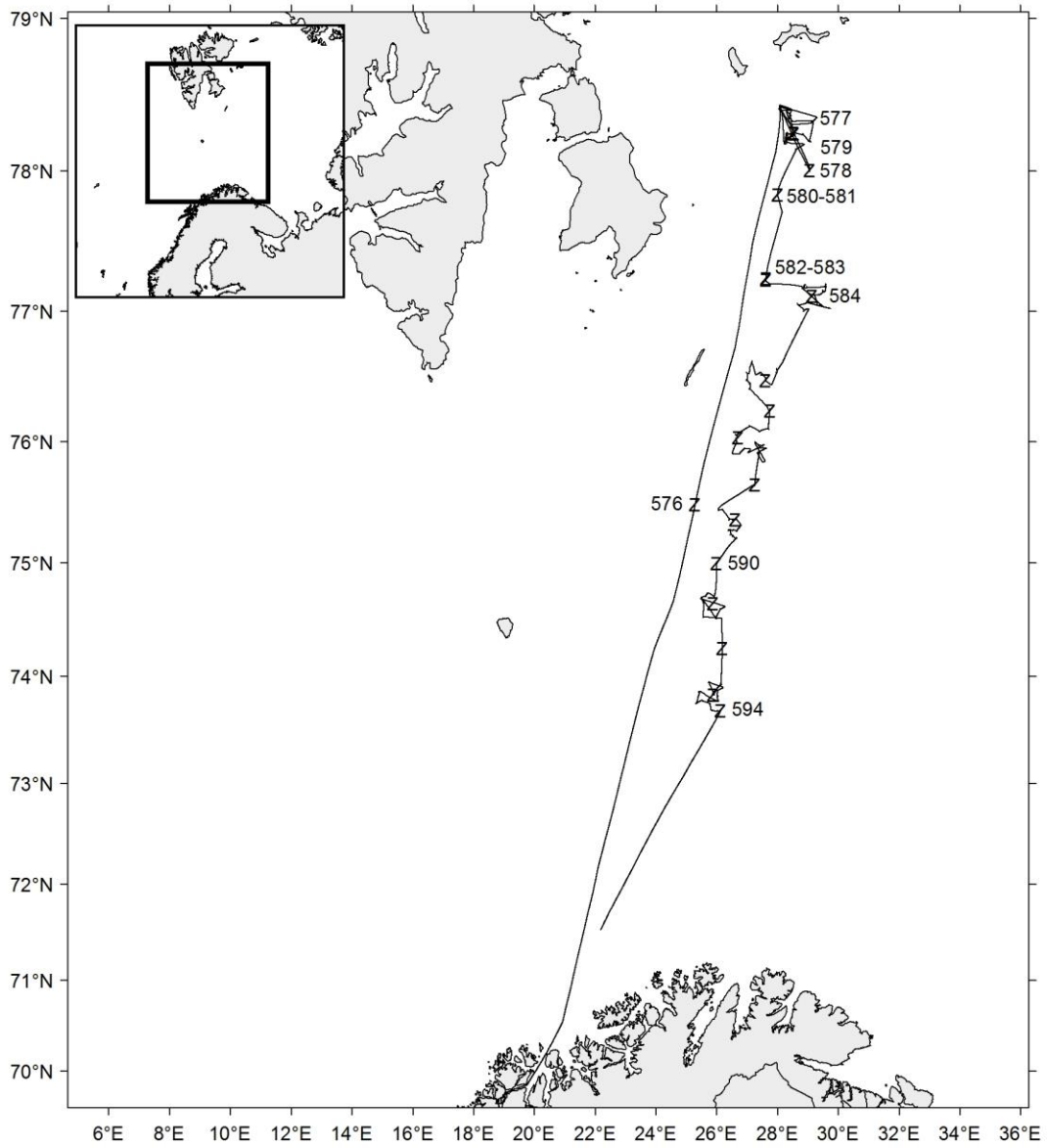
Cruise no 2016111 "G.O.Sars"
2–13 August 2016

z CTD st.no 525–565



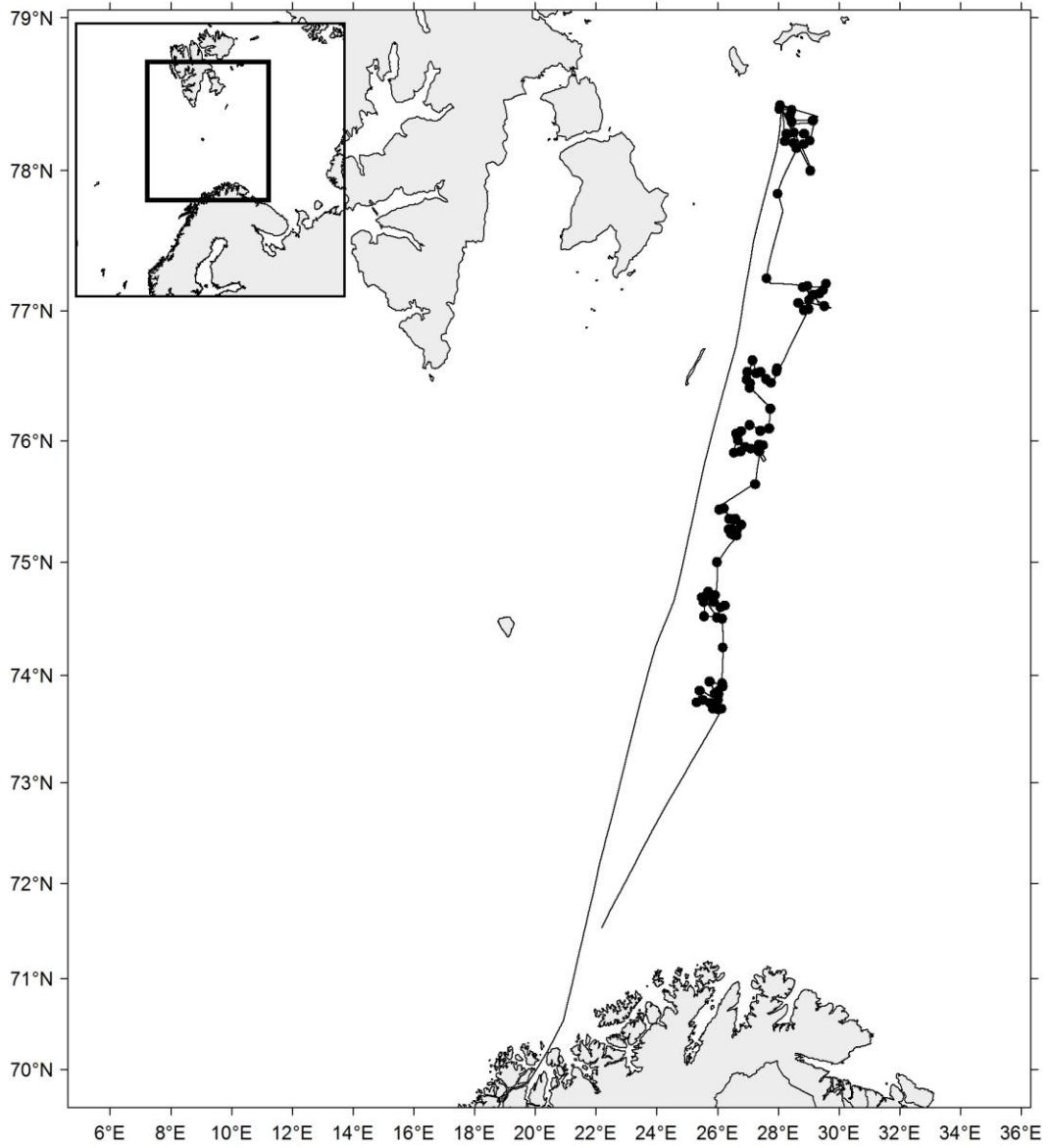
Cruise no 2016112 "G.O.Sars"
16 August–5 September 2016

z CTD st.no 566–575 □ Sledge st.
○ Plankton st. (WP-II-net) ● Multicore st.



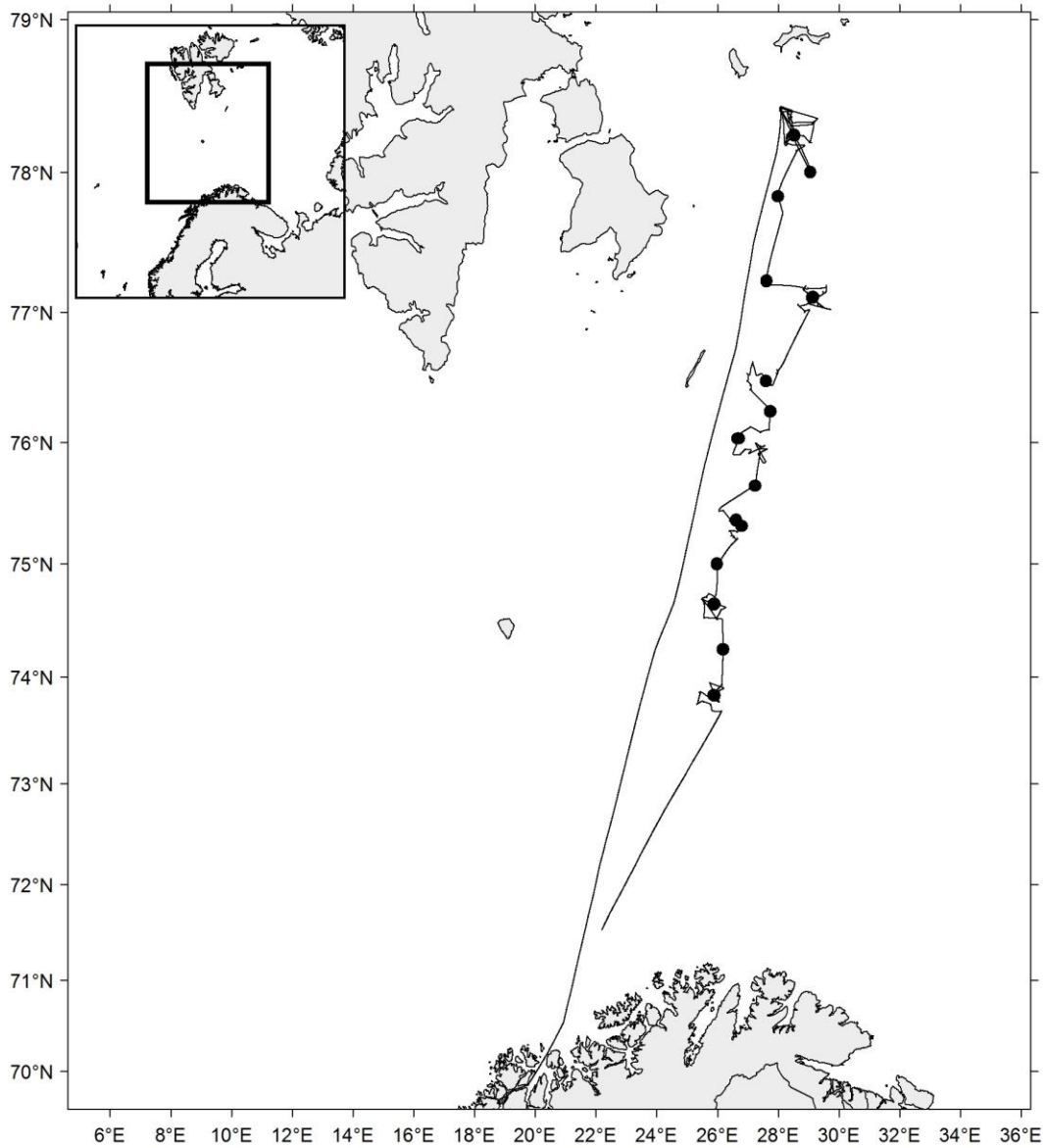
Cruise no 2016113 "G.O.Sars"
13 September–4 October 2016

z CTD st.no 576–594



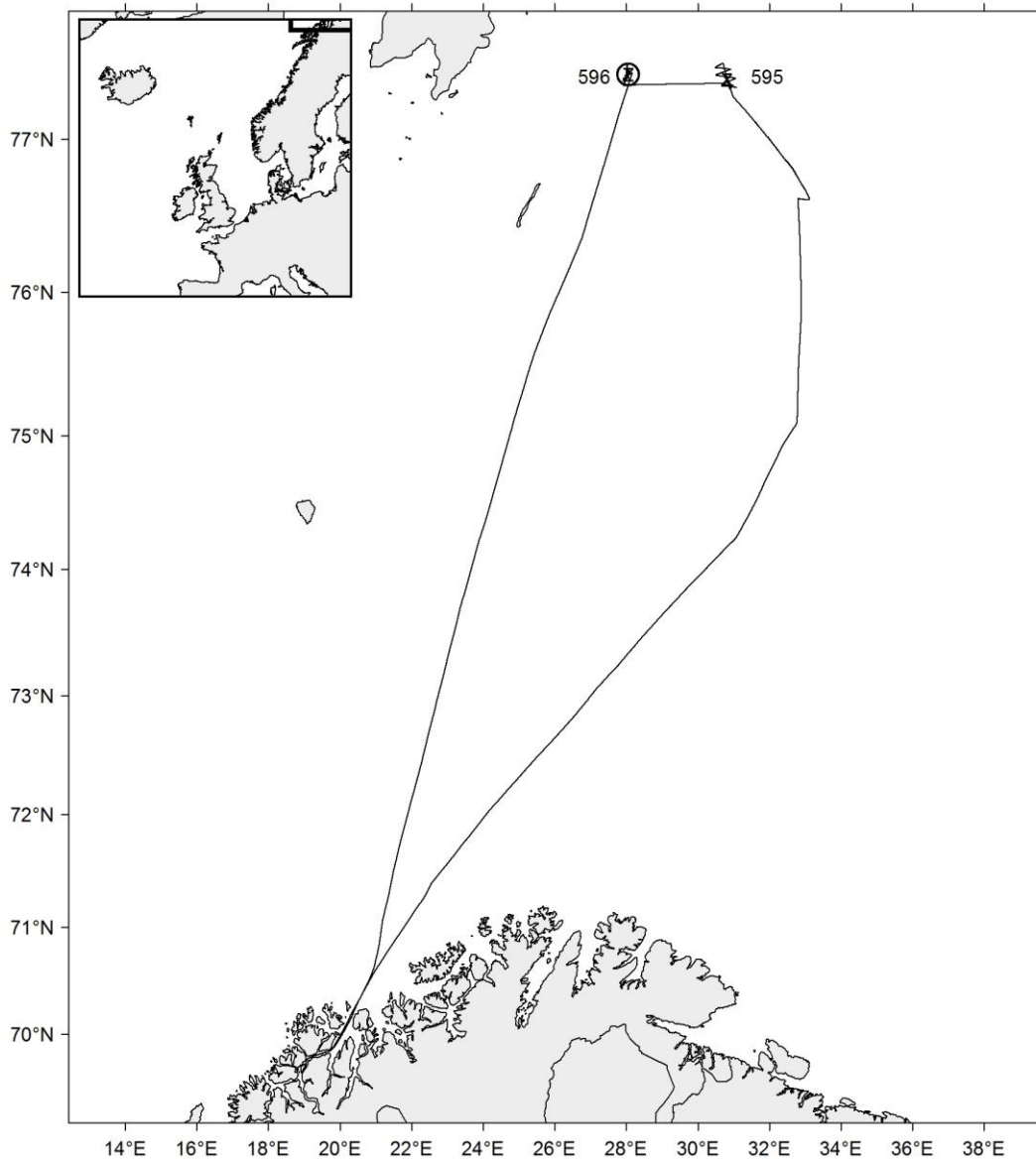
Cruise no 2016113 "G.O.Sars"
13 September–4 October 2016

● Video st.



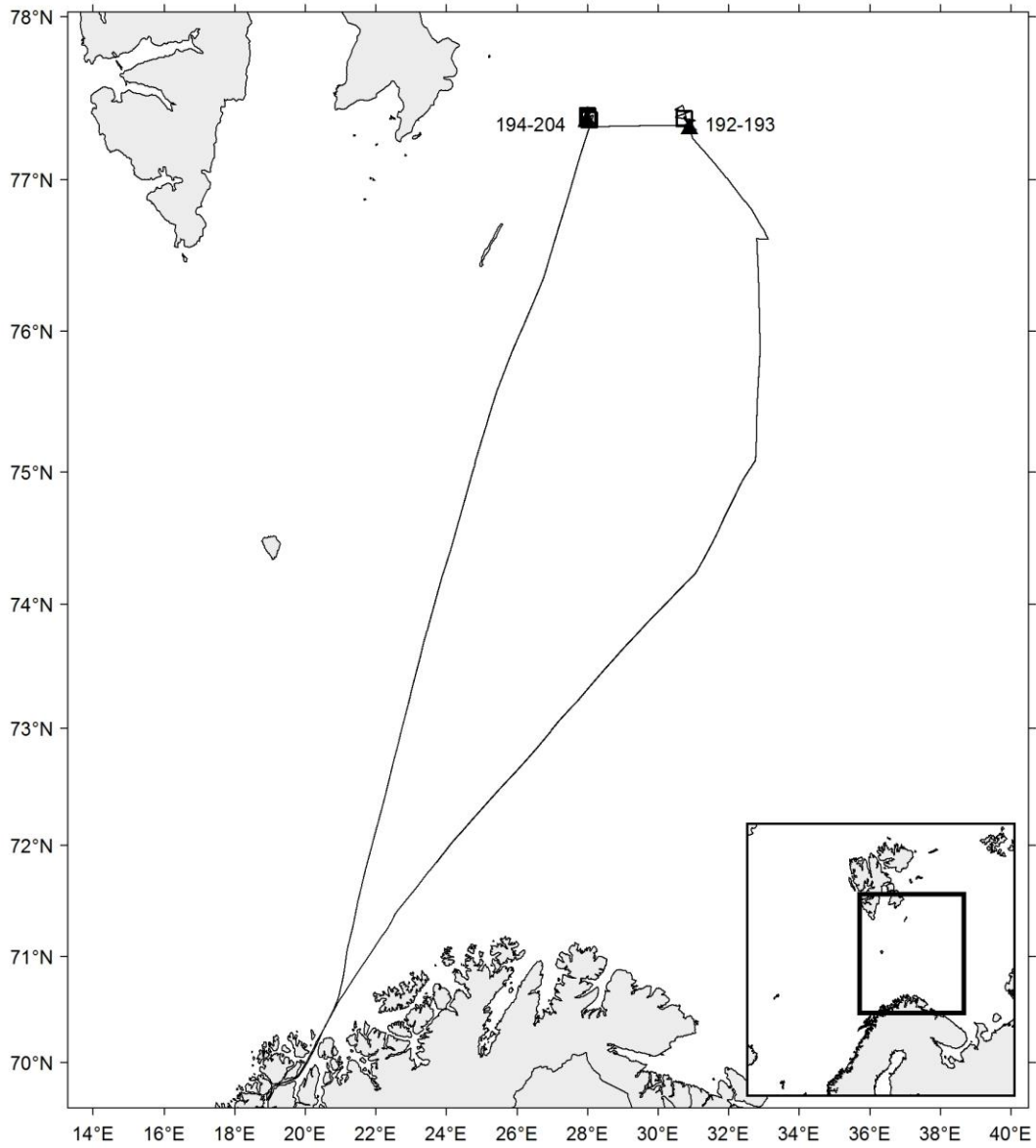
Cruise no 2016113 "G.O.Sars"
13 September–4 October 2016

- Different stations like grab st., box core st., beam trawl st., sledge st. and multicore st.



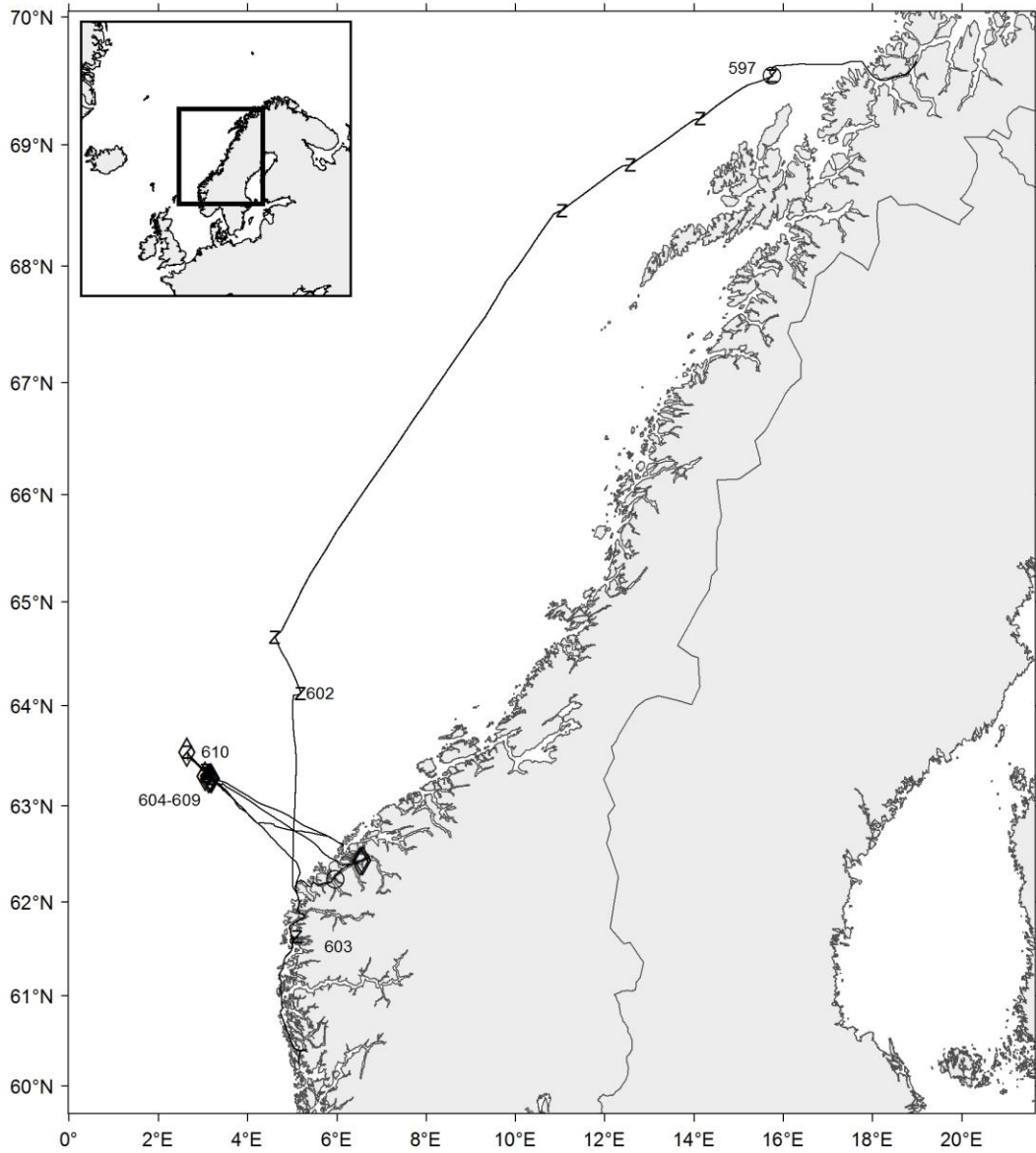
Cruise no 2016114 "G.O.Sars"
4–12 October 2016

z CTD st.no 595–596
○ Plankton st. (WP-II-net)



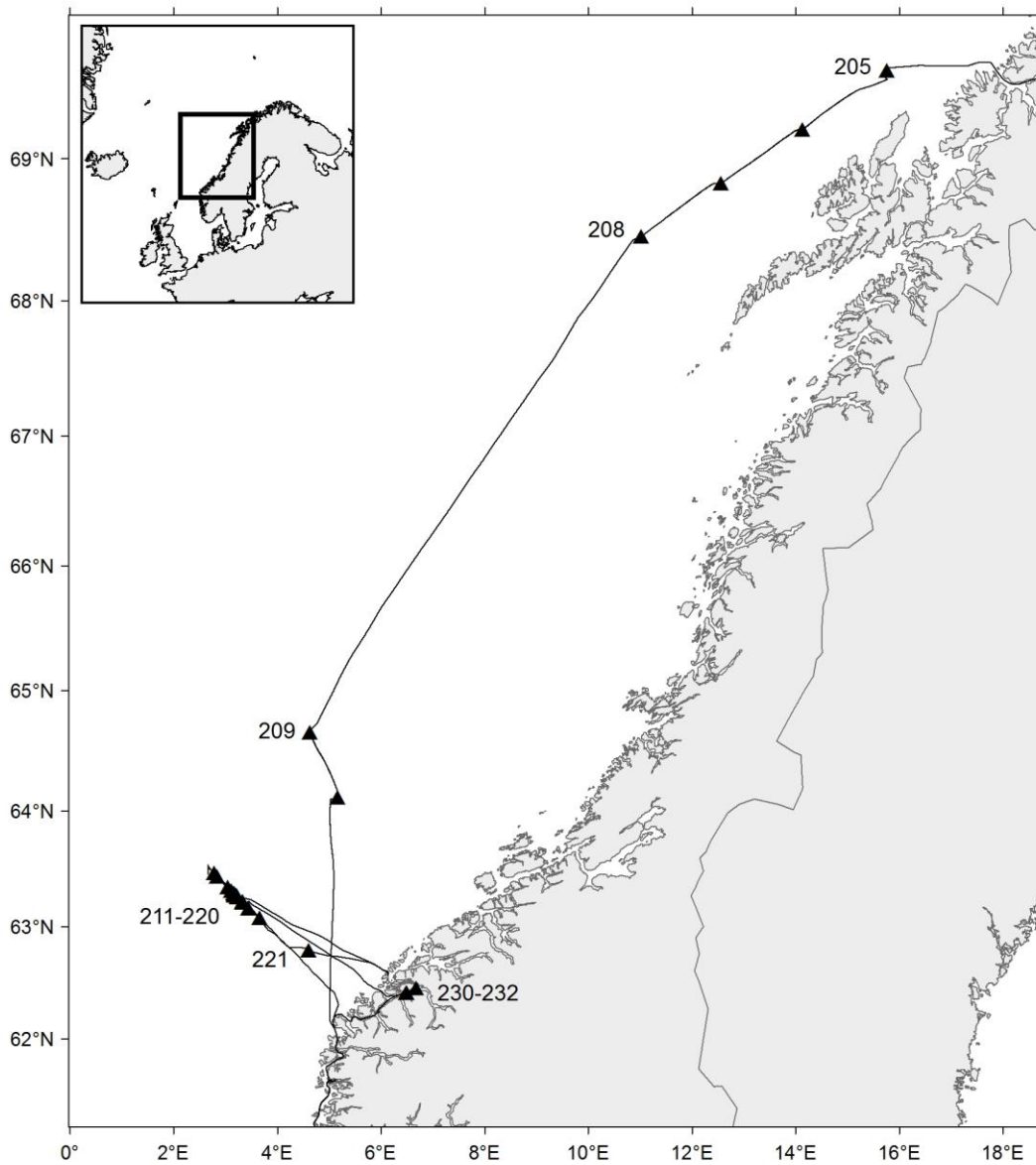
Cruise no 2016114 "G.O.Sars"
4–12 October 2016

Trawl st.no 192-204
□ Bottom trawl
▲ Pelagic trawl



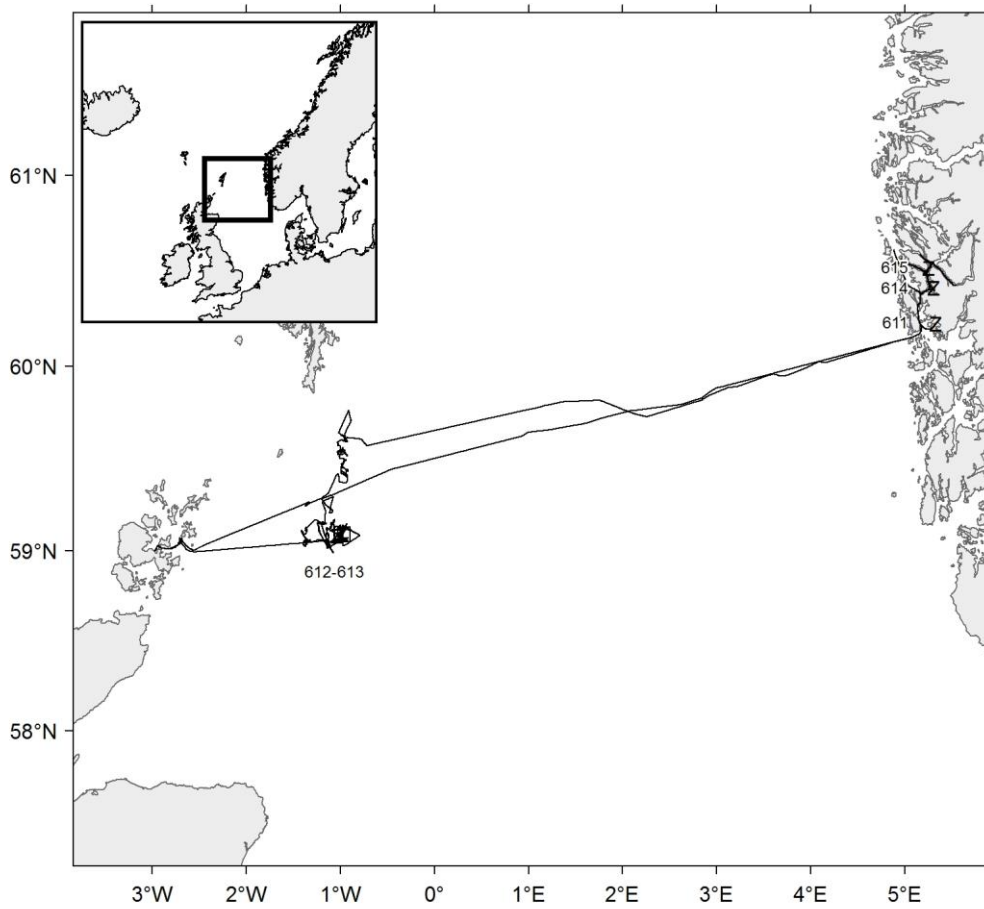
Cruise no 2016115 "G.O.Sars"
13–27 October 2016

- z CTD st.no 597–610
- Plankton st. (WP-II-net)
- ◇ Plankton st. (Mocness)



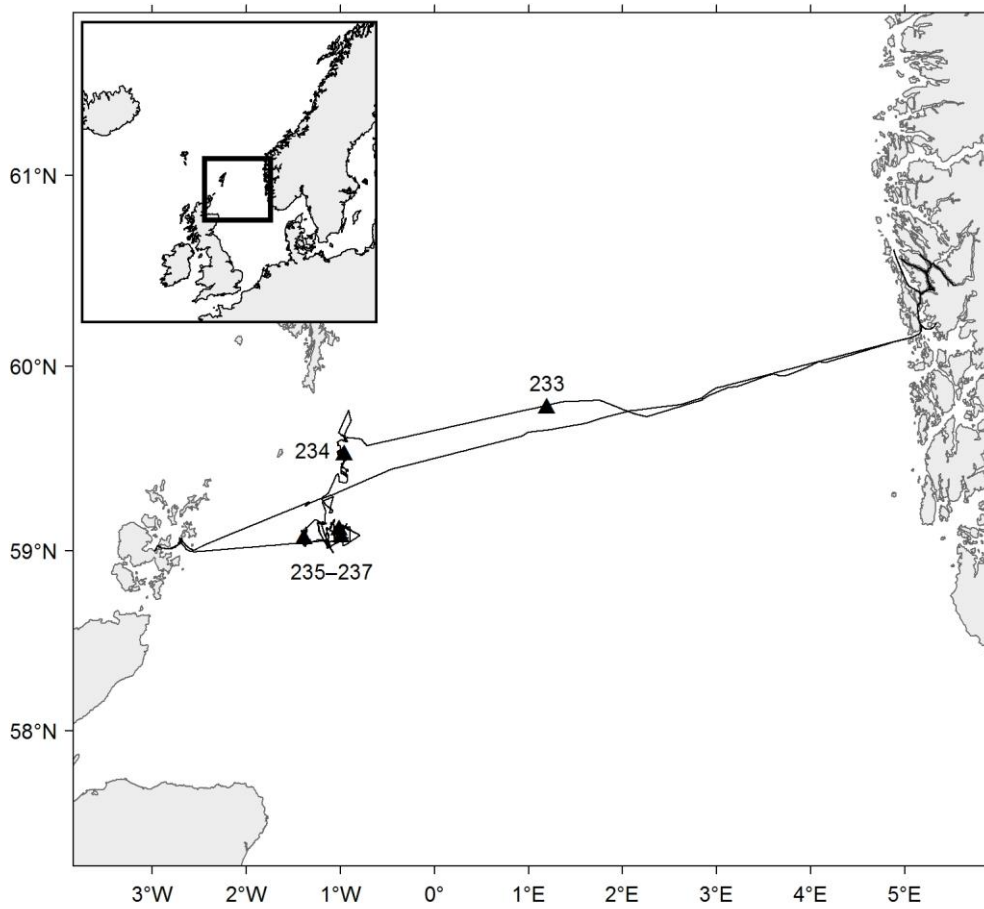
Cruise no 2016115 "G.O.Sars"
 13–27 October 2016

▲ Pelagic trawl st.no 205–232



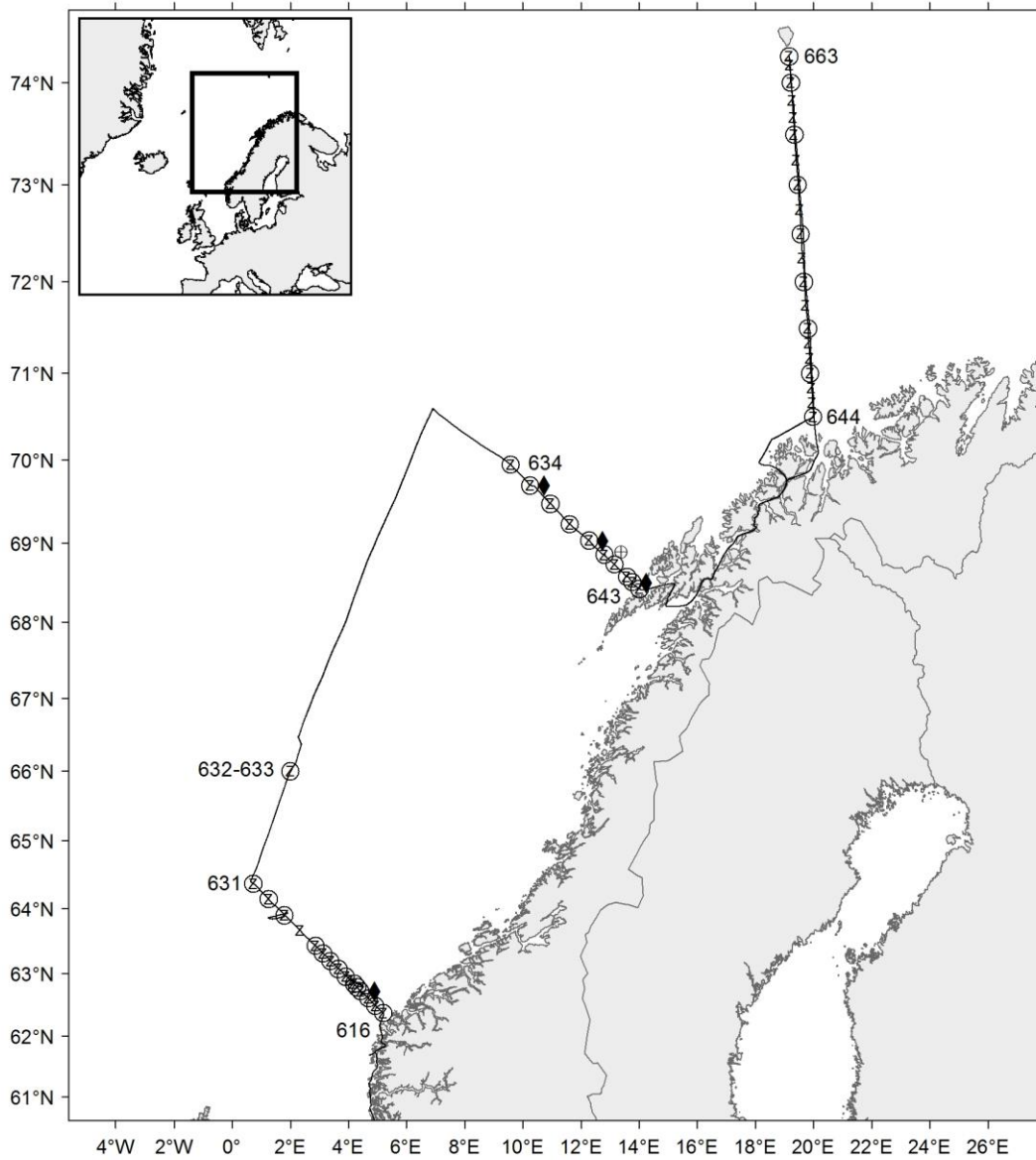
Cruise no 2016116 "G.O.Sars"
28 October–10 November 2016

z CTD st.no 611-615



Cruise no 2016116 "G.O.Sars"
28 October–10 November 2016

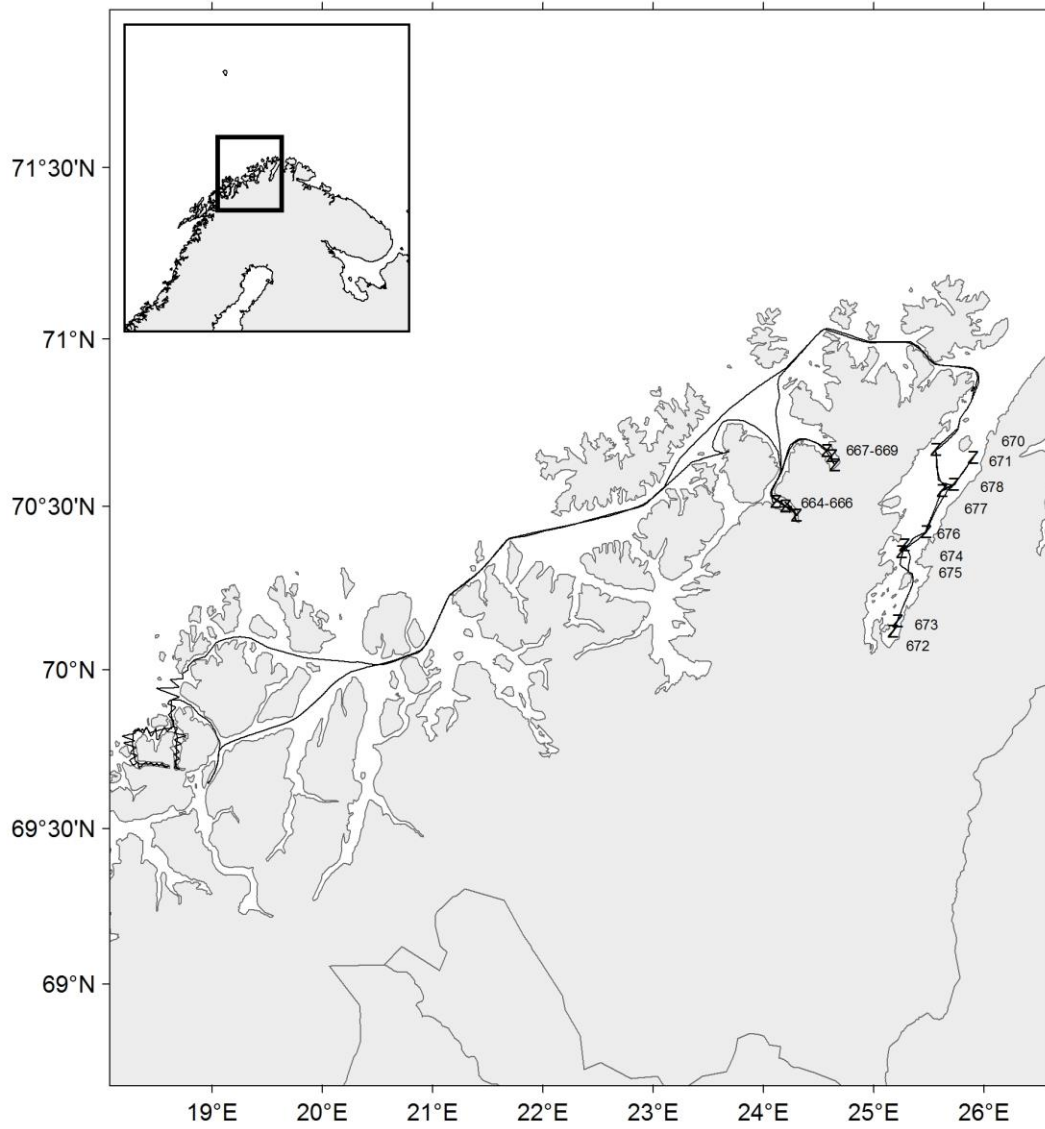
▲ Pelagic trawl st.no233-237



Cruise no 2016117 "G.O.Sars"
12–23 November 2016

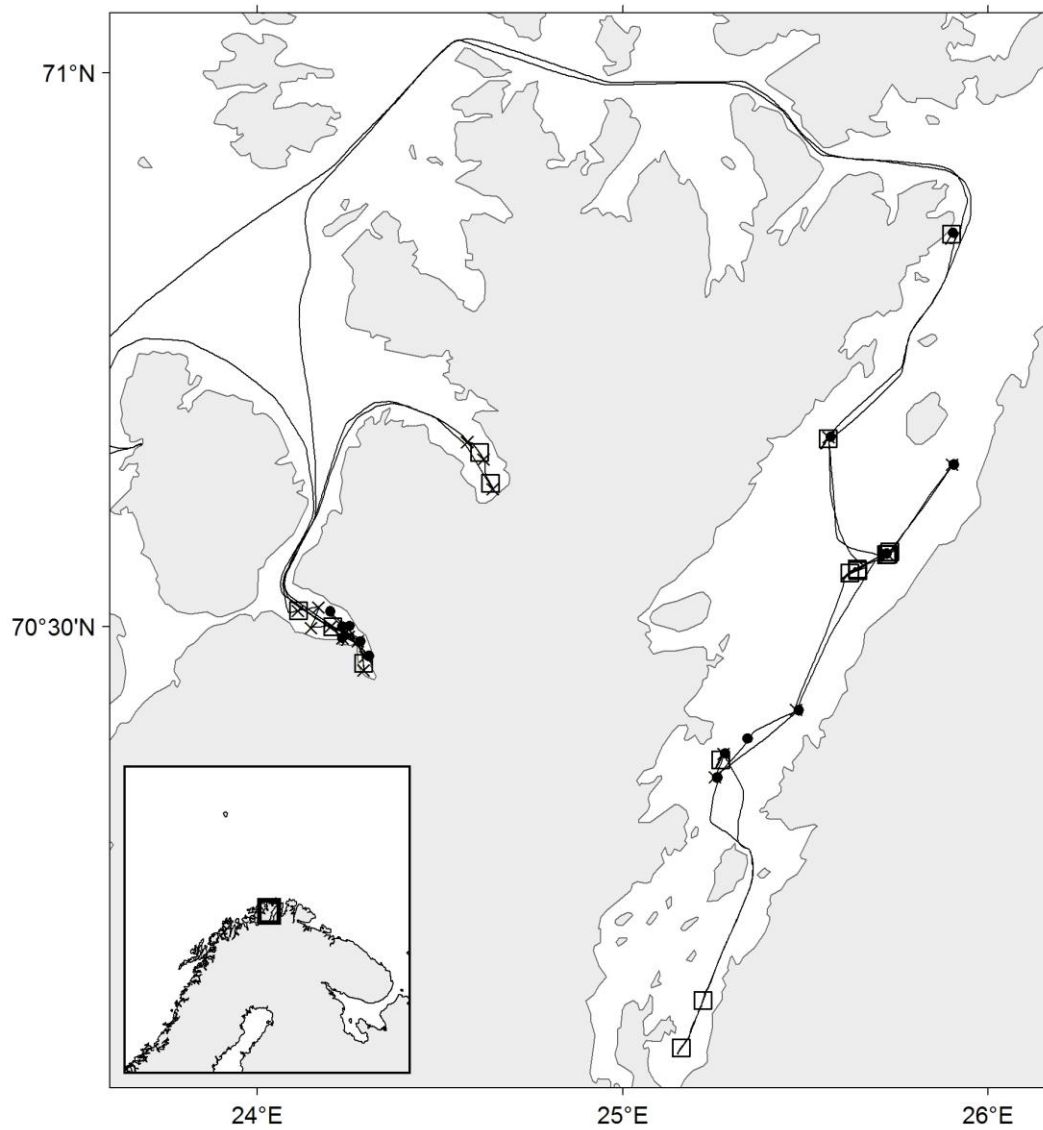
- z CTD st.no 616-663
- Plankton st. (WP-II-net)
- ◆ Plankton st. (Mocness)
- ⊕ Bouy deployed

Standard sections:
Svinøy NW st.no 616-631
Gimsøy NW st.no 634-643
Fugløya–Bjørnøya st.no 644-663
St.M st.no 632-633



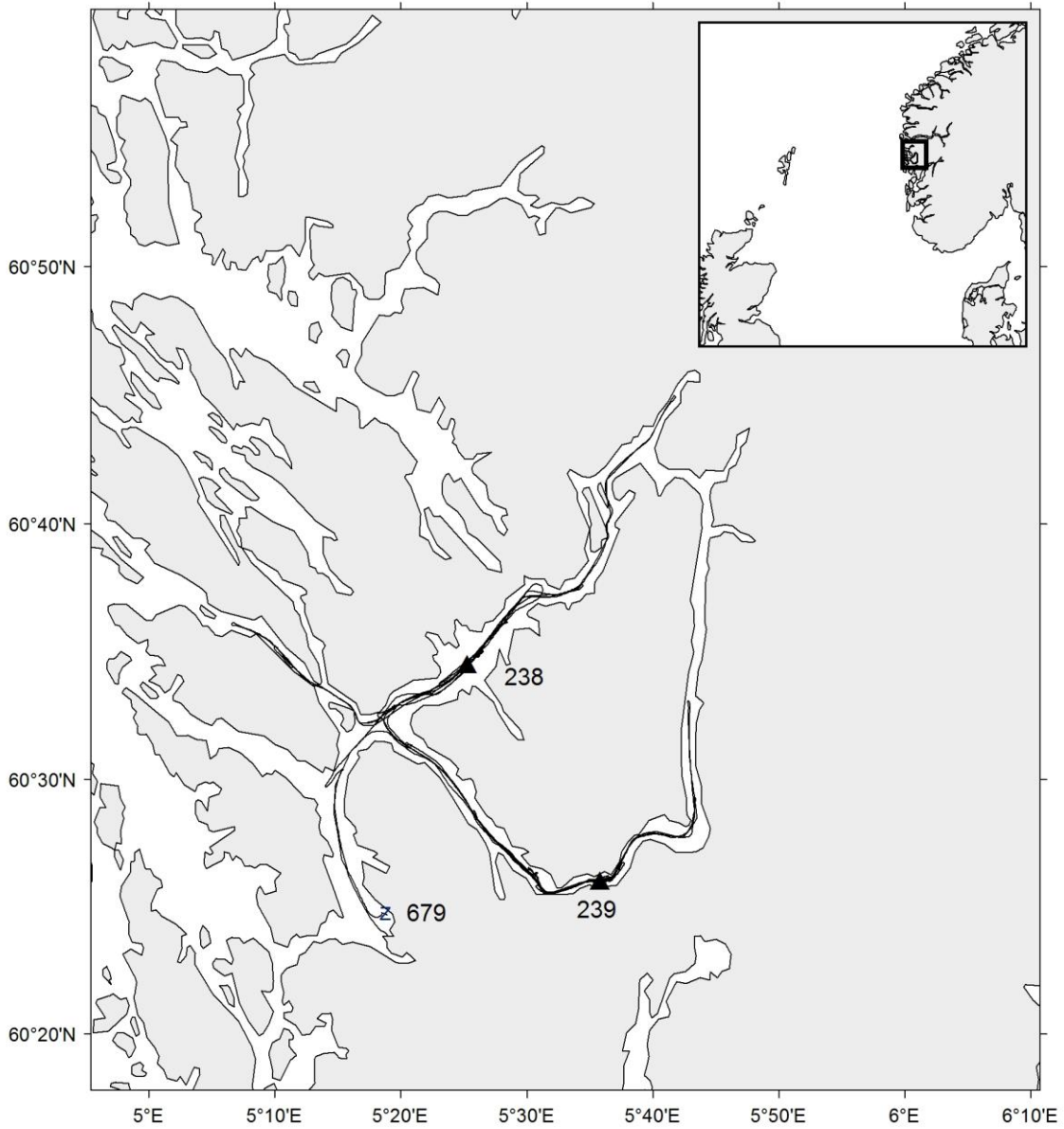
Cruise no 2016118 "G.O.Sars"
24 Nov–1 Dec 2016

z CTD st.no 664-678



Cruise no 2016118 "G.O.Sars"
24 Nov–1 Dec 2016

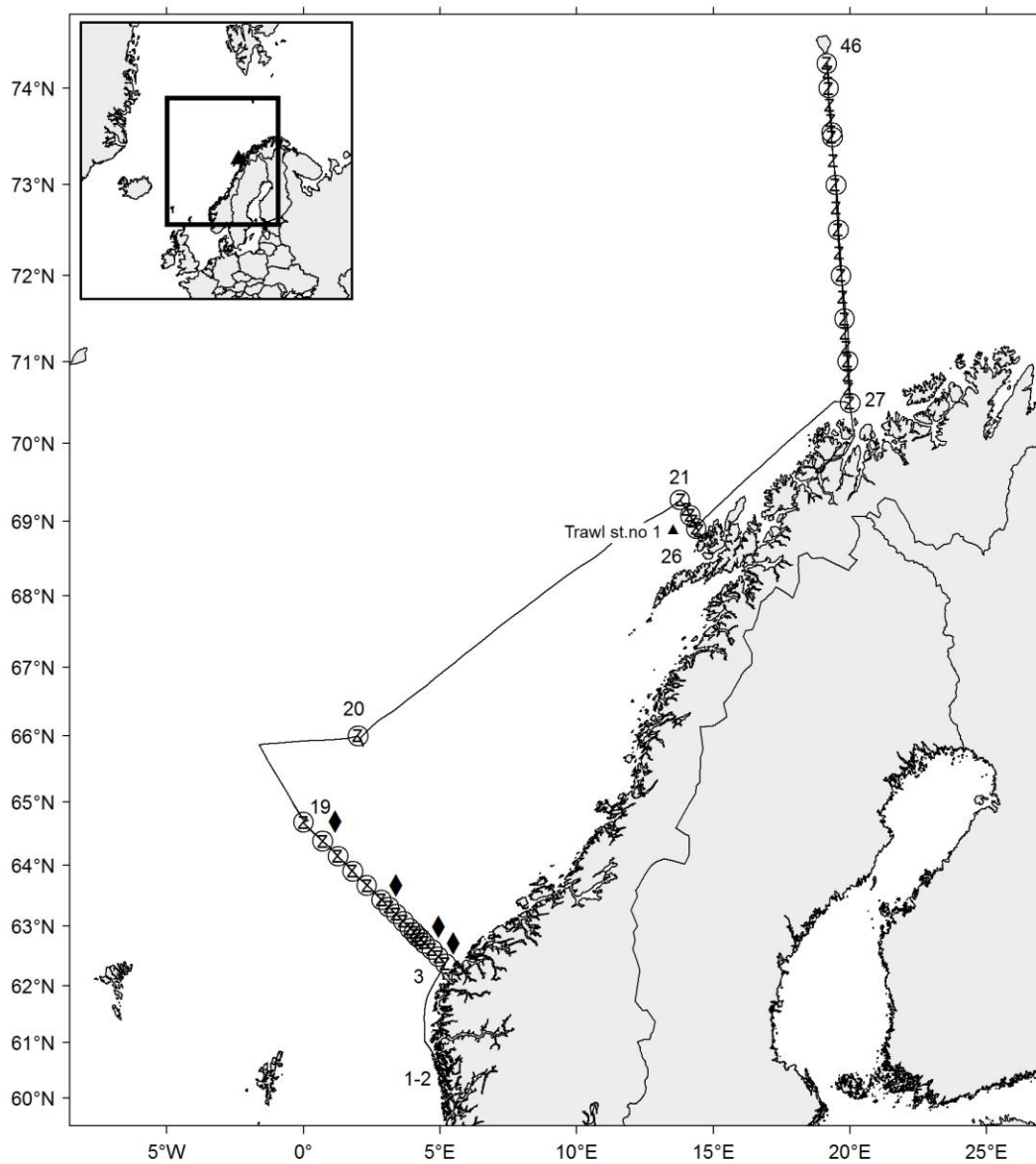
- Beam trawl
- × Grab st.
- ROV st.



Cruise no 2016119 "G.O.Sars"
7–14 December 2016

z CTD st.no 679
▲ Pelagic trawl st. 238-239

4.2 Johan Hjort



Cruise no 2016201 "Johan Hjort"

11–20 January 2016

z CTD st.no 1–46

○ Plankton st. (WP-II-net)

◆ Plankton st. (Mocness)

▲ Pelagic trawl st.no 1

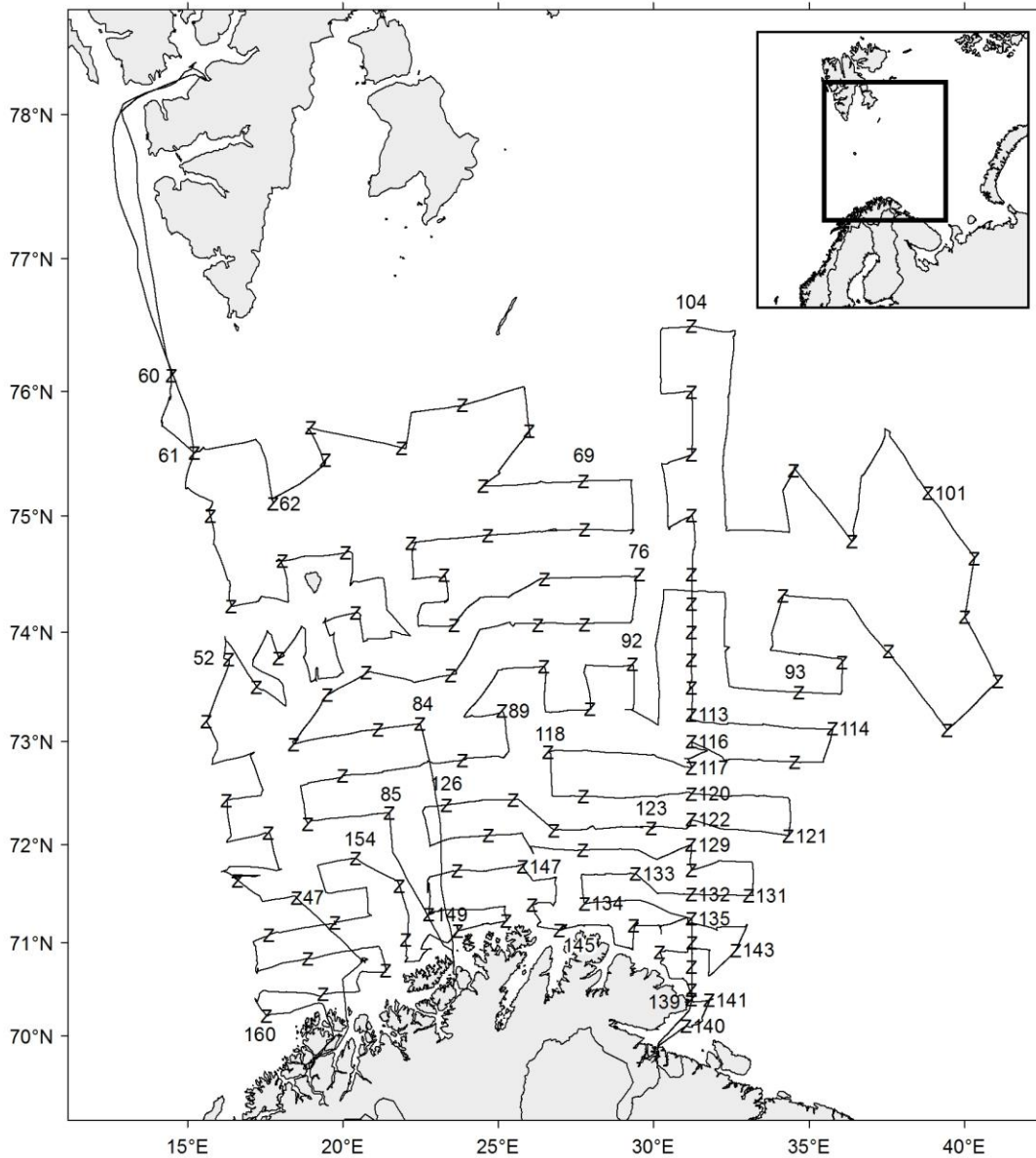
Standard sections:

Svinøy–NW st.no 3–19

Fugløya–Bjørnøya st.no 27–46

St. M st.no 20

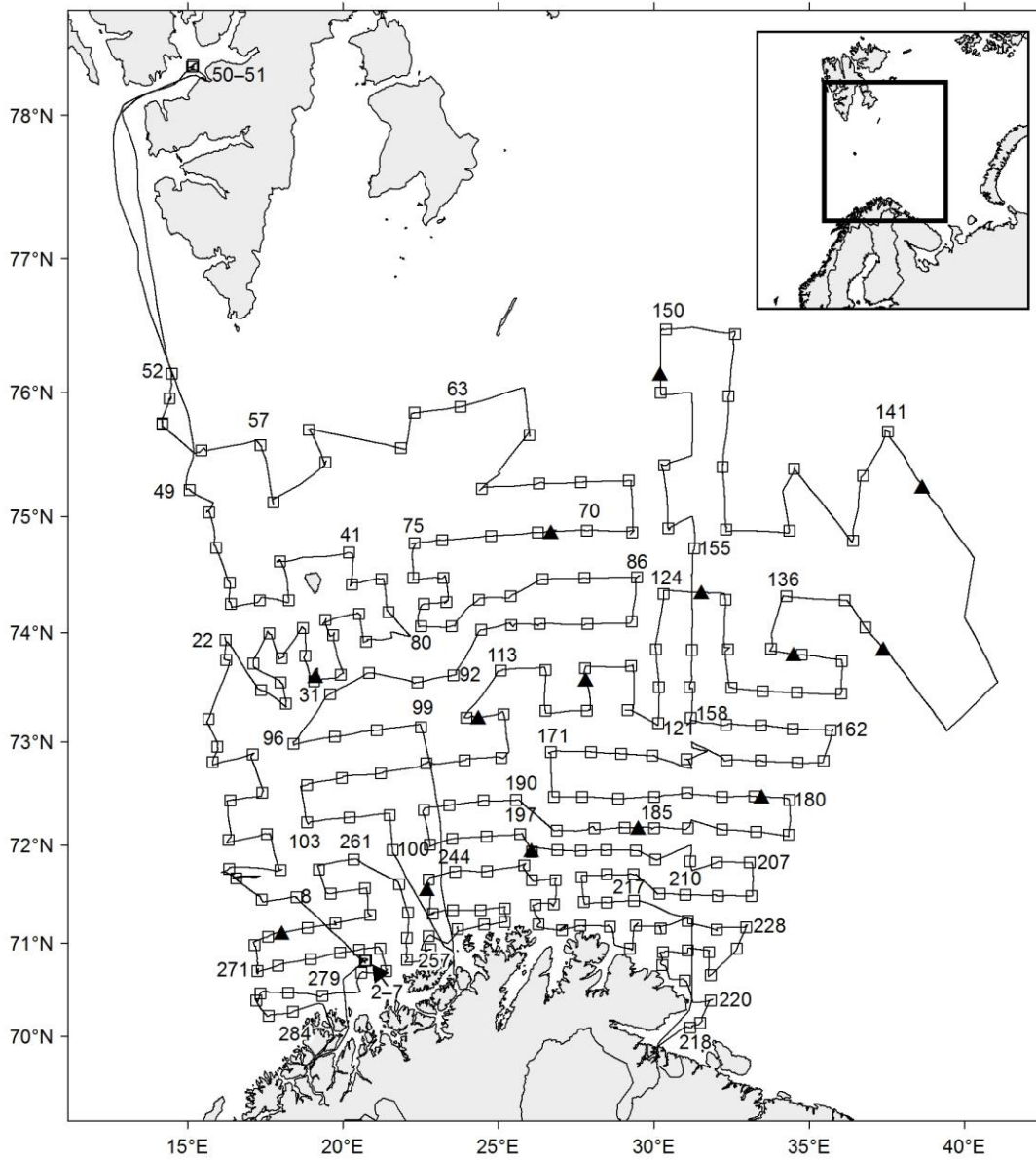
Project LoVe st.no 21–26



Cruise no 2016202 "Johan Hjort"
 24 Jan–10 Mar 2016

z CTD st.no 47–160

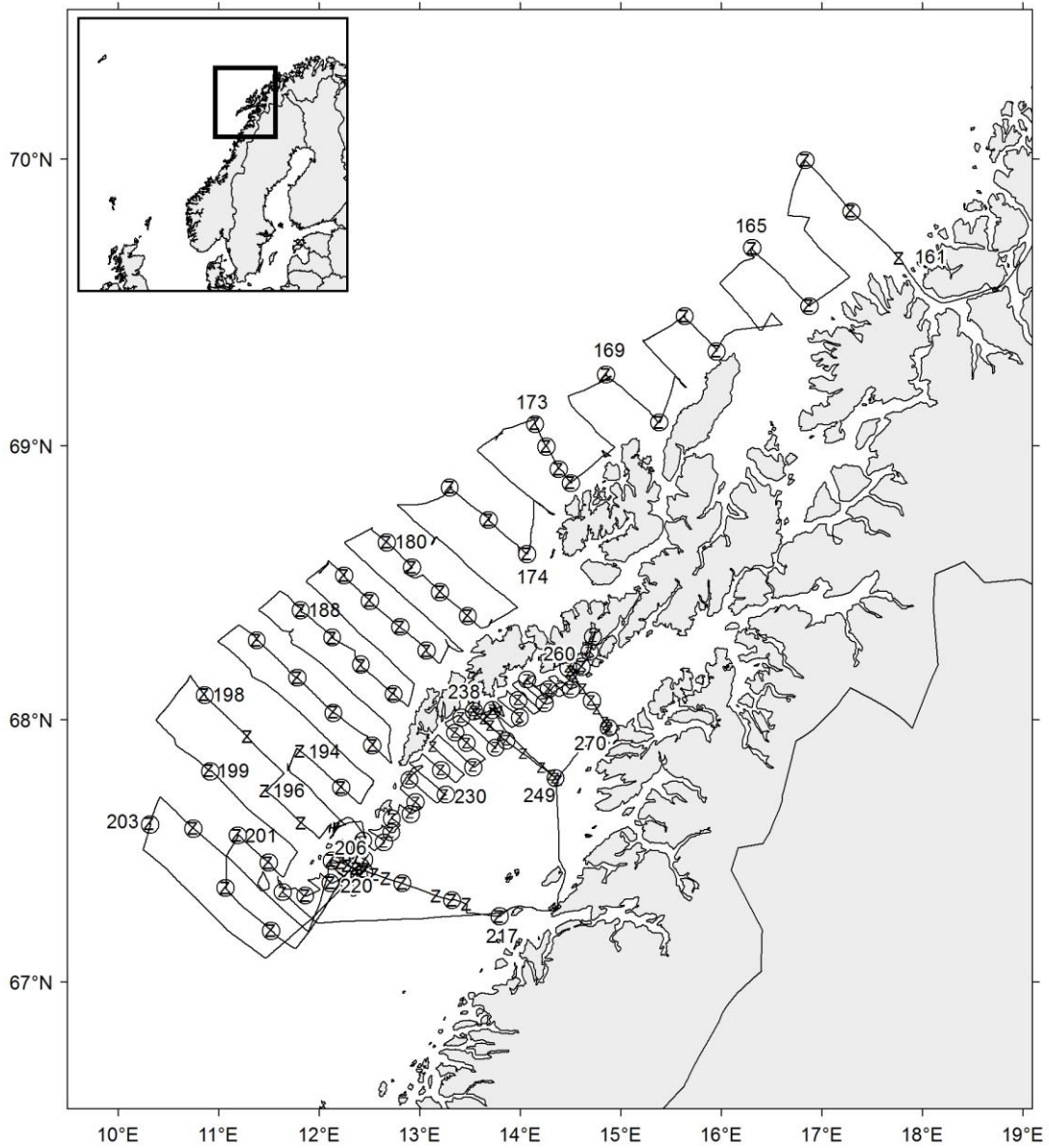
Standard section Vardø N: st.no 104–113,116–117,120,122,129–130,132,135–139



Cruise no 2016202 "Johan Hjort"
24 Jan–10 Mar 2016

Trawl st.no 2–284

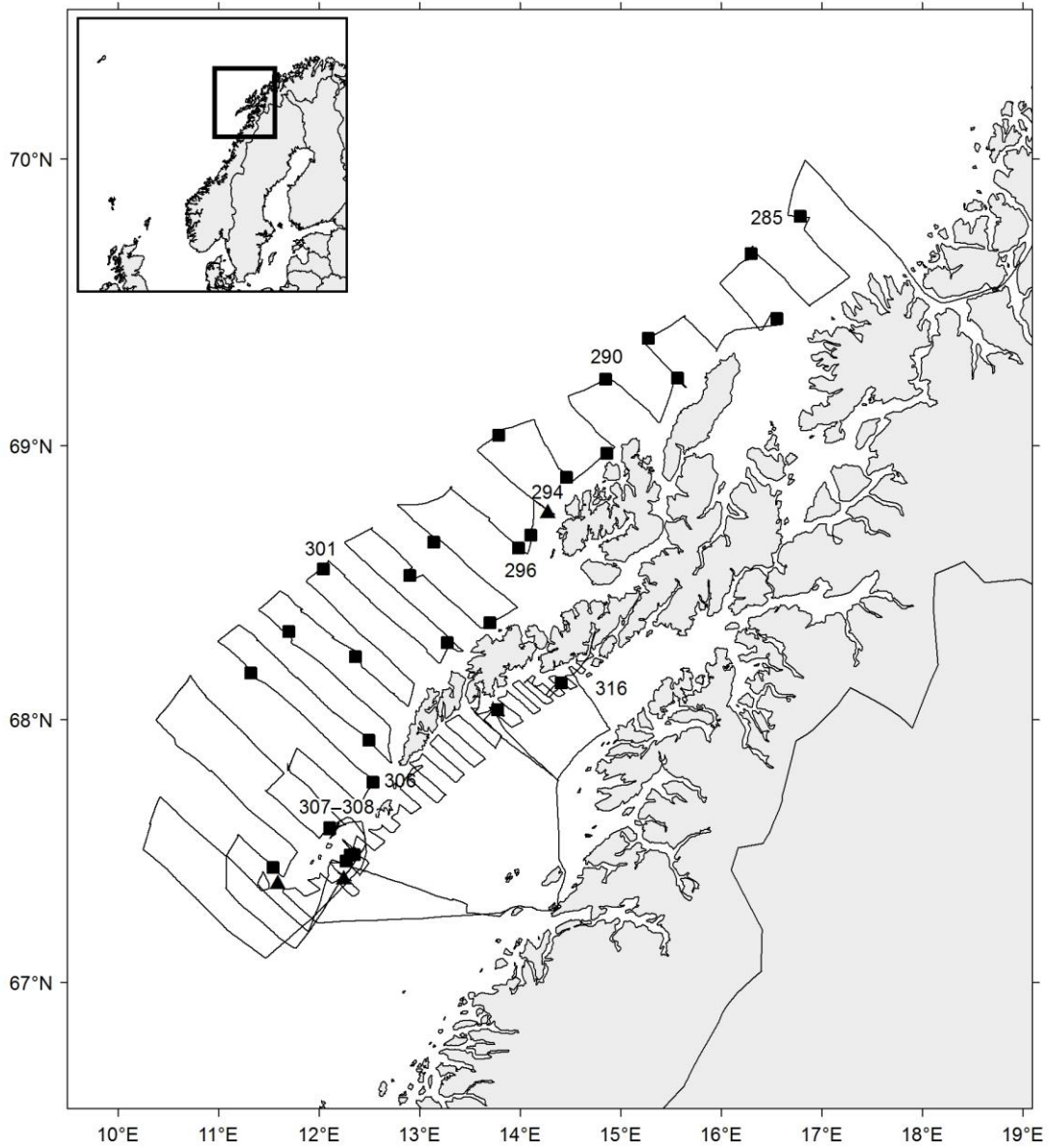
- Bottom trawl
- ▲ Pelagic trawl



Cruise no 2016203 "Johan Hjort"
21 Mar–3 Apr 2016

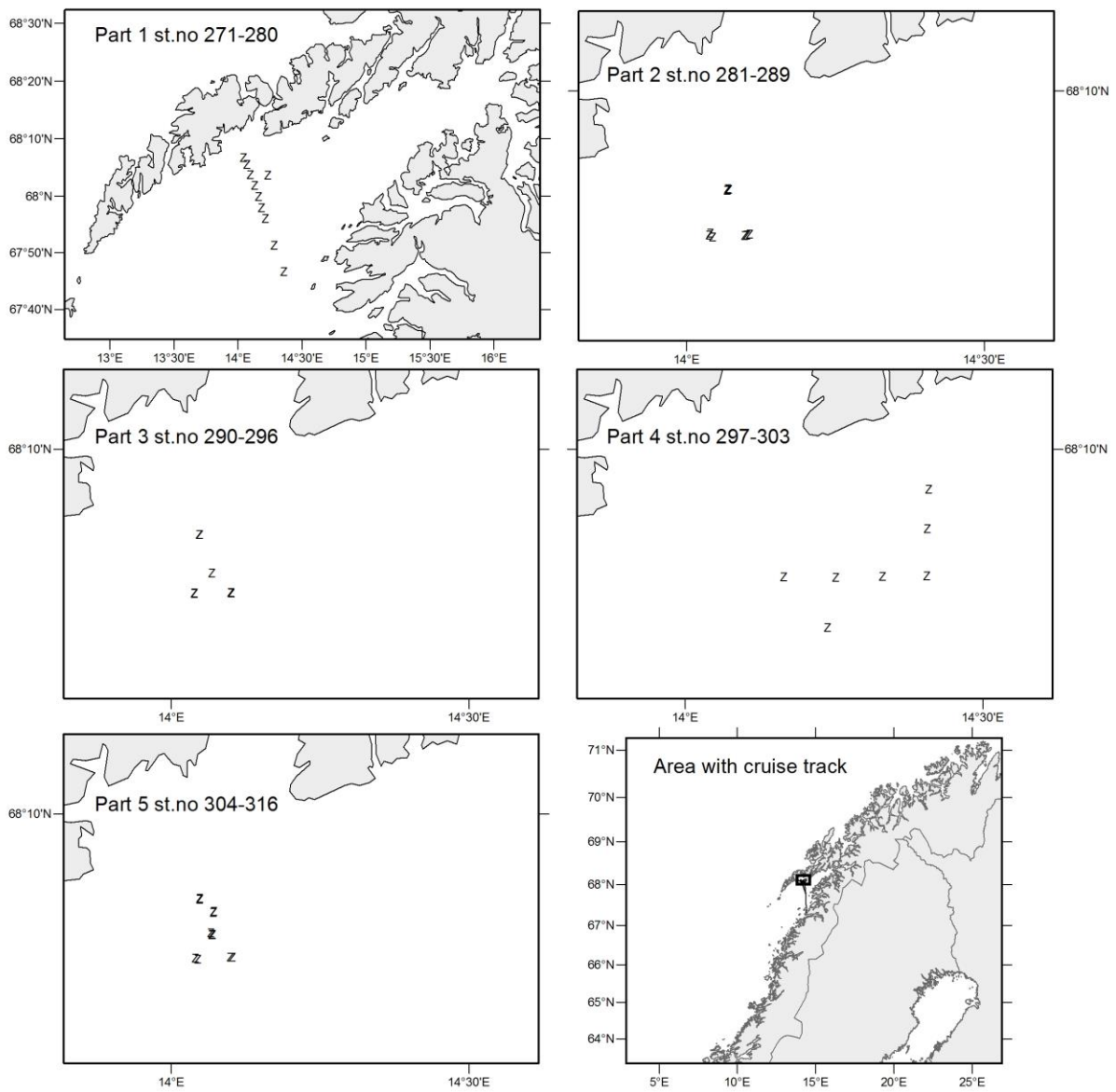
z CTD st.no 161–270
○ Egg st. (WP-II-net)

Standard sections:
Tennholmen–Røst st.no 206–217
Ballstad–Måløy/Skarholmen st.no 238–249
Kabelvåg–Steigen st.no 260–270



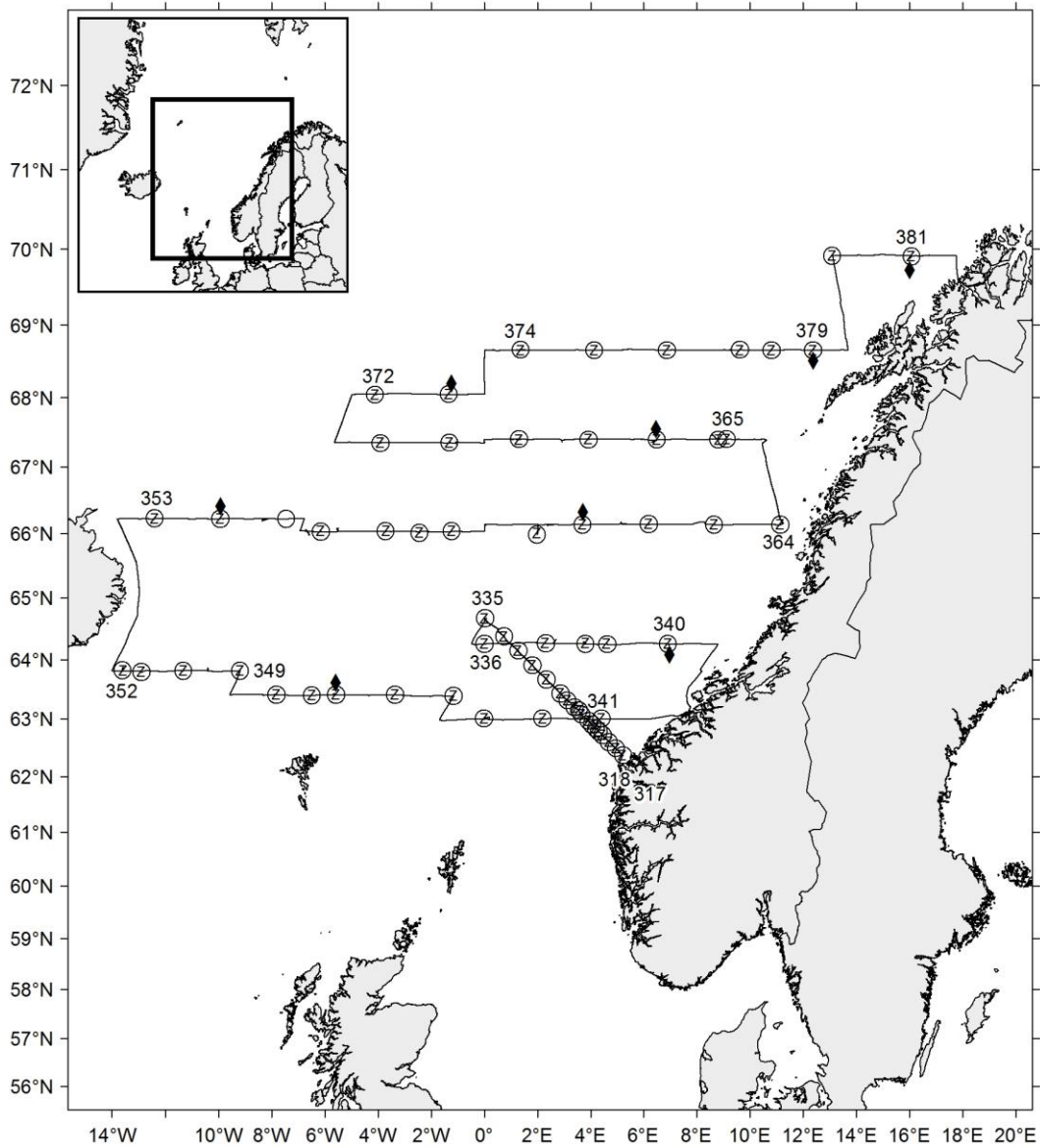
Cruise no 2016203 "Johan Hjort"
21 Mar–3 Apr 2016

Trawl st.no 285–316
 ■ Bottom trawl
 ▲ Pelagic trawl



Cruise no 2016204 "Johan Hjort"
4-7 April 2016

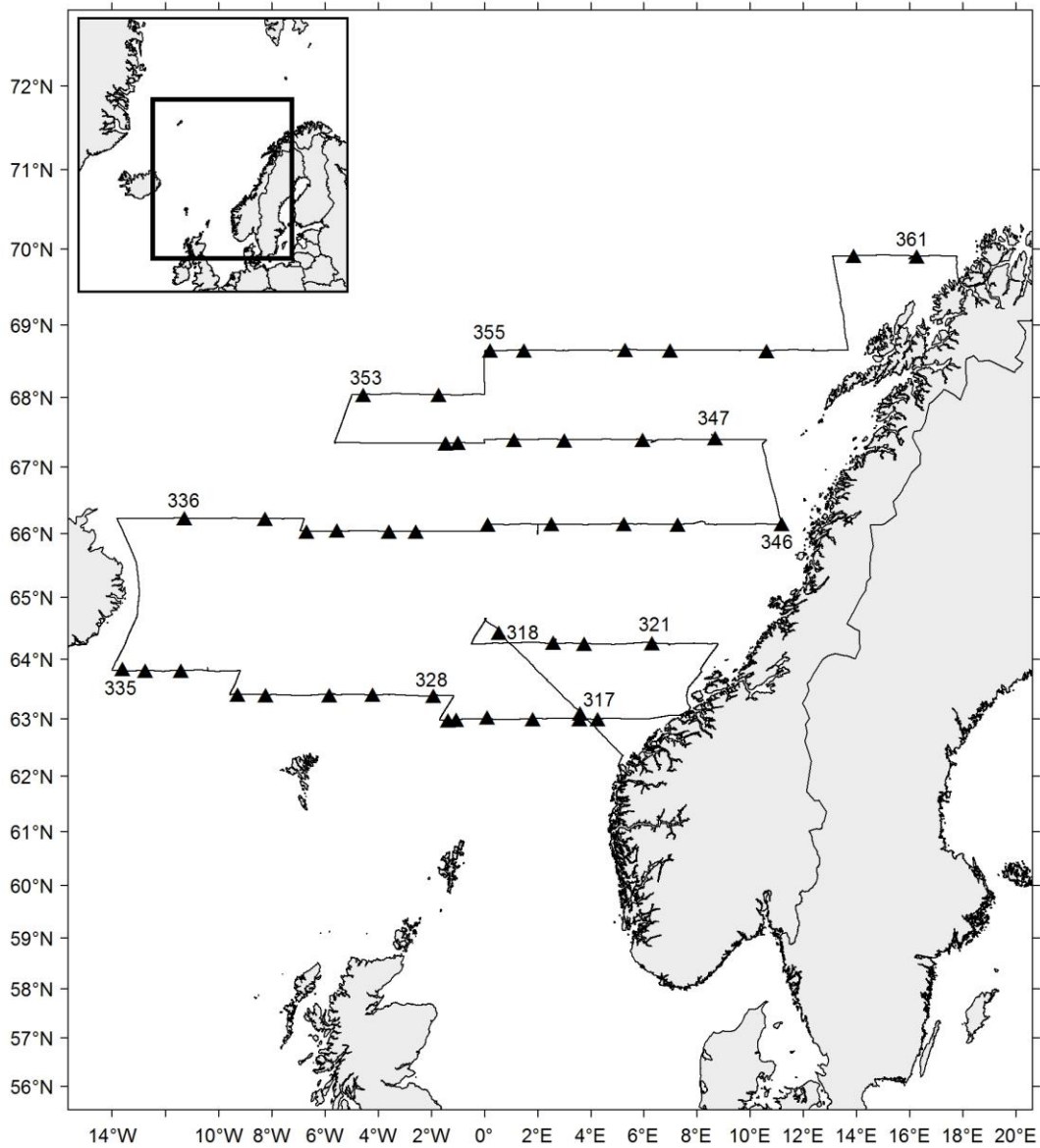
z CTD st.no 271-316
Egg st. (WP-II-net) at every ctd station



2016205 "Johan Hjort"
2–23 May 2016 (Part 1)

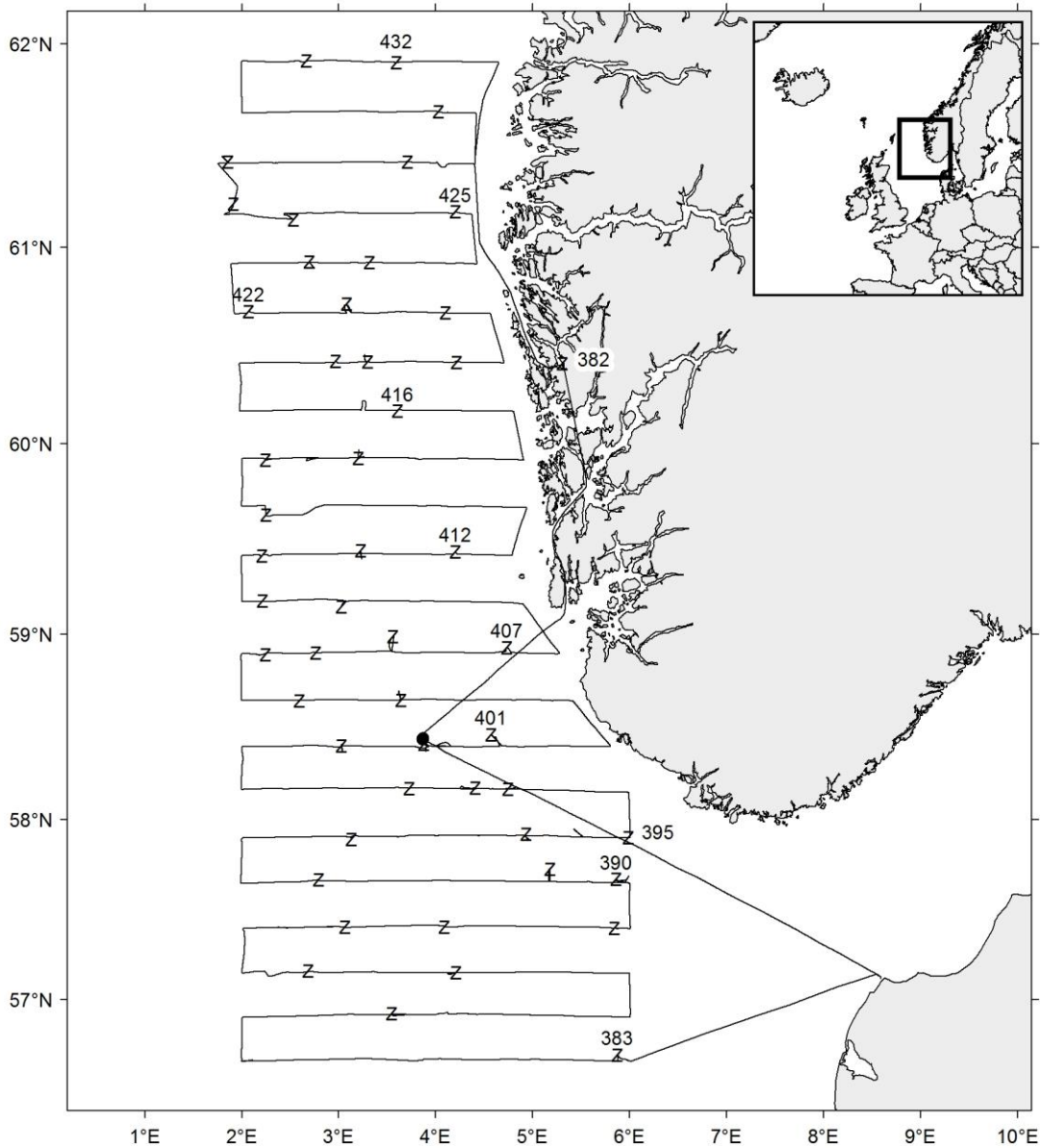
Standard section:
Svinøy NW st.no 318–335

- z CTD st.no 317–381
- Plankton st. (WP-II-net)
- ◆ Plankton st. (Mocness)



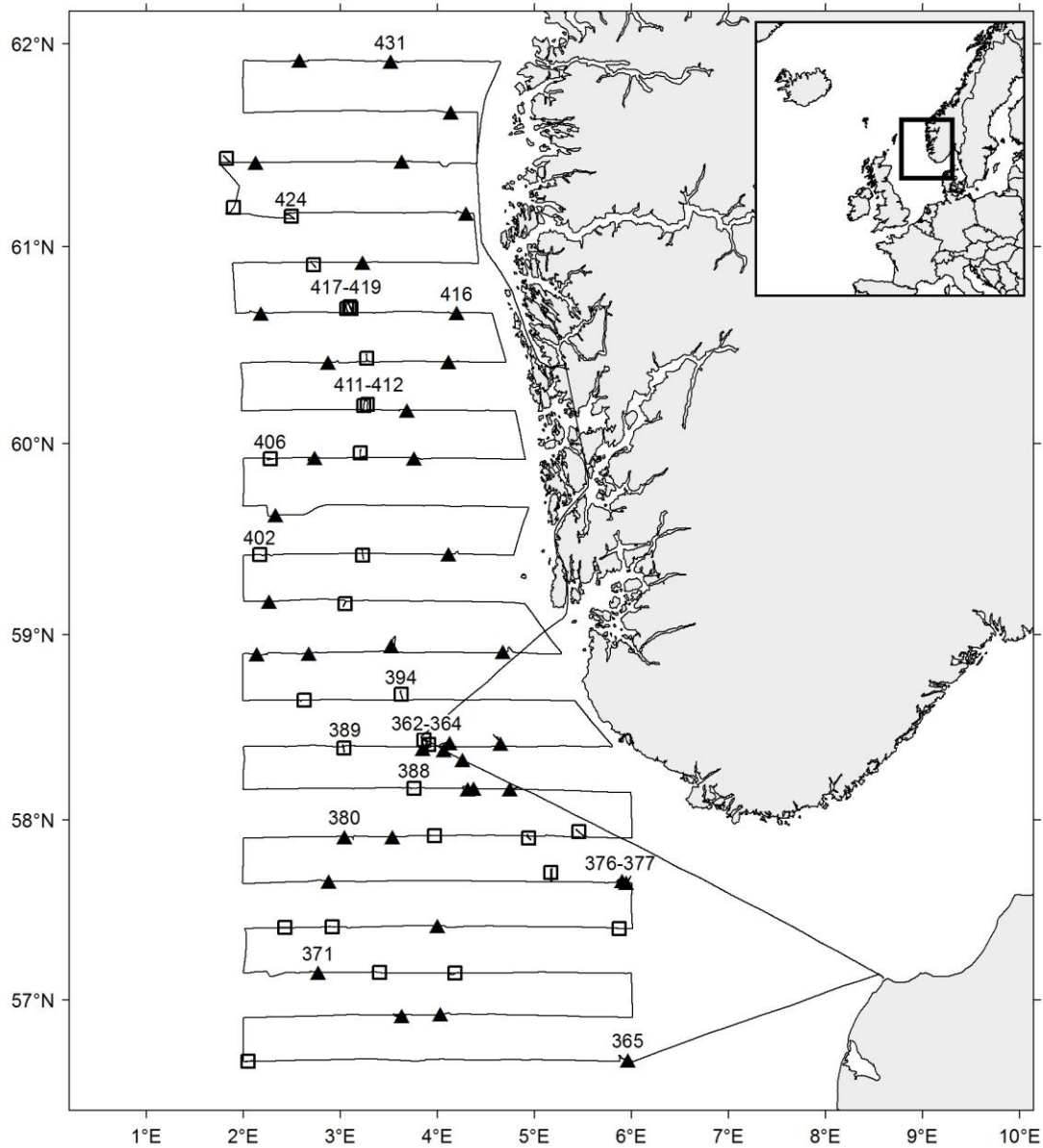
2016205 "Johan Hjort"
2–23 May 2016 (Part I)

- ▲ Pelagic trawl st.no 317–361
(some krill trawl)



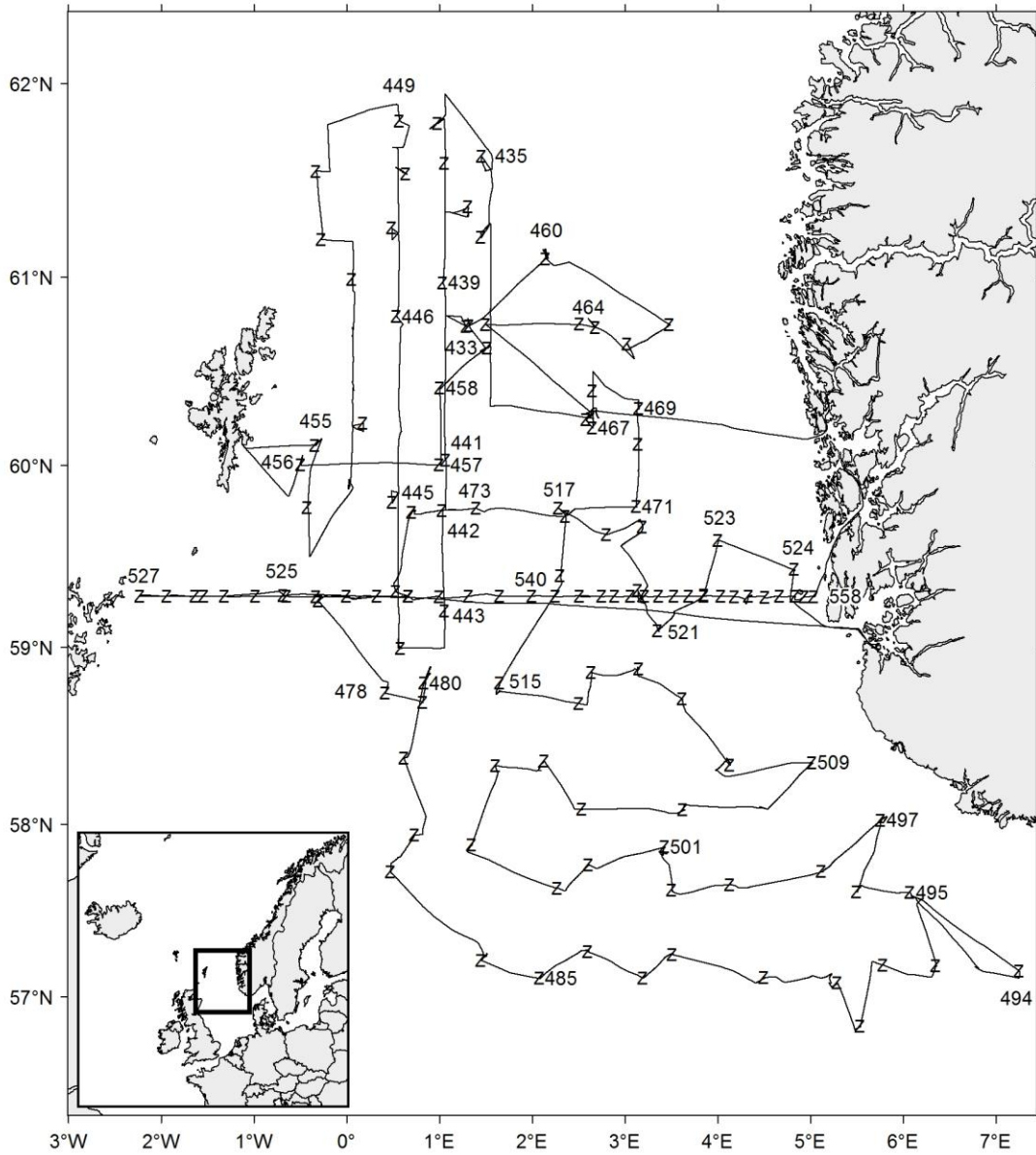
Cruise no 2016207 "Johan Hjort"
 27 June–14 July 2016

z CTD st.no 382–432
 ● Mik station



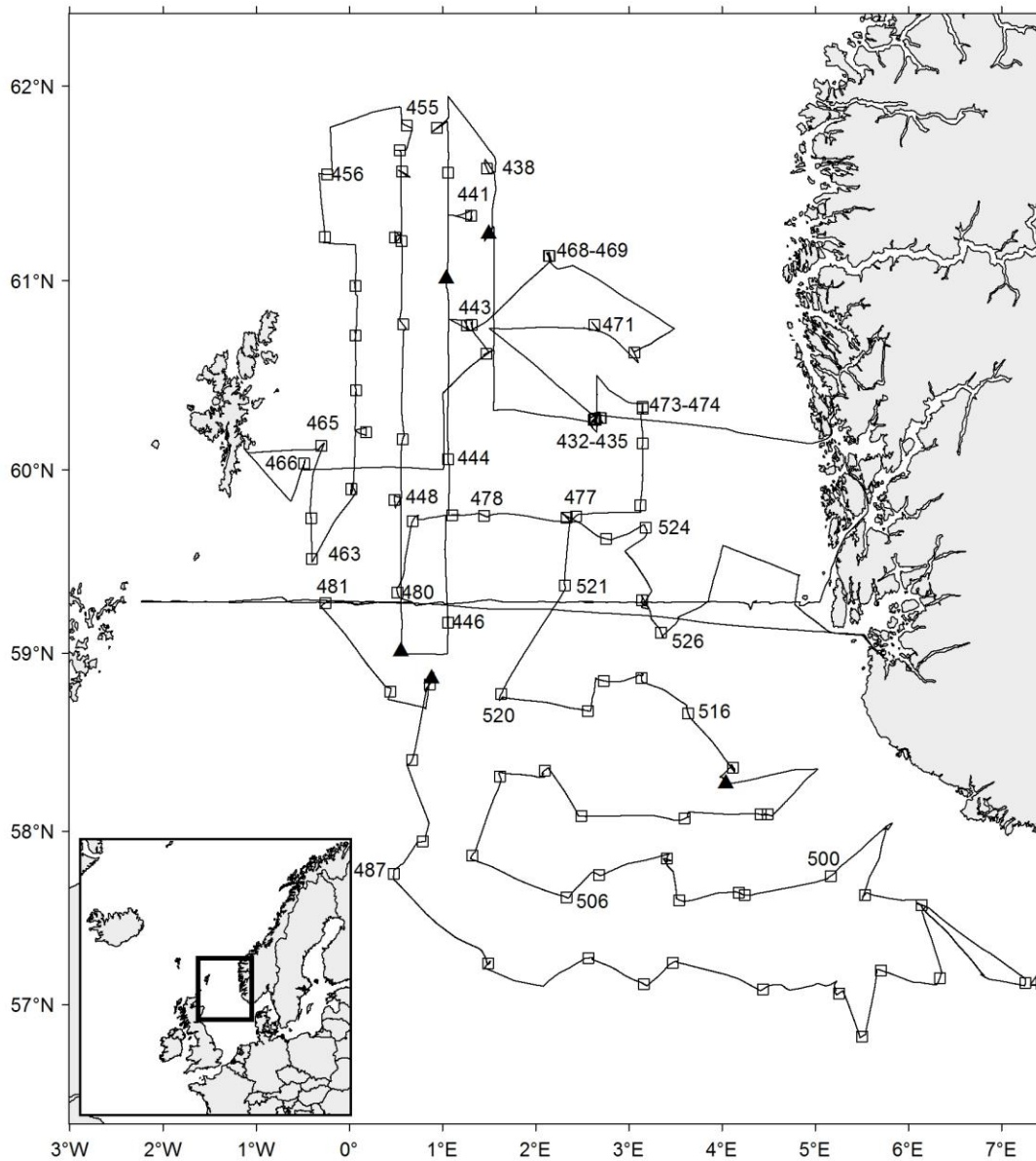
Cruise no 2016207 "Johan Hjort"
27 June–14 July 2016

Trawl st.no 362–431
 □ Bottom trawl
 ▲ Pelagic trawl



Cruise no 2016208 "Johan Hjort" Standard section Utsira W: st.no 527–558
 15 July–13 August 2016

z CTD st.no 433-558

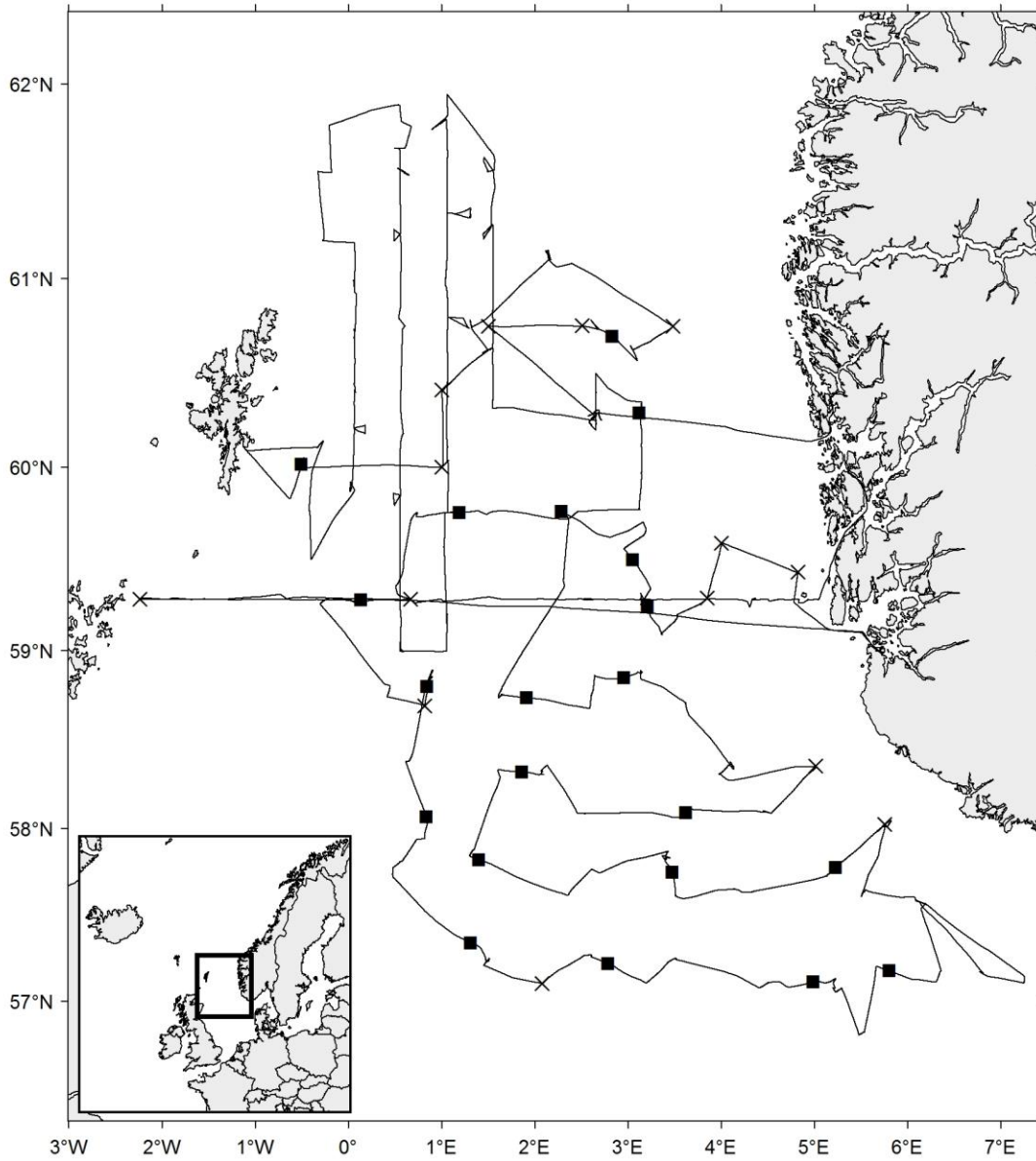


Cruise no 2016208 "Johan Hjort"
15 July–13 August 2016

Trawl st.no 432-526

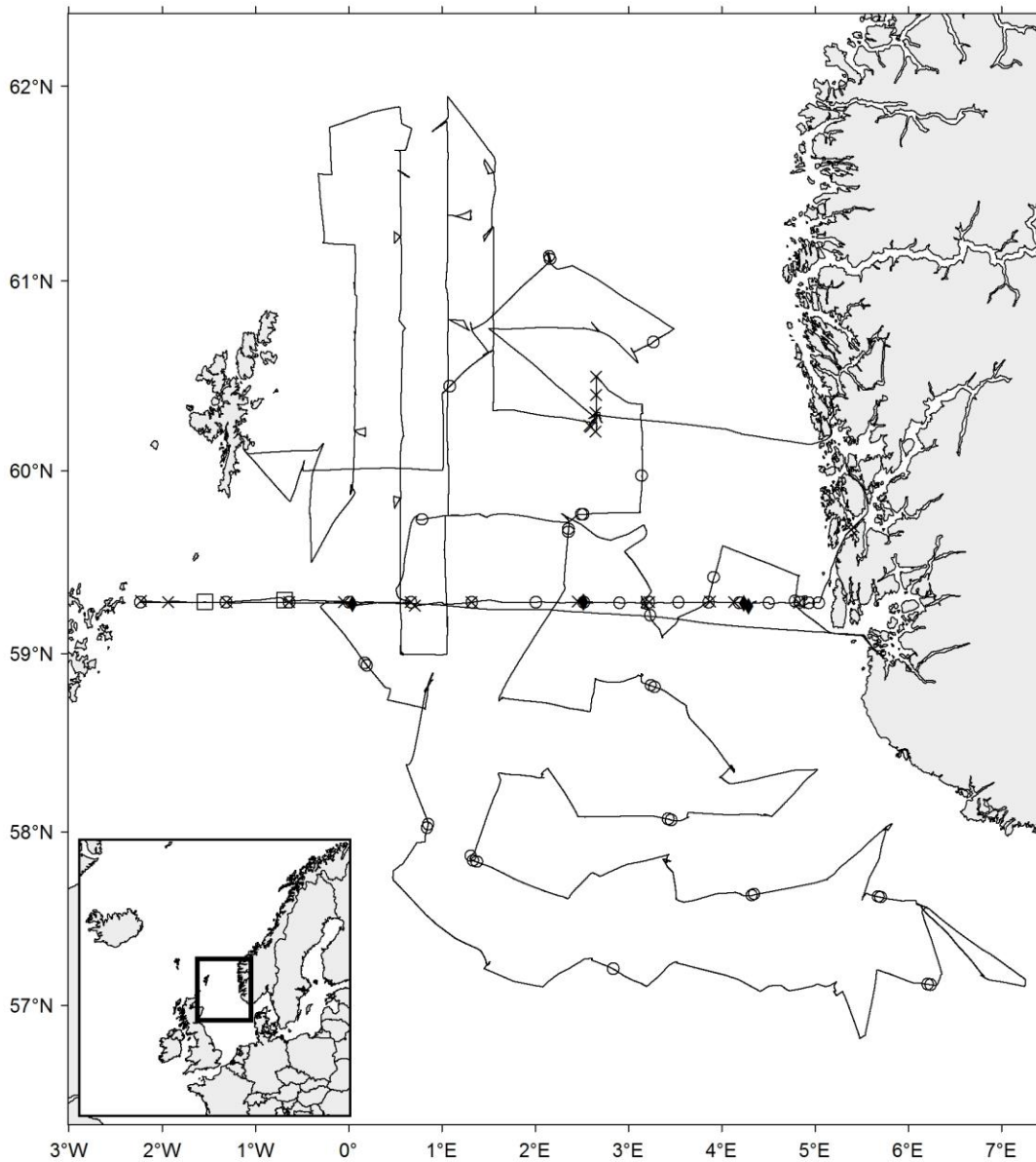
□ Bottom trawl

▲ Pelagic trawl



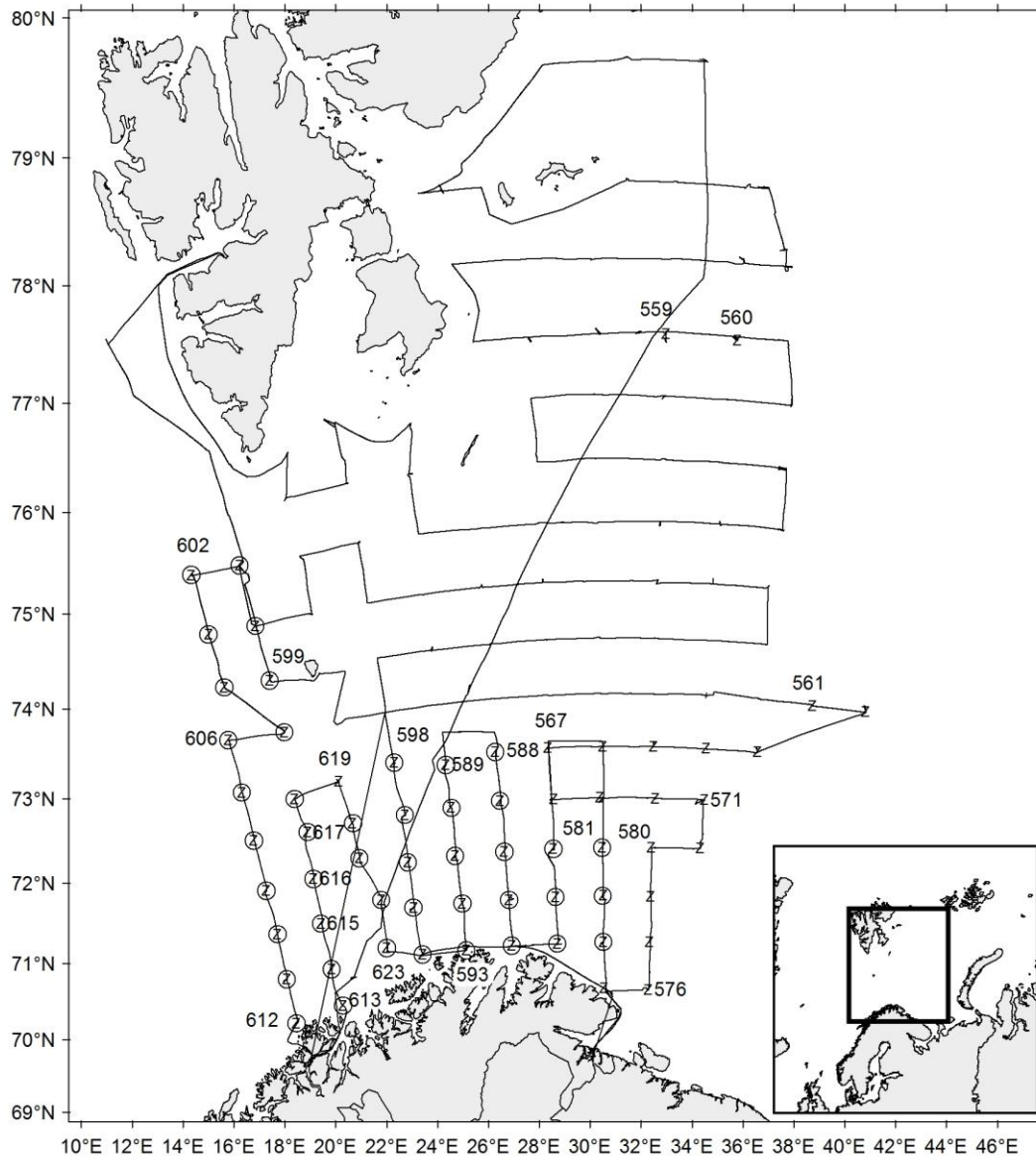
Cruise no 2016208 "Johan Hjort"
15 July–13 August 2016

- × Grab st.
- Beam trawl st.



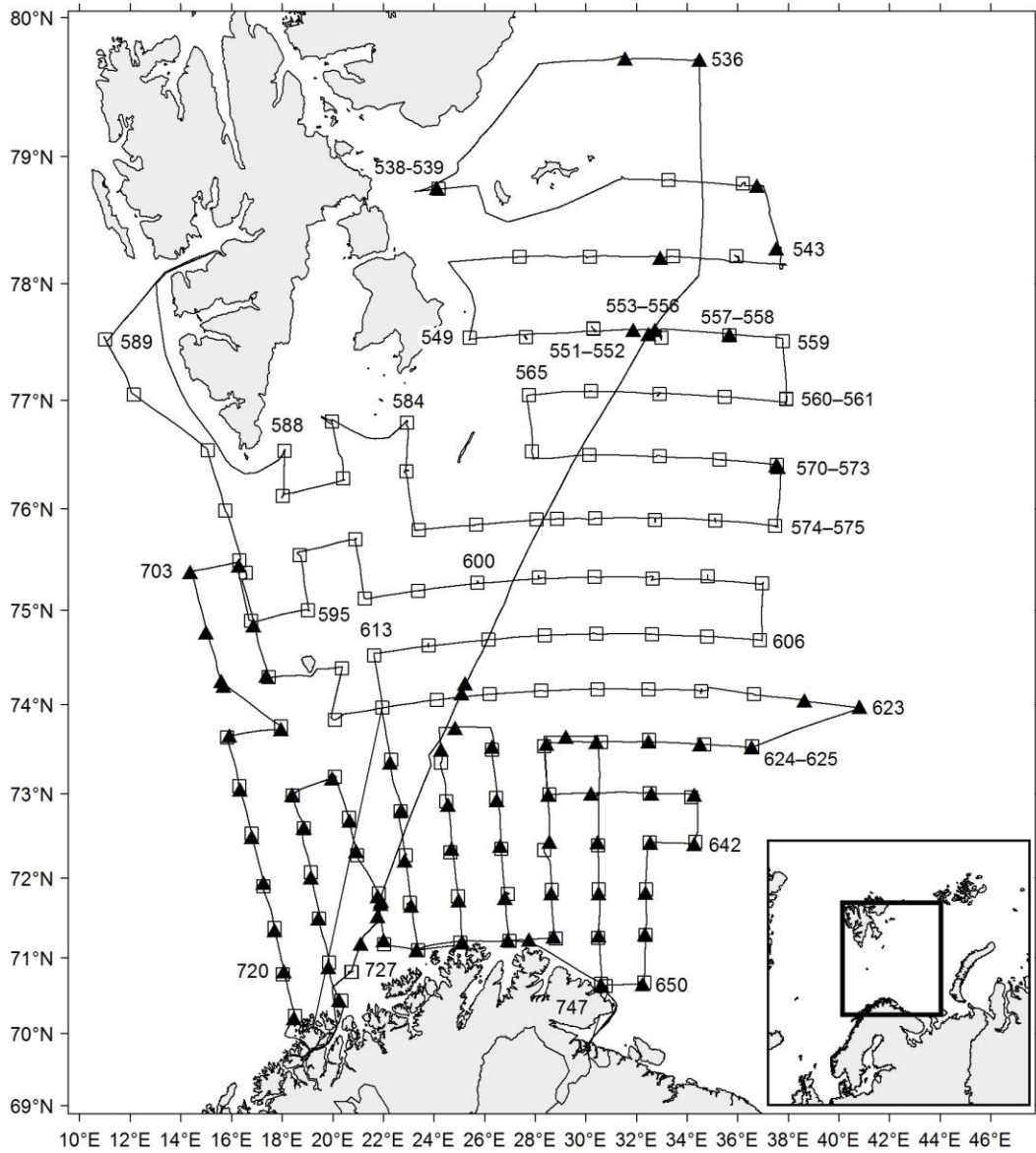
Cruise no 2016208 "Johan Hjort"
15 July–13 August 2016

- WP-II-net, Bongo and Otter st.
- ◆ MOCNESS st.
- × Mik st.
- Multinet st.



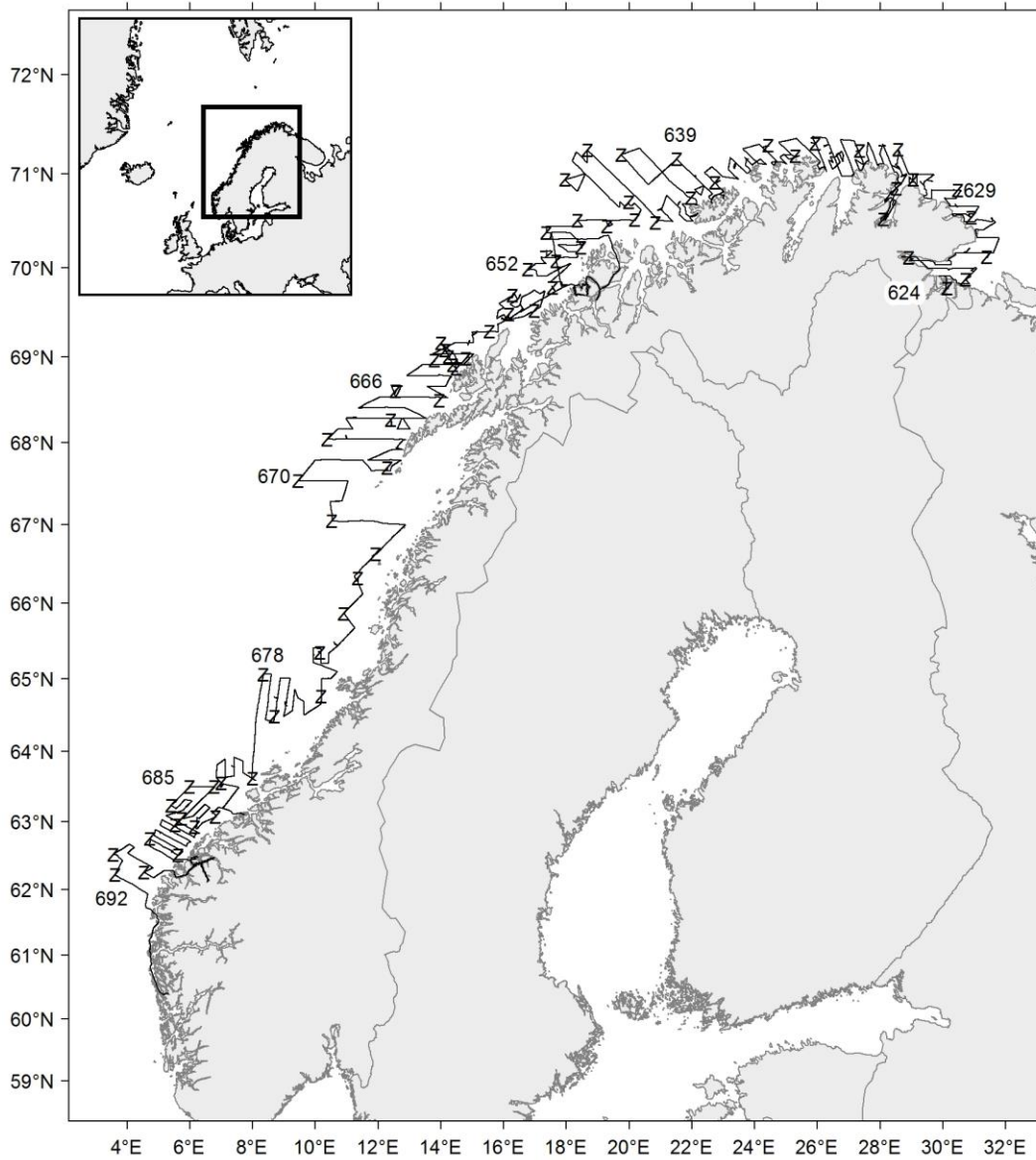
Cruise no 2016209 "Johan Hjort"
20 August–30 September 2016

z CTD st.no 559–623
o Plankton st. (WP-II-net)



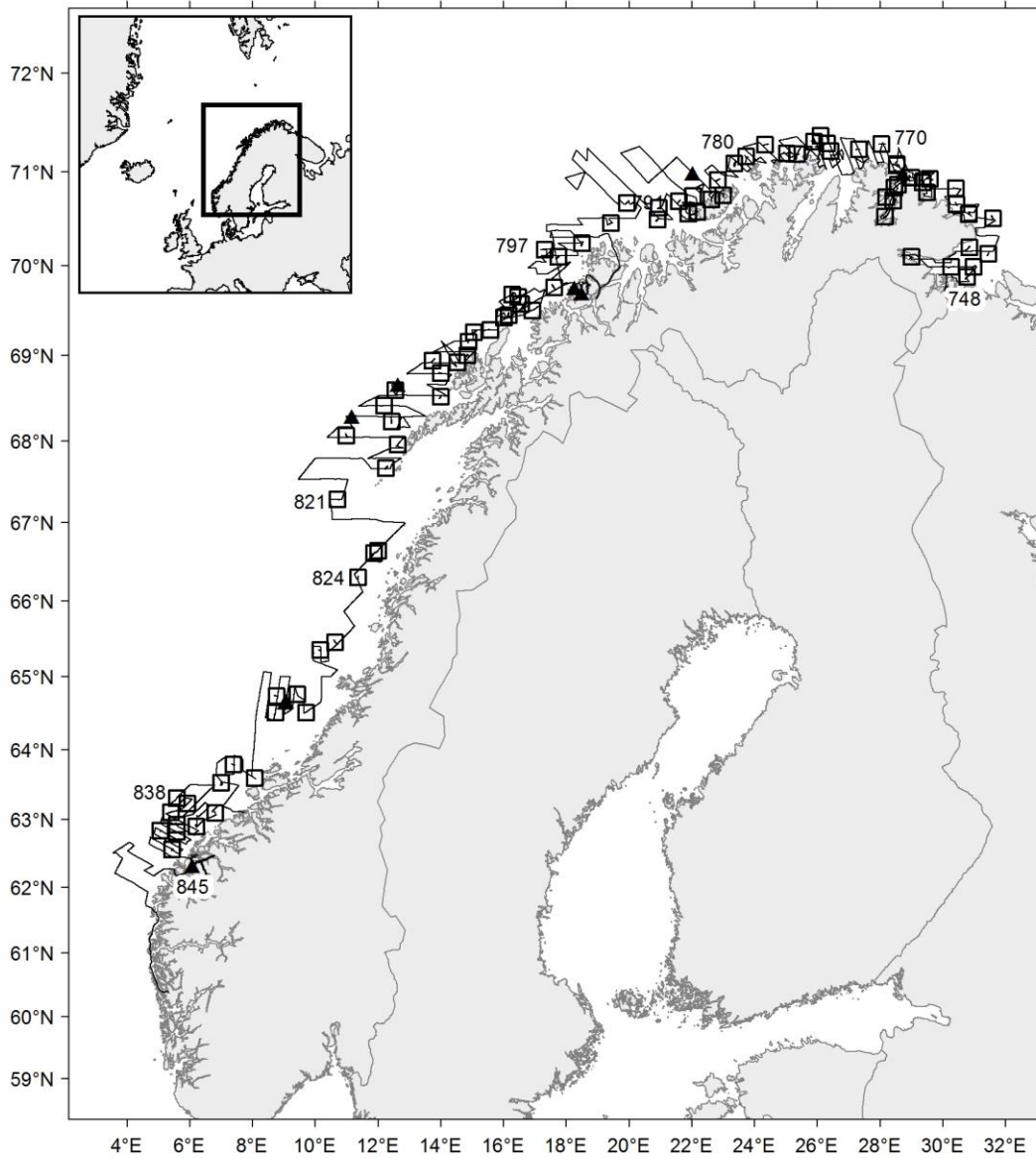
Cruise no 2016209 "Johan Hjort"
20 August–30 September 2016

Trawl st.no 527–747
 □ Bottom trawl
 ▲ Pelagic trawl



Cruise no 2016210 "Johan Hjort"
1–30 October 2016

z CTD st.no 624–692



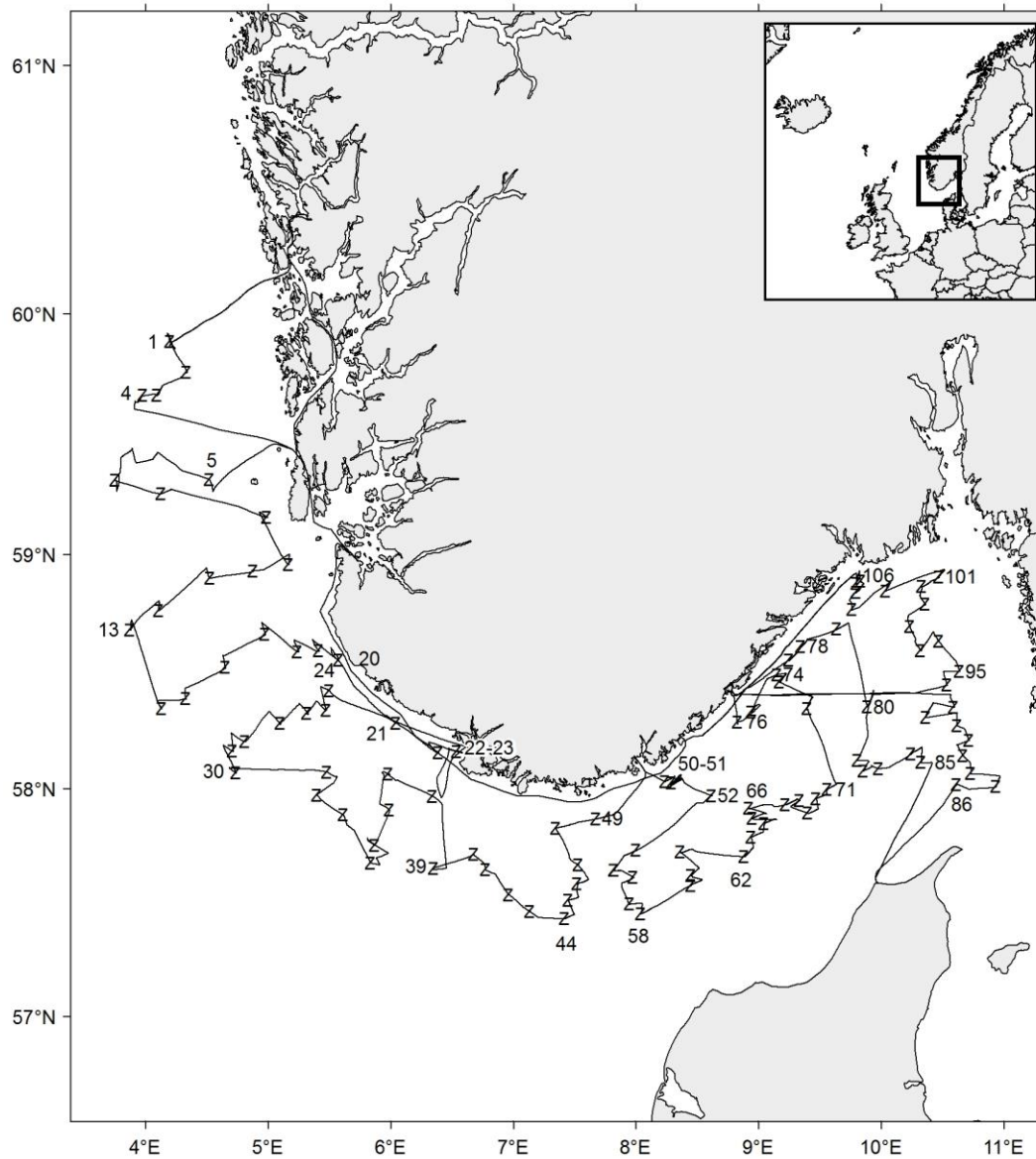
Cruise no 2016210 "Johan Hjort"
 1–30 October 2016

Trawl st.no 748–845

□ Bottom tr.

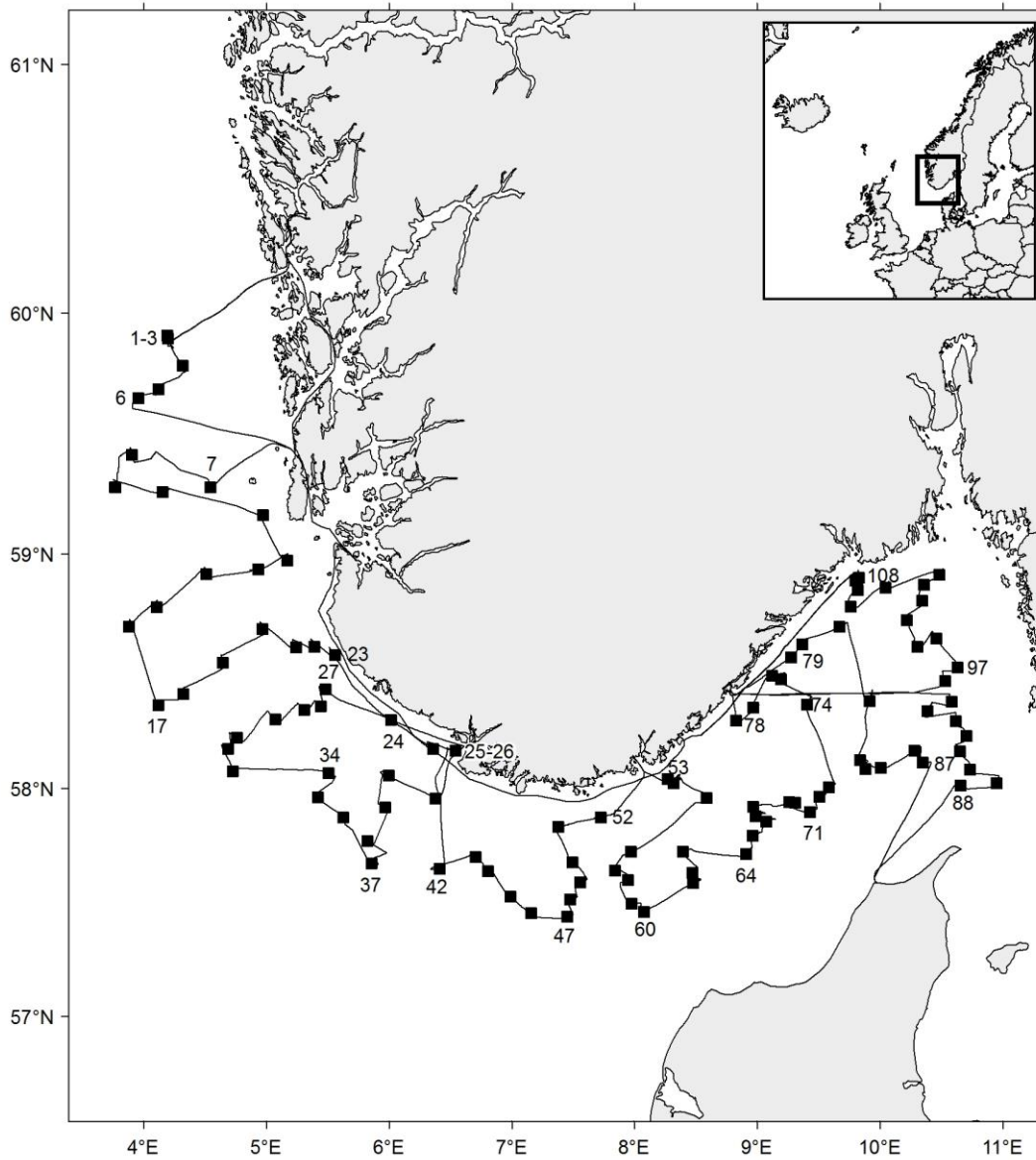
▲ Pelagic tr.

4.3 Håkon Mosby



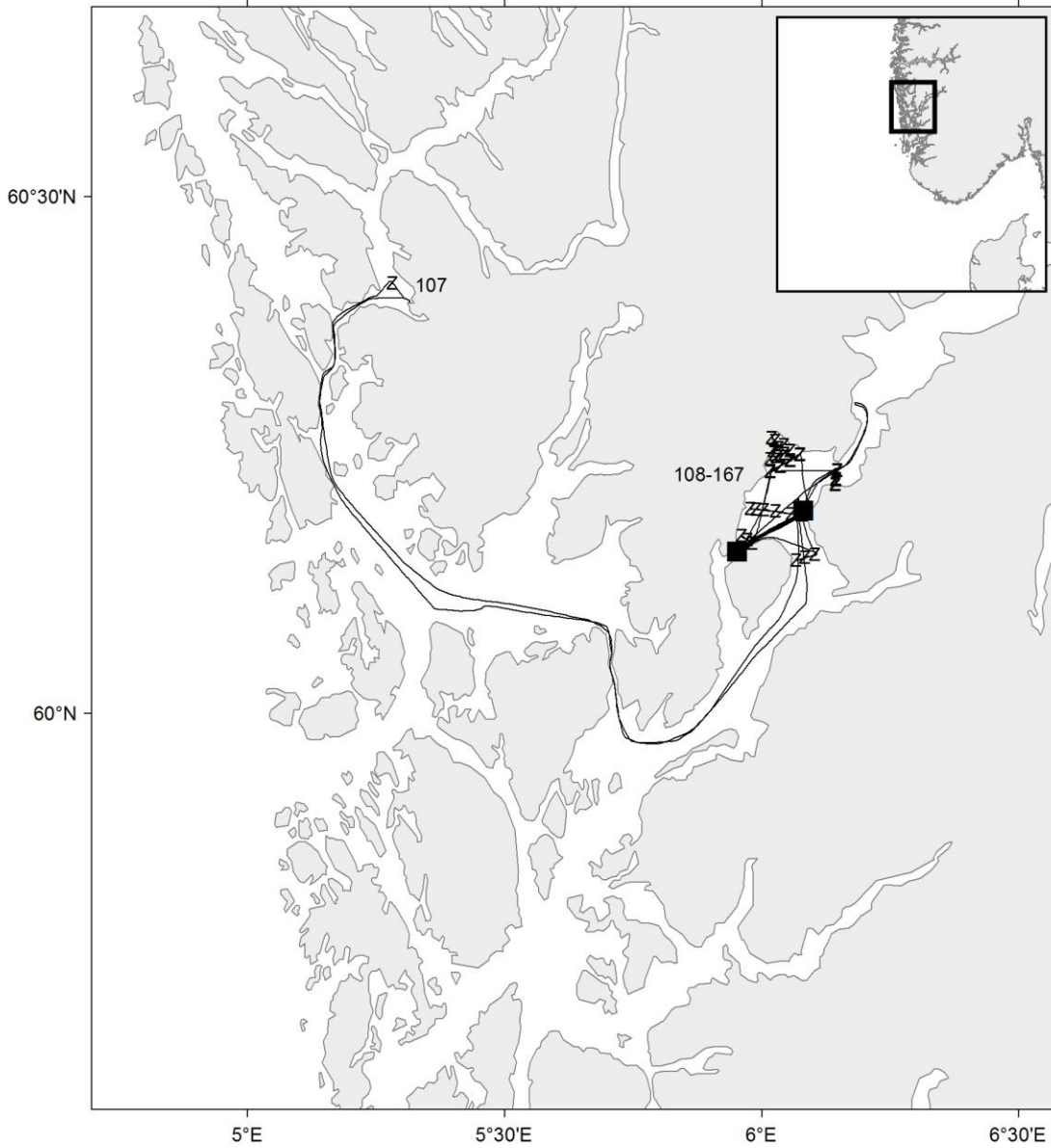
Cruise no 2016601 "H.Mosby"
8–28 January 2016

z CTD st.no 1–106



Cruise no 2016601 "H.Mosby"
8–28 January 2016

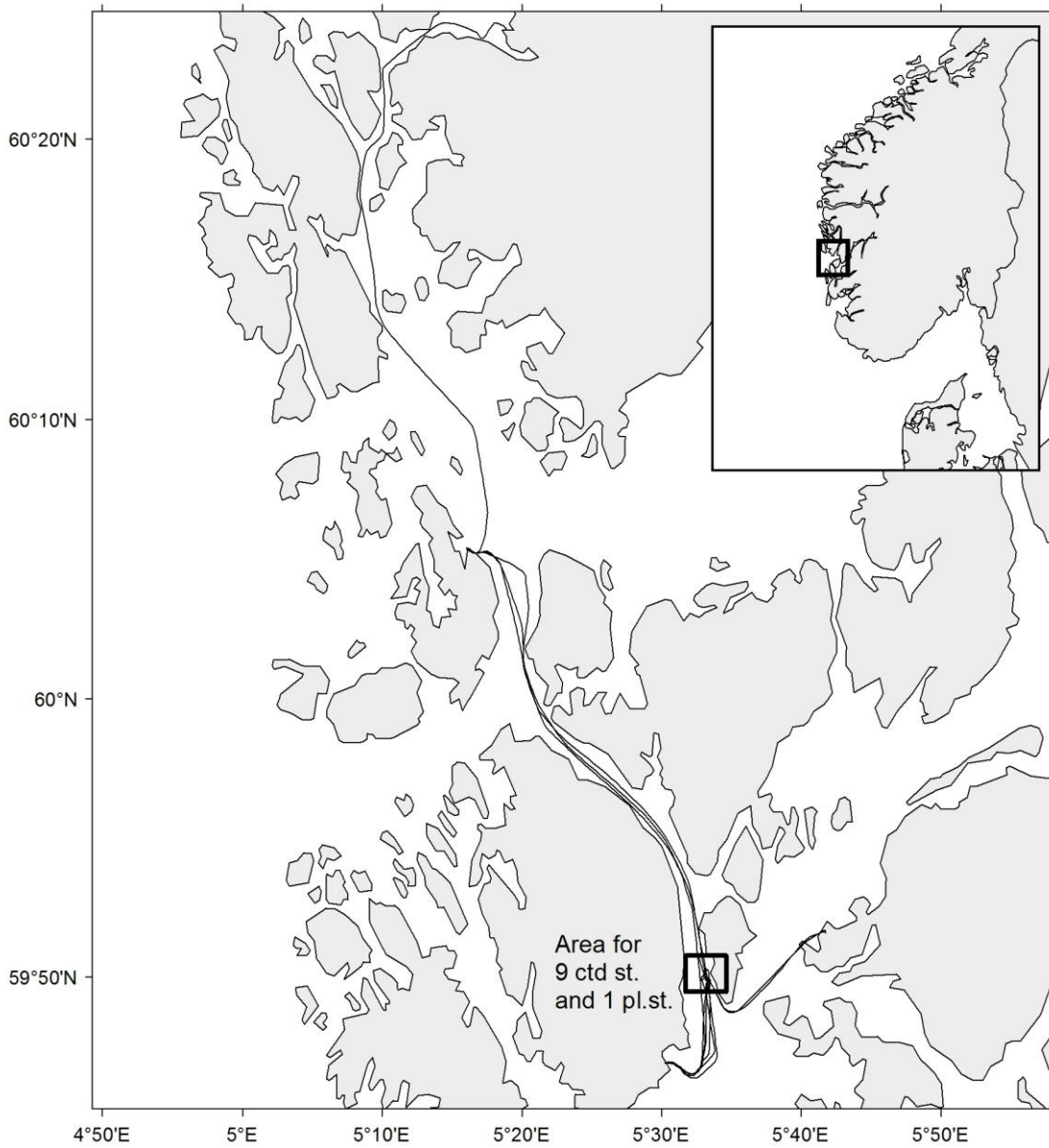
■ Bottom trawl st.no 1–108



Cruise no 2016602 "H.Mosby"
9–11 February 2016

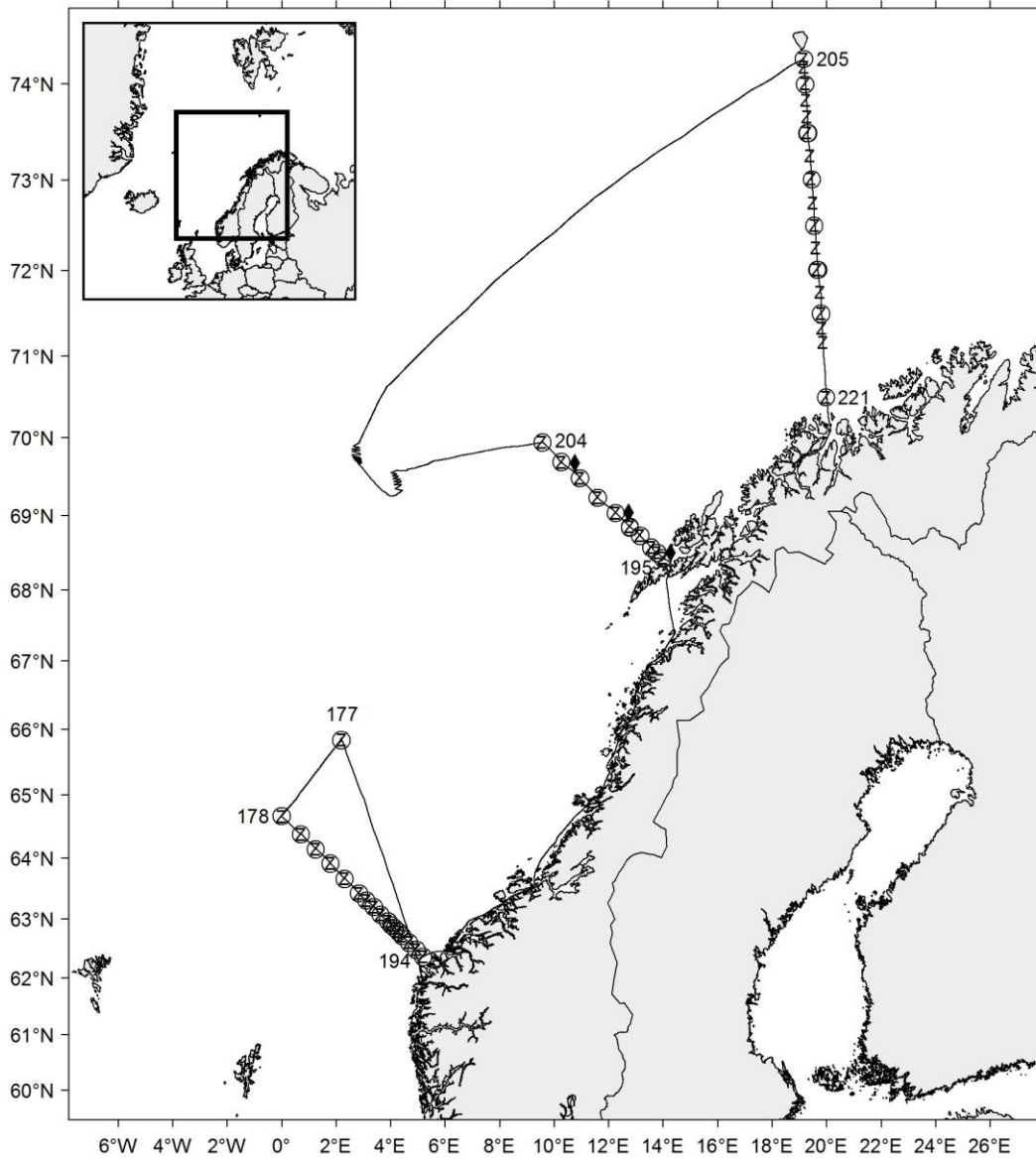
z CTD st.no 107–167

■ Aanderaa Seaguard and Teledyne Sentinel ADCP
deployed and recovered



Cruise no 2016603 "Håkon Mosby"
15–19 February 2016

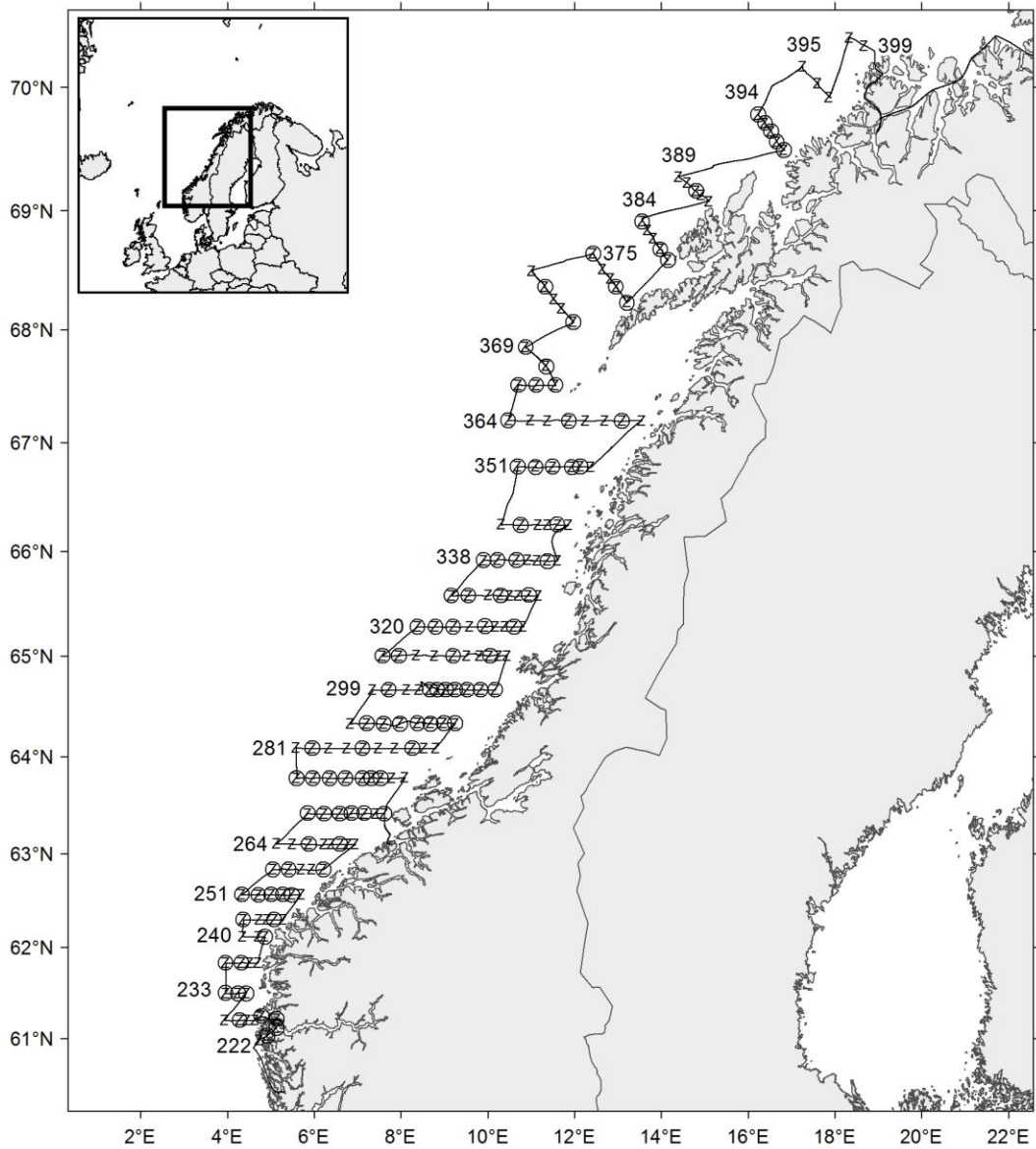
CTD st.no 168–176, and 1 plankton st. (WP-II-net)



Cruise no 2016605 "Håkon Mosby"
1–13 March 2016

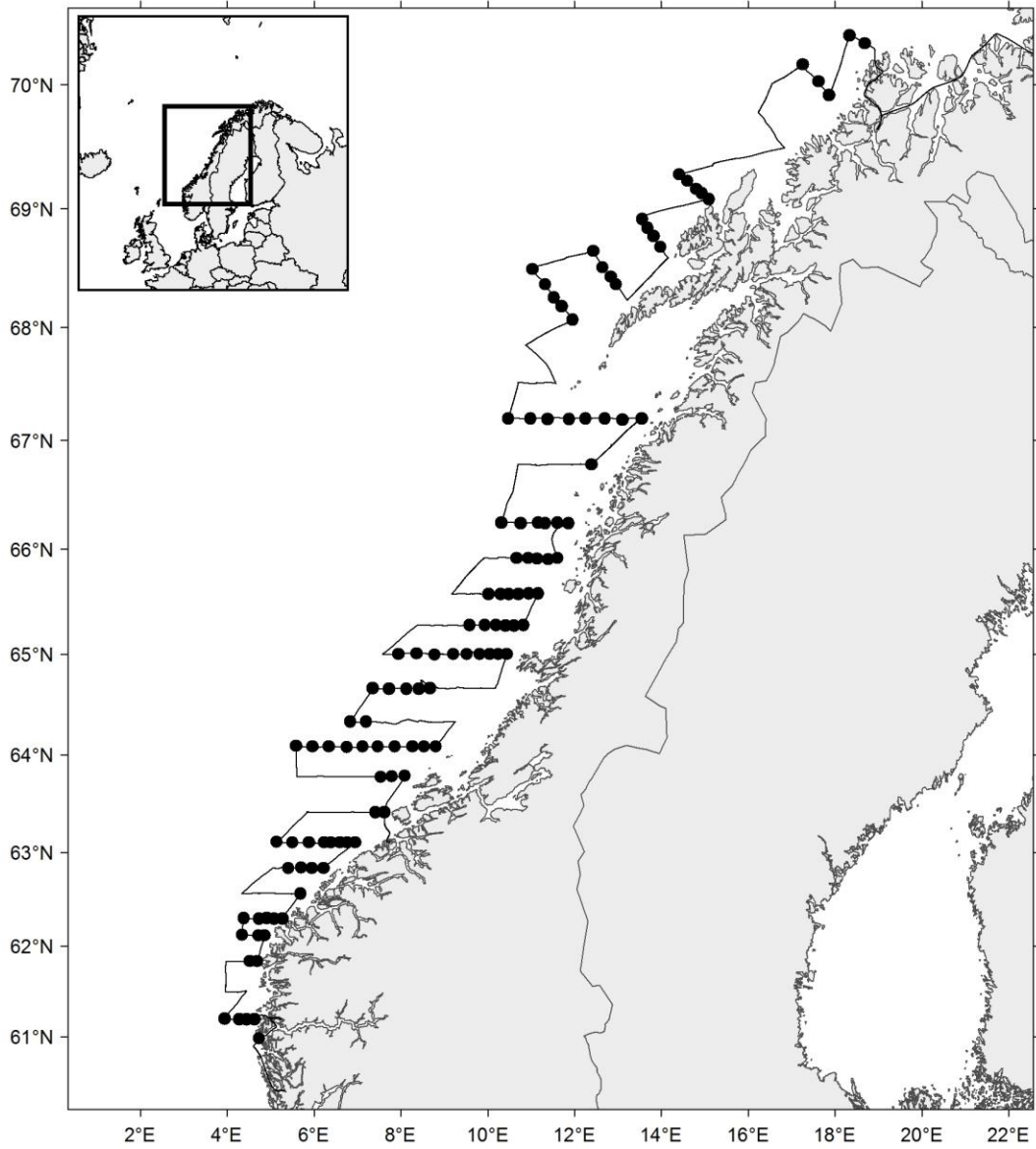
z CTD st.no 177–221
○ Plankton st. (WP-II-net)
◆ Plankton st. (Mocness)

Standard sections:
Svinøy-NW st.no 178–194
Gimsøy-NW st.no 195–204
Fugløya-Bjørnøya st.no 205–221
St. M st.no 177



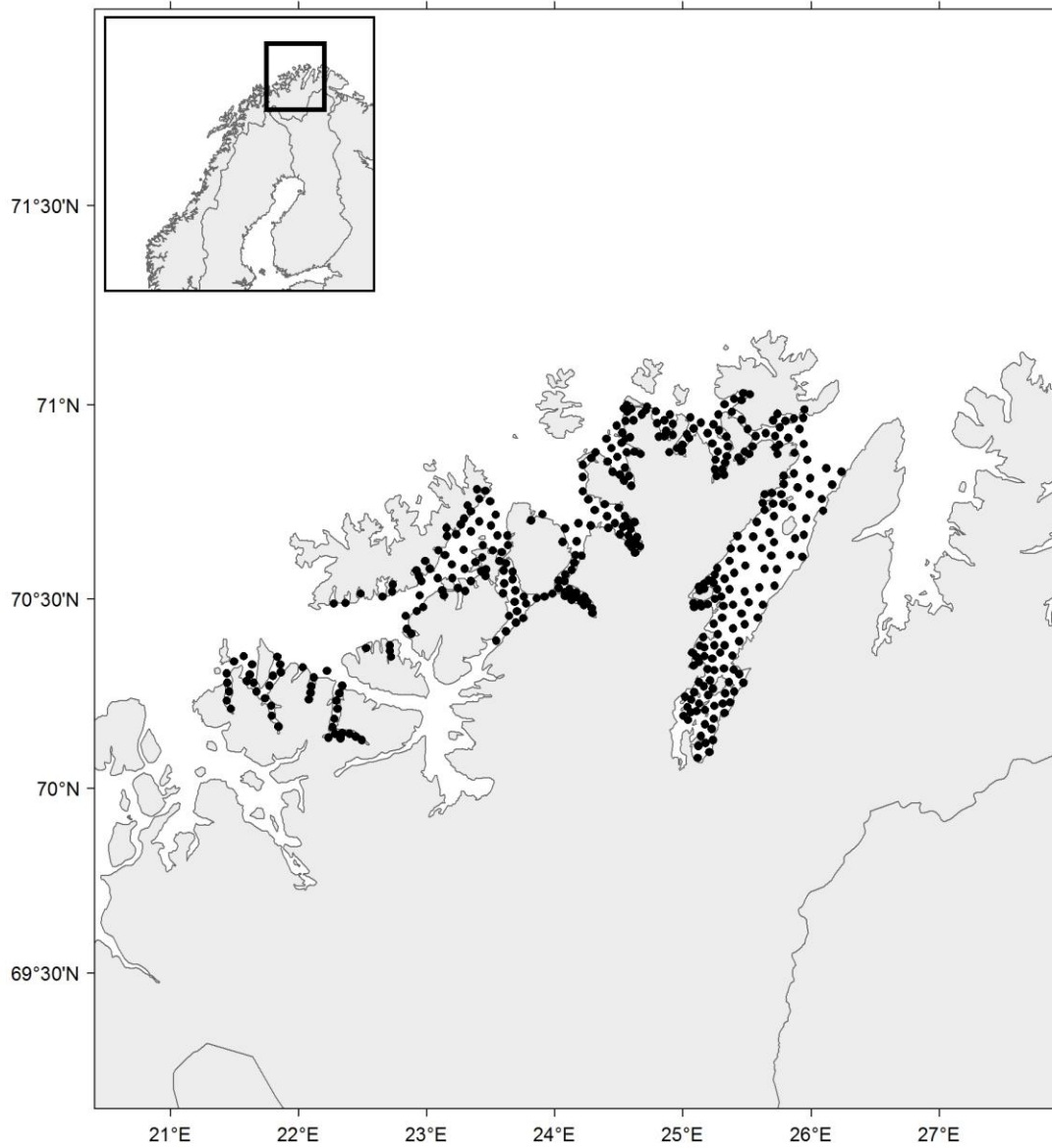
Cruise no 2016607 "Håkon Mosby"
1–14 April 2016

z CTD st.no 222–399
○ WP II st. (plankton) / T-80 st. (larvae).



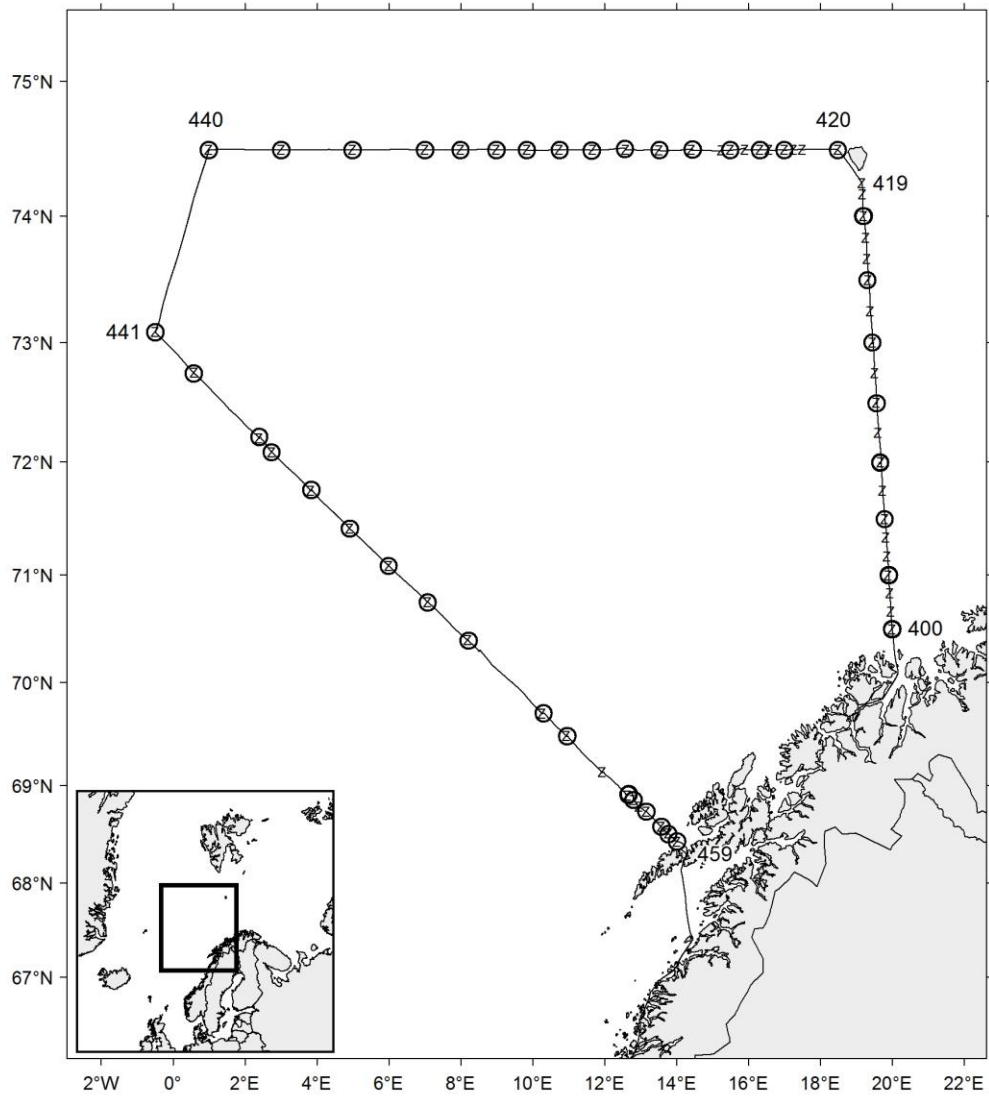
Cruise no 2016607 "Håkon Mosby"
1–14 April 2016

● Gulf III stations



Cruise no 2016608 "Håkon Mosby"
17–25 April 2016

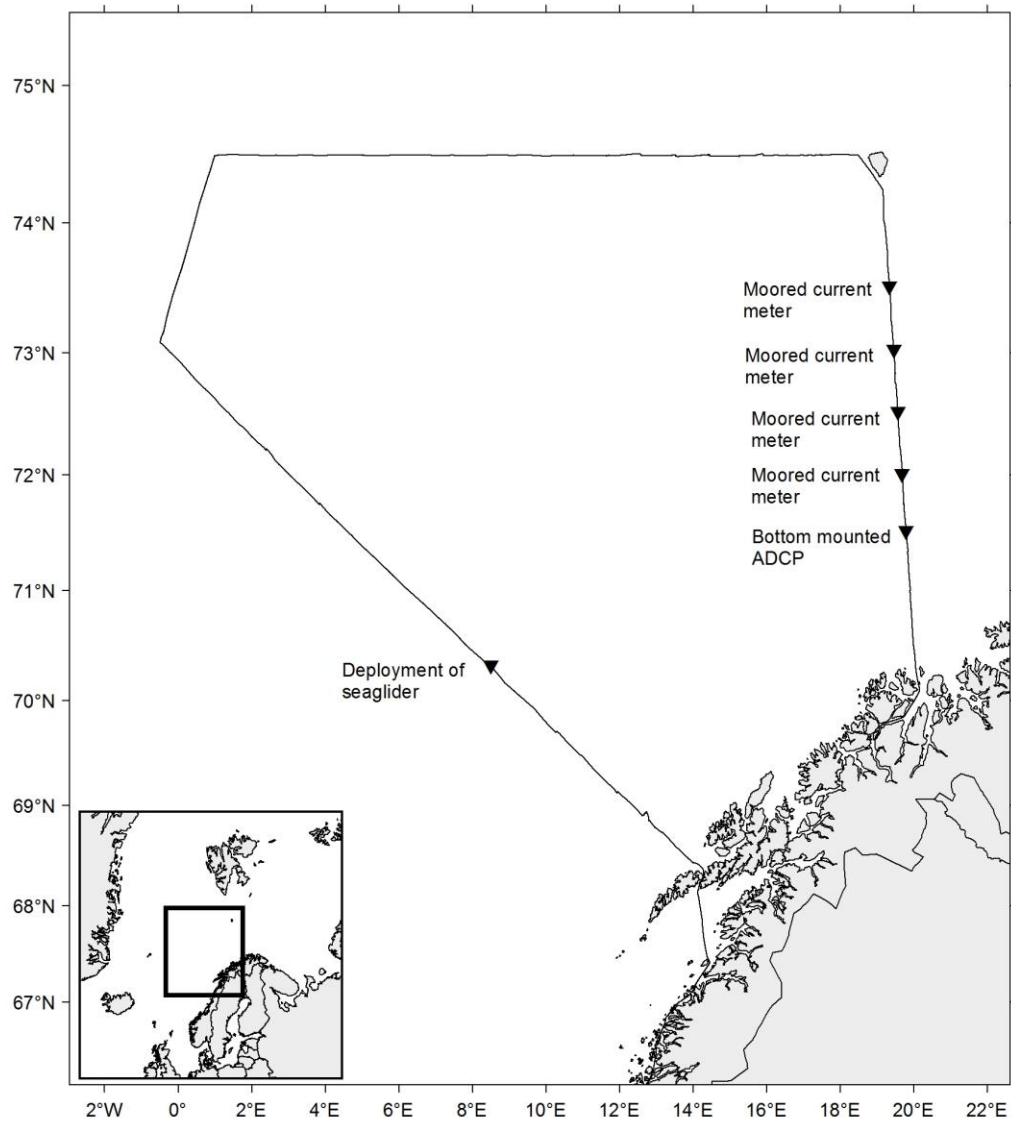
386 CTD casts and vertical WP2 egg net (500 μ m) hauls.



Cruise no 2016609 "Håkon Mosby"
 27 April–8 May 2016

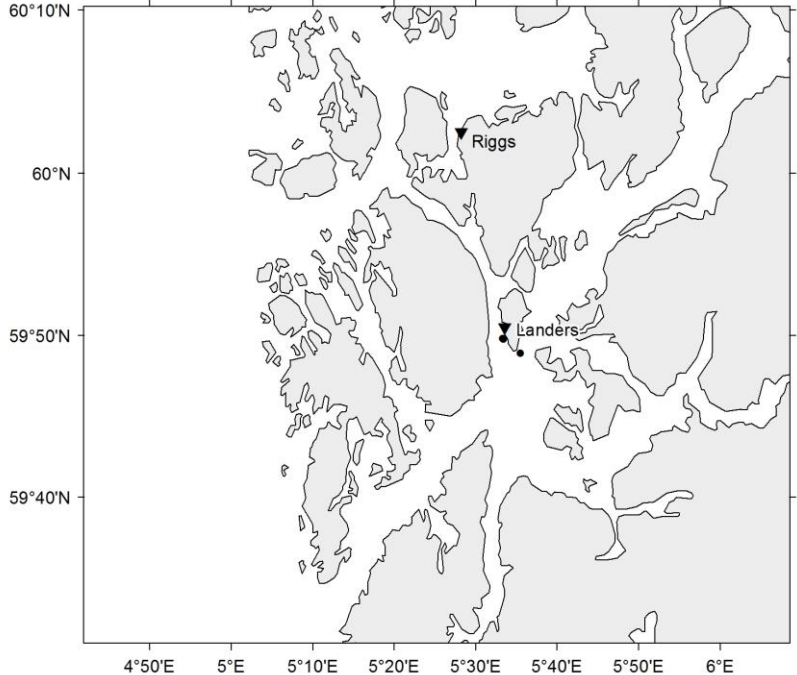
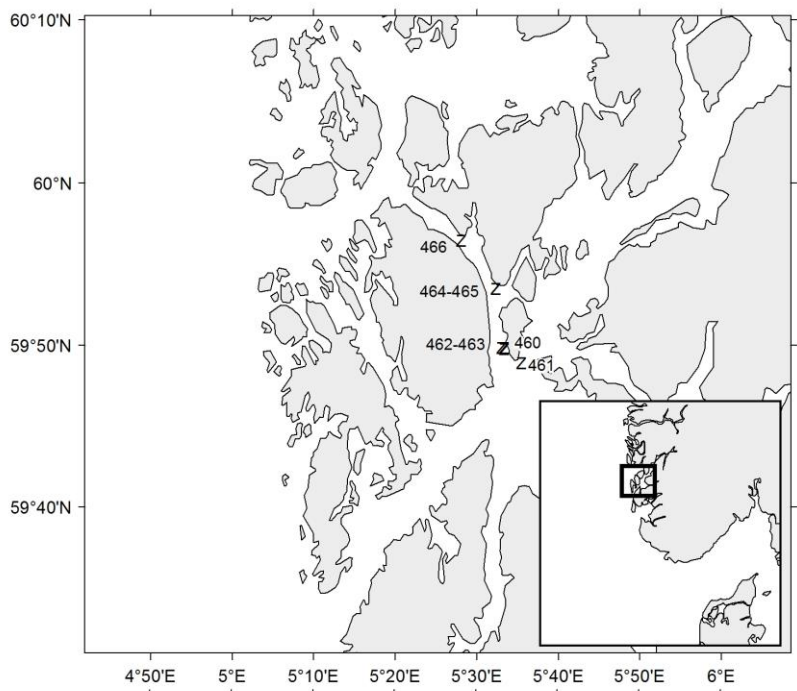
z CTD st.no 400–459
 ○ Plankton st. (WP-II-net)

Standard sections:
 Fugløya-Bjørnøya: st.no 400–419
 Bjørnøya W: st.no 420–440
 Gimsøy NW: st.no 441–459



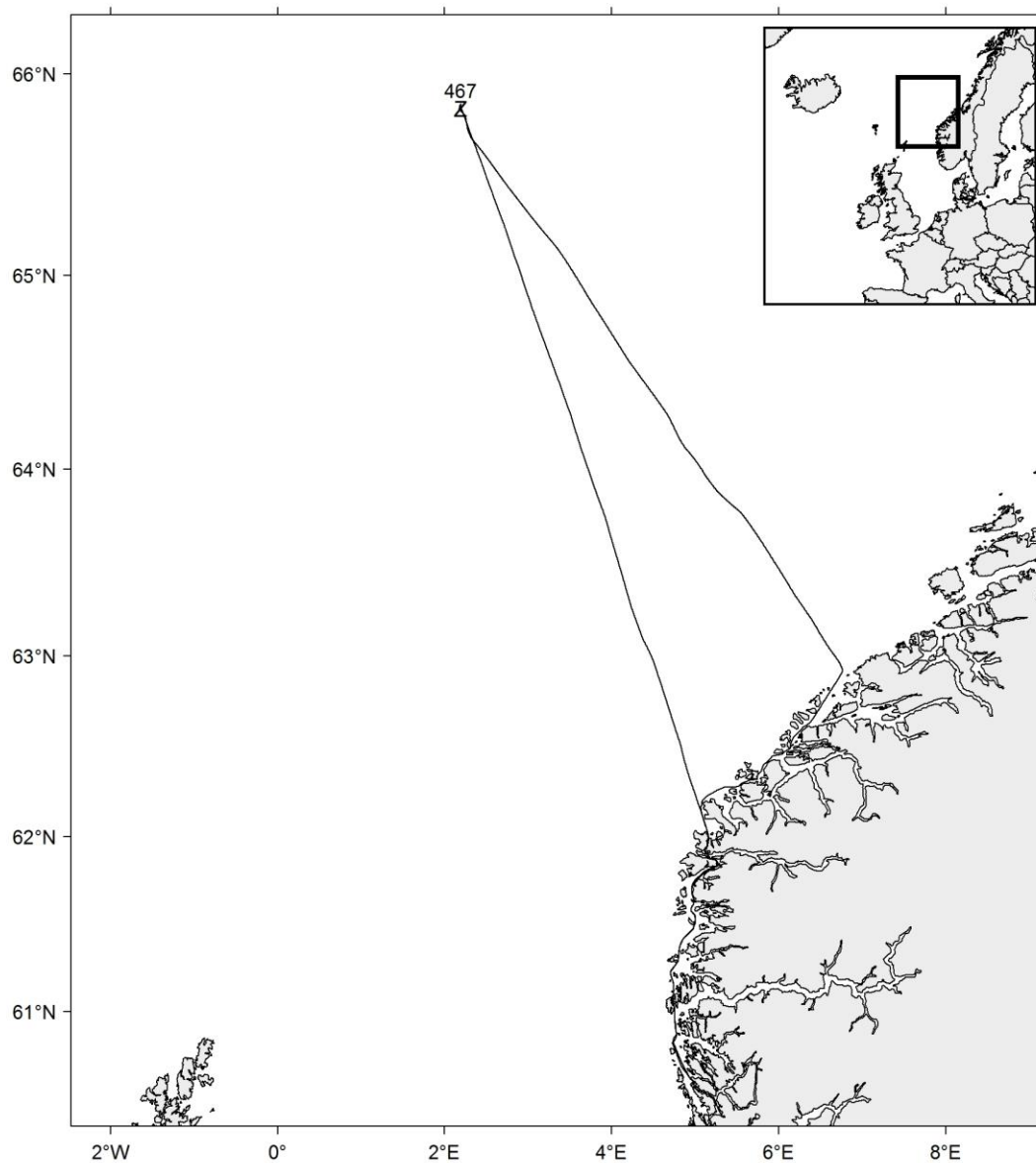
Cruise no 2016609 "Håkon Mosby"
27 April–8 May 2016

- ▼ Bottom mounted profiling ADCP
- Moored current meters recovered and re-deployed
- Deployment of seaglider



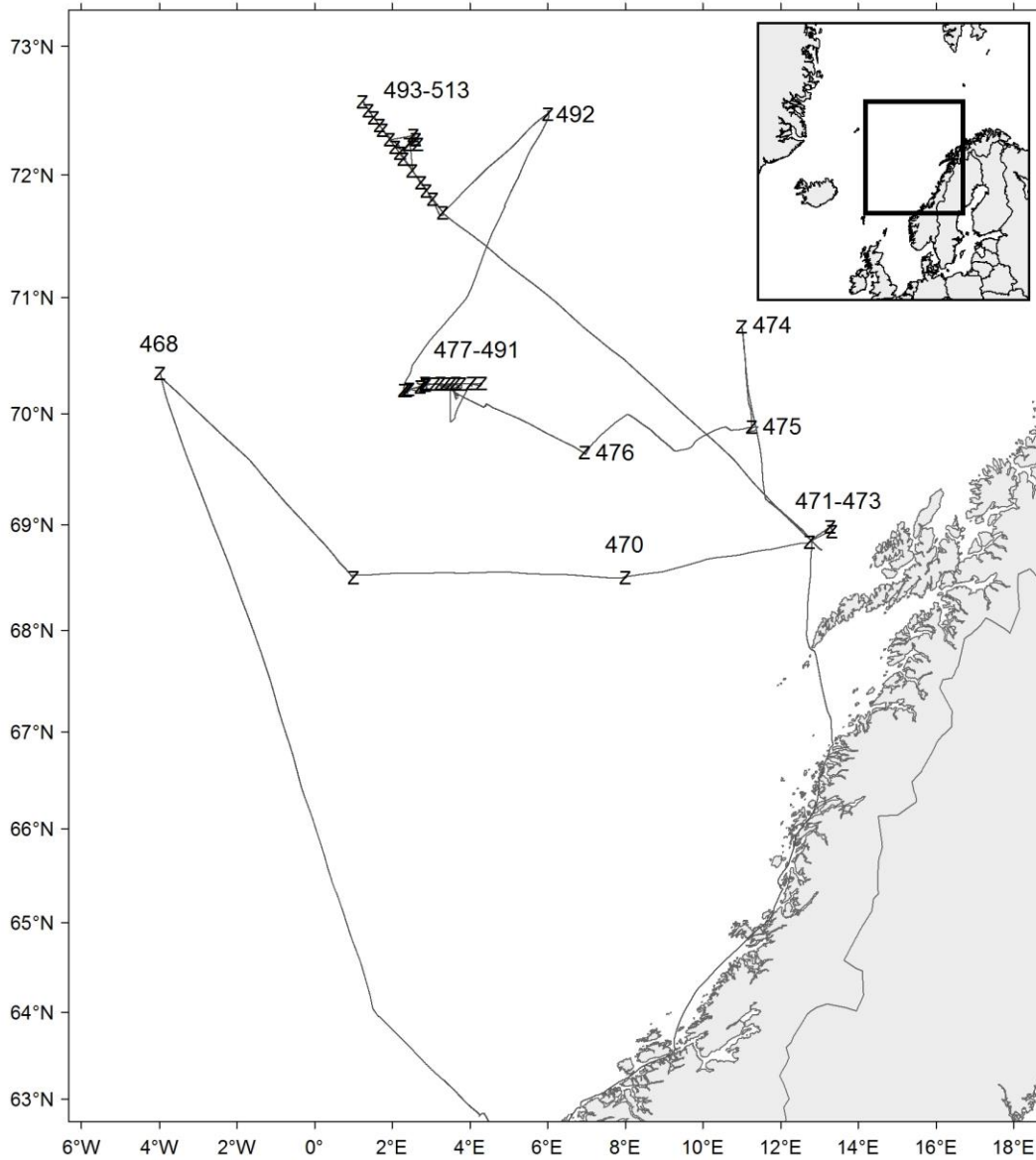
Cruise no 2016625 "Håkon Mosby"
 9–13 May 2016

- z CTD st.no 460-466
- Rov stations
- ▼ Sponge cultivation riggs
- ▼ Fauna landers and Geomar bentic lander



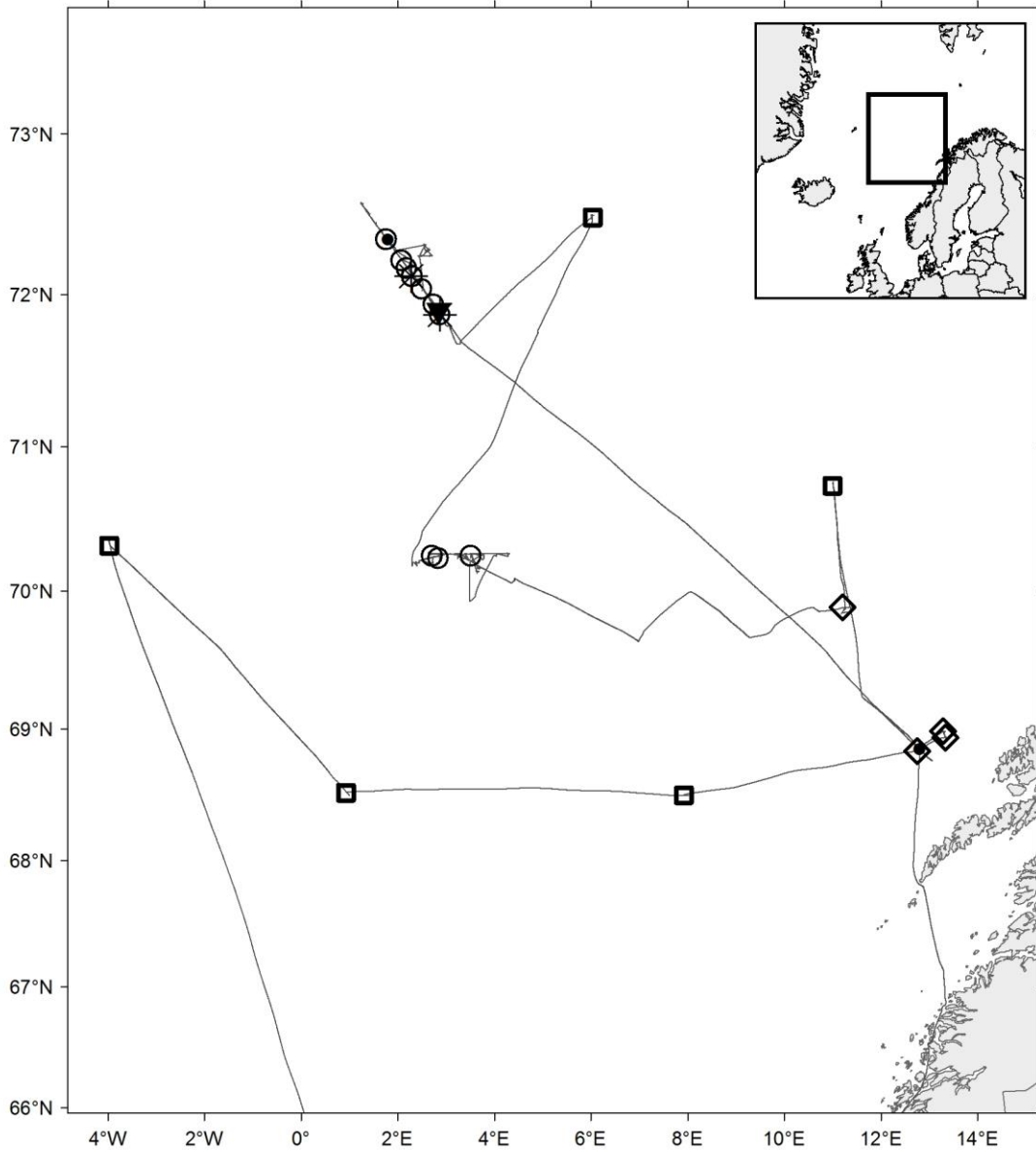
Cruise no 2016612 "Håkon Mosby"
21–25 May 2016

z CTD st.no 467



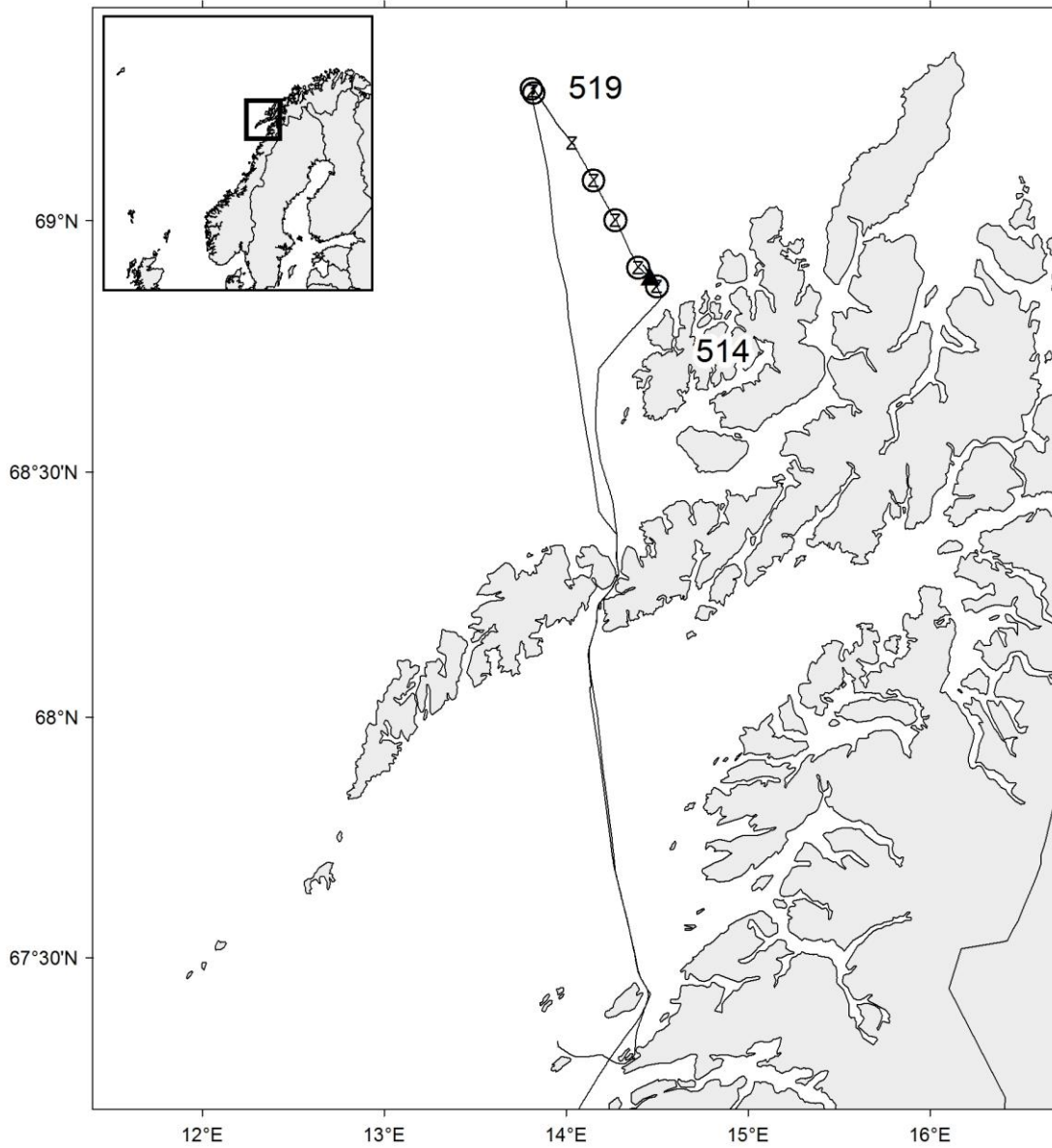
Cruise no 2016611 "Håkon Mosby"
 26 May–15 June 2016

z CTD st.no 468–513



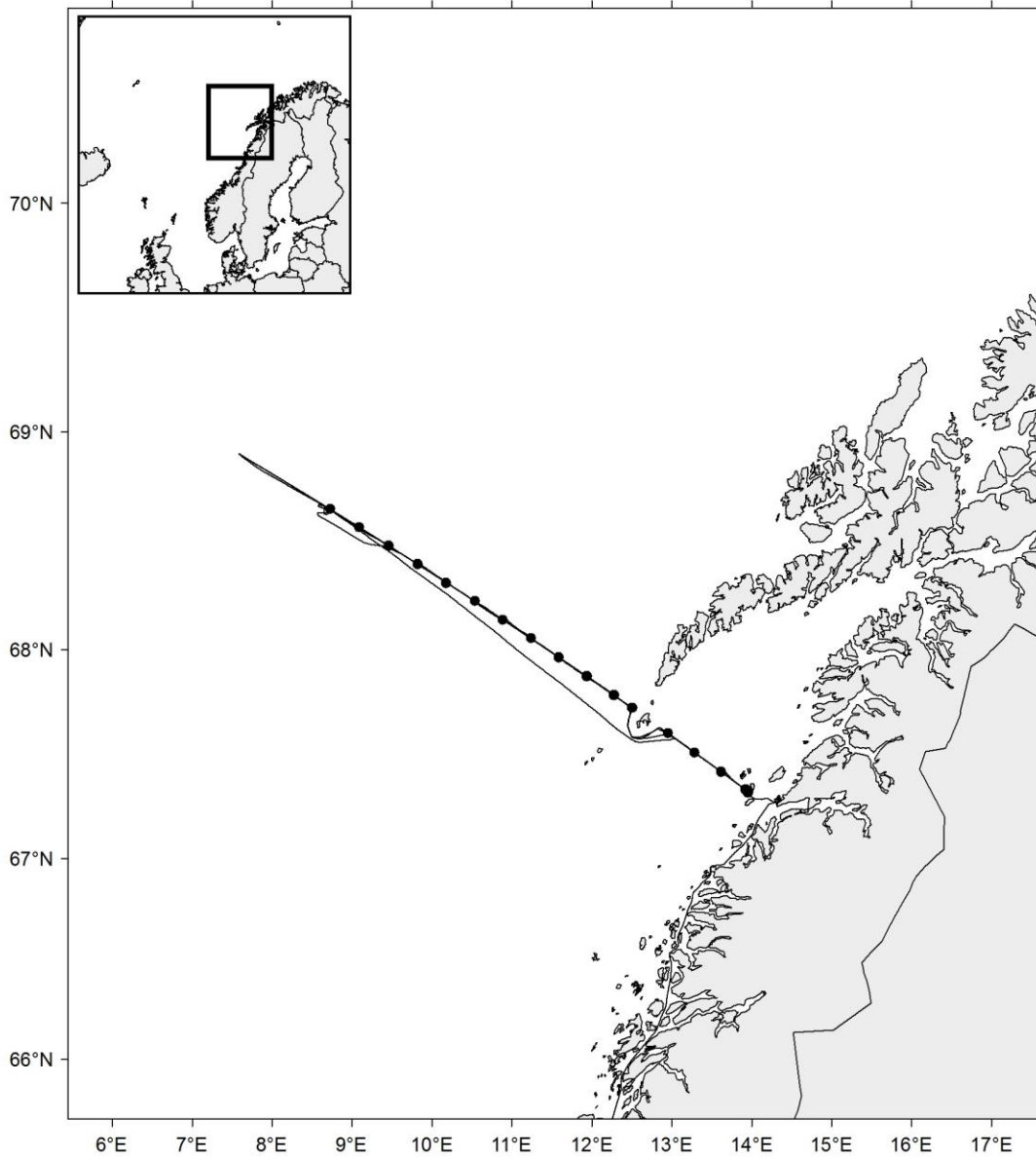
Cruise no 2016611 "Håkon Mosby"
26 May–15 June 2016

- ◆ Deployed mooring
- ▼ Deployed seaglider
- RAFOS sound source mooring deployed
- RAFOS – Neutrally buoyant deployed
- CODE – I Surface drifter deployed
- * SVP-Argos Surface drifter deployed



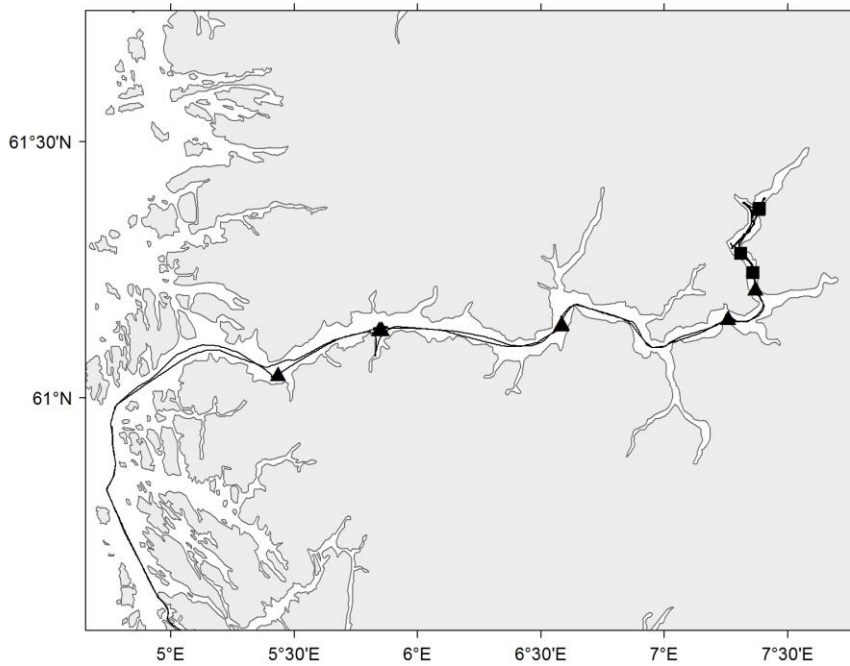
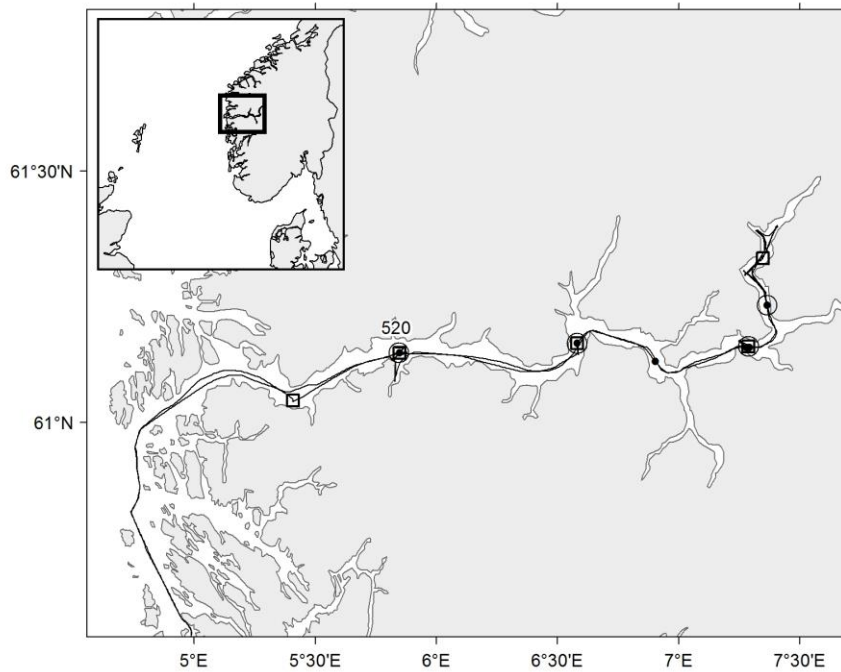
Cruise no 2016628 "H.Mosby"
3–6 July 2016

z CTD st.no 514–519
○ Plankton st. (WP-II-net)
▲ Pelagic trawl.st.



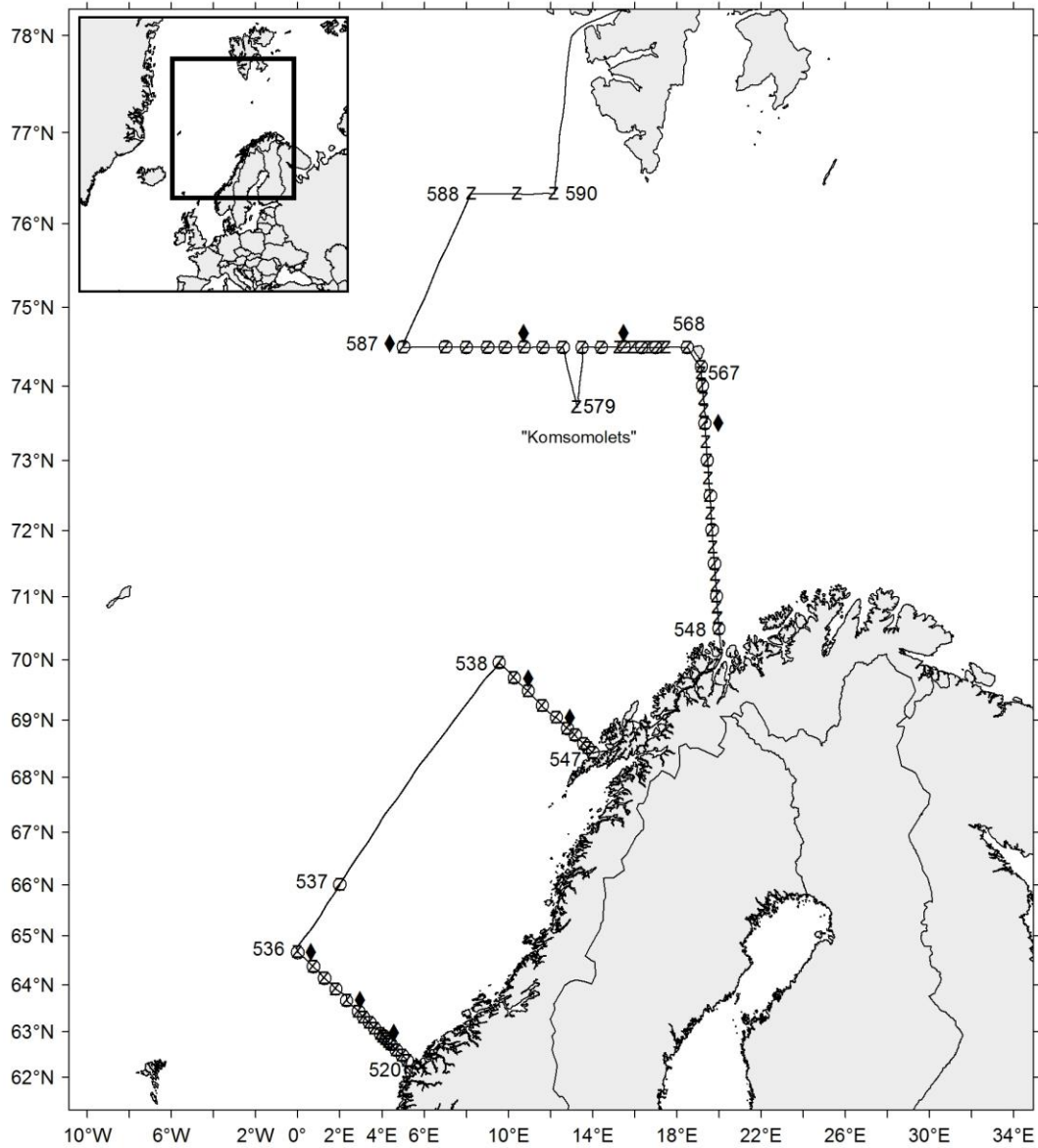
Cruise no 2016614 "Håkon Mosby"
8–14 July 2016

● Seismic refraction
Geophysical seismic survey, joint with land seismic experiment.



Cruise no 2016615 "Håkon Mosby"
21–24 July 2016

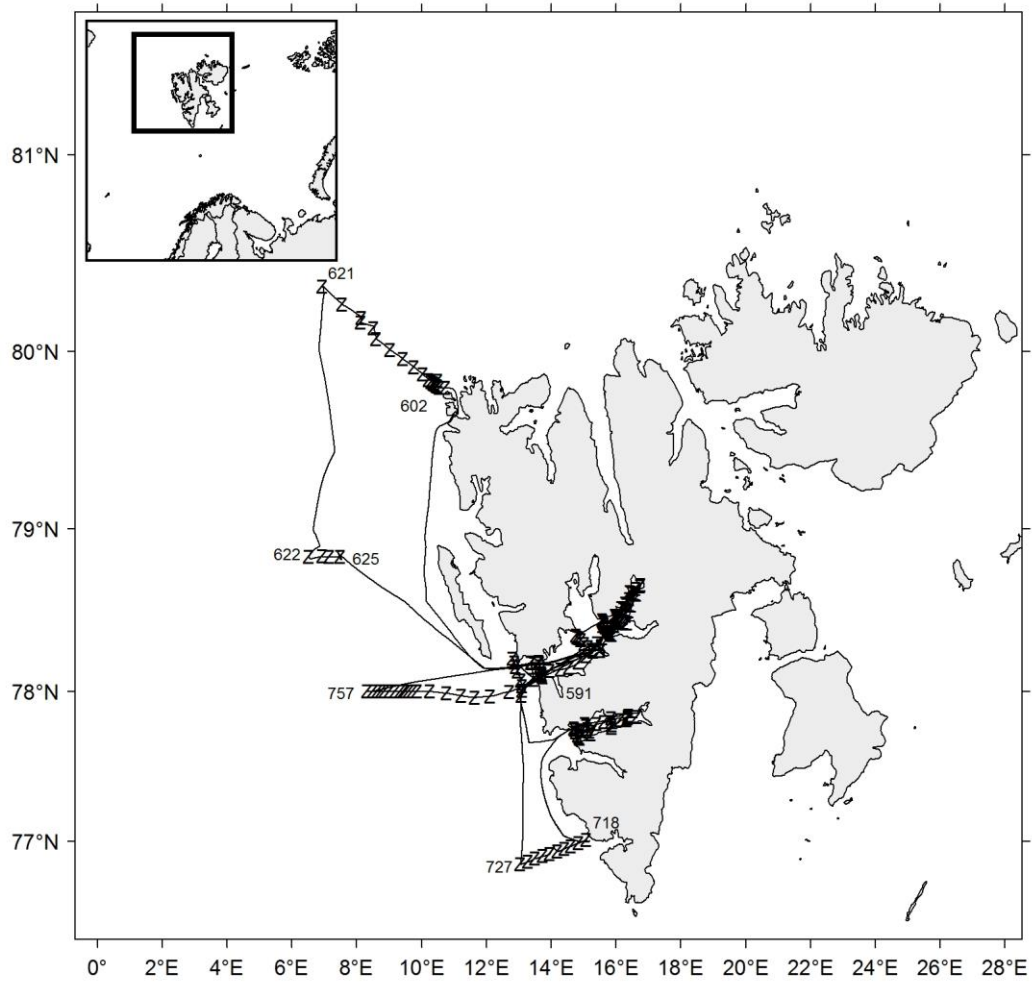
- Rov st.
- Multinet
- Grab st.
- Trawl st.
- ▲ Sledge st.



Cruise no 2016616 "Håkon Mosby"
25 July–6 August 2016

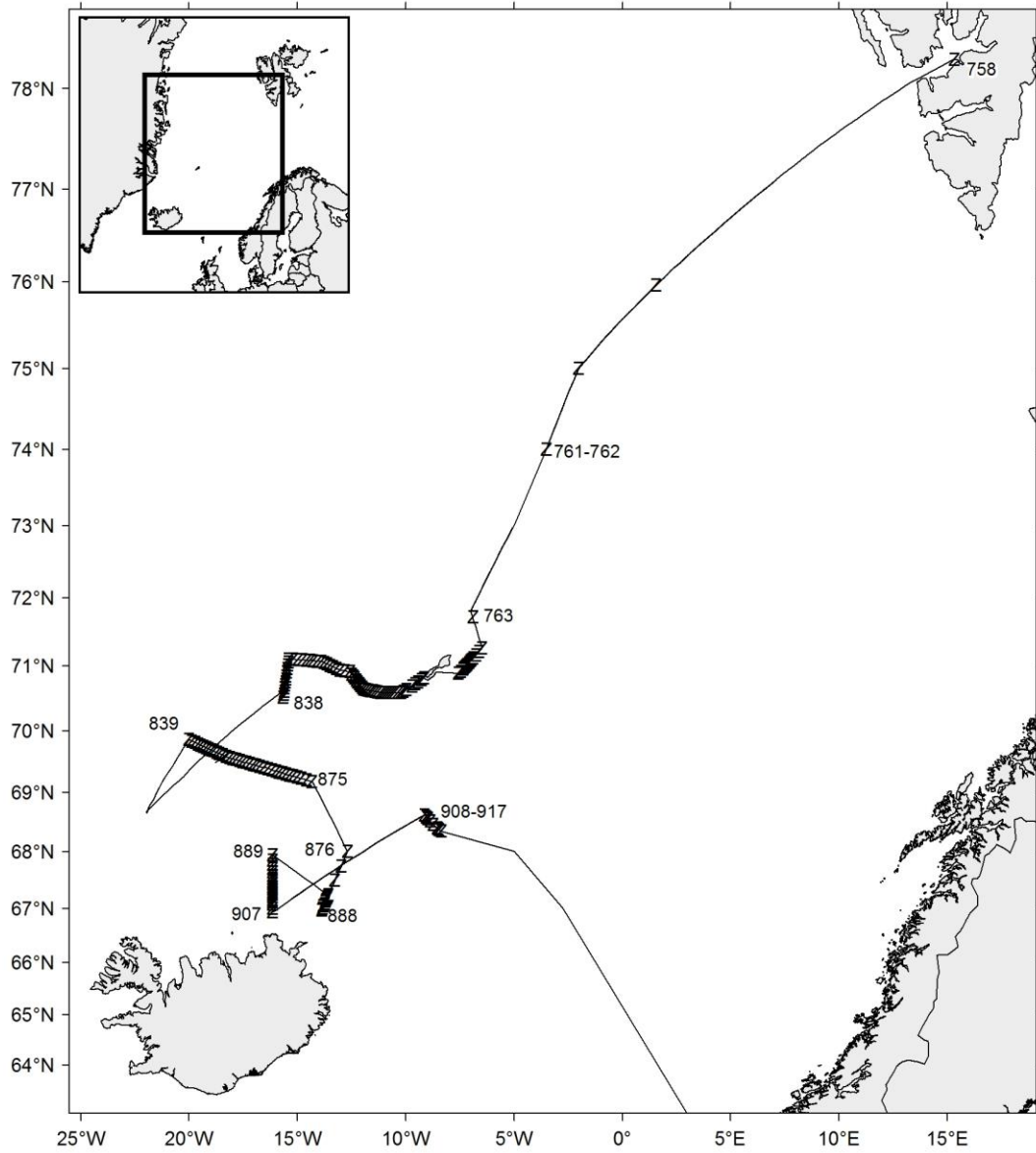
z CTD st.no 520-590
○ Plankton st. (WP-II-net)
◆ Plankton st. (Mocness)

Standard sections:
Svinøy-NW st.no 520–536
Gimsøy NW st.no 538–547
Fugløya–Bjørnøya st.no 548–567
Bjørnøya W st.no 568–587
SørkappW st.no 588–590
St. M st.no 537



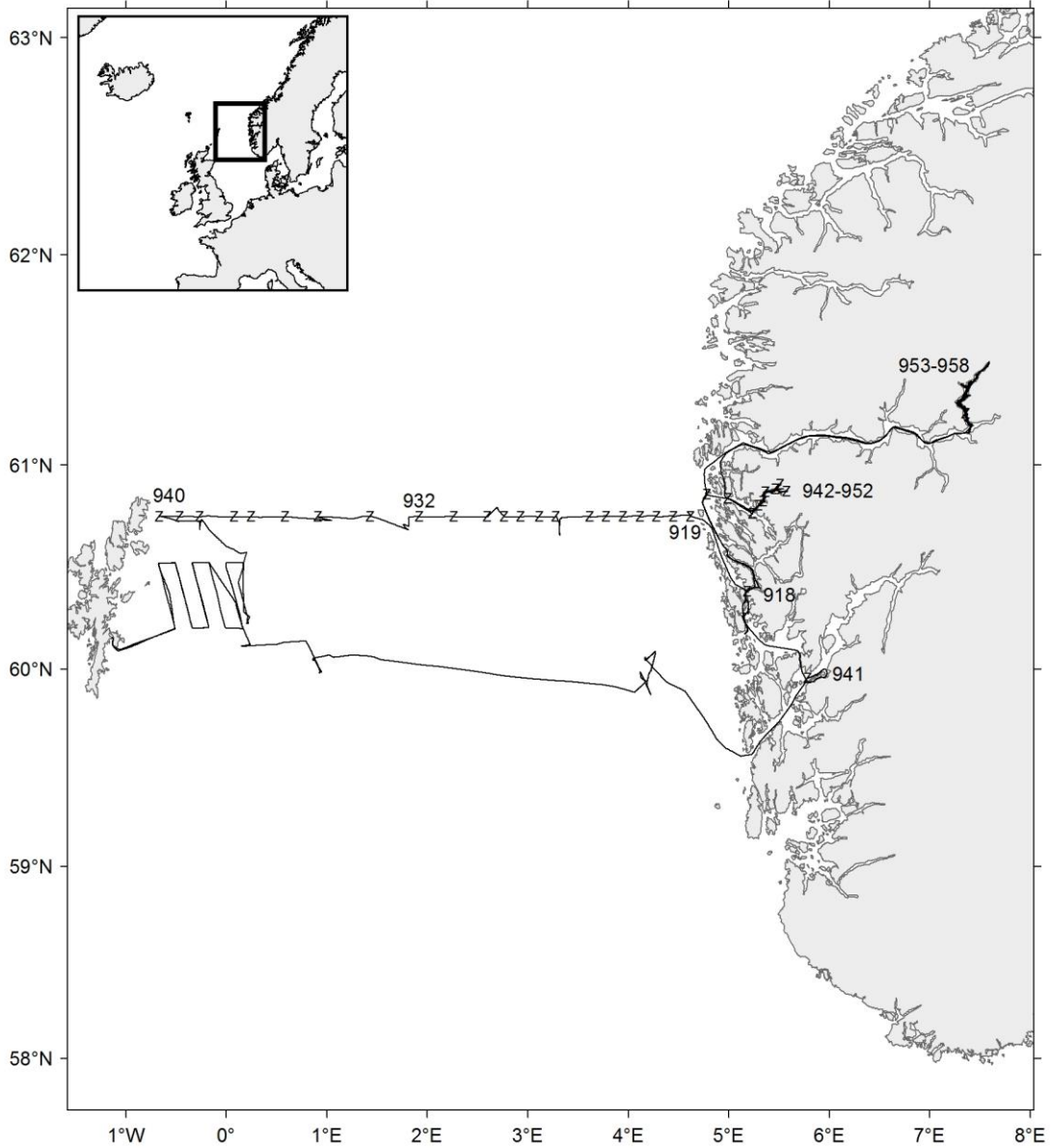
Cruise no 2016617 "Håkon Mosby"
12–20 August 2016

z CTD st.no 591-757



Cruise no 2016618 "Håkon Mosby"
21 August–6 September 2016

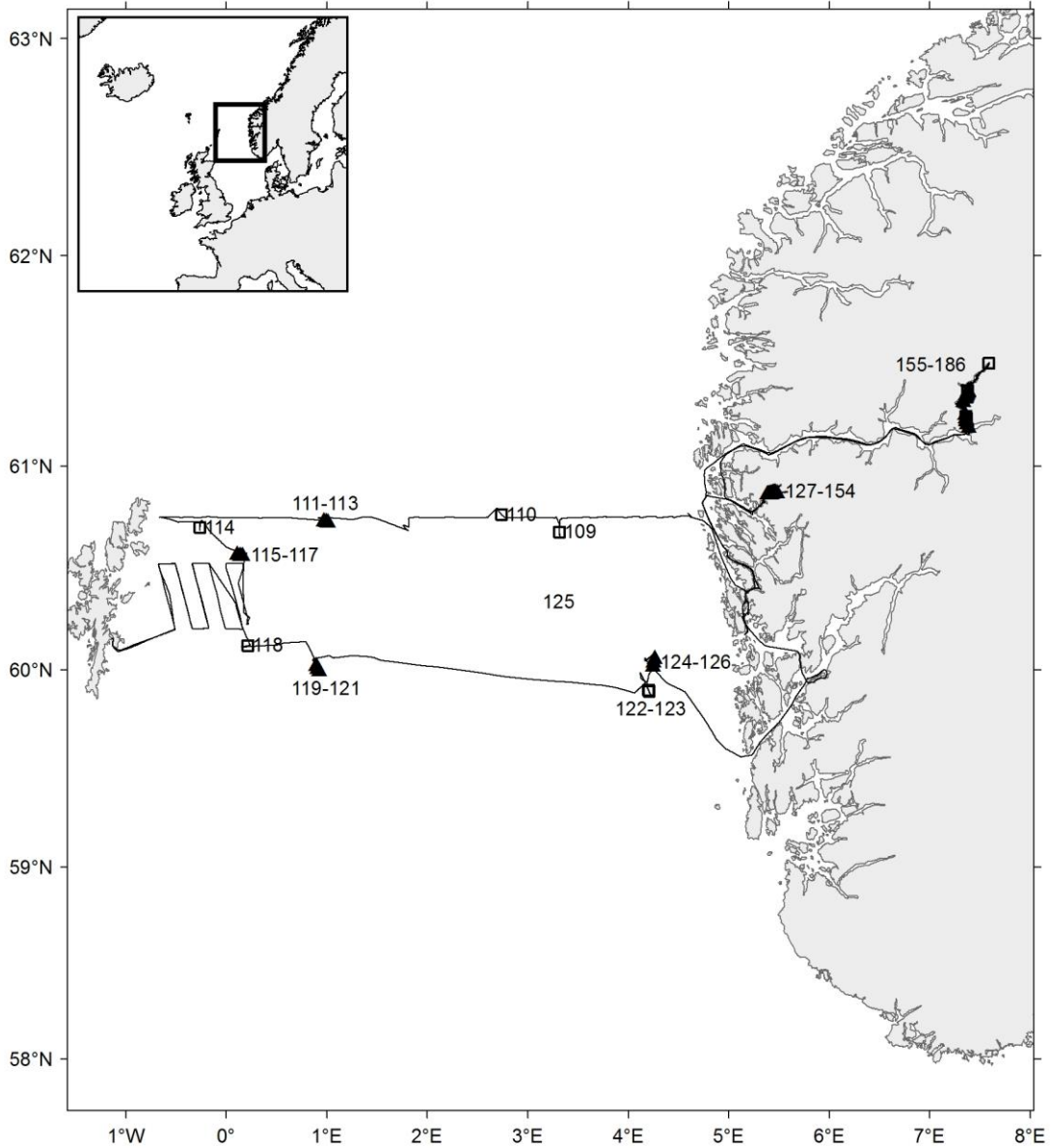
z CTD st.no 758–917



Cruise no 2016619 "Håkon Mosby"
12–28 September 2016

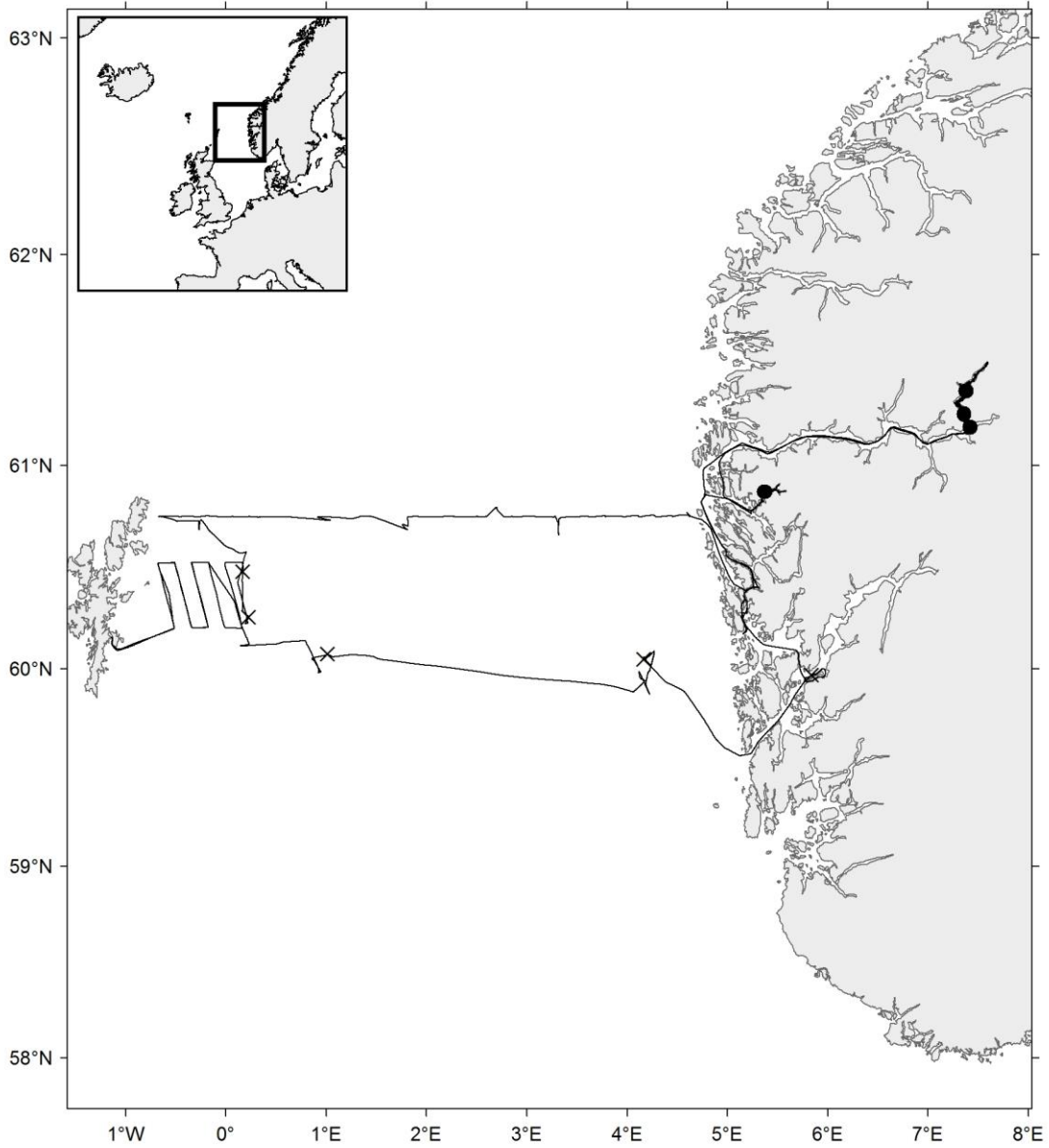
z CTD st.no 918-958

Standard section Fedje Shetland



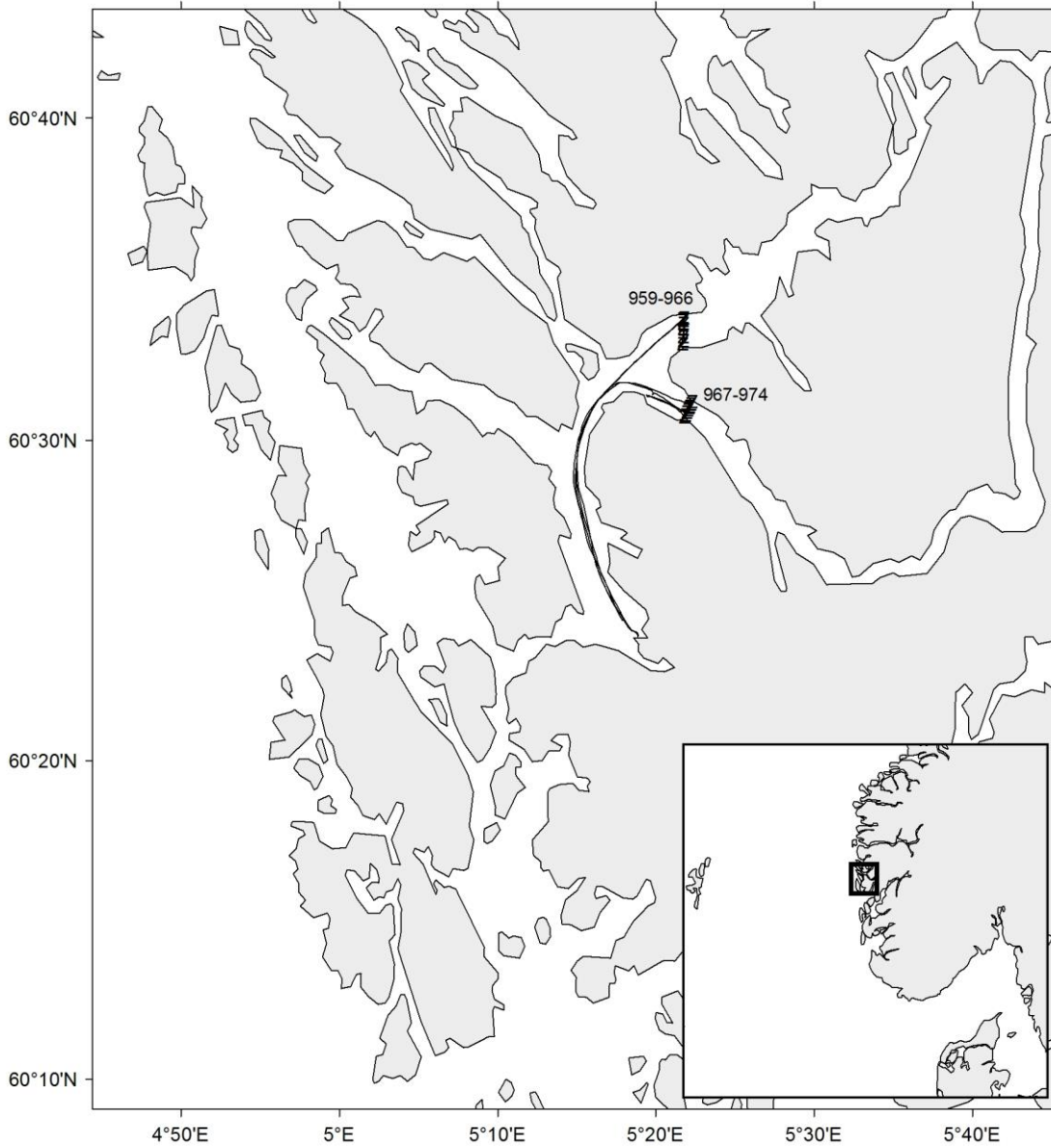
Cruise no 2016619 "Håkon Mosby"
12–28 September 2016

Trawl st.no 109–186
 ▲ Pelagic trawl (multisampler)
 □ Bottom trawl



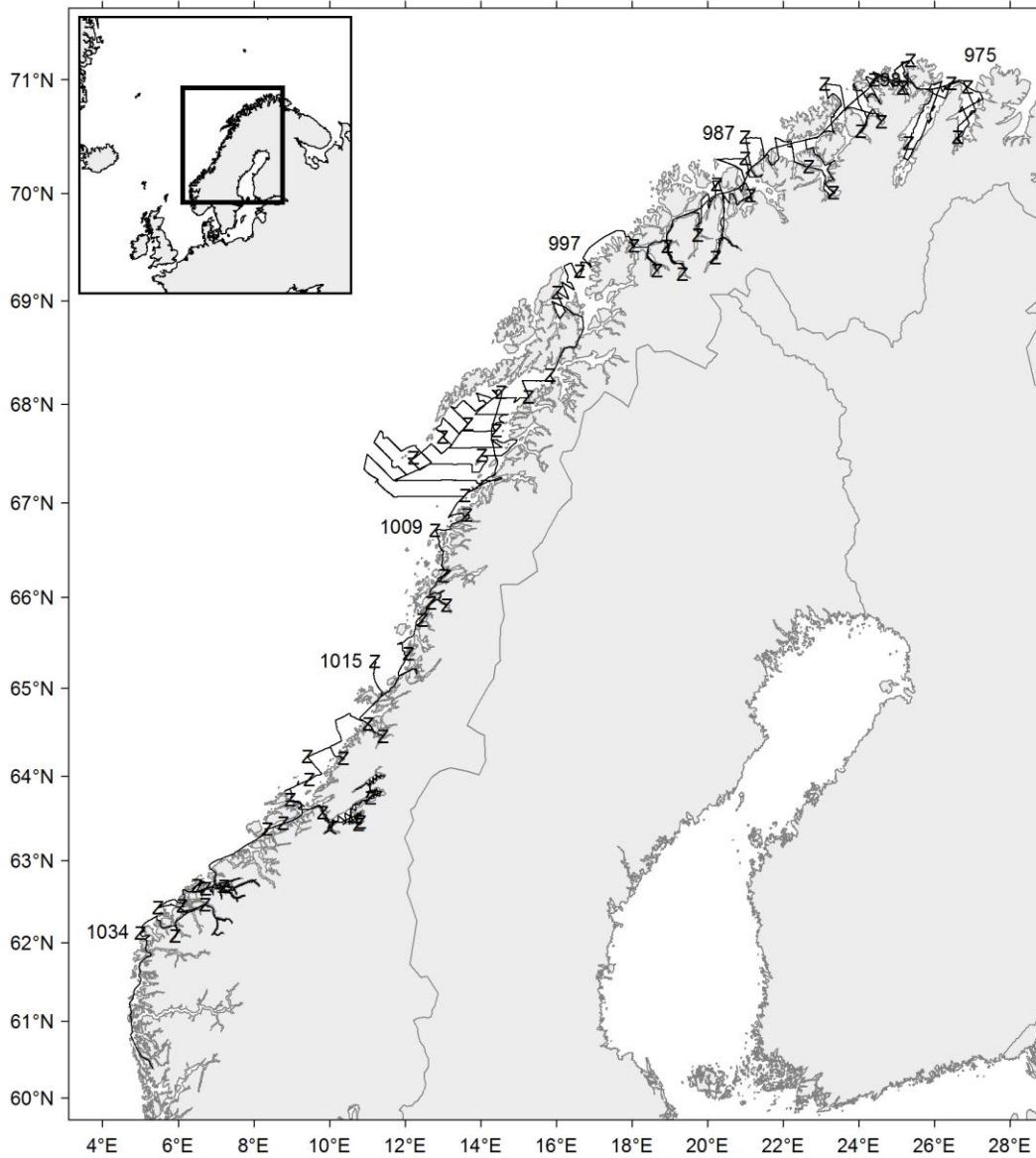
Cruise no 2016619 "Håkon Mosby"
12–28 September 2016

- × Mik st.
- Multinet st.



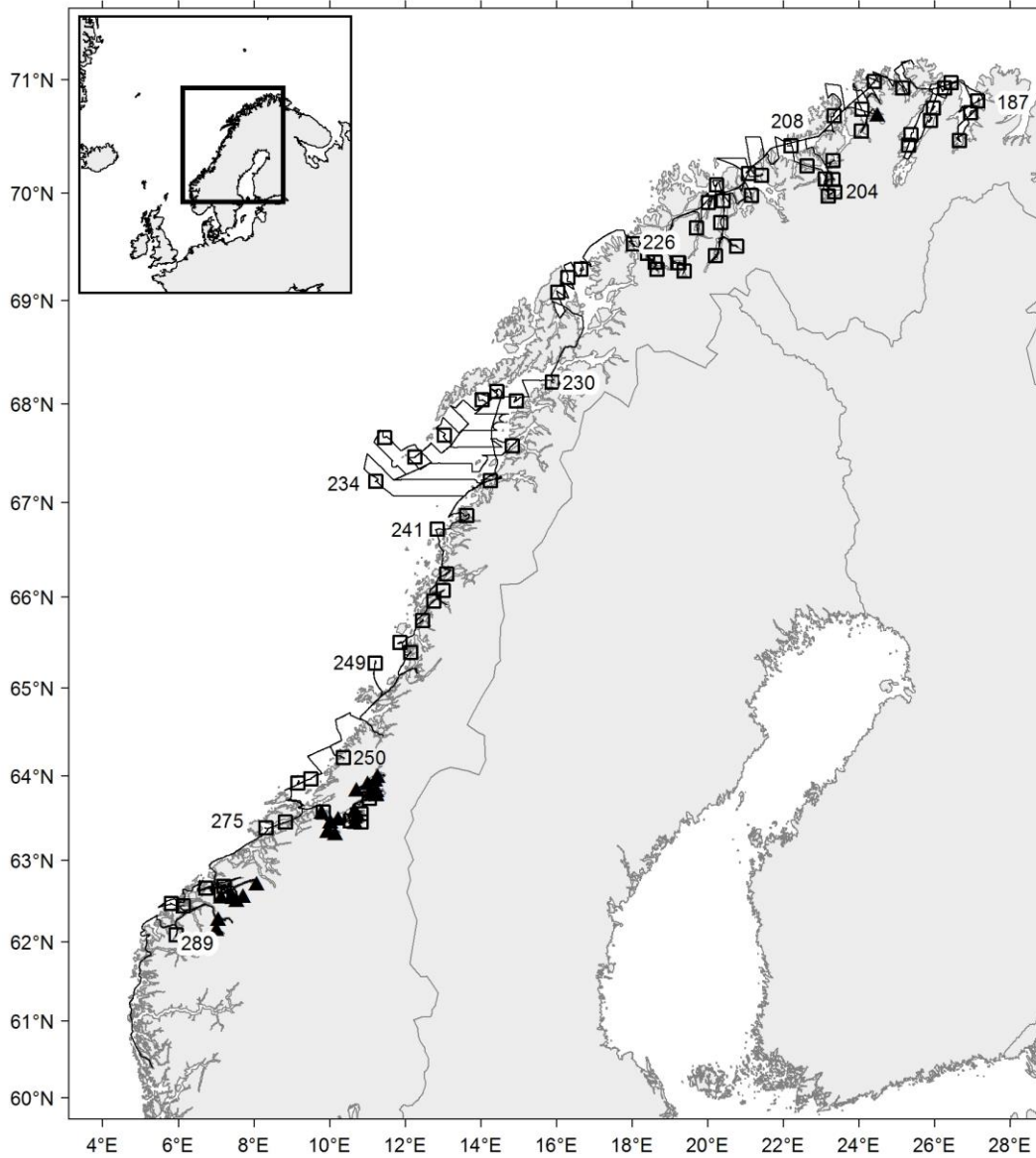
Cruise no 2016627 "Håkon Mosby"
28–29 September 2016

z CTD st.no 959–974



Cruise no 2016620 "H.Mosby"
5 October–1 November 2016

z CTD st.no 975–1034

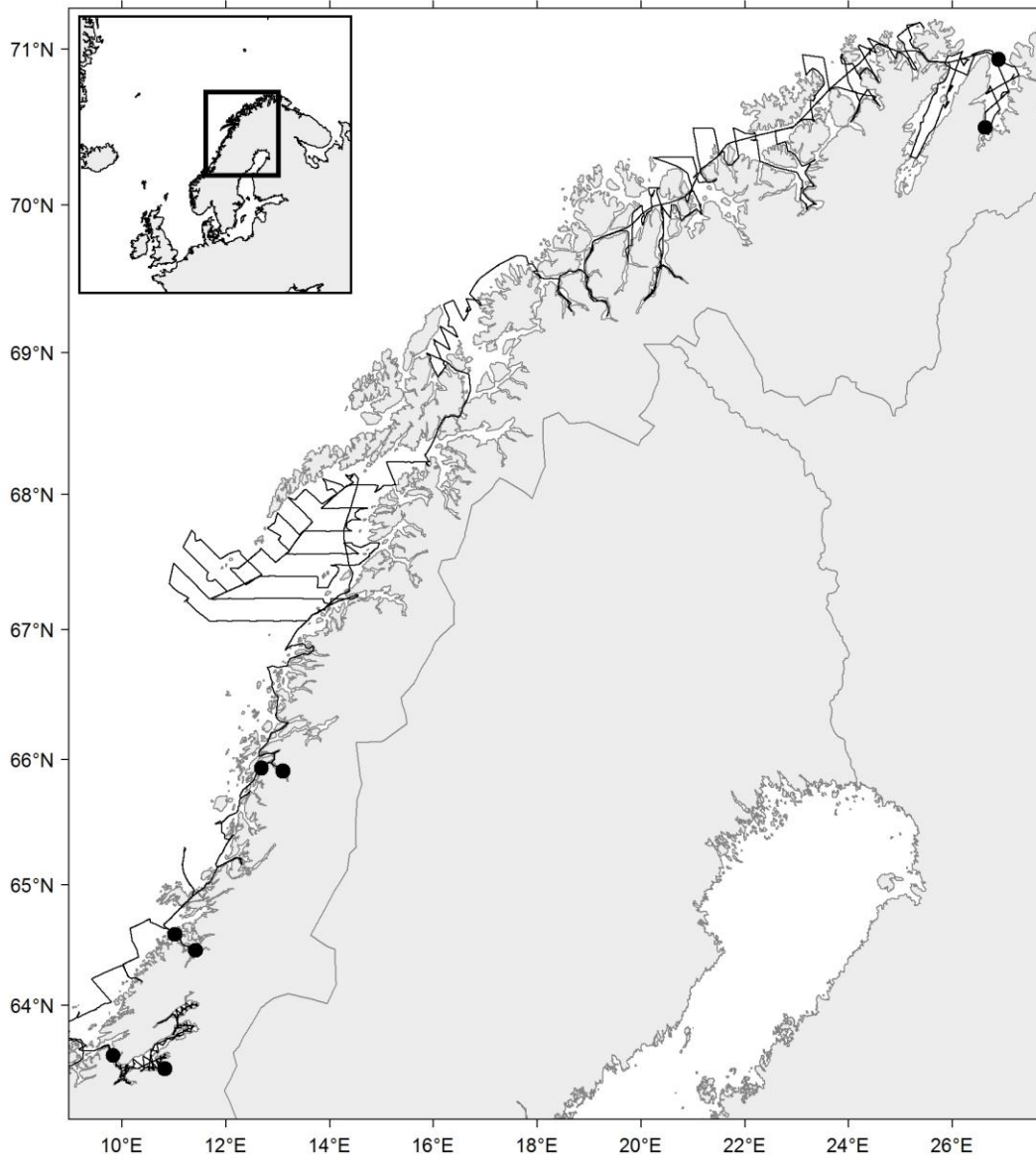


Cruise no 2016620 "H.Mosby"
 5 October–1 November 2016

Trawl st.no 187–289

□ Bottom tr.

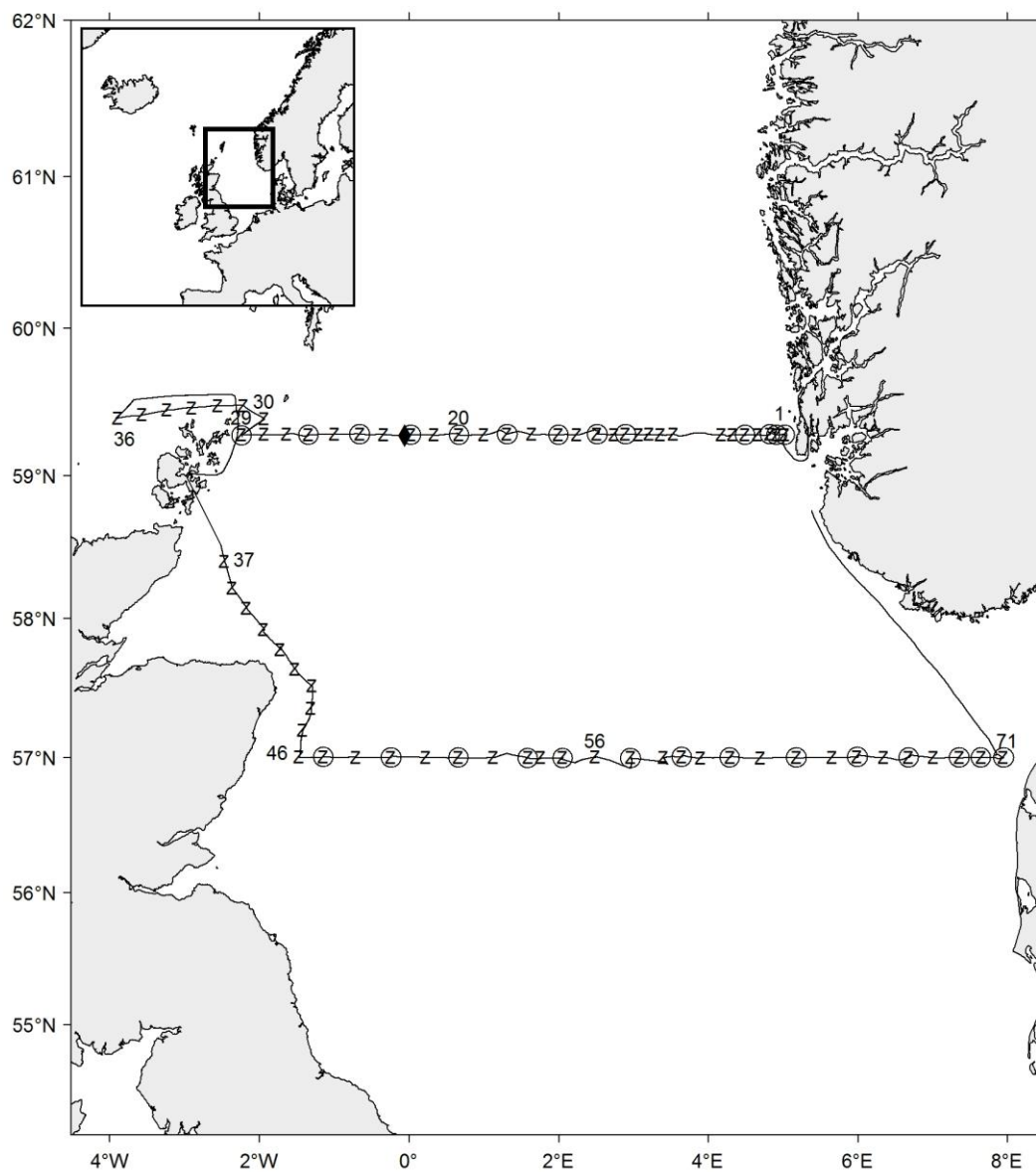
▲ Pelagic tr.



Cruise no 2016620 "H.Mosby"
5 October–1 November 2016

● Grab st.

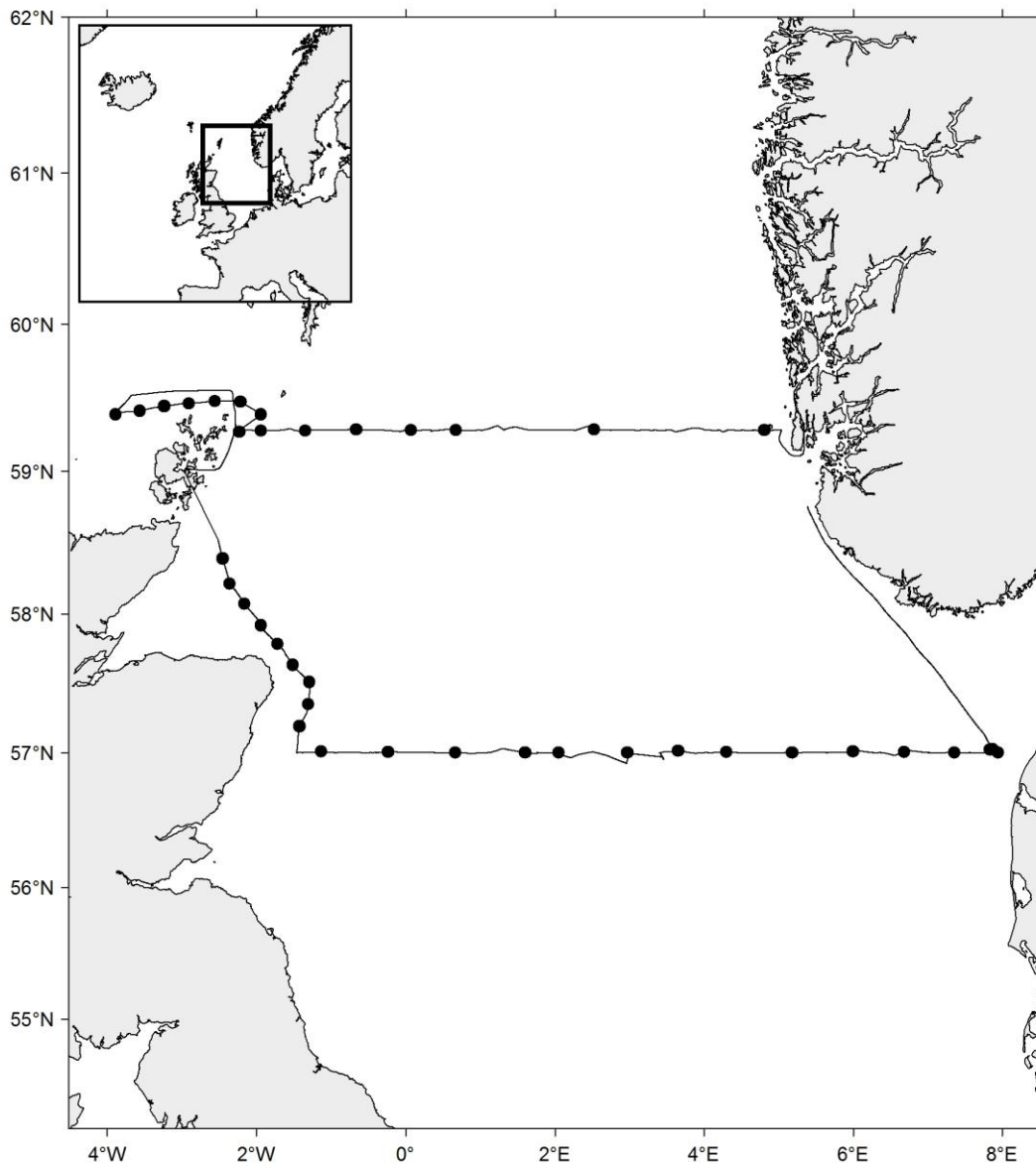
4.5. K. Bonnevie



Cruise no 2016623 "Kristine Bonnevie"
25 November – 4 December 2016

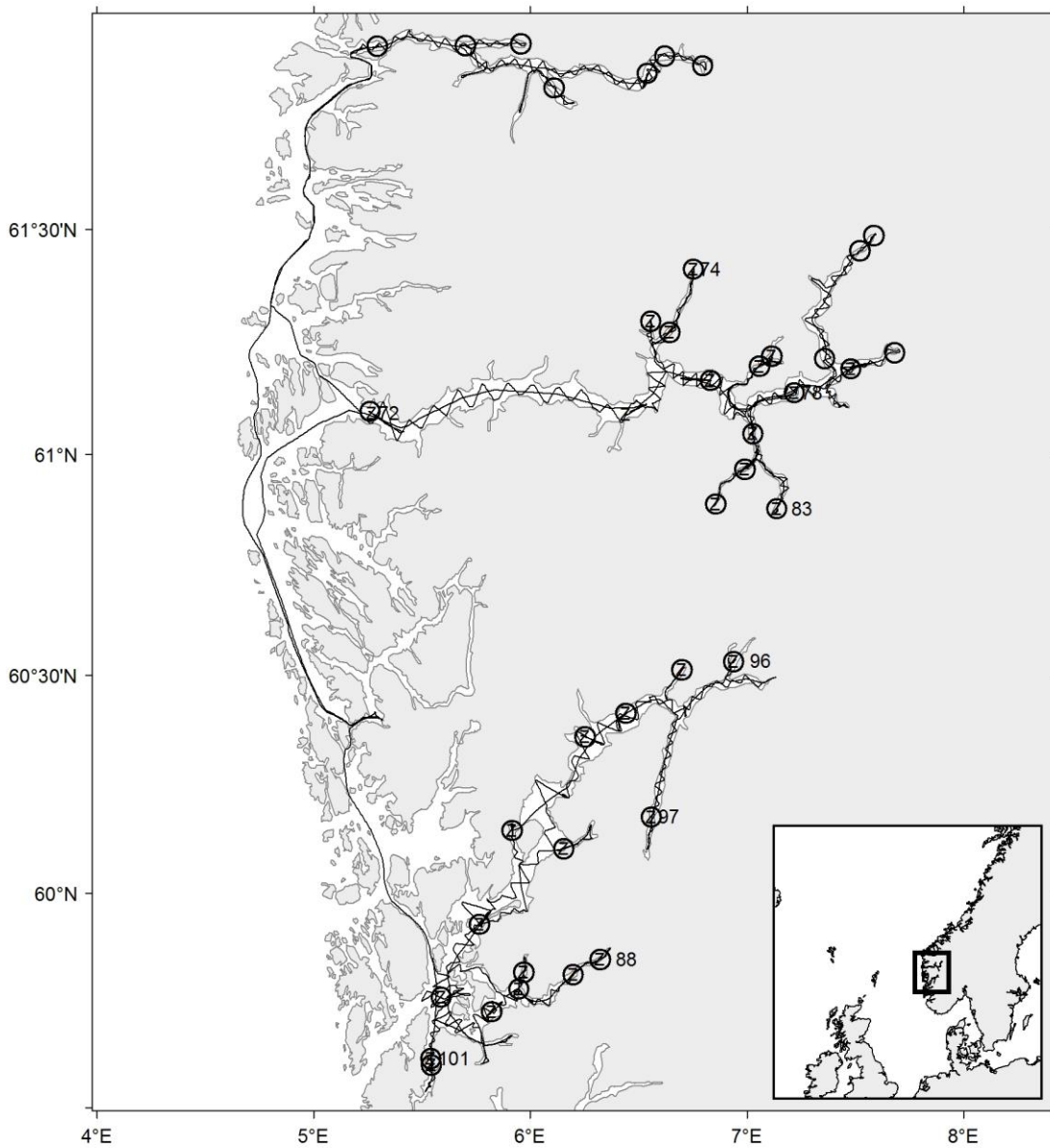
- z CTD st.no 1–71
- Plankton st. (WP-II-net)
- ◆ Plankton st. (Mocness)

Standard sections:
Utsira W st.no 1-29
Hanstholm-Aberdeen st. 46-71



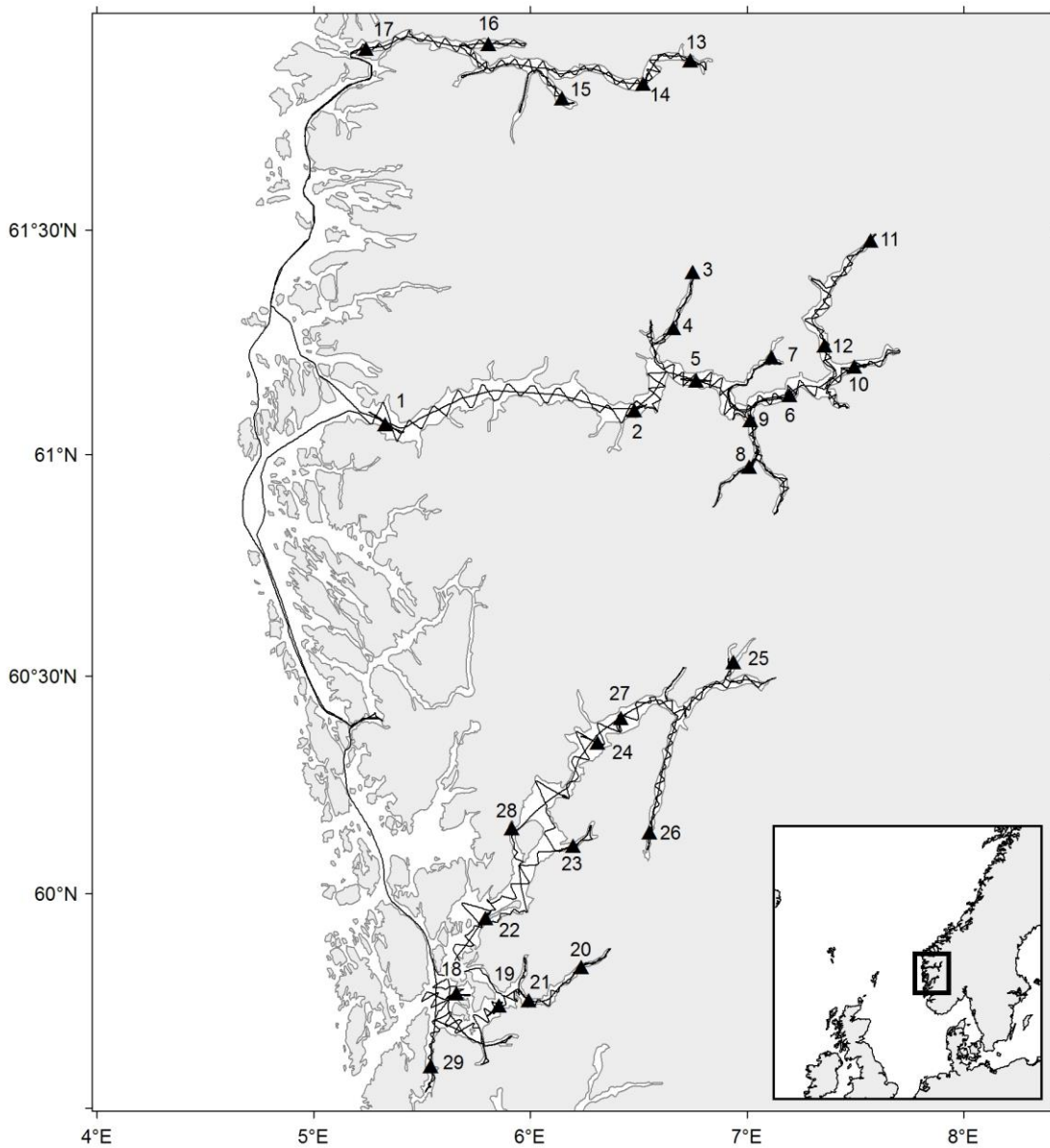
Cruise no 2016623 "Kristine Bonnevie"
25 November – 4 December 2016

● Mik st.



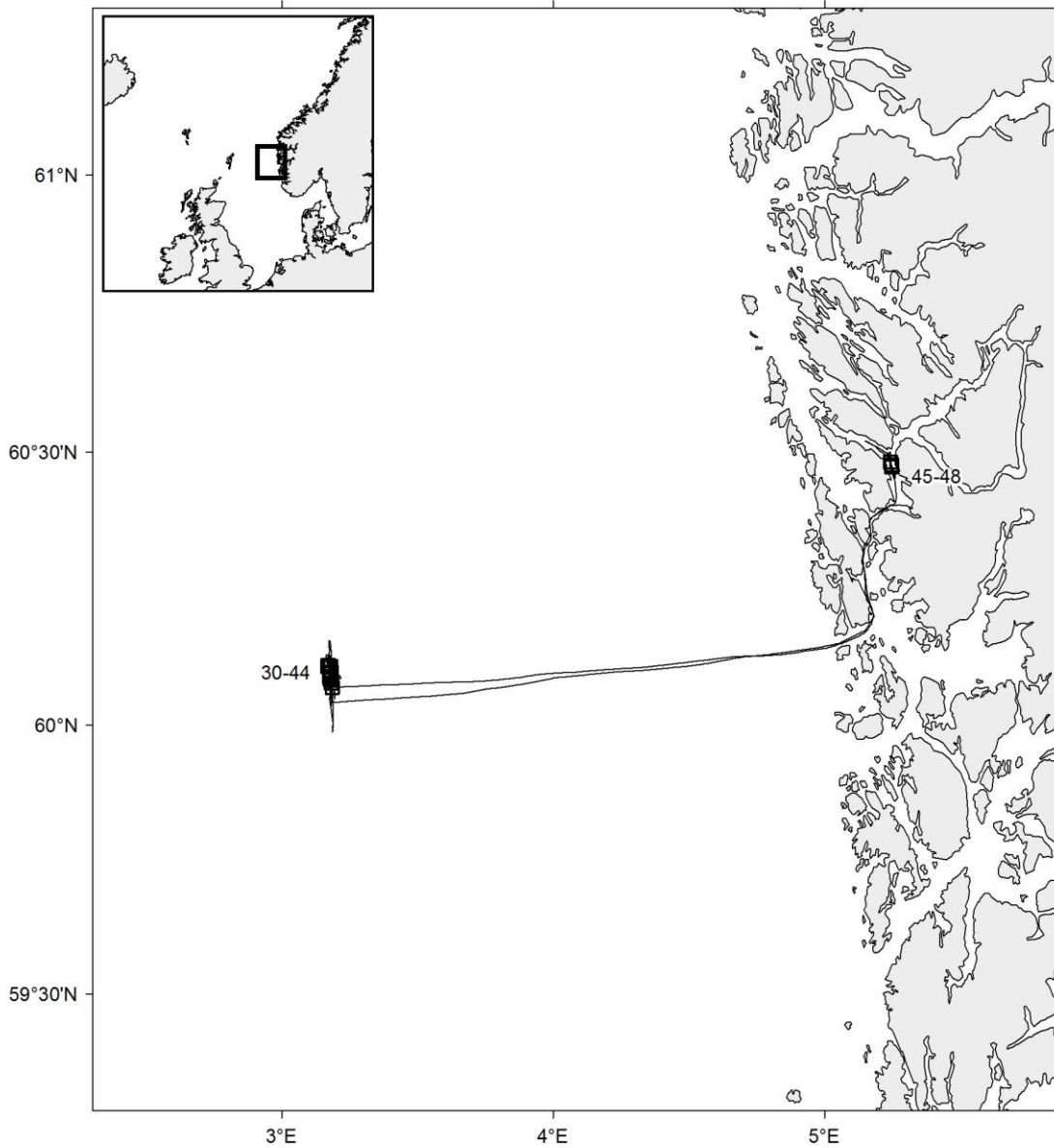
Cruise no 2016624 "Kristine Bonnevie"
6–16 December 2016

z CTD st.no 72–101
O Plankton st. (WP-II-net)



Cruise no 2016624 "Kristine Bonnevie"
6–16 December 2016

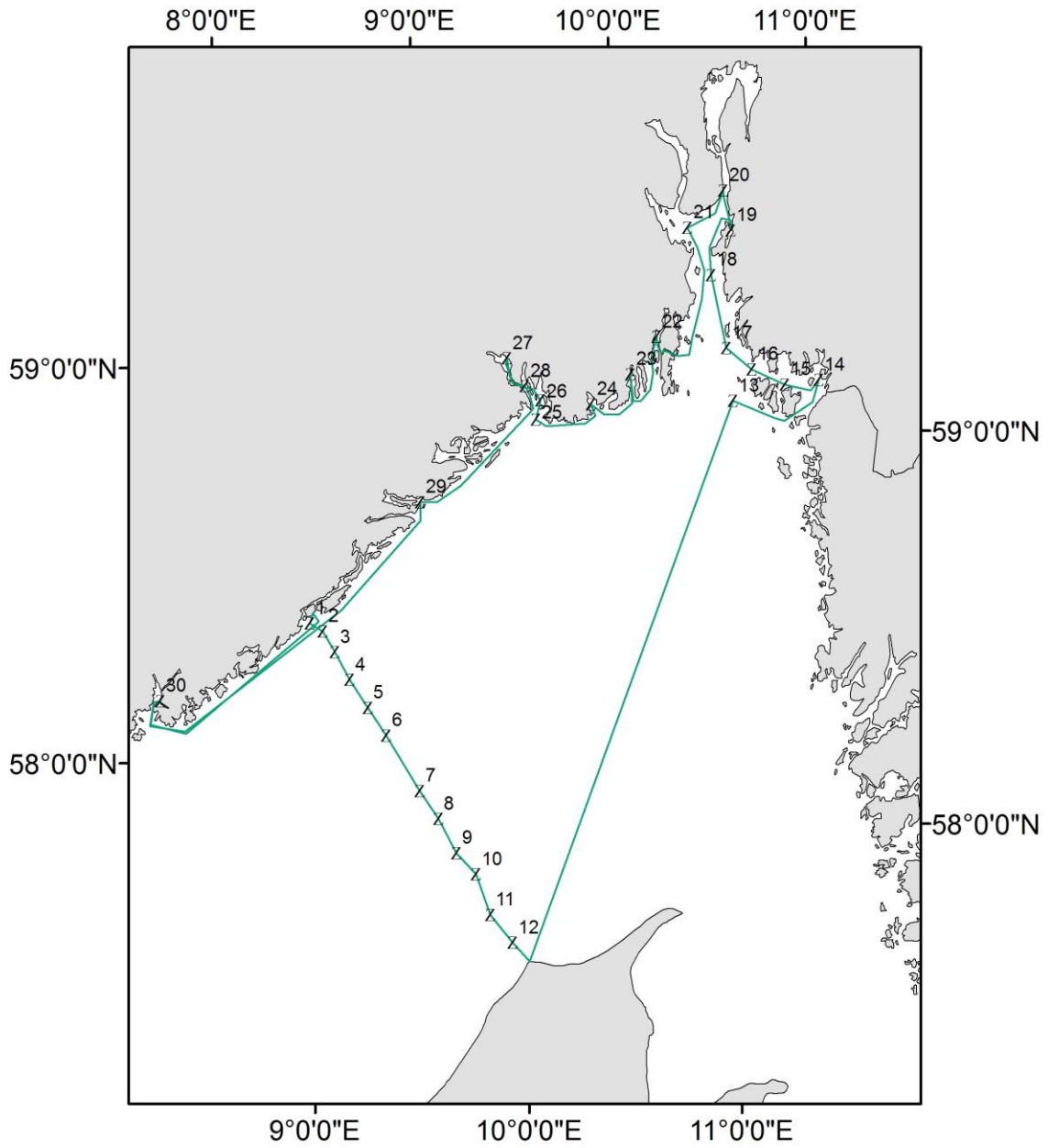
▲ Pelagic trawl st.no 1–29



Cruise no 2016630 "Kristine Bonnevie"
18–20 December 2016

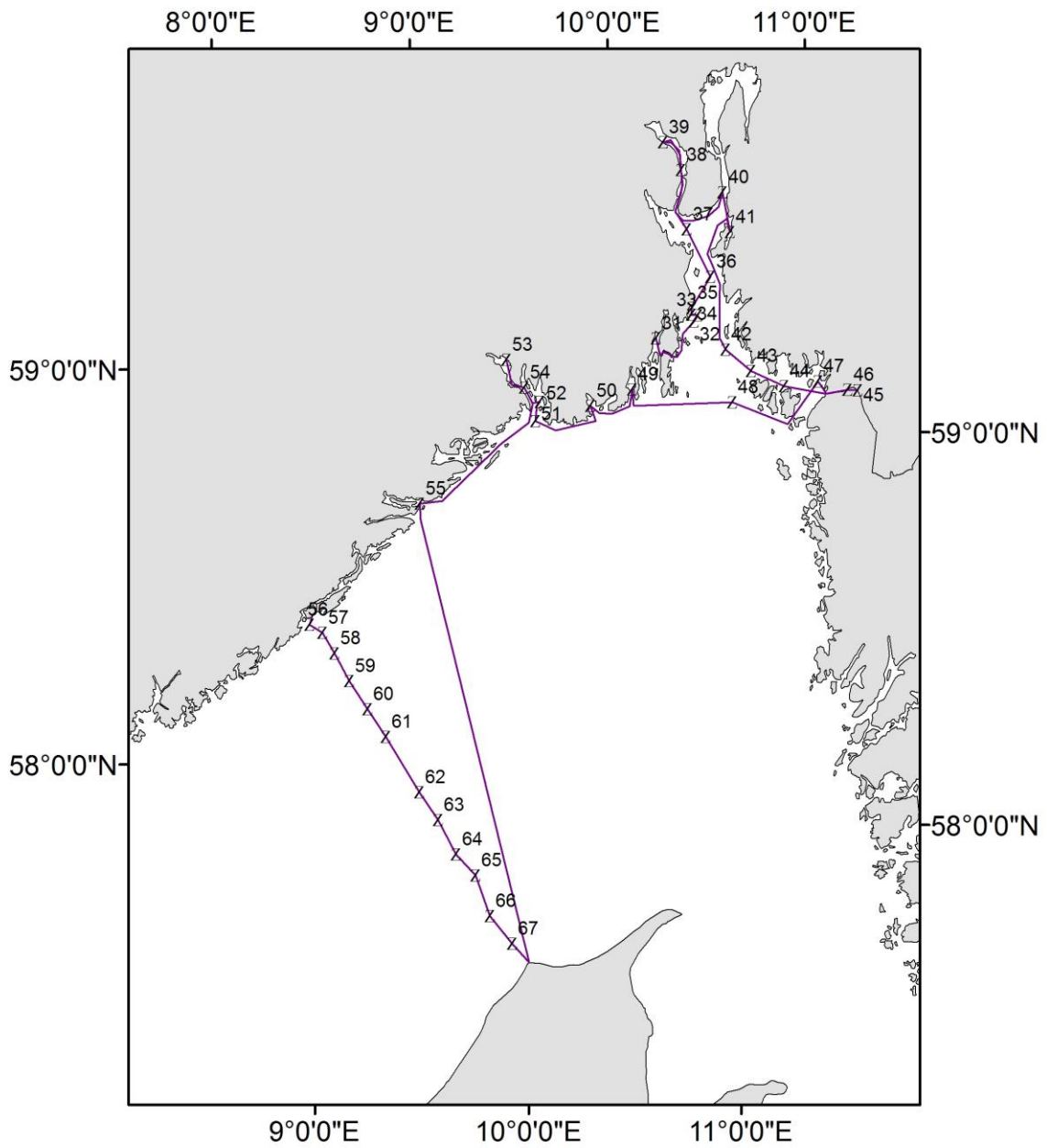
□ Demersal trawl st.no 30–48

4.5
G.M.Dannevig



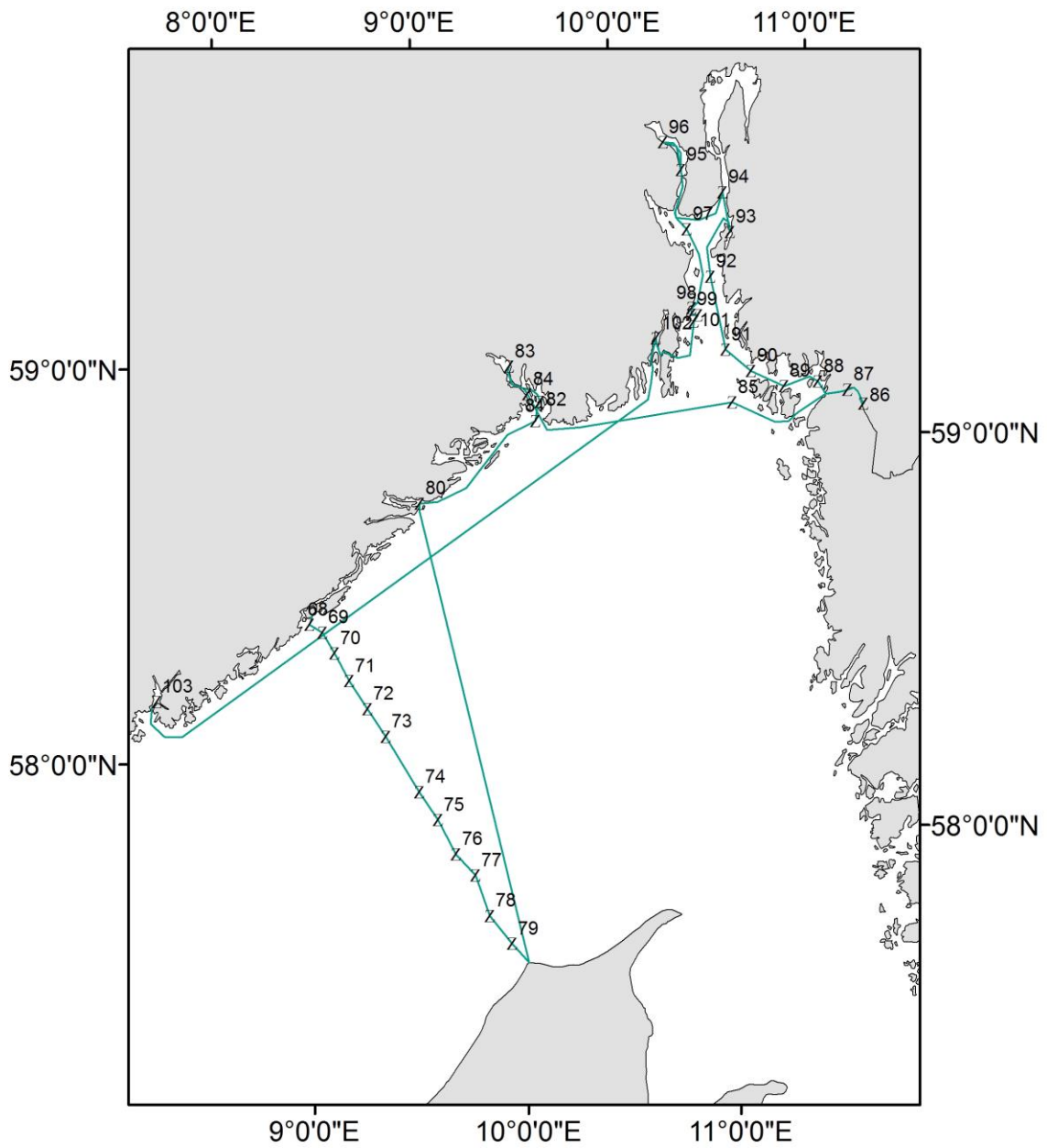
Cruise no 2016301
"G. M. Dannevig"
13.01-19.01

Z CTD st.no. 1-30



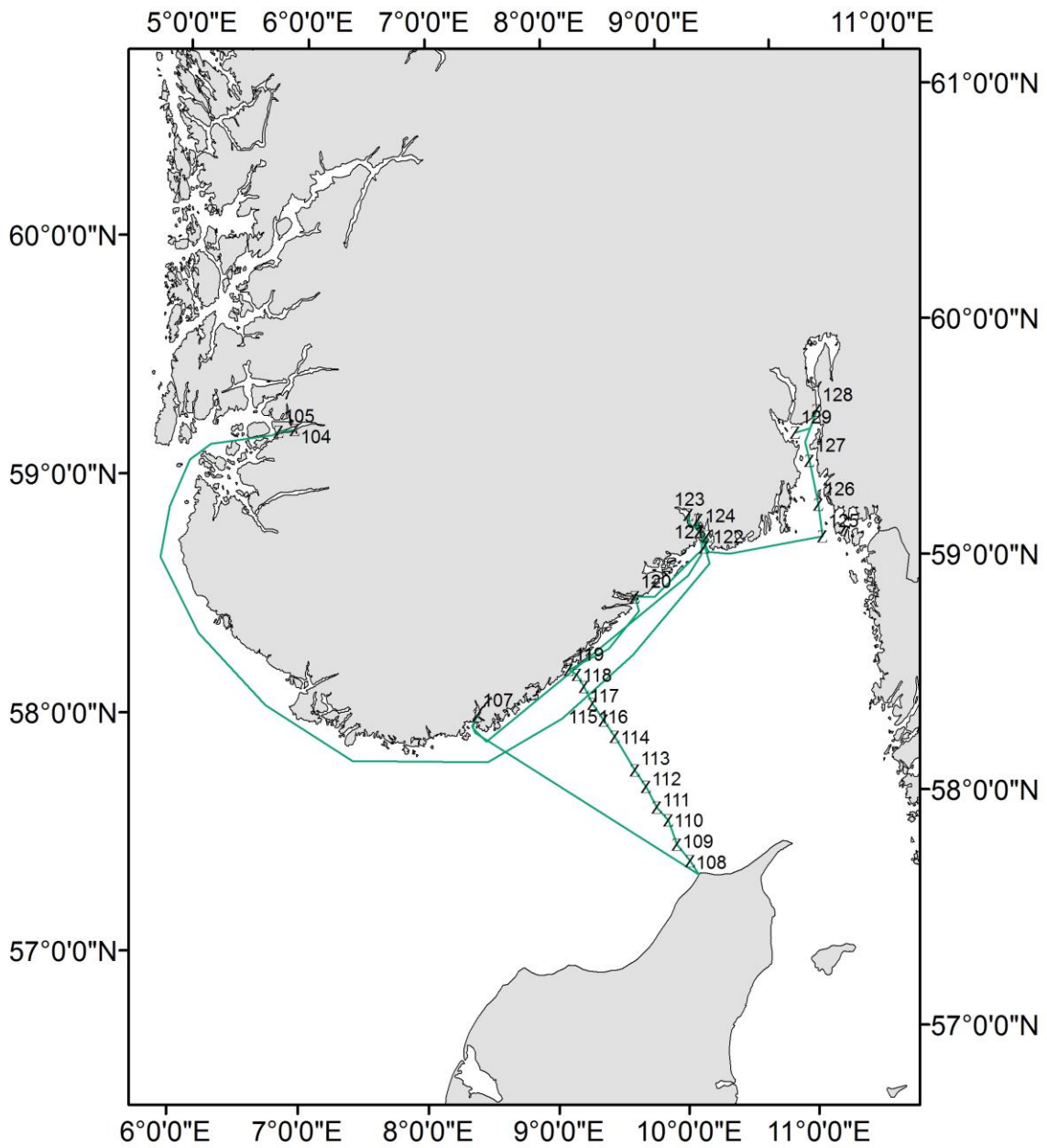
Cruise no 2016302
"G. M. Dannevig"
01.02-07.02

Z CTD st.no. 31-67



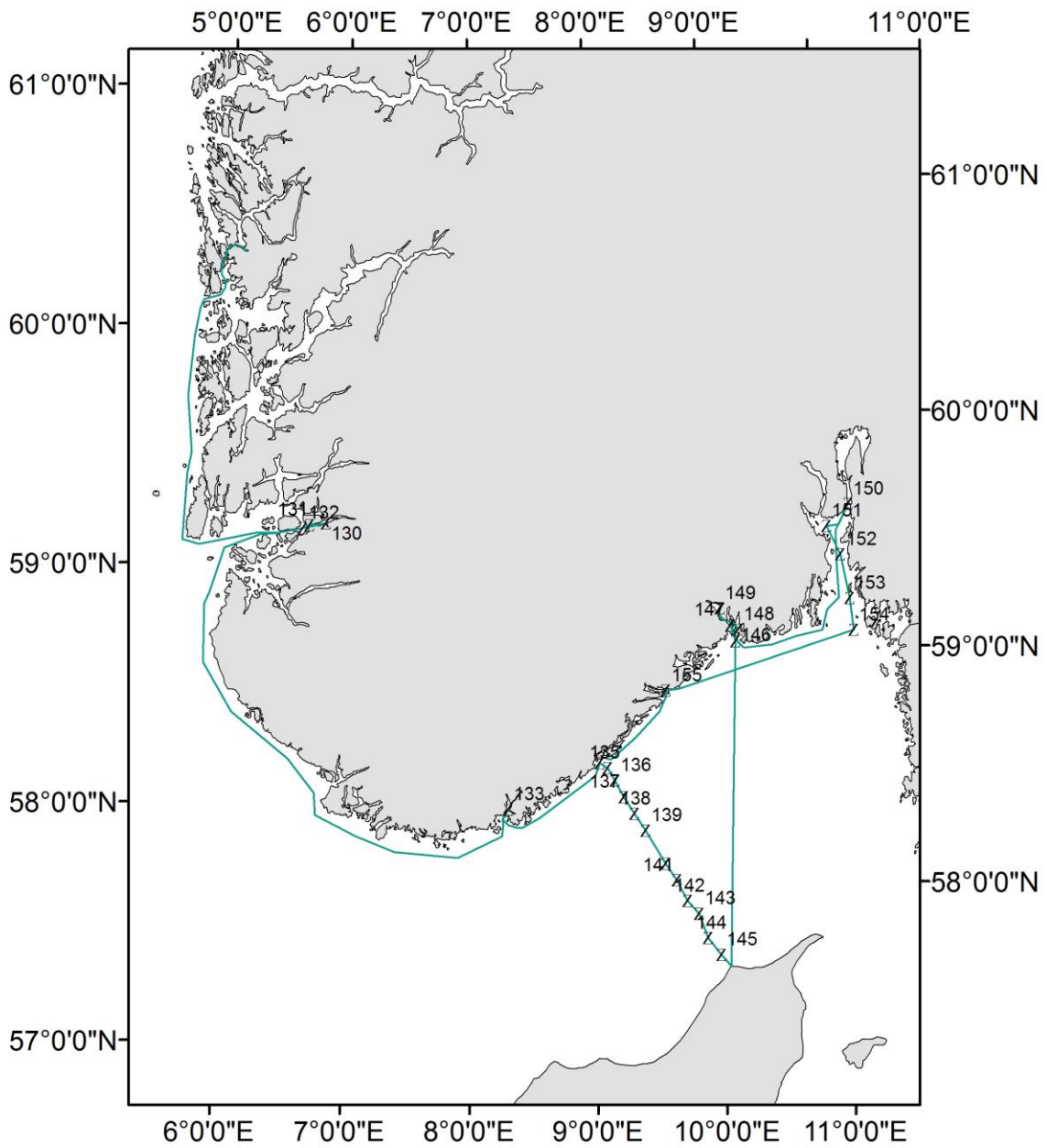
Cruise no 2016303
"G. M. Dannevig"
02.03-08.03

Z CTD st.no. 68-103



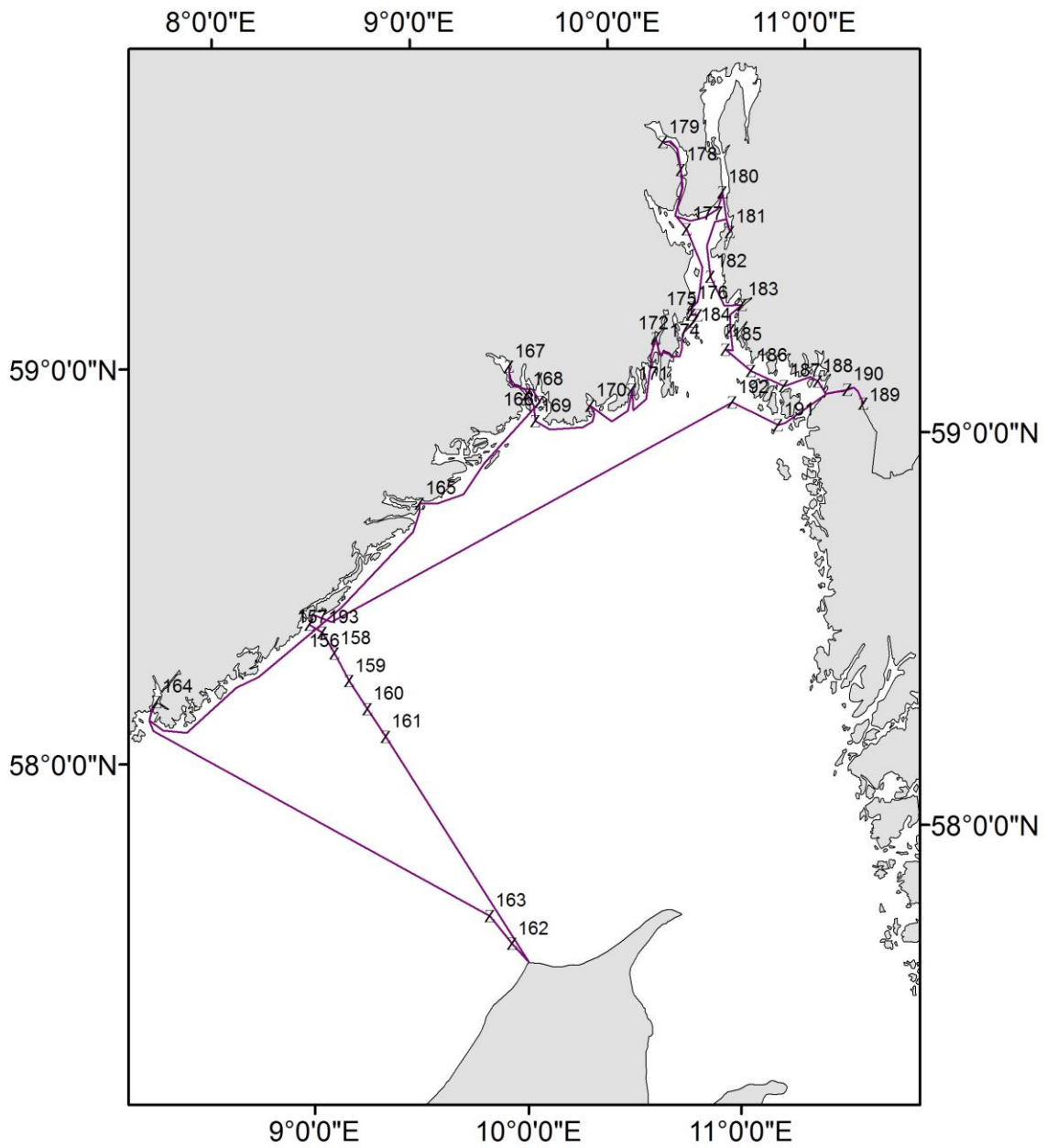
Cruise no 2016305
"G. M. Dannevig"
13.04-20.04

Z CTD st.no. 104-129



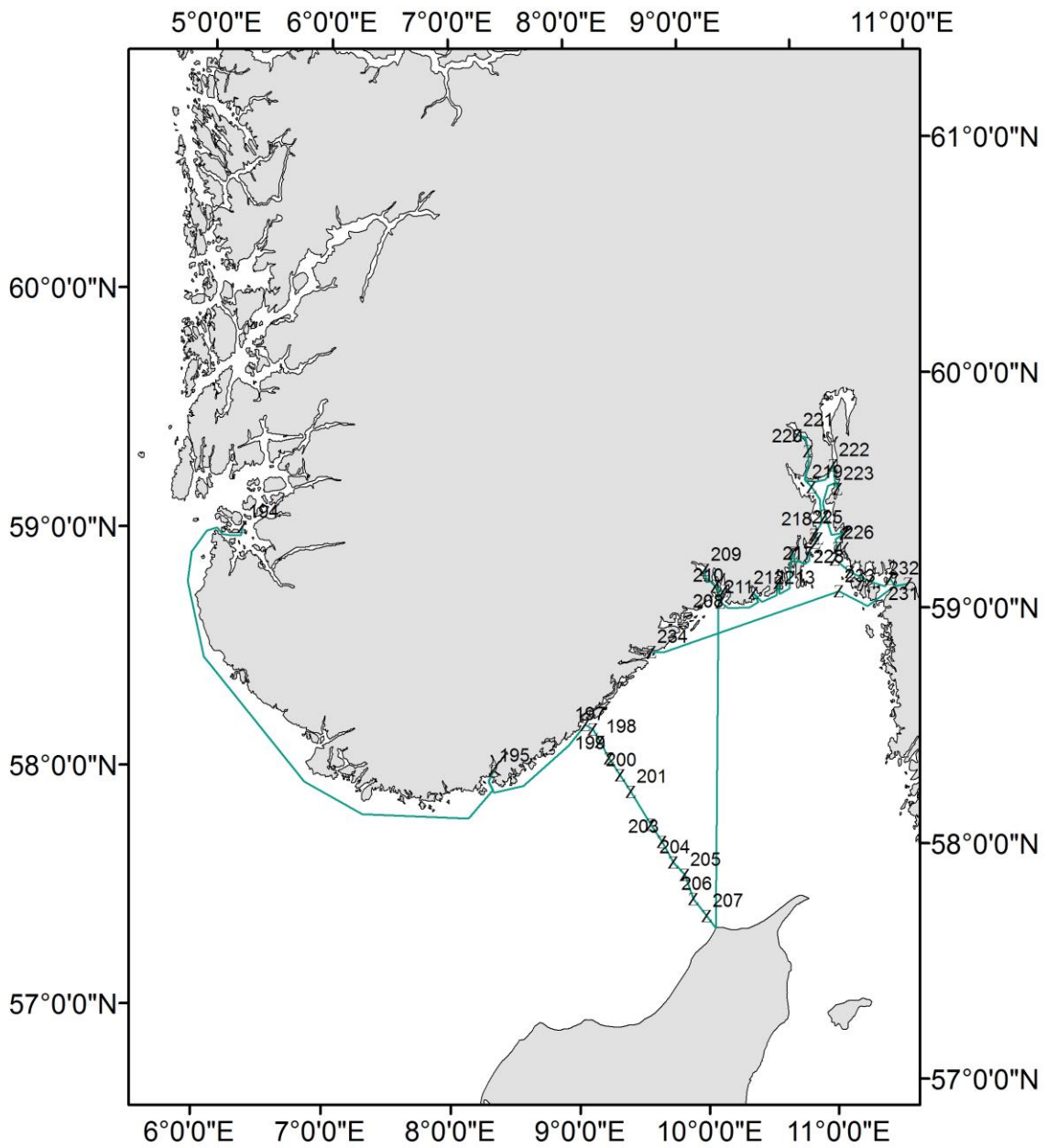
Cruise no 2016306
 "G. M. Dannevig"
 07.05-13.05

Z CTD st.no. 130-155



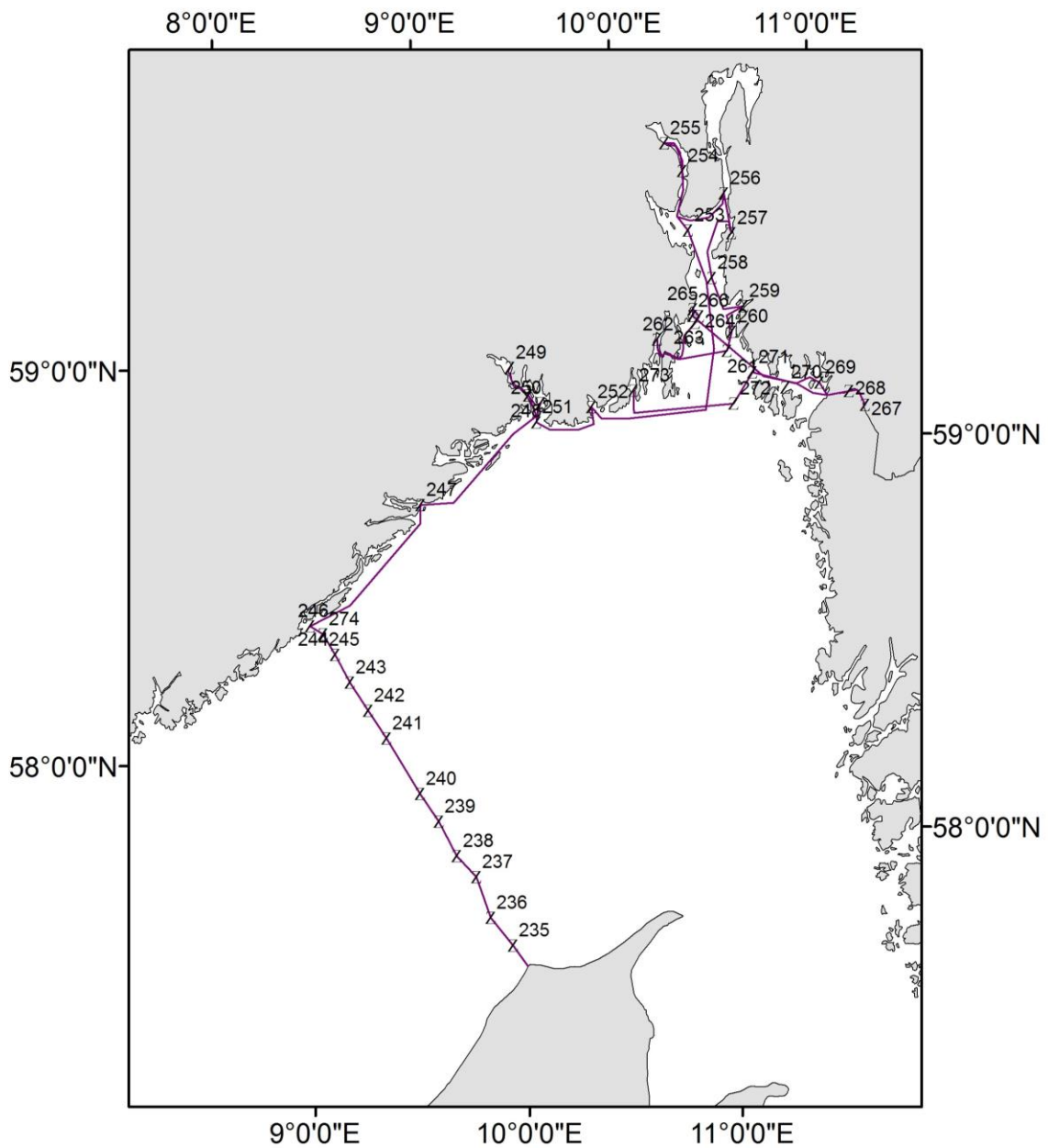
Cruise no 2016307
 "G. M. Dannevig"
 05.06-14.06

Z CTD st.no. 156-193



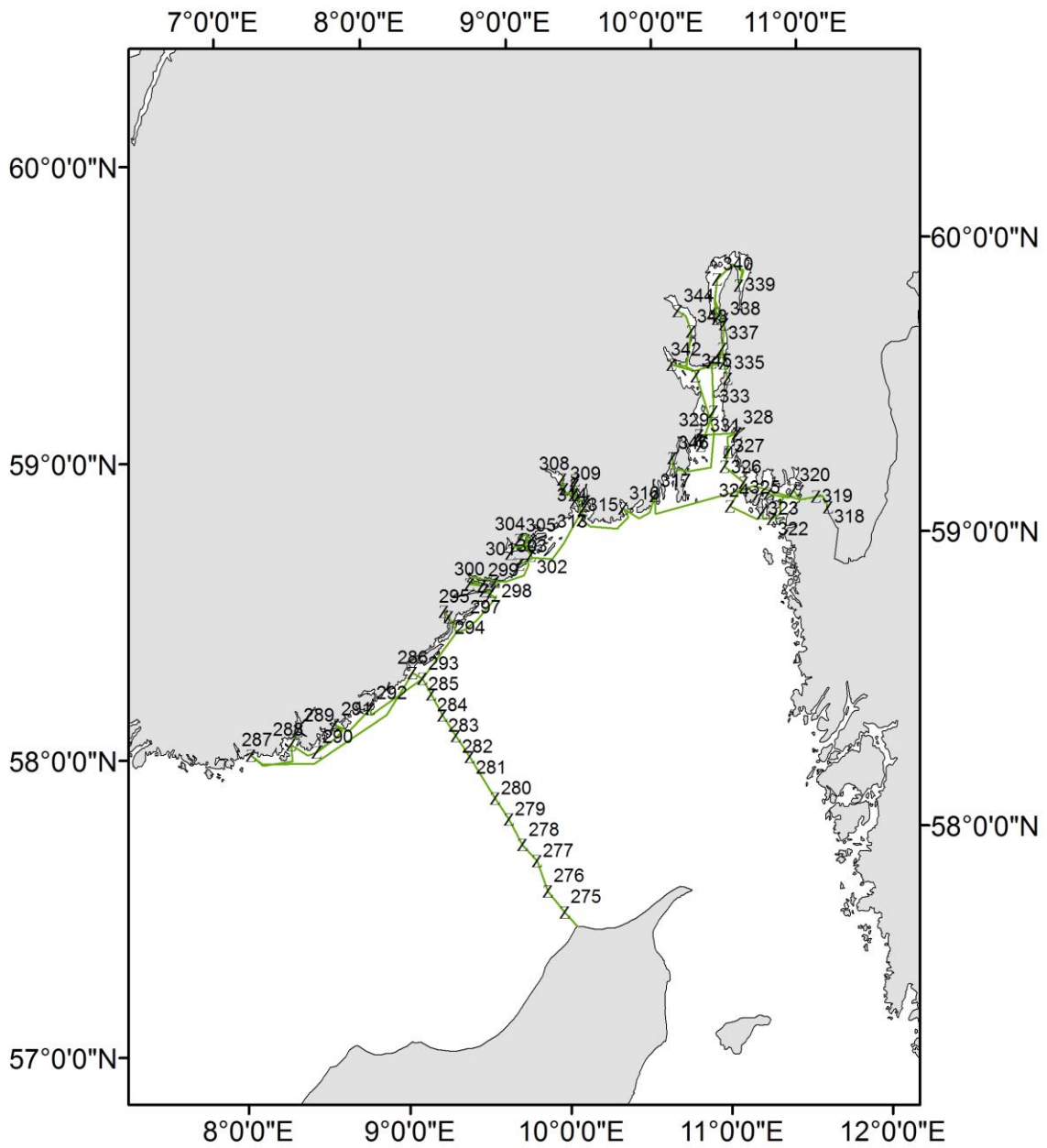
Cruise no 2016308
 "G. M. Dannevig"
 01.07-08.07

Z CTD st.no. 194-234



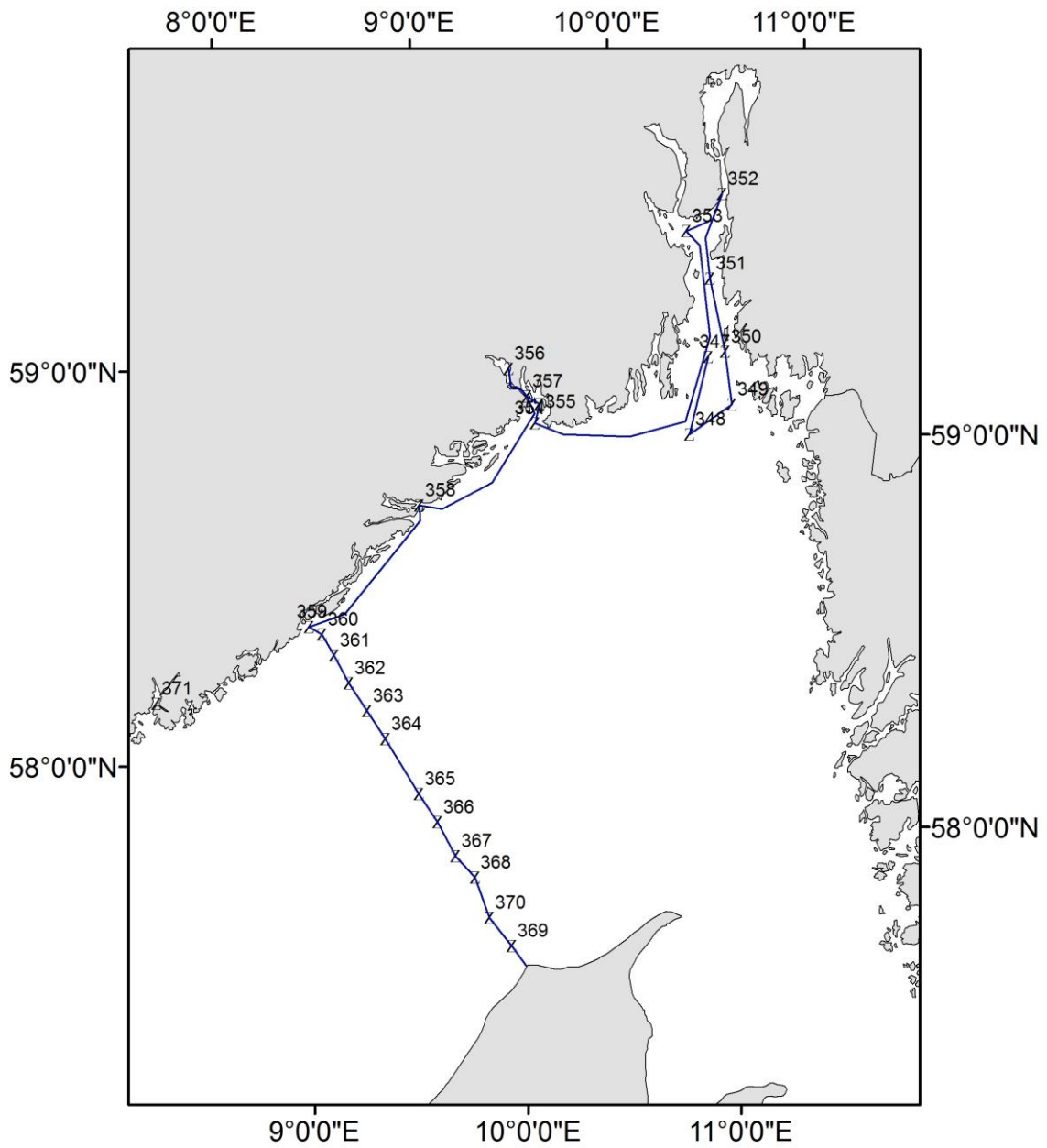
Cruise no 2016309 & 2016310
 "G. M. Dannevig"
 08.08-24.08

Z CTD st.no. 235-274



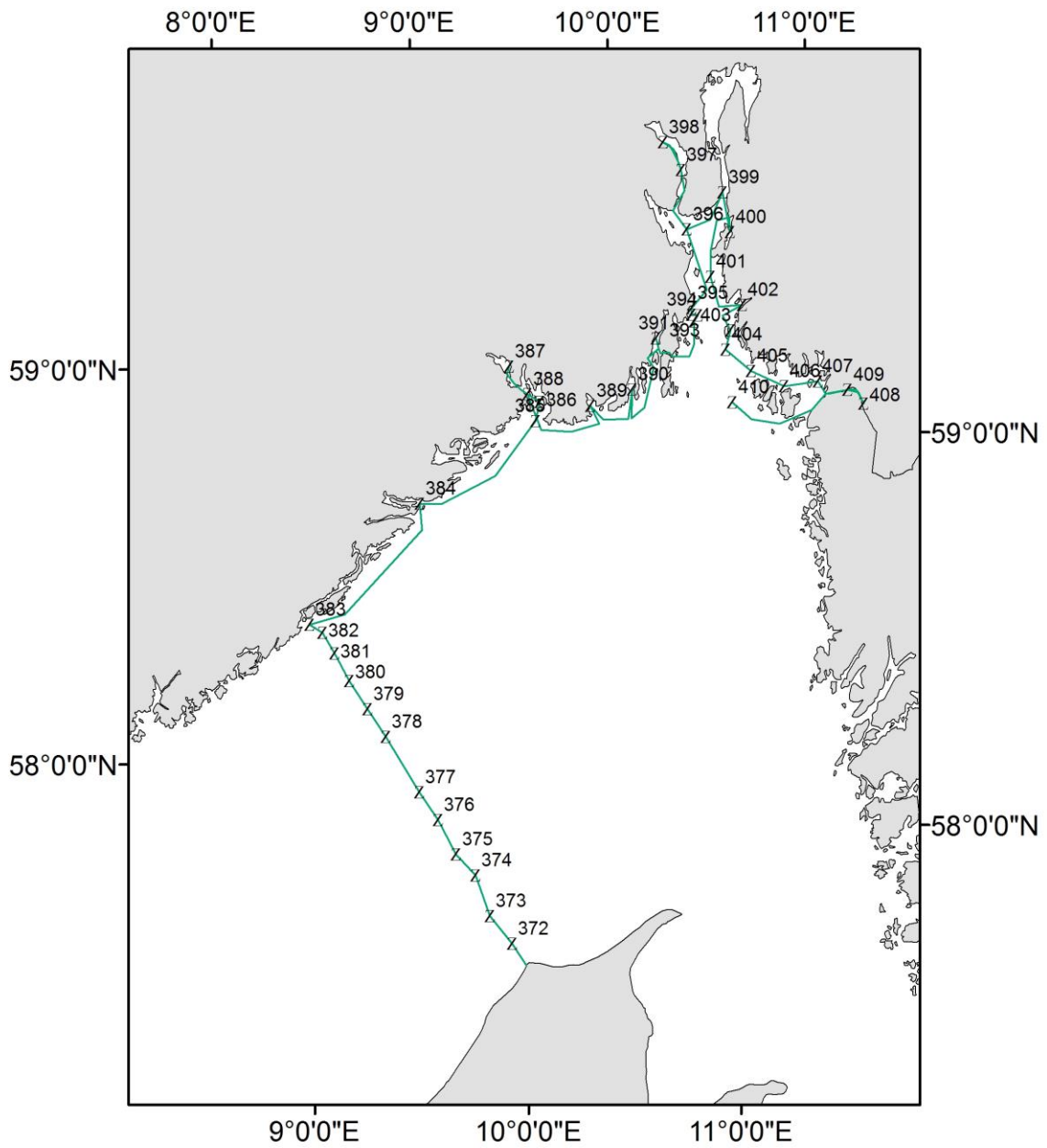
Cruise no 2016312 & 2016313
"G. M. Dannevig"
13.09-02.10

Z CTD st.no. 275-347



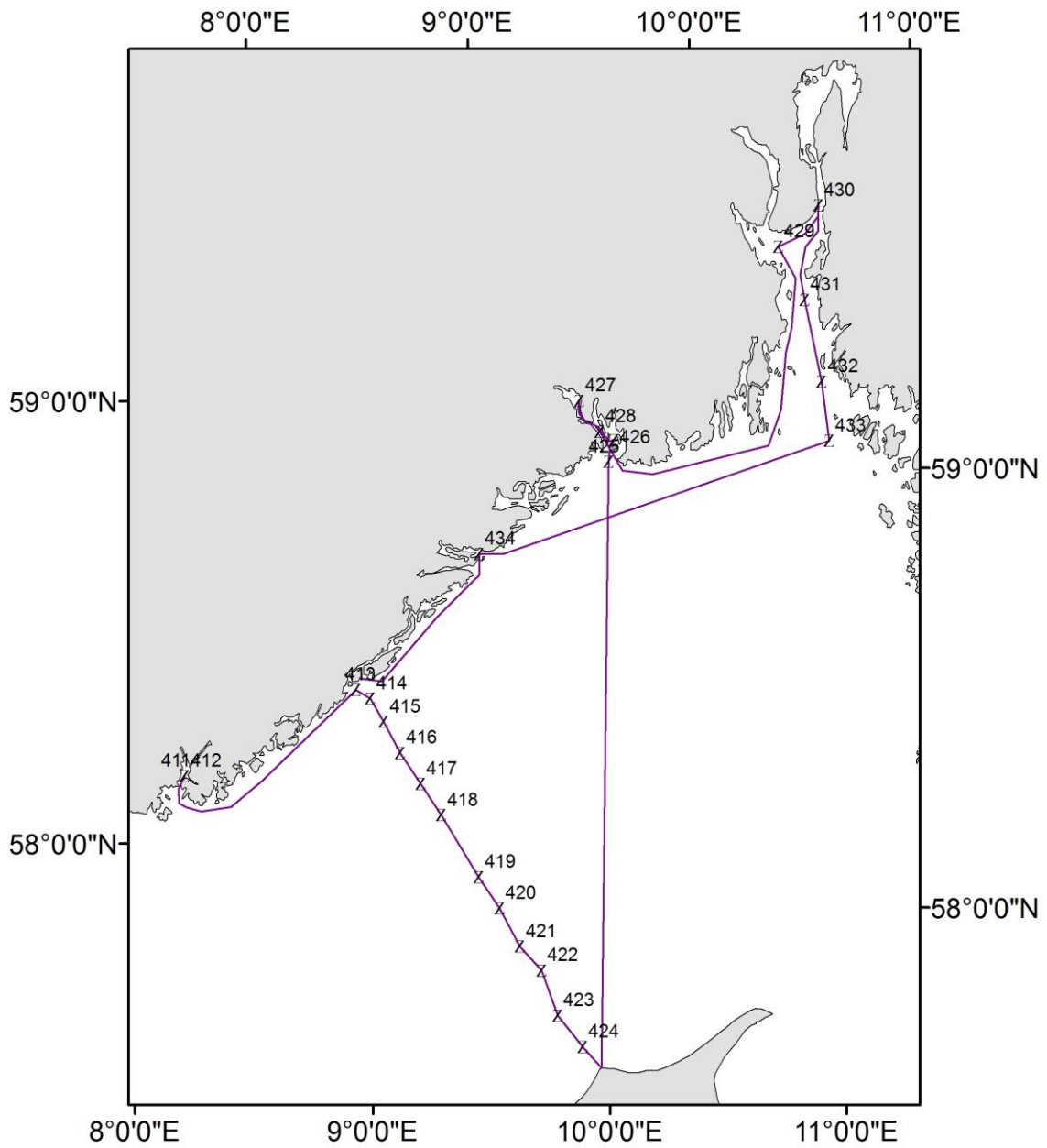
Cruise no 2016314
 "G. M. Dannevig"
 03.10-08.10

Z CTD st.no. 348-371



Cruise no 2016315
"G. M. Dannevig"
09.11-14.11

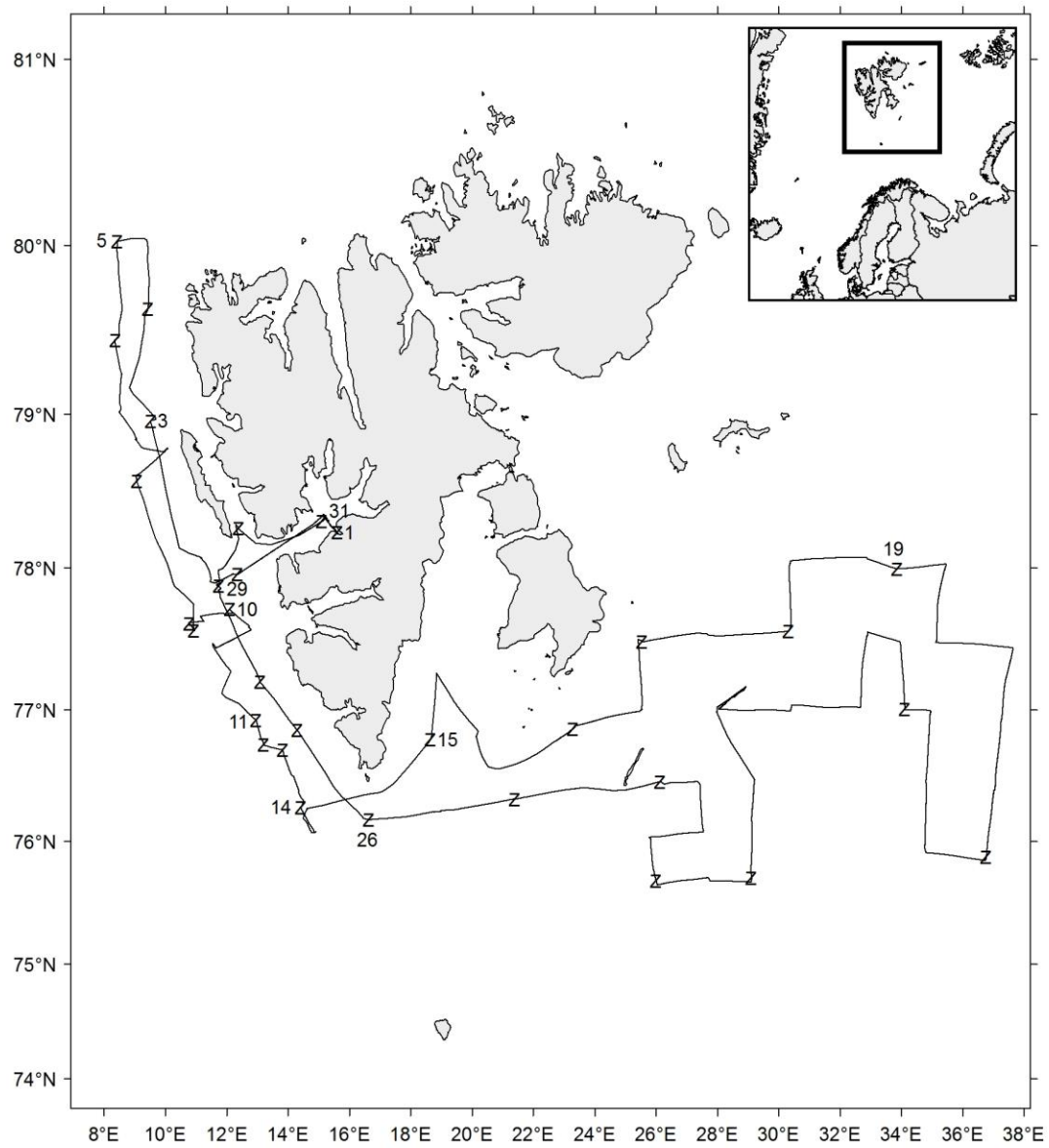
Z CTD st.no. 372-410



Cruise no 2016316-17
 "G. M. Dannevig"
 15.11-13.12

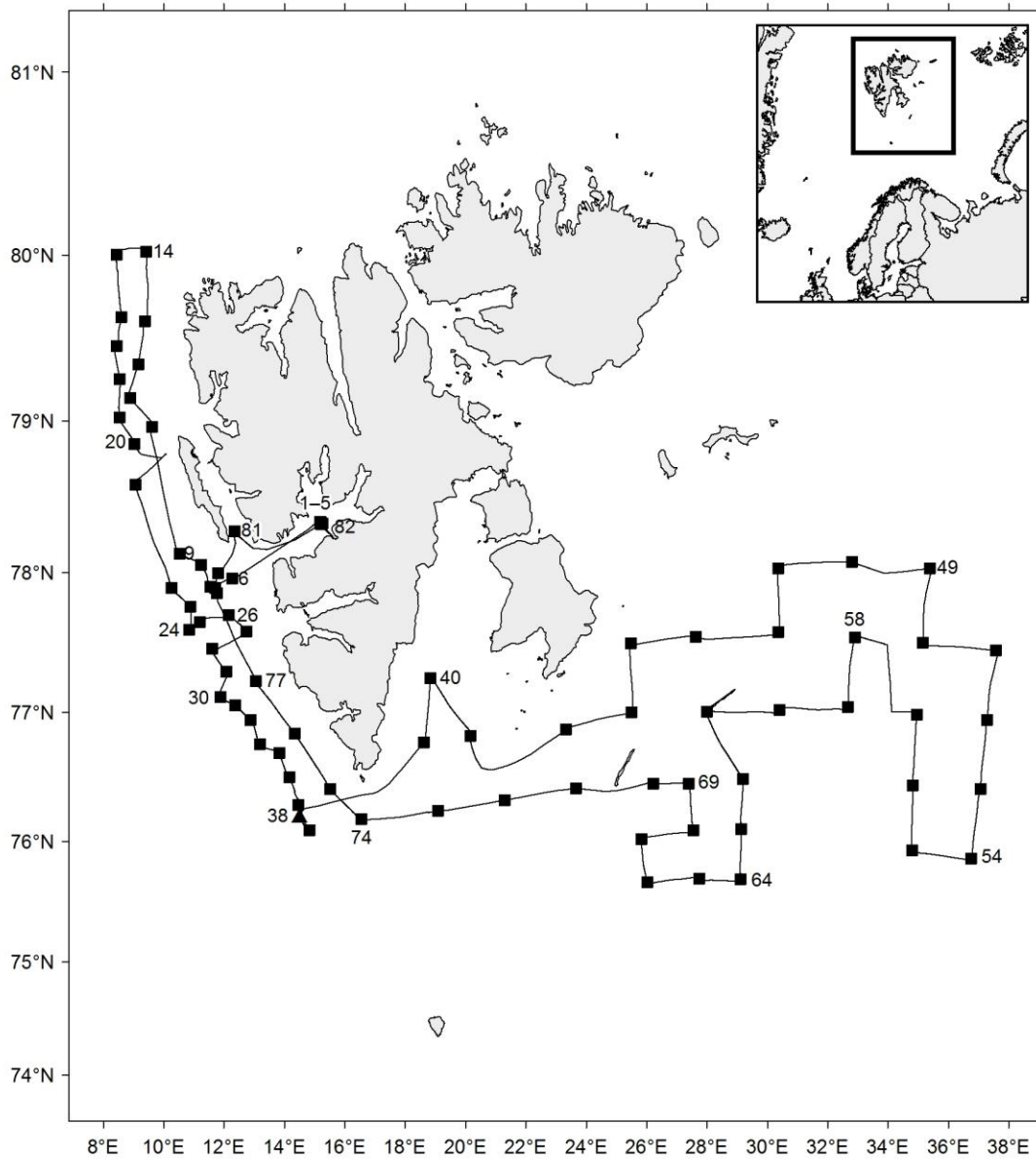
Z CTD st.no. 411-434

1.6 Selected cruises carried out by fishing vessels hired by IMR



Cruise no 2016846 "Helmer Hanssen"
25 Jan–8 Feb 2016

z CTD st.no 1–31



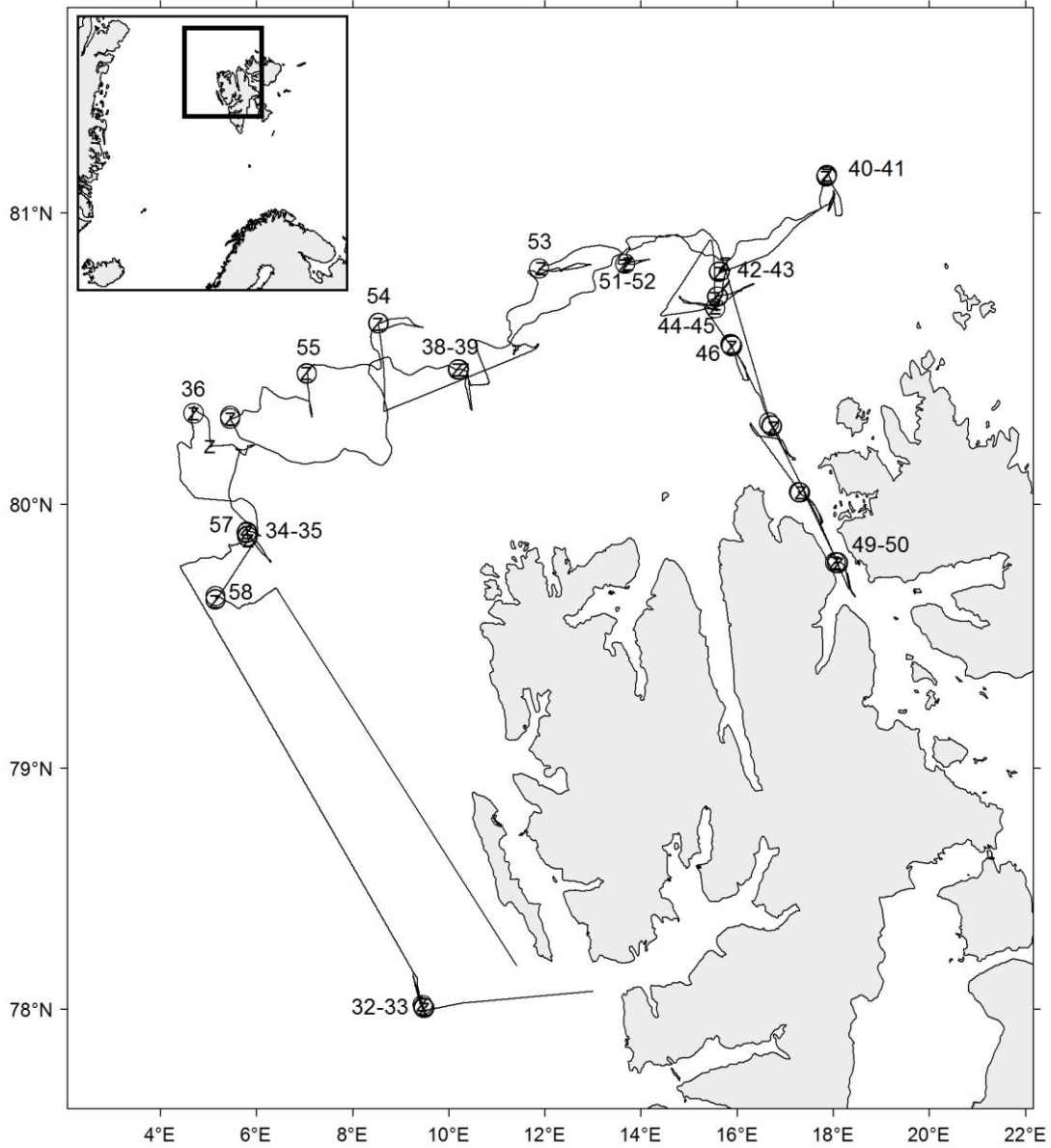
Cruise no 2016846 "Helmer Hanssen"

25 Jan–8 Feb 2016

Trawl st.no 1–82

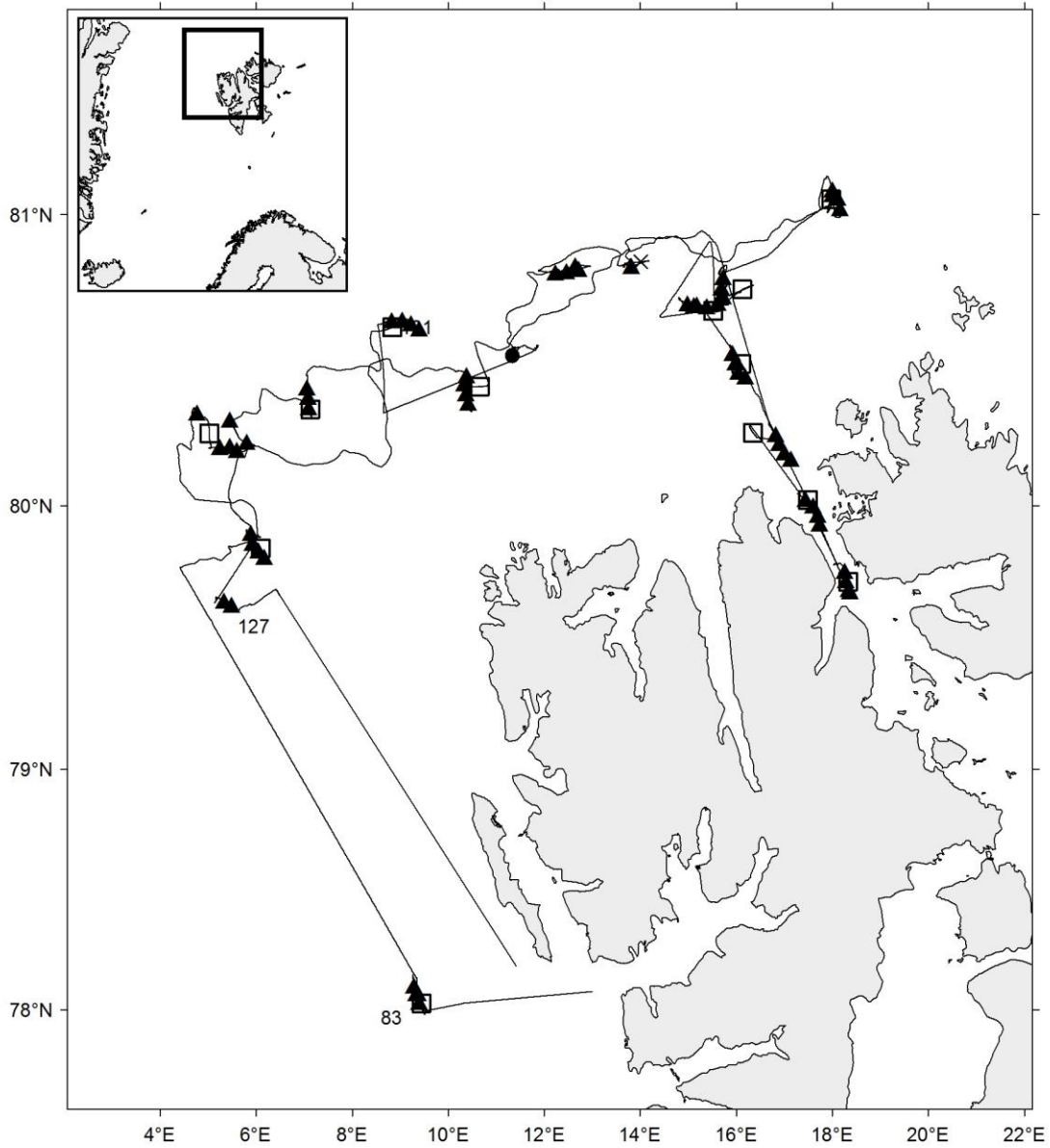
■ Bottom trawl

▲ Pelagic trawl (st.no 38)



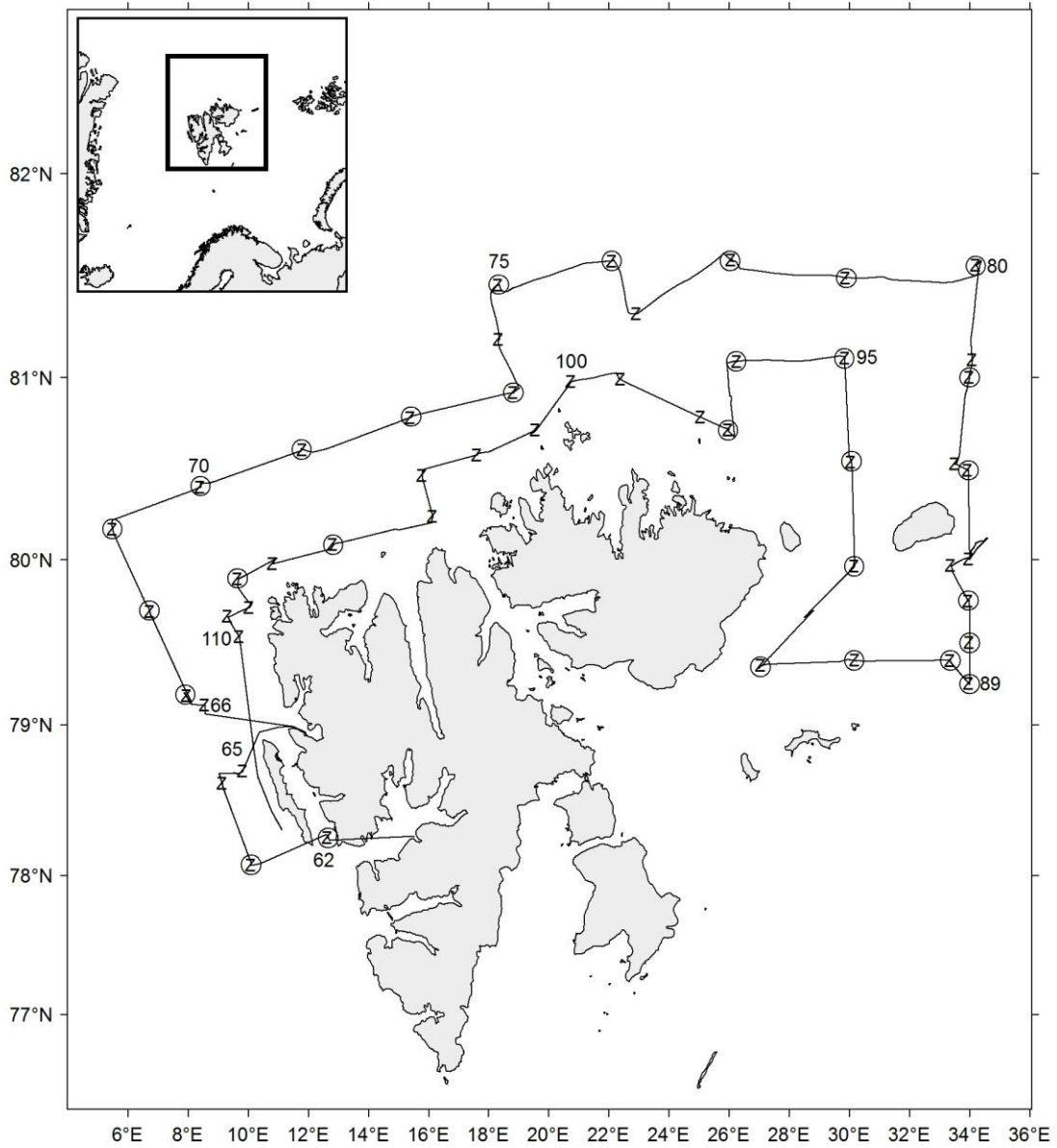
Cruise no 2016838 "Helmer Hanssen"
2–16 September 2016

z CTD st.no 32-58
○ Plankton st. (WP-II-net)



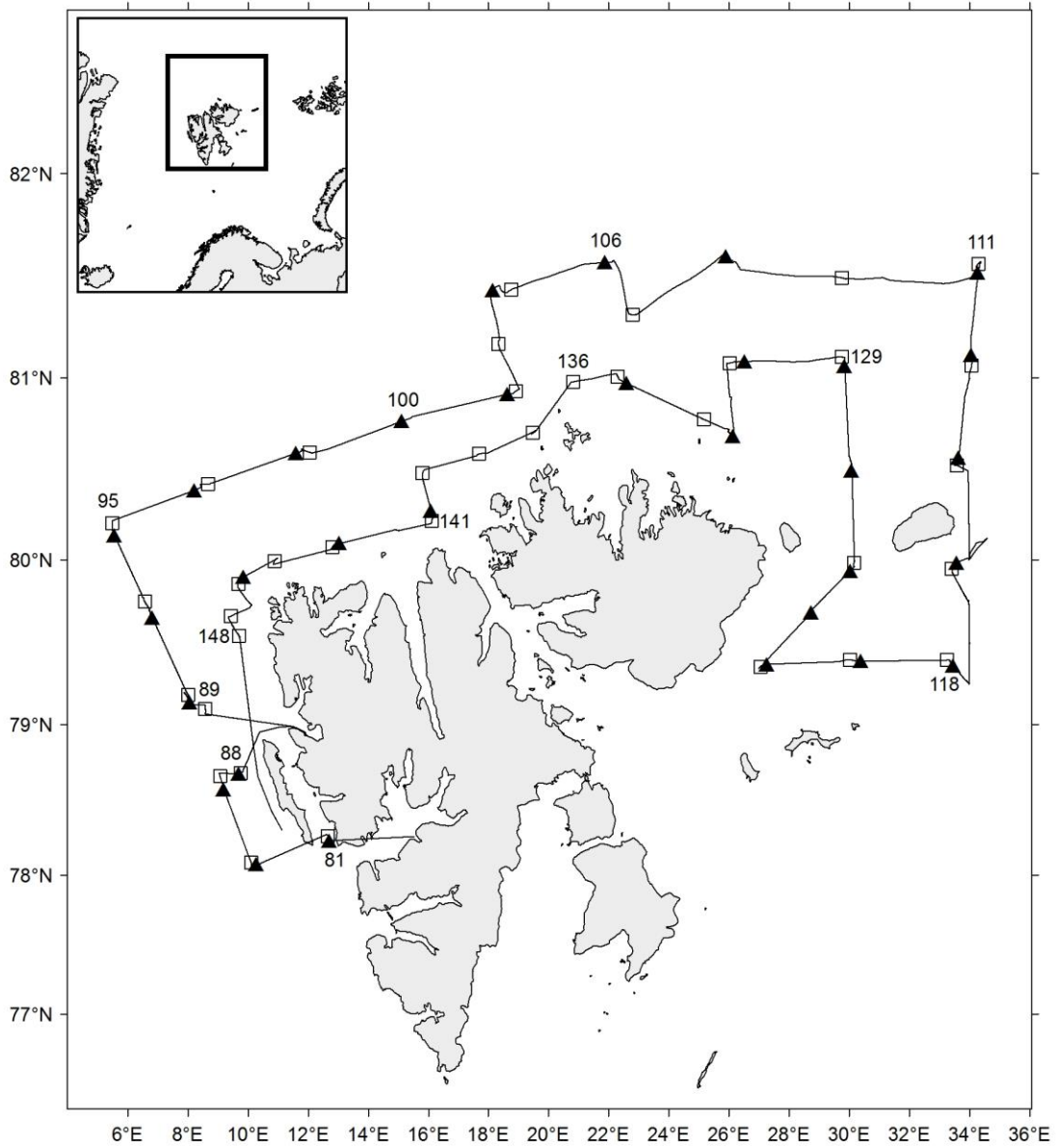
Cruise no 2016838 "Helmer Hanssen"
2–16 September 2016

- Trawl st. no 83–127
 ▲ Pelagic trawl st.
 □ Bottom trawl st.
 ● Mik st.
 × Beam trawl st.



Cruise no 2016847 "Helmer Hanssen"
 24 September–5 October 2016

z CTD st.no 62–110
 ○ Plankton st. (WP-II-net)

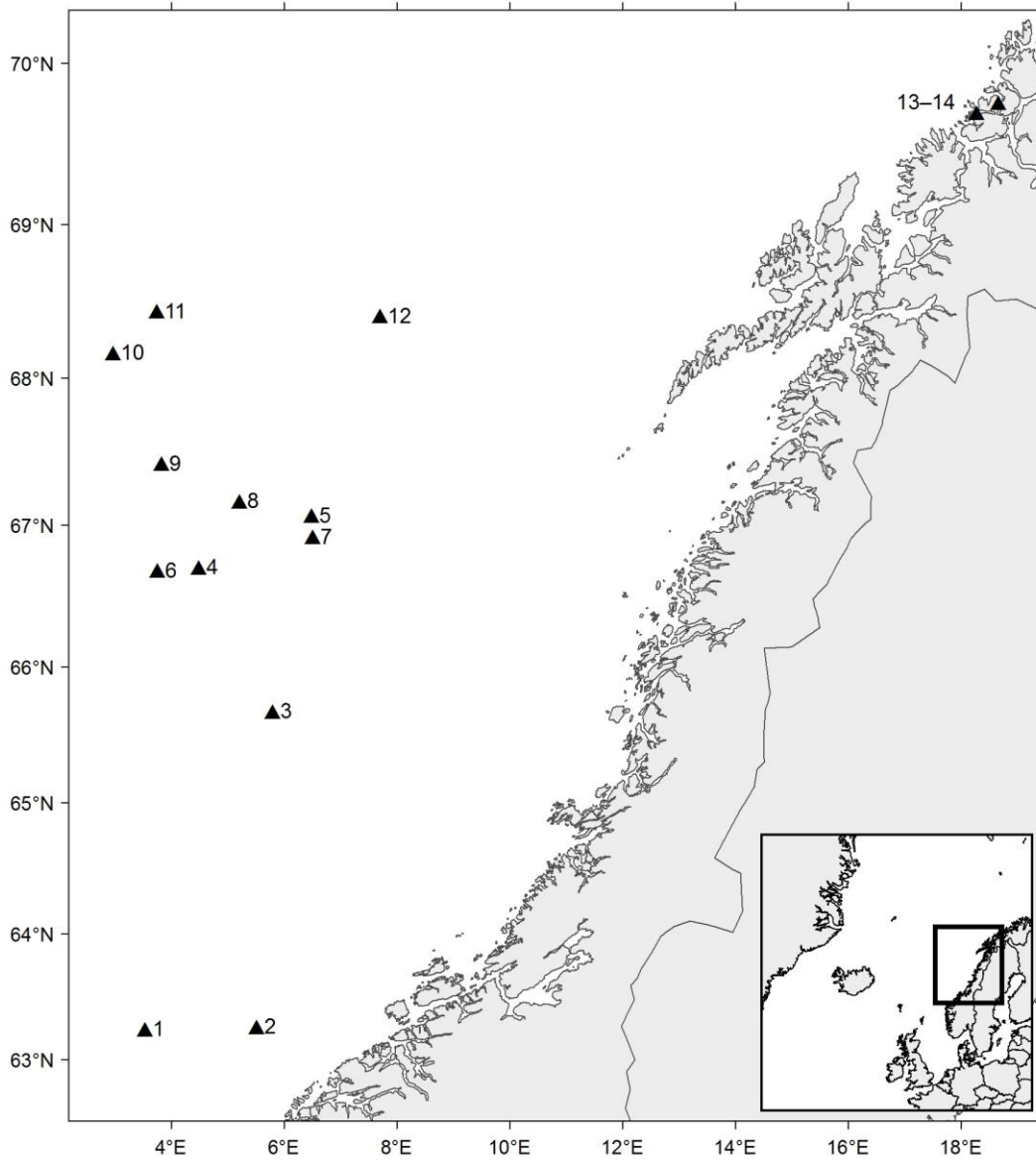


Cruise no 2016847 "Helmer Hanssen"
24 September–5 October 2016

Trawl st.no 81–148

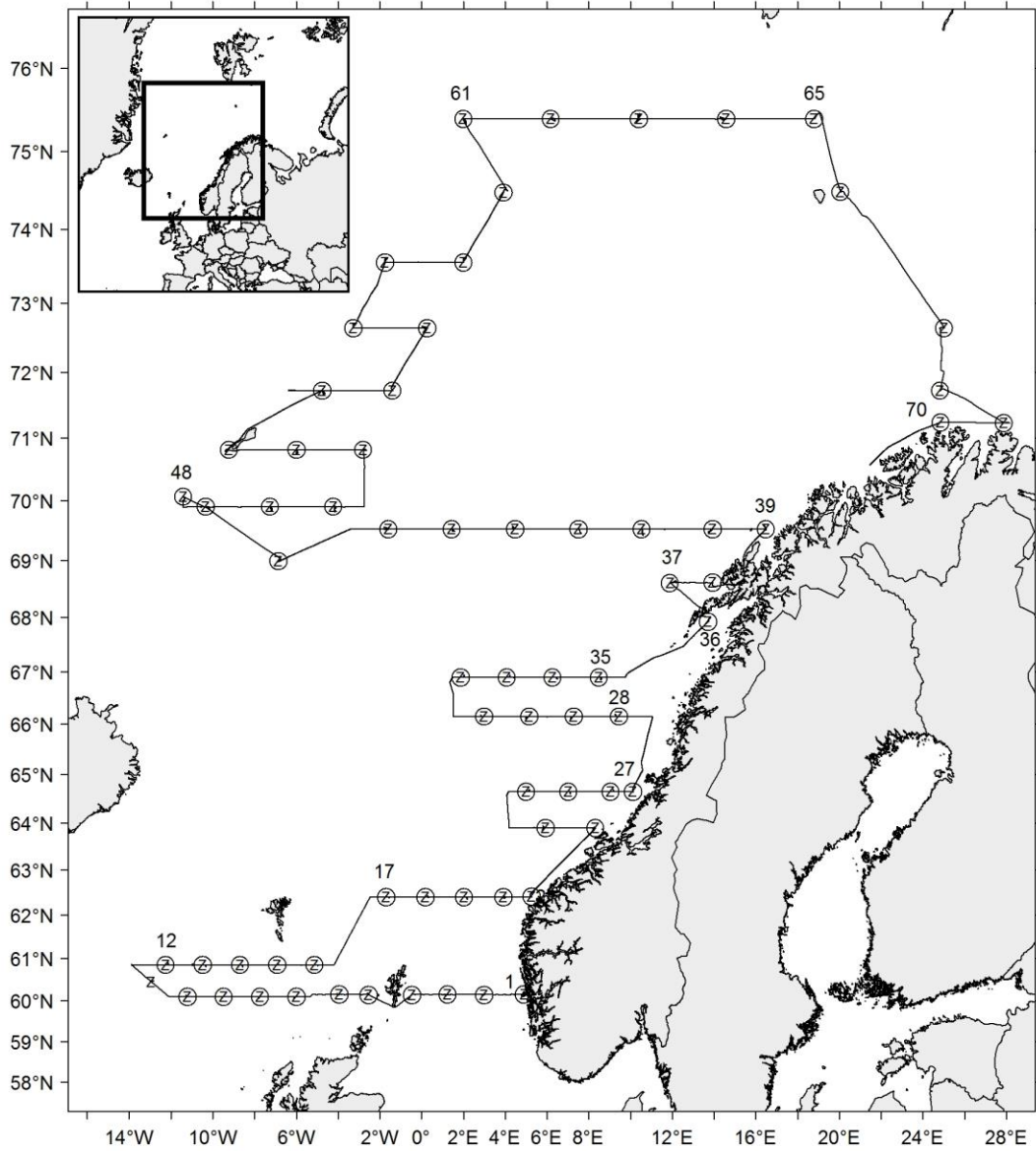
▲ Pelagic tr.

□ Bottom tr.



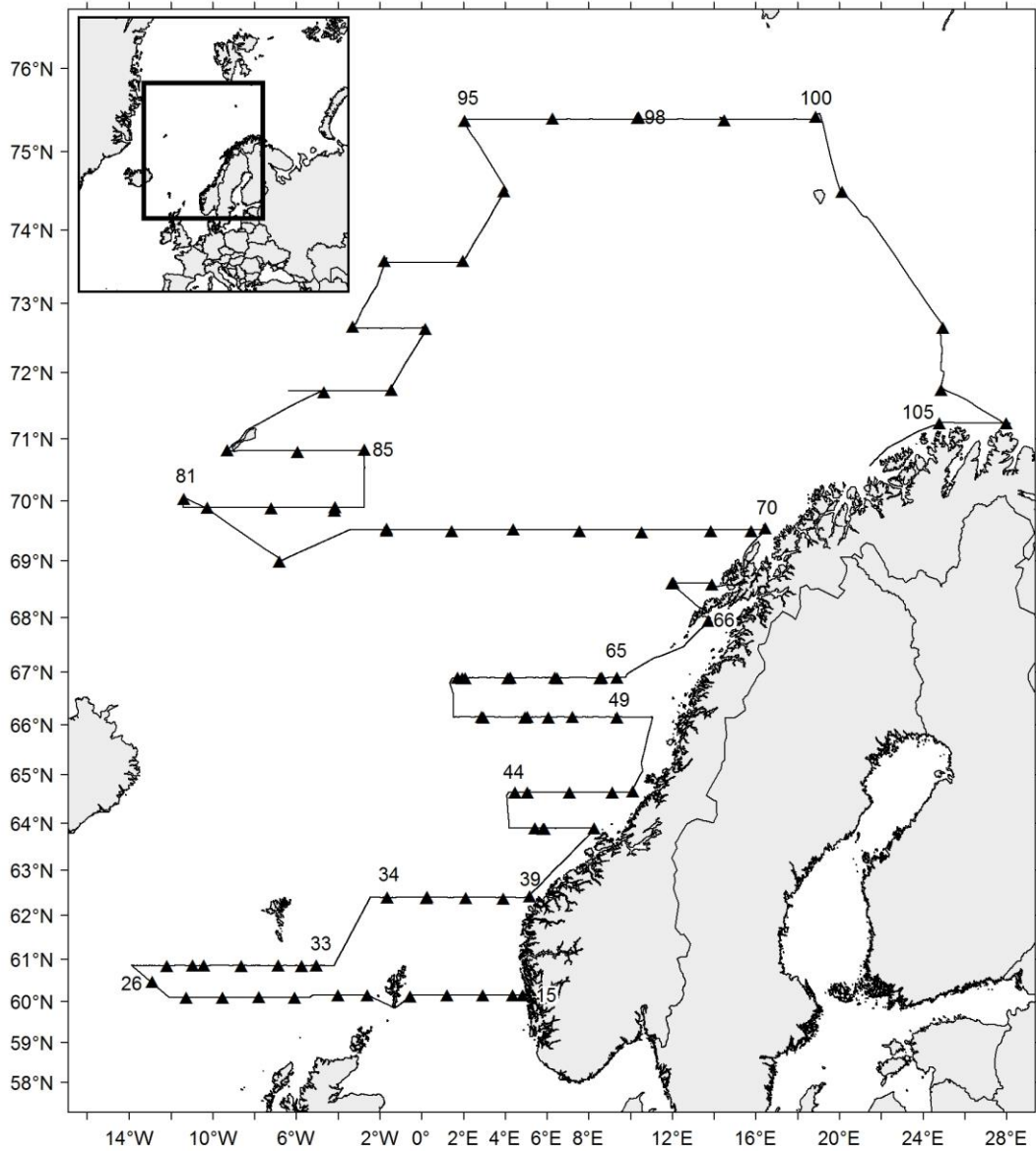
Cruise no 2016851 "Vendla"
2-14 February 2016

▲ Pelagic trawl st.no 1-14



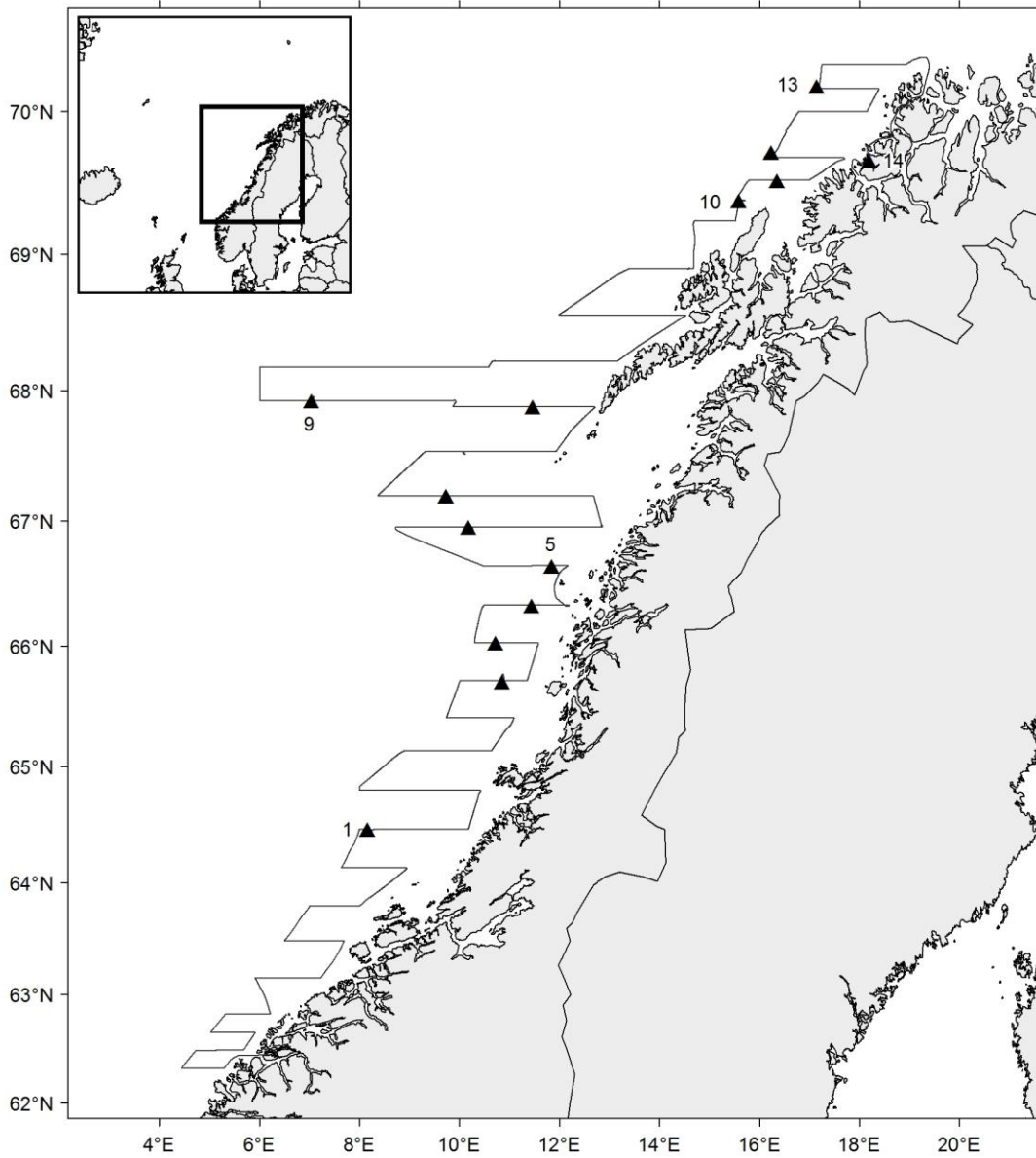
Cruise no 2016829 "Vendla"
1-31 July 2016

z CTD st.no 1-70
o Plankton st. (WP-II-net)



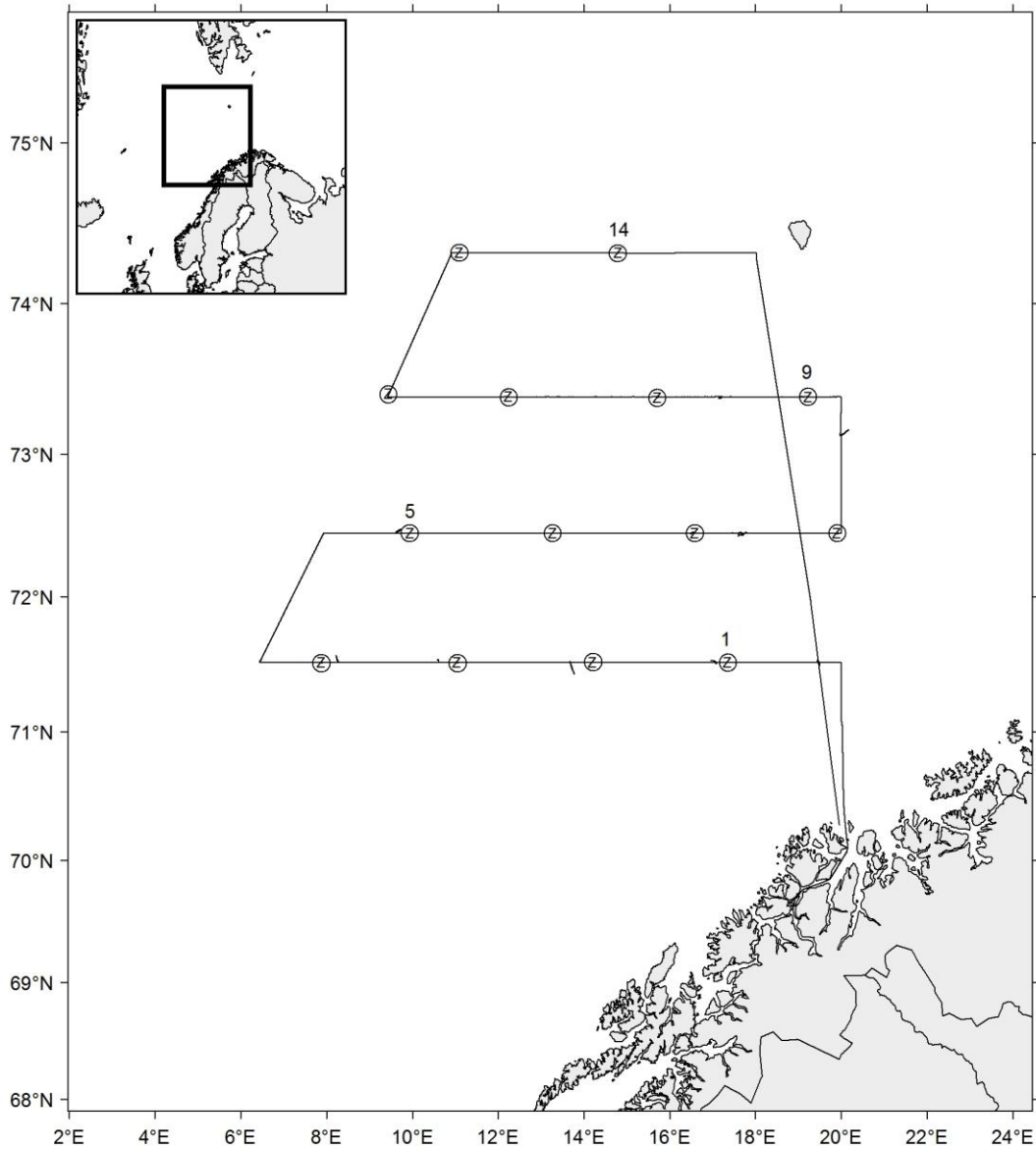
Cruise no 2016829 "Vendla"
1-31 July 2016

▲ Pelagic trawl st.no 15-105



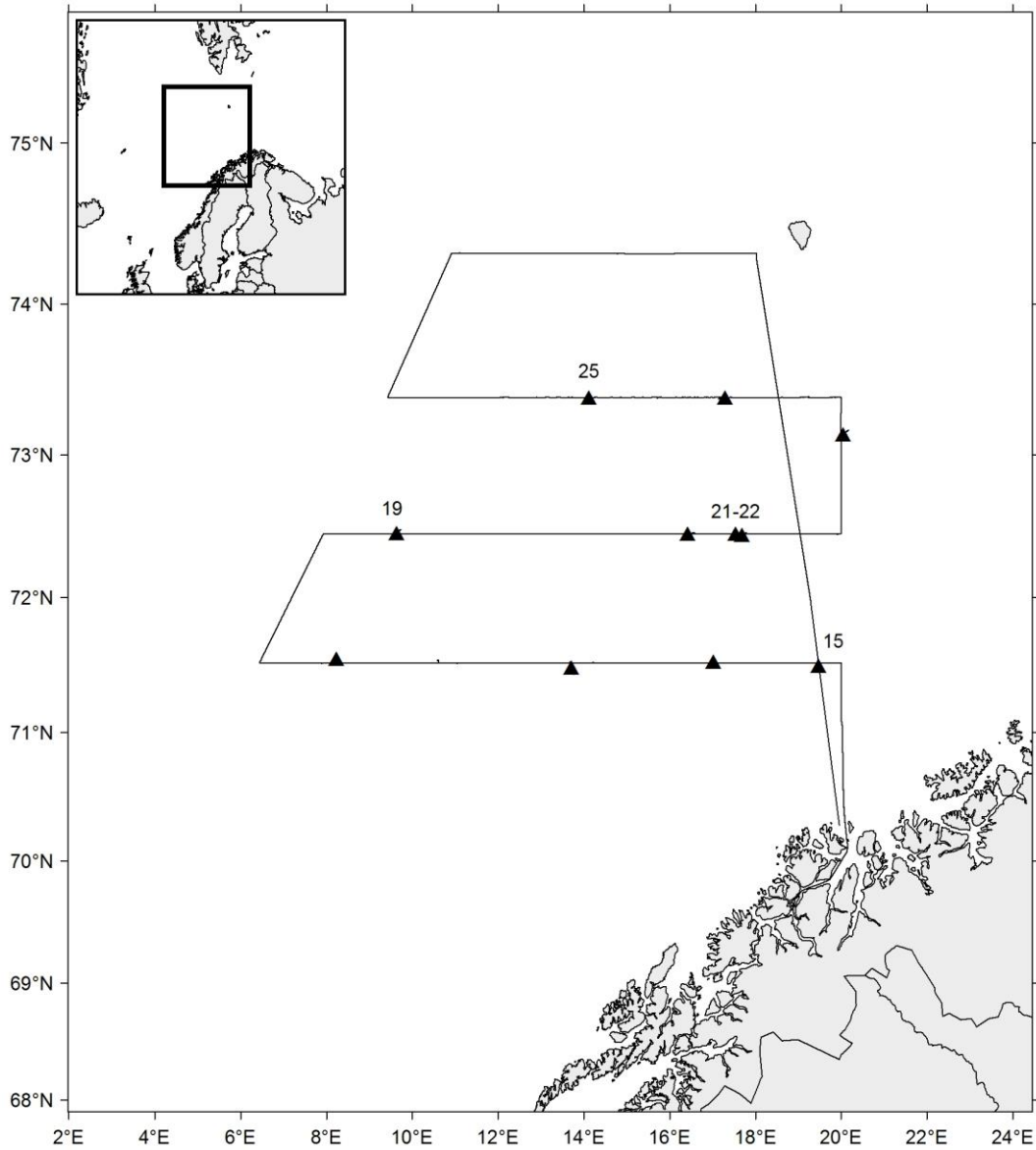
Cruise no 2016833 "M. Ytterstad"
2–12 February 2016

▲ Pelagic trawl st.no 1–14



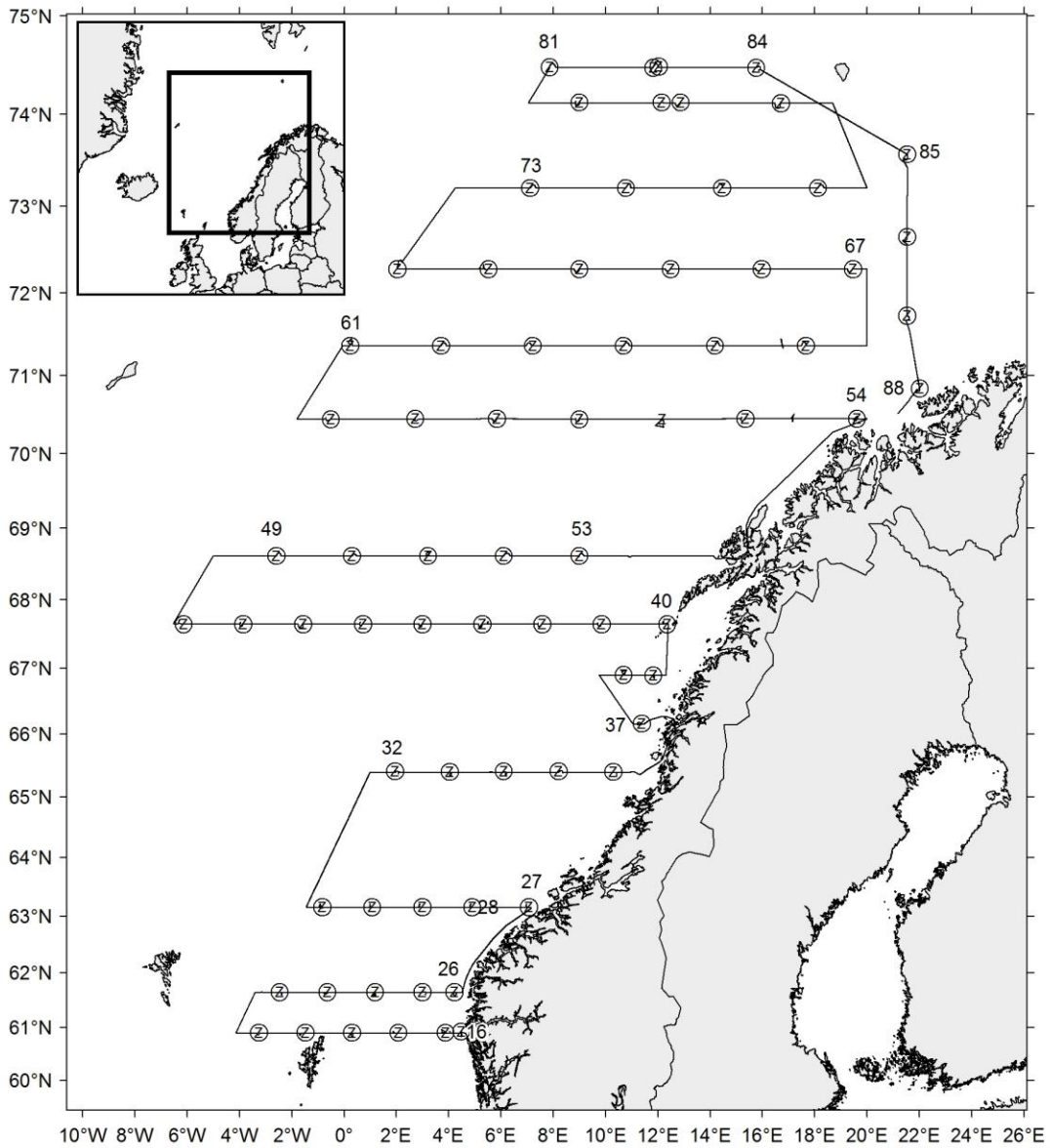
Cruise no 2016857 "M. Ytterstad" (This is part 2 of the cruise 2016205 with
3–10 June 2016 "Johan Hjort")

z CTD st.no 1–14
○ Plankton st. (WP-II-net)



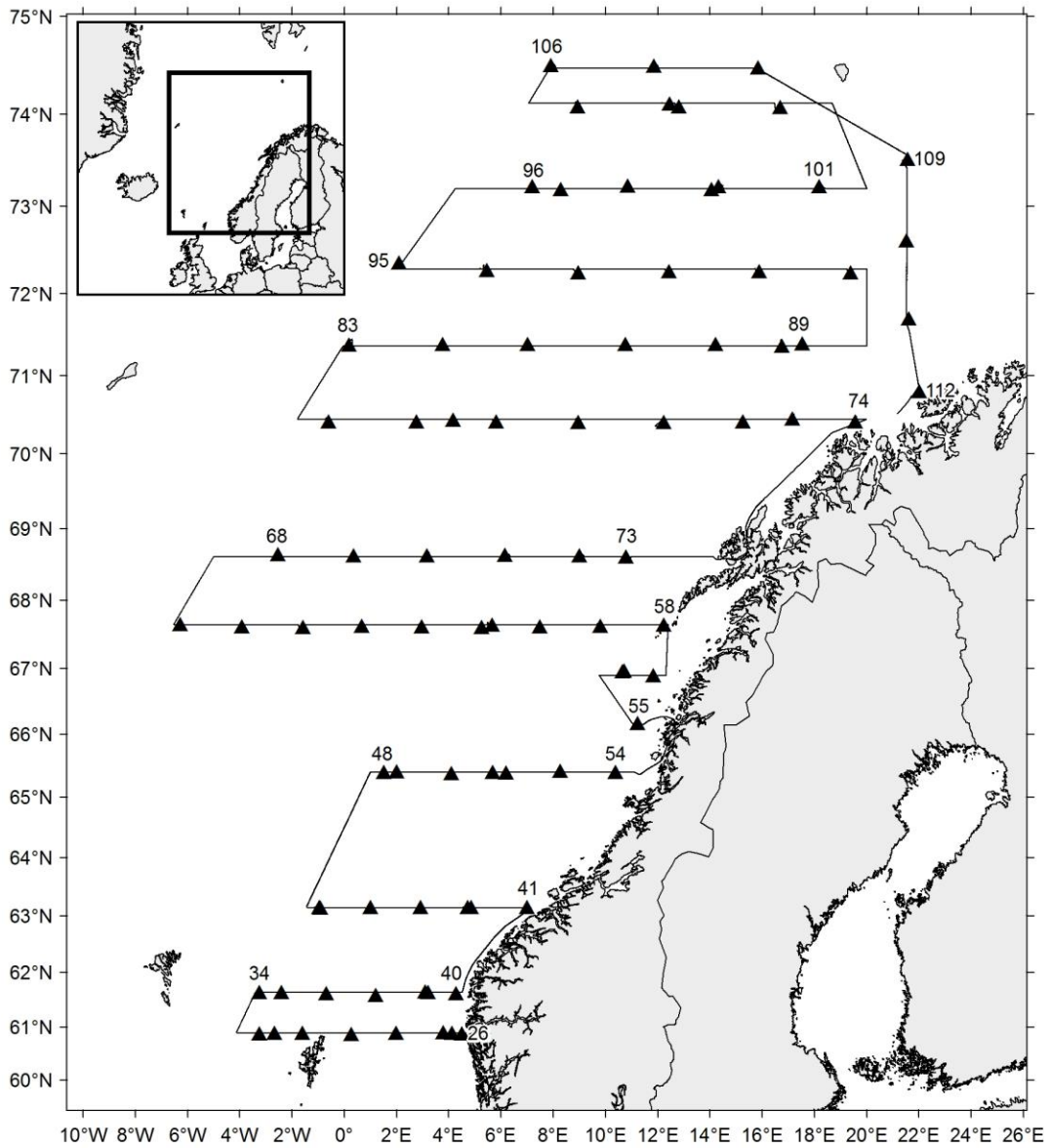
Cruise no 2016857 "M. Ytterstad" This is part 2 of the cruise 2016205 with
 3–10 June 2016 "Johan Hjort"

▲ Pelagic trawl st.no 15–25



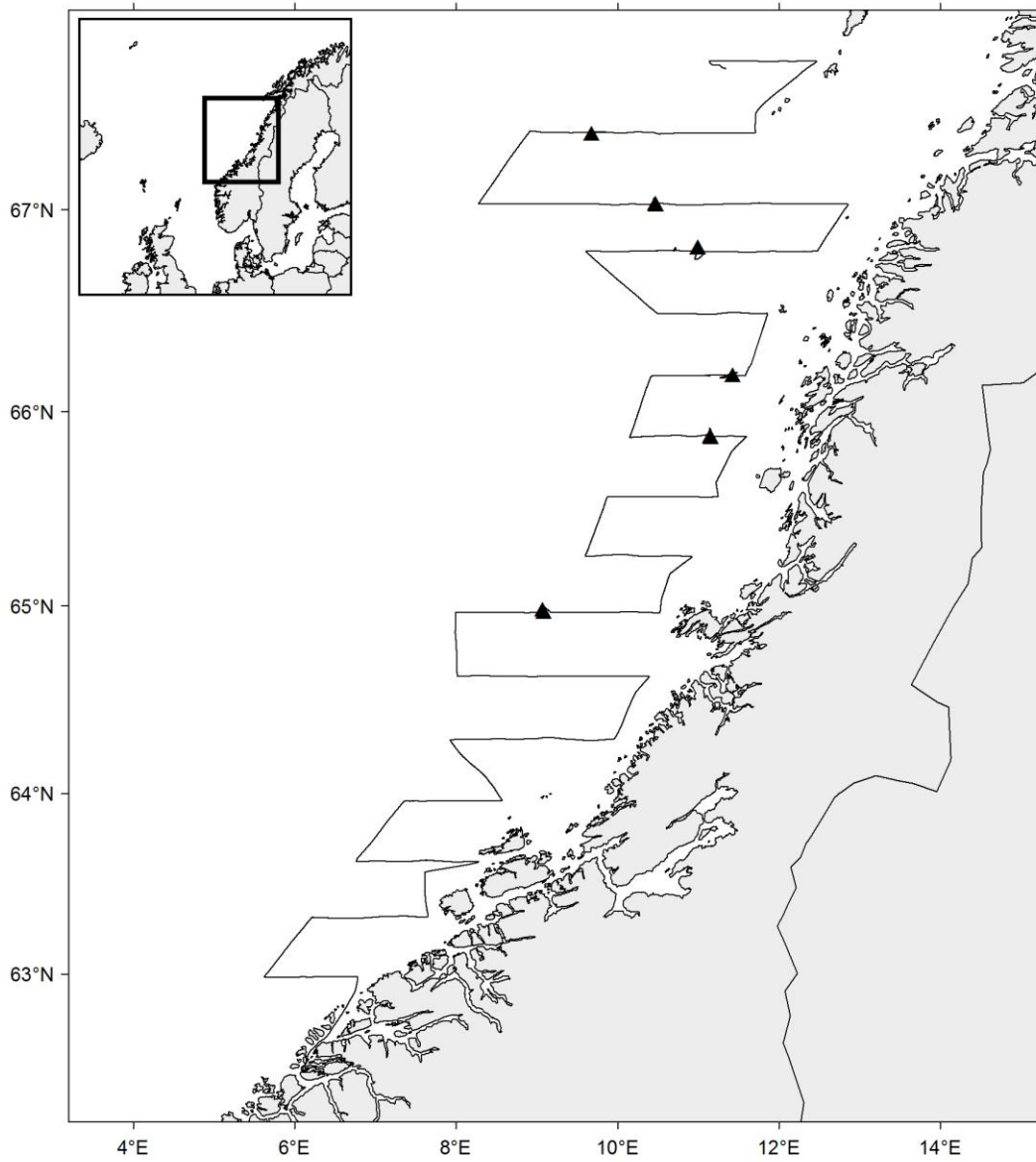
Cruise no 2016828 "M. Ytterstad"
 1–31 July 2016

z CTD st.no 16–88
 ○ Plankton st. (WP-II-net)



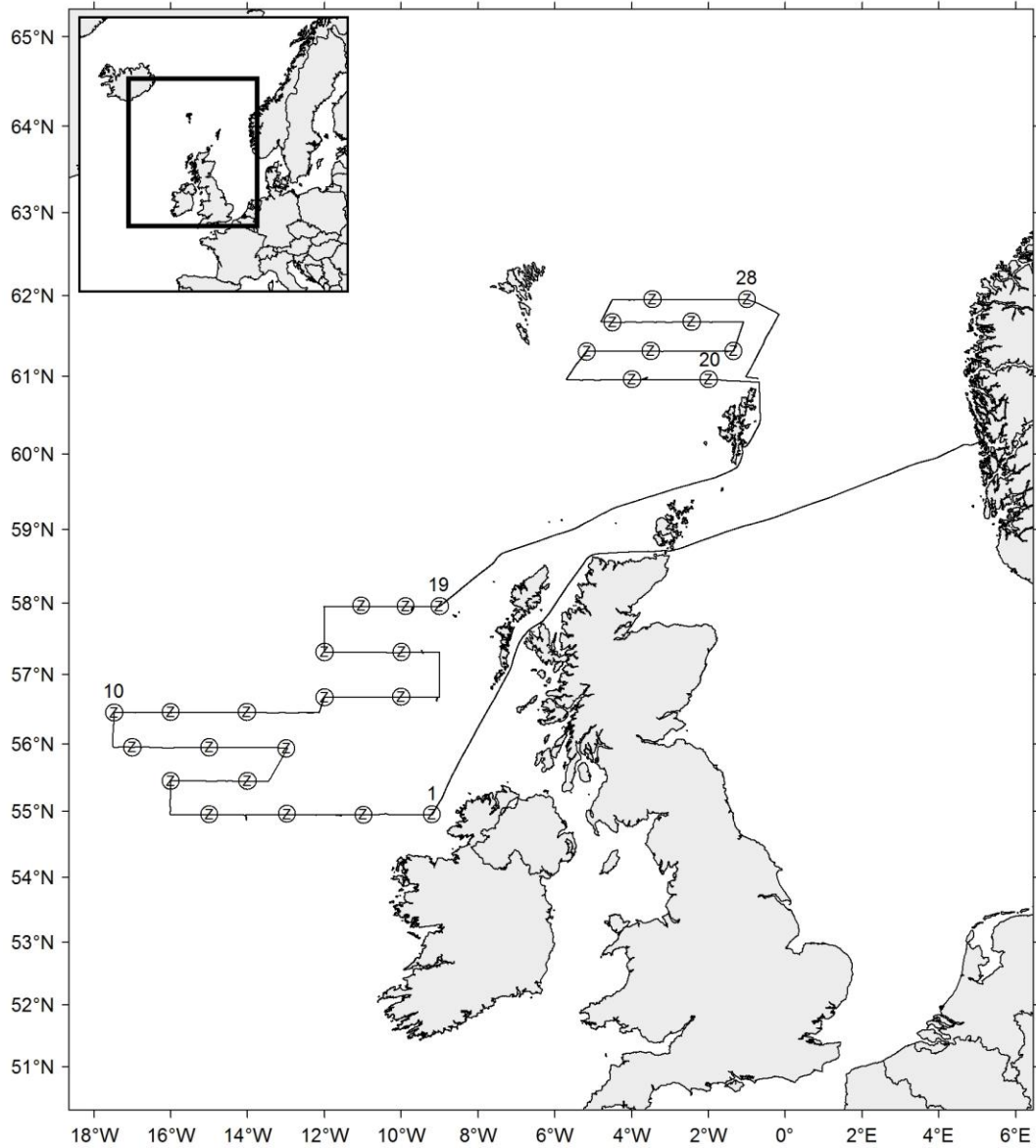
Cruise no 2016828 "M. Ytterstad"
1-31 July 2016

▲ Pelagic trawl st.no 26-112



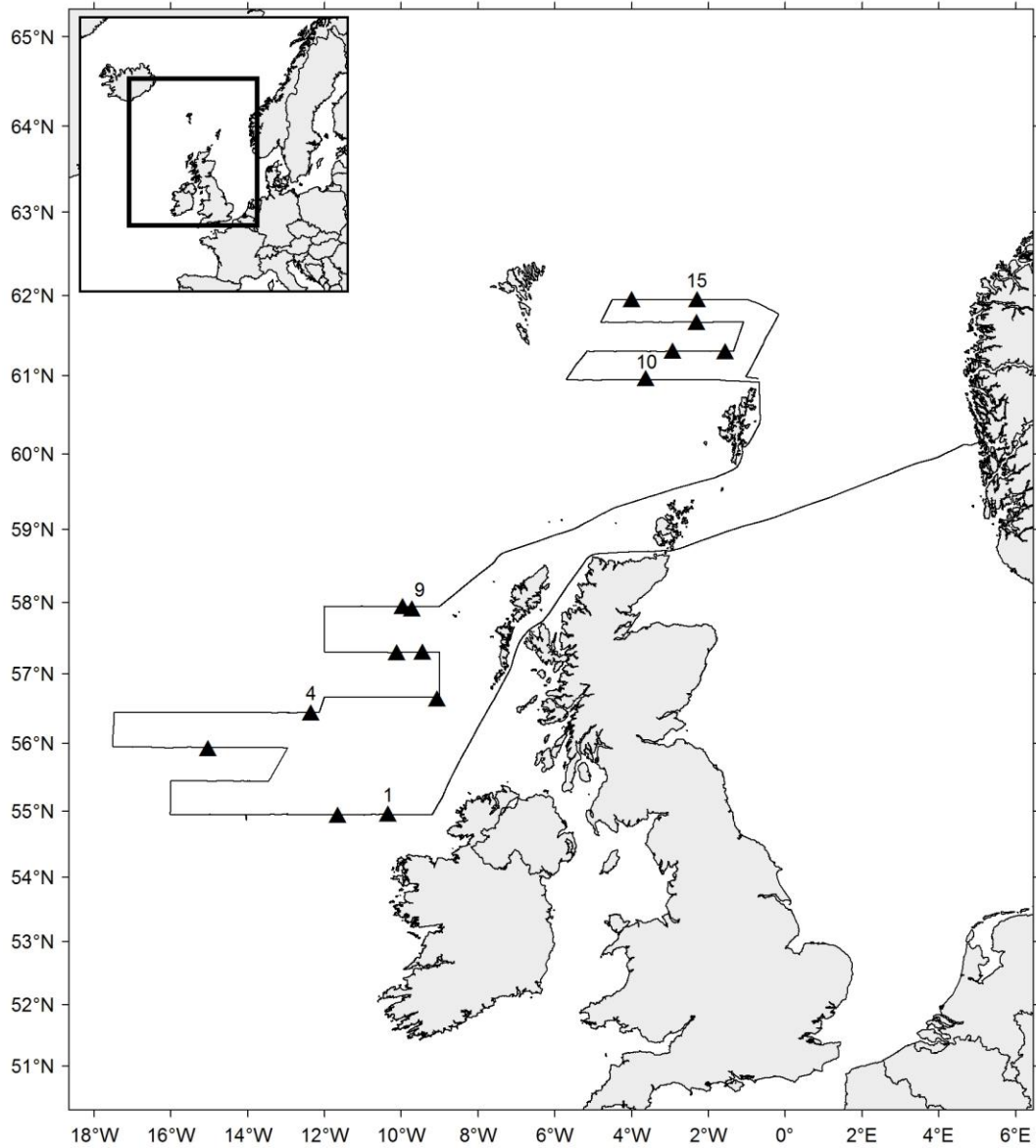
Cruise no 2016834 "Libas"
3–8 February 2016

▲ Pelagic trawl stations 1-6



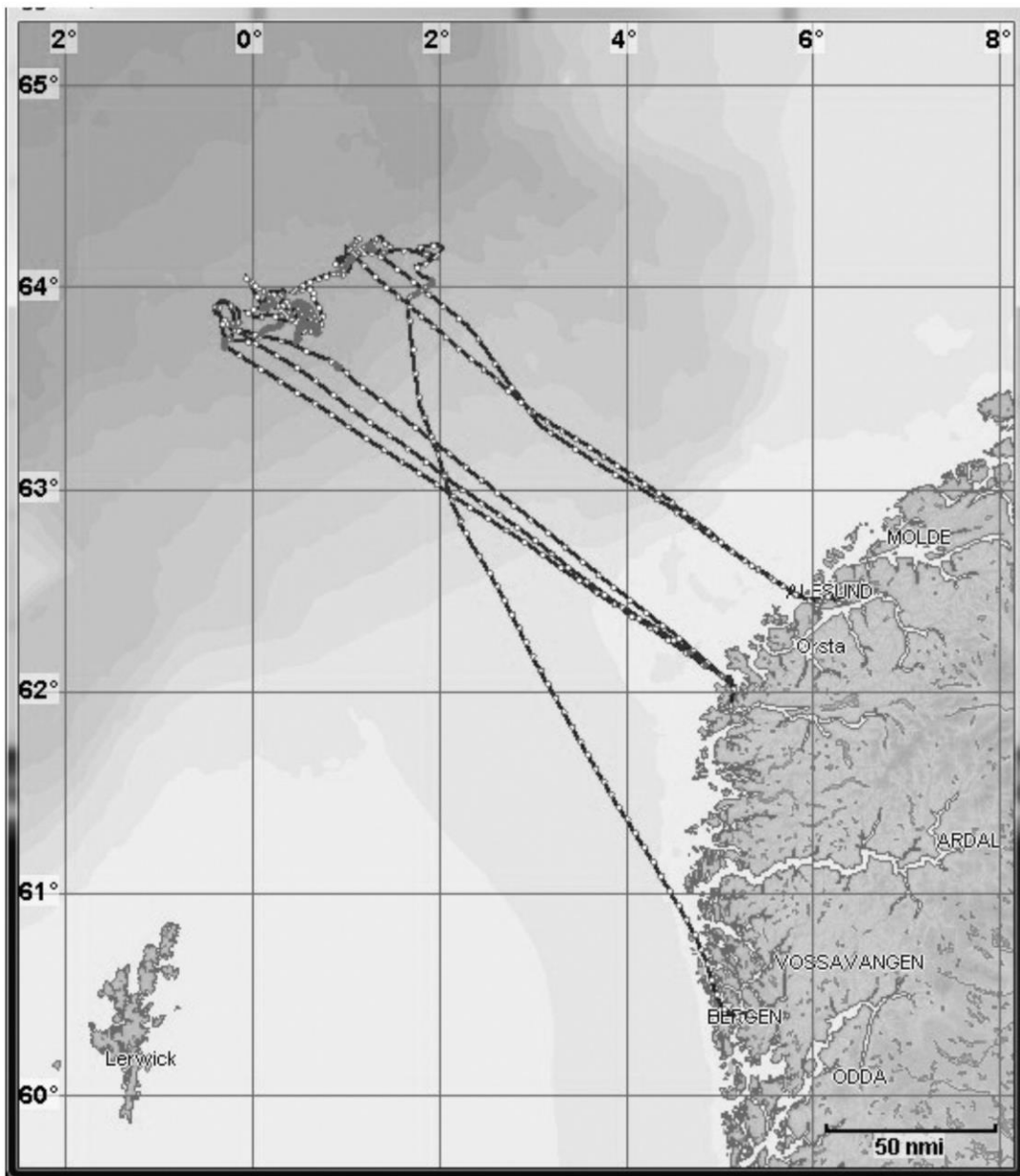
Cruise no 2016843 "Brennholm"
 21 Mar–6 Apr 2016

z CTD st.no 1–28
 o Plankton st. (WP-II-net)



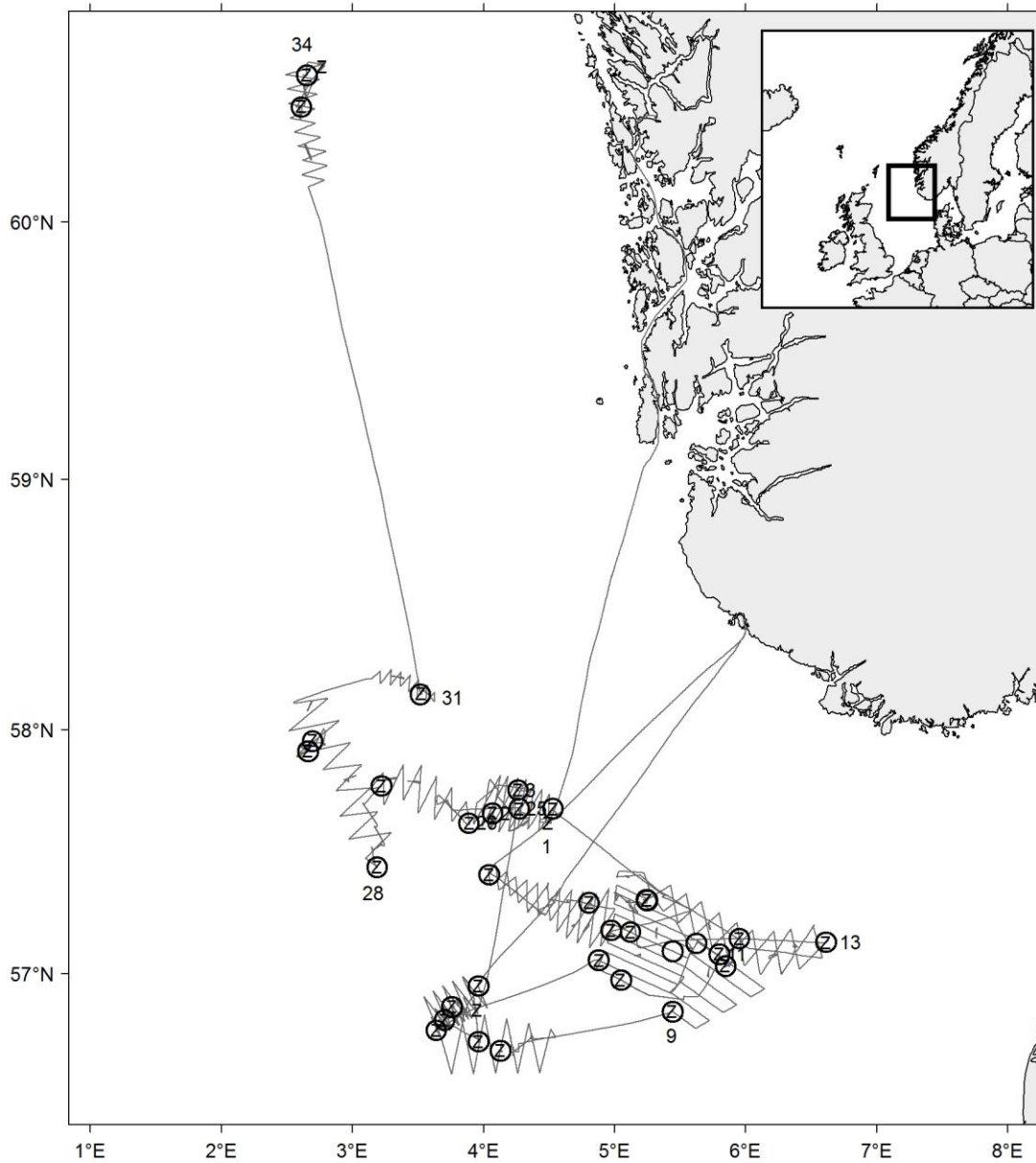
Cruise no 2016843 "Brennholm"
21 Mar–6 Apr 2016

▲ Pelagic trawl st.no 1–15



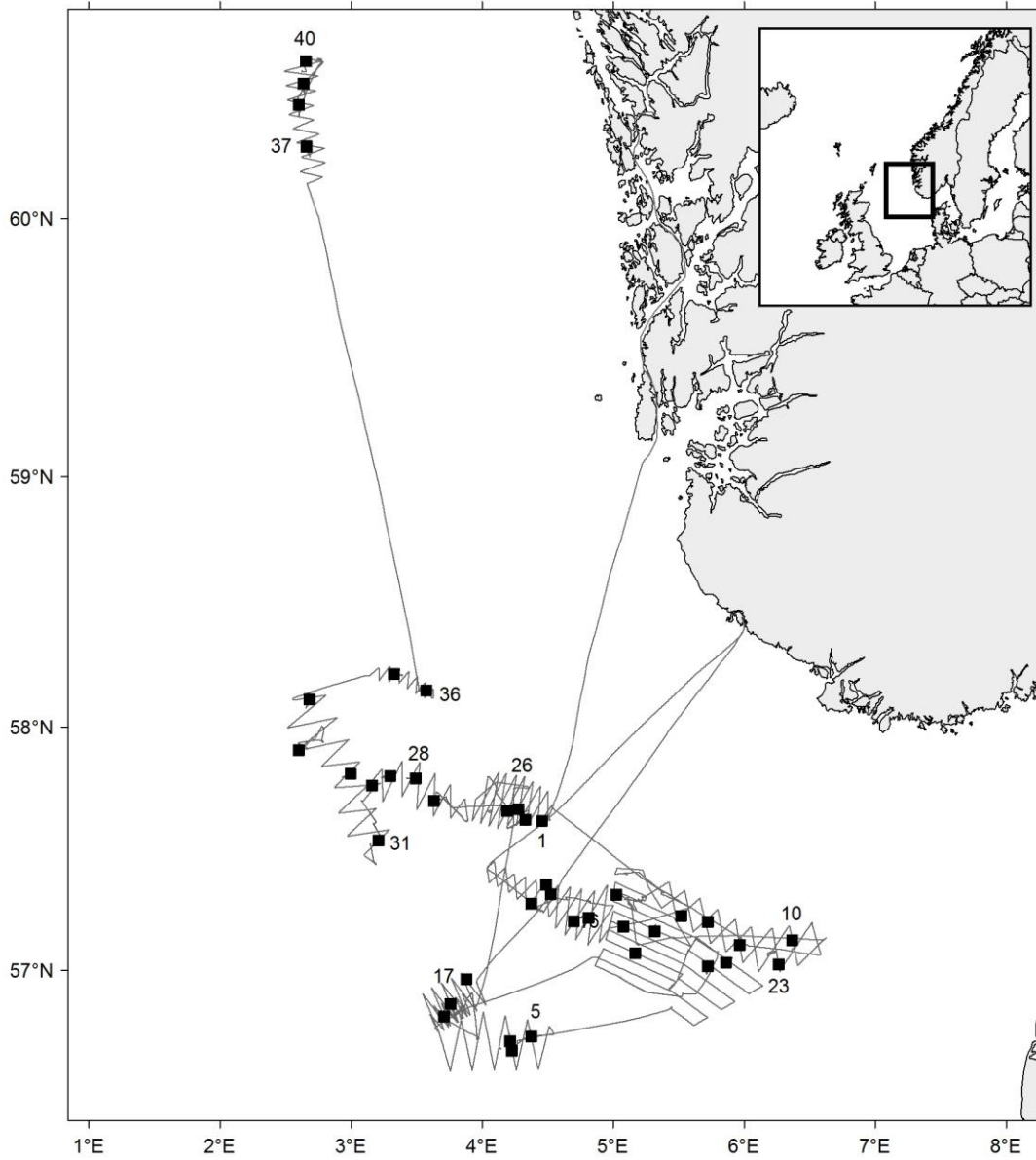
Cruise no 2016810 "Brennholm"
19 September–2 October 2016

Cruise track



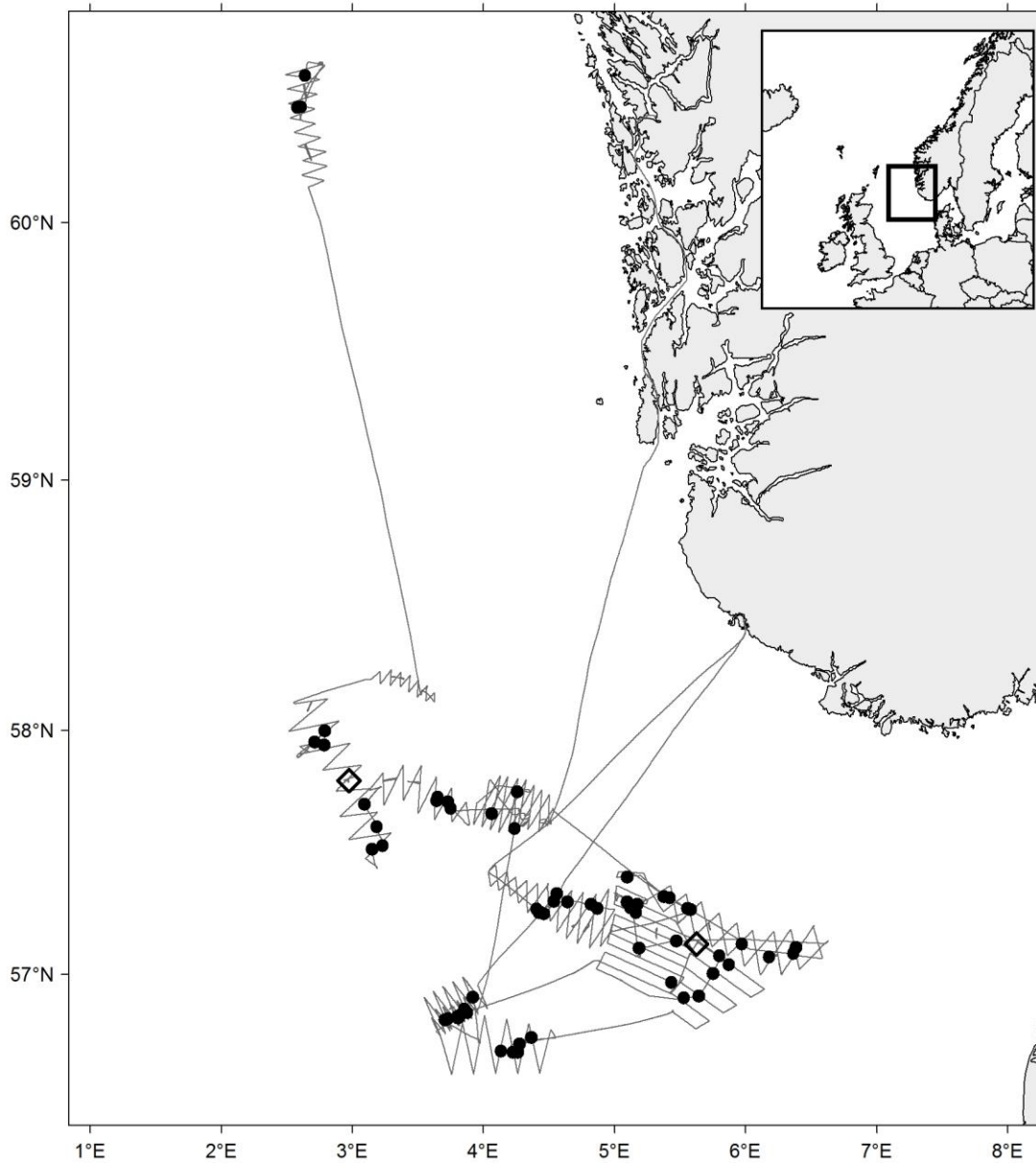
Cruise no 2016837 "Eros"
25 Apr–15 May 2016

z CTD st.no 1–34
○ Plankton st. (WP-II-net)



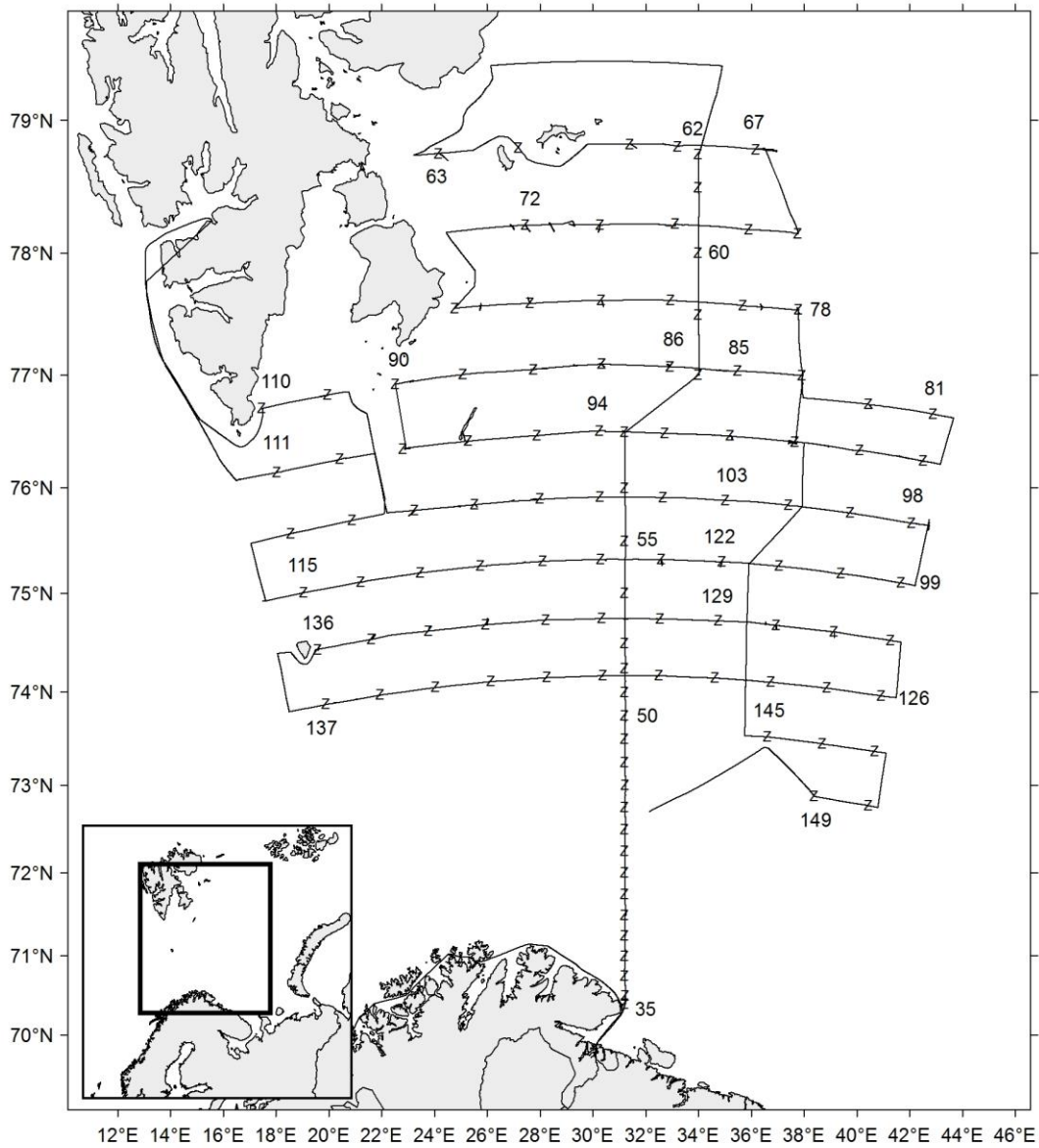
Cruise no 2016837 "Eros"
25 Apr–15 May 2016

■ Bottom trawl st.no 1–40



Cruise no 2016837 "Eros"
 25 Apr–15 May 2016

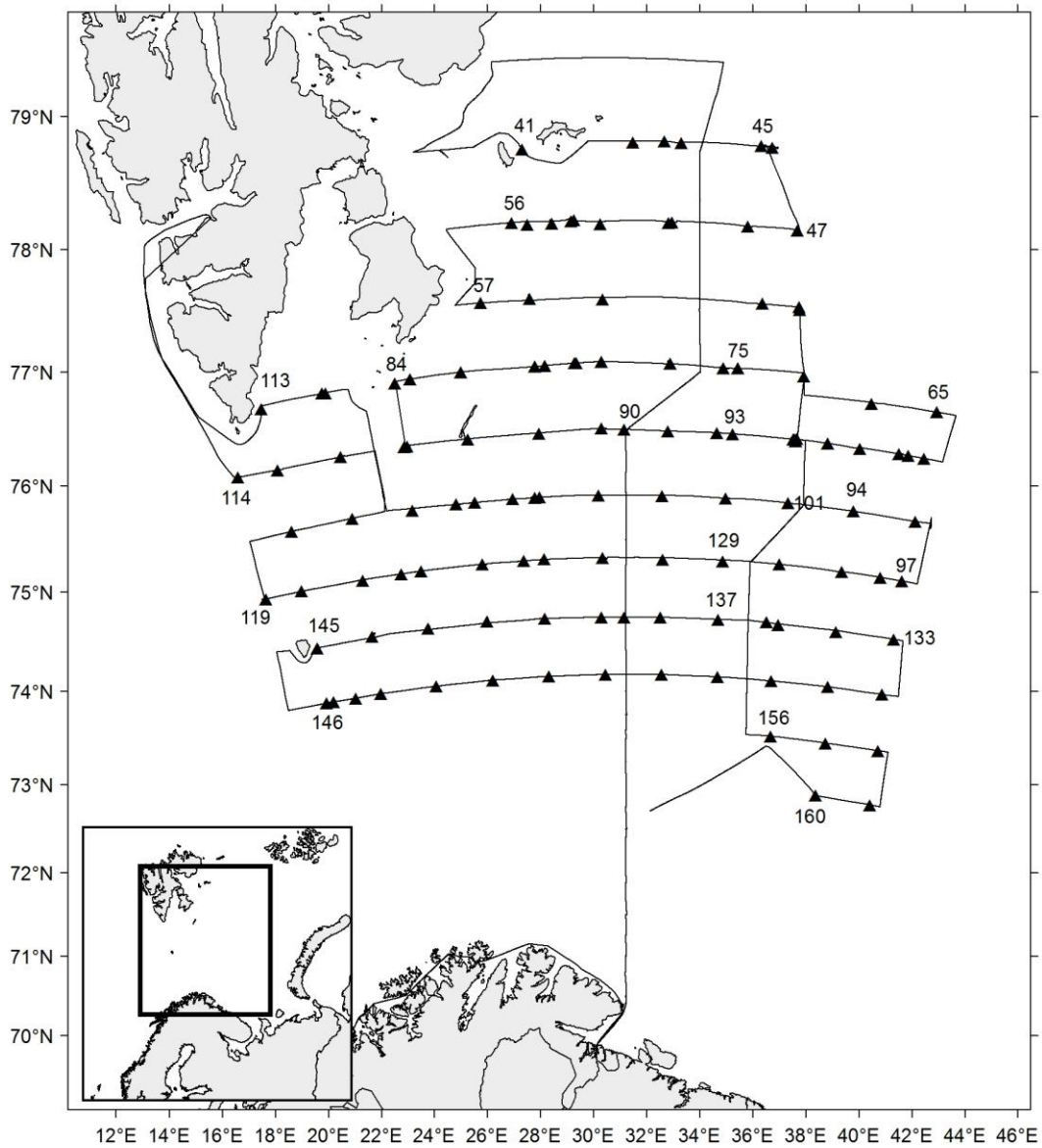
- Sledge st.
- ◆ Video st.



Cruise no 2016842 "Eros"
 17 August–20 September 2016

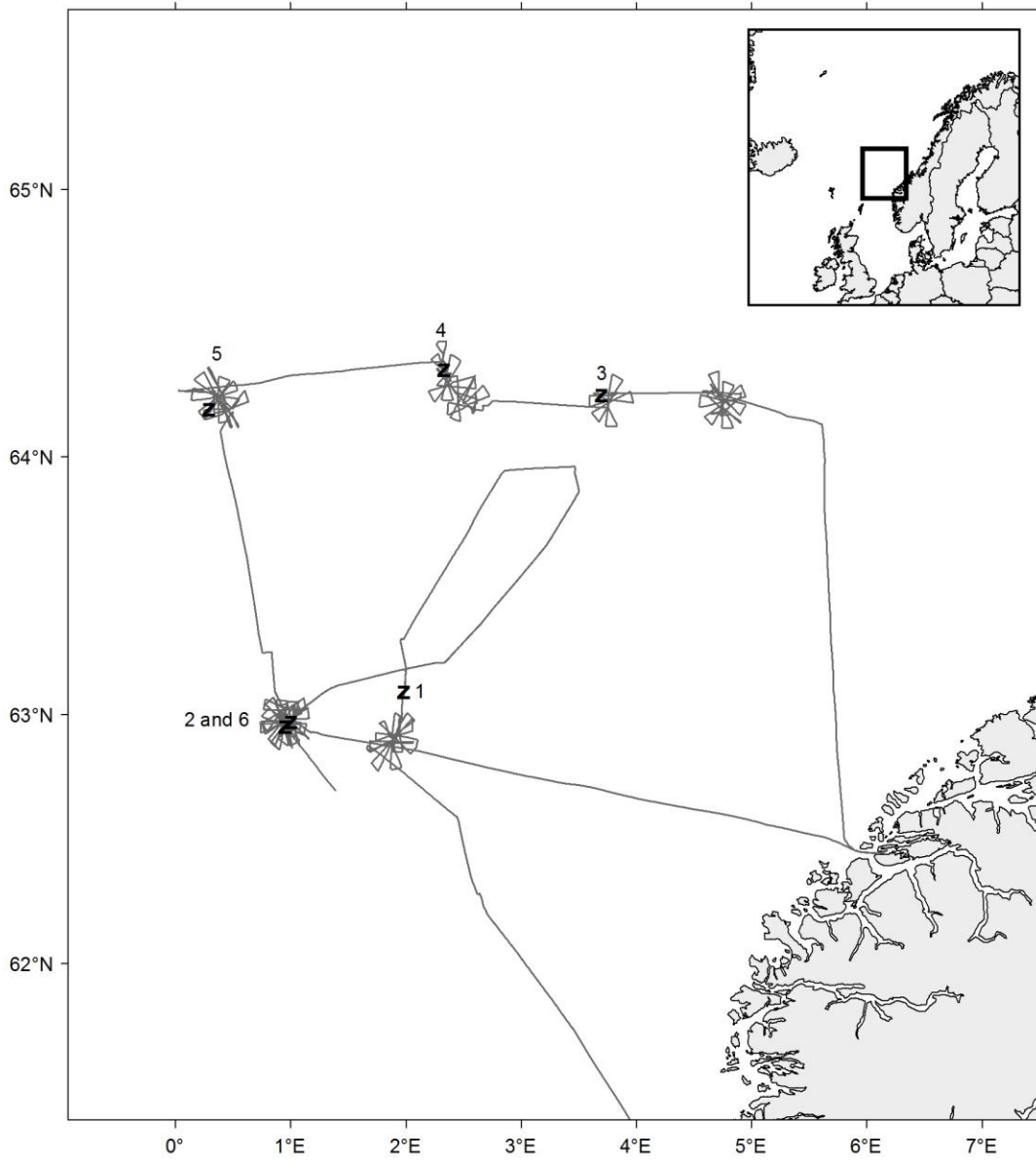
z CTD st.no 35–149
 ○Plankton st. (WP-II-net)

Standard section Vardø N: st.no 35–62



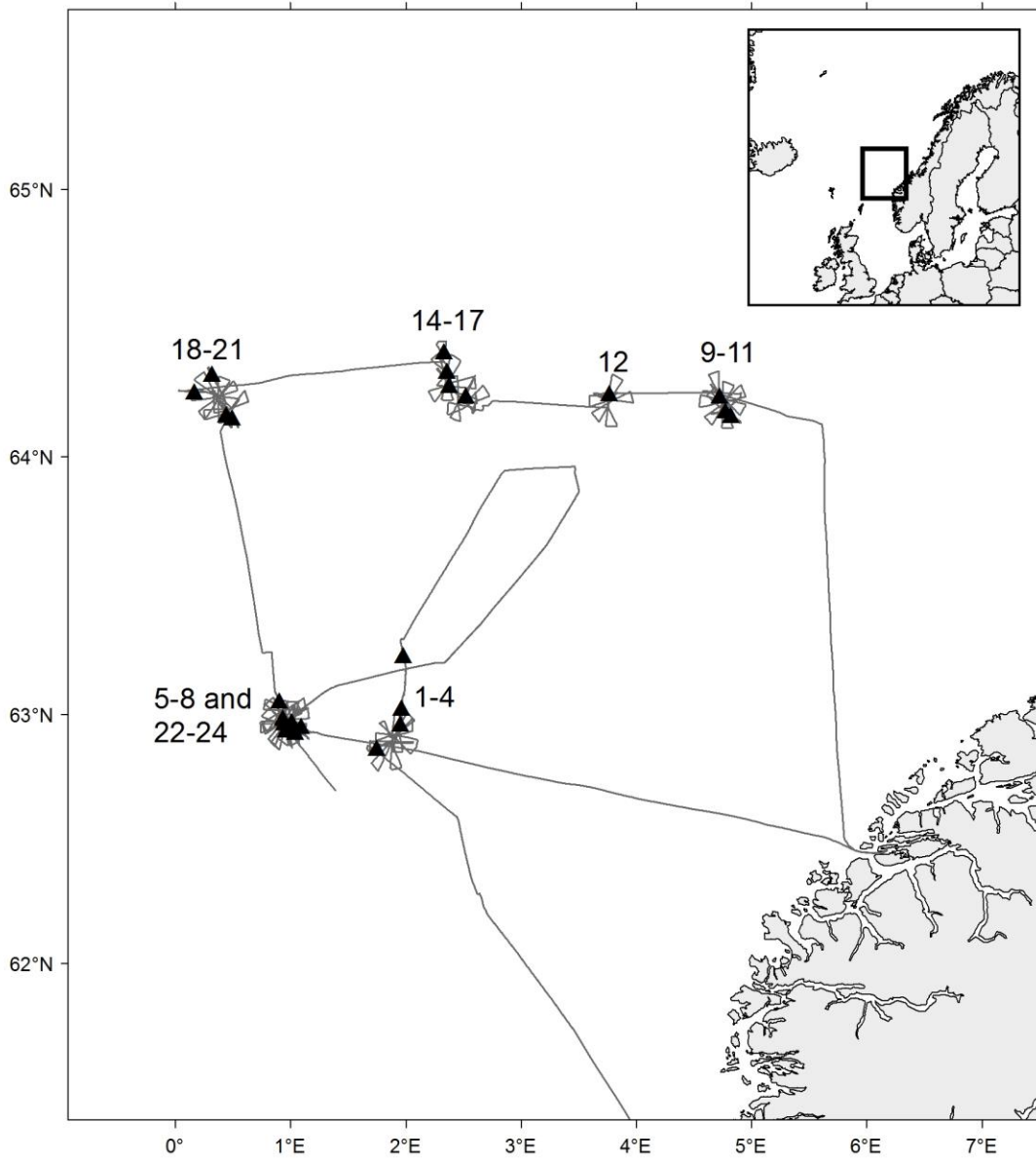
Cruise no 2016842 "Eros"
 17 August–20 September 2016

▲ Pelagic trawl st.no 41–160



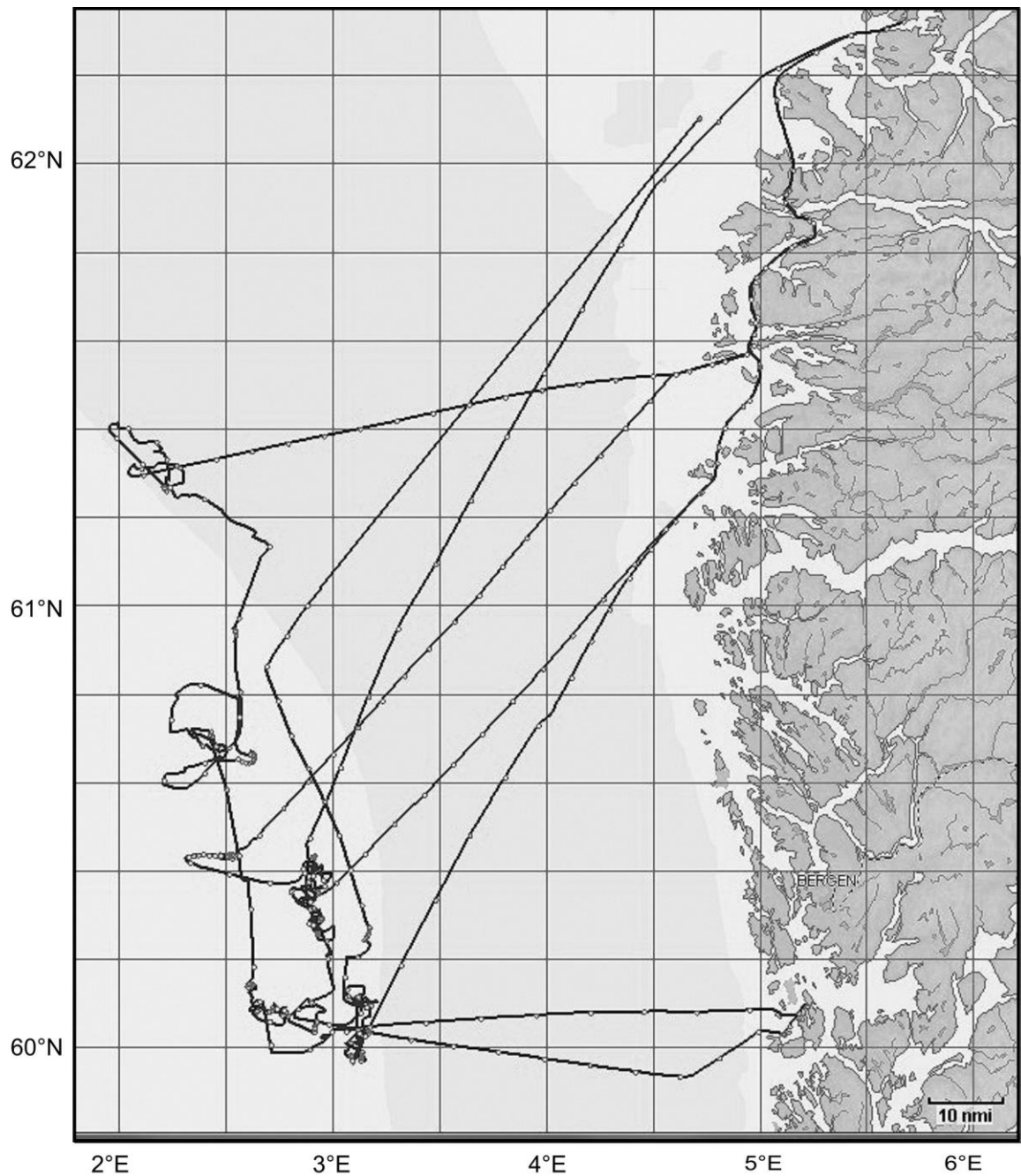
Cruise no 2016844 "Kings Bay"
2-15 May 2016

z CTD st.no 1-6



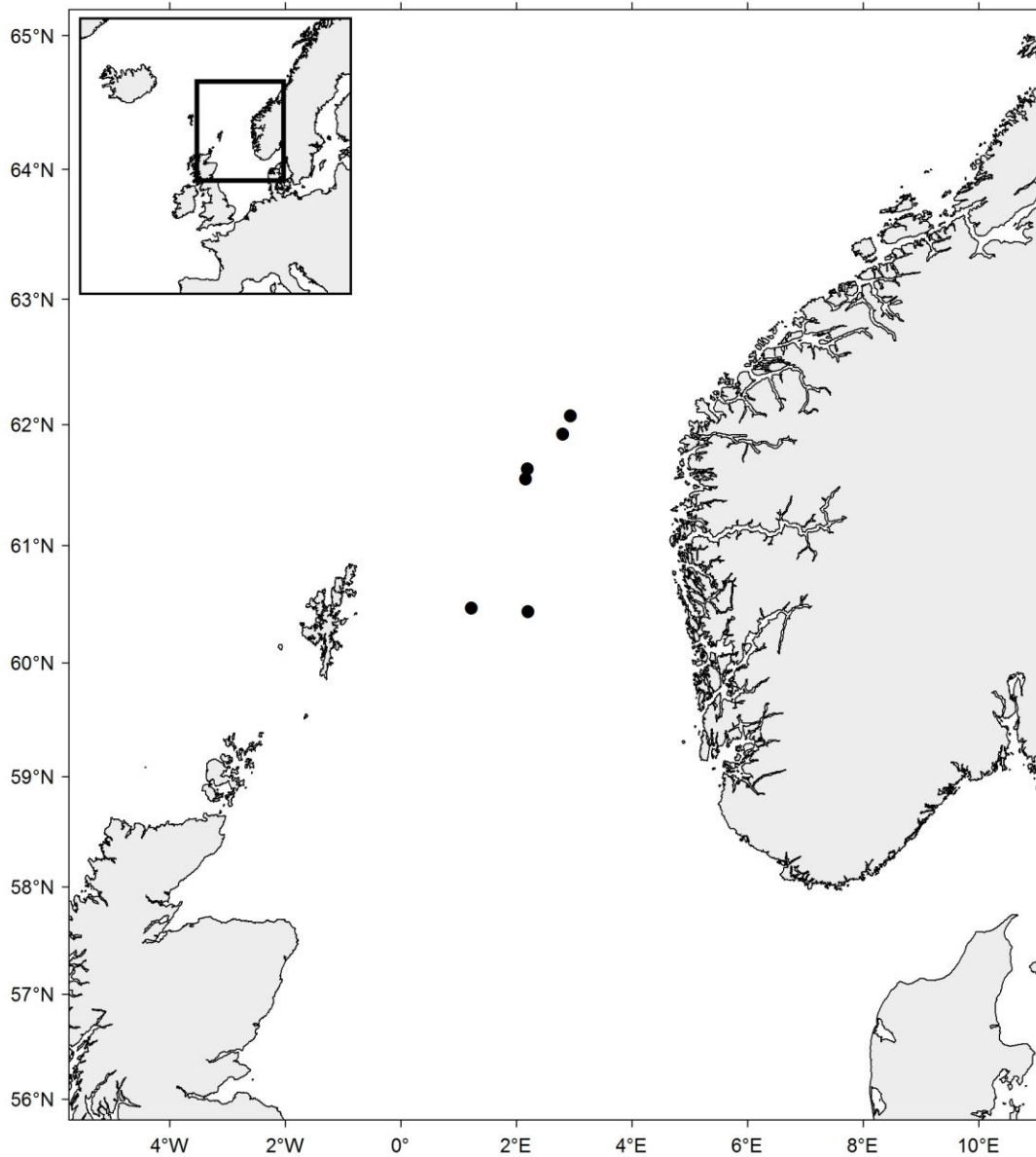
Cruise no 2016844 "Kings Bay"
2-15 May 2016

▲ Pelagic trawl st.no 1-24



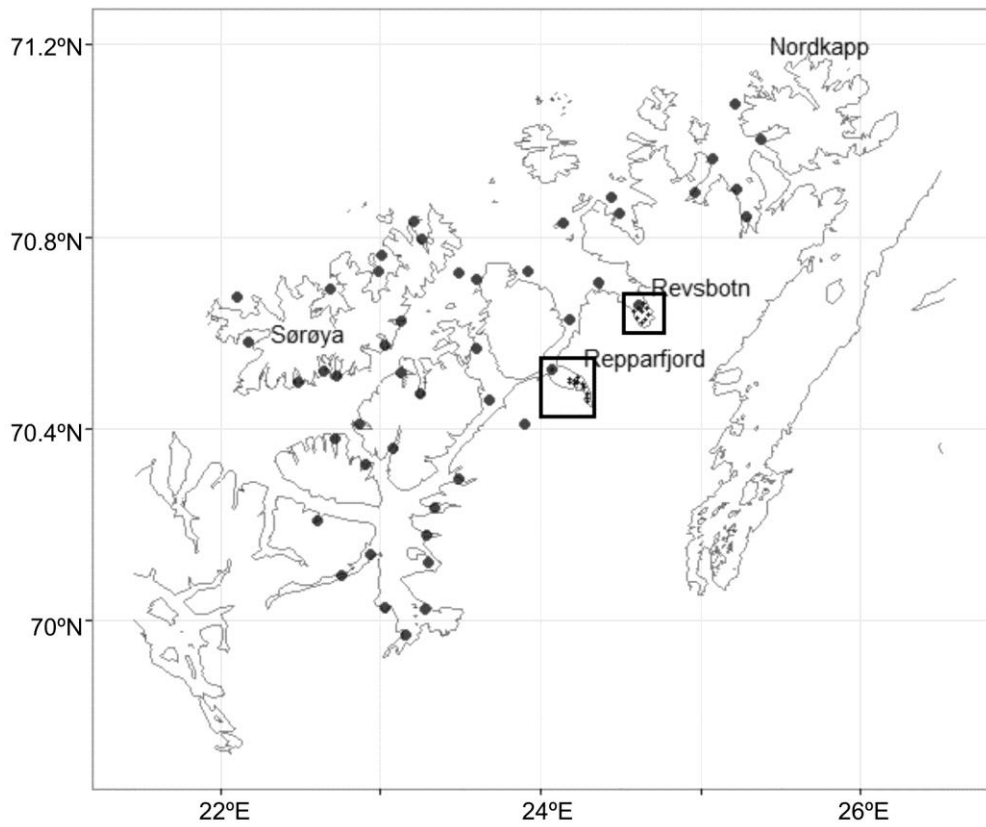
Cruise no 2016840 "Kings Bay"
6 October–17 June 2016

Cruise track and purse seine catch



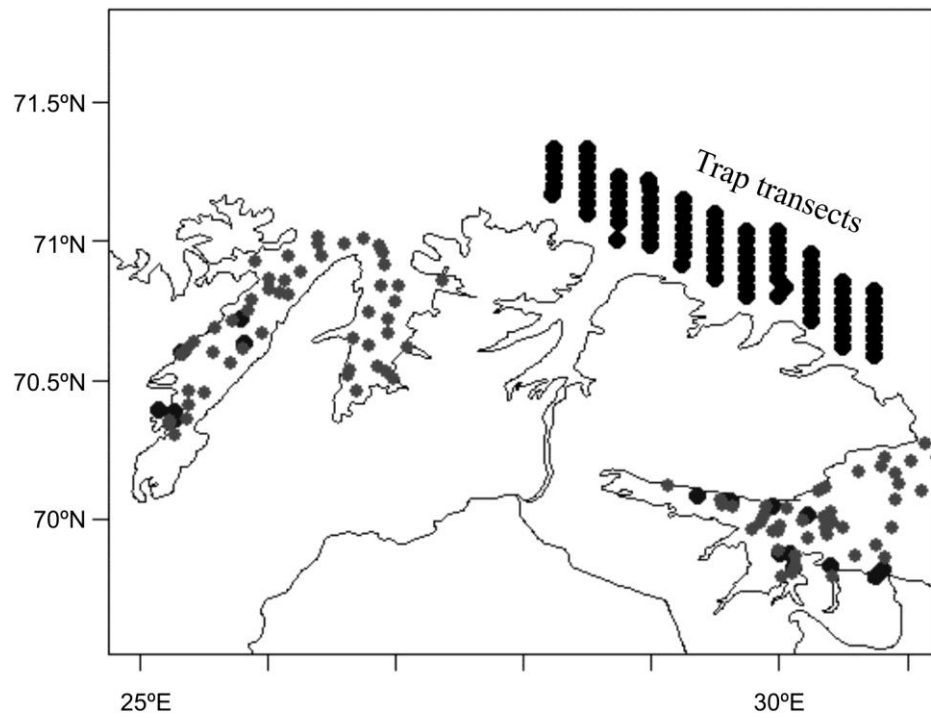
Cruise no 2016852 "Fiskebas"
6–10 October 2016

● Purse seine cast.
Net equipped with depth sensors and cameras.



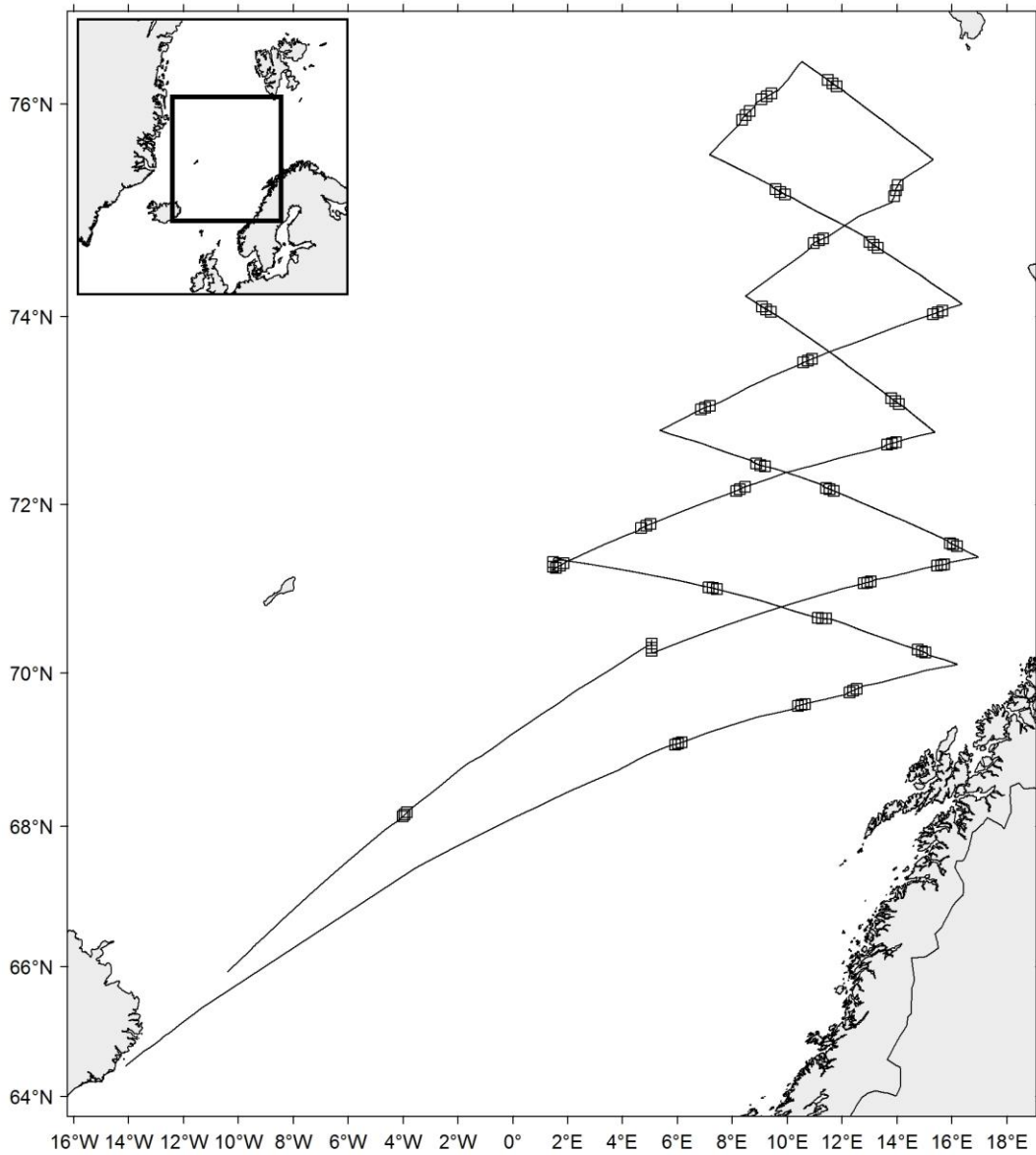
Cruise no 2016848 «Johan Ruud»
6–12 June 2016

- Trap hauls
- ☒ Two areas for egg sampling and hydrographic st.



Cruise no 2016849 «Johan Ruud»
22 August–9 September 2016

In the fjords: light dots: trawl hauls. Dark dots: trap stations
Open sea: trap transects



Cruise no 2016845 "Arni Fridriksson"
 11 August–1 September 2016

- 30 pelagic trawl stations with Gloria Trawl (multisampler).
 Towed CTD measurements. SAIV AS/SD204 attached to the pelagic fishing trawl.
 1 st. CTD profile

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